

**Computer-aid-operate dynamic
Balance detector and correcting
machine**

PC-18 User's manual

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Introduction

Product Description

This dynamic balance detector and correcting machine is fully new generation of our series of products. It is designed to precisely detect the deviation caused from rotation and provides an easy way to correct the deviation. Through this computer-aid-operate balance detector, you can easily test your products if they should comply with ISO grades. We also have both vertical type (single support rotation) and horizontal type (two supports rotation) machines which are suitable for what you need.

Computer-Aid-Operate System

Item Checklist

- diskette containing support software for XP home.
- diskette for main board installation.
- diskette for Computer-Aid-Operate System installation.
- diskette containing support software for NI-6010 DAQ driver.

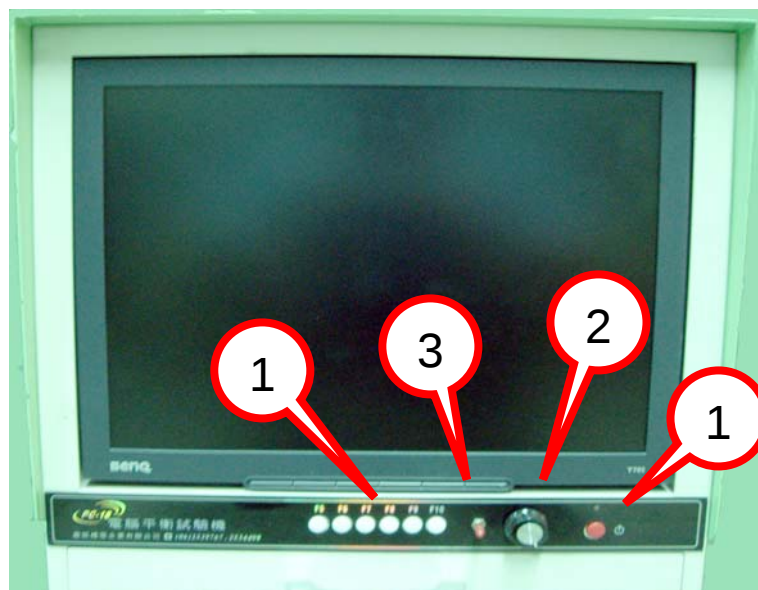


Figure of System

Monitor and front control locations and functions

① Power

- press this knob, the green LED lights and the power is ON.
- press this knob again, the green LED disappears and the power is

OFF.

② **Coefficient correction dial**

- used to adjust the weight added to reset the coefficient when R.P.M. is changed.

③ **Coefficient correction switch**

- turn up before you adjust the dial down, after you adjust the dial

④ **Function knob**

- F5 : vertical type
- F6 : horizontal type



Rear connector locations and functions

① power source input

② power of printer

③ photoelectric switch (4-pins)

④ vibration signal source connector (black)

⑤ vibration signal source connector (red)

⑥ motor control connector (5-pins)

Motor control locations and functions



- ① R.P.M. : Rotation velocity selector
- ② U.D.TIM : Up and Down Timer
 - short time : Motor starts faster stops faster.
 - long time : Motor starts slowly stops slowly.
- ③ A.S.T : Auto-stop timer
- ④ START : Start the motor
- ⑤ STOP : Stop the motor with brake
- ⑥ OFF : Stop the motor without brake
- ⑦ ROTATION : Clockwise or anticlockwise rotation control
- ⑧ POWER : “Power” LED light
- ⑨ RUN : “Work” LED light
- ⑩ TRIP : “Exit” LED light
- ⑪ AUTO-MANUAL : up↑, operate automatically
down↓, operate manually

Operation

Please make sure the electric power and your machine are connected safely. Then turn on the computer from the front control “power”.

Establish customer's information

- after opening the window choose to enter CK-30 by your mouse or keyboard, the screen soon shows as follows.



- according to the type of your machine, please enter the correct system, by using your mouse; keyboard or press the knob [F5] or [F6] on the front control board.

- then you will notice that there are two selections on the screen one is the customer's information established and the other is the customer's information not established.

- if the customer's information has been established in your computer.

You can move your mouse to select the "established customer's information" then key in the name you have named for it and the item number needed. then enter it by path 1 (see the figure) thus you will enter next procedure.

轉動動平衡校正系統

客戶已存在之資料

品名編號

確定

建立客戶新資料

品名編號

請輸入新的品名

戶品名資料

CK-30

HSU CHUANG MACHINERY ENT. CO., LTD
地址：台南縣永康市正南一街48號
NO.48, JENG NAN 1st STREET, YUNG KAN SHIH 71046,
TAINAN, TAIWAN, R.O.C
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- in contrast, if the customer is new, you should choose the other selection "not established customer's information". What you have to do is the same as the procedure that you have just done. After that you can proceed the next procedure.

Measure procedure

- after you complete customer's information, now you are ready to start the measure procedure of your samples. Because we have two different kinds of machines, we have to discuss them individually.

Vertical type

(1) Offset certain deviation

• because vertical type machine works with just one single support, there always is a small but not ignored deviation caused by the vibration of the shaft.

