

# MESS MATİC

**ODM SERIES**

**VERTICAL BALANCING MACHINE**

**INSTRUCTIONS MANUAL**



DIN EN ISO 9001:2000  
Zertifikat: 01 100 042856



TEKNİK BALANS  
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TÜV Rheinland Group

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## CHAPTER 1 INTRODUCTION

### 1.1 General Introducing

ODM Series Vertical Balancing Machine is an industrial balancing machine designed for sensitive balancing operation for flywheels, clutch, brake disc, pulleys, etc. The machine is not suitable for other purpose of usage. Balancing operation is performed when the spinning axis of the rotor is vertical to the ground. The motor spin movement (Accelerating, constant speed, braking) is performed by motor speed control device. The machine is computerized, Windows operated, and user friendly.

The machine measures the imbalance value by measuring the vibrations of spinning rotor with the help of the sensors located on the main body of the machine. The machine is capable of measuring static imbalance values. The angular position of this measured imbalance is measured by encoder which is connected to the mechanic of the machine.



**Before starting using ht emachine, please read the instructions manual carefully in order to prevent the possible wrong usage of the machine.  
In case of any further needs, please keep this instructions manual always near to the machine**

### 1.2 Packacing and carriage

According to customers' request, the machines are packaged for delivery in the factory in two ways,

1. On pallet
2. Without package

In two ways, the machine is stretched.



**Carriage of the machine should be performed by fork-lift. The machine should never be lifted from the balance adaptor.**



**Please control the main body of the machine as you open the first cover if there is any broken part of not. If there is, please immediately contact with the seller or manufacturer.**

### 1.3 Technical Features Table

Balancing RPM (rpm/minute)	100-1000
Rotor Weight (Kg)	0.5 – 100
Maximum rotor diameter (mm)	700
Balancing type	STATIC



The operating of the machine should be performed by authorized and experienced operator. Do not change anything on the control panel of the machine. In case of any problem with the machine, contact with the after sales department or the manufacturer.

## CHAPTER 2 INSTALLATION AND COMMISSIONING

### 2.1 Customers' duty for installation

For installation, prefer a comfortable, safe, smooth surface, and far from any vibrating machines position. Please connect the machine to the ground with the bolts that given with the machine. In case of not connecting the machine to the ground, the requested balancing measurement datas will not be measured. The required working condition are as follows:

- Humidity : %30 - %95
- Temperature : -20 °C + 55 °C

### 2.2 Electrical Connection



If there is any voltage loss in your system, you should use regulator before connecting your machine to the electricity. There should be earth connection in your system.



Any change or work on the electricity system, should be performed by authorized personel.

## SECTION 3 INSTRUCTIONS

### 3.1 Starting the machine

After installing the machine and connected to the electricity, first turn on the shalter on the control panel. Then, if your computer doesn't starts automatically, push the button on the computer.



**During balancing operation, please keep away your hands and body as much as possible from the spinning parts of the machine. Neckless, accessories, large clothes are dangerous for the operator. During operation, please do not wear these accessories**

### 3.2 Screen Information

After turning on the machine, you will see username and password entrance menu. (Figure-1) Username is (MESSMATIC) and password is (1), press enter.

User Rights

User Name : MESSMATIC

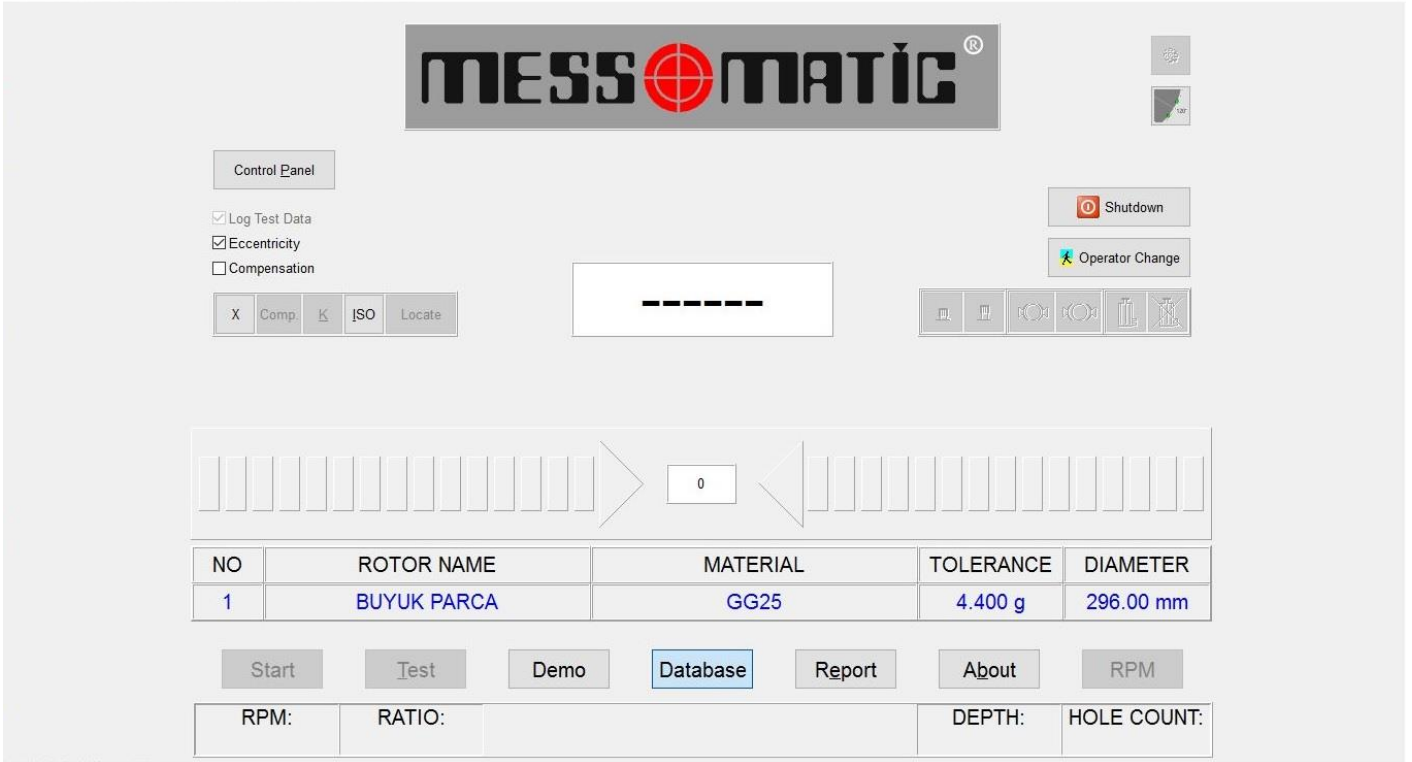
Password :

OK Cancel

**Figure-1**

During the startup, drilling unit moves on X and Y axial for referance. For this movements the door should be closed and emergency stop button should not be pressed.

After a while, you will see the main screen (Figure-2).



**Figure-2**

## Main screen buttons and functions:

- **DISPLAY BOX** : Shows the unbalance in selected units.
- **RIGHT AND LEFT ARROWS** : Shows you which direction that you should turn the rotor to find the imbalance point. You should turn the rotor in the direction of arrow until you see OK on the screen.
- **NO, ROTOR NAME,...** : In this section, the information is displayed belonging to the part which is chosen in database menu.
- **START** : Starts the machine.
- **DEMO** : Show the demo page of the company
- **DATABASE** : To put and save the datas of the part and some special operations.
- **REPORT** : To print out the first and the last unbalance values of the rotor. (Note: Printer is not included on the machine and it is optional)

- **ABOUT** : To display the manufacturer company details.
- **RPM** : To see the RPM of the machine.
- **RATIO** : To see the measuring ratio of the machine.
- **DEPTH** : Maximum depth of the holes during the balancing operation with automatic drilling unit.
- **HOLE COUNT (DRILLING)** : Maximum drilling hole number of the balancing operation.
- **ECCENTRICITY** : Automatically eliminates the errors caused by mechanical eccentricity. During balancing operation, this option must be enabled.
- **COMPENSATION** : Electronically admits the imbalance of the adaptor as "Zero"
- **X** : Exit to Windows.
- **K** : It is a shortcut for eccentricity process

Eccentricity means to compensate the eccentric misalignments on the clamping unit. Rotating the loosen the balanced rotor 120 degree during the clamping unit is stable, you may read an unbalance value. This value means the error of centering. To compensate this error, you should perform the eccentricity process. You may change the angle of the eccentricity on the database menu.

Before starting the operation, put a mark on the clamping unit and the rotor make it easy for you. To start, click the K button or press the K button on the keyboard.

"Mount the part and the machine will run" message is going to appear. On the left side of this message there is a left arrow ok (ECCENTRICITY BACK), right arrow ok (ECCENTRICITY FORWARD) and ECCENTRICITY STOP buttons. Click the eccentricity forward button, the machine is going to start and after awhile it is going to stop.

"Rotate the part 120 degree and the machine will run" message is going to appear. Loose the rotor and rotate it 120 degree and mount it again. Click the eccentricity forward button and the machine is going to start, after awhile it is going to stop.

This procedure is going to go on until 360 degree is completed. (for 120° three times). After it is completed, eccentricity is completed message appears. By pressing the eccentricity forward button eccentricity procedure ends.

- **ISO** : It is for calculate the resudable unbalance according to the number 1940 of ISO standard.
- **LOCATE** : Makes position.
- **SHUT DOWN** : Shuts down the computer.

- **OPERATOR CHANGE** : When you click this button, you will see the menu Figure-1. Every operator will enter their own username and password before starting operating. During shift changes and not working times on the machine, the operator clicks this button to prevent non authorized usage of the machine.

### 3.3 Saving the data of the rotor

Before balancing, you should enter the DATA menu to enter the necessary information about the rotor. When you enter the DATA menu, you will see the screen on Figure-3.

