

ALSTOM	Power	ARAUCO ESP for Power Boiler	BR- 402D824	
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Written by: Salvatore Ingui/WG		APPROVED BY: Adolfo B. Martinez		DATE 4/6/2003

3 TECHNICAL DATA

3.1 Specification of parts

One (1) ALSTOM ELECTROSTATIC PRECIPITATOR PLANT, type FTA, consisting of one precipitator casing with two (2) electrical fields in series. Precipitator plant mainly comprises:

- 1 PRECIPITATOR CASING as prefabricated panels made of 5 mm carbon steel,
- 1 set of SUPPORT BEARINGS including plates for the precipitator casing support, which allows unrestricted thermal expansion in all directions,
- 1 INLET FUNNEL as prefabricated panels for the precipitator casing, constructed of 5 mm carbon steel,
- 1 set of DOBLE GAS DISTRIBUTION SCREENS located at the inlet of the precipitator,
- 1 OUTLET FUNNEL as prefabricated panels for the precipitator casing, constructed of 5 mm carbon steel,
- 1 set of SINGLE GAS DISTRIBUTION SCREENS located at the outlet of the precipitator,
- 1 set of STEEL OUTER ROOFS as panels, constructed in 5 mm carbon steel,
- 1 set of HINGED INSPECTION DOORS,
- 2 EMITTING SYSTEMS comprising rigid framework delivered as separate parts with emitting electrodes of the MULTYPEAK type, high voltage support insulators and bushing insulators,
- 2 RAPPING MECHANISMS for the emitting electrodes with insulating shaft including drive arrangement with gear reducer and motor,
- 2 sets of COLLECTING ELECTRODES with suspension arrangement, plate thickness 1,5 mm,
- 2 RAPPING MECHANISMS for collecting electrodes including drive arrangement with gear reducer and motor,
- 1 sets of HEATING ELEMENTS for support insulators and insulating shafts

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- 1 sets of HEATING ELEMENTS for bottom hoppers,
- 1 sets of GAS SCREENING PLATES to prevent gas leakage,
- 2 HIGH VOLTAGE SILICON DIODE TRANSFORMER-RECTIFIERS,
- 2 OIL TROUGHS for transformer-rectifiers,
- 2 CONTROL CUBICLES for transformer-rectifiers, each equipped with ALSTOM microprocessor based EPIC II emission optimization and control unit, including one common remote terminal unit RTUs for all T/Rs,
- 2 HIGH-VOLTAGE BUS DUCT CONNECTIONS between the rectifiers and the emitting system,
- 1 Set of AUXILIARY EQUIPMENT comprising grounding rods and signs.
- 1 set of KEY INTERLOCKING SYSTEMS
- 1 AIR FLUSHING SYSTEM with fan, motor, ducts and heating unit for support insulators and insulating shafts,
- 1 DUST CONVEYOR, chain type, complete with drive arrangement, gear reducer and motor,
- 2 ROTARY FEEDERS, complete with drive arrangement, gear reducer and motor,
- 2 SLIDE GATE VALVE, manual operation with limit switches

The specified parts are in accordance with ALSTOM's standards. The specification for the various parts defined in the "Specification of Parts" and their relationship may be changed by ALSTOM Finland, it being understood that all changes shall result in the performance that shall meet the standards set by ALSTOM.

Surface treatment uninsulated parts:

Sa 2,5 + E 180

Insulated parts:

Transport protection

Standard components:

Manufacturer's standard surface treatment

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3.2 Initial and limit data

INITIAL DATA

Fuel specification		Bark & Sawdust	
Boiler type		Fluidized Bed Boiler	
Load case	%MCR	100	
Chambers in use	Pcs	2	
Flue gas flow, wet	Nm ³ /s	27,19	(calculated value)
	m ³ /s	48,4	(actual value)
Flue gas temperature	°C	200	
Operating pressure	Pa	-2000	Estimated
Flue gas flow, wet	m ³ /s	170,0	
Flue gas H ₂ O-content	vol-%	34,1	
Unburnt fuel in ash	%	<10	Estimated
Flue gas O ₂ -content	Vol-%	3,6	
Dust concentration before precipitator, wet gas, ac- tual-O ₂	g/Nm ³	5,0	
Dust concentration before precipitator, dry gas, 5%-O ₂	g/Nm ³	7,81	
Outlet dust concentration dry gas , 5%-O ₂	mg/N m ³	100	
Collecting efficiency	%	92,72	

