

**PORTABLE  
GENERAL  
PURPOSE  
DYNAMOMETERS**

KAHN SERIES  
**101**



**KAHN**  
KAHN INDUSTRIES INC.

# KAHN SERIES 101 GENERAL PURPOSE DYNAMOMETERS

**FOR LOAD TESTING OF SMALL GAS TURBINES, GASOLINE ENGINES, AUXILIARY POWER UNITS, ELECTRIC AND HYDRAULIC MOTORS, HIGH SPEED GEARBOXES, BELT AND CHAIN DRIVES.**

## FEATURES

- Easy to install and to operate
- Lightweight, portable units with standard AND 10266/10262 mounting flange
- Hardened stainless steel power elements providing superior resistance to cavitation and corrosion
- Straightforward design permitting quick overhaul
- Spring loaded, precision ball bearings—grease packed or oil mist lubricated
- Water cooled quality carbon face seal
- Built-in 60 tooth gear for use with magnetic speed pickup
- Full power absorption in either direction of rotation

## OPERATING PRINCIPLE

A single perforated disc rotates in a housing between perforated stators. Cold water enters the rotor chamber at the center. The water is accelerated by the rotating disc and thrown outwards. From the outer diameter of the rotor chamber inwards, the water forms an annulus which rotates at approximately half of the angular disc speed. The centrifugal pressure resulting from this process, forces the hot water out of the rotor chambers.

Power is absorbed—and converted into heat—by water vortices generated in rotor and stator holes. The resulting drag applies a resistance to rotation and tends, with an equal effort, to turn the dynamometer housing in the trunnion bearings. The housing is restrained from turning by a load cell which is mounted to the torque arm at a fixed distance from the center-line of the dynamometer.

The amount of power absorbed by the dynamometer is a function of water level (size of rotating water annulus) and speed. The water level is modulated with the inlet and outlet control valves. At a given speed, maximum power is absorbed when the rotor chambers are completely filled with water.

## WATER SUPPLY REQUIREMENTS

Hydraulic dynamometers convert mechanical energy into heat. The heat is dissipated by a continuous flow of water through the dynamometer. The flow rate is proportional to the amount of power absorbed.

Water Flow*	6 gal/hr hp (30 l/hr kW)
Supply Pressure	50 psig (3.5 bar)
Max. Inlet Temperature	90°F (32°C)
Max. Outlet Temperature	140°F (60°C)
Filtration	40 mesh screen
Seal Water Flow	0.1 gal/min (0.4 l/min)

\*at delta t = 50°F (28°C)

## ROTOR ASSEMBLY

Single perforated disc mounted on shaft by means of an involute spline. Shaft and disc made from hardened stainless steel. 60-tooth shaft mounted gear. Entire rotor assembly dynamically balanced.

## BEARINGS, LUBRICATION AND SEAL

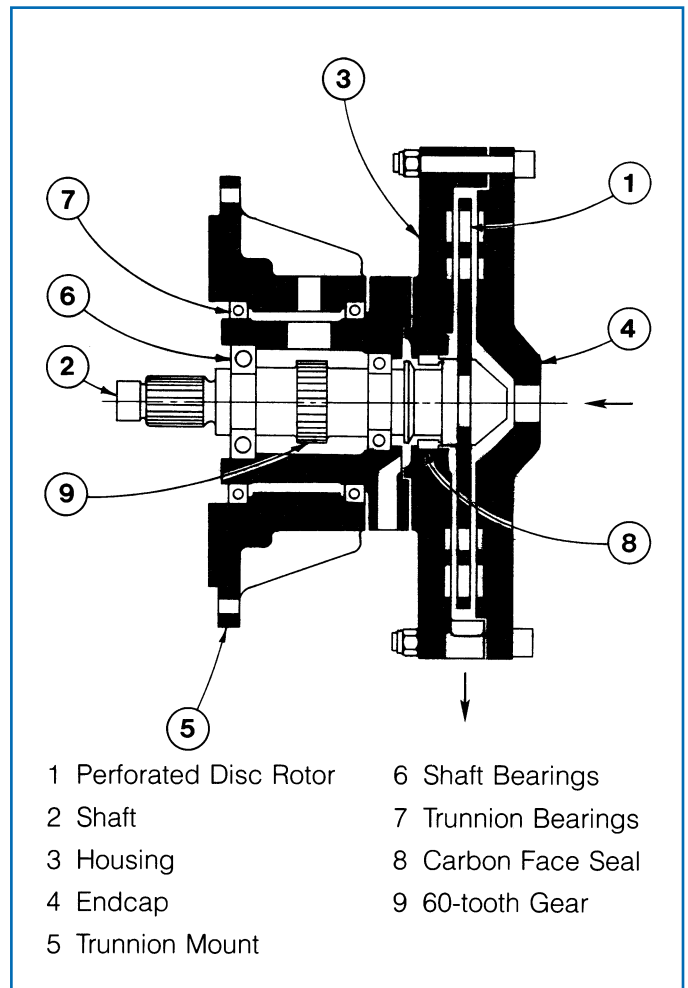
Two ABEC 5 or ABEC 7 precision ball bearings. Spring loaded to reduce vibration. Grease packed or oil mist lubricated. Oil mist lubricated units with one removable oil injector per bearing. Including wall mounted oil mist system with air pressure regulator, filter and lubricator.

