Thermal Heads for Power and Single-Shot Energy - mW to KW, mJ 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

Thermal Heads - Medium Powers to 300W

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

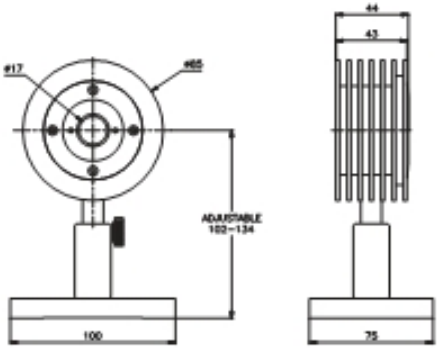
CW & Pulsed Measurements 50mW - 150W 20mJ - 300J

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: 0.4-3µm	
Aperture:	Ø17mm	
Digital Power Scales:	150W / 30W [a]	
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%	
Maximum energy density J/cm²:	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:	300J / 30J / 3J	
Energy threshold:	20mJ	
Cooling:	Convection	

NEW

30 (150)A



30(150)A-HE/HE1

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

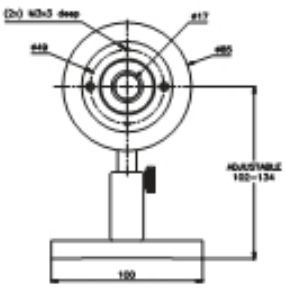
Recommended Use: High energy and average power pulsed lasers.
HE: YAG and harmonics, Holmium, Erbium / HE1: Ruby
Special Features: High damage threshold for short pulses, high average power

Absorber:	HE: 0.19 - 3µm except for 625 - 900nm HE1: 0.19 - 0.76µm, 2.9µm	
Aperture:	Ø17mm	
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%	
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%	
Energy Scales:	200J / 30J / 3J	
Energy threshold:	50mJ	
Linearity with energy:	±1.5% ±50µJ	
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	Power/energy meter 30W continuous 150W intermittent	1Z02608
30(150)A-LP1	As above with high damage LP1 Coating	1Z02657
30(150)A-HE	30 / 150 Watt power/energy meter for wavelengths 0.19-.625 and 0.9-3µm. Energy calibrated for 0.19-0.6µm and 2.9µm	1Z02380
30(150)A-HE-106	As 30(150)A-HE but with energy calibrated for 1.064nm	1Z02385
30(150)A-HE1	30 / 150 Watt power/energy meter for wavelengths 0.19-0.76µm. Energy calibrated for 0.694µm (Ruby)	1Z02382

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

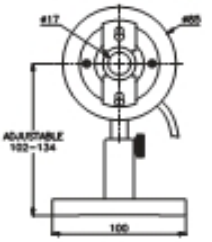
Absorber:	HE: 0.19 - 3µm except for 625 - 900nm [a]	
Aperture:	Ø16mm	
Digital Power Scales:	150W / 30W / 3W	
Maximum Power	150W for 50s, 100W for 90s 30W continuous	
Maximum Average Power Density:	500W/cm²	
Power Noise Level:	3mW	
Power Accuracy:	±5%	
Maximum energy density J/cm² for <100ns pulses and 10 - 50Hz	Diffuser IN	Diffuser OUT
1064m	5	2
532nm	4	2
355nm	1.5	1
Response Time with Display (0-95%):	3.8s typ	
Linearity with Power:	± 1%	
Energy Scales:	30J / 3J	
Energy threshold:	50mJ	
Cooling:	Convection	

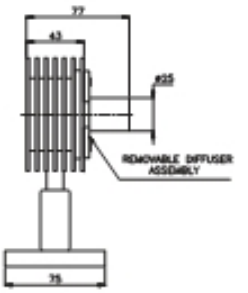
Note: a: With diffuser in, head is only calibrated for wavelengths listed above

30 (150)A-HE-DIF

Diffuser IN

Diffuser OUT





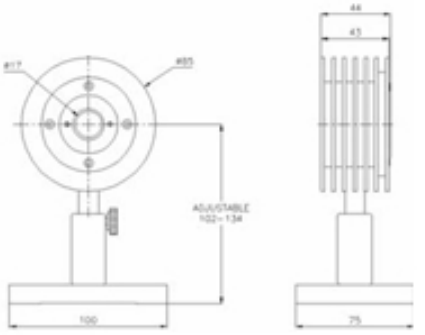
30(150)A-SV

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:	Ø17mm
Digital Power Scales:	150W / 30W / 3W
Maximum 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	1Z02354
30(150)A-SV	30 / 150W power/energy meter with extremely high damage threshold	1Z02625

