

## 919E Series Pyroelectric Sensor Specifications

<b>Model</b>	<b>919E-20U-10-20K</b>	
<b>Effective Aperture Diameter</b>	Ø 10mm	
<b>Wavelength Range</b>	0.19– 1.1 µm	
<b>Absorber Type</b>	Si photodiode	
<b>Surface Reflectivity</b>	50% approx.	
<b>Calibration Accuracy <sup>(a)</sup></b>	±5%	
<b>Energy Scale</b>	20µJ to 20nJ	
<b>Lowest Measurable Energy<sup>(b)</sup></b>	1nJ at 900nm	
<b>Max Pulse Width</b>	5µs	
<b>Max pulse Rate</b>	20KHz	
<b>Noise on Lowest Range</b>	0.05nJ	
<b>Additional Error with Frequency<sup>(c)</sup></b>	±1% to 20KHz	
<b>Damage Threshold</b>	0.1 J/cm <sup>2</sup>	
<b>Linearity With Energy for <sup>(b)</sup> &gt;10% of full scale</b>	±1.5%	
<b>Maximum Average Power</b>	50mW at 800nm	
<b>Maximum Average Power Density</b>	50 W/cm <sup>2</sup>	
<b>Maximum Energy vs. Wavelength</b>	Wavelength	Maximum Energy
	<300nm	15 µJ
	350-550nm	8 µJ
	>800nm	5 µJ
<b>Dimension</b>	Ø62 x 22mm	
<b>Weight</b>	0.25 kg	

Notes:

- a: This is basic calibration accuracy. In certain wavelength regions calibration there is additional error.      <250nm      add ±3%  
    >950nm      add ±2%.
- b: With the “user threshold” setting set to minimum. For other settings, the spec is for >10% of full scale or greater than twice the “user threshold”, whichever is greater.
- c: Additional Error with Frequency of ±1% only for energies up to 2µJ. For higher energies ±1% up to 10kHz, -4% at 20kHz.

## 919E Series Pyroelectric Sensor Specifications

Model	919E-200U-8-25K			919E-0.1-12-25K		919E-0.1-12-250	
Effective Aperture Diameter	Ø 8mm			Ø 12mm		Ø 12mm	
Wavelength Range	0.15– 12 µm			0.15 – 12 µm		0.15 – 3 µm, 10.6 µm <sup>(d)</sup>	
Absorber Type	Metallic			Metallic		BF	
Surface Reflectivity	50% approx.			50% approx.		20% approx.	
Calibration Accuracy <sup>(a)</sup>	±3%			±4%		±3%	
Max Pulse Width Setting	1µs	2µs	20µs	1µs	30 µs	1ms	5ms
Energy Scale	200µJ to 200nJ	200µJ to 200nJ	200µJ to 2µJ	10mJ to 2µJ	10mJ to 20µJ	10mJ to 20µJ	10mJ to 200µJ
Lowest Measurable Energy <sup>(b)</sup>	0.1µJ	<0.1µJ	0.1µJ	1µJ	1µJ	7µJ	20µJ
Max Pulse Width	1µs	2µs	20µs	1µs	30µs	1ms	5ms
Max pulse Rate	25KHz	15KHz	10KHz	25KHz	5KHz	250Hz	50Hz
Noise on Lowest Range	0.01µJ	0.01µJ	0.02µJ	0.1µJ	0.15µJ	1µJ	5µJ
Additional Error with Frequency	±1.5% to 20KHz	±1.5% to 15KHz	±1.5% to 10KHz	±2% to 15KHz ±3% to 25KHz	±1% to 5KHz	±1%	±1%
<b>Damage Threshold</b>							
<100ns	0.1 J/cm <sup>2</sup>			0.1 J/cm <sup>2</sup>		0.8 J/cm <sup>2(c)</sup>	
1µs	0.2 J/cm <sup>2</sup>			0.2 J/cm <sup>2</sup>		1 J/cm <sup>2(c)</sup>	
300µs	3 J/cm <sup>2</sup>			3 J/cm <sup>2</sup>		4 J/cm <sup>2(c)</sup>	
Linearity With Energy <sup>(b)</sup>	±1.5%			±1.5%		±3%	
Maximum Average Power	2W			2W		3W	
Maximum Average Power Density	30 W/cm <sup>2</sup>			50 W/cm <sup>2</sup>		50 W/cm <sup>2</sup>	
Dimension	Ø62 x 21mm			Ø62 x 21mm		Ø62 x 21mm	
Weight	0.25 kg			0.25 kg		0.25 kg	

