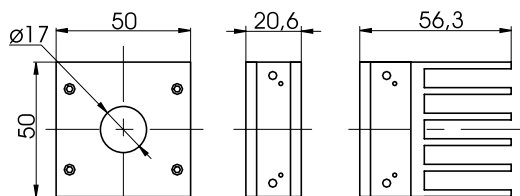


Power Detector (High Average Power Density)

11PMK-W5



11PMK-15S-W5



11PMK-15S-W5

11PMK-30H-W5

Typical Lasers

- YAG (various)
- Solid - state
- Ti: sapphire
- Ruby (long pulse)
- Argon ion (CW)

- Durable
- Full NIST-Traceability
- Highest damage threshold: 100 kW/cm²
- Personal Wavelength Correction™
- Smart interface
- New disk technology with the best absorber
- Energy mode
- Effective aperture diameter 17 mm (area 2.27 m²)

SPECIFICATIONS

Measurement capability

Spectral range	0.19-10 μm
Noise equivalent power	1 mW
Rise time (nominal)	1.4 sec
Sensitivity (typ into 100 kΩ load)	0.65 mV/W
Calibration Uncertainty	±2.5 %
Repeatability	±0.5 %

Energy Mode

Sensitivity	0.3 mV/J
Maximum measurable energy	200 J
Noise equivalent energy	0.02 J
Minimum repetition period	5 sec
Maximum pulse width	133 ms
Accuracy with energy calibration option	±5 %

MODEL	11PMK-15S-W5	11PMK-30H-W5	11PMK-50L-W5
Maximum measurable power, W	15	30	30
Max average power (continuous), W	15	30	50
Max average power (1 minute), W	30	60	85
Maximum average power density, kW/cm ²	100	100	100
Weight (head only), kg	0.16	0.21	0.48

Pulsed Laser Damage Thresholds	Max Energy Density, J/cm ²	Peak Power Density, kW/cm ²
1.064 μm, 360 μs, 5 Hz	100	667
1.064 μm, 7 ns, 10 Hz	1.1	157
532 nm, 7ns, 10 Hz	1.1	157
266 nm, 7 ns, 10 Hz	0.7	27

11PMK-W5 surface absorber stands up to average power densities of **100 kW/cm²**. That is the best in the world for average power density. **11PMK-W5** come ready to mount on a rod, a bracket and the square case even lets you set them right on the optical table.

This **11PMK** series detector is the best choice for any high average power density application.

With **Energy Mode** option every member of **11PMK-H5** family can be equipped to measure single shot pulse energies as well as average power. From **450 mJ** up to **6 J Q-switched** or **600 J long pulse**.

11PMK-W5 family is compatible with Standa Uno standalone power meter and **11P-Link** PC based power meter.

Compatible with: **11UNO**, **11SOLO 2** (page 11-4), **11TUNER** (page 11-5), **11P-LINK** (page 11-6).

Compatible with **11UNO** power meter

Compatible with **11TUNER** single channel, power monitor with tuning needle

PC based power meter monitoring solutions



11P-LINK

PC based monitor **11P-LINK** with appropriate software is available for **11PMK** series. It is possible to connect many power detectors via **11P-LINKs** to a single PC which is good for simultaneous monitoring of many detectors.

Online datasheets are available. Please, visit us at www.standa.it

e-mail: sales@standa.it

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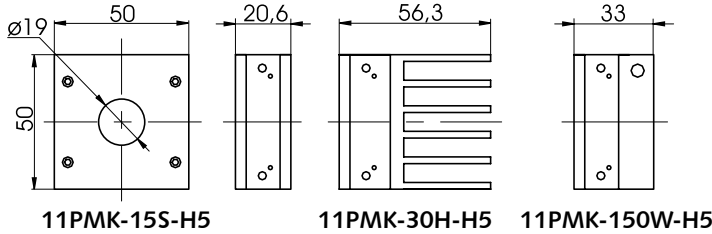
Power Detector (Mid Power - Compact)

11PMK-H5



11PMK-15S-W5

- Fast
- Small size
- Flat spectral response
- Full NIST - traceability
- High damage threshold: 36 kW/cm² to 45 kW/cm²
- Personal Wavelength Correction™
- Low profile
- Air and water cooled
- Energy mode
- Effective aperture diameter 19 mm (area 2.84 cm²)



The **11PMK** series detectors can take a lot of laser power in a small body. They come ready to mount on a rod, a bracket and the square case even lets you set them right on the table.

