



**Three Pass Wet Back**  
**COCHRAN HW34 LT/HT**  
**Low & High Temperature**  
**Package Hot Water Boiler**

# **Technical Specification**

## COCHRAN HW34 LT & HT HOT WATER BOILER SPECIFICATION

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The **COCHRAN HW 34 LT & HT HOT WATER BOILER** is built to the latest harmonised European codes and of horizontal three pass wet back design. Developed for higher operational efficiencies and lower emissions, it is available as the HW34 LT for low temperature hot water applications, built to EN14394 and the HW34 HT version for medium and high temperature applications built to EN12953.

For UK applications the boiler is designed to meet the current UK building regulations with gross seasonal efficiency of over 86% and complies with the requirements of the Factories Act (1961) and with HSE and UK Inspection Authority requirements. In addition, the Boiler is CE Marked to meet the requirements of:

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

Throughout the manufacturing process, the **BOILER** is subject to inspection by a leading Independent Insurance Company in addition to **COCHRAN** quality procedures that comply with the requirements of ISO 9001.

The attached schedules detail the specification of the Boiler proposed in the tender enclosed.

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We reserve the right to amend or alter these Specifications 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.

## **Schedule 1: Boiler Pressure Part**

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### **General**

All plate used in the construction of the boiler is cut and profiled by computer controlled equipment. Shell plates and furnace are then rolled, assembled, welded and inspected in accordance with the Construction Codes.

Tube plates are drilled by computer controlled equipment to ensure correct ligaments are maintained and accuracy of tube hole finish and weld preparation for welded tubes.

### **Boiler Shell**

The Boiler shell, dependent on Boiler size, is constructed in suitable sections. Following the rolling process, longitudinal and circumferential seams are machine welded and subjected to X-Ray and NDT Inspection to comply with the latest standard requirements.

### **Furnace and Reversal Chamber**

The furnace tube incorporates a 'bowling hoop' design to provide sufficient stiffness to allow for adequate expansion. It is located between the boiler front and reversal chamber tube plates with a totally submerged, wet back reversal chamber.

### **Convection Tubes**

Two separate passes of convection tubes are fitted. First pass between boiler front tube plate and the reversal chamber tube plate, second pass tubes between boiler front and rear tubeplates.

All plain tubes are expanded into position with the inlet to first pass tubes in the reversal chamber being expanded and welded. Stay tubes and stay bars are fitted to ensure that stressing of tube plates and tube nests are within construction code limits.

### **Access Doors**

For inspection purposes, openings are provided to gain access to the steam/water side of the boiler. One 420 × 320 elliptical manway opening is provided on the top of the boiler. Two 320 × 220 elliptical headhole openings are provided in the lower quadrants toward the rear of the boiler, one provided on each side. One 125×90 elliptical handhole opening is provided in the bottom of the rear tubeplate.

To permit observation and access into boiler furnace tube, a rear access door complete with a flame viewing sight port is provided.

### Seatings

Mountings and controls are fitted to pads, standpipes and bosses welded to boiler shell.  
The Materials Specification for the Shell and Shell Attachments are:

Shell, Furnace & Tubeplates: BS EN 10025-2 P265 GH

Stay Bars: BS EN 10273 P235 GH

Play & Stay Tubes: BS EN 10216-1-TR2  
BS EN 10216-2  
BS EN 10217-1-TR2  
BS EN 10217-2

Mandoor, Head holes, Muddoor & Lifting Lugs: BS EN 10025-2 P265 GH

Pads (Valves): BS EN 10025-2 P265 GH

Standpipes: ASTM A106 GR B

## **Schedule 2: Boiler Mounted Fabrication – Casings; insulation & Supports**

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### **Front and Rear Casing**

Boiler front and rear casings are fabricated from mild steel plate fully welded to the Boiler tubeplates and shell.