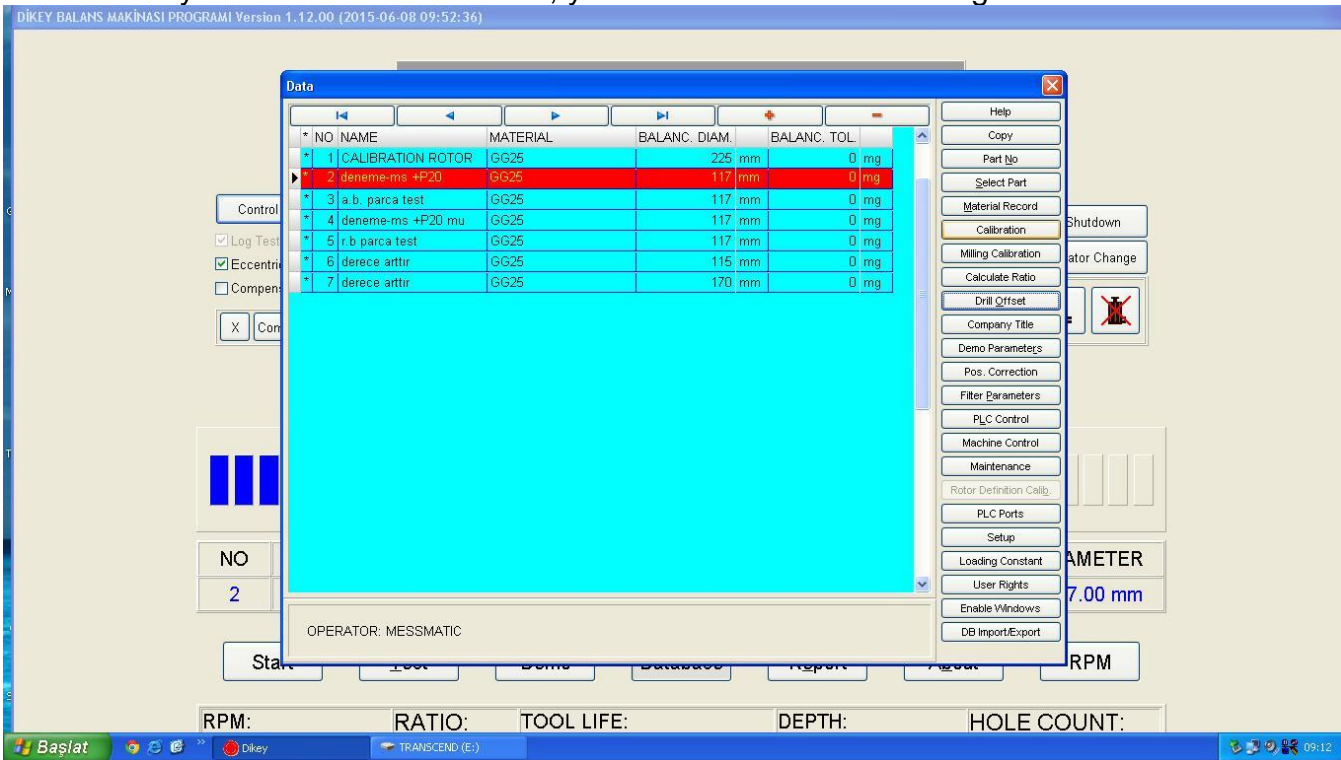



Figure-3

- By pressing [TAB] or [SHIFT+TAB] buttons, or by clicking with your mouse on NO, PART NAME, MATERIAL, BALANCE DIAMETER, BALANCE TOLERANCE, you can start entering the datas. Here;
- **NO** : The number of the rotor.
- **ROTOR NAME** : The name of the rotor.
- **MATERIAL** : Production material of the rotor.  
On the unbaalnce calculations for correction with drilling / milling, mass weight is being used automatically.
- **BALANCING DIAMETER** : The balancing diameter of the rotor.





- **BALANCING TOLERANCE:** Permitted minimum residuable unbalance.


Using [CTRL+Home], UP key ok [↑], Down key ok [↓], [CTRL+End], [INSERT], [CTRL+Delete] buttons or 


By clicking these buttons, you may add new record , delete or correct the record.


By pressing the [INSERT] button or by clicking  button you may add a new record.

By pressing the [CTRL+Delete] button or clicking the  button you may erase the record.

By pressing the [CTRL+Home] button or by clicking the  button you may go on the first record.

By pressing the [CTRL+End] button or by clicking the  button you may go on the last record.

By pressing the Up arrow key [↑] or by clicking the  button you may go on the previous record.



By pressing the Down arrow key [↓] or by clicking the  button you may go on the next record.

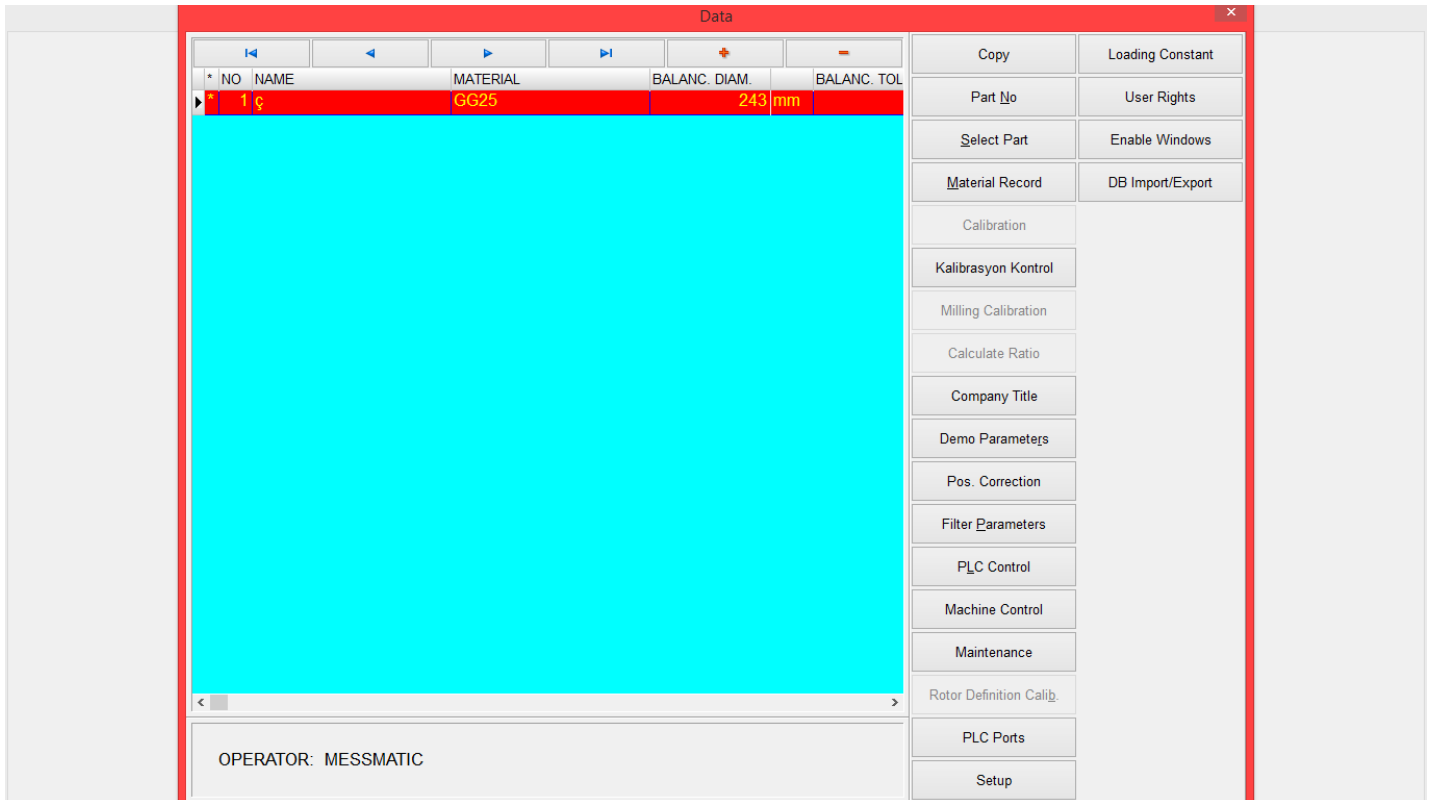
By pressing the [TAB] button you may go to the next area.

By pressing the [SHIFT+TAB] button you may go to the previous area.

By pressing the [End] button you may go to the last area.

By pressing the [Home] button you may go to the first area.

If you press the [CTRL+Delete] button there will appear a dialog box which is asking the approval of delete or not, if you want to delete the record press the  button, otherwise press the  button to cancel it.




The right side of the database manu means below;

- **COPY**

By pressing the [Alt + A] buttons or by clicking the copy button, you may copy the data of the rotor to another rotor line, for easy creating a database for a new rotor.

- **PART NO**

It uses to ake active the balancing rotor by its number. By pressing the [Alt + N ] buttons or by clicking the “PART NO” button, you may choose this menu. After you choosed this there is going to appear a dialog box which is asking you the part number. Enter the number of the part and clixk the  button.

- **SELECT PART**

Is used to select the part which will be balanced. By pressing [Alt + S] or clicking on “SELECT PART” you can use this feature. The selected part will shown in red. The part that which is going to be operated should be selected in this way. After selecting the part, all the values needed for calibration, testing the imbalance value, etc will be used off the selected part.

- **MATERIAL RECORD**

During the entering the data of the rotor on the DATABASE menu, if there is not any information of

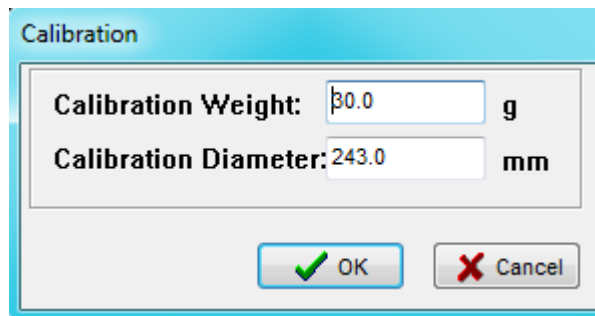
the production material of the part, you may add new record by pressing [Alt + M ] buttons. Material list is going to appear on the screen. By pressing the [TAB] or [SHIFT+TAB] buttons or by clicking, you may move the line and put new data. On this menu, you may find the "MATERIAL NAME" and "DENSITY" information. Some general substances are already entered, if your substance is not present on the list, you can enter by yourself.

- [INSERT] you can create a new data.
- [CTRL+Delete] you can delete a present data.
- [CTRL+Home] you can reach the first data
- [CTRL+End] you can reach the last data
- [TAB] you can reach the next area
- [SHIFT+TAB] you can reach the previous area
- [End] you can reach the last area
- [Home] you can reach the first area

If you press [CTRL + Delete] a dialog box opens asking whether the entry should be deleted or not, if you want to delete, click  , if not you should click .

## • CALIBRATION

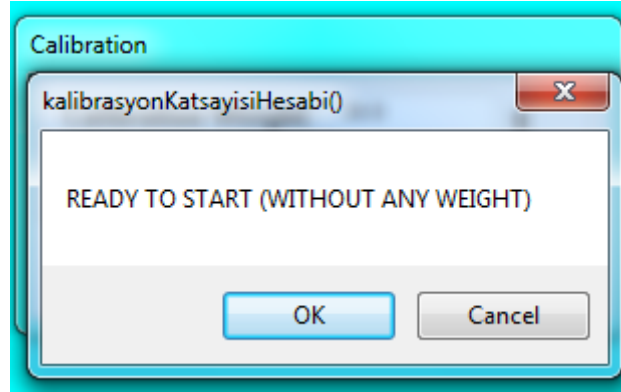
You should definitely perform calibration before starting balancing operation of the rotor which you choosed on the DATABASE menu. Press the. [Alt + K ] buttons or  button. There is going to appear a dialog box on the screen which is asking the calibration weight and calibration diameter.



**Figure-4**

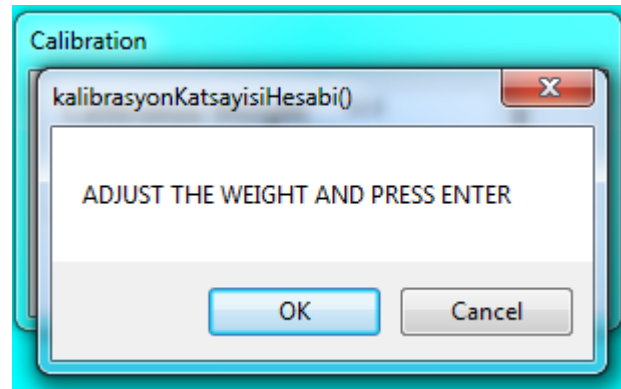
Calibration weight is very important. You should use the recommended, certified special calibration weight which is delivered by the manufacturer. Write the calibration weight and calibration diameter on the screen and click the  button. There is going to appear " mount the rotor and press enter" message on the screen.

The calibration weight and calibration diameter information can be entered once in the database menü: Enter Global Data menü by double clicking to the selected rotor's line.



