

GUARANTEE

12 months guarantee on material and labour. Guarantee is not applied to xenon lamp and in case of opening or improper use.

RESPONSIBILITY

RISHI responsibility is limited to what is established by the guarantee terms. Other responsibilities for direct or indirect damages caused by use of instrument or their parts are not considered. Stroboscopes and their accessories includes high tension circuits: their utilization requires great care and consciousness. The user is responsible of safety.

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RISHI D20 K STROBOSCOPE
Instruction Manual 01/11/eng

RISHIKESH reserves the right to change the specification or design without prior notice.

Fully complies with CE directives



RAEE complies



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RISHI STROB D20 K

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FREQUENCY RANGE

200 - 20.000 flashes/min (ext signal up to 128.000 flashes/min are accepted)

DIRECT FLASHING USE

flashes frequency 200 - 20.000 flashes/min

AUTOMATC FLASHING DIVISION USE

flashes frequency 200 - 4.000 flashes/min

(automatic flashing division set at 4.000 flashes/min)

DIVIDER FREQUENCY

automatic flashing division :2 :4 :8 :16 :32 on external signal and internal oscillator

FLASH CONTROL

by internal oscillator not devided (INT) - by internal oscillator devided

by external signal devided

INTERNAL OSCILLATOR

coarse and fine adjustment of flash frequency

EXTERNAL SIGNAL

Electric signal >1V - Inductive sensor - photocell - microswitch

(with tachimetric function)

DISPLAY by means of dot matrix LCD display in RPM

(with ext signal is always displayed the real frequency of input signal)

RESOLUTION 1 RPM

DELAY TIME (PHASE-SHIFT) adjustable from 0,1 to 60 ms. approx

LAMP high brightness long life xenon white light tube

FLASH ENERGY 20 - 180 mWs/flash, depending on frequency range

(in "Automatic Flashing Division Use" flash energy always maximum)

POWER SUPPLY

Double AC/DC power supply (by means of the supplied AC adapter):

- Internal rechargeable battery, with external charger.

- 220 Vac - 50/60 Hz, by means of the supplied AC adapter.

Battery life: variable from 1 to 4 hours approx.

Battery recharging time: 10 hours approx (use only the supplied charger).

DIMENSION 115 x 70 x 195 mm

WEIGHT 0,700 kg

ACCESSORIES (supplied) charger.

OPERATING PROCEDURE - continue

SYNCHRONIZATION BY EXTERNAL TRIGGER

EXT position

Displayed frequency is the real frequency proportional to the frequency of the external signal. Flashes is divided over 4.000 flashes/min.

- Select the RANGE/ switch into the EXT position.
- Turn the PHASE-SHIFT knob on "0" position.
- Applying an external signal the flash lamp will flash proportionally.
- Automatic Flashing Division Function will divide flashing frequency over 4.000 flashes/min.
- The digital readout will accurately indicate the number of flashes per minute in RPM; display always indicate non-divided real frequency.
- Adjust the delay time with the PHASE SHIFT control.
- STROB Function allows to obtain image stop at any input frequency, always with a high brightness flash lamp (refer to pages 4-5 "Automatic Flashing Division Function").

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DELAY ADJUSTMENT (PHASE SHIFT)

Phase-shifter permits to obtain the angle of observation into the most favourable position on 360°. Adjust slowly the PHASE-SHIFT knob starting by the "0" position: in "0" position the phase-shifter is off, turning the knob by clockwise the phase shifter will increase.

Note that over the point of maximum shift the flash frequency will divide.

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CAUTION IN USE

- ⇒ **Stroboscopes and their accessories includes high tension circuits: their utilization requires great care and consciousness. Users are responsible of their safety.**
- ⇒ **Replacement of the xenon flash lamp**
Before replacement makes a short circuit between the pins of the flash lamp, to discharge the capacitors.
Xenon lamp is very fragile, do not apply any strength between glass and pins.
Handle the lamp by the socket, do not touch the lamp.
Replacement has to be made by qualified technicians, RISHI will not accept complaint for accidental breakages of the xenon flash lamp.
Follows the mounting instruction supplied with the spare part xenon lamp.
- ⇒ High voltage are present inside the equipment during use and can remain at dangerous levels for same time after switching off.
Allow at least 5 minutes after switching off before dismanting the equipment.
Makes attention when the xenon lamp is changed.
- ⇒ Flash lamp may be dangerous. Do not look directly at the flash, do not make experiments with your eyes or other people's eyes.
- ⇒ Life of xenon lamp depending on brightness and frequency.
High frequency and brightness limited life of the lamp. Use the stroboscope with the appropriate frequency and brightness.
We recommend to make observations using flashes submultiples, to obtain a high flash brightness, a longer life of xenon lamp and a battery charge longer life.