Lubricating Oil	MIL-L-7808 or Mobil DTE 24
Oil Reservoir Capacity	19 oz. (.56 l)
Air Requirements	max. 20 scfm dry air
Air Supply Pressure	50-100 psig (3.5-7.0 bar)

Stationary carbon face seal with chrome plated mating ring. Continuously cooled with water to prevent distortion and cracking of the carbon ring. Any water leakage across the carbon face seal is discharged by a rotating flinger into a drain cavity.

## HOUSING AND TRUNNION MOUNT

Lightweight aluminum housing supported by two grease packed trunnion bearings. Trunnion mount with AND 10266/10262 mounting flange. Rotor chamber lined with hardened stainless steel stator plates. Built-in vacuum breaker to maintain atmospheric pressure in the rotor chamber.



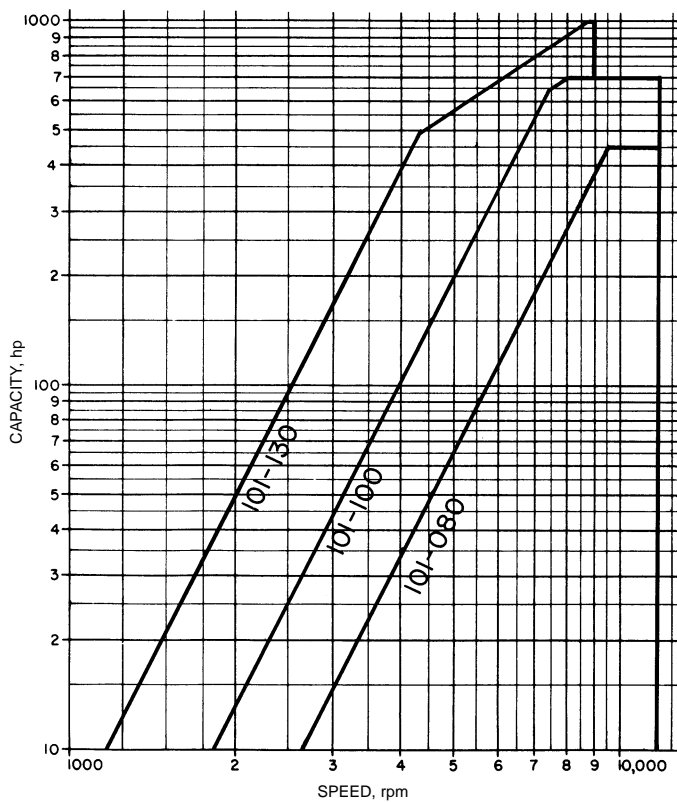
## SERIES 101 GENERAL PURPOSE DYNAMOMETERS