The **11PMK-15S-H5**, just **21 mm thin**, is ideal for laser maintenance and service applications. From a **few mW** to **15 W** it is the smallest, toughest and fastest detector in its class. The absorber handles **36 kW/cm²** of average power density. You can even run it up to **23 watts** for short periods.

With **Energy Mode** option every member of **11PMK-H5** family can be equipped to measure single shot pulse energies as well as average power. From **20 mJ** up to **5 J Q-switched** or **25 J long pulse**.

11PMK-H5 family is compatible with **Standa 11TUNER**, **11UNO** standalone power meter and **11PMK-Link** PC based power meter.

SPECIFICATIONS

Measurement capability

Spectral range	0.19-11 μm
Noise equivalent power	1 mW
Rise time (nominal)	0.6 sec
Sensitivity (typ into 100 kΩ load)	0.65 mV/W
Calibration Uncertainty	±2.5 %
Repeatability	±0.5 %

Energy Mode

Sensitivity	0.65 mV/J
Maximum measurable energy	15 J
Noise equivalent energy	0.02 J
Minimum repetition period	4 sec
Maximum pulse width	88 ms
Accuracy with energy calibration option	±5 %

MODEL	11PMK-15S-H5	11PMK-30H-H5	11PMK-150W-H5
Maximum measurable power, W	15	30	150
Max average power (continuous), W	15	30	150
Max average power (2 minutes), W	23	45	170
Maximum average power density, kW/cm ²	36	36	36
Weight (head only), kg	0.16	0.21	0.24

Pulsed Laser Damage Thresholds	Max Energy Density, J/cm ²	Peak Power Density, kW/cm ²
1.064 μm, 360 μs, 5 Hz	5	14
1.064 μm, 7 ns, 10 Hz	1	143
532 nm, 7ns, 10 Hz	0.6	86
266 nm, 7 ns, 10 Hz	0.3	43

Typical Lasers

- CO₂
- Ti: sapphire
- Diode (pulse or CW)
- YAG (diode pumped, CW or high rep. rate)
- Ruby (long pulse)
- DPSSL
- Excimer
- Argon ion



Accessories for mounting 11PMK series detectors

see catalogue section 3



3MP, 3PC, 3PH



3CMB



3UBP



3APC

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Extreme Low Power Detector

11XLP12-3S-H2



Fiber optics adapters available upon request

- μW to W range
- Thermopile-based
- Minimal thermal drift
- Flat spectral response
- High sensitivity
- Effective aperture $\varnothing 12$ mm



SPECIFICATIONS

Measurement capability

Spectral range	0.19-20 μm
Maximum measurable power	3 W
Noise equivalent power	$\pm 0.5 \mu\text{W}$
Rise time (nominal)	2.5 sec
Sensitivity	200 mV/W
Calibration uncertainty	$\pm 2.5 \%$
Repeatability	$\pm 0.5 \%$
Thermal drift*	12 $\mu\text{W}/^\circ\text{C}$

*Thermal drift down to 6 $\mu\text{W}/^\circ\text{C}$ can be achieved while using IR filter. Please contact us for more details.

Damage thresholds

Maximum average power (continuous)	3 W
Maximum average power (1 minutes)	3 W
Maximum average power density	1 kW/cm ²
Pulse laser damage thresholds	max energy density
1064 nm, 360 μs , 5 Hz	5 J/cm ²
1064 nm, 7 ns, 10 Hz	1 J/cm ²

Physical characteristics

Effective aperture diameter	12 mm
Absorber	H2
Dimensions (HxWxD, without isolation tube)	73x73x20 mm
Dimensions (HxWxD, with isolation tube)	73x73x70 mm
Weight (head only)	0.31 kg
Effective area	6.25 cm ²

11XLP12 extreme low power detector is best suitable for low power im both the μW and mW regimes with very low thermal drift. Featuring broad-band flat spectral response, minimal thermal drift and a noise equivalent power as low as 1 μW the **11XLP12** is ideally suited for measuring any pulsed or CW low power laser.

11XLP12 is compatible with **11UNO**, **11TUNER**, **11SOLO 2** and PC based **11P-Link** power monitors.

