



# DYNAMIC BALANCING MACHINES

## With Microprocessor Based Measuring Panel

### HARD BEARING MODEL - HDM

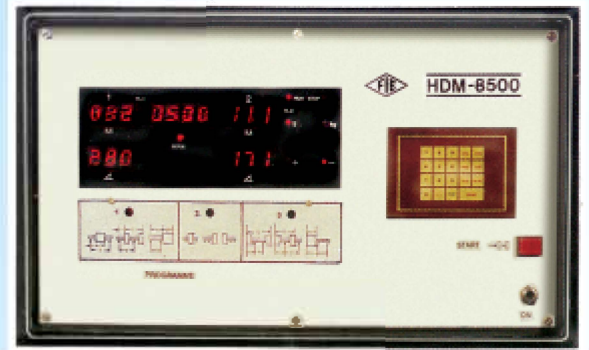
Machines Model HDM are horizontal type universal hard bearing balancing machines provided with Microprocessor based measuring panel HDM-8500 for balancing different shapes of rotors like rotors of electrical machines, crankshafts, cylinders, Gas Compressors, flywheels, turbine rotors, rotors of centrifugal pumps and any other type of rotors of rotating machines.

These machines feature a very simple operation. The working cycle is fully automatic. From safety point of view a double press push button starts machine, measures and stores the unbalance values on DPMs for two planes simultaneously and stops machine (with brake if machine is provided with electrical braking facility). The measuring cycle in general is less than 10 seconds for normal rotors, which can be accelerated within 5 seconds.

To have smooth & gradual acceleration models HDM 3,000/7,000/10,000/20,000 are provided with slipping motors in order not to have damage to drive coupling as well other rotating parts in drive system like gears etc. The starting of these machines is done manually by cutting remittances of starter in 4 to 5 steps.

Key-board facility provided on measuring panel for correct data feeding of rotor with 1 digit accuracy for its dimensions like A,B,C,R1&R2. Tolerance limits of both correction planes i.e. t1, and t2 can be fed, so that when rotor is balanced within the limits respective LED s glow up, indicating no further correction necessary. For other details please refer 'Features of Measuring panel HDM-8500.'

The usable length of machine is established according to the longest rotor to be balanced. Extension beds can be supplied on request, which can be added to standard bed of machine. It is also possible to install an additional bed (Gap bed) with a pit between this bed and standard bed of machine in order to balance rotors having its outside diameter exceeding swing over standard bed. Models HD-7,000/10,000/20,000 are provided with fixed separate drives and hence gap-bed design is not possible.



#### HDM-8500

This is a Microprocessor based measuring panel suitable for FIE Hard Bearing Machine.