Front casing is insulated internally to reduce radiation loss to a minimum and incorporates hinged doors with screen plates which allow access to boiler tubeplates and tubes to facilitate tube cleaning, tube removal and inspection.

Rear casing is provided with flanged outlet for chimney connection.

Hinged doors allow access to tubeplate and tube nest and are fitted with screen plates.

### **Insulation and Sheeting**

Exposed areas of boiler shell and tubeplates are insulated with 100 mm thick high density insulation to reduce radiation loss to a minimum and is retained in position with bands.

20G (0.812mm thick) "Stucco" aluminium sheeting to BS1470 SICH.H. is applied to shell. Tubeplates, pads and standpipe penetrations are finished with aluminium collars.

To aid access for inspection purposes inspection doors and valves are not provided with insulation, if this is required then this is available on request as an added option.

### **Support**

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 control panel.

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

### Schedule 3: Boiler Mountings

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#### General

Depending on the flow temperature of the system we offer valves and gauges to comply with EN12828 or BS EN 12953 which are fitted to the boiler with suitable joints and flanges drilled to BS EN 1092. Standard valves and fitting are tabulated below:

Qty	Description	Manufacturer	Material
1	Single Spring High Lift Safety Valve sized to provide 100% discharge capacity	Spirax Sarco	SG Iron
1	Manual Blowdown Valve, ball type	RTK Control	Carbon steel
1	Compact Vibrating fork low level switch (HT only)	Emerson	
1	Flush mounted Flow Temperature gauge	Stewart Buchanan	Aluminium
1	Excess Temperature Switch	Honeywell	-

#### Standard Connections on Boiler Pressure Part

- 1 Flow Connection, excluding Control/Isolating Valve
- 1 Return Connecting, excluding Control/Isolating Valve

#### Optional Equipment

We can provide optional equipment including

- 1 Vibrating Fork low level switch (LT Only)
- 1 Flash Trap Replacement Kit
- 1 Backend Protection system
- 1 Flue gas economiser solutions

#### Notes

- Valve materials provided are suitable for the rating, pressure and temperature requirements.
- Please refer to tender for additional mountings offered.

## Schedule 4: Combustion Equipment; Control Panel & Wiring

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### Combustion Equipment

If required the Boiler can be fitted with a pressure jet burner matched to the Boiler furnace configuration and suitable for the fuel(s) specified in our tender. The burner can be provided as a complete unit pre-wired and fitted prior to leaving our factory. In the case of gas fired units a matched gas train is supplied.

### Boiler / Burner Controls

A boiler control panel would be fitted to the boiler and includes the necessary control equipment and starters plus mains isolation. Control temperature switches are attached to the side of the panel.

Note: Certain combustion equipment has its management system includes as an integral part of the burner.

### Electrical Wiring

Heat resistant cabling is used for wiring between water level controls and the control panel, all other wiring is in P.V.C. 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 system is carried out and witnessed by the Cochran Q.A. Department Inspectors.

## Schedule 5: Painting

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

Standard Colours are as follows:-

Baseframe & valves	Black
Front and Rear Casings	Silver
Screen Plates	Blue
Sheeting	Unpainted Stucco Aluminium
Burner	Manufacturer's Standard
Control Panel	Manufacturer's Standard

## Schedule 6: Terminal Points

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

### Description

Safety Valve (Outlet)	Flanged/Screwed
Drain Valve (Outlet)	Flanged
Drain Pipework (Outlets)	Screwed
Flue Gas (Outlet)	Horizontal
Oil Flow (Connection)	Screwed
Oil Return (Connection)	Screwed
Gas (Inlet)	Flanged
Pilot Gas (Inlet)	Screwed
Flow Connection	Flanged
Return Connection	Flanged
Low Water Level Limiter Connection	Screwed

## Schedule 7: tools & Documentation

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### Tools

Tube cleaning brushes and rod handle are provided.

### Documentation

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

### Notes:

In order to take advantage of all Technical Developments, we reserve the right to amend details given in this Specification.