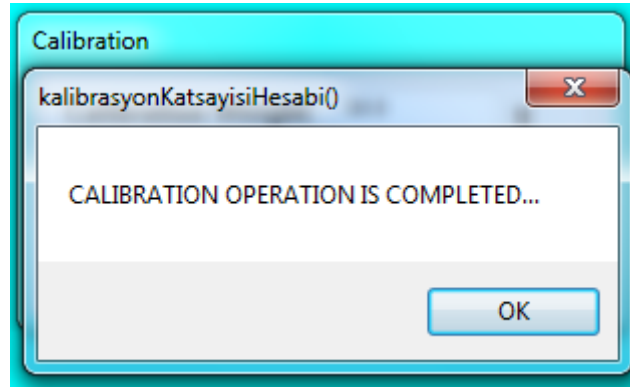
**Figure-5**

Mount the master calibration rotor on the balancing machine. **(Attention: Do not mount the calibration weight on the master rotor!)** Press OK button. Rotor is going to rotate and it is going to stop "Adjust the weight and press enter" message is going to appear on the screen.



**Figure-6**

Mount the calibration weight and position this weight exactly under the drilling unit (laser line – if present) and press OK. Rotor is going to rotate again. "Calibration operation is completed" message is going to appear on the screen (Figure-7).



**Figure-7**

By pressing OK button you will save and exit.

You should make the calibration again in case of below occasions.

- After you install and setup the machine
- If the machine does not measure certain results
- If you change the fixture
- If you change the PC
- If you change the TMS card
- If you change the RPM of the machine
- If you change the vibration sensors (Piezzo)
- If you move the machine to other location.

- **RATIO CALCULATION**

It is a special feature for the manufacturer company. Please do not use this menu.

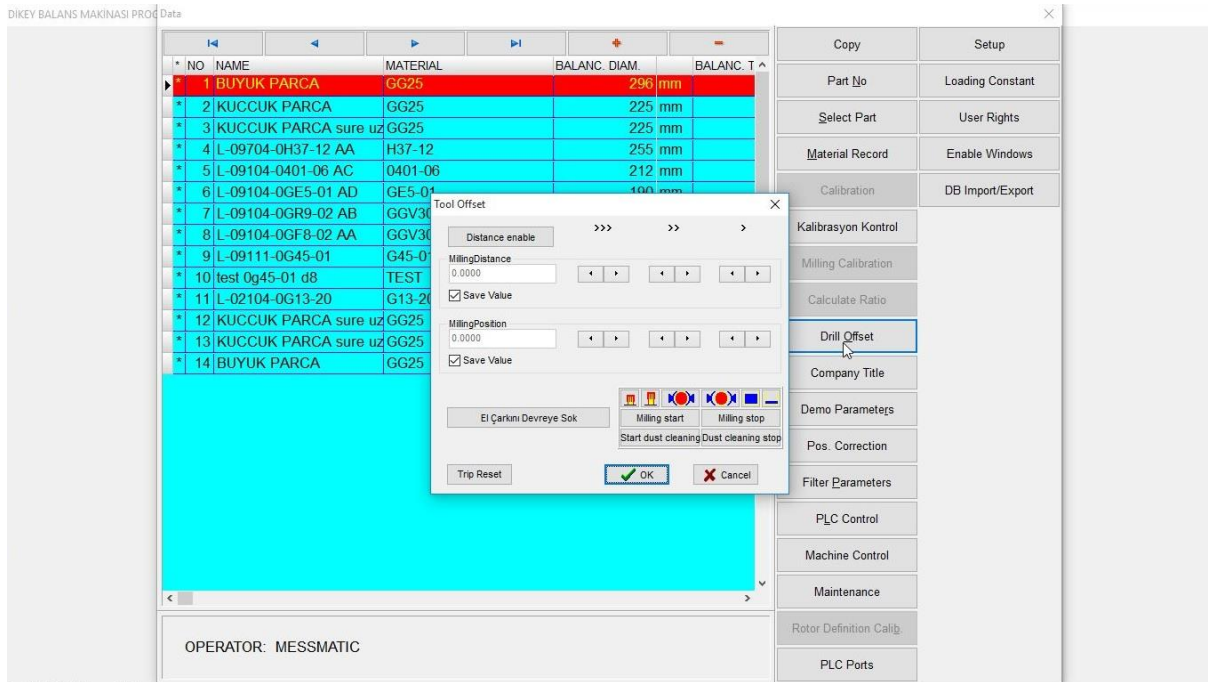
- **COMPANY LETTERHEAD**

It is used for to print out report from the printer under your company's letterhead. By pressing the [Alt + F] buttons or  button you may choose this option. Text editor is going to be appear on the screen, After the changes on this text you may save the data by pressing the  button, or you may press the  button to cancel it.

- **POS. CORRECTION**

Position Correction is used to change the unbalance position. After calibration, if the balance weight position is not correct when you test the master rotor (Compensation should be enabled), you can correct this error by position correction. Make Compensation without any weight on the master rotor. Then put the calibration weight and press TEST. After rotation it stops and position the master rotor to the correct balance weight position that you want to see for unbalance (Exactly under the drilling unit). To start the POS. CORRECTION, on the DATABASE menü press the [Alt + D] button or click POS. CORRECTION. "Attention you change the position" message appears. Press OK button to save the changes. If you press CANCEL button it is going to be cancelled. Position correction will be completed.

- **TOOL OFFSET**



You may calculate the Drill – rotor center by TOOL OFFSET operation.

If the drill depth is different or if you add a new rotor you should make the TOOL OFFSET in order to introduce the 0 (touching) point of the drilling unit to the rotor.

For this operation;

Mount a rotor on the machine. On the TOOL OFFSET press twice to the **DISTANCE ENABLE** button.

Clamp the rotor manually. **ATTENTION! If you don't clamp the rotor you may damage the system.**

Start the drilling unit, and manually move the drilling unit to the rotor until touching level "0 point"

Click OK button. The machine will ask you to enter the depth of the drilling.

Drilling unit is going to move back. Take off the rotor and measure the depth of drill. By keyboard write this depth value and press OK button. The tool offset value is set.

- **OPERATOR DEFINITIONS**

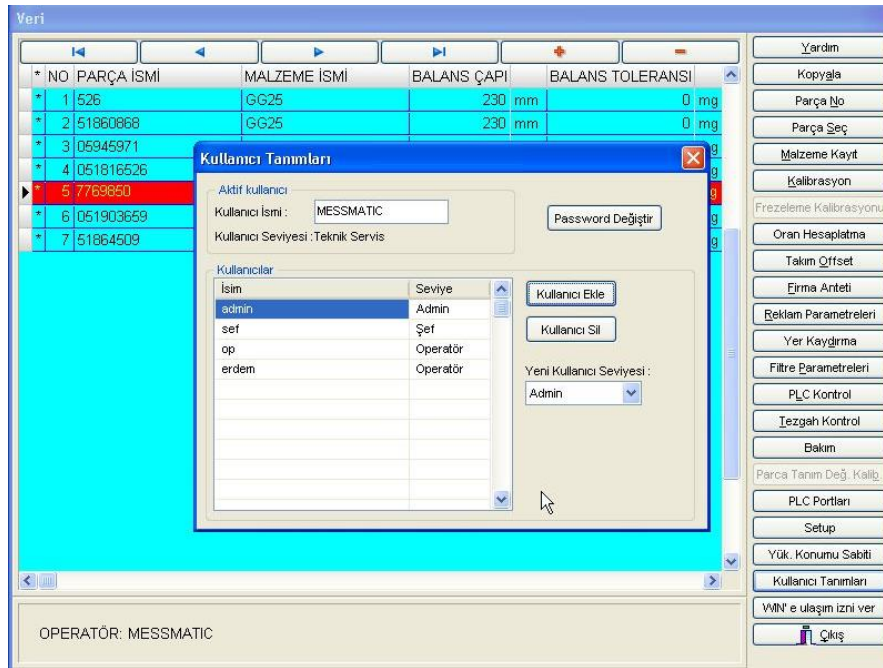


Figure -8

You may assign name and password for every operator. There are levels between operators. Admin, Chef, Operator. The highest level is Admin. The lowest level is the operator. Chef is between Admin and Operator. (Figure-8)

- **ENABLE WINDOWS**

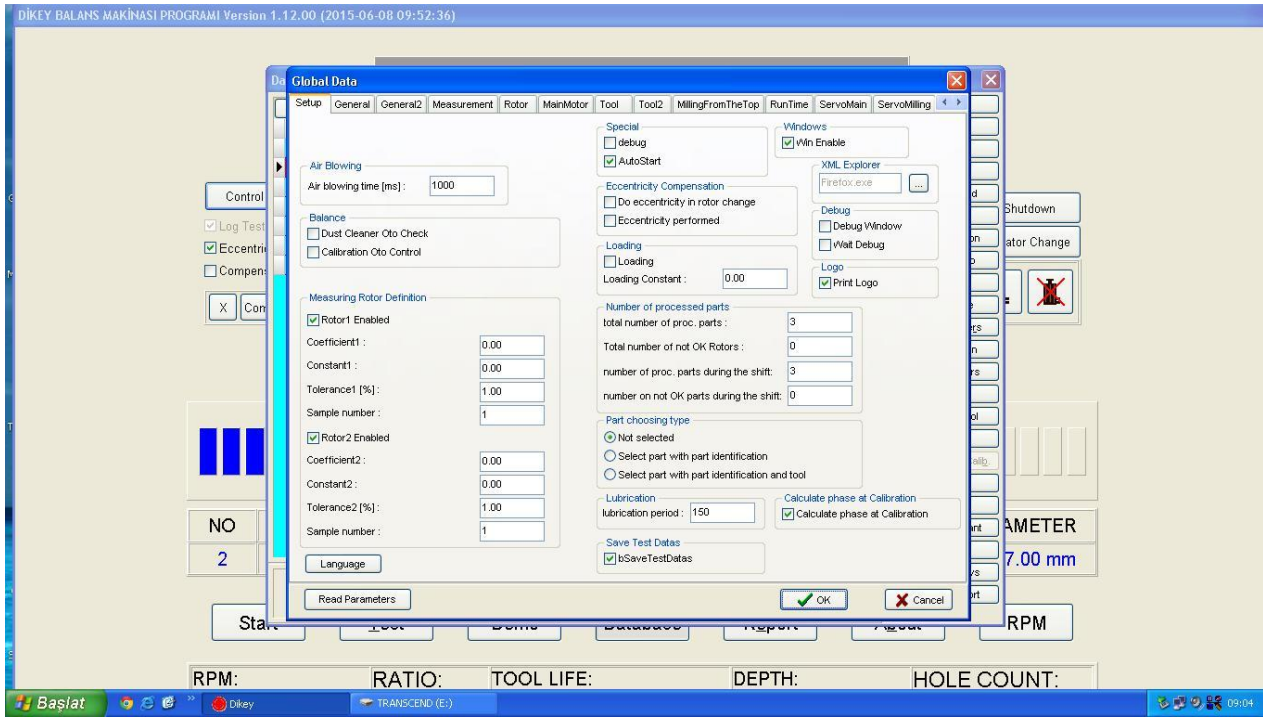
It allows the user to enter to the Windows menu without exiting the balancing machine software.

## QUIT

By pressing [Alt + Ç ] buttons or by pressing to the QUIT button you may choose this function. Quit operation makes you to get out from the GLOBAL DATA menü. To reach back the global data menu of a rotor double click on the rotor name.