Photo Detector (low power)

11PD100-Si



Photo detectors for deeper UV and IR regions available upon request

- Wavelength selection in 1 nm steps
- Fast
- Small size
- Si
- Full NIST - Traceability
- Smart interface
- Effective aperture $\varnothing 11.28$ mm



SPECIFICATIONS

Measurement capability

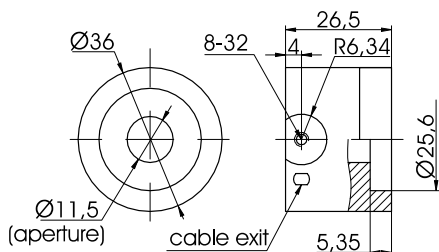
Spectral range	300 - 1100 nm
Maximum measurable power	30 mW (1064 nm)
Minimum measurable power	600 pW (980 nm)
Rise time (nominal)	0.2 sec
Peak sensitivity	0.5 A/W (980 nm)
Calibration uncertainty	$\pm 6.5\%$ 0.3 - 0.39 μm $\pm 2.5\%$ 0.4 - 0.99 μm $\pm 5\%$ 1.0 - 1.1 μm

Damage thresholds

Maximum average power density (1064 nm)	100 W/cm ²
Saturation level	30 mW/cm ² (1064 nm)

Physical characteristics

Effective aperture diameter	$\varnothing 11.28$ mm
Weight	0.13 kg
Active area	1 cm ²



11PD series silicon detector provide a generous aperture for laser beams up to **10 mm** in diameter. The threaded aperture allows you to install filters, attenuators, fiber optic adapters or other optics that suit your specific needs. All of the detectors have a NIST traceable calibration and *Personal wavelength correction*TM.

This is the choice for typical low power CW lasers from 300 to 1100 nm.

MODEL	11PD100-Si	11PD100-Si-OD-1	11PD100-Si-OD-2
Spectral range	300-1100 nm	400-1100 nm	630-1100 nm
Max. measurable power (1064 nm)	30 mW	0.3 W	0.75 W
Min. measurable power (680 nm)	600 pW	6 nW	60 nW
Accuracy, %	-	± 5	± 5

Make measurements down to 600 pW and up to 0.75 W with an **11PD100-Si-OD-2** attenuator.

To extend the performance of the photo detectors to higher measurable powers you can select one of our attenuators. The transmission of the **11PD100-Si-OD-1** is 10% and the transmission of the **11PD100-Si-OD-2** is 1%.

Online datasheets are available. Please, visit us at www.standa.it

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Laser Power/Energy Meter

11SOLO 2 • 11UNO



11SOLO 2

- Simple to use
- Ergonomically designed
- Reads energy detectors (with metallic absorbers) up to 3kHz
- Full statistical functions
- Power/Energy/Photo detectors



11UNO

- Simple to use
- Ergonomically designed
- 24 bit A/D converter for high resolution measurement
- Compatible with 11PMK series power detectors
- Unbeatable price

Standa portable power meters bring unprecedented performance in a compact hand-held instrument. The one-finger navigation of the **11UNO** makes it most simple to use monitor, and it has just the functions you need to take a fast and precise power measurement.

11SOLO 2 brings the flexibility to handle any application from analyzing a single short pulse with high resolution to sampling performance over a period of months. It can store data in flash memory and transfer it to a PC. The **11SOLO 2**'s menu-driven Windows CE based interface is easy and intuitive enough to master in minutes.

