

HYDRAULIC DYNAMOMETERS & CONTROLLERS

(swinging type/programmable)

Application:

MHDM series of hydraulic dynamometers are available in more than 30 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 engine/automobile (low/high rpm). These dynamometers possess least mechanical time constant, windage losses, 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:

Several blades tilted at a 45 degrees angle face the oval impeller chamber, which contains rotary and stationary impellers. Behind the rotary impeller, several linear blades are radially arranged. The casing is mechanically linked with a loadcell by means of a torque lever. Water circulates along the rotating impeller as the main shaft of the dynamometer is driven by the engine under test. The friction of water generated in the chamber gives brake power to the rotary impeller and torque power to the stationary impeller. The mechanical energy caused by the fluid friction is converted into a thermal energy and absorbed into the water. Brake torque is stabilized by maintaining constant water flow rate. Brake torque is regulated by controlling the amount of water in the linear blades. Brake torque generated is given as...



$$T = k_1 \cdot V^{1.2} - V^{1.8}$$

(Maximum torque varies between 0.3 lbs-ft to 1000.0 lbs-ft)
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 dynamometer controller:

Operating Power supply	220 volts/50 hz
Excitation current	15 amps (max)
Torque pulsation	100 ppm
Torque control range	10-100%
Display	Power/Torque/Speed (3-1/2 digit)
Short-circuit	50% of rated current
Equivalent magnetic field	0.0 to 1.0 tesla.

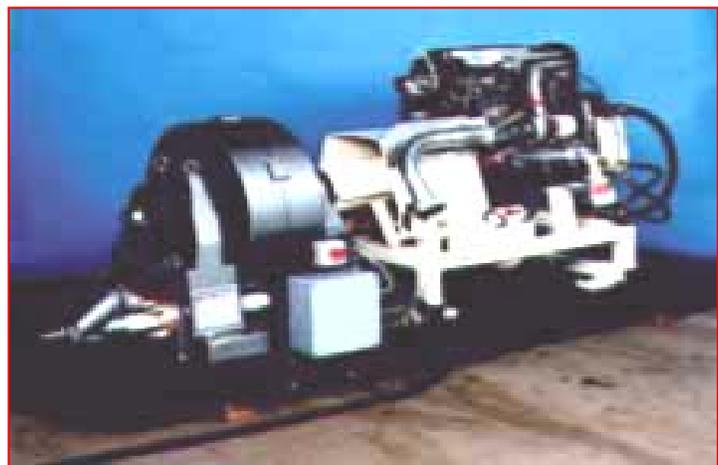
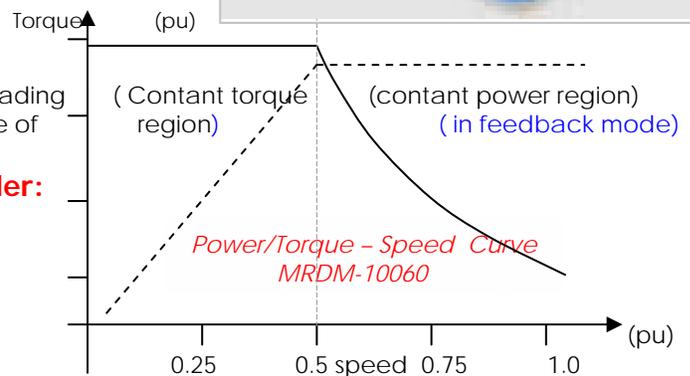
Control unit of dynamometers are equipped with cooling water and exhaust gas temperature, exhaust calorimeter electronic flow meter for monitoring fuel consumption air, tachometer, torque (load cell) and real shaft power sensors interface to Digital controller / SCADA system with facility to simulate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

Weight/ Size (inches):

MHDM20002	4.5kg/4x5x5	MHDM20010	10.0kg/6x7x7
MHDM20003	5.0kg/4x5x5	MHDM20015	12.0kg/6x7x7
MHDM20004	6.0kg/4x6x6	MHDM20020	15.0 kg/6x8x8
MHDM20005	7.0kg/6x6x6	MHDM20050	20.0kg/6x10x10



