

## APPLICATION SYSTEMS

Gawkar Industrial Estate,  
Panch Pakhadi Service Road,  
Thane - 400602. Mah. India  
Ph No: +91 022 32420541/ 25383001, Mobile:+91 9323724866  
E mail: [applicationsystems@gmail.com](mailto:applicationsystems@gmail.com)  
[aplicationsystems@yahoo.co.in](mailto:aplicationsystems@yahoo.co.in)

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*Dynamometer is loading device for Performance & Endurance test of Engines, Motors, Gear boxes, Cordon shaft & Axles, Starter motors, Alternators, Bearings, all types of rotating machines, etc & other mechanical transmission devices. Our manufacturing range includes Eddy Current Dynamometers, Powder Dynamometers. Tandem - combination of Eddy Current & PowderDynamometers, AC / DC Regenrative Dynamometers Test Benches & Test Beds.*

### **EDDY CURRENT DYNAMOMETER - Water cooled.**

Power rating : 0.18 KW to 900 KW.  
Max Torque : 400 KgM (4000Nm)  
Max Speed : 18000 RPM  
Water Flow & : Depends on KW rating

Pressure

Speed Sensor : AC Tachogenerartor or Proximity with toothed wheel / Encoder.

Speed Indication : Digital Indicator

Torque Sensor : Reaction Type or Rotary Torque Sensor.

Torque Indicator : Digital Indicator with Zero, Span, Calibration presets.



### **EDDY CURRENT DYNAMOMETER & RETARDER - Self cooled.**

Power rating : 0.18 KW to 55 KW.  
Max Torque : 37 KgM (370 Nm)  
Max Speed : 2,000 RPM  
Cooling : Self Cooled  
Speed Sensor : AC Tachogenerartor  
Speed Indication : Digital Indicator  
Torque Sensor : Spring Balance with Pulley & rope, Load cell or Rotary Torque Sensor  
Torque Indicator : Spring Balance OF Digital Indicator with Zero, Span, Calibration presets



### **EDDY CURRENT RETARDER.**

Low speed High Torque design  
upto 1000 Nm Torque  
Max Speed 8500 RPM

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## Salient features:

Available in different speed ranges. Suitable for loading prime movers that develop torque, gradually increasing with speed or constant torque over mid-to-high speed ranges

## PRODUCT HIGHLIGHTS

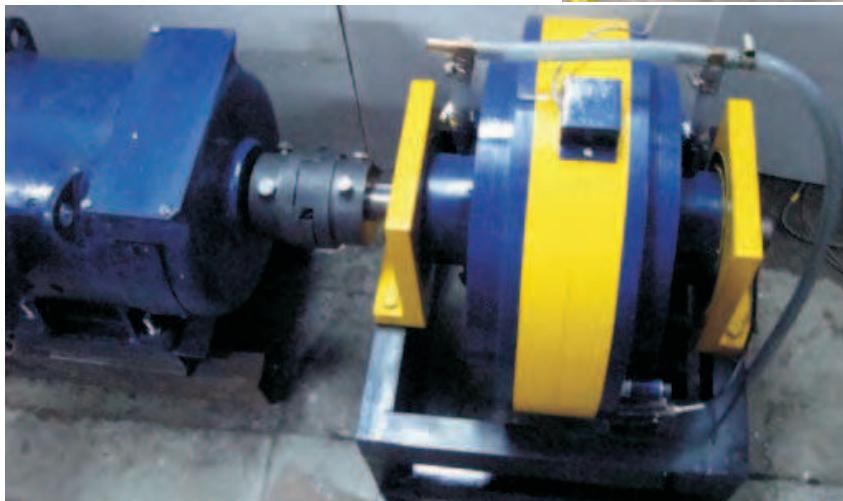
- Same capacity in bi-directional operation.
- Excellent stability.
- Better accuracy.
- Easier and smoother load control
- Suitable for remote control.
- Instantaneous response to load control, ideally suited for all types of governing Tests.
- Very little down time and maintenance.
- Low noise-levels. Quiet operation.
- Direct reversibility of direction.
- Longer life because of low wear and tear of moving parts.
- Extremely rugged construction.
- Small and compact.
- Wide range of power and speed & Excellent mechanical stability.



Gear Box Test



Engine Test



DC Motor Test



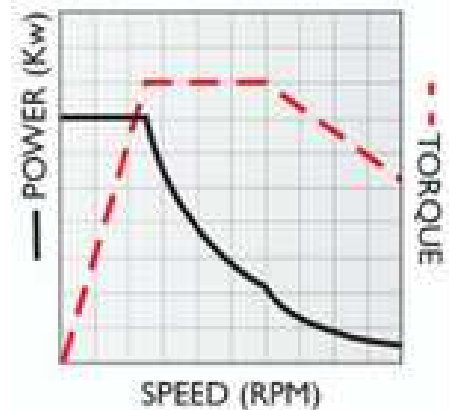
AC Motor Test

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## POWDER DYNAMOMETER

Powder dynamometers develop torque on the basis of electro-mechanical principles wherein the torque developed is independent of speed. The braking torque is infinitely controlled magnetic field. These dynamometers are ideal for testing motors from zero speed, transmissions and machines demanding high torque at low speeds.

