Oriel® Phase Locked Optical Chopper System

- Ideal for spectroscopy applications
- Stable and reliable phase locking
- Frequencies from 4 Hz to 2.00 kHz
- Chopping is phase-locked to an internal frequency synthesizer
- Lock to external references for harmonic or sub-harmonic chopping
- Enclosed chopper head for enhanced safety and performance
- Flange or rod mounting options for chopper head

The Oriel Model 75160NF Optical Chopper System introduces a periodic interruption of the light path in an optical experiment, resulting in an amplitude modulation. This is useful for many small optical signal detection schemes. The chopping frequency is phase-locked to its own internal frequency synthesizer, providing rock-solid stability and flexibility. Easy-to-use cursor keys provide easy adjustment of operating parameters. The front panel display of the controller allows monitoring of the chopping frequency, as well as a number of other operating parameters.

The chopping rate may be set from 4 Hz to 2.00 kHz, using either the internal frequency synthesizer or an external source as the reference. Chopping mode options are selectable at the fundamental, a harmonic (2 to 15), or even a sub-harmonic (1/2 to 1/15) of the reference.

ENCLOSED CHOPPER HEAD

The controller drives the chopper head containing a multi-aperture wheel to modulate the light. The chopper head includes standard Oriel 1.5-inch series flanges, which couple to a wide variety of Oriel instruments and accessories. Chopper wheels are easily interchangeable. The enclosed chopper head design prevents detector saturation from unchopped background light and prevents scattering. The enclosure of the wheel also reduces noise and enhances safety.

Oriel Phase Locked Optical Chopper System

WHATS INCLUDED

The 75160NF chopper comes complete with four wheels, a chopper head and a USB 2.0 interface. To mount the chopper controller in a standard 19" rack, order the Model 3510 rack-mount kit. The kit includes hardware for mounting one controller in a rack or two controllers side-by-side in a rack.

CHOPPER WHEELS

Model	Description	Minimum Frequency	Maximum Frequency	Jitter @ Min Freq*	Jitter @ Max Freq*	Maximum Beam Diameter
75162	Oriel Chopper Wheel, 2 Apertures	4 Hz	140 Hz	1900 µs	2.5 µs	1.26 in [32.0 mm]
75163	Oriel Chopper Wheel, 5 Apertures	25 Hz	350 Hz	560 µs	1.28 µs	1.06 in [27.0 mm]
75166	Oriel Chopper Wheel, 12 Apertures	60 Hz	800 Hz	540 µs	1.0 µs	0.43 in [11 mm]
75164	Oriel Chopper Wheel, 30 Apertures	150 Hz	2.0 kHz	150 µs	0.68 µs	0.18 in [4.5 mm]

* Jitter measured peak-to-peak (typical) with Sync set to Internal and Mode set to Normal.

SPECIFICATIONS

INTERNAL SYNTHESIZER

Paramter	Specification
Stability	100 ppm after one hour warm-up
Drift	Less than 10 ppm/°C
Accuracy	< 1/5 of least significant digit
Resolution	3 significant digits
Range limits (EXT)	4 Hz to 2.00 kHz

REFERENCE INPUT

Paramter	Specification
Input Type	Sync InTTL-level pulse
Frequency Limit	Same as internal oscillator
Pulse width	≥ 1 µs

HARMONIC LOCKING

Paramter	Specification
Harmonic (H)	1 to 15
Subharmonic (S)	1 to 15

Note: H and S may be set in any combination.

PHASE SHIFTER

Paramter	Specification
Range	-180.0° to +179.0°
Resolution	0.1°, increasing to 0.25° at 2.0 kHz

REFERENCE OUTPUT

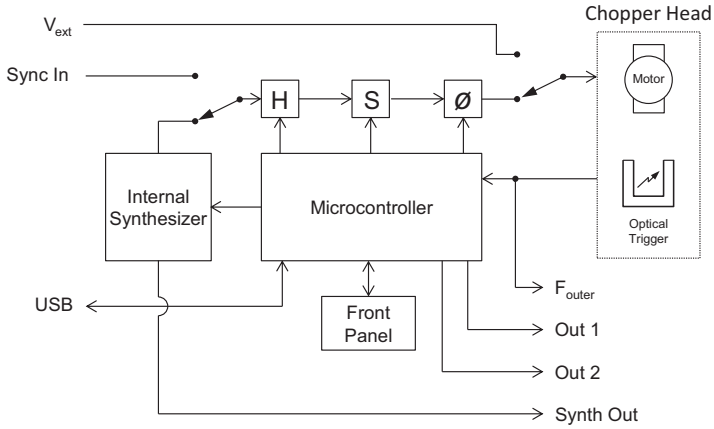
Paramter	Specification
Sync Out	TTL level square wave May be used as free-running oscillator when using EXT+, EXT- or Vext Sync setting
F_{outer}	TTL-level square wave at the chopping frequency
OUT 1	TTL level pulse: $5*F_{outer}$ in NORMAL mode $(H/S)*F_{outer}$ in H/S mode
OUT 2	TTL level pulse: [H/(7*S)]*Fsync in H/S mode

EXTERNAL VOLTAGE CONTROL

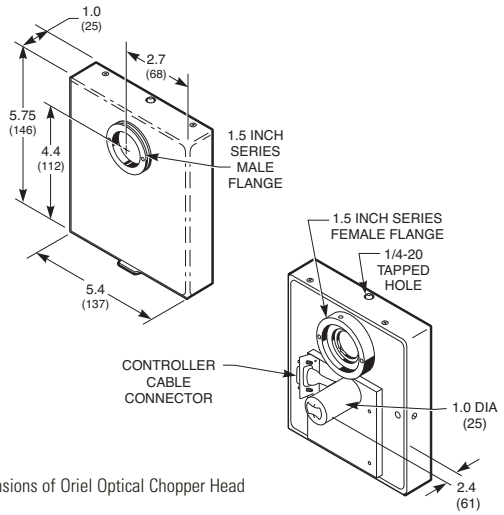
Paramter	Specification
Voltage	0 to 10.0 VDC
Control Range	0 to 100% of maximum chopping frequency

