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Thermal Heads for Power and Single-Shot Energy - µW to KW, µJ to 300J



- The highest damage threshold in the industry
- Models for 1500W, 5000W and 10KW for high power laser measurement
- LP coating that can withstand up to 6KW/cm^2 (at maximum rated head power)
- Energy damage threshold up to 250J/cm^2
- EMI rejection
- Single pulse energy measurement up to 600 joules
- Sensitive meters to measure power down to 40µW and energy down to 7µJ
- Heads with integral Quasar wireless interface now avialable

Thermal Heads - Low Powers to 50W

3A

CW & Pulsed Measurements 60µW - 3W 15µJ - 2J

Recommended Use: Very low power and energy lasers

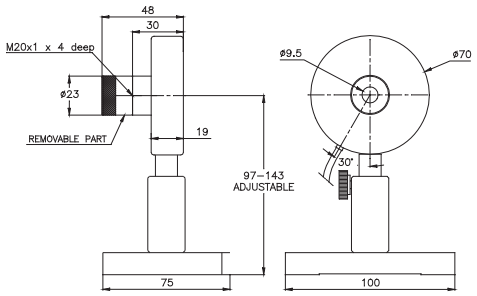
Special Features: Very sensitive, low noise, fast response

Absorber:	Broadband: 0.19 - 20µm
Aperture:	∅9.5 mm
Digital Power Scales:	3W / 300mW / 30mW / 3mW / 300µW
Maximum Average Power Density:	200W/cm²
Power Noise Level:	2µW
Thermal Drift (30 min):	5 - 20µW [a]
Power Accuracy:	± 3% [b]
Maximum Energy Density J/cm²:	0.3 for <100ns pulses
Response Time with Display (0 – 95%):	1.8 s
Linearity with Power:	±1.5%
Linearity with Energy:	± 2% ± 2µJ
Energy Scales:	2J / 200mJ / 20mJ / 2mJ / 200µJ
Energy Threshold:	20µJ
Cooling:	Convection

Notes:
a. Depending on typical room airflow and temperature variations
b. This head has a software linearity correction which is not supported in AN/2 display. The error can reach as much as 10% at full power with the AN/2 display.



3A



3A-FS

CW & Pulsed Measurements 60µW - 3W 15µJ - 2J

Recommended Use: Very low power and energy lasers

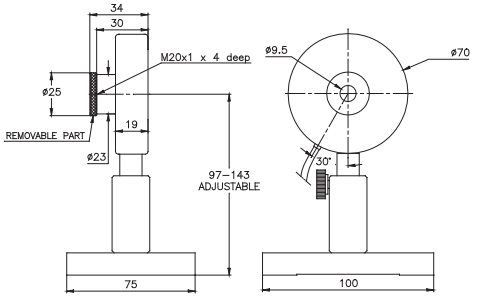
Special Features: Very sensitive, low noise, fast response

Absorber:	Broadband: 0.19 - 20µm [a]
Aperture:	∅9.5 mm
Digital Power Scales:	3W / 300mW / 30mW / 3mW / 300µW
Maximum Average Power Density:	200W/cm²
Maximum Energy Density J/cm²:	0.3 for <100ns pulses
Power Noise Level:	2µW
Thermal Drift (30 min):	2 - 10µW [b]
Power Accuracy	± 3% [c]
Response Time with Display (0 – 95%):	1.8 s
Linearity with Power:	±1.5% [c]
Linearity with Energy:	± 2% ± 2µJ
Energy Scales:	2J / 200mJ / 20mJ / 2mJ / 200µJ
Energy Threshold:	15µJ
Cooling:	Convection

Notes:
a. For measurement beyond 2.5µm and up to 20µm, window should be removed. Noise and drift will be higher
b. Depending on typical room airflow and temperature variations
c. This head has software linearity correction which is not supported in AN/2 displays. The error can reach as much as 10% at full power with the AN/2 display.



3A-FS



Ordering Information		
Item	**Description**	**Ophir P/N**
3A	3 Watt Power/Energy Meter for low power lasers	7Z02621
3A-FS	3 Watt Power/Energy Meter for low power lasers with removable fused silica window	7Z02628

3A-P

CW & Pulsed Measurements 60µW - 3W 20µJ - 2J

Recommended Use: Very low power and energy pulsed laser
Special Features: Very sensitive, low noise, spectrally flat

Absorber:	P type: 0.15 - 6µm	
Aperture:	∅12 mm	
Digital Power Scales:	3W / 300mW / 30mW / 3mW / 300µW	
Maximum Average Power Density:	50W/cm²	
Power Noise Level:	4µW	
Thermal Drift (30 min):	5 - 30µW [a]	
Power Accuracy:	± 3% [c]	
Maximum Energy Density J/cm² [b]:	Single shot	10 - 30Hz
	10	1
Response Time with Display (0 – 95%):	2.5 s	
Linearity with Power:	± 1.5% [c]	
Linearity with Energy:	± 2% ± 4µJ	
Energy Scales:	2J / 200mJ / 20mJ / 2mJ / 200µJ	
Energy Threshold:	20µJ	
Cooling:	Convection	

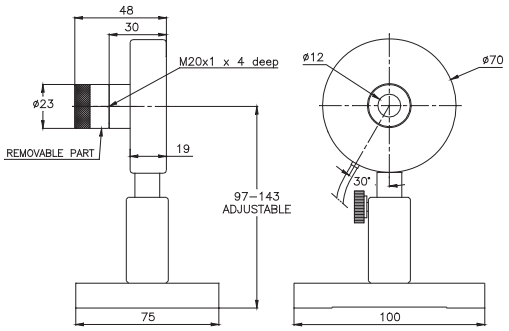
Notes:
a. Depending on typical room airflow and temperature variations
b. For shorter wavelengths derate to values shown:

Wavelengths	Derate to value
355nm	40%
266nm	10%
193nm	10%

c. This head has software linearity correction which is not supported in AN/2 displays. The error can reach as much as 10% at full power with the AN/2 display.



3A-P



10A

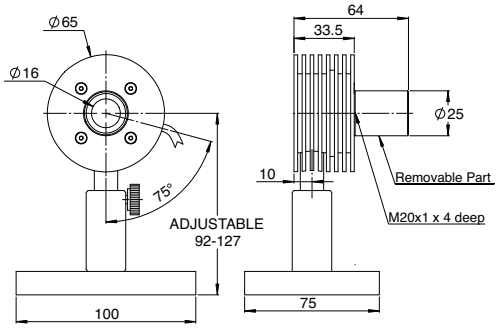
CW & Pulsed Measurements 20mW - 10W 6mJ - 2J

Recommended Use: General, powers to 10W
Special Features: Compact, fast response

Absorber:	Broadband: 0.19-20µm
Aperture:	∅16mm
Digital Power Scales:	10W / 5W / 0.5W
Maximum Average Power Density:	30KW/cm²
Power Noise Level:	1mW
Power Accuracy:	±3%
Response Time with Display (0-95%):	0.8s
Linearity with Power:	± 1%
Energy Scales:	2J / 200mJ
Energy Threshold:	6mJ
Cooling:	Convection



10A



Ordering Information		
Item	**Description**	**Ophir P/N**
3A-P-V1	3 Watt Power/Energy Meter for low energy pulsed lasers	7Z02622
10A-V1.1	10 Watt power/energy meter for low power lasers	7Z02637

10A-P

CW & Pulsed Measurements 40mW –10W 10mJ - 10J

Recommended Use: General, single pulsed Q-switched laser,
low average power pulsed laser

Special Features: Broad spectral range

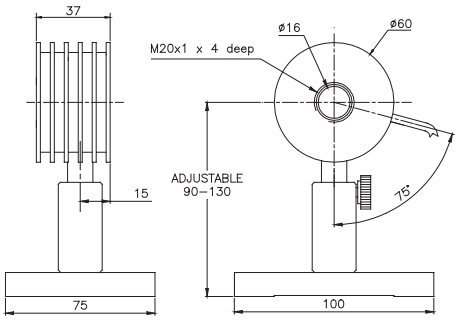
Absorber:	P type: 0.15 - 6µm	
Aperture:	∅16mm	
Digital Power Scales:	10W / 2W / 200mW and dBm	
Maximum Average Power Density:	50W/cm²	
Power Noise Level:	2mW	
Power Accuracy:	± 3%	
Maximum Energy Density J/cm² [a] :	Single shot	10 - 30Hz
	10	1
Response Time with Display (0 – 95%):	3.5s	
Linearity with Power:	± 1.5%	
Energy Scales:	10J / 2J / 200mJ	
Energy Threshold:	10mJ	
Cooling:	Convection	

Notes: a. For shorter wavelengths derate to values shown:

Wavelength	Derate to value:
355nm	40%
266nm	10%
193nm	10%



10-A-P-SH



12A / 12A-P

CW & Pulsed Measurements 2mW - 12W 1mJ - 30J

Recommended Use: Very low to low power and energy lasers

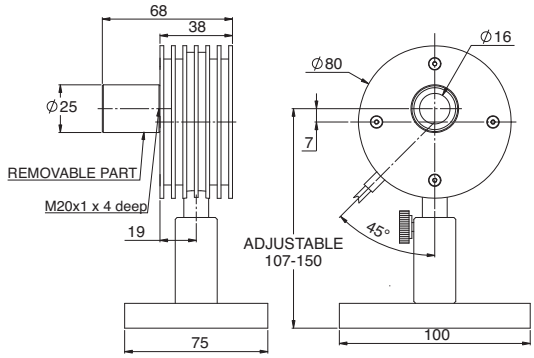
Special Features: Wide dynamic range, P type for short pulses

Absorber:	Broadband: 0.19-20µm , P type: 0.15 - 6µm			
Aperture:	∅16mm			
Digital Power Scales:	12W / 2W / 200mW / 20mW			
Maximum Average Power Density:	Broadband: 25KW/cm², P type: 50W/cm²			
Power Noise Level:	50µW			
Thermal Drift (30min.):	40 - 150µW [a]			
Power Accuracy:	±3%			
Maximum Energy Density J/cm²:	single shot		10 - 30Hz	
Head Type:	BB	P	BB	P
<100ns	0.3	10	0.3	1
0.5ms	5	10	5	1
2ms	10	10	10	1
10ms	30	10	30	1
Response Time with Display (0-95%):	BB: 2.5s, P: 3.5s			
Linearity with Power:	± 1.5% [c]			
Energy Scales:	30J / 3J / 300mJ / 30mJ [b]			
Energy Threshold:	1mJ			
Linearity with Energy:	±1.5% ±50µJ			
Cooling:	Convection			

Notes:
a. Depending on typical room airflow and temperature variations
b. For the 30mJ energy scale measurements it is recommended to use the screw on barrel supplied with the head to protect from direct air flow.
c. This head has a software linearity correction which is not supported in AN/2 displays. The error can reach as much as 10% at full power with the AN/2 display.



