



C-Tech
Laboratory equipment co.,limited

MICRO-DEVAL MACHINE 48-D0523

PRODUCT MANUAL



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I. Description

This manual is a guide to the operation and maintenance of the MICRO-DEVAL MACHINE 48-D0523. This equipment has been designed and manufactured to comply with current published specification requirements. The equipment meets the accuracy and repeatability requirements of ASTM D6928 Standard Test Method for Degradation Resistance of Coarse Aggregates and ASTM D 7428 Standard Test Method for Resistance of Fine Aggregates to Degradation in Micro-Deval apparatus.

II. Technical specifications

Power supply	220V 50Hz
Power	0.55Kw
Jar Revolution Speed:	100±5RPM
Max Revolution Count:	32762
Dimensions	584*352*1050mm
Weight	95kg

III. Working principle

The MICRO-DEVAL MACHINE 48-D0523 is supplied with two stainless steel jars, stainless steel abrasive charges and a magnetic pickup(optional).

A prepared aggregate specimen is placed in the abrasion jar along with an abrasive charge of stainless steel balls and water. The sealed jar is then placed on a set of rollers and turned for a period of time. At test completion, the aggregate sample is removed from the jar and tested to determine degradation resulting from abrasion.

The controller functions as both a timer and a jar revolution counter. Duration of the test may be controlled by either method. Most current specifications call for the test to be based on elapsed time at a specified speed.

In TIME mode, operation terminates when the timer counts down to zero from the time input by the operator. In REVS(Revolution Counter) mode, the user inputs the desired number of revolutions into the counter. Revolutions are then tracked via an optical encoder until they reach zero, at which point



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the unit will stop.

IV. Installation

Locate equipment on smooth level floor surface. Bottom of instrument has four adjustable feet to permit leveling. A short spirit level may be placed across the rollers while leveling. When complete, tighten the upper hex nuts on each foot against the frame to lock the feet into position.

There are long holes for ventilation on the back of the device, and there should be enough space between the device and the wall to ensure air flow and ensure the heat dissipation of the motor.

The doors are equipped with safety interlocks (refer to Figure 1) and the equipment will not operate unless the doors are properly closed. Open the cabinet door and inspect the inside of the cabinet before operation. Make sure there are no obstacles preventing the rotation of the jars.



Figure 1

V. Mode selection

The 48-D0523 is equipped with a controller that allows test duration to be controlled either by elapsed time or counted jar revolutions.

Once the timer or counter mode of operation is selected, that mode becomes the default method of operation until reset by interruption of power. To change operation from one mode to another, simply disconnect the equipment from its power supply, then reconnect it. If a power outage occurs, the mode must be selected again prior to use.

Timing mode

In this mode, the timer determines and controls test completion. The timer must be set to the specified time. Press the input box as shown in the figure and input the required test time (in minutes)



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through the keypad, and press ENTER. Then press the start button to run until the timer reaches zero and the device stops running. The number of revolutions is displayed on the counter, but the counter does not control the test.



Counter mode

In this mode, the counter determines and controls test completion. The counter must be set to the specified number of revolutions. The test will then run until the revolutions reaches the set number and stops the machine. Time can be displayed on the timer, but the timer does not control the test.

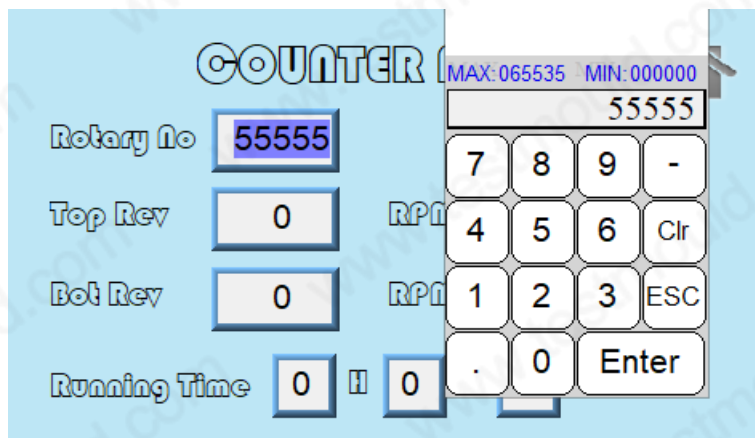
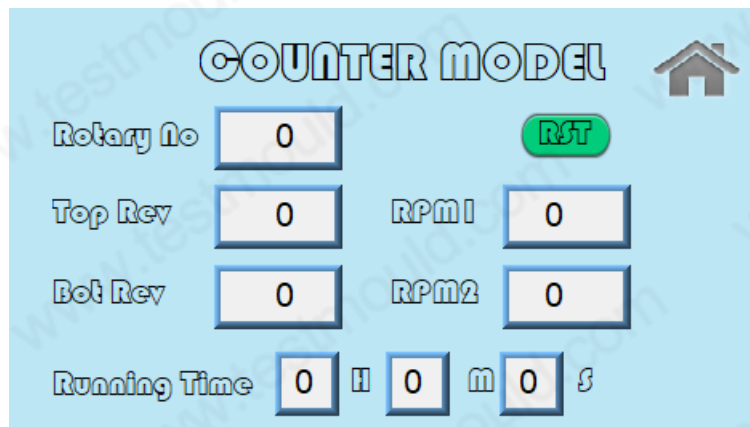


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Main interface

When power is applied to the device for the first time following a power interruption, a title screen showing the model and version number will display briefly, then the main interface will appear. The user selects which method the Micro-Deval will use to control test duration. If TIMING is selected, the test will be terminated when the preset time period expires. If COUNTER is selected, the test will be terminated when the preset number of jar revolutions is complete. If power is lost and reapplied, this screen will reappear. At this time, re-select the mode used when the power is off, the data when the power is off will be maintained, and you can start to continue the test.



