

用频闪仪测量转速

USING A STROBOSCOPE TO MEASURE RPM

频闪仪的主要用途是观测运动物体以进行诊断检查。然而，频闪仪可用于测量设备转速。为了做到这一点，需要考虑几个因素。首先，被测物体在 360° 旋转时都应该是可见的（例如轴的末端）。其次，物体上应该有一些独特的部分，比如螺栓、键槽或缺陷，作为参考点。如果正在查看的对象是完全对称的，那么用户需要在单个位置用胶带或油漆标记对象仅用作参考点。

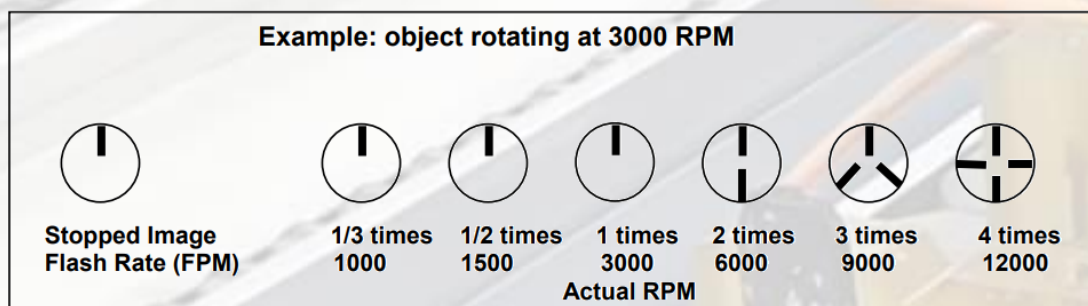
The primary use for a stroboscope is to stop motion for diagnostic inspection purposes. However, the stroboscope can be used to measure speed. In order to do this, several factors need to be considered. First, the object being measured should be visible for all 360° of rotation (e.g. The end of a shaft). Second, the object should have some unique part on it, like a bolt, keyway or imperfection to use as a reference point. If the object being viewed is perfectly symmetrical, then the user needs to mark the object with a piece of tape or paint in a single location only, to be used as a reference point.

如果旋转速度在频闪仪的范围内，则从最高闪光频率开始，然后将闪光频率调低。在某些时候，您将看到物体停止运动，只看到对象的单个图像。请注意，以两倍于图像实际速度的闪光频率，您将看到两幅图像。当您接近正确的速度时，你可能会看到三个、四个或更多与实际速度谐波的图像。你看到的第一张图片是真实的速度。要确认真实速度，请记录读数并将频闪仪调整到读数的一半。您应该再次看到一张图像（可能会相对于看到的第一张图像发生相移）。

If the speed of rotation is within the range of the stroboscope, start at the highest flash rate and adjust the flash rate down. At some point you will stop the motion with only a single image of the object in view. Note that at a flash rate twice the actual speed of the image you will see two images. As you approach the correct speed, you may see three, four or more images at harmonics of the actual speed. The first SINGLE image you see is the true speed. To confirm the true speed, note the reading and adjust the stroboscope to exactly half this reading. You should again see a single image (which may be phase shifted with respect to the first image seen).

例如，当查看具有单个键槽的轴时，您将看到键槽在实际速度和实际速度的 1/2、1/3、1/4 等处的静止图像。您将看到 2 张实际速度为 2 倍的键槽图像，3 张实际速度的键槽图像等。FPM 等于轴在最高闪光速率下的每分钟转数 (RPM)，该速率仅提供键槽的一个静止图像。

For example, when viewing a shaft with a single keyway, you will see one stationary image of the keyway at the actual speed and at 1/2, 1/3, 1/4, etc. of the actual speed. You will see 2 images of the key way at 2 times the actual speed, 3 key way at 3 times, etc. The FPM equals the shafts Revolutions Per Minute (RPM) at the highest flash rate that gives only one stationary image of the keyway.



在可以关闭设备并安装一条反光带的情况下，光学转速表很容易用于 RPM 测量。当您无法关闭设备时，必须使用频闪仪。当闪光速率低于 300FPM 时，人眼不容易被频闪仪欺骗看到停止的图像。因此，频闪仪几乎不可能在 300FPM 以下用于检查或测量 RPM。

In instances when you can shut down the device and install a piece of reflective tape then an optical tachometer is easy to use for RPM measurement. Stroboscopes must be used when you can't shut down the device. The human eye is not easily tricked into seeing a stopped image by a stroboscope when the flash rate is slower than 300 FPM. Therefore, stroboscopes are just about impossible to use below 300 FPM for inspection or to measure RPM.