



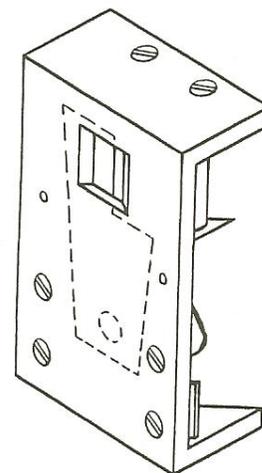
# **ELECTRO-OPTICAL PRODUCTS CORP.**

P.O. BOX 650441 . FRESH MEADOWS, NY 11365 . TEL: (718) 456-6000 . FAX: (718) 456-6050 . www.EOPC.com

## **LOW FREQUENCY OPTICAL MODULATOR/SHUTTER CH-60**

### **FEATURES AND ADVANTAGES:**

- \*Chopping frequency from DC to 50 Hz  
(when used as a chopper)
- \*Response time of 10msec (when used as a shutter)
- \*No hard stop, no "click" sound
- \*No shock to the system when opening and closing
- \*LOW COST
- \*Aperture 0.25" X 0.45" (6.3mm X 11.4mm)
- \*Jitter free operation
- \*High frequency stability
- \*Small size
- \*Withstands shock and vibration
- \*High reliability, long life
- \*Accepts external clock input (with DCH-60 driver)
- \*Phase locking to an external input  
(with DCH-60 driver)
- \*Can be stopped in the "ON" or "OFF" position
- \*No radiated electromagnetic interference (EMI)
- \*Bright or dark blade
- \*A BOXED chopper optional
- \*Integrated IR EMITTER (BLACK BODY) optional
- \*Special pricing for OEM applications.



Patents No.: US 6,046,836  
US 6,215,575 B1  
US 6,466,353 B2

### **DESCRIPTION:**

The VARIABLE LOW FREQUENCY chopper/shutter Model **CH-60** consists of a blade (vane) mounted on a motor with a limited rotation angle. The position of the blade follows the direction of the current in the motor winding. Current in one direction will set the chopper to the open position and current in the other direction will set the chopper to the closed position. Alternating the current will cause the blade to open and close the chopper at a frequency range from DC to 50Hz. This method of chopping is jitter free. High reliability and long life is achieved by eliminating the use of a brush type motor or gear heads. AT the same time it can also be used as a shutter that is controlled by the current direction.

The model **CH-60-B** is a boxed chopper (1.90" W x 3.00" L x 1.25" D) with a 0.25" x 0.45" window (cutout) for laser light, larger cutout available.

The model **CH-60-NF** indicates the motor assembly with the blade and cable but without the frame.

The model **CH-60-IR** offers an integrated IR emitter (black body).

Using our **DCH-60** driver with the  $\delta$ MODE selector switch provides two modes of operation for the **CH-60** chopper/shutter: internal mode and external mode.

In the internal mode the **CH-60** is used as a variable low frequency chopper. The chopping frequency is set by an internal oscillator adjustable from 1 Hz to 50 Hz.

In the external mode the **CH-60** is used as a chopper or as a shutter and is controlled by an external TTL signal input.  $\delta$ high input keeps the CH-60 open,  $\delta$ low input keeps it close. Response time is 10msec. Maximum frequency for TTL input is 50Hz.

The chopper is especially suitable for low cost dedicated applications, OEM, built into an instrument/system, and for portable systems.