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VI. Initial function check

Before first use, a brief series of functional checks should be performed to confirm that the equipment is functioning properly.

To check for proper operation in the **Timing Mode**:

- DO NOT place jars in the machine yet. Close the door.
- Following the controller instructions above, input a short test time into the timer; 1 or 2 minutes is sufficient.
- Press the Green button on the front panel to activate the drive motor and check to see that the rear roller in the top and bottom set are spinning smoothly.
- When the running time reaches the set time, the device stops.

To check for proper operation in the **Counter Mode**:

- DO NOT place jars in the machine yet. Close the door.
- Set the controller to counter mode as instructed above. Enter any number of revolutions.

NOTE: If there is no jar, the counter will not count.

- Press the Green button (refer to Figure 2) to start the drive motor and check to see that the rear rollers in the top and bottom are spinning smoothly. The controller will not count down when there are no jars on the rollers. After about 30 seconds, depress the red button.
- Remove the lids by loosening the locking knob.
- Divide steel balls about evenly between the two jars. Fill jars half full of tap water and secure the lids. Invert each jar to check for a watertight seal.



Figure 2



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- After watertight seal is confirmed, load the jars onto the rollers. The lid of each jar must face the optical encoder on the left side of the cabinet (refer to Figure 3).

NOTE: DO NOT block the light path to the encoder.

- Close the door properly to ensure the safety interlock is active and press the Green button. The jars will turn and the controller will count. After the counter accumulates to the set value, the motor will stop running.



Figure 3

VII. Operation

The Micro-Deval is now ready to perform a test.

For additional tests with the same time or number of revolutions, simply press the green button.

NOTE: The counter will retain the last number displayed if power is interrupted. The instrument can resume a test after a power outage by pressing the green button.

Performing a Test

To perform a test with the 48-D0523, first refer to the test protocol in the standard and prepare the specimen as specified.

1. Load the prepared sample into the abrasion jar along with the specified amounts of abrasive charge (stainless steel balls) and water.
2. Carefully clean and dry off the rim of the jar and the lid gasket.
3. Place the lid on the jar and secure with the threaded locking knob.
4. Invert the jar and check for leaks.
5. Check for foreign objects around the rollers that are preventing jars' rotation.
6. Place the jar on its side on the roller set with the clamping end facing the optical encoder (refer to Figure 4).



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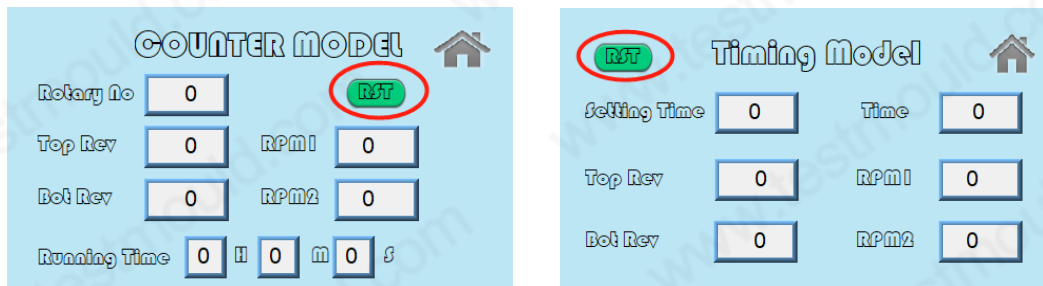
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7. Select the control mode and set. If necessary, input new settings as noted in previous section.
8. Close and secure the cabinet door.
9. Press the green button. Depending on the mode selected, the timer or the revolutions counter will control the duration of the test and stop the machine automatically at completion.
10. Whether in counter mode or timing mode, after the test is completed, before the next test starts, press the reset button to clear the last test data. As shown below:



Figure 4



NOTE: Pressing the large, red <STOP> button located on the front panel will cut power to the motor and rotation will cease. Reset the red <STOP> button to restore power to the device. Pressing the green button will resume operation.

WARNING!



It is possible for pressure to build inside the sealed jars during testing. Use caution when removing the jar lid after completion of test.

VIII. Maintenance



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**WARNING!**

Always disconnect and lockout the power supply to this machine before performing any maintenance or repair.

Routine Cleaning

The optical path from the encoder to the sensor decal on the jar lid should be periodically inspected for excessive dirt, wear or obstruction. These conditions may decrease cycle count accuracy.


Belt Replacement


1. Open the right panel
2. Loosen the tension pulley retaining nut and remove the roller belt when the belt is sufficiently slack.
3. Loosen the motor fixing screws and remove the motor belt.


Lubrication

Open the left and right side panels, you can see the roller bearings, which should be injected with grease every 3 months.

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