



Water-Brake Dynamometers

- Perform load testing on high power motors
- Delivers precise measurements
- Models available up to 4500 HP, 900-3600 RPM



TESTING APPLICATIONS

Water brake dynamometers can be used in any application where a load brake is required on a rotational load. In the motor industry, dynamometers are used in conjunction with a power source and instrumentation to determine motor HP, Torque, and Efficiency ratings with a high degree of accuracy.

Other characteristics of an operating motor can only be determined with a dynamometer, such as: heat rise, bearing performance, winding design rating, insulation integrity, harmonic distortion, rotor bar looseness, DC brush contact, variable frequency drive influences, and motor slip characteristics. A properly operating motor should last longer, run better, and cost less to maintain.



Whether you need a complete Motor Testing Package with power supply and dynamometer, or a dynamometer alone with a dedicated control, Phenix Technologies has your solution!

Water-Brake Dynamometers are proven durable designs which use water flowing through the absorber to create a load on the motor. Only the amount of water necessary to provide the load is required. Sufficient internal clearance within the absorber body eliminates the need for cooling water and thermal overload protection, unlike typical industry offerings. If the water overheats under test and vaporizes, then the dynamometer simply stops absorbing the load.

With equal absorption in both CW and CCW directions, operator set up is reduced. Precise load control of the dynamometer is as simple as increasing or decreasing water volume flowing through the dynamometer absorption body. The controls ensure motor load remains stable throughout the duration of the test cycle. Torque, horsepower, RPM, and water temperature are displayed on highly accurate digital instrumentation.

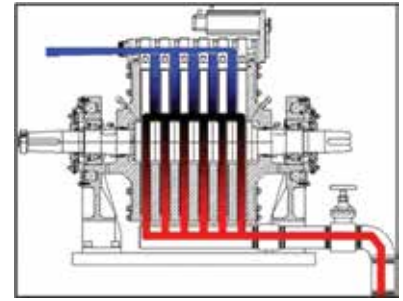
Phenix Technologies can also customize your system with special water cooling system options, adjustable lift tables, drive shafts with shaft guards, and custom controls and instrumentation. These systems can be set up for simple, manual operation or more sophisticated computer-controlled operation.

STANDARD DYNAMOMETER SIZES

Phenix Technologies offers water brake dynamometers in 7 standard sizes with custom sizes and configurations available for any motor testing requirement.

OPERATION THEORY

Water brake dynamometers utilize water flow proportional to the applied load to create resistance to the motor. A controlled flow of water through the inlet manifold is directed at the center of the rotor in each absorption section. This water is then expelled towards the outside of the dynamometer body by centrifugal force. As it is directed outward, the water is accelerated into pockets on the stationary stator plates where it is decelerated. This continuous acceleration/deceleration of the water creates the applied load to the motor. Through this transfer of energy, the water is heated and discharged.



DESIGN FEATURES

- Trunnion-mounted fixed base design
- Cast iron rotors and stators
- Multiple absorption sections
- Precise metered inlet manifolds
- Readily available bearings and seals, cartridge mounted and easily accessible for field servicing
- Equal absorption in both CW and CCW directions
- Water flow requirement for loading typically is less than 6 GPM per each 100 HP of load applied
- No additional water required for cooling
- Maximum recommended water discharge temperature is 160°F and controlled by discharge valve position

MODEL	3600 RPM	1800 RPM	1200 RPM	900 RPM
PTD-45X10E	4500 HP	4500 HP	3312 HP	1750 HP
PTD-45X08E	3600 HP	3600 HP	2650 HP	1400 HP
PTD-45X06E	2700 HP	2700 HP	1987 HP	1050 HP
PTD-35X06E	2100 HP	2094 HP	1546 HP	800 HP
PTD-35X04E	1400 HP	1396 HP	1030 HP	550 HP
PTD-35X02E	700 HP	698 HP	515 HP	275 HP
PTD-35X01E	350 HP	349 HP	258 HP	138 HP





PRECISION WATER SUPPLY CONTROL VALVE

- Includes servo motor load control manifold pre-plumbed, variable speed motor control, gasketed junction box
- Finite control of water metering
- Allows operator to program test plans
- Automatic or Manual loading of motors



CONTROLS and INSTRUMENTATION

The system's operating controls may be either **PANEL-MOUNTED** into an existing or new Motor Test System control panel (19" rack position required) or contained in a separate **STAND ALONE** steel enclosure.

