

P3240 FAN TEST STAND (D.C. DYNAMOMETER)

APPLICATIONS

- ◆ Air flow rate measurement as a function of fan speed
- ◆ Static pressure measurement and its variation with air flow rate
- ◆ Dynamic and total pressure measurement
- ◆ Measurement of electrical power required by fan
- ◆ Fan motor torque
- ◆ Fan efficiency at different speeds
- ◆ Flow measurement by pitot static tube traverse and by flow nozzle
- ◆ Measurement of temperature rise across fan

INTRODUCTION

Cussons Fan Test Stand has been designed and constructed to act as a comprehensive teaching bench to demonstrate the capability of a centrifugal fan unit generally in accordance with BS 848, but it can also be used as a base unit for a series of additional experiments involving air flow in pipes, heat transfer and aerodynamics.

DESCRIPTION

The bench consists of a welded steel frame mounted on castors providing two work surfaces for experiments together with ample storage space for experimental apparatus when not in use. The working surfaces accommodate a control console and a centrifugal fan with variable speed dynamometer drive, to which can be coupled a series of inlet and outlet ducts.

The ductwork supplied with the bench is manufactured in aluminium sections assembled by deep spigoted sockets, sealed by 'O' rings. It includes a venturi nozzle, a bell mouthed inlet, flow straighteners, pressure tapping points and disc valves and is designed to allow assembly to various configurations by means of quick release toggle latches.

The centrifugal fan which has a low chord impeller and split volute diffuser casing is directly driven by a DC dynamometer giving a variable speed from 0-4000 rpm, with a swinging stator providing load cell torque measurement and equipped with a toothed wheel for speed measurement (see Fig. 1 for performance data).

The control console houses all electrical components and circuitry associated with the power and speed control, while the instrument panel includes START/STOP pushbuttons, speed control knob and torque, speed, armature voltage and current displays.

A dual multi-slope manometer scaled 0-5 and 0-2.5 kPa is supplied for use with the air flow nozzle pitot static tube, as well as providing a means of measuring duct friction loss and pressure rise across the fan. Temperature measurement is by locally mounted mercury in glass thermometers.

TENDER SPECIFICATION

Apparatus consists of trolley unit with control console, centrifugal fan with low chord impeller driven by variable speed 0-4000 rpm DC dynamometer with swinging stator providing load cell torque measurement and toothed wheel for speed measurement; quick release toggle assembled ductwork comprising 60° conical inlet 95 mm dia. with four static tapping., 95/145 mm dia. divergence section, 145 mm dia. 400 mm long section with flow straightener and pitot static tube provision and four static tappings, 145 mm dia. 300 mm long exit flow straightener, 145 mm dia. 350 mm long section with four static tappings, an inlet/outlet valve assembly, a 145 mm dia. bell mouthed inlet, a 145 mm dia. 1m long section with four static tapping., a 145 mm dia. nozzle inlet with twelve static tappings, a venturi nozzle assembly, a 95 mm dia. pitot traverse section, a valve adaptor ring and disc valves; adjustable angle manometers scaled 0-5 and 0-2.5 kPa, air flow nozzle pitot static tube with 40-0-40 mm scale, armature voltage meter 0-250V, ammeter 0-10A, speed 0-100%, torque 0-100%, speed control potentiometer, START/STOP pushbuttons and earth leakage circuit breaker.

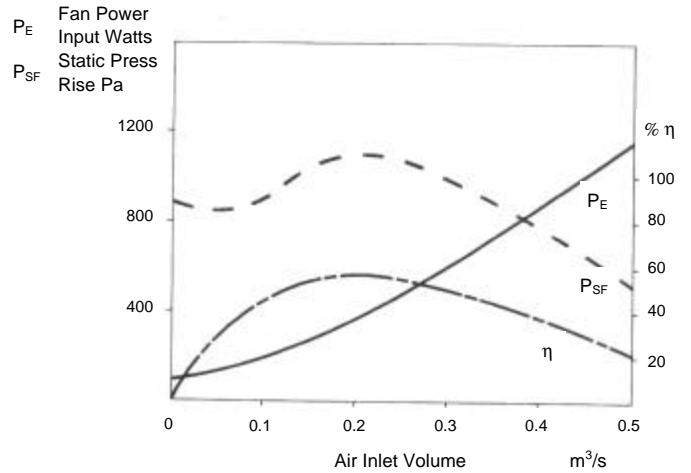


FIG. 1 Fan Performance Curves

SERVICES

Single phase 220/240 volt 50/60 Hz as required.
Maximum current limit 10 amps (fused).

PHYSICAL DETAILS

	Nett Weight		Length		Width		Height	
	kg	lb	m	in	m	in	m	in
P3240	142	314	210	78.7	0.75	29.5	1.6	63