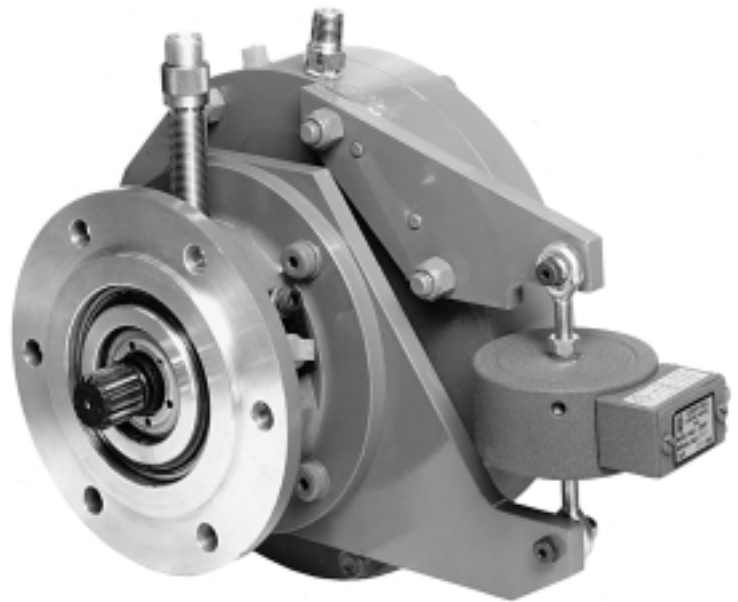
### SPECIFICATIONS

Model	Max. Power hp	Max. Speed rpm	Max. Torque ft.lb.	WR <sup>2</sup> in <sup>2</sup> lb	Dry Weight lbs
101-080	450	14,000	250	21	50
101-100	700	11,500	450	57	60
101-130	1000	9,000	600	180	85