MODEL	11SOLO 2	11UNO
Power Meter Specification		
Power range (thermal head)	1 μ W to 30 kW	Single wide range scale
Power range (photo detector head)	4 pW to 3 W	Autoscale
Resolution (digital)	Current Scale / 2048	1 pW (Photo Detector) 1 mW (Thermal Detector)
Monitor accuracy	± 0.5 % (± 5 μ V) full scale	included
Response time (accelerated)	1 sec	included
Statistics	Current Value, Max, Min, Average, Std Dev., RMS & PTP Stability, Time	None
Energy Meter Specification		
Energy range	0.1 μ J to 30 kJ	—
Monitor accuracy	± 1 % < 500 Hz (ful scale)	—
Software trigger level	0.1 to 99.9 %, 0.1 % resolution, default 2 % (3 % in MT)	—
Repetition rate	3000 Hz/10000 Hz in sampling	—
Statistics	Current Value, Max, Min, Average, Std Dev., RMS & PTP Stability, Pulse #, Repetion Rate, Average Power	—
Detector Compatibility		
Thermopile (power detector)	Average Power	included
	Single Shot Energy	—
Pyroelectric (energy detector)	Pulse Energy including single shot / Average Power / Repetition Rate	—
Photo detector	Average Power (mW, dBm)	included
General Specifications		
Digital display	77x58 mm LCD 240x160 pixels	76x57 mm LCD High Contrast Fields
Data storage	up to 225 000 points	—
Data displays	Real Time, Line plot, Histogram, Statistics, Digital Tuning Needle	Real Time
User input correction factors	2 Multipliers and 2 Offsets (7 digits)	—
Analog output	0-1 volt, full scale, ± 1 %	—
Internet upgrades	USB or RS-232	—
PC interface software	included	—
PC serial commands	USB and RS-232	—
LabView drivers	included	—
Real-Time data transfer rate	200 Hz	—
Dimensions (WxHxD, mm, without stand)	210x122x44	210x122x44
Weight, kg (with stand)	0.52	0.47
Battery pack	4 rechargeable 1.2 V Ni-MH AA (6 hours to full charge)	4 Alkaline AA Batteries
Battery life (estimated)	11 hours, 6 hours with backlight	650 hours with Detector
External power supply	100/240 VAC, 50-60 Hz, to 9 VDC, 1.66 A	100/240 VAC 50-60 Hz, to 9 VDC 1.5 A (optional)



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Sets

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Measurement
Instruments

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Single Channel, Power Monitor with Tuning Needle

11TUNER

NEW



11TUNER

- Ultra-Fast Needle
- Less than 1 second response time, faster than any analog needle
- Reads Power Detectors
- Large LCD Display
 - 77 x 58 mm
 - 17.5 mm digits in the numerical display
- Backlight (with AC adaptor)

3 Display Functions for the Needle



Tail



Bargraph



High/Low

New **11TUNER** Power Monitor presents both a large LCD display and an ultrafast needle, up to 10X faster than anything else on the market. It comes with more features than the competition, like min and

max holds for both displays, comet tail needle and bargraph function. As always, the new **11TUNER** comes in STANDAs ergonomic design, with a large LCD display and easy to use direct access keys.

MODEL	11TUNER
Power Meter Specification	
Power range	1 μ W to 10 kW
Digital resolution	
XLP Series	1 μ W
PMK Series	1 mW
Monitor accuracy	± 0.5 % (± 5 μ V) full scale
Statistics	None
Detector Compatibility	
Thermopiles	Average Power
General Specifications	
Digital display	77x58 mm LCD
Needle display	Ultrafast Tuning Needle
Needle accuracy	0.9 %
Refresh rate	4 Hz
Analog output	0-1 volt, full scale, ± 1 %
Dimensions (WxHxD, mm, without stand)	210x122x44
Weight, kg (with batteries)	0.5
Battery pack	4 Alkaline AA Batteries
Battery life (estimated)	300 hours with Detector
External power supply	100/240 VAC, 50-60 Hz to 9 VDC, 1.66 A

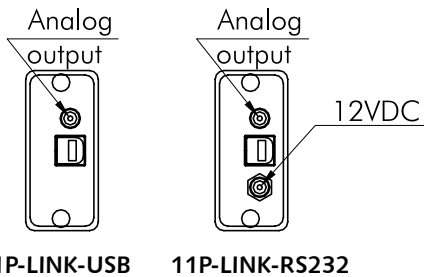
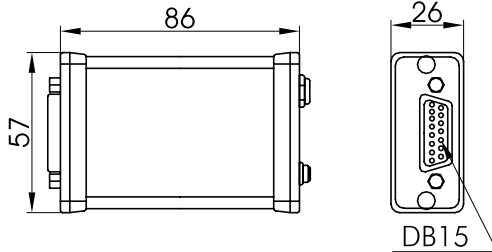
Online datasheets are available. Please, visit us at www.standa.it

PC Based Power Monitor

11P-LINK



- Single Channel, USB or RS232
- PC-Based Microsoft Windows™
- Ergonomically designed
- Full Statistical Functions
- Easy Data Acquisition Capabilities
- PC Serial Commands
- Power/Photo Detectors
- Compatible with 11PMK series power detectors
- Energy Mode