GENERAL

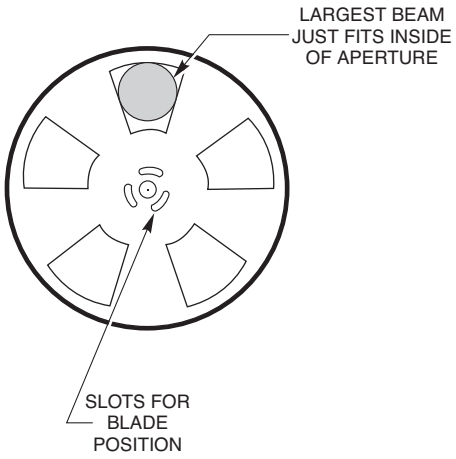
Paramter	Specification
Net Weight	2.59 kg [5.7 lbs], including chopper head
Electrical Ratings	100 to 240 VAC, 50 to 60 Hz 25 Watts
Operating Environment	10°C to 40°C [50°F to 104°F] ≤ 90% humidity, non-condensing
Storage Environment	0°C to 50°C [32°F to 122°F] ≤ 90% humidity, non-condensing
Altitude	< 3000 meters [10000 feet]
Pollution Degree	2



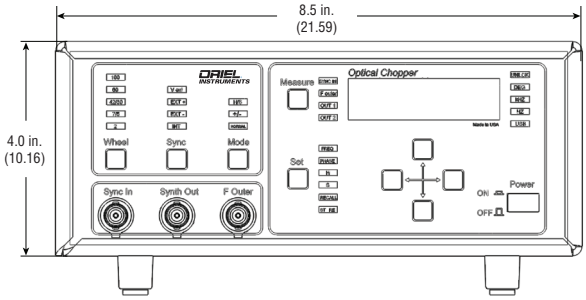
Functional block diagram for Model 75160NF Optical Chopper System



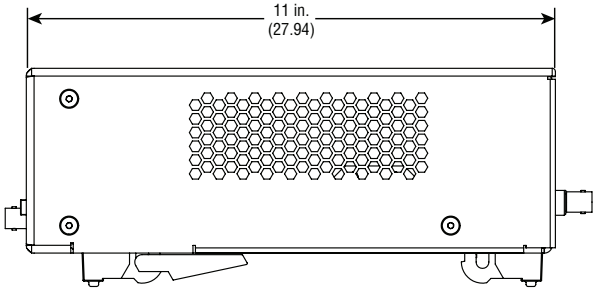
Dimensions of Oriel Optical Chopper Head



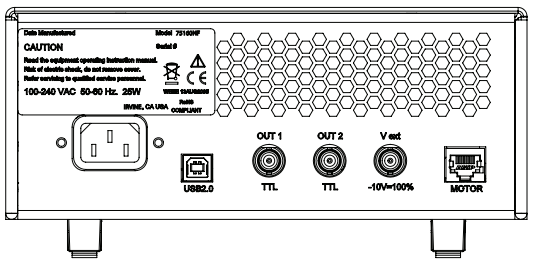
Maximum beam diameter is dependent on wheel aperture size.



Front View



Side View



Rear View

Oriel Phase Locked Optical Chopper System

Ordering Information

Model	Description
Optical Chopper System	
75160NF	New Oriel Phase Locked Optical Chopper System, Includes 4 Wheels
Accessories	
3510	Rack Mount Kit, 3502 Optical Chopper
Replacement Wheels[1]	
75162	Oriel Chopper Wheel, 2 Apertures
75163	Oriel Chopper Wheel, 5 Apertures
75164	Oriel Chopper Wheel, 30 Apertures
75166	Oriel Chopper Wheel, 12 Apertures
Replacement Cable	
CBL-75160NF	Cable, Oriel Chopper Head to Chopper Controller

[1]If a wheel is bent during handling or storage, it may affect performance.
Order a replacement if the original wheel becomes damaged or lost.

Newport Experience | Solutions

Newport Corporation, Global Headquarters
1791 Deere Avenue, Irvine, CA 92606, USA
www.newport.com
PHONE: 1-800-222-6440 1-949-863-3144 FAX: 1-949-253-1680 EMAIL: sales@newport.com
Complete listings for all global office locations are available online at www.newport.com/contact

	PHONE	EMAIL		PHONE	EMAIL
Belgium	+32-(0)0800-11 257	belgium@newport.com	Irvine, CA, USA	+1-800-222-6440	sales@newport.com
China	+86-10-6267-0065	china@newport.com	Netherlands	+31-(0)30 6592111	netherlands@newport.com
France	+33-(0)1-60-91-68-68	france@newport.com	United Kingdom	+44-1235-432-710	uk@newport.com
Japan	+81-3-3794-5511	spectra-physics@splasers.co.jp	Germany / Austria / Switzerland	+49-(0)6151-708-0	germany@newport.com
Taiwan	+886 -(0)2-2508-4977	sales@newport.com.tw			

Newport Corporation, Irvine and Santa Clara, California and Franklin, Massachusetts; Evry and Beaune-La-Rolande, France; Stahnsdorf, Germany and Wuxi, China have all been certified compliant with ISO 9001 by the British Standards Institution.

DS-101402 (11/14)