12A-P



Ordering Information		
Item	**Description**	**Ophir P/N**
10A-P-V3	10 Watt Power/Energy Meter for average power pulsed lasers	7Z02649
12A-V1	12 Watt power/energy meter for low power lasers	7Z02638
12A-P	12 Watt power/energy meter for pulsed lasers	7Z02624
Fiber adapters	See page 54 for fiber adapter ordering information	

30A / 30A-P

CW & Pulsed Measurements 20mW - 30W 6mJ - 30J

Recommended Use: General, powers to 30W

Special Features: 30A: Fast response, wide dynamic range
30A-P: Flat spectral response for pulsed lasers

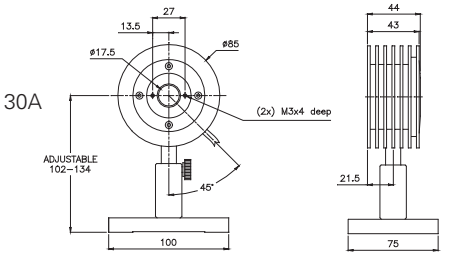
Absorber:	Broadband: 0.19 - 20µm , P type: 0.15 - 6µm			
Aperture:	∅17mm			
Digital Power Scales:	30W / 3W			
Maximum Average Power Density:	Broadband: 25KW/cm², P type: 50W/cm²			
Power Noise Level:	BB: 1mW, P: 3mW			
Power Accuracy:	±3%			
Maximum Energy Density J/cm²:	single shot		10 - 30Hz	
Head Type:	BB	P [a]	BB	P [a]
<100ns	0.3	10	0.3	1
0.5ms	2	10	2	1
2ms	2	10	2	1
10ms	2	10	2	1
Response Time with Display (0-95%):	BB: 0.8s, P: 2.5s			
Linearity with Power:	30A: ±1%, 30A-P: ±1.5%			
Energy Scales:	30J / 3J			
Energy Threshold:	BB: 6mJ, P: 30mJ			
Linearity with Energy:	±1.5% ±50µJ			
Cooling:	Convection			

Note: a: For shorter wavelengths derate to values shown:

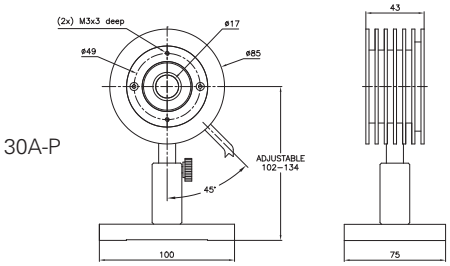
Wavelengths	Derate to value
355nm	40%
266nm	10%
193nm	10%



30A



30A



30A-P

30A-P-DIF

CW & Pulsed Measurements 50mW - 30W 30mJ - 30J

Recommended Use: Concentrated beam Q switched lasers

Special Features: Diffuser to spread out concentrated beams

Absorber:	P type: 0.15 - 6µm [a]	
Aperture:	∅17mm	
Digital Power Scales:	30W / 3W	
Maximum Average Power Density:	500W/cm²	
Power Noise Level:	3mW	
Power Accuracy:	±5%	
Maximum Energy Density J/cm² for <100ns pulses and 10 – 50Hz:	Diffuser IN	Diffuser OUT
1064nm	3	1
532nm,	2	1
355nm	1	0.4
Response Time with Display (0-95%):	2.5s typ	
Linearity with Power:	± 1.5%	
Energy Scales:	30J / 3J	
Energy Threshold:	30mJ	
Cooling:	Convection	

Note: a: With diffuser in, head is only calibrated for 1064nm, 532nm and 355nm wavelengths.

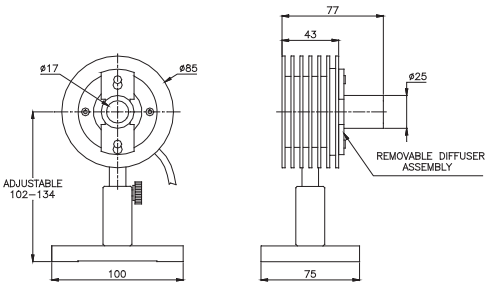


Diffuser IN



Diffuser OUT

30A-P-DIF



Ordering Information		
Item	**Description**	**Ophir P/N**
30A-V1	30 Watt power/energy meter	7Z02604
30A-P-V1	30 Watt power/energy meter for pulsed lasers	7Z02613
30A-P-DIF-V1	30W power/energy meter for pulsed lasers with diffuser for concentrated beams up to 500W/cm²	7Z02616
Quasar: Some of the above heads are available with integral Quasar Bluetooth module for wireless transmission direct to PC. See page 97 for more details.		

30A-N

CW & Pulsed Measurements 60mW - 30W 30mJ - 200J

Recommended Use: Concentrated beam YAG lasers

Special Features: High damage threshold for high power density

Absorber:	N type: 1064nm, 532nm
Aperture:	∅17.5mm
Digital Power Scales:	30W / 3W
Maximum Average Power Density:	5KW/cm²
Power Noise Level:	3mW
Power Accuracy:	±3%
Maximum Energy Density J/cm²:	
1µs	1
0.5ms	20
>5ms	>100
Response Time with Display (0-95%):	2s typ
Linearity with Power:	± 1%
Energy Scales:	200J / 30J / 3J
Energy Threshold:	30mJ
Cooling:	Convection



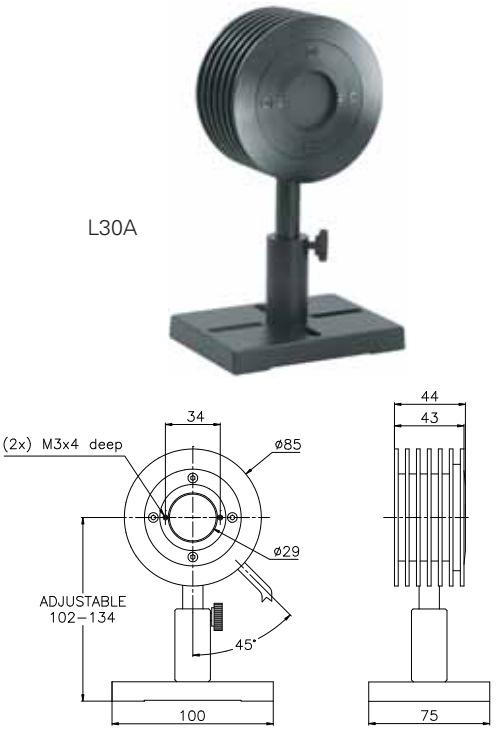
L30A

CW & Pulsed Measurements 80mW -30W 20mJ - 30J

Recommended Use: Divergent beams, medium apertures

Special Features: 29mm aperture, 30 Watts

Absorber:	Broadband: 0.19-20µm
Aperture:	∅29mm
Digital Power Scales:	30W / 3W
Maximum Average Power Density:	25KW/cm²
Power Noise Level:	4mW
Power Accuracy:	±3%
Maximum Energy Density J/cm²:	
<100ns	0.3
0.5ms	5
2ms	10
10ms	30
Response Time with Display (0-95%):	1.5s
Linearity with Power:	± 1% to 15W, ±1.5% to 25W
Energy Scales:	30J / 3J / 300mJ
Energy Threshold:	20mJ
Cooling:	Convection



Ordering Information		
Item	**Description**	**Ophir P/N**
30A-N	30W power/energy meter for concentrated or high energy YAG beams	7Z02003
L30A-V1	Medium aperture 30 Watt power/energy meter	7Z02603
Quasar: Some of the above heads are available with integral Quasar Bluetooth module for wireless transmission direct to PC. See page 97 for more details.		