**OTHER MENUS**

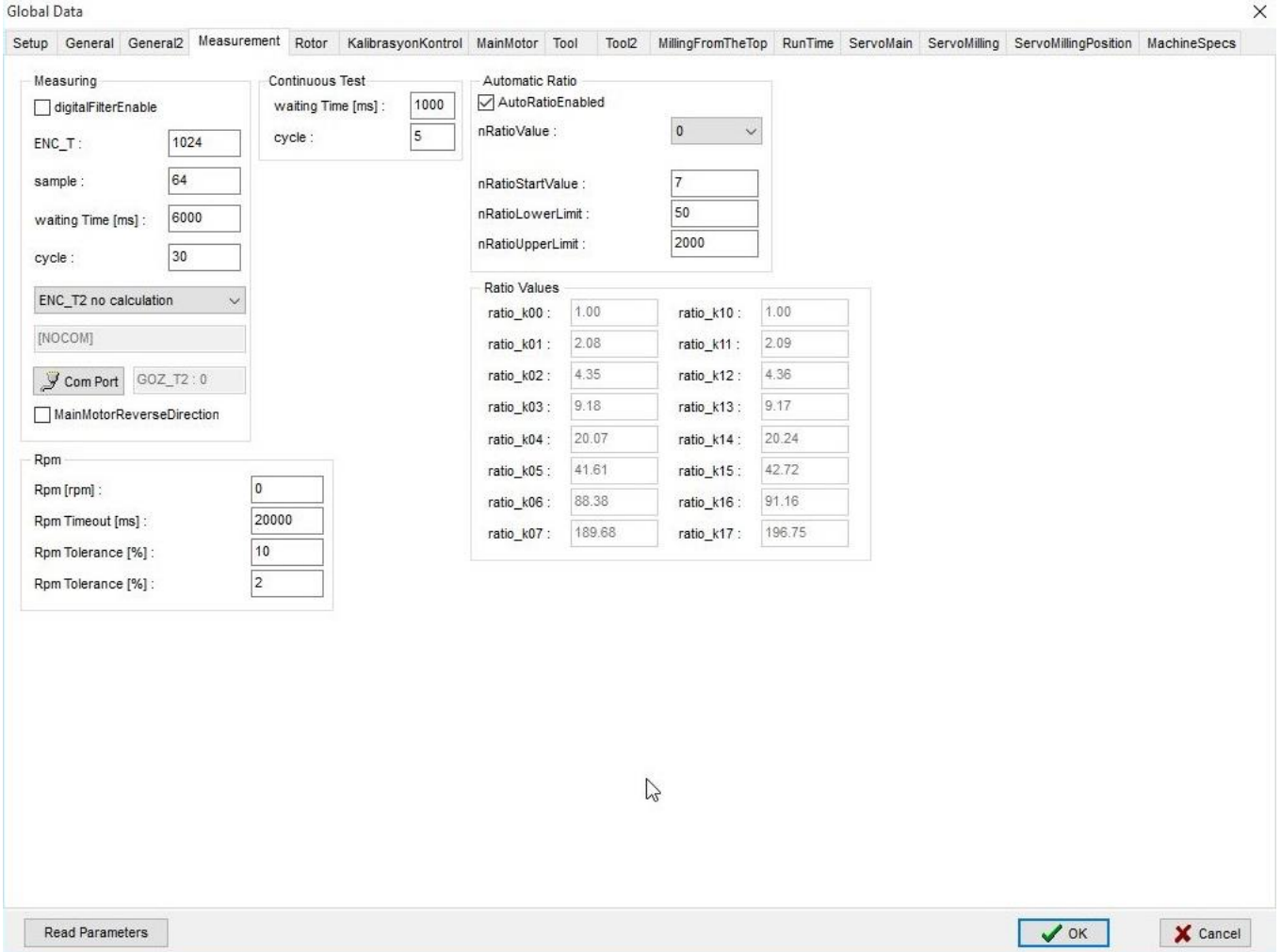
**SETUP :** On this menu, you may enable the eccentricity or disable if you have changed the rotor.



**Figure-9**



**GENERAL:** On this menü, you may find the reference point, tolerances of the rotor, balancing methods, unbalance units.



The screenshot shows the 'Global Data' window with the following sections and values:

- Measuring:**
  - digitalFilterEnable
  - ENC\_T: 1024
  - sample: 64
  - waiting Time [ms]: 6000
  - cycle: 30
  - ENC\_T2 no calculation (dropdown)
  - [NOCOM] (dropdown)
  - Com Port: GOZ\_T2 : 0
  - MainMotorReverseDirection
- Continuous Test:**
  - waiting Time [ms]: 1000
  - cycle: 5
- Automatic Ratio:**
  - AutoRatioEnabled
  - nRatioValue: 0 (dropdown)
  - nRatioStartValue: 7
  - nRatioLowerLimit: 50
  - nRatioUpperLimit: 2000
- Ratio Values:**

ratio_k00 :	1.00	ratio_k10 :	1.00
ratio_k01 :	2.08	ratio_k11 :	2.09
ratio_k02 :	4.35	ratio_k12 :	4.36
ratio_k03 :	9.18	ratio_k13 :	9.17
ratio_k04 :	20.07	ratio_k14 :	20.24
ratio_k05 :	41.61	ratio_k15 :	42.72
ratio_k06 :	88.38	ratio_k16 :	91.16
ratio_k07 :	189.68	ratio_k17 :	196.75
- Rpm:**
  - Rpm [rpm]: 0
  - Rpm Timeout [ms]: 20000
  - Rpm Tolerance [%]: 10
  - Rpm Tolerance [%]: 2

Buttons at the bottom: Read Parameters, OK, Cancel.

Figure 10

### Suggested Parameters:

1. Position after balancing should be clicked.
2. Do not position if in tolerance should be clicked.
3. Disable servo after positioning should be clicked.
4. Write the tolerances on the screen.
5. Balancing method is going to be DRILLING FROM THE TOP.
6. Eccentricity Phase should be written.
7. By pressing ISO you may determine the tolerances of the rotor.

**MEASUREMENT MENU:** You may just use Waiting Time on this menu. (Figure-11)

- **Waiting time** is the total time between the start of the rotation of the rotor, and unbalance measurement starting. After the adjusted rpm level is reached, the machine waits some seconds to get a stable signal level from the rotation. (During Acceleration

- or deceleration, the unbalance signal is not stable!
- **Sample** – this value is representing the number of the measurement points on the signal.
- **Cycle** – this value is representing the teh cycle numbers which will define the unbalance measurement average of the total cycles' measurement.

ATTENTION! These values are factory set, changing these values will affect the cycle time of the balancing machine and may cause unexpected sensitivity problems fort he unbalance measurement.

**Com Port:** There are the cominication protocols of the TMS electronic inside of the computer. They are factory set.

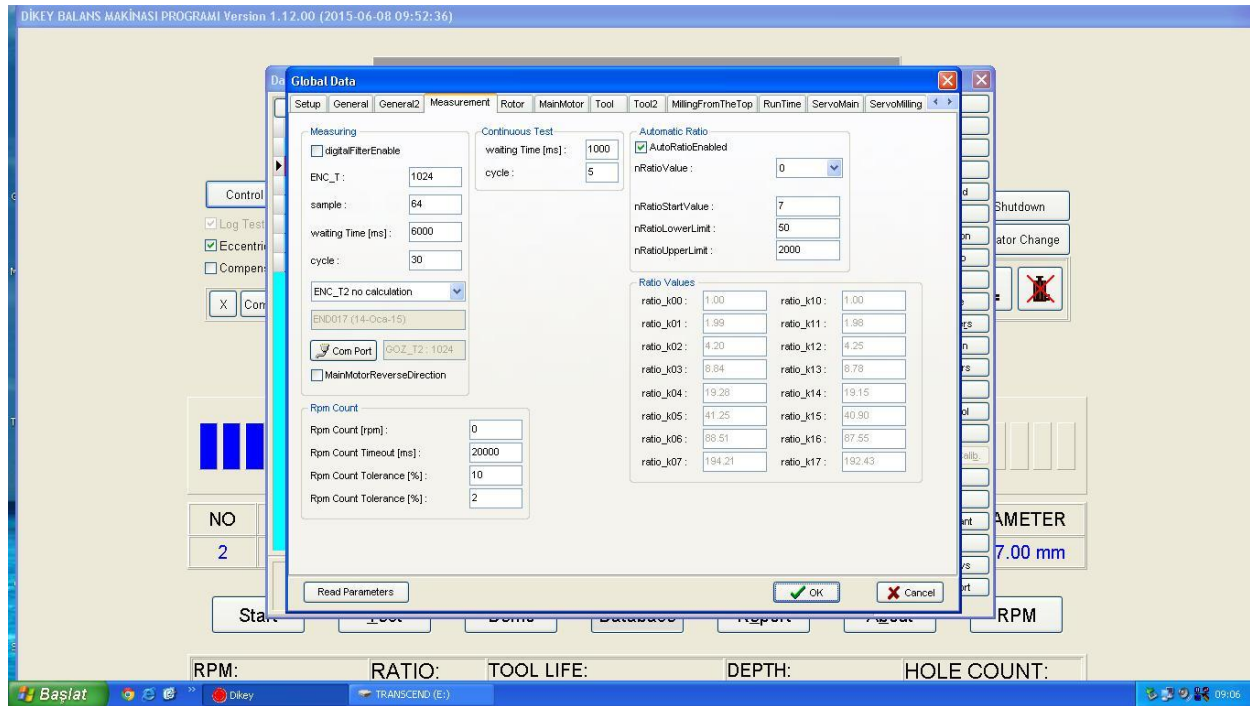


Figure 11

### SERICOM[ timeout]:

It is the retime of connection time, If you see an error during the data transfer (milisecond)