Notes:

a: Calibrated curve is checked and adjusted at the following wavelengths (µm):

0.355, 1.064, 1.48-1.6 (919E-200U-8-25K).

1.064, 0.355 (919E-0.1-12-25K).

0.193, 0.248, 0.355, 0.532, 1.064 (919E-0.1-12-250).

For other wavelengths in the curve there is additional calibration error as stated:

240 – 800nm add ±4%, 2-3µm add ±8%, 10.6µm add ±15%, <240nm not calibrated (919E-200U-8-25K).

240 – 800nm add ±4%, 2-3µm add ±8%, 10.6µm add ±15%, <240nm not calibrated (919E-0.1-12-25K).

0.2-3µm ±2%, 10.6µm ±5% (919E-0.1-12-250).

b: For >7% (>10% for 919E-200U-8-25K) of full scale, with the “user threshold” setting set to minimum. For other settings, the spec is for >7%/>10% of full scale or greater than twice the “user threshold”, whichever is greater.

c: For wavelengths below 600nm, derate damage threshold to 60% of given values. Below 300nm, derate to 40% of given values.

d. The absorption at 675nm is approximately the same as at 10.6µm. Therefore, to measure a CO<sub>2</sub> laser, set to the 675nm setting.

The additional error for measuring 10.6µm is ±5%.

## 919E Series Pyroelectric Sensor Specifications

Model	919E-10-24-10K					919E-10-20-250				
Effective Aperture Diameter	Ø 24mm					Ø 20mm				
Wavelength Range	0.15– 3µm					0.24 – 2.2 µm				
Absorber Type	Metallic					BF with Diffuser				
Surface Reflectivity	50% approx.					25% approx.				
Calibration Accuracy <sup>(a)</sup>	±3%					±3%				
Max Pulse Width Setting	2µs	30µs	500µs	1ms	5ms	1ms	2ms	5ms	10ms	20ms
Energy Scale	10J to 200µJ	10J to 200µJ	10J to 2mJ	10J to 2mJ	10J to 2mJ	10J to 2mJ	10J to 2mJ	10J to 20mJ	10J to 20mJ	10J to 20mJ
Lowest Measurable Energy <sup>(b)</sup>	8µJ	10µJ	60µJ	80µJ	100µJ	100µJ	150µJ	200µJ	200µJ	300µJ
Max Pulse Width	0.002ms	0.03ms	0.5ms	1ms	5ms	1ms	2ms	5ms	10ms	20ms
Max pulse Rate	10kHz	5kHz	900Hz	450Hz	100Hz	250Hz	100Hz	50Hz	40Hz	20Hz
Noise on Lowest Range	0.5µJ	1µJ	6µJ	10µJ	20µJ	15µJ	30µJ	40µJ	40µJ	60µJ
Additional Error with Frequency	±2% to 5KHz ±4% to 10KHz	±1.5%	±2% to 750Hz	±1.5% to 400Hz	±1.5% to 80Hz	±1%	±1%	±1%	±1%	±2%
Damage Threshold <sup>(c)</sup>										
<100ns	0.1 J/cm <sup>2</sup>					4 J/cm <sup>2</sup>				
1µs	0.2 J/cm <sup>2</sup>					5 J/cm <sup>2</sup>				
300µs	2 J/cm <sup>2</sup>					20 J/cm <sup>2</sup>				
2ms	6 J/cm <sup>2</sup>					60 J/cm <sup>2</sup>				
Linearity With Energy for <sup>(b)</sup> >7% of full scale	±1.5%					±2%				
Maximum Average Power	15W					20W				
Maximum Average Power Density	20 W/cm <sup>2</sup>					120 W/cm <sup>2</sup>				
Uniformity over Surface	±2.5% over central 50% of aperture					±2.5% over central 10mm				
Dimension	Ø62 x 21mm					Ø62 x 28.5mm				
Weight	0.25 kg					0.25 kg				

Notes:

a: Calibrated curve is checked and adjusted at the following wavelengths (nm):

248-266, 355, 1064 and 2940 (919E-10-24-10K).