L30A-EX

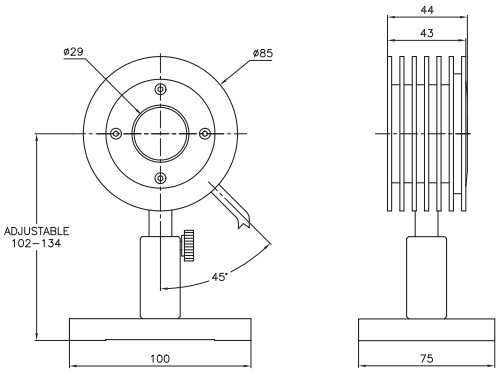
CW & Pulsed Measurements 80mW - 30W 20mJ - 30J

Recommended Use: Medium aperture excimer lasers, Cu vapor lasers, TEA Lasers
Special Features: Sensitive, spectrally flat in th UV, compact

Absorber:	EX absorber: 0.15 – 0.4µm, 10.6µm
Aperture:	∅29mm
Digital Power Scales:	30W / 5W
Maximum Average Power Density:	2KW/cm²
Power Noise Level:	4mW
Power Accuracy:	±3%
Maximum Energy Density J/cm²:	
<100ns	0.5
1µs	0.6
0.5ms	6
2ms	12
Response Time with Display (0-95%):	1.5s
Linearity with Power:	± 1% to 15W, ±1.5% to 25W
Energy Scales:	30J / 3J / 300mJ
Energy Threshold:	20mJ
Cooling:	Convection



L30A-EX



L30A-10MM

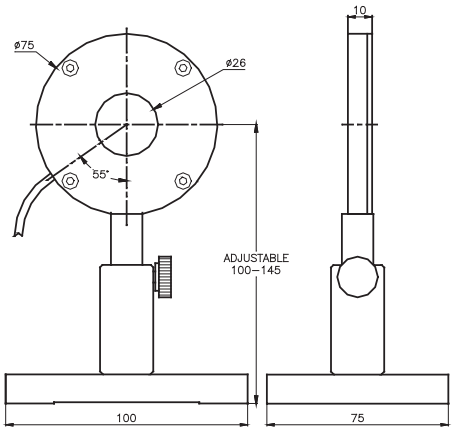
CW & Pulsed Measurements 80mW - 30W 20mJ - 60J

Recommended Use: Tight spaces, photolithography exposure
Special Features: Low profile – 10mm thick, 26mm aperture

Absorber:	Broadband: 0.15-20µm
Aperture:	∅26mm
Digital Power Scales:	30W / 3W
Maximum Power:	8W free standing, 30W heat sinked
Maximum Average Power Density:	25KW/cm²
Power Noise Level:	4mW
Power Accuracy:	±3%
Maximum Energy Density J/cm²:	
<100ns	0.3
0.5ms	5
2ms	10
10ms	30
Response Time with Display (0-95%):	1.5s
Linearity with Power:	± 1%
Energy Scales:	60J / 20J / 2J / 200mJ
Energy Threshold:	20mJ
Repeatability of Energy:	0.5%
Max Width of Pulse Train:	4s for measuring accumulated energy
Cooling:	Convection, conduction



L30A-10MM



Ordering Information		
Item	**Description**	**Ophir P/N**
L30A-EX	Medium aperture 30 Watt excimer power/energy meter	7Z02194
L30A-10MM	Medium aperture 10mm thick 30 Watt power/energy meter	7Z02273

L50A

CW & Pulsed Measurements 80mW - 50W 20mJ - 100J

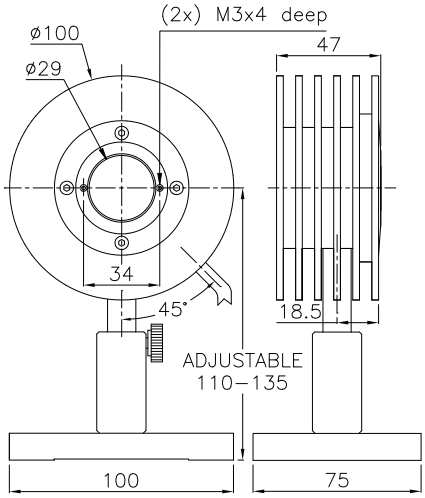
Recommended Use: General purpose to 50W

Special Features: Medium aperture, convection cooled

Absorber:	Broadband: 0.19 - 20µm
Aperture:	∅29mm
Digital Power Scales:	50W / 5W
Maximum Average Power Density:	20KW / cm^2
Power Noise Level:	4mW
Power Accuracy:	±3%
Maximum Energy Density J/cm^2:	
<100ns	0.3
0.5ms	5
2ms	10
10ms	30
Response Time with Display (0-95%):	1.5s typ
Linearity with Power:	± 1.5%
Energy Scales:	100J / 30J / 3J / 300mJ
Energy Threshold:	20mJ
Cooling:	Convection



L50A



Ordering Information		
Item	**Description**	**Ophir P/N**
L50A	50 Watt power meter for general use	7Z02606
Quasar: Some of the above heads are available with integral Quasar Bluetooth module for wireless transmission direct to PC. See page 97 for more details.		

Thermal Heads - Medium Powers to 300W

30(150)A/30(150)A-LP1

CW & Pulsed Measurements 50mW - 150W 20mJ - 300J

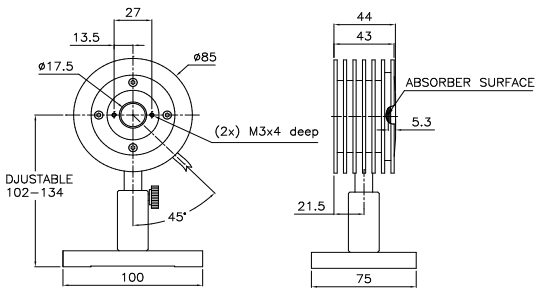
Recommended Use: Short term measurement to 150W
Broadband absorber: general use
LP1 absorber: high energy, long pulses
Special Features: Compact, convection cooled

Absorber:	Broadband: 0.19 - 20µm, LP1: 0.25-2.2µm	
Aperture:	∅17.5mm	
Digital Power Scales:	150W / 30W for BB, 150W/30W/3W for LPI	
Maximum Power:	150W for 50s, 100W for 90s 30W continuous	
Maximum Average Power Density:	BB: 20KW/cm², LP1: 35KW/cm²	
Power Noise Level:	3mW	
Power Accuracy:	±3%[a]	
Maximum Energy Density J/cm[c]:	Broadband	LP1
<100ns	0.3	0.05
1µs	0.5	0.3
0.5ms	5	20
2ms	10	50
10ms	30	250
Response Time with Display (0-95%):	1.2s	
Linearity with Power:	± 1%	
Energy Scales:	LP1: 300J/30J/3J BB: 100J/30J/3J	
Energy Threshold:	20mJ	
Cooling:	Convection	

Note a: LP1 heads have relatively large spectral variation in absorption and have a calibrated spectral curve at all wavelengths in their spectral range. When used with the Nova II (software v 1.59 and above) or USBI (V 1.17 or above) supporting this feature, accuracy is ±3% for any wavelength from 250 to 2200nm. When used with displays not supporting this feature, accuracy will be ±3% for wavelengths 532nm, 755nm, 1064nm and 2100nm and ±6% for other wavelengths in the spectral range 400 – 1100nm.



30(150)A



30(150)A-HE/HE1

CW & Pulsed Measurements 50mW - 150W 50mJ - 200J

Recommended Use: High energy and average power pulsed lasers
HE: YAG and harmonics, Holmium, Erbium
HE1: Ruby
Special Features: High damage threshold for short pulses, high average power

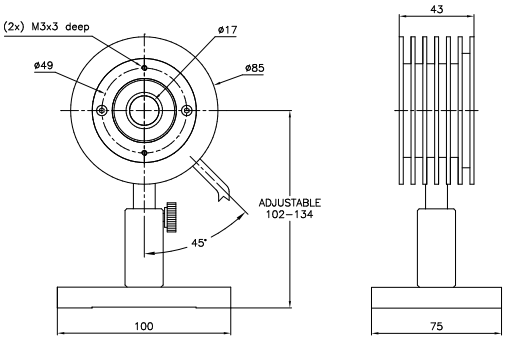
Absorber:	HE: 0.19 - 0.625µm, 1.064µm, 2.1µm, 2.94µm HE1: 0.19 - 0.76µm, 2.9µm	
Aperture:	∅17mm	
Digital Power Scales:	150W / 30W / 3W	
Maximum Power:	150W for 50s, 100W for 90s 30W continuous	
Maximum Average Power Density:	500W/cm²	
Power Noise Level:	3mW	
Power Accuracy:	±3%[a]	
Maximum Energy Density J/cm²[a]:	Single shot	10-50Hz
<100ns	5	2
0.5ms	100	25
2ms	150	40
Response Time with Display (0-95%):	3.8s typ	
Linearity with Power:	±1.5%	
Energy Scales:	200J / 30J / 3J	
Energy Threshold:	50mJ	
Cooling:	Convection	

Note a: For shorter wavelengths, derate to values shown:

Wavelength	Derate to value
355nm	50%
266nm	50%
193nm	10%



30(150)A-HE/HE1



Ordering Information		
Item	**Description**	**Ophir P/N**
30(150)A-V1	Power/energy meter 30W continuous, 150W intermittent	7Z02608
30(150)A-LP1-V1	As above with high damage threshold LP1 coating	7Z02657S
30(150)A-HE	30 / 150 Watt power/energy meter for wavelengths 0.19-2.94µm. Energy calibrated for 0.19-0.6µm and 2.9µm	7Z02380
30(150)A-HE1	30 / 150 Watt power/energy meter for wavelengths 0.19-0.76µm. Energy calibrated for 0.694µm (Ruby)	7Z02382
Quasar: Some of the above heads are available with integral Quasar Bluetooth module for wireless transmission direct to PC. See page 97 for more details.		

30(150)A-HE-DIF

CW & Pulsed Measurements 50mW - 150W 50mJ - 30J

Recommended Use: Highly concentrated beam Q switched lasers
Special Features: Diffuser to spread out concentrated beam

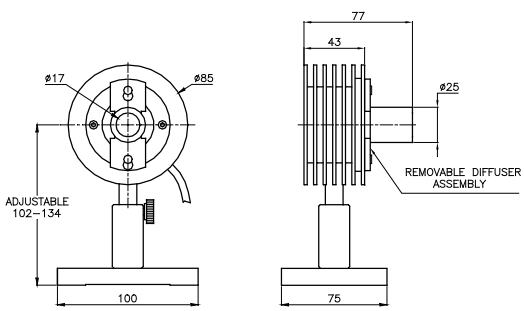
Absorber:	HE: 0.19 - 3µm except for 625 – 900nm [a]	
Aperture:	∅17mm	
Digital Power Scales:	150W / 30W / 3W	
Maximum Power:	150W for 50s, 100W for 90s 30W continuous	
Maximum Average Power Density:	500W/cm²	
Power Noise Level:	3mW	
Power Accuracy:	±5%	
Maximum Energy Density J/cm² for <100ns pulses and 10 - 50Hz:	Diffuser IN	Diffuser OUT
1064nm	5	2
532nm	4	2
355nm	1.5	1
Response Time with Display (0-95%):	3.8s typ	
Linearity with Power:	± 1.5%	
Energy Scales:	30J / 3J	
Energy Threshold:	50mJ	
Cooling:	Convection	

Note: a: With diffuser in, head is only calibrated for 1064nm, 532nm and 355nm wavelengths.