L30(150)A-LP1

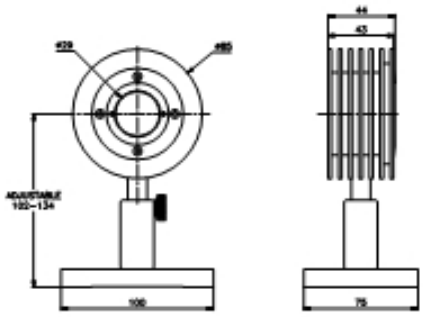
CW & Pulsed Measurements 80mW - 150W 80mJ - 300J

NEW

L30(150)A-LP1

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

Absorber:	LP1 0.19 - 3µm
Aperture:	Ø29mm
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 at calibrated wavelengths 532nm, 755nm, 1064nm and 2940nm. Accuracy for other wavelengths in the range 400-1100 is ±6%
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



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

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

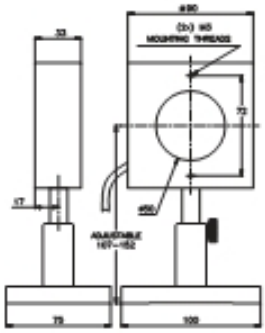
NEW

L40(150)A

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: 0.4 - 3µm EX: 0.15 - 0.4µm, 10.6µm		
Surface diffuse reflectance:	5-15%		
Aperture:	Ø50mm		
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		
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: Because of larger spectral variation of the LP1 coating, the ±3% accuracy is specified at calibrated wavelengths only, 532nm, 755nm, 1064nm, 2100nm and 2940nm. Accuracy for other wavelengths in the range of 400-1100nm is ±6%



Ordering information		
Item	**Description**	**Ophir P/N**
L30(150)A-LP1	30/150W Power meter for high energy pulses	1Z02654
L40(150)A-V2	Large aperture power/energy meter 35W continuous, 150W intermittent	1Z02626
L40(150)A-LP1	As above with high damage threshold LP1 coating	1Z02652
L40(150)A-EX	As above for excimer lasers 0.15 - 0.4µm	1Z02614

L50(150)A

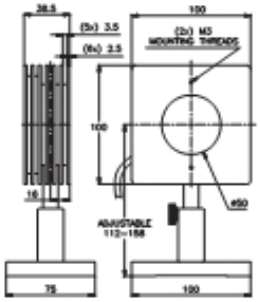
CW & Pulsed Measurements 200mW - 150W 80mJ - 200J

Recommended Use: Large aperture lasers

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

L50(150)A

Absorber:	Broadband, 0.19-20µm
Aperture:	Ø50mm
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:	200J / 30J / 3J
Energy Threshold:	80mJ
Cooling:	Convection



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

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

Recommended Use: LP1: Very large beams, long pulse high energy lasers

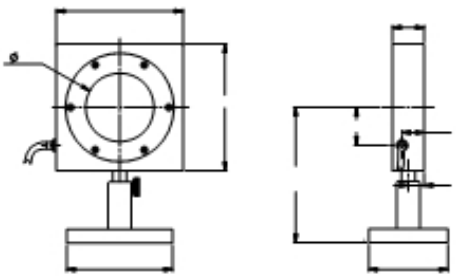
IPL: Medical IPL sources

Special Features: Ø65mm aperture, high damage threshold for CW and pulses. IPL version has window for gel coupled IPL sources where IPL source is coupled to window with gel or water for measurement