The control and metering package features an Allen-Bradley Micrologix PLC controller with Panelview display and RS232 interface. A data transfer software program is included to transfer meter readings to a Motor Test System Database Software Program, a spreadsheet, or output results to a serial printer.

- N.O. pushbuttons for Raise/Lower load
- Panelview will display readings for torque, RPM, and horsepower

LOAD CELL and LINKAGE KIT

- Provides calibrated torque and speed signal to metering system
- Factory mounted 60 tooth gear, housing and magnetic speed sensor for monitoring dynamometer RPM
- Torque arm and linkage connected to a 5000 lb. capacity beam style load cell
- Effective torque arm length is 1.75 feet



DYNAMOMETER MOUNTING OPTIONS

Two mounting options are offered to accommodate installation requirements and a suitable shaft connection to the motor under test.

FIXED SUBBASE

- Stationary mount for either 32" or 38" shaft centerline height
- Customer provides motor mounting fixture or test bed
- Motor shaft must be aligned with dynamometer centerline

HYDRAULIC LIFT TABLE

- Allows dynamometer shaft alignment with motor shaft
- Vertical shaft centerline adjustment from 33" to 63"
- Motorized control complete with motor and starter/disconnect
- Positive locking mechanism prevents table movement
- Telescoping drain assembly allows adjustable vertical extension of drain pipe
- Customer provides motor mounting fixture or test bed

DRIVELINE PACKAGE OPTION

The driveline package allows coupling the tapered shaft of the dynamometer to the shaft coupling of the motor under test and includes the following:

DRIVE FLANGE

- Allows drive shaft to couple to tapered dynamometer shaft

DRIVE SHAFT

- With two splined-shaft universal joints and coupling flanges
- Connects dynamometer drive flange to motor coupling
- Dynamically balanced
- For PTD-35X Series Dynaometers, Model 1810 Drive Shaft provides a maximum torque rating of 6,500 ft-lbs intermittently
- For PTD-45X Series Dynaometers, Model 1910 Drive Shaft provides a maximum torque rating of 12,000 ft-lbs intermittently

SHAFT GUARD

- With adjustable base and removable top for proper alignment
- Free-standing pedestal mount

TORQUE CALIBRATION WEIGHTS OPTION

- 8 x 30 lb. weights

DIMENSIONS & WEIGHT (approx.) (excludes mounting base/table)

MODEL	LENGTH	WIDTH	HEIGHT	WEIGHT
PTD-45X10E	65" (1651 mm)	25" (635 mm)	36" (914 mm)	4100 lbs (1860 kgs)
PTD-45X08E	58" (1473 mm)	25" (635 mm)	36" (914 mm)	3600 lbs (1633 kgs)
PTD-45X06E	52" (1321 mm)	25" (635 mm)	36" (914 mm)	3100 lbs (1406 kgs)
PTD-35X06E	55" (1397 mm)	25" (635 mm)	36" (914 mm)	3100 lbs (1406 kgs)
PTD-35X04E	49" (1245 mm)	25" (635 mm)	36" (914 mm)	2600 lbs (1179 kgs)
PTD-35X02E	43" (1092 mm)	25" (635 mm)	36" (914 mm)	2100 lbs (953 kgs)
PTD-35X01E	40" (1016 mm)	25" (635 mm)	36" (914 mm)	1600 lbs (426 kgs)

Other motor testing products PHENIX offers:

- High and Low Power Motor Test Systems
- Core Loss Testers
- AC and DC Hipots
- Insulation Analyzers
- Megohmmeters
- Microhmmeters

High Voltage • High Current • High Power Test Systems and Components

ISO 9001
CERTIFIED



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