Diffuser IN Diffuser OUT

30(150)A-HE-DIF



30(150)A-SV

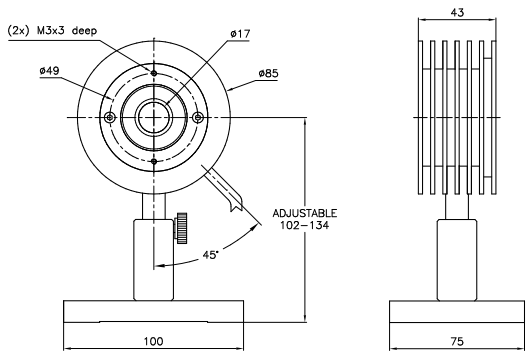
CW & Pulsed Measurements 50mW - 150W 50mJ - 300J

Recommended Use: Both high power density and energy density
Special Features: Extremely high damage threshold for average power and single pulses

Absorber:	SV type: 0.19 – 12µm
Aperture:	∅17mm
Digital Power Scales:	150W / 30W / 3W
Maximum Average Power:	30 Watts continuous, 150 Watts intermittent
Maximum Average Power Density:	>60KW/cm²
Power Noise Level:	3mW
Power Accuracy:	± 3%
Maximum Energy Density J/cm² :	
<100ns	>1J/cm²
0.5ms	20J/cm²
2ms	>50J/cm²
Response Time with Display (0-95%):	1.5s typ.
Linearity with Power:	± 1%
Energy Scales:	300J / 30J / 3J
Energy Threshold:	50mJ
Cooling:	Convection



30(150)A-SV



Ordering Information		
Item	**Description**	**Ophir P/N**
30(150)A-HE-DIF	30(150)A-HE with diffuser for concentrated beams up to 500W/cm²	7Z02354
30(150)A-SV	30/150W power/energy meter with extremely high damage threshold	7Z02625
Quasar: Some of the above heads are available with integral Quasar Bluetooth module for wireless transmission direct to PC. See page 97 for more details.		

L30(150)A-LP1

CW & Pulsed Measurements 80mW - 150W 80mJ - 300J

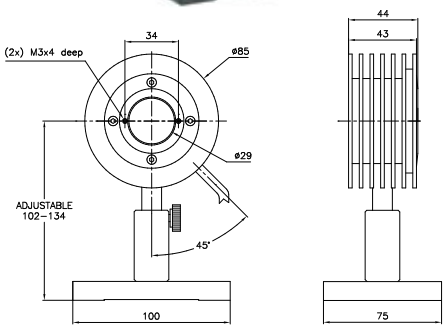
Recommended Use: Long pulse lasers, Erbium lasers
Special Features: High damage threshold for long pulses and CW

Absorber:	LP1: 0.25 – 2.2µm and 2.94µm
Aperture:	∅29mm
Digital Power Scales:	150W / 30W / 3W
Maximum Average Power:	150W for 80s, 100W for 2min, 30W continuous
Maximum Average Power Density:	35KW/cm² at 150W, >100KW/cm² at 50W
Power Noise Level:	4mW
Power Accuracy:	±3% [a]
Maximum Energy Density J/cm²:	
<100ns	0.05
0.5ms	20
2ms	50
10ms	250
Response Time with Display (0-95%):	1.5s
Linearity with Power:	± 1%
Energy Scales:	300J / 30J / 3J
Energy Threshold:	25mJ
Cooling:	Convection

Note a: LP1 heads have relatively large spectral variation in absorption and have a calibrated spectral curve at all wavelengths in their spectral range. When used with the Nova II (software v 1.59 and above) or USBI (V 1.17 or above) supporting this feature , accuracy is ±3% for any wavelength in the range. When used with other displays, accuracy will be ±3% for wavelengths 532nm, 755nm, 1064nm and 2940nm and ±6% for other wavelengths in the spectral range 400 – 1100nm



L30(150)A-LP1



L40(150)A / L40(150)A-LP1 / L40(150)A-EX

CW & Pulsed Measurements 200mW - 150W 80mJ - 300J

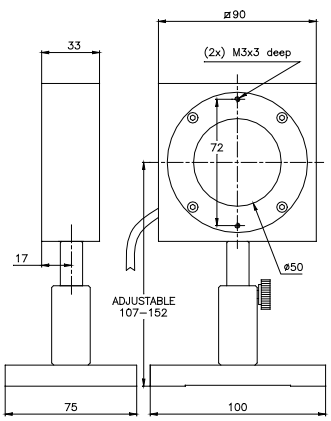
Recommended Use: Large beams, low profile, single shot energy
Broadband absorber: general use
LP1 absorber: high energy, long pulses
EX: excimer lasers
Special Features: Large aperture, slim profile

Absorber:	Broadband: 0.19-20µm LP1: 0.25 - 2.2µm EX: 0.15- 0.4µm, 10.6µm		
Surface Diffuse Reflectance:	5-15%		
Aperture:	∅50mm		
Digital Power Scales:	150W / 20W [a]		
Maximum Average Power:	150W for 65s, 80W for 2min, 35W continuous		
Maximum Average Power Density:	BB: 20KW/cm², LP1: 35KW/cm², EX: 2KW/cm²		
Maximum Energy Density J/cm²:	Broadband	LP1	EX
<100ns	0.3	0.05	0.5
1µs	0.5	0.3	0.6
0.5ms	5	20	6
2ms	10	50	12
10ms	30	250	NA
Power Noise Level:	15mW		
Power Accuracy:	± 3% [a]		
Response Time with Display (0-95%):	2.5s		
Linearity with Power:	± 1%		
Energy Scales:	LP1: 300J/30J/3J, BB and EX: 200J/30J/3J		
Energy Threshold:	80mJ		
Cooling:	Convection		

Note a: LP1 heads have relatively large spectral variation in absorption and have a calibrated spectral curve at all wavelengths in their spectral range. When used with the Nova II (software v 1.59 and above) or USBI (V 1.17 or above) supporting this feature, accuracy is ±3% for any wavelength in the range. When used with other displays, accuracy will be ±3% for wavelengths 532nm, 755nm, 1064nm and 2100nm and ±6% for other wavelengths in the spectral range 400 - 1100nm



L40(150)A



Ordering Information

Item	Description	Ophir P/N
L30(150)A-LP1-V1	30 / 150W Power meter for high energy pulses	7Z02654S
L40(150)A-V2	Large aperture power/energy meter 35W continuous, 150W intermittent	7Z02626
L40(150)A-LP1-V1	As above with high damage threshold LP1 coating	7Z02652S
L40(150)A-EX	As above for excimer lasers 0.15 – 0.4µm	7Z02614

L50(150)A

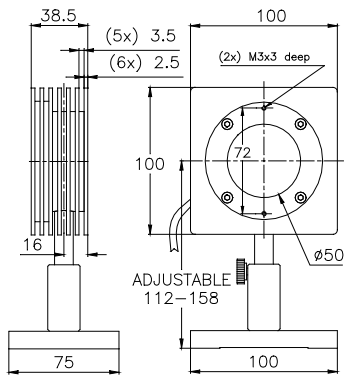
CW & Pulsed Measurements 200mW - 150W 80mJ - 300J

Recommended Use: Large aperture lasers

Special Features: Convection cooled, up to 50W CW, 150W intermittent

Absorber:	Broadband: 0.19-20µm
Aperture:	∅50mm
Digital Power Scales:	150W / 20W
Maximum Average Power:	150W for 1.5min, 100W for 2.5min, 50W continuous
Maximum Average Power Density:	20KW/cm²
Maximum Energy Density J/cm²:	
<100ns	0.3
0.5ms	5
2ms	10
10ms	30
Power Noise Level:	15mW
Power Accuracy:	±3%
Response Time with Display (0-95%):	2.5s
Linearity with Power:	± 1%
Energy Scales:	300J / 30J / 3J
Energy Threshold:	80mJ
Cooling:	Convection

L50(150)A



L50(300)A / L50(300)A-LP1

CW & Pulsed Measurements 500mW - 300W 120mJ - 300J

Recommended Use: BB: General use, very large beams

LP1: Very large beams, long pulse high energy lasers

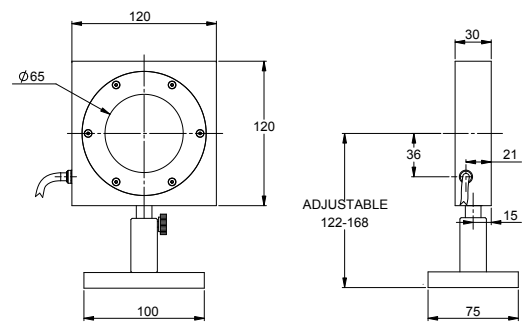
Special Features: ∅65mm aperture, high damage threshold for CW and pulses.

Absorber	Broadband: 0.19-20µm, LP1: 0.25 - 2.2µm	
Aperture:	∅65mm	
Digital Power Scales:	300W / 30W	
Maximum Average Power:	300W for 70s, 150W for 150s 50W continuous	
Maximum Average Power Density:	at 150W: BB: 15KW/cm², LP1: 20KW/cm²	
Maximum Energy Density J/cm²:	Broadband	LP1
<100ns	0.3	0.05
0.5ms	5	20
2ms	10	40
10ms	30	100
Power Noise Level:	20mW	
Power Accuracy	± 3% [a]	
Response Time with Display (0-95%):	3s	
Linearity with Power:	± 1%	
Energy Scales:	300J/60J/6J	
Energy Threshold:	80mJ	
Uniformity Over Surface	± 1.5%	
Cooling:	Convection	

Note a: LP1 heads have relatively large spectral variation in absorption and have a calibrated spectral curve at all wavelengths from 250 to 2200nm. When used with the Nova II (software v 1.59 and above) or USBI (V 1.17 or above) supporting this feature, accuracy is ±3% for any wavelength in the range. When used with other displays, accuracy will be ±3% for wavelengths 532nm, 755nm, 1064nm and 2100nm and ±6% for other wavelengths in the spectral range 400 – 1100nm.