248-266, 355, 532, 1064 and 2100 (919E-10-20-250).

At other wavelengths, there may be an additional error up to the value given:

Max additional error at other wavelengths: ±2%. <240nm not calibrated (919E-10-24-10K).

Max additional error at other wavelengths not specified above: ±2%. <240nm not calibrated (919E-10-20-250).

b: With the “user threshold” setting set to minimum. For other settings, the spec is for >7% of full scale or greater than twice the “user threshold”, whichever is greater.

c: For 919E-200U-8-25K wavelengths below 600nm, derate to 60% of given values. For wavelengths below 240nm, derate to 1J/cm<sup>2</sup>.

For beam size <=4mm. For 8mm beam, derate to 50% of above values.

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## 919E Series Pyroelectric Sensor Specifications

Model	919E-10-35-10K					919E-10-35-250				
Effective Aperture Diameter	Ø 35mm					Ø 35mm				
Wavelength Range	0.19– 2.2µm, 2.94 µm					0.24 – 2.2 µm				
Absorber Type	Metallic with Diffuser					BF with Diffuser				
Surface Reflectivity	25% approx.					25% approx.				
Calibration Accuracy <sup>(a)</sup>	±3%					±3%				
Max Pulse Width Setting	2µs	30µs	500µs	1ms	5ms	1ms	2ms	5ms	10ms	20ms
Energy Scale	10J to 200µJ	10J to 200µJ	10J to 2mJ	10J to 2mJ	10J to 20mJ	10J to 2mJ	10J to 2mJ	10J to 20mJ	10J to 20mJ	10J to 20mJ
Lowest Measurable Energy <sup>(b)</sup>	20µJ	20µJ	100µJ	120µJ	200µJ	0.2mJ	0.4mJ	0.8mJ	0.8mJ	0.8mJ
Max Pulse Width	0.002ms	0.03ms	0.5ms	1ms	5ms	1ms	2ms	5ms	10ms	20ms
Max pulse Rate	10kHz	5kHz	900Hz	450Hz	100Hz	250Hz	100Hz	50Hz	40Hz	20Hz
Noise on Lowest Range	1µJ	2µJ	20µJ	20µJ	40µJ	40µJ	80µJ	200µJ	200µJ	200µJ
Additional Error with Frequency	±2% to 5KHz ±4% to 10KHz	±2%	±1% to 750Hz	±2% to 400Hz	±1% to 80Hz	±1%	±1%	±1%	±2%	±2%
Damage Threshold <sup>(c)</sup>										
<100ns	1 J/cm <sup>2</sup>					4 J/cm <sup>2</sup>				
1µs	2 J/cm <sup>2</sup>					5 J/cm <sup>2</sup>				
300µs	20 J/cm <sup>2</sup>					20 J/cm <sup>2</sup>				
2ms	40 J/cm <sup>2</sup>					60 J/cm <sup>2</sup>				
Linearity With Energy for <sup>(b)</sup> >7% of full scale	±1.5%					±2%				
Maximum Average Power	25W					25W				
Maximum Average Power Density	100 W/cm <sup>2</sup>					200 W/cm <sup>2</sup>				
Uniformity over Surface	±2.5% over central 20mm					±2.5% over central 20mm				
Dimension	Ø62 x 35mm					Ø62 x 35mm				
Weight	0.25 kg					0.25 kg				

Notes:

a: Calibrated curve is checked and adjusted at the following wavelengths (nm):

193nm, 248-266nm, 532nm, 1064nm and 2100nm (919E-10-35-10K).

