SUPERIOR QUARTZ PRODUCTS, INC.

LAMP CHARACTERISTICS & DESCRIPTION

SQP's xenon short arc lamps, filled with xenon gas, reach eighty percent (80%) of total output immediately after ignition. The output of the xenon short arc lamps provide high intensity light similar to daylight with a color temperature of 6000 degrees Kelvin. Along with high output in the visible spectrum, xenon short arc lamps provide an excellent supply of infrared radiation. These lamps are specifically designed to run in either a vertical or horizontal position. SQP's air-cooled xenon short arc lamps range from 150 to 10,000 watts, and the luminous efficacy varies from 15 to over 60 lumens, depending on lamp wattage.

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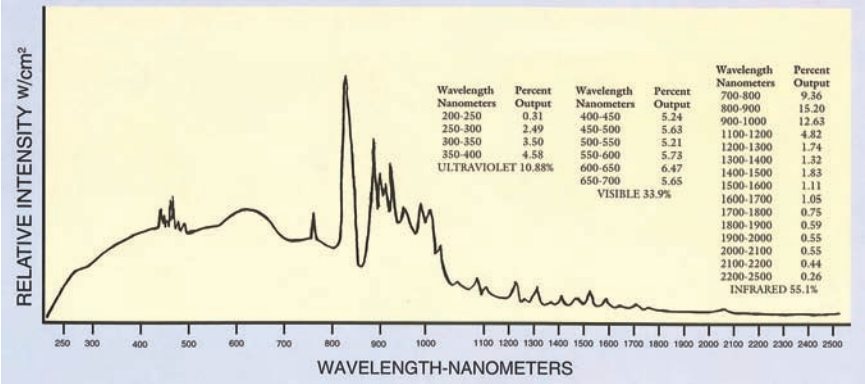
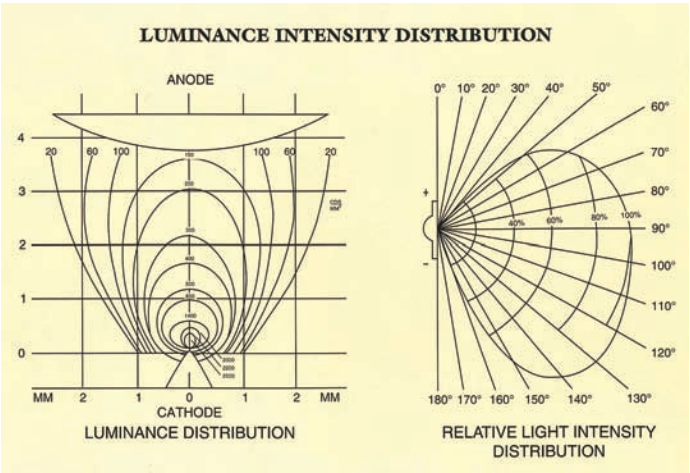


The white color output of xenon lamps makes them a perfect fit for film and image projection applications. In addition, xenon lamps are also used in solar and space simulators, search and spot-lights, and other specialized lighting applications needing a bright white light source.



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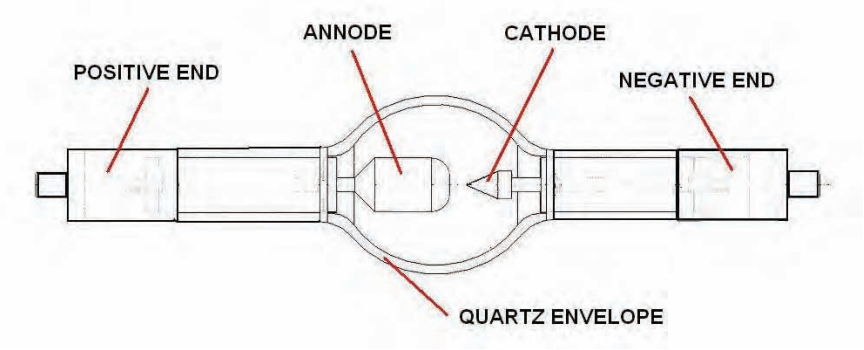
Highly specialized designs of the lamps, materials, individual components, and the system they are operated in all have a critical impact on the lamp's performance. The process of assembling the lamps still encompasses "old-world" craftsmanship; each lamp is individually made and inspected by highly skilled staff, and tested to make sure it conforms to proper specifications.

Power supplies for the lamps are always a DC source with variable current, and fixed voltage. Minimal ripple is essential for long lamp life and flicker-free operation. The power supplies must provide an open circuit voltage high enough for proper ignition, and support the current needs of the connected lamp. In addition, an external igniter is needed to induce the flame inside the lamp.

Even the fixture or lamphouse the lamp is operating in affects the performance. Mounting position will predicate specifics in the lamp design, as well as the need for magnetic stabilization to keep the arc burning straight and centered. A properly designed reflector and optics system will yield the most efficient and even light output. The lamp's need to be kept at a proper operating temperature is also crucial for best lamp performance.

LAMP DIAGRAM – BASIC LAYOUT & PARTS DIAGRAM

Parts of the lamp:



A Xenon Lamp is comprised of a simple construction in theory, yet the assemblies and parts are all highly specialized. The diagram below shows the basic layout only, hiding many of the details. Listed below is a simplified overview of a typical Xenon lamp:

Quartz Envelope – The thick clear glass that the lamp is built within. The quartz has high strength to withhold the high internal operating pressures, as well as having very specific optical properties for the transmittal of a specific spectrum of light.

Positive & Negative Ends – The ends of the bulb serve many purposes. The thick outer end caps provide a means to mechanically mount the bulb into a fixture, as well as make proper electrical connections. Inside these shells are the lamp seals. The seals are a complex assembly specially designed to seal the inner cavity so no gasses escape, yet allow the electrode leads to pass through to connect the end cap to. The two most common seals used are the "cup" seal, and the "foil" seal. While each are different in construction, both do the same purpose and are each used only in the bulb family sizes where their construction and conductive properties are properly sized.

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Electrodes – The Anode & Cathode are the two electrodes that the arc, or flame, flows across. The smaller, or Cathode, is negatively charged, and the tip is where the flame originates from. The larger, or Anode, is positively charged, and receives, or lands, the flame. Both Electrodes are made from pure Tungsten, and then specially treated to survive the lamp's operating characteristics.

TROUBLESHOOTING

All lamps are rated for a certain number of hours in a service life. As long as the lamp and environment it operates in are within specification, the lamp will provide a long and dependable life. When a problem occurs, it is most important to identify the problem, all possible causes, and if any steps can be taken to prevent a repeated problem cycle.

The problems can generally be divided into two separate areas; a problem with the environment the lamp is operated in (lamphouse / lamp fixture / power supply), or a specific problem or defect with the lamp itself. In many cases, a problem with the environment will ultimately lead to lamp damage and finally failure. This is the premise of when a lamp problem occurs, a "whole-system" approach should be used when problem solving.

In the next section, both areas will be investigated in depth, with the goal being to definitively identify the problem, and then progress with a solution. If the problem is system related, then the appropriate repairs will need to be accomplished, or continued lamp problems and damage will persist. If the problem is within the lamp itself, and not a repeated problem, then replacing the lamp is the solution.

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PROJECTION SYSTEM:

When encountering lamp problems, such as flicker, starting problems, or short lamp life, there are many areas of the entire system to look at. Typically the problem is not the bulb itself; rather the damage to the bulb is caused by its environment. The following areas and related questions should be used as a starting point to help analyze the problem, and ultimately find the problem to restore the system.

1. Building & Environment

The power levels available within a building will have a direct effect on the lamp performance. The final available voltage levels fed to the projection equipment power supplies will dictate the available power for the lamp. Lighting systems with magnetic power supplies is generally more susceptible to lamp striking problems when the input voltage is much lower that the recommended levels. Another similar problem is when the voltage levels fluctuate, and/or the three-phase input power is no longer balanced, a magnetic supply will reflect that in the lamp's performance. If the projection system's input voltage is much lower, and the supply transformer is tapped, then changing these taps to a higher position may help considerably. An electronic (switching) power supply is generally much less affected by variances in the incoming voltage levels, as long as the levels do not stray too far from the manufacturer's recommendations.

Aside from proper power feed, other building areas can affect lamp health. Accumulated Lamphouse heat must be evacuated, and that is reliant upon a properly sized and functioning exhaust system in the building. Too much heat will shorten lamp life. This ventilation system must also keep moisture out, as any water can cause both electrical and lamp damage. Cleanliness is also paramount, as any chemicals deposited on the quartz envelope can have detrimental effects on the lamp.

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2. Power Supply / Igniter

The condition and performance of the power supplies is probably the single largest factor in a lamp's health. Proper maintenance and correcting of problems when one occurs is a key to the longetivity and smooth performance of a power supply. Failed internal components, such as diodes, contactor, or capacitors and critical internal electronic components will upon failure, have an immediate and noticeable affect on the lamp's performance. Gradual degradation of components, such as filter capacitors, electrical connections, and internal components will reduce the efficiency over a long time period. Other factors, such as an un-balanced input, inadequate or restricted cooling, and loose, burned, or corroded electrical connections can contribute to poor performance as well. The most important aspect of any power supply is the DC rectification. Xenon Lamps require a power feed that is as devoid of fluctuations or overlaying AC voltage (ripple) as possible for best operation. Excessive ripple will damage the lamp electrodes, and lead to flicker and an unsteady lamp arc. If a diode or similar component has failed, this is a major cause of ripple in the DC output. This should be a primary focus when the lamp's Electrodes show damage. Also, the filter capacitors should also be checked, as they are part of the system. Any shorted or burned wiring can also adversely affect the output power.

Poor or inadequate Igniter performance and output are the main causes of lamp ignition problems. The Igniter functions by overlaying a momentary high-frequency pulse of 35-60 Kilo-volts to jump the electrode arc in the lamp, and ignite the lamp. This pulse is created by taking a 110 or 220VAC input, and multiplying it via a step-up transformer and a spark gap to achieve this final voltage. The final step is to momentarily overlay this pulse over the supply DC voltage only long enough to ignite the lamp. Once the lamp sustains an arc, this ignition voltage is ended. Typically, all igniters have few

internal parts, so troubleshooting is usually simple, confined to a failure within a transformer, spark gap, or connections. Modern high-pressure lamps need a strong igniter output, so problems and maintenance are usually centered on the spark gap. Length and timing of the ignition pulse can also damage the electrodes in a lamp if the igniter continues to cycle after the lamp is lit.

3. Lamphouse / Fixture

Problems within the lamphouse or lamp fixture are one of the major causes of poor lamp performance and lamp problems. Major areas of focus include DC connections, magnetic stabilization, lamp position, and cooling. The entire path of the DC input has many facets that can cause problems. Cable connections, crimps, and insulation, as well as problems with internal components. A fault with any of these will result in overheating and corrosion of the connection, and a reduction in current flow. If there is magnetic stabilization for the lamp, it must be checked for correct orientation and position. Any changes in this aspect will have a visible effect on the lamp, and contribute to flame "flicker" and wander on the Anode, as well as starting problems. Lamp cooling is another very important area. If a lamp overheats, the seals and body structure can be weakened to the point of failure, as well as the performance of the lamp can be compromised. The entire cooling system, from the lamp cooling itself, through the system/enclosure evacuation system must be functioning properly. Even operating angle can have an effect. If the angle is greater than recommended, the flame can overpower the existing magnetic stabilization, and no longer be centered on the Anode face, and affect the visible output.

Cooling of the lamp is also a critical factor. Overheating of the lamp can cause many problems, from seal failure to explosion. Make sure all cooling systems are operating properly

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4. Usage Patterns & Characteristics

Probably one of the most critical areas to watch is current levels. If the lamp is run either over or under the specified current range, lamp life will be affected. The most damaging is over-current, as this will quickly destroy the Anode by either leaving deposits on, or the actual destruction of the anode. Running under the listed current levels will also damage the electrodes by "sputtering" or running too cool, and leaving deposits on the Cathode.

Probably one of the most critical areas to watch is current levels. If the lamp is run either over or under the specified current range, lamp life will be affected. The most damaging is over-current, as this will quickly destroy the electrodes.

5. General

Depending on the particular characteristics of the bulb, these factors can affect the lamp life and performance as well. Newer High-Intensity lamps, which have higher internal pressures and shorter arc gaps, will typically need a strong ignition pulse and high open-circuit voltage level to insure reliable starts. A properly functioning system is required to insure proper lamp performance and long life.

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LAMP PROBLEMS:

Once the environment the lamp is mounted and operates in has been thoroughly examined, and any problems have been properly rectified, then the lamp itself can be further examined as a cause for failure. Following is a list of lamp failures and the related causes.

A dis-colored bulb indicates a failure of one of the seals. The cause of the failure can be attributed to many factors. The most common cause for a failure is overheating or uneven cooling of the lamp that results in abnormal thermal stress of the seal area that eventually weakens the seal materials or quartz body itself, and leads to a seal failure. A second cause in the same area is mechanical stress when installing, mounting, or handling the lamp, which stresses and eventually weakens the seal area, resulting in a seal failure. Very uncommon, but possible, can be defects in construction or materials, but this scenario is usually discovered during initial lamp testing, or happens very quickly in the service life.

Seal failure indications:
A rapid seal failure will quickly result in a blue-yellow discoloration of the bulb envelope, or worse a catastrophic failure of the quartz body. In rare cases, the fill nipple may fail, allowing instant contamination of the lamp. At the same time, the operating current level of the lamp will also dramatically increase as the internal gas mixture changes due to air infiltration.

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Here is what's happening inside:

A gradual and even blackening of the lamp envelope, and the reduced output of light usually indicates a slow seal failure.

Re-check the cooling system to make sure the airflow is proper, unrestricted, and directed properly. Over-heating of the lamp is the primary cause of seal failures. In addition, make sure the method of mounting the lamp does not induce physical stress on the lamp

while operating. This to will loosen a seal, and lead directly to a seal or body failure.

Small darkened areas of the envelope usually indicate Over Current, Electrode failure, bad stabilization, or the need for rotation of the lamp over it's rated life. This is usually the first sign of bulb aging and/or a developing problem.

As the Lamp reaches the end of it's warranted life period, some degradation of many components of the lamp is to be expected, and the luminous output will begin to fall off. This is normal as the bulb ages. By the time the bulb has exceeded it's rated life by 25%, the bulb should be taken out of service if not already done so.

Damage to the Electrodes is caused by variety of problems, all usually related to the power supply or electrical connections. Depending on the severity of the problem, lamp life and performance will either gradually or rapidly deteriorate, as well as the development of arc instability.

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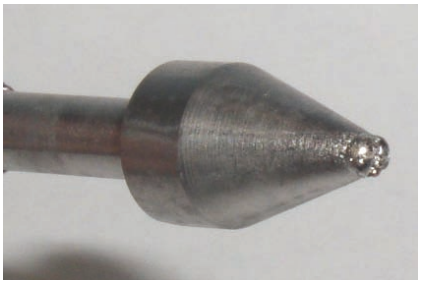
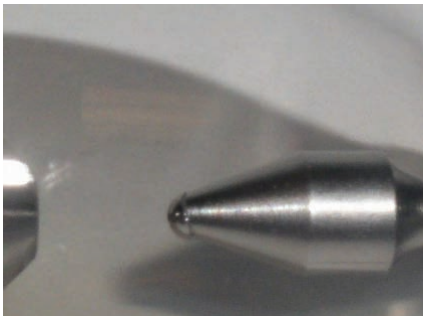
TYPICAL ELECTRODE PROBLEMS/SYMPTOMS:

CATHODE: The smaller end usually only suffers damage from specific problems caused by the power supply. Most commonly, the pointed end will "mushroom" or deform due to excessive current set by the operator, excessive ripple in the DC output of the power supply, or excessive ignition strikes.



Reversed polarity of the DC connections will also quickly cause a melted cathode



ANODE: The larger electrode suffers the brunt of the Electrode related problems, as it is on the receiving end of the arc flame. Proper evaluation of the damage can typically identify the problem, or at least simplify the analysis.

When excessive ripple is present in the DC input, the result will be a visible flicker in the flame caused by arc instability. If present for long periods, both damage to the Anode face, as well as build-up of deposits in a dual or triple pattern will cause arc-flame deflection and flame wander. Once the damage occurs, the lamp will not return to a steady state. This is the most common type of lamp problem.

Incorrect current outside the lamp's rating will also damage the anode by the flame literally blasting the anode material away, or leaving deposits due to incorrect operating temperature.

Lamp position and/or incorrect magnetic stabilization will also affect the lamp. If the lamp is operated at an excessive angle, the flame will drift away from the center of the anode, and leave deposits that will lead to flicker. In the same principle, if there is missing or incorrect magnetic stabilization, the flame will react in the same manner, drifting away from the center and leaving deposits that will permanently cause flame instability.

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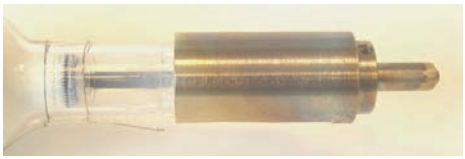
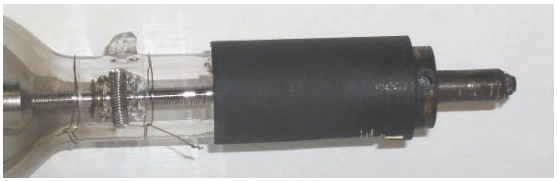
Dis-Colored End Fittings are the result of improper cooling / lamp overheating, or in rare cases, the reflector focusing the light on the lamp end. Mild over-heating will turn the fittings a blue color.



While excessive overheating will turn the end caps black, and cause the seal underneath to fail. In extreme cases, the danger of explosion is present.



Explosion – A Catastrophic failure of the bulb is the most un-common, yet most spectacular failure that occurs. The reasons this phenomena occur are usually very specific, including drastic overheating, a high amount of mechanical stress on the bulb, oil and dirt on the quartz body of the lamp, or excessive over-current of the lamp leading to internal component failure. In addition, running the lamp past the recommended life span of the lamp will increase this risk considerably.

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CONCLUSION

A Hard-Starting Lamp can have many causes, either the lamp itself, or within the projection system. External of the lamp, problems typically originate with the power supply, igniter, and DC cabling. These areas are covered in the Projection system trouble-shooting section. From the lamp end, a hard-starting lamp usually indicates either an internal problem, or the lamp has reached the end of its useable life. Refer to this guide to try to find the exact problem, as well as to check the hours and number of strikes on the lamp to determine its age and life span.

SUPERIOR QUARTZ PRODUCTS, INC.