L50(300)A





Ordering Information		
Item	**Description**	**Ophir P/N**
L50(150)A	Large aperture power/energy meter, 50W continuous, 150W intermittent	7Z02633
L50(300)A	Very large aperture power/energy meter, 50W continuous, 300W intermittent	7Z02658
L50(300)A-LP1-V1	As above with high damage threshold LP1 coating	7Z02641S

F100A-HE

CW & Pulsed Measurements 120mW - 100W 50mJ - 200J

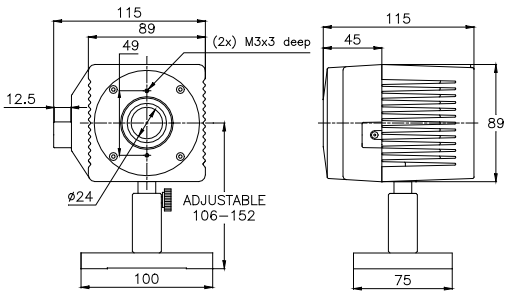
Recommended Use: High energy and average power pulsed lasers
HE: YAG + harmonics, Holmium, Erbium
Special Features: High damage threshold for short pulses, high average power


F100A-HE

Absorber:	HE type: 0.19 - 0.625µm, 1.064µm, 2.1µm, 2.9µm	
Aperture:	∅24mm	
Digital Power Scales:	100W / 30W / 3W	
Maximum Average Power Density:	500W/cm²	
Power Noise Level:	6mW	
Power Accuracy:	±3%	
Maximum Energy Density J/cm² [a]:	Single shot	10-50Hz
<100ns	5	2
0.5ms	100	15
2ms	150	40
Response Time with Display (0-95%):	3.8s typ	
Linearity with Power:	± 1%	
Energy Scales:	200J / 50J / 5J	
Energy Threshold:	50mJ	
Cooling:	Fan	

Note a: For shorter wavelengths, derate to values shown:

Wavelength	Derate to value
355nm	50%
266nm	50%
193nm	10%



See Ophir website for revised dimensions and P/N

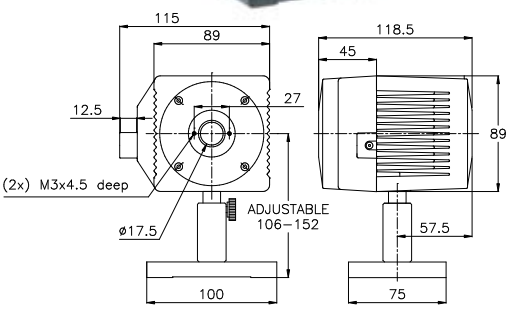
F150A

CW & Pulsed Measurements 60mW - 150W 20mJ - 100J

Recommended Use: General use to 150W
Special Features: Fan cooled


F150A

Absorber:	Broadband: 0.19-20µm
Aperture:	∅17.5mm
Digital Power Scales:	150W / 30W
Maximum Average Power Density:	15KW/cm²
Power Noise Level:	3mW
Power Accuracy:	± 3%
Maximum Energy Density J/cm²:	
<100ns	0.3
0.5ms	5
2ms	10
10ms	30
Response Time with Display (0-95%):	1.2s
Linearity with Power:	± 1%
Energy Scales:	100J/30J/3J
Energy Threshold:	20mJ
Cooling:	Fan



See Ophir website for revised dimensions and P/N

Ordering Information		
Item	**Description**	**Ophir P/N**
F100A-HE	100 Watt power/energy meter for wavelengths 0.19-.625 and 0.9-3µm. Energy calibrated for 0.19-0.6µm and 2.9µm. Fan cooled	7Z02430
F150A-V1	Fan cooled 150W power/energy meter	7Z02656
Quasar: Some of the above heads are available with integral Quasar Bluetooth module for wireless transmission direct to PC. See page 97 for more details.		

FL250A / FL250A-LP1 / FL250A-EX

CW & Pulsed Measurements 200mW - 250W 50mJ - 300J

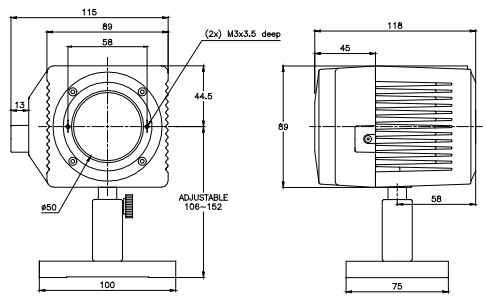
Recommended Use: Broadband: General use to 250W
LP1: High power and energy density – not for CO_2
EX: Excimer lasers
Special Features: Fan cooled, large aperture



FL250A

Absorber:	Broadband: 0.19 - 20µm LP1: 0.25 - 2.2µm EX: 0.15 - 0.4µm, 10.6µm		
Aperture:	∅50mm		
Digital Power Scales:	250W / 30W		
Maximum Average Power Density:	BB: 10KW/cm², LP1: 15KW/cm², EX: 2KW/cm²		
Power Noise Level:	10mW		
Power Accuracy:	± 3% [a]		
Maximum Energy Density J/cm²:	Broadband	LP1	EX
<100ns	0.3	0.05	0.5
1µs	0.5	0.3	0.6
0.5ms	5	20	6
2ms	10	50	12
10ms	30	250	
Response Time with Display (0-95%):	2.5s		
Linearity with Power:	± 1%		
Energy Scales:	BB and LP1: 300J/30J/3J, EX: 200J/30J/3J		
Energy Threshold:	50mJ		
Cooling:	Fan		

Note a: LP1 heads have relatively large spectral variation in absorption and have a calibrated spectral curve at all wavelengths in their spectral range. When used with Nova II (software v 1.59 and above) or USBI (V 1.17 or above) supporting this feature, accuracy is ±3% for any wavelength from 250 to 2200nm. When used with other displays, accuracy will be ±3% for wavelengths 532nm, 755nm, 1064nm and 2100nm and ±6% for other wavelengths in the spectral range 400 - 1100nm



See Ophir website for revised dimensions and P/N

FL250A-LP1-DIF

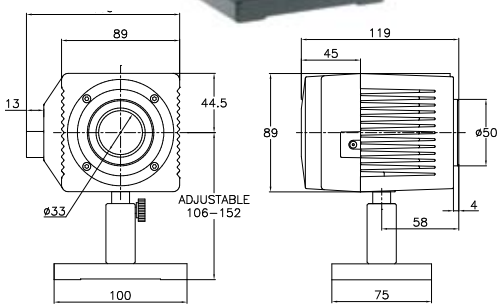
CW & Pulsed Measurements 200mW - 250W 200mJ - 600J

Recommended Use: Highest power and energy density thermal head
Special Features: Fan cooled, diffuser



FL250A-LP1-DIF

Absorber:	LP1 with diffuser 0.4-3µm
Aperture:	∅33mm
Digital Power Scales:	250W / 30W
Maximum Average Power Density:	2KW/cm²
Power Noise Level:	10mW
Power Accuracy:	± 3% [a] at callbrated wavelengths 755nm, 1064nm and 532nm
Maximum Energy Density J/cm²:	
<100ns	0.5
1µs	3
0.5ms	200
>2ms	>400
Response Time with Display (0-95%):	2.5s
Linearity with Power:	± 1%
Energy Scales:	600J/100J/10J
Energy Threshold:	200mJ
Cooling:	Fan



See Ophir website for revised dimensions and P/N

Ordering Information

Item	Description	Ophir P/N
FL250A-V1	Large aperture fan cooled 250 Watt power/energy meter	7Z02605
FL250A-LP1-V1	Same as above with high damage threshold LP1 coating - not for CO_2	7Z02653S
FL250A-EX	Same as above with EX coating for excimer lasers	7Z02391
FL250A-LP1-DIF	Fan cooled 250 Watt power/energy meter with diffuser	7Z02666
Quasar: Some of the above heads are available with integral Quasar Bluetooth module for wireless transmission direct to PC. See page 97 for more details.		

L250W

CW & Pulsed Measurements 4W - 250W 200mJ - 200J

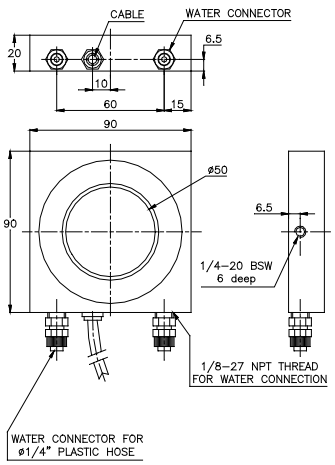
Recommended Use: Tight spaces

Special Features: Water cooled, very thin design - 20mm thick

Absorber:	Broadband: 0.19 - 20µm
Aperture:	∅50mm
Digital Power Scales:	250W / 30W
Maximum Average Power Density:	10KW/cm²
Power Noise Level:	200mW
Power Accuracy:	±3%
Maximum Energy Density J/cm²:	
<100ns	0.3
0.5ms	5
2ms	10
Response Time with Display (0-95%):	2.5s typ
Linearity with Power:	± 2%
Energy Scales:	200J / 30J / 3J
Energy Threshold:	200mJ
Cooling:	Water - 1.0 liter/minute, minimum Water temperature range 18-30°C Water temperature rate of change <1°C/min.