NEW

L50(300)A

Absorber:	LP1 0.19 - 3µm, IPL 0.5 - 1µm
Surface diffuse reflectance:	~5-15% to 1.1µm
Aperture:	Ø65mm
Digital Power Scales:	300W / 30W
Maximum Average Power:	300W for 70s, 150W for 150s, 50W for continuous
Maximum Average Power Density:	30KW/cm² at 150W
Maximum Energy Density J/cm²	
<100ns	0.05
0.5ms	20
2ms	50
10ms	250
Power Noise Level:	20mW
Power Accuracy for L50(300)A-LP1:	±5% from 400-1064nm
Power Accuracy for L50(300)A-IPL:	±6% for most contact coupled IPL sources
Response Time with Display (0-95%):	3s
Linearity with Power:	± 1%
Energy Scales:	600J/60J/6J
Energy Threshold:	80mJ
Uniformity Over Surface:	±1.5%
Cooling:	Convection



Ordering information		
Item	**Description**	**Ophir P/N**
L50(150)A	Large aperture power/energy meter, 50W continuous, 150W intermittent	1Z02633
L50(300)A-LP1	Very large aperture power/energy meter, 50W continuous, 300W intermittent	1Z02641
L50(300)A-IPL	As above with glass window for use with gel coupled IPL sources	1Z02651

F100A-HE

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

Recommended Use: High energy and average power pulsed lasers

HE: YAG + harmonics, Holmium, Erbium

HE1: Ruby, Erbium

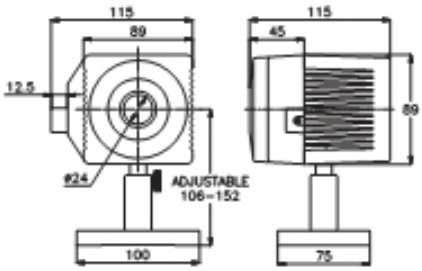
Special Features: High damage threshold for short pulses, high average power

Absorber:	HE type: 0.19 - 3µm except for 625 - 900nm	
Aperture:	Ø25mm	
Digital Power Scales:	100W / 30W	
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 / 30J / 3J	
Energy threshold:	50mJ	
Cooling:	Fan	

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

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

F100A-HE



F150A

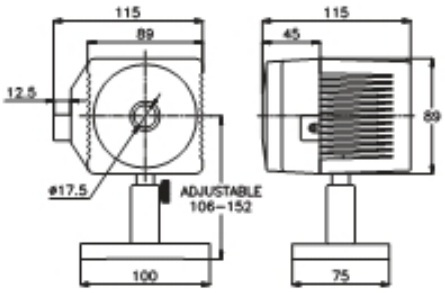
CW & Pulsed Measurements 60mW - 150W 20mJ - 100J

Recommended Use: General use to 150W

Special Features: Fan cooled

Absorber:	Broadband, 0.19-20µm
Aperture:	Ø17.5mm
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

F150A



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	1Z02430
F150A-V1	Fan cooled 150W power/energy meter	1Z02656

FL250A / FL250A-LP1 / FL250A-EX

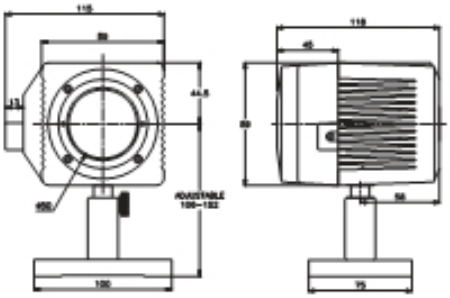
CW & Pulsed Measurements 200mW - 250W 50mJ - 300J

NEW

Recommended Use: Broadband: General use to 250W
LP1: High power and energy density - not for CO2
EX: Excimer lasers

Special Features: Fan cooled, large aperture

FL250A



Absorber:	Broadband: 0.19 - 20µm LP1: 0.19 - 3µm EX: 0.15 - 0.4µm, 10.6µm		
Aperture:	Ø50mm		
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: Because of larger spectral variation of the LP1 coating, the ±3% accuracy is specified at the following calibrated wavelengths only: 532nm, 755nm, 1064nm and 2100nm. Accuracy for other wavelengths in the range of 400-700nm is ±6%.

