



Recommended Spare Part List



RNP DCU Plant Project (WP1)

Supplier Name:	PHB Weserhütte
SDR Code(s):	P03-A06-DO1 D01-A06, P03-A06
Equipment / Tag Number(s):	ALL
Document Title:	Recommended Spare Part List
Supplier Document No:	000951-00-0CG-LT-0003

Supplier's Revision Record

Rev	Date	Issue State	By	Checked	Approved
7	24/10/2019	Cover update	SDV	Margarita P	JL Moral
6	13/07/2019	As per comments	Javier A	Margarita P	JL Moral
5	28/06/2019	As per comments	Javier A	Margarita P	JL Moral
4	03/06/2019	As per comments	Javier A	Margarita P	JL Moral
3	29/03/2018	General updates	Javier A	Margarita P	JL Moral
2	12/12/2018	General updates	Javier A	Margarita P	Michel F
1	30/10/2018	General updates	Javier A	Margarita P	Michel F
0	10/07/2018	First submission	Javier A	Margarita P	Michel F

Project Document Number

Project Number		Purchase Order Number		Seq. No.	Project Rev.
172784	-	0300-001	- SD -	000006	6

SUPPLIER DOCUMENT REVIEW STATUS

Purchaser's review of Supplier's documents does not relieve Supplier of the responsibility for correctness under the Purchase Order. Permission to proceed does not constitute acceptance of design, detail and calculations, test methods or materials developed or selected by the Supplier and does not relieve the Supplier from full compliance with the Purchase Order or any other obligations, nor detract from any of the Purchaser's rights.

Purchaser's Review Stamp

CB&I RNP DCU Plant Project No. 172784		 By: CHARLOTTE.PA RRA Date: 10/31/2019
Engineering Review Status Code 1 - No Comments	<small>These comments do not relieve the supplier of his responsibility to meet the requirements of the PO.</small>	

Should the Supplier consider that any comments made by the Purchaser change the Scope of Supply, the Supplier shall advise the price and delivery implications of such changes within five working days of receipt. The Supplier must not incorporate such changes without prior approval of the Purchaser of the revised price and/or delivery period. RETROSPECTIVE CLAIMS WILL NOT BE CONSIDERED.

The document consists of this front sheet
plus 63 pages.

SPARE PARTS & INTERCHANGEABILITY RECORD

Instructions for Completion

1 INTRODUCTION

The SPIR workbook file is a formatted spreadsheet file made in Microsoft's Excel and contains four different worksheets: AUTHORISATION, EQUIPMENT LIST, SPIR and SUMMARY.

- 1,1 AUTHORISATION - This single sheet shows the total cost resulting from the recommendation or authorisation by the parties involved. By signing and dating a hard copy of this sheet (after completing the workbook), SELLER, PURCHASER and OWNER each successively endorse their input.
- 1,2 EQUIPMENT LIST - All tagged parent equipment is entered in this worksheet.
- 1,3 SPIR 1A-1L (and SPIR 2A-2L, etc) - This part of the workbook contains the actual Spare Parts & Interchangeability Record. The parts data are entered in this list.
- 1,4 SUMMARY - This sheet summarises the total quantities of installed parts from the preceding SPIR sheets allowing SELLER, PURCHASER and OWNER to enter their recommended/authorised quantities of Two Year Operating Spare Parts.
- 1,5 DEFINITION OF SPARE PART CATEGORIES:

TWO YEAR OPERATING SPARE PARTS Are parts required to maintain equipment in satisfactory working order during the first two (2) years of operation.

2 INSTRUCTIONS FOR COMPLETION

Just the yellow-shaded cells are intended for SELLER's input. Data only have to be entered once, Excel copies the data to other sheets where necessary. Start with the Authorisation sheet, then the Equipment List, the SPIR sheet(s) and the Summary sheet as last.

- 2,1 AUTHORISATION - complete by inputting:
SELLER's data: reference, name & address etc., currency, date of submission of the recommendation and name of authorized contact person.
 - 2,2 EQUIPMENT LIST - complete by inputting:
Equipment data: QTY, tag no., model and serial number.
 - 2,3 SPIR sheets - complete by inputting:
Parts data: the number of installed Parts per single unit of Equipment, unit of measure, description, drawing number, part number and (sub)manufacturer's part number.
- !! Interchangeability may only be assessed if a part figures just once on the list. All parts are input in SPIR sheet 1A-1L. Excel copies the parts data to the other sheets SPIR 2A-2L, SPIR 3A-3L etc. in case the number of equipment items exceeds 12.
- !! For bought-out items, the original component manufacturer's unique part number must be input as well. This identification is an indispensable tool for OWNER's management of spare parts.
- !! In case of packaged (skid-mounted) equipment, containing large sub-assemblies from sub-suppliers, it is advisable to make separate SPIRs for each sub-assembly (or have the SPIRs completed by the sub-suppliers themselves)

SPARE PARTS & INTERCHANGEABILITY RECORD

2,4 SUMMARY sheet - complete by inputting:

SELLER:

- Recommended number of Two Year Operating Spare Parts as well as unit price and delivery time.

PURCHASER:

- Recommendation for number of Two Year Operating Spare Parts.

OWNER:

- Required number of Two Year Operating Spare Parts.

!! Pricing should include all costs for labeling (identification of the spare parts), packing, marking, and delivery on the basis of FCA Supplier's works including shipping documents.

!! Packing must be suitable for two years storage as a minimum. Any special storage requirements are also to be included in SELLER's offer.

3 AFTER COMPLETION OF THE SPIR FORM

3,1 The Authorisation sheet will now show the total cost resulting from SELLER's recommendation. Return the completed file by E-mail to the spare parts coordinator.

3,2 The relevant assembly or cross sectional drawings referenced in the SPIR as well as any related standard parts lists, are to be submitted with the SPIR.

3,3 The recommendation and selection of spare parts is to be the balanced result of input by SELLER, PURCHASER and OWNER. The final version of this SPIR will contain all spare parts and equipment related data as well as the historical data on who recommended / selected / purchased what and when.

3,4 It goes without saying that the quality of the data should be such as to allow the SPIR to be used as scope of supply for the Spare Parts Purchase Order and as input for OWNER's Maintenance Management System.

3,5 Contact the spare parts coordinator for any support you may require to complete the SPIR file.

4 CONTACT DETAILS SPARE PARTS COORDINATOR

CB&I
Holandská 8
639 00 Brno
Czech Republic

Spare Parts Coordinator:

Tel : To be advised
Fax : To be advised
E-mail : To be advised

SPARE PARTS & INTERCHANGEABILITY RECORD

Client : NIS		Always refer to this number :
Plant : RNP DCU Plant Project (WP1)		172784 - 0300-001-SD-000006
Location : Pancevo, Serbia		(project number) (spir number)
Equipment :	Rev.: 4	Date: 13-ago-19
SELLER'S DATA		
SELLER's Ref. Nr : 000951-00-0CG-LT-0003		
Company : PHB WESERHÜTTE S.A.U		
Address : ADA BYRON 220		
Zip/City : 33203 GIJON		
Country : SPAIN		
Contact person : MARGARITA PEREZ	E-mail : margarita.perez@pwh.es	
Tel. number : +34 984 49 56 71		
Fax number :		

A U T H O R I S A T I O N

RECOMMENDATION BY SELLER:		CURRENCY
1. TWO YEAR OPERATING SPARE PARTS :		555.535,00
DATE :	SIGNATURE :	NAME :
13-ago-19		JAVIER ALLER

REVIEW BY PURCHASER:		
1. TWO YEAR OPERATING SPARE PARTS :		
DATE :	SIGNATURE :	NAME :

REVIEW & AUTHORISATION FOR PURCHASE BY CLIENT:		
1. TWO YEAR OPERATING SPARE PARTS :		
DATE :	SIGNATURE :	NAME :

PURCHASER	Contact person : To be advised Direct telephone : To be advised Fax : To be advised E-mail : To be advised
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EQUIPMENT LIST

[illegible]

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

EQUIPMENT

ITEM	QTY	TAG NUMBER(S)	MODEL	SERIAL No.(s)	DESCRIPTION	ALWAYS REFER TO THIS NUMBER : 172784 - I-SD-000006 (project number) (spir number)	
1A	1	SP-5304	SP-5304	000951-TT-01-0600	HOPPER		
1B	1	SP-5307	SP-5307	000951-EX01	BELT FEEDER	Rev. :	4 Date : 13-ago-19
1C	1	SP-5315	SK 16.15 BD / 220MEC54/M	S1802009.1/ M9991	MAGNETIC SEPARATOR	Plant :	RNP DCU Plant Project (WP1)
1D	1	SP-5305	COB 24"-36"-003	20188001	CRUSHER	Location :	Pancevo, Serbia
1E	1	SP-5601	TKDE 650/300 Ex2D	2042	METAL DETECTOR	Equipment :	.....
1F	1	JD-5601A	JD-5601A	000951-TR-01	BELT CONVEYOR	Seller's Ref. :	000951-00-0CG-LT-0003
1G	1	VX-5601	BEP 06 / VX-5601	50-V127071A01	BELT SCALE	Seller :	PHB WESERHÜTTE S.A.U
1H	1	JD-5601B	JD-5601B	000951-TR-02	BELT CONVEYOR	Tel. number :	+34 984 49 56 71
1I	1	SP-5321	GKC-SH4 Ex	7101210	HOIST FOR SEPARATOR		
1J	1	JD-5601C	JD-5601C	000951-TR-03	TUBE CONVEYOR		
1K	1	JD-5602	JD-5602	000951-TR-04	FEED CONVEYOR		
1L	1	FC-5601A	FABRIPULSE-EV 12-10	118801-EV	DUST COLLECTOR A		

PARTS

	QUANTITY OF INSTALLED PARTS PER SINGLE UNIT OF EQUIPMENT :												NO. OF INSTALLED PARTS IN 1A to 1L	UNIT OF MEASURE	DESCRIPTION	DRAWING No.	PART NUMBER			REMARKS
																	SELLER'S	MANUFACTURER'S	OWNER'S	
1																				
2		2				2		2		7	2		15	PC	INSTRUMENTS	172784-0300-001-SD-000114	LHPEw-10/1-B-EX	TAEX		
3		4				4		4		4	4		20	PC	POSITION SWITCH	172784-0300-001-SD-000114	LHPEw-10/2EX-L50V	TAEX		
4		1				1		1		1	1		5	PC	LEVEL SWITCH	172784-0300-001-SD-000114	VEGACAP 62 CP62	VEGA		
5		1										1	2	PC	LEVEL SWITCH	172784-0300-001-SD-000114	VEGACAP 65 CP65	VEGA		
6												1	1	PC	LEVEL DETECTION	172784-0300-001-SD-000114	VEGAPULS 69 PS69	VEGA		
7		2											2	PC	SPEED LIMIT SWITCH	172784-0300-001-SD-000114				
8		1								1			2	PC	INDUCTIVE SENSOR	-	XS630B1PAL10EX	SCHNEIDER		
9		1				1		1		1	1		5	PC	INDUCTIVE SENSOR	-	XSAV12373EX	SCHNEIDER		
10								1		1			2	PC	LIMIT SWITCH	-	XCKD3945P16 EX	SCHNEIDER		
11														PC	ENCODER	-	8.5863FS2.1A4BG72	PEPPERL & FUCHS		
12															ROTOFLUID COUPLING ALFA 55 K02 FC					
13										3			3	PC	120°C 1/2" GAS FUSIBLE PLUG	000951-03-0TTR-EM-1100	N/A	WESTCAR		
14										1			1	PC	FLEXIBLE ELEMENT RN5	000951-03-0TTR-EM-1100	N/A	WESTCAR		
15										1			1	PC	VITON SEALS KIT GU5	000951-03-0TTR-EM-1100	N/A	WESTCAR		
16										1			1	PC	BEARINGS KIT CU5	000951-03-0TTR-EM-1100	N/A	WESTCAR		
17															ELECTROMAGNETIC SEPARATOR SK 16.15					
18			1										1	SET	SET OF FUSES	000951-01-0EX-EM-1200	GZ000052	MEC		
19			1										1	PC	24 Vdc FEEDER	000951-01-0EX-EM-1200	CA007020	MEC		
20			1										1	SET	SET OF LED LAMP	000951-01-0EX-EM-1200	GZ000029	MEC		

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

EQUIPMENT

ITEM	QTY	TAG NUMBER(S)	MODEL	SERIAL No.(s)	DESCRIPTION	ALWAYS REFER TO THIS NUMBER : 172784 - I-SD-000006 (project number) (spir number)	
1A	1	SP-5304	SP-5304	000951-TT-01-0600	HOPPER		
1B	1	SP-5307	SP-5307	000951-EX01	BELT FEEDER	Rev. :	4 Date : 13-ago-19
1C	1	SP-5315	SK 16.15 BD / 220MEC54/M	S1802009.1/ M9991	MAGNETIC SEPARATOR	Plant :	RNP DCU Plant Project (WP1)
1D	1	SP-5305	COB 24"-36"-003	20188001	CRUSHER	Location :	Pancevo, Serbia
1E	1	SP-5601	TKDE 650/300 Ex2D	2042	METAL DETECTOR	Equipment :	.....
1F	1	JD-5601A	JD-5601A	000951-TR-01	BELT CONVEYOR	Seller's Ref. :	000951-00-0CG-LT-0003
1G	1	VX-5601	BEP 06 / VX-5601	50-V127071A01	BELT SCALE	Seller :	PHB WESERHÜTTE S.A.U
1H	1	JD-5601B	JD-5601B	000951-TR-02	BELT CONVEYOR	Tel. number :	+34 984 49 56 71
1I	1	SP-5321	GKC-SH4 Ex	7101210	HOIST FOR SEPARATOR		
1J	1	JD-5601C	JD-5601C	000951-TR-03	TUBE CONVEYOR		
1K	1	JD-5602	JD-5602	000951-TR-04	FEED CONVEYOR		
1L	1	FC-5601A	FABRIPULSE-EV 12-10	118801-EV	DUST COLLECTOR A		

PARTS

21	3	PC	RECTIFIER DIODE	000951-01-0EX-EM-1200	CA005157	MEC		
22			ELECTROMECHANIC ACTUATOR					
23		PC	ELECTRIC MOTOR	000951-01-0SL-EM-0009	3P-CA-660V-50Hz	MECVEL 02		
24		PC	TORQUE LIMITER	000951-01-0SL-EM-0009	N/A	MECVEL 03		
25		PC	LIMIT SWITCHES GROUP	000951-01-0SL-EM-0009	N/A	MECVEL 07		
26		PC	MANUAL HAND WHEEL	000951-01-0SL-EM-0009	N/A	MECVEL 04		
27		PC	BELLOWS BOOT	000951-01-0SL-EM-0009	N/A	MECVEL 05		
28		PC	FRONT END WITH SHOCK ABSORBER	000951-01-0SL-EM-0009	N/A	MECVEL 06		
29			AUTOMATIC SAMPLING SYSTEM					
30		PC	Limit switch type 1	000951-02-0TR-EM-0140	TEMA - HAMMER SAMPLE TAKER	TEMA		
31		PC	Limit switch type 2	000951-02-0TR-EM-0140	TEMA - HAMMER SAMPLE TAKER	TEMA		
32		PC	Atex brush	000951-02-0TR-EM-0140	TEMA - HAMMER SAMPLE TAKER	TEMA		
33		PC	Atex rubber strip	000951-02-0TR-EM-0140	TEMA - HAMMER SAMPLE TAKER	TEMA		
34		PC	Rubber scraper drum	000951-02-0TR-EM-0140	TEMA - GFB 500 CONVEYOR	TEMA		
35		PC	Rubber scraper lower belt	000951-02-0TR-EM-0140	TEMA - GFB 500 CONVEYOR	TEMA		
36		SET	Wearing plates for crushing roll	000951-02-0TR-EM-0140	TEMA - SINGLE ROLLER MILL EW 30/40	TEMA		
37		SET	Wearing plates for crushing plate, upper part	000951-02-0TR-EM-0140	TEMA - SINGLE ROLLER MILL EW 30/40	TEMA		
38		PC	Wearing plates for crushing plate, lower part	000951-02-0TR-EM-0140	TEMA - SINGLE ROLLER MILL EW 30/40	TEMA		
39		SET	Rubber scrapers	000951-02-0TR-EM-0140	TEMA - TURNSTILE DIVIDER DKT 370 A	TEMA		
40		PC	Rubber collar Ø154	000951-02-0TR-EM-0140	TEMA - SAMPLE COLLECTOR S 4/10L	TEMA		
41		PC	Rubber collar Ø162	000951-02-0TR-EM-0140	TEMA - SAMPLE COLLECTOR S 4/10L	TEMA		
42		PC	Sample collectors stainless steel	000951-02-0TR-EM-0140	TEMA - SAMPLE COLLECTOR S 4/10L	TEMA		
43			BELTS					
44	16,3 6	Meter	Rubber belt W1200	000951-01-0EX-EM-0002	TEXTER 400/3 6+3 BS W1200	SIG		

ALWAYS REFER TO THIS NUMBER :

172784 - |-SD-000006

(project number) (spir number)

Rev. : 4 Date : 13-ago-19

Plant : RNP DCU Plant Project (WP1)

Location : Pancevo, Serbia

Equipment :

Seller's Ref. : 000951-00-0CG-LT-0003

Seller : PHB WESERHÜTTE S.A.U

Tel. number : +34 984 49 56 71

SIG		
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510		
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310		
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ROUMECA		

ROUMECA		

ROLMECA		

ROLMECA		

ROLMECA		

ROLMECA		

ROLMECA		

ROLMEGA		

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SEW		
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SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

EQUIPMENT

ITEM	QTY	TAG NUMBER(S)				MODEL	SERIAL No.(s)	DESCRIPTION			
1A	1	SP-5304				SP-5304	000951-TT-01-0600	HOPPER			
1B	1	SP-5307				SP-5307	000951-EX01	BELT FEEDER			
1C	1	SP-5315				SK 16.15 BD / 220MEC54/M	S1802009.1/ M9991	MAGNETIC SEPARATOR			
1D	1	SP-5305				COB 24"-36"-003	20188001	CRUSHER			
1E	1	SP-5601				TKDE 650/300 Ex2D	2042	METAL DETECTOR			
1F	1	JD-5601A				JD-5601A	000951-TR-01	BELT CONVEYOR			
1G	1	VX-5601				BEP 06 / VX-5601	50-V127071A01	BELT SCALE			
1H	1	JD-5601B				JD-5601B	000951-TR-02	BELT CONVEYOR			
1I	1	SP-5321				GKC-SH4 Ex	7101210	HOIST FOR SEPARATOR			
1J	1	JD-5601C				JD-5601C	000951-TR-03	TUBE CONVEYOR			
1K	1	JD-5602				JD-5602	000951-TR-04	FEED CONVEYOR			
1L	1	FC-5601A				FABRIPULSE-EV 12-10	118801-EV	DUST COLLECTOR A			

ALWAYS REFER TO THIS NUMBER :

172784 - I-SD-000006

(project number) (spir number)

Rev. : 4 Date : 13-ago-19

Plant : RNP DCU Plant Project (WP1)

Location : Pancevo, Serbia

Equipment :

Seller's Ref. : 000951-00-0CG-LT-0003

Seller : PHB WESERHÜTTE S.A.U

Tel. number : +34 984 49 56 71

PARTS

67										12	12	PC	BAG FILTER			27-100003	AAF		
68										1	1	PC	ELECTRICAL CLEANING CIRCUIT			GAMMA	AAF		
69										3	3	PC	MEMBRANE VALVE REPAIR KIT			FPVD25	AAF		
70										3	3	PC	ELECTROVALVE REPAIR KIT			FPV24V	AAF		
71										12	12	PC	GALVANIZED CAGE			N/A	AAF		
72													ELASTIC COUPLING						
73	1									1	1	PC	ELASTIC COUPLING	000951-01-0EX-EM-1100	POLY-NORM 38 ADL	KTR			
74													MOTORS						
75					1					1	1	PC	Motor M3GP 132SME 4. 7.50 kW	000951-01-0TR-EM-0070	3GGP132250-BDL	ABB			
76						1				1	1	PC	Motor M3GP 160MLB 4. 15 kW	000951-02-0TR-EM-0070	3GGP162420-BDL	ABB			
77							1			1	1	PC	Motor M3GP 225SMB 4. 45 kW	000951-03-0TR-EM-1100	3GGP222220-ADL	ABB			
78								1		1	1	PC	Motor M3GP 132SMB 4. 5.50 kW	000951-04-0TR-EM-0070	3GGP132220-BDL	ABB			
79												PC	Motor M3GP 112ME 4. 4 kW	000951-05-0TR-EM-1000	3GGP112350-BDL	ABB			
80				1						1	1	PC	Motor M3GP 250SMA 6. 37 kW	000951-00-0OM-CO-0090	3GGP253210-ADL	ABB			
81	1									1	1	PC	Motor M3GP 132SMF 6. 4 kW	000951-01-0EX-EM-1100	3GGP133260-ADL	ABB			
82													HOIST SH4016-16 4/1						
83						45				45	45	METER	WIRE ROPE Ø9	-		3300079	STAHL		
84							1			1	1	PC	ROPE GUIDE RING LEFT 8,5-9	-		0443000430	STAHL		
85								1		1	1	PC	BOTTOM HOOK 6300 KG H162-4	-		0143027510	STAHL		
86								1		1	1	PC	BRAKE DISC 12/2H42MF (HOIST)	-		2327043650	STAHL		
87								1		1	1	PC	BRAKE DISC 8/2F12 (TROLLEY)	-		2127023650	STAHL		
88								1		1	1	PC	MOTOR 12/2H42-MF (HOIST)	-		70002098	STAHL		
89								1		1	1	PC	MOTOR 8/2F12 (TROLLEY)	-		2127087119	STAHL		
90													BELT CLEANER						
91	1						1		1	3	3	PC	QC1 Heavy duty segment blade W 1200	-		35381-421040OR	MARTIN ENGINEERING		

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

EQUIPMENT

ITEM	QTY	TAG NUMBER(S)	MODEL	SERIAL No.(s)	DESCRIPTION	ALWAYS REFER TO THIS NUMBER : 172784 - I-SD-000006 (project number) (spir number)	
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1C	1	SP-5315	SK 16.15 BD / 220MEC54/M	S1802009.1/ M9991	MAGNETIC SEPARATOR	Plant :	RNP DCU Plant Project (WP1)
1D	1	SP-5305	COB 24"-36"-003	20188001	CRUSHER	Location :	Pancevo, Serbia
1E	1	SP-5601	TKDE 650/300 Ex2D	2042	METAL DETECTOR	Equipment :	.....
1F	1	JD-5601A	JD-5601A	000951-TR-01	BELT CONVEYOR	Seller's Ref. :	000951-00-0CG-LT-0003
1G	1	VX-5601	BEP 06 / VX-5601	50-V127071A01	BELT SCALE	Seller :	PHB WESERHÜTTE S.A.U
1H	1	JD-5601B	JD-5601B	000951-TR-02	BELT CONVEYOR	Tel. number :	+34 984 49 56 71
1I	1	SP-5321	GKC-SH4 Ex	7101210	HOIST FOR SEPARATOR		
1J	1	JD-5601C	JD-5601C	000951-TR-03	TUBE CONVEYOR		
1K	1	JD-5602	JD-5602	000951-TR-04	FEED CONVEYOR		
1L	1	FC-5601A	FABRIPULSE-EV 12-10	118801-EV	DUST COLLECTOR A		

PARTS

92						1	1	PC	QC1 Heavy duty segment blade W 650	-	35381-241022OR	MARTIN ENGINEERING	
93									ELECTRO ACTUATED GATE BC				
94								PC	SLIDER KIT FOR BC 900X1150	-	N/A	ORBINOX	
95								PC	JOINT FOR BC 900X1150 (2 SEAL OF 5 METERS)	-	N/A	ORBINOX	
96								PC	PACKING ST+ O-RING EPDM FOR BC 900X1150)	-	N/A	ORBINOX	
97									AISI				
98	2				2		4	PC	AISI #6X450X600	000951-01-0EX-EM-1031 000951-03-0TR-EM-1041	AISI 316L	PHB	
99	1						1	PC	AISI #6X298X1751	000951-01-0EX-EM-1034	AISI 304	PHB	
100	1						1	PC	AISI #6X318X1820	000951-01-0EX-EM-1035	AISI 304	PHB	
101	1						1	PC	AISI #6X263X1820	000951-01-0EX-EM-1036	AISI 304	PHB	
102	1						1	PC	AISI #5X80X183	000951-01-0EX-EM-1037	AISI 304	PHB	
103	4						4	PC	AISI #6X90X668	000951-01-0EX-EM-1061	AISI 316L	PHB	
104	1						1	PC	AISI #6X75X708	000951-01-0EX-EM-1160	AISI 316L	PHB	
105	3						3	PC	AISI #6X140X708	000951-01-0EX-EM-1160	AISI 316L	PHB	
106	1						1	PC	SKIRT BOARD AISI	000951-01-0EX-EM-1510	AISI 316L	PHB	
107	1						1	PC	CLOSING BAR AISI	000951-01-0EX-EM-1550	AISI 316L	PHB	
108			2	2	2		6	PC	AISI #6X490X520	000951-01-0TR-EM-0024 000951-02-0TR-EM-0024	AISI 316L	PHB	
109			1				1	PC	DUCT AISI	000951-01-0TR-EM-0031	AISI 316L	PHB	
110				1			1	PC	DUCT AISI	000951-02-0TR-EM-0031	AISI 316L	PHB	
111				1			1	PC	SKIRTBOARD AISI	000951-02-0TR-EM-0083	AISI 316L	PHB	
112					1		1	PC	HEAD CHUTE AISI	000951-04-0TR-EM-0028	AISI 316L	PHB	
113					1		1	PC	DISCHARGE PIPE AISI	000951-04-0TR-EM-0029	AISI 316L	PHB	
114					1		1	PC	SKIRTBOARD AISI	000951-04-0TR-EM-0083	AISI 316L	PHB	
115								PC	BY PASS 500X500 DEFLECTOR	000951-03-0TR-EM-1076_1081_1082	AISI 316L	PHB	
116								PC	DISCHARGE DUCT AISI	000951-03-0TR-EM-1076_1161_1162_1171_1172_1173	AISI 316L	PHB	

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

EQUIPMENT

ITEM	QTY	TAG NUMBER(S)	MODEL	SERIAL No.(s)	DESCRIPTION	ALWAYS REFER TO THIS NUMBER : 172784 - I-SD-000006 (project number) (spir number)	
1A	1	SP-5304	SP-5304	000951-TT-01-0600	HOPPER		
1B	1	SP-5307	SP-5307	000951-EX01	BELT FEEDER	Rev. :	4 Date : 13-ago-19
1C	1	SP-5315	SK 16.15 BD / 220MEC54/M	S1802009.1/ M9991	MAGNETIC SEPARATOR	Plant :	RNP DCU Plant Project (WP1)
1D	1	SP-5305	COB 24"-36"-003	20188001	CRUSHER	Location :	Pancevo, Serbia
1E	1	SP-5601	TKDE 650/300 Ex2D	2042	METAL DETECTOR	Equipment :	.....
1F	1	JD-5601A	JD-5601A	000951-TR-01	BELT CONVEYOR	Seller's Ref. :	000951-00-0CG-LT-0003
1G	1	VX-5601	BEP 06 / VX-5601	50-V127071A01	BELT SCALE	Seller :	PHB WESERHÜTTE S.A.U
1H	1	JD-5601B	JD-5601B	000951-TR-02	BELT CONVEYOR	Tel. number :	+34 984 49 56 71
1I	1	SP-5321	GKC-SH4 Ex	7101210	HOIST FOR SEPARATOR		
1J	1	JD-5601C	JD-5601C	000951-TR-03	TUBE CONVEYOR		
1K	1	JD-5602	JD-5602	000951-TR-04	FEED CONVEYOR		
1L	1	FC-5601A	FABRIPULSE-EV 12-10	118801-EV	DUST COLLECTOR A		

PARTS

117								1			1	PC	SKIRTBOARD AISI	000951-03-0TR-EM-1511	AISI 316L	PHB		
118												PC	HEAD CHUTE AISI	000951-05-0TR-EM-1060	AISI 304L	PHB		
119												PC	SKIRTBOARD AISI	000951-05-0TR-EM-1511	AISI 316L	PHB		
120													METAL DETECTOR GRS-650X300 ATEX					
121											1	PC	MODULE	000951-01-0TR-EM-0012	EKM 06-V2	A. TRISTANY		
122											1	PC	HORN	000951-01-0TR-EM-0012	P40A	A. TRISTANY		
123											4	PC	SHOCK ABSORBERS	000951-01-0TR-EM-0012		A. TRISTANY		
124											3	PC	GLAND	000951-01-0TR-EM-0012	EX 3D M25X1,5	A. TRISTANY		
125													WEAR PLATES					
126											3	PC	HARDOX 400 #6X487X600	000951-01-0EX-EM-1031 000951-03-0TR-EM-1041	HARDOX 400	PHB		
127											1	PC	HARDOX 400 #6	000951-01-0EX-EM-1061	HARDOX 400	PHB		
128											1	PC	HARDOX 400 #6X520x782	000951-01-0TR-EM-024 000951-02-0TR-EM-024 000951-04-0TR-EM-024	HARDOX 400	PHB		
129											2	PC	HARDOX 400 #6X150x530	000951-01-0TR-EM-0083 000951-02-0TR-EM-0083	HARDOX 400	PHB		
130											1	PC	HEAD CHUTE WEAR PLATES	000951-02-0TR-EM-028	HARDOX 400	PHB		
131											1	PC	HEAD CHUTE WEAR PLATES	000951-04-0TR-EM-028	HARDOX 400	PHB		
132											1	PC	DISCHARGE CHUTE HARDOX 400	000951-03-0TR-EM-1061	HARDOX 400	PHB		
133												PC	HARDODX #6X300X500	000951-05-0TR-EM-1031	HARDOX 400	PHB		
134												PC	DEFLECTOR	000951-05-0TR-EM-1050	HARDOX 400	PHB		
135													RUBBER					
136											1	PC	#15X150X1450	000951-01-0EX-EM-1063	45-50 SHORE	PHB		
137											1	PC	#10X165X3400	000951-01-0EX-EM-1161	45-50 SHORE	PHB		
138											1	PC	#10X200X728	000951-01-0EX-EM-1162	45-50 SHORE	PHB		
139											1	PC	SKIRT BOARD RUBBER	000951-01-0EX-EM-1510	45-50 SHORE	PHB		
140											1	PC	CLOSING BAR RUBBER	000951-01-0EX-EM-1550	45-50 SHORE	PHB		

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

EQUIPMENT

ITEM	QTY	TAG NUMBER(S)			MODEL		SERIAL No.(s)		DESCRIPTION		172784 - I-SD-000006											
1A	1	SP-5304			SP-5304		000951-TT-01-0600		HOPPER		(project number) (spir number)											
1B		1	SP-5307			SP-5307		000951-EX01		BELT FEEDER		Rev. : 4 Date : 13-ago-19										
1C			1	SP-5315			SK 16.15 BD / 220MEC54/M		S1802009.1/ M9991		MAGNETIC SEPARATOR		Plant : RNP DCU Plant Project (WP1)									
1D				1	SP-5305			COB 24"-36"-003		20188001		CRUSHER		Location : Pancevo, Serbia								
1E					1	SP-5601			TKDE 650/300 Ex2D		2042		METAL DETECTOR		Equipment :							
1F						1	JD-5601A			JD-5601A		000951-TR-01		BELT CONVEYOR		Seller's Ref. : 000951-00-0CG-LT-0003						
1G							1	VX-5601			BEP 06 / VX-5601		50-V127071A01		BELT SCALE		Seller : PHB WESERHÜTTE S.A.U					
1H								1	JD-5601B			JD-5601B		000951-TR-02		BELT CONVEYOR		Tel. number : +34 984 49 56 71				
1I									1	SP-5321			GKC-SH4 Ex		7101210		HOIST FOR SEPARATOR					
1J										1	JD-5601C			JD-5601C		000951-TR-03		TUBE CONVEYOR				
1K											1	JD-5602			JD-5602		000951-TR-04		FEED CONVEYOR			
1L												1	FC-5601A			FABRIPULSE-EV 12-10		118801-EV		DUST COLLECTOR A		

PARTS

141				1	1		1	3	PC	HEAD FRAMEWORK RUBBER	000951-01-0TR-EM-0025	45-50 SHORE	PHB		
142				1				1	PC	SKIRT BOARD RUBBER	000951-02-0TR-EM-0025	45-50 SHORE	PHB		
143					1			1	PC	SKIRT BOARD RUBBER	000951-01-0TR-EM-0083Pos 24	45-50 SHORE	PHB		
144							1	1	PC	SKIRT BOARD RUBBER	000951-02-0TR-EM-0083 Pos 25	45-50 SHORE	PHB		
145							1	1	PC	SKIRT BOARD RUBBER	000951-04-0TR-EM-0083 Pos 26	45-50 SHORE	PHB		
146							1	1	PC	DISCHARGE RUBBER #8X1155X1850	000951-03-0TR-EM-1043	45-50 SHORE	PHB		
147							1	1	PC	DISCHARGE CHUTE RUBBER #15X150X1400	000951-03-0TR-EM-1060_1066	45-50 SHORE	PHB		
148							1	1	PC	SKIRTBOARD RUBBER	000951-03-0TR-EM-1510	45-50 SHORE	PHB		
149							1	1	PC	TAKE UP SYSTEM	000951-03-0TR-EM-1920	45-50 SHORE	PHB		
150									PC	HEAD CHUTE RUBBER	000951-05-0TR-EM-1066	45-50 SHORE	PHB		
151									PC	SKIRTBOARD RUBBER	000951-05-0TR-EM-1510	45-50 SHORE	PHB		
152	12							12	PC	IMPACT BAR 70X200X830	000951-01-0ST-EM-0400		PHB		
153	2							2	PC	IMPACT BAR 70X200X240	000951-01-0ST-EM-0410		PHB		
154							1	1	PC	V-PLOW W1200 RUBBER	000951-01-0ST-EM-0950	45-50 SHORE	PHB		
155				1	2		1	4	PC	V-PLOW W650 RUBBER	000951-01-0ST-EM-0910	45-50 SHORE	PHB		
156										BEARING & SUPPORTS					
157									PC	SNL515+22215K+H315+2XFRB+2XTSNL	000951-05-0TR-EM-8010-8020	SNL515+22215K+H3	SKF		
158									PC	SNL515+22215K+H315+2XTSNL	000951-05-0TR-EM-8010-8020	SNL515+22215K+H3	SKF		
159	2						2	4	PC	SNLN3024+23024CCK	000951-02-0ST-EM-0010_0070		SKF		
160				2	2		6	12	PC	SNL518+22218K	000951-02-0ST-EM-0030_0080_0090_0110_0120		SKF		
161					4			4	PC	SNL513+22213K	000951-02-0ST-EM-0040		SKF		
162					4			4	PC	SNL511+22211EK	000951-02-0ST-EM-0060		SKF		
163	2							2	PC	22218EK+H318	000951-02-0ST-EM-9010		SKF		
164				2			2	4	PC	22213EK+H313	000951-02-0ST-EM-9020_9030		SKF		
165										PULLEYS					
166	1							1	PC	DRIVE PULLEY Ø500 W1200 SHAFT Ø140-110-90	000951-02-0ST-EM-0010		PHB		
167	1							1	PC	TAIL TAKE UP PULLEY Ø500 W1200 SHAFT Ø120-80	000951-02-0ST-EM-0020		PHB		

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

EQUIPMENT

ITEM	QTY	TAG NUMBER(S)			MODEL	SERIAL No.(s)	DESCRIPTION			172784 - I-SD-000006											
1A	1	SP-5304			SP-5304	000951-TT-01-0600	HOPPER			(project number)	(spir number)										
1B		1	SP-5307			SP-5307	000951-EX01	BELT FEEDER			Rev. : 4 Date : 13-ago-19										
1C			1	SP-5315			SK 16.15 BD / 220MEC54/M	S1802009.1/ M9991	MAGNETIC SEPARATOR			Plant : RNP DCU Plant Project (WP1)									
1D				1	SP-5305			COB 24"-36"-003	20188001	CRUSHER			Location : Pancevo, Serbia								
1E					1	SP-5601			TKDE 650/300 Ex2D	2042	METAL DETECTOR			Equipment :							
1F						1	JD-5601A			JD-5601A	000951-TR-01	BELT CONVEYOR			Seller's Ref. : 000951-00-0CG-LT-0003						
1G							1	VX-5601			BEP 06 / VX-5601	50-V127071A01	BELT SCALE			Seller : PHB WESERHÜTTE S.A.U					
1H								1	JD-5601B			JD-5601B	000951-TR-02	BELT CONVEYOR			Tel. number : +34 984 49 56 71				
1I									1	SP-5321			GKC-SH4 Ex	7101210	HOIST FOR SEPARATOR						
1J										1	JD-5601C			JD-5601C	000951-TR-03	TUBE CONVEYOR					
1K											1	JD-5602			JD-5602	000951-TR-04	FEED CONVEYOR				
1L												1	FC-5601A			FABRIPULSE-EV 12-10	118801-EV	DUST COLLECTOR A			

PARTS

167				1				1		2	PC	DRIVE PULLEY Ø400 W650 SHAFT Ø100-80-50	000951-02-OST-EM-0030		PHB		
168						2				2	PC	TAIL TAKE UP PULLEY Ø400 W650 SHAFT Ø80-60	000951-02-OST-EM-0040		PHB		
169				1				1		2	PC	TAIL TAKE UP PULLEY Ø400 W650 SHAFT Ø80-60	000951-02-OST-EM-0050_0100		PHB		
170						2				2	PC	TAIL TAKE UP PULLEY Ø315 W650 SHAFT Ø80-50	000951-02-OST-EM-0060		PHB		
171								1		1	PC	DRIVE PULLEY Ø630 W1200 SHAFT Ø160-110-100	000951-02-OST-EM-0070		PHB		
172								1		1	PC	TAKE UP PULLEY Ø500 W1200 SHAFT Ø120-80	000951-02-OST-EM-0080		PHB		
173								1		1	PC	TAKE UP BEND PULLEY Ø400 W1200 SHAFT Ø120-80	000951-02-OST-EM-0090		PHB		
174								1		1	PC	TAKE UP BEND PULLEY Ø400 W1200 SHAFT Ø120-80	000951-02-OST-EM-0110		PHB		
175					1					1	PC	DRIVE PULLEY Ø400 W650 SHAFT Ø100-80-60	000951-02-OST-EM-0120		PHB		
176											PC	DRIVE PULLEY Ø400 W650 SHAFT Ø100-80-40	000951-02-OST-EM-0130		PHB		
177			1							1		24"x36" COBRA CRUSHER					
178											PC	TIP Cr. PIMCL400 24X36	000951-01-OTT-EM-0001		MCLANAHAN CORPORATION		
179											PC	TIP BOLT 7/8" X 6"	000951-01-OTT-EM-0001		MCLANAHAN CORPORATION		
180											PC	FLAT WASHER 7/8"	000951-01-OTT-EM-0001		MCLANAHAN CORPORATION		
181											PC	GRIP NUT 7/8"	000951-01-OTT-EM-0001		MCLANAHAN CORPORATION		
182											PC	SEGMENT MCL400 24X36	000951-01-OTT-EM-0001		MCLANAHAN CORPORATION		
183											PC	SQUARE HEAD BOLT 1"X4"	000951-01-OTT-EM-0001		MCLANAHAN CORPORATION		
184											PC	FLAT WASHER 1"	000951-01-OTT-EM-0001		MCLANAHAN CORPORATION		
185											PC	GRIP NUT 1"	000951-01-OTT-EM-0001		MCLANAHAN CORPORATION		
186											PC	HOPPER SIDE LINER LH	000951-01-OTT-EM-0001		MCLANAHAN CORPORATION		
187											PC	HOPPER SIDE LINER RH	000951-01-OTT-EM-0001		MCLANAHAN CORPORATION		
188											PC	FLAT SOCKET HEAD CAPSCREW 3/4"X2"	000951-01-OTT-EM-0001		MCLANAHAN CORPORATION		
189											PC	GRIP NUT 3/4"	000951-01-OTT-EM-0001		MCLANAHAN CORPORATION		
190											PC	HOLD-BACK BOLT ASSEMBLY	000951-01-OTT-EM-0001		MCLANAHAN CORPORATION		
191																	
192												PLC					

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

EQUIPMENT

ITEM	QTY	TAG NUMBER(S)	MODEL	SERIAL No.(s)	DESCRIPTION	ALWAYS REFER TO THIS NUMBER :	
1A	1	SP-5304	SP-5304	000951-TT-01-0600	HOPPER	172784 - I-SD-000006	(project number) (spir number)
1B	1	SP-5307	SP-5307	000951-EX01	BELT FEEDER	Rev. :	4 Date : 13-ago-19
1C	1	SP-5315	SK 16.15 BD / 220MEC54/M	S1802009.1/ M9991	MAGNETIC SEPARATOR	Plant :	RNP DCU Plant Project (WP1)
1D	1	SP-5305	COB 24"-36"-003	20188001	CRUSHER	Location :	Pancevo, Serbia
1E	1	SP-5601	TKDE 650/300 Ex2D	2042	METAL DETECTOR	Equipment :	.....
1F	1	JD-5601A	JD-5601A	000951-TR-01	BELT CONVEYOR	Seller's Ref. :	000951-00-0CG-LT-0003
1G	1	VX-5601	BEP 06 / VX-5601	50-V127071A01	BELT SCALE	Seller :	PHB WESERHÜTTE S.A.U
1H	1	JD-5601B	JD-5601B	000951-TR-02	BELT CONVEYOR	Tel. number :	+34 984 49 56 71
1I	1	SP-5321	GKC-SH4 Ex	7101210	HOIST FOR SEPARATOR		
1J	1	JD-5601C	JD-5601C	000951-TR-03	TUBE CONVEYOR		
1K	1	JD-5602	JD-5602	000951-TR-04	FEED CONVEYOR		
1L	1	FC-5601A	FABRIPULSE-EV 12-10	118801-EV	DUST COLLECTOR A		

PARTS

193	PC	7 Slot ControlLogix Chassis	1756-A7	ROCKWELL	Redundant Control
194	PC	ControlLogix, 85-265 VAC Power Supply (10 Amp @ 5V)	1756-PA72	ROCKWELL	Redundant Control
195	PC	ControlLogix 5570 Controller with 4 MB Memory, USB Port	1756-L72	ROCKWELL	Redundant Control
196	PC	EtherNet 10-100M Interface Module (supports 128 TCP/IP)	1756-EN2T	ROCKWELL	Redundant Control
197	PC	EtherNet dual port 10-100M Interface Module	1756-EN2TR	ROCKWELL	Redundant Control
198	PC	Redundancy Module	1756-RM2	ROCKWELL	Redundant Control
199	PC	Fiber Cable, 1 Meter	1756-RMC1	ROCKWELL	Redundant Control
200	PC	2-slot adapter base unit	1715-A2A	ROCKWELL	PERIFERIA SIL2
201	PC	3-slot I/O base unit	1715-A3IO	ROCKWELL	PERIFERIA SIL2
202	PC	EtherNet/IP Adapter	1715-AENTR	ROCKWELL	PERIFERIA SIL2
203	PC	16-point digital input module	1715-IB16D	ROCKWELL	PERIFERIA SIL2
204	PC	8-point digital output module	1715-OB8DE	ROCKWELL	PERIFERIA SIL2
205	PC	Termination Assembly - digital input simplex	1715-TASIB16D	ROCKWELL	PERIFERIA SIL2
206	PC	Termination Assembly - digital output simplex	1715-TASOB8DE	ROCKWELL	PERIFERIA SIL2
207	PC	1794 Flex, Flex Ex, Flex XT I/O System, FLEX I/O Dual Port EtherNet/IP	1794-AENTR	ROCKWELL	PERIFERIA ESTANDAR
208	PC	1794 Flex, Flex Ex, Flex XT I/O System, Input Module, 24VDC, 32 Sink Inputs	1794-IB32	ROCKWELL	PERIFERIA ESTANDAR
209	PC	1794 Flex, Flex Ex, Flex XT I/O System, Output Module, 24V DC, 32 Source	1794-OB32P	ROCKWELL	PERIFERIA ESTANDAR
210	PC	1794 Flex, Flex Ex, Flex XT I/O System, HART Analog Input Modules, 8 Single-Ended Inputs	1794-IE8H	ROCKWELL	PERIFERIA ESTANDAR
211	PC	1794 Flex, Flex Ex, Flex XT I/O System, HART Analog 8 Output Module	1794-OF8IH	ROCKWELL	PERIFERIA ESTANDAR
212	PC	40 point feed-through digital IFM, standard,	1492-IFM40F	ROCKWELL	PERIFERIA ESTANDAR
213	PC	Pre-wired cable 1,5mt (1794-IB32)	1492-CAB015B94	ROCKWELL	PERIFERIA ESTANDAR
214	PC	Ready cable 1,5mt (1794-IB32/1794-OB32P)	1492-CAB015H94	ROCKWELL	PERIFERIA ESTANDAR
215	PC	Terminal base, for 32 point modules, 62 pin D-shell termination	1794-TB62DS	ROCKWELL	PERIFERIA ESTANDAR
216	PC	1794 Flex, Flex Ex, Flex XT I/O System, Terminal Base, 3-Wire grounded, Screw Clamp	1794-TB3G	ROCKWELL	PERIFERIA ESTANDAR
217	PC	FLEX I/O 1ft extended cable 0,9m	1794-CE3	ROCKWELL	PERIFERIA ESTANDAR
218	PC	1606-XLE480E: Essential Power Supply, 24-28V DC, 480 W, 240V AC Input Voltage	1606-XLE480EP	ROCKWELL	POWER SUPPLY

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

EQUIPMENT

ITEM	QTY	TAG NUMBER(S)			MODEL		SERIAL No.(s)		DESCRIPTION		172784 - I-SD-000006											
1A	1	SP-5304			SP-5304		000951-TT-01-0600		HOPPER		(project number) (spir number)											
1B		1	SP-5307			SP-5307		000951-EX01		BELT FEEDER		Rev. : 4 Date : 13-ago-19										
1C			1	SP-5315			SK 16.15 BD / 220MEC54/M		S1802009.1/ M9991		MAGNETIC SEPARATOR		Plant : RNP DCU Plant Project (WP1)									
1D				1	SP-5305			COB 24"-36"-003		20188001		CRUSHER		Location : Pancevo, Serbia								
1E					1	SP-5601			TKDE 650/300 Ex2D		2042		METAL DETECTOR		Equipment :							
1F						1	JD-5601A			JD-5601A		000951-TR-01		BELT CONVEYOR		Seller's Ref. : 000951-00-0CG-LT-0003						
1G							1	VX-5601			BEP 06 / VX-5601		50-V127071A01		BELT SCALE		Seller : PHB WESERHÜTTE S.A.U					
1H								1	JD-5601B			JD-5601B		000951-TR-02		BELT CONVEYOR		Tel. number : +34 984 49 56 71				
1I									1	SP-5321			GKC-SH4 Ex		7101210		HOIST FOR SEPARATOR					
1J										1	JD-5601C			JD-5601C		000951-TR-03		TUBE CONVEYOR				
1K											1	JD-5602			JD-5602		000951-TR-04		FEED CONVEYOR			
1L												1	FC-5601A			FABRIPULSE-EV 12-10		118801-EV		DUST COLLECTOR A		

PARTS

219												PC	1606-XLERED: Essential Redundancy Module, Vin 1 -.9Vin, 384 W, 10-60V DC Input Voltage	1606-XLERED	ROCKWELL		POWER SUPPLY	
220												PC	Module voltage, module protection, 6A, 6A, 6A, 6A, Electronic Circuit Protection, 24Vdc	1692-ZG6666	ROCKWELL		POWER SUPPLY	
221												PC	Stratix 5700 Switch, Managed, 8 Fast Ethernet Copper Ports, 2 Fast Ethernet Combo Ports	1783-BMS10CL	ROCKWELL		NETWORKS	
222												PC	Networks and Communication Products, EtherNet/IP Tap1 copper port, 2 fiber ports	1783-ETAP2F	ROCKWELL		NETWORKS	
223												PC	Networks and Communication Products, EtherNet/IP Tap2 copper ports, 1 fiber port	1783-ETAP1F	ROCKWELL		NETWORKS	
224												PC	Stratix 2000 Switch, Unmanaged, 8 Copper Ports	1783-US8T	ROCKWELL		NETWORKS	
225												PC	EtherNet/IP to Serial Linking Device Gateway	HMS-EN2SER	ROCKWELL		NETWORKS	
226												PC	EtherNet/IP Adapter to Modbus-TCP Slave gateway	AB7632	ROCKWELL		NETWORKS	
227												PC	Ethernet IP to Modbus TCP Gateway	PLX31-EIP-MBTCP	ROCKWELL		NETWORKS	
228												PC	PanelView Plus 7 Standard Terminal, Touch Screen, 15 TFT Color, Ethernet DLR	2711P-T15C22D8S	ROCKWELL		HMI	
229												PC	2-Channel Isolated Barrier, 24Vdc power supply, dry contact or NAMUR inputs,	KFD2-SR2-Ex2.W	PEPPERL-FUCHS		OTHERS	
230												PC	PLC Relay Module, screw connection and pluggable miniature relay w/power	PLC-RSC-230UC/21	PHOENIX CONTACT		OTHERS	
231												PC	PLC -INTERFACE, screw connection and plug-in miniature relay w/power contact	PLC-RSC-24DC/1/A	PHOENIX CONTACT		OTHERS	
232												PC	Coupling Relay for SIL 2 high -and- low- demand applications	PSR-PS21-1NO-1NC	PHOENIX CONTACT		OTHERS	
233												PC	Filter fan, 230Vac, up to 536m³/h, 223x223mm	01883.0-00	STEGO		OTHERS	
234												PC	Miniature Circuit Breaker, 2P/16A, Curve C	5SL6516-7	SIEMENS		OTHERS	
235												PC	Miniature Circuit Breaker, 2P/6A, Curve C	5SL6506-7	SIEMENS		OTHERS	
236												PC	RCCB, 2-pole, type AC, 25A, 30mA	5SV53120FB	SIEMENS		OTHERS	
237																		
238													EXPLOSION PANELS					
239												PC	EXPLOSION VENT KER 940X1440	000951-01-OSL-EM-0001	AISI 304 DIN 14301	ATEXPREEN		
240												PC	SENSOR ATEX	000951-01-OSL-EM-0001	S3-HT	ATEXPREEN		
241																		
242													OTHER					
243		2			2		2		2	2		10	PC	HORN&LAMP	-	D1XC1C10-AC230	PEPER&FUCHS	
244													Meter	15w/m HEAT TRACING CABLE	-			

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

EQUIPMENT

ITEM	QTY	TAG NUMBER(S)	MODEL	SERIAL No.(s)	DESCRIPTION	ALWAYS REFER TO THIS NUMBER :	
1A	1	SP-5304	SP-5304	000951-TT-01-0600	HOPPER	172784 - I-SD-000006	(project number) (spir number)
1B	1	SP-5307	SP-5307	000951-EX01	BELT FEEDER	Rev. :	4 Date : 13-ago-19
1C	1	SP-5315	SK 16.15 BD / 220MEC54/M	S1802009.1/ M9991	MAGNETIC SEPARATOR	Plant :	RNP DCU Plant Project (WP1)
1D	1	SP-5305	COB 24"-36"-003	20188001	CRUSHER	Location :	Pancevo, Serbia
1E	1	SP-5601	TKDE 650/300 Ex2D	2042	METAL DETECTOR	Equipment :	.....
1F	1	JD-5601A	JD-5601A	000951-TR-01	BELT CONVEYOR	Seller's Ref. :	000951-00-0CG-LT-0003
1G	1	VX-5601	BEP 06 / VX-5601	50-V127071A01	BELT SCALE	Seller :	PHB WESERHÜTTE S.A.U
1H	1	JD-5601B	JD-5601B	000951-TR-02	BELT CONVEYOR	Tel. number :	+34 984 49 56 71
1I	1	SP-5321	GKC-SH4 Ex	7101210	HOIST FOR SEPARATOR		
1J	1	JD-5601C	JD-5601C	000951-TR-03	TUBE CONVEYOR		
1K	1	JD-5602	JD-5602	000951-TR-04	FEED CONVEYOR		
1L	1	FC-5601A	FABRIPULSE-EV 12-10	118801-EV	DUST COLLECTOR A		

PARTS

245	8	PC	Weight cell 1000T	000951-01-OSL-EM-0001	C3 ATEX 22	SERVIPESA		
246	8	PC	Support weight cell with accesories	000951-01-OSL-EM-0001	HDG	SERVIPESA		
247	2	PC	Conection box	000951-01-OSL-EM-0001		SERVIPESA		
248	2	PC	Panel with ethernet communication	000951-01-OSL-EM-0001	MOD 1700	SERVIPESA		
249	1	Kit	HILTI DRILL KIT DX 351 BT G + SF BT 22-A + B22/2.6	-	DX351 BT G	HILTI		
250	1	Kit	HILTI SCREWDRIVER KIT SBT 4-A22 + B22/3.0 + S-DG BT M	-	SBT 4-A22	HILTI		
251								
252			TELESCOPIC CHUTE					
253		PC	Filter cartridge	000951-01-0CC-EM-0001	HE-FJ-OS-000164-K00	HENNLICH		
254		PC	Level switch	000951-01-0CC-EM-0001	HE-NZ-EM-000195-K00	HENNLICH		
255		PC	Inlet part	000951-01-0CC-EM-0001	HE-NZ-OD-024200-000	HENNLICH		
256		PC	Tube No. 1	000951-01-0CC-EM-0001	HE-NZ-OD-024170-000	HENNLICH		
257		PC	Tube No. 2	000951-01-0CC-EM-0001	HE-NZ-OD-024175-000	HENNLICH		
258		PC	Tube No. 3	000951-01-0CC-EM-0001	HE-NZ-OD-024181-000	HENNLICH		
259		PC	Tube No. 4	000951-01-0CC-EM-0001	HE-NZ-OD-024186-000	HENNLICH		
260		PC	Outer bellows	000951-01-0CC-EM-0001	HE-NZ-OS-024231-000	HENNLICH		
261		PC	Rope dia 6 mm	000951-01-0CC-EM-0001	HE-NZ-ME-024210-000	HENNLICH		
262								
263			VULCANIZER					