L250W





FL300A

CW & Average Power Measurements

200mW - 300W 50mJ - 300J

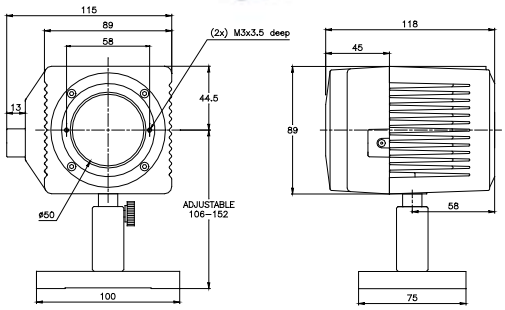
Recommended Use: General purpose to 300W

Special Features: Fan cooled, large aperture

Absorber:	Broadband, 0.19 - 20µm
Aperture:	∅50mm
Digital Power Scales:	300W / 30W
Maximum Average Power Density:	9KW/cm²
Power Noise Level:	10mW
Power Accuracy:	± 3%
Response Time with Display (0 – 95%):	2.5s
Linearity with Power:	± 2%
Energy Scales:	300J / 30J / 3J
Energy Threshold:	50mJ
Surface Uniformity:	± 2% over central 70% of surface
Cooling:	Fan

FL300A





See Ophir website for revised dimensions and P/N

Ordering Information		
Item	**Description**	**Ophir P/N**
L250W	Thin profile water cooled 250W power/energy meter	7Z02688
FL300A	Large aperture fan cooled 300W power/energy meter	7Z02627
Quasar: Some of the above heads are available with integral Quasar Bluetooth module for wireless transmission direct to PC. See page 97 for more details.		

FL300A-LP

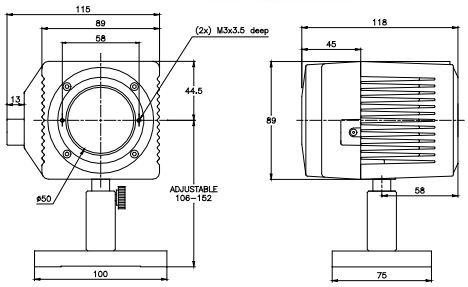
CW & Average Power Measurements 200mW - 300W 50mJ - 300J

Recommended Use: High power and long pulse lasers
Special Features: High power density and high pulse energy density

Absorber:	LP: 0.4-1.5, 10.6µm
Aperture:	∅50mm
Digital Power Scales:	300W / 30W
Maximum Average Power:	300W
Maximum Average Power Density:	10KW/cm²
Power Noise Level:	10mW
Power Accuracy:	± 3%
Response Time with Display (0 – 95%):	2.5s
Linearity with Power:	± 2%
Energy Scales:	300J / 30J / 3J
Energy Threshold:	50mJ
Maximum Energy Density J/cm² at full power:	
<100ns	0.05
0.5ms	20
2ms	50
10ms	150
Cooling:	Fan



FL300A-LP



See Ophir website for revised dimensions and P/N

L300W-LP

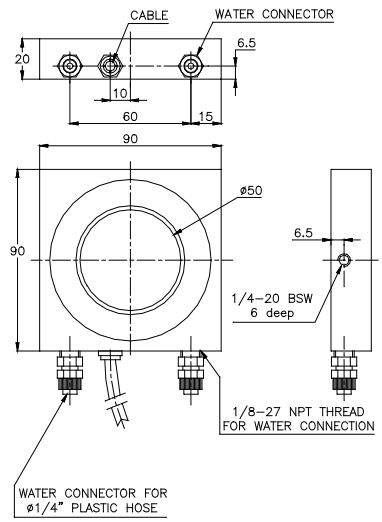
CW & Pulsed Measurements 3W - 300W 200mJ - 300J

Recommended Use: Tight spaces, high power and power densities
Special Features: Water cooled, very thin design – 20mm thick

Absorber:	LP: 0.4 – 1.5µm, 10.6µm, calibrated at 1064nm and 10.6µm
Aperture:	∅ 50mm
Digital Power Scales:	300W / 30W
Maximum Average Power Density:	10KW/cm²
Power Noise Level:	200mW
Power Accuracy:	±3%
Maximum Energy Density J/cm²	
<100ns	0.05
0.5ms	20
5ms	50
20ms	150
Response Time with Display (0-95%):	2.5s typ
Linearity with Power:	± 2%
Energy Scales:	300J / 30J / 3J
Energy Threshold:	200mJ
Cooling:	Water – 1.0 liter/minute, minimum Water temperature range 18-30°C Water temperature rate of change <1°C/min.



L300W-LP



Ordering Information		
Item	**Description**	**Ophir P/N**
FL300A-LP	Large aperture fan cooled 300W power/energy meter with damage resistant LP coating	7Z02635
L300W-LP	Thin profile water cooled 300W power/energy meter	7Z02689
Quasar: Some of the above heads are available with integral Quasar Bluetooth module for wireless transmission direct to PC. See page 97 for more details.		

Meters For Intense Pulsed Light (IPL) Medical Sources

L50(300)A-IPL

CW & Pulsed Energy Measurements 500mW – 300W 120mJ - 300J

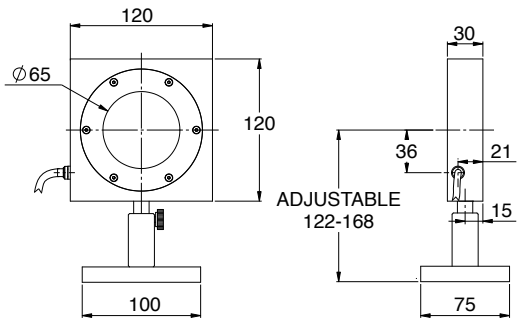
Recommended Use: Medical IPL sources

Special Features: ∅65mm aperture, high damage threshold for CW and pulses. Head has a window for gel coupled IPL sources where IPL source is coupled to window with gel or water for measurement. Can also measure air coupled IPLs



L50(300)A-IPL

Absorber:	0.5 – 1µm
Aperture:	∅ 65mm
Digital Power Scales:	300W / 30W
Maximum Average Power:	300W for 70s, 150W for 150s 50W continuous
Maximum Average Power Density:	20KW/cm²
Maximum Energy Density J/cm²:	
<100ns	0.05
0.5ms	20
2ms	40
10ms	100
Power Noise Level:	20mW
Energy Accuracy:	± 6% for most gel or air coupled IPL sources
Response Time with Display (0-95%):	3s
Linearity with Power:	± 1%
Energy Scales:	300J/60J/6J
Energy Threshold:	80mJ
Uniformity Over Surface:	± 1.5%
Cooling:	Convection



Ordering Information		
Item	**Description**	**Ophir P/N**
L50(300)A-IPL	Very large aperture energy meter for up to 300J with glass for gel coupled IPL sources	7Z02651

Thermal Heads - High Powers 500W and Up

FL500A / FL500A-LP1

CW & Pulsed Measurements 500mW - 500W 120mJ - 600J

Recommended Use: Very large beams to 500W

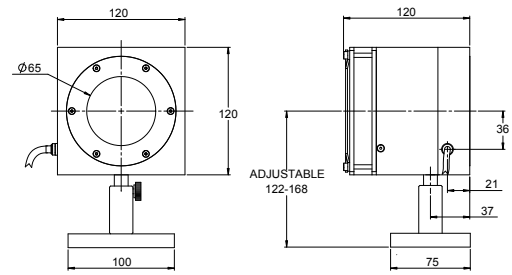
Special Features: Fan cooled ∅65mm aperture, 500W CW

Absorber:	Broadband: 0.19 – 20µm LP1: 0.25 – 2.2µm	
Aperture:	∅65mm	
Digital Power Scales:	500W / 50W	
Maximum Average Power:	500W continuous	
Maximum Average Power Density:	BB: 8KW/cm², LP1: 10KW/cm² at 500W	
Maximum Energy Density J/cm²:	BB	LP1
<100ns	0.3	0.05
0.5ms	5	15
2ms	10	40
10ms	30	200
Power Noise Level:	25mW	
Power Accuracy:	± 3% [a]	
Response Time with Display (0-95%):	2.8s	
Linearity with Power:	± 1%	
Energy Scales:	600J/60J/6J	
Energy Threshold:	100mJ	
Cooling:	Fan	

Note a: LP1 heads have relatively large spectral variation in absorption and have a calibrated spectral curve at all wavelengths in their spectral range. When used with Nova II (software v 1.59 and above) or USBI (v1.17 or above) supporting this feature, accuracy is ±3% for any wavelength from 250 to 2200nm. When used with other displays, accuracy will be ±3% for wavelengths 532nm, 755nm, 1064nm and 2100nm and ±6% for other wavelengths in the spectral range 400 – 1100nm



FL500A/
FL500A-LPI



L100(500)A

CW & Pulsed Measurements 500mW – 500W 120mJ - 600J

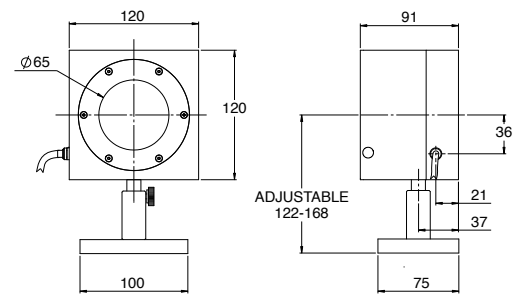
Recommended Use: Very large beams, single shot energy, IPL sources

Special Features: ∅65mm aperture, up to 500W for short periods.
High damage threshold for CW and pulses

Absorber:	Broadband, 0.19 - 20µm
Aperture:	∅65mm
Digital Power Scales:	500W / 50W
Maximum Average Power:	500W for 1min, 300W for 2 min, 75W continuous
Maximum Average Power Density:	8KW/cm² at 500W
Maximum Energy Density J/cm²:	
<100ns	0.3
0.5ms	5
2ms	10
10ms	30
Power Noise Level:	25mW
Power Accuracy:	± 3%
Response Time with Display (0-95%):	2.8s
Linearity with Power:	± 1%
Energy Scales:	600J / 60J / 6J
Energy Threshold:	100mJ
Cooling:	Convection



L100(500)A



Ordering Information		
Item	**Description**	**Ophir P/N**
FL500A	Very large aperture fan cooled power/energy meter to 500W CW	7Z02648
FL500A-LP1	As above but with high damage threshold LP1 coating	7Z02667S
L100(500)A	Very large aperture power/energy meter 75W continuous 500W intermittent	7Z02643
Quasar: Some of the above heads are available with integral Quasar Bluetooth module for wireless transmission direct to PC. See page 97 for more details.		

