MPW 5 Modular engine test bed (braking dynamometer) for combustion engines, with MP Computer

In the following the basic design is described. A wide variety of standard functions is additionaly available.

In basic design the engine test bed is not supposed to be run unattended, if internal faults of the test bed or external faults may lead to dangerous situations.

Loading system:	air-cooled electromagnetic eddy-current brake both senses of rotation possible		
Max. speed (continuously permissible):	5000 r.p.m.		
Min. sensed speed:	100 r.p.m.		
Max. torque at operation temperature:	at 500 r.p.m.	-	35 Nm
	at 3000 r.p.m.	-	62 Nm
Max. continuous load-carrying capacity:	at 500 r.p.m.	-	1.2 kW
	at 3000 r.p.m.	-	3.5 kW

The engine test bed consists of the braking and measuring unit and the control unit (evaluation, display and control unit with MP Computer). Both units are connected by cables and plugs.

The braking and measuring unit is suitable for testing engines with horizontal axis. The engines to be tested are to be fixed on module plates. These module plates are adjusted on the table of the braking and measuring unit by a prismatic guide and then fixed by clamping sets.

The brake is fixed on the table. The engine to be tested is connected to the brake by a double-cardanic flexible damping coupling. The brake and the coupling are protected against accidental contact by means of a protective grating.

The table is equipped with damping masses and elastically fixed to the mobile support of the braking and measuring unit.

A foundation or fixation to the floor are not required. The test bed is mobile.

Weights:	braking and measuring unit:	approx.	145 kg		
	control unit:	approx.	45 kg		
Space required:	braking and measuring unit:	approx. 0.85 m	x	0.90 m	
	control unit:	approx. 0.70 m	x	0.75 m	
Electric supply:	220 V, 50/60 Hz with protection earth via 10 m cable with connector rated current 0.85 A, max. fuse rating 16 A Other supply voltages are possible.				
Exhaust evacuation:	required, available on request				

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Control and measurement

The control unit contains:
the MP Computer,
the control circuits for the eddy-current brake and
the required power supplies.

Protection class of the control unit: IP 55
The 19" desktop case shown on several illustrations is no more recommended.

Rotational speed n, torque M, power P, work (energy) W

Loading of the engine by the brake is controlled by limiting the brake speed. This is achieved by manually entering the desired speed value (analog input) at a manually operated input potentiometer. This potentiometer acts through a fast response analog control circuit with thyristor amplifier. The amplifier controls the current magnetizing the eddy current brake.

The input potentiometer is installed in a separate hand-control housing and connected to the control unit via a spiral cable in such a way, that it can be operated from any point near the engine, if the control unit is positioned in an appropriate location.

A speed-stabilizing function of the MP Computer with numerical input of the desired value can be optionally superimposed to the manual speed adjustment and allows fast and precise adjustment of the speed.

Speed measurement: digital incremental pick-up non-sensitive for sense of rotation

Torque measurement: analog measurement of the reactive torque at the stator of the brake by strain gage load cell

The MP Computer displays the following measured and calculated values simultaneously via LED's 20 mm high:

Speed	display range	9999	r.p.m.
	display resolution	1	r.p.m.
Torque	display range	20	Nm
	display resolution	0.02	Nm
	permissible oscillation amplitude	+/- 50	Nm
	calibration value	20	Nm
Power	display range	99.99	kW
	display resolution	0.01	kW
Work (energy)	display range (automatic change-over)	9.999	kWh
	or	99.99	kWh
	or	999.9	kWh
	or	9999	kWh
	corresponding display resolution	0.001	kWh
	or	0.01	kWh
	or	0.1	kWh
	or	1	kWh

The work counter (kWs) can be set On/Off and also be reset.

Setting On/Off of the work counter controls at the same time the

determination of the specific fuel consumption (additional equipment)

Subject to change !

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