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

EQUIPMENT

ITEM	QTY	TAG NUMBER(S)	MODEL	SERIAL No.(s)	DESCRIPTION	172784 -	I-SD-000006
1A	1	SP-5304	SP-5304	000951-TT-01-0600	HOPPER	(project number)	(spir number)
1B	1	SP-5307	SP-5307	000951-EX01	BELT FEEDER	Rev. :	4 Date : 13-ago-19
1C	1	SP-5315	SK 16.15 BD / 220MEC54/M	S1802009.1/ M9991	MAGNETIC SEPARATOR	Plant :	RNP DCU Plant Project (WP1)
1D	1	SP-5305	COB 24"-36"-003	20188001	CRUSHER	Location :	Pancevo, Serbia
1E	1	SP-5601	TKDE 650/300 Ex2D	2042	METAL DETECTOR	Equipment :	.....
1F	1	JD-5601A	JD-5601A	000951-TR-01	BELT CONVEYOR	Seller's Ref. :	000951-00-0CG-LT-0003
1G	1	VX-5601	BEP 06 / VX-5601	50-V127071A01	BELT SCALE	Seller :	PHB WESERHÜTTE S.A.U
1H	1	JD-5601B	JD-5601B	000951-TR-02	BELT CONVEYOR	Tel. number :	+34 984 49 56 71
1I	1	SP-5321	GKC-SH4 Ex	7101210	HOIST FOR SEPARATOR		
1J	1	JD-5601C	JD-5601C	000951-TR-03	TUBE CONVEYOR		
1K	1	JD-5602	JD-5602	000951-TR-04	FEED CONVEYOR		
1L	1	FC-5601A	FABRIPULSE-EV 12-10	118801-EV	DUST COLLECTOR A		

PARTS

264																			PC	spare bag size 39" x 54"	-		SVP3954-17 (39-54)	ALMEX		
265																			PC	spare element 39" x 54"	-		SVP3954-17 (39-54)	ALMEX		
266																			PC	Platen Receptacle Insert (High Temp)	-		SVP3954-17 (SVP-18)	ALMEX		
267																			PC	1/4" (6mm) 100 Ohm RTD Probe	-		SVP3954-17 (SVP-23)	ALMEX		
268																			PC	Platen Handle Assembly	-		SVP3954-17 (SVP-25)	ALMEX		
269																			PC	Locking Pin	-		SVP3954-17 (SVP-3)	ALMEX		
270																			PC	Quick coupler Male	-		SVP3954-17 (SVP-10)	ALMEX		
271																			PC	Quick coupler Male Dust-cap	-		SVP3954-17 (SVP-11)	ALMEX		
272																			PC	Quick coupler Female	-		SVP3954-17 (SVP-30)	ALMEX		
273																			PC	Quick coupler Female Dust-cap	-		SVP3954-17 (SVP-31)	ALMEX		
274																				FOR RC3 TEMPERATURE CONTROL PANEL	-			ALMEX		
275																			PC	Fuse Holder C/w 2 Amp Fuse	-		SVP3954-17 (RC3-9)	ALMEX		
276																			PC	Platen Connector Insert	-		SVP3954-17 (RC3-15)	ALMEX		
277																			PC	Platen Connector Housing	-		SVP3954-17 (RC3-15)	ALMEX		
278																										
279																				AUTOMATIC SAMPLING SYSTEM						
280																				Hammer sampler HPN650/30/482/D/300	000951-01-OCG-PI-0008_03 S-5600					
281																			PC	Geared motor with brake	000951-01-OCG-PI-0008_03 S-5600	351005	SIEBTECHNIK			

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

EQUIPMENT

ITEM	QTY	TAG NUMBER(S)	MODEL	SERIAL No.(s)	DESCRIPTION	ALWAYS REFER TO THIS NUMBER :	
1A	1	SP-5304	SP-5304	000951-TT-01-0600	HOPPER	172784 - I-SD-000006	(project number) (spir number)
1B	1	SP-5307	SP-5307	000951-EX01	BELT FEEDER	Rev. :	4 Date : 13-ago-19
1C	1	SP-5315	SK 16.15 BD / 220MEC54/M	S1802009.1/ M9991	MAGNETIC SEPARATOR	Plant :	RNP DCU Plant Project (WP1)
1D	1	SP-5305	COB 24"-36"-003	20188001	CRUSHER	Location :	Pancevo, Serbia
1E	1	SP-5601	TKDE 650/300 Ex2D	2042	METAL DETECTOR	Equipment :	.....
1F	1	JD-5601A	JD-5601A	000951-TR-01	BELT CONVEYOR	Seller's Ref. :	000951-00-0CG-LT-0003
1G	1	VX-5601	BEP 06 / VX-5601	50-V127071A01	BELT SCALE	Seller :	PHB WESERHÜTTE S.A.U
1H	1	JD-5601B	JD-5601B	000951-TR-02	BELT CONVEYOR	Tel. number :	+34 984 49 56 71
1I	1	SP-5321	GKC-SH4 Ex	7101210	HOIST FOR SEPARATOR		
1J	1	JD-5601C	JD-5601C	000951-TR-03	TUBE CONVEYOR		
1K	1	JD-5602	JD-5602	000951-TR-04	FEED CONVEYOR		
1L	1	FC-5601A	FABRIPULSE-EV 12-10	118801-EV	DUST COLLECTOR A		

PARTS

282	PC	Proximity switches	000951-01-0CG-PI-0008_03 S-5600	351510	SIEBTECHNIK		
283	PC	Guide plates (set)	000951-01-0CG-PI-0008_03 S-5600	351551	SIEBTECHNIK		
284	PC	Back panel	000951-01-0CG-PI-0008_03 S-5600	351550	SIEBTECHNIK		
285	PC	Stripper rubber	000951-01-0CG-PI-0008_03 S-5600	351553	SIEBTECHNIK		
286	PC	Brush	000951-01-0CG-PI-0008_03 S-5600	351555	SIEBTECHNIK		
287	PC	Spherical roller bearings	000951-01-0CG-PI-0008_03 S-5600	131577	SIEBTECHNIK		
288	PC	Tension sleeve	000951-01-0CG-PI-0008_03 S-5600	217035	SIEBTECHNIK		
289	PC	V-sealing ring	000951-01-0CG-PI-0008_03 S-5600	195568	SIEBTECHNIK		
290		Belt conveyor GFB500x3175	000951-01-0CG-PI-0008_03 S-5600				
291	PC	Geared motor	000951-01-0CG-PI-0008_03 S-5600	351006	SIEBTECHNIK		
292	PC	Drive pulley	000951-01-0CG-PI-0008_03 S-5600	351303	SIEBTECHNIK		
293	PC	Take-up pulley	000951-01-0CG-PI-0008_03 S-5600	347771	SIEBTECHNIK		
294	PC	Flanged bearing FY65	000951-01-0CG-PI-0008_03 S-5600	351304	SIEBTECHNIK		
295	PC	Flanged bearing FY45	000951-01-0CG-PI-0008_03 S-5600	347751	SIEBTECHNIK		
296	PC	Idler, top	000951-01-0CG-PI-0008_03 S-5600	206482	SIEBTECHNIK		
297	PC	Idler, bottom	000951-01-0CG-PI-0008_03 S-5600	347755	SIEBTECHNIK		
298	PC	Belt	000951-01-0CG-PI-0008_03 S-5600	351516	SIEBTECHNIK		
299	PC	Rubber for material guide, set	000951-01-0CG-PI-0008_03 S-5600	357689	SIEBTECHNIK		
300	PC	Rubber for drum stripper	000951-01-0CG-PI-0008_03 S-5600	347759	SIEBTECHNIK		
301	PC	Rubber for angular stripper	000951-01-0CG-PI-0008_03 S-5600	347760	SIEBTECHNIK		
302	PC	Sensor for speed monitoring	000951-01-0CG-PI-0008_03 S-5600	350896	SIEBTECHNIK		
303		Single roll crusher EW 30/25	000951-01-0CG-PI-0008_03 S-5600				
304	PC	Roller body	000951-01-0CG-PI-0008_03 S-5600	200719	SIEBTECHNIK		
305	PC	Crushing bars	000951-01-0CG-PI-0008_03 S-5600	164696	SIEBTECHNIK		
306	PC	Wear plate towards the crusher wall, 2 parts	000951-01-0CG-PI-0008_03 S-5600	357690	SIEBTECHNIK		
307	PC	Wear plate towards the crusher wall, bottom	000951-01-0CG-PI-0008_03 S-5600	350645	SIEBTECHNIK		

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

EQUIPMENT

ITEM	QTY	TAG NUMBER(S)	MODEL	SERIAL No.(s)	DESCRIPTION	172784 -	I-SD-000006
1A	1	SP-5304	SP-5304	000951-TT-01-0600	HOPPER	(project number)	(spir number)
1B	1	SP-5307	SP-5307	000951-EX01	BELT FEEDER	Rev. :	4 Date : 13-ago-19
1C	1	SP-5315	SK 16.15 BD / 220MEC54/M	S1802009.1/ M9991	MAGNETIC SEPARATOR	Plant :	RNP DCU Plant Project (WP1)
1D	1	SP-5305	COB 24"-36"-003	20188001	CRUSHER	Location :	Pancevo, Serbia
1E	1	SP-5601	TKDE 650/300 Ex2D	2042	METAL DETECTOR	Equipment :	.....
1F	1	JD-5601A	JD-5601A	000951-TR-01	BELT CONVEYOR	Seller's Ref. :	000951-00-0CG-LT-0003
1G	1	VX-5601	BEP 06 / VX-5601	50-V127071A01	BELT SCALE	Seller :	PHB WESERHÜTTE S.A.U
1H	1	JD-5601B	JD-5601B	000951-TR-02	BELT CONVEYOR	Tel. number :	+34 984 49 56 71
1I	1	SP-5321	GKC-SH4 Ex	7101210	HOIST FOR SEPARATOR		
1J	1	JD-5601C	JD-5601C	000951-TR-03	TUBE CONVEYOR		
1K	1	JD-5602	JD-5602	000951-TR-04	FEED CONVEYOR		
1L	1	FC-5601A	FABRIPULSE-EV 12-10	118801-EV	DUST COLLECTOR A		

PARTS

[illegible]

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

EQUIPMENT

ITEM	QTY	TAG NUMBER(S)	MODEL	SERIAL No.(s)	DESCRIPTION	ALWAYS REFER TO THIS NUMBER :	
1A	1	SP-5304	SP-5304	000951-TT-01-0600	HOPPER	172784 - I-SD-000006	(project number) (spir number)
1B	1	SP-5307	SP-5307	000951-EX01	BELT FEEDER	Rev. :	4 Date : 13-ago-19
1C	1	SP-5315	SK 16.15 BD / 220MEC54/M	S1802009.1/ M9991	MAGNETIC SEPARATOR	Plant :	RNP DCU Plant Project (WP1)
1D	1	SP-5305	COB 24"-36"-003	20188001	CRUSHER	Location :	Pancevo, Serbia
1E	1	SP-5601	TKDE 650/300 Ex2D	2042	METAL DETECTOR	Equipment :	.....
1F	1	JD-5601A	JD-5601A	000951-TR-01	BELT CONVEYOR	Seller's Ref. :	000951-00-0CG-LT-0003
1G	1	VX-5601	BEP 06 / VX-5601	50-V127071A01	BELT SCALE	Seller :	PHB WESERHÜTTE S.A.U
1H	1	JD-5601B	JD-5601B	000951-TR-02	BELT CONVEYOR	Tel. number :	+34 984 49 56 71
1I	1	SP-5321	GKC-SH4 Ex	7101210	HOIST FOR SEPARATOR		
1J	1	JD-5601C	JD-5601C	000951-TR-03	TUBE CONVEYOR		
1K	1	JD-5602	JD-5602	000951-TR-04	FEED CONVEYOR		
1L	1	FC-5601A	FABRIPULSE-EV 12-10	118801-EV	DUST COLLECTOR A		

PARTS

334	PC	Enclosure heater 800/870W, 230V,50/60 Hz	000951-01-0CG-PI-0008_03 S-5600	350469-1	SIEBTECHNIK		
335	PC	Fan and filter unit	000951-01-0CG-PI-0008_03 S-5600	350469-2	SIEBTECHNIK		
336	PC	SITOP PSE200U	000951-01-0CG-PI-0008_03 S-5600	350469-3	SIEBTECHNIK		
337	PC	KTP700 Basic DP	000951-01-0CG-PI-0008_03 S-5600	350469-4	SIEBTECHNIK		
338	PC	CPU 314C PN/DP	000951-01-0CG-PI-0008_03 S-5600	350469-5	SIEBTECHNIK		
339	PC	SM 323, 16 DI/DO, DC24V, 0.5 A	000951-01-0CG-PI-0008_03 S-5600	350469-6	SIEBTECHNIK		
340	PC	Safety relais module SRB-Exi	000951-01-0CG-PI-0008_03 S-5600	350469-7	SIEBTECHNIK		
341	PC	Thermistor motor protection	000951-01-0CG-PI-0008_03 S-5600	350469-8	SIEBTECHNIK		
342	PC	Coupling relay	000951-01-0CG-PI-0008_03 S-5600	350469-9	SIEBTECHNIK		
343	PC	Sirius safety relay stanard series device	000951-01-0CG-PI-0008_03 S-5600	350469-10	SIEBTECHNIK		
344	PC	Contactore AC-3, 3 kW/400V, 1NC, DC 24V	000951-01-0CG-PI-0008_03 S-5600	350469-11	SIEBTECHNIK		
345	PC	Contactore AC-3, 5.5 kW/400V, 1NC, DC 24V	000951-01-0CG-PI-0008_03 S-5600	350469-12	SIEBTECHNIK		
346	PC	2NO+2NC contactor, AC 3, 4KW AC 230V50 Hz	000951-01-0CG-PI-0008_03 S-5600	350469-13	SIEBTECHNIK		
347	PC	Aux. Switch block, 2NO+2NC	000951-01-0CG-PI-0008_03 S-5600	350469-14	SIEBTECHNIK		
348	PC	Sitop PSU200 M	000951-01-0CG-PI-0008_03 S-5600	350469-15	SIEBTECHNIK		
349							
350		TRUCK WASHING BOX					
351	PC	Flat fan nozzels	000951-01-0CG-PI-0009_06 S-5600	JB 1/4	LECHLER		
352	PC	Photo-electric sensor	000951-01-0CG-PI-0009_06 S-5600	XUX5ARCNT16	SCHNEIDER		
353	KIT	Sseals kit for pumps	000951-01-0CG-PI-0009_06 S-5600	RC.SS1CG_C1	TECNOTER		
354							
355							
356							
357							
358							
359							

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

EQUIPMENT

ITEM	QTY	TAG NUMBER(S)	MODEL	SERIAL No.(s)	DESCRIPTION	ALWAYS REFER TO THIS NUMBER :	
2A	1	FC-5601B	FABRIPULSE-EV 12-10	118800-EV	DUST COLLECTOR B	172784 - I-SD-000006	(project number) (spir number)
2B	1	FE-5601A	KER 940x1440	1806049	EXPLOSION PANELS	Rev. :	4 Date : 13-ago-19
2C	1	FE-5601B	KER 940x1440	1806049	EXPLOSION PANELS	Plant :	RNP DCU Plant Project (WP1)
2D	1	JD-5605A BELT	MTD-E 1245	50-V127070.A01	WEIGHING FEEDER	Location :	Pancevo, Serbia
2E	1	JD-5605B BELT	MTD-E 1245	50-V127069.A01	WEIGHING FEEDER	Equipment :	.....
2F	1	JD-5606A	JD-5606A	000951-TR-05	MOVEABLE CONVEYOR	Seller's Ref. :	000951-00-0CG-LT-0003
2G	1	JD-5606B	JD-5606B	000951-TR-05	MOVEABLE CONVEYOR	Seller :	PHB WESERHÜTTE S.A.U
2H	1	SP-5612A	NZO-F-TM-4-3L-VE-R	92/2018 - 40518004	TELESCOPIC CHUTE	Tel. number :	+34 984 49 56 71
2I	1	SP-5612B	NZO-F-TM-4-3L-VE-R	91/2018 - 40518004	TELESCOPIC CHUTE		
2J	1	SP-5605	RC4.32TAS1RS	361.18	TRUCK WASHING BOX		
2K	1	252PLC-221-222-223	300-17-003	30017003-001	PLC/CABLE		
2L	1	SP-5614	SVP-3954-17	2018-10-28978	VULCANIZER		

PARTS

QUANTITY OF INSTALLED PARTS PER SINGLE UNIT OF EQUIPMENT :										NO. OF INSTALLED PARTS IN 2A to 2L	UNIT OF MEASURE	DESCRIPTION	DRAWING No.	PART NUMBER			REMARKS
														SELLER'S	MANUFACTURER'S	OWNER'S	
1												INSTRUMENTS					
2				2	2					4	PC	HAND SWITCH	172784-0300-001-SD-000114	LHPEw-10/1-B-EX	TAEX		
3				4	4					8	PC	POSITION SWITCH	172784-0300-001-SD-000114	LHPEw-10/2EX-L50V	TAEX		
4				1	1					2	PC	LEVEL SWITCH	172784-0300-001-SD-000114	VEGACAP 62 CP62	VEGA		
5	1									1	PC	LEVEL SWITCH	172784-0300-001-SD-000114	VEGACAP 65 CP65	VEGA		
6	1									1	PC	LEVEL DETECTION	172784-0300-001-SD-000114	VEGAPULS 69 PS69	VEGA		
7											PC	SPEED LIMIT SWITCH	172784-0300-001-SD-000114				
8											PC	INDUCTIVE SENSOR	-	XS630B1PAL10EX	SCHNEIDER		
9				1	1					2	PC	INDUCTIVE SENSOR	-	XSAV12373EX	SCHNEIDER		
10											PC	LIMIT SWITCH	-	XCKD3945P16 EX	SCHNEIDER		
11				1	1					2	PC	ENCODER	-	8.5863FS2.1A4BG722.010	PEPPERL & FUCHS		
12												ROTOFLUID COUPLING ALFA 55 K02 FC					
13											PC	120°C 1/2" GAS FUSIBLE PLUG	000951-03-0TTR-EM-1100	N/A	WESTCAR		
14											PC	FLEXIBLE ELEMENT RN5	000951-03-0TTR-EM-1100	N/A	WESTCAR		
15											PC	VITON SEALS KIT GU5	000951-03-0TTR-EM-1100	N/A	WESTCAR		
16											PC	BEARINGS KIT CU5	000951-03-0TTR-EM-1100	N/A	WESTCAR		
17												ELECTROMAGNETIC SEPARATOR SK 16.15					
18											SET	SET OF FUSES	000951-01-0EX-EM-1200	GZ000052	MEC		
19											PC	24 Vdc FEEDER	000951-01-0EX-EM-1200	CA007020	MEC		
20											SET	SET OF LED LAMP	000951-01-0EX-EM-1200	GZ000029	MEC		

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

EQUIPMENT

ITEM	QTY	TAG NUMBER(S)	MODEL	SERIAL No.(s)	DESCRIPTION	172784 -	I-SD-000006
2A	1	FC-5601B	FABRIPULSE-EV 12-10	118800-EV	DUST COLLECTOR B	(project number)	(spir number)
2B	1	FE-5601A	KER 940x1440	1806049	EXPLOSION PANELS	Rev. :	4 Date : 13-ago-19
2C	1	FE-5601B	KER 940x1440	1806049	EXPLOSION PANELS	Plant :	RNP DCU Plant Project (WP1)
2D	1	JD-5605A BELT	MTD-E 1245	50-V127070.A01	WEIGHING FEEDER	Location :	Pancevo, Serbia
2E	1	JD-5605B BELT	MTD-E 1245	50-V127069.A01	WEIGHING FEEDER	Equipment :	.....
2F	1	JD-5606A	JD-5606A	000951-TR-05	MOVEABLE CONVEYOR	Seller's Ref. :	000951-00-0CG-LT-0003
2G	1	JD-5606B	JD-5606B	000951-TR-05	MOVEABLE CONVEYOR	Seller :	PHB WESERHÜTTE S.A.U
2H	1	SP-5612A	NZO-F-TM-4-3L-VE-R	92/2018 - 40518004	TELESCOPIC CHUTE	Tel. number :	+34 984 49 56 71
2I	1	SP-5612B	NZO-F-TM-4-3L-VE-R	91/2018 - 40518004	TELESCOPIC CHUTE		
2J	1	SP-5605	RC4.32TAS1RS	361.18	TRUCK WASHING BOX		
2K	1	252PLC-221-222-223	300-17-003	30017003-001	PLC/CABLE		
2L	1	SP-5614	SVP-3954-17	2018-10-28978	VULCANIZER		

PARTS

[illegible]

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

EQUIPMENT

ITEM	QTY	TAG NUMBER(S)	MODEL	SERIAL No.(s)	DESCRIPTION	172784 -	I-SD-000006
2A	1	FC-5601B	FABRIPULSE-EV 12-10	118800-EV	DUST COLLECTOR B	(project number)	(spir number)
2B	1	FE-5601A	KER 940x1440	1806049	EXPLOSION PANELS	Rev. :	4 Date : 13-ago-19
2C	1	FE-5601B	KER 940x1440	1806049	EXPLOSION PANELS	Plant :	RNP DCU Plant Project (WP1)
2D	1	JD-5605A BELT	MTD-E 1245	50-V127070.A01	WEIGHING FEEDER	Location :	Pancevo, Serbia
2E	1	JD-5605B BELT	MTD-E 1245	50-V127069.A01	WEIGHING FEEDER	Equipment :	.....
2F	1	JD-5606A	JD-5606A	000951-TR-05	MOVEABLE CONVEYOR	Seller's Ref. :	000951-00-0CG-LT-0003
2G	1	JD-5606B	JD-5606B	000951-TR-05	MOVEABLE CONVEYOR	Seller :	PHB WESERHÜTTE S.A.U
2H	1	SP-5612A	NZO-F-TM-4-3L-VE-R	92/2018 - 40518004	TELESCOPIC CHUTE	Tel. number :	+34 984 49 56 71
2I	1	SP-5612B	NZO-F-TM-4-3L-VE-R	91/2018 - 40518004	TELESCOPIC CHUTE		
2J	1	SP-5605	RC4.32TAS1RS	361.18	TRUCK WASHING BOX		
2K	1	252PLC-221-222-223	300-17-003	30017003-001	PLC/CABLE		
2L	1	SP-5614	SVP-3954-17	2018-10-28978	VULCANIZER		

PARTS

[illegible]

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

EQUIPMENT

ITEM	QTY	TAG NUMBER(S)			MODEL		SERIAL No.(s)		DESCRIPTION			172784 - I-SD-000006													
2A	1	FC-5601B			FABRIPULSE-EV 12-10		118800-EV		DUST COLLECTOR B			(project number)	(spir number)												
2B		1	FE-5601A			KER 940x1440		1806049		EXPLOSION PANELS			Rev. :	4	Date :	13-ago-19									
2C			1	FE-5601B			KER 940x1440		1806049		EXPLOSION PANELS			Plant :	RNP DCU Plant Project (WP1)										
2D				1	JD-5605A BELT			MTD-E 1245		50-V127070.A01		WEIGHING FEEDER			Location :	Pancevo, Serbia									
2E					1	JD-5605B BELT			MTD-E 1245		50-V127069.A01		WEIGHING FEEDER			Equipment :	.....							
2F						1	JD-5606A			JD-5606A		000951-TR-05		MOVEABLE CONVEYOR			Seller's Ref. :	000951-00-0CG-LT-0003							
2G							1	JD-5606B			JD-5606B		000951-TR-05		MOVEABLE CONVEYOR			Seller :	PHB WESERHÜTTE S.A.U						
2H								1	SP-5612A			NZO-F-TM-4-3L-VE-R		92/2018 - 40518004		TELESCOPIC CHUTE			Tel. number :	+34 984 49 56 71					
2I									1	SP-5612B			NZO-F-TM-4-3L-VE-R		91/2018 - 40518004		TELESCOPIC CHUTE								
2J										1	SP-5605			RC4.32TAS1RS		361.18		TRUCK WASHING BOX							
2K											1	252PLC-221-222-223			300-17-003		30017003-001		PLC/CABLE						
2L												1	SP-5614			SVP-3954-17		2018-10-28978		VULCANIZER					

PARTS

64				1	1					2	PC	Gearbox KA67/T AM112	000951-05-0TR-EM-1000	KA67/T AM112	SEW		
65											PC	Motor Gearbox KA87BB EDRN90L4	000951-05-0TR-EM-8010	KA87BB EDRN90L4	SEW		
66												FABRIPULSE EV 12-10-B FILTRE					
67											PC	BAG FILTER	-	27-100003	AAF		
68											PC	ELECTRICAL CLEANING CIRCUIT	-	GAMMA	AAF		
69											PC	MEMBRANE VALVE REPAIR KIT	-	FPVD25	AAF		
70				1	1					2	PC	ELECTROVALVE REPAIR KIT	-	FPV24V	AAF		
71				1	1					2	PC	GALVANIZED CAGE	-	N/A	AAF		
72												ELASTIC COUPLING					
73	12									12	PC	ELASTIC COUPLING	000951-01-0EX-EM-1100	POLY-NORM 38 ADR	KTR		
74	1									1		MOTORS					
75	3									3	PC	Motor M3GP 132SME 4. 7.50 kW	000951-01-0TR-EM-0070	3GGP132250-BDL	ABB		
76	3									3	PC	Motor M3GP 160MLB 4. 15 kW	000951-02-0TR-EM-0070	3GGP162420-BDL	ABB		
77	12									12	PC	Motor M3GP 225SMB 4. 45 kW	000951-03-0TR-EM-1100	3GGP222220-ADL	ABB		
78											PC	Motor M3GP 132SMB 4. 5.50 kW	000951-04-0TR-EM-0070	3GGP132220-BDL	ABB		
79				1	1					2	PC	Motor M3GP 112ME 4. 4 kW	000951-05-0TR-EM-1000	3GGP112350-BDL	ABB		
80											PC	Motor M3GP 250SMA 6. 37 kW	000951-00-0OM-CO-0090	3GGP253210-ADL	ABB		
81											PC	Motor M3GP 132SMF 6. 4 kW	000951-01-0EX-EM-1100	3GGP133260-ADL	ABB		
82												HOIST SH4016-16 4/1					
83											METER	WIRE ROPE Ø9	-	3300079	STAHL		
84											PC	ROPE GUIDE RING LEFT 8,5-9	-	0443000430	STAHL		
85											PC	BOTTOM HOOK 6300 KG H162-4	-	0143027510	STAHL		
86											PC	BRAKE DISC 12/2H42MF (HOIST)	-	2327043650	STAHL		
87											PC	BRAKE DISC 8/2F12 (TROLLEY)	-	2127023650	STAHL		
88											PC	MOTOR 12/2H42-MF (HOIST)	-	70002098	STAHL		
89											PC	MOTOR 8/2F12 (TROLLEY)	-	2127087119	STAHL		

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

EQUIPMENT

ITEM	QTY	TAG NUMBER(S)	MODEL	SERIAL No.(s)	DESCRIPTION
2A	1	FC-5601B	FABRIPULSE-EV 12-10	118800-EV	DUST COLLECTOR B
2B	1	FE-5601A	KER 940x1440	1806049	EXPLOSION PANELS
2C	1	FE-5601B	KER 940x1440	1806049	EXPLOSION PANELS
2D	1	JD-5605A BELT	MTD-E 1245	50-V127070.A01	WEIGHING FEEDER
2E	1	JD-5605B BELT	MTD-E 1245	50-V127069.A01	WEIGHING FEEDER
2F	1	JD-5606A	JD-5606A	000951-TR-05	MOVEABLE CONVEYOR
2G	1	JD-5606B	JD-5606B	000951-TR-05	MOVEABLE CONVEYOR
2H	1	SP-5612A	NZO-F-TM-4-3L-VE-R	92/2018 - 40518004	TELESCOPIC CHUTE
2I	1	SP-5612B	NZO-F-TM-4-3L-VE-R	91/2018 - 40518004	TELESCOPIC CHUTE
2J	1	SP-5605	RC4.32TAS1RS	361.18	TRUCK WASHING BOX
2K	1	252PLC-221-222-223	300-17-003	30017003-001	PLC/CABLE
2L	1	SP-5614	SVP-3954-17	2018-10-28978	VULCANIZER

172784 -

I-SD-000006

(project number)

(spir number)

Rev. :

4

Date :

13-ago-19

Plant :

RNP DCU Plant Project (WP1)

Location :

Pancevo, Serbia

Equipment :

.....

Seller's Ref. :

000951-00-0CG-LT-0003

Seller :

PHB WESERHÜTTE S.A.U

Tel. number :

+34 984 49 56 71

PARTS

[illegible]

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

EQUIPMENT

ITEM	QTY	TAG NUMBER(S)	MODEL	SERIAL No.(s)	DESCRIPTION	172784 -	I-SD-000006
2A	1	FC-5601B	FABRIPULSE-EV 12-10	118800-EV	DUST COLLECTOR B	(project number)	(spir number)
2B	1	FE-5601A	KER 940x1440	1806049	EXPLOSION PANELS	Rev. :	4 Date : 13-ago-19
2C	1	FE-5601B	KER 940x1440	1806049	EXPLOSION PANELS	Plant :	RNP DCU Plant Project (WP1)
2D	1	JD-5605A BELT	MTD-E 1245	50-V127070.A01	WEIGHING FEEDER	Location :	Pancevo, Serbia
2E	1	JD-5605B BELT	MTD-E 1245	50-V127069.A01	WEIGHING FEEDER	Equipment :	.....
2F	1	JD-5606A	JD-5606A	000951-TR-05	MOVEABLE CONVEYOR	Seller's Ref. :	000951-00-0CG-LT-0003
2G	1	JD-5606B	JD-5606B	000951-TR-05	MOVEABLE CONVEYOR	Seller :	PHB WESERHÜTTE S.A.U
2H	1	SP-5612A	NZO-F-TM-4-3L-VE-R	92/2018 - 40518004	TELESCOPIC CHUTE	Tel. number :	+34 984 49 56 71
2I	1	SP-5612B	NZO-F-TM-4-3L-VE-R	91/2018 - 40518004	TELESCOPIC CHUTE		
2J	1	SP-5605	RC4.32TAS1RS	361.18	TRUCK WASHING BOX		
2K	1	252PLC-221-222-223	300-17-003	30017003-001	PLC/CABLE		
2L	1	SP-5614	SVP-3954-17	2018-10-28978	VULCANIZER		

PARTS

[illegible]

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

EQUIPMENT

ITEM	QTY	TAG NUMBER(S)	MODEL	SERIAL No.(s)	DESCRIPTION	172784 -	I-SD-000006
2A	1	FC-5601B	FABRIPULSE-EV 12-10	118800-EV	DUST COLLECTOR B	(project number)	(spir number)
2B	1	FE-5601A	KER 940x1440	1806049	EXPLOSION PANELS	Rev. :	4 Date : 13-ago-19
2C	1	FE-5601B	KER 940x1440	1806049	EXPLOSION PANELS	Plant :	RNP DCU Plant Project (WP1)
2D	1	JD-5605A BELT	MTD-E 1245	50-V127070.A01	WEIGHING FEEDER	Location :	Pancevo, Serbia
2E	1	JD-5605B BELT	MTD-E 1245	50-V127069.A01	WEIGHING FEEDER	Equipment :	.....
2F	1	JD-5606A	JD-5606A	000951-TR-05	MOVEABLE CONVEYOR	Seller's Ref. :	000951-00-0CG-LT-0003
2G	1	JD-5606B	JD-5606B	000951-TR-05	MOVEABLE CONVEYOR	Seller :	PHB WESERHÜTTE S.A.U
2H	1	SP-5612A	NZO-F-TM-4-3L-VE-R	92/2018 - 40518004	TELESCOPIC CHUTE	Tel. number :	+34 984 49 56 71
2I	1	SP-5612B	NZO-F-TM-4-3L-VE-R	91/2018 - 40518004	TELESCOPIC CHUTE		
2J	1	SP-5605	RC4.32TAS1RS	361.18	TRUCK WASHING BOX		
2K	1	252PLC-221-222-223	300-17-003	30017003-001	PLC/CABLE		
2L	1	SP-5614	SVP-3954-17	2018-10-28978	VULCANIZER		

PARTS

[illegible]

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

EQUIPMENT

ITEM	QTY	TAG NUMBER(S)	MODEL	SERIAL No.(s)	DESCRIPTION	172784 -	I-SD-000006
2A	1	FC-5601B	FABRIPULSE-EV 12-10	118800-EV	DUST COLLECTOR B	(project number)	(spir number)
2B	1	FE-5601A	KER 940x1440	1806049	EXPLOSION PANELS	Rev. :	4 Date : 13-ago-19
2C	1	FE-5601B	KER 940x1440	1806049	EXPLOSION PANELS	Plant :	RNP DCU Plant Project (WP1)
2D	1	JD-5605A BELT	MTD-E 1245	50-V127070.A01	WEIGHING FEEDER	Location :	Pancevo, Serbia
2E	1	JD-5605B BELT	MTD-E 1245	50-V127069.A01	WEIGHING FEEDER	Equipment :	.....
2F	1	JD-5606A	JD-5606A	000951-TR-05	MOVEABLE CONVEYOR	Seller's Ref. :	000951-00-0CG-LT-0003
2G	1	JD-5606B	JD-5606B	000951-TR-05	MOVEABLE CONVEYOR	Seller :	PHB WESERHÜTTE S.A.U
2H	1	SP-5612A	NZO-F-TM-4-3L-VE-R	92/2018 - 40518004	TELESCOPIC CHUTE	Tel. number :	+34 984 49 56 71
2I	1	SP-5612B	NZO-F-TM-4-3L-VE-R	91/2018 - 40518004	TELESCOPIC CHUTE		
2J	1	SP-5605	RC4.32TAS1RS	361.18	TRUCK WASHING BOX		
2K	1	252PLC-221-222-223	300-17-003	30017003-001	PLC/CABLE		
2L	1	SP-5614	SVP-3954-17	2018-10-28978	VULCANIZER		

PARTS

[illegible]

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

EQUIPMENT

ITEM	QTY	TAG NUMBER(S)	MODEL	SERIAL No.(s)	DESCRIPTION	172784 -	I-SD-000006
2A	1	FC-5601B	FABRIPULSE-EV 12-10	118800-EV	DUST COLLECTOR B	(project number)	(spir number)
2B	1	FE-5601A	KER 940x1440	1806049	EXPLOSION PANELS	Rev. :	4 Date : 13-ago-19
2C	1	FE-5601B	KER 940x1440	1806049	EXPLOSION PANELS	Plant :	RNP DCU Plant Project (WP1)
2D	1	JD-5605A BELT	MTD-E 1245	50-V127070.A01	WEIGHING FEEDER	Location :	Pancevo, Serbia
2E	1	JD-5605B BELT	MTD-E 1245	50-V127069.A01	WEIGHING FEEDER	Equipment :	.....
2F	1	JD-5606A	JD-5606A	000951-TR-05	MOVEABLE CONVEYOR	Seller's Ref. :	000951-00-0CG-LT-0003
2G	1	JD-5606B	JD-5606B	000951-TR-05	MOVEABLE CONVEYOR	Seller :	PHB WESERHÜTTE S.A.U
2H	1	SP-5612A	NZO-F-TM-4-3L-VE-R	92/2018 - 40518004	TELESCOPIC CHUTE	Tel. number :	+34 984 49 56 71
2I	1	SP-5612B	NZO-F-TM-4-3L-VE-R	91/2018 - 40518004	TELESCOPIC CHUTE		
2J	1	SP-5605	RC4.32TAS1RS	361.18	TRUCK WASHING BOX		
2K	1	252PLC-221-222-223	300-17-003	30017003-001	PLC/CABLE		
2L	1	SP-5614	SVP-3954-17	2018-10-28978	VULCANIZER		

PARTS

185																			PC	GRIP NUT 1"	000951-01-OTT-EM-0001			MCLANAHAN CORPO		
186																			PC	HOPPER SIDE LINER LH	000951-01-OTT-EM-0001			MCLANAHAN CORPO		
187																			PC	HOPPER SIDE LINER RH	000951-01-OTT-EM-0001			MCLANAHAN CORPO		
188																			PC	FLAT SOCKET HEAD CAPSCREW 3/4"x2"	000951-01-OTT-EM-0001			MCLANAHAN CORPO		
189																			PC	GRIP NUT 3/4"	000951-01-OTT-EM-0001			MCLANAHAN CORPO		
190																			PC	HOLD-BACK BOLT ASSEMBLY	000951-01-OTT-EM-0001			MCLANAHAN CORPO		
191																										
192																				PLC						
193																	1	1	PC	7 Slot ControlLogix Chassis		1756-A7	ROCKWELL		Redundant Control	
194																	1	1	PC	ControlLogix, 85-265 VAC Power Supply (10 Amp @ 5V)		1756-PA72	ROCKWELL		Redundant Control	
195																	1	1	PC	ControlLogix 5570 Controller with 4 MB Memory, USB Port		1756-L72	ROCKWELL		Redundant Control	
196																	1	1	PC	EtherNet 10-100M Interface Module (supports 128 TCP/IP)		1756-EN2T	ROCKWELL		Redundant Control	
197																	1	1	PC	EtherNet dual port 10-100M Interface Module		1756-EN2TR	ROCKWELL		Redundant Control	
198																	1	1	PC	Redundancy Module		1756-RM2	ROCKWELL		Redundant Control	
199																	1	1	PC	Fiber Cable, 1 Meter		1756-RMC1	ROCKWELL		Redundant Control	
200																	1	1	PC	2-slot adapter base unit		1715-A2A	ROCKWELL		PERIFERIA SIL2	
201																	1	1	PC	3-slot I/O base unit		1715-A3IO	ROCKWELL		PERIFERIA SIL2	
202																	1	1	PC	EtherNet/IP Adapter		1715-AENTR	ROCKWELL		PERIFERIA SIL2	
203																	1	1	PC	16-point digital input module		1715-IB16D	ROCKWELL		PERIFERIA SIL2	
204																	1	1	PC	8-point digital output module		1715-OB8DE	ROCKWELL		PERIFERIA SIL2	
205																	1	1	PC	Termination Assembly - digital input simplex		1715-TASIB16D	ROCKWELL		PERIFERIA SIL2	
206																	1	1	PC	Termination Assembly - digital output simplex		1715-TASOB8DE	ROCKWELL		PERIFERIA SIL2	
207																	1	1	PC	1794 Flex, Flex Ex, Flex XT I/O System, FLEX I/O Dual Port EtherNet/IP		1794-AENTR	ROCKWELL		PERIFERIA ESTANDAR	
208																	1	1	PC	1794 Flex, Flex Ex, Flex XT I/O System, Input Module, 24VDC, 32 Sink Inputs		1794-IB32	ROCKWELL		PERIFERIA ESTANDAR	
209																	1	1	PC	1794 Flex, Flex Ex, Flex XT I/O System, Output Module, 24V DC, 32 Source		1794-OB32P	ROCKWELL		PERIFERIA ESTANDAR	
210																	1	1	PC	1794 Flex, Flex Ex, Flex XT I/O System, HART Analog Input Modules, 8 Single-Ended Inputs		1794-IE8H	ROCKWELL		PERIFERIA ESTANDAR	

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

EQUIPMENT

ITEM	QTY	TAG NUMBER(S)	MODEL	SERIAL No.(s)	DESCRIPTION	ALWAYS REFER TO THIS NUMBER :	
2A	1	FC-5601B	FABRIPULSE-EV 12-10	118800-EV	DUST COLLECTOR B	172784 - I-SD-000006	(project number) (spir number)
2B	1	FE-5601A	KER 940x1440	1806049	EXPLOSION PANELS	Rev. :	4 Date : 13-ago-19
2C	1	FE-5601B	KER 940x1440	1806049	EXPLOSION PANELS	Plant :	RNP DCU Plant Project (WP1)
2D	1	JD-5605A BELT	MTD-E 1245	50-V127070.A01	WEIGHING FEEDER	Location :	Pancevo, Serbia
2E	1	JD-5605B BELT	MTD-E 1245	50-V127069.A01	WEIGHING FEEDER	Equipment :	.....
2F	1	JD-5606A	JD-5606A	000951-TR-05	MOVEABLE CONVEYOR	Seller's Ref. :	000951-00-0CG-LT-0003
2G	1	JD-5606B	JD-5606B	000951-TR-05	MOVEABLE CONVEYOR	Seller :	PHB WESERHÜTTE S.A.U
2H	1	SP-5612A	NZO-F-TM-4-3L-VE-R	92/2018 - 40518004	TELESCOPIC CHUTE	Tel. number :	+34 984 49 56 71
2I	1	SP-5612B	NZO-F-TM-4-3L-VE-R	91/2018 - 40518004	TELESCOPIC CHUTE		
2J	1	SP-5605	RC4.32TAS1RS	361.18	TRUCK WASHING BOX		
2K	1	252PLC-221-222-223	300-17-003	30017003-001	PLC/CABLE		
2L	1	SP-5614	SVP-3954-17	2018-10-28978	VULCANIZER		

PARTS

211	1	1	PC	1794 Flex, Flex Ex, Flex XT I/O System, HART Analog 8 Output Module	1794-OF8IH	ROCKWELL	PERIFERIA ESTANDAR
212	1	1	PC	40 point feed-through digital IFM, standard,	1492-IFM40F	ROCKWELL	PERIFERIA ESTANDAR
213	1	1	PC	Pre-wired cable 1,5mt (1794-IB32)	1492-CAB015B94	ROCKWELL	PERIFERIA ESTANDAR
214	1	1	PC	Ready cable 1,5mt (1794-IB32/1974-OB32P)	1492-CAB015H94	ROCKWELL	PERIFERIA ESTANDAR
215	1	1	PC	Terminal base, for 32 point modules, 62 pin D-shell termination	1794-TB62DS	ROCKWELL	PERIFERIA ESTANDAR
216	1	1	PC	1794 Flex, Flex Ex, Flex XT I/O System, Terminal Base, 3-Wire grounded, Screw Clamp	1794-TB3G	ROCKWELL	PERIFERIA ESTANDAR
217	1	1	PC	FLEX I/O 1ft extended cable 0,9m	1794-CE3	ROCKWELL	PERIFERIA ESTANDAR
218	1	1	PC	1606-XLE480E: Essential Power Supply, 24-28V DC, 480 W, 240V AC Input Voltage	1606-XLE480EP	ROCKWELL	POWER SUPPLY
219	1	1	PC	1606-XLERED: Essential Redundancy Module, Vin 1 -.9Vin, 384 W, 10-60V DC Input Voltage	1606-XLERED	ROCKWELL	POWER SUPPLY
220	1	1	PC	Module voltage, module protection, 6A, 6A, 6A, 6A, Electronic Circuit Protection, 24Vdc	1692-ZG6666	ROCKWELL	POWER SUPPLY
221	1	1	PC	Stratix 5700 Switch, Managed, 8 Fast Ethernet Copper Ports, 2 Fast Ethernet Combo Ports	1783-BMS10CL	ROCKWELL	NETWORKS
222	1	1	PC	Networks and Communication Products, EtherNet/IP Tap1 copper port, 2 fiber ports	1783-ETAP2F	ROCKWELL	NETWORKS
223	1	1	PC	Networks and Communication Products, EtherNet/IP Tap2 copper ports, 1 fiber port	1783-ETAP1F	ROCKWELL	NETWORKS
224	1	1	PC	Stratix 2000 Switch, Unmanaged, 8 Copper Ports	1783-US8T	ROCKWELL	NETWORKS
225	1	1	PC	EtherNet/IP to Serial Linking Device Gateway	HMS-EN2SER	ROCKWELL	NETWORKS
226	1	1	PC	EtherNet/IP Adapter to Modbus-TCP Slave gateway	AB7632	ROCKWELL	NETWORKS
227	1	1	PC	Ethernet IP to Modbus TCP Gateway	PLX31-EIP-MBTCP	ROCKWELL	NETWORKS
228	1	1	PC	PanelView Plus 7 Standard Terminal, Touch Screen, 15 TFT Color, Ethernet DLR	2711P-T15C22D8S	ROCKWELL	HMI
229	1	1	PC	2-Channel Isolated Barrier, 24Vdc power supply, dry contact or NAMUR inputs,	KFD2-SR2-Ex2.W	PEPPERL-FUCHS	OTHERS
230	1	1	PC	PLC Relay Module, screw connection and pluggable miniature relay w/power	PLC-RSC-230UC/21	PHOENIX CONTACT	OTHERS
231	1	1	PC	PLC -INTERFACE, screw connection and plug-in miniature relay w/power contact	PLC-RSC-24DC/1/ACT	PHOENIX CONTACT	OTHERS
232	1	1	PC	Coupling Relay for SIL 2 high -and low- demand applications	PSR-PS21-1NO-1NC-24D	PHOENIX CONTACT	OTHERS
233	1	1	PC	Filter fan, 230Vac, up to 536m³/h, 223x223mm	01883.0-00	STEGO	OTHERS
234	1	1	PC	Miniature Circuit Breaker, 2P/16A, Curve C	5SL6516-7	SIEMENS	OTHERS
235	1	1	PC	Miniature Circuit Breaker, 2P/6A, Curve C	5SL6506-7	SIEMENS	OTHERS
236	1	1	PC	RCCB, 2-pole, type AC, 25A, 30mA	5SV53120FB	SIEMENS	OTHERS

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

EQUIPMENT

ITEM	QTY	TAG NUMBER(S)	MODEL	SERIAL No.(s)	DESCRIPTION	172784 -	I-SD-000006
2A	1	FC-5601B	FABRIPULSE-EV 12-10	118800-EV	DUST COLLECTOR B	(project number)	(spir number)
2B	1	FE-5601A	KER 940x1440	1806049	EXPLOSION PANELS	Rev. :	4 Date : 13-ago-19
2C	1	FE-5601B	KER 940x1440	1806049	EXPLOSION PANELS	Plant :	RNP DCU Plant Project (WP1)
2D	1	JD-5605A BELT	MTD-E 1245	50-V127070.A01	WEIGHING FEEDER	Location :	Pancevo, Serbia
2E	1	JD-5605B BELT	MTD-E 1245	50-V127069.A01	WEIGHING FEEDER	Equipment :	.....
2F	1	JD-5606A	JD-5606A	000951-TR-05	MOVEABLE CONVEYOR	Seller's Ref. :	000951-00-0CG-LT-0003
2G	1	JD-5606B	JD-5606B	000951-TR-05	MOVEABLE CONVEYOR	Seller :	PHB WESERHÜTTE S.A.U
2H	1	SP-5612A	NZO-F-TM-4-3L-VE-R	92/2018 - 40518004	TELESCOPIC CHUTE	Tel. number :	+34 984 49 56 71
2I	1	SP-5612B	NZO-F-TM-4-3L-VE-R	91/2018 - 40518004	TELESCOPIC CHUTE		
2J	1	SP-5605	RC4.32TAS1RS	361.18	TRUCK WASHING BOX		
2K	1	252PLC-221-222-223	300-17-003	30017003-001	PLC/CABLE		
2L	1	SP-5614	SVP-3954-17	2018-10-28978	VULCANIZER		

PARTS

[illegible]

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

EQUIPMENT

ITEM	QTY	TAG NUMBER(S)				MODEL		SERIAL No.(s)		DESCRIPTION				172784 - I-SD-000006												
2A	1	FC-5601B				FABRIPULSE-EV 12-10		118800-EV		DUST COLLECTOR B				(project number) (spir number)												
2B		1	FE-5601A				KER 940x1440		1806049		EXPLOSION PANELS				Rev. : 4 Date : 13-ago-19											
2C			1	FE-5601B				KER 940x1440		1806049		EXPLOSION PANELS				Plant : RNP DCU Plant Project (WP1)										
2D				1	JD-5605A BELT				MTD-E 1245		50-V127070.A01		WEIGHING FEEDER				Location : Pancevo, Serbia									
2E					1	JD-5605B BELT				MTD-E 1245		50-V127069.A01		WEIGHING FEEDER				Equipment :								
2F						1	JD-5606A				JD-5606A		000951-TR-05		MOVEABLE CONVEYOR				Seller's Ref. : 000951-00-0CG-LT-0003							
2G							1	JD-5606B				JD-5606B		000951-TR-05		MOVEABLE CONVEYOR				Seller : PHB WESERHÜTTE S.A.U						
2H								1	SP-5612A				NZO-F-TM-4-3L-VE-R		92/2018 - 40518004		TELESCOPIC CHUTE				Tel. number : +34 984 49 56 71					
2I									1	SP-5612B				NZO-F-TM-4-3L-VE-R		91/2018 - 40518004		TELESCOPIC CHUTE								
2J										1	SP-5605				RC4.32TAS1RS		361.18		TRUCK WASHING BOX							
2K											1	252PLC-221-222-223				300-17-003		30017003-001		PLC/CABLE						
2L												1	SP-5614				SVP-3954-17		2018-10-28978		VULCANIZER					

PARTS

259						1	1			2	PC	Tube No. 4	000951-01-0CC-EM-0001	HE-NZ-OD-024186-000	HENNLICH		
260						1	1			2	PC	Outer bellows	000951-01-0CC-EM-0001	HE-NZ-OS-024231-000	HENNLICH		
261						1	1			2	PC	Rope dia 6 mm	000951-01-0CC-EM-0001	HE-NZ-ME-024210-000	HENNLICH		
262																	
263									1	1		VULCANIZER					
264									1	1	PC	spare bag size 39" x 54"	-	SVP3954-17 (39-54)	ALMEX		
265									4	4	PC	spare element 39" x 54"	-	SVP3954-17 (39-54)	ALMEX		
266									1	1	PC	Platen Receptacle Insert (High Temp)	-	SVP3954-17 (SVP-18)	ALMEX		
267									1	1	PC	1/4" (6mm) 100 Ohm RTD Probe	-	SVP3954-17 (SVP-23)	ALMEX		
268									1	1	PC	Platen Handle Assembly	-	SVP3954-17 (SVP-25)	ALMEX		
269									1	1	PC	Locking Pin	-	SVP3954-17 (SVP-3)	ALMEX		
270									1	1	PC	Quick coupler Male	-	SVP3954-17 (SVP-10)	ALMEX		
271									1	1	PC	Quick coupler Male Dust-cap	-	SVP3954-17 (SVP-11)	ALMEX		
272									1	1	PC	Quick coupler Female	-	SVP3954-17 (SVP-30)	ALMEX		
273									1	1	PC	Quick coupler Female Dust-cap	-	SVP3954-17 (SVP-31)	ALMEX		
274												FOR RC3 TEMPERATURE CONTROL PANEL	-		ALMEX		
275									1	1	PC	Fuse Holder C/w 2 Amp Fuse	-	SVP3954-17 (RC3-9)	ALMEX		
276									1	1	PC	Platen Connector Insert	-	SVP3954-17 (RC3-15)	ALMEX		
277									1	1	PC	Platen Connector Housing	-	SVP3954-17 (RC3-15)	ALMEX		
278																	
279												AUTOMATIC SAMPLING SYSTEM					
280												Hammer sampler HPN650/30/482/D/300	000951-01-0CG-PI-0008_03 S-56				
281											PC	Geared motor with brake	000951-01-0CG-PI-0008_03 S-56	351005	SIEBTECHNIK		
282											PC	Proximity switches	000951-01-0CG-PI-0008_03 S-56	351510	SIEBTECHNIK		

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

EQUIPMENT

ITEM	QTY	TAG NUMBER(S)				MODEL		SERIAL No.(s)		DESCRIPTION				172784 - I-SD-000006												
2A	1	FC-5601B				FABRIPULSE-EV 12-10		118800-EV		DUST COLLECTOR B				(project number) (spir number)												
2B		1	FE-5601A				KER 940x1440		1806049		EXPLOSION PANELS				Rev. : 4 Date : 13-ago-19											
2C			1	FE-5601B				KER 940x1440		1806049		EXPLOSION PANELS				Plant : RNP DCU Plant Project (WP1)										
2D				1	JD-5605A BELT				MTD-E 1245		50-V127070.A01		WEIGHING FEEDER				Location : Pancevo, Serbia									
2E					1	JD-5605B BELT				MTD-E 1245		50-V127069.A01		WEIGHING FEEDER				Equipment :								
2F						1	JD-5606A				JD-5606A		000951-TR-05		MOVEABLE CONVEYOR				Seller's Ref. : 000951-00-0CG-LT-0003							
2G							1	JD-5606B				JD-5606B		000951-TR-05		MOVEABLE CONVEYOR				Seller : PHB WESERHÜTTE S.A.U						
2H								1	SP-5612A				NZO-F-TM-4-3L-VE-R		92/2018 - 40518004		TELESCOPIC CHUTE				Tel. number : +34 984 49 56 71					
2I									1	SP-5612B				NZO-F-TM-4-3L-VE-R		91/2018 - 40518004		TELESCOPIC CHUTE								
2J										1	SP-5605				RC4.32TAS1RS		361.18		TRUCK WASHING BOX							
2K											1	252PLC-221-222-223				300-17-003		30017003-001		PLC/CABLE						
2L												1	SP-5614				SVP-3954-17		2018-10-28978		VULCANIZER					