SPECIFICATIONS

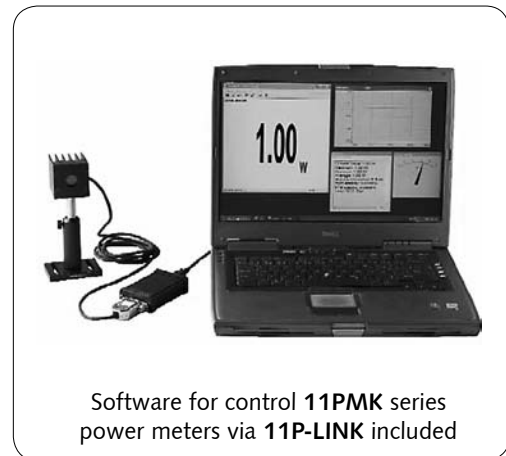
Power range (thermal head)	1 mW to 10 kW
Power range (photo detector head)	300 pW to 3 W
Resolution (digital)	5 μ W on the 30 mW scale
Monitor Accuracy	± 0.5 %
Response time (accelerated)	1 sec
Statistics	Current value, Max., Min., Avg., Std. Dev., RMS & PTP Stability, Time
Software	Full Window application PC-LINK software
Communication	USB or RS232
	Communication between Host Computer and 11P-LINK
Digital display	Computer Screen
Data storage	Limited by PC capacity
Data displays	Real time, Histogram, Statistics
User input correction factors	1 Multiplier and 1 Offset
Analog output	0-2 volt, full scale, ± 1 %
Internet upgrades	PC-LINK upgrades via USB or RS232
PC serial commands	USB and RS232

MODEL	11P-LINK-USB	11P-LINK-RS232
Communication between host PC and 11P-LINK	USB	RS232
External Power Supply	Not required	100-240 VAC, 50-60 Hz to 12 VDC, 800 mA-1A
Weight, kg	0.106	0.120

11P-LINK compact interface box is the choice for users who want to do all the control as well as the analysis from their computer. With its impressive features for statistics calculation and display options, the **11P-LINK** is also an answer to scientific or **OEM** users who need a low-cost computer based power monitor.

Because of very compact size and advanced features the **11P-LINK** is the perfect choice for integration in machines. You can control it with our **PC-LINK** software or with **PC** serial commands. You can even connect many **11P-LINK** units to a single computer, which makes it a device of choice for the simultaneous monitoring of many detectors.

The **11P-LINK** will recognize the power meter as soon as it is plugged in. Only menus that function for that head will appear. Moreover, the **11P-LINK** will auto-calibrate using the data stored in the intelligent connector to ensure the most accurate measurement possible.



Software for control **11PMK** series power meters via **11P-LINK** included

11PMK-H5 mid-power, compact family is designed for applications such as low power OEM, industrial machining, medical applications, concentrated beams high repetition rate pulses, etc.

11PMK-W5 high average power density family is designed for applications such as concentrated beams, high repetition rate pulses, photolithography, long pulse energy applications, low power OEM and medical applications, etc.

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Energy Detectors

11QE



11QE12(S)

NEW



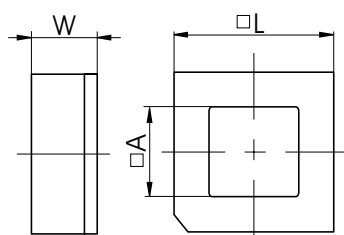
11QE25(H)



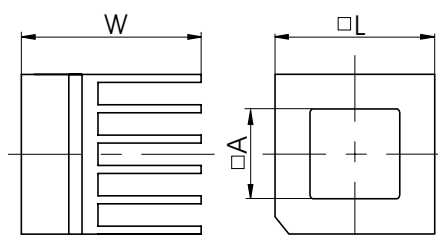
11QE50(S)

- High damage thresholds
- Durable
- Versatile
- Broadband
- Full NIST - Traceability
- Smart interface
- Effective aperture
 - 12x12 mm
 - 25x25 mm
 - 50x50 mm

Model	L, mm	A, mm	W, mm
11QE12 (S)	36	12	14
11QE12 (H)	36	12	32.9
11QE25 (S)	50	25	14
11QE25 (H)	50	25	52.5
11QE50 (S)	75	50	15
11QE50 (H)	75	50	44