- Set torque is fairly stable right down to zero speed
- Speeds of operation up to 3000 rpm, depending on the model
- Low inertia, dynamically balanced rotors
- Low residual torque as specified for each model
- Available in water-cooled models



### Features:

- Torque ratings: 2.5 Nm to 1000 Nm
- Power absorption: 189 W to 24 kW
- Speed: Up to 4000 rpm depending on the model
- Set torque: Stable right down to zero speed
- Compact, high torque-to-inertia ratio

### Specification:

Power rating: 0.18 KW to 24 KW.

Torque: 0.25 KgM to 1000 Nm

Max Speed: 4000 RPM

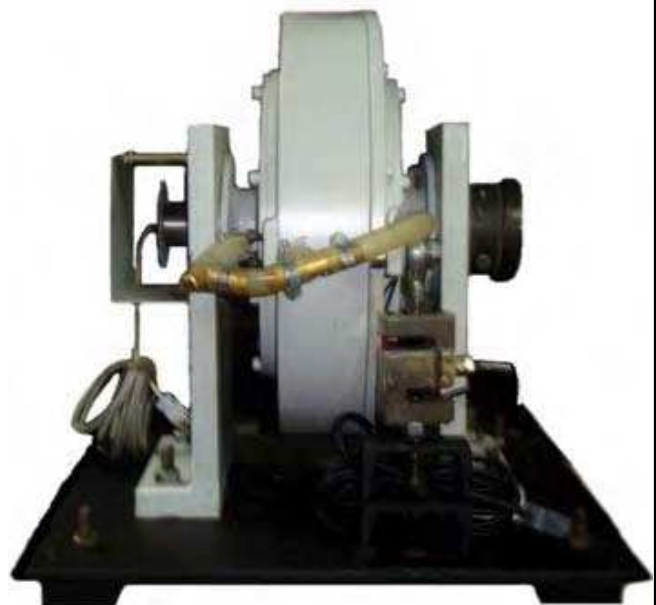
Cooling: Self Or Water Cooling

Speed Sensor: AC Tachogenerator or Proximity with toothed Wheel / Encoder.

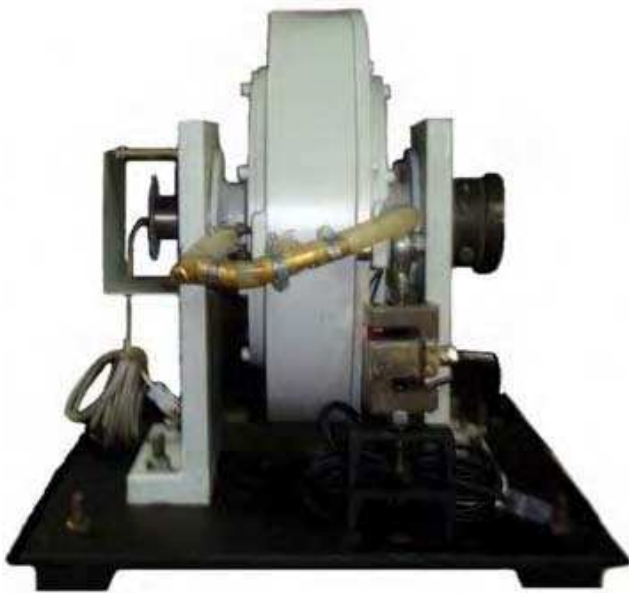
Speed Indication: Digital Indicator

Torque Sensor: Load cell or Rotary Torque Sensor.

Torque Indicator: Digital Indicator with Zero, Span, Calibration presets.



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**POWDER DYNAMOMETER - Water cooled**



**MANUAL CONTROLLER**



**PC BASED CONTROL**

## BLDC MOTOR TEST



**POWDER BRAKE - SELF COOLED**



**POWDER CLUTCH - SELF COOLED**

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## **TANDEM DYNAMOMETER**

**Tandem dynamometer – combination of Powder Dynamometer & Eddy Current Dynamometer.**

- Powder Dynamometers, as their name suggests, contain Magnetic Powder in Dynamometer. The electrical current passing through the excitation coil, generates a magnetic field, which changes the property of the powder, from free flowing condition at no excitation to solid rock condition at full excitation. Thus producing a smooth braking torque through friction between rotor and stator – proportional to excitation applied to coil. The Powder Dynamometers produces their rated torque at zero speed. The element to be tested can be loaded at standstill to determine the starting torque. Powder Dynamometer achieves at low control power, a high torque, being independent from the slip speed. It is a simple construction, low weight and small required space. By changing the exciting power force, the torque to be transmitted can be adjusted infinitely variable in the range 1:25.
- A simple eddy current adjustable dynamometer, is dynamic load system for accurate testing applications of all type of electric motors, engines and other rotating machinery's. The need for dynamic load system which allows flexibility of applications in an economical way has been felt for a long time in technical education institutions, research and development laboratories, quality control in industry, defence organisations. Eddy Current adjustable Dynamometer provides the ideal solution for accurate analysis of Power, Torque, Speed, Fuel and Lubrication consumption and quick pass / fail testing of all type of Electric Motors, Engines and other Rotating Machineries.