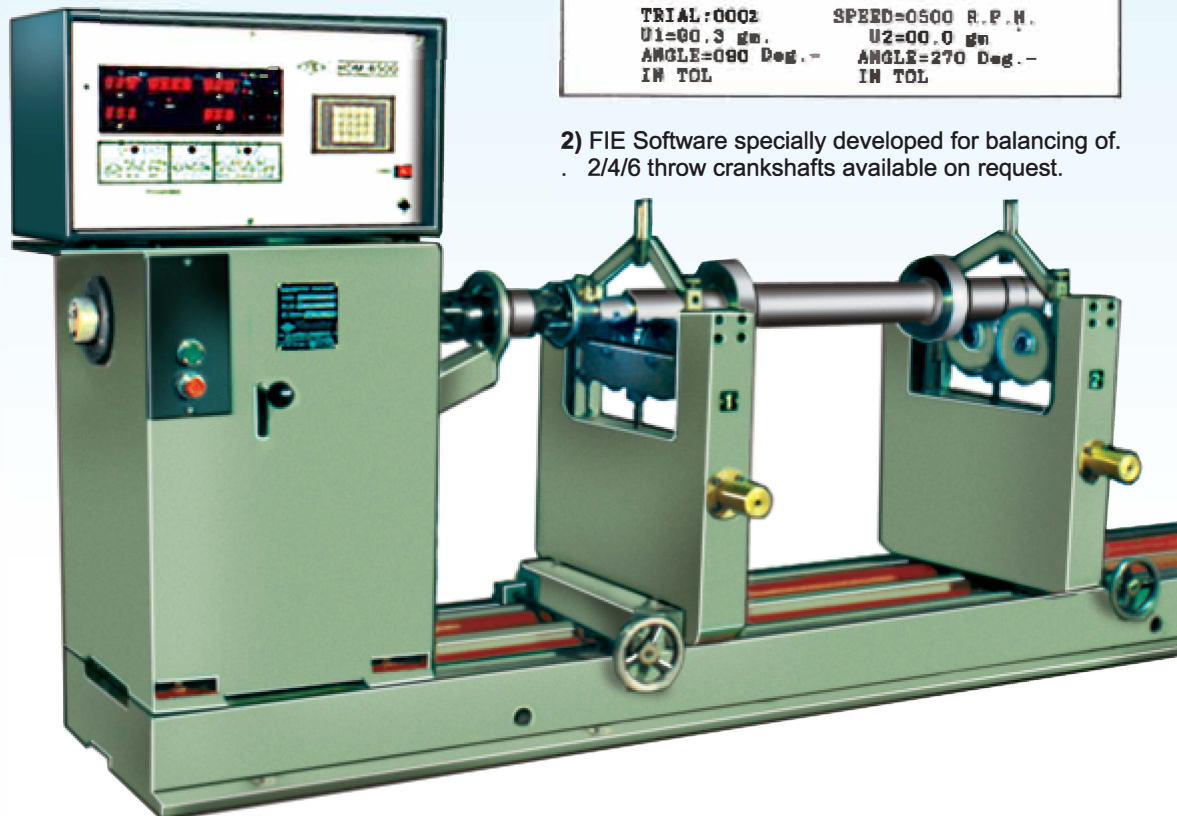
#### Additional Features on Demand

##### 1) Printer :

A matrix printer can be connected through available 'FIE' software. See sample printout. It shows trial runs till rotor is balanced within balancing tolerance.

ROTOR.NO:01	SERIAL.NO:0001
A=0155 mm	B=0765 mm C=0455 mm
R1=0080 mm	R2=0080 mm
TL1=0150 g.mm	TL2=0150 g.mm
TRIAL:0001	SPEED=0500 R.P.M.
U1=076 gm.	U2=075 gm
ANGLE=037 Deg.-	ANGLE=036 Deg.-
TL1=40.53	TL2=40.00
TRIAL:0002	SPEED=0500 R.P.M.
U1=00.3 gm.	U2=00.0 gm
ANGLE=090 Deg.-	ANGLE=270 Deg.-
IN TOL	IN TOL

2) FIE Software specially developed for balancing of . 2/4/6 throw crankshafts available on request.





# DYNAMIC BALANCING MACHINES

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### HARD BEARING MODEL - HDM

#### STANDARD FEATURES :

##### 1) Digital display for unbalance indication

Amount and angle for unbalance for both planes displayed on separate DPMS. Hence linear accuracy is very good as compared to Analog meter. Accuracy  $\pm 1$  Digit for amount and  $\pm 1$  Degree for angle.

##### 2) Digital display for RPM indication

A DPM is provided to indicate balancing speed continuously as a standard feature.

##### 3) Auto Stop

No necessary to stop machine once started. It stops automatically after stabilization of unbalance results.

##### 4) Simultaneous Indication

Amount and Angle of unbalance in both planes displayed simultaneously and remains displayed (Stored) till next run. This totally eliminates operation of plane selector and reduces additional time for stabilization of readings in other plane.

##### 5) Key-board

Data of rotor dimensions and balancing tolerance i.e. values of A,B,C, R1,R2,t1,t2, are fed by key operation. Hence accuracy of data feedings accurate upto 1 digit.

##### 6) Tolerance Indicators

Separate LEDS are provided for both planes which glow when unbalance is reduced within balancing tolerance.

##### 7) Auto-range

Depending upon whether unbalance amount is more or less a respective course or fine range gets automatically selected till rotor gets balanced within tolerance limits. Multiplier operation is totally eliminated.