CROSS REFERENCE OF SQP BULBS TO OTHER MANUFACTURERS

Lamp Type	Competitors Part				
	Ushio	Christie	Osram	ORC	Other
SQP-SX1501				XM150-3HS	L5122-000, 6256
SQP-SX1502	UXL-151H		XBO150W/S	XMN150-3HS	901C-0011
SQP-SX1505				XMN-150-13HS	
SQP-SX1507					Solar Light
SQP-SX1508	UXL-S150MO		XBO150W/CR OFR	XM150-7HS	
SQP-SX2001					Solar Light
SQP-SX2501	KXL-252HF				
SQP-SX2502	KD250S/H-OL				
SQP-SX3004	UXL-302-O				
SQP-SX3004HA					
SQP-SX3501	UXL-351E-O				
SQP-SX4502	UXL-450-SO		XBO-450W/2 OFR	XM450HS	
SQP-SX5001					L5269-000
SQP-SX5002					959C1980
SQP-SX5003				XM500HS	
SQP-SX5004					L5307-400
SQP-SX5005					Spectrolab
SQP-SX5006	UXL-5SB	CXL-5	XBO500W/H OFR	XM500-3HS	
SQP-SX5007					TEC
SQP-SX5008					L5307-200
SQP-SX5009					
SQP-SX5501	UXL-555				
SQP-SX5502	UXL-553				
SQP-SX7001	UXL-7SSB	CXL-7S	XBO700W/HS OFR	XM700HS	
SQP-SX7501	KXL-752HF				
SQP-SX9002		CXL-900A	XBO900W/CA OFR	XM900H/VC	
SQP-SX10001				XM1000-21HS	6271
SQP-SX10002				XMN1000-21HS	6269
SQP-SX10003					976C-0990
SQP-SX10004					982C-0990

SUPERIOR QUARTZ PRODUCTS, INC.

CROSS REFERENCE OF SQP BULBS TO OTHER MANUFACTURERS

Lamp Type	Competitors Part				
	Ushio	Christie	Osram	ORC	Other
SQP-SX10005				XM1000-23HS	
SQP-SX10006				XM1000-17HS	
SQP-SX10007				XM1000PII	
SQP-SX10008					
SQP-SX10009	UXL-10SB	CXL-10S	XBO1000W/HS OFR	XM1000HS	
SQP-SX10009C	UXL-10SCB	CXL-10SC	XBO1000W/HSC OFR	XM1000HSC	
SQP-SX100010				XM1000-39HS	
SQP-SX100011			XBO1000W/HAS	XM1000-5HS	
SQP-SX100012				1235485	
SQP-SX100013					
SQP-SX1000HTP	UXL-1000HA	CXL-10	XBO1000W/HTP OFR	XM1000HTP	
SQP-SX13001				XM1300HS	
SQP-SX13002HA					
SQP-SX16001	UXL-16SB	CXL-16S	XBO1600WHS OFR	XM1600HS	
SQP-SX16002	UXL-16SCB	CXL-16SC	XBO1600WHSC OFR	XM1600HSC	
SQP-SX16003					
SQP-SX16004		CXL-1600A	XBO1600W/CA OFR	XM1600HVC	
SQP-SX16005	UXL-1600-0	CXL-1600NC	XBO1600W OFR	XM1600H/V	
SQP-SX16006				XM1600-43HS	
SQP-SX16007					Oriel
SQP-SX16009				XM1600-19HS	
SQP-SX160011					Uinv Searchlight
SQP-SX160012	UXL-16SPD				
SQP-SX160013				XM1600-13HS	
SQP-SX20001					L5470-000
SQP-SX20002	UXL-2000HR	CXL-2000/20R	XBO2000W/H OFR	XM2000H/VC	
SQP-SX20003	UXL-20SC	CXL-20SC	XBO2000W/HS OFR	XM2000HS	
SQP-SX20005				XM2000-13HS	
SQP-SX20006				XM2000PII	
SQP-SX20007				XM2000-11HS	

SUPERIOR QUARTZ PRODUCTS, INC.

CROSS REFERENCE OF SQP BULBS TO OTHER MANUFACTURERS

Lamp Type	Competitors Part				
	Ushio	Christie	Osram	ORC	Other
SQP-SX20008			XBO2000W/SHSC OFR	XM2000-27HSC	
SQP-SX200010	UXL-2003HKL/O			XM2000-9HS	XD2000S/H OL
SQP-SX200011	UXL-16SJ				
SQP-SX200013	UXL-2003HKL-O				
SQP-SX2000HTP	UXL-2000HA	CXL-20	XBO2000W/HTP OFR	XM2000HTP	
SQP-SX22001			XBO2200W/HP OFR		
SQP-SX25001	UXL-25SC	CXL-25SC	XBO2500W/HS OFR	XM2500HS	
SQP-SX25003	UXL-2500-O	CXL-2500LC	XBO2500W OFR	XM2500HVC	
SQP-SX25005	UXL-2500HA			XM2500-9HS	
SQP-SX30001	UXL-3000HR	CXL-3000/30R	XBO3000W/H OFR	XM3000H/VC	
SQP-SX30002	UXL-30SC	CXL-30SC	XBO3000W/HS OFR	XM3000HSC	
SQP-SX30003	UXL-3000HK-O				
SQP-SX30005			XBO3000W/HP2		
SQP-SX30006	UXL-30BA	PXL-30BA	XBO3000W/HVSC		
SQP-SX3000HTP	UXL-3000HA	CXL-25,30	XBO3000W/HTP OFR	XM3000HTP	
SQP-SX4000HTP	UXL-4000HA	CXL-40	XBO4000W/HTP OFR	XM4000HTP	
SQP-SX4000XT					
SQP-SX4000HI				XM4500W-HS	
SQP-SX40002				XM4000-X12	
SQP-SX40003				XM4000-3HS	
SQP-SX40004				XM4000PII	
SQP-SX42001	UXL-40SC	CXL-40SC	XBO4000W/HS OFR	XM4500HS	
SQP-SX42004		CXL-4200A	XBO4200W/CA OFR	XM4200H/VC	
SQP-SX50001		CXL-50SC	XBO5000W/HS OFR	XM5000HS	
SQP-SX50001-OP				XMN5000HS	
SQP-SX50002			XBO5000W/H OFR		
SQP-SX50003			XBO5000W/HBM OFR		
SQP-SX60001			XBO6000W/HS OFR	XM6000-5HS	
SQP-SX60002	UXL-60SC	CXL-60SC			
SQP-SX60003		DXL-60BA2			

SUPERIOR QUARTZ PRODUCTS, INC.

CROSS REFERENCE OF SQP BULBS TO OTHER MANUFACTURERS

Lamp Type	Competitors Part				
	Ushio	Christie	Osram	ORC	Other
SQP-SX6000HTP	UXL-6000HA	CXL-60	XBO6000W/HPT OFR		
SQP-SXD6000HTP					
SQP-SX70001	UXL-70SC	CXL-70SC	XBO7000W/HS OFR	XM7000HS	
SQP-SX70002				XM7000HVC	
SQP-SX70001-I					
SQP-SX70001HI					IMAX SR
SQP-SX7000HTP	UXL-7000HA	CXL-70	XBO7000W/HTP OFR	XM7000HTP	
SQP-SX7000XT					
SQP-SX80001	UXL-80SC	CXL-80SC	XBO 8000W/HS OFR		
SQP-SX100003				XM10000HS	
SQP-SX10000FXT					

SUPERIOR QUARTZ PRODUCTS, INC.

SXD DIGITAL PROJECTION LAMPS

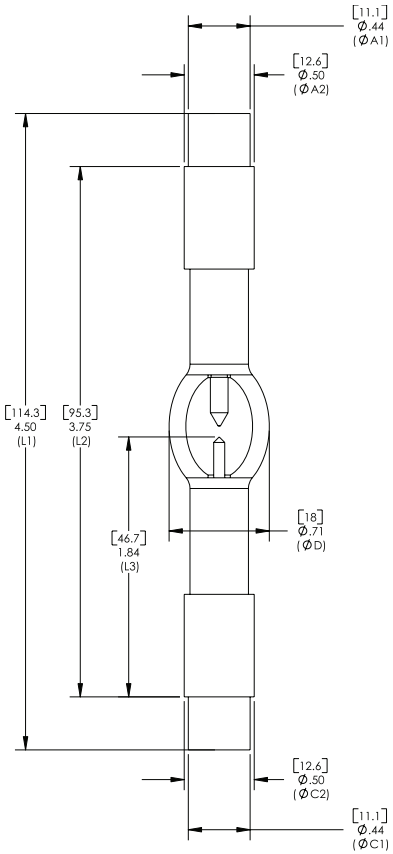
	SXD	CHRISTIE	OSRAM	NOTES
2000 Watts	SXD2000HTP	CDXL20	XBO2000W/DTP	Christie
	SXD2000DHS		XBO2000W/HPS	Sony SRX
3000 Watts	SXD3000HTP	CDXL30	XBO3000W/DTP	Christie
	SXD30005		XBO3000W/HP1	Barco
	SXD30006		XBO3000W/HP2	Barco
	SXD30007		XBO3000W/HP3	Barco
	SXD3000DHS		XBO3000W/DHS	Barco
	SXD3000DHP		XBO3000W/DHP	Barco
	SXD3000HPS		XBO3000W/HPS	Sony SRX
4000 Watts	SXD4000DHP		XBO4000W/DHP	
	SXD4200HPS		XBO4200W/HPS	
4500 Watts	SXD4500HTP	CDXL45	XBO4500W/DTP	Christie
	SX4500DHP		XBO4500W/DHP	Barco
5000 Watts				
6000 Watts	SXD60004		XBO6000W/HP	Barco
	SX6000DHP		XBO6000W/DHP	Barco
	SXD6000HTP	CDXL60	XBO6000W/DTP	Christie
6500 Watts			XBO6500W/DHP	Barco

SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX1501
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	150
Voltage	20
Amperage	7.5
Current Range	7-8
Open Circuit Voltage	60
Luminous Flux	2200
Luminous Intensity	300
Average Luminance	18000
Overall Length (L1)	4.50
Lamp Length (L2)	3.75
Tip to Shoulder Length (L3)	1.84
Bulb Diameter (D)	0.71
Cathode Pin (C1)	0.44
Cathode Base (C2)	0.50
Anode Pin (A1)	0.44
Anode Base (A2)	0.50
Arc Length	0.08
Lead Wire	N

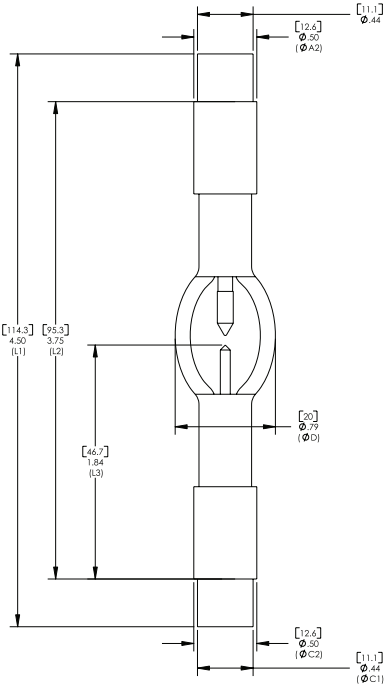


SQP-SX1502
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	CLEAR
Wattage	150
Voltage	20
Amperage	7.5
Current Range	7-8
Open Circuit Voltage	60
Luminous Flux	2200
Luminous Intensity	300
Average Luminance	18000
Overall Length (L1)	4.50
Lamp Length (L2)	3.75
Tip to Shoulder Length (L3)	1.84
Bulb Diameter (D)	0.79
Cathode Pin (C1)	0.44
Cathode Base (C2)	0.50
Anode Pin (A1)	0.44
Anode Base (A2)	0.50
Arc Length	0.08
Lead Wire	N

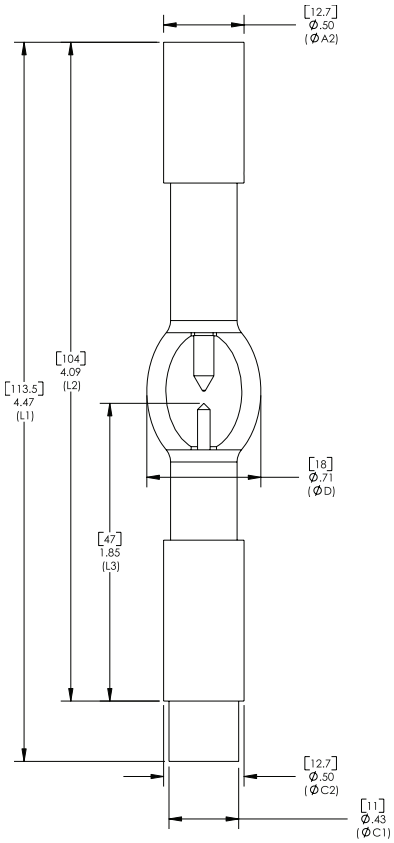


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX1505
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	265
Voltage	18
Amperage	15
Current Range	14-20
Open Circuit Voltage	60
Luminous Flux	4500
Luminous Intensity	500
Average Luminance	26000
Overall Length (L1)	4.47
Lamp Length (L2)	4.09
Tip to Shoulder Length (L3)	1.85
Bulb Diameter (D)	0.71
Cathode Pin (C1)	0.43
Cathode Base (C2)	0.50
Anode Pin (A1)	NONE
Anode Base (A2)	0.50
Arc Length	0.06
Lead Wire	N

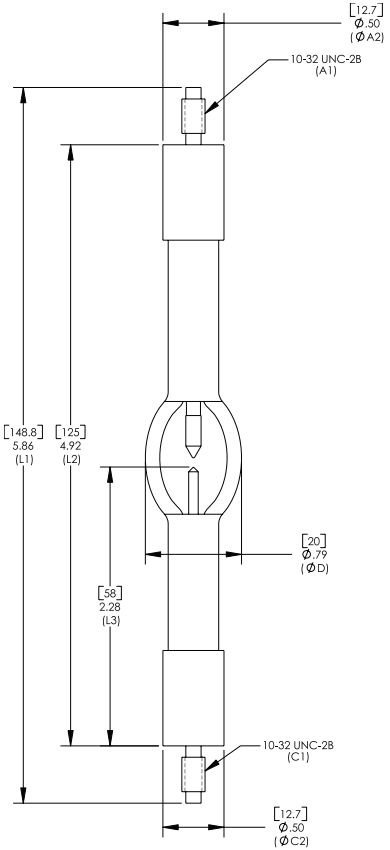


SQP-SX1506
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	Ozone Free
Wattage	265
Voltage	18
Amperage	15
Current Range	14-20
Open Circuit Voltage	60
Luminous Flux	4500
Luminous Intensity	500
Average Luminance	26000
Overall Length (L1)	4.47
Lamp Length (L2)	4.09
Tip to Shoulder Length (L3)	1.85
Bulb Diameter (D)	0.71
Cathode Pin (C1)	0.43
Cathode Base (C2)	0.50
Anode Pin (A1)	NONE
Anode Base (A2)	0.50
Arc Length	0.06
Lead Wire	N

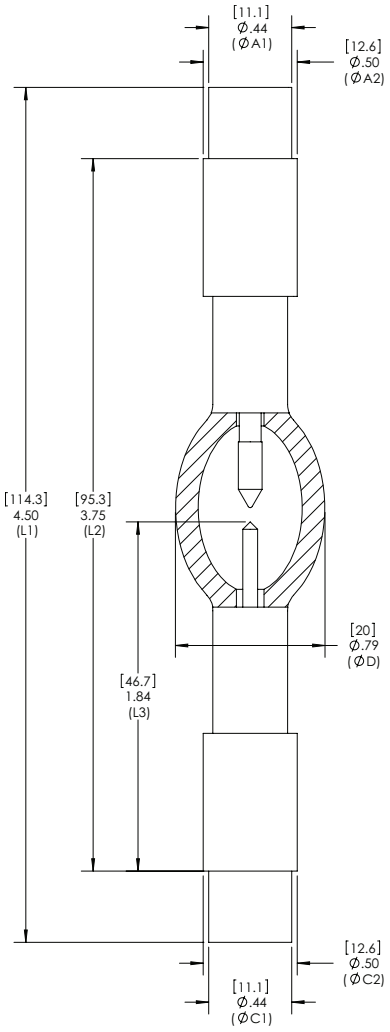


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX1507
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	150
Voltage	20
Amperage	7.5
Current Range	7-8
Open Circuit Voltage	60
Luminous Flux	2200
Luminous Intensity	300
Average Luminance	18800
Overall Length (L1)	4.50
Lamp Length (L2)	3.75
Tip to Shoulder Length (L3)	1.84
Bulb Diameter (D)	0.79
Cathode Pin (C1)	0.44
Cathode Base (C2)	0.50
Anode Pin (A1)	0.44
Anode Base (A2)	0.50
Arc Length	0.08
Lead Wire	N

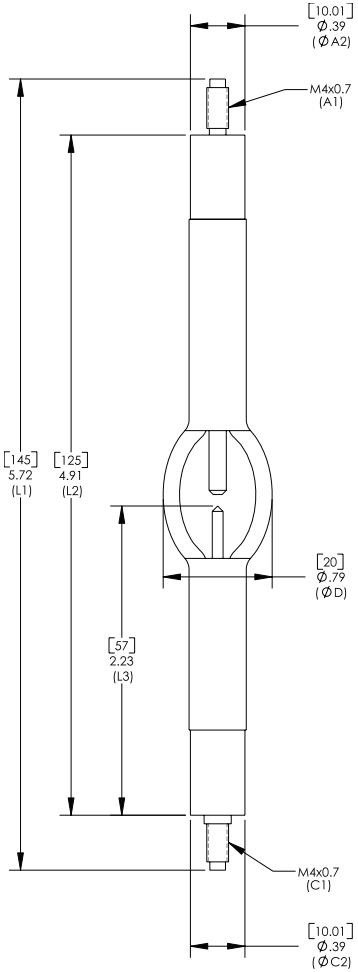


SQP-SX1508
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	Ozone Free
Wattage	150
Voltage	18
Amperage	8.5
Current Range	7-8
Open Circuit Voltage	60
Luminous Flux	2900
Luminous Intensity	290
Average Luminance	20000
Overall Length (L1)	5.72
Lamp Length (L2)	4.91
Tip to Shoulder Length (L3)	2.23
Bulb Diameter (D)	0.79
Cathode Pin (C1)	M4x0.7
Cathode Base (C2)	0.39
Anode Pin (A1)	M4x0.7
Anode Base (A2)	0.39
Arc Length	0.08
Lead Wire	N

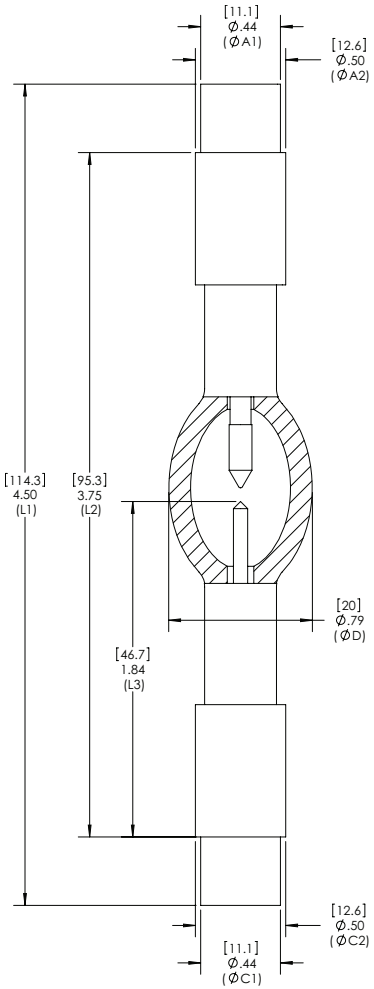


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX2001
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	200
Voltage	25
Amperage	8
Current Range	7-9
Open Circuit Voltage	60
Luminous Flux	3000
Luminous Intensity	400
Average Luminance	25000
Overall Length (L1)	4.50
Lamp Length (L2)	3.75
Tip to Shoulder Length (L3)	1.84
Bulb Diameter (D)	0.79
Cathode Pin (C1)	0.44
Cathode Base (C2)	0.50
Anode Pin (A1)	0.44
Anode Base (A2)	0.50
Arc Length	0.08
Lead Wire	N