LIMIT DATA, under which operation of the precipitator is possible without any mechanical disturbances

Flue gas temperature		
- min.	Sufficiently above dew point	
- max.	°C	250
- static pressure	Pa	± 5000
- Unburnt carbon in fly ash		max 10% w

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3.3 Precipitator data

Number of casings	Pcs	1
Number of fields per casing	Pcs	2
Number of hoppers per casing	Pcs	2
Material of casing		ASTM – A - 36
Material of hoppers		ASTM – A - 36
Pressure drop		
100% MCR	Pa	< 220
Total power consumption for T/R's		
100% MCR	kVA	2 x 43
Rating of rectifiers/chamber		
field 1	kV/mA	110/400
field 2	kV/mA	110/400
Emitting electrodes		
-type	Multipeak	
-material	DIN 2394	
Collecting electrodes		
-type	profiled plate, 750 mm	
-material	SS 1142-32	
-plate thickness	mm	1,25
-collecting area	m ²	1684,8
-effective height of field	m	9,0
-effective length of field	m	2 x 3,6
-effective width of chamber	m	5,2
-number of gas passages	Pcs	13
Collecting chain conveyor (inclined)		
-chain conveyor	Pcs	1
-number of drives	Pcs	1
-material		Carbon steel
Retention time	s	6,96
Gas velocity	m/s	1,03
Rotary feeders		
-Rotary feeders	Pcs	2
-number of drives	Pcs	2
-material		Corten (rotor)

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3.4 List of motors

Installed power for T/R set	kVA	2 x 43
Charging electrode rapping system 0,37 kW gear motor, 1 rpm	A	1,15
Collecting electrode rapping system 0,37 kW gear motor, 1 rpm	A	1,15
Heating elements for the support insulators 1,0 kW / insulator	A	21,1
Heating elements for the insulator shafts 1,0 kW / insulator shaft	A	5,6
Heating elements for bottom hoppers 6,0 kW / hopper	A	31,5
Air flushing system fan motors 1 x 2,2 kW	A	4,9
heating resistors 1 x 13,0 kW	A	34,2
Drive for dust conveyors 1,5 kW / conveyor	A	3,4
Rotary feeder 0,75 kW / feeder	kW	18,0

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3.5 Conditions for availability guarantee

The guarantee presupposes that the purchaser has spare parts in the extent recommended by the supplier, and that the purchaser's normal repair personnel are available.

Normal shutdowns are efficiently utilized by the supplier for carrying out service and maintenance measures as stated in the instructions for operation and maintenance.

The time of breakdowns caused by the fact that the plant has been operated against the instructions, and time when the plant is out of operation for reasons due to the purchaser, including e.g. planned rebuilds or productional and economical reasons, are not considered as operating interruptions.

The purchaser is obliged, at his own initiative, together with the supplier, to try to continue the operation and to reduce the interruptions to the minimum. The purchaser shall also keep a record of the breakdowns and operating interruptions, and report them to the supplier. Any unreported breakdowns or operating interruptions are not included in the availability guarantee.

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3.6 Guarantee

The seller gives a guarantee on the electrostatic precipitator as provided in the contract, concerning performance data, durability of the equipment and faultlessness of the materials.

The guarantee presupposes that the precipitator is maintained and inspected according to the instructions for operation and maintenance, and that inspections and maintenance work are recorded in a logbook so that the measures taken are documented for later examination.

The logbook could be like this:

LOGBOOK

Date	Maintenance	Supervisor
dd.mm.yyyy	Internal inspection and cleaning of the Electrostatic precipitator. All internals have been inspected visually and the rappers tested for approx. 5 min each. According to a visual inspection, the distances between the electrode systems are correct, and there are no dust deposits on the electrodes. The salt conveyors have been tested for approximately 30 min, and they work normally. The work was completed at 16.00.	N.N
dd.mm.yyyy	The precipitator was started up at 02.00. All the equipment works normally.	H.H