11QE standalone (S)



11QE heatsink (H)

Model	11QE12	11QE25	11QE50
Measurement capability			
Spectral range	0.19 - 20 μm	0.19 - 20 μm	0.19 - 20 μm
Energy range	0.7 μJ - 3.5 J	2 μJ - 20 J	10 μJ - 75 J
Max. pulse widths	10 μs - 2 ms	10 μs - 4 ms	10 μs - 4 ms
Max. rep. rate	300 - 6000 Hz	300 - 6000 Hz	200 - 4000 Hz
Technical specifications			
Effective aperture	12x12 mm	25x25 mm	50x50 mm
Rise time (0-100%)	20 - 550 μs	20 - 550 μs	20 - 900 μs
Sensitivity	60 - 100 V/J	10 - 20 V/J	3 - 4 V/J
Calibration uncertainty		$\pm 3\%$	
Damage thresholds			
Max. energy density (1064 nm, 7 ns, single shot)		2 - 16 J/cm ²	
Max. energy density (1064 nm, 7 ns, 10 Hz)		2 - 8 J/cm ²	
Max. energy density (532 nm, 7 ns, 10 Hz)		0.35 - 6 J/cm ²	
Max. energy density (266 nm, 7 ns, 10 Hz)		0.3 - 1 J/cm ²	
Max. avg. power	3-12.5 W	5 - 30 W	10 - 45 W

For higher energy applications please request for **11QED** attenuator. The attenuator provides 30 - 40% transmission in 190 - 2500 nm range.

Model	Aperture, mm
11QED-12	12x12
11QED-25	25x25
11QED-50	50x50

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ORDERING INFORMATION

Model	Aperture, mm	Energy range		Max. rep. rate, Hz	Sensitivity, V/J	Noise equivalent energy, μ J	Maximum pulse width, μ s
		Alone	Attenuator				
11QE12-LP-S-MB	12x12	0.7 μ J - 0.85 J	0.7 μ J - 3.9 J	300	60	0.7	400
11QE12-LP-H-MB	12x12	0.7 μ J - 0.85 J	0.7 μ J - 3.9 J	300	60	0.7	400
11QE12-SP-S-MT	12x12	0.8 μ J - 0.7 J	0.8 μ J - 1.6 J	6000	100	0.8	10
11QE12-SP-H-MT	12x12	0.8 μ J - 0.7 J	0.8 μ J - 1.6 J	6000	100	0.8	10
11QE25-LP-S-MB	25x25	4 μ J - 3.8 J	4 μ J - 23 J	300	10	4	400
11QE25-LP-H-MB	25x25	4 μ J - 3.8 J	4 μ J - 23 J	300	10	4	400
11QE25-SP-S-MT	25x25	2 μ J - 3 J	2 μ J - 10 J	6000	20	2	10
11QE25-SP-H-MT	25x25	2 μ J - 3 J	2 μ J - 10 J	6000	20	2	10
11QE50-LP-S-MB	50x50	15 μ J - 15 J	15 μ J - 85 J	200	3	15	675
11QE50-LP-H-MB	50x50	15 μ J - 15 J	15 μ J - 85 J	200	3	15	675
11QE50-SP-S-MT	50x50	10 μ J - 13 J	10 μ J - 75 J	4000	4	10	10
11QE50-SP-H-MT	50x50	10 μ J - 13 J	10 μ J - 75 J	4000	4	10	10

Energy Detectors

11QE4



NEW

- Our Smallest Energy Detector
- Complete pyroelectric detector
- Size only 20x17.5x30 mm
- Low Noise Level
Only 1 mJ noise (MT coating)
- High Sensitivity
200 V/J (MT coating)
- Available with Metallic Absorber
High Repetition Rate (6000 Hz)
- BNC Mounted

STANDA has packaged its latest energy detection technology into a BNC connector! **Tiny** and **robust**, it is ideal for the most confining and tough OEM applications. Apply your laser in a single pulse or at high repetition rates. Their small size and low thermal mass absorbers make these some of the fastest and most sensitive energy detectors in the STANDA family.

We offer **two versions** so that you can get the best performance for your application. The **11QE4-BL** is for small aperture applications that need a high repetition rate. The

11QE4-MT is for applications with low energy that require the highest repetition rate. You can easily run the signal into an oscilloscope or your data acquisition system. Getting the signal out is as easy as connecting a BNC cable.