##### 8) Data Store

Data of various rotors can be stored against respective rotor type nos. Hence no need of measuring of rotor dimensions or rotor data feeding when repeat balancing operation required. Just call rotor type no. and machine is ready for balancing.

##### 6) Self Check

Panel is provided with "Self-Check" mode which checks proper functioning of digital displays, LEDS is cyclic operation. This helps immediate fault detection.

#### TECHNICAL SPECIFICATIONS

#### "FIE" HORIZONTAL TYPE UNIVERSAL HARD BEARING BALANCING MACHINES

MODELS	UNIT	HDM-10	HDM-30	HDM-50	HDM-100	HDM-300	HDM-650	HDM-1,000	HDM-3,000	HDM-7,000	HDM-10,000	HDM-20,000
Weight of Rotor	kg	0.5-10	1-30	2-50	3-100	10-300	20-650	10-1,000	30-3,000	70-7,000	100-10,000	200-20,000
Max. Weight on each pedestal	kg	7.5	22.5	30	75	180	480	600	1,800	5,250	6,000	12,000
Max. diameter of rotor over bed	mm	600	600	600	1,000	1,000	1,200	1,600	2,000	2,400	2,400	3,000
Max. distance measured from coupling end to extreme bearing centre.	mm	480	480	1,100	1,350	1,350	1,650	1,650	2,400	3,300	3,300	3,200
Min. distance between Roller bearing of pedestals	mm	75	75	75	90	110	300	350	500	560	560	660
Rotor journal dia	mm	5-50	5-50	5-50	15-80	20-120	20-120	25-140	35-200	55-300	55-300	70-300
Balancing speed (n)	RPM	1,000	700	700	600	500	350	300,600	250,500	200,400	200,400	200,400
Power of drive motor	HP	0.33	0.75	0.75	1.5	3	5	7.5	20 Slipring	30 Slipring	40 Slipring	60 Slipring
Acceleration Capability ( $GD^2n^2$ )	kgm <sup>2</sup> n <sup>2</sup>	$0.29 \times 10^6$	$0.37 \times 10^6$	$0.37 \times 10^6$	$0.88 \times 10^6$	$3.9 \times 10^6$	$8.56 \times 10^6$	$14.12 \times 10^6$	$88 \times 10^6$	$168 \times 10^6$	$216 \times 10^6$	$301 \times 10^6$
Minimum unbalance mass measured	g	0.01	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1	1	1
Maximum unbalance mass measured	kg	0.4	4	4	4	4	4	4	4	40	40	40
Unbalance reduction ratio	%	95	95	95	95	95	95	95	95	95	95	95
Minimum achievable unbalance per Rotor Weight (for max. weight or rotor)	gmm/kg	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

\* PC & Printer is not in our standard scope of supply.

# CANAN TESTING SERVICES

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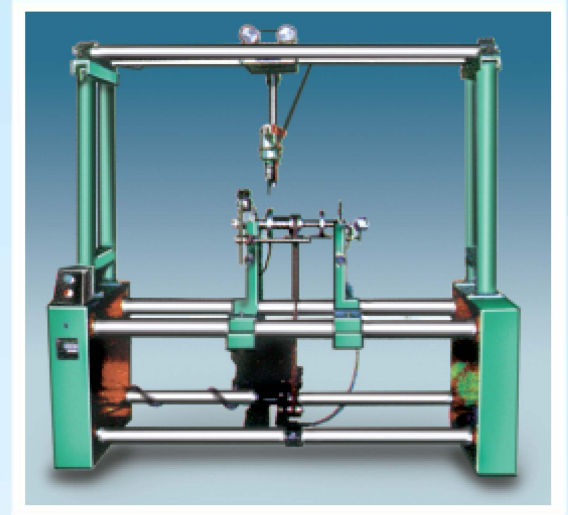
### HARD BEARING MODELS - HDCM

Machines Model HDCM are belt driven horizontal type photo scanning Universal Hard Bearing Balancing Machine, provided with microprocessor based measuring panel HDCM-8500 suitable for balancing different shapes of rotors, of electrical machines, Cylinders, fly wheel, rotor of centrifugal pumps and other type of rotating machines.

