



Boston Electronics Corporation

91 Boylston Street, Brookline, Massachusetts 02445 USA
(800)347-5445 or (617)566-3821 fax (617)731-0935
www.boselec.com boselec@boselec.com

The Scitec Model 310CD HIGH SPEED Chopper

Features

→ The Model 310CD is a high speed optical chopper based on our standard 102 mm diameter discs. By spinning the discs many times faster than our standard (Model 300C/CD) system, chopping speeds up to 120 kHz can be achieved.

→ The high speed is reached by using a 50 W electrically commutated motor and drive unit. The high efficiency of the motor means that a large proportion of the energy is transferred to the disc. Wind resistance is the limiting factor on the speed discs can be spun at. The greater the number of slots, the higher the wind resistance produced by the edge of the slots and hence the slower the maximum speed. To minimize losses, the chopping disc is enclosed in a carefully designed blade protector which guides the air flow around the disc.

→ Fast chopping speeds come at a cost however. The 50 W of energy put into the motor has to be released somewhere. The action of the disc moving through the air causes the air to heat significantly. This coupled with the high speed of the disc causes jets of warm air to be released through any open apertures in the blade protector. Vibration is also an issue and it is therefore necessary to ensure that the chopping head is securely bolted to a secure surface at all times. Finally, the motion of the 2 slot disc, in particular, through the air causes a siren effect. This, at maximum speed, is deafening to the extent that ear defenders are considered necessary. Operation with the 445 slot disc is considered loud but only to the point where you would leave the room to make a phone call.

→ Safety is an obvious concern with a system that has parts moving at 130m/s (290mph). This is achieved by enclosing the chopping disc in a blade protector. However, apertures in the blade protector remain a cause for safety concerns. To help reduce the dangers to a



minimum, blanking plates are provided to cover all unused apertures. Plates are also supplied to reduce the size of apertures in use. However, in some experiments, due to the size of the optical beam to be chopped, it is not possible to completely remove the danger of finger ingress. It is therefore necessary for the user to ensure that it is not possible for fingers to come into contact with a moving disc through the use of guards etc.

Disc	Revs Per Second	Revs Per Minute	Chopping Frequency Range
300D2 (2 slots)	50 - 400 rps	3000 - 24000 rpm	100 - 800 Hz
300D5 (5 slots)	50 - 370 rps	3000 - 22000 rpm	250 - 1850 Hz
300D10 (10 slots)	50 - 340 rps	3000 - 20000 rpm	500 - 3400 Hz
300D30 (30 slots)	50 - 300 rps	3000 - 18000 rpm	1500 - 9000 Hz
300D445 (445 slots)	50 - 270 rps	3000 - 16000 rpm	22 - 120 kHz

The 310 is shipped with customer's choice of ONE disk from the list above. Please specify your choice at time of order.

(please note, our 300D200 (200 slot disc) is **not suitable** for use with the Model 310 system as it is not strong enough for the speeds involved)