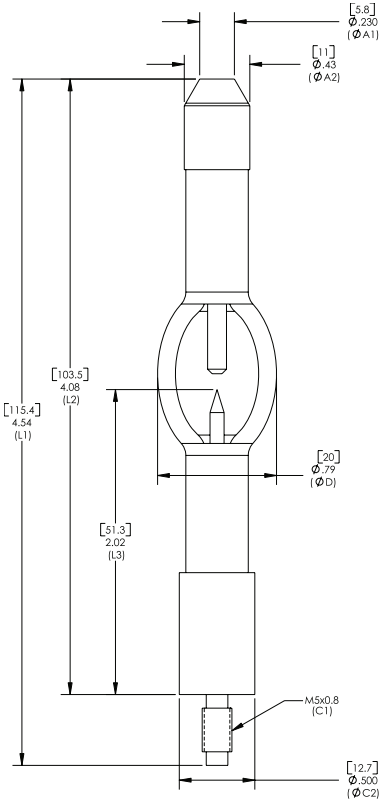


SQP-SX2501
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	Ozone Free
Wattage	250
Voltage	21
Amperage	12
Current Range	11-13
Open Circuit Voltage	60
Luminous Flux	4500
Luminous Intensity	500
Average Luminance	26000
Overall Length (L1)	4.54
Lamp Length (L2)	4.08
Tip to Shoulder Length (L3)	2.02
Bulb Diameter (D)	0.79
Cathode Pin (C1)	M5x0.8
Cathode Base (C2)	0.50
Anode Pin (A1)	0.23
Anode Base (A2)	0.43
Arc Length	0.10
Lead Wire	Y

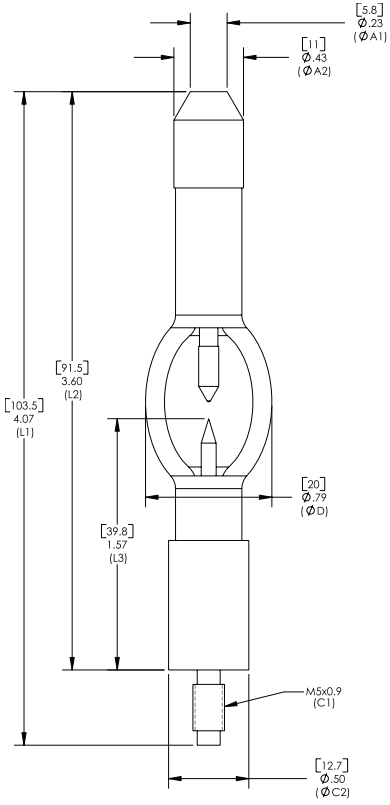


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX2502
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	250
Voltage	21
Amperage	12
Current Range	11-13
Open Circuit Voltage	60
Luminous Flux	4500
Luminous Intensity	500
Average Luminance	26000
Overall Length (L1)	4.07
Lamp Length (L2)	3.60
Tip to Shoulder Length (L3)	1.57
Bulb Diameter (D)	0.79
Cathode Pin (C1)	M5x0.9
Cathode Base (C2)	0.50
Anode Pin (A1)	0.23
Anode Base (A2)	0.43
Arc Length	0.10
Lead Wire	Y

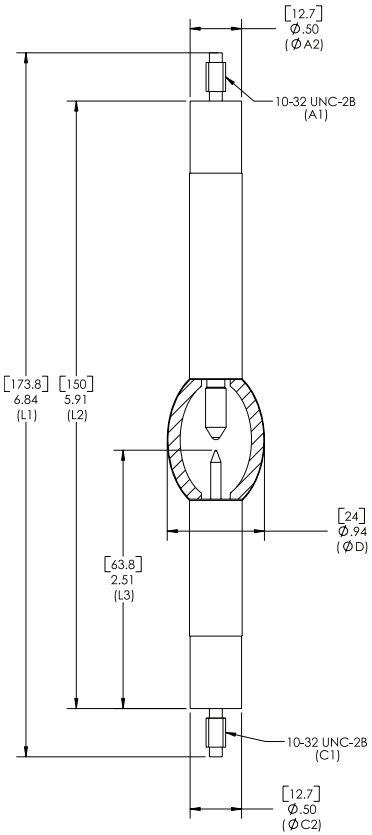


SQP-SX3004
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	Ozone Free
Wattage	300
Voltage	20
Amperage	15
Current Range	13-16
Open Circuit Voltage	60
Luminous Flux	7000
Luminous Intensity	700
Average Luminance	27000
Overall Length (L1)	6.84
Lamp Length (L2)	5.91
Tip to Shoulder Length (L3)	2.51
Bulb Diameter (D)	0.94
Cathode Pin (C1)	10-32 UNC-2B
Cathode Base (C2)	0.50
Anode Pin (A1)	10-32 UNC-2B
Anode Base (A2)	0.50
Arc Length	0.10
Lead Wire	N

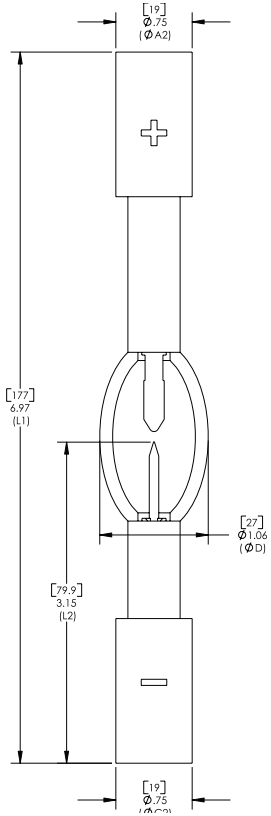


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX3501
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	350
Voltage	21
Amperage	17
Current Range	15-18
Open Circuit Voltage	60
Luminous Flux	7500
Luminous Intensity	900
Average Luminance	28000
Overall Length (L1)	5.09
Lamp Length (L2)	4.64
Tip to Shoulder Length (L3)	2.53
Bulb Diameter (D)	0.94
Cathode Pin (C1)	M5x0.9
Cathode Base (C2)	0.50
Anode Pin (A1)	NONE
Anode Base (A2)	NONE
Arc Length	0.10
Lead Wire	Y

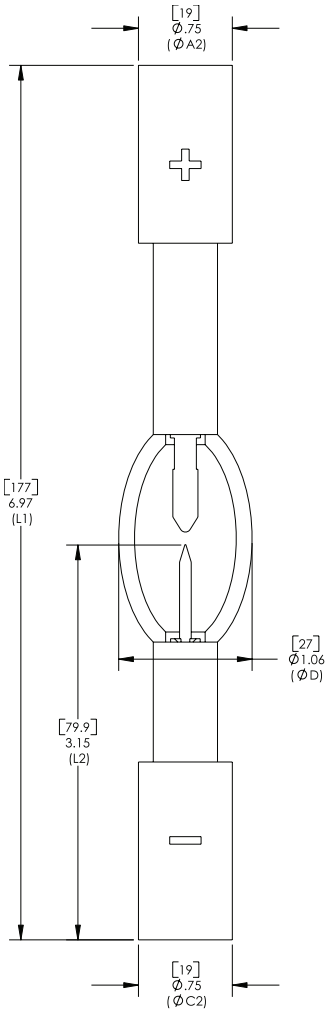


SQP-SX4502
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	Ozone Free
Wattage	450
Voltage	18
Amperage	25
Current Range	17-30
Open Circuit Voltage	70
Luminous Flux	13000
Luminous Intensity	1300
Average Luminance	35000
Overall Length (L1)	6.97
Lamp Length (L2)	NONE
Tip to Shoulder Length (L3)	3.15
Bulb Diameter (D)	1.06
Cathode Pin (C1)	NONE
Cathode Base (C2)	0.75
Anode Pin (A1)	NONE
Anode Base (A2)	0.75
Arc Length	0.10
Lead Wire	N

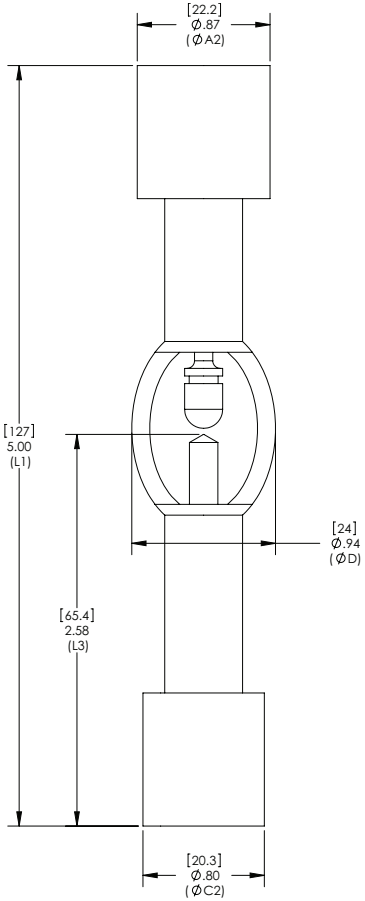


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX5001
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	500
Voltage	14-20
Amperage	30
Current Range	17-35
Open Circuit Voltage	70
Luminous Flux	9000
Luminous Intensity	1500
Average Luminance	40000
Overall Length (L1)	5.00
Lamp Length (L2)	NONE
Tip to Shoulder Length (L3)	2.58
Bulb Diameter (D)	0.94
Cathode Pin (C1)	NONE
Cathode Base (C2)	0.80
Anode Pin (A1)	NONE
Anode Base (A2)	0.87
Arc Length	0.04
Lead Wire	N

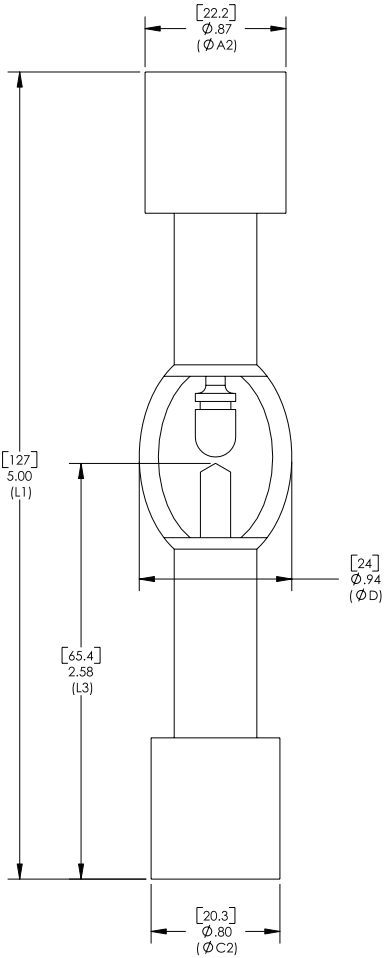


SQP-SX5002
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	CLEAR
Wattage	500
Voltage	14-20
Amperage	30
Current Range	17-35
Open Circuit Voltage	70
Luminous Flux	9000
Luminous Intensity	1500
Average Luminance	40000
Overall Length (L1)	5.00
Lamp Length (L2)	NONE
Tip to Shoulder Length (L3)	2.58
Bulb Diameter (D)	0.94
Cathode Pin (C1)	NONE
Cathode Base (C2)	0.80
Anode Pin (A1)	NONE
Anode Base (A2)	0.87
Arc Length	0.04
Lead Wire	N

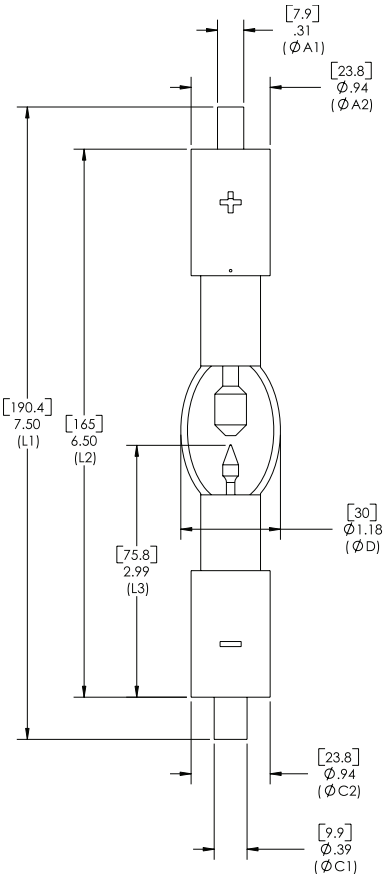


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX5003
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	500
Voltage	18
Amperage	28
Current Range	17-30
Open Circuit Voltage	70
Luminous Flux	15000
Luminous Intensity	1450
Average Luminance	40000
Overall Length (L1)	7.50
Lamp Length (L2)	6.50
Tip to Shoulder Length (L3)	2.99
Bulb Diameter (D)	1.18
Cathode Pin (C1)	0.39
Cathode Base (C2)	0.94
Anode Pin (A1)	0.31
Anode Base (A2)	0.94
Arc Length	0.10
Lead Wire	N

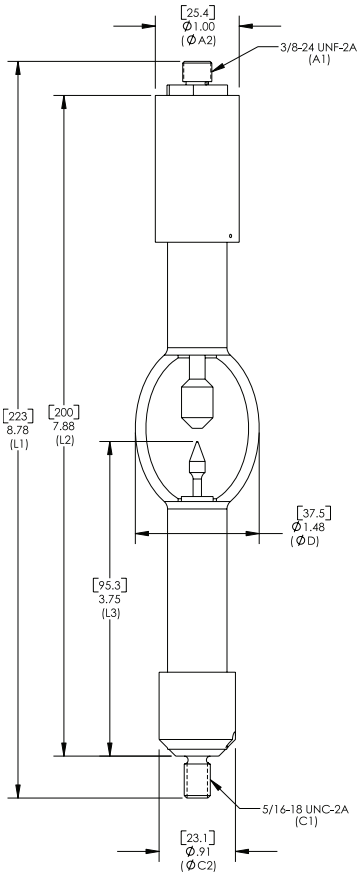


SQP-SX5004
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	Ozone Free
Wattage	500
Voltage	18
Amperage	28
Current Range	17-30
Open Circuit Voltage	70
Luminous Flux	15000
Luminous Intensity	1450
Average Luminance	40000
Overall Length (L1)	8.78
Lamp Length (L2)	7.88
Tip to Shoulder Length (L3)	3.75
Bulb Diameter (D)	1.48
Cathode Pin (C1)	5/16-18 UNC-2A
Cathode Base (C2)	0.91
Anode Pin (A1)	3/8-24 UNF-2A
Anode Base (A2)	1.00
Arc Length	0.13
Lead Wire	N

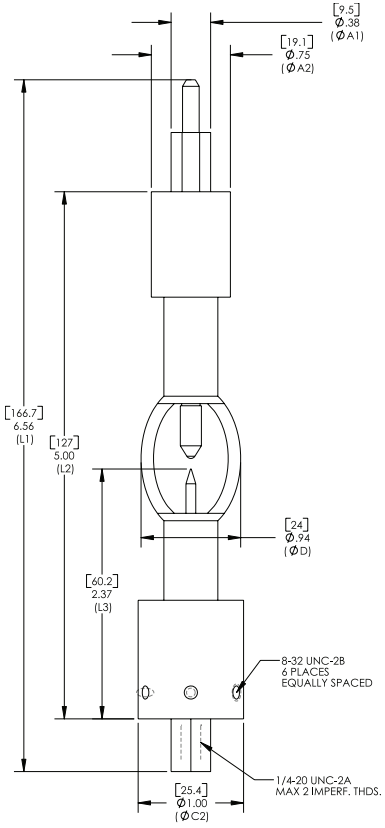


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX5005
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	500
Voltage	24
Amperage	27.5
Current Range	25-30
Open Circuit Voltage	70
Luminous Flux	14000
Luminous Intensity	1400
Average Luminance	40000
Overall Length (L1)	6.56
Lamp Length (L2)	5.00
Tip to Shoulder Length (L3)	2.37
Bulb Diameter (D)	0.94
Cathode Pin (C1)	*
Cathode Base (C2)	1.00
Anode Pin (A1)	0.38
Anode Base (A2)	0.75
Arc Length	0.10
Lead Wire	N

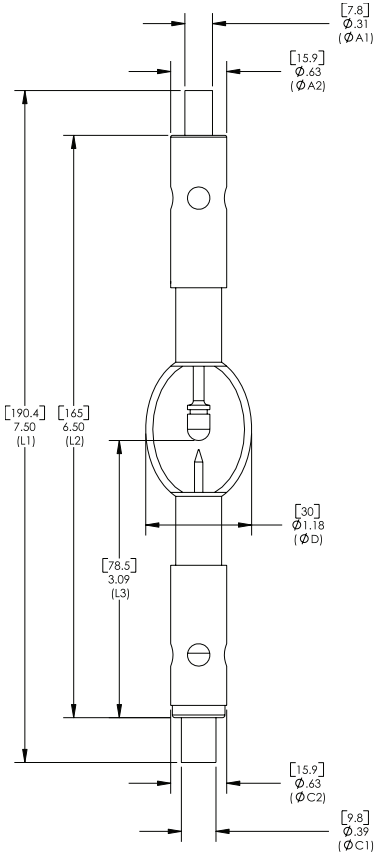


SQP-SX5006
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	Ozone Free
Wattage	500
Voltage	20
Amperage	25
Current Range	20-26
Open Circuit Voltage	70
Luminous Flux	14500
Luminous Intensity	1450
Average Luminance	40000
Overall Length (L1)	7.50
Lamp Length (L2)	6.50
Tip to Shoulder Length (L3)	3.09
Bulb Diameter (D)	1.18
Cathode Pin (C1)	0.39
Cathode Base (C2)	0.63
Anode Pin (A1)	0.31
Anode Base (A2)	0.63
Arc Length	0.10
Lead Wire	N