Hydraulic dynamometer Controller MHDM-25030
Dynamometer controller MHDM-20005



Dynamometer Test Bench(Diesel Engine)

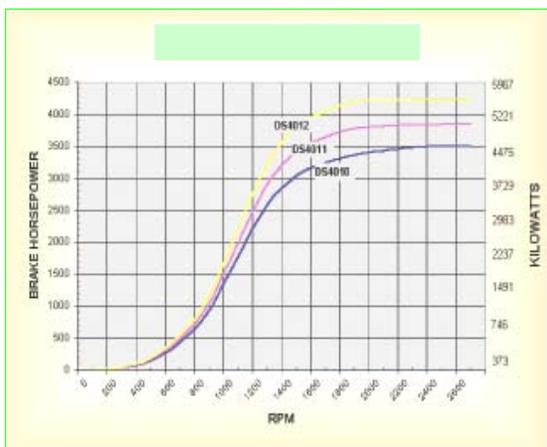
MOTORON SEMICONDUCTORS CORPORATION

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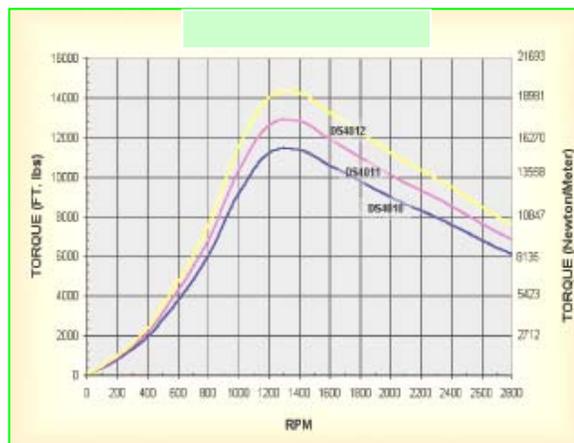
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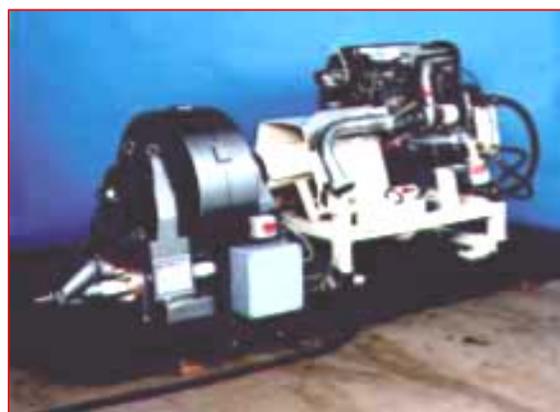
Horse-power Vs Speed characterization
Diesel-Dynamometer-MHDM-80005



Torque Vs Speed characterization
Diesel dynamometer- MHDM-150003



Chassis dynamometer (Two wheeler)
MHDM-10060



Dynamometer Test bench(Diesel- engine)
MHDM-50120

Technical specifications and selection chart (MHDM- series)

P < 2000.0 kilo.watts

Model	Power (kilo watts)	Rated Torque N.m	Non excited torque % R.T.	RPM	Cooling Water/Air	Thermal rise °C (an hour)
MHDM150003	1500.0	4700	0.0	300	Liquid	65
MHDM080005	1000.0	1900	0.0	500	Liquid	65
MHDM075010	750.0	7160	0.0	1000	Air	65
MHDM050015	500.0	3180	0.0	1500	Air	65
MHDM025030	250.0	790	0.0	3000	Air	65
MHDM010060	100.0	160	0.0	6000	Air	65
MHDM050120	50.0	38.9	0.0	12000	Air	65
MHDM020150	20.0	12.7	0.0	15000	Air	65
MHDM010200	10.0	7.9	0.0	20000	Air	65

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

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