## ROTOR MENU:

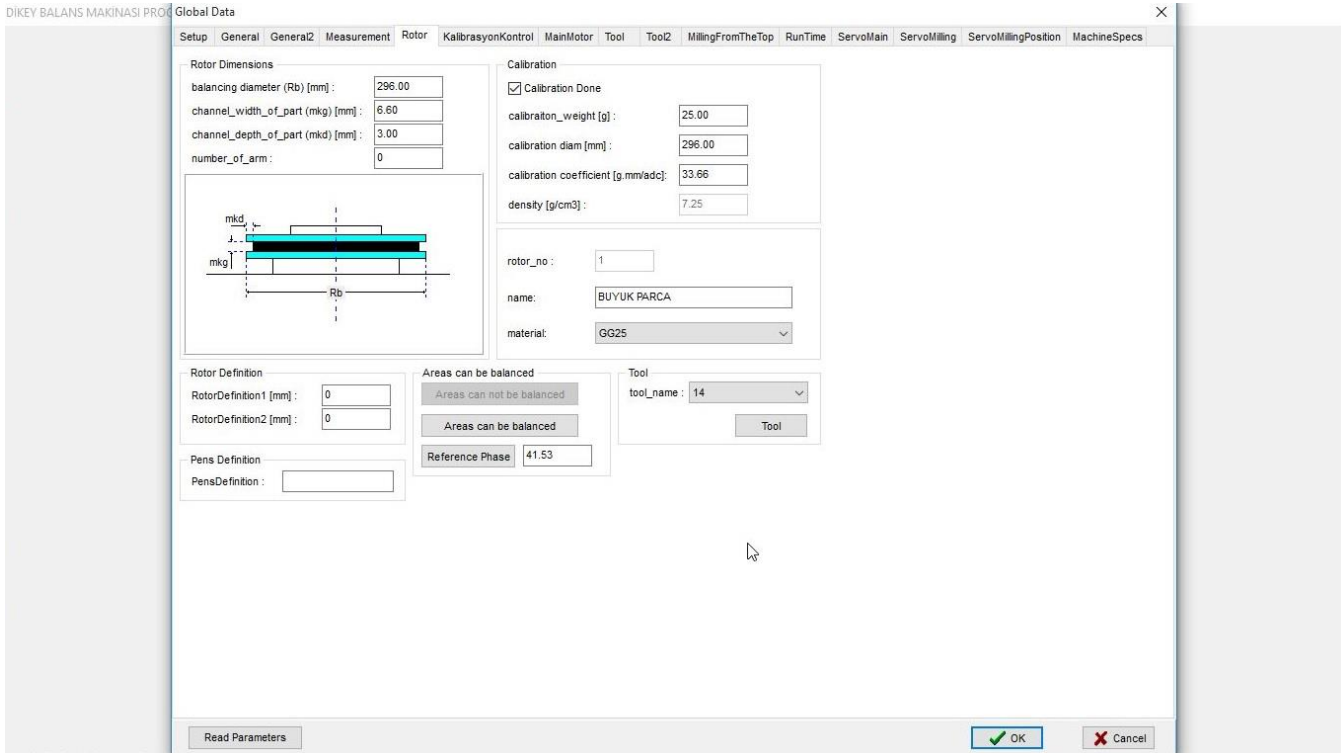
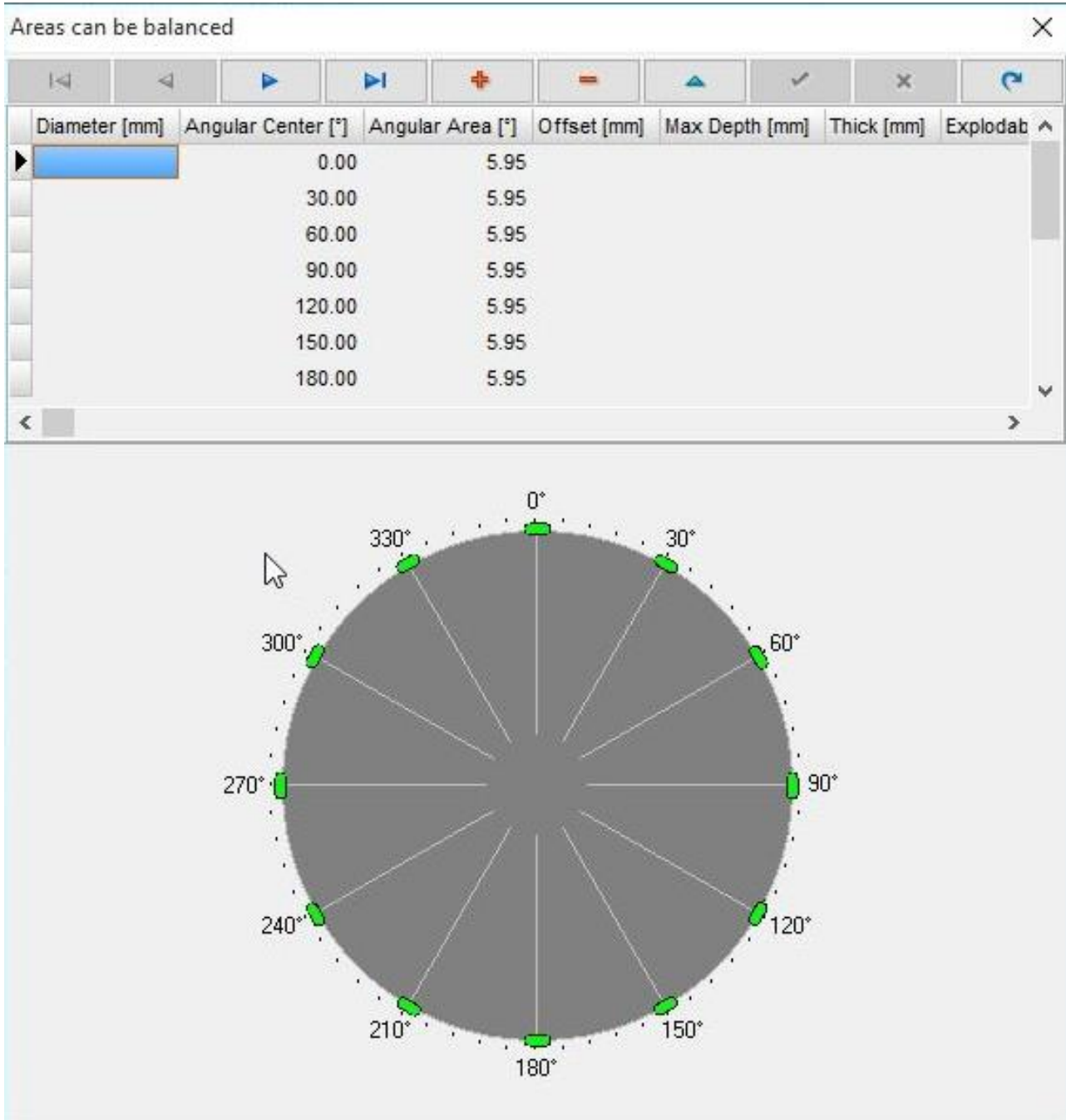


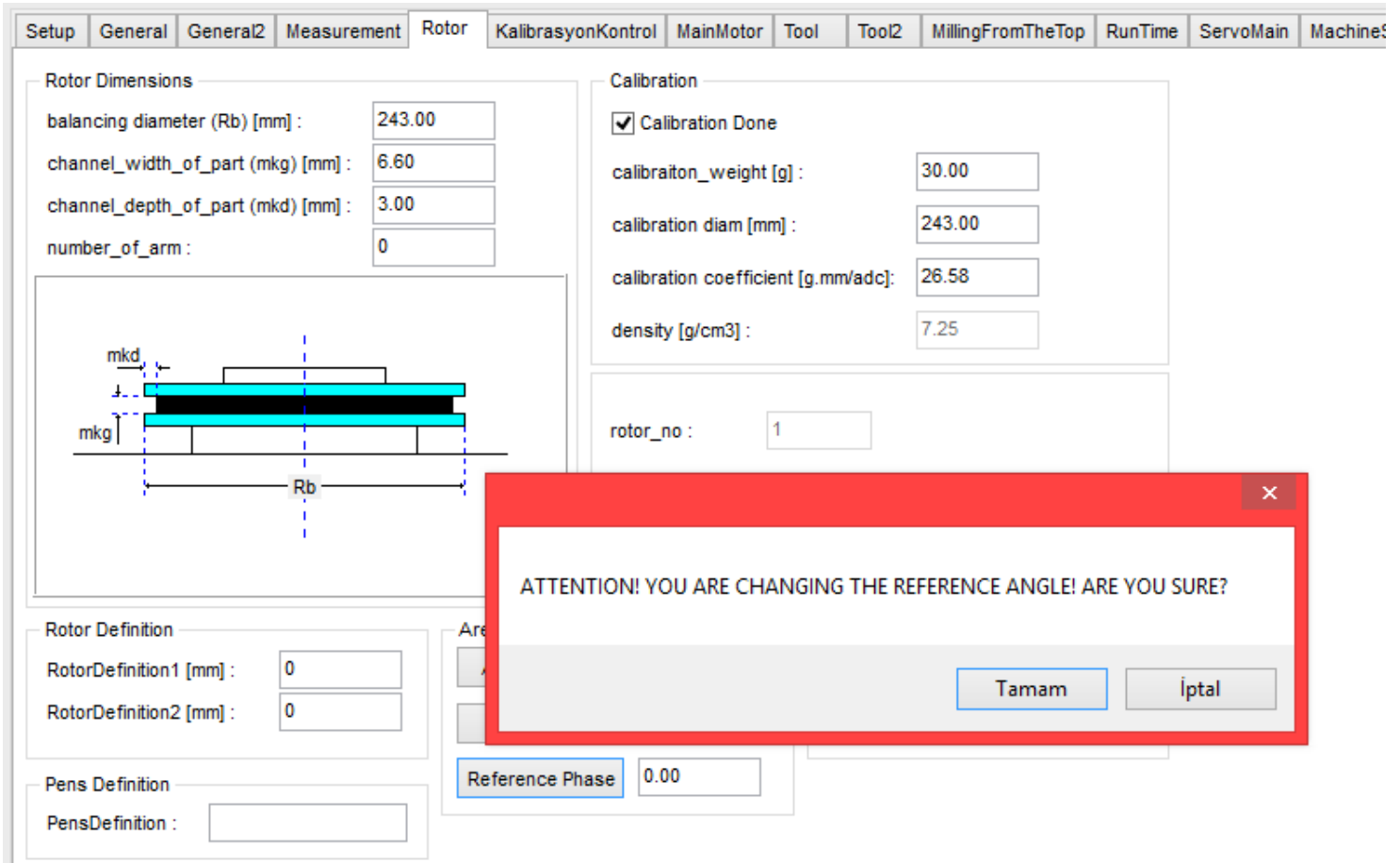
Figure 12

### Parameters:

1. **Balancing Diameter:** Diameter of the rotor, calculated by the drilling center point on the rotor.
2. **Calibration Weight:** The weight of the calibration weight.
3. **Calibration Diameter:** The diameter of the place that you apply the calibration weight during the calibration.
4. **Part Name:** The technical drawing name of the balanced rotor.
5. **Material Name:** It shows the density of the rotor. (drilling unit considers the density for calculation dor automatic balancing operation.)
6. **Balancing Areas:** Balancing areas that the machine is permitted for drilling operation.