Model	11QE4-SP-S-BL	11QE4-SP-S-MT
Measurement capability		
Spectral range	0.19 - 20 μ m	0.19 - 20 μ m
Maximum measurable energy		
1064 nm, 7 ns, 10 Hz	16 mJ	43 mJ
266 nm, 7 ns, 10 Hz	0.7 mJ	7.6 mJ
Noise equivalent energy	15 μ J	1 μ J
Max repetition frequency	1200 Hz	6000 Hz
Maximum pulse width (typical)	100 μ s	10 μ s
Technical specifications		
Effective aperture	\varnothing 3.7 mm	\varnothing 3.7 mm
Rise time (0-100%)	200 μ s	20 μ s
Sensitivity	150 V/J	200 V/J
Calibration uncertainty	\pm 4%	\pm 4%
Repeatability	<0.5%	<0.5%
Weight	20 g	20 g
Damage thresholds		
Max. energy density (1064 nm)	150 mJ/cm ²	400 mJ/cm ²
Max. energy density (266 nm)	6 mJ/cm ²	70 mJ/cm ²
Max. avg. power	0.3 W	0.3 W

Compatible with 11SOLO2 power/energy meter



Online datasheets are available. Please, visit us at www.standa.it



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Optical
Tables

1
Brackets
& Rails

2
Base
Mounts &
Accessories

3
Optical
Mounts

4

Optical
Positioners

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Base
Positioners

6

Translation &
Rotation
Stages

7

Motorised
Positioners &
Controllers

8

Fine
Adjustment
Screws

9

Opto-
Mechanics &
Sets

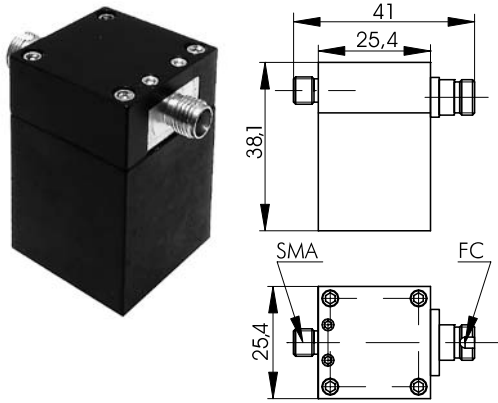