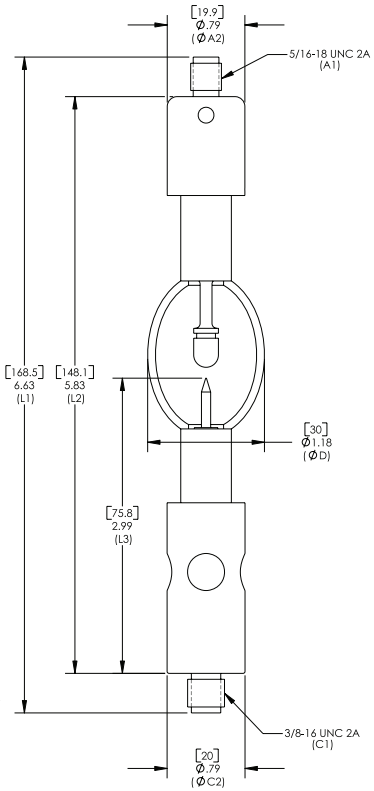


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX5007
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	500
Voltage	22
Amperage	23
Current Range	20-26
Open Circuit Voltage	70
Luminous Flux	14500
Luminous Intensity	1450
Average Luminance	40000
Overall Length (L1)	6.63
Lamp Length (L2)	5.83
Tip to Shoulder Length (L3)	2.99
Bulb Diameter (D)	1.18
Cathode Pin (C1)	3/8-16 UNC-2A
Cathode Base (C2)	0.79
Anode Pin (A1)	5/16-18 UNC-2A
Anode Base (A2)	0.79
Arc Length	0.11
Lead Wire	N

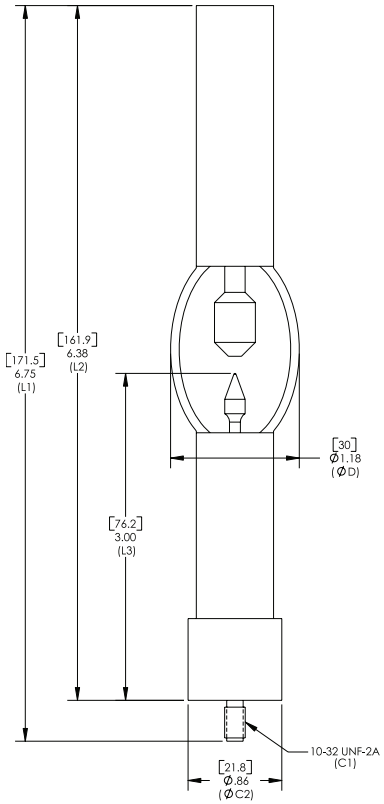


SQP-SX5008
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	Ozone Free
Wattage	500
Voltage	20
Amperage	23
Current Range	20-26
Open Circuit Voltage	70
Luminous Flux	14500
Luminous Intensity	1450
Average Luminance	40000
Overall Length (L1)	6.75
Lamp Length (L2)	6.38
Tip to Shoulder Length (L3)	3.00
Bulb Diameter (D)	1.18
Cathode Pin (C1)	10-32 UNF-2A
Cathode Base (C2)	0.86
Anode Pin (A1)	NONE
Anode Base (A2)	NONE
Arc Length	0.13
Lead Wire	Y

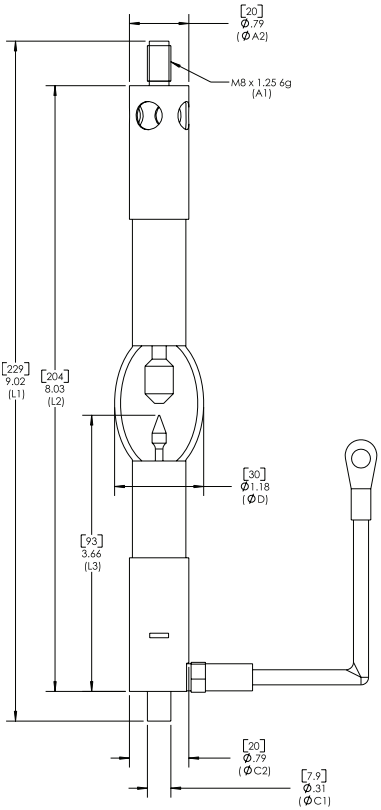


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX5009
Technical Brief

Lamp Specifications

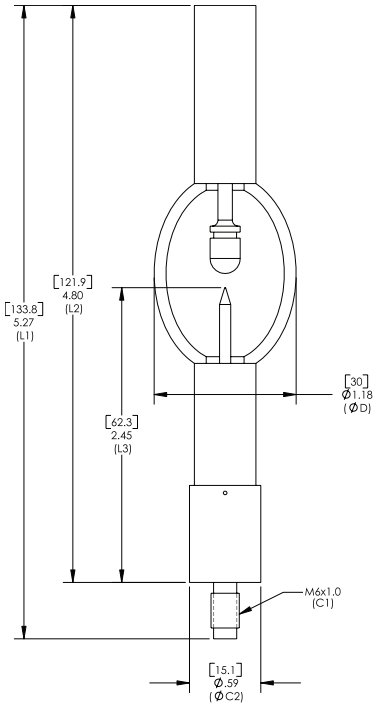
Quartz Type	Ozone Free
Wattage	500
Voltage	20
Amperage	25
Current Range	20-26
Open Circuit Voltage	70
Luminous Flux	16000
Luminous Intensity	1700
Average Luminance	40000
Overall Length (L1)	9.02
Lamp Length (L2)	8.03
Tip to Shoulder Length (L3)	3.66
Bulb Diameter (D)	1.18
Cathode Pin (C1)	0.31
Cathode Base (C2)	0.79
Anode Pin (A1)	M8x1.25
Anode Base (A2)	0.79
Arc Length	0.16
Lead Wire	N



SQP-SX5501
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	550
Voltage	20
Amperage	28
Current Range	25-30
Open Circuit Voltage	70
Luminous Flux	17000
Luminous Intensity	1800
Average Luminance	41000
Overall Length (L1)	5.27
Lamp Length (L2)	4.80
Tip to Shoulder Length (L3)	2.45
Bulb Diameter (D)	1.18
Cathode Pin (C1)	M6-1.0
Cathode Base (C2)	0.59
Anode Pin (A1)	NONE
Anode Base (A2)	NONE
Arc Length	0.10
Lead Wire	Y

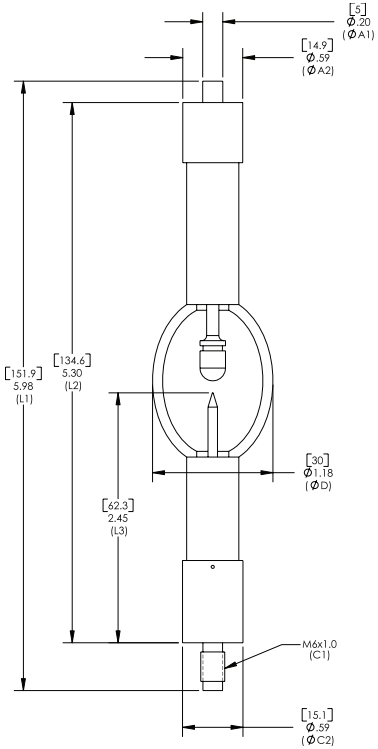


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX5502
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	550
Voltage	20
Amperage	28
Current Range	25-30
Open Circuit Voltage	75
Luminous Flux	17000
Luminous Intensity	1800
Average Luminance	41000
Overall Length (L1)	5.98
Lamp Length (L2)	5.30
Tip to Shoulder Length (L3)	2.45
Bulb Diameter (D)	1.18
Cathode Pin (C1)	M6-1.0
Cathode Base (C2)	0.59
Anode Pin (A1)	0.20
Anode Base (A2)	0.59
Arc Length	0.12
Lead Wire	Y

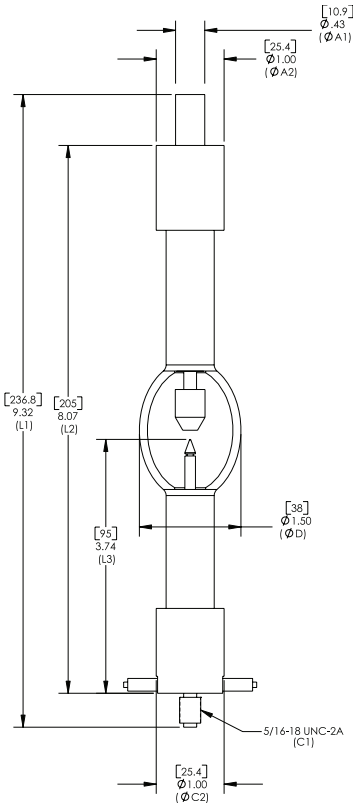


SQP-SX7001
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	Ozone Free
Wattage	700
Voltage	19
Amperage	37
Current Range	30-45
Open Circuit Voltage	75
Luminous Flux	22000
Luminous Intensity	2300
Average Luminance	42000
Overall Length (L1)	9.32
Lamp Length (L2)	8.07
Tip to Shoulder Length (L3)	3.74
Bulb Diameter (D)	1.50
Cathode Pin (C1)	5/16-18 UNC-2A
Cathode Base (C2)	1.00
Anode Pin (A1)	0.43
Anode Base (A2)	1.00
Arc Length	0.14
Lead Wire	N

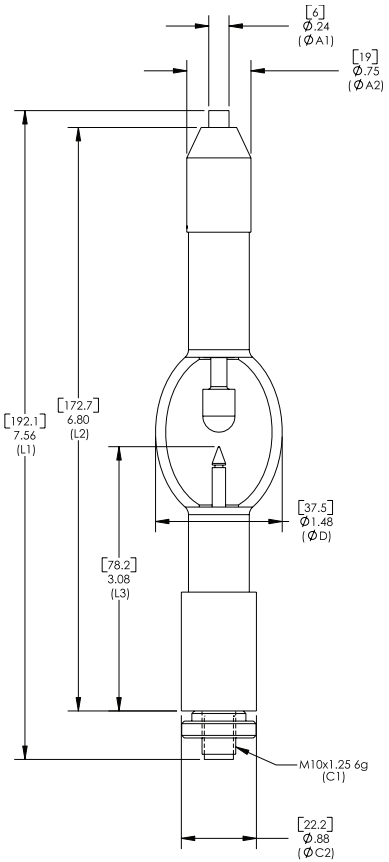


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX7501
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	750
Voltage	22
Amperage	34
Current Range	30-45
Open Circuit Voltage	75
Luminous Flux	20000
Luminous Intensity	2500
Average Luminance	45000
Overall Length (L1)	7.56
Lamp Length (L2)	6.80
Tip to Shoulder Length (L3)	3.08
Bulb Diameter (D)	1.48
Cathode Pin (C1)	M10x1.25 6g
Cathode Base (C2)	0.88
Anode Pin (A1)	0.24
Anode Base (A2)	0.75
Arc Length	0.16
Lead Wire	Y

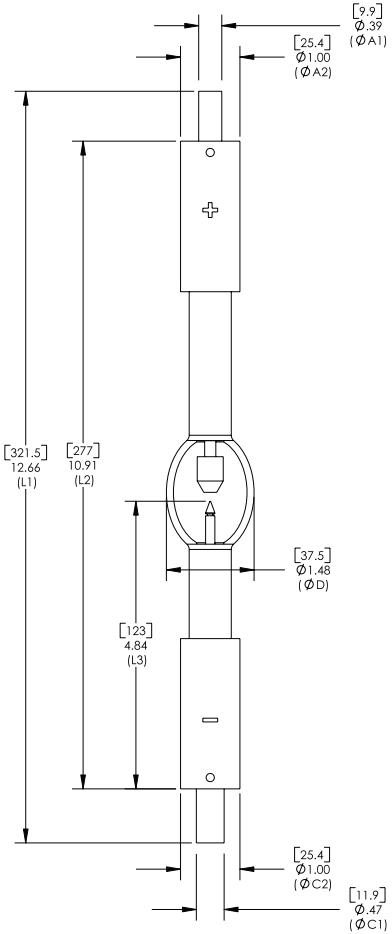


SQP-SX9002
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	Ozone Free
Wattage	900
Voltage	20
Amperage	45
Current Range	30-55
Open Circuit Voltage	75
Luminous Flux	30000
Luminous Intensity	3000
Average Luminance	50000
Overall Length (L1)	12.66
Lamp Length (L2)	10.91
Tip to Shoulder Length (L3)	4.84
Bulb Diameter (D)	1.48
Cathode Pin (C1)	0.47
Cathode Base (C2)	1.00
Anode Pin (A1)	0.39
Anode Base (A2)	1.00
Arc Length	0.16
Lead Wire	Y

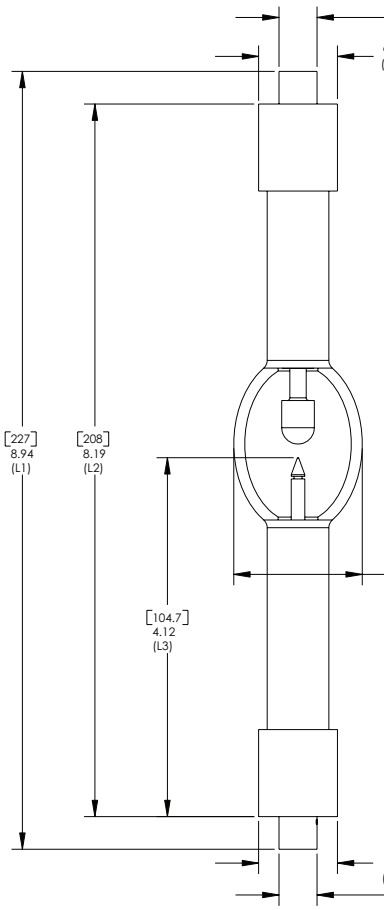


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX10001
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	1000
Voltage	23
Amperage	43.5
Current Range	30-55
Open Circuit Voltage	75
Luminous Flux	33000
Luminous Intensity	3100
Average Luminance	50000
Overall Length (L1)	8.94
Lamp Length (L2)	8.19
Tip to Shoulder Length (L3)	4.12
Bulb Diameter (D)	1.48
Cathode Pin (C1)	0.44
Cathode Base (C2)	0.91
Anode Pin (A1)	0.44
Anode Base (A2)	0.91
Arc Length	0.16
Lead Wire	N

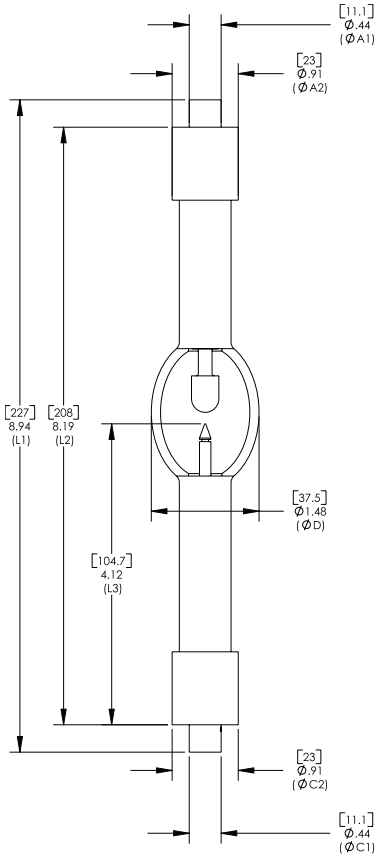


SQP-SX10002
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	CLEAR
Wattage	1000
Voltage	23
Amperage	43.5
Current Range	30-55
Open Circuit Voltage	75
Luminous Flux	33000
Luminous Intensity	3100
Average Luminance	50000
Overall Length (L1)	8.94
Lamp Length (L2)	8.19
Tip to Shoulder Length (L3)	4.12
Bulb Diameter (D)	1.48
Cathode Pin (C1)	0.44
Cathode Base (C2)	0.91
Anode Pin (A1)	0.44
Anode Base (A2)	0.91
Arc Length	0.16
Lead Wire	N

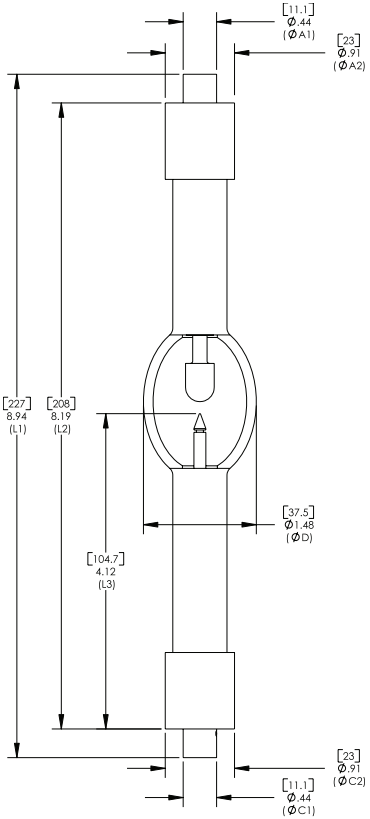


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX10003
Technical Brief

Lamp Specifications

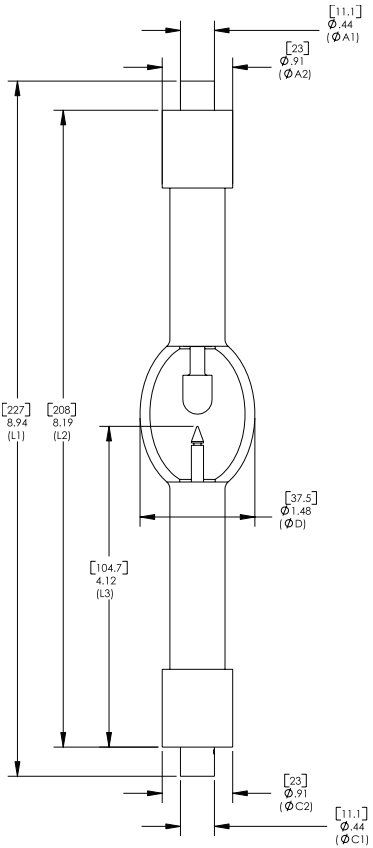
Quartz Type	Ozone Free
Wattage	1000
Voltage	23
Amperage	43.5
Current Range	30-55
Open Circuit Voltage	75
Luminous Flux	33000
Luminous Intensity	3100
Average Luminance	50000
Overall Length (L1)	8.94
Lamp Length (L2)	8.19
Tip to Shoulder Length (L3)	4.12
Bulb Diameter (D)	1.48
Cathode Pin (C1)	0.44
Cathode Base (C2)	0.91
Anode Pin (A1)	0.44
Anode Base (A2)	0.91
Arc Length	0.16
Lead Wire	N



SQP-SX10004
Technical Brief

Lamp Specifications

Quartz Type	CLEAR
Wattage	1000
Voltage	23
Amperage	43.5
Current Range	30-55
Open Circuit Voltage	75
Luminous Flux	33000
Luminous Intensity	3100
Average Luminance	50000
Overall Length (L1)	8.94
Lamp Length (L2)	8.19
Tip to Shoulder Length (L3)	4.12
Bulb Diameter (D)	1.48
Cathode Pin (C1)	0.44
Cathode Base (C2)	0.91
Anode Pin (A1)	0.44
Anode Base (A2)	0.91
Arc Length	0.16
Lead Wire	N