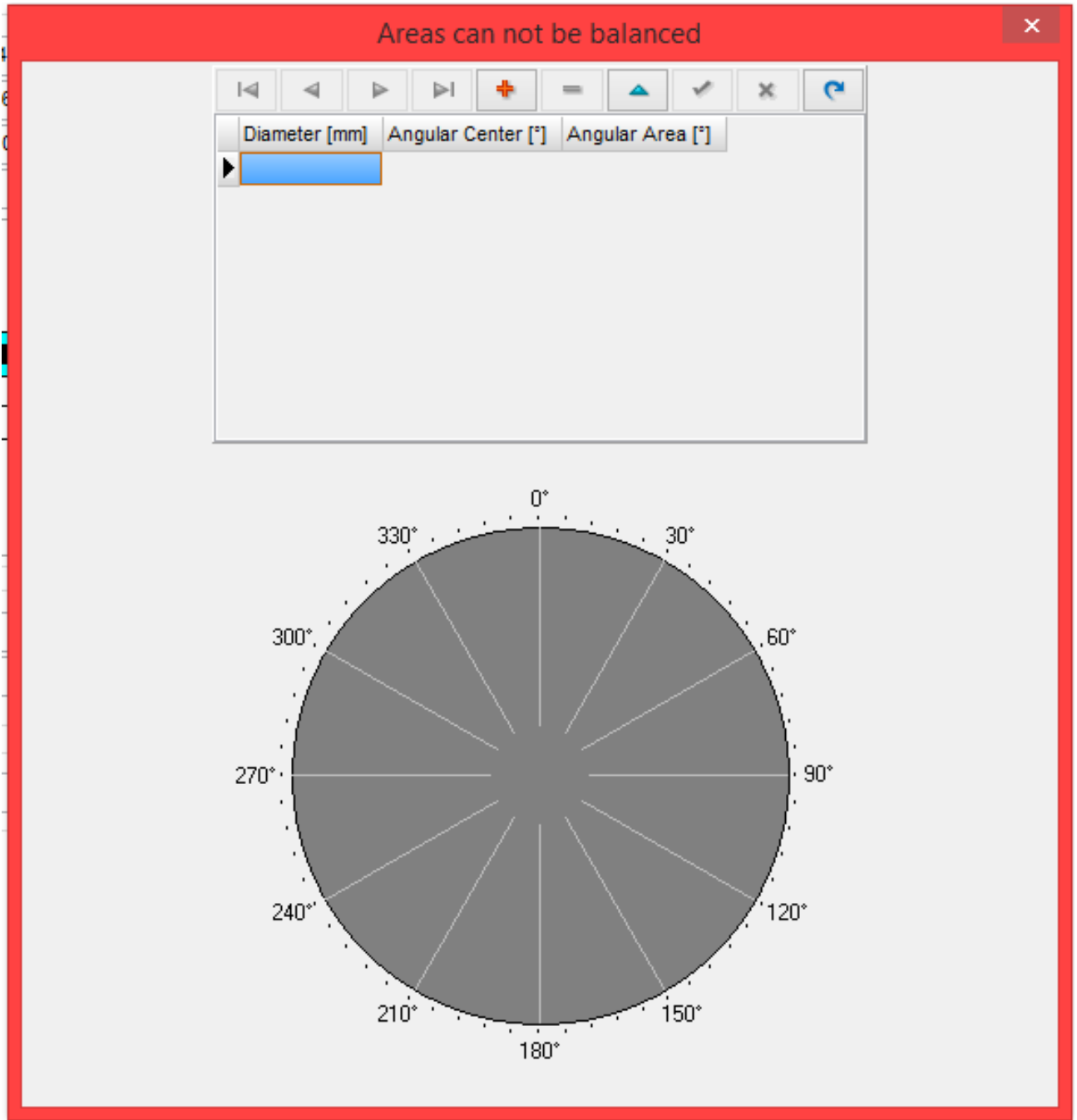


- 7. Reference angle:** It is used if there are specified balancing areas, if there isn't any forbidden balance correction areas, this angle is useless, no need to enter, this means the drilling unit will be able to drill any location on the rotor. In order to specify this reference angle, mount the master rotor, enter TOOL OFFSET menu, manually position the drilling unit to the master rotor's 0° and click "Reference Phase" (Figure-13). The actual position of the encoder will be saved as 0° of this rotor for the balancing area calculation.



**Figure 13**

**8. Areas Can not be balanced:** Forbidden areas for drilling of unbalance correction. Drilling unit will not drill these forbidden areas for balancing operation.



**Process Sequence:**

1. Calibration.
2. Compansation.
3. Test by putting the weight on the calibration diameter.
4. You should read the correct calibration weight under the drilling tool.
5. If the weight is under the drilling unit or on the lazer line, enter the Data menu.
6. Double left click on the selected part .
7. Press the reference degree to define the reference on the part menü on Figure-12.

**CALIBRATION CONTROL**

If this feature is enabled, every 4 hours the software will automatically request for calibration control. You have to enter the data. The operator chooses the gram calibration and presses te start button og the gram calibration.

Global Data

Setup General General2 Measurement Rotor KalibrasyonKontrol MainMotor Tool Tool2 MillingFromTheTop RunTime ServoMain ServoMilling ServoMillingPosition MachineSpecs

Mastar Parça  
tolerance [mg] : 25.000 @ 183.3°

Genlik Toleransı [g] : 0.500

Açı Toleransı [°] : 5.0

Köprölme Toleransı [g] : 4.000

Kalibrasyon Kontrol Sonuçları

gram\_testi\_OK

kopruleme\_testi\_OK

Read Parameters OK Cancel

Figure 14

**Main Motor:**

You may adjust here the main motor's rpm, start and stop movements

Sub menus;

- Main motor rotating speed
- Main motor positioning speed
- Speed controller
- Current controller

**MAIN MOTOR ROTATING SPEED**

You may write here the balancing unit's rpm, start speed, stop speeds According to the rotor's weight.

**MAIN MOTOR POSITIONING SPEED**

You may check the rpm, start and stop movements of the balancing unit to find the unbalance position.

**ATTENTION! These values are factory set for the optimum conditions of the balancing machine and is not recommended to be changed.**



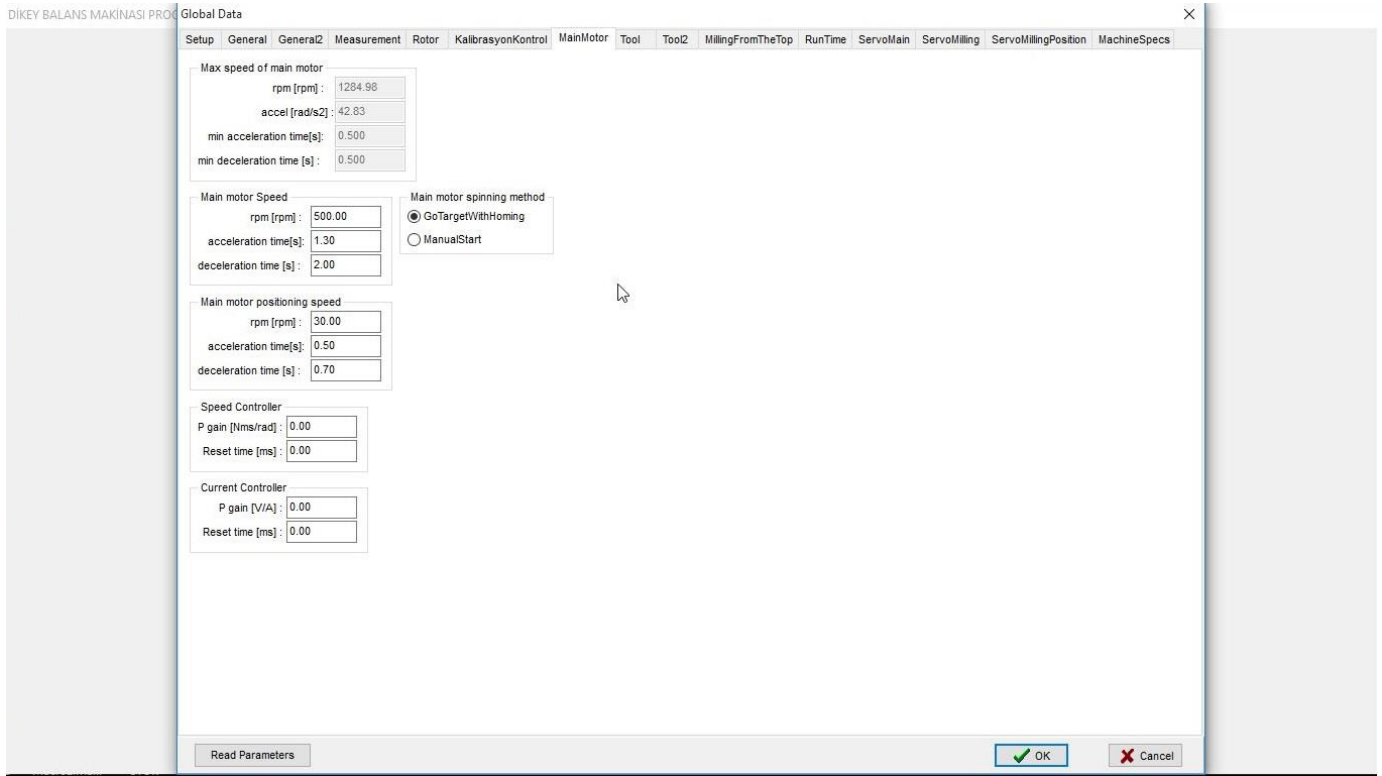


Figure 15

## DRILLING UNIT

**Drill diameter** : The diameter of the drill tool.

**Drill conical degree** : Conical degree of the drill tool.

Drill tool life is changable on the ROTOR MENU.

**Max hole number** : Maximum balancing drilling hole number.

**Degree between the holes** : The degree between two holes

**Drill distance** : The distance of drill to the part. It automatically calculates

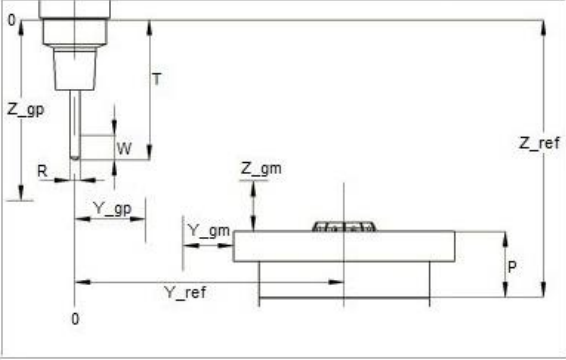
during the tool offset operation.

Global Data

Setup General General2 Measurement Rotor KalibrasyonKontrol MainMotor Tool Tool2 MillingFromTheTop RunTime ServoMain ServoMilling ServoMillingPosition MachineSpecs

**Tool Coordinates**

milling_distance_reference (Z_ref) [mm] :	539.61
milling_position_reference (Y_ref) [mm] :	256.84
tool_wear (W) [mm] :	0.00
tool_height (T) [mm] :	189.80
part_height (P) [mm] :	223.00
milling_safety_position (Z_gp) [mm] :	0.00
milling_safety_distance (Z_gm) [mm] :	10.00
milling_safety_distance2 (Z_gm2) [mm] :	20.00
milling_pos_safety_pos. (Y_gp) [mm] :	0.00
milling_pos_safety_dist. (Y_gm) [mm] :	200.00



**Tool Measurements**

tool_diameter (R) [mm] :	14.00
drill_conical_angle [deg] :	141.0
milling width of the mouth (ag) [mm] :	13.50
max_tool_depth [mm] :	10.00
max balance angle [deg] :	65.0
max hole count :	6
angle_in_the_between_holes [deg] :	12.0
distance_between_holes [mm] :	0.00

matkap_konik_derinligi [mm] :	2.479
matkap_acisal_bolge [°] :	5.42

tool_life [mm] :	9999999999
used_tool_life [mm] :	4.20

Read Parameters OK Cancel

Figure 16

## MAIN SERVO

You may adjust the start / stop speeds of the main servo motor.

