

Enquiry / Contract Reference Number : 49/7724-02 ST28-A3+230 +230mm
 Client : Breathe QEQM
 Date : 20/08/2020

1.0 General Information

1.1 Boiler Type: Composite Three Pass Wet Back Steam Boiler
 1.2 Manufacturer: Cochran Ltd.
 1.3 Design & Construction Code: EN 12953
 1.4 Quality Assurance: ISO 9000
 1.5 Country of Origin: United Kingdom
 1.6 Ambient Air Temperature: 25 °C

2.0 Boiler Details

2.1 Rating Fired Side Only: 3350 kg/hr From & At 100°C
 2100 KW
 Rating W H Side Only: 593 kg/hr From & At 100°C
 366 KW
 Working As a Composite:
 Rating Total: 3980 kg/hr From & At 100°C
 2495 KW
 Rating Fired Side: 3350 kg/hr From & At 100°C
 2100 KW
 Rating W H Side: 630 kg/hr From & At 100°C
 395 KW

2.2 Operating Pressure: 5.50 Bar g.
 2.3 Design Pressure : 10.00 Bar g.
 2.4 Hydraulic Test Pressure : 14.30 Bar g.

3.0 Performance Details : Fired side Only.

3.1 Net Thermal Efficiencies

% Boiler Load	100	80	60	20	
Natural Gas * :	93.6	93.7	93.6	92.5	%
Natural Gas :	90.5	90.5	90.3	88.4	%
Class D Oil :	91.5	91.4	91.1	89.0	%

3.2 Gross Thermal Efficiencies

% Boiler Load	100	80	60	20	
Natural Gas * :	85.0	85.1	85.0	83.8	%
Natural Gas :	82.2	82.2	82.0	80.2	%
Class D Oil :	86.1	86.0	85.7	83.7	%

3.3 Fuel Consumption

% Boiler Load	100	80	60	20	
Natural Gas * :	225.6	180.3	135.4	45.7	m3/hr
Natural Gas :	233.2	186.6	140.4	47.8	m3/hr
Class D Oil :	228.5	183.0	137.6	47.0	litres/hr

3.4 Flue Gas Temperatures (*including economiser)

% Boiler Load	100	80	60	20	
Natural Gas * :	136*	130*	124*	107*	°C
Natural Gas :	201.4	196.6	192.3	184.7	°C
Class D Oil :	199.3	194.9	190.8	184.5	°C

3.5 Net Furnace Heat Release Rates

Natural Gas * :	1304 kW/m ³
Natural Gas :	1348 kW/m ³
Class D Oil :	1334 kW/m ³

3.6 Gas Inlet Details		
Waste Heat Source	800 kW _e Engine	Composite Mode
Mas Gas Flow	4533 kg/h	4533 kg/h
Inlet Temperature	426 °C	426 °C
Boiler Outlet Temperature	177 °C	177 °C
Economiser Outlet Temperature	147 °C	129 °C
Overall Efficiency	68.7 %	73.0 %

4.0 Heating Surfaces, Volumes and Release Rates

4.1 Plate Heating Surface :	11.7 m ²	
Fired Tube Heating Surface :	84.5 m ²	96.21834439
W H Tube Heating Surface :	40.9 m ²	
Total Boiler Heating Surface :	137.1 m ²	
4.2 Steam Release Rate :	39.1 mm/s	46.43 mm/s
Steam Content @ NWL :	2.14 m ³	
Water Content @ NWL :	9.9 m ³	
Water Surface @ NWL :	6.99 m ²	

5.0 Overall Dimensions

5.1 Overall Length :	6200 mm	
Overall Width :	3665 mm	Approximate Figures
Overall Height :	4200 mm	see sketch
5.2 Boiler Weights :		
Empty Complete :	15.6 Te	
Operating Weight (@NWL) :	25.5 Te	Approximate Figures
Fully Flooded :	27.6 Te	

5.3 Valve Details

Safety Valve Type :	Single Spring
Safety Valve Size :	50 mm
Safety Valve Outlet :	80 mm
Stop Valve :	100 mm
Feed Check Valve :	32 mm
Blow Down Valve :	40 mm

6.0 Exhaust Details At 100% Load

Fuel	volume flow rate	efflux velocity
Natural Gas :	1.1 m ³ /s	10.8 m/s
Natural Gas :	1.3 m ³ /s	12.5 m/s
Class D Oil :	1.3 m ³ /s	12.5 m/s
Based on a flue diameter :	360 mm	

7.0 Pressure Part Physical Dimensions

7.1	Shell Internal Diameter :	2300 mm	
	Shell Length (LOTP) :	3900 mm	
	Shell Thickness :	13 mm	
	End Plate Thickness :	18 mm	
	Shell Material :	BS 1501 161 430 B	
	Endplate Material :	BS 1501 161 430 B	
7.2	Furnace Internal Diameter :	820 mm	
	Furnace Internal Length :	3259 mm	
	Furnace Thickness :	15 mm	
	No Bowling Hoops :	0	
	Furnace Internal Volume :	1.721 m ³	
	Furnace Material :	BS 1501 223 490 B	
7.3	RC Internal Diameter :	1385 mm	
	RC Internal Length :	419 mm	
	RC Wrapper Thickness :	13 mm	
	RC Tubeplate Thickness :	13 mm	
	RC Wrapper Material :	BS 1501 161 430 B	
	RC Tubeplate Material :	BS 1501 161 430 B	
7.4	2nd Pass Tube O/Dia :	44.5 mm	
	No of 2nd Pass Plain Tubes :	62	
	2nd Pass Plain Thickness :	3.2 mm	
	No of 2nd Pass Stay Tubes :	12	
	2nd Pass Stay Thickness :	6.3 mm	
	Tube Material :	EN10216-1 or 2 P235 (TR2)	
7.5	3rd Pass Tube O/Dia :	44.5 mm	
	No of 3rd Pass Plain Tubes :	76	
	3rd Pass Plain Thickness :	3.2 mm	
	No of 3rd Pass Stay Tubes :	18	
	3rd Pass Stay Thickness :	6.3 mm	
	Tube Material :	EN10216-1 or 2 P235 (TR2)	
7.5b	W H Pass Tube O/Dia :	51 mm	
	No of 3rd Pass Plain Tubes :	52	
	3rd Pass Plain Thickness :	3.2 mm	
	No of 3rd Pass Stay Tubes :	14	66
	3rd Pass Stay Thickness :	6.3 mm	
	Tube Material :	EN10216-1 or 2 P235 (TR2)	
7.6	Other Information		
	Stay Bars No. :	4	Height To NWL
	Stay Bars Diameter :	50 mm	710 mm
	Stay Pins No. :	15	
	Stay Pins Diameter :	40 mm	
	Burner Manufacturer :	TBA	
	Tube Ligament/Design Temp :	STD °C	
	Weight Allowance :	7.0 Tonnes	
8.0	Pressure Drops		
	Natural Gas :	10.6 mbar	(Inc 1.25mbar
	Natural Gas :	11.1 mbar	Chimney Allowance)
	Class D Oil :	10.8 mbar	
8.1	Pressure Drops W H Side		
	From Inlet to Outlet	14.7 mbar	(Not including Damper)