

# A.C. TRANSIENT DYNAMOMETERS & CONTROLLERS

(Swinging type/programmable)

## Application:

**MACA** series of low time constant A.C. Dynamometers are available in more than 10 different models (10 to 1000 kilo watts/ 500 to 50,000 rpm) including some tailor made models practically offering readymade solution in measurement, testing / diagnostic of any principal parameter like power, rpm and torque as well as other inferential parameter like rated power/torque capacity, overload power/torque capacity, efficiency, plotting torque/speed and power/speed curve, desired phase trajectories of any diesel/gases /petrol engine/automobile ( low/high rpm). These fast responding dynamometers has ability to detect fast variation in engine parameters on account of its ultra low constant due to low mechanical time constant, windage losses, least rheological problem, mechanical black-lash/ dead band, and exhibits a repeatable and hysteresis less Torque/Power vs Excitation current characteristics which guarantees accurate identification of parameters during steady state/transient conditions.

## Operating Principle:

These A.C. dynamometer can operate in both absorbing mode as well in motoring mode with smooth transition between each mode. While performing in regenerative mode, power is transferred into electricity main. with this type of dynamometer an infinitely variable load can be applied at constant speed or set to a constant load with a variable speed. It offers linear/stable torque/speed behaviour, especially at lower speed range with speed holding within +0.1% of full speed. These dynamometers can also be used to estimate internal losses in engine while working in motoring mode.

Power/Torque absorbed/delivered by A.C. Dynamometer is given as under....

$$w = K_1 \cdot V / I_f - K_2 \cdot T / I_f^2 \text{ (torque between 0.1-1000.0 kg.m).}$$

$$W = \text{RPM}, T = \text{torque}, V/I = \text{voltage/current}$$

Feedback controlled power supply ensure fine resolution in loading i.e. 0.1% of torque/power at any time, with a very high degree of stability and repeatability.

## Technical specifications of A.C. Dynamometer controller:

Operating Power supply	220 volts/50 hz
Excitation current	500 amps (max)
Torque pulsation	100 ppm
Current ripple	50 micro amp
Conversion frequency of chopper	50 Hz/50 kHz
Display	Power/Torque/Speed ( 3-1/2 digit)
Short-circuit	50% of rated current
Equivalent magnetic field	0.0 to 1.0 tesla.

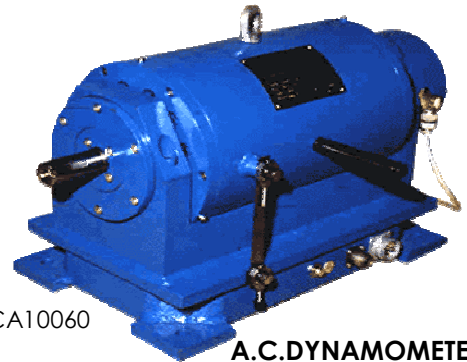
Control unit of dynamometers are equipped with cooling water and exhaust gas temperature, exhaust calorimeter electronic flow meter for monitoring fuel consumption air, tachometer, torque (load cell) and real shaft power sensors interface to Digital controller / SCADA system with facility to simulate desired characterization with consistency and accuracy.

## Weight/ Size (inches):

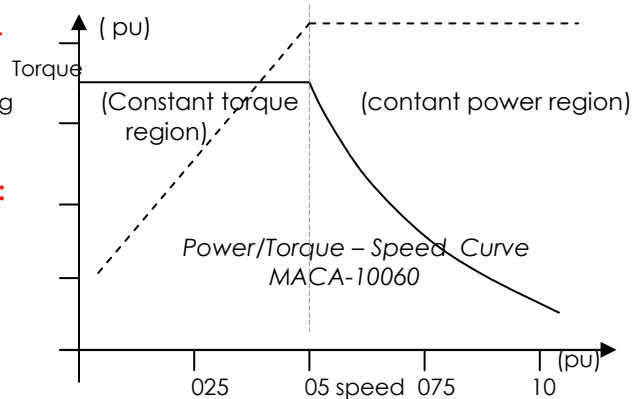
MACA02300	20.0 kg/08x08x12	MACA50120	120.0 kg/20x24x36
MACA05300	50.0kg/12x12x16	MACA10060	150.0 kg/24x24x40
MACA10200	70.0kg/16x16x20	MACA25030	160.0 kg/24x24x50
MACA20005	100.0kg/18x18x20	MACA50015	200.0kg/24x24x52



A.C. Dynamometer (MACA-10200)



A.C. DYNAMOMETER



Dynamometer Test Bench (Diesel Engine) MACA50120

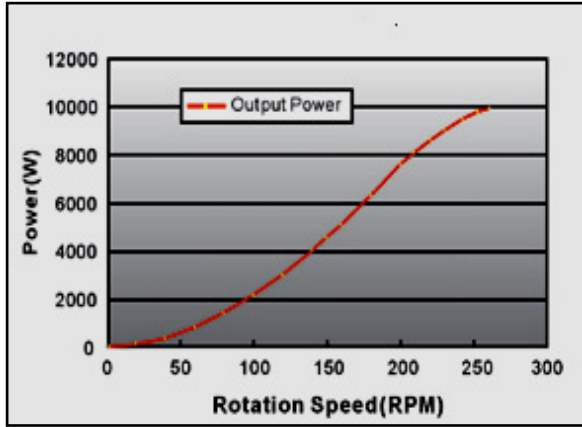
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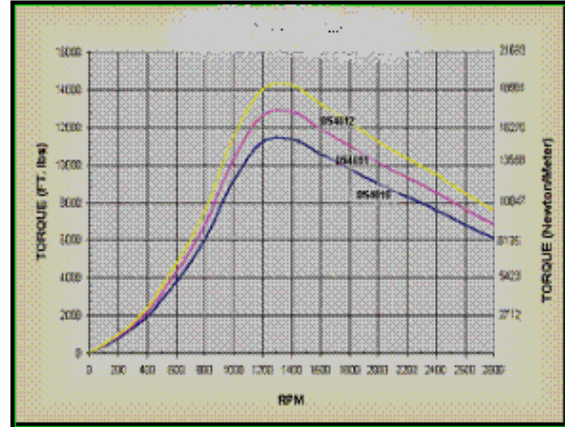
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Horse-power Vs Speed characterization  
Diesel-Dynamometer-MACA-80005



Torque Vs Speed characterization  
Diesel dynamometer- MACA-150003



Chassis dynamometer (Two wheeler )  
MACA-10060



Dynamometer Test bench (Diesel- engine)  
MACA-50120

## Technical specifications and selection chart (MACA series) P<2000.0 kilo.watts

Model	Power (kilo watts)	Rated Torque N.m	Non excited torque % R.T.	RPM other rpm option	Cooling Water/Air	Thermal rise °C (an hour)
MACA150003	1500.0	4700	0.0	300	Liquid	65
MACA80005	1000.0	1900	0.0	500	Liquid	65
MACA75010	750.0	7160	0.0	1000	Air	65
MACA50015	500.0	3180	0.0	1500	Air	65
MACA25030	250.0	790	0.0	3000	Air	65
MACA10060	100.0	160	0.0	6000	Air	65
MACA50120	50.0	38.9	0.0	12000	Air	65
MACA20150	20.0	12.7	0.0	15000	Air	65
MACA10200	10.0	7.9	0.0	20000	Air	65
MACA05300	5.0	1.6	0.0	30000	Air	65
MACA02300	2.0	0.63	0.0	30000	Air	65

Last two numeral after MACA indicates rpm.x100 an remaining numeral indicates power( kilo-watts)

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