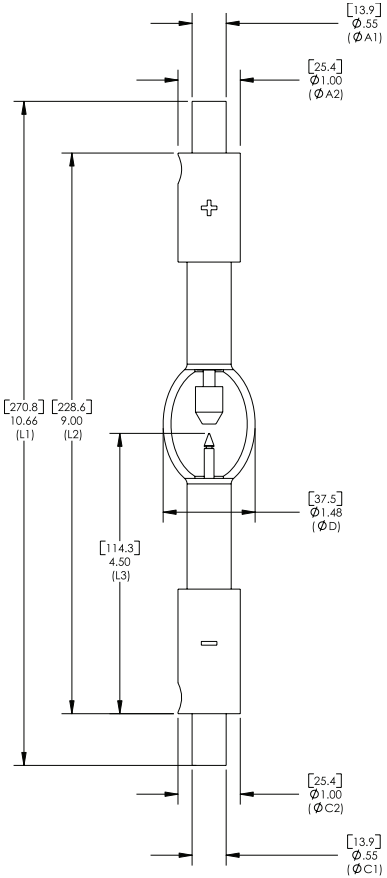


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX10005
Technical Brief

Lamp Specifications

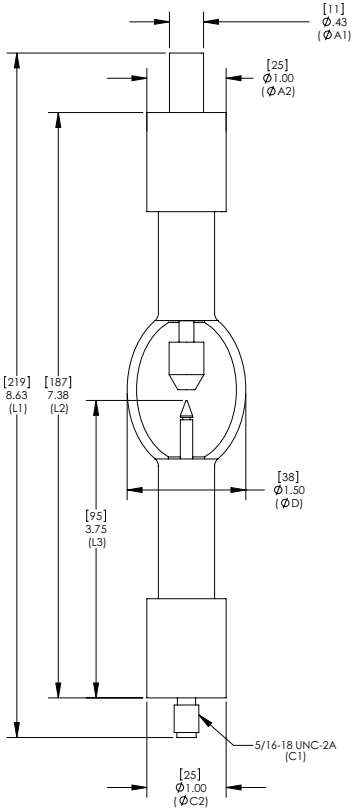
Quartz Type	Ozone Free
Wattage	1000
Voltage	20
Amperage	50
Current Range	30-55
Open Circuit Voltage	75
Luminous Flux	33000
Luminous Intensity	3100
Average Luminance	50000
Overall Length (L1)	10.66
Lamp Length (L2)	9.00
Tip to Shoulder Length (L3)	4.50
Bulb Diameter (D)	1.48
Cathode Pin (C1)	0.55
Cathode Base (C2)	1.00
Anode Pin (A1)	0.55
Anode Base (A2)	1.00
Arc Length	0.15
Lead Wire	Y



SQP-SX10006
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	1000
Voltage	20
Amperage	50
Current Range	30-55
Open Circuit Voltage	75
Luminous Flux	33000
Luminous Intensity	3100
Average Luminance	50000
Overall Length (L1)	8.63
Lamp Length (L2)	7.38
Tip to Shoulder Length (L3)	3.75
Bulb Diameter (D)	1.50
Cathode Pin (C1)	5/16-18 UNC-2A
Cathode Base (C2)	1.00
Anode Pin (A1)	0.43
Anode Base (A2)	1.00
Arc Length	0.14
Lead Wire	N

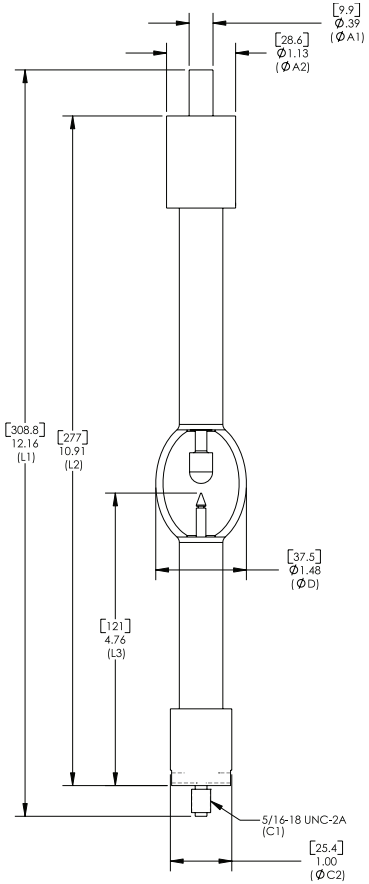


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX10007
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	1000
Voltage	20
Amperage	50
Current Range	30-55
Open Circuit Voltage	75
Luminous Flux	33000
Luminous Intensity	3100
Average Luminance	50000
Overall Length (L1)	12.16
Lamp Length (L2)	10.19
Tip to Shoulder Length (L3)	4.76
Bulb Diameter (D)	1.48
Cathode Pin (C1)	5/16-18 UNC-2A
Cathode Base (C2)	1.00
Anode Pin (A1)	0.39
Anode Base (A2)	1.13
Arc Length	0.16
Lead Wire	N

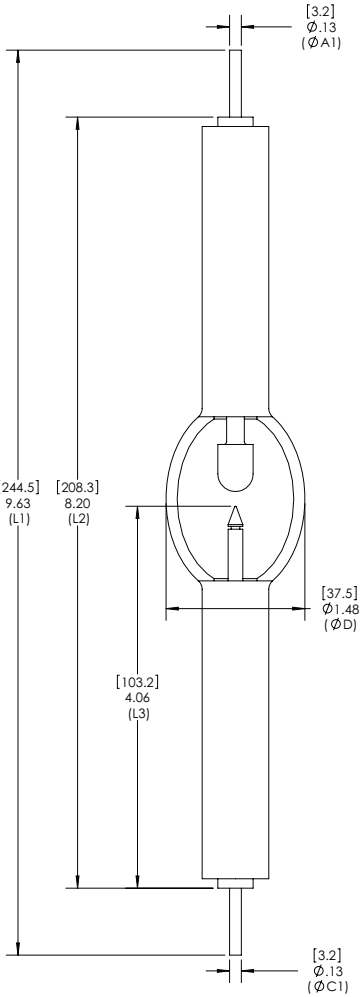


SQP-SX10008
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	Ozone Free
Wattage	1000
Voltage	20
Amperage	50
Current Range	30-55
Open Circuit Voltage	75
Luminous Flux	33000
Luminous Intensity	3100
Average Luminance	50000
Overall Length (L1)	9.63
Lamp Length (L2)	8.20
Tip to Shoulder Length (L3)	4.06
Bulb Diameter (D)	1.48
Cathode Pin (C1)	0.13
Cathode Base (C2)	NONE
Anode Pin (A1)	0.13
Anode Base (A2)	NONE
Arc Length	0.16
Lead Wire	N

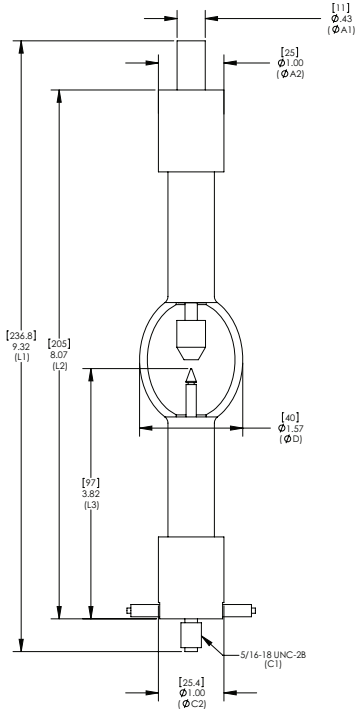


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX10009
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	1000
Voltage	21
Amperage	50
Current Range	30-55
Open Circuit Voltage	75
Luminous Flux	33000
Luminous Intensity	3400
Average Luminance	60000
Overall Length (L1)	9.32
Lamp Length (L2)	8.07
Tip to Shoulder Length (L3)	3.82
Bulb Diameter (D)	1.57
Cathode Pin (C1)	5/16-18 UNC-2B
Cathode Base (C2)	1.00
Anode Pin (A1)	0.43
Anode Base (A2)	1.00
Arc Length	0.14
Lead Wire	N

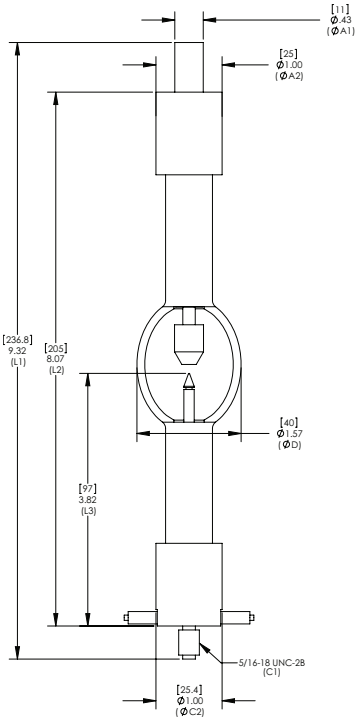


SQP-SX10009C
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	Ozone Free
Wattage	1000
Voltage	21
Amperage	50
Current Range	30-55
Open Circuit Voltage	75
Luminous Flux	33000
Luminous Intensity	3400
Average Luminance	60000
Overall Length (L1)	9.32
Lamp Length (L2)	8.07
Tip to Shoulder Length (L3)	3.82
Bulb Diameter (D)	1.57
Cathode Pin (C1)	5/16-18 UNC-2B
Cathode Base (C2)	1.00
Anode Pin (A1)	0.43
Anode Base (A2)	1.00
Arc Length	0.14
Lead Wire	Y

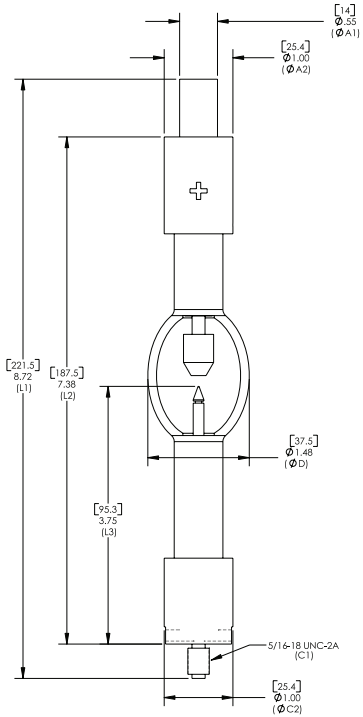


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX100010
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	1000
Voltage	20
Amperage	50
Current Range	30-55
Open Circuit Voltage	75
Luminous Flux	33000
Luminous Intensity	3400
Average Luminance	60000
Overall Length (L1)	8.72
Lamp Length (L2)	7.38
Tip to Shoulder Length (L3)	3.75
Bulb Diameter (D)	1.48
Cathode Pin (C1)	5/16-18 UNC-2A
Cathode Base (C2)	1.00
Anode Pin (A1)	0.55
Anode Base (A2)	1.00
Arc Length	0.14
Lead Wire	N

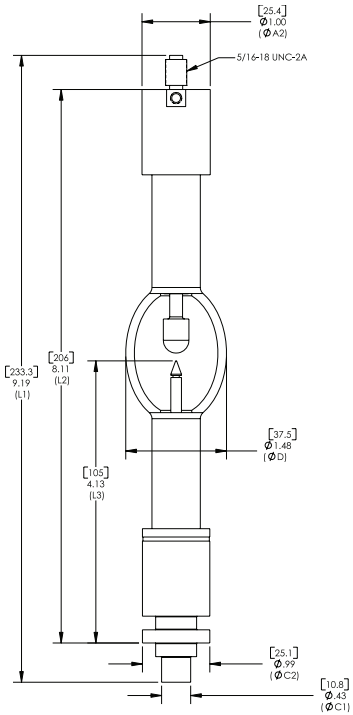


SQP-SX100011
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	Ozone Free
Wattage	1000
Voltage	20
Amperage	50
Current Range	30-55
Open Circuit Voltage	75
Luminous Flux	30000
Luminous Intensity	3400
Average Luminance	60000
Overall Length (L1)	9.19
Lamp Length (L2)	8.11
Tip to Shoulder Length (L3)	4.13
Bulb Diameter (D)	1.48
Cathode Pin (C1)	0.43
Cathode Base (C2)	0.99
Anode Pin (A1)	5/16-18 UNC-2A
Anode Base (A2)	1.00
Arc Length	0.01
Lead Wire	N

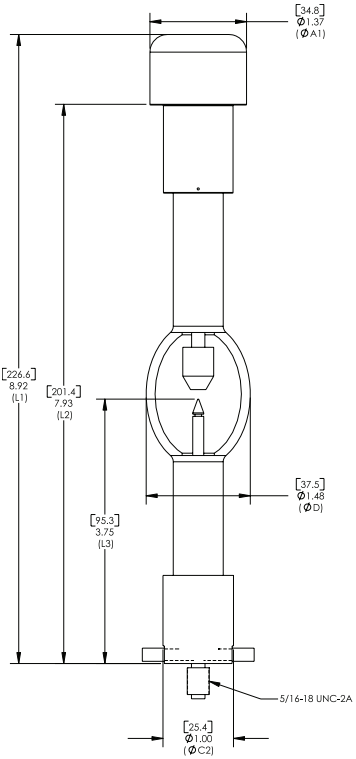


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX100012
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	1000
Voltage	20
Amperage	50
Current Range	30-55
Open Circuit Voltage	75
Luminous Flux	30000
Luminous Intensity	3400
Average Luminance	60000
Overall Length (L1)	8.92
Lamp Length (L2)	7.93
Tip to Shoulder Length (L3)	3.75
Bulb Diameter (D)	1.48
Cathode Pin (C1)	5/16-18 UNC-2A
Cathode Base (C2)	1.00
Anode Pin (A1)	1.37
Anode Base (A2)	NONE
Arc Length	0.14
Lead Wire	N

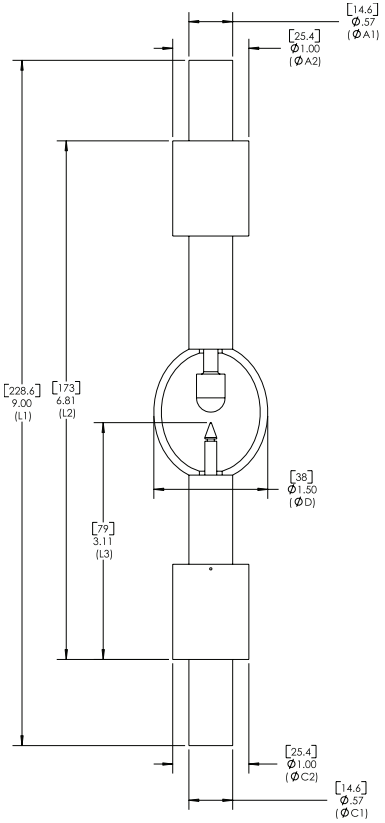


SQP-SX100013
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	Ozone Free
Wattage	1000
Voltage	20
Amperage	50
Current Range	30-55
Open Circuit Voltage	75
Luminous Flux	30000
Luminous Intensity	3400
Average Luminance	60000
Overall Length (L1)	9.00
Lamp Length (L2)	6.81
Tip to Shoulder Length (L3)	3.11
Bulb Diameter (D)	1.50
Cathode Pin (C1)	0.57
Cathode Base (C2)	1.00
Anode Pin (A1)	0.57
Anode Base (A2)	1.00
Arc Length	0.14
Lead Wire	N

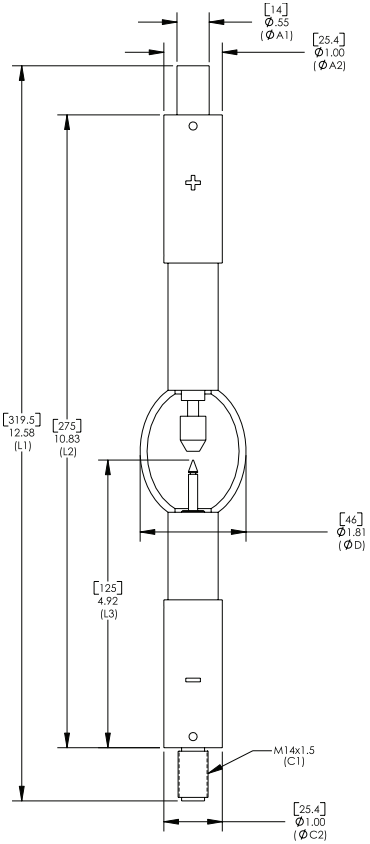


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX1000HTP
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	1000
Voltage	22
Amperage	45
Current Range	30-55
Open Circuit Voltage	75
Luminous Flux	33000
Luminous Intensity	3400
Average Luminance	45000
Overall Length (L1)	12.58
Lamp Length (L2)	10.83
Tip to Shoulder Length (L3)	4.92
Bulb Diameter (D)	1.81
Cathode Pin (C1)	M14x1.5
Cathode Base (C2)	1.00
Anode Pin (A1)	0.55
Anode Base (A2)	1.00
Arc Length	0.16
Lead Wire	N

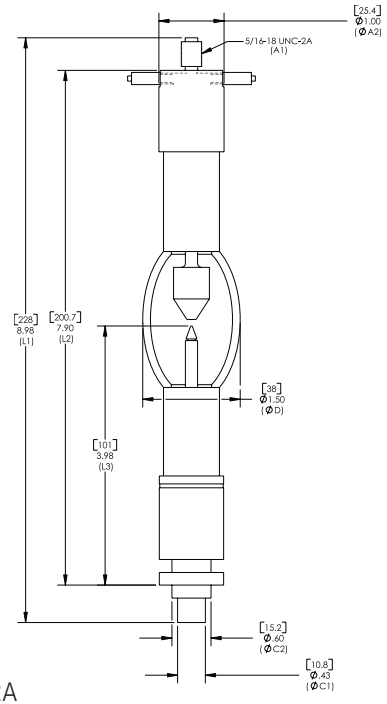


SQP-SX13001
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	Ozone Free
Wattage	1300
Voltage	22
Amperage	60
Current Range	35-60
Open Circuit Voltage	75
Luminous Flux	50000
Luminous Intensity	5000
Average Luminance	50000
Overall Length (L1)	8.98
Lamp Length (L2)	7.90
Tip to Shoulder Length (L3)	3.98
Bulb Diameter (D)	1.50
Cathode Pin (C1)	0.43
Cathode Base (C2)	0.60
Anode Pin (A1)	5/16-18 UNC-2A
Anode Base (A2)	1.00
Arc Length	0.01
Lead Wire	N

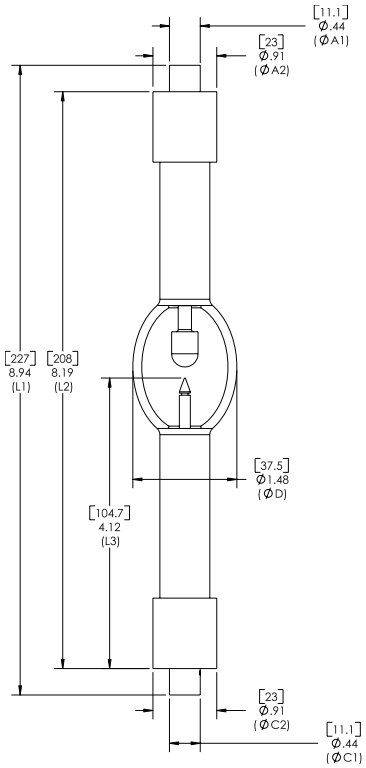


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX13002HA
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	1300
Voltage	25
Amperage	55
Current Range	30-55
Open Circuit Voltage	75
Luminous Flux	50000
Luminous Intensity	5000
Average Luminance	50000
Overall Length (L1)	8.94
Lamp Length (L2)	8.19
Tip to Shoulder Length (L3)	4.12
Bulb Diameter (D)	1.48
Cathode Pin (C1)	0.44
Cathode Base (C2)	0.91
Anode Pin (A1)	0.44
Anode Base (A2)	0.91
Arc Length	0.16
Lead Wire	N