PARTS

283	PC	Guide plates (set)	000951-01-0CG-PI-0008_03 S-56	351551	SIEBTECHNIK		
284	PC	Back panel	000951-01-0CG-PI-0008_03 S-56	351550	SIEBTECHNIK		
285	PC	Stripper rubber	000951-01-0CG-PI-0008_03 S-56	351553	SIEBTECHNIK		
286	PC	Brush	000951-01-0CG-PI-0008_03 S-56	351555	SIEBTECHNIK		
287	PC	Spherical roller bearings	000951-01-0CG-PI-0008_03 S-56	131577	SIEBTECHNIK		
288	PC	Tension sleeve	000951-01-0CG-PI-0008_03 S-56	217035	SIEBTECHNIK		
289	PC	V-sealing ring	000951-01-0CG-PI-0008_03 S-56	195568	SIEBTECHNIK		
290		Belt conveyor GFB500x3175	000951-01-0CG-PI-0008_03 S-56				
291	PC	Geared motor	000951-01-0CG-PI-0008_03 S-56	351006	SIEBTECHNIK		
292	PC	Drive pulley	000951-01-0CG-PI-0008_03 S-56	351303	SIEBTECHNIK		
293	PC	Take-up pulley	000951-01-0CG-PI-0008_03 S-56	347771	SIEBTECHNIK		
294	PC	Flanged bearing FY65	000951-01-0CG-PI-0008_03 S-56	351304	SIEBTECHNIK		
295	PC	Flanged bearing FY45	000951-01-0CG-PI-0008_03 S-56	347751	SIEBTECHNIK		
296	PC	Idler, top	000951-01-0CG-PI-0008_03 S-56	206482	SIEBTECHNIK		
297	PC	Idler, bottom	000951-01-0CG-PI-0008_03 S-56	347755	SIEBTECHNIK		
298	PC	Belt	000951-01-0CG-PI-0008_03 S-56	351516	SIEBTECHNIK		
299	PC	Rubber for material guide, set	000951-01-0CG-PI-0008_03 S-56	357689	SIEBTECHNIK		
300	PC	Rubber for drum stripper	000951-01-0CG-PI-0008_03 S-56	347759	SIEBTECHNIK		
301	PC	Rubber for angular stripper	000951-01-0CG-PI-0008_03 S-56	347760	SIEBTECHNIK		
302	PC	Sensor for speed monitoring	000951-01-0CG-PI-0008_03 S-56	350896	SIEBTECHNIK		
303		Single roll crusher EW 30/25	000951-01-0CG-PI-0008_03 S-56				
304	PC	Roller body	000951-01-0CG-PI-0008_03 S-56	200719	SIEBTECHNIK		
305	PC	Crushing bars	000951-01-0CG-PI-0008_03 S-56	164696	SIEBTECHNIK		
306	PC	Wear plate towards the crusher wall, 2 parts	000951-01-0CG-PI-0008_03 S-56	357690	SIEBTECHNIK		
307	PC	Wear plate towards the crusher wall, bottom	000951-01-0CG-PI-0008_03 S-56	350645	SIEBTECHNIK		
308	PC	Wear plate towards the crusher housing	000951-01-0CG-PI-0008_03 S-56	350647	SIEBTECHNIK		

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

EQUIPMENT

ITEM	QTY	TAG NUMBER(S)			MODEL		SERIAL No.(s)		DESCRIPTION			172784 - I-SD-000006													
2A	1	FC-5601B			FABRIPULSE-EV 12-10		118800-EV		DUST COLLECTOR B			(project number)	(spir number)												
2B		1	FE-5601A			KER 940x1440		1806049		EXPLOSION PANELS			Rev. :	4	Date :	13-ago-19									
2C			1	FE-5601B			KER 940x1440		1806049		EXPLOSION PANELS			Plant :	RNP DCU Plant Project (WP1)										
2D				1	JD-5605A BELT			MTD-E 1245		50-V127070.A01		WEIGHING FEEDER			Location :	Pancevo, Serbia									
2E					1	JD-5605B BELT			MTD-E 1245		50-V127069.A01		WEIGHING FEEDER			Equipment :	.....							
2F						1	JD-5606A			JD-5606A		000951-TR-05		MOVEABLE CONVEYOR			Seller's Ref. :	000951-00-0CG-LT-0003							
2G							1	JD-5606B			JD-5606B		000951-TR-05		MOVEABLE CONVEYOR			Seller :	PHB WESERHÜTTE S.A.U						
2H								1	SP-5612A			NZO-F-TM-4-3L-VE-R		92/2018 - 40518004		TELESCOPIC CHUTE			Tel. number :	+34 984 49 56 71					
2I									1	SP-5612B			NZO-F-TM-4-3L-VE-R		91/2018 - 40518004		TELESCOPIC CHUTE								
2J										1	SP-5605			RC4.32TAS1RS		361.18		TRUCK WASHING BOX							
2K											1	252PLC-221-222-223			300-17-003		30017003-001		PLC/CABLE						
2L												1	SP-5614			SVP-3954-17		2018-10-28978		VULCANIZER					

PARTS

309	PC	Stripper towards the back panel	000951-01-0CG-PI-0008_03 S-56	200727	SIEBTECHNIK		
310	PC	Stripper for crushing bar	000951-01-0CG-PI-0008_03 S-56	170846	SIEBTECHNIK		
311	PC	Rubber plate	000951-01-0CG-PI-0008_03 S-56	200723	SIEBTECHNIK		
312	PC	Self-aligning roller bearing	000951-01-0CG-PI-0008_03 S-56	200712	SIEBTECHNIK		
313	PC	Adapter sleeve	000951-01-0CG-PI-0008_03 S-56	200713	SIEBTECHNIK		
314	PC	Rubber battery spring	000951-01-0CG-PI-0008_03 S-56	118722	SIEBTECHNIK		
315	PC	Geared motor	000951-01-0CG-PI-0008_03 S-56	350632	SIEBTECHNIK		
316		Turnstile divider DKT 370 A/1P	000951-01-0CG-PI-0008_03 S-56				
317	PC	Geared motor	000951-01-0CG-PI-0008_03 S-56	350926	SIEBTECHNIK		
318	PC	Rotary arm	000951-01-0CG-PI-0008_03 S-56	265023	SIEBTECHNIK		
319	PC	Stripper for the rotary arm	000951-01-0CG-PI-0008_03 S-56	350933	SIEBTECHNIK		
320	PC	Discharge arm in the feeder housing	000951-01-0CG-PI-0008_03 S-56	350931	SIEBTECHNIK		
321	PC	Stripper set for the discharge arm in the feeder housing	000951-01-0CG-PI-0008_03 S-56	357314	SIEBTECHNIK		
322	PC	Cone scraper	000951-01-0CG-PI-0008_03 S-56	350932	SIEBTECHNIK		
323		Sample collector S4/10	000951-01-0CG-PI-0008_03 S-56				
324	PC	Geared motor	000951-01-0CG-PI-0008_03 S-56	350895	SIEBTECHNIK		
325	PC	Proximity switches	000951-01-0CG-PI-0008_03 S-56	350896	SIEBTECHNIK		
326	PC	Safety switch with actuator	000951-01-0CG-PI-0008_03 S-56	268454	SIEBTECHNIK		
327	PC	Container	000951-01-0CG-PI-0008_03 S-56	223146	SIEBTECHNIK		
328	PC	Rubber collar	000951-01-0CG-PI-0008_03 S-56	350903	SIEBTECHNIK		
329	PC	Rubber collar	000951-01-0CG-PI-0008_03 S-56	350904	SIEBTECHNIK		
330	PC	Hose clamp	000951-01-0CG-PI-0008_03 S-56	39515	SIEBTECHNIK		
331	PC	Rubber collar	000951-01-0CG-PI-0008_03 S-56	350905	SIEBTECHNIK		
332	PC	Hose clamp	000951-01-0CG-PI-0008_03 S-56	39075	SIEBTECHNIK		
333		Control unit	000951-01-0CG-PI-0008_03 S-56				
334	PC	Enclosure heater 800/870W, 230V,50/60 Hz	000951-01-0CG-PI-0008_03 S-56	350469-1	SIEBTECHNIK		

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

EQUIPMENT

ITEM	QTY	TAG NUMBER(S)	MODEL	SERIAL No.(s)	DESCRIPTION
2A	1	FC-5601B	FABRIPULSE-EV 12-10	118800-EV	DUST COLLECTOR B
2B	1	FE-5601A	KER 940x1440	1806049	EXPLOSION PANELS
2C	1	FE-5601B	KER 940x1440	1806049	EXPLOSION PANELS
2D	1	JD-5605A BELT	MTD-E 1245	50-V127070.A01	WEIGHING FEEDER
2E	1	JD-5605B BELT	MTD-E 1245	50-V127069.A01	WEIGHING FEEDER
2F	1	JD-5606A	JD-5606A	000951-TR-05	MOVEABLE CONVEYOR
2G	1	JD-5606B	JD-5606B	000951-TR-05	MOVEABLE CONVEYOR
2H	1	SP-5612A	NZO-F-TM-4-3L-VE-R	92/2018 - 40518004	TELESCOPIC CHUTE
2I	1	SP-5612B	NZO-F-TM-4-3L-VE-R	91/2018 - 40518004	TELESCOPIC CHUTE
2J	1	SP-5605	RC4.32TAS1RS	361.18	TRUCK WASHING BOX
2K	1	252PLC-221-222-223	300-17-003	30017003-001	PLC/CABLE
2L	1	SP-5614	SVP-3954-17	2018-10-28978	VULCANIZER

172784 -
 (project number)

I-SD-000006
 (spir number)

Rev. : 4

Date : 13-ago-19

Plant : RNP DCU Plant Project (WP1)

Location : Pancevo, Serbia

Equipment :

Seller's Ref. : 000951-00-0CG-LT-0003

Seller : PHB WESERHÜTTE S.A.U

Tel. number : +34 984 49 56 71

PARTS

[illegible]

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

EQUIPMENT

ITEM	QTY	TAG NUMBER(S)	MODEL	SERIAL No.(s)	DESCRIPTION	ALWAYS REFER TO THIS NUMBER : 172784 - I-SD-000006 (project number) (spir number)	
3A	1	HBV-1641	BC-03 "S" / Z106.136	099681-001 / 3218MM64	ELECTROACTUATED GATE A		
3B	1	HBV-1651	BC-03 "S" / Z106.136	099681-001 / 3218MM64	ELECTROACTUATED GATE B	Rev. :	4 Date : 13-ago-19
3C	1	SP-5608	EC1-250	PP018-0171	FEEDING CHUTE	Plant :	RNP DCU Plant Project (WP1)
3D	1	SP_5607	HPN650/30/482/D/300	48497	Primary Sampler	Location :	Pancevo, Serbia
3E	1	JD-5603	GFB500x3175	48498	Primary Belt Feeder	Equipment :	.....
3F	1	JD-5617	DKT370 A/1P	48500	Secondary Sampler	Seller's Ref. :	000951-00-0CG-LT-0003
3G	1	SP-5616	S4/10L	48501	Sample Rotary Collector	Seller :	PHB WESERHÜTTE S.A.U
3H	1	SP-5615	EW30/25	48499	Single Roller Mill	Tel. number :	+34 984 49 56 71
3I	1	252PLC-224	Control Unit	0	Sampler Control Unit		
3J							
3K							
3L							

PARTS

													NO. OF INSTALLED PARTS IN 2A to 2L	UNIT OF MEASURE	DESCRIPTION	DRAWING No.	PART NUMBER			REMARKS
																	SELLER'S	MANUFACTURER'S	OWNER'S	
QUANTITY OF INSTALLED PARTS PER SINGLE UNIT OF EQUIPMENT :																				
1																				
2																				
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				
11																				
12																				
13																				
14																				
15																				
16																				
17																				
18																				
19																				
20																				

EQUIPMENT

ALWAYS REFER TO THIS NUMBER :			
172784 -		I-SD-000006	
(project number)		(spir number)	
Rev. :	4	Date :	13-ago-19
Plant :	RNP DCU Plant Project (WP1)		
Location :	Pancevo, Serbia		
Equipment :	.....	
Seller's Ref. :	000951-00-0CG-LT-0003		
Seller :	PHB WESERHÜTTE S.A.U		
Tel. number :	+34 984 49 56 71		

21																			PC	RECTIFIER DIODE	000951-01-OEX-EM-1200	CA005157	MEC				
22																				ELECTROMECHANIC ACTUATOR							
23			1																1	PC	ELECTRIC MOTOR	000951-01-OSL-EM-0009	3P-CA-660V-50Hz	MECVEL 02			
24			1																1	PC	TORQUE LIMITER	000951-01-OSL-EM-0009	N/A	MECVEL 03			
25			1																1	PC	LIMIT SWITCHES GROUP	000951-01-OSL-EM-0009	N/A	MECVEL 07			
26			1																1	PC	MANUAL HAND WHEEL	000951-01-OSL-EM-0009	N/A	MECVEL 04			
27			1																1	PC	BELLOWS BOOT	000951-01-OSL-EM-0009	N/A	MECVEL 05			
28			1																1	PC	FRONT END WITH SHOCK ABSORBER	000951-01-OSL-EM-0009	N/A	MECVEL 06			
29																				AUTOMATIC SAMPLING SYSTEM							
30				1															1	PC	Limit switch type 1	000951-02-OTR-EM-0140	TEMA - HAMMER SAMPLE TAKER	TEMA			
31				1															1	PC	Limit switch type 2	000951-02-OTR-EM-0140	TEMA - HAMMER SAMPLE TAKER	TEMA			
32				1															1	PC	Atex brush	000951-02-OTR-EM-0140	TEMA - HAMMER SAMPLE TAKER	TEMA			
33				1															1	PC	Atex rubber strip	000951-02-OTR-EM-0140	TEMA - HAMMER SAMPLE TAKER	TEMA			
34					1														1	PC	Rubber scraper drum	000951-02-OTR-EM-0140	TEMA - GFB 500 CONVEYOR	TEMA			
35					1														1	PC	Rubber scraper lower belt	000951-02-OTR-EM-0140	TEMA - GFB 500 CONVEYOR	TEMA			
36							1												1	SET	Wearing plates for crushing roll	000951-02-OTR-EM-0140	TEMA - SINGLE ROLLER MILL EW 30/40	TEMA			
37							1												1	SET	Wearing plates for crushing plate, upper part	000951-02-OTR-EM-0140	TEMA - SINGLE ROLLER MILL EW 30/40	TEMA			
38							1												1	PC	Wearing plates for crushing plate, lower part	000951-02-OTR-EM-0140	TEMA - SINGLE ROLLER MILL EW 30/40	TEMA			
39					1														1	SET	Rubber scrapers	000951-02-OTR-EM-0140	TEMA - TURNSTILE DIVIDER DKT 370 A	TEMA			
40						4													4	PC	Rubber collar Ø154	000951-02-OTR-EM-0140	TEMA - SAMPLE COLLECTOR S 4/10L	TEMA			
41						4													4	PC	Rubber collar Ø162	000951-02-OTR-EM-0140	TEMA - SAMPLE COLLECTOR S 4/10L	TEMA			

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

EQUIPMENT

ITEM	QTY	TAG NUMBER(S)		MODEL		SERIAL No.(s)		DESCRIPTION		172784 - I-SD-000006 (project number) (spir number)	
3A	1	HBV-1641		BC-03 "S" / Z106.136		099681-001 / 3218MM641		ELECTROACTUATED GATE A		Rev. : 4 Date : 13-ago-19	
3B		1	HBV-1651		BC-03 "S" / Z106.136		099681-001 / 3218MM641		ELECTROACTUATED GATE B		Plant : RNP DCU Plant Project (WP1)
3C		1	SP-5608		EC1-250		PP018-0171		FEEDING CHUTE		Location : Pancevo, Serbia
3D		1	SP_5607		HPN650/30/482/D/300		48497		Primary Sampler		Equipment :
3E		1	JD-5603		GFB500x3175		48498		Primary Belt Feeder		Seller's Ref. : 000951-00-0CG-LT-0003
3F		1	JD-5617		DKT370 A/1P		48500		Secondary Sampler		Seller : PHB WESERHÜTTE S.A.U
3G		1	SP-5616		S4/10L		48501		Sample Rotary Collector		Tel. number : +34 984 49 56 71
3H		1	SP-5615		EW30/25		48499		Single Roller Mill		
3I		1	252PLC-224		Control Unit		0		Sampler Control Unit		
3J											
3K											
3L											

PARTS

42	4	PC	Sample collectors stainless steel	000951-02-0TR-EM-0140	TEMA - SAMPLE COLLECTOR S 4/10L	TEMA		
43			BELTS					
44		Meter	Rubber belt W1200	000951-01-0EX-EM-0002	TEXTER 400/3 6+3 BS W1200	SIG		
45		Meter	Rubber belt W650	000951-01-0TR-EM-0007 000951-02-0TR-EM-0007 000951-04-0TR-EM-0007	TEXTER 400/3 6+3 BS W650	SIG		
46		Meter	Rubber belt W1200	000951-03-0TR-EM-0007	PIPEX 500/4 6+2 BS W1200	SIG		
47			IDLERS					
48		PC	CARRYING IDLER W650 Ø89 X 250	000951-01-0ST-EM-0010_0030	PSV/1 20F14 89J	RULMECA		
49		PC	IMPACT IDLER W650 Ø89 X 250	000951-01-0ST-EM-0020	PSV/1 20F14 63/89	RULMECA		
50		PC	RETURN IDLER W650 Ø108 X 750	000951-01-0ST-EM-0040	PSV/1 20Y14 63/108	RULMECA		
51								
52		PC	IMPACT IDLER Ø133/89 X 750	000951-01-0ST-EM-0400_0140	PSV/4 30F22 89/133	RULMECA		
53		PC	CLEANING IDLER Ø133/89 X 1400	000951-01-0ST-EM-0420_0430_0440	PSV/1 20Y14 89/133	RULMECA		
54		PC	CARRYING IDLER W1200 Ø108 X 465	000951-01-0ST-EM-0150_0180	PSV/1 20F14 108J	RULMECA		
55		PC	IMPACT IDLER W1200 Ø108/63 X 465	000951-01-0ST-EM-0160	PSV/1 20F14 63/108	RULMECA		
56		PC	CARRYING IDLER W1200 Ø89 X 165	000951-01-0ST-EM-0170_0200	PSV/1 20F14 108J	RULMECA		
57								
58								
59			GEARBOX					
60		PC	Gearbox KA107 R77 AD4	000951-01-0EX-EM-1100	KA107 R77 AD4	SEW		
61		PC	Gearbox KA77/T AM13S/M/RS	000951-01-0TR-EM-0070 & 000951-04-0TR-EM-0070	KA77/T AM132S/M/RS	SEW		
62		PC	Gearbox KA87/T AM160/RS	000951-02-0TR-EM-0070	KA87/T AM160/RS	SEW		
63		PC	Gearbox KA127B AD8/RS	000951-03-0TR-EM-1100	KA127B AD8/RS	SEW		
64		PC	Gearbox KA67/T AM112	000951-05-0TR-EM-1000	KA67/T AM112	SEW		

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

EQUIPMENT

ITEM	QTY	TAG NUMBER(S)		MODEL	SERIAL No.(s)	DESCRIPTION		172784 - I-SD-000006	
3A	1	HBV-1641		BC-03 "S" / Z106.136	099681-001 / 3218MM641	ELECTROACTUATED GATE A		(project number)	(spir number)
3B		1	HBV-1651	BC-03 "S" / Z106.136	099681-001 / 3218MM641	ELECTROACTUATED GATE B		Rev. :	4 Date : 13-ago-19
3C		1	SP-5608	EC1-250	PP018-0171	FEEDING CHUTE		Plant :	RNP DCU Plant Project (WP1)
3D		1	SP_5607	HPN650/30/482/D/300	48497	Primary Sampler		Location :	Pancevo, Serbia
3E		1	JD-5603	GFB500x3175	48498	Primary Belt Feeder		Equipment :	.....
3F		1	JD-5617	DKT370 A/1P	48500	Secondary Sampler		Seller's Ref. :	000951-00-0CG-LT-0003
3G		1	SP-5616	S4/10L	48501	Sample Rotary Collector		Seller :	PHB WESERHÜTTE S.A.U
3H		1	SP-5615	EW30/25	48499	Single Roller Mill		Tel. number :	+34 984 49 56 71
3I		1	252PLC-224	Control Unit	0	Sampler Control Unit			
3J									
3K									
3L									

PARTS

65											PC	Motor Gearbox KA87BB EDRN90L4	000951-05-OTR-EM-8010	KA87BB EDRN90L4	SEW		
66												FABRIPULSE EV 12-10-B FILTRE					
67											PC	BAG FILTER	-	27-100003	AAF		
68											PC	ELECTRICAL CLEANING CIRCUIT	-	GAMMA	AAF		
69											PC	MEMBRANE VALVE REPAIR KIT	-	FPVD25	AAF		
70											PC	ELECTROVALVE REPAIR KIT	-	FPV24V	AAF		
71											PC	GALVANIZED CAGE	-	N/A	AAF		
72												ELASTIC COUPLING					
73											PC	ELASTIC COUPLING	000951-01-0EX-EM-1100	POLY-NORM 38 ADR	KTR		
74												MOTORS					
75											PC	Motor M3GP 132SME 4. 7.50 kW	000951-01-OTR-EM-0070	3GGP132250-BDL	ABB		
76											PC	Motor M3GP 160MLB 4. 15 kW	000951-02-OTR-EM-0070	3GGP162420-BDL	ABB		
77											PC	Motor M3GP 225SMB 4. 45 kW	000951-03-OTR-EM-1100	3GGP222220-ADL	ABB		
78											PC	Motor M3GP 132SMB 4. 5.50 kW	000951-04-OTR-EM-0070	3GGP132220-BDL	ABB		
79											PC	Motor M3GP 112ME 4. 4 kW	000951-05-OTR-EM-1000	3GGP112350-BDL	ABB		
80											PC	Motor M3GP 250SMA 6. 37 kW	000951-00-0OM-CO-0090	3GGP253210-ADL	ABB		
81											PC	Motor M3GP 132SMF 6. 4 kW	000951-01-0EX-EM-1100	3GGP133260-ADL	ABB		
82												HOIST SH4016-16 4/1					
83											METER	WIRE ROPE Ø9	-	3300079	STAHL		
84											PC	ROPE GUIDE RING LEFT 8,5-9	-	0443000430	STAHL		
85											PC	BOTTOM HOOK 6300 KG H162-4	-	0143027510	STAHL		
86											PC	BRAKE DISC 12/2H42MF (HOIST)	-	2327043650	STAHL		
87											PC	BRAKE DISC 8/2F12 (TROLLEY)	-	2127023650	STAHL		
88											PC	MOTOR 12/2H42-MF (HOIST)	-	70002098	STAHL		
89											PC	MOTOR 8/2F12 (TROLLEY)	-	2127087119	STAHL		
90												BELT CLEANER					

EQUIPMENT

[illegible]

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

EQUIPMENT

ITEM	QTY	TAG NUMBER(S)		MODEL		SERIAL No.(s)		DESCRIPTION		172784 - I-SD-000006 (project number) (spir number)	
3A	1	HBV-1641		BC-03 "S" / Z106.136		099681-001 / 3218MM641		ELECTROACTUATED GATE A		Rev. : 4 Date : 13-ago-19	
3B		1	HBV-1651		BC-03 "S" / Z106.136		099681-001 / 3218MM641		ELECTROACTUATED GATE B		Plant : RNP DCU Plant Project (WP1)
3C		1	SP-5608		EC1-250		PP018-0171		FEEDING CHUTE		Location : Pancevo, Serbia
3D		1	SP_5607		HPN650/30/482/D/300		48497		Primary Sampler		Equipment :
3E		1	JD-5603		GFB500x3175		48498		Primary Belt Feeder		Seller's Ref. : 000951-00-0CG-LT-0003
3F		1	JD-5617		DKT370 A/1P		48500		Secondary Sampler		Seller : PHB WESERHÜTTE S.A.U
3G		1	SP-5616		S4/10L		48501		Sample Rotary Collector		Tel. number : +34 984 49 56 71
3H		1	SP-5615		EW30/25		48499		Single Roller Mill		
3I		1	252PLC-224		Control Unit		0		Sampler Control Unit		
3J											
3K											
3L											

PARTS

115	1	PC	BY PASS 500X500 DEFLECTOR	000951-03-OTR-EM-1076_1081_1082	AISI 316L	PHB		
116	1	PC	DISCHARGE DUCT AISI	000951-03-OTR-EM-1076_1161_1162_1171_1172_1173	AISI 316L	PHB		
117		PC	SKIRTBOARD AISI	000951-03-OTR-EM-1511	AISI 316L	PHB		
118		PC	HEAD CHUTE AISI	000951-05-OTR-EM-1060	AISI 304L	PHB		
119		PC	SKIRTBOARD AISI	000951-05-OTR-EM-1511	AISI 316L	PHB		
120			METAL DETECTOR GRS-650X300 ATEX					
121		PC	MODULE	000951-01-OTR-EM-0012	EKM 06-V2	A. TRISTANY		
122		PC	HORN	000951-01-OTR-EM-0012	P40A	A. TRISTANY		
123		PC	SHOCK ABSORBERS	000951-01-OTR-EM-0012		A. TRISTANY		
124		PC	GLAND	000951-01-OTR-EM-0012	EX 3D M25X1,5	A. TRISTANY		
125			WEAR PLATES					
126		PC	HARDOX 400 #6X487X600	000951-01-0EX-EM-1031000951-03-0T	HARDOX 400	PHB		
127		PC	HARDOX 400 #6	000951-01-0EX-EM-1061	HARDOX 400	PHB		
128		PC	HARDOX 400 #6X520x782	000951-01-OTR-EM-024000951-02-0T	HARDOX 400	PHB		
129		PC	HARDOX 400 #6X150x530	000951-01-OTR-EM-0083000951-02-0T	HARDOX 400	PHB		
130		PC	HEAD CHUTE WEAR PLATES	000951-02-OTR-EM-028	HARDOX 400	PHB		
131		PC	HEAD CHUTE WEAR PLATES	000951-04-OTR-EM-028	HARDOX 400	PHB		
132		PC	DISCHARGE CHUTE HARDOX 400	000951-03-OTR-EM-1061	HARDOX 400	PHB		
133		PC	HARDODX #6X300X500	000951-05-OTR-EM-1031	HARDOX 400	PHB		
134		PC	DEFLECTOR	000951-05-OTR-EM-1050	HARDOX 400	PHB		
135			RUBBER					
136		PC	#15X150X1450	000951-01-0EX-EM-1063	45-50 SHORE	PHB		
137		PC	#10X165X3400	000951-01-0EX-EM-1161	45-50 SHORE	PHB		
138		PC	#10X200X728	000951-01-0EX-EM-1162	45-50 SHORE	PHB		
139		PC	SKIRT BOARD RUBBER	000951-01-0EX-EM-1510	45-50 SHORE	PHB		

EQUIPMENT

[illegible]

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

EQUIPMENT

ITEM	QTY	TAG NUMBER(S)				MODEL	SERIAL No.(s)		DESCRIPTION	172784 - I-SD-000006 (project number) (spir number)	
3A	1	HBV-1641				BC-03 "S" / Z106.136	099681-001 / 3218MM641		ELECTROACTUATED GATE A	Rev. : 4 Date : 13-ago-19	
3B		1	HBV-1651				BC-03 "S" / Z106.136	099681-001 / 3218MM641		ELECTROACTUATED GATE B	Plant : RNP DCU Plant Project (WP1)
3C		1	SP-5608				EC1-250	PP018-0171		FEEDING CHUTE	Location : Pancevo, Serbia
3D		1	SP_5607				HPN650/30/482/D/300	48497		Primary Sampler	Equipment :
3E		1	JD-5603				GFB500x3175	48498		Primary Belt Feeder	Seller's Ref. : 000951-00-0CG-LT-0003
3F		1	JD-5617				DKT370 A/1P	48500		Secondary Sampler	Seller : PHB WESERHÜTTE S.A.U
3G		1	SP-5616				S4/10L	48501		Sample Rotary Collector	Tel. number : +34 984 49 56 71
3H		1	SP-5615				EW30/25	48499		Single Roller Mill	
3I		1	252PLC-224				Control Unit	0		Sampler Control Unit	
3J											
3K											
3L											

PARTS

163										PC	22213EK+H313	000951-02-0ST-EM-9020_9030		SKF		
164											PULLEYS					
165										PC	DRIVE PULLEY Ø500 W1200 SHAFT Ø140-110-90	000951-02-0ST-EM-0010		PHB		
166										PC	TAIL TAKE UP PULLEY Ø500 W1200 SHAFT Ø120-80	000951-02-0ST-EM-0020		PHB		
167										PC	DRIVE PULLEY Ø400 W650 SHAFT Ø100-80-50	000951-02-0ST-EM-0030		PHB		
168										PC	TAIL TAKE UP PULLEY Ø400 W650 SHAFT Ø80-60	000951-02-0ST-EM-0040		PHB		
169										PC	TAIL TAKE UP PULLEY Ø400 W650 SHAFT Ø80-60	000951-02-0ST-EM-0050_0100		PHB		
170										PC	TAIL TAKE UP PULLEY Ø315 W650 SHAFT Ø80-50	000951-02-0ST-EM-0060		PHB		
171										PC	DRIVE PULLEY Ø630 W1200 SHAFT Ø160-110-100	000951-02-0ST-EM-0070		PHB		
172										PC	TAKE UP PULLEY Ø500 W1200 SHAFT Ø120-80	000951-02-0ST-EM-0080		PHB		
173										PC	TAKE UP BEND PULLEY Ø400 W1200 SHAFT Ø120-80	000951-02-0ST-EM-0090		PHB		
174										PC	TAKE UP BEND PULLEY Ø400 W1200 SHAFT Ø120-80	000951-02-0ST-EM-0110		PHB		
175										PC	DRIVE PULLEY Ø400 W650 SHAFT Ø100-80-60	000951-02-0ST-EM-0120		PHB		
176										PC	DRIVE PULLEY Ø400 W650 SHAFT Ø100-80-40	000951-02-0ST-EM-0130		PHB		
177											24"x36" COBRA CRUSHER					
178										PC	TIP Cr. PIMCL400 24X36	000951-01-0TT-EM-0001		MCLANAHAN CORPO		
179										PC	TIP BOLT 7/8" X 6"	000951-01-0TT-EM-0001		MCLANAHAN CORPO		
180										PC	FLAT WASHER 7/8"	000951-01-0TT-EM-0001		MCLANAHAN CORPO		
181										PC	GRIP NUT 7/8"	000951-01-0TT-EM-0001		MCLANAHAN CORPO		
182										PC	SEGMENT MCL400 24X36	000951-01-0TT-EM-0001		MCLANAHAN CORPO		
183										PC	SQUARE HEAD BOLT 1"x4"	000951-01-0TT-EM-0001		MCLANAHAN CORPO		
184										PC	FLAT WASHER 1"	000951-01-0TT-EM-0001		MCLANAHAN CORPO		
185										PC	GRIP NUT 1"	000951-01-0TT-EM-0001		MCLANAHAN CORPO		
186										PC	HOPPER SIDE LINER LH	000951-01-0TT-EM-0001		MCLANAHAN CORPO		
187										PC	HOPPER SIDE LINER RH	000951-01-0TT-EM-0001		MCLANAHAN CORPO		
188										PC	FLAT SOCKET HEAD CAPSCREW 3/4"x2"	000951-01-0TT-EM-0001		MCLANAHAN CORPO		

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

EQUIPMENT

ITEM	QTY	TAG NUMBER(S)		MODEL	SERIAL No.(s)	DESCRIPTION		172784 - I-SD-000006	
3A	1	HBV-1641		BC-03 "S" / Z106.136	099681-001 / 3218MM641	ELECTROACTUATED GATE A		(project number)	(spir number)
3B		1	HBV-1651		BC-03 "S" / Z106.136	099681-001 / 3218MM641	ELECTROACTUATED GATE B		Rev. : 4 Date : 13-ago-19
3C		1	SP-5608		EC1-250	PP018-0171	FEEDING CHUTE		Plant : RNP DCU Plant Project (WP1)
3D		1	SP_5607		HPN650/30/482/D/300	48497	Primary Sampler		Location : Pancevo, Serbia
3E		1	JD-5603		GFB500x3175	48498	Primary Belt Feeder		Equipment :
3F		1	JD-5617		DKT370 A/1P	48500	Secondary Sampler		Seller's Ref. : 000951-00-0CG-LT-0003
3G		1	SP-5616		S4/10L	48501	Sample Rotary Collector		Seller : PHB WESERHÜTTE S.A.U
3H		1	SP-5615		EW30/25	48499	Single Roller Mill		Tel. number : +34 984 49 56 71
3I		1	252PLC-224		Control Unit	0	Sampler Control Unit		
3J									
3K									
3L									

PARTS

189	PC	GRIP NUT 3/4"	000951-01-0TT-EM-0001		MCLANAHAN CORPO		
190	PC	HOLD-BACK BOLT ASSEMBLY	000951-01-0TT-EM-0001		MCLANAHAN CORPO		
191							
192		PLC					
193	PC	7 Slot ControlLogix Chassis		1756-A7	ROCKWELL		Redundant Control
194	PC	ControlLogix, 85-265 VAC Power Supply (10 Amp @ 5V)		1756-PA72	ROCKWELL		Redundant Control
195	PC	ControlLogix 5570 Controller with 4 MB Memory, USB Port		1756-L72	ROCKWELL		Redundant Control
196	PC	EtherNet 10-100M Interface Module (supports 128 TCP/IP)		1756-EN2T	ROCKWELL		Redundant Control
197	PC	EtherNet dual port 10-100M Interface Module		1756-EN2TR	ROCKWELL		Redundant Control
198	PC	Redundancy Module		1756-RM2	ROCKWELL		Redundant Control
199	PC	Fiber Cable, 1 Meter		1756-RMC1	ROCKWELL		Redundant Control
200	PC	2-slot adapter base unit		1715-A2A	ROCKWELL		PERIFERIA SIL2
201	PC	3-slot I/O base unit		1715-A3IO	ROCKWELL		PERIFERIA SIL2
202	PC	EtherNet/IP Adapter		1715-AENTR	ROCKWELL		PERIFERIA SIL2
203	PC	16-point digital input module		1715-IB16D	ROCKWELL		PERIFERIA SIL2
204	PC	8-point digital output module		1715-OB8DE	ROCKWELL		PERIFERIA SIL2
205	PC	Termination Assembly - digital input simplex		1715-TASIB16D	ROCKWELL		PERIFERIA SIL2
206	PC	Termination Assembly - digital output simplex		1715-TASOB8DE	ROCKWELL		PERIFERIA SIL2
207	PC	1794 Flex, Flex Ex, Flex XT I/O System, FLEX I/O Dual Port EtherNet/IP		1794-AENTR	ROCKWELL		PERIFERIA ESTANDAR
208	PC	1794 Flex, Flex Ex, Flex XT I/O System, Input Module, 24VDC, 32 Sink Inputs		1794-IB32	ROCKWELL		PERIFERIA ESTANDAR
209	PC	1794 Flex, Flex Ex, Flex XT I/O System, Output Module, 24V DC, 32 Source		1794-OB32P	ROCKWELL		PERIFERIA ESTANDAR
210	PC	1794 Flex, Flex Ex, Flex XT I/O System, HART Analog Input Modules, 8 Single-Ended Inputs		1794-IE8H	ROCKWELL		PERIFERIA ESTANDAR
211	PC	1794 Flex, Flex Ex, Flex XT I/O System, HART Analog 8 Output Module		1794-OF8IH	ROCKWELL		PERIFERIA ESTANDAR
212	PC	40 point feed-through digital IFM, standard,		1492-IFM40F	ROCKWELL		PERIFERIA ESTANDAR
213	PC	Pre-wired cable 1,5mt (1794-IB32)		1492-CAB015B94	ROCKWELL		PERIFERIA ESTANDAR
214	PC	Ready cable 1,5mt (1794-IB32/1794-OB32P)		1492-CAB015H94	ROCKWELL		PERIFERIA ESTANDAR

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

EQUIPMENT

ITEM	QTY	TAG NUMBER(S)			MODEL	SERIAL No.(s)		DESCRIPTION	ALWAYS REFER TO THIS NUMBER :			
3A	1	HBV-1641			BC-03 "S" / Z106.136	099681-001 / 3218MM641		ELECTROACTUATED GATE A	172784 - I-SD-000006			
3B	1	HBV-1651			BC-03 "S" / Z106.136	099681-001 / 3218MM641		ELECTROACTUATED GATE B	(project number)	(spir number)		
3C	1	SP-5608			EC1-250	PP018-0171		FEEDING CHUTE	Rev. :	4	Date :	13-ago-19
3D	1	SP_5607			HPN650/30/482/D/300	48497		Primary Sampler	Plant :	RNP DCU Plant Project (WP1)		
3E	1	JD-5603			GFB500x3175	48498		Primary Belt Feeder	Location :	Pancevo, Serbia		
3F	1	JD-5617			DKT370 A/1P	48500		Secondary Sampler	Equipment :	.....	
3G	1	SP-5616			S4/10L	48501		Sample Rotary Collector	Seller's Ref. :	000951-00-0CG-LT-0003		
3H	1	SP-5615			EW30/25	48499		Single Roller Mill	Seller :	PHB WESERHÜTTE S.A.U		
3I	1	252PLC-224			Control Unit	0		Sampler Control Unit	Tel. number :	+34 984 49 56 71		
3J												
3K												
3L												

PARTS

215										PC	Terminal base, for 32 point modules, 62 pin D-shell termination	1794-TB62DS	ROCKWELL		PERIFERIA ESTANDAR
216										PC	1794 Flex, Flex Ex, Flex XT I/O System, Terminal Base, 3-Wire grounded, Screw Clamp	1794-TB3G	ROCKWELL		PERIFERIA ESTANDAR
217										PC	FLEX I/O 1ft extended cable 0,9m	1794-CE3	ROCKWELL		PERIFERIA ESTANDAR
218										PC	1606-XLE480E: Essential Power Supply, 24-28V DC, 480 W, 240V AC Input Voltage	1606-XLE480EP	ROCKWELL		POWER SUPPLY
219										PC	1606-XLERED: Essential Redundancy Module, Vin 1 -.9Vin, 384 W, 10-60V DC Input Voltage	1606-XLERED	ROCKWELL		POWER SUPPLY
220										PC	Module voltage, module protection, 6A, 6A, 6A, 6A, Electronic Circuit Protection, 24Vdc	1692-ZG6666	ROCKWELL		POWER SUPPLY
221										PC	Stratix 5700 Switch, Managed, 8 Fast Ethernet Copper Ports, 2 Fast Ethernet Combo Ports	1783-BMS10CL	ROCKWELL		NETWORKS
222										PC	Networks and Communication Products, EtherNet/IP Tap1 copper port, 2 fiber ports	1783-ETAP2F	ROCKWELL		NETWORKS
223										PC	Networks and Communication Products, EtherNet/IP Tap2 copper ports, 1 fiber port	1783-ETAP1F	ROCKWELL		NETWORKS
224										PC	Stratix 2000 Switch, Unmanaged, 8 Copper Ports	1783-US8T	ROCKWELL		NETWORKS
225										PC	EtherNet/IP to Serial Linking Device Gateway	HMS-EN2SER	ROCKWELL		NETWORKS
226										PC	EtherNet/IP Adapter to Modbus-TCP Slave gateway	AB7632	ROCKWELL		NETWORKS
227										PC	Ethernet IP to Modbus TCP Gateway	PLX31-EIP-MBTCP	ROCKWELL		NETWORKS
228										PC	PanelView Plus 7 Standard Terminal, Touch Screen, 15 TFT Color, Ethernet DLR	2711P-T15C22D8S	ROCKWELL		HMI
229										PC	2-Channel Isolated Barrier, 24Vdc power supply, dry contact or NAMUR inputs,	KFD2-SR2-Ex2.W	PEPPERL-FUCHS		OTHERS
230										PC	PLC Relay Module, screw connection and pluggable miniature relay w/power	PLC-RSC-230UC/21	PHOENIX CONTACT		OTHERS
231										PC	PLC -INTERFACE, screw connection and plug-in miniature relay w/power contact	PLC-RSC-24DC/1/ACT	PHOENIX CONTACT		OTHERS
232										PC	Coupling Relay for SIL 2 high -and low- demand applications	PSR-PS21-1NO-1NC-24DC-SC	PHOENIX CONTACT		OTHERS
233										PC	Filter fan, 230Vac, up to 536m³/h, 223x223mm	01883.0-00	STEGO		OTHERS
234										PC	Miniature Circuit Breaker, 2P/16A, Curve C	5SL6516-7	SIEMENS		OTHERS
235										PC	Miniature Circuit Breaker, 2P/6A, Curve C	5SL6506-7	SIEMENS		OTHERS
236										PC	RCCB, 2-pole, type AC, 25A, 30mA	5SV53120FB	SIEMENS		OTHERS
237															
238											EXPLOSION PANELS				
239										PC	EXPLOSION VENT KER 940X1440	000951-01-OSL-EM-0001	AIISI 304 DIN 14301	ATEXPREEN	
240										PC	SENSOR ATEX	000951-01-OSL-EM-0001	S3-HT	ATEXPREEN	

EQUIPMENT

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SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

EQUIPMENT

ITEM	QTY	TAG NUMBER(S)				MODEL		SERIAL No.(s)		DESCRIPTION				172784 - I-SD-000006	
3A	1	HBV-1641				BC-03 "S" / Z106.136		099681-001 / 3218MM641		ELECTROACTUATED GATE A				(project number) (spir number)	
3B		1	HBV-1651			BC-03 "S" / Z106.136		099681-001 / 3218MM641		ELECTROACTUATED GATE B				Rev. : 4 Date : 13-ago-19	
3C		1	SP-5608			EC1-250		PP018-0171		FEEDING CHUTE				Plant : RNP DCU Plant Project (WP1)	
3D		1	SP_5607			HPN650/30/482/D/300		48497		Primary Sampler				Location : Pancevo, Serbia	
3E		1	JD-5603			GFB500x3175		48498		Primary Belt Feeder				Equipment :	
3F		1	JD-5617			DKT370 A/1P		48500		Secondary Sampler				Seller's Ref. : 000951-00-0CG-LT-0003	
3G		1	SP-5616			S4/10L		48501		Sample Rotary Collector				Seller : PHB WESERHÜTTE S.A.U	
3H		1	SP-5615			EW30/25		48499		Single Roller Mill				Tel. number : +34 984 49 56 71	
3I		1	252PLC-224			Control Unit		0		Sampler Control Unit					
3J															
3K															
3L															

PARTS

267												PC	1/4" (6mm) 100 Ohm RTD Probe	-	SVP3954-17 (SVP-23)	ALMEX		
268												PC	Platen Handle Assembly	-	SVP3954-17 (SVP-25)	ALMEX		
269												PC	Locking Pin	-	SVP3954-17 (SVP-3)	ALMEX		
270												PC	Quick coupler Male	-	SVP3954-17 (SVP-10)	ALMEX		
271												PC	Quick coupler Male Dust-cap	-	SVP3954-17 (SVP-11)	ALMEX		
272												PC	Quick coupler Female	-	SVP3954-17 (SVP-30)	ALMEX		
273												PC	Quick coupler Female Dust-cap	-	SVP3954-17 (SVP-31)	ALMEX		
274													FOR RC3 TEMPERATURE CONTROL PANEL	-		ALMEX		
275												PC	Fuse Holder C/w 2 Amp Fuse	-	SVP3954-17 (RC3-9)	ALMEX		
276												PC	Platen Connector Insert	-	SVP3954-17 (RC3-15)	ALMEX		
277												PC	Platen Connector Housing	-	SVP3954-17 (RC3-15)	ALMEX		
278																		
279													AUTOMATIC SAMPLING SYSTEM					
280													Hammer sampler HPN650/30/482/D/300	000951-01-0CG-PI-0008_03 S-5600				
281				1								1	PC	Geared motor with brake	000951-01-0CG-PI-0008_03 S-5600	351005	SIEBTECHNIK	
282				2								2	PC	Proximity switches	000951-01-0CG-PI-0008_03 S-5600	351510	SIEBTECHNIK	
283				1								1	PC	Guide plates (set)	000951-01-0CG-PI-0008_03 S-5600	351551	SIEBTECHNIK	
284				1								1	PC	Back panel	000951-01-0CG-PI-0008_03 S-5600	351550	SIEBTECHNIK	
285				1								1	PC	Stripper rubber	000951-01-0CG-PI-0008_03 S-5600	351553	SIEBTECHNIK	
286				1								1	PC	Brush	000951-01-0CG-PI-0008_03 S-5600	351555	SIEBTECHNIK	
287				2								2	PC	Spherical roller bearings	000951-01-0CG-PI-0008_03 S-5600	131577	SIEBTECHNIK	
288				2								2	PC	Tension sleeve	000951-01-0CG-PI-0008_03 S-5600	217035	SIEBTECHNIK	
289				2								2	PC	V-sealing ring	000951-01-0CG-PI-0008_03 S-5600	195568	SIEBTECHNIK	

EQUIPMENT

[illegible]

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

EQUIPMENT

ITEM	QTY	TAG NUMBER(S)		MODEL	SERIAL No.(s)	DESCRIPTION		172784 - I-SD-000006	
3A	1	HBV-1641		BC-03 "S" / Z106.136	099681-001 / 3218MM64	ELECTROACTUATED GATE A		(project number)	(spir number)
3B		1	HBV-1651	BC-03 "S" / Z106.136	099681-001 / 3218MM64	ELECTROACTUATED GATE B		Rev. :	4 Date : 13-ago-19
3C		1	SP-5608	EC1-250	PP018-0171	FEEDING CHUTE		Plant :	RNP DCU Plant Project (WP1)
3D		1	SP_5607	HPN650/30/482/D/300	48497	Primary Sampler		Location :	Pancevo, Serbia
3E		1	JD-5603	GFB500x3175	48498	Primary Belt Feeder		Equipment :	.....
3F		1	JD-5617	DKT370 A/1P	48500	Secondary Sampler		Seller's Ref. :	000951-00-0CG-LT-0003
3G		1	SP-5616	S4/10L	48501	Sample Rotary Collector		Seller :	PHB WESERHÜTTE S.A.U
3H		1	SP-5615	EW30/25	48499	Single Roller Mill		Tel. number :	+34 984 49 56 71
3I		1	252PLC-224	Control Unit	0	Sampler Control Unit			
3J									
3K									
3L									

PARTS

313					2					2	PC	Adapter sleeve	000951-01-0CG-PI-0008_03 S-5600	200713	SIEBTECHNIK		
314					5					5	PC	Rubber battery spring	000951-01-0CG-PI-0008_03 S-5600	118722	SIEBTECHNIK		
315					1					1	PC	Geared motor	000951-01-0CG-PI-0008_03 S-5600	350632	SIEBTECHNIK		
316												Turnstile divider DKT 370 A/1P	000951-01-0CG-PI-0008_03 S-5600				
317					1					1	PC	Geared motor	000951-01-0CG-PI-0008_03 S-5600	350926	SIEBTECHNIK		
318					1					1	PC	Rotary arm	000951-01-0CG-PI-0008_03 S-5600	265023	SIEBTECHNIK		
319					1					1	PC	Stripper for the rotary arm	000951-01-0CG-PI-0008_03 S-5600	350933	SIEBTECHNIK		
320					1					1	PC	Discharge arm in the feeder housing	000951-01-0CG-PI-0008_03 S-5600	350931	SIEBTECHNIK		
321					1					1	PC	Stripper set for the discharge arm in the feeder housing	000951-01-0CG-PI-0008_03 S-5600	357314	SIEBTECHNIK		
322					1					1	PC	Cone scraper	000951-01-0CG-PI-0008_03 S-5600	350932	SIEBTECHNIK		
323												Sample collector S4/10	000951-01-0CG-PI-0008_03 S-5600				
324					1					1	PC	Geared motor	000951-01-0CG-PI-0008_03 S-5600	350895	SIEBTECHNIK		
325					2					2	PC	Proximity switches	000951-01-0CG-PI-0008_03 S-5600	350896	SIEBTECHNIK		
326					2					2	PC	Safety switch with actuator	000951-01-0CG-PI-0008_03 S-5600	268454	SIEBTECHNIK		
327					8					8	PC	Container	000951-01-0CG-PI-0008_03 S-5600	223146	SIEBTECHNIK		
328					4					4	PC	Rubber collar	000951-01-0CG-PI-0008_03 S-5600	350903	SIEBTECHNIK		
329					4					4	PC	Rubber collar	000951-01-0CG-PI-0008_03 S-5600	350904	SIEBTECHNIK		
330					12					12	PC	Hose clamp	000951-01-0CG-PI-0008_03 S-5600	39515	SIEBTECHNIK		
331					1					1	PC	Rubber collar	000951-01-0CG-PI-0008_03 S-5600	350905	SIEBTECHNIK		
332					2					2	PC	Hose clamp	000951-01-0CG-PI-0008_03 S-5600	39075	SIEBTECHNIK		
333												Control unit	000951-01-0CG-PI-0008_03 S-5600				
334					1					1	PC	Enclosure heater 800/870W, 230V, 50/60 Hz	000951-01-0CG-PI-0008_03 S-5600	350469-1	SIEBTECHNIK		
335					1					1	PC	Fan and filter unit	000951-01-0CG-PI-0008_03 S-5600	350469-2	SIEBTECHNIK		

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

EQUIPMENT

ITEM	QTY	TAG NUMBER(S)		MODEL	SERIAL No.(s)	DESCRIPTION	ALWAYS REFER TO THIS NUMBER : 172784 - I-SD-000006 (project number) (spir number)	
3A	1	HBV-1641		BC-03 "S" / Z106.136	099681-001 / 3218MM641	ELECTROACTUATED GATE A		
3B	1	HBV-1651		BC-03 "S" / Z106.136	099681-001 / 3218MM641	ELECTROACTUATED GATE B	Rev. : 4	Date : 13-ago-19
3C	1	SP-5608		EC1-250	PP018-0171	FEEDING CHUTE	Plant : RNP DCU Plant Project (WP1)	
3D	1	SP_5607		HPN650/30/482/D/300	48497	Primary Sampler	Location : Pancevo, Serbia	
3E	1	JD-5603		GFB500x3175	48498	Primary Belt Feeder	Equipment :	
3F	1	JD-5617		DKT370 A/1P	48500	Secondary Sampler	Seller's Ref. : 000951-00-0CG-LT-0003	
3G	1	SP-5616		S4/10L	48501	Sample Rotary Collector	Seller : PHB WESERHÜTTE S.A.U	
3H	1	SP-5615		EW30/25	48499	Single Roller Mill	Tel. number : +34 984 49 56 71	
3I	1	252PLC-224		Control Unit	0	Sampler Control Unit		
3J								
3K								
3L								

PARTS

336					1				1	PC	SITOP PSE200U	000951-01-0CG-PI-0008_03 S-5600	350469-3	SIEBTECHNIK		
337					1				1	PC	KTP700 Basic DP	000951-01-0CG-PI-0008_03 S-5600	350469-4	SIEBTECHNIK		
338					1				1	PC	CPU 314C PN/DP	000951-01-0CG-PI-0008_03 S-5600	350469-5	SIEBTECHNIK		
339					1				1	PC	SM 323, 16 DI/DO, DC24V, 0.5 A	000951-01-0CG-PI-0008_03 S-5600	350469-6	SIEBTECHNIK		
340					1				1	PC	Safety relais module SRB-Exi	000951-01-0CG-PI-0008_03 S-5600	350469-7	SIEBTECHNIK		
341					1				1	PC	Thermistor motor protection	000951-01-0CG-PI-0008_03 S-5600	350469-8	SIEBTECHNIK		
342					5				5	PC	Coupling relay	000951-01-0CG-PI-0008_03 S-5600	350469-9	SIEBTECHNIK		
343					1				1	PC	Sirius safety relay stanard series device	000951-01-0CG-PI-0008_03 S-5600	350469-10	SIEBTECHNIK		
344					1				1	PC	Contacteur AC-3, 3 kW/400V, 1NC, DC 24V	000951-01-0CG-PI-0008_03 S-5600	350469-11	SIEBTECHNIK		
345					1				1	PC	Contacteur AC-3, 5.5 kW/400V, 1NC, DC 24V	000951-01-0CG-PI-0008_03 S-5600	350469-12	SIEBTECHNIK		
346					1				1	PC	2NO+2NC contactor, AC 3, 4KW AC 230V50 Hz	000951-01-0CG-PI-0008_03 S-5600	350469-13	SIEBTECHNIK		
347					1				1	PC	Aux. Switch block, 2NO+2NC	000951-01-0CG-PI-0008_03 S-5600	350469-14	SIEBTECHNIK		
348					1				1	PC	Sitop PSU200 M	000951-01-0CG-PI-0008_03 S-5600	350469-15	SIEBTECHNIK		
349																
350											TRUCK WASHING BOX					
351										PC	Flat fan nozzels	000951-01-0CG-PI-0009_06 S-5600	JB 1/4	LECHLER		
352										PC	Photo-electric sensor	000951-01-0CG-PI-0009_06 S-5600	XUX5ARCNT16	SCHNEIDER		
353										KIT	Sseals kit for pumps	000951-01-0CG-PI-0009_06 S-5600	RC.SS1CG_C1	TECNOTER		
354																
355																
356																
357																
358																

EQUIPMENT

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SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

Owner : NIS	SELLER's Ref. :	ALWAYS REFER TO THIS NUMBER : 172784 - 300-001-SD-000006 (project number) - (SPIR number)
Plant : RNP DCU Plant Project (WP1)	SELLER :	
Location : Pancevo, Serbia	Tel. number :	
Equipment :	E-mail :	
		Rev.: Date:

S U M M A R Y

ITEM	TOTAL QUANTITY OF INSTALLED PARTS	UNIT OF MEASURE	PART DESCRIPTION	SUPPLIER'S PART NUMBER	Included in the Purchase Order for the Parent Equipment:			SUPPLIER'S RECOMMENDATION	RECOMMENDATION PURCHASER	COMPANY'S APPROVAL TO PURCHASE	RECEIVED ON SITE	HANDLED OVER	UNIT PRICE EXW - SPAIN CURRENCY	TOTALS FOR PURCHASE	DELIVERY TIME - WEEKS (EXW Gijón - Spain)
					CAPITAL Spare Parts	COMMISSIONING Spare Parts									
1			INSTRUMENTS												
2	19	PC	HAND SWITCH	LHPEw-10/1-B-EX			TAEX	4					360,00		5
3	28	PC	POSITION SWITCH	LHPEw-10/2EX-L50V			TAEX	6					545,00		5
4	7	PC	LEVEL SWITCH	VEGACAP 62 CP62			VEGA	2					750,00		5
5	3	PC	LEVEL SWITCH	VEGACAP 65 CP65			VEGA	1					970,00		5
6	2	PC	LEVEL DETECTION	VEGAPULS 69 PS69			VEGA	1					2.390,00		5
7	2	PC	SPEED LIMIT SWITCH												
8	2	PC	INDUCTIVE SENSOR	XS630B1PAL10EX			SCHNEIDER	1					110,00		4
9	7	PC	INDUCTIVE SENSOR	XSAV12373EX			SCHNEIDER	2					165,00		4
10	2	PC	LIMIT SWITCH	XCKD3945P16 EX			SCHNEIDER	2					120,00		4
11	2	PC	ENCODER	8.5863FS2.1A4BG722.0100EX			PEPPERL & FUCHS								
12			ROTOFLUID COUPLING ALFA 55 K02 FC												
13	3	PC	120°C 1/2" GAS FUSIBLE PLUG	N/A			WESTCAR	3					90,00		6
14	1	PC	FLEXIBLE ELEMENT RN5	N/A			WESTCAR	2					520,00		6
15	1	PC	VITON SEALS KIT GU5	N/A			WESTCAR	1					195,00		6
16	1	PC	BEARINGS KIT CU5	N/A			WESTCAR	1					550,00		6
17			ELECTROMAGNETIC SEPARATOR SK 16.15												
18	1	SET	SET OF FUSES	GZ000052			MEC	1					180,00		3
19	1	PC	24 Vdc FEEDER	CA007020			MEC	1					210,00		3
20	1	SET	SET OF LED LAMP	GZ000029			MEC	1					180,00		3
21	3	PC	RECTIFIER DIODE	CA005157			MEC	1					170,00		3
22			ELECTROMECHANIC ACTUATOR												
23	1	PC	ELECTRIC MOTOR	MECVEL 02			MECVEL 02	1					550,00		5
24	1	PC	TORQUE LIMITER	MECVEL 03			MECVEL 03	1					745,00		5
25	1	PC	LIMIT SWITCHES GROUP	MECVEL 07			MECVEL 07	1					500,00		5
26	1	PC	MANUAL HAND WHEEL	MECVEL 04			MECVEL 04	1					260,00		5
27	1	PC	BELLOWS BOOT	MECVEL 05			MECVEL 05	1					290,00		5
28	1	PC	FRONT END WITH SHOCK ABSORBER	MECVEL 06			MECVEL 06	1					585,00		5
29			AUTOMATIC SAMPLING SYSTEM												
30	1	PC	Limit switch type 1	TEMA - HAMMER SAMPLE TAKER			TEMA	1					320,00		6

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

Owner : NIS	SELLER's Ref. :	ALWAYS REFER TO THIS NUMBER : 172784 - 300-001-SD-000006 (project number) - (SPIR number)
Plant : RNP DCU Plant Project (WP1)	SELLER :	
Location : Pancevo, Serbia	Tel. number :	
Equipment :	E-mail :	
		Rev.: Date:

S U M M A R Y

I T E M	TOTAL QUANTITY OF INSTALLED PARTS	U N I T OF MEASURE	PART DESCRIPTION	SUPPLIER'S PART NUMBER	Included in the Purchase Order for the Parent Equipment:			SUPPLIER'S RECOMMEN- DATION	RECOMMEN- DATION PURCHASER	COMPANY'S APPROVAL TO PURCHASE	RECEIVED ON SITE	HANDED OVER	UNIT PRICE EXW - SPAIN CURRENCY	T O T A L S F O R P U R C H A S E	DELIVERY TIME - WEEKS (EXW Gijón - Spain)
					CAPITAL Spare Parts	COMMISSIO- NING Spare Parts	.								
31	1	PC	Limit switch type 2	TEMA - HAMMER SAMPLE TAKER			TEMA	1					320,00		6
32	1	PC	Atex brush	TEMA - HAMMER SAMPLE TAKER			TEMA	1					940,00		6
33	1	PC	Atex rubber strip	TEMA - HAMMER SAMPLE TAKER			TEMA	1					225,00		6
34	1	PC	Rubber scraper drum	TEMA - GFB 500 CONVEYOR			TEMA	1					170,00		6
35	1	PC	Rubber scraper lower belt	TEMA - GFB 500 CONVEYOR			TEMA	1					180,00		6
36	1	SET	Wearing plates for crushing roll	TEMA - SINGLE ROLLER MILL EW 30/40			TEMA	1					5.200,00		6
37	1	SET	Wearing plates for crushing plate, upper part	TEMA - SINGLE ROLLER MILL EW 30/40			TEMA	1					1.250,00		6
38	1	PC	Wearing plates for crushing plate, lower part	TEMA - SINGLE ROLLER MILL EW 30/40			TEMA	1					2.100,00		6
39	1	SET	Rubber scrapers	TEMA - TURNSTILE DIVIDER DKT 370 A			TEMA	1					775,00		6
40	4	PC	Rubber collar Ø154	TEMA - SAMPLE COLLECTOR S 4/10L			TEMA	4					155,00		6
41	4	PC	Rubber collar Ø162	TEMA - SAMPLE COLLECTOR S 4/10L			TEMA	4					95,00		6
42	4	PC	Sample collectors stainless steel	TEMA - SAMPLE COLLECTOR S 4/10L			TEMA	4					725,00		6
43			BELTS												
44	16	Meter	Rubber belt W1200	TEXTER 400/3 6+3 BS W1200			SIG	19					110,00		10
45	307	Meter	Rubber belt W650	TEXTER 400/3 6+3 BS W650			SIG	65					70,00		10
46	480	Meter	Rubber belt W1200	PIPEX 500/4 6+2 BS W1200			SIG	60					130,00		10
47			IDLERS												
48	330	PC	CARRYING IDLER W650 Ø89 X 250	PSV/1 20F14 89J			RULMECA	36					30,00		6
49	27	PC	IMPACT IDLER W650 Ø89 X 250	PSV/1 20F14 63/89			RULMECA	6					45,00		6
50	95	PC	RETURN IDLER W650 Ø108 X 750	PSV/1 20Y14 63/108			RULMECA	5					70,00		6

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

Owner : NIS	SELLER's Ref. :	ALWAYS REFER TO THIS NUMBER : 172784 - 300-001-SD-000006 (project number) - (SPIR number)
Plant : RNP DCU Plant Project (WP1)	SELLER :	
Location : Pancevo, Serbia	Tel. number :	
Equipment :	E-mail :	
		Rev.: Date:

S U M M A R Y

ITEM	TOTAL QUANTITY OF INSTALLED PARTS	UNIT OF MEASURE	PART DESCRIPTION	SUPPLIER'S PART NUMBER	Included in the Purchase Order for the Parent Equipment:			SUPPLIER'S RECOMMENDATION	RECOMMENDATION PURCHASER	COMPANY'S APPROVAL TO PURCHASE	RECEIVED ON SITE	HANDED OVER	UNIT PRICE EXW - SPAIN CURRENCY	TOTALS FOR PURCHASE	DELIVERY TIME - WEEKS (EXW Gijón - Spain)
					CAPITAL Spare Parts	COMMISSIONING Spare Parts	.								
51													40,00		6
52	25	PC	IMPACT IDLER Ø133/89 X 750	PSV/4 30F22 89/133			RULMECA	6					75,00		6
53	5	PC	CLEANING IDLER Ø133/89 X 1400	PSV/1 20Y14 89/133			RULMECA	2					70,00		6
54	66	PC	CARRYING IDLER W1200 Ø108 X 465	PSV/1 20F14 108J			RULMECA	6					40,00		6
55	9	PC	IMPACT IDLER W1200 Ø108/63 X 465	PSV/1 20F14 63/108			RULMECA	3					45,00		6
56	1642	PC	CARRYING IDLER W1200 Ø89 X 165	PSV/1 20F14 108J			RULMECA	50					25,00		6
57															
58															
59			GEARBOX												
60	1	PC	Gearbox KA107 R77 AD4	KA107 R77 AD4			SEW	1					5.250,00		6
61	2	PC	Gearbox KA77/T AM13S/M/RS	KA77/T AM132S/M/RS			SEW	1					2.350,00		6
62	1	PC	Gearbox KA87/T AM160/RS	KA87/T AM160/RS			SEW	1					3.050,00		6
63	1	PC	Gearbox KA127B AD8/RS	KA127B AD8/RS			SEW	1					8.600,00		6
64	2	PC	Gearbox KA67/T AM112	KA67/T AM112			SEW	1					2.525,00		6
65	2	PC	Motor Gearbox KA87BB EDRN90L4	KA87BB EDRN90L4			SEW	1					2.530,00		6
66			FABRIPULSE EV 12-10-B FILTRE												
67	12	PC	BAG FILTER	27-100003			AAF	12					20,00		6
68	1	PC	ELECTRICAL CLEANING CIRCUIT	GAMMA			AAF	1					820,00		6
69	3	PC	MEMBRANE VALVE REPAIR KIT	FPVD25			AAF	3					80,00		6
70	5	PC	ELECTROVALVE REPAIR KIT	FPV24V			AAF	3					60,00		6
71	14	PC	GALVANIZED CAGE	N/A			AAF	12					110,00		6
72			ELASTIC COUPLING												
73	13	PC	ELASTIC COUPLING	POLY-NORM 38 ADR			KTR	1					450,00		4
74	1		MOTORS												
75	4	PC	Motor M3GP 132SME 4. 7.50 kW	3GGP132250-BDL			ABB	1					2.800,00		8
76	4	PC	Motor M3GP 160MLB 4. 15 kW	3GGP162420-BDL			ABB	1					3.850,00		8
77	13	PC	Motor M3GP 225SMB 4. 45 kW	3GGP222220-ADL			ABB	1					6.650,00		8
78	1	PC	Motor M3GP 132SMB 4. 5.50 kW	3GGP132220-BDL			ABB	1					2.600,00		8
79	2	PC	Motor M3GP 112ME 4. 4 kW	3GGP112350-BDL			ABB	1					2.450,00		8
80	1	PC	Motor M3GP 250SMA 6. 37 kW	3GGP253210-ADL			ABB	1					8.300,00		8
81	1	PC	Motor M3GP 132SMF 6. 4 kW	3GGP133260-ADL			ABB	1					2.750,00		8

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

Owner : NIS	SELLER's Ref. :	ALWAYS REFER TO THIS NUMBER : 172784 - 300-001-SD-000006 (project number) - (SPIR number)
Plant : RNP DCU Plant Project (WP1)	SELLER :	
Location : Pancevo, Serbia	Tel. number :	
Equipment :	E-mail :	
Rev.:		Date:

S U M M A R Y

ITEM	TOTAL QUANTITY OF INSTALLED PARTS	UNIT OF MEASURE	PART DESCRIPTION	SUPPLIER'S PART NUMBER	Included in the Purchase Order for the Parent Equipment:			SUPPLIER'S RECOMMENDATION	RECOMMENDATION PURCHASER	COMPANY'S APPROVAL TO PURCHASE	RECEIVED ON SITE	HANDLED OVER	UNIT PRICE EXW - SPAIN CURRENCY	TOTALS FOR PURCHASE	DELIVERY TIME - WEEKS (EXW Gijón - Spain)
					CAPITAL Spare Parts	COMMISSIONING Spare Parts									
82			HOIST SH4016-16 4/1												
83	45	METER	WIRE ROPE Ø9	3300079			STAHL	45					20,00		4
84	1	PC	ROPE GUIDE RING LEFT 8,5-9	0443000430			STAHL	1					2.100,00		4
85	1	PC	BOTTOM HOOK 6300 KG H162-4	0143027510			STAHL	1					2.200,00		4
86	1	PC	BRAKE DISC 12/2H42MF (HOIST)	2327043650			STAHL	1					1.650,00		6
87	1	PC	BRAKE DISC 8/2F12 (TROLLEY)	2127023650			STAHL	1					360,00		6
88	1	PC	MOTOR 12/2H42-MF (HOIST)	70002098			STAHL	1					11.600,00		9
89	1	PC	MOTOR 8/2F12 (TROLLEY)	2127087119			STAHL	1					5.700,00		9
90			BELT CLEANER												
91	3	PC	QC1 Heavy duty segment blade W 1200	35381-421040OR			MARTIN ENGINEER	2					990,00		6
92	1	PC	QC1 Heavy duty segment blade W 650	35381-241022OR			MARTIN ENGINEER	1					520,00		6
93			ELECTRO ACTUATED GATE BC												
94	2	PC	SLIDER KIT FOR BC 900X1150	N/A			ORBINOX	1					460,00		8
95	2	PC	JOINT FOR BC 900X1150 (2 SEAL OF 5 METERS)	N/A			ORBINOX	1					400,00		8
96	2	PC	PACKING ST+ O-RING EPDM FOR BC 900X1150)	N/A			ORBINOX	1					240,00		8
97	2		AISI												
98	4	PC	AISI #6X450X600	AISI 316L			PHB	4					185,00		4
99	1	PC	AISI #6X298X1751	AISI 304			PHB	1					170,00		4
100	1	PC	AISI #6X318X1820	AISI 304			PHB	1					180,00		4
101	1	PC	AISI #6X263X1820	AISI 304			PHB	1					150,00		4
102	1	PC	AISI #5X80X183	AISI 304			PHB								
103	4	PC	AISI #6X90X668	AISI 316L			PHB	4					100,00		4
104	1	PC	AISI #6X75X708	AISI 316L			PHB	1					50,00		4
105	3	PC	AISI #6X140X708	AISI 316L			PHB	3					140,00		4
106	1	PC	SKIRT BOARD AISI	AISI 316L			PHB	1					1.250,00		4
107	1	PC	CLOSING BAR AISI	AISI 316L			PHB	1					525,00		4
108	6	PC	AISI #6X490X520	AISI 316L			PHB	6					180,00		4
109	1	PC	DUCT AISI	AISI 316L			PHB	1					650,00		4
110	1	PC	DUCT AISI	AISI 316L			PHB	1					580,00		4
111	1	PC	SKIRTBOARD AISI	AISI 316L			PHB	1					320,00		4
112	1	PC	HEAD CHUTE AISI	AISI 316L			PHB	1					110,00		4

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

Owner : NIS	SELLER's Ref. :	ALWAYS REFER TO THIS NUMBER : 172784 - 300-001-SD-000006 (project number) - (SPIR number)
Plant : RNP DCU Plant Project (WP1)	SELLER :	
Location : Pancevo, Serbia	Tel. number :	
Equipment :	E-mail :	
		Rev.: Date:

S U M M A R Y

ITEM	TOTAL QUANTITY OF INSTALLED PARTS	UNIT OF MEASURE	PART DESCRIPTION	SUPPLIER'S PART NUMBER	Included in the Purchase Order for the Parent Equipment:			SUPPLIER'S RECOMMENDATION TWO YEAR OPERATING Spare Parts	RECOMMENDATION PURCHASER TWO YEAR OPERATING Spare Parts	COMPANY'S APPROVAL TO PURCHASE TWO YEAR OPERATING Spare Parts	RECEIVED ON SITE TWO YEAR OPERATING Spare Parts	HANDED OVER TWO YEAR OPERATING Spare Parts	UNIT PRICE EXW - SPAIN CURRENCY	TOTALS FOR PURCHASE TWO YEAR OPERATING SPARE PARTS	DELIVERY TIME - WEEKS (EXW Gijón - Spain)
					CAPITAL Spare Parts	COMMISSIONING Spare Parts	.								
113	1	PC	DISCHARGE PIPE AISI	AISI 316L			PHB	1					2.050,00		4
114	1	PC	SKIRTBOARD AISI	AISI 316L			PHB	1					470,00		4
115	1	PC	BY PASS 500X500 DEFLECTOR	AISI 316L			PHB	1					465,00		4
116	1	PC	DISCHARGE DUCT AISI	AISI 316L			PHB	1					19.500,00		4
117	1	PC	SKIRTBOARD AISI	AISI 316L			PHB	1					490,00		4
118	2	PC	HEAD CHUTE AISI	AISI 304L			PHB						490,00		4
119		PC	SKIRTBOARD AISI	AISI 316L			PHB						200,00		4
120			METAL DETECTOR GRS-650X300 ATEX												
121	1	PC	MODULE	EKM 06-V2			A. TRISTANY	1					2.800,00		6
122	1	PC	HORN	P40A			A. TRISTANY	1					350,00		6
123	4	PC	SHOCK ABSORBERS				A. TRISTANY	4					160,00		6
124	3	PC	GLAND	EX 3D M25X1,5			A. TRISTANY	3					90,00		6
125			WEAR PLATES												
126	6	PC	HARDOX 400 #6X487X600	HARDOX 400			PHB	6					185,00		6
127	1	PC	HARDOX 400 #6	HARDOX 400			PHB	1					740,00		6
128	5	PC	HARDOX 400 #6X520x782	HARDOX 400			PHB	3					140,00		6
129	6	PC	HARDOX 400 #6X150x530	HARDOX 400			PHB	4					50,00		6
130	1	PC	HEAD CHUTE WEAR PLATES	HARDOX 400			PHB	1					200,00		6
131	1	PC	HEAD CHUTE WEAR PLATES	HARDOX 400			PHB	1					190,00		6
132	1	PC	DISCHARGE CHUTE HARDOX 400	HARDOX 400			PHB	1					220,00		6
133	2	PC	HARDODX #6X300X500	HARDOX 400			PHB	1					310,00		6
134	2	PC	DEFLECTOR	HARDOX 400			PHB	1					110,00		6
135			RUBBER												
136	1	PC	#15X150X1450	45-50 SHORE			PHB	1					270,00		3
137	1	PC	#10X165X3400	45-50 SHORE			PHB	1					450,00		3
138	1	PC	#10X200X728	45-50 SHORE			PHB	1					180,00		3
139	1	PC	SKIRT BOARD RUBBER	45-50 SHORE			PHB	1					2.100,00		3
140	1	PC	CLOSING BAR RUBBER	45-50 SHORE			PHB	1					540,00		3
141	3	PC	HEAD FRAMEWORK RUBBER	45-50 SHORE			PHB	1					630,00		3
142	1	PC	SKIRT BOARD RUBBER	45-50 SHORE			PHB	1					710,00		3
143	1	PC	SKIRT BOARD RUBBER	45-50 SHORE			PHB	1					95,00		3

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

Owner : NIS	SELLER's Ref. :	ALWAYS REFER TO THIS NUMBER : 172784 - 300-001-SD-000006 (project number) - (SPIR number)
Plant : RNP DCU Plant Project (WP1)	SELLER :	
Location : Pancevo, Serbia	Tel. number :	
Equipment :	E-mail :	
		Rev.: Date:

S U M M A R Y

I T E M	TOTAL QUANTITY OF INSTALLED PARTS	U N I T OF MEASURE	PART DESCRIPTION	SUPPLIER'S PART NUMBER	Included in the Purchase Order for the Parent Equipment:			SUPPLIER'S RECOMMEN- DATION	RECOMMEN- DATION PURCHASER	COMPANY'S APPROVAL TO PURCHASE	RECEIVED ON SITE	HANDED OVER	UNIT PRICE EXW - SPAIN CURRENCY	TOTALS	DELIVERY TIME - WEEKS (EXW Gijón - Spain)
					CAPITAL Spare Parts	COMMISSIO- NING Spare Parts	,							FOR PURCHASE	
144	1	PC	SKIRT BOARD RUBBER	45-50 SHORE			PHB	1					110,00		3
145	1	PC	DISCHARGE RUBBER #8X1155X1850	45-50 SHORE			PHB	1					1.250,00		3
146	1	PC	DISCHARGE CHUTE RUBBER #15X150X1400	45-50 SHORE			PHB	1					270,00		3
147	1	PC	SKIRTBOARD RUBBER	45-50 SHORE			PHB	1					2.100,00		3
148	1	PC	TAKE UP SYSTEM	45-50 SHORE			PHB	1					450,00		3
149	2	PC	HEAD CHUTE RUBBER	45-50 SHORE			PHB	1					90,00		3
150	2	PC	SKIRTBOARD RUBBER	45-50 SHORE			PHB	1					2.100,00		3
151	12	PC	IMPACT BAR 70X200X830				PHB	12					280,00		3
152	2	PC	IMPACT BAR 70X200X240				PHB	2					120,00		3
153	1	PC	V-PLOW W1200 RUBBER	45-50 SHORE			PHB	1					180,00		3
154	6	PC	V-PLOW W650 RUBBER	45-50 SHORE			PHB	1					140,00		3
155			BEARING & SUPPORTS												
156	8	PC	SNL515+22215K+H315+2XFRB+2XTSNL	SNL515+22215K+H315+2XFRB +2XTSNL			SKF	1					280,00		5
157	8	PC	SNL515+22215K+H315+2XTSNL	SNL515+22215K+H315+2XTSN L			SKF	1					260,00		5
158	4	PC	SNLN3024+23024CCK				SKF	1					255,00		5
159	12	PC	SNL518+22218K				SKF	1					250,00		5
160	4	PC	SNL513+22213K				SKF	1					210,00		5
161	4	PC	SNL511+22211EK				SKF	1					150,00		5
162	2	PC	22218EK+H318				SKF	1					140,00		5
163	4	PC	22213EK+H313				SKF	1					110,00		5
164			PULLEYS												
165	1	PC	DRIVE PULLEY Ø500 W1200 SHAFT Ø140-110-90				PHB	1					9.500,00		10
166	1	PC	TAIL TAKE UP PULLEY Ø500 W1200 SHAFT Ø120-80				PHB	1					8.400,00		10
167	2	PC	DRIVE PULLEY Ø400 W650 SHAFT Ø100-80-50				PHB	1					5.000,00		10
168	2	PC	TAIL TAKE UP PULLEY Ø400 W650 SHAFT Ø80-60				PHB	1					3.650,00		10
169	2	PC	TAIL TAKE UP PULLEY Ø400 W650 SHAFT Ø80-60				PHB	1					4.800,00		10
170	2	PC	TAIL TAKE UP PULLEY Ø315 W650 SHAFT Ø80-50				PHB	1					3.100,00		10
171	1	PC	DRIVE PULLEY Ø630 W1200 SHAFT Ø160-110-100				PHB	1					12.200,00		10
172	1	PC	TAKE UP PULLEY Ø500 W1200 SHAFT Ø120-80				PHB	1					6.850,00		10
173	1	PC	TAKE UP BEND PULLEY Ø400 W1200 SHAFT Ø120-80				PHB	1					7.950,00		10

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

Owner : NIS	SELLER's Ref. :	ALWAYS REFER TO THIS NUMBER : 172784 - 300-001-SD-000006 (project number) - (SPIR number)
Plant : RNP DCU Plant Project (WP1)	SELLER :	
Location : Pancevo, Serbia	Tel. number :	
Equipment :	E-mail :	
		Rev.: Date:

S U M M A R Y

ITEM	TOTAL QUANTITY OF INSTALLED PARTS	UNIT OF MEASURE	PART DESCRIPTION	SUPPLIER'S PART NUMBER	Included in the Purchase Order for the Parent Equipment:			SUPPLIER'S RECOMMENDATION	RECOMMENDATION PURCHASER	COMPANY'S APPROVAL TO PURCHASE	RECEIVED ON SITE	HANDLED OVER	UNIT PRICE EXW - SPAIN CURRENCY	TOTALS FOR PURCHASE	DELIVERY TIME - WEEKS (EXW Gijón - Spain)
					CAPITAL Spare Parts	COMMISSIONING Spare Parts									
174	1	PC	TAKE UP BEND PULLEY Ø400 W1200 SHAFT Ø120-80				PHB	1					6.350,00		10
175	1	PC	DRIVE PULLEY Ø400 W650 SHAFT Ø100-80-60				PHB	1					4.950,00		10
176	2	PC	DRIVE PULLEY Ø400 W650 SHAFT Ø100-80-40				PHB	1					4.980,00		10
177	1		24"x36" COBRA CRUSHER												
178		PC	TIP Cr. PIMCL400 24X36				MCLANAHAN CORPOR	1					10.220,00		14
179		PC	TIP BOLT 7/8" X 6"				MCLANAHAN CORPOR	2					30,00		10
180		PC	FLAT WASHER 7/8"				MCLANAHAN CORPOR	2					5,00		4
181		PC	GRIP NUT 7/8"				MCLANAHAN CORPOR	2					5,00		4
182		PC	SEGMENT MCL400 24X36				MCLANAHAN CORPOR	3					23.600,00		14
183		PC	SQUARE HEAD BOLT 1"X4"				MCLANAHAN CORPOR	24					50,00		6
184		PC	FLAT WASHER 1"				MCLANAHAN CORPOR	24					5,00		6
185		PC	GRIP NUT 1"				MCLANAHAN CORPOR	24					5,00		6
186		PC	HOPPER SIDE LINER LH				MCLANAHAN CORPOR	1					1.600,00		12
187		PC	HOPPER SIDE LINER RH				MCLANAHAN CORPOR	1					1.600,00		12
188		PC	FLAT SOCKET HEAD CAPSCREW 3/4"X2"				MCLANAHAN CORPOR	8					5,00		4
189		PC	GRIP NUT 3/4"				MCLANAHAN CORPOR	8					5,00		4
190		PC	HOLD-BACK BOLT ASSEMBLY				MCLANAHAN CORPOR	1					1.160,00		7
191															
192			PLC												
193	1	PC	7 Slot ControlLogix Chassis	1756-A7			ROCKWELL	1					580,00		4
194	1	PC	ControlLogix, 85-265 VAC Power Supply (10 Amp @ 5V)	1756-PA72			ROCKWELL	1					1.045,00		6
195	1	PC	ControlLogix 5570 Controller with 4 MB Memory, USB Port	1756-L72			ROCKWELL	1					8.925,00		8
196	1	PC	EtherNet 10-100M Interface Module (supports 128 TCP/IP)	1756-EN2T			ROCKWELL	1					3.160,00		4
197	1	PC	EtherNet dual port 10-100M Interface Module	1756-EN2TR			ROCKWELL	1					3.380,00		4
198	1	PC	Redundancy Module	1756-RM2			ROCKWELL	1					5.660,00		5
199	1	PC	Fiber Cable, 1 Meter	1756-RMC1			ROCKWELL	1					190,00		2
200	1	PC	2-slot adapter base unit	1715-A2A			ROCKWELL	1					560,00		4
201	1	PC	3-slot I/O base unit	1715-A3IO			ROCKWELL	1					160,00		3
202	1	PC	EtherNet/IP Adapter	1715-AENTR			ROCKWELL	1					1.690,00		6
203	1	PC	16-point digital input module	1715-IB16D			ROCKWELL	1					1.210,00		5
204	1	PC	8-point digital output module	1715-OB8DE			ROCKWELL	1					960,00		4

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

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Location : Pancevo, Serbia	Tel. number :	
Equipment :	E-mail :	
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I T E M	TOTAL QUANTITY OF INSTALLED PARTS	U N I T OF MEASURE	PART DESCRIPTION	SUPPLIER'S PART NUMBER	Included in the Purchase Order for the Parent Equipment:			SUPPLIER'S RECOMMEN- DATION	RECOMMEN- DATION PURCHASER	COMPANY'S APPROVAL TO PURCHASE	RECEIVED ON SITE	HANDED OVER	UNIT PRICE EXW - SPAIN CURRENCY	T O T A L S F O R P U R C H A S E	DELIVERY TIME - WEEKS (EXW Gijón - Spain)
					CAPITAL Spare Parts	COMMISSIO- NING Spare Parts									
205	1	PC	Termination Assembly - digital input simplex	1715-TASIB16D			ROCKWELL	1					280,00		3
206	1	PC	Termination Assembly - digital output simplex	1715-TASOB8DE			ROCKWELL	1					145,00		3
207	1	PC	1794 Flex, Flex Ex, Flex XT I/O System, FLEX I/O Dual Port EtherNet/IP	1794-AENTR			ROCKWELL	1					800,00		4
208	1	PC	1794 Flex, Flex Ex, Flex XT I/O System, Input Module, 24VDC, 32 Sink Inputs	1794-IB32			ROCKWELL	1					540,00		4
209	1	PC	1794 Flex, Flex Ex, Flex XT I/O System, Output Module, 24V DC, 32 Source	1794-OB32P			ROCKWELL	1					610,00		4
210	1	PC	1794 Flex, Flex Ex, Flex XT I/O System, HART Analog Input Modules, 8 Single-Ended Inputs	1794-IE8H			ROCKWELL	1					1.510,00		4
211	1	PC	1794 Flex, Flex Ex, Flex XT I/O System, HART Analog 8 Output Module	1794-OF8IH			ROCKWELL	1					2.260,00		4
212	1	PC	40 point feed-through digital IFM, standard,	1492-IFM40F			ROCKWELL	1					120,00		4
213	1	PC	Pre-wired cable 1,5mt (1794-IB32)	1492-CAB015B94			ROCKWELL	1					210,00		4
214	1	PC	Ready cable 1,5mt (1794-IB32/1794-OB32P)	1492-CAB015H94			ROCKWELL	1					200,00		4
215	1	PC	Terminal base, for 32 point modules, 62 pin D-shell termination	1794-TB62DS			ROCKWELL	1					190,00		4
216	1	PC	1794 Flex, Flex Ex, Flex XT I/O System, Terminal Base, 3-Wire grounded, Screw Clamp	1794-TB3G			ROCKWELL	1					220,00		4
217	1	PC	FLEX I/O 1ft extended cable 0,9m	1794-CE3			ROCKWELL	1					235,00		4
218	1	PC	1606-XLE480E: Essential Power Supply, 24-28V DC, 480 W, 240V AC Input Voltage	1606-XLE480EP			ROCKWELL	1					380,00		5
219	1	PC	1606-XLERED: Essential Redundancy Module, Vin 1 -.9Vin, 384 W, 10-60V DC Input Voltage	1606-XLERED			ROCKWELL	1					115,00		5
220	1	PC	Module voltage, module protection, 6A, 6A, 6A, 6A, Electronic Circuit Protection, 24Vdc	1692-ZG6666			ROCKWELL	1					130,00		5
221	1	PC	Stratix 5700 Switch, Managed, 8 Fast Ethernet Copper Ports, 2 Fast Ethernet Combo Ports	1783-BMS10CL			ROCKWELL	1					1.640,00		6
222	1	PC	Networks and Communication Products, EtherNet/IP Tap1 copper port, 2 fiber ports	1783-ETAP2F			ROCKWELL	1					750,00		6
223	1	PC	Networks and Communication Products, EtherNet/IP Tap2 copper ports, 1 fiber port	1783-ETAP1F			ROCKWELL	1					610,00		6
224	1	PC	Stratix 2000 Switch, Unmanaged, 8 Copper Ports	1783-US8T			ROCKWELL	1					230,00		6
225	1	PC	EtherNet/IP to Serial Linking Device Gateway	HMS-EN2SER			ROCKWELL	1					1.100,00		6
226	1	PC	EtherNet/IP Adapter to Modbus-TCP Slave gateway	AB7632			ROCKWELL	1					1.100,00		6
227	1	PC	Ethernet IP to Modbus TCP Gateway	PLX31-EIP-MBTCP			ROCKWELL	1					1.190,00		6
228	1	PC	PanelView Plus 7 Standard Terminal, Touch Screen, 15 TFT Color, Ethernet DLR	2711P-T15C22D8S			ROCKWELL	1					4.510,00		8

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

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Location : Pancevo, Serbia	Tel. number :	
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Rev.:		Date:

S U M M A R Y

ITEM	TOTAL QUANTITY OF INSTALLED PARTS	UNIT OF MEASURE	PART DESCRIPTION	SUPPLIER'S PART NUMBER	Included in the Purchase Order for the Parent Equipment:			SUPPLIER'S RECOMMENDATION	RECOMMENDATION PURCHASER	COMPANY'S APPROVAL TO PURCHASE	RECEIVED ON SITE	HANDED OVER	UNIT PRICE EXW - SPAIN CURRENCY	TOTALS FOR PURCHASE	DELIVERY TIME - WEEKS (EXW Gijón - Spain)
					CAPITAL Spare Parts	COMMISSIONING Spare Parts									
229	1	PC	2-Channel Isolated Barrier, 24Vdc power supply, dry contact or NAMUR inputs,	KFD2-SR2-Ex2.W			PEPPERL-FUCHS	1					300,00		6
230	1	PC	PLC Relay Module, screw connection and pluggable miniature relay w/power	PLC-RSC-230UC/21			PHOENIX CONTACT	10					25,00		6
231	1	PC	PLC -INTERFACE, screw connection and plug-in miniature relay w/power contact	PLC-RSC-24DC/1/ACT			PHOENIX CONTACT	10					15,00		6
232	1	PC	Coupling Relay for SIL 2 high -and low- demand applications	PSR-PS21-1NO-1NC-24DC-SC			PHOENIX CONTACT	1					150,00		6
233	1	PC	Filter fan, 230Vac, up to 536m³/h, 223x223mm	01883.0-00			STEGO	1					220,00		6
234	1	PC	Miniature Circuit Breaker, 2P/16A, Curve C	5SL6516-7			SIEMENS	1					15,00		6
235	1	PC	Miniature Circuit Breaker, 2P/6A, Curve C	5SL6506-7			SIEMENS	1					20,00		6
236	1	PC	RCCB, 2-pole, type AC, 25A, 30mA	5SV53120FB			SIEMENS	1					25,00		6
237															
238			EXPLOSION PANELS												
239	14	PC	EXPLOSION VENT KER 940X1440	AISI 304 DIN 14301			ATEXPREEN	2					750,00		6
240	14	PC	SENSOR ATEX	S3-HT			ATEXPREEN	2					300,00		6
241															
242			OTHER												
243	12	PC	HORN&LAMP	D1XC1C10-AC230			PEPER&FUCHS	2					1.100,00		6
244		Meter	15w/m HEAT TRACING CABLE					500					14,00		3
245	8	PC	Weight cell 1000T	C3 ATEX 22			SERVIPESA	1					7.025,00		10
246	8	PC	Support weight cell with accesories	HDG			SERVIPESA								
247	2	PC	Conection box				SERVIPESA	1					650,00		10
248	2	PC	Panel with ethernet communication	MOD 1700			SERVIPESA	1					1.690,00		10
249	1	Kit	HILTI DRILL KIT DX 351 BT G + SF BT 22-A + B22/2.6	DX351 BT G			HILTI	1					2.850,00		2
250	1	Kit	HILTI SCREWDRIVER KIT SBT 4-A22 + B22/3.0 + S-DG BT M10	SBT 4-A22			HILTI	1					1.450,00		2
251								1							
252			TELESCOPIC CHUTE												
253	18	PC	Filter cartridge	HE-FJ-OS-000164-K00			HENNLICH	9					180,00		8
254	2	PC	Level switch	HE-NZ-EM-000195-K00			HENNLICH	1					2.570,00		8
255	2	PC	Inlet part	HE-NZ-OD-024200-000			HENNLICH	1					1.250,00		8
256	2	PC	Tube No. 1	HE-NZ-OD-024170-000			HENNLICH	1					1.100,00		8
257	2	PC	Tube No. 2	HE-NZ-OD-024175-000			HENNLICH	1					1.100,00		8

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

Owner : NIS	SELLER's Ref. :	ALWAYS REFER TO THIS NUMBER : 172784 - 300-001-SD-000006 (project number) - (SPIR number)
Plant : RNP DCU Plant Project (WP1)	SELLER :	
Location : Pancevo, Serbia	Tel. number :	
Equipment :	E-mail :	
		Rev.: Date:

S U M M A R Y

I T E M	TOTAL QUANTITY OF INSTALLED PARTS	U N I T OF MEASURE	PART DESCRIPTION	SUPPLIER'S PART NUMBER	Included in the Purchase Order for the Parent Equipment:			SUPPLIER'S RECOMMEN- DATION	RECOMMEN- DATION PURCHASER	COMPANY'S APPROVAL TO PURCHASE	RECEIVED ON SITE	HANDED OVER	UNIT PRICE EXW - SPAIN CURRENCY	T O T A L S F O R P U R C H A S E TWO YEAR OPERATING SPARE PARTS	DELIVERY TIME - WEEKS (EXW Gijón - Spain)
					CAPITAL Spare Parts	COMMISSIO- NING Spare Parts	.								
258	2	PC	Tube No. 3	HE-NZ-OD-024181-000			HENNLICH	1					1.100,00		8
259	2	PC	Tube No. 4	HE-NZ-OD-024186-000			HENNLICH	1					1.100,00		8
260	2	PC	Outer bellows	HE-NZ-OS-024231-000			HENNLICH	1					5.400,00		8
261	2	PC	Rope dia 6 mm	HE-NZ-ME-024210-000			HENNLICH	1					290,00		8
262															
263	1		VULCANIZER												
264	1	PC	spare bag size 39" x 54"	SVP3954-17 (39-54)			ALMEX	1					3.620,00		7
265	4	PC	spare element 39" x 54"	SVP3954-17 (39-54)			ALMEX	1					2.600,00		7
266	1	PC	Platen Receptacle Insert (High Temp)	SVP3954-17 (SVP-18)			ALMEX	1					350,00		7
267	1	PC	1/4" (6mm) 100 Ohm RTD Probe	SVP3954-17 (SVP-23)			ALMEX	1					150,00		7
268	1	PC	Platen Handle Assembly	SVP3954-17 (SVP-25)			ALMEX	2					170,00		7
269	1	PC	Locking Pin	SVP3954-17 (SVP-3)			ALMEX	2					50,00		7
270	1	PC	Quick coupler Male	SVP3954-17 (SVP-10)			ALMEX	1					50,00		7
271	1	PC	Quick coupler Male Dust-cap	SVP3954-17 (SVP-11)			ALMEX	1					50,00		7
272	1	PC	Quick coupler Female	SVP3954-17 (SVP-30)			ALMEX	1					130,00		7
273	1	PC	Quick coupler Female Dust-cap	SVP3954-17 (SVP-31)			ALMEX	1					30,00		7
274			FOR RC3 TEMPERATURE CONTROL PANEL				ALMEX	1							
275	1	PC	Fuse Holder C/w 2 Amp Fuse	SVP3954-17 (RC3-9)			ALMEX	1					75,00		7
276	1	PC	Platen Connector Insert	SVP3954-17 (RC3-15)			ALMEX	1					150,00		7
277	1	PC	Platen Connector Housing	SVP3954-17 (RC3-15)			ALMEX	1					150,00		7
278															
279			AUTOMATIC SAMPLING SYSTEM												
280			Hammer sampler HPN650/30/482/D/300												
281	1	PC	Geared motor with brake	351005			SIEBTECHNIK	1					10.670,00		14
282	2	PC	Proximity switches	351510			SIEBTECHNIK	2					350,00		10
283	1	PC	Guide plates (set)	351551			SIEBTECHNIK	1					1.725,00		10
284	1	PC	Back panel	351550			SIEBTECHNIK	1					1.540,00		10
285	1	PC	Stripper rubber	351553			SIEBTECHNIK	1					250,00		10
286	1	PC	Brush	351555			SIEBTECHNIK	1					1.050,00		10
287	2	PC	Spherical roller bearings	131577			SIEBTECHNIK	2					175,00		10
288	2	PC	Tension sleeve	217035			SIEBTECHNIK	2					50,00		10

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

Owner : NIS	SELLER's Ref. :	ALWAYS REFER TO THIS NUMBER : 172784 - 300-001-SD-000006 (project number) - (SPIR number)
Plant : RNP DCU Plant Project (WP1)	SELLER :	
Location : Pancevo, Serbia	Tel. number :	
Equipment :	E-mail :	
		Rev.: Date:

S U M M A R Y

I T E M	TOTAL QUANTITY OF INSTALLED PARTS	U N I T OF MEASURE	PART DESCRIPTION	SUPPLIER'S PART NUMBER	Included in the Purchase Order for the Parent Equipment:			SUPPLIER'S RECOMMEN- DATION	RECOMMEN- DATION PURCHASER	COMPANY'S APPROVAL TO PURCHASE	RECEIVED ON SITE	HANDED OVER	UNIT PRICE EXW - SPAIN CURRENCY	T O T A L S F O R P U R C H A S E	DELIVERY TIME - WEEKS (EXW Gijón - Spain)
					CAPITAL Spare Parts	COMMISSIO- NING Spare Parts									
289	2	PC	V-sealing ring	195568			SIEBTECHNIK	2					50,00		10
290			Belt conveyor GFB500x3175												
291	1	PC	Geared motor	351006			SIEBTECHNIK	1					6.175,00		14
292	1	PC	Drive pulley	351303			SIEBTECHNIK	1					2.500,00		10
293	1	PC	Take-up pulley	347771			SIEBTECHNIK	1					2.050,00		10
294	2	PC	Flanged bearing FY65	351304			SIEBTECHNIK	2					250,00		10
295	2	PC	Flanged bearing FY45	347751			SIEBTECHNIK	2					150,00		10
296	16	PC	Idler, top	206482			SIEBTECHNIK	16					280,00		10
297	3	PC	Idler, bottom	347755			SIEBTECHNIK	3					350,00		10
298	1	PC	Belt	351516			SIEBTECHNIK	1					1.450,00		10
299	1	PC	Rubber for material guide, set	357689			SIEBTECHNIK	1					2.700,00		10
300	1	PC	Rubber for drum stripper	347759			SIEBTECHNIK	1					285,00		10
301	1	PC	Rubber for angular stripper	347760			SIEBTECHNIK	1					310,00		10
302	1	PC	Sensor for speed monitoring	350896			SIEBTECHNIK	1					350,00		10
303			Single roll crusher EW 30/25												
304	1	PC	Roller body	200719			SIEBTECHNIK	1					4.850,00		10
305	1	PC	Crushing bars	164696			SIEBTECHNIK	1					5.200,00		10
306	1	PC	Wear plate towards the crusher wall, 2 parts	357690			SIEBTECHNIK	1					850,00		10
307	1	PC	Wear plate towards the crusher wall, bottom	350645			SIEBTECHNIK	1					2.100,00		10
308	1	PC	Wear plate towards the crusher housing	350647			SIEBTECHNIK	1					4.400,00		10
309	1	PC	Stripper towards the back panel	200727			SIEBTECHNIK	1					630,00		10
310	1	PC	Stripper for crushing bar	170846			SIEBTECHNIK	1					580,00		10
311	1	PC	Rubber plate	200723			SIEBTECHNIK	1					175,00		10
312	2	PC	Self-aligning roller bearing	200712			SIEBTECHNIK	2					320,00		10
313	2	PC	Adapter sleeve	200713			SIEBTECHNIK	2					85,00		10
314	5	PC	Rubber battery spring	118722			SIEBTECHNIK	5					450,00		10
315	1	PC	Geared motor	350632			SIEBTECHNIK	1					6.000,00		14
316			Turnstile divider DKT 370 A/1P												
317	1	PC	Geared motor	350926			SIEBTECHNIK	1					2.250,00		14
318	1	PC	Rotary arm	265023			SIEBTECHNIK	1					2.950,00		10
319	1	PC	Stripper for the rotary arm	350933			SIEBTECHNIK	1					210,00		10

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

Owner : NIS	SELLER's Ref. :	ALWAYS REFER TO THIS NUMBER : 172784 - 300-001-SD-000006 (project number) - (SPIR number)
Plant : RNP DCU Plant Project (WP1)	SELLER :	
Location : Pancevo, Serbia	Tel. number :	
Equipment :	E-mail :	
Rev.:		Date:

S U M M A R Y

ITEM	TOTAL QUANTITY OF INSTALLED PARTS	UNIT OF MEASURE	PART DESCRIPTION	SUPPLIER'S PART NUMBER	Included in the Purchase Order for the Parent Equipment:			SUPPLIER'S RECOMMENDATION TWO YEAR OPERATING Spare Parts	RECOMMENDATION PURCHASER TWO YEAR OPERATING Spare Parts	COMPANY'S APPROVAL TO PURCHASE TWO YEAR OPERATING Spare Parts	RECEIVED ON SITE TWO YEAR OPERATING Spare Parts	HANDED OVER TWO YEAR OPERATING Spare Parts	UNIT PRICE EXW - SPAIN CURRENCY	TOTALS FOR PURCHASE TWO YEAR OPERATING SPARE PARTS	DELIVERY TIME - WEEKS (EXW Gijón - Spain)
					CAPITAL Spare Parts	COMMISSIONING Spare Parts									
320	1	PC	Discharge arm in the feeder housing	350931			SIEBTECHNIK	1					4.200,00		10
321	1	PC	Stripper set for the discharge arm in the feeder housing	357314			SIEBTECHNIK	1					350,00		10
322	1	PC	Cone scraper	350932			SIEBTECHNIK	1					1.900,00		14
323			Sample collector S4/10												
324	1	PC	Geared motor	350895			SIEBTECHNIK	1					3.650,00		10
325	2	PC	Proximity switches	350896			SIEBTECHNIK	2					350,00		10
326	2	PC	Safety switch with actuator	268454			SIEBTECHNIK	2					170,00		10
327	8	PC	Container	223146			SIEBTECHNIK	8					970,00		10
328	4	PC	Rubber collar	350903			SIEBTECHNIK	4					170,00		10
329	4	PC	Rubber collar	350904			SIEBTECHNIK	4					100,00		10
330	12	PC	Hose clamp	39515			SIEBTECHNIK	12					40,00		10
331	1	PC	Rubber collar	350905			SIEBTECHNIK	1					150,00		10
332	2	PC	Hose clamp	39075			SIEBTECHNIK	2					40,00		10
333			Control unit												
334	1	PC	Enclosure heater 800/870W, 230V,50/60 Hz	350469-1			SIEBTECHNIK	1					460,00		14
335	1	PC	Fan and filter unit	350469-2			SIEBTECHNIK	1					150,00		14
336	1	PC	SITOP PSE200U	350469-3			SIEBTECHNIK	1					260,00		14
337	1	PC	KTP700 Basic DP	350469-4			SIEBTECHNIK	1					1.700,00		14
338	1	PC	CPU 314C PN/DP	350469-5			SIEBTECHNIK	1					5.150,00		14
339	1	PC	SM 323, 16 DI/DO, DC24V, 0.5 A	350469-6			SIEBTECHNIK	1					1.250,00		14
340	1	PC	Safety relais module SRB-Exi	350469-7			SIEBTECHNIK	1					350,00		14
341	1	PC	Thermistor motor protection	350469-8			SIEBTECHNIK	1					120,00		14
342	5	PC	Coupling relay	350469-9			SIEBTECHNIK	5					280,00		14
343	1	PC	Sirius safety relay stanard series device	350469-10			SIEBTECHNIK	1					350,00		14
344	1	PC	Contactora AC-3, 3 kW/400V, 1NC, DC 24V	350469-11			SIEBTECHNIK	1					75,00		14
345	1	PC	Contactora AC-3, 5.5 kW/400V, 1NC, DC 24V	350469-12			SIEBTECHNIK	1					90,00		14
346	1	PC	2NO+2NC contactor, AC 3, 4KW AC 230V50 Hz	350469-13			SIEBTECHNIK	1					60,00		14
347	1	PC	Aux. Switch block, 2NO+2NC	350469-14			SIEBTECHNIK	1					50,00		14
348	1	PC	Sitop PSU200 M	350469-15			SIEBTECHNIK	1					560,00		14
349															
350			TRUCK WASHING BOX												

SPARE PARTS & INTERCHANGEABILITY RECORD (SPIR)

Owner : NIS	SELLER's Ref. :	ALWAYS REFER TO THIS NUMBER :
Plant : RNP DCU Plant Project (WP1)	SELLER :	172784 - 300-001-SD-000006
Location : Pancevo, Serbia	Tel. number :	(project number) - (SPIR number)
Equipment :	E-mail :	Rev.: Date:

S U M M A R Y

ITEM	TOTAL QUANTITY OF INSTALLED PARTS	UNIT OF MEASURE	PART DESCRIPTION	SUPPLIER'S PART NUMBER	Included in the Purchase Order for the Parent Equipment:			SUPPLIER'S RECOMMEN-DATION	RECOMMEN-DATION PURCHASER	COMPANY'S APPROVAL TO PURCHASE	RECEIVED ON SITE	HANDED OVER	UNIT PRICE EXW - SPAIN CURRENCY	T O T A L S F O R P U R C H A S E	DELIVERY TIME - WEEKS (EXW Gijón - Spain)
					CAPITAL Spare Parts	COMMISSIO-NING Spare Parts									
351	14	PC	Flat fan nozzels	JB 1/4			LECHLER	50					20,00		6
352	1	PC	Photo-electric sensor	XUX5ARCNT16			SCHNEIDER	1					190,00		4
353	1	KIT	Sseals kit for pumps	RC.SS1CG_C1			TECNOTER	1					160,00		2
354	<p>THE RE-CERTIFICATION OF THE SPARE PARTS IS NOT INCLUDED. IT MUST BE DONE BY CLIENT</p> <p>The indicated delivery time and price is in EXW conditions</p>														
355															
356															
357															
358															
359															
359															



SILOS FILTERS DATA SHEET



RNP DCU Plant Project (WP1)

Supplier Name:	PHB Weserhütte
SDR Code(s):	P03 - B02
Equipment / Tag Number(s):	FC-5601A & FC-5601B
Document Title:	Silos Filters data sheet
Supplier Document No:	000951-00-0CG-HD-0013

Supplier's Revision Record

6	30/01/2019		Edition updates	Lola G	Margarita P	Michel F
5	08/01/2019		Edition updates	Lola G	Margarita P	Michel F
4	13/12/2018		Updated, motor is very small and is not included in MDS	Lola G	Margarita P	Michel F
3	20/11/2018		Updated	Daniel C	Margarita P	Michel F
2	25/04/2018		Updated	Daniel C	Margarita P	Michel F
1	05/02/2018		Updated	Borja J	Margarita P	Michel F
0	30/11/2017		First submission	Borja J	Margarita P	Michel F
Rev	Date		Issue State	By	Checked	Approved

Project Document Number

Project Number	Purchase Order Number		Seq. No.	Project Rev.
172784	- 0300-001	- SD -	000020	6

SUPPLIER DOCUMENT REVIEW STATUS

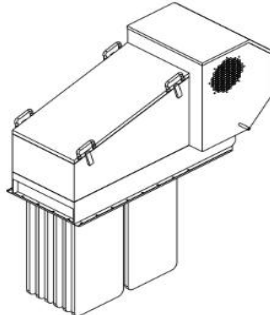
Purchaser's review of Supplier's documents does not relieve Supplier of the responsibility for correctness under the Purchase Order. Permission to proceed does not constitute acceptance of design, detail and calculations, test methods or materials developed or selected by the Supplier and does not relieve the Supplier from full compliance with the Purchase Order or any other obligations, nor detract from any of the Purchaser's rights.

Purchaser's Review Stamp

CB&I		
RNP DCU Plant Project No. 172784		
Engineering Review Status	By:	
Code 1 - No Comments	CHARLOTTE.PA	
	RRA	
	Date: 19.2.2019	
<small>These comments do not relieve the supplier of his responsibility to meet the requirements of the PO.</small>		

Should the Supplier consider that any comments made by the Purchaser change the Scope of Supply, the Supplier shall advise the price and delivery implications of such changes within five working days of receipt. The Supplier must not incorporate such changes without prior approval of the Purchaser of the revised price and/or delivery period. RETROSPECTIVE CLAIMS WILL NOT BE CONSIDERED.

The document consists of this frontsheet plus 1 pages.

Document title:		Document No.	Rev
Silos Filters data sheet		000951-00-0CG-HD-0013	6
Pos	Design parameters		
1	Quantity		
2	Equipment tag		
3	Location		
4	Operating and design conditions		
5	Ambient Temperature		
6	Coke Temperature		
7	Operating design humidity		
8	Operation type		
9	Location		
10	Transfer rate		
11	Design data		
12	Manufacturer	AAF	2
13	Model	FPE V 12/10 MI	2
14	Number of cartridges	12	2
15	Total filtering surface	12 m ²	2
16	Cartridges clean per electrovalve	4	2
17	Electrovalves connection	220Vdc / 50 Hz	2
18	Colour finishing	RAL 7046	2
19	Total weight	350 Kg	2
20	Design vacuum	600 daPa	2
20	Air connection	1" BSP female	2
21	Performance Data		
22	Flow rate	1200 m ³ /h	2
23	Operating temperature	-40 to 40 °C	2
24	Cartridges material	Polyester	2
25	Cartridges height	1000 mm	2
26	Filtration ratio	1,66 m/min	2
27	Head loss	150 daPa	2
28	Enclosure material	Carbonsteel	2
29	Cleaning programmer type	Delta Pulse	2
30	Cleaning air		
31	Air consumption	0,045 Nm ³ /pulse	2
32	Air consumption	7 m ³ /h	2
33	Air pressure required	4 bar	2
34	Quality (ISO8573-1)	2.4.2	2
35	Fan		
36	Flow rate	1200 m ³ /h	2
37	Pressure	250 daPa	2
38	Fan power	1,5 kW / 3000 rpm	2
39	Electrical data		
40	Local Control Station	Yes (Start pushbutton, Stop pushbutton, Local/Remote selector, ESD)	5
41	Power supply	1,7 kW / 400Vac / 50Hz	2
42	Valve power	1,5 kW	2
43	Air pressure	4 bar	2
44	Fault confirmation signal (system failure), Running confirmation signal	Yes	4
45	Instrumentation		
46	Differential Pressure Transmitter	Yes (1 per silo). See PID 172784-0300-001-SD-000153	3
47	ATEX Clasification	II 2D Ex tb IIIC T135°C Db	6
48	Atex		
49	FAN	II 2Dc Ex IIIC T135°C IP65	6
50	Induction MOTOR	II 2D Ex tb IIIC T125 °C Db IP65	6



Operation Manual. Commercial equipment



RNP DCU Plant Project (WP1)

Supplier Name:	PHB Weserhütte
SDR Code(s):	P03-M01
Equipment / Tag Number(s):	FC-5601A/B
Document Title:	Installation, Operation and Maintenance manual for Dust Filters
Supplier Document No:	000951-00-0CG-MN-0105

Supplier's Revision Record

Rev	Date	Issue State	By	Checked	Approved
3	22/03/19	As per comments	Lola G	Margarita P	Michel F
2	21/03/19	Clarification note	Lola G	Margarita P	Michel F
1	08/02/19	Preliminary revision	Lola G	Margarita P	Michel F
0	09/10/18	Preliminary revision	Lola G	Margarita P	Michel F

Project Document Number

Project Number		Purchase Order Number		Seq. No.	Project Rev.
172784	-	0300-001	- SD -	000392	3

SUPPLIER DOCUMENT REVIEW STATUS

Purchaser's review of Supplier's documents does not relieve Supplier of the responsibility for correctness under the Purchase Order. Permission to proceed does not constitute acceptance of design, detail and calculations, test methods or materials developed or selected by the Supplier and does not relieve the Supplier from full compliance with the Purchase Order or any other obligations, nor detract from any of the Purchaser's rights.

