1. As can be seen from the above table, a single image or a double image does not appear at only one flash frequency. Therefore, when using this instrument to measure the speed, if the speed range is known, we will put the flash frequency in this range to look for; if the speed range is unknown, we will start from the highest to look for the low direction, so that the number of heavy images is getting smaller and smaller, until the first appearance of a single stable image, is to measure the real speed, when the flash frequency continues to decrease, although there will appear a single image, but the image is dark, small contrast, this is to be noted, in case of error.

2. As a means to extend the range of velocity measurement and a checking method, the indirect measurement method can be used. There is a k-weighted image at F 1, followed by a k-weighted image at lower f 2, with a rotational velocity of W.

Because $F_1 = \frac{N}{K} W$ $F_2 = \frac{K}{N+1} W$ $W = \frac{F_1 * F_2}{K(F_1 - F_2)}$

$$\frac{F_1 * F_2}{F_1 - F_2} = \frac{\frac{K^2 W^2}{N(N+1)}}{(N+1)KW - \overline{NKW}} = \frac{K^2 W^2}{K W} = K W$$
$$N(N-1)$$

If we take the simple image as the criterion, that is, K = 1, then $W = \frac{F_1 * F_2}{F_1 - F_2}$

This is the indirect method of measurement. Specifically, it measures the flash frequency of two adjacent single images

F1、F2，Into the formula $W = \frac{F_1 * F_2}{F_1 - F_2}$ You get the rotational speed to be measured.

Five、matters needing attention

1. Do not test the instrument for a long time (preferably not more than 5 minutes) when it is high flash speed.

2.Because the instrument has hundreds of volts of high-voltage DC and nearly 10,000 volts of pulse voltage, and high-voltage power is not isolated transformer, direct from the 220V grid voltage rectifier. Therefore, do not open the instrument to check and repair, in order to avoid electric shock and damage to the instrument, if necessary, it is best to send to the factory inspection, or under the guidance of the factory repair.

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computer digital flash velocimeter

DSS-2A

Foshan Huazhike Electronic Technology Co. , Ltd.

DSS-2A computer digital flash velocimeter

One、Overview

This instrument is a kind of rotational speed measuring instrument. At the same time, it can also carry on the dynamic observation to the rotating object and the turning judgment.

The instrument uses internal trigger pulse xenon lamp, high height, long life, reliable release. Microcomputer technology and digital display of digital tube are applied in the instrument. The reading is bright and clear. The instrument has the advantages of small volume, light weight and beautiful appearance. Its biggest characteristic is that the speed measurement accuracy is in the leading level of similar instruments in China, because of the non-contact speed measurement, simple operation, with unique advantages of flash speed measurement. Therefore, the instrument is especially suitable for measuring the speed of micro-motor, spindle and small electric tools. It can also be widely used in electromechanical, textile, light industry, metrology, universities, scientific research and other departments.

Two、Main technical parameters

1.Speed Range: 200-20000(rpm/min).

2.Speed measurement accuracy: $\pm(1x10^{-4}x$ Readings $+1)$(rpm/min)

3.Display: Five-digit LED digital display.

4.Power supply: 220V ± 10% , Max power consumption less than 20W.

5.Size: 220x94x74mm.

6.Weight: less than 1 kg.

Three、Step by step

1.Speed measurement

(1) Mark the near-center part of the measured object or identify the existing characteristic marks (suitable for asymmetric marks) .

(2) Plug the power plug into the socket, press the power switch at the end, turn on the power, the display screen will display the last saved test speed of the instrument.

(3) If the approximate range of the rotational speed value of the object to be measured is not known, first put the key switch in the“ 凵 ”position. Fine tuning knob (drive 10-turn potentiometer) . First clockwise to the head, the flash to mark, while the fine-tuning knob counter-clockwise fine-tuning, while watching the mark, when the first single image of the mast, the digital tube shows the reading is measured by the number of revolutions per minute. If the“ 凵 ”file does not have a single image, use a method similar to the above. Look in the“ 凵 ” .

(4)If the range of rotational speed of the object to be measured is known, the tachometer can be adjusted to the corresponding rotational speed, and then the method of fine tuning can be used to change the light from high speed to low speed, the reading on the display is the number of revolutions per minute of the object being measured.

2.Dynamic observation

The same way 1. When the first single image appears, fine-tune the speed of the test, so that the flash frequency and speed slightly different. In this way, a single elephant is not stationary but rotates at a slow speed, and the direction and speed of rotation of the elephant is carefully controlled, as required.

3.Rotation direction discrimination

The same way 1. When the first single image appears, fine-tune the speed of the test, so that the flash frequency and speed slightly different. In this way, a single image is not stationary but rotates at a slow speed, and the direction of rotation of the image is the direction of rotation of the object.

Four、The law of velocity measurement

The flash velocimeter actually provides a pulse light source with adjustable frequency and extremely short duration. If the fan to the speed of 1300 revolutions per minute rotation, flash frequency is 1300 times per minute, because the two speed is equal (synchronous) . It is clear that each flash, the fan blade will be in the last flash when the position. Therefore, with the help of People's visual retention, the fan blades seem not to move at all. That is to say, when the flash frequency of the instrument is equal to the rotation frequency of the object being measured, the rotating object appears to be at rest, presenting a still image. At this point, the frequency of the flash is the speed of the object. This is the principle of flash velocimetry.

Assuming that the fan is still spinning at 1300 rpm, and that the flash speed becomes 1301 rpm, because the flash speed is faster than the fan speed, each time the flash, the blades of the fan have not yet reached the position where they were when the last flash hit them and lag slightly. This phenomenon will be visually felt in the fan slowly backward rotation. Conversely, when the flash of 1299 times per minute, the human eye will feel the star fan slowly forward rotation. That is to say, when the frequency of the flash of the instrument is slightly different from the rotation frequency of the object under test, a stroboscopic image appears that is much slower than the actual rotation speed, and it is exactly the real rebellion of high-speed movement. This phenomenon can be used for high-speed branch line careful observation and measurement.

In fact, the stroboscopic image of a moving object is more complicated under the irradiation of a pulsed flash light source. For easy understanding, various stroboscopic images and their generating conditions are listed in the chart.

Rotation speed W (rpm/min)	Flash frequency F (frequency/minute)	Disc pattern	Speed ratio	Notes
0	0			The object under test does not move and does not flash
W	$F=\frac{KW}{N}$		$F=\frac{KW}{N}$	Visible K
3000	3000		F= W	Flash frequency and speed synchronization, see single image
3000	$\frac{750、1500、3000}{N}$		$F=\frac{W}{N}$	Visible 1. The light is dim
3000	6000		F=KW K=2	See 2
3000	9000		F=KW K=3	See 3
3000	4000		$F=\frac{4}{3}W$	See 4
3000	1200		$F=\frac{2}{5}W$	See 2
3000	2999		S=W-F	The image rotates in the original direction of rotation with the apparent velocity s = 1(rotation/minute)
3000	3001		S=F-W	The image rotates the apparent velocity s = 1(rotation/min) in the direction of reverse rotation

Note: K.N is a positive integer. $\frac{K}{N}$ Minimum score.