### OPERATING RANGE



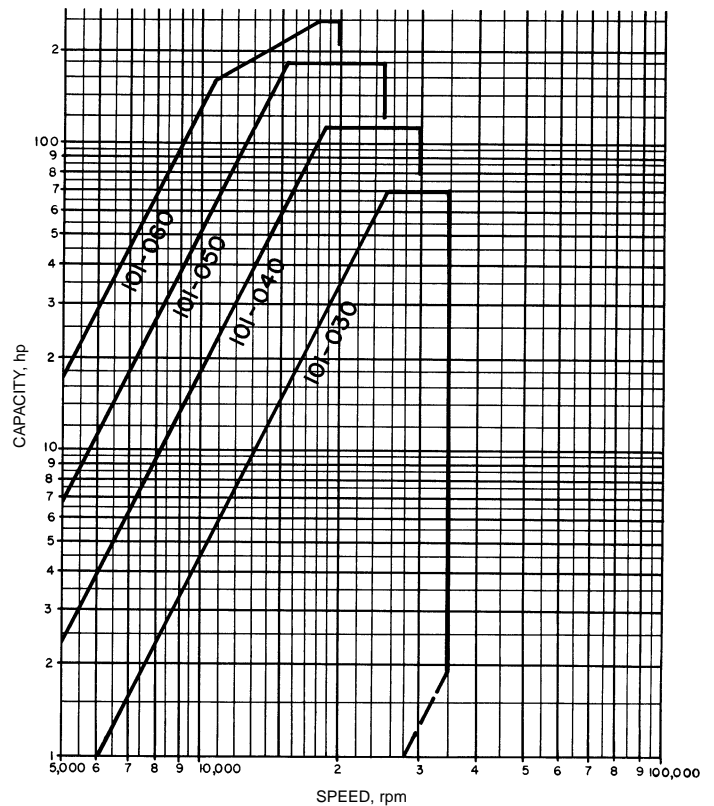
## SERIES 101 HIGH SPEED DYNAMOMETERS

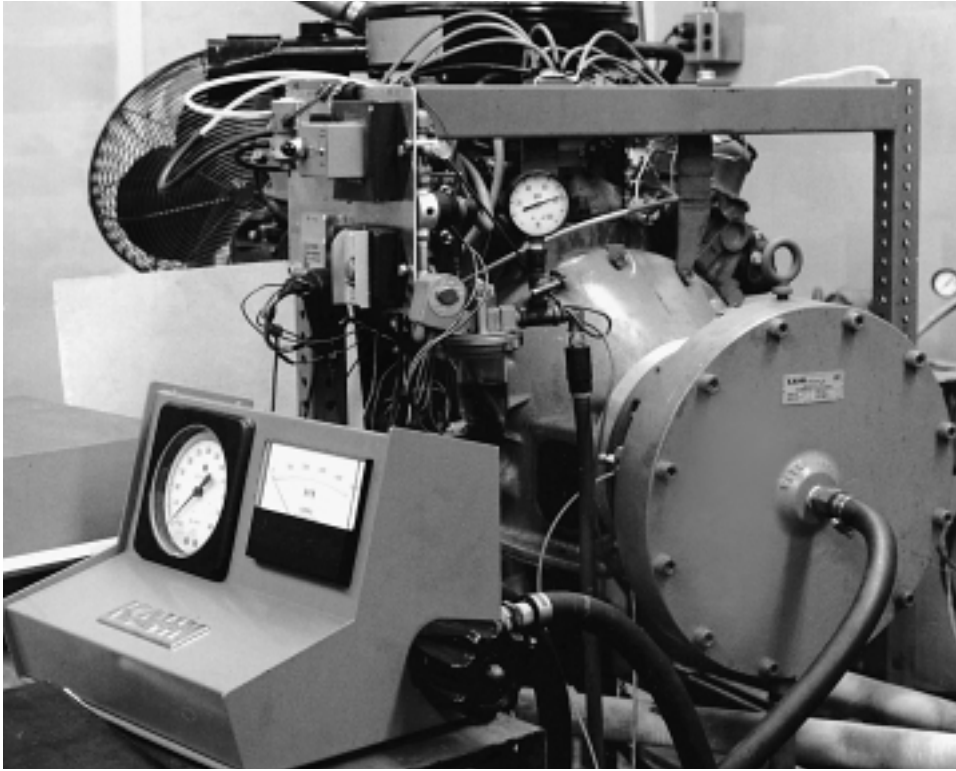


### SPECIFICATIONS

Model	Max. Power hp	Max. Speed rpm	Max. Torque ft.lb.	WR <sup>2</sup> in <sup>2</sup> lb	Dry Weight lbs
101-030	70	35,000	14.7	2.9	23
101-040	110	30,000	32	3.3	23
101-050	180	25,000	60	4.5	23
101-060	250	20,000	75	6.1	23

### OPERATING RANGE





*Model 101-130 dynamometer mounted to Chrysler 318 cu. in., V-8 gasoline engine. Control console Series 513 shown in foreground.*

### **LOAD CONTROL SYSTEM SERIES 513**

Portable control console with built-in 4½" torque gage, self-powered analog speed indicator and water inlet control valve. Torque is measured by a hydraulic load cell (compression only). Magnetic speed pickup, outlet valve, seal water valve. Connecting cables 10 feet (3.0m) long. Filled with hydraulic fluid and calibrated in the factory. Standard ranges 600 ft. lb/10,000 rpm. System accuracy: ± 2% F.S. for torque and ± 1% F.S. for speed.

### **CALIBRATION SYSTEM SERIES 504**

Including calibration arm 36" long, weight hanger, adjustable counter weight. Max. ten slotted weights 20 lbs each per National Bureau of Standards, Class C.

### **DIGITAL READOUT SYSTEM SERIES 511**

Portable instrument console 9½" wide with digital display of torque and speed. Built-in strain gage conditioner with mV/V reference standard. Calibrated in in. lb., ft. lb., Kgm or Nm. Easy to recalibrate. Universal strain gage load cell (tension and compression), magnetic speed pickup, connecting cables 30 feet (9.14m) long. Power requirements 120V, 50/60 Hz, 35 Watts. System accuracy ± 0.2% F.S. for torque and ± 0.1% F.S. for speed. In conjunction with Series 503 pneumatic control valves.

NOTE: The information included herein was correct at the time of publication and supersedes all previous data. It is our policy to continually improve our products to insure even better performance. Consequently, current Kahn products may incorporate modifications not shown on these pages.

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