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THEORY and PURPOSE

RISHI D20 K stroboscope works according to the stroboscopic principle: it makes motion sequences visible which otherwise cannot be observed by the naked eye.

Synchronizing the flash frequency to the movement of the observed object and emitting intensive light pulses of short duration, the object to be observed is always illuminated at the same point of its movement, so that it appears to the eye as if it were motionless or stationary.

Stroboscopes are always used wherever motion sequences have to be analyzed or rotation speeds are to be measured.

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FUNCTION : real speed and their submultiples

AUTOMATIC FLASHING DIVISION FUNCTION

Stroboscopic principle is based on emission on light pulses with variable repetition frequency. Synchronizing the flash frequency to the movement of the observed object, a stationary image is obtained.

Stationary image of an in motion object can be obtained:

- at the same flash frequency of the real object speed;
- at different flash frequencies submultiples of the real speed (harmonical and subharmonical).

Basing on this principle it is possible to observe fast movements at lower flash frequencies, always obtaining the stationary images: higher brightness will be obtained also for long time and obtaining a lower wear of xenon flash lamp.

The device is equipped with a microprocessor controlled circuit for automatic division of flashing frequency: when overcoming the intervention point (4.000 flashes/min), flashing frequency is automatically divided referring to schedule at page 5.

This system permits to obtain at any input frequency a high brightness flash lamp for a long time.

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OPERATING PROCEDURE

The device is equipped with a microprocessor controlled circuit for automatic division of flashing frequency: when overcoming the intervention point (4.000 flashes/min), flashing frequency is automatically divided.

This system permits to obtain at any input frequency a high brightness flash lamp for a long time.

SYNCHRONIZATION BY INTERNAL OSCILLATOR

Two operating mode are foreseen:

- INT : flash frequency is not divided.
- INT : flash frequency is divided over 4.000 flash/min.

INT position

Displayed frequency is the same of the real frequency given by internal oscillator. Flashes are not divided and maximum frequency is 20.000 flashes/min. Brightness of flashes is consistent to the maximum overtake frequency.

Use this operation mode when it is necessary to obtain a flash frequency proportional to the displayed frequency, i.e. to measure the real speed of the object.

INT position

Displayed frequency is the real frequency given by internal oscillator. Flashes is divided over 4.000 flashes/min.

Use this operation mode for high brightness flash lamp observations.

- Select the RANGE/ switch into the INT or INT positions.
- The phase-shifter circuit (PHASE SHIFT) doesn't work.
- Adjust the flash frequency by means of the FREQUENCY knobs, until to obtain a stationary image of the object under observation.
- Over 4.000 flashes/min intervention point starts and flashing is automatically divided.
- The digital readout will accurately indicate the number of flashes per minute (RPM); display always indicate non-divided real frequency.
- STROB Function allows to obtain image stop at any input frequency, always with a high brightness flash lamp (refer to pages 4-5 "Automatic Flashing Division Function").

continue

SPECIFICATIONS

RANGE/ : 3 POSITIONS ROTATING SWITCH

To select the flash control:

- INT : flashing by internal oscillator not deviated
- INT : flashing by internal oscillator deviated
- EXT : flashing by external signal deviated

For more information refer to pages 4-5 "STROB: Automatic Flashing Division Function".

FREQUENCY : COARSE and FINE KNOBS

To adjust the flash frequency with internal oscillator :

COARSE: coarse adjustment

FINE : fine adjustment

Adjust knobs until the object to be observed appears motionless or stopped.

Flash frequency in RPM will be indicate on display.

PHASE SHIFT KNOB (Phase-Shifter)

PHASE SHIFT control works only with external signal (EXT position).

Permits to obtain the angle of observation into the most favourable position.

Starting the observations with the PHASE SHIFT knob into the "0" position.

Note that over the point of maximum shift the flash frequency will divide.

DISPLAY

Shown the flash frequency in RPM (flashes/min):

- INT position: displayed frequency is the same of the flashes.
- INT and EXT position: displayed frequency is the real non-deviated input frequency.

Continue

SPECIFICATIONS - continue

EXT TRIGGER SOCKET

Use this socket to connect external signal of flash synchronization.

