EffiMax™
Boiler Manager for Solid Fuel Fired Boilers

<table>
<thead>
<tr>
<th>Excess Air</th>
<th>Efficiency</th>
<th>S.F</th>
<th>Steam Cost</th>
<th>Steam Flow</th>
<th>Steam Temp</th>
</tr>
</thead>
<tbody>
<tr>
<td>161.54 %</td>
<td>74.00 %</td>
<td>9.00</td>
<td>₹ 888.9/Ton</td>
<td>6000 kg/hr</td>
<td>174.5 °C</td>
</tr>
</tbody>
</table>

- Stack Loss: 9.70 %
- Ambient Air Temp: 28.0 °C
- Unburnt Loss: 14.00 %
Buying an Efficient Boiler does not Guarantee High Efficiency

Boilers do not operate at rated efficiency
Surveys reveal that operating efficiency of unmonitored boilers lags behind the rated efficiency by 5-15%
The fuel bill is determined by operating efficiency
Over time, fuel costs are more than those of boilers - many times over!

EffiMax™ Diagnostic Reports

The first step towards improving boiler efficiency is to know its current operating efficiency. The Forbes Marshall EffiMax boiler efficiency monitoring system is a proven and complete solution which helps improve boiler efficiency to reduce steam cost.

The analysis of EffiMax reports leads to creating boiler specific standard operating procedures, which not only bridge the efficiency gap but also help sustain it over the entire operating life of a boiler.

Features

Touch screen display for instantaneous display of all boiler parameters that impact boiler efficiency
Online boiler efficiency measurement with break up of losses (as per BS845)
Graphical analysis of boiler performance metrics
Boiler performance diagnostic reports with alarms
Web based remote performance monitoring

<table>
<thead>
<tr>
<th>Measured Parameters</th>
<th>Calculated Parameters</th>
<th>Control Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steam flow</td>
<td>Boiler efficiency</td>
<td>Stack O₂</td>
</tr>
<tr>
<td>Fuel flow</td>
<td>Steam to fuel ratio</td>
<td>Drum TDS</td>
</tr>
<tr>
<td>Steam pressure</td>
<td>Stack loss</td>
<td>Induced draft</td>
</tr>
<tr>
<td>Steam temperature</td>
<td>Blowdown loss</td>
<td>Forced draft</td>
</tr>
<tr>
<td>Stack temperature</td>
<td>Enthalpy loss</td>
<td>Fuel feeder</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>Radiation loss</td>
<td>Drum level</td>
</tr>
<tr>
<td>Feed water temperature</td>
<td>Blowdown quantity</td>
<td>Water tank level</td>
</tr>
<tr>
<td>% O₂ in flue gas</td>
<td></td>
<td>Deaerator level</td>
</tr>
<tr>
<td>Blow down TDS</td>
<td></td>
<td>Deaerator pressure</td>
</tr>
</tbody>
</table>
EffiMax™ 500

Benefits
Improved fuel feeding practices
Improved combustion air practices
Improved blowdown practices
Increased operator safety
Indirect efficiency (optional)
Indirect/direct steam to fuel ratio (optional)
ID - FD control (optional)
Feedwater tank level control (optional)
Drum level control (optional)
Data logging
Web connectivity and mobile app

Intelligent Alerts and Commands
How much fuel to feed?
When to feed fuel?
Close / Open damper
Drain mobrey
Mobrey not drained
Possible back fire
Clean the TDS sensor
Clean the tubes
Improve water quality
Close the feeding door
Stir / poke the bed

EffiMax™ 2000

EffiMax 2000 is a cost effective solution to keep a check on the boiler to ensure optimum fuel consumption.
Measures all critical parameters affecting boiler fuel consumption
Calculates the boiler's indirect efficiency and breakup of all losses as per BS845 standards
Calculates indirect steam to fuel ratio
Generates powerful trends, reports, diagnostics, etc. for data analysis
Suitable for any kind of boiler
Web connectivity with mobile app
Benefits and Features
All features of EffiMax 2000 included
Calculates the indirect efficiency of the boiler and breakup of all losses as per BS 845 standards
Calculates direct steam to fuel ratio
ID FD feeder control automation for optimum combustion
Minimum manual intervention
Improved boiler efficiency by reducing stack loss, unburnt loss and blowdown loss
Web connectivity with mobile app
Single / three element drum level control (optional)
Deaerator level control (optional)

Boiler Peak Performance Service
A service package to enhance and sustain boiler efficiency
Helps develop an SOP for efficient boiler operation based on EffiMax reports
Regular visits by our engineer to oversee SOP implementation and guidance
BEESAS
Boiler Efficiency and Environment Safety Automation System

Benefits and Features
Complete boiler house automation - totally unmanned operation
Includes emission monitoring system like suspended Particulate Matter - SPM, SOx, NOx and CO, etc.
Includes boiler safety alarms and sms alerts
Built on DCS platform with redundant CPU and I/Os with hot-swappable feature
Preventive maintenance scheduling and alert
Lowest downtime, smooth operation and highly safe and efficient operation
Better load management and delivery
Remote connectivity
Full development support
Flexible system configuration
All language support
Guaranteed fuel and electricity savings

Complete Boiler House Readings at a Glance
Payback - Minimum 3% Efficiency Improvement

<table>
<thead>
<tr>
<th>Boiler (TPH)</th>
<th>Coal (Domestic)</th>
<th></th>
<th>Coal (International)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Savings(L) ₹ / annum</td>
<td>Payback (Months)</td>
<td>Savings(L) $ / annum</td>
<td>Payback (Months)</td>
</tr>
<tr>
<td>2</td>
<td>4.8</td>
<td>22</td>
<td>8410</td>
<td>29</td>
</tr>
<tr>
<td>3</td>
<td>7.2</td>
<td>14</td>
<td>12615</td>
<td>22</td>
</tr>
<tr>
<td>4</td>
<td>9.6</td>
<td>10</td>
<td>16820</td>
<td>17</td>
</tr>
<tr>
<td>5</td>
<td>12.0</td>
<td>8</td>
<td>21025</td>
<td>13</td>
</tr>
<tr>
<td>10</td>
<td>24.0</td>
<td>5</td>
<td>42050</td>
<td>9</td>
</tr>
<tr>
<td>15</td>
<td>35.0</td>
<td>3</td>
<td>63075</td>
<td>6</td>
</tr>
</tbody>
</table>

Basis of Calculations

Coal

Efficiency improvement from 70% to 73%
GCV = 4200 kCal/kg
Cost = ₹ 4500 per ton

Operating hours per annum = 8000
* The above prices are average prevailing domestic prices

Innovation Experience

70 years

EffiMax™ Systems

1500+

Global Presence

50+

Offices