10

Light Test &
Measurement
Instruments

11

High-speed Photodetectors

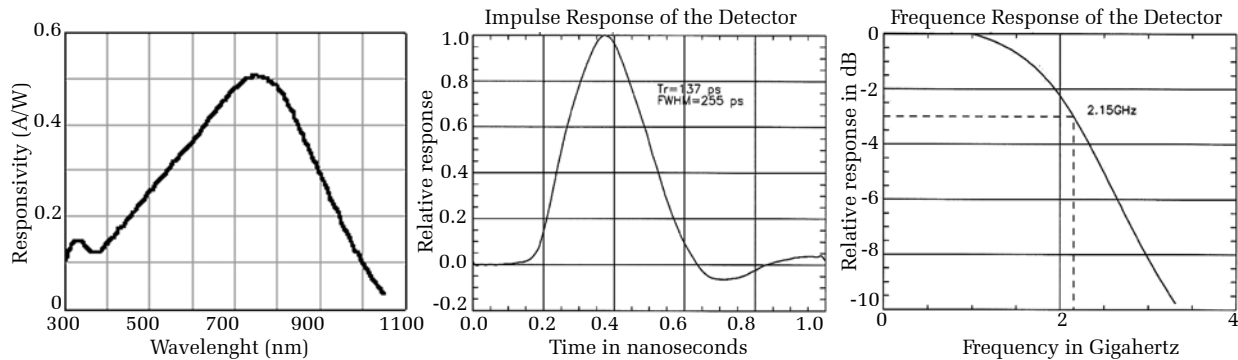
11HSP



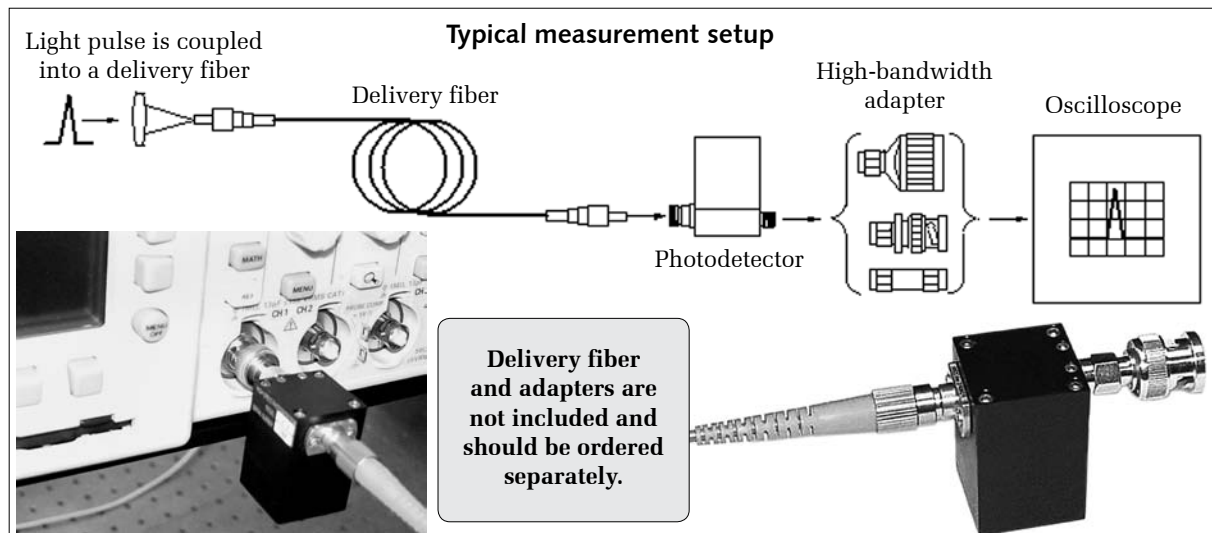
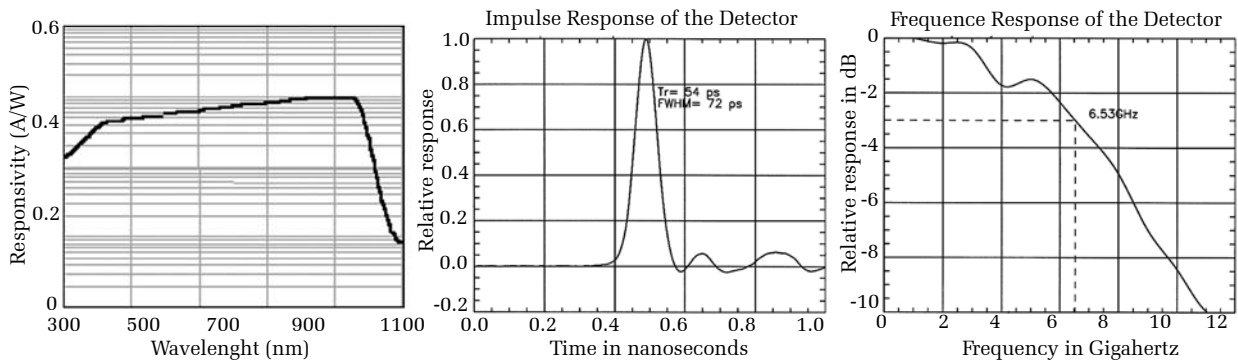
Model	11HSP-V2	11HSP-IR6
Wavelength range	320-1100 nm	900-1650 nm
Photodetectors materials	Si	InGaAs
Photodetectors diameter	0.4 mm	0.08 mm
Bandwidth	>2 GHz	~6 GHz
Rise and fall time	<150 ps	<70 ps
Afterpulse ringing (% of maximum)	<20	<20
Fiber input receptacle		FC
Output impedance		50 Ohms
Maximum safe output		2 V
Battery power supply		20 V
Battery shelf life		~5 years

- Only gigahertz-bandwidth qualified components are used in those high-speed photodetectors
- An impedance matched microstrip line is used to couple the diode's output to the output connector
- A microwave quality SMA electro-magnetic wave launcher is used to couple the signal to the scope
- Each detector is tested using a 20-GHz sampling scope and passed only if the peak-to-peak distortion due to ringing is <4%

Visible 11HSP-V2 photodetector spectral and impulse response



Near-IR 11HSP-IR6 photodetector spectral and impulse response



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