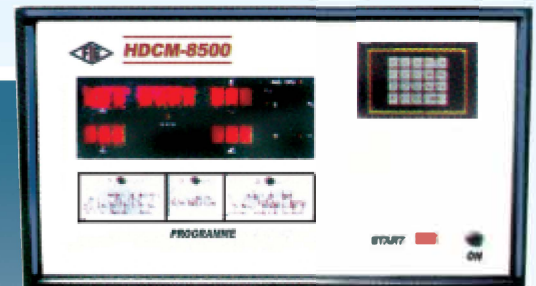
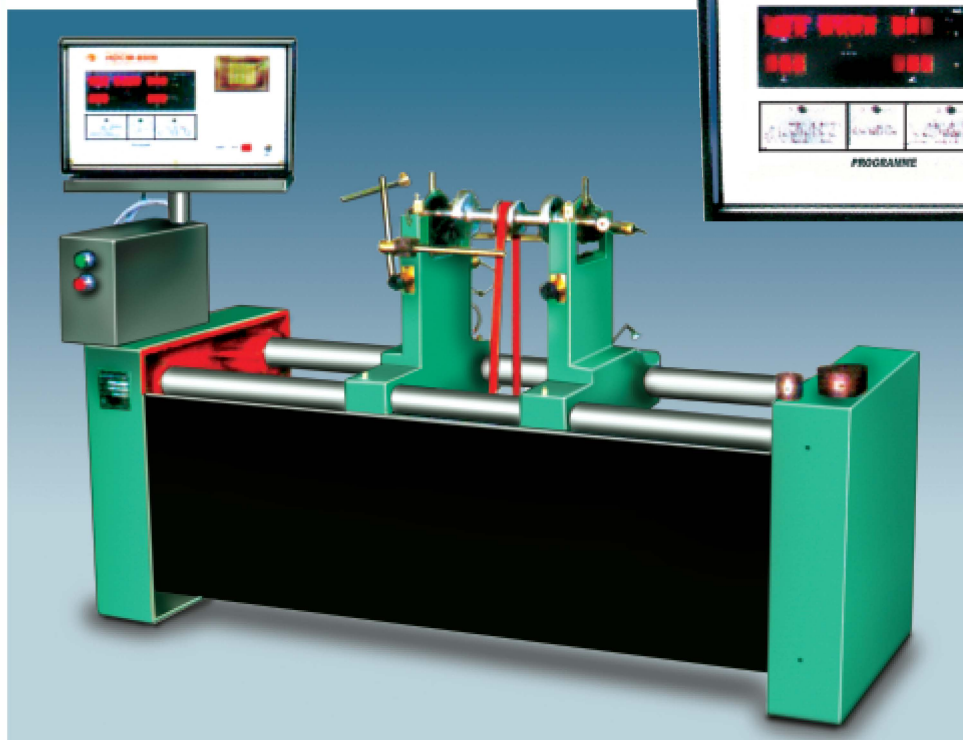
These machines are very simple in design, No drive coupling/adaptor etc. required to connect to the rotor to be balanced. It has following advantages -

1. Cost saving on manufacturing of precision adaptor to connect drive coupling to rotor.
2. Any rotor can be balanced without losing time in manufacturing of adaptor.
3. The balancing accuracy of rotor not disturbed due to unbalance in drive coupling/adaptor.
4. Belt drive machine are more accurate (about 5 times) as compared to end drive machine.

The machines features a very simple operation. The working cycle is fully automatic. From safety point of view a double press push button starts machine, measures and stores the unbalance values on DPMs for two plane simultaneously and stops machine. Key board facility provided in measuring panel for correct data feeding of rotor with 1 digit accuracy for its dimensions like A, B, C, R1 & R2. Tolerance limits of both correction planes i.e. +11 & +12 can be feed so that when rotor is balanced within the limits respective LEDs glow up, indicating no further correction necessary. For other details please refer "features of measuring panel HDCM-8500".



Machine provided with optional vertical drilling attachment.