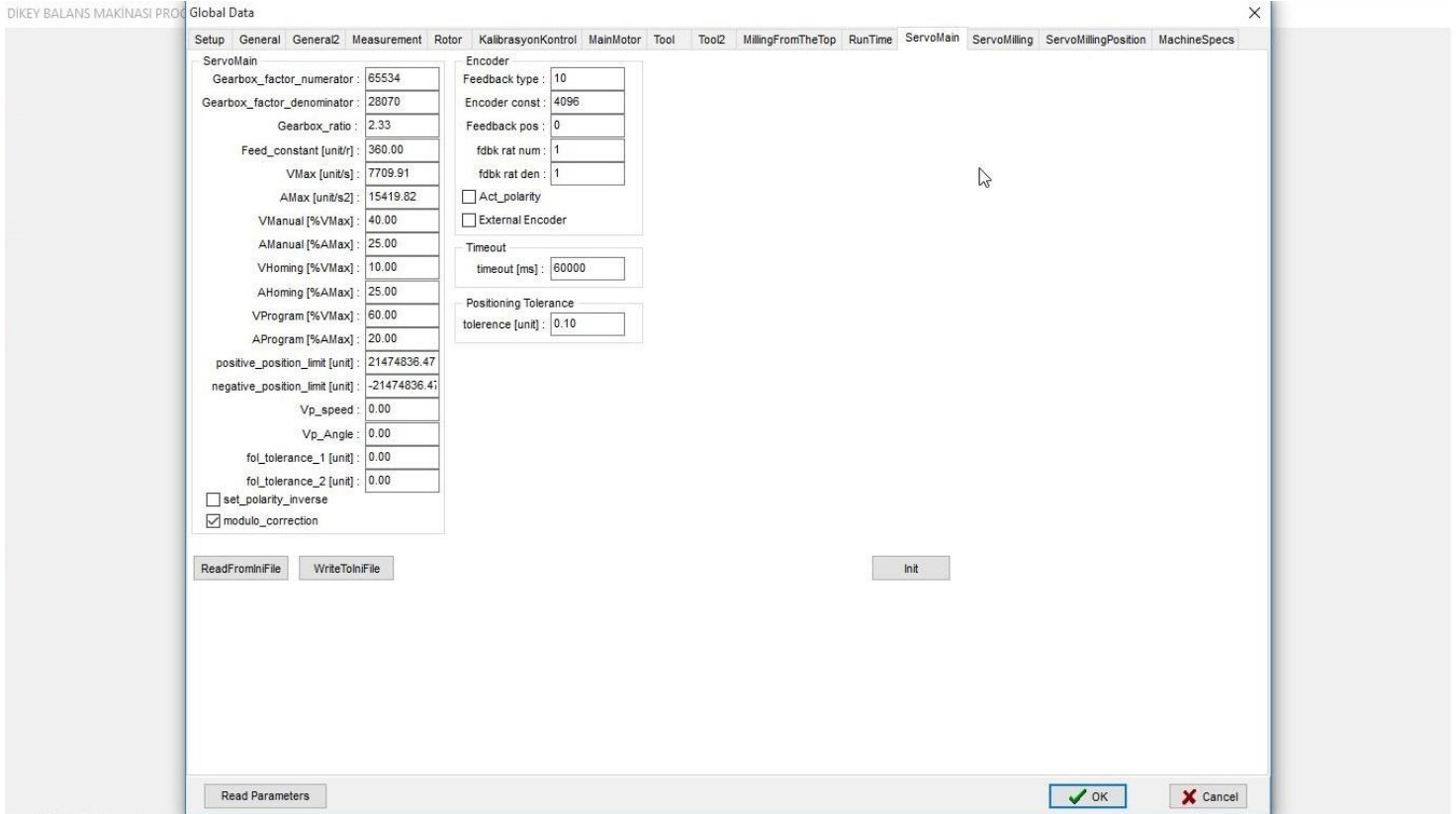


Figure 19

## SERVO MILLING DISTANCE

You may adjust the forward, backward, start, stop speeds manually.

**Positive position limit:** The positive limits of the programme. (Drilling unit backward) limit switches determined before 10mm from the last touching point. Positive means that, the forward movement of the servo motor.

**Negative position limit:** These are the negative switches of the programme. Mekanik olarak (Drilling unit backward) limit switches determined before 10mm from the last touching point. Negative means that, the backward movement of the servo motor.

**You should not use the other adjustments.**

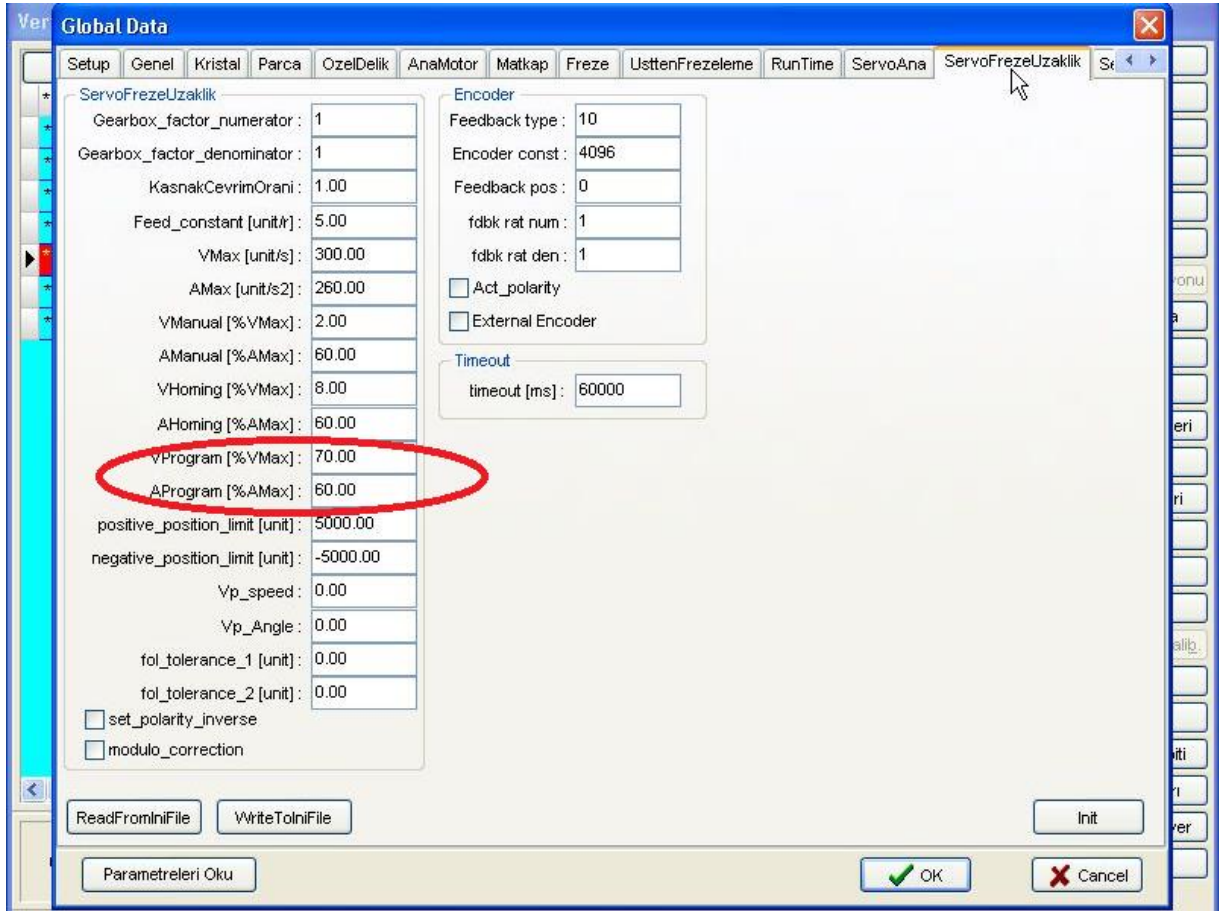


Figure 20

## SERVO MILLING POSITION

You may adjust the forward, backward, start, stop speeds manually.

**Positive position limit:** The positive limits of the programme. Mekanik olarak (Drilling unit backward) limit switches determined before 10mm from the last touching point. Postive means that, the forward movement of the servo motor.

**Negative position limit:** These are the negative switches of the programme. Mekanik olarak (Drilling unit backward) limit switches determined before 10mm from the last touching point. Negative means that, the bacward movement of the servo motor.

**You should not use the other adjustments.**

Global Data

Setup	General	General2	Measurement	Rotor	KalibrasyonKontrol	MainMotor	Tool	Tool2	MillingFromTheTop	RunTime	Serv
-------	---------	----------	-------------	-------	--------------------	-----------	------	-------	-------------------	---------	------

**Serial com**  
timeout [ms]: 3000

**Split Weight**  
 split\_weight  
reference point: 0.00

**Display**  
 inverted arrows  
posConst: 89.09

**Report**  
SerialNo: 0  
Operator: MESSMATIC

**Compensation**  
X0: ( 163.54 @ 167.5°  
XEccen: ( 209.57 @ 172.8°  
Eccen. Phase: 120.0  
 auto. eccentr. elim.

**Customer**  
Customer:  
Note:

**Breaking**  
 wait for breaking rpm  
breaking rpm [rpm]: 100  
positioning cycle: 10

**Balancing Method**  
With Top Drill

**Unit**  
g.mm

test\_freq: 0  
 mark of the piece within tolerance  
marking depth [mm]: 4  
 position after balancing  
 do not position if in tolerance  
 position to balancing start point  
 disable servo after positioning  
 unlock rotor after the test  
 unlock rotor after the test if ok  
 unlock rotor after balancing  
 acilista\_parca\_cozme

**Tolerance**

balancing tolerance [g]:	0.000	0.00 g.cm
machining tolerance [g]:	0.000	0.00 g.cm
maximum unbalance [g]:	1.500	18.23 g.cm
rework tolerance [g]:	1.500	18.23 g.cm

ISO

Figure 21

## REPORT:

Serial number: During the saving of the unbalance values to the database, you should write the serial numbers here.

Operator: The name of the operator during saving the unbalance values.

## TOLERANCE:

Machining Tolerance: is the target level that the balancing machine will try to reach during balance correction operation (Drilling)

Max. Residual unbalance: The maximum unbalance according to the ISO standards.

**COMPENSATION:** Compensation values in this menü are created automatically during compensation operation and should not be changed manually.

**ECCENTRICITY ANGLES:** This value is uses for the eccentricity. We advice it to make 120 degree or 90 degree. Depending on the rotor type.

**POSITIONING AFTER BALANCE:** It means automatic positioning according to the unbalance angle

**BALANCING METHOD:** You have to choose the balancing method for automatic operation

**UNIT:** You may choose the unity of unbalance.

## CHAPTER 4 BALANCING OPERATION

### 4.1. Turning on the machine and preparation of balancing

4.1.1. Turn ON the main switch on the control panel.

4.1.2. If the computer does not open automatically, turn on the computer manually and wait for a while. You should wait until the servo drivers connect to the opc server. It takes approx. one minute. And press ENERGY START button

4.1.3 Enter the user name and password.

4.1.4 Balancing machine is going to open the clamping unit after drilling offset is done and the programme will start.

4.1.5 Check the rotor if is selected or not after the system is ON. You may see the data of the current rotor at the bottom of the screen. If the right rotor is ntr choosen, enter the data menu and choose the correct rotor and press select part button. To enter the database menu you should enter the user name and password.

4.1.6 If you want to balance a new rotor, make the definition of new part operation that you may see how to do it below.

4.1.7 The tests on the first start up of the machine

i. Measuring test

Mount the master rotor and press compansation button. Put the calibration weight and press the TEST button, the rotor is going to rotate. Check the value if it is correct or not on the screen. Make this test with another weight to check the reading of the value. Because of the diameter differences the value may be different.

Value = Test weight x diameter of the place that you put the test weight / Calibration diameter

If the value is not equal to the calculated value perform Calibration.

To check the unbalance position press the position button. If the unbalance position is not correct, by hand move the weight under the drilling unit and press the pos correction button.

#### ii. Eccentricity Test

By loosening the balanced rotor from the spindle, ( by unclamp ), rotate it 120 degree ( the spindle should be stable.

## 4.2 Balancing operation

For balancing operation, after you mount the rotor press the START button. Machine is going to balance automatically.

## 4.3 Changing the Rotor Type

4.3.1 Mount the clamping unit according to the part.

4.3.2 Mount the suitable tool.

4.3.3 Adjust the position of the drilling unit according to the rotors' height and diameter.

4.3.4 Mount the rotor on the machine and adjust the rotor recognising sensor 3-4 mm until catching the sensor light is On.

4.3.5 Select the rotor on the database menu.

4.3.6 Make the measuring test. If necessary perform the CALIBRATION again.

4.3.7 Perform the ECCENTRICITY.

4.3.8 Make a test by balancing a rotor.

## 4.4 Description of a new rotor

4.4.1 Perform the first 4 steps of "Changing the Rotor Type"

4.4.2 Enter the database manu and press the + button.

4.4.3 One click on the bottom of the line and make it blue. Press OK button after you click the Copy button. The choosen part's all values are going to be copied on the new line.

