



P5631

MECHANICAL EQUIVALENT OF HEAT

INTRODUCTION

This equipment is a modern version of the Mechanical Equivalent of Heat apparatus derived from the original design by Callendar which aptly demonstrated the relationship between mechanical energy and heat energy. Though extremely simple in design, the apparatus will yield results with an accuracy of 0.5%.

DESCRIPTION

The apparatus incorporates a universal electric motor with variable speed control for driving a brass drum calorimeter, two sets of weights, heavy and light, a set of brake bands to encircle the drum, a spring balance, a thermometer and a counter for recording the revolutions of the drum. All items of equipment are mounted on the steel cabinet which contains the motor control gear.

OPERATION

When fully assembled the double part of the belts suspends the heavier weights up to a total of 4 kg, while the single part suspends the carrier for the light weights and the spring balance. A measured amount of water, approx. 350g, is then carefully inserted into the calorimeter.

Rotation is then begun and the light weights are adjusted to keep the heavy weight in floating equilibrium with the spring balance pointer near the centre of the scale. Calorimeter speed can then be set between 60-120 rev/min. After a few revolutions the friction will become practically constant and the water temperature will rise at an approximate rate of 1°C per 100 revolutions.

The weight of the drum is engraved upon it which, together with the specific heat of the brass, 0.092, allows the total thermal capacity of the drum to be calculated. The heat generated is then the product of the total thermal capacity of the drum and water, and the observed rise in water temperature. Mechanical work done is the product of the difference in weight on either side of the drum, including the carriers, multiplied by the number of revolutions of the drum and its circumference.

TENDER SPECIFICATION

Equipment comprises electric motor driven rotating drum calorimeter, brake bands furnished with mass hangers and masses/spring balance weighing system, thermometer, revolution counter and motor variable speed control.

SERVICES

Electrical supply:- 220/240 volt AC single phase 50 & 60 Hz.

PHYSICAL DETAILS

	Nett Weight		Length		Width		Height	
	kg	lb	m	in	m	in	m	in
P5631	28	62	0.54	21	0.35	14	0.82	32