HDCM-8500 Panel

## STANDARD FEATURES :

### 1) Digital display for unbalance indication

Amount and angle for unbalance for both planes displayed on separate DPMS. Hence linear accuracy is very good as compared to analog meter  $\pm$  digit for amount and  $\pm$  Degree for angle.

### 2) Digital display for RPM indication

A DPM is provided to indicate balancing speed continuously as a standard feature.

### 3) Auto Stop

No necessary to stop machine once started. It stops automatically after stabilization of unbalance results.

### 4) Simultaneous Indication

Amount and Angle of unbalance in both planes displayed simultaneously and remains displayed (Stored) till next run. This totally eliminates operation of plane selector and reduces additional time for stabilization of readings in other plane.

### 5) Key-board

Data of rotor dimensions and balancing tolerance i.e. values of A,B,C, R1,R2,I11,I12 are fed by key operation. Hence accuracy of data feedings accurate upto 1 digit.

### 6) Tolerance Indicators

Separate LEDs are provided for both planes which glow when unbalance is reduced within balancing tolerance.

### 7) Auto-range

Depending upon whether unbalance amount is more or less a respective course or fine range gets automatically selected till rotor gets balanced within tolerance limits. Multiplier operation is totally eliminated.

### 8) Data Store

Data is provided with 'Self check' mode which checks proper functioning of digital display. LEDs is cyclic operation. This helps immediate fault detection.

### 6) Self Check

Panel is provided with "Self-Check" mode which checks proper functioning of digital displays, LEDs is cyclic operation (optional). This helps immediate fault detection.

## B) Additional Features on demand

### 1) Printer :

A matrix printer can be connected through 'FIE' software. It shows runs till rotor is balanced within balancing tolerance.

### 2) Compensation Indication :

'FIE' software specially developed with 3-99 component indication, is suitable for balancing of rotor with fixed locations for balancing correction.

### 3) Unbalance Correction :

i) Drill attachment 8mm capacity portable drill with supporting overhead railing.

ii) Separate drilling attachment 19mm capacity with a vertical drilling head, manual.

iii) Portable type reveting hammer (piston type) speed 1800 blows/minute, capacity 6mm in a aluminium suspended from top with rail.

iv) Tangential belt drive, in addition to standard (suitable for a particular type of rotor for production balancing).

v) Longitudinal movement of right hand pedestal by chain & sprocket attachment.

## SPECIFICATIONS :

MODELS	UNIT	HDCM-10	HDCM-30	HDCM-50	HDCM-100	HDCM-300
Weight of Rotors	kg	0.2-10	0.3-30	0.5-50	1-100	3-300
Max. wt. of each pedestal	kg	7.5	22.5	30	75	180
Max. diameter of rotor	mm	250	500	500	800	1000
Max. distance between bearings	mm	300	1200	1200	1200	2100
Min. distance between bearings (drive outside pedestal)	mm	20	50	50	50	150
Shaft diameter	mm	5-50	5-50	5-50	15-80	20-120
*balancing speed range (n)	RPM	750-3000	500-2000	500-2000	400-1600	300-1500
Power of drive motor	HP	0.33	0.75	0.75	1.5	3
Acceleration capability ( $gs^2 n^2$ )	$kgm^2 n^2$	$0.29 \times 10^6$	$0.37 \times 10^6$	$0.37 \times 10^6$	$0.88 \times 10^6$	$3.9 \times 10^6$
Min. unbalance mass measured	g	0.01	0.1	0.1	0.1	0.1
Max. unbalance measured	kg	0.4	4	4	4	4
Unbalance reduction ratio	%	95	95	95	95	95
Min. achievable unbalance per rotor wt. (for max. rotor wt.)	$gmm/kg$ of micron	0.2	0.2	0.2	0.2	0.2

- The balancing speed depends upon selection of the rotor diameter, where drive is to be given and the motor pulley diameter.
- All the machines above operate on mains supply of 400 to 440 V, 3 $\phi$ , 50 cycles.
- Due to constant R&D, specifications and features are subject to change without notice. The dimensions given above are approximate.

\* PC & Printer is not in our standard scope of supply.

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