

EB90 Technical Specification

# EB90 Electric Boiler

Medium Voltage Package Steam Boiler



  
COCHRAN

# EB90 Medium Voltage Steam Boiler

The COCHRAN EB90 MEDIUM VOLTAGE PACKAGE STEAM BOILER is built to BS EN12953 with independent inspection by British Engineering Services (BES) and UKCA or UKNI marked as appropriate (see footnote).

This boiler model has a steam output range of 3,000 to 15,000 kg/hr F&A 100°C using resistance heating element technology.

It complies with the requirements of the Factories Act (1961) and Arrangement 3 of Guidance on Safe Operation of Boilers Ref: BG01 and/or BG13 developed by the Safety Assessment Federation (SAFED) and the Combustion Engineering Association (CEA), the latter being the acceptance criteria for compliance with HSE and UK Inspection Authority requirements. In addition, it meets the requirements of:

- Pressure Equipment Directive
- Low Voltage Directive
- Electro-Magnetic Compliance Directive
- Machinery Safety Directive

Throughout the manufacturing process, in addition to the inspection carried out by BES, COCHRAN apply their own quality procedures that comply with the requirements of ISO 9001.

The following schedules detail the specification of the Boiler proposed in our tender.

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**Note:** Boilers destined for markets within the EU will be CE marked as appropriate.

# Schedule 1: Boiler Pressure Parts

## General

All material used in the construction of the boiler is cut and profiled by computer controlled equipment. The shell plates are then rolled, assembled, machine welded and subjected to NDT (either radiographic or ultrasonic) to ensure compliance with the latest construction standard requirements.

Tube plates are drilled by computer controlled equipment to ensure the correct ligament is maintained and a satisfactory tube hole finish is achieved.

Stay bars are fitted to ensure that stressing of tube plates are within construction code limits.

## Boiler Shell

**Access and Inspection:** For inspection purposes, openings are provided to gain access to the steam/water side of the boiler:

One	420x320mm elliptical manway opening is provided on the top of the boiler.
Two	320x220mm elliptical headhole openings are provided in the lower quadrants toward the rear of the boiler, one provided on each side.
One	125x90mm elliptical handhole opening is provided in the rear tubeplate.

## Seatings

Mountings and controls are fitted to pads, standpipes and bosses welded to boiler shell.

## Materials, Specification, Shell and Shell Attachments:

Shell and Tube Plates:	BS EN 10025-2 P265 GH
Stay Bars:	BS EN 10273 P235 GH
Mandoor Head Holes Muddoor Lifting Lug:	BS EN 10025-2 P265 GH
Pads (Valves):	BS EN 10025-2 P265 GH
Standpipes:	ASTM A106 GR B



## Schedule 2: Boiler-Mounted Fabrications

### Casings, Insulation and Supports

#### Insulation and Sheeting

The boiler shell is insulated with 100mm thick high density insulation to reduce radiation loss then clad in 0.7mm thick Embossed Aluzinc sheeting. Tubeplates, pads and standpipe penetrations are finished with Aluzinc collars.

To aid access for inspection purposes inspection doors and valves are not provided with insulation, this is available on request as an added option. Pipework is provided uninsulated as the client may find it easier to insulate on site with other connecting pipework between the package and the system.

#### Supports

Boiler supports are fabricated as an all-welded structure fabricated from suitably sized hollow sections, incorporating outriggers which are welded or bolted as appropriate for the boiler feed pump and control panel.

Jacking points are provided on the support structure to assist in offloading, positioning and manoeuvring the boiler.

#### Ladders and Platform (Optional Extra)

Access ladder and platform is fitted to allow access to top of boiler and safety valve.

The ladder incorporates safety hoops beginning at a level of 2515 mm from floor level of the Boiler baseframe terminating above the level of the platform safety railing.

The platform is provided with safety handrailing on three sides to a height of 950 mm, the fourth side left open for access to the boiler valves.