Accept a stereo jack 3,5 mm diameter.

For more details about connection of external signal refer to SYNCHRONIZATION page 8.

ON-OFF SWITCH

To switch on-off the instrument.

CHARGE IN 7,5 Vdc – 1,6A socket

- To recharge the battery (refer BATTERY RECHARGING).
- To use the instrument powered by 220Vac (by means of the supplied AC adapter).
- Using exclusively the supplied AC adapter.

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BATTERY RECHARGING

Recharge battery only when it is partly or completely exhausted. Don't leave charger always connected to instrument (10 hours max).

Recharge the battery when during use the "bat" appearing on display :

- Switch off the instrument.
- Connect the supplied charger to the CHARGE IN socket and to the 220Vac power supply.
- For a complete recharge occurs 10 hours approx.
- When the battery is off is however possible to use the stroboscope powered by 220Vac, using the supplied AC adapter.
- When the battery is totally discharge wait a few minutes before using the instrument with 220Vac power supply.
- Using exclusively the supplied AC adapter.

FLASH SYNCHRONIZATION BY EXTERNAL TRIGGER

- Synchronization of flash lamp with external signal occurs selecting the RANGE/ switch on EXT position.
- Applying to EXT TRIGGER socket the external signal the flash lamp will flashing proportionally.
- Intervention point of Automatic Flashing Division is set at 4.000 flashes/min: when overcoming this point, flashing frequency is automatically divided (for more info refer to paragraph "Automatic Flashing Division Function" pages 4-5).

Contacts of jack are the follows:

- **POINT** contact : INPUT (synchronization signal).
- **MEDIUM** contact : + (positive 6V to powered the sensor).
- **EARTH** contact : - (negative).

SYNCHRONIZATION BY ELECTRIC SIGNAL

Connect the electric signal to the **EARTH** contact and to the **POINT** contact. Do not use the **MEDIUM** contact.

SYNCHRONIZATION BY INDUCTIVE SENSOR

Connect the negative pole of the inductive sensor to the **EARTH** contact and the positive pole of the inductive sensor to the **POINT** and **MEDIUM** contact connected together.

SYNCHRONIZATION BY PHOTOCELL

Photocell always powered:

Connect the negative pole of photocell to **EARTH** contact, and the INPUT of the photocell to **POINT** contact. Do not use **MEDIUM** contact.

Photocell to be powered by stroboscope:

Connect the negative pole of photocell to **EARTH** contact, the positive pole of photocell to contact **MEDIUM**, and the INPUT of photocell to **POINT** contact.

SYNCHRONIZATION BY MICROSWITCH

Connect one wire of the microswitch to the **EARTH** contact, and the other wire of the microswitch to the **POINT** and **MEDIUM** connected together.

STROB : AUTOMATIC FLASHING DIVISION FUNCTION

The device is equipped with a microprocessor controlled circuit for automatic division of flashing frequency: once a pre-set intervention point is overcome (4.000 flashes/min) circuit divides input frequency according to the following schedule.

Input frequency rpm	over 4.000	over 8.000	over 16.000	over 32.000	over 64.000	over 128.000
Flashing division	:2	:4	:8	:16	:32	over range

The great advantage of this system is that the operator can dispose of a high brightness flashing at any input frequency, for a long time.

By "Input Frequency" we mean the real frequency generated by internal oscillator or the real frequency of external trigger.

Automatic division of flash frequency is useful and indispensable above all with external trigger, because it makes impossible to exceed maximum frequency range.

- Intervention point is set to 4.000 flashes/min: up to this frequency, flashing is proportional to input frequency (without division).
- Over 4.000 rpm circuit divides frequency by 2: a 6.000 rpm input frequency will give a flashing of 3.000 flashes/min.
- Over 8.000 rpm circuit divides frequency by 4: a 14.000 rpm input frequency will give a flashing of 3.500 flashes/min.
- Over 16.000 rpm circuit divides frequency by 8: a 20.000 rpm input frequency will give a flashing of 2.5000 flashes/min.
- Over 32.000 rpm circuit divides frequency by 16: a 44.000 rpm input frequency will give a flashing of 2.750 flashes/min.
- Over 64.000 rpm circuit divides frequency by 32: a 88.000 rpm input frequency will give a flashing of 2.750 flashes/min.
- Over 128.000 rpm input frequency will cause a flashing block because of over range.

Display: it always indicates the real non-divided input frequency.