Purchaser's Review Stamp

CB&I RNP DCU Plant Project No. 172784		 By: CHARLOTTE.PA RRA Date: 26.3.2019
Engineering Review Status Code 1 - No Comments		
<small>These comments do not relieve the supplier of his responsibility to meet the requirements of the PO.</small>		

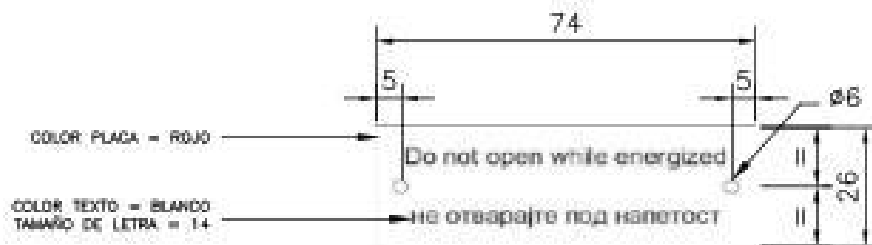
Should the Supplier consider that any comments made by the Purchaser change the Scope of Supply, the Supplier shall advise the price and delivery implications of such changes within five working days of receipt. The Supplier must not incorporate such changes without prior approval of the Purchaser of the revised price and/or delivery period. RETROSPECTIVE CLAIMS WILL NOT BE CONSIDERED.

The document consists of this front sheet
plus 106 pages.

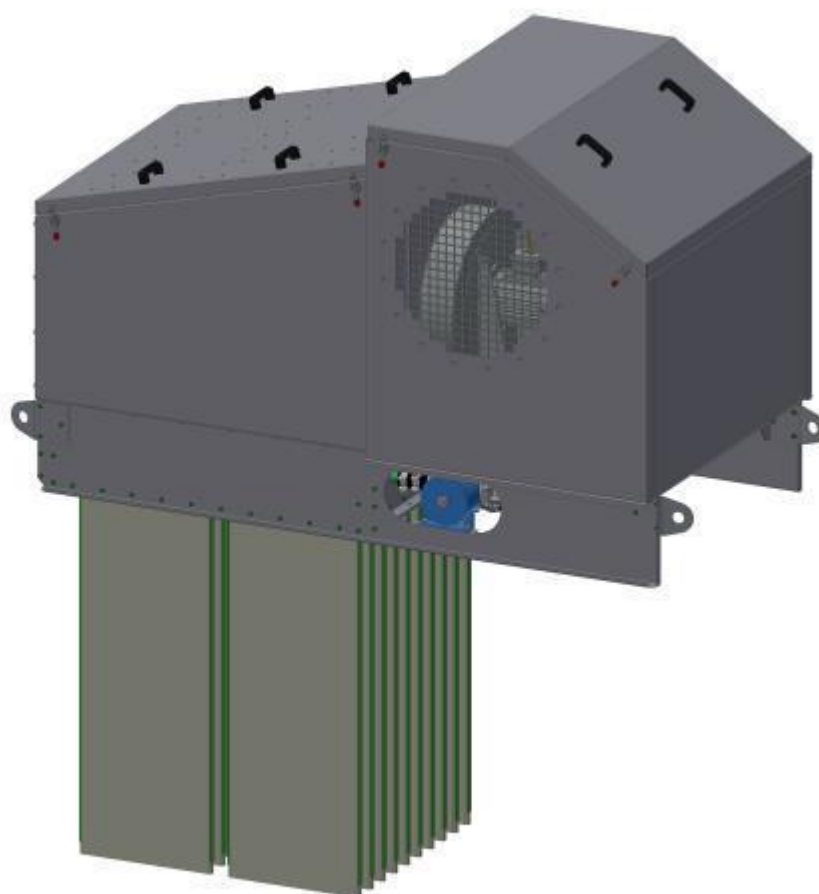
Document Title:	Document No.	Rev:
Operation Manual. Commercial Equipment	000951-00-0CG-MN-0105	3

Clarification note:

Nameplates in cabinet (pag 38):



FABRIPULSE MANUAL EVOLUTION





IMPORTANT ANNOUNCEMENT

READ THIS MANUAL CAREFULLY BEFORE INSTALLING

**AAF NOT RESPONSIBLE USE OF IMPROPER OR FOR ERRORS DERIVED FROM A BAD ASSEMBLY /
INSTALLATION**

NOTICE

IMPROPER OPERATION CONTROL SYSTEM OF DUST MAY CHANGE WORKING CONDITIONS, AND AS A RESULT OF THIS, COULD RESULT IN INJURY OR PRODUCT. VERIFY ALL FILTERS HAVE BEEN SELECTED CORRECTLY, ITS DIMENSIONS ARE CORRECT AND THAT ARE BEING USED IN AN APPROPRIATE APPLICATION.



FABRIPULSE MANUAL EVOLUTION



ENVIRONMENTAL
SOLUTIONS

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1-GENERAL SAFETY REQUIREMENTS.....	5
2-INTRODUCTION.....	9
3-INSTALLATION / ASSEMBLY.....	12
4-START	22
5-MAINTENANCE.....	24

1-GENERAL SAFETY REQUIREMENTS

- Only authorized personnel, who knows the contents of this Manual, must handle this machine for installation, commissioning or operation.
 - The filter must be stored as supplied. Remove only the package for installation.
 - Check that the equipment has not suffered damage, the technical data listed on the nameplate match the order data.
 - You can only use the filter when it is in perfect condition from a technical standpoint, according to the use to which this intended and following the instructions in the manual supplied with the equipment. Therefore, you should immediately remedied any malfunction, especially those affecting the safety of the appliance.
 - The team has moorings for download. The weight and dimensions of the equipment shown on the drawings / documentation provided. Both transport and handling should be done with appropriate means weight / measures. Should not lift the equipment by means of eyebolts each element, eg: eyebolts engines that are exclusively for independent transport.
 - The design of ventilation, ventilation ducts and pressure-resistant design are developed by AAF SA specifically for products, circumstances and environment and should never be altered or only with permission of AAF SA
 - The equipment should not be installed in potentially explosive atmospheres or with explosive applications, unless the application for that certificate ATEX (Directive 94/9 / EC). If no express reference to the plate, the supplied equipment is not suitable for working in explosive atmospheres.
 - If the filter is manipulating potentially explosive dust or is located in a potentially explosive atmosphere, connect all engines to thermal protection devices to prevent excess in maximum surface temperature. Such electrical equipment must meet the EN 60079-0.
- If the powder to be treated can trigger an exothermic reaction, including an autoignition installation should include a blast protection system. To avoid this risk a routine for removing dust layers cleaning is recommended.
- The equipment must be installed and fixed in a solid and fastened by screws horizontal base.
 - Ensure that the filter temperature does not exceed 120C.
 - When making the electrical connection, pay special attention to the type of current and nominal voltage of the equipment.
 - The electrical installation to which the device is connected must have shunts and protections

against overcurrent.

- All work on the equipment must be performed when standing and separate sources of air and power and depressurized pneumatically (keeping activated cleaning system after cutting supply, until the pressure reboiler down to 0 bar) . To effect separation of energy sources:

- Power have a disconnecter
- The air supply the boiler will have stopcock

- These devices separation of energy sources will have lock, if not possible vigilance from maintenance points and clearly marked.

-if explosion is mandatory a stop signal equipment.

- Equipment maintenance will be performed according to conditions most suitable ambient lighting.

- Leave the installation in its original condition after maintenance (fixations, shelter, fasteners, joints and grounding).

- Performing regular maintenance removing dust and inspecting the cleaning mechanism at least once a month.

- They must use personal protective equipment appropriate to the application depending on its nature (toxicity, harmfulness, ...) during maintenance work.

- If you have a fall arrest equipment inside grid, it will periodically inspect their status, changing it as any deterioration is found.

- Use only authorized parts, supplied by AAF SA

-the compressed air is recommended for the filters using a counterflow cleaning, however may use other gases is explosive if the atmosphere during cleaning of the filter fabric.

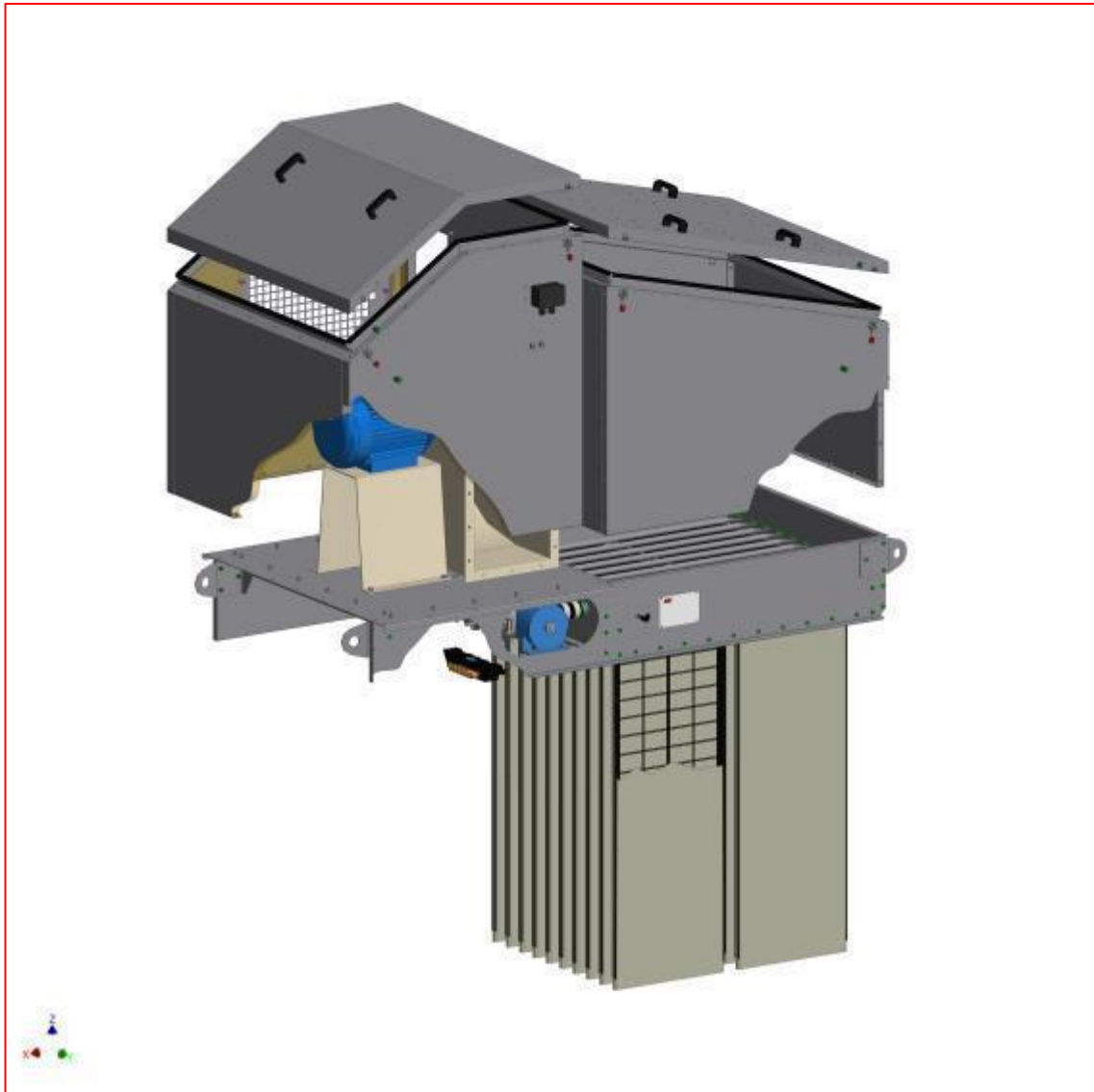
- In assessing risk potential ignition sources in dust and gas mixtures with a low level of EMI it has been detected electrostatic discharges risk of accumulated dust. In this case, security is based on the use of a conductive container, powders with an average particle size below 400 microns and performing frequent emptying.

- a sprinkler system is recommended in applications of explosives or flammable materials.

- If the original design of the filter or the process is changed without carrying out changes in the security system, this may be adversely affected. A Careless or incorrect maintenance can also lead to a lack of security.

- Changing the process can change the amount of product or process temperatures but can also, and more importantly, change the range of products.

- Any control system installed on this machine will be in accordance with paragraph 1.2 of the essential requirements of Directive 2006/42 / EC.
- Always use original equipment filter elements. electrical, rotary valves, etc.
- No fan can be considered completely sealed and that come equipped with an inlet / outlet open. For that reason, the internal and external atmosphere can be considered the same in terms of classification of explosive atmospheres.
- standard fan assemblies must not exceed 3000r / min (50Hz supply) in equipped with an inverter systems.
- For removing sleeves withdrawals for destruction, contact an authorized waste manager.
- The manufacturer should be consulted for any change in the dust collector, security system, process, product or location of the filter.
- For dismantling to clean and condition the filter respecting the codes and regulations.



2-INTRODUCTION

FP Evolution is a dust filter with pulse cleaning air, designed to clean large quantities of dust-laden air, and can run continuously for long periods under cleaning system employed, consisting of a pulse of compressed air discharged counterflow. This system, which works during normal use of the filter, not only serves to maintain at all times the best performance, but allows the filter to run at a constant rate because the pressure loss is kept uniform.

The basis of all types of filter FP Evolution is a module comprising a group of filter elements mounted on a single plate. The elements are introduced into the support plate and by effective mounting of each element, the dirty side (inlet) of the filter and the clean side (output). The introduction and extraction of the elements is separated is always done on the clean side.

The dust filter FP Evolution is based on six sizes, each containing a number of filter elements.

The filter is designed for application in silos, tanks, conveyor transfer points, etc. Depending on the type of use there are different variants filter for pneumatic conveying systems operating at pressures above or below atmospheric pressure, depending on the type of unit, etc. For more information consult AAF SA Depending on the computer model can work in hazardous (Directive 94/9 / EC) reaching the requirements of Group II category 2G and 3G or 2D or 3D T135 ° C.

BUILDING

The filter body has a drilled flange for mounting on or adjacent a tank or silo. The FPE-VM and FPE-V-MI filter also has a built to produce the necessary suction for proper operation under no pressure, as in the case of transfer points or discharge conveyors fan.

Compressed air distributor

The distributed factory is thick steel tube of square section, 150 x 6 mm thick or 180 x 8 mm, with welded ends. There are holes for valves, drain plug, safety valve and connections for moisture separator inlet air. (The moisture separator and the safety valve are not supplied as standard with filter).

Blowpipe compressed air

Positioned on the clean side of the filter consists of a series of tubes with small diameter holes. Each tube extends throughout the length of the panels. The open side of each tube is connected by a rubber sleeve to the compressed air valve, the other end blind, she is bored and fastened with a screw and nuts.

Filter panels (* Fig 6)

Each panel is rectangular and consists of a metal cage to support the filter bag, on top of the cage with an outlet manifold flange and closure welded. The filter bag itself is rectangular in shape, with a resilient seal gasket at the open end. The sleeve is placed pulling it above the support cage until the seal reaches the flange. The gasket is compressed when attaching the filter panel to the support plate, effectively separating the dirty side of the filter clean side. There are six sizes of panels, 700mm, 1000mm, 1250mm, 1500mm, 1750mm and 2000mm along the length of the sleeve, which are normally used as shown in Table No. 3.

Backplate sleeves (* Fig 6 and 7)

The support plate is constructed sleeves in steel, rectangular structure with large flanges provide rigidity, and incorporates housings shaped grooves in which the panels are inserted and secured with cable ties. The number of support sleeves plates depends on the size of the filter.

In all versions antistatic filter connections for making antistatic earth are mounted.

Valves (* Fig 8)

The compressed air to each injector is supplied via the diaphragm valve, the opening and closing of which is controlled by pilot valve solenoid valve connected to the diaphragm by a flexible nylon tube. Solenoid valves are sequentially connected by electrical impulses generated by the controller.

*** Table- Design Details compressed air distributor**

Design pressure :	6,9 bar
Maximum operating pressure PS:	6.2 bar
Test pressure :	10.35 bar
Design temperature :	-30 ° to + 150 ° C
maximum exhaust graduation:	25 dm³ / s at 7.1 bar (the factory setting is 7.1 bar) (not supplied as standard)
Volume Dealer:	6.23 liters 9.55 liters 13.61 liters 17.14 liters 24.37 liters
Pressure product and capacity:	38.63 liters bar 59.21 liters bar 106.27 bar liters 84.38 liters bar 151.09 bar liters
Material used in the construction of Supplier:	hollow structural section
The minimum metal thickness, before the dealer requires special inspection is:	To improve corrosion resistance, the distributor is painted inside and outside cathodic electrocoat with paint. 5.5 mm 7.0 mm

* 1 bar = Pa10⁵



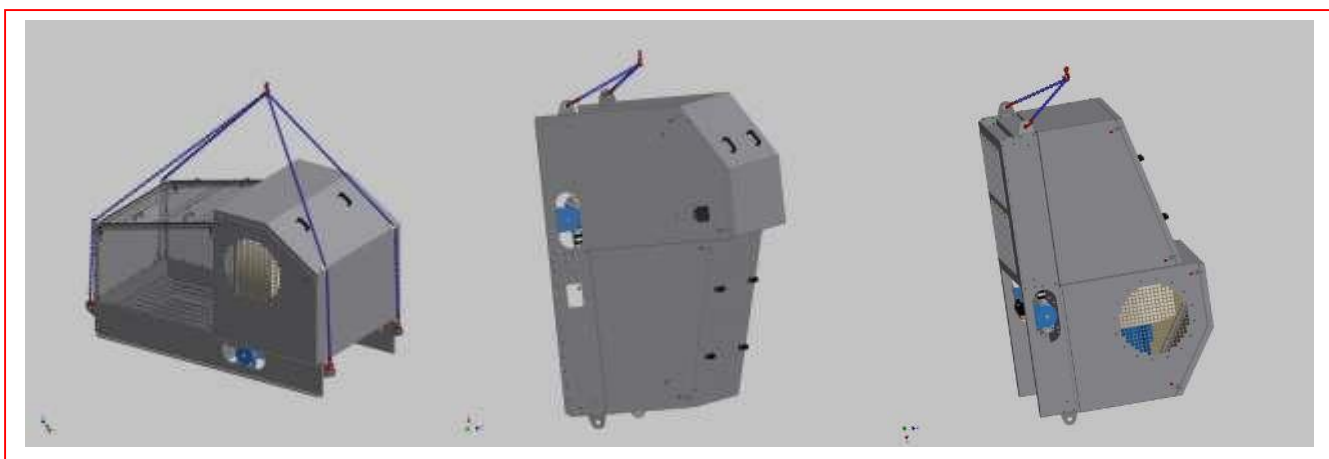
3-INSTALLATION / ASSEMBLY

If the equipment is installed in a potentially explosive atmosphere must be careful not to place the collector in places where they can go outside sources of ignition, for example, stray electrical currents, rays, electromagnetic waves, ionizing radiation, ultrasonic waves. When handling explosive or flammable materials, with a high risk of fire, certain precautions should be considered as installing a sprinkler system or out filter zone 22 / 1. At handling explosive or flammable materials the filter should be positioned so that avoid external heat sources.

The collector is not designed to support the weight of installed locally, interconnected pipes or electrical wiring ducts. All ducts, pipes or electrical wires must be properly restrained. You must properly sealed all connected to the output (p. Eg. Lines) external equipment. The sealing can be performed by applying a continuous bead of sealant 5mm on the mounting surface along each side of the hole structure.

The details of the supply voltage standard fan motor are specified in Table 8 (see "Specifications").

SUSPENSION METHOD

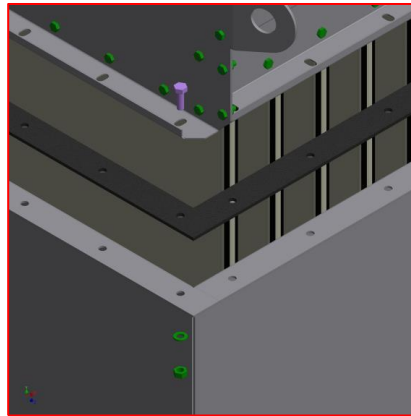


* Be careful not placed under high loads.

MOUNTING HOUSING

Evolution FP filters are shipped partially disassembled. The final assembly of each filter is:

- 1- Check that the opening and the fastening holes are correct, both in size and in position for assembly.

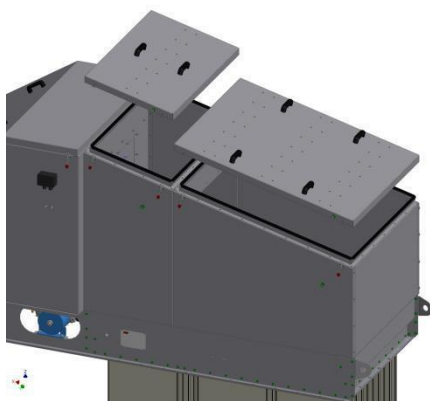


- 2- Place the self-adhesive seal along the fixing holes, as shown in the image.
- 3- Suspend the filter as shown in Page 12

In the filters there are 4 vertical lifting points. In versions head, weather protection and fan (with or without soundproofing box) is hoisted using the four ears of the upper head. Should be used with chains or slings SWL (Safe Working Load) .The appropriate chains should be long enough to ensure that the included angle between the diagonal chains is not greater than 90 °.

- 4- Lift and position the filter body on the housing. Centering holes and screw, nuts and washers.

For filters mounted in a box it is advisable to mount the box in position before installation of the filter body. Many boxes are mounted with clamps for elevation, or through a system of slings. If they have to raise both the filter body and the casing, the clamps of the filter body can be used for vertical holding, provided that the weight of the box is less than 600 kg. (See equipment weight specifications for hoisting). For horizontal insertion clamps elevation of the filter body is not only permissible, it is also necessary to use clamps elevation of the box or slings system to give additional support.



1. Fig -opening the lid

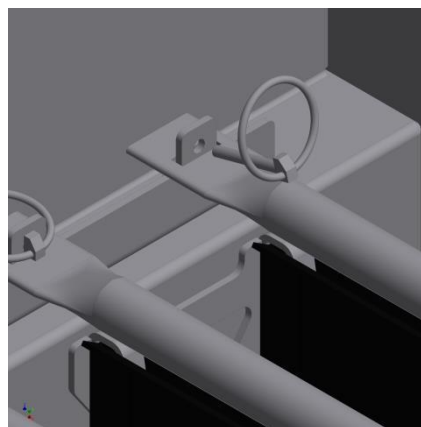
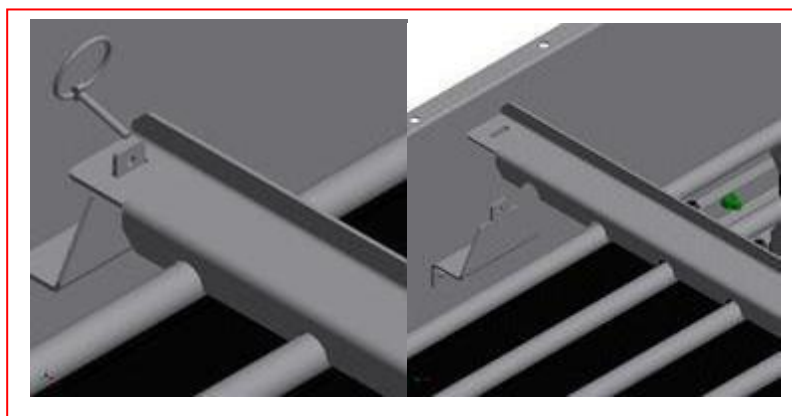


Fig 2. -Extraction locking clip



*** Fig.3 -Reinforcement of blowtubes**



Fig.4 -Remove blowtube

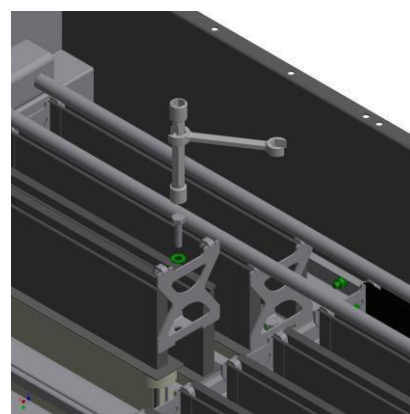


Fig.5-Loosen clamp screw



Fig.6- Place the bag in the cage

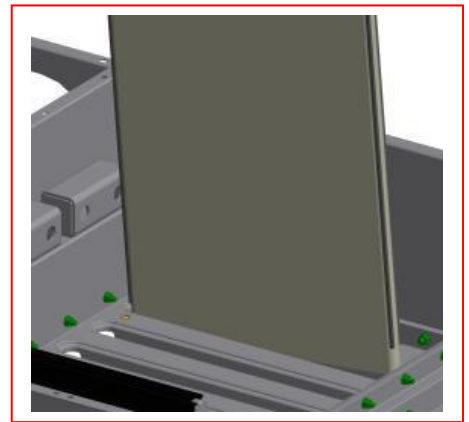


Fig.7- Insert into the slot

FITTING ELEMENTS

- 5- Remove the cover if fitted. (Fig.1)
- 6- Remove the locking clip (Fig.2)
- 7- Extract reinforcing blowtubes (* This element is found in equipment sleeves 30/40) (Fig.3)
- 8- Remove blowtubes (Fig.4)
- 9- Remove screw fastening clamp to release the cage / sleeve (Fig.5)
- 10- Before inserting the filter element into the computer, placing the bag in the cage until stop (Fig.6)
- 11- Insert sleeve / cage into the slot (* Fig.7)
- 12- Operations performed again in reverse.

FINAL ASSEMBLY

- 13- Place the injector tubes (* Fig.4) again. Ensure that the open end is firmly inserted in its housing and that the holes in the tubes injectors are facing cages.
- 14- Open plastic bags containing the screws, washers, nuts, and the connecting tubes fixations controller.
- 15- Screw fasteners to STR controller using 4 screws and nuts M4

- 16- Attaching the controller to a side panel of the filter (which is preferred), using 6 screws and nuts M8.
- 17- The way the solenoid valves based controller will be connected by pipes to diaphragm valves under the air pressure manifold. Cutting the tube to the proper size.
- 18- Connecting pipes to diaphragm valves.
- 19- Passing the tubes through the holes of the side panel filter and connected to the corresponding solenoid valve controller (solenoid valves in the controller are numbered from the left,
- 20- Ensure each tube is firmly connected to the valves.
- 21- Reassembling filter cover (if fitted) (* Fig. 1).

AIR REQUIRED

Evolution FP filters need a separate power clean, dry and oil-free compressed air. In Table X data atmospheric pressure and volume are indicated. When going to a facility existing compressed air used in the factory may be necessary to install a filter / additional separator in the feed line to the filter. If a compressor is installed to supply air to filter the following conditions must be observed:

Compressor type:

a compressor large capacity (an overloaded compressor tends to produce excessively contaminated air containing moisture) should be used.

Location of air intake:

Should avoid placing the air intake in a contaminated and install a suitable filter.

Laying air lines

Piping between the compressor and filters should be long enough so that the compressed air chilled. The pipe must be installed so that it has a drop in the flow direction of air to assist drainage of accumulated moisture. You must be a tap extraction at the lowest point of the installation.

Security valve

The compressed air tank has a maximum operating pressure of 6.2 bar (see Table 5 in section "Specifications"). It is necessary to take adequate measures to prevent any higher pressure. When AAF SA provides a safety valve is triggered to 7.1 bar and 25 dm³ / s. If the compressed air supply exceeds these values a system of extra security is needed.



EEx CONTROLS

When the filter has to be installed in a hazardous area where there is risk of fire or explosion, it will be equipped with a suitable EEx engine and any of the following control systems:

- Solenoids EExd and remote controller

When this option is mounted, the filter has its solenoid valves in a cover EExd IIb T6 mounted on the filter body. A controller, in a case IP66 is supplied loose. This has to be installed in a safe area and connected to the solenoid valves on the filter using appropriate cable.

It is recommended to use cable with a 2.5 mm² section.

The maximum cable length which can be used is 100 m.

The driver installation instructions are the same as for standard controllers.



INSTALLATION CHECKS

- ☐ Ensure that the filter is tightly screwed FP Evolution over the opening.
- ☐ Ensure that the compressed air supply arrives correctly and leak the team.
- ☐ Ensure that the power supply is installed correctly and complies with the law.

Supply regulations engineering (security) 1992 provide adequate insulation advise and emergency stops. Due to the variety of facilities these points can not be supplied by AAF SA, (they are the responsibility of the client).

4-START

CHECKS OF COMMISSIONING:

- ☐ Ensure that the filter body is perfectly fixed
- ☐ Ensure that all pipes are complete and that all removable panels are put in place.
- ☐ Check the status of the board of the filter cover.
- ☐ If the filter module is antistatic, check that they have been properly grounded.

- ☐ Ensure that the controller is connected to the correct voltage and interval and duration of pulses are due. 24 V DC versions to ensure that the polarity is correct. It is essential that the controller is mounted to ground on both AC and DC versions
- ☐ Ensure that power is available.
- ☐ Ensure that the cylinder of compressed air, has the necessary protection for over pressure.
- ☐ Start the compressor and check that the air supply is maintained at the recommended pressure.
- ☐ Turn on the controller and verify that all valves are operating in sequence, (watch and hear the exhaust pulses) .At operate each valve indicating air pressure must drop to about 50% of the initial value set.
- ☐ Check that the fan motor has a correct rotation and the full load current is not excessive (See label fan rotation located above the ear fan inlet in the outlet header powder).
- ☐ If you can, start the main fan and other equipment.

Check the operation of the interlocks and alarm systems if they are installed correctly.

* (If in doubt see table troubleshooting, maintenance section).

STARTING ORDER MANEUVERS

After reviewing all the necessary checks, the equipment can be operated. An installation with a filter, you should start:

- 1-Start the installation of compressed air.
- 2-Start the other teams, (If any).
- 3-Turn the controller.
- 4-Start the main fan.

ORDER STOPPING MANEUVER

At the end of every operating period it is important to leave any dust deposited on the filter bags, filter box and unloading equipment. To achieve this, you must stop the installation as follows:

- 1-Stopping only the main fan, leaving connected the controller and the compressed air to the filter cleanable "out of service".

Fanless cleaning can be used for this purpose (see controller manual).

- 2-After 10-15 minutes, disconnect the controller and the compressor running but leave unloading equipment to make sure it is empty.

- 3-After another 5 minutes, disconnect the computer from downloading.

Upon completion of the above procedure the filter installation is maintained under optimum conditions.

5-MAINTENANCE

- You must use a platform when the level exceeds 2 or more meters.
- Before performing any work, make sure the equipment is properly isolated from the main power supply.
- Make sure the pneumatic system is totally isolated and depressurized before performing any work.
- Auxiliary equipment in non-AAF.SA, refer to the manufacturer's instructions.
- In case you can not avoid it and have to work on the unit an explosive atmosphere must be careful to avoid the introduction of sources of ignition are not present during operation. Right tools to be used antispark.
- Access to dirty air chamber equipment can result in risks and dangers that under normal circumstances would not occur and, therefore, this work must be performed only by trained personnel. These risks include inhalation and dust and potential dangers of explosions. personal protective equipment (PPE) such as dust mask, safety helmets, gloves should be used etc.
- To maintain the original filter specification and ensure that the same level of security is maintained, only original parts must be installed.
- They should take all possible precautions to avoid the risk of ignition in an explosive atmosphere. Measures taken to prevent ignition can not be changed because they could give a dangerous result. Should take special care during maintenance and replacement of components to ensure that the same level of security is maintained. When the turbine fan is replaced, not polishing the components (to prevent sparking).
- During cleaning and maintenance care should be taken to avoid creating static discharge that could ignite a potentially explosive atmosphere.

ROUTINE INSPECTION

To maintain optimum performance of the filters FP Evolution a routine inspection should be done to minimize downtime in the event of any malfunction of equipment, particularly in installations that have to work continuously and ensure that the equipment it is maintained in its original condition supply.

Any unusual variation of the pressure loss of the filter elements indicating a change of working conditions and the presence of a fault to be corrected. For example, a prolonged interruption of the compressed air will result in an excessive accumulation of dust on the filter elements, with consequent loss of suction.

Having rectified the fault, the resumption of the cleaning cycle with compressed air will return the filter to its normal efficiency, although it may be necessary to operate the controller in a position "out of service" for a short period for the accumulated dust dislodging the filter before putting back into service.

It can be seen filter resistance by connecting a pressure gauge "U" tube or a differential pressure to the jacks in the box filter. A continuous indication of the state of the filter is thus obtained. Once operational, the operating resistance will be relatively stable, the value depends on the air volume and the powder characteristic is handled.

To install a pressure gauge connections, removing the hex head screw, washer and nut Blinding connection point, located on the side panel. If the head is mounted, to reach the connections should removing the head cover. Connect a suitable pressure gauge connection points, ensuring that these connection points are blind if not used.

It is advisable to inspect the condition of the chassis periodically.

Fans minimizing ignition are equipped with an inner liner inside the box. Since this can provide protection only for a limited period, if any disturbance that produces friction is given, the fan must be disconnected immediately and resolved the problem.

Do not work under the recommended air pressure. Excessive pressure will reduce the operating life of the components.

Evolution FP filters equipped with explosion panels should be inspected weekly to ensure that the protective panels are intact and unobstructed. During the winter we must take special care to prevent accumulations of snow or ice from forming on the panels explosion protection.

CARE PERIODICALLY

It must be updated daily protocol all pressure checks in order to record errors or malfunctions.

Weekly

- 1- Open the bottom valve of the moisture separator, letting all the water exits collection and close the valve.
- 2- Connecting a manometer to the connection points and measuring the pressure drop filter.



Monthly

Check operation of the valves.

It may be necessary to check the valve operation while the system is under pressure, care should be taken not to damage.

If necessary, replace a diaphragm using the following procedure (* Fig. 10):

- 1- Remove the nylon tube 6 mm diameter pulling the valve.
- 2- Unscrewing the hex screws holding the valve.
- 3- Now you can replace the diaphragm and spring (if fitted), first making sure the pin exhaust not blocked.
- 4- Ensure that the diaphragm is mounted in the exhaust plug and lock washer nylon it is within the valve neck.
- 5- Positioning spring (if fitted) within the cover housing.
- 6- Mount cover ensuring that the spring (if fitted) is placed on the diaphragm disc and the cover is inserted into the plug.
- 7- Fit and tighten hex screws.
- 8- Introducing again nylon tube, within the valve.



*** Fig.10 diaphragm -Valve**

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- 8- Introducing again nylon tube, within the valve.



*** Fig.10 diaphragm -Valve**



Biannual

The fan rotor has been dynamically balanced and the vibration level of assembly thereof should be in the category BV-3, ISO 14694. It is necessary to evaluate vibration semiannually, or after a significant issue or misuse, is advisable to keep track of the values given. In case of excessive investigated and corrected immediately vibrations.

The vibration monitoring is mandatory in sets of fans categories 2G, 3G and 2D.

Annual

1- To remove moisture, insulate the air supply; remove and clean the filter element.

2- Having isolated the supply of compressed air, removing the drain plug and the inlet air side and clean and inspect the accumulated flows as indicated by local law.

For a detailed internal inspection removing diaphragm valves.

3-Check all joints if they are damaged doors and ensure that properly adjusted to prevent the ingress of water. If it were the case, replace these items.

4-For cages / first out sleeves blowtubes of each item and check its status. In the case of damaged parts replaced by new ones. * If the abrasive powder was examined frequently.

Do not tighten the elements too. If the elements are mounted horizontally and tighten the lower flange first. (Maximum torque 27Nm recommended)

5- Check holes blowtubes are clear and clean.

6- Maintenance protection flameproof. It is important that these protections engines and glands are inspected annually for corrosion or loss of thickness. * If aggressive environments frequently review.

7-To predict the risk of explosion, check that the anti-ignition measures are operational.

8-For fans, remove the cover cap and inspect the fan through the inlet hoop. If applicable, remove the existing residual dust.

The fan must be inspected immediately after a period of fugitive dust. For example, the sleeves if they are damaged or there are problems together.

The fan should be inspected immediately if there was a suspicious noise or an increase in temperature or vibrations.

The fan should be inspected every twelve months or immediately after misuse.



If the inspection reveals any damage the fan should not be put into service before the subsequent repair and / or replacement.

REMOVING OR CHANGE THE FAN

Important disconnect the unit from the mains.

Follow the instructions below:

- 1-Disconnect the electrical cables terminal box.
- 2-Remove the cover cap loosening the fasteners and fastening strip (if any).
- 3-From the top, removing the screws holding the fan to the sheet.
- 4-Had mounted an acoustic diffuser, removing the access cover, loosening the screws.
- 5-Out the screws, nuts and washers motor pedestal (2 in the front of the compressed air tank and two in back).
- 6- Finally remove the fan with the right tools.

Remove the turbine / or engine

Take note of Table No. 1 and follow the instructions below:

- 1-See the distance from the back plate of the turbine to the fan housing or the distance from the inlet opening to the front plate of the turbine, these distances are not required to make the change.
- 2-From the front of fan (not the end of the motor) removing the clamping ring of the turbine to the fan, removing the screws and pulling the sheet out.
- 3-Remove the screw holding the hub to the motor shaft.
- 4-unscrew and remove the bolt at the end of the motor shaft holding the retaining ring hub.
- 5 -Remove the key-keyway.
- 6- Using slots bushing, pull the turbine from the motor shaft through the front of the fan.
- 7-Slide the spacer off the motor shaft.
- 8-Remove bolts, washers and nuts, securing the motor to the pedestal.
- 9-It is now possible to move the motor using suitable hoisting equipment, taking care not to damage the seal between the end plate of the motor and fan housing.



10-Place the new engine in the pedestal and put the washer makes sealing between the motor and the fan housing.

Place the motor 11 on the support and fix loosely replacing the 4 nuts, bolts and washers.

12-Place the key within the keyway of the motor shaft.

13-Thrust spacer motor shaft on the motor shaft

14- A linear keyway hub of the turbine with the key and slide the turbine on the motor shaft.

15-Replace the retaining ring hub and washer vibration proof. Seal the pin end motor shaft and replace the bolt, ensuring that the rotor is again on the spacer.

16-Seal stud bolts holding the bucket and tighten.

17-Place the rotor, according to the dimensions taken during removal, moving the motor support and making sure that the engine still agreeing with the fan housing.

18-If the measurement was taken of the back plate of the rotor to the fan housing, adjust to fit and tighten the fixation-detents motor through the bracket and the motor feet. Relocating input using a sealant layer between the sheet and the fan housing and return the bolt circle.

19 -If the measurement was taken from the entrance to the front plate of the turbine, then the corresponding input, using a layer of sealant between the plate and the fan housing and return the bolt circle. Adjust the rotor to fit and tighten the fixation-detents motor through the bracket and the motor feet.

*** Table Nº 2 Troubleshooting**

ERROR	POSSIBLE CAUSE	ACTION
1- Partial loss of aspiration (excessive pressure difference)	1.1 Malfunction of compressed air	a) If the compressor is stopped, rectify the fault in the compressor; check the interlocks; check the motor and power supply; check the transmission. b) If the compressor is fine, check the pulses on the manifold gauge. In the plug-in filters, check the line pressure at the filter inlet.
	1.2 No air pulses pass to the valves	c) Clean the filters and disassemble and clean the moisture separator. d) Check if there is excessive amount of water or oil in the compressed air, and possible accumulation in the distributor.
	1.3 Clogged filter	a) See fault location table in the controller manual, supplied with the filter
	1.4 The motor rotates at low speed	a) Check that the emptying device works a) Check the overload protections, fuses and starter interlocks.
	1.5 Incorrect rotation of the fan motor	b) Let the vacuum filter work to clean it, and then take the sleeves in turns; Clean the bags inside and out with a vacuum cleaner and renew any sleeves that are damaged. a) Check voltages, phases, motor connections. For star / delta applications, check that the motor is in a triangle. a) Check the electrical connections and change them if necessary.
2- Total loss of aspiration	2.1 Engine stopped fan	a) Check the overload protections, fuses and interlocks of the motor power supply.
	2.2 Clogged filter	b) Check motor connections and windings a) Check that the emptying device works. Check the overload protections and the fuses and the interlocks of the starters.
	2.3 Clogged Aspirations	b) Let the filter run in vacuum to be cleaned, and then remove the sleeves in turn, clean the sleeves inside and out with the vacuum cleaner and renew any sleeves that are damaged. a) Check carefully and clean.
3- There is dust in the clean air outlet	3.1 Filter elements incorrectly sealed	a) Tighten flanges until you get a perfect seal.
	3.2 Damaged bags, causing the dust to pass to the clean side of the filter	a) The sleeve damaged by the presence of dust in the clean air chamber can be identified. Remove the element and renew the sleeve.



FABRIPULSE MANUAL EVOLUTION



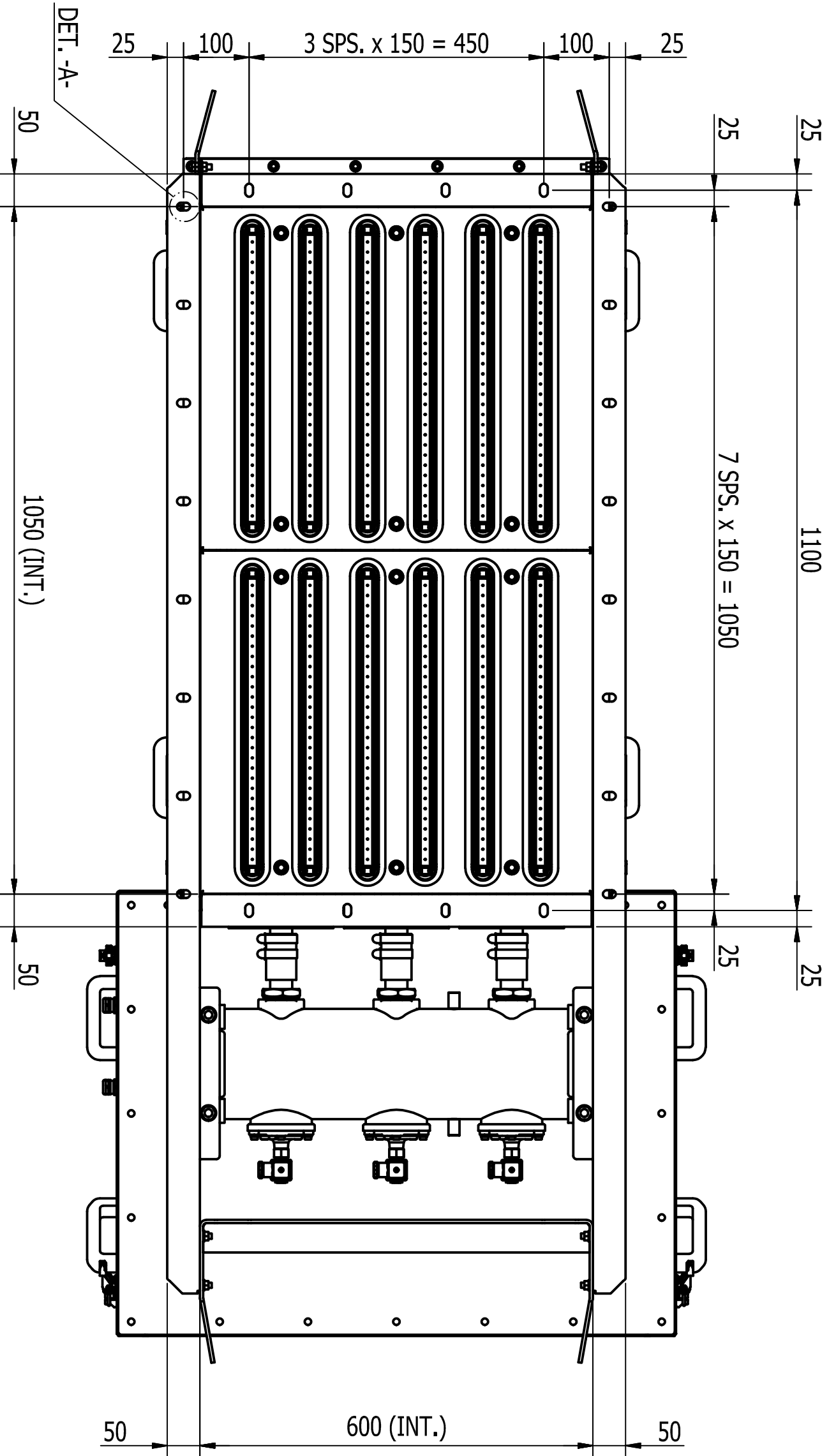
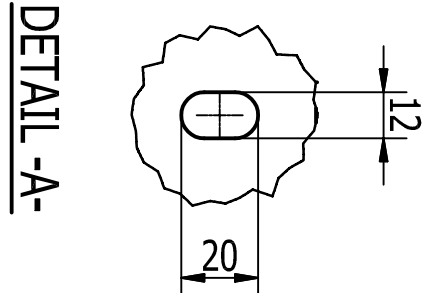
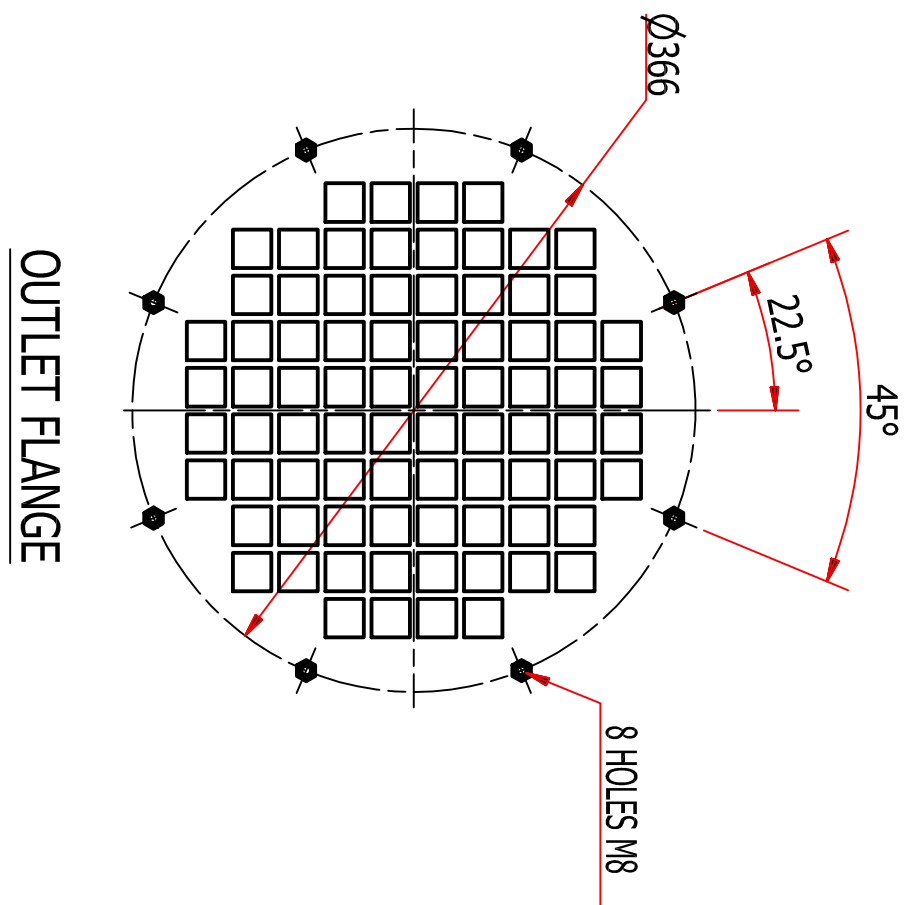
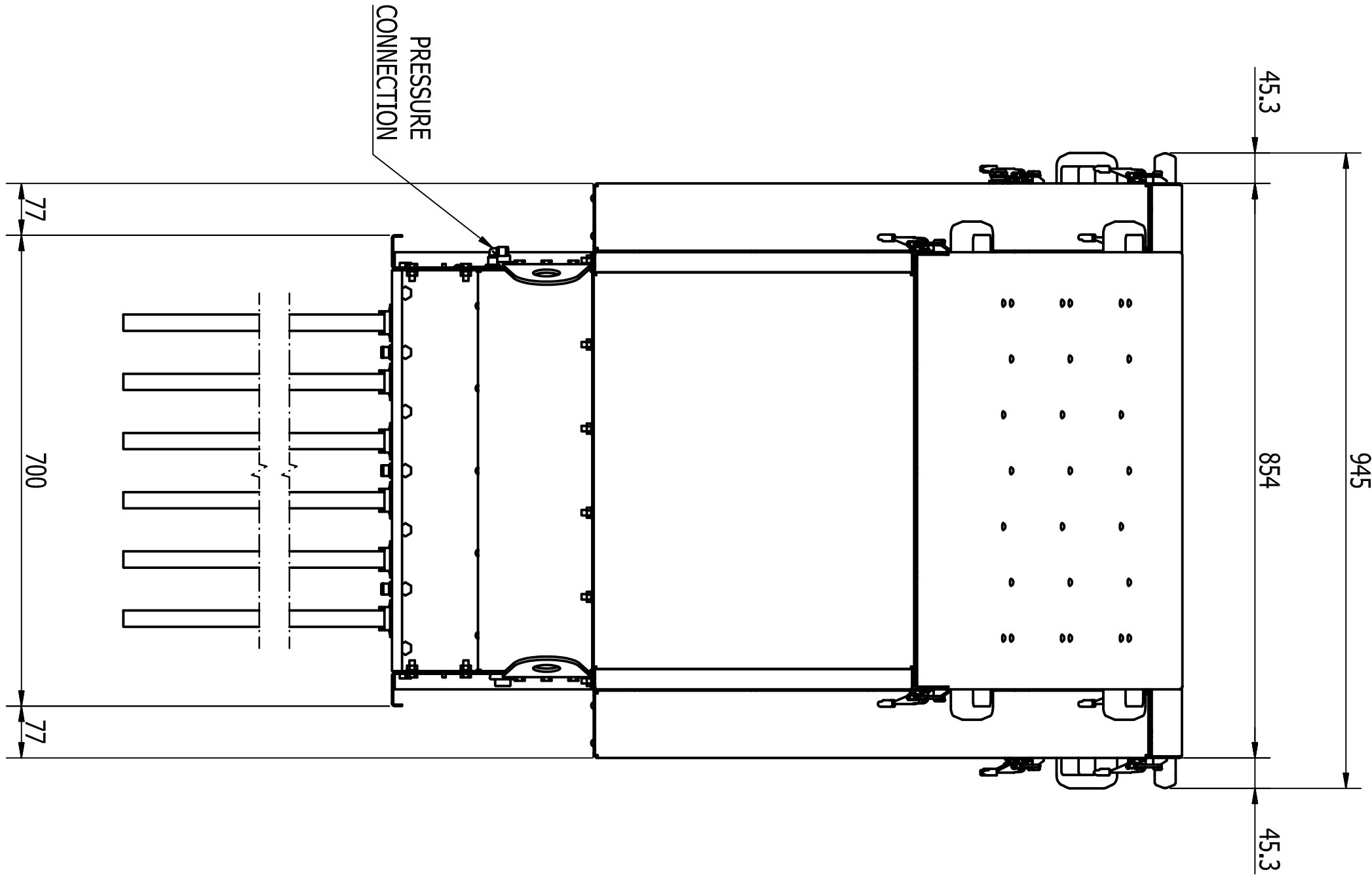
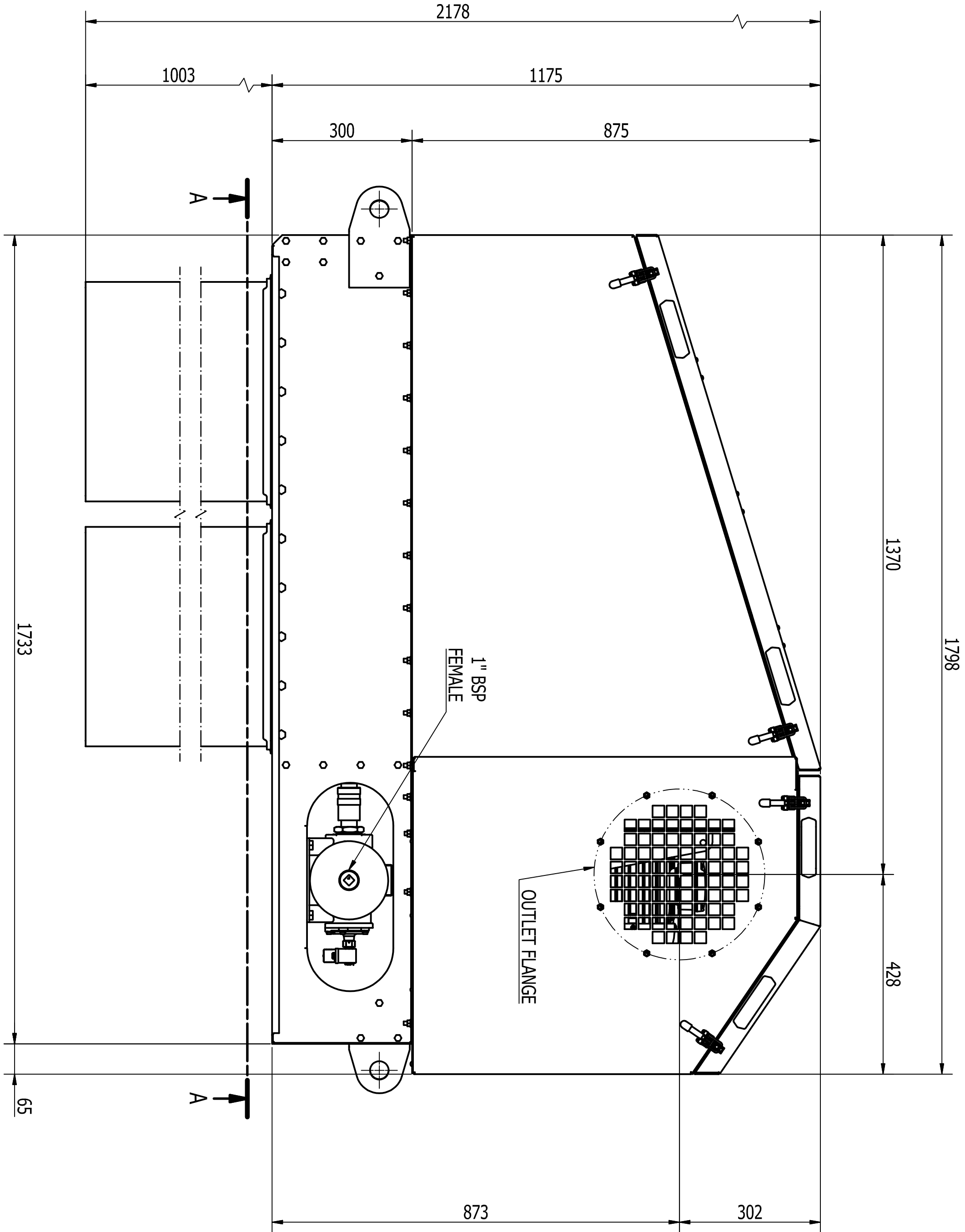
EVER AIR IS OUR BUSINESS®



ENVIRONMENTAL
SOLUTIONS



FABRIPULSE MANUAL EVOLUTION





SECTION A-A

REV.	DATE	FIRST ISSUE	STATUS	DRAWN	CHECKED	APPROVED
0	28/02/2018			Nereia		

ASSEMBLY NO. 001		COMPOSED BY:		TOTAL WEIGHT	
				296 kg	
REFERENCE PARENT DRAWINGS					
TITLE					
FABRI PULSE EVOLUTION - V SIZE 12 - BAGS 1000 mm. LENGTH - 1,5 kw GENERAL ARRANGEMENT DRAWING				PROD.:	
CUSTOMER: PHB					
 ® AAF S.A. C/ URARTEA 11 01010 VITORRA INTERNATIONAL SPAIN					
THIS DRAWING IS THE PROPERTY OF AAF AND IS LOANED SUBJECT TO THE CONDITION THAT IT SHALL NOT BE REPRODUCED, COPIED, LOANED OR SUBMITTED TO THIRD PARTIES WITHOUT WRITTEN CONSENT		OT		DRAWING NO.	
		217038		12B-1000-0001	
A1		SCALE: AS Note		PAGE 1 OF 1	
				REV. 0	

RECEPTION AND STORAGE INSTRUCTION

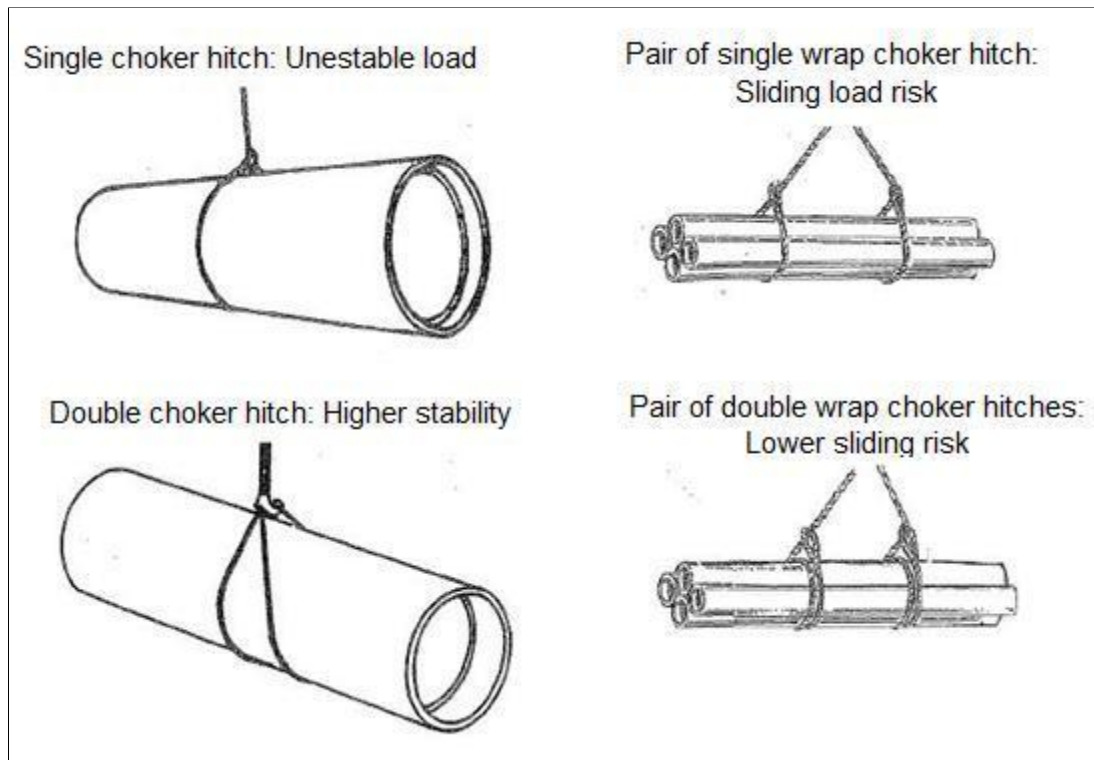
GOODS RECEPTION AND STORAGE

1 – UNLOADING AND TRANSPORT

When unloading and transporting the equipment and goods be aware of these considerations:

- Ensure that the specified lifting and tie down points are used. Items' weights are shown on the lists and drawings attached.
- Lifting equipment must be properly rated for the weight of items. Transport must be done by suitable media for the weight to be supported.
- Particular care must be taken during handling, avoiding knocking the goods, which could damage the painting or even cause malfunctions.
- When moving use the forklift truck, don't exceed the speed or maximum slope limits.
- Never leave the load hanging and do not work on or walk under the load while it is suspended.
- Once everything is unloaded check that all parts of the equipment are in good condition with no damages

Basic sling hitches:



2 - STORAGE

- Location

There are parts of the equipment sensitive to corrosion, humidity or vibrations. These items like electrical components, filters, isolation material, silencers, valves, motorized parts, bags, cages etc. must be kept in a closed and dry place, free of dust, moisture and vibrations until their assembly. Moreover, the temperature of the place where these elements are stored has to be warm and constant. While the installation is not completely assembled and working, these parts are sensitive to temperature changes.