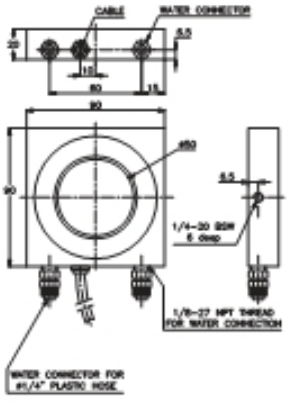
L250W

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

Recommended Use: Tight spaces

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

L250W



Absorber:	Broadband: 0.19 - 20µm	
Aperture:	Ø50mm	
Digital Power Scales:	250W/100W / 30W	
Maximum Average Power Density:	10KW/cm²	
Power Noise Level:	200mW	
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%):	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 18-30ºC Water temperature rate of change <1ºC/min.	

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

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

Ordering information

Item	Description	Ophir P/N
FL250A-V1	Large aperture fan cooled 250 watt power/energy meter	1Z02605
FL250-LP1	Same as above with high damage threshold LP1 coating - not for CO_2	1Z02653
FL250A-EX	Same as above with EX coating for excimer lasers	1Z02391
L250W	Thin profile water cooled 250W power/energy meter	1Z02688

FL300A

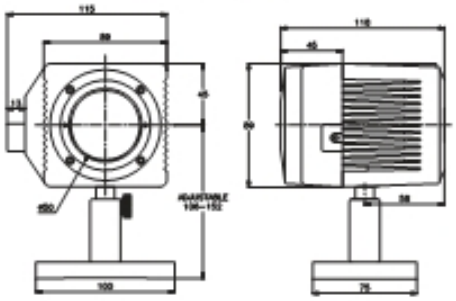
CW & Average Power Measurements 200mW - 300W 50mJ to 300J

Recommended Use: General purpose to 300W

Special Features: Fan cooled, large aperture

Absorber:	Broadband, 0.19 - 20µm
Aperture:	Ø50mm
Digital Power Scales:	300W / 30W
Maximum Average Power Density:	8KW/cm²
Power Noise Level:	10mW
Power Accuracy:	± 3%
Response Time with Display (0 - 95%):	2.5s
Linearity with Power:	± 1%
Energy Scales:	300J / 30J / 3J
Energy Threshold:	50mJ
Surface Uniformity:	± 2% over central 70% of surface
Cooling:	Fan

FL300A



FL300A-LP

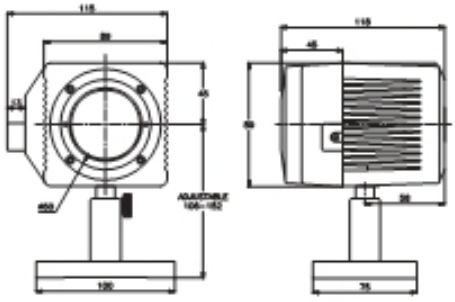
CW & Average Power Measurements 200mW - 300W 50mJ to 300J

Recommended Use: High power and long pulse lasers

Special Features: High power density anf high pulse energy density

Absorber:	LP 0.4-1.5, 10.6µm	
Aperture:	Ø50mm	
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:	± 1%	
Energy Scales:	300J / 30J / 3J	
Energy Threshold:	50mJ	
Maximum Energy Density J/cm²	Single Shot	Repetitive, Full power
<100ns	0.1	0.1
0.5ms	20	15
5ms	100	70
20ms	300	200
Surface Uniformity:	± 2% over central 70% of surface	
Cooling:	Fan	

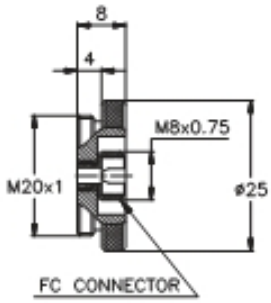
FL300A-LP



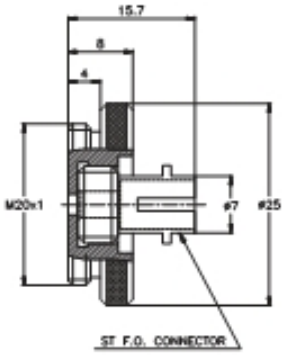
Ordering information		
Item	**Description**	**Ophir P/N**
FL300A	Large aperture fan cooled 300W power/energy meter	1Z02627
FL300A-LP	Large aperture fan cooled 300W power/energy meter with damage resistant LP coating	1Z02635

