

230 SERIES LIGHT BEAM CHOPPER

DL Instruments, LLC

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DESCRIPTION

DL Instruments Model 230 Light Beam Chopper is a durable, low cost chopper that works from 4 Hz – 3 kHz. The Model 230 comes complete with three spring steel chopper blades that won't bend as easily as brass or aluminum blades. The blades are only 2.875" in diameter to make chopper head mounting possible in tight places. The compact design of the chopper head also makes mounting easy. The control cable is attached to the side of the head to conserve head mounting space.

The 230 Control unit sets the chopping frequency with a front panel control or an external voltage input. The reference output is a 5 volt square wave.

The Model 230A Chopper Head is also compatible with all DL Instruments 220 Series Controllers. Modification M101 to the 220 Controller is recommended to insure reliable operation of the reference pickups when interchanging 220A and 230A Chopper Heads.

The Model 230 Controller Unit is *not* fully compatible with the 220A head, however. It cannot supply enough current to overcome the higher aerodynamic drag of the larger 220 blade at speeds above roughly half of the full 6000 rpm.

230A CHOPPER HEAD

DRIVE: 11-pole dc motor, moving coil, sleeve bearings with typically 3000 hours lifetime at half speed and 1000 hours full speed (6000 rpm).

REFERENCE: IR interrupter, spectral sensitivity approximately 900nm. Pickup located vertically below shaft at a radius of 1.26" (32mm).

SIZE (without blade): 2.125" (54mm) high x 2.362" (60mm) deep x 1.023" (26mm) wide.

WEIGHT: 11 oz (310 grams), including cable and mounting screw.

CABLE LENGTH: 2 meters (6½ feet). Extendable using 3 meter (10 foot) lengths of 230 head cable.

SPECIFICATIONS

CONTROL UNIT

AMPLIFIER: Bipolar power amplifier with 100Ω resistive positive current limit.

OUTPUT VOLTAGE: -10Vdc nominal for 6000 rpm.

VOLTAGE STABILITY: 0.01%/°C stability typical.

OUTPUT CURRENT: -100mA active current limit.

INTERNAL FREQUENCY CONTROL: Via 10-turn pot. Range 4 Hz – 3 kHz with three blades. Frequency readout on dial, resolution 1 Hz with 10 slot blade, accuracy 1% for settings between 10% to 100% maximum frequency.

EXTERNAL FREQUENCY CONTROL: Via BNC connector. Input Impedance 100kΩ.

Nominal frequency for external mode and input voltage of +10V.

230/2 Blade 200 Hz

230/10 Blade 1 kHz

230/30 Blade 3 kHz

+30%, -10% depending on motor tolerances

REFERENCE OUTPUT: Via BNC connector
5V square wave

Output Impedance 330Ω

POWER SUPPLY: 170–260V/90–130V. 50–60 Hz maximum 5 VA. 6VJ1 Corcom power connector.

HOUSING: Plastic. Aluminum front and rear panel.

DIMENSIONS & WEIGHT: 6.81" deep x 2.488" high x 6.062" wide. 1.8 lbs.

HEAD CARRIER: Anodized aluminum.

MOUNTING: By 1/2" horizontal and vertical hole and M5 milled head screw. Connection to the control unit with 6 foot cable, from side of head.

FREQUENCY STABILITY: (intermittant service)* Typical short term motor speed (phase) jitter (peak deviation from 1 minute mean): ±0.5% @600 rpm, ±0.3% @ 3000 and 6000 rpm. Typical long term stability (peak deviation from 1 hour mean): ±0.3% within 10% to 100% of FS maximum frequency.

* *Not recommended for continuous around the clock service if stability performance is critical.*

230 CHOPPER BLADE SET

MATERIAL: 0.012" spring steel for high mechanical strength.

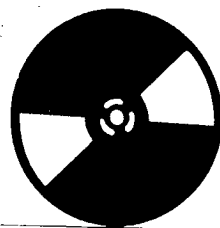
OUTER DIAMETER: 2.76" (70mm) photochemically etched.

CENTER HOLE DIAMETER: 0.3150", +0.0006 -0.0000" (8mm, +15 μ m -0 μ m)

SURFACE: black, optically absorbent.

MARK/SPACE RATIO: 1/1 with one blade mounted.

VARIABLE APERTURE:
With two identical blades mounted: allows 1/1 to 0/1 duty cycle.