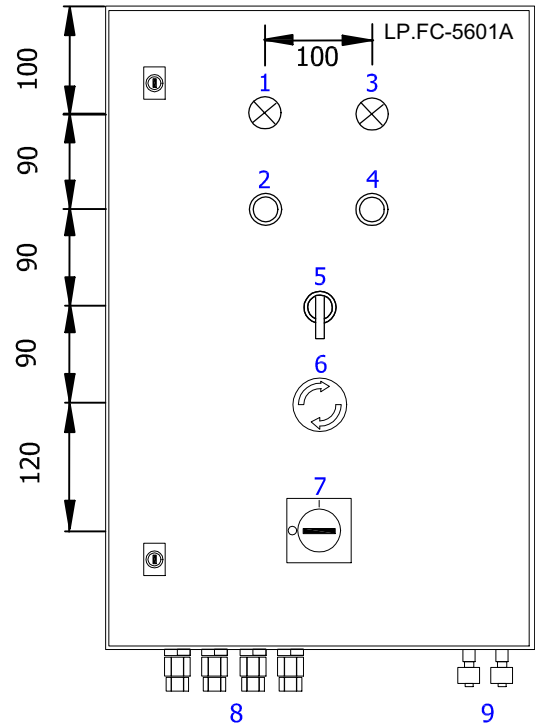
Ducts can be stored in the open air, but they must be covered with some kind of roof that prevents them from the direct hit of sun, snow or rain. If there is no other choice, cover them with tarpaulins; periodically the tarpaulins must be raised to avoid water condensations. Installation items must stand on pallets, chocks or platforms to isolate them from the ground and rain water.

- Long storage periods:

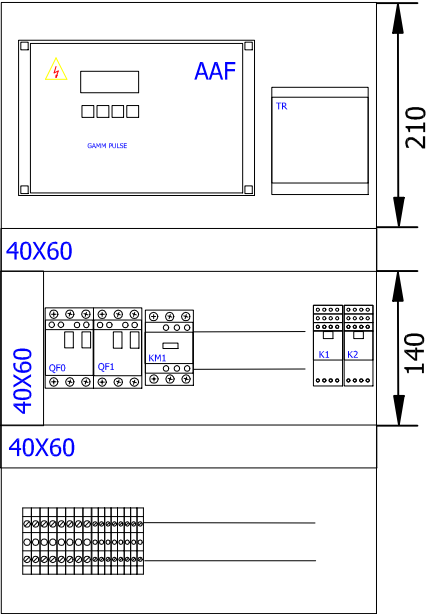
In case of storage periods longer than 3 months, following consideration must be taken into account:

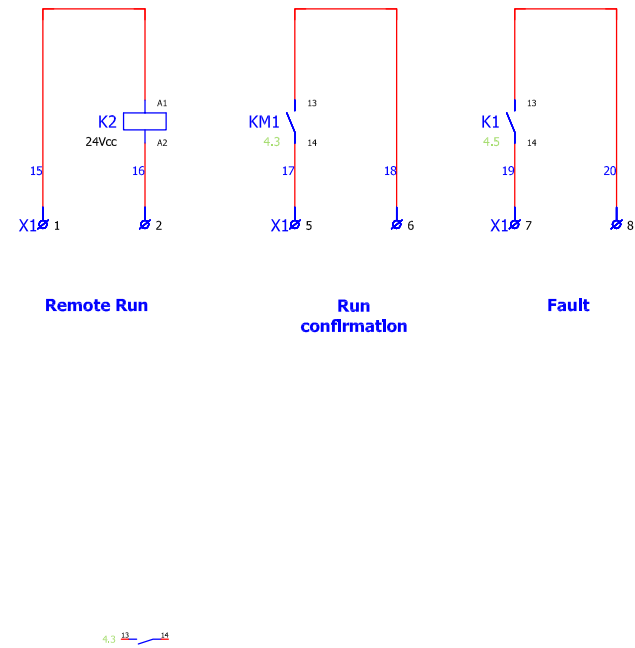
- It is important to have the valves and dampers cleaned and well covered to not damage their joints and keep them with perfect air tightness.
- Mechanical parts are painted or covered with an anticorrosive varnish (mechanized surfaces), they must be checked periodically and replaced in case it is needed, it is also important to have shafts protected with anticorrosive oil or a suitable varnish.
- To guarantee the corrosion protection of the bearings, filter parts that have them should be manually turned every month to distribute uniformly the grease and oil along the bearings. For more accurate information read the manual to know how to act to avoid any bearing problem.
- Grease and oil of the bearings must be replaced after one year storage.
- Electric and motorized parts must be kept in a clean and dry place to keep the electrical windings free of moisture.
- Silencer and isolation material must be protected from dirt and moisture.
- Moisture may cause white rust formations on galvanized steel. Although this does not affect to the internal part of the material, it's recommended to cover the galvanized steel plates.


400X600X250

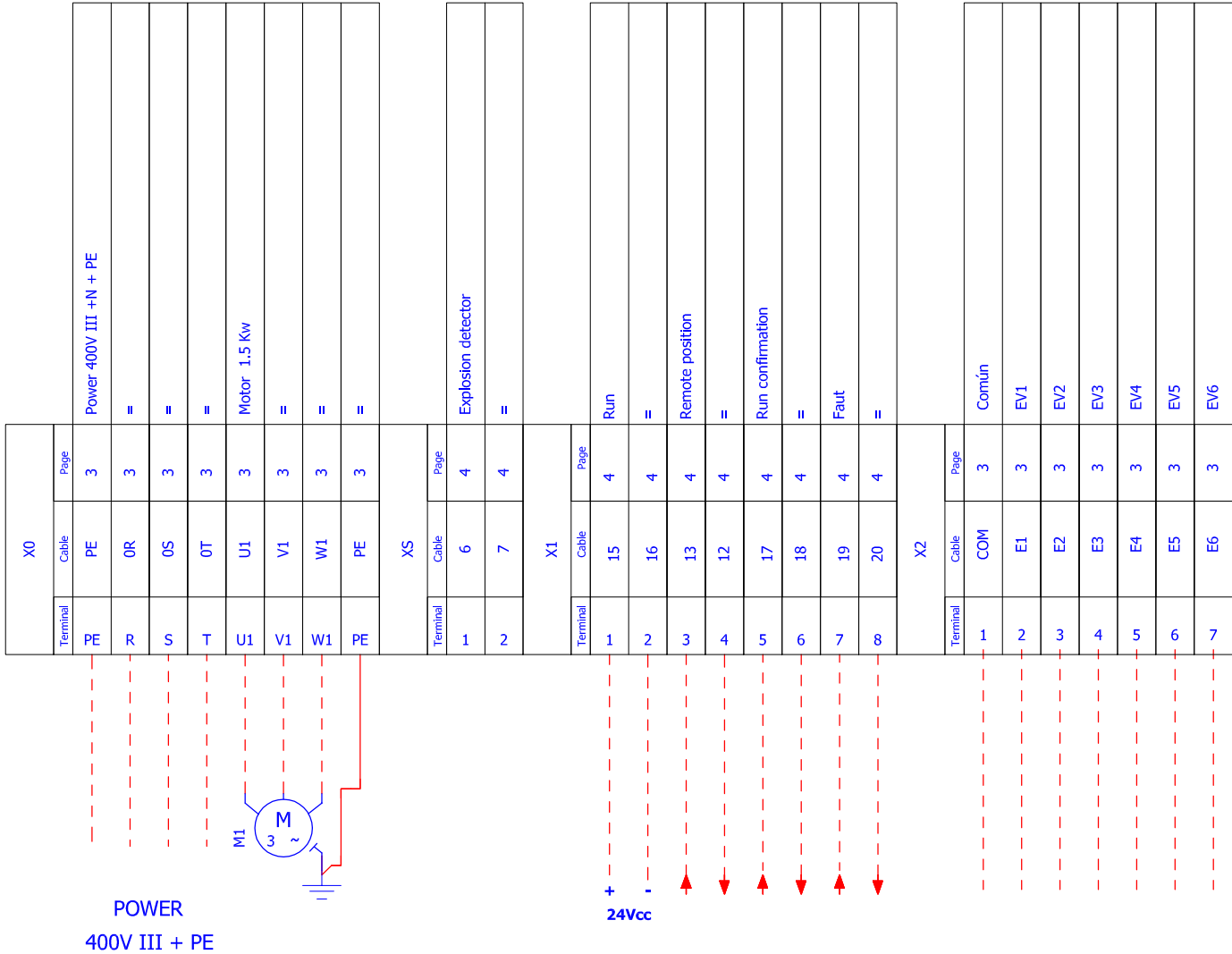


- 1 - RUN(H1)
- 2 - Start button(PM)
- 3 - Fault(H2)
- 4 - Stop button (PP)
- 5 - Selector "Local Remote" (S1)
- 6 - Emergency button (SB)
- 7 - Power Swich (Q1)
- 8 - Cable entry
- 9 - Pneumatic connection





	NAME	DATE	CUSTOMER		PRODUCT		Control circuit	T1801000 1.5KW
MADE BY	M. Ángel Sánchez	05/07/2017			STARTER FAN FILTER			Page / Total
REVIEWED	Ernest Roca	04/02/2019	CUSTOMER REF:		NUMBER:	MODEL:		4 / 6
EDITION								





REDClean® GAMMA PULSE 6

FULL OPTIONAL

ATEX II 3D



USER'S MANUAL

Certified ATEX Zone 22



II 3D Ex tc IIIB IP66 T 90°C Dc

**STR CONTROLLER DOESN'T APPLY FOR THIS
PROJECT**




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GENERAL DESCRIPTION

REDClean® GAMMA PULSE 6-ATEX range are digital sequential timers with built-in differential pressure switches **certified Atex zone 22**.

REDClean® GAMMA PULSE 6-ATEX enable control of 6 to 12, solenoid valves respectively.

In all versions there is a display with 3 digit    that can display the differential pressure unit of programmed (tens Pa, mmH₂O, mbar, kPa and mmHg) or the number of the cleaning valve; the three keys also enable programming of parameters on the instrument according to personal requirements including, pause time, operation time, post-cleaning time (or number of cycles) and washing start and end pressure, post-cleaning pressure, alarm pressure and operation mode (automatic/manual). All models are equipped with LEDs to display activation of outputs, pause phases and power on, the power supply presence, the post-cleaning status, and so on and so on.

The controllers with AC power supply are able to control both electronic valves with AC input and electronic valves with 24VDC. The output stage is made up of triac with on/off to zero-crossing to reduce noise. On demand it is available the version with 24VDC power supply only to control 24VDC electronic valves.

REDClean® GAMMA PULSE 6-ATEX is supplied in polycarbonate enclosures with transparent lids and **IP66** protection rating

REDClean® GAMMA PULSE 6-ATEX properly connected to the dust meter GDM-1, SDM-1, or simply to a dust detector probe RP02, is able to detect the broken bags, showing the line where the damage is occurred.

REDClean® GAMMA PULSE 6-ATEX instrument is provided of an **ACTIVE** analogical output proportional to the pressure read by the sensor. The pressure interval allowed is programmable through two parameters: "P32" e "P33";

ATEX CERTIFICATION

REDClean® GAMMA PULSE 6-ATEX is comply with the European Directive ATEX 2014/34/EU intended for the use in places where could be potential explosive atmospheres due to dusts or fibers.

The type of protection against explosion risk is indicated in the marking CE-ATEX of the device.

Naturally, the safety of the people is important, is necessary and law compulsory that all the people involved (device manufacturer, planners system, constructor, installer, final costumer, maintainer, etc) must be aware of the obligations and follow the imposed procedures. It is necessary to read this manual carefully and control that elements mentioned by the constructor would be suitable for the elements of the places where the device will function.

It is also necessary to read the remarks regarding installation device, its correct use while it's operative life, the correct procedures in case of trouble and/or maintenance. This remarks are exposed in the special chapter of this manual.

Each **REDClean® GAMMA PULSE 6-ATEX** is equipped by a declaration of conformity CE-ATEX, the manual and a plate in accordance to the directive 2014/34/EU having the marking ATEX.

The marking ATEX of this device is:



II 3D Ex tc IIIB IP66 T 90°C Dc

This marking indicates that while the operation runs, the device operates in places where an explosive atmosphere caused by dusts (D) could rarely occurs and in short time (operation in the zone 22). The device is equipped for give a normal level of protection in normal conditions (there is no consideration of troubles). The anti-explosion method of protection is identified by the word "tc" indicating the protection method by IP6X rating enclosure.

It is guaranteed that in case of troubles, the maximal external temperature in every place of the container would not increase 90° C.

This is an important matter for the planner, the installer and the maintainer for determine which is maximal thickness of the layer of combustible gas that is allowed to deposit on the device surface before a cleaning.

Besides, they must verify that the temperature of 90° C need to be less than the minimal temperature of the combustible dusts ignition present in the system and that could determine a potential explosive atmosphere.

GENERAL TECHNICAL FEATURES

Voltage:	24 Vac, 115 Vac, 230 Vac +/- 15%, 50-60Hz Optional is available a DC voltage between 22Vdc 34V
Fuses REDClean® GAMMA PULSE 6-ATEX:	F2 general fuse 2A 5x20 rapid F4 electrovalves power supply fuse 1.6A 5x20 delayed
Working temperature:	-28 / +50 °C
Connection:	Cables drawing through wall connector or through ATEX fairleads, with IP66 min protection degree <u>To be installed by the installer or by the end user</u>
Max Adsorbe Power:	100VA.
Input REDClean GAMMA PULSE 6	n° 3 inputs opto-isolated
Relay Output REDClean GAMMA PULSE 6	n° 1 relay 2A resistant load 115Vac
Electrovalves Output:	outputs triac with activation/deactivation <i>zero-crossing</i> 24, 115 o 230 Vac and 24Vdc with max. current 2A

TIMER TECHNICAL CHARACTERISTICS

Standard Break times:	Duration: 1- 999 sec.	Accuracy: 0,1 sec.
Standard Working Time:	Duration: 0.03 - 9.99 sec.	Accuracy: 0,01 sec.
Post Times - cleaning:	Duration: 1 - 999 sec.	Accuracy: 0,1 sec.

TECHNICAL FEATURES ACTIVE ANALOG OUTPUTCURRENT OUTPUT

Visualization range:	From 4.0 to +20.0 mA (standard) / From 0.0 to +20.0 mA (optional)
Precision:	+/- 0.1 mA, +/- 1 digit.
Maximum load allowed:	500 Ohm

VOLTAGE OUTPUT

Visualization range:	From 0.0 to +5.0 V (optional) / From 0.0 to +10.0 V (optional)
Precision:	+/- 0.1 V, +/- 1 digit.
Minimum load allowed:	1K Ohm

DIMENSION AND FEATURES BOX ECOMATIC-NET

REDClean® GAMMA PULSE 6-ATEX is enclosed inside a box with IP66 protection rating.



REDClean® GAMMA PULSE 6-ATEX

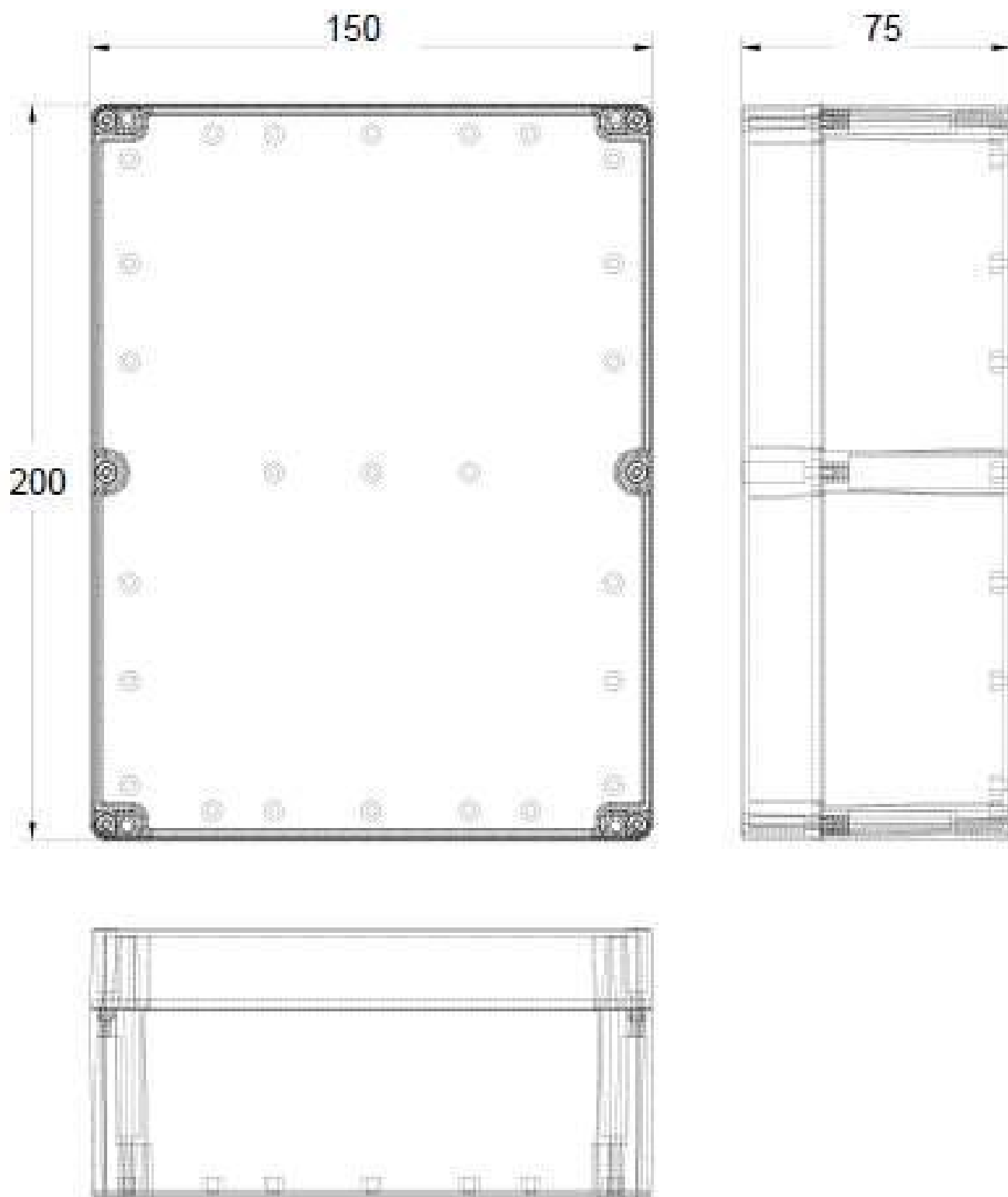
Size BxHxP (mm)

150x200X75

Number top screws

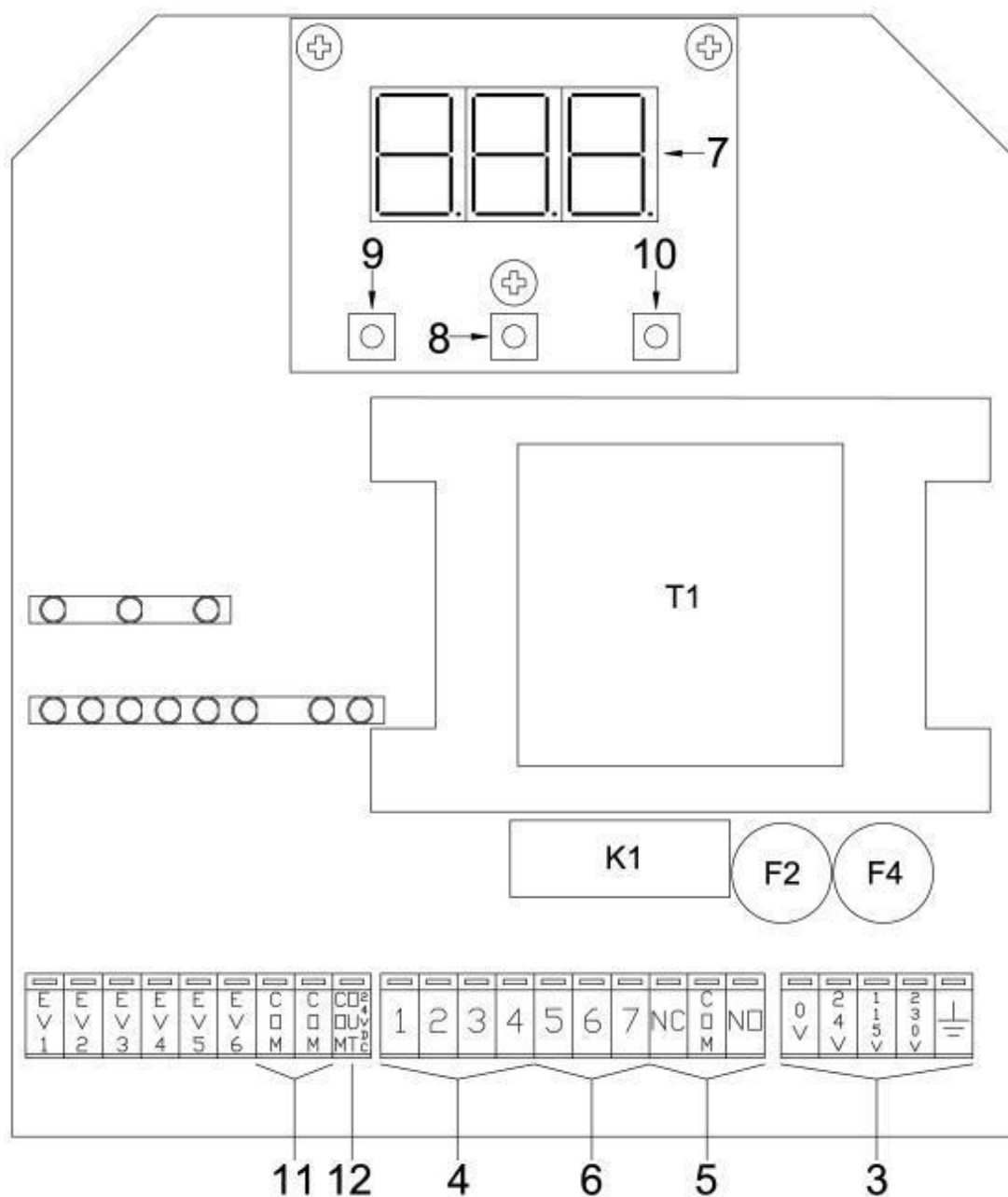
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BOX DIMENSION REDClean® GAMMA PULSE 6-ATEX



LAYOUT LEGEND BOARD REDClean® GAMMA PULSE 6-ATEX

REDClean® GAMMA PULSE 6-ATEX



1 - F2, Power supply protection fuse.

2 - F4, Electrovalves protection fuse.

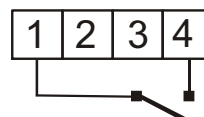
3 - Power supply terminals

4 - Input Contacts terminals

Terminals 1, 4: Input Contact n°1

Open contact: no-activated input

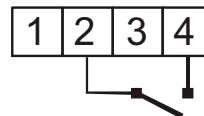
Closed contact: activated input



Terminals 2, 4: Input Contact n°2

Open contact: no-activated input

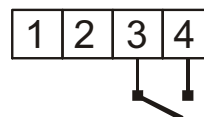
Closed contact: activated input



Terminals 3, 4: Input Contact n°3

Open contact: no-activated input

Closed contact: activated input



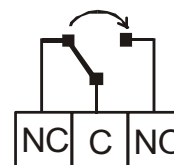
5 – Relay output terminals:

Terminals NC, COM, NO: Relay contact 1 (K1)

Terminals NC: Contact N.C.

Terminals COM: Common.

Terminals NO: Contact N.O.



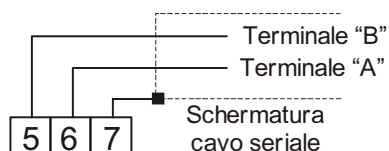
6 – Auxiliary outputs terminals (optional, used with expansion boards):

Terminals 5,6,7: in case of terminals for expansion board RS 485

Terminal 5: terminal B for serial board RS 485

Terminal 6: terminal A for serial board RS 485

Terminal 7: connection frame RS 485 (optional, but advised)

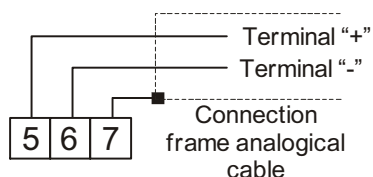


Terminals 5,6,7: for expansion board 4-20mA

Terminal 5: positive terminal for analogical output board

Terminal 6: negative terminal for analogical output board

Terminal 7: connection frame analogical cable (optional, but advised)



Note: the analogical output is an **ACTIVE** type.

7 - Display 7 Segments 3 DIGIT

8 - Enter Key (E)

9 - Decrease Key (↓)

10 - Increase Key (↑)

11 - Common terminal by free contact for electronic valves

12 - Common terminal with + 24Vdc for 24Vdc electronic valves

TECHNICAL FEATURES DIFFERENTIAL GAUGE

In this device, you can choose the preferred measurement's unit through a P51 programmable parameter. Below are listed the maximum fields of reading pressure:

Measurement unit:	dPa
Measurement range:	from -99 to +999
Measurement unit:	mmH ₂ O
Measurement range:	from -99 to +999
Measurement unit:	mbar
Measurement range:	from -9.9 to +99.9
Measurement unit:	Kpa
Measurement range:	From -0.99 to +9.99
Measurement unit:	mmHg
Measurement range:	from -7.5 to +75.0
Precision:	+/- 1% F.S. , +/- 1 digit. Reference unit mmH ₂ O
Broken pressure:	0,5 bar (5000 mmH ₂ O).

Conversion Chart per Measurement units of pressure.

Equal to →	mmH ₂ O	pascal	mbar	kpascal	mmHg
mmH₂O	1	9.8064	0.098064	0.0098064	0.07355592
pascal	0.101974	1	0.01	0.001	0.007500617
mbar	10.1974	100	1	0.1	0.7500617
kpascal	101.974	1000	10	1	7.500617
mmHg	13.5951	133.3224	1.333224	0.1333224	1

The temperature range of inlet gas to the pressure sensor is -40 ° C to +125 ° C.
For values above or below it is necessary to provide cooling or heating gas.

REDClean® GAMMA PULSE 6-ATEX POWER SUPPLY

All the REDClean® GAMMA PULSE models can have as power supply 3 different tensions 24 Vac, 115 Vac e 230 Vac. Optionally it is available the power supply 24 VDC too.



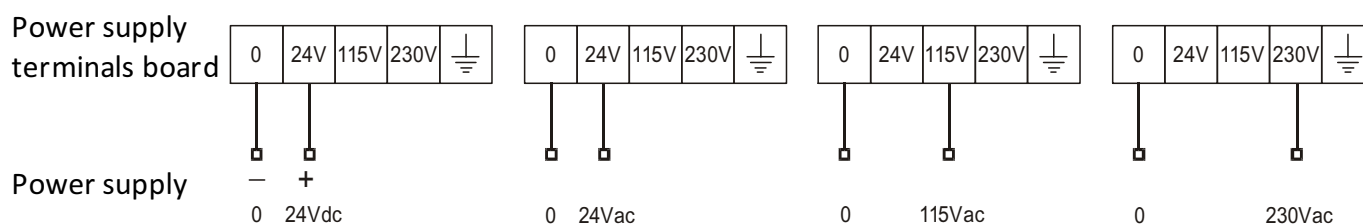
CAUTION

Ensure that the power supply is disconnected before making or modifying cable connections.



The power supply has to be connected in this way (according to the chosen power supply).

REDClean® GAMMA PULSE 6-ATEX



Note

- The power supply has to be *sectioned upstream* of the equipment;
- Both for the *economizers* and the *electrovalves* has to be done the earth connection;
- You have to use shielded cable, far from noise sources, like Inverter power cables and engines in general.

ELECTROVALVES CONNECTION SCHEME

The solenoid valves are connected between output terminals 1 -2 ... - N and terminal C (common) which is connected to a suitable power supply via an external connection.

The controllers are equipped with more than one common terminal: obviously they are all interconnected and therefore *do not require* additional external connections.

According to the power supply given to the unit it is possible to use some types of electro valves. Here following the options:

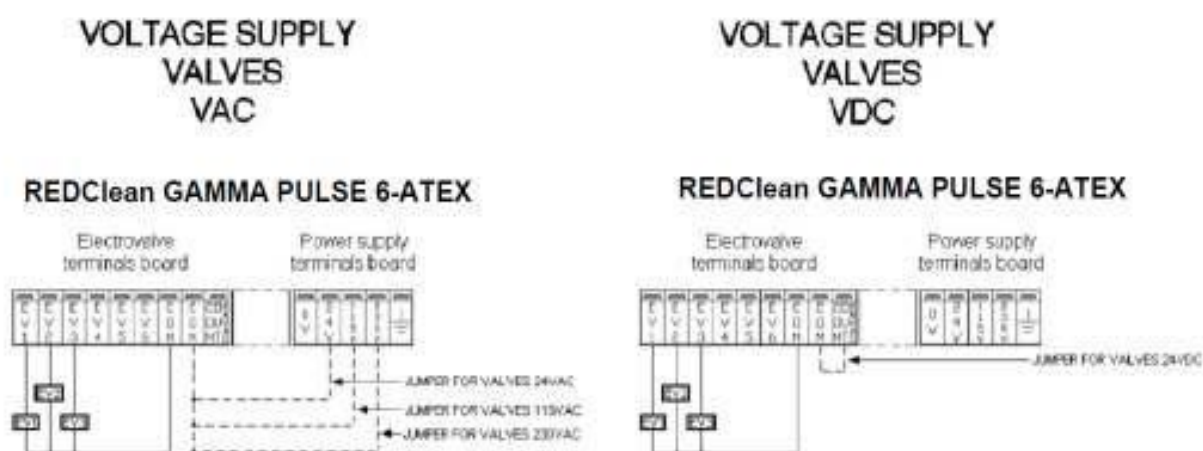
- **Power supply 24 Vac:** it can be used **24 Vac** or **24 Vdc** electronic valves
- **Power supply 115 Vac:** it can be used **24 Vac**, **115 Vac** or **24Vdc** electronic valves
- **Power supply 230 Vac:** it can be used **24 Vac**, **115 Vac**, **230 Vac** or **24 Vdc** electronic valves
- **Power supply 24 Vdc:** it can be used electronic valves supplied *only* with **24 Vdc**.

In case of controller's power supply with **DC** it is necessary to indicate it at the purchase order phase in order to adapt the circuit at this kind of output

For the load's connection has to be done an **external bridge** connected according to the voltage of used electronic valves (to do the connection between the **terminal C** (common), and the **power supply terminal**, corresponding to the operating power of the electro valves). *If you forget to do this connection*, the electro valves will not be driven: the instrument will quickly scan all the outputs (the LEDs on the outputs will be switched on for a short time, and the pause LEDs will quickly blink) *without activating any electrovalve*.

N.B.: In the case of electro valves with **24DC**, the connection bridge for the power supply of the load has to be done with ComOut 24VDC (output common with 24Vdc) and the terminal C (Common). This voltage is automatically created by the card and therefore it must not be supplied from outside.

The following pictures show the different kinds of connection that have to be made according to the working voltage of the electrovalves.



DISPLAY VISUALIZATION

Through the display you can see different information of the system, regarding pressure, output number or cleaning command, cycle status and value of analogical output. There are 2 or 3 visualization menu (3 if the analogical output is enabled) selected through the button **Inc** (↑) while the button **Dec** (↓) indicates which menu is visualizing. The three menu are divided as follows:

The 1° menu identifies the pressure value read by the instrument;

- Visualization: **"Pr."**

- followed by a number to identify the pressure measure unit.:

"0" tens Pascal

"1" mmH₂O

"2" mbar

"3" KPa

"4" mmHg

The 2° menu identifies the system status, the output number or cleaning command, and the command for cell opening or closing;

- if the system is in **STOP** or almost in stop, you will see: **"S.xx"**
- if the system is in **CLEANING**, you will see: **"U.xx"** (if it corresponds to the output)
"C.xx" (if it corresponds to the command)
- if the system is in **POSTCLEANING**, you will see: **"P.xx"**

In all these status of the system, on the part **xx** you can view the following wordings:

- **number n°** (if it is an output or command for cleaning valve)
- **OP** (if it is a valve for cell opening)
- **CL** (if it is a valve for cell closing)
- **SC** (during the cycle start-up)
- **Enb.** (if the system is in stand-by phase)

The 3° menu (if enabled) identifies the value of the analogical output

- visualization: **"Cor."** (if the output is in current)
- visualization: **"Vol."** (if the output is in tension)

ALARMS VISUALIZATION

In REDClean®GAMMA PULSE 6-ATEX there are different types of alarms, you find the indications here under:

- 1) Triboelectrical Alarm: in case of triboelectrical alarm, display will show the flashing alarm code **"E n"** (if P38=0, where "n" is the number of output where the alarm has been detected) or the flashing alarm code **"F n"** (if P38≠0, where "n" is the cleaning command where the alarm has been detected).
- 2) Load Alarm: in case of load alarm, display will show the flashing alarm code **"H n"** (if P38=0, where "n" is the number of output where the alarm has been detected) or the flashing alarm code **"L n"** (if P38≠0, where "n" is the cleaning command where the alarm has been detected).
- 3) Tank Pressure switch Alarm: in case of alarm of tank pressure switch, display will show the flashing alarm code **"A 1"**.

N.B.1: alarm 1 (if P 28=0) has an automatic reset in case of the condition come back to the established limits.

N.B.2: With the buttons **Inc** (↑) and **Dec** (↓), pressing at the same time for 1 second in the pressure visualization, it is possible to reset all the alarms.

ERRORS VISUALIZATION

PRESSURE ERROR

When the instrument visualizes the pressure value, two indications of *out of range* are foreseen: if the input differential pressure is higher than the positive full scale set, the display will visualize the indication 'EEE'.

In the case the pressure would be lower than the negative full scale set, the display will visualize the indication '-EE'.

E2PROM ERROR

In the case we will have problems with the configuration of the E2prom, the instrument will visualize on the display the indication "---" to show the loss of programming and setting data.

Pressing the key **Dec** (↓) the normal function of the instrument will be reloaded as well as the default data, although it will be necessary to do once more the setting and programming phase by qualified people in the company.

PRELIMINARY PROCEDURES

At the ignition, the unit will be ready for the visualization of the differential pressure value read by the internal sensor.

With the button **Inc** (↑) or **Dec** (↓) you can look through the visualizations of the pressure, the number of valve in cleaning and of the value in analogical output (if enabled).

To enter in the configuration or programming menu is enough to press the key **E**: it will appear on the display the blinking indication **H 00**, which shows the password insertion to have access to the menu.

The configuration menu has a unique structure, but the programming menu has two structures:

-1 quick access menu without password (all values allowed as a password) for programming parameters from P1 to P6;

-2 access menu with password (password value 7), for programming all the parameters.

The configuration menu has as a password the value **29**

N.B. Please pay attention to this menu because it is where the proper function of the board comes from.

Once the password has been inserted, pressing continuously the key **Inc** or **Dec**, it will be possible to look at one by one all the parameters.

To exit from the configuration menu, press keys **Inc** and **Dec** at the same time.

The exit from the programming menu is automatic after 10 seconds when you do not press any key during the parameters scrolling.

PROGRAMMATION PARAMETERS

The following table shows all the available *parameters*, explaining the *function* and the admissible range of *values*.

Param. Eco	Function	Possible values	Further informations
L1	Hourcounter	0 - 65534 hours	Hourcounter functioning
L2	Cyclecounter	0 - 65534 cycles	Cyclecounter functioning
P1	Functioning modality	0 – 24	Ecomatic-net functioning
P2	Pause - cycles/hour Automatic or Pause - cycles/hour max Autopause.	Pause: 1-999 seconds or minutes. Cycles: 1-30 cycles/hour	Automatic and Autopause functioning
P3	Pause - cycles/hour Manual/Remote/ Sincro or pause - cycles/hour minimum Autopause		
P4	Working time.	0.03 – 9.99 seconds 0.3 – 99.9 seconds 3 – 999 seconds 30 – 9990 seconds	Work time table
P5	Start cleaning pressure or maximum pressure Autopause	From 0 to F.S. positive	Automatic and Autopause functioning
P6	End cleaning pressure or minimum pressure Autopause.	From 0 to F.S. positive	
P7	Postcleaning function.	0=Disabled 1=Internal 2=External	Postcleaning functioning
P8	Postcleaning time or cycles selection.	0= Time 1= Cycles	
P9	Value of time or cycles.	1 – 999 seconds 1 – 999 cycles	
P10	Internal postcleaning pressure threshold	Da 0 al F.S. positivo	Postcleaning functioning Work time table
P11	Postcleaning pause time	1 – 999 secondi o minuti	
P12	Postcleaning working time	0.03 – 9.99 seconds 0.3 – 99.9 seconds 3 – 999 seconds 30 – 9990 seconds	
P13	Relay 1 pressure threshold	From 0 to F.S. positive	Relay Output functioning
P14	Relay 1 functioning selection.	0 – 15	Relay Output functioning

Param. Eco	Function	Possible values	Further informations
P15	Function of relay 1.	0=Normal 1=Hysteresis pressure 2=Temporized	Relay Output functioning
P16	Value of relay 1 function.	From 1 to F.S. positive or from 1 – 999 seconds	
P17	Relay 2 pressure threshold	From 0 to F.S. positive	Relay Output functioning Note: Not present in REDClean® GAMMA FUSION 6
P18	Relay 2 functioning selection.	0 – 15	
P19	Function of relay 2.	0=Normal 1=Hysteresis pressure 2=Temporized	
P20	Value of relay 2 function.	From 1 to F.S. positive or from 1 – 999 seconds	
P21	Enable precoating.	0=Disabled 1=Enabled	Precoating Functioning
P22	Precoating threshold	From 0 to F.S. positive	
P23	Hourcounter functionality	0=always enabled 1=pressure threshold 2=cleaning phase	Hourcounter Functioning
P24	Hourcounter pressure threshold	From 0 to F.S. positive	
P25	Number of repetitive shots for each output.	1 – 10 shot	Repetitive shots functioning
P26	Pause time among consecutive shots	1 – 999 seconds or minutes	
P27	Time of tribo alarm detection	0= Disabled 1 – 999 seconds	Tribo alarm functioning
P28	Max number of valve to jump with tribo alarm	0=No jump 1 – 10 jumps	
P29	ID device for RS485	1 – 254	RS485 serial communication
P30	Not present in REDClean® GAMMA PULSE 6	0 = 4200 1 = 9600 2 = 19200	
P31	Not present in REDClean® GAMMA PULSE 6	0 = None 1 = Even 2 = Odd	
P32	Value of pressure responding to the minimum value of the analog output	From 0 to F.S. positive	Analog output functioning
P33	Value of pressure responding to the maximum value of the analog output	From 0 to F.S. positive	

Param. Eco	Function	Possible values	Further informations
P34	Pause time from external contact	1 – 999 seconds	External pause functioning
P35	Alarm time of tank's manostat	0= Disabled 1 – 999 seconds	Tank's manostat functioning
P36	Tank's manostat threshold with serial	1 – 999 Kpa	
P37	Number of valves or command in cleaning mode	1 – Command n or 1 – Command n-1	Functioning of number or command cleaning EV
P38	Ev command modality	0 – 6	Ev command modality
P39	Excitation valve time for cell opening/closing	0.50 – 9.99 seconds	ON-LINE/OFF-LINE Functioning
P40	Time before cleaning cell	1 – 999 seconds	
P41	Time before opening cell	1 – 999 seconds	
P42	Time before start cycle	0 – 999 seconds	
P43	Relay 3 pressure threshold	From 0 to F.S. positive	Relay Output functioning Note: Not present in REDClean® GAMMA PULSE 6
P44	Relay 3 functioning selection.	0 – 15	
P45	Function of relay 3.	0=Normal 1=Hysteresis pressure 2=Temporized	
P46	Value of relay 3 function.	From 1 to F.S. positive or from 1 – 999 seconds	
P47	Relay 4 pressure threshold	From 0 to F.S. positive	Relay Output functioning Note: Not present in REDClean® GAMMA PULSE 6
P48	Relay 4 functioning selection.	0 – 15	
P49	Function of relay 4.	0=Normal 1=Hysteresis pressure 2=Temporized	
P50	Value of relay 4 function.	From 1 to F.S. positive or from 1 – 999 seconds	
P51	Unit pressure measure	0 = tens Pa 1 = mmH ₂ O 2 = mbar 3 =Kpa 4 = mmHg	Unit pressure measure
H0	Pressure zero	To be done by specialized staff <i>only if</i> the pressure with open air vents is appreciably different from zero.	

CONFIGURATION PARAMETERS

The following table shows all the available *parameters*, explaining the *function* and the admissible range of *values*.

Parameter	Function	Possible values	Further informations
E0	Pause time unit	0= Seconds 1= Minutes	-
E1+E2	Working time scale	See table	Working time table
E3	Activation of automatic load recognition	0= Disabled 1= Enabled	-
E4	Start of the cleaning cycle modality	0= Pause Phase 1= Working Phase	-
E5	Activation of load control functioning	0= Disabled 1= Enabled	Load control functioning
E6	Activation of cleaning cycle end type	0= EV Current 1= Fine Cell	Cycle end functioning
E7	Activation of the optional analog output	0= Disabled 1= Enabled	-
E8	Activation of the optional serial output	0= Disabled 1= Enabled	-
E9	Activation of jump output from charge alarm	0= Disabled 1= Enabled	Load control functioning
E10	Visualization of the analog output	0= Current 1= Voltage	-
E11	Activation compensation in pressure temperature	0= Disabled 1= Enabled	-
E12	Configuration input n°1	From 0 to 8	Inputs functioning Note: E15 not used in REDClean® GAMMA PULSE 6
E13	Configuration input n°2	From 0 to 8	
E14	Configuration input n°3	From 0 to 8	
E15	Configuration input n°4	From 0 to 8	
E16	Activation memorize last valve	0= Disabled 1= Enabled	
E17	Choice pause time or cycles/hour	0= Pause 1= Cycles/hour	-
E18	Activation mode Stop Autopause	0= Disabled 1= Enabled	Autopause Functioning
E19	Activation mode external sensor	0= Disabled 1= Enabled	-

E0: configuration regarding pause values of the unit (P2, P3, P11 e P26).

E1+E2: configuration regarding working values of the unit (P4 e P12)

Working time chart:

E1	E2	Working time scale
0	0	scale 0.03 at 9.99 seconds
1	0	scale 0.3 at 99.9 seconds
0	1	scale 3 at 999 seconds
1	1	scale 3 at 999 dozen of seconds

E3: configuration of outputs load automatic recognition.

To optimize pause and working time in case of some outputs are or used, it is possible to activate the automatic load recognition.

E4: configuration of starting mode of the cleaning cycle.

When you start the cleaning cycle after the start up of the instrument, the cycle itself can start to work or counting first the pause time set, or starting immediately with the electrovalve activation.

E5: configuration for the function of the load control.

Parameter used for particular applications with all the output connected.

This configuration is used to find out potential load faults not detected on the outputs. When the unit activates the output checks out the presence of the electrovalve and in the case it has been detected it arises a visual relay alarm (if enabled). Furthermore it is possible to decide if skipping the alarm outputs in the following cycles (look at **E9**).

E6: configuration of the activation for cleaning cycle end type.

Parameter used for all type of applications.

If the instrument is used to control the cells filters cleaning, it is necessary to choose the desired end cycle modality.

E7: configuration of the analogical output of the unit.

In the case the analogical output is installed in the unit on costumer's demand it is necessary to enable the function through this parameter.

E8: configuration of the activation of the serial output of the unit.

In the case the serial output RS485 is installed in the unit on costumer's demand, it is necessary to enable the function through this parameter.

E9: configuration of output skip with load alarm.

In the case you want to skip the outputs where it has been arisen a load alarm till a maximum of 10 outputs for all the models it is necessary to set this parameter.

E10: configuration of analogical output visualization.

According to the kind of analogical output you need to set the correspondent visualization mode for a proper values shown in the display.

E11: configuration of pressure's temperature compensation.

It's possible through this parameter enable or disable the temperature compensation of the pressure measured by internal sensor. Useful parameter in the case of a malfunction of the internal temperature sensor.

E12 – E15: input configuration (look at the paragraph “**INPUT FUNCTION**”).

E16: configuration of activation of memorize of last started up valve. Through these parameters it is possible, when you starts again the controller, to start up again the cleaning cycle from the next valves up to the last memorized one in the previous cycle.

E17: configuration of the pause time or cycles / hour.

With this parameter you can choose to determine the waiting time according to a time (scale seconds or minutes) or cycles / hour. This selection is in effect only during the normal working hours, not during the post-cleaning or external pause.

E18: configuration of the activation of the Stop mode operation in AutoPause.

With this parameter you can choose whether AutoPause mode the duty cycle must be stopped once the pressure dropped below the minimum pressure or AutoPause must continue with the maximum times.

E19: configuration of the activation of the mode through External Sensor.

Through this parameter it is possible to activate the functions for External Sensor pressure.

This configuration should be enabled only when the card provides this function, to be requested at time of order. This function involves the use of an external sensor instead of the internal sensor that will not be mounted.

REDClean® GAMMA PULSE 6 FUNCTION

REDClean® GAMMA PULSE 6 instruments have different functioning possibility to clean the filters, to be set in parameter P1 and P38, which differ from the filter configuration (Standard, ON-Line Valv. Monostable, OFF-Line Valv. Monostable, ON-Line Valv. Bistable, OFF-Line Valv. Bistable), the filter cleaning mode (Manual, Automatic, Autopause, Remote and Synchronized) and the type of electrovalves control (Single, Multiple, Skip).

All these combinations offer you a big possibility to chose and to find and use the better way to clean your filter. With these functioning modalities you can have a real save in air consumption and on the life of bags and filters, because you operate only when necessary.

Let's see in details these single functioning modalities:

FILTER CONFIGURATION

Standard: all the outputs of the economiser are used for valves control of filter cleaning.

ON-Line/OFF-Line Monostables Valves: the first output of the economiser is used to control the valves for the single cell opening/closing, while the other are for the valves control of filter cleaning. With the activation of the first output, the valve won't be closed, while with the output not activated, the valve remains open.

Example of connection for OFF-Line Filter with Monostable valve:

The first output of the instrument (drawing of a REDClean® GAMMA PULSE) is used to control the monostable valve.

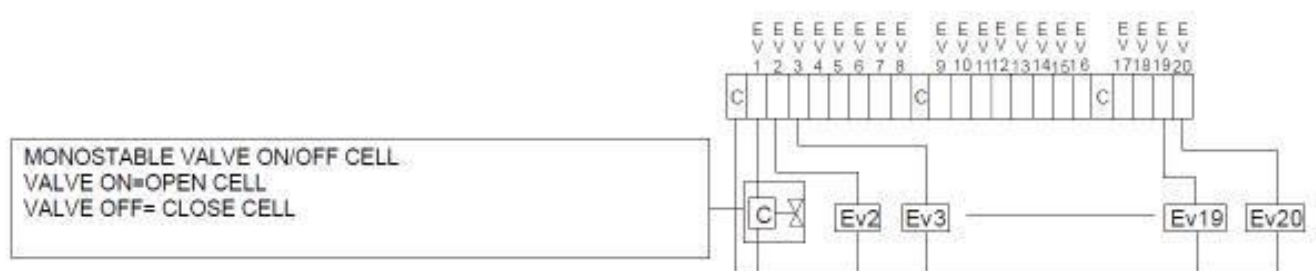
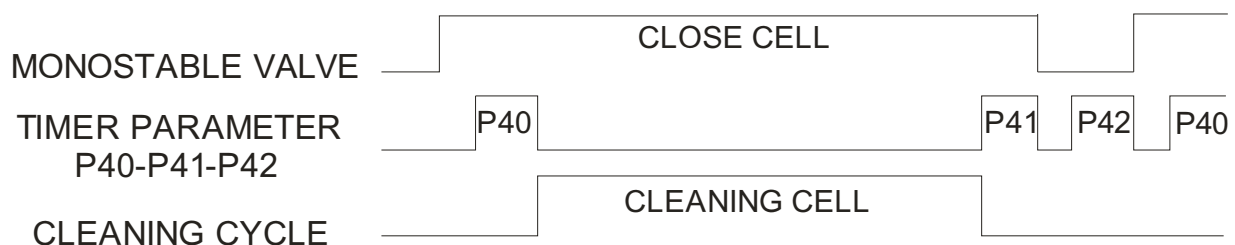


Chart which shows the control times for electrovalves of cell opening/closing.