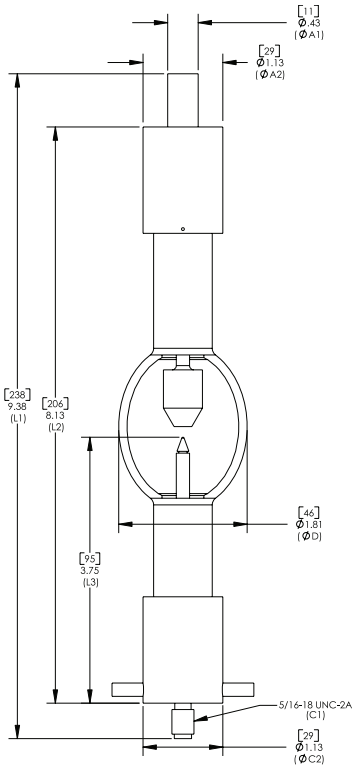


SQP-SX16001
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	Ozone Free
Wattage	1600
Voltage	22
Amperage	65
Current Range	45-70
Open Circuit Voltage	75
Luminous Flux	79000
Luminous Intensity	5500
Average Luminance	70000
Overall Length (L1)	9.38
Lamp Length (L2)	8.13
Tip to Shoulder Length (L3)	3.75
Bulb Diameter (D)	1.81
Cathode Pin (C1)	5/16-18 UNC-2A
Cathode Base (C2)	1.13
Anode Pin (A1)	0.43
Anode Base (A2)	1.13
Arc Length	0.16
Lead Wire	N

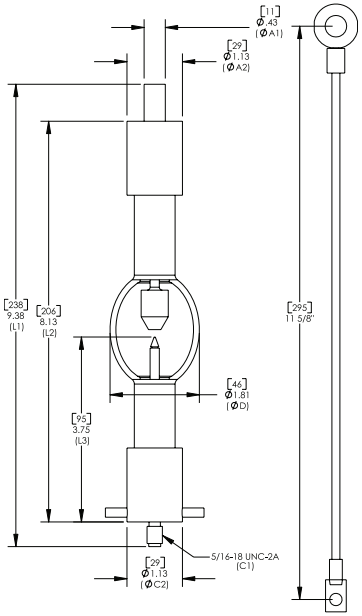


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX16002
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	1600
Voltage	22
Amperage	65
Current Range	45-70
Open Circuit Voltage	75
Luminous Flux	79000
Luminous Intensity	5500
Average Luminance	70000
Overall Length (L1)	9.38
Lamp Length (L2)	8.13
Tip to Shoulder Length (L3)	3.75
Bulb Diameter (D)	1.81
Cathode Pin (C1)	5/16-18 UNC-2A
Cathode Base (C2)	1.13
Anode Pin (A1)	0.43
Anode Base (A2)	1.13
Arc Length	0.16
Lead Wire	Y

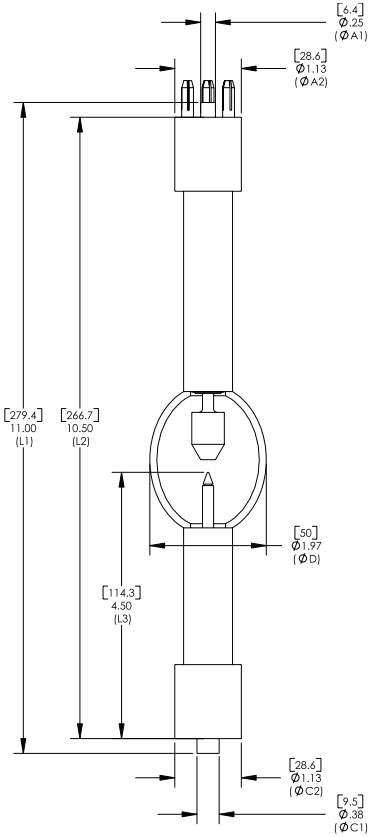


SQP-SX16003
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	Ozone Free
Wattage	1600
Voltage	20-22
Amperage	65
Current Range	45-70
Open Circuit Voltage	75
Luminous Flux	60000
Luminous Intensity	6000
Average Luminance	65000
Overall Length (L1)	11.00
Lamp Length (L2)	10.50
Tip to Shoulder Length (L3)	4.50
Bulb Diameter (D)	1.97
Cathode Pin (C1)	0.38
Cathode Base (C2)	1.13
Anode Pin (A1)	0.25
Anode Base (A2)	1.13
Arc Length	0.21
Lead Wire	N

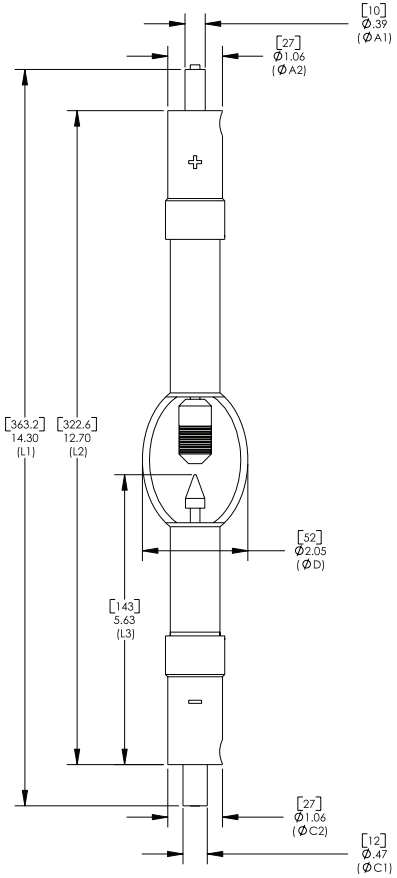


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX16004
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	1600
Voltage	20-22
Amperage	65
Current Range	45-70
Open Circuit Voltage	75
Luminous Flux	60000
Luminous Intensity	6000
Average Luminance	65000
Overall Length (L1)	14.30
Lamp Length (L2)	12.70
Tip to Shoulder Length (L3)	5.63
Bulb Diameter (D)	2.05
Cathode Pin (C1)	0.47
Cathode Base (C2)	1.06
Anode Pin (A1)	0.39
Anode Base (A2)	1.06
Arc Length	0.22
Lead Wire	Y

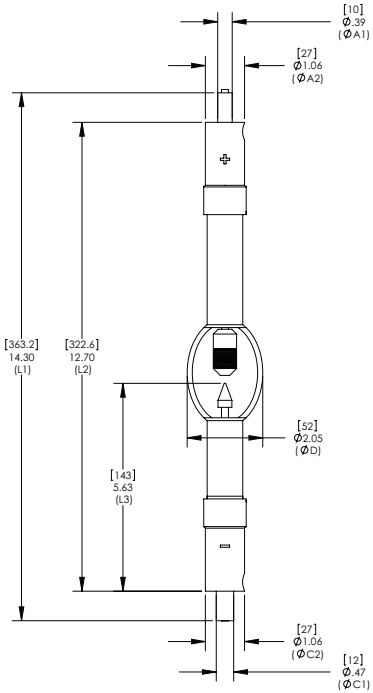


SQP-SX16005
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	Ozone Free
Wattage	1600
Voltage	22
Amperage	65
Current Range	45-70
Open Circuit Voltage	75
Luminous Flux	60000
Luminous Intensity	6000
Average Luminance	65000
Overall Length (L1)	14.30
Lamp Length (L2)	12.70
Tip to Shoulder Length (L3)	5.63
Bulb Diameter (D)	2.05
Cathode Pin (C1)	0.47
Cathode Base (C2)	1.06
Anode Pin (A1)	0.39
Anode Base (A2)	1.06
Arc Length	0.22
Lead Wire	N

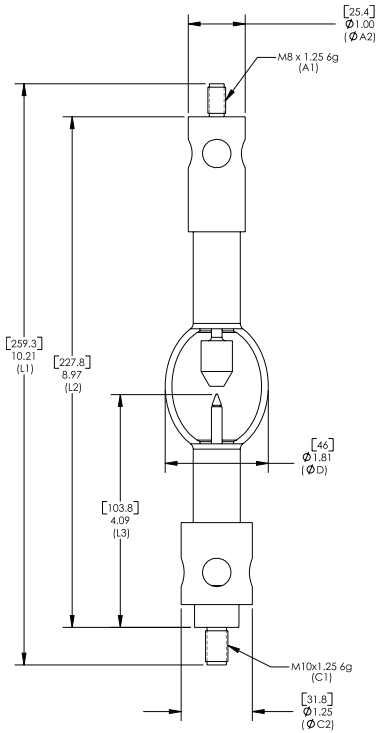


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX16006
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	1600
Voltage	22
Amperage	65
Current Range	45-70
Open Circuit Voltage	75
Luminous Flux	60000
Luminous Intensity	6000
Average Luminance	65000
Overall Length (L1)	10.21
Lamp Length (L2)	8.97
Tip to Shoulder Length (L3)	4.09
Bulb Diameter (D)	1.81
Cathode Pin (C1)	M10x1.25 6g
Cathode Base (C2)	1.25
Anode Pin (A1)	M8x1.25 6g
Anode Base (A2)	1.00
Arc Length	0.14
Lead Wire	N

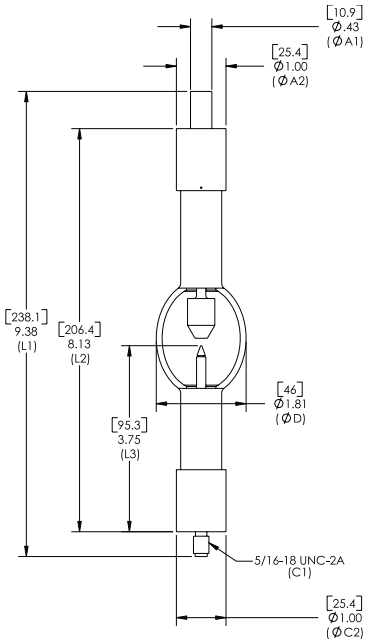


SQP-SX16007
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	Ozone Free
Wattage	1600
Voltage	22
Amperage	65
Current Range	45-70
Open Circuit Voltage	75
Luminous Flux	60000
Luminous Intensity	6000
Average Luminance	65000
Overall Length (L1)	9.38
Lamp Length (L2)	8.13
Tip to Shoulder Length (L3)	3.75
Bulb Diameter (D)	1.81
Cathode Pin (C1)	5/16-18 UNC-2A
Cathode Base (C2)	1.00
Anode Pin (A1)	0.43
Anode Base (A2)	1.00
Arc Length	0.16
Lead Wire	N

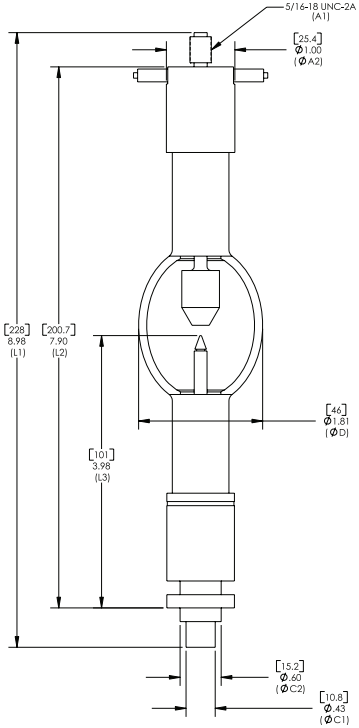


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX16009
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	1600
Voltage	22
Amperage	65
Current Range	45-70
Open Circuit Voltage	75
Luminous Flux	60000
Luminous Intensity	6000
Average Luminance	65000
Overall Length (L1)	8.98
Lamp Length (L2)	7.90
Tip to Shoulder Length (L3)	3.98
Bulb Diameter (D)	1.81
Cathode Pin (C1)	0.43
Cathode Base (C2)	0.60
Anode Pin (A1)	5/16-18 UNC-2A
Anode Base (A2)	1.00
Arc Length	0.15
Lead Wire	N

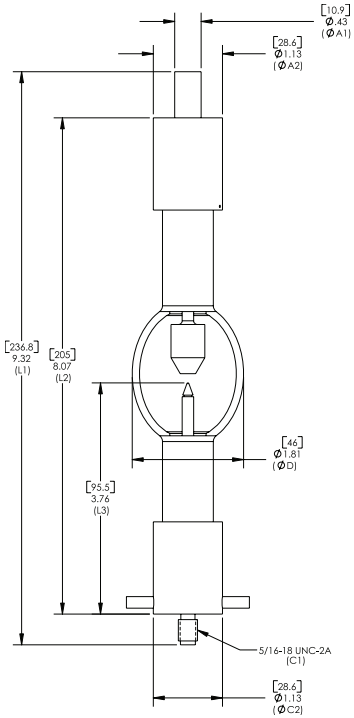


SQP-SX160011
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	Ozone Free
Wattage	1600
Voltage	25
Amperage	64
Current Range	45-70
Open Circuit Voltage	75
Luminous Flux	60000
Luminous Intensity	6000
Average Luminance	65000
Overall Length (L1)	9.32
Lamp Length (L2)	8.07
Tip to Shoulder Length (L3)	3.76
Bulb Diameter (D)	1.81
Cathode Pin (C1)	5/16-18 UNC-2A
Cathode Base (C2)	1.13
Anode Pin (A1)	0.43
Anode Base (A2)	1.13
Arc Length	0.15
Lead Wire	N

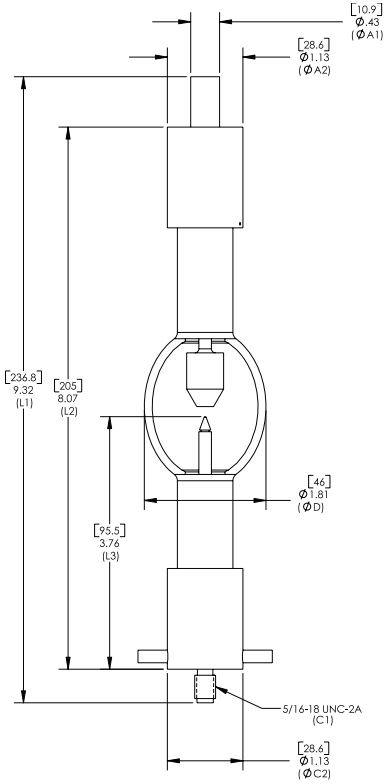


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX160012
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	1600
Voltage	25
Amperage	64
Current Range	45-70
Open Circuit Voltage	75
Luminous Flux	60000
Luminous Intensity	6000
Average Luminance	65000
Overall Length (L1)	9.63
Lamp Length (L2)	8.47
Tip to Shoulder Length (L3)	3.76
Bulb Diameter (D)	1.81
Cathode Pin (C1)	M8x1.25
Cathode Base (C2)	1.00
Anode Pin (A1)	0.60
Anode Base (A2)	1.00
Arc Length	0.17
Lead Wire	Y

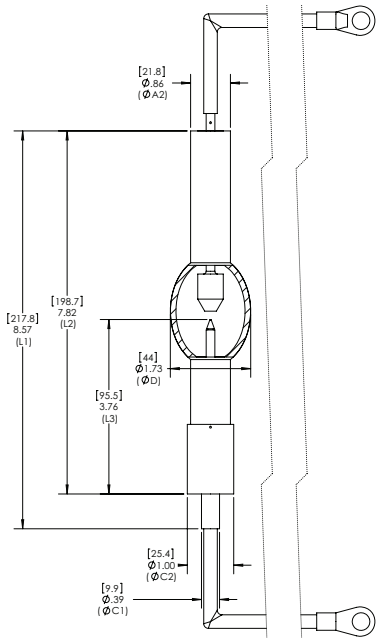


SQP-SX160013
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	Ozone Free
Wattage	1600
Voltage	22
Amperage	65
Current Range	55-70
Open Circuit Voltage	75
Luminous Flux	60000
Luminous Intensity	6000
Average Luminance	65000
Overall Length (L1)	8.57
Lamp Length (L2)	7.82
Tip to Shoulder Length (L3)	3.76
Bulb Diameter (D)	1.73
Cathode Pin (C1)	0.39
Cathode Base (C2)	1.00
Anode Pin (A1)	NONE
Anode Base (A2)	0.86
Arc Length	0.18
Lead Wire	Y

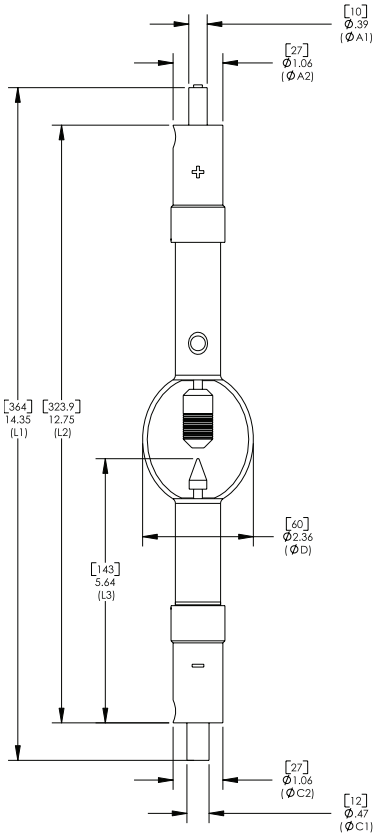


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX20001
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	2000
Voltage	23
Amperage	80
Current Range	50-85
Open Circuit Voltage	100
Luminous Flux	80000
Luminous Intensity	7500
Average Luminance	75000
Overall Length (L1)	14.35
Lamp Length (L2)	12.75
Tip to Shoulder Length (L3)	5.64
Bulb Diameter (D)	2.36
Cathode Pin (C1)	0.47
Cathode Base (C2)	1.06
Anode Pin (A1)	0.39
Anode Base (A2)	1.06
Arc Length	0.22
Lead Wire	N

