3-Point Balancing

with X-Viber

Version 1.00
VMI AB  04 September 2006
Press firmly the **ON/OFF** or **ESCAPE** or **OK** buttons until the instrument starts.

![Images of buttons]

Move the black line with the **Up** or **Down** buttons to **Measurements** and press the **OK** button.

![Main Menu]

Move the black line with the **Up** or **Down** buttons to **3-Point balancing** and press the **OK** button.

![Measurements Menu]

Before we start to balance we have to make some settings in the Set Up window.

![Set Up Menu]

While still in this window press the **Settings** button.
Move the black line with the Up or Down buttons to **Backlight:**

Press the side arrow buttons to select the Backlight:

If the light should be OFF or ON.

Move the black line to **Contrast:**

Press the side arrow buttons to select the Contrast:

The contrast might change slightly with the environment temperature.

Move the black line with the Up or Down buttons to **Unit:**

Press the side arrow buttons to select the Unit:

METRIC: mm/s, um, mm, m/s, g
IMPERIAL: in/s, mils, thou, g

Move the black line to **Frequency:**

Press the side arrow buttons to select the Frequency:

RPM or HZ.

Move the black line to **Auto-save:**

Press the side arrow buttons to select ENABLE or DISABLE. In Enable mode the X-Viber will automatically finish and store the measured value.

Press the Settings button when finished.

Press the side arrow buttons to increase or decrease the value. The weight can also be changed at a later stage.
Hardware installation

The 3-Point Balancing method does not need any additional hardware except the X-Viber instrument and the vibration transducer.

1. Mount the vibration transducer on the bearing and in the direction where you have the highest vibration caused by unbalance.
2. Use this measuring point for all following measurements. If you need to leave the place during the balancing procedure disconnect the BNC connector from the instrument and take all other equipment with you if necessary. If this is not possible, then mark the position with a pen or paint!
3. It is important that it is only the trial weights that will influence the vibrations and not the change in vibrations due to a different position of the transducer.

Mark with a pen or paint 3 positions in the rotor 0, 120 and 240 degrees apart but on the same radius. You must later place a trial weight on these positions. The angle has to be measured in the direction against the rotation.
Move the line to **New balancing** and press the **OK** button.

**Note!**
This message will appear.
If you answer **NO** you cannot start a new balancing.

Press the side arrow buttons to change from **NO** to **YES** then press the **OK** button.

**Note!** When you select **YES** the existing ongoing balancing will be deleted.

The new balancing round has started.
Place the transducer on the measuring point and start the machine and select your balancing speed.
Press the **OK** button and X-Viber starts to measure.

<table>
<thead>
<tr>
<th></th>
<th>0.00</th>
<th>0.00</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>mm/s rms</strong></td>
<td></td>
<td>0 CPM</td>
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</tbody>
</table>

Press **OK** to measure
This window is shown when X-Viber is measuring.

Press the OK button to save.

The measurement or wait until the Instrument is saving automatically.

This window is shown, when X-Viber has finished and stored the measurement.

Press the OK button and re-measure if you want to change the speed.

**Note!**
You must use the same speed for all remaining trial runs.
Now we must add a trial weight in the machine. To select a proper trial weight is always a sort of guesswork because we do not know the vibration sensitivity if we have not balanced this machine before.

Use this formula to calculate the size of the trial weight.

\[ T_{\text{grams}} = \frac{W_{\text{kg}} \times 180000}{R_{\text{mm}} \times S_{\text{rpm}}} \]

Where
- \( W_{\text{kg}} \) = The rotor weight in kg
- \( R_{\text{mm}} \) = The radius for the trial weight
- \( S_{\text{rpm}} \) = The balancing speed

**Note!**
This calculation is only to give you a hint of the size of the trial weight. If for example your calculation gives 134.5 grams, then you can use 120 or 100 or 80 grams.

Use the **Up** or **Down** buttons to increase or decrease the value.

