

HW34 Technical Specification

HW34 Hot Water Boiler

Low & High Temperature Three Pass Wet Back Boiler



HW34 Package Hot Water Boiler

The COCHRAN HW34 LT & HT HOT WATER BOILER is of horizontal three pass wet back design and is built to BSEN 12953 with independent inspection by British Engineering Services (BES) and UKCA or UKNI marked as appropriate (see footnote).

This model has an output range of 5,000 to 16,000kw and is suitable for both low and high temperature applications.

It is of horizontal three pass reverse flame type design developed for higher operational efficiencies and lower emissions to meet the requirements of the Medium Combustion Plant Directive (MCPD).

It is designed to meet the current UK building regulations with gross seasonal efficiency above 86% and complies with the requirements of the Factories Act (1961) and with HSE and UK Inspection Authority requirements. In addition, it meets the requirements of the:

- 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 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 420x320 elliptical manway opening is provided on the top of the boiler. Two 320x220 elliptical headhole openings are provided in the lower quadrants toward the rear of the boiler, one provided on each side. One 125x90 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.

Materials, Specification, Shell and Shell Attachments:

Shell, Furnace and Tubeplates:	BS EN 10025-2 P265 GH
Stay Bars:	BS EN 10273 P235 GH
Play and Stay Tubes:	BS EN 10216-1-TR2 BS EN 10216-2 BS EN 10217-1-TR2 BS EN 10217-2
Mandoor, Head holes, Muddoor and 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 Fabrications

Casings, Insulation and Supports

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

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.

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

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	Manufacturer	Material
1	Single Spring High Lift Safety Valve sized to provide 100% discharge capacity	Ari Armaturen	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 are provided for the rating, pressure and temperature requirements.
- Please refer to quotation for any additional valves or mountings offered.

Schedule 4: Combustion Equipment/ Control Panel/Wiring & Testing

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

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:

All Valves	Blue
Front and Rear Casings	Blue
Screen Plates	Blue
Sheeting Embossed	Aluzinc sheeting
Burner	Manufacturer's Standard
Control Panel	Manufacturer's Standard

Schedule 6: Terminal Points

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

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 & Documents

Tools Provided

Tube cleaning brushes and rod handle are provided.

Documents Provided

- 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.

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.

+44(0) 1461 202 111

www.cochran.co.uk

Cochran Ltd, Newbie Works, Annan, Dumfries & Galloway, UK DG12 5QU. info@cochran.co.uk