1000W

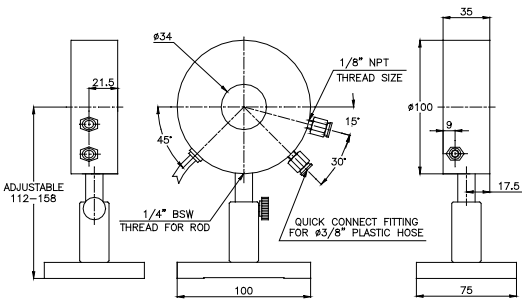
CW & Pulsed Measurements 5W - 1000W 300mJ - 300J

Recommended Use: High power CO_2, YAG and Diode lasers
Special Features: High power, fast response, compact

Absorber:	Broadband: 0.19 - 20µm
Aperture:	∅34mm
Digital Power Scales:	1000W / 200W
Maximum Average Power Density:	6KW/cm²
Maximum Energy Density J/cm²:	
<100ns	0.3
0.5ms	5
2ms	10
10ms	30
Power Noise Level:	0.2W
Power Accuracy:	± 3%
Response Time with Display (0-95%):	2.5s
Linearity with Power:	± 2%
Energy Scales:	300J/30J
Energy Threshold:	300mJ
Surface Uniformity:	±2.5%
Cooling:	Water – 1.8 liter / minute (minimum) Water termperature range 18 – 30°C Water temperature rate of change <1°C/ min.



1000W



L1500W / L1500W-LP

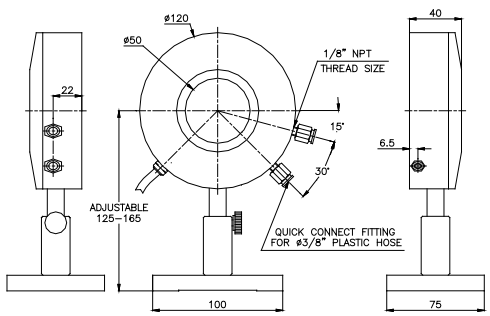
CW & Pulsed Measurements 20W - 1500W 500mJ - 200J

Recommended Use: High power and long pulse YAG, CO_2 and Diode lasers
Special Features: High power and energy density, large aperture

Absorber:	Broadband: 0.19 - 20µm, LP: 0.19 - 3µm, 10.6µm	
Aperture:	∅50mm	
Digital Power Scales:	1500W / 300W	
Maximum Average Power Density:	BB: 5KW/cm², LP: 6KW/cm²	
Maximum Energy Density J/cm²:	Broadband	LP
<100ns	0.3	0.05
1µs	0.5	0.3
0.5ms	5	20
2ms	10	50
10ms	30	150
Power Noise Level:	0.7W	
Power Accuracy:	± 5%	
Response Time with Display (0-95%):	2.7s	
Linearity with Power:	± 2%	
Energy Scales:	200J/20J	
Energy Threshold:	500mJ	
Cooling:	Water – 2.5 liter / minute (minimum) Water termperature range 18 – 30°C Water temperature rate of change <1°C/min.	



L1500W/L1500W-LP



Ordering Information		
Item	**Description**	**Ophir P/N**
1000W-V2	1000 Watt power/energy meter	7Z02664
L1500W-V1	Water cooled 1500 Watt power/energy meter	7Z02661
L1500W-LP-V1	Water cooled 1500 Watt power/energy meter with damage resistant LP coating	7Z02665
Quasar: Some of the above heads are available with integral Quasar Bluetooth module for wireless transmission direct to PC. See page 97 for more details.		

5000W / 5000W-LP

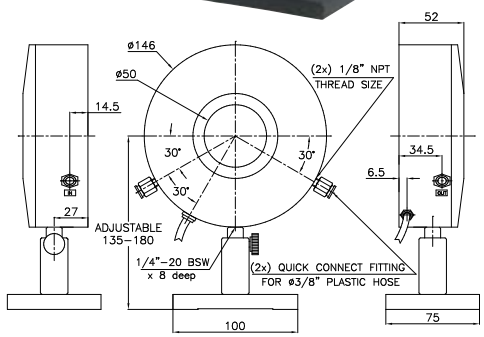
CW Power 100W - 5000W

Recommended Use: High power and long pulse YAG, CO_2 and Diode lasers
Special Features: High power and energy density, large aperture

Absorber:	Broadband: 0.19 - 20µm, LP: 0.19 - 1.5µm, 10.6µm		
Aperture:	∅50mm		
Digital Power Scales:	5000W / 500W		
Maximum Average Power Density:	BB: 3KW/cm², LP: 4KW/cm²		
Maximum Energy Density J/cm²:	Broadband	LP	
<100ns	0.3	0.05	
1µs	0.5	0.3	
0.5ms	5	20	
2ms	10	50	
10ms	30	150	
Power Noise Level:	1W		
Power Accuracy:	± 5%		
Response Time with Display (0-95%):	3s		
Linearity with Power:	± 2%		
Energy Scales:	N.A.		
Cooling:	Water – 4.5 liter / minute (minimum) Water temperature range 18 – 30°C Water temperature rate of change <1°C/min.		



5000W/5000W-LP

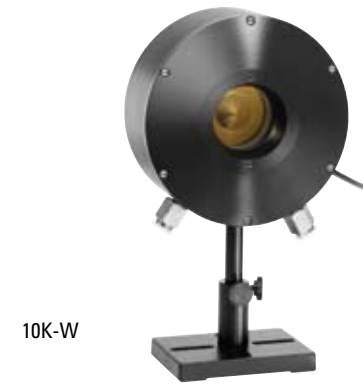


10K-W

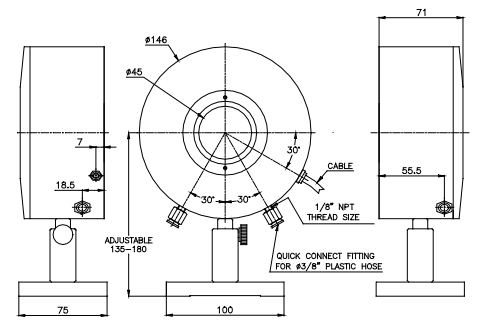
CW Power 200W - 10,000W

Recommended Use: Very high powers and power densities
Special Features: Withstands up to 10KW/cm² at 10,000W

Absorber:		Broadband: 0.8 -1.1µm and 10.6µm with special beam intensity reduction.			
Aperture:		∅45mm			
Digital Power Scales:		10KW / 1KW			
Maximum Ave. Power and Energy Density:	Beam Diameter	Max Power Density	Max Energy Density 1ms pulse w.	3ms p.w.	10ms p.w.
	<15mm	10KW/cm²	30J/cm²	60J/cm²	150J/cm²
	15-20mm	7KW/cm²	20J/cm²	40J/cm²	100J/cm²
	20-40mm	5KW/cm²	15J/cm²	30J/cm²	70J/cm²
	40-45mm	4KW/cm²	12J/cm²	25J/cm²	60J/cm²
Power Noise Level:		2W			
Power Accuracy:		± 5%			
Response Time with Display (0-95%):		<3s			
Linearity with Power:		± 2%			
Beam Size Dependence:		± 2% for beam to ∅35mm dia.			
Energy Scales:		N.A.			
Cooling:		Water – 9 liter / minute (minimum) Water temperature range 18 – 30°C Water temperature rate of change <1°C/min.			



10K-W



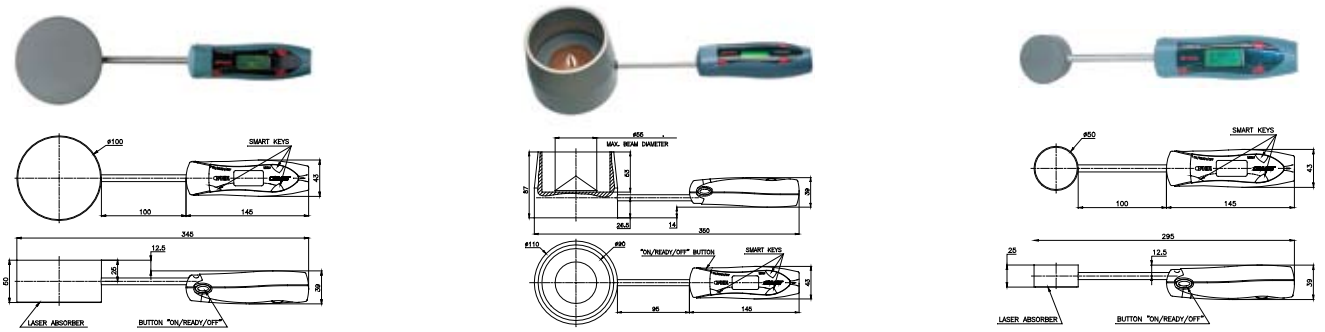
Ordering Information		
Item	**Description**	**Ophir P/N**
5000W	Water cooled 5000 Watt power/energy meter	7Z02119
5000W-LP	Water cooled 5000 Watt power/energy meter with damage resistant LP coating	7Z02255
10K-W-V1	Water cooled 10,000 Watt power/energy meter	7Z02645
Quasar: Some of the above heads are available with integral Quasar Bluetooth module for wireless transmission direct to PC. See page 97 for more details.		