• start the motor to rotate the support without any sample fitted. You will obtain an unbalance value.

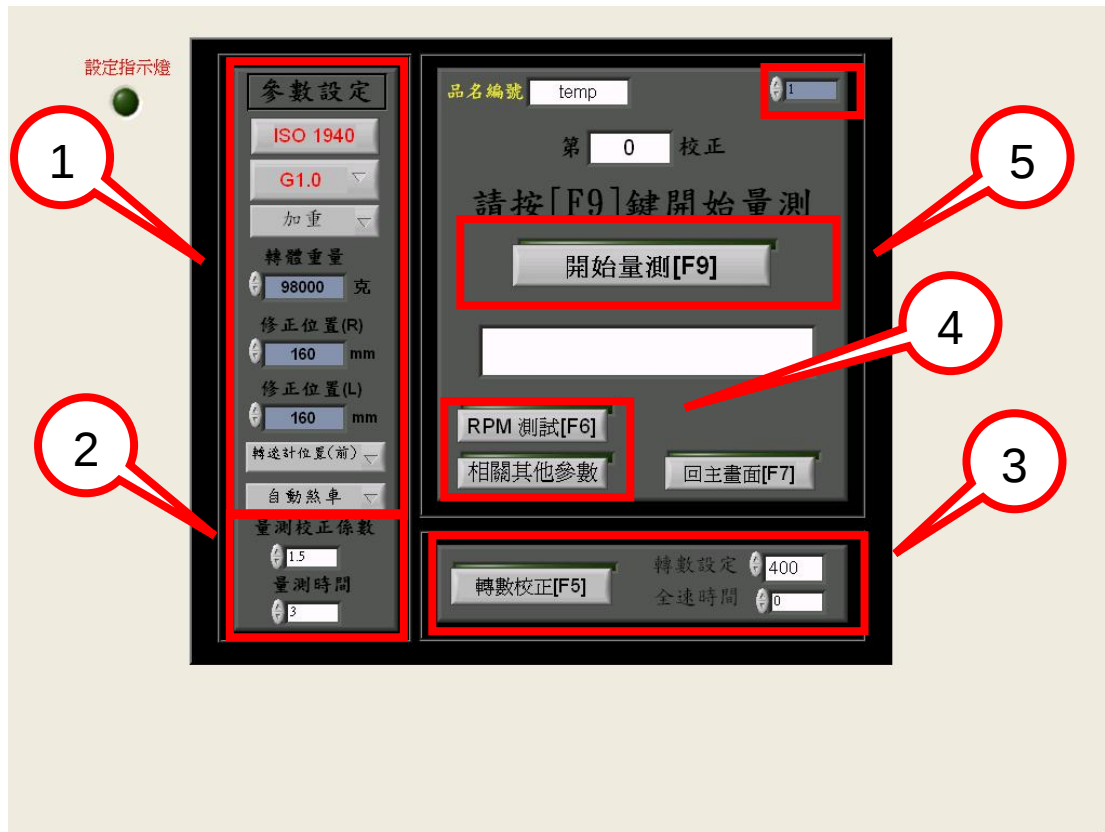
• use the mouse to select “certain deviation save” to save the value.

• then select “certain deviation offset” to offset the value.



(2) Parameters setting

- Use mouse or keyboard to enter the parameters that refer to the work sample.



- Parameters such as

- ①ISO grades required.
- ②ways of weight addition (increasing or decreasing the weight)
- ③sample weight
- ④correction location : the position where the weight is increased or decreased
- ⑤photoelectric switch location : the suitable position may be in the front or the rear of the rotating sample.

(3) Measure correction coefficient setting

Before the first measure of the same group samples, the measure correction coefficient must be set first. If the rotating velocity (R.P.M.) is changed, the coefficient also has to be changed simultaneously.

- principles

W₁ : The first measured unbalance quantity

W₂ : The second measured unbalance quantity

G : Properly known weight that is added to the sample after the first measure was completed

Measure correction coefficient = $G / (W_2 \pm W_1)$

W₂+W₁ : when the degree difference between the first and the second measure is 180°

W₂-W₁ : when the degree difference between the first and the second measure is 0°

Let's take an example : If W₁=3 W₂=23 G=1 degree difference is 0° then coefficient is equal to $1 / (23-3) = 0.05$

- Steps

step 1 : Pick one of the group samples randomly and fit it on the support.

step 2 : Press [F9] to start and wait until the measure is completed

step 3 : The result of the measure show the correction angle degree and the unbalance quantity W₁



step 4 : Add the properly know weight G at the correction angle degree of the sample

step 5 : Press [F9] again to proceed with the measure. When it is

completed, you will get another unbalance quantity W_2

Now we have W_1 , W_2 and G . use the formula to calculate the coefficient.

- **Another method**

There is also a different way to set the coefficient by using front control switch.



step 1 : Push the switch upwards

step 2 : Turn the dial to select the properly known weight G that you will add to the sample.

step 3 : Push the switch downwards, thus the coefficient correction is completed.