As you can see from the chart, at each status change of the valve corresponds a little delay before the program timer starts to count. This is the excitement time of the valve (P39).

This time is useful especially with bistable valves.

ON-Line/OFF-Line Bistable Valve: the first and the last output of Economiser are used to control the valves of cell opening/closing, while the other outputs are used for control of filter cleaning valves. The first output is used for cell closing; the last one for the cell opening.

Example of connection for OFF-Line Filter with Bistable valve:

The first and the last output of the instrument (drawing of an REDClean® GAMMA PULSE) are used to control the bistable valve.

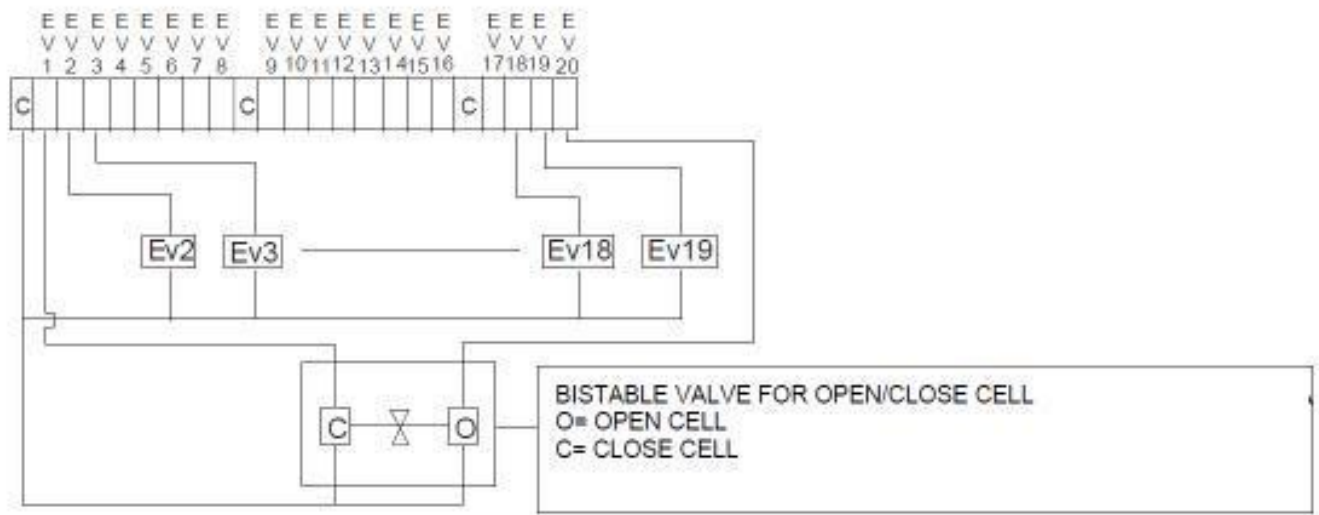
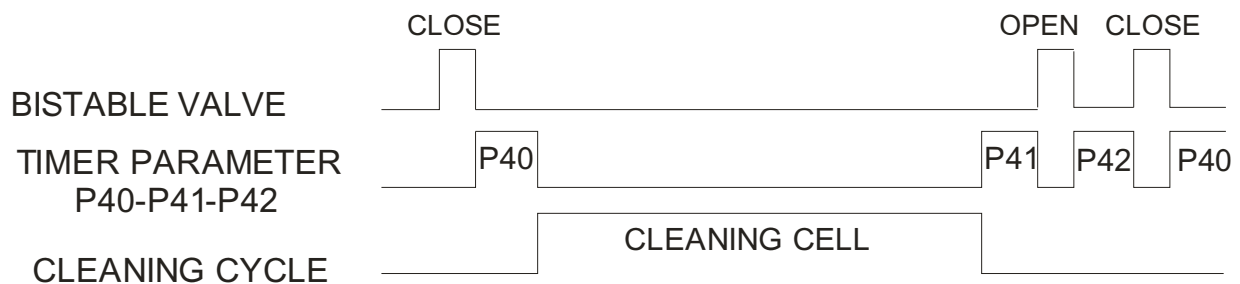


Chart which shows the control times for electrovalves of cell opening/closing.



CLEANING MODE

Manual: the REDClean GAMMA PULSE drives one by one the output correspondent to the connected valves, regardless any kind of programming. The driving of the outputs starts from the first electrovalve, going ahead with the second, the third and so on and so on, after which starts again from the first. The working time and pause time will alternate each other between the activation of one output and the other.

Automatic: the electrovalves will be activated if the visualized pressure is higher to the one set in the parameter **P 5** (starting cleaning pressure); the activation itself will be interrupted as soon as the pressure will go down the value set in the parameter **P 6** (end cleaning pressure).

When the pressure goes down the end cleaning pressure, the normal cycle of function will be stopped just if REDClean® GAMMA PULSE is on pause phase. On the other way round (if in working phase), it will be first ended the working phase running at that time.

When the pressure goes up the pressure of starting cleaning or a post-cleaning cycle starts, the REDClean® GAMMA PULSE does the job at the end of the pause, starting from the subsequent electrovalve of the last activated.

Autopause: the electrovalves will be activated if the pressure visualized is higher than the one set in the parameter **P 6** (minimum Auto pause pressure); the activation itself will be interrupted as soon as the pressure goes down this value. In case Stop Autopause configuration is disabled (E18=0) the scan will go ahead even below the threshold of **P 6**.

The pause time between one shot and the other is changed automatically according to the pressure value measured. Higher the pressure is and lower the pause time between one shot and the other will be.

The pause time starts from the minimum value set in the parameter **P 3** (pause/minimum cycles Autopause) connected to the pressure value set in the parameter **P 5** (maximum Auto pause pressure), till getting the values set in the parameter **P 2** (pause/maximum cycles Autopause) connected to the pressure values set in the parameter **P 6** (minimum Auto pause pressure).

N.B: pay attention please to the programming phase of these parameters, to avoid to change the values. This could lead to a faulty function of the unit with the cleaning performing times. The choice between pause or cycles / hour is done through the configuration parameter **E 17**.

Let's now look at one example:

Programming of the function modality

Parameter	Programming
P 1	2 (Autopause)

Programming of times configuration:

Parameters	Configuration
E 17	0 (Pause)

Let's suppose we set these values

Parameters	Programming
P 2	40 seconds
P 3	10 seconds
P 5	100 mmH ₂ O
P 6	60 mmH ₂ O

The cleaning logic will be the following.

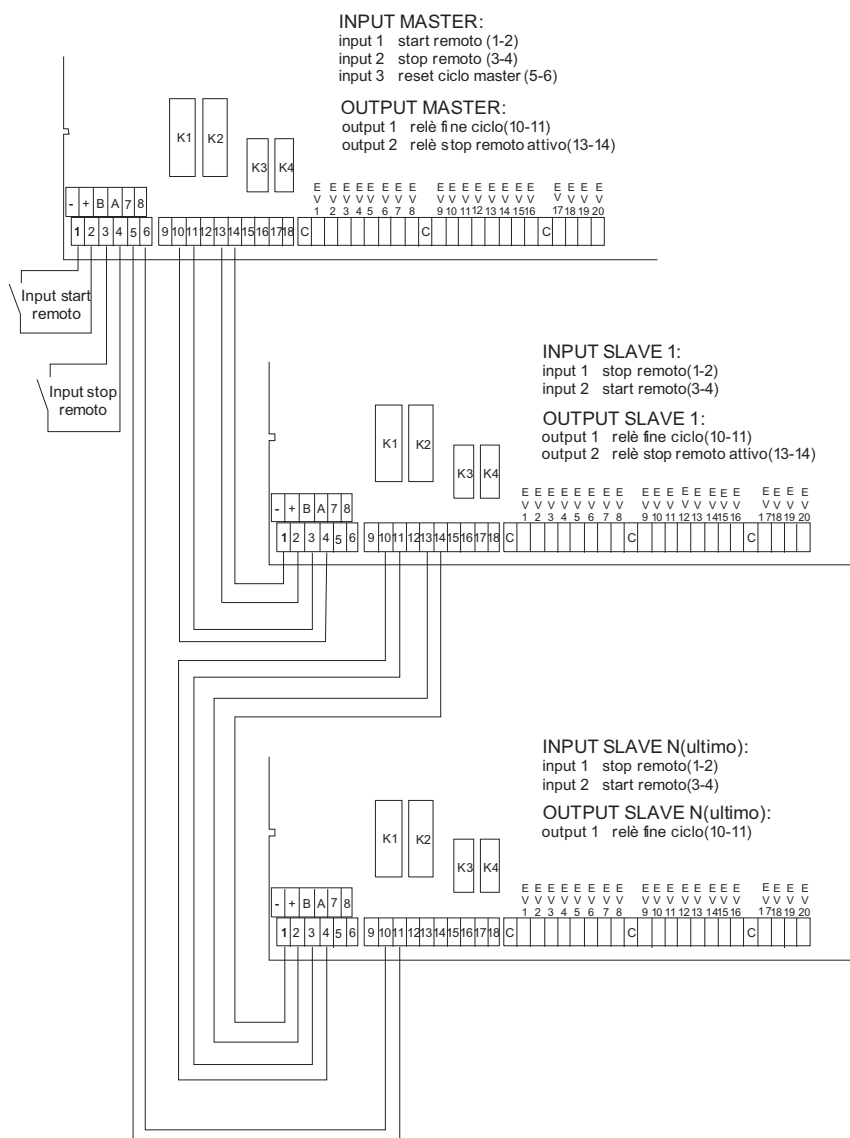
If the pressure is less than 60 mmH₂O the system is not making any washing, when the pressure is higher than 60 mmH₂O the system begins washing with a pause time of 40 seconds to decrease the pause time between one shot and the other a 10 seconds when the pressure reaches 100 mmH₂O. Pressure values in the intermediate pause time is automatically calculated in proportion.

Remote: the cleaning cycle is activated through the closing of the inlet start from remote, or through serial line with the remote start control. The cycle will remain activated up to the closing of the inlet stop from remote, or to the sending of the correspondent remote stop command.

Synchronized: this kind of cleaning is used when you need to control more then one device in series. The cleaning cycle is activated through the closing of the inlet start from remote, or through serial line with the remote start control on the MASTER card. It will be performed just a complete cycle of the device, then it will stop automatically. Once the cycle will stop, it will activate the following on through the relay, till the last SLAVE. When also the last SLAVE is over, it is possible to reset the line having a new cycle, through the inlet master cycle reset.

It is possible to stop the cycle in every moment, closing the inlet stop from remote. When you will open it again, it will be necessary to activate the start from remote to continue the cycle.

Example of connection to more devices in Synchronized modality:



In all these functioning modalities, in case the cleaning is interrupted and enabled again, the REDClean® GAMMA PULSE will start again from the point where it was interrupted.

In all these functioning modalities, every time you turn on the instrument, the cleaning cycle can start.

Directly with the valve activation (working status) or wait a pause time (pause status), set in P42, programming the configuration parameter E4. This choice has affects just on the first valve activated after each turning-on of the instrument. At the end of the first cleaning cycle and the start of the following one, the time set in P42 will be considered in the cleaning cycle as well.

The possible cleaning modalities are shown in the following pattern, and can be selected through P1 parameter.

	FILTER CONFIGURATION					FILTER CLEANING MODE				
	Stand	Onl-M	Onl-B	OfI-M	OfI-B	Man.	Aut.	Autp	Rem	Syn.
P1=0	x					x				
P1=1	x						x			
P1=2	x							x		
P1=3	x								x	
P1=4	x									x
P1=5		x				x				
P1=6		x					x			
P1=7		x						x		
P1=8		x							x	
P1=9		x								x
P1=10			x			x				
P1=11			x				x			
P1=12			x					x		
P1=13			x						x	
P1=14			x							x
P1=15				x		x				
P1=16				x			x			
P1=17				x				x		
P1=18				x					x	
P1=19				x						x
P1=20					x	x				
P1=21					x		x			
P1=22					x			x		
P1=23					x				x	
P1=24					x					x

Key:

Stand.= Standard

Onl-M.= ON-Line Monostable Valve

OfI-M.= OFF-Line Monostable Valve

Onl-B.= ON-Line Bistable Valve

OfI-B.= OFF-Line Bistable Valve

Man.= Manual

Aut.= Automatic

AutP.= Autopause

Rem.= Remote

Syn. = Synchronized

EV COMMAND MODALITY

Single: the outputs for electrovalves command of filter cleaning are activated one after the other in consecutive way.

Multiple: more then one output for electrovalves command of filter cleaning are activated at the same time, up to 4 activated outputs.

Skip: for electrovalves command of filter cleaning are activated separately but far-between with skip settable from 2 to 4 outputs.

In the above schedule, you can find the values of P38 parameter which correspond to the various working combinations.

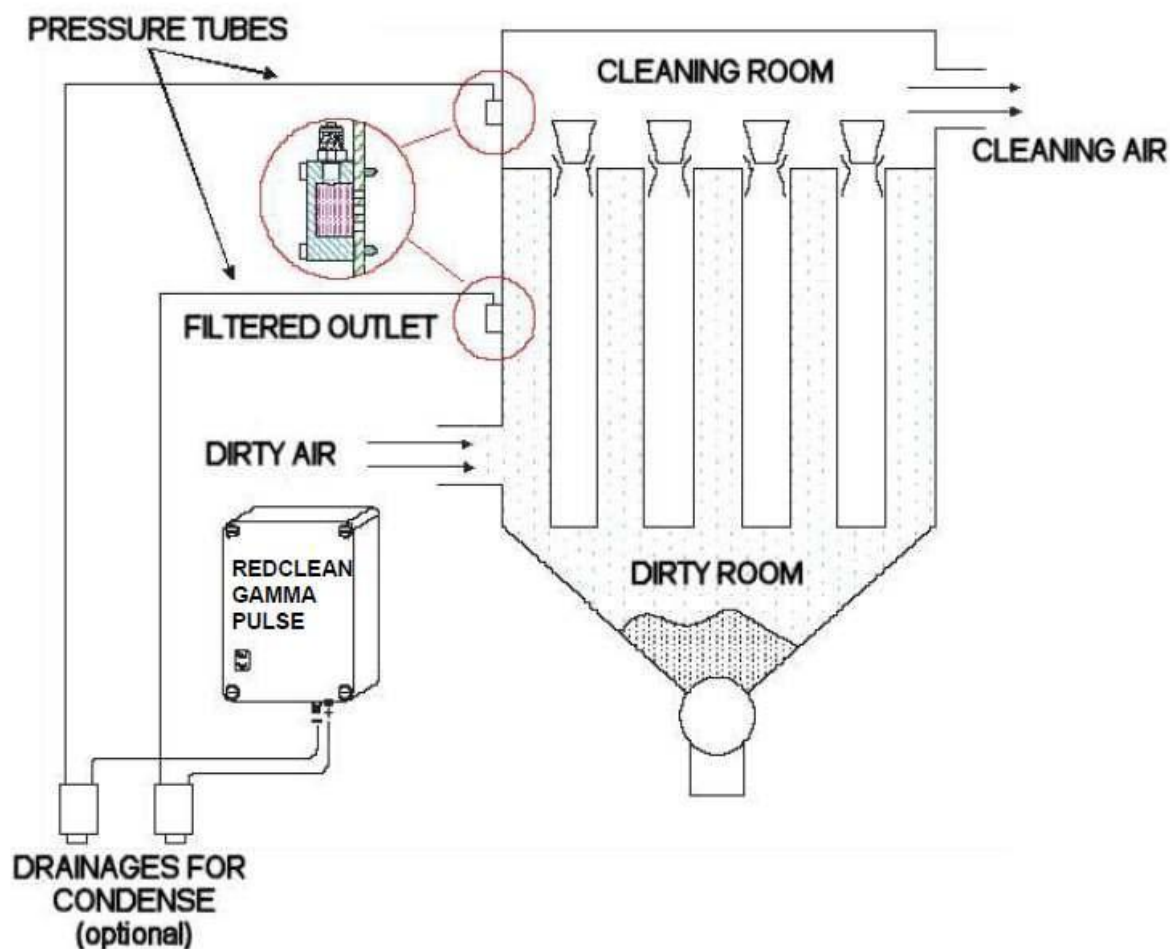
EV COMMAND MODALITY						
	SINGLE	MULTIPLE	SKIP	2	3	4
P38=0	x			-	-	-
P38=1		x		x		
P38=2		x			x	
P38=3		x				x
P38=4			x	x		
P38=5			x		x	
P38=6			x			x

PRESSURE TUBES CONNECTION SCHEME

Disposal of pressure tube connection on the REDClean® GAMMA PULSE device are as follows:



With the installation of pressure gauges is recommended the installation of filtered outlets to limit possible failure internal pressure sensor. These filters prevent dust or other substances to be traced back to the pressure sensor and small bodies to obstruct the flow inside the tubes. It can also be possible not to use these filters, but at the expense of the safety of the instrument. These filters are mounted directly on the filter where they are usually positioned in the outlet pipes. It is recommended to install a filtered outlets for each pressure tube applied, both with the extent of ΔP inside the filter:

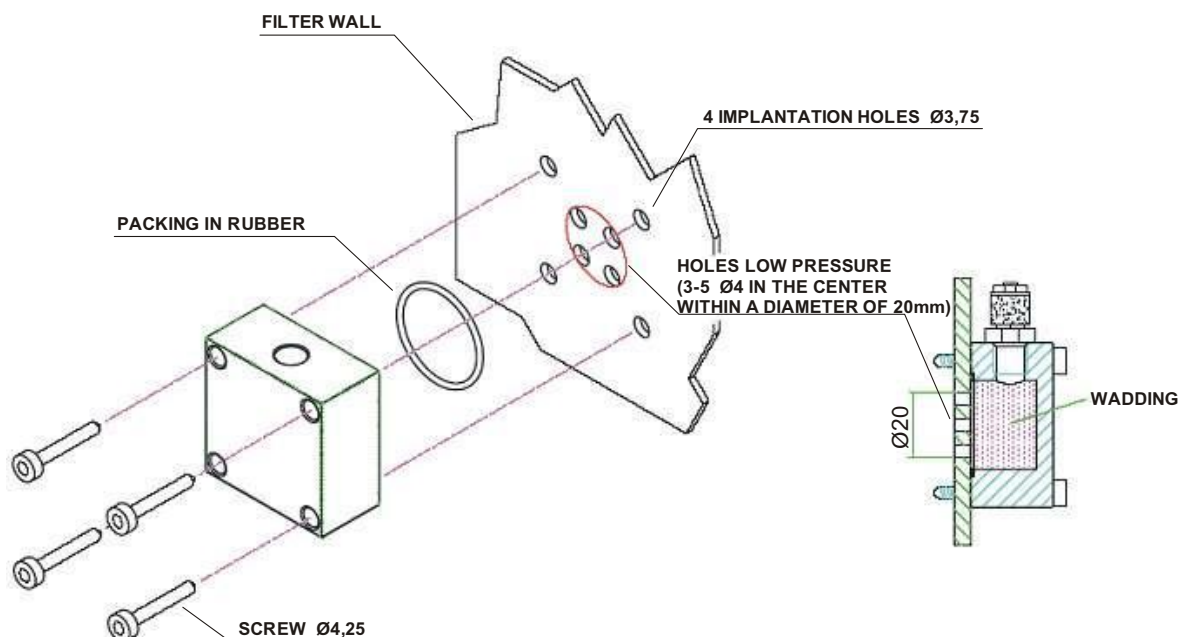


The pressure hose recommended is the Rilsan type 6x4.

The positive nozzle of the instrument must be connected to the dirty room while the negative nozzle must be connected to the clean room of the filter.

At temperatures above 125 ° C it is necessary to reduce the level of inlet sensor temperature in order to fall within the permissible temperature range (-40 ° C / 125 ° C). To do this we suggest using a length of copper tubing needed to dissipate excess heat.

Let's have a look now at the installation of these filters in details.



PRESSURE ZERO SETTING

During the operation it may happen that the pressure on the display slightly different for equal pressure applied to the sensor, due to the changing conditions of temperature, humidity, etc.. . To restore the correct pressure, you must perform an operation to eliminate the pressure reading of the instrument.

Entering programming using the key **E** in the menu and make sure that the jets of grafting of the tubes are free, i.e. not connected to the pipes from the air filter.

Pressing **Inc** select the parameter **H 0** and follow the steps listed below:

- press **E** (flashes the message **0**);
- wait 4 or 5 sec.;
- confirm the reset by pressing the **E** key (the display will show once more the indication **H 0**)
- wait 5 seconds so that the display returns to the pressure value and verify that the reading is 0.

CAUTION

Pressure can be reset (parameter **H 0**) only if the pressure reading on display with outlets open is notably different from zero. This operation must be carried out exclusively by skilled personnel and only after the instrument has been switched on for at least 15 minutes.

OUTPUTS TEST ACTIVATION FUNCTION

It is possible to use a particular configuration of the card to prove each exit in case it becomes necessary during the testing, maintenance or any mal operations.

To join this setup go with the Key **Dec** (↓) on the number visualization of the active output. In this condition simultaneously press the keys **Inc** (↑) e **Dec** (↓) and so it enters the menu of test outputs.

Once you will enter you will see the number of outputs by activating flashing.

To activate the visualized output press the key **E**, while to change the number of output use the keys **Inc** (↑) e **Dec** (↓). The minimum time that must pass for a shot through the following key **E** is 1 second. To return to the normal cycle of operation simultaneously press all three keys.

If you have the serial RS485 output on the controller, you can perform this function testing with dedicated serial commands from PC.

Ev. Test Command: this function is able to perform the functioning test of the single outputs through the serial commands, as you can do directly on the device.

The command and its description is described here under:

Hexadecimal command (Data 16 bit hex) **A B C D** where:

A = activation of test modality (0= disabled; 1=enabled);

B = attivazione sparo uscita (0= disabled; 1=enabled);

C – D = number of the output to be activated (hex);

Inlet command in test with setting of valve n°2 : 1002 (hex).

Inlet command in test with setting and activation of valve n°4 : 1104 (hex).

Inlet command in test with setting and activation of valve n°20 : 1114 (hex).

Output command and test reset : 0000 (hex).

HOURS COUNTER FUNCTION

The value hours counter is possible to be visualized in the parameter L 1 from the programming menu.

Still in the programming menu it is possible to configurate the mode of counting of the hours counter. This can be done through the parameter **P 23** in the following ways:

- 1) **P 23**= 0 the hours counter starts to count from the initial of the instrument;
- 2) **P 23**= 1 the hours counter starts to count when the pressure visualized on the display is higher or equal to the one set in the parameter **P 24**;
- 3) **P 23**= 2 the hours counter counts just in the cleaning phase of the filter.

The maximum value that can be set for the number of hours is “**65534**”, after which the counter is reset automatically.

Although the instrument is fitted with a 3-digit display, numbers comprising up to 5 digits can be displayed: for values from **0** to **999**, the number of hours is displayed as normal; for values *greater* than **999**, the display cannot show the entire number but when one of the 2 outer numbers (left or right) flashes, this indicates that the number on display is not complete. If the left number flashes, the remaining numbers for display are to the left and vice versa. If both numbers flash this means that there is a number remaining both to the left and right.

Example

If the number displayed is “954” and the number 9 is flashing, this means that there is a hidden number to the left of the number 9. Press “Inc” to display the number to the left (the other numbers are shifted to the right). At this point, the number displayed is “395” but the whole number is “3954”; in this case the number 5 flashes to indicate a number remaining to the right. Press “Dec” to display the number to the right (the other numbers are shifted to the left, concealing the first figure to the left); the figure “954” returns on display.

CYCLES COUNTER FUNCTION

Parameter **L2** enables access and display of the counter monitoring operation cycles performed during output scanning.

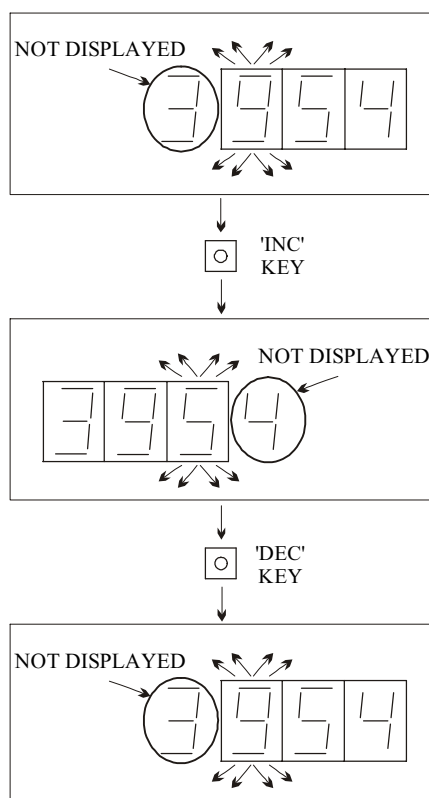
The counting is done every time one complete cycle of activation of outputs even if these are not connected.

The total number of possible cycles is “65534”, after which all stored values in the counter memory are reset.

The method to display the number of cycles is as described above for the hour counter.

INPUT FUNCTION

Inputs present in REDClean® GAMMA PULSE have different operation modes selectable in the setup menu in **E12, E13, E14 e E15** parameters. Each input is independent from the others, with its own configuration.



The modes of operation are:

- 1) **= 0 disabled input**
- 2) **= 1 external post- cleaning input:** when it is closed and enabled the external post cleaning function (P 7=2), it activates the post cleaning cycle.
- 3) **= 2 triboelectric input:** when it is enabled (P 27>0) and it keeps closed for the time set in the parameter (if P 27=3 that it is to say at least for 3 seconds), it activates the triboelectric alarm;
- 4) **= 3 remote start input:** when it is closed, it activates the cleaning cycle in all the functioning modalities, except the Manual.
- 5) **= 4 remote stop input:** when it is closed, it deactivates the cleaning cycle in all the functioning modalities. The cleaning cycle will be stopped immediately or at the end of the actual cycle, on the basis of the E6 configuration. This input is more important then the external start input;
- 6) **= 5 external pause enable input:** when it is closed it activates the external pause programmed in the parameter P 34, instead the one used by the normal programming (this input has an effect in the Manual, Automatic and Remote function modes, not in the Auto pause);
- 7) **= 6 header tanks gauge input:** when it is closed and enable (P 35>0), it activates the permission of cleaning from the gauge to indicate that internally the header tanks there is the right pressure to perform the cleaning.
- 8) **=7 remote enable input:** when it is closed it enables the normal function of the unit and it exits from the stand-by phase. This input has the priority rather than all the others.
- 9) **=8=Inlet Master cycle reset:** when it is closed, it do resets the cleaning cycle of the instrument, and the relay of end cycle signal. This inlet is mainly used in case there are several devices connected in series, for its coordination. See description Synchronized functioning.

RELAY OUTPUTS FUNCTIONING

The relays present on the REDClean GAMMA PULSE have different ways of functioning, selectable in the programming menu. Each relay is independent from the others, with its own parameters and with the possibility to activate every relay in a different way.

The possible ways of functioning are:

- 1) **= 0 as minimum relay:**
 - a) standard (see paragraph **STANDARD MINIMUM RELAY**)
 - b) temporized relay (see paragraph **TEMPORIZED OUTPUT**)
 - c) hysteresis (see paragraph **HYSTERESIS OUTPUT**)

2) = **1 as maximum relay:**

- a) standard (see paragraph **STANDARD MAXIMUM RELAY**)
- b) temporized relay (see paragraph **TEMPORIZED OUTPUT**)
- c) hysteresis (see paragraph **HYSTERESIS OUTPUT**)

3) = **2 system-ok and system-on relay:** the relay activates and remains active once you turn on the device and if you don't find anomalies in the micro-processor functionalities.

4) = **3 cycle-on relay:** the relay activates and remain active during the whole cleaning of the filter

5) = **4 relay active in postcleaning phase:** the relay activates and remains active during the whole postcleaning phase

6) = **5 relay active at the end of the postcleaning phase:** the relay activates at the end of the postcleaning phase for a period of time selectable in the parameter "function value";

7) = **6 triboelectric alarm relay:** the relay activates and remain active when there is a triboelectric alarm;

8) = **7 load alarm relay:** the relay activates and remains active when no output valves are detected

9) = **8 relay active with active output:** the relay activates when the working phase of a linked output is activated (the minimum working time for a correct activation of the output which activates the relays is 0.15s, for inferior times the start is not sure);

10) = **9 relay active in pause:** the relay activates when the pause phase is activated;

11) = **10 start relay from remote activated:** the relay is activated when the remote input start is closed or when the serial start command from remote is sent.

12) = **11 start relay from remote deactivated:** the relay is deactivated when the remote input start is closed or when the serial start command from remote is sent.

13) = **12 stop relay from remote activated:** the relay is activated when the remote input stop is closed or when the serial stop command from remote is sent.

14) = **13 stop relay from remote deactivated:** the relay is deactivated when the remote input stop is closed or when the serial start command from remote is sent.

15) = **14 end cycle relay:** the relay is activated, in Synchronized modality, at the end of the cleaning cycle, and it remains activated till the opening of the inlet start from remote for Slave instruments, or of the inlet reset master Cycle for Master devices. For the other modalities, the relay will be activated at the end of the cleaning cycle, for a certain time settable by the parameter "value of relay n° ... function" of the associated relay.

16) = **15 external pressure switch alarm relay:** the relay activates and remain active when the consent from the pressure switch doesn't arrive within the programmed time.

The inlets that can influence the condition of the card cleaning, have a priority scale.

Here follows this scale (from the top):

- inlet enabling from remote;
- inlet stop from remote or serial stop command from remote;
- inlet start from remote or serial start command from remote;

RELAY OF STANDARD MINIMUM AND MAXIMUM

Let's suppose to work with relay 1 as **minimum standard relay**.

First of all we need to set the value 0 in parameter P 14 and P 15, in P 13 the pressure value of relay work. When the pressure is equal or less then pressure in P 13, our relay will be activated.

Let's suppose to work with relay 1 as **maximum standard relay**.

First of all we need to set the value 1 in parameter P 14 and P 15, in P 13 the pressure value of relay work. When the pressure is major then pressure in P 13, our relay will be activated.

TEMPORIZED OUTPUT

The temporized output allows us to activate the relay with a settable pressure gap.

1) E.i.: relay 1 as **minimum temporized relay**.

First of all, we need to set the value 0 in P 14 parameter, in P 13 parameter the pressure value for relay, in P 15 the value 2 and in P 16 our time value.

Let's suppose P 13 equal to 20mmH₂O and P 16 equal to 3 sec.

The functioning of our relay will be the following:

- the relay will be activated after 3 seconds when the pressure will be equal or less then 20mmH₂O;
- the relay will be deactivated when the pressure will be major then 20mmH₂O.

2) E.i.: relay 1 as **maximum temporized relay**.

First of all, we need to set the value 1 in P 14 parameter, in P 13 parameter the pressure value for relay, in P 15 the value 2 and in P 16 our time value.

Let's suppose P 13 equal to 20mmH₂O and P 16 equal to 5 sec.

The functioning of our relay will be the following:

- the relay will be activated after 5 seconds when the pressure will be major then 20mmH₂O;
- the relay will be deactivated when the pressure will be equal or less then 20mmH₂O.

OUTPUT WITH HYSTERESIS

Output with hysteresis allows us to activate and deactivate the relay with a settable pressure gap.

1) E.i.: relay 1 as **minimum relay and pressure hysteresis**

First of all we need to set the value 0 in parameter P 14, in P 13 parameter the pressure value for relay, in P 15 the value 1 and in P 16 our hysteresis pressure.

Let's set P 13 equal to 20mmH₂O and P 16 equal to 4 mmH₂O.

The functioning of our relay will be the following:

- the relay will be activated when the pressure will be equal or less then $20-4=16\text{mmH}_2\text{O}$;
- the relay will be deactivated when the pressure will be major then $20+4=24\text{mmH}_2\text{O}$.

2) E.i.: relay 1 as maximum relay and with pressure hysteresis

First of all, we need to set the value 1 in P 14 parameter, in P 13 parameter the pressure value for relay, in P 15 the value 1 and in P 16 our hysteresis pressure.

Let's set P 13 equal to 20mmH₂O and P 16 equal to 4 mmH₂O.

The functioning of our relay will be the same:

- the relay will be activated when the pressure will be major then 20+4=24mmH₂O;
- the relay will be deactivated when the pressure will be equal or less then 20-4=16mmH₂O.

SYSTEM-OK AND SYSTEM-ON RELAY

This configuration allows to check the correct functioning of the instrument (power supply check and microprocessor), closing the contact between terminals COM. and N.O. in case there is any kind of problems. The opening of the previous contact indicates that the device has some functioning problems, that are:

- no power supply to the instrument;
- the micro processor is broken;
- the software does not work correctly or it stop due to disturbs or supply falling;

CYCLE-ON RELAY

This configuration allows to know when the cycle is in cleaning status in all the settable modalities and it will remain on till its conclusion. This is possible through the closing of the COM. and N.O. contacts.

POSTCLEANING RELAY

This configuration allows to know when the cycle is in Postcleaning time. This is possible through the closing of the COM. and N.O. contacts.

RELAY OF POSTCLEANING END

This configuration allows to know when the Postcleaning is finished, and it remains activated for a time settable through **P 16** and **P 20** parameters. This is possible through the closing of the COM. and N.O. contacts.

RELAY OF TRIBOELECTRICAL ALARM

This configuration allows to know when you have a triboelectrical alarm. The relay will be activated till a complete reset of the device (ON-OFF) or through a general reset of the alarms. This is possible through the closing of the COM. and N.O. contacts.

RELAY OF ELECTROVALVES ALARM

This configuration (if activated) allows to know the presence of an alarms for electrovalves. This is possible through the closing of the contacts COM. and N.O. The possible anomalies could be the following:

- the load is not connected to the output;
- the coil interrupted or its absorption is not enough for being detected;

The relay will be activated till a complete reset of the device (ON-OFF) or through a general reset of the alarms.

RELAY OF ACTIVATED OUTPUT

This configuration allows to know when it is activated a shot electrovalve output. The minimum time for relay activation is 0.1 second. This is possible through the closing of the COM. and N.O. contacts.

PAUSE RELAY

This configuration allows to know when the cycle is in pause time, and it remains activated till its conclusion. This is possible through the closing of the COM. and N.O. contacts.

RELAY START/STOP REMOTE

These configurations are used to supervise the commands (from inlet or serial command) of start and stop from remote, or to transfer a possible start or stop command to another device (Synchronized Modality).

END CYCLE RELAY

If the card is set to Synchronized Modality, configuration used when you need to control more than one device in series, the relay allows to know, through the closing of COM. and N.O. contacts, when the cycle of the instrument is over. In this way, it is possible to give the consent for the cleaning of next instrument. The relay remains activated till the opening of the inlet start from remote for Slave instruments, or till the opening of the inlet reset master cycle, for Master instruments. In the other functioning modalities, the relay allows to know, through the closing of COM. and N.O. contacts, when the cycle of the instrument is over. It will remain activated for a programmable time (value of the function of relay n°, e.i. P16).

RELAY OF EXTERNAL PRESSURE SWITCH

This configuration allows, through the closing of COM. and N.O. contacts, to know when you have an alarm of external pressure switch. The relay remains activated till a complete reset of the device (ON-OFF) or through the general reset of the alarms.

POST-CLEANING FUNCTIONING

Post-cleaning is activated through the closing of an external contact (if **P 7**=2), or when the pressure is *lower* than the value set in **P 10** parameter (see **P 7** =1); the economiser scans in sequence all the outputs, alternating work time (**P 12**) to pause time (**P 11**). The process ends after a *time* (if **P 8**=0) or the *number of cycle* (if **P 8**= 1) set in **P 9** parameter.

The internal postcleaning (**P 7** =1) has effect in Automatic or Autopause modality, and not in the Manual functioning.

The external postcleaning (**P 7** =2) has effects in all the functioning modalities.

The postcleaning cycles begin to be counted starting from the first crossing of the electrovalve N°1 to consider complete scan cycles. If the post cleaning starts from valve N° 10 having 12 valves in total, the first cycle will be composed by 12 + 3 (10-11-12) valves.

Note: if **P 7** = 1, the activation of the post-cleaning cycle can take place only if the device, after the ignition, has passed the threshold set in **P 10** at least one time.

EXTERNAL PAUSE FUNCTIONING

In the parameter **P 34** you can set a value of additional pause that can be used as an alternative to the pause values programmed in parameters **P 2** and **P 3**. The pause set in the parameter **P 34** is used when it is closed on entry "**EXTERNAL INPUT PAUSE**" if configured. Once the input is activated, the shot cycle will use as pause time, the **P 34** value.

PRECOATING FUNCTIONING

When the REDClean GAMMA PULSE is set to Automatic or Autopause, the parameter **P 21 = 1** and the parameter **P 22** is set to a value higher than the start pressure cleaning or minimum pressure, the tool remains stationary (in stop) till the pressure on the display shall not exceed the pressure of precoating.

After passing this threshold, the cyclical starts and now it behaves normally, that is the function of precoating is automatically disabled permanently (even power cycle the instrument, the disabled remain stored).

NOTE: To re-enable the function of precoating is necessary again to force the parameter **P 21 = 1**.

RIPETITIVE SHOTS FUNCTIONING

This function allows you to perform more that one shot on the same electrovalve, during the cleaning cycle, setting the number of shot you need in parameter **P25**.

With the setting of a number of shots major then 1, it is necessary to set the pause time between the shots on the same electrovalve in parameter **P 26**.

The pause set between the shots on the same electrovalve is assigned from the **P 26** value, while when you go to the following valve, the used pause time is the basis pause time of the system (**P 2** if Automatic, **P 3** if Manual/Remote/Synchronized or the calculated pause time, if Autopause).

TRIBOELECTRICAL FUNCTIONING

If REDClean® GAMMA PULSE is connected to the dust meter GDM-1 or SDM-1 or RP02, if the tribo function is enabled through the parameter **P 27** (=0 disabled or >0 activated with activation alarm time), when it comes the triboelectrical alarm condition through the closing of its input, on the display of the device you will see a flashing message to signal this anomaly: "**E n**" (if **P38=0**), where "**n**" is the number of the output, and it will be activated the alarm relay, if programmed, or "**F n**" (if **P38≠0**), where "**n**" is the number of the command, and it will be activated the alarm relay, if programmed. If other electrovalves in alarm are detected, the number of outputs or commands will roll alternately to visual all the electrovalves with errors. If the dust value will come back to the following cycle for a certain electrovalve, the respective alarm will be reset.

Through the parameter **P 28** you can skip the output or command where you had a triboelectrical alarm. The number set in this parameter indicates the maximum number of outputs or commands which can be excluded on the line (e.i. **P 28=3**, the first 3 outputs with triboelectrical alarm will be excluded from the cycle). Once excluded, these outputs won't be controlled anymore till the complete reset of the instrument (turn-off), or a complete reset of the alarms.

In this modality, you will see just the outputs in alarm, which will be skipped up to a maximum of 10, while if you want not to skip them, you need to set **P 28** parameter =0.

TRIBOELECTRICAL SIGNAL CONNECTION

The connections between dust meter GDM-1, SDM-1, RP02 and REDClean® GAMMA PULSE take place through the triboelectrical input configured on the device. If the REDClean® GAMMA PULSE has not been assigned by a configuration for triboelectrical input, this connection cannot be performed.

The contact is brought to the REDClean® GAMMA PULSE input, so that, when it gets closed, REDClean® GAMMA PULSE shows the dust alarm condition through the displaying of the number of valve with the high dust. If there are many electrovalves with the same problem, REDClean® GAMMA PULSE will show their numbers one after the other.

LOAD CONTROL FUNCTIONING

In the REDClean® GAMMA PULSE devices, it is possible to use a special function (activated through the configuration parameter **E5**) to check the presence and the correct functioning of output load. Through this function, we can know if the load will be connected in the right way or if in a second moment it will be interrupted due to a cabling or coil problem.

The alarm condition is indicated through the displaying of code "**H n**" (where "n" indicates the number of output in current) or "**L n**" (where "n" indicates the number of command in alarm status). If programmed, also the relay for load alarm will be activated. The number of outputs or commands in alarm status will be displayed in series, in the same order of the alarm order on the outputs.

In this function it is necessary to use all the outputs of the device, to avoid continuous alarms to not used outputs. Furthermore, it is possible to choose if, when activated the alarm condition, the output you are interesting in has to be eliminated from the cycle (activated through the configuration parameter **E9**).

The number of outputs which can be excluded from the cycle are different according to the models:

- 2 outputs for REDClean® GAMMA PULSE 6-atex model;

TANK PRESSURE SWITCH FUNCTIONING

In all the modalities of instruments functioning, if the parameter **P 35**>0, the device will correct the pause between the shots on the basis of the programmed value and of the consent of tank pressure switch, this last one through the pressure switch input and serial communication. In case of pressure switch consent is always verified, the device will perform the system pause time (**P 2** if Automatic, **P 3** if Manual/Remote/ Synchronized or the calculated pause time if Autopause). After the expiring of the basis pause time, if there is not the pressure switch consent yet, the device will wait another pause time, till receiving the consent, or till exceeding the latest time (value given by the basis pause time + the alarm time of **P 35** pressure switch). After exceeding the latest time, the device will go ahead following electrovalve control, the activation of alarm contact (if programmed) and the displaying of correspondent error code **A 1**.EXAMPLE:

Programming of functioning mode:

Parameters	Programming
P 1	1 (Automatic)

Let's suppose to have the following parameters set:

Parameters	Programming
P 2	20 seconds
P 35	10 seconds
P 36	500 Kpa

If we use the tank pressure switch input as consent, **P 36** parameter won't be considered. On the other side, it will be necessary if we use the control through serial communication.

With pressure switch input from tank:

In input conditions always activated, the device will have a break of 20 seconds between a shot and the other one, while at the end of these 20 seconds the input is not activated, the pause will go on till the time will arrive to the latest time which come from the addition of basis pause time (20 seconds) and time of pressure switch alarm (10 seconds). If the time expected for input activation is higher then the addition of these two parameters (30 seconds), the device will perform the valve shot but it will activate the alarm relay if programmed and it will visualize the error code **A 1** on the display.

If the input activation will come early then 30 seconds of latest time, the device won't signal any anomaly.

Con control through serial communication:

If you are using the control through the serial transmission, you need to set in **P 36** parameter the pressure value of reference. When the value read by the pressure switch on the tank and transmitted through serial line to the REDClean® GAMMA PULSE is equal or higher then the value set in **P 36**, the device will work in the same way of a simple input activation.

NOTE: you can give the consent also using both activation methods.

FUNCTIONING NUMBER OR ACTIVATED COMMANDS FOR CLEANING EV

In all the functioning modalities of the device, it is possible to chose in **P37** parameter, the number of activated outputs; in case of EV single Command Modality (P38=0), or the number of activated commands in cleaning cycle, or in the other cases of EV Command Modality.

In case of EV single Command Modality, the wording on the display (**U. 2** e.i. for valve n°2) will correspond to the number of activated valve; otherwise, on the display you will have the wording (**C. 2** e.i. for command EV n°2), which corresponds to the number of the activated command in the cycle. It is possible to associate two or more activated valves to the command number, or even activated valves not in series, on the basis of the EV Command Modality.

For cells filter with monostable valves, or simple filters, the maximum limit of outputs or activated commands will be the total number of outputs of the instrument (e.i. REDClean GAMMA PULSE 12/8 ATEX max. limit =**12**). For cells filters with bistable valves, the maximum number of output or activated commands will be the total number of outputs of the instrument, except 1 (e.i. REDClean® GAMMA PULSE 12/8 ATEX max. limit **12-1=11**). The reason for that is that in cells filters with bistable valves, the last valve is not an output used for the cleaning, but a valve for cell opening/closing. For this reason, it will always be activated.

These maximum limits can be reduced according to the EV Command Modality (P38).

END CYCLE FUNCTIONING

In all configurations, it is possible, through the configuration parameter **E6**, the end cycle modality which has to be used in case of cleaning cycle stop. The possible choices are to EV Current (E6=0) or to Cell End (E6=1). With the modality Cell End, the cycle does not stop when the cleaning stop command arrives, but it will work till the last valve, to complete the cleaning cycle, then it will stop. With the modality EV Current, the cleaning cycle will stop immediately after the last working phase of the cleaning valve, keeping the conditions of cell opening or closing.

VALVE MEMORIZE FUNCTIONING

Only for the STANDARD configuration, through configuration's parameter **E16**, it is possible, in lack of power supply's voltage, to start again the cleaning cycle from the next output to last one memorized in the previous cycle. This function allows, in case of short usages of controller, not to repeat the cleaning cycles always on the same outputs.

ACTIVE ANALOGICAL OUTPUT FUNCTIONING

REDClean® GAMMA PULSE 6 ATEX come provide a current or tension output, which changes in a linear way. When you place the order, you need to indicate the solution you need. Current or Tension output must be specified in order phase, as standard this option will be supplied with current output.

CURRENT OUTPUT

It is possible to generate a current which changes in a linear way between 4-20mA or between 0-20mA in output, through the programming of **P 32** e **P 33** parameters.

P 32 parameter corresponds to the pressure which has to be supplied to obtain a current output equal to 4mA or 0mA.

P 33 parameter corresponds to the pressure which has to be supplied to obtain a current output equal to 20mA.

According to the displayed pressure, it is possible to generate a current output linear function of the pressure.

N.B. : Max applicable load 500ohm.

TENSION OUTPUT

It is possible to generate a tension which change in a linear way between 0-10V or 0-5V in output, through the programming of **P 32** and **P 33** parameters.

P 32 parameter corresponds to the pressure which has to be supplied to obtain a current equal to 0V.

P 33 parameter corresponds to the pressure which has to be supplied to obtain a current equal to 5V or to 10V.

On the basis of the displayed pressure, you can generate current output linear function of pressure.

NOTE: Minimum load applicable 1Kohm.

ANALOGICAL OUTPUT CONNECTION

Connection between REDClean® GAMMA PULSE and expansion card 4-20 mA and a potential external has to be performed using the following terminals on the basis of the instrument model:

For REDClean® GAMMA PULSE 6 ATEX, terminals n°5 (+) , n°6 (-) and n°7 (earth) ;

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Low voltage Motors for explosive atmospheres

Installation, operation, maintenance and safety manual

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1. Introduction

NOTE!

These instructions must be followed to ensure safe and proper installation, operation and maintenance of the motor. They should be brought to the attention of anyone who installs, operates or maintains the motor or associated equipment. Ignoring these instructions may invalidate all applicable warranties.

WARNING

Motors for explosive atmospheres are specially designed to comply with official regulations concerning the risk of explosion. The reliability of these motors may be impaired if they are used improperly, badly connected, or altered in any way no matter how minor.

Standards relating to the connection and use of electrical apparatus in hazardous areas must be taken into consideration, especially the national standards for installation in the country where the motors are being used. Only trained personnel familiar with these standards should handle this type of apparatus.

1.1 Declaration of Conformity

Declaration of Conformity with respect to the Directive 94/9/EC or 2014/34/EU (ATEX) is delivered separately with each motor.

The conformity of the end product according to the Directive 2006/42/EC (Machinery) has to be established by the commissioning party when the motor is fitted to the machinery.

1.2 Validity

These instructions are valid for the following ABB electrical motor types, when used in explosive atmospheres.

Non-sparking Ex nA
series M2A*/M3A*
series M3B*/M3G*

Increased safety Ex e
series M3H*

Flameproof enclosure Ex d, Ex de
series M3KP/JP

Dust ignition protection (Ex t)
series M2A*/M3A*
series M2B*/M3B*/M3D*/M3G*

Flame proof enclosure for mines Exd / Ex de
series M3JM/M3KM

(Additional information may be required by ABB when deciding on the suitability of certain motor types used in special applications or with special design modifications.)

These instructions are valid for motors installed and stored in ambient temperatures above -20°C and below $+40^{\circ}\text{C}$. Note that the motor range in question is suitable for this whole range. In ambient temperatures exceeding these limits, please contact ABB.

1.3 Conformity

As well as conforming to the standards relating to mechanical and electrical characteristics, motors designed for explosive atmospheres must also conform to one or more of the following European or IEC-standards for the protection type in question:

Product standards

IEC/EN 60079-0	Equipment - General requirements
IEC/EN 60079-1	Equipment protection by flameproof enclosures "d"
IEC/EN 60079-7	Equipment protection by increased safety "e"
IEC/EN 60079-15	Equipment protection by type of protection "n"
IEC/EN 60079-31	Equipment dust ignition protection by enclosure "t"
IEC 60050-426	Equipment for explosive atmospheres

Installation standards

IEC/EN 60079-14	Electrical installations design, selection and erection
IEC/EN 60079-17	Electrical installations inspections and maintenance
IEC/EN 60079-19	Equipment repair, overhaul and reclamation
IEC 60050-426	Equipment for explosive atmospheres
IEC/EN 60079-10	Classification of hazardous area (gas areas)
IEC 60079-10-1	Classification of areas – Explosive gas atmospheres
IEC 60079-10-2	Classification of areas – Combustible dust atmospheres
EN 1127-1, -2	Explosive prevention and protection

ABB IEC LV motors (valid for Group I, II and III of the Directive 94/9/EC or 2014/34/EU) can be installed in areas corresponding to the following markings:

Zone	Equipment protection levels (EPLs)	Category	Protection type
1	'Gb'	2G	Ex d/Ex de/Ex e
2	'Gb' or 'Gc'	2G or 3G	Ex d/Ex de/Ex e/Ex nA
21	'Db'	2D	Ex t
22	'Db' or 'Dc'	2D or 3D	Ex t
–	'Mb'	M2	Ex d/Ex de

Atmosphere:

G – explosive atmosphere caused by gases

D – explosive atmosphere caused by combustible dust

M – mines susceptible to firedamp

2. Safety considerations

The motor is intended for installation and use by qualified personnel, familiar with health and safety requirements and national legislation.

Safety equipment necessary for the prevention of accidents at the installation and operating site must be provided in accordance with local regulations.

WARNING!

Emergency stop controls must be equipped with restart lockouts. After emergency stop a new start command can take effect only after the restart lockout has been intentionally reset.

Points to be observed

1. Do not step on the motor.
2. The temperature of the outer casing of the motor may be hot to the touch during normal operation and especially after shut-down.
3. Some special motor applications may require additional instructions (e.g. when supplied with a frequency converter).
4. Observe rotating parts of the motor.
5. Do not open terminal boxes while energized.

NOTE!

Additional Warnings and/or Notes related to safe use can be found in other chapters of this manual.

2.1 Motors in Group IIC and Group III

For motors in Group IIC and Group III which are certified according to EN60079-0 or IEC60079-0:

WARNING!

In order to minimize the risk of hazards caused by electrostatic charges, a motor may be cleaned only with a wet rag or by non-frictional means.

3. Handling

3.1 Reception check

Immediately upon receipt, check the motor for external damage (e.g. shaft, -ends and flanges and painted surfaces) and, if found, inform the forwarding agent without delay.

Check all rating plate data, especially voltage, winding connections (star or delta), category, type of protection and temperature class. The type of bearing is specified on the rating plate of all motors except the smallest frame sizes.

In the case of a variable speed drive application, check the maximum loadability allowed according to the frequency stamped on the motor's second rating plate.

3.2 Transportation and storage

The motor should always be stored indoors (above -20 °C) in dry, vibration-free and dust-free conditions. During transportation, shocks, falls and humidity should be avoided. In other conditions, please contact ABB.

Unprotected machined surfaces (shaft-ends and flanges) should be treated against corrosion.

It is recommended that shafts are rotated periodically by hand to prevent grease migration.

Anti-condensation heaters, if fitted, are recommended to be energized to avoid water condensing in the motor.

The motor must not be subject to any external vibrations exceeding 0.5 mm/s at standstill so as to avoid causing damage to the bearings.

Motors fitted with cylindrical-roller and/or angular contact bearings must be fitted with locking devices during transport.

3.3 Lifting

All ABB motors above 25 kg are equipped with lifting lugs or eyebolts.

Only the main lifting lugs or eyebolts of the motor should be used for lifting the motor. They must not be used to lift the motor when it is attached to other equipment.

Lifting lugs for auxiliaries (e.g. brakes, separate cooling fans) or terminal boxes must not be used for lifting the motor.

Because of different frame lengths, mounting arrangements and auxiliary equipment, motors with the same frame may have a different center of gravity

Damaged lifting lugs must not be used. Check that eyebolts or integrated lifting lugs are undamaged before lifting.

Lifting eyebolts must be tightened before lifting. If needed, the position of the eyebolt can be adjusted using suitable washers as spacers.

Ensure that proper lifting equipment is used and that the sizes of the hooks are suitable for the lifting lugs.

Care must be taken not to damage auxiliary equipment and cables connected to the motor.

Remove eventual transport jigs fixing the motor to the pallet.

Specific lifting instructions are available from ABB.

WARNING!

During lifting, mounting or maintenance work, all necessary safety considerations shall be in place and special attention is to be taken so that nobody will be subject to lifted load.

3.4 Motor weight

The total motor weight can vary within the same frame size (center height) depending on different output, mounting arrangement and auxiliaries.

The following table shows the estimated maximum weights for motors in their basic versions as a function of their frame material.

The actual weight of all ABB's motors is shown on the rating plate.

Frame Size	Aluminum Max. weight kg	Cast iron Max. weight kg	Flameproof Max. weight kg
71	7	12	–
80	15	31	40
90	20	44	53
100	31	63	72
112	35	72	81
132	93	120	120
160	145	260	260
180	180	310	310
200	250	340	350
225	320	430	450
250	390	530	510
280	430	900	850
315	–	1600	1300
355	–	2600	3000
400	–	3500	3700
450	–	4800	5000

If the motor is equipped with a brake and/or separate fan, contact ABB for the weight.

4. Installation and commissioning

WARNING

Disconnect and lock out before working on the motor or the driven equipment. Ensure no explosive atmosphere is present while executing insulation resistance check procedures.

4.1 General

All rating plate values relating to certification must be carefully checked to ensure that the motor protection, atmosphere and zone are compatible.

Special attention should be paid to dust ignition temperature and dust layer thickness in relation to the motor's temperature marking.