**SPECIFICATIONS (when used with the DCH-60 Driver):**

APERTURE SIZE: 0.25 X 0.45 inch

FREQUENCY RANGE: DC to 50Hz

RESPONSE TIME: 10 mSec, from an OPEN position to a CLOSED position, or vice-versa

FREQUENCY STABILITY: 0.1% internal clock

0.005% with external crystal clock input

EXTERNAL CLOCK INPUT: DC to 50Hz TTL level input

5V or "OPEN" to open the chopper/shutter

0V or "GND" to close the chopper/shutter

SETTLING TIME TO EXTERNAL CLOCK: 20 mSec

MONITOR OUTPUT: TTL level output

"Hi" indicates the chopper is open

"Lo" indicates the chopper is closed

POWER REQUIREMENTS:

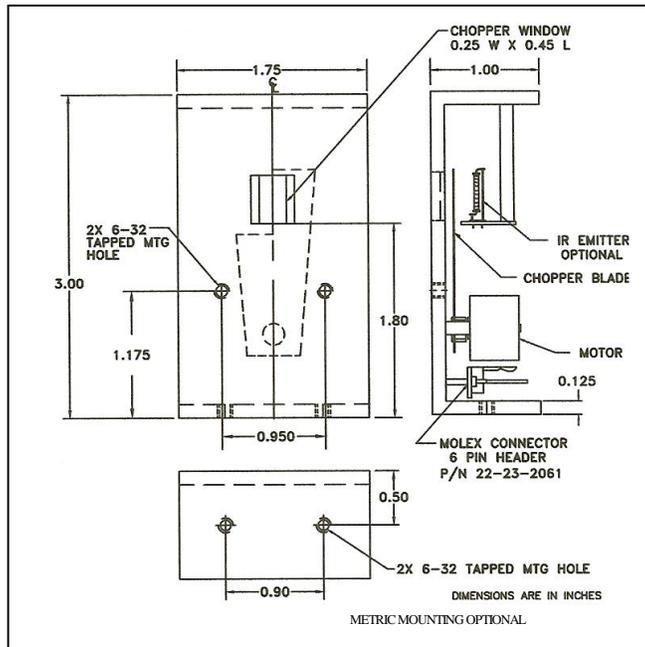
1. The CH-60 and driver board: 15V dc, 250 mA

2. CH-60-IR (emitter option) and driver board:  
15V dc, 250mA and 5V dc, 1.0 Amp

CHOPPER SIZE: 1.75" W X 3.0" H X 1.0" D  
(1.90" W x 3.00" L x 1.25" D boxed)

CHOPPER WEIGHT: 2.5 Oz (70 grams)

OPERATING TEMPERATURE: 0-65°C



**THE DCH-60 DRIVER CONFIGURATION:**

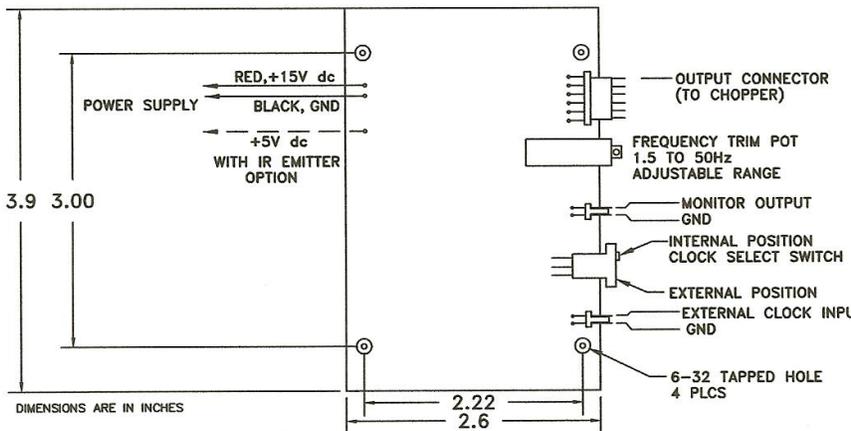
The DCH-60 Driver is available in two configurations:

Model DCH-60-PC: A board level driver

Model DCH-60-110 or -220: A cased driver, 5.3" x 5.3" x 2"

Operating from a line voltage of 110V ac or from 220V ac

**CH-60 CHOPPER OUTLINE DRAWING**



**DCH-60 DRIVER HOOK UP DIAGRAM**

**DCH-60 DRIVER**