## Schedule 3: Steam & Water Mountings

### General

As standard, the valves and gauges we offer comply with BS EN 12953 and are fitted to the boiler standpipes with suitable joints and flanges drilled to BS EN 1092. Flange fixing is by metric studs and nuts or bolts. Standard valves and fitting are tabulated below:

Quantity	Description	Material
1	Steam Stop Valve, Angle pattern type	Cast steel
1	Single Spring High Lift Safety Valve sized to provide 100% discharge capacity	SG Iron
1	Feed water isolation, Angle pattern type	Cast steel
1	Feed water, wafer pattern non-return	Stainless steel
1	Multi stage, variable speed, centrifugal feed pump	Stainless steel
1	Water strainer, Y Type (supplied loose)	Cast Iron
1	Manual Blowdown Valve, ball type	Carbon steel
2	Reflex type water gauge assembly with steam and water cocks fitted to a plate type column	Carbon steel
1	High integrity Probe type controls with modulating operation	-
1	Bourdon type, Direct mounted Pressure Gauge	Aluminium
1	Air vent valve	Bronze
1	DN25 Blanked connection for TDS Control or Chemical injection	-

Drain pipework from the water gauge drain cocks and safety valve drain are extended in suitably sized pipework terminating individually at boiler centre line.

### Notes

- Valve materials are provided for the rating, pressure and temperature requirements.
- For multi-boiler installations an additional steam non-return valve will be required to comply with the requirements of Guidance Notes BG01. Cochran can provide this additional valve on request if not being supplied by your Installation Contractor.
- Please refer to quotation for any additional valves or mountings offered.

## Schedule 4: Feed Pumps & Water Level Controls

### **Water Level Controls - Direct Mounted Probe Type**

Water Level Controls are Direct Mounted Probe Type which are located on the top centreline of the boiler shell.

#### **Modulating Control, including:**

- Modulating Feed Water Control Valve
- High Water Alarm
- First Low Water Level Alarm and System Lockout
- Second Low Water Level Alarm and System Lockout

### **Feed Water Pump**

The feed water pump is multistage type sized to suit the boiler working pressure and rating. The pump is fitted to the boiler and connected to the boiler feed check valve in suitably sized mild steel pipework. The feed water pump is fitted with a Variable Speed Drive as standard.

A feed water inlet strainer is supplied loose.

# Schedule 5: Medium Voltage Resistance Heating Element Bundle; Control Panels; Wiring & Testing

## Medium Voltage Element Bundle

The boiler is fitted with either a 4,160V or 6,600V medium voltage resistance heating element bundle matched to the boiler in accordance with the rating. The bundle is flange mounted and pre-wired with elements to flange connections made via compression fittings.

## Medium Voltage Power Converter System

The medium voltage power converter system controls the medium voltage element bundle. The converter system will be made up of multiple sections, including converter, control and load.

## Control Panel

A Synergy control panel complete with HMI, is fitted to the Boiler supports and includes the necessary control equipment, starters, water level alarms, controls for feed pump and mains isolation. Control pressure switches are attached to the side of the panel.

## Electrical Wiring

Heat resistant cabling is used for wiring between water level controls and the control panel, all other wiring is in PVC covered wiring carried in flexible conduit. Colour Coding to BS EN 60204-1:2006.

## Functional Testing

An electrical functional test of the boiler safety and control panel are carried out and witnessed by the Cochran Q.A. Department Inspectors.

## Schedule 6: Painting

Surfaces are degreased prior to painting and one coat of primer, one coat of undercoat and one finishing coat is applied.

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**Standard Colours are as follows:**


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Baseframe, ALL Valves, Platform and Ladder (when fitted)	Black
Sheeting	Embossed Aluzinc Sheeting
Control Panels	Manufacturer's Standard
Feed Pump	Manufacturer's Standard

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## Schedule 7: Terminal Points

Flanges to BS EN 1092 except where otherwise stated.  
Screwed connections BSP except where otherwise stated.

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**Description:**


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Stop Valve (Outlet)	Flanged
Safety Valve (Outlet)	Flanged
Blowdown Valve (Outlet)	Flanged
Feed Water (Inlet)	Flanged
Drain Pipework (Outlets)	Screwed

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## Schedule 8: Documents

### Documents Provided

- General Arrangement Drawing and Electrical Wiring Diagrams are provided.
- Certificate of Compliance is provided, certified by independent Inspection Authority.
- Operation and Maintenance Manual is provided.

### Important Note:

Cochran reserve the right to amend or alter this Specification during the tender validity period or the manufacturing stage of any subsequent order to comply with any alteration or amendment to applicable Standards, Safety Codes, Guidance Notes or Revisions in Manufacturing Techniques.

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