History:

Comet Laser Power Probes

CW power: Comet 10K, 10K-HD - 200W to 10KW, Comet 1K - 20W to 1KW

Ophir now offers the Comet laser power probe series that is simple to use, economical but also highly accurate. It operates by measuring the heat rise from a 10 second exposure to a laser beam and thereby calculates the laser power. It has a sophisticated algorithm to take into account the heat loss due to the Comet temperature and thus can give accurate readings even if the Comet is hot before the measurement. This allows you to take several measurements before cooling the probe with water. Along with the Comet 10K for industrial lasers which measures mainly from 1KW to 10KW, there is the smaller Comet 1K for measuring from ~50W up to 1KW.
Recommended Use: Comet 10K/10K-HD - Industrial Lasers, Comet 1K - quick power check of low-med power lasers
Special Features: Accurate, simple to use and inexpensive



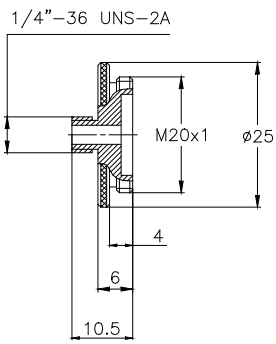
Model	Comet 10K	Comet 10K HD	Comet 1K
Power Measurement Range:	200W to 10,000W	200W to 10,000W	20W to 1000W
Spectral Range:	CO_2, YAG & diode	CO_2	0.2 – 20µm
Absolute Calibration Accuracy at Calibrated Wavelengths:	±5%	±5%	±5%
Repeatability:	±1% for same initial temperature	±1% for same initial temperature	±1% for same initial temperature
Linearity with Power:	±2 % from 1KW to 10KW	±2 % from 1KW to 10KW	±2% ±1W from 20W to 1KW
Number of readings before probe must be cooled (for 25°C starting temp.):	1KW 4 3KW 3 4KW 2 10KW 1	1KW 4 3KW 3 4KW 2 10KW 1	100W 4 300W 3 400W 2 1KW 1
Dimensions:	Absorber: ∅100mm dia x 50mm thick. Length: 340mm	Absorber: ∅110mm dia x 87mm thick. Max beam size 55mm. Length: 350mm	Absorber: ∅ 50mm dia x 25mm thick. Length: 295mm
Damage Threshold for Power:	Power / Damage Threshold 1KW 3500W/cm² 2KW 2800W/cm² 3KW 2500W/cm² 5KW 1500W/cm² 10KW 1000W/cm²	Beam dia <40mm / Beam dia >40mm 10KW/cm² 7KW/cm² 10KW/cm² 6KW/cm² 8KW/cm² 5KW/cm² 6KW/cm² 3 KW/cm² 4KW/cm² 2KW/cm²	Power 1K Model 100W 10KW/cm² 200W 8KW/cm² 300W 6KW/cm² 500W 5KW/cm² 1KW 4KW/cm²
Damage Threshold for Energy: Pulse Width <100ns 10µs 1ms 10ms	 0.3J/cm² 1J/cm² 10J/cm² 50J/cm²	 1J/cm² 3J/cm² 30J/cm² 150J/cm²	 0.3J/cm² 1J/cm² 10J/cm² 50J/cm²
Time to Reading:	Initial reading approximately 20s after exposure, final reading 40s after exposure	Initial reading approximately 30s after exposure, final reading 70s after exposure	Initial reading 10s after exposure, final reading 20s after exposure
Weight:	1.2Kg		300g
Temperature Compensation:	Temperature compensated to give accurate readings independent of starting probe temperature		
Maximum Permitted Probe Temperature:	70°C before measurement, 140°C after measurement		
Swivel Mount:	Fixed position		Handle swivels ±90 degrees vis a vis absorber for ease of use.
Display:	2x8 character LCD. Character height 5mm		
Operation Modes:	AUTO: Automatic measurement with laser set to 10s timed exposure. Unit senses temperature rise and measures automatically. MANUAL: User places probe in front of beam for 10s. Unit beeps to indicate start and stop measurement points.		
History:	Stores last three readings		
Calibration:	Can be recalibrated by user		
Battery:	2 x AA. Lifetime in normal use approximately 1 year.		
Electromagnetic Compatibility:	CE approved		

Ordering Information		
Item	**Description**	**Ophir P/N**
Comet 10K-V1	Hand held power probe for 200 – 10,000W	7Z02705
Comet 10K HD V2	Hand held power probe for 200 – 10,000W with conical absorber for high damage threshold	7Z02706
Comet 1K	Hand held power probe for 20 – 1000W	7Z02702

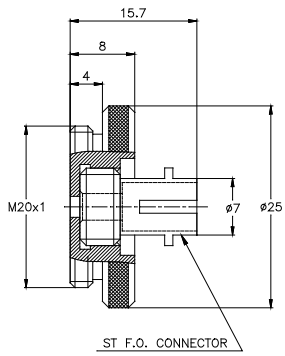
Fiberoptic Adapters and Accessories for Thermal Heads

The heads can work either with or without the adapters attached

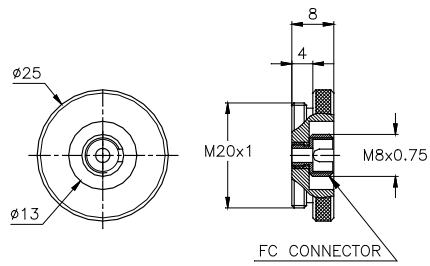




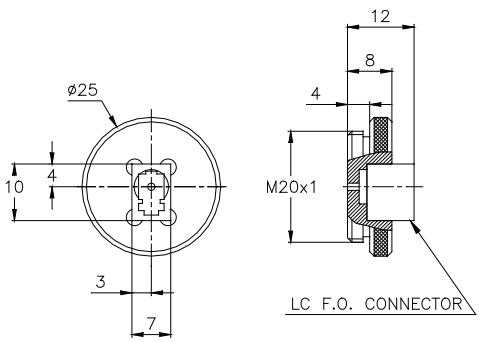
SMA fiber adapter



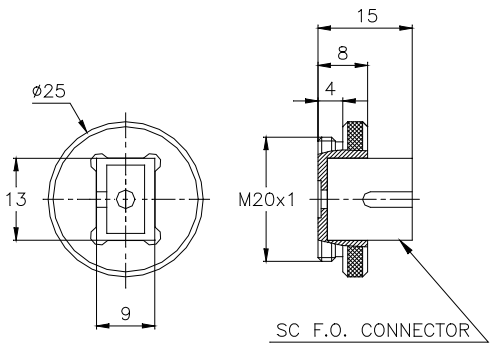
ST fiber adapter



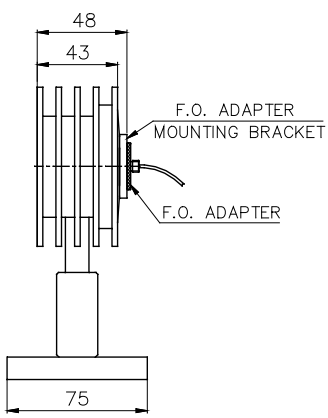
FC fiber adapter



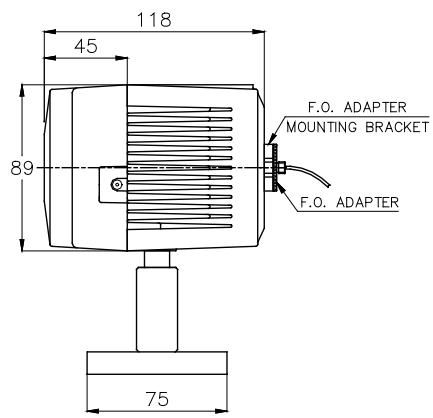
LC fiber adapter



SC fiber adapter



30A / L30A
with F.O. input



FL250A
with F.O. input

History:

Ordering Information for Fiber Adapters for Thermal and Photodiode Heads

Head Series	Fiber Adapter Mounting Bracket (1 Bracket Will Fit All Fiber Adapters)	SC Fiber Adapter	LC Fiber Adapter	ST Fiber Adapter	FC Fiber Adapter	SMA Fiber Asdapter
PD300	not needed	7Z08221	Not available	7Z02210	7Z02213	7Z02212
PD300-IRG-V1	not needed		7Z08215		7Z08216	7Z08222
3A-IS-V1 / 3A-IS-IRG	7Z08213	7Z08227	7Z08228	7Z08226	7Z08229	1G01236
F100A-IS	7Z08213	7Z08227	7Z08228	7Z08226	7Z08229	1G01236
3A	not needed	7Z08227	7Z08228	7Z08226	7Z08229	1G01236
3A-P-V1	not needed	7Z08227	7Z08228	7Z08226	7Z08229	1G01236
10A-V1.1	not needed	7Z08227	7Z08228	7Z08226	7Z08229	1G01236
12A / 12A-P	not needed	7Z08227	7Z08228	7Z08226	7Z08229	1G01236
30A -V1 / F150A-V1	7Z08211	7Z08227	7Z08228	7Z08226	7Z08229	1G01236
30A-P-V1 / F100A-HE/HE1	7Z08230	7Z08227	7Z08228	7Z08226	7Z08229	1G01236
L30A-V1	7Z08210	7Z08227	7Z08228	7Z08226	7Z08229	1G01236
L50A	7Z08210	7Z08227	7Z08228	7Z08226	7Z08229	1G01236
30(150)A-HE	7Z08211	7Z08227	7Z08228	7Z08226	7Z08229	1G01236
30(150)A-SV	7Z08230	7Z08227	7Z08228	7Z08226	7Z08229	1G01236
30(150)A-HE/HE1	7Z08230	7Z08227	7Z08228	7Z08226	7Z08229	1G01236
30(150)A-V1	7Z08211	7Z08227	7Z08228	7Z08226	7Z08229	1G01236
L40(150)A-V2/ L50(150)A	7Z08238 [a]	7Z08227	7Z08228	7Z08226	7Z08229	1G01236
FL250A-V1	7Z08212	7Z08227	7Z08228	7Z08226	7Z08229	1G01236
FL300A / FL300A-LP	7Z08212	7Z08227	7Z08228	7Z08226	7Z08229	1G01236

Note: a. The fiber mounting bracket for these heads is a triple adapter for mounting up to three different fibers looking at same head.

SH to BNC Adapter



Ordering Information		
Item	**Description**	**Ophir P/N**
SH to BNC Adapter	Allows connection of smart head to voltage measuring device for measurement of raw voltage output.	7Z11010

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