**Note!**
Enter the weight of trial weight you actually mount in the machine and not the calculated value.

Start the machine with the trial weight mounted in 0 degree angle.

Press the **OK** button to start the measurement, t when the speed is the same as in the initial run.
This window is shown when the measurement is finished.

Change to YES with the Side arrow buttons and press the OK button, if you want to re-measure.

Otherwise just press the right Side arrow button, if you want to continue balancing.

Remove the weight at 0 degrees and mount it in 120 degrees.

Note!
Use the same radius.

Press the OK button.

Start the machine with the trial weight mounted in 120 degrees angle.

Press the OK button to start the measurement, when the speed is the same as in the initial run.
This window is shown while X-Viber is still measuring.

Remove the weight at 120 degree and mount it in 240 degrees.

Note!
Use the same radius.
Press the OK button.

This window is shown when the measurement is finished.
Press the right Side arrow button if you want to continue balancing.

Here comes the balancing result.
Remove the trial weight at 240 degrees and mount the balancing weight at the indicated angle starting from the 0 degree mark and counted against rotation.
Press the right Side arrow button if you want to continue balancing.

The prognosis is a measurement of the stability of the measurements and how well this balancing will succeed.

It can be problematic to balance a machine, if the prognosis is below 60-70%. This is usually caused by resonance amplifications or lost bolts and joints.

Press the OK button if you want to repeat this measurement.
Press the OK button to start the measurement when the speed is the same as in the initial run.

The instrument starts to measure and it is looking for the level at the balancing speed.

Because the machine is now balanced it might be another speed that has the highest vibration and it will take some time until it finds the level of the balancing speed.

This is the final result.

The improvement became 96.9% instead of the prognosis 99.8%.

This is mainly due to the difficult task of placing the weight at exactly 394.4 degrees.

If the improvement is much smaller than the prognosis please check that you have the correct size of the balancing weight and that it is placed in the correct angle.

Do not forget to remove the trial weight in 240 degrees!!!

If you want to make further improvement you must start a complete new balancing using smaller trial weights. This is the disadvantages of the 3-point method compared with the Single plane balancing method.
Saving the balancing

Press the Escape button to exit the balancing function.

Move the black marker line to Files and press the OK button.

There are 10 memory locations 0-9 where you can save a balancing round. X-Viber is automatically selecting the first available free location in the memory.

You can change to another number with the Side arrow buttons.

Press the OK button to save the balancing.

Note!
When storing a new balancing on an occupied location the old balancing will be lost.
Viewing a stored balancing

Move the black marker line to **Files** and press the **OK** button.

Move the black marker line to **Restore**.

You can change to another number with the **Side arrow** buttons.

Press the **OK** button to view the balancing.

Change to **Yes** with one of the **Side arrow** buttons and press the **OK** button

**Note!**

All information about the existing Ongoing balancing will be lost if it is not previously stored.

Go back to **Ongoing balancing** to view details in the selected balancing procedure.
Deleting a stored balancing

Move the black marker line to Files and press the **OK** button.

Move the black marker line to Delete.

You can change to another number with the **Side arrow** buttons and press the **OK** button.

Change to Yes with one of the **Side arrow** buttons and press the **OK** button.

This information shows that this location is now free for storage.
SAVING A BALANCING FILE IN THE X-TREND SOFTWARE

Transferring a Balancing file to the X-TREND software
Select the “Communication” menu in the X-VIBER Instrument

Start the X-TREND software and select the command “Transfer / X-VIBER”.

Click the line “Show Balancing” on the lower part of the virtual “X-VIBER” instrument

and a new window will appear:
Both “Single Plane Balancing” and “3-Point Balancing” files will appear in the list but with different icons.

A “Balancing report” will appear on the right side of the window.

Now you can:
- send the contents of the “Balancing Report” to the X-TREND machine database. The destination will be a Notepad associated with the machine.
- send the “Balancing Report” to a MS Word document where you can edit the content.
- print the “Balancing Report” directly to the system printer.