Fiberoptic Adapters and Accessories for Thermal Heads

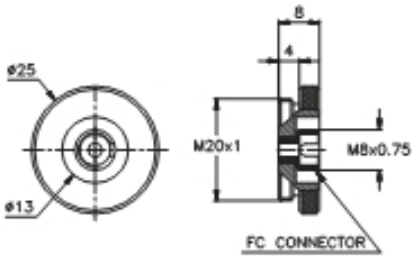
The heads can work either with or without the adapters attached



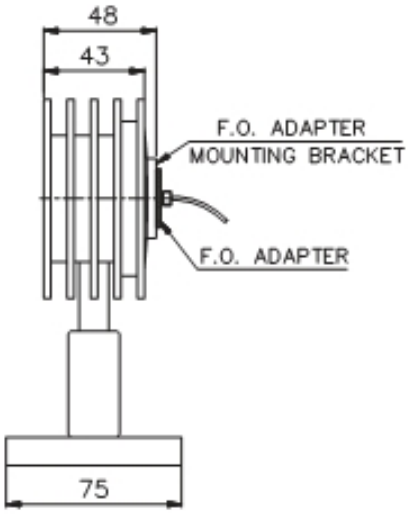
SMA fiber adapter



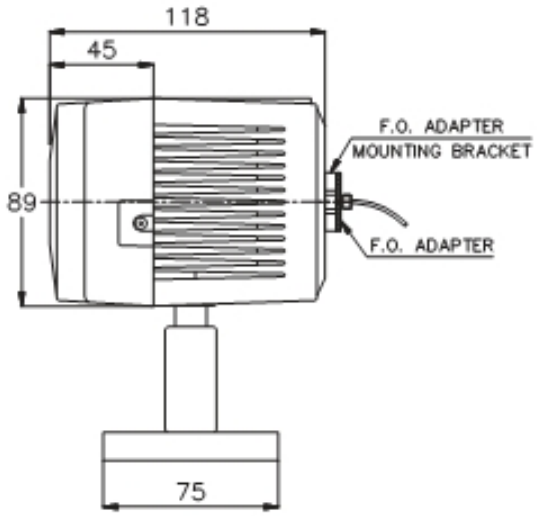
ST fiber adapter



FC fiber adapter



30A / L30A
with F.O. input



FL250A
with F.O. input

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 adapter
PD300	not needed	1Z08221	Not available	1Z02210	1Z02213	1Z02212
PD300-IRG-V1	not needed		1Z08215		1Z08216	1Z08222
3A-IS-V1	1Z08213	1Z08227	1Z08228	1Z08226	1Z08229	1G01236
F100A-IS	1Z08213	1Z08227	1Z08228	1Z08226	1Z08229	1G01236
3A	not needed	1Z08227	1Z08228	1Z08226	1Z08229	1G01236
3A-P-V1	not needed	1Z08227	1Z08228	1Z08226	1Z08229	1G01236
10A-V1.1	not needed	1Z08227	1Z08228	1Z08226	1Z08229	1G01236
12A / 12A-P	not needed	1Z08227	1Z08228	1Z08226	1Z08229	1G01236
30A -V1	1Z08211	1Z08227	1Z08228	1Z08226	1Z08229	1G01236
30A-P-V1 / F100A-HE/HE1	1Z08230	1Z08227	1Z08228	1Z08226	1Z08229	1G01236
L30A-V1 / F150A-V1	1Z08210	1Z08227	1Z08228	1Z08226	1Z08229	1G01236
L50A	1Z08210	1Z08227	1Z08228	1Z08226	1Z08229	1G01236
30(150)A-HL	1Z08211	1Z08227	1Z08228	1Z08226	1Z08229	1G01236
30(150)A-SV	1Z08230	1Z08227	1Z08228	1Z08226	1Z08229	1G01236
30(150)A-HE/HE1	1Z08230	1Z08227	1Z08228	1Z08226	1Z08229	1G01236
30(150)A-V1	1Z08211	1Z08227	1Z08228	1Z08226	1Z08229	1G01236
L40(150)A-V2/ L50(150)A	1Z08238[a]	1Z08227	1Z08228	1Z08226	1Z08229	1G01236
FL250A-V1	1Z08212	1Z08227	1Z08228	1Z08226	1Z08229	1G01236
FL300A / FL300A-LP	1Z08212	1Z08227	1Z08228	1Z08226	1Z08229	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.	1Z11010