Eddy Current Dynamometer has Ferro- magnetic, Spoke structured – Low inertia - Pole is surrounded by stator plates. & excitation coil is placed around stator & Pole. Until the pole structure is energized by stationary excitation coil, the Pole rotor can spin freely on its shaft bearings. When a magnetizing force from the field coil is applied to the pole structure, the air gap becomes a flux field and the rotor is magnetically restrained, providing a braking action between pole structure and stator plates.

Eddy current adjustable dynamometer possesses certain unique features, which gives it a clear advantage over conventional loading systems. Ruggedness and Reliability. Eddy current adjustable dynamometer functions without the need for mechanical contact. This eliminates the main cause of wear. Further, the stationery coil is protected against adverse atmospheric conditions, the use of commutators, brushes and slip rings is avoided, control is affected at a relatively low power level. Electronic controller provides finger-tip operation and flexible control of the eddy current dynamometer from 0% to 100% torque load.

Advantage of Powder Dynamometer is that it controls Torque right from Zero RPM but has poor heat dissipation capacity, whereas Eddy Current Dynamometer operating range is 300 RPM onwards to 18000 /30000RPM, but below 300 RPM, it doesn't produce rated braking torque. Hence Tandem Dynamometer – At lower speed - Powder Dynamometer is in operation whereas at higher speeds Eddy Current Dynamometer will be in use. Powder Dynamometer & Eddy Current Dynamometer are constructed in line.

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## TANDEM DYNAMOMETER



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## AC DYNAMOMETER

The energy-efficient AC dynamometers are highly versatile and can operate in both motoring and absorption modes. These dynamometers are ideal for transient studies and for loading from true no-load to stall conditions.

### Features:

- Energy-efficient
- Fast response and high degree of control stability
- Direct measurement of friction / system losses
- Ratings up to 750 kW
- Inertia and vehicle road-load pattern simulation
- Trunnion mounted or with in-line torque sensor



## PNEUMATIC DYNAMOMETER

### Salient Features

- Fairly stable set torque right down to zero speed
- Speed of operation up to 2000 rpm, depending on the model
- Low inertia, dynamically balanced rotors
- Low residual torque, as specified for each model
- Bi-directional operation

Built-in filter-regulator and electric/pneumatic converter



Pneumatic Dynamometers

# APPLICATION SYSTEMS

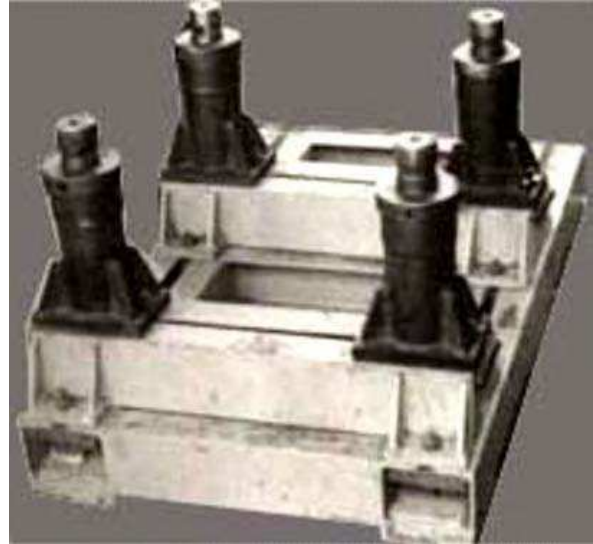
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## Test Benches

### • Engine Test Stands

For the evaluation of

- Engine Torque v/s Speed Characteristics
- Brake Horse Power (BHP)
- Frictional Horse Power (FHP)
- Indicated Horse Power (IHP)
- Fuel consumption at rated torque
- Mechanical efficiency
- Thermal Efficiency
- Air-fuel ratio



### • Motor Test Rigs

Test rigs are designed to provide a self-contained platform to conduct a comprehensive range of validation tests on motors. They consist of a low-vibration structure on casters, suitably rated application-specific dynamometer such as AC dynamometer or Magnetic Powder dynamometer, suitable sensors, special fixtures for clamping of different types of motors, coupling arrangement, safety guards and interlocks.

PC-based intelligent control system, integral to the test bench, ensures proper sequencing of tests and recording of data for analysis and outputting various information in the form of tabulated and performance graphs. The automated test sequences can be performed by selecting appropriate set up Menu on the dedicated PC-based control system

### • Transmission Test Rigs

For the evaluation of

Chassis, Gear boxes, Axles, Shafts, Bearings, Belts, Chains etc.



Please contact us with details for drawings.