Scitec Instruments Ltd

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MODEL 350C AND 350CD VARIABLE FREQUENCY MINIATURE OPTICAL CHOPPER

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1 INTRODUCTION

The model 350 optical chopper consists of a remotely mounted chopping head connected by a cable to a control unit.

2 UNPACKING

When the Model 350 is shipped, the control unit, mini chopping head, second chopping disc and interconnecting cable are individually packed. The second chopping disc is packed between pieces of plywood or polystyrene and must be unpacked with extreme care.

3 ASSEMBLY

Using the cable supplied, connect the chopping head to the socket on the rear panel of the control unit.

BEFORE CONNECTING THE POWER, ENSURE THAT THE VOLTAGE INDICATED ON THE REAR OF THE UNIT IS CORRECT. DAMAGE TO THE UNIT COULD RESULT IF THE WRONG VOLTAGE IS APPLIED. A voltage selection switch is mounted inside the unit. To remove the instrument cover remove four screws, two on either side of the instrument case and lift the cover. MAKE SURE THAT THE POWER IS DISCONNECTED BEFORE OPENING COVER.

4 CHANGING THE DISC

Remove the three M3 x 6 countersunk screws that secure the front face of the chopper housing (when viewing the front face of the housing, the connector is on the right hand side of the housing). Place a small screwdriver or similar object through one of the three apertures - this is to prevent the disc already fitted from rotating. Using an Allen Key, carefully remove the two M3 socket cap screws and lift off the blade retaining ring. Remove the blade. Fit the new chopping disc in reverse order taking care not to over tighten the two M3 socket cap screws.

5 OPERATION

5.1 On/Off

Power to the control unit is controlled by the ON/OFF switch located on the right side of the front panel. The frequency display of the model 350CD lights when the power is switched on. The model 350C is fitted with a red LED indicator beside the switch which lights when the unit is switched on.

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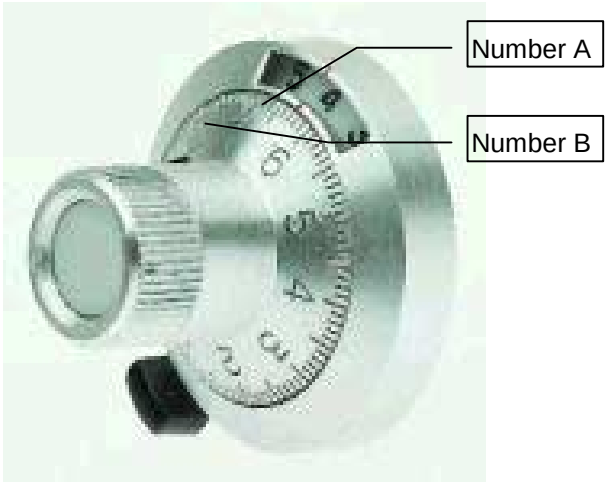
5.2 Chopping Frequency

The model 350CD chopper control unit is fitted with an LED display which reads the chopping frequency correctly for all discs. The frequency is set by the front panel mounted FREQUENCY control knob.

The model 350C frequency control is fitted with a 10 turn dial. The current frequency in Hz can be calculated by appending number A to number B and then multiplying by the number of slots in the chopping blade and then by 2.5. For example, on the dial below, A=4 and B=6.3. If a 2 slot blade is in use then the chopping frequency is 4 6.3 x 2 x 2.5 = 231Hz.



Chopping Frequency (Hz) = A B × No of slots in blade x 2.5

5.3 Reference

The reference signal is output from a BNC socket on the front panel of the control unit. This signal is a HCT TTL square wave at the chopping frequency and has a constant phase relative to the chopping action.

5.4 Frequency range

The following table gives the maximum usable frequency range for each blade.

2 slot blade	10 to 500 Hz
4 slot blade	20 to 1000 Hz
40 slot blade	200 to 10000 Hz

Please ensure that these frequency limits are not exceeded.

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The maximum motor speeds specified above was increased by 66% in July 1999 from information received from the motor manufacturer. This increased motor speed will affect the motor life span if used.

5.5 Motor Life Time

The lifetime of the motor is limited by the bearings within the motor which wear out in rough proportion to the speed of the motor. If the speed is reduced by a factor of 2 then the lifetime is approximately doubled. Other factors also come into play such as repeated stop start motion and ambient temperature and as such the motor manufacturer is unwilling to specify or guarantee motor lifetimes. Lifetimes of many 1000's of hours have been reported by customers running the motors at approx 6000 rpm. As the maximum motor speed has only recently been increased to 15000 rpm, lifetime information at this speed is not currently available but it will be less than this.

If long motor life time is important, Scitec recommends that the motor speed is kept below half maximum speed if possible.

5.6 External Control

The instrument can be externally controlled via the front panel mounted BNC type socket. For this mode of operation the EXT/INT switch must be placed in the EXT position. The chopping frequency is then controlled by an externally applied voltage. Maximum input voltage is 15v, input impedance is 20 kΩ. In this mode the frequency control is used to set the proportionality between the input voltage and chopping frequency.

A common fault is to have the frequency dial set to 0 when applying an external voltage. With the dial in this position the motor will not turn, no matter what the applied voltage. The usual position for the dial when in external mode is turned clockwise to its maximum.

5.7 Fuse

The line fuse in this instrument is mounted on the printed circuit board. Before changing the fuse, ensure that the unit is isolated from the line supply. Replace only with a 1 Amp 20mm x 5mm semi-delay fuse.

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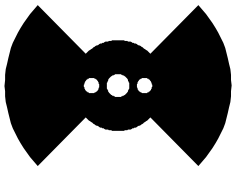
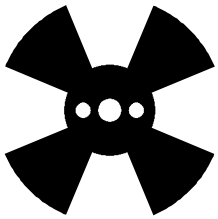
6 Spare Parts

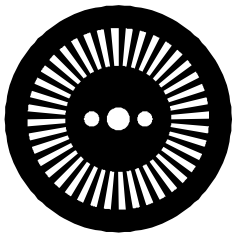
The following blades can be purchased separately and are compatible with the 350C and 350CD.



350-2



350-4



360-40

Special blades, made to customer requirements, can be made. Contact Scitec or your local representative for prices.

All blades can be gold coated at an additional cost.