ESG Corporation SPEEDYLECTRIC ELECTRODE STEAM GENERATORS
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AUTOMATIC BALANCE CONTROL SERIES OPERATION PRINCIPLES

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SAFETY, EFFICIENCY, AND ECONOMY are but three characteristics of the SPEEDYLECTRIC Automatic Balance Control Electrode Steam Generator and Electric boilers. Non-fluctuating steam pressure, stable temperature and automatically balanced electrical input are features engineered into SPEEDYLECTRIC Steam Generators and Electric Boilers.

In areas where scale forming water is used for make up, scaling with electrode steam generator presents a relatively minor problem when compared to fuel fired and resistance element boilers where extremely high heating surface temperatures bake on solids thrown out as water flashes into steam.

In SPEEDYLECTRIC Electrode Steam Generators and electric boilers, the resistance of the water to the passage of electricity generates heat and steam. No part of the generator is ever hotter than the water or steam itself. Therefore, no baking of solids or residue occurs. Furthermore, when the electrode tips become uncovered, no current can pass, hence, no low water damage can occur.

With in the pressure vessel of the generator, a cylinder, open at the bottom, is welded to the inside of the upper-head of a pressure vessel. This cylinder divides the vessel into two concentric chambers. The outer chamber (K) is the regulating chamber. The inner chamber (J) is the generating chamber. Suspended within the generating chamber are the electrodes (N). Electric power (P) is easily connected to the three electrode terminals.

A prescribed quantity of Electrolyte is dissolved in water and poured into the generator through the hand fill (G). This Electrolyte remains in the generator until drawn off with the water through the drain valve (M). Electric power is turned on, and heat is generated by the resistance of the water to the passage of current between the solid electrodes. Steam produced in the generating chamber (J) flows through the steam valve outlet (I), and via the steam header (E), through the pressure regulating valve or (C) to the regulating chamber (K). Before the electric boiler is turned on, water levels would be balanced. (See Figure 1.) Adjusting the screw on the pressure regulator valve (D) sets the desired pressure. When the system is turned on, air is automatically exhausted through the air eliminator (A), which closes when heated by the steam. If the steam consumed is less than maximum, pressure built-up in the generator chamber until it reaches the pressure limit set by the pressure regulator. (See Figure 2.)

At this point the pressure regulator valve partially closes, reducing the amount of steam entering the regulating chamber. This unbalances the system momentarily, permitting the water to rise in the regulating chamber due to the higher pressure condition in the generating chamber. As the water level drops in the generating chamber the electrodes are progressively exposed, and the amount of steam being generated decreases. (See Figure 3.)

Inasmuch as current input is proportional to the immersed area of the electrodes, the falling water level reduces the electric input. Conversely, if heavy use of steam tends to lower the desired pressure, the regulating valve opens wide, allowing more steam into the regulating chamber. This forces water back into the generating chamber, increasing the flow of current and rate of steam production by completely enveloping the electrodes.

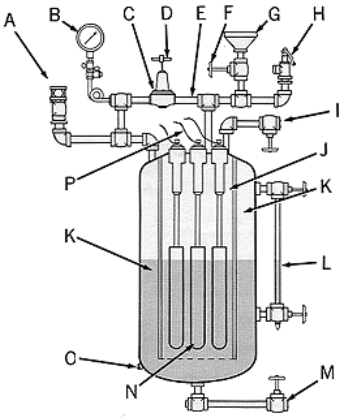

Figure 1

A.Air Eliminator
B.Pressure Gauge
C.Pressure Regulator
D.Pressure Regulating Screw
E.Steam Header
F.Hand-Fill Valve
G.Hand-Fill
H.Safety Valve
I.Steam Outlet To Load
J.Generating Chamber
K.Regulating Chamber
L.Water Gauge
M.Drain Valve
N.Electrodes
O.Water Inlet
P.Power Supply Wires

The water level in both chambers is rarely balanced. This condition occurs only at full load. The SPEEDYLECTRIC Automatic Balance Control System automatically adjusts electric input in precise balance with steam output in your electric boilers.

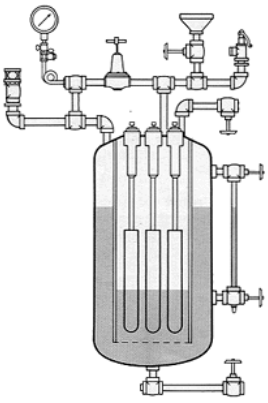

Figure 2

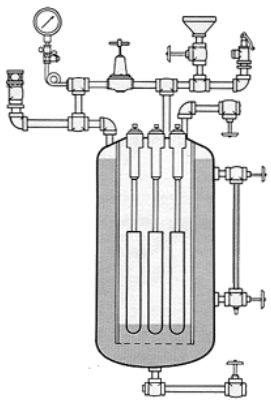

Figure 3

Contact us for details on the many Speedylectric parts that are interchangeable with Ebcor electrode boiler parts.

Assembled in the U.S.A. for over 50 years.