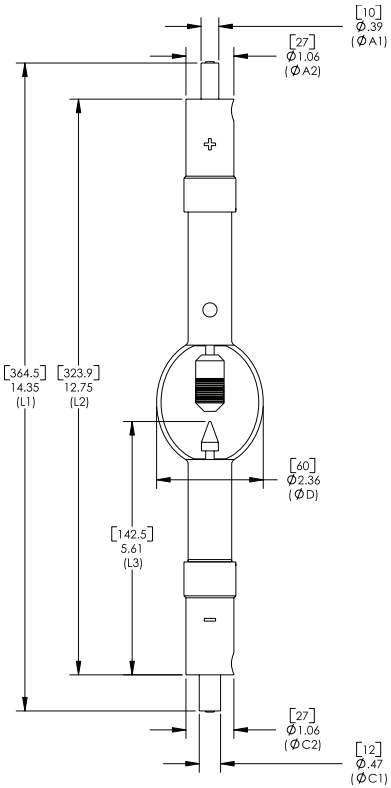


SQP-SX20002
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	Ozone Free
Wattage	2000
Voltage	27
Amperage	70
Current Range	50-75
Open Circuit Voltage	100
Luminous Flux	80000
Luminous Intensity	7500
Average Luminance	75000
Overall Length (L1)	14.35
Lamp Length (L2)	12.75
Tip to Shoulder Length (L3)	5.61
Bulb Diameter (D)	2.36
Cathode Pin (C1)	0.47
Cathode Base (C2)	1.06
Anode Pin (A1)	0.39
Anode Base (A2)	1.06
Arc Length	0.22
Lead Wire	Y

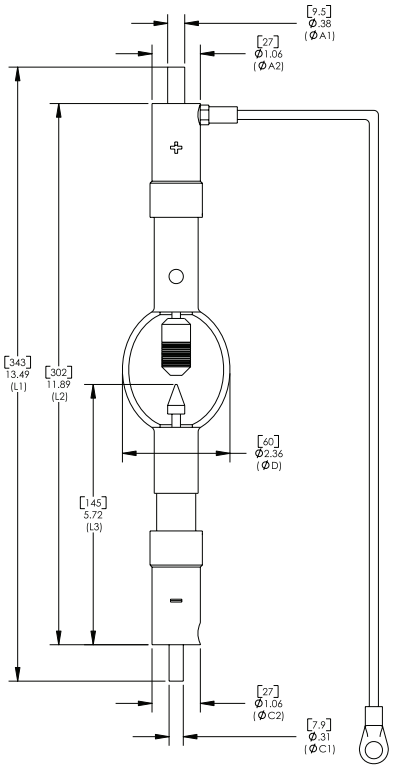


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX20003
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	2000
Voltage	27
Amperage	70
Current Range	50-75
Open Circuit Voltage	100
Luminous Flux	80000
Luminous Intensity	7500
Average Luminance	80000
Overall Length (L1)	13.49
Lamp Length (L2)	11.89
Tip to Shoulder Length (L3)	5.72
Bulb Diameter (D)	2.36
Cathode Pin (C1)	0.31
Cathode Base (C2)	1.06
Anode Pin (A1)	0.38
Anode Base (A2)	1.06
Arc Length	0.22
Lead Wire	Y

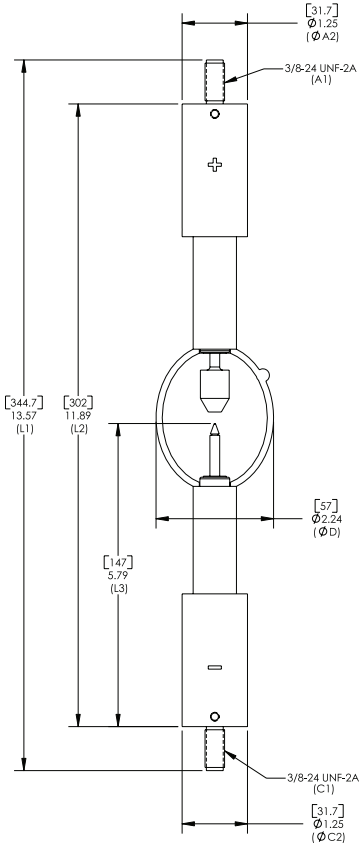


SQP-SX20005
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	Ozone Free
Wattage	2000
Voltage	24
Amperage	80
Current Range	50-85
Open Circuit Voltage	100
Luminous Flux	80000
Luminous Intensity	7500
Average Luminance	80000
Overall Length (L1)	13.57
Lamp Length (L2)	11.89
Tip to Shoulder Length (L3)	5.79
Bulb Diameter (D)	2.24
Cathode Pin (C1)	3/8-24 UNF-2A
Cathode Base (C2)	1.25
Anode Pin (A1)	3/8-24 UNF-2A
Anode Base (A2)	1.25
Arc Length	0.22
Lead Wire	N

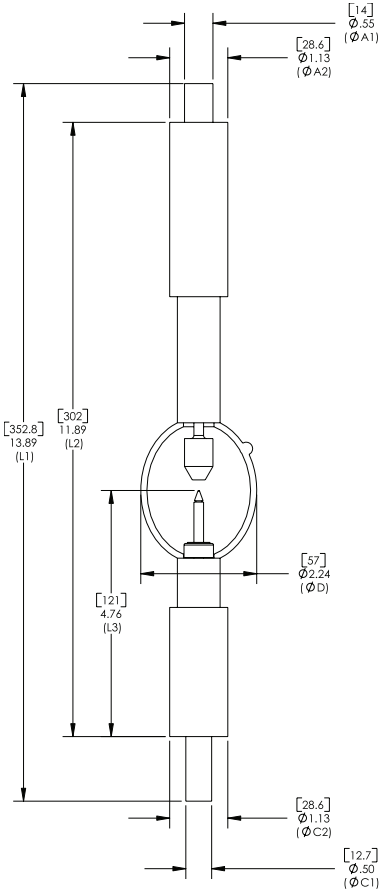


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX20006
Technical Brief

Lamp Specifications

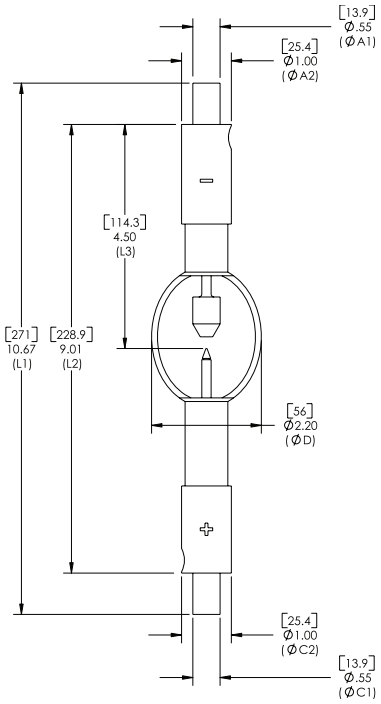
Quartz Type	Ozone Free
Wattage	2000
Voltage	26
Amperage	78
Current Range	50-85
Open Circuit Voltage	100
Luminous Flux	80000
Luminous Intensity	7500
Average Luminance	80000
Overall Length (L1)	13.89
Lamp Length (L2)	11.89
Tip to Shoulder Length (L3)	4.76
Bulb Diameter (D)	2.24
Cathode Pin (C1)	0.50
Cathode Base (C2)	1.13
Anode Pin (A1)	0.55
Anode Base (A2)	1.13
Arc Length	0.22
Lead Wire	Y



SQP-SX20007
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	2000
Voltage	24
Amperage	80
Current Range	50-85
Open Circuit Voltage	100
Luminous Flux	80000
Luminous Intensity	7500
Average Luminance	80000
Overall Length (L1)	10.67
Lamp Length (L2)	9.01
Tip to Shoulder Length (L3)	4.50
Bulb Diameter (D)	2.20
Cathode Pin (C1)	0.55
Cathode Base (C2)	1.00
Anode Pin (A1)	0.55
Anode Base (A2)	1.00
Arc Length	0.22
Lead Wire	Y

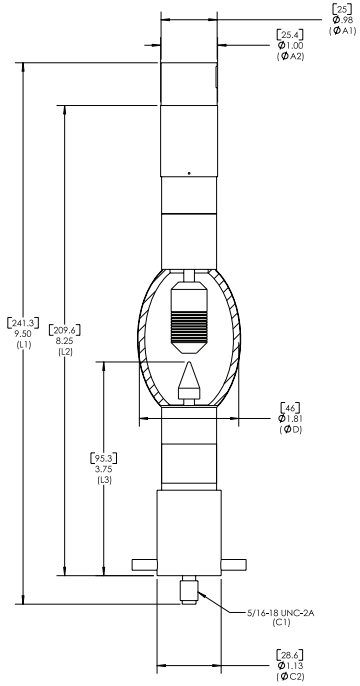


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX20008
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	2000
Voltage	28
Amperage	70
Current Range	50-75
Open Circuit Voltage	100
Luminous Flux	80000
Luminous Intensity	7500
Average Luminance	80000
Overall Length (L1)	9.50
Lamp Length (L2)	8.25
Tip to Shoulder Length (L3)	3.75
Bulb Diameter (D)	1.81
Cathode Pin (C1)	5/16-18 UNC-2A
Cathode Base (C2)	1.13
Anode Pin (A1)	0.98
Anode Base (A2)	1.00
Arc Length	0.16
Lead Wire	Y

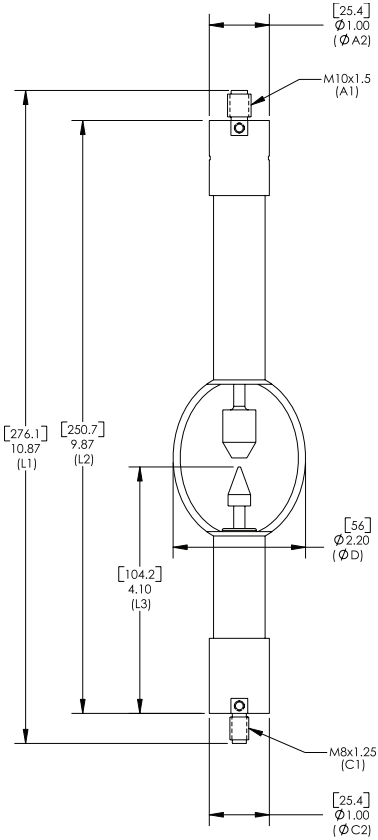


SQP-SX200010
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	Ozone Free
Wattage	2000
Voltage	26
Amperage	80
Current Range	50-85
Open Circuit Voltage	100
Luminous Flux	80000
Luminous Intensity	7500
Average Luminance	80000
Overall Length (L1)	10.87
Lamp Length (L2)	9.87
Tip to Shoulder Length (L3)	4.10
Bulb Diameter (D)	2.20
Cathode Pin (C1)	M8x1.25
Cathode Base (C2)	1.00
Anode Pin (A1)	M10x1.5
Anode Base (A2)	1.00
Arc Length	0.15
Lead Wire	Y

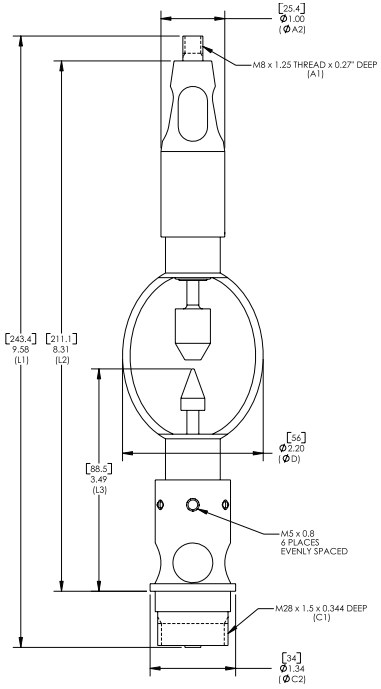


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX200011
Technical Brief

Lamp Specifications

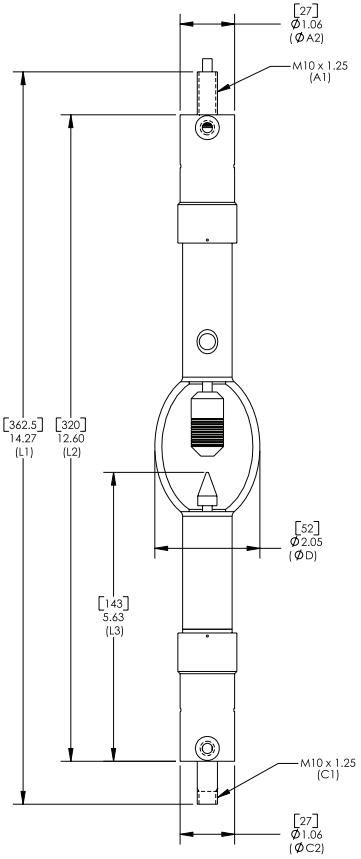
Quartz Type	Ozone Free
Wattage	2000
Voltage	25
Amperage	80
Current Range	50-85
Open Circuit Voltage	100
Luminous Flux	80000
Luminous Intensity	7500
Average Luminance	80000
Overall Length (L1)	9.58
Lamp Length (L2)	8.31
Tip to Shoulder Length (L3)	3.49
Bulb Diameter (D)	2.20
Cathode Pin (C1)	M28x1.5
Cathode Base (C2)	1.34
Anode Pin (A1)	M8x1.25
Anode Base (A2)	1.00
Arc Length	0.14
Lead Wire	Y



SQP-SX200013
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	2000
Voltage	25
Amperage	80
Current Range	50-85
Open Circuit Voltage	100
Luminous Flux	65000
Luminous Intensity	6700
Average Luminance	68000
Overall Length (L1)	14.27
Lamp Length (L2)	12.60
Tip to Shoulder Length (L3)	5.63
Bulb Diameter (D)	2.05
Cathode Pin (C1)	M10x1.25
Cathode Base (C2)	1.06
Anode Pin (A1)	M10x1.25
Anode Base (A2)	1.06
Arc Length	0.22
Lead Wire	N

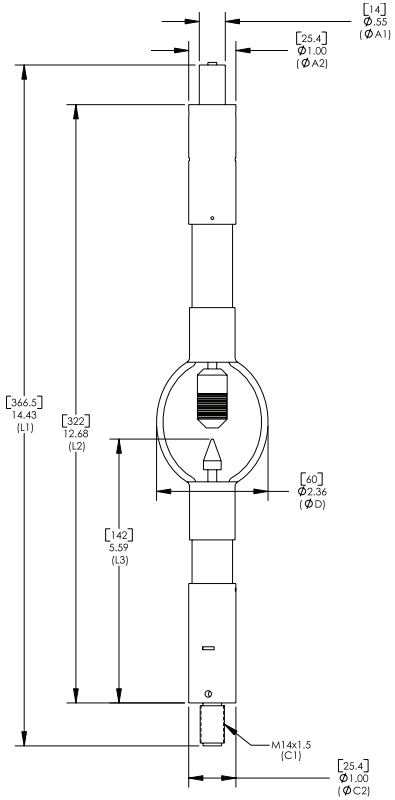


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX2000HTP
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	2000
Voltage	25
Amperage	80
Current Range	50-85
Open Circuit Voltage	100
Luminous Flux	80000
Luminous Intensity	7500
Average Luminance	75000
Overall Length (L1)	14.43
Lamp Length (L2)	12.68
Tip to Shoulder Length (L3)	5.59
Bulb Diameter (D)	2.36
Cathode Pin (C1)	M14x1.5
Cathode Base (C2)	1.00
Anode Pin (A1)	0.55
Anode Base (A2)	1.00
Arc Length	0.22
Lead Wire	N

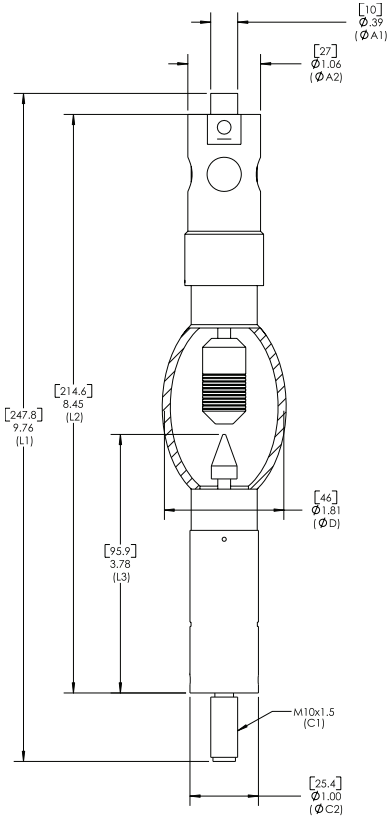


SQP-SX22001
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	Ozone Free
Wattage	2200
Voltage	26
Amperage	85
Current Range	55-90
Open Circuit Voltage	100
Luminous Flux	80000
Luminous Intensity	9000
Average Luminance	170000
Overall Length (L1)	9.76
Lamp Length (L2)	8.45
Tip to Shoulder Length (L3)	3.78
Bulb Diameter (D)	1.81
Cathode Pin (C1)	M10x1.5
Cathode Base (C2)	1.00
Anode Pin (A1)	0.39
Anode Base (A2)	1.06
Arc Length	0.18
Lead Wire	Y

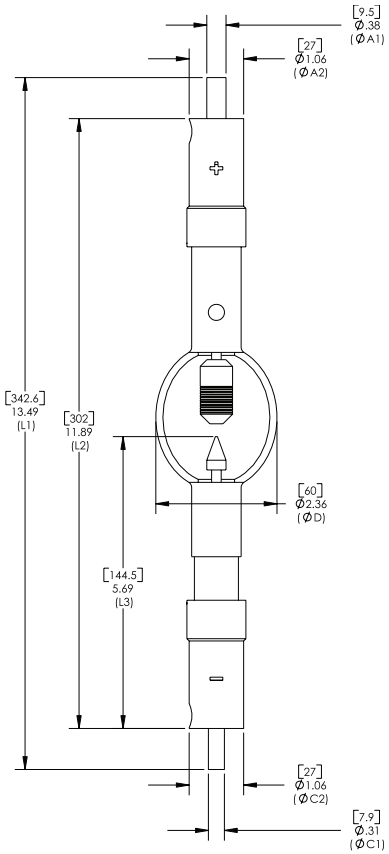


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX25001
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	2500
Voltage	28
Amperage	90
Current Range	70-100
Open Circuit Voltage	100
Luminous Flux	100000
Luminous Intensity	10000
Average Luminance	80000
Overall Length (L1)	13.49
Lamp Length (L2)	11.89
Tip to Shoulder Length (L3)	5.69
Bulb Diameter (D)	2.36
Cathode Pin (C1)	0.31
Cathode Base (C2)	1.06
Anode Pin (A1)	0.38
Anode Base (A2)	1.06
Arc Length	0.23
Lead Wire	Y

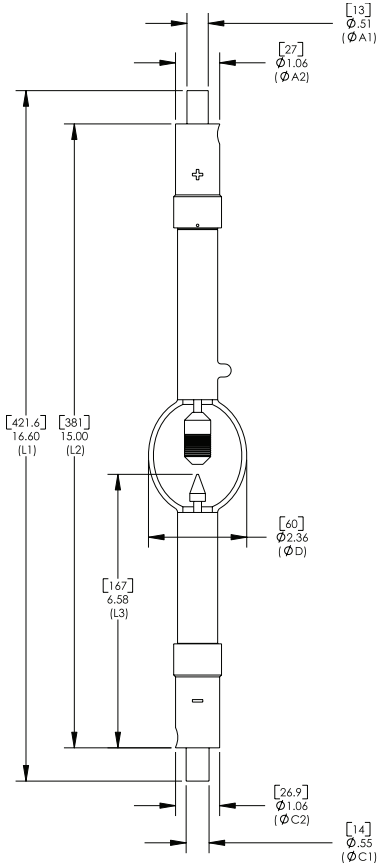


SQP-SX25003
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	Ozone Free
Wattage	2500
Voltage	28
Amperage	90
Current Range	70-100
Open Circuit Voltage	100
Luminous Flux	100000
Luminous Intensity	9500
Average Luminance	61000
Overall Length (L1)	16.60
Lamp Length (L2)	15.00
Tip to Shoulder Length (L3)	6.58
Bulb Diameter (D)	2.36
Cathode Pin (C1)	0.55
Cathode Base (C2)	1.06
Anode Pin (A1)	0.51
Anode Base (A2)	1.06
Arc Length	0.24
Lead Wire	Y