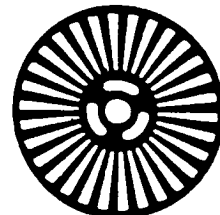
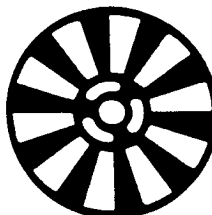


25% Duty Cycle Using two blades

0.118 (3mm)
rim thickness

Hub Dia.
1.024" (26mm)

Clear Aperture
0.748" (19mm)



230/2

230/10

230/30

FREQUENCY RANGE

4 Hz – 200 Hz

20 Hz – 1 kHz

60 Hz – 3 kHz

MAXIMUM BEAM DIAMETER

0.748"/19mm

0.341"/8.66mm

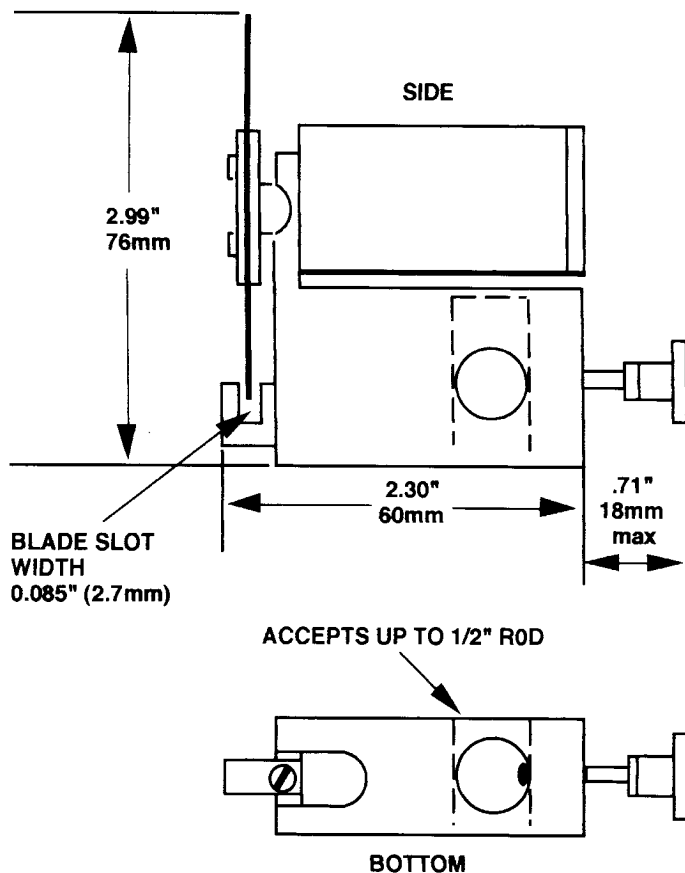
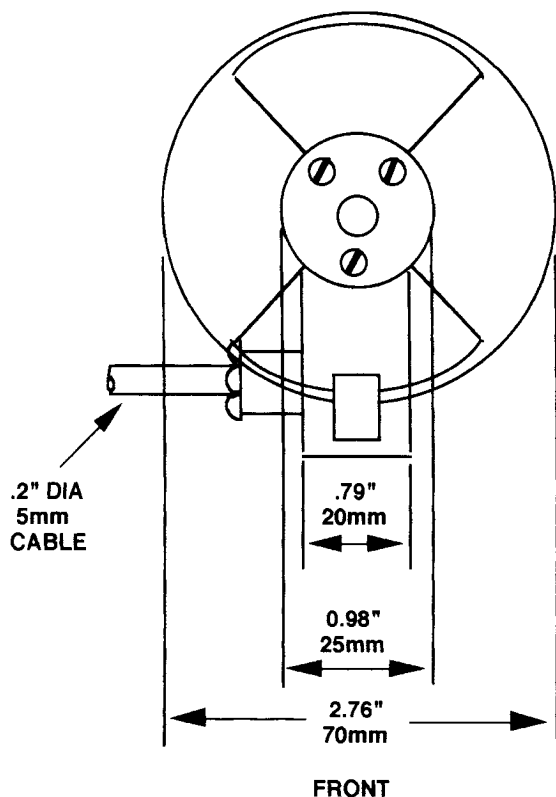
0.125"/3.18mm

BLADE JITTER

$\pm 0.2^\circ$ maximum

$\pm 1^\circ$ maximum

$\pm 3^\circ$ maximum



For more information contact