Motors requiring protective roof:

When fitted in a vertical position with the shaft pointing downwards, the motor must have a protective cover to prevent foreign objects and fluid from falling into the ventilation openings. This task can also be achieved by a separate cover not fixed to the motor. In this case, the motor must have a warning label.

4.2 Motors with other than ball bearings

Remove transport locking if employed. Turn the shaft of the motor by hand to check free rotation, if possible.

Motors equipped with roller bearings:

Running the motor with no radial force applied to the shaft may damage the roller bearing due to a "sliding" effect.

Motors equipped with angular contact bearing:

Running the motor with no axial force applied in the right direction in relation to the shaft may damage the angular contact bearing.

WARNING

For Ex d and Ex de motors with angular contact bearings the axial force must not by any means change direction, because the flameproof gaps around the shaft change dimensions and may even cause contact!

The bearing types are specified on the rating plate.

Motors equipped with re-greasing nipples:

When starting the motor for the first time, or after long storage, apply the specified quantity of grease.

See section "7.2.2 Motors with re-greasing nipples" for more details.

4.3 Insulation resistance check

Measure insulation resistance before commissioning and when winding dampness is suspected.

Insulation resistance, corrected to 25 °C, may not in any cases be below 1 MΩ (measured with 500 or 1000 VDC). The insulation resistance value is halved for each 20°C increase in temperature.

Figure 1 can be used for the insulation correction to the desired temperature.

WARNING

To avoid risk of electrical shock, the motor frame must be grounded and the windings should be discharged against the frame immediately after each measurement.

If the reference resistance value is not attained, the winding is too damp and must be oven dried. The oven temperature should be 90 °C for 12–16 hours followed by 105 °C for 6–8 hours.

If fitted, drain plugs must be removed and closing valves must be opened during heating. After heating, make sure the drain plugs are refitted. Even if the drain plugs are fitted, it is recommended to disassemble the end shields and terminal box covers for the drying process.

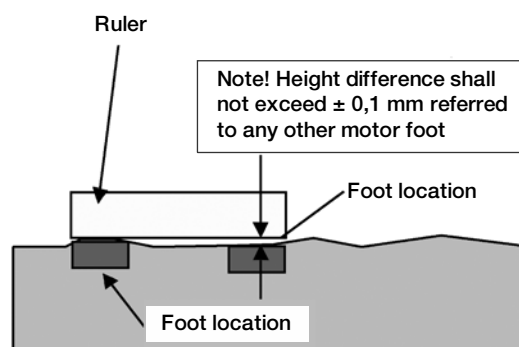
Windings drenched in seawater normally need to be rewound.

4.4 Foundation

The end user has full responsibility for the preparation of the foundation.

Metal foundations should be painted to avoid corrosion.

Foundations must be even, , and sufficiently rigid to withstand possible short circuit forces. They must be designed and dimensioned to avoid the transfer of vibration to the motor and vibration caused by resonance. See figure below.



4.5 Balancing and fitting coupling halves and pulleys

As standard, balancing of the motor has been carried out using a half key.

Coupling halves or pulleys must be balanced after machining the keyways. Balancing must be done in accordance with the balancing method specified for the motor.

Coupling halves and pulleys must be fitted on the shaft by using suitable equipment and tools which do not damage the bearings and seals.

Never fit a coupling half or pulley by hammering or remove it by using a lever pressed against the body of the motor

4.6 Mounting and alignment of the motor

Ensure that there is enough space for free airflow around the motor. It is recommended to have a clearance between the fan cover and the wall etc. of at least $\frac{1}{2}$ of the air intake of the fan cover. Additional information may be found from the product catalog or from the dimension drawings available on our web pages: www.abb.com/motors&generators.

Correct alignment is essential to avoid bearing, vibration and possible shaft failures.

Mount the motor on the foundation using the appropriate bolts or studs and place shim plates between the foundation and the feet.

Align the motor using appropriate methods.

If applicable, drill locating holes and fix the locating pins into position.

Mounting accuracy of a coupling half: check that clearance **b** is less than 0.05 mm and that the difference **a1** to **a2** is also less than 0.05 mm. See figure 2.

Re-check the alignment after the final tightening of the bolts or studs.

Do not exceed permissible loading values for bearings as stated in the product catalogs.

Check that the motor has sufficient airflow. Ensure that no nearby objects or direct sunshine radiate additional heat to the motor.

For flange mounted motors (e.g. B5, B35, V1), make sure that the construction allows sufficient air flow on the outer surface of the flange.

4.7 Radial forces and belt drives

Belts must be tightened according to the instructions of the supplier of the driven equipment. However, do not exceed the maximum belt forces (i.e. radial bearing loading) stated in the relevant product catalogs.

WARNING

Excessive belt tension will damage bearings and can cause shaft breakage. For Ex d and Ex de-motors excessive belt tension may even cause danger by eventual mutual contact of the flame path parts.

4.8 Motors with drain plugs for condensation

Check that drain holes and plugs face downwards. In vertical position mounted motors the drain plugs may be in horizontal position.

Non-sparking & Increased safety motors

Motors with sealable plastic drain plugs are delivered with these in the closed position in aluminum motors and in the open position in cast iron motors. In clean environments, open the drain plugs before operating the motor. In very dusty environments, all drain holes should be closed.

Flameproof motors

Drain plugs, if requested, are located at the lower part of the end shields in order to allow condensation to escape from the motor. Open the drain plug by turning it counter-clockwise, tap it to check free operation and close it by pressing and screwing it clockwise.

Dust Ignition Protection Motors

The drain holes must be closed on all dust ignition protection motors.

4.9 Cabling and electrical connections

The terminal box on standard single speed motors normally contains six winding terminals and at least one earth terminal.

In addition to the main winding and earthing terminals, the terminal box can also contain connections for thermistors, heating elements or other auxiliary devices.

Suitable cable lugs must be used for the connection of all main cables. Wiring for auxiliaries can be connected into their terminal blocks as such.

Motors are intended for fixed installation only. Unless otherwise specified, cable entry threads are metric. The protection class and the IP-class of the cable gland must be at least the same as those of the terminal boxes.

Ensure only certified cable glands for increased safety and flameproof motors are used. For non-sparking motors, cable glands must comply with IEC/EN 60079-0. For Ex tD/Ex t motors, cable glands must comply with IEC/EN 60079-0 and IEC/EN 60079-31.

NOTE!

Cables should be mechanically protected and clamped close to the terminal box to fulfill the appropriate requirements of IEC/EN 60079-0 and local installation standards.

Unused cable entries must be closed with blanking elements according to the protection and IP class of the terminal box.

The degree of protection and diameter are specified in the documents relating to the cable gland.

WARNING

Use appropriate cable glands and seals in the cable entries according to the protection type and the type and diameter of the cable.

Earthing must be carried out according to local regulations before the machine is connected to the supply voltage.

The earth terminal on the frame has to be connected to PE (protective earth) with a cable as shown in Table 5 of IEC/EN 60034-1:

Minimum cross-sectional area for protective conductors

Cross-sectional area of phase conductors of the installation, S , mm ²	Minimum cross-sectional area of the corresponding protective conductor, S_p , mm ²
4	4
6	6
10	10
16	16
25	25
35	25
50	25
70	35
95	50
120	70
150	70
185	95
240	120
300	150
400	185

In addition, earthing or bonding connection facilities on the outside of an electrical apparatus must provide an effective connection of a conductor with a cross-sectional area of at least 4 mm².

The cable connection between the network and motor terminals must meet the requirements stated in the national standards for installation or in the standard IEC/EN 60204-1 according to the rated current indicated on the rating plate.

NOTE!

When the ambient temperature exceeds +50 °C, cables having a permissible operating temperature of +90 °C as minimum shall be used. Also all other conversion factors depending on the installation conditions shall be taken into account while sizing the cables.

Ensure that the motor protection corresponds to the environment and weather conditions.

The seals of terminal boxes (other than Ex d) must be placed correctly in the slots provided, to ensure the correct IP class. A leak could lead to penetration of dust or water, creating a risk of flashover to live elements. If seals or gaskets are replaced, original sealing solution materials must be used.

4.9.1 Flameproof motors

There are two different types of protection for the terminal box:

- Ex d for M3JP-motors and M3JM
- Ex de for M3KP-motors and M3KM

Ex d-motors; M3JP

Certain cable glands are approved for a maximum amount of free space in the terminal box. The amount of free space for the motor range and the number and type of gland threads are listed below.

Motor type M3JP / M3JM	Pole number	Terminal box type	Threaded holes	Terminal box free volume	Cover bolt size	Tightening torque of terminal box bolts
80 – 90	2 – 8	25	1xM25	1.0 dm ³	M8	23 Nm
100 – 132	2 – 8	25	2xM32	1.0 dm ³	M8	23 Nm
160 – 180	2 – 8	63	2xM40	4.0 dm ³	M10	46 Nm
200 – 250	2 – 8	160	2xM50	10.5 dm ³	M10	46 Nm
280	2 – 8	210	2xM63	24 dm ³	M8	23 Nm
315	2 – 8	370	2xM75	24 dm ³	M8	23 Nm
355	2 – 8	750	2xM75	79 dm ³	M12	80 Nm
400 – 450	2 – 8	750	2xM75	79 dm ³	M12	80 Nm

Auxiliary cable entries

Motor type	Pole number	Threaded holes
80 – 132	2 – 8	1xM20
160 – 450	2 – 8	2xM20

When closing the terminal box cover ensure that no dust has settled on the surface gaps. Clean and grease the surface with non-hardening contacting grease.

WARNING

Do not open the motor or the terminal box while the motor is still warm and energized when an explosive atmosphere is present.

Ex de-motors; M3KP and M3KM

The letter 'e' or 'box Ex e' is shown on the terminal box cover.

Ensure that assembly of the terminal connection is carried out precisely in the order described in the connection instructions, which are found inside the terminal box.

The creepage distance and clearance must conform to IEC/ EN 60079-7.

4.9.2 Dust ignition protection motors Ex t

As standard, motors have the terminal box fitted on the top with a cable entry possible from both sides. A full description is contained in the product catalogs.

Pay special attention to the sealing of the terminal box and cables to prevent the access of combustible dust into the terminal box. It is important to check that the external sealing is in good condition and well placed because they can be damaged or moved during handling.

When closing the terminal box cover, ensure that no dust has settled on the surface gaps and check that the sealing is in good condition – if not, it has to be replaced with an identical seal.

WARNING

Do not open the motor or the terminal box while the motor is still warm and energized when an explosive atmosphere is present.

4.9.3 Connections for different starting methods

The terminal box on single speed motors normally contains a terminal block with six winding terminals and at least one separate earth terminal. This enables the use of DOL- or Y/D -starting. See Figure 3.

For two-speed and special motors, the terminal connection must follow the instructions inside the terminal box or in the motor manual.

The voltage and connection are stamped on the rating plate.

Direct-on-line starting (DOL):

Y or D winding connections may be used.

For example, 690 VY, 400 VD indicates Y-connection for 690 V and D-connection for 400 V.

Star/Delta (Wye/Delta) starting (Y/D):

The supply voltage of the motor must be equal to the rated voltage when using a D-connection.

Remove all connection straps from the terminal block.

For increased safety motors (Ex e), both direct-on-line and star-delta starting of motors are allowed. In the case of star-delta starting, only Ex-approved equipment is allowed.

Other starting methods and severe starting conditions:

In the case where other starting methods (e.g. converter or soft starter) will be used in the duty types of S1 and S2, it is considered that the device is “isolated from the power system when the electrical machine is running” as in the standard IEC 60079-0 and thermal protection is optional.

4.9.4 Connections of auxiliaries

If a motor is equipped with thermistors or other RTDs (Pt100, thermal relays, etc.) and auxiliary devices, it is recommended they be used and connected by appropriate means. For certain applications, it is mandatory to use thermal protection. More detailed information can be found in the documents delivered with the motor. Connection diagrams for auxiliary elements and connection parts can be found inside the terminal box.

The maximum measuring voltage for the thermistors is 2.5 V. The maximum measuring current for Pt100 is 5 mA. Using a higher measuring voltage or current may cause errors in readings or a damaged temperature detector.

The insulation of thermal sensors fulfills the requirements of basic insulation.

4.10 Terminals and direction of rotation

The shaft rotates clockwise when viewing the shaft face at the motor drive end, and the line phase sequence – L1, L2, L3 – is connected to the terminals as shown in figure 3.

To alter the direction of rotation, interchange any two connections on the supply cables.

If the motor has a unidirectional fan, ensure that it rotates in the same direction as the arrow marked on the motor.

4.11 Protection against overload and stalling

All motors for explosive atmospheres must be protected against overloads, see installation standards IEC/EN 60079-14 and local installation requirements.

For increased safety motors (Ex e), the maximum tripping time for protective devices must not be longer than the time t_E shown on the motor rating plate.

For Ex nA- and Ex t -type of motors, no additional safety devices above normal industrial protection(s) are required.

5. Operation

5.1 General

The motors are designed for the following conditions unless otherwise stated on the rating plate:

- Motors are to be installed in fixed installations only.
- Normal ambient temperature range is from $-20\text{ }^{\circ}\text{C}$ to $+40\text{ }^{\circ}\text{C}$.
- Maximum altitude is 1000 m above sea level.
- The variation of the supply voltage and frequency may not exceed the limits mentioned in relevant standards. Tolerance for supply voltage is $\pm 5\%$, and for frequency $\pm 2\%$ according to Figure 4 (EN / IEC 60034-1, paragraph 7.3, Zone A). Both extreme values are not supposed to occur at the same time.

The motor can only be used in applications for which it is intended. The rated nominal values and operational conditions are shown on the motor rating plates. In addition, all requirements of this manual and other related instructions and standards must be followed.

If these limits are exceeded, motor data and construction data must be checked. Please contact ABB for further information.

Particular attention must be paid to corrosive atmospheres when using flameproof motors; ensure that the paint protection is suitable for the ambient conditions as corrosion can damage the explosion-proof enclosure.

WARNING!

Ignoring any instructions or maintenance of the apparatus may jeopardize safety and thus prevent the use of the machine in explosive atmospheres.

6. Motors for explosive atmospheres and variable speed operation

6.1 Introduction

This part of the manual provides additional instructions for motors, later Ex motors, used in explosive atmospheres in a frequency converter supply. Ex motor is intended to operate from a single frequency converter supply and not motors running in parallel from one frequency converter. In addition to these instructions in this manual, additional instructions provided by the converter manufacturer shall be followed.

ABB manufactured Ex motors; Ex nA, Ex t, Ex d and Ex de have been type tested with ACS800/ACS880 converters in DTC control and ACS550 converters, so these combinations can be selected using the dimensioning instructions provided in Chapter 6.8.2. The minimum switching frequency is 3 kHz for all type of Ex motors and is the basis for the dimensioning guidelines in the following chapters.

6.2 Main requirements according to EN and IEC standards

Flameproof motors Ex d, Ex de

The motor must be dimensioned so that the maximum surface temperature of the motor is limited according to the temperature or temperature class. In most cases, this requires either type tests or controlling the surface temperature of the motor.

If the temperature class T5 or T6 for Ex d or Ex de motor is requested, please contact your local sales office for assistance.

In case of other voltage source converters with pulse width modulation type of control (PWM), combined tests are usually needed to confirm the correct thermal performance of the motor. These tests can be avoided if flameproof motors are equipped with thermal sensors intended for control of surface temperatures. Such motors have the following additional markings on the rating plate: – “PTC” with the tripping temperature and “DIN 44081/82”.

Increased safety motors Ex e

ABB does not recommend the use of random wound low voltage increased safety motors with variable speed drives. This manual does not cover these motors in variable speed drives.

Non-sparking motors Ex nA

The combination of a motor and converter must be tested as a unit or dimensioned by calculation.

In case of other voltage source PWM converters with a minimum switching frequency of 3 kHz or higher, preliminary dimensioning instructions provided in Chapter 6.8.3 in this manual can be used. The final values must be verified by combined tests.

Dust ignition protection motors, Ex t (Ex tD)

The motor must be dimensioned so that the maximum outer surface temperature of the motor is limited according to the temperature class (e.g. T125 °C or T150 °C). For more information on a temperature class lower than 125 °C, please contact ABB.

In case of other voltage source converters with pulse width modulation type of control (PWM), combined tests are usually needed to confirm the correct thermal performance of the motor. These tests can be avoided if Ex t motors are equipped with thermal sensors intended for control of the surface temperatures. Such motors have the following additional markings on the rating plate: – “PTC” with the tripping temperature and “DIN 44081/82”.

In case of voltage source PWM converters with a minimum switching frequency of 3 kHz or higher, instructions provided in Chapter 6.8.3 can be used for preliminary dimensioning.

6.3 Winding insulation

6.3.1 Phase to phase voltages

The maximum allowed phase to phase voltage peaks on the motor terminal as a function of the rise time of the pulse is shown in Figure 5.

The highest curve “ABB Special Insulation” (variant code 405) applies to motors with a special winding insulation for a frequency converter supply.

The “ABB Standard Insulation” applies to all other motors covered by this manual.

6.3.2 Phase to ground voltages

The allowed phase to ground voltage peaks at motor terminals are:

- Standard Insulation 1300 V peak
- Special Insulation 1800 V peak

6.3.3 Selection of winding insulation with frequency converters

The selection of winding insulation and filters can be made according to table below:

Nominal supply voltage U_N of the converter	Winding insulation and filters required
$U_N \leq 500$ V	ABB Standard insulation
$U_N \leq 600$ V	ABB Standard insulation + dU/dt filters OR ABB Special insulation (variant code 405)
$U_N \leq 690$ V	ABB Special insulation (variant code 405) AND dU/dt-filters at converter output

6.4 Thermal protection of windings

All cast iron Ex -motors are equipped with PTC thermistors to prevent the winding temperatures exceeding the thermal limits of used insulation system. In all cases it is recommended to connect them.

NOTE!

If not otherwise indicated on the rating plate, these thermistors do not prevent motor surface temperatures exceeding their temperature classes (T4 or T5).

ATEX-countries:

If the motor certificate requires, the thermistors must be connected to a thermistor circuit relay functioning independently and that is dedicated to reliably trip off the supply to the motor according to the requirements of the "Essential Health and Safety Requirements" in Annex II, item 1.5.1 of the ATEX Directive 94/9/EC or 2014/34/EU.

Non-ATEX countries:

It is recommended that the thermistors are connected to a thermistor circuit relay functioning independently and that is dedicated to reliably trip off the supply to the motor.

NOTE!

According to the local installation rules, it may be possible to also connect the thermistors to equipment other than a thermistor relay; for example, to the control inputs of a frequency converter.

6.5 Bearing currents

Bearing voltages and currents must be avoided in all variable speed applications to ensure the reliability and safety of the application. For this purpose, insulated bearings or bearing constructions, common mode filters and suitable cabling and grounding methods (see chapter 6.6) must be used.

6.5.1 Elimination of bearing currents

The following methods must be used to avoid harmful bearing currents in frequency converter driven motors:

Frame size	
250 and smaller	No actions needed
280 – 315	Insulated non-drive end bearing
355 – 450	Insulated non-drive end bearing AND Common mode filter at the converter

For the exact type of bearing insulation, see the motor's rating plate. Changing the bearing type or insulation method without ABB's permission is prohibited.

6.6 Cabling, grounding and EMC

To provide proper grounding and to ensure compliance with any applicable EMC requirements, motors above 30 kW must be cabled using shielded symmetrical cables and EMC glands, i.e. cable glands providing 360° bonding. Also for smaller motors, symmetrical and shielded cables are highly recommended. Make the 360° grounding arrangement at all cable entries as described in the instructions for the glands. Twist the cable shields into bundles and connect to the nearest ground terminal/ busbar inside the terminal box, converter cabinet, etc.

NOTE!

Proper cable glands providing 360° bonding must be used at all termination points, e.g. at motor, converter, possible safety switch, etc.

For motors of frame size IEC 280 and upward, additional potential equalization between the motor frame and the driven equipment is needed, unless both are mounted on a common steel base. In this case, the high frequency conductivity of the connection provided by the steel base should be checked by, for example, measuring the potential difference between the components.

More information about grounding and cabling of variable speed drives can be found in the manual "Grounding and cabling of the drive system" (Code: 3AFY 61201998) and material on fulfilling the EMC requirements can be found in respective converter manuals.

6.7 Load and speed limitations

6.7.1 General

NOTE!

The maximum speed of the motor must not be exceeded even if the loadability curves are given up to 100 Hz.

6.7.2 Motor loadability with ACS800/880-series of converters with DTC-control

The loadability curves (or load capacity curves) presented in Figures 6 and 7 show the maximum allowed continuous output torque of the motors as a function of supply frequency. The output torque is given as a percentage of the nominal torque of the motor.

6.7.3 Motor loadability with ACS500 –series and other voltage source converters

The loadability curves (or load capacity curves) presented in Figures 10 and 11 show the maximum allowed continuous output torque of the motors as a function of supply frequency. The output torque is given as a percentage of the nominal torque of the motor.

NOTE!

The loadability curves in Figures 10 and 11 are based on 3 kHz switching frequency.

For constant torque applications, the lowest allowed continuous operating frequency is 15 Hz.

For quadratic torque applications, the lowest continuous operating frequency is 5 Hz.

The combination of other voltage source converters than the ACS 500 –series must either be tested or thermal sensors to control the surface temperatures must be connected.

6.7.4 Short time overloads

ABB flameproof motors usually provide a possibility for short time overloading. For exact values, please see the motor's rating plate or contact ABB.

Overloadability is specified by three factors:

I_{OL}	Maximum short time current
T_{OL}	The length of allowed overload period
T_{COOL}	Cooling time required after each overload period. During the cooling period motor current and torque must stay below the limit of allowed continuous loadability.

6.8 Rating plates

A VSD plate is mandatory for variable speed operation and shall contain the necessary data to define the allowed duty range in variable speed operation. At least the following parameters must be shown on the rating plates of motors for explosive atmospheres intended for variable speed operation:

- Duty type
- Type of load (constant or quadratic)
- Type of converter and minimum switching frequency
- Power or torque limitation
- Speed or frequency limitation

6.8.1 Content of standard VSD plate

The standard VSD plate, Figure 14, contains following information:

- Supply voltage or voltage range (VALID FOR) and supply frequency (FWP) of the drive
- Motor type
- Minimum switching frequency for PWM converters (MIN. SWITCHING FREQ. FOR PWM CONV.)
- Limits for short time overloads (I_{OL} , T_{OL} , T_{COOL}), see chapter 6.7.4
- Allowed load torque for DTC controlled ACS800 converters (DTC-CONTROL). The load torque is provided as percent of the nominal torque of the motor.
- Allowed load torque for PWM controlled ACS550 converters (PWM-CONTROL). The load torque is provided as percent of the nominal torque of the motor. See also chapter 6.7.3.

The standard VSD plate requires calculation by the customer to convert the generic data into motor specific data. The hazardous motor catalogue will be required to convert the frequency limits to speed limits, and the torque limits into current limits. Customer specific plates can be requested from ABB if preferred.

6.8.2 Content of customer specific VSD plate

Customer specific VSD plates, Figures 15 and 16, contain application and motor specific data for variable speed application as follows:

- Motor type
- Motor serial number
- Frequency converter type (FC Type)
- Switching frequency (Switc. freq.)
- Field weakening or nominal point of the motor (F.W.P.)
- List of specific duty points
- Type of load (CONSTANT TORQUE, QUADRATIC TORQUE, etc.)
- Speed range
- If the motor is equipped with thermal sensors suitable for direct thermal control, a text "PTC xxx C DIN44081/-82", where "xxx" denotes the tripping temperature of the sensors.

In customer specific VSD plates, the values are for the specific motor and application. The duty point values can in most cases be used for programming the converters' protective functions as such.

6.9 Commissioning the variable speed application

The commissioning of the variable speed application must be done according to the instructions provided in this manual, in the respective frequency converter manuals and local laws and regulations. The requirements and limitations set by the application must also be taken into account.

The most often needed parameters to set up the converter are:

- Motor nominal
 - voltage
 - current
 - frequency
 - speed
 - power

These parameters may be taken from a single line of the standard rating plate fixed on the motor, see Figure 13 for an example.

NOTE!

In the case of missing or inaccurate information, do not operate the motor before ensuring correct settings!

It is recommended to use all suitable protective features provided by the converter to improve the safety of the application. Converters usually provide features such as:

- Minimum speed
- Maximum speed
- Stall protection
- Acceleration and deceleration times
- Maximum current
- Maximum power
- Maximum torque
- User load curve

WARNING

These features are only additional and do not replace the safety functions required by local safety regulations or standards.

6.9.1 Setting parameters based on the VSD plate

Check that the VSD plate is valid for the application in question, i.e. that the supply network corresponds to the data of “FWP” and that the requirements set for the converter are met (type and control type of the converter, as well as the switching frequency)

Check that the load complies with allowed loading for the converter in use.

Feed in the basic start-up data. The basic start-up data needed in converters shall be taken from a rating plate (See Figure 13 for an example). Detailed instructions are available in the manuals of respective frequency converters.

In case of converters supplied by ABB, e.g. ACS800, ACS880, ACS550 etc., all parameter settings can be found from the respective manuals. In all frequency converters, at least the following parameter settings influence motor temperatures; minimum switching frequency, preventing over modulation at and above the field weakening point must be checked.

7. Maintenance

WARNING

Voltage may be connected at standstill inside the terminal box for heating elements or direct winding heating.

WARNING

Standards IEC/EN 60079-17 and -19 relating to repair and maintenance of electrical apparatus in explosive atmospheres must be taken into consideration. Only competent personnel acquainted with these standards should handle this type of apparatus.

Depending on the nature of the work in question, disconnect and lock out before working on motor or driven equipment. Ensure no explosive gas or dust is present while work is in progress.

IEC/EN 60079-17 is not applicable for M3JM and M3KM motors.

7.1 General inspection

1. For inspection and maintenance, use standards IEC/EN 60079-17 (especially tables 1-4) as a guideline.
2. Inspect the motor at regular intervals. The frequency of checks depends on, for example, the humidity level of the ambient air and on the local weather conditions. This can initially be determined experimentally and must then be strictly adhered to.
3. Keep the motor clean and ensure free ventilation airflow. If the motor is used in a dusty environment, the ventilation system must be regularly checked and cleaned.
4. Check the condition of shaft seals (e.g. V-ring or radial seal) and replace if necessary.
5. For Ex t motors, carry out a detailed inspection according to IEC/EN 60079-17 table 4 with a recommended interval of 2 years or 8,000 h.
6. Check the condition of the connections, and mounting and assembly bolts.
7. Check the bearing condition by listening for any unusual noise, vibration measurement, bearing temperature, inspection of spent grease or SPM bearing monitoring. Pay special attention to bearings when their calculated rated life time is coming to an end.

When signs of wear are noticed, dismantle the motor, check the parts and replace if necessary. When bearings are changed, replacement bearings must be of the same type as those originally fitted. The shaft seals have to be replaced with seals of the same quality and characteristics as the originals when changing the bearings.

For flameproof motors, periodically open the drain plug, if equipped, by turning it counterclockwise, tap it to check free operation and close it by pressing and screwing it clockwise. This operation must be done when the motor is at standstill. The frequency of checks depends on the humidity level of the ambient air and on the local weather conditions. This can initially be determined experimentally and must then be strictly adhered to.

In the case of the IP 55 motor and when the motor has been delivered with a plug closed, it is advisable to periodically open the drain plugs in order to ensure that the way out for condensation is not blocked and allows condensation to escape from the motor. This operation must be done when the motor is at a standstill and has been made safe to work on

7.1.1 Standby motors

If the motor is in standby for a longer period of time on a ship or in other vibrating environment the following measures have to be taken:

1. The shaft must be rotated regularly every 2 weeks (to be reported) by means of starting of the system. In case a startup is not possible, for any reason, at least the shaft has to be turned by hand in order to achieve a different position once a week. Vibrations caused by other vessel equipment will cause bearing pitting which should be minimized by regular operation/hand turning.
2. The bearing must be greased while rotating the shaft every year (to be reported). If the motor has been provided with roller bearing at the driven end, the transport lock must be removed before rotating the shaft. The transport locking must be remounted in case of transportation.
3. All vibrations must be avoided to prevent a bearing from failing. All instructions in the motor instruction manual for commissioning and maintenance have to be followed. The warranty will not cover the winding and bearing damages if these instructions have not been followed.

7.2 Lubrication

WARNING

Beware of all rotating parts.

WARNING

Grease can cause skin irritation and eye inflammation. Follow all safety precautions specified by the manufacturer of the grease.

Bearing types are specified in the respective product catalogs and on the rating plate of all motors except smaller frame sizes.

Reliability is a vital issue for bearing lubrication intervals. ABB uses the L1-principle (i.e. that 99 % of the motors are certain to make the life time) for lubrication.

7.2.1 Motors with permanently greased bearings

Bearings are usually permanently greased bearings of 1Z, 2Z, 2RS or equivalent.

As a guide, adequate lubrication for sizes up to 250 can be achieved for the following duration, according to L_1 . For duties with higher ambient temperatures, please contact ABB. The informative formula to change the L_1 values roughly to L_{10} values: $L_{10} = 2.7 \times L_1$.

Duty hours for permanently greased bearings at ambient temperatures of 25 °C and 40 °C are:

Frame size	Poles	Duty hours at 25 °C	Duty hours at 40 °C
71	2	67 000	42 000
71	4 – 8	100 000	56 000
80-90	2	100 000	65 000
80-90	4 – 8	100 000	96 000
100-112	2	89 000	56 000
100-112	4 – 8	100 000	89 000
132	2	67 000	42 000
132	4 – 8	100 000	77 000
160	2	60 000	38 000
160	4 – 8	100 000	74 000
180	2	55 000	34 000
180	4 – 8	100 000	70 000
200	2	41 000	25 000
200	4 – 8	95 000	60 000
225	2	36 000	23 000
225	4 – 8	88 000	56 000
250	2	31 000	20 000
250	4 – 8	80 000	50 000

Data is valid up to 60 Hz.

7.2.2 Motors with re-greasable bearings

Lubrication information plate and general lubrication advice

If the machine is equipped with a lubrication information plate, follow the given values.

Greasing intervals regarding mounting, ambient temperature and rotational speed are defined on the lubrication information plate.

During the first start or after a bearing lubrication, a temporary temperature rise may appear, approximately 10 to 20 hours.

Some motors may be equipped with a collector for old grease. Follow the special instructions given for the equipment.

After re-greasing a Ex t motor, clean the motor end shields so they are free of any dust layer.

A. Manual lubrication

Re-greasing while the motor is running

- Remove grease outlet plug or open closing valve if fitted.
- Be sure that the lubrication channel is open
- Inject the specified amount of grease into the bearing.
- Let the motor run for 1-2 hours to ensure that all excess grease is forced out of the bearing. Close the grease outlet plug or closing valve if fitted.

Regreasing while the motor is at a standstill

If it is not possible to re-grease the bearings while the motors are running, lubrication can be carried out while the machine is at a standstill.

- In this case use only half the quantity of grease and then run the motor for a few minutes at full speed.
- When the motor has stopped, apply the rest of the specified amount of grease to the bearing.
- After 1–2 running hours, close the grease outlet plug or closing valve if fitted.

B. Automatic lubrication

The grease outlet plug must be removed permanently with automatic lubrication or open closing valve if fitted.

ABB recommends only the use of electromechanical systems.

The amount of grease per lubrication interval stated in the table should be multiplied by three if a central lubrication system is used. When using a smaller automatic re-grease unit (one or two cartridges per motor) the normal amount of grease can be used.

When 2-pole motors are automatically re-greased, the note concerning lubricant recommendations for 2-pole motors in the Lubricants chapter should be followed.

The used grease should be suitable for automatic lubrication. The automatic lubrication system deliverer and the grease manufacturer's recommendations should be checked.

Calculation example of amount of grease for automatic lubrication system

Central lubrication system: Motor IEC M3_P 315_ 4-pole in 50 Hz network, re-lubrication interval according to table below is 7600 h/55 g (DE) and 7600 h/40g (NDE):

(DE) RLI = $55 \text{ g}/7600\text{h} \cdot 3 \cdot 24 = 0,52 \text{ g/day}$

(NDE) RLI = $40 \text{ g}/7600\text{h} \cdot 3 \cdot 24 = 0,38 \text{ g/day}$

Calculation example of amount of grease for single automation lubrication unit (cartridge)

(DE) RLI = $55 \text{ g}/7600 \text{ h} \cdot 24 = 0,17 \text{ g/day}$

(NDE) RLI = $40 \text{ g}/7600 \text{ h} \cdot 24 = 0,13 \text{ g/day}$

RLI = Re-lubricaion interval, DE = Drive end, NDE = Non drive end

7.2.3 Lubrication intervals and amounts

Lubrication intervals for vertical machines are half of the values shown in the table below.

As a guide, adequate lubrication can be achieved for the following duration, according to L1. For duties with higher ambient temperatures please contact ABB. The informative formula to change the L1 values roughly to L10 values is: $L10 = 2.0 \times L1$ with manual lubrication

The lubrication intervals are based on a bearing operating temperature of 80 °C (ambient temperature +25 °C).

NOTE!

An increase in the ambient temperature raises the temperature of the bearings correspondingly. The interval values should be halved for a 15 °C increase in bearing temperature and may be doubled for a 15 °C decrease in bearing temperature.

Higher speed operation, e.g. in frequency converter applications, or lower speed with heavy load will require shorter lubrication intervals.

WARNING

The maximum operating temperature of the grease and bearings, +110°C, must not be exceeded.

The designed maximum speed of the motor must not be exceeded.

Ball bearings

Frame size	Amount of grease DE-bearing [g]	Amount of grease NDE-bearing [g]	3600 r/min	3000 r/min	1800 r/min	1500 r/min	1000 r/min	500-900 r/min
Lubrication intervals in duty hours								
160	13	13	7 100	8 900	14 300	16 300	20 500	21 600
180	15	15	6 100	7 800	13 100	15 100	19 400	20 500
200	20	15	4 300	5 900	11 000	13 000	17 300	18 400
225	23	20	3 600	5 100	10 100	12 000	16 400	17 500
250	30	23	2 400	3 700	8 500	10 400	14 700	15 800
280	35	35	1 900	3 200	–	–	–	–
280	40	40	–	–	7 800	9 600	13 900	15 000
315	35	35	1 900	3 200	–	–	–	–
315	55	40	–	–	5 900	7 600	11 800	12 900
355	35	35	1 900	3 200	–	–	–	–
355	70	40	–	–	4 000	5 600	9 600	10 700
400	40	40	1 500	2 700	–	–	–	–
400	85	55	–	–	3 200	4 700	8 600	9 700
450	40	40	1 500	2 700	–	–	–	–
450	95	70	–	–	2 500	3 900	7 700	8 700

Roller bearings

Frame size	Amount of grease DE-bearing [g]	Amount of grease NDE-bearing [g]	3600 r/min	3000 r/min	1800 r/min	1500 r/min	1000 r/min	500-900 r/min
Lubrication intervals in duty hours								
160	13	13	3 600	4 500	7 200	8 100	10 300	10 800
180	15	15	3 000	3 900	6 600	7 500	9 700	10 200
200	20	15	2 100	3 000	5 500	6 500	8 600	9 200
225	23	20	1 800	1 600	5 100	6 000	8 200	8 700
250	30	23	1 200	1 900	4 200	5 200	7 300	7 900
280	35	35	900	1 600	–	–	–	–
280	40	40	–	–	4 000	5 300	7 000	8 500
315	35	35	900	1 600	–	–	–	–
315	55	40	–	–	2 900	3 800	5 900	6 500
355	35	35	900	1 600	–	–	–	–
355	70	40	–	–	2 000	2 800	4 800	5 400
400	40	40	–	1300	–	–	–	–
400	85	55	–	–	1 600	2 400	4 300	4 800
450	40	40	–	1 300	–	–	–	–
450	95	70	–	–	1 300	2 000	3 800	4 400

7.2.4 Lubricants

WARNING

Do not mix different types of grease.

Incompatible lubricants may cause bearing damage.

When regreasing, use only special ball bearing grease with the following properties:

- good quality grease with lithium complex soap and with mineral- or PAO-oil
- base oil viscosity 100-160 cST at 40 °C
- consistency NLGI grade 1.5 – 3 *)
- temperature range –30 °C – +140 °C, continuously.

*) A stiffer end of scale is recommended for vertical mounted motors or in hot conditions..

The above mentioned grease specification is valid if the ambient temperature is above –30 °C or below +55 °C, and the bearing temperature is below 110 °C, otherwise consult ABB regarding suitable grease.

Grease with the correct properties is available from all major lubricant manufacturers.

Admixtures are recommended, but a written guarantee must be obtained from the lubricant manufacturer, especially concerning EP admixtures, that admixtures do not damage bearings or the properties of lubricants at the operating temperature range.

WARNING

Lubricants containing EP admixtures are not recommended in high bearing temperatures in frame sizes 280 to 450.

The following high performance greases can be used:

- Mobil Unirex N2 or N3 (lithium complex base)
- Mobil Mobilith SHC 100 (lithium complex base)
- Shell Gadus S5 V 100 2 (lithium complex base)
- Klüber Klüberplex BEM 41-132 (special lithium base)
- FAG Arcanol TEMP110 (lithium complex base)
- Lubcon Turmogrease L 802 EP PLUS (special lithium base)
- Total Multiplex S2 A (lithium complex base)
- Rhenus Rhenus LKZ 2 (lithium complex base)

NOTE!

Always use high speed grease for high speed 2-pole machines where the speed factor is higher than 480,000 (calculated as $D_m \times n$ where D_m = average bearing diameter, mm; n = rotational speed, r/min).

The following greases can be used for high speed cast iron motors but not mixed with lithium complex greases:

- Klüber Klüber Quiet BQH 72-102 (polyurea base)
- Lubcon Turmogrease PU703 (polyurea base)

If other lubricants are used, check with the manufacturer that the qualities correspond to those of the above mentioned lubricants. The lubrication intervals are based on the listed high performance greases above. Using other greases can reduce the interval.

8. After Sales support

8.1 Spare parts

Unless otherwise stated, spare parts must be original parts or approved by ABB.

Requirements in standard IEC/EN 60079-19 must be followed.

When ordering spare parts, the motor's serial number, full type designation and product code, as stated on the rating plate, must be specified.

8.2 Dismantling, re-assembly and rewinding

Follow the instructions given in standard IEC/EN 60079-19 regarding dismantling, re-assembly and rewinding. **Any operation must be undertaken by the manufacturer, i.e. ABB, or by an ABB authorized repair partner.**

No manufacturing alterations are permitted on the parts that make up the explosion-proof enclosure and the parts that ensure dust-tight protection. Also ensure that the ventilation is never obstructed.

Rewinding must always be carried out by an ABB authorized repair partner.

8.3 Bearings

Special care should be taken with the bearings.

These must be removed using pullers and fitted by heating or using special tools.

Bearing replacement is described in detail in a separate instruction leaflet available from the ABB Sales Office. Special recommendations apply when changing the bearings of dust ignition protection Ex t-motors (as the seals should be changed at the same time).

Any directions placed on the motor, such as labels, must be followed. The bearing types indicated on the rating plate must not be changed.

NOTE!

Any repair by the end user, unless expressly approved by the manufacturer, releases the manufacturer from responsibility to conformity.

8.4 Gaskets and sealing

Terminal boxes others than Ex d boxes are equipped with tested and approved sealing. When gaskets and/or sealing need to be renewed, they have to be replaced by original spare parts.

9. Environmental requirements

Most of ABB's motors have a sound pressure level not exceeding 82 dB(A) (± 3 dB) at 50 Hz.

Values for specific machines can be found in the relevant product catalogs. At 60 Hz, sinusoidal supply the values are approximately 4 dB(A) higher compared to 50 Hz values stated in the product catalogs.

For sound pressure levels at frequency converter supplies, please contact ABB.

When motor(s) need to be scrapped or recycled, appropriate means, local regulations and laws must be followed.

10. Troubleshooting

These instructions do not cover all details or variations in equipment nor provide information for every possible condition to be met in connection with installation, operation or maintenance. Should additional information be required, please contact the nearest ABB Sales Office.

Motor troubleshooting chart

Your motor service and any troubleshooting must be handled by qualified persons who have the proper tools and equipment.

TROUBLE	CAUSE	WHAT TO DO
Motor fails to start	Blown fuses	Replace fuses with proper type and rating.
	Overload trips	Check and reset overload in starter.
	Improper power supply	Check to see that power supplied agrees with motor rating plate and load factor.
	Improper line connections	Check connections against diagram supplied with motor.
	Open circuit in winding or control switch	Indicated by humming sound when switch is closed. Check for loose wiring connections and ensure that all control contacts are closing.
	Mechanical failure	Check to see if motor and drive turn freely. Check bearings and lubrication.
	Short circuited stator Poor stator coil connection	Indicated by blown fuses. Motor must be rewound. Remove end shields and locate fault.
	Rotor defective	Look for broken bars or end rings.
	Motor may be overloaded	Reduce load.
Motor stalls	One phase may be open	Check lines for open phase.
	Wrong application	Change type or size. Consult equipment supplier.
	Overload	Reduce load.
	Low voltage	Ensure the rating plate voltage is maintained. Check connection.
	Open circuit	Fuses blown. Check the overload relay, stator and push buttons.
Motor runs and then dies down	Power failure	Check for loose connections to line, fuses and control.
Motor does not accelerate up to nominal speed	Not applied properly	Consult equipment supplier for proper type.
	Voltage too low at motor terminals because of line drop	Use higher voltage or transformer terminals or reduce load. Check connections. Check conductors for proper size.
	Starting load too high	Check the motor's starts against "no load".
	Broken rotor bars or loose rotor	Look for cracks near the rings. A new rotor may be required as repairs are usually temporary.
	Open primary circuit	Locate fault with testing device and repair.

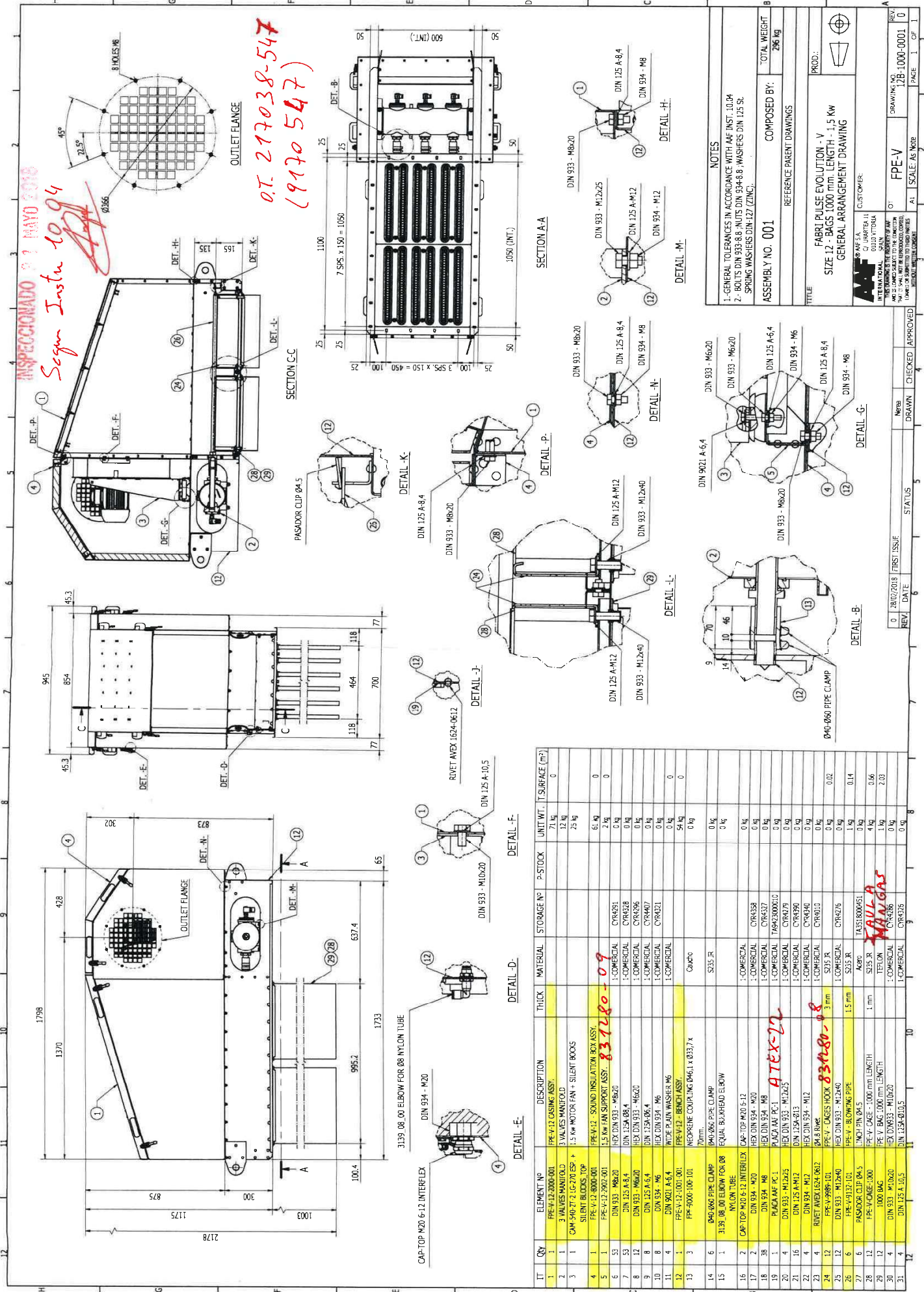
TROUBLE	CAUSE	WHAT TO DO
Motor takes too long to accelerate and/or draws high current	Excessive load	Reduce load.
	Low voltage during start	Check for high resistance. Make sure that an adequate cable size is used.
	Defective squirrel cage rotor	Replace with a new rotor.
	Applied voltage too low	Correct power supply.
Wrong rotation direction	Wrong sequence of phases	Reverse connections at motor or at switchboard.
Motor overheats while running	Overload	Reduce load.
	Frame or ventilation openings may be full of dirt and prevent proper ventilation of motor	Open vent holes and check for a continuous stream of air from the motor.
	Motor may have one phase open	Check that all leads and cables are well connected.
	Grounded coil	Motor must be rewound.
	Unbalanced terminal voltage	Check for faulty leads, connections and transformers.
Motor vibrates	Motor misaligned	Realign.
	Weak support	Strengthen base.
	Coupling out of balance	Balance coupling.
	Driven equipment unbalanced	Rebalance driven equipment.
	Defective bearings	Replace bearings.
	Bearings not in line	Repair motor.
	Balancing weights shifted	Rebalance rotor.
	Contradiction between balancing of rotor and coupling (half key – full key)	Rebalance coupling or rotor.
	Poly-phase motor running single phase	Check for open circuit.
	Excessive end play	Adjust bearing or add shim.
Scraping noise	Fan rubbing end shield or fan cover	Correct fan mounting.
	Loose on bedplate	Tighten holding bolts.
Noisy operation	Air gap not uniform	Check and correct end shield fits or bearing fits.
	Rotor unbalance	Rebalance rotor.

TROUBLE	CAUSE	WHAT TO DO
Hot bearings	Bent or sprung shaft	Straighten or replace shaft.
	Excessive belt pull	Decrease belt tension.
	Pulleys too far away from shaft shoulder	Move pulley closer to motor bearing.
	Pulley diameter too small	Use larger pulleys.
	Misalignment	Correct by realigning the drive.
	Insufficient grease	Maintain proper quality and amount of grease in bearing.
	Deterioration of grease or lubricant contaminated	Remove old grease, wash bearings thoroughly in kerosene and replace with new grease.
	Excess lubricant	Reduce quantity of grease: bearing should not be more than half full.
	Overloaded bearing	Check alignment, side and end thrust.
	Broken ball or rough races	Clean housing thoroughly, and then replace bearing.

INSPECCIONADO 27 MAYO 2018

Segun Instru 1094

O.T. 217038-547
(19170 547)



NOTES	
1- GENERAL TOLERANCES IN ACCORDANCE WITH AAE INST. 10.04	
2- BOLTS DIN 933-8.8, NUTS DIN 934-8.8, WASHERS DIN 125-5, SPRING WASHERS DIN-127 (ZINC).	
ASSEMBLY NO. 001	COMPOSED BY:
REFERENCE PARENT DRAWINGS	
TOTAL WEIGHT 206 kg	
PROD:	
TITLE	
FABRI PULSE EVOLUTION - V	
SIZE 12 - BAGS 1000 mm LENGTH - 1.5 KW	
GENERAL ARRANGEMENT DRAWING	
CUSTOMER	
AAE	
INSTRUMENTAL: 0010 VITORIA	
AAE IS LOANED SUBJECT TO THE COMPANY'S POLICY OF NOT BEING LOANED TO OTHER COMPANIES WITHOUT WRITTEN CONSENT	
REV	DATE
0	28/02/2018
1	01/03/2018
2	01/03/2018
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100	01/03/2018

IT	Qty	ELEMENT NO	DESCRIPTION	THICK	MATERIAL	STORAGE NO	P-STOCK	UNIT WT.	SURFACE (m²)
1	1	PRE-V-12-2000-001	PRE-V-12 CASING ASSY.					71 kg	0
2	1	3 VALVES MANIFOLD	3 VALVES MANIFOLD					12 kg	0
3	1	3 VALVES MOTOR FAN + SILENT ROOMS	1.5 KW MOTOR FAN + SILENT ROOMS					25 kg	0
4	1	PRE-V-12-2000-001	PRE-V-12 SOUND INSULATION BOX ASSY.					61 kg	0
5	1	PRE-V-12-2000-001	PRE-V-12-2000-001					2 kg	0
6	53	DIN 933 - M8x20	HEX DIN 933 - M8x20		1-COMERCIAL	CR4051		0 kg	0
7	53	DIN 933 - M8x20	HEX DIN 933 - M8x20		1-COMERCIAL	CR4052		0 kg	0
8	12	DIN 125 A-8.4	HEX DIN 125 A-8.4		1-COMERCIAL	CR4056		0 kg	0
9	8	DIN 933 - M12x40	HEX DIN 933 - M12x40		1-COMERCIAL	CR4057		0 kg	0
10	8	DIN 934 - M6	HEX DIN 934 - M6		1-COMERCIAL	CR4057		0 kg	0
11	4	DIN 9021 A-5.4	WIDE PLAIN WASHER M6		1-COMERCIAL	CR4057		0 kg	0
12	1	PRE-V-12-1001-001	PRE-V-12 - BENCH ASSY.					54 kg	0
13	3	PRE-V-12-1001-001	NEOPRENE COUPLING P46.1 x Ø33.7 x 70mm		CAU-20			0 kg	0
14	6	Ø40-Ø60 PIPE CLAMP	Ø40-Ø60 PIPE CLAMP		S235 JR			0 kg	0
15	1	3139 Ø8.00 ELBOW FOR Ø8 NYLON TUBE	3139 Ø8.00 ELBOW FOR Ø8 NYLON TUBE		S235 JR			0 kg	0
16	2	Ø40-Ø60 PIPE CLAMP	Ø40-Ø60 PIPE CLAMP		1-COMERCIAL	CR4058		0 kg	0
17	2	Ø40-Ø60 PIPE CLAMP	Ø40-Ø60 PIPE CLAMP		1-COMERCIAL	CR4058		0 kg	0
18	38	DIN 934 - M8	HEX DIN 934 - M8		1-COMERCIAL	CR4058		0 kg	0
19	38	DIN 934 - M8	HEX DIN 934 - M8		1-COMERCIAL	CR4058		0 kg	0
20	1	Ø40-Ø60 PIPE CLAMP	Ø40-Ø60 PIPE CLAMP		1-COMERCIAL	CR4058		0 kg	0
21	16	DIN 933 - M12x40	HEX DIN 933 - M12x40		1-COMERCIAL	CR4058		0 kg	0
22	4	DIN 934 - M12	HEX DIN 934 - M12		1-COMERCIAL	CR4058		0 kg	0
23	4	RIVET AWEX 1024-0612	RIVET AWEX 1024-0612		1-COMERCIAL	CR4058		0 kg	0
24	12	DIN 933 - M12x40	HEX DIN 933 - M12x40		1-COMERCIAL	CR4058		0 kg	0
25	12	DIN 933 - M12x40	HEX DIN 933 - M12x40		1-COMERCIAL	CR4058		0 kg	0
26	6	PASADOR CLIP Ø4.5	PASADOR CLIP Ø4.5		1-COMERCIAL	CR4058		0 kg	0
27	6	PASADOR CLIP Ø4.5	PASADOR CLIP Ø4.5		1-COMERCIAL	CR4058		0 kg	0
28	12	1000 BAG	1000 BAG		1-COMERCIAL	CR4058		0 kg	0
29	12	1000 BAG	1000 BAG		1-COMERCIAL	CR4058		0 kg	0
30	4	DIN 933 - M12x40	HEX DIN 933 - M12x40		1-COMERCIAL	CR4058		0 kg	0
31	4	DIN 125 A-10.5	HEX DIN 125 A-10.5		1-COMERCIAL	CR4058		0 kg	0

AAE

AAE

AAE

AAF[®]

INTERNATIONAL



II 3 D C 135°C

**Urarte, 11 Ali-Gobeo
01010 Vitoria (España)
TEL: (+34) 945 24 18 00**



**PRODUCTO:
PRODUCT:**

FABRI PULSE

**MODELO:
MODEL:**

EV

**DISPOSICION:
DISPOSITION:**

B

**TAMAÑO:
SIZE:**

12-10

**AÑO:
YEAR:**

2018

**Nº SERIE:
SERIAL Nº:**

118801-EV

**Nº CONTROL:
CONTROL Nº:**

217038-547

FC-5601A

FILTER

PC 21-C



II 3 D C 135°C



Urartea, 11 Ali-Gobeo
01010 Vitoria (España)
TEL.: (+34) 945 24 18 00

PRODUCTO:
PRODUCT:

FABRI PULSE

MODELO:
MODEL:

EV

DISPOSICION:
DISPOSITION:

B

TAMAÑO:
SIZE:

12-10

AÑO:
YEAR:

2018

Nº SERIE:
SERIAL Nº:

118800-EV

Nº CONTROL:
CONTROL Nº:

217038-547

FC-5601B

FILTER

PC 21-C