4.4.4 Double click on the part to choose it.

4.4.5 General Menu

- i. Residable unbalance (from the drawings of the par tor calculated value of ISO 1940).
- ii. Balancing tolerance

4.4.6 Part Menu

- i. Balancing diameter
- ii. Channel width should be (0)
- iii. Maximum channel depth (from the drawings of the part)
- iv. Part name

4.4.7 Drilling Menu

Input the drilling values and movement speed

4.4.8 Milling Menu

Write the;

- i. Milling diameter
- ii. Milling mouth width
- iii. Maximum balancing angle
- iv. Milling depth

4.4.9 Do the measuring test. If necessary do the CALIBRATION.

4.4.10 Do the ECCENTRICITY.

4.4.11 Do the eccentricity test. If necessary do the ECCENTRICITY again.

4.4.12 Do the TOOL OFFSET.

4.4.13 Do the MILLING CALIBRATION

4.4.14 Balance one part to check.

## 4.5 Shutting Down the Machine

Do not switch off the machine by the on off switch directly, always first turn off the computer from the balancing machine software.



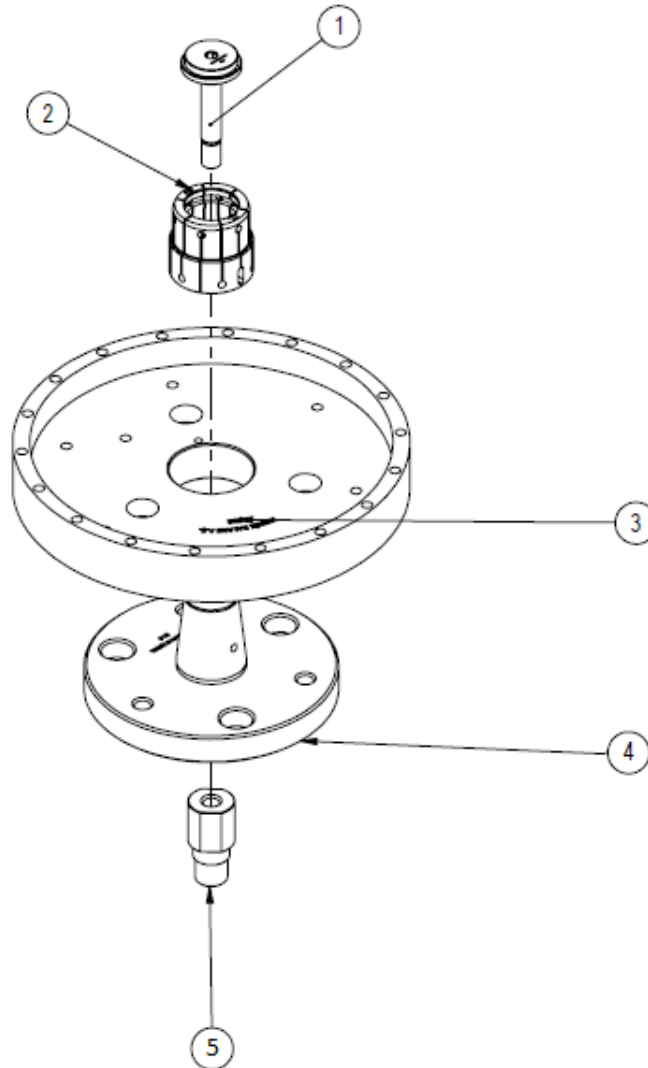
4.6.1 To turn off the computer press the shut down button and wait for the computer to be OFF.

4.6.2 Turn off the main power switch.

## HOW TO CHANGE THE CLAMPING SYSTEM

The clamping system is consist of the following parts in the example clamping unit

1. Clamping screw
2. The clamp
3. Clamping fixture – supporting rotor, and point support for drilling
4. Clamping conical
5. Clamping mill.



The clamping system should be designed regarding the rotors' technical drawing. Clamping system shouldn't have any runout. In order to change the clamping unit for a different type of rotor, the pieces should be dismantled and mounted in the same sequence.

## CHAPTER 5 MAINTENANCE INSTRUCTIONS AND AFTER SALES SERVICE ADDRESS

### 5.1 Maintenance of the operator should do



**Before cleaning and maintenance of the machine, please turn off the power.**

Clean the chips on the machine.

To make the life of the flange and adaptör long, make them lubricated regularly.

Fill the regülatör tank with the oil.( ISO VG 32 )

Please clean the monitorscreen by a dry swab. If the screen is so dirty, first clean it with a wet swab and than make it dry with another swab.

These two screen below is uses for meintenance. (Figure 22-23)

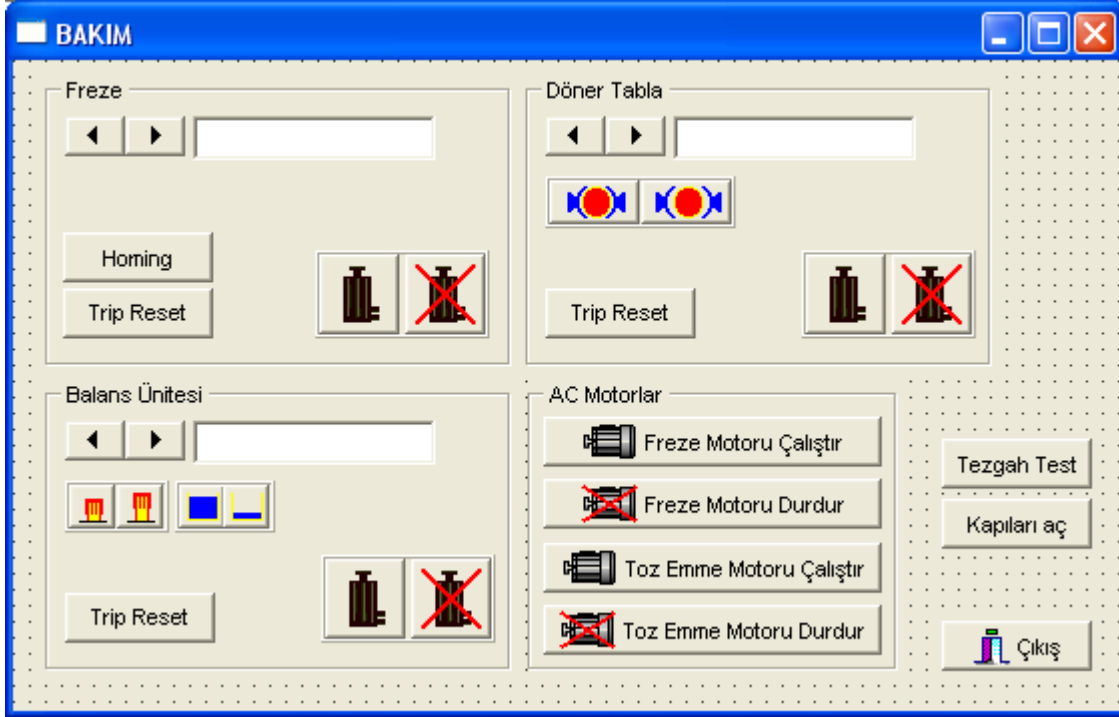


Figure 22

With this screen you may test the SERVO MOTORS. In case of an error, By the Trip Reset button you may reset this error.

- PLC Ports

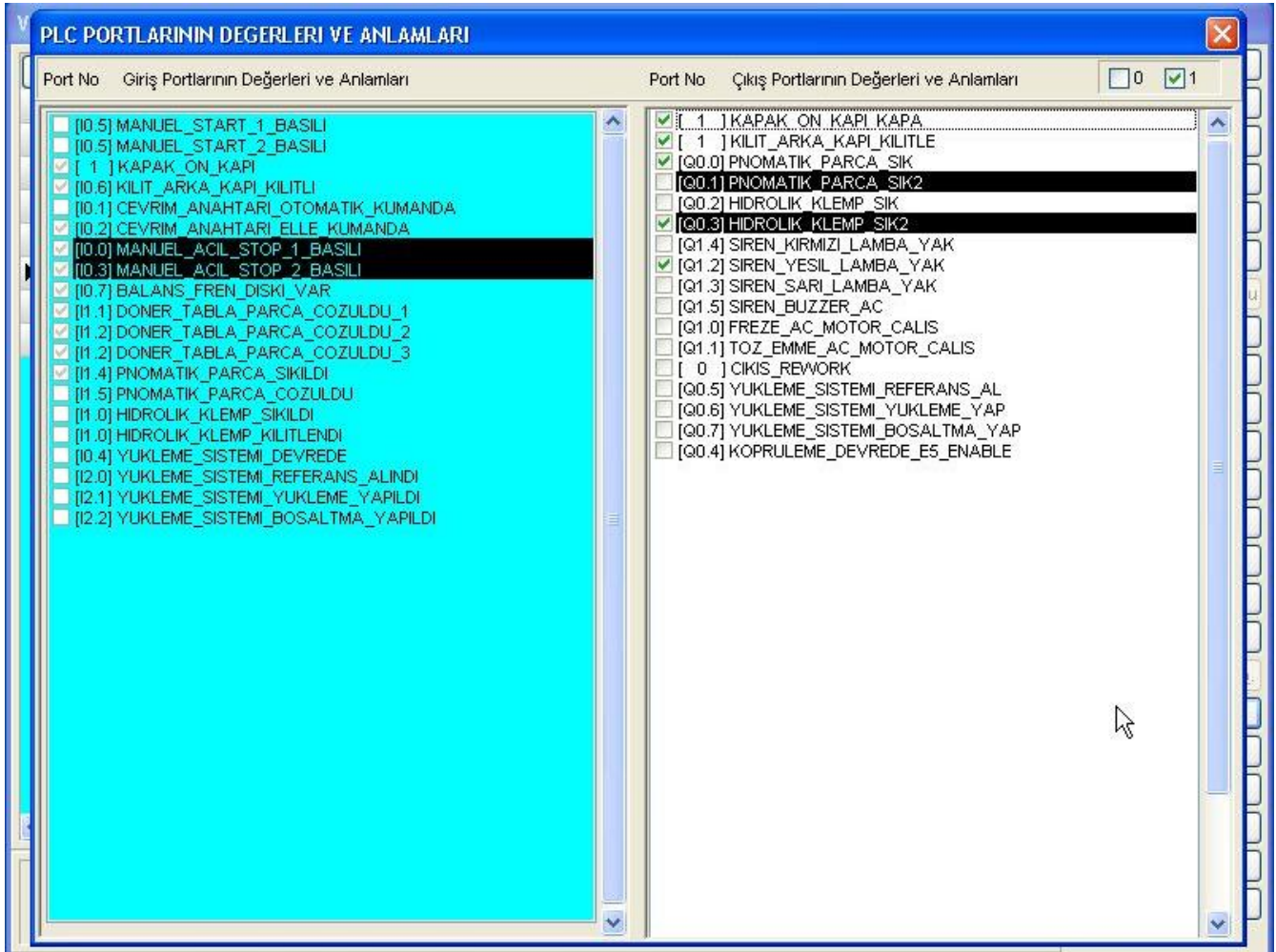


Figure 23

On the right screen you may see the PLC outputs. You may test these outputs one by one.

On the left screen you may see the PLC inputs. You may test the inputs / outputs here one by one.

**Vacumming System Meintenance**

1. Vacumming system tank should be controlled regularly. If it is full, by opening the locks, you should make it empty.
2. The filter of the tank of the vaccumming system should be cleaned once in every six months and should be changed every year.
3. There are air blowers on the entrance and exit of the vacumming system. You should control these blowers regularly if there is a hole on it or not.

**5.2 Address and Telephones****Teknik Balans A.Ş.**

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Mobile : 0090-5305844930