355nm, 532nm, 1064nm and 2100nm (919E-10-35-250).

At other wavelengths, there may be an additional error up to the value given:

Max additional error at 193nm ±6%. Max additional error at other wavelengths not specified above: ±2%,

193nm reading may need 1min irradiation to stabilize (919E-10-35-10K).

Max additional error at other wavelengths not specified above: ±2%. <240nm not calibrated (919E-10-35-250).

b: With the "user threshold" setting set to minimum. For other settings, the spec is for >7% of full scale or greater than twice the "user threshold", whichever is greater.

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c: For 919E-10-35-10K wavelengths >2.1μm, derate to 40% of above values. For beam size <=5mm. For 10mm beam, derate to 40% of above value.  
 For 919E-10-35-250 wavelengths >2.1μm, derate to 10% of above values. For wavelengths below 600nm, derate to 60% of given values.  
 For wavelengths below 240nm, derate to 1J/cm<sup>2</sup>. For beam size <=5mm. For 10mm beam, derate DIF to 80% of above values.

## 919E Series Pyroelectric Sensor Specifications

Model	919E-30-46-10K									
Diffuser	Diffuser Out					Diffuser In				
Effective Aperture Diameter	Ø 46mm					Ø 33mm				
Wavelength Range	0.19– 3μm					0.4 – 3μm				
Absorber Type	Metallic					Metallic with Diffuser				
Surface Reflectivity	50% approx.					50% approx.				
Calibration Accuracy <sup>(a)</sup>	±3%					±4%				
Max Pulse Width Setting	2μs	30μs	500μs	1ms	5ms	2μs	30μs	500μs	1ms	5ms
Energy Scale	10J to 200μJ	10J to 200μJ	10J to 2mJ	10J to 2mJ	10J to 2mJ	30J to 600μJ	30J to 600μJ	30J to 6mJ	30J to 6mJ	30J to 6mJ
Lowest Measurable Energy <sup>(b)</sup>	0.01mJ	0.01mJ	0.06mJ	0.08mJ	0.1mJ	0.05mJ	0.05mJ	0.3mJ	0.4mJ	0.5mJ
Max Pulse Width	0.002ms	0.03ms	0.5ms	1ms	5ms	0.002ms	0.03ms	0.5ms	1ms	5ms
Max pulse Rate	10kHz	5kHz	800Hz	400Hz	100Hz	10kHz	5kHz	800Hz	400Hz	100Hz
Noise on Lowest Range	1μJ	1μJ	6μJ	10μJ	20μJ	5μJ	5μJ	30μJ	50μJ	100μJ
Additional Error with Frequency	±2% to 2KHz ±4.5% to 5KHz	±2%	±2%	±2%	±1% to 80Hz	±2% to 2KHz ±4.5% to 5KHz	±2%	±2%	±2%	±1% to 80Hz
Damage Threshold										
<100ns	0.1 J/cm <sup>2</sup>					1.5 J/cm <sup>2</sup>				
1μs	0.2 J/cm <sup>2</sup>					3 J/cm <sup>2</sup>				
300μs	2 J/cm <sup>2</sup>					20 J/cm <sup>2</sup>				
2ms	6 J/cm <sup>2</sup>					60 J/cm <sup>2</sup>				
Linearity With Energy for <sup>(b)</sup> >10% of full scale	±1.5%									
Maximum Average Power	15W					40W				
Maximum Average Power Density	20 W/cm <sup>2</sup>					500 W/cm <sup>2</sup>				
Dimension	Ø62 x 28.5mm									
Weight	0.3 kg									

Notes:

a: Calibrated curve is checked and adjusted at the following wavelengths (nm):  
 DIF OUT Calibrated at 532nm and 1064nm.  
 DIF IN Calibrated at 1064nm, 2100nm and 2940nm.

b: With the “user threshold” setting set to minimum. For other settings, the spec is for >10% of full scale or greater than twice the “user threshold”, whichever is greater.

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