The value of the correction coefficient will be put in the computer automatically



(4) R.P.M signal test

The installation of the photoelectric switch influences the accuracy of the R.P.M. measure value. You can easily find the proper location of the photoelectric switch by using this function key [F6]. If the screen shows a regular continuous periodic wave shape as shown in the picture below, the position of the photoelectric switch then is confirmed.



(5) R.P.M control coefficient correction

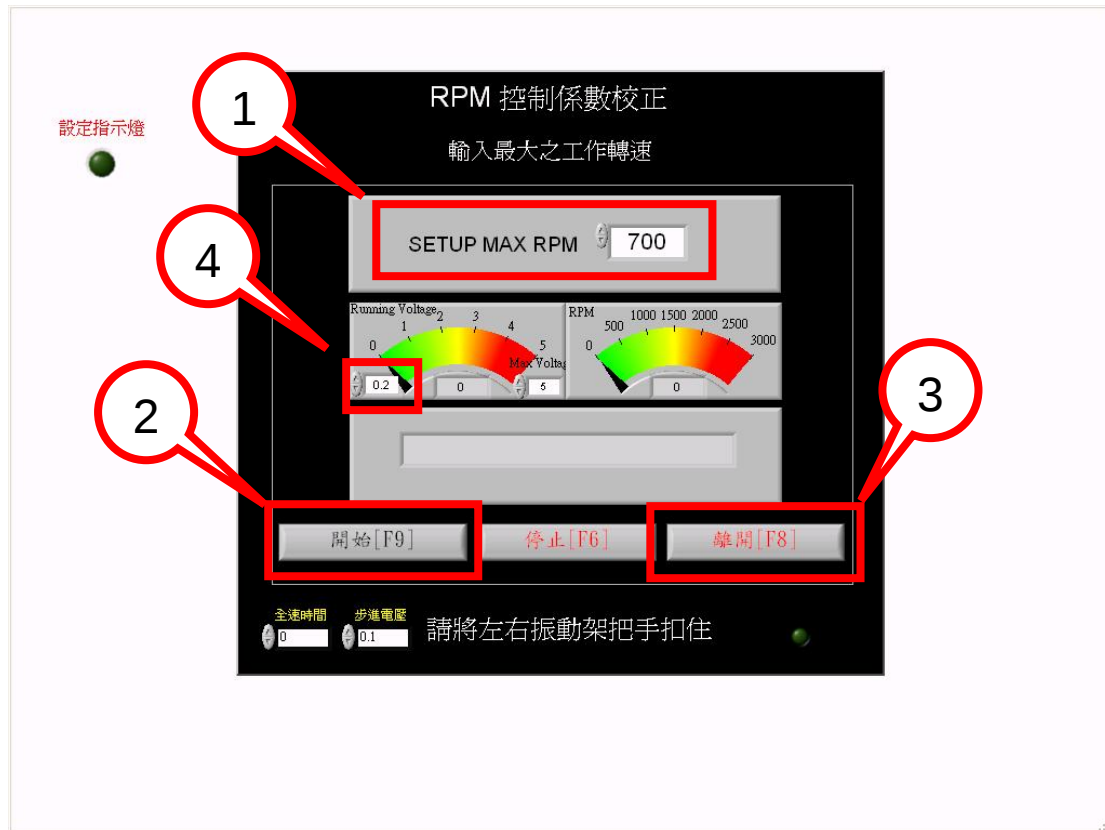
This dynamic balance machine supplies two different kinds of operation methods for R.P.M. control.—manual control and auto-control. The R.P.M. control coefficient will change with the ratio of the work sample's diameter to the rotation velocity of the driving motor. A different sample diameter needs a different rotation velocity, so you have to set the correction coefficient before you start to measure

- set free the holder to be in non-vibration situation
- use [F5] to enter the R.P.M. coefficient correction system



- setup max R.P.M. the value relates the maximum rotation velocity that will be used
- use the key [F9] to start the correction
- use the key [F8] to exit. Then the coefficient now is setup

- set firm the holder to start the measure



(6) Start to work (measure)

When those parameters and coefficient are set up, you now can use [F9] to start the measure. The screen shows the unbalance data for detail.

green line : the position and angle degree of correction.

red line : the position and the angle degree of unbalance.

up to standard : the work sample will be acceptable. In this case you can go on the next.

- if the sample is not up to standard, you can use the [F9] key to proceed the correction. According to the data shown on the screen, you can choose to add or remove the weight on the green line position.

It may take you several times of correction procedure to make the sample to the up to standard.





- change work sample when a work sample is qualified, you need to
 - ①Use [F5] key to back to the measure system.
 - ②Replace the qualified sample with a new one.
 - ③Use [F9] key to start the measure again.
- print the detail : this computer support data list by printer. It needs to install the driver program of your printer in advance.
- use [F7] back to main menu.

Horizontal type



If your dynamic balance machine is horizontal type, you don't have to offset certain deviation. Except that, all the operation procedures of horizontal type are almost the same as those of vertical type balance machine we have discussed in the former chapters. Because horizontal type has two supports, there will be two radar screen pictures. Both of them show the position and angle degree of unbalance or correction. Also you have two photoelectric switches to be located at both sides of your work sample (the right and the left).