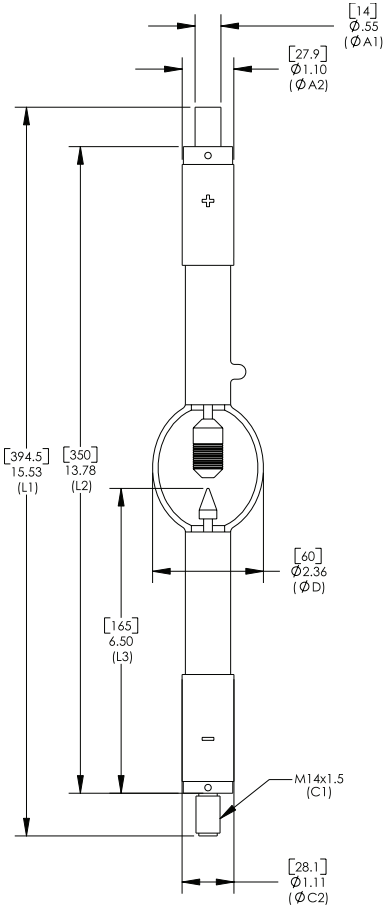


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX25005
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	2500
Voltage	28
Amperage	90
Current Range	70-95
Open Circuit Voltage	100
Luminous Flux	100000
Luminous Intensity	9500
Average Luminance	61000
Overall Length (L1)	15.53
Lamp Length (L2)	13.78
Tip to Shoulder Length (L3)	6.50
Bulb Diameter (D)	2.36
Cathode Pin (C1)	M14x1.5
Cathode Base (C2)	1.11
Anode Pin (A1)	0.55
Anode Base (A2)	1.10
Arc Length	0.23
Lead Wire	N

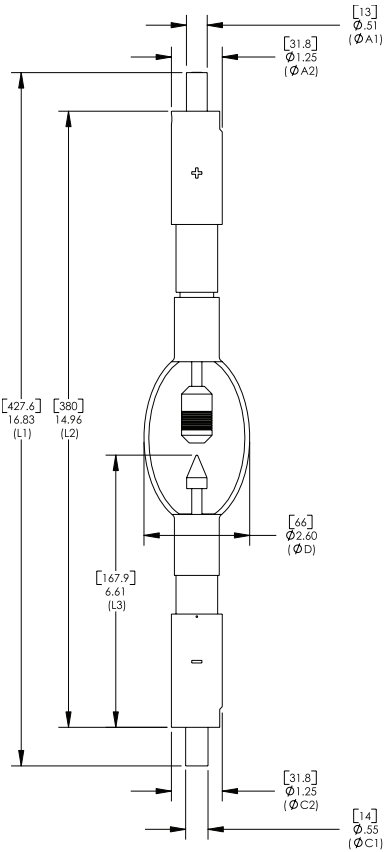


SQP-SX30001
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	Ozone Free
Wattage	3000
Voltage	32
Amperage	95
Current Range	60-110
Open Circuit Voltage	110
Luminous Flux	130000
Luminous Intensity	12000
Average Luminance	85000
Overall Length (L1)	16.83
Lamp Length (L2)	14.96
Tip to Shoulder Length (L3)	6.61
Bulb Diameter (D)	2.60
Cathode Pin (C1)	0.55
Cathode Base (C2)	1.25
Anode Pin (A1)	0.51
Anode Base (A2)	1.25
Arc Length	0.30
Lead Wire	Y

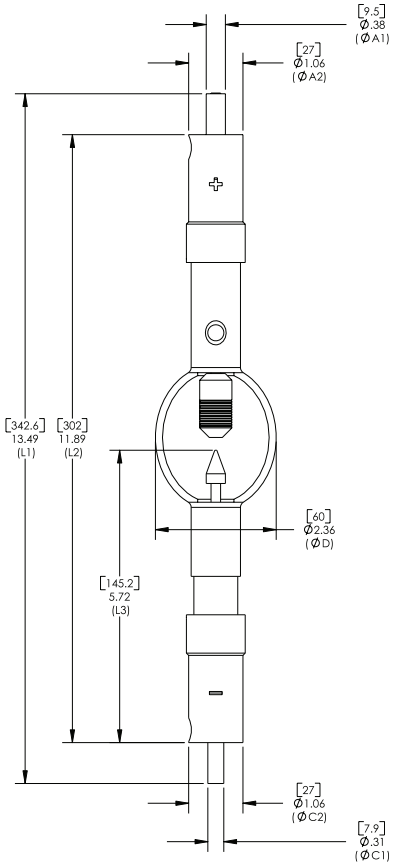


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX30002
Technical Brief

Lamp Specifications

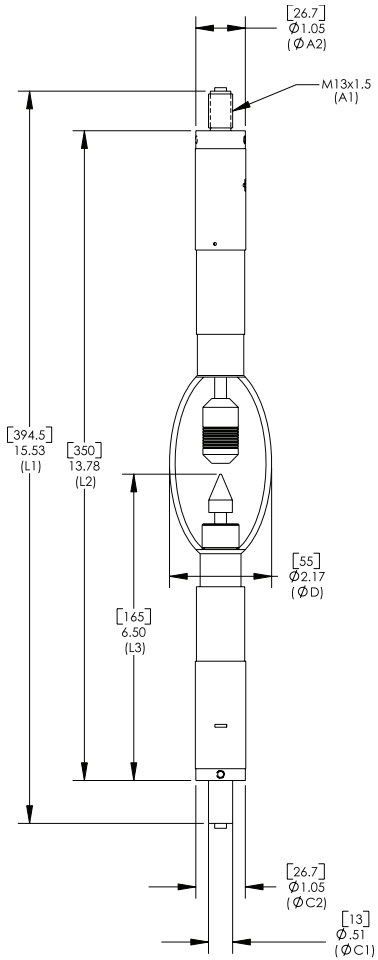
Quartz Type	Ozone Free
Wattage	3000
Voltage	30
Amperage	100
Current Range	60-110
Open Circuit Voltage	110
Luminous Flux	130000
Luminous Intensity	12000
Average Luminance	90000
Overall Length (L1)	13.49
Lamp Length (L2)	11.89
Tip to Shoulder Length (L3)	5.72
Bulb Diameter (D)	2.36
Cathode Pin (C1)	0.31
Cathode Base (C2)	1.06
Anode Pin (A1)	0.38
Anode Base (A2)	1.06
Arc Length	0.23
Lead Wire	Y



SQP-SX30003
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	2500
Voltage	25
Amperage	90
Current Range	70-110
Open Circuit Voltage	110
Luminous Flux	83000
Luminous Intensity	8600
Average Luminance	81000
Overall Length (L1)	15.53
Lamp Length (L2)	13.78
Tip to Shoulder Length (L3)	6.50
Bulb Diameter (D)	2.17
Cathode Pin (C1)	0.51
Cathode Base (C2)	1.05
Anode Pin (A1)	M13x1.5
Anode Base (A2)	1.05
Arc Length	0.20
Lead Wire	N

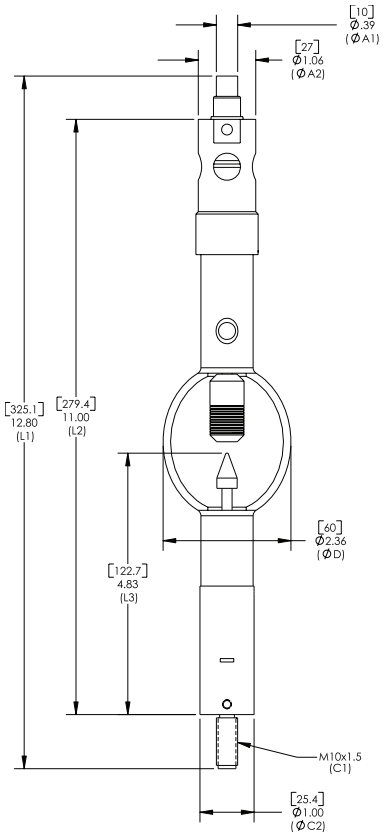


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SXD30005
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	3000
Voltage	30
Amperage	100
Current Range	90-105
Open Circuit Voltage	110
Luminous Flux	140000
Luminous Intensity	13500
Average Luminance	200000
Overall Length (L1)	12.80
Lamp Length (L2)	11.00
Tip to Shoulder Length (L3)	4.83
Bulb Diameter (D)	2.36
Cathode Pin (C1)	M10x1.5
Cathode Base (C2)	1.00
Anode Pin (A1)	0.39
Anode Base (A2)	1.06
Arc Length	0.23
Lead Wire	Y

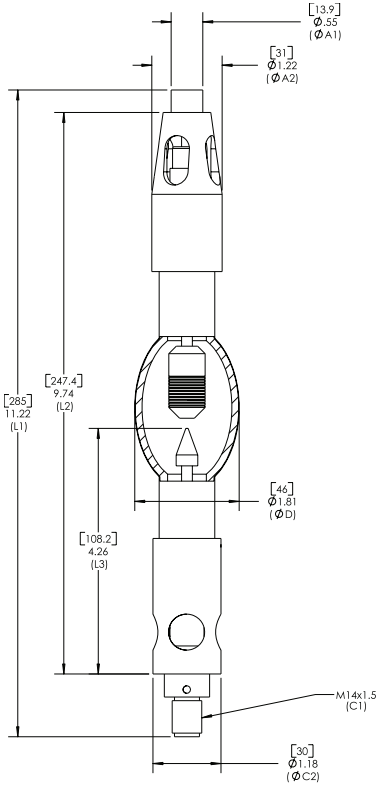


SQP-SXD30006
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	Ozone Free
Wattage	3000
Voltage	30
Amperage	100
Current Range	90-105
Open Circuit Voltage	110
Luminous Flux	140000
Luminous Intensity	13500
Average Luminance	200000
Overall Length (L1)	11.22
Lamp Length (L2)	9.74
Tip to Shoulder Length (L3)	4.26
Bulb Diameter (D)	1.81
Cathode Pin (C1)	0.55
Cathode Base (C2)	1.22
Anode Pin (A1)	M14x1.5
Anode Base (A2)	1.18
Arc Length	0.25
Lead Wire	Y

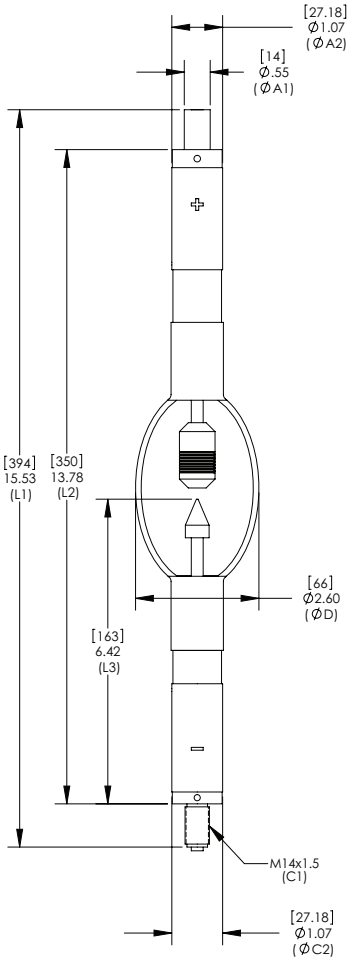


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX3000HTP
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	3000
Voltage	30
Amperage	100
Current Range	60-110
Open Circuit Voltage	110
Luminous Flux	130000
Luminous Intensity	12000
Average Luminance	85000
Overall Length (L1)	15.53
Lamp Length (L2)	13.78
Tip to Shoulder Length (L3)	6.42
Bulb Diameter (D)	2.60
Cathode Pin (C1)	M14x1.5
Cathode Base (C2)	1.07
Anode Pin (A1)	0.55
Anode Base (A2)	1.07
Arc Length	0.30
Lead Wire	N

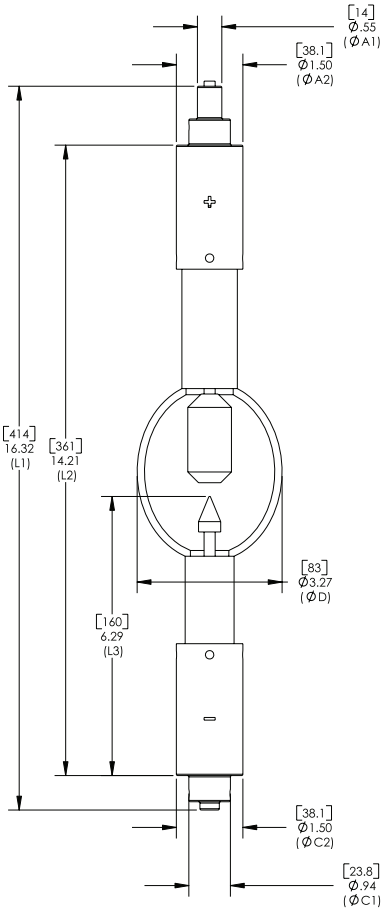


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX40002
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	4000
Voltage	30
Amperage	130
Current Range	100-140
Open Circuit Voltage	110
Luminous Flux	155000
Luminous Intensity	16000
Average Luminance	90000
Overall Length (L1)	16.32
Lamp Length (L2)	14.21
Tip to Shoulder Length (L3)	6.29
Bulb Diameter (D)	3.27
Cathode Pin (C1)	0.94
Cathode Base (C2)	1.50
Anode Pin (A1)	0.55
Anode Base (A2)	1.50
Arc Length	0.30
Lead Wire	Y

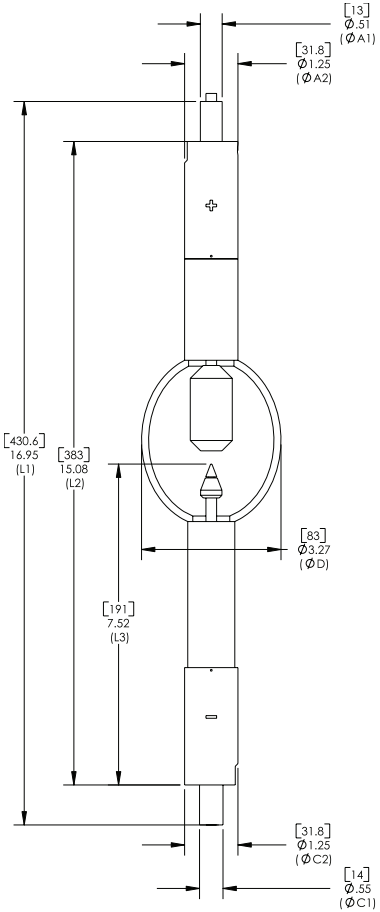


SQP-SX40003
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	Ozone Free
Wattage	4000
Voltage	30
Amperage	130
Current Range	100-140
Open Circuit Voltage	110
Luminous Flux	155000
Luminous Intensity	16000
Average Luminance	90000
Overall Length (L1)	16.95
Lamp Length (L2)	15.08
Tip to Shoulder Length (L3)	7.52
Bulb Diameter (D)	3.27
Cathode Pin (C1)	0.55
Cathode Base (C2)	1.25
Anode Pin (A1)	0.51
Anode Base (A2)	1.25
Arc Length	0.30
Lead Wire	N

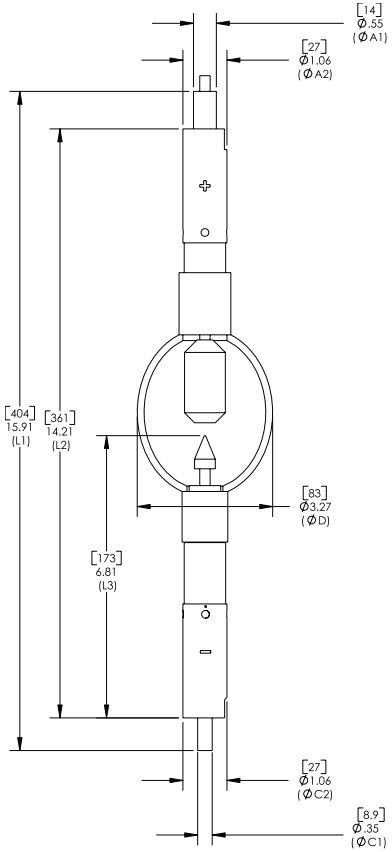


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX40004
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	4000
Voltage	30
Amperage	130
Current Range	100-140
Open Circuit Voltage	110
Luminous Flux	155000
Luminous Intensity	16000
Average Luminance	90000
Overall Length (L1)	15.91
Lamp Length (L2)	14.21
Tip to Shoulder Length (L3)	6.81
Bulb Diameter (D)	3.27
Cathode Pin (C1)	0.35
Cathode Base (C2)	1.06
Anode Pin (A1)	0.55
Anode Base (A2)	1.06
Arc Length	0.31
Lead Wire	Y

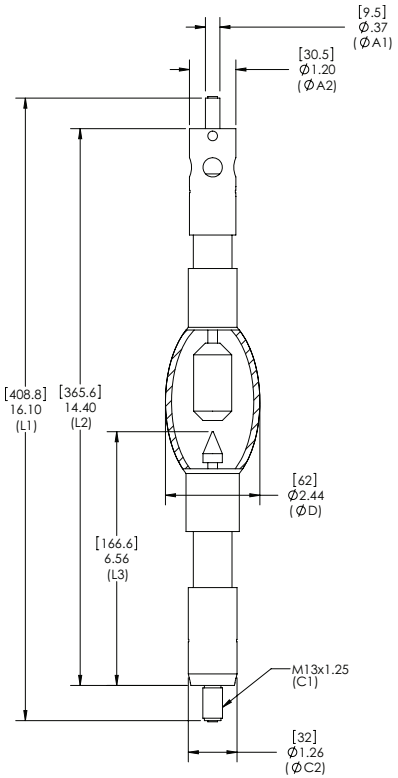


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX40005
Technical Brief

Lamp Specifications

Quartz Type	
Wattage	4000
Voltage	30
Amperage	
Current Range	100-140
Open Circuit Voltage	
Luminous Flux	155000
Luminous Intensity	16000
Average Luminance	90000
Overall Length (L1)	16.10
Lamp Length (L2)	14.40
Tip to Shoulder Length (L3)	6.56
Bulb Diameter (D)	2.44
Cathode Pin (C1)	M13 x 1.25
Cathode Base (C2)	1.26
Anode Pin (A1)	0.37
Anode Base (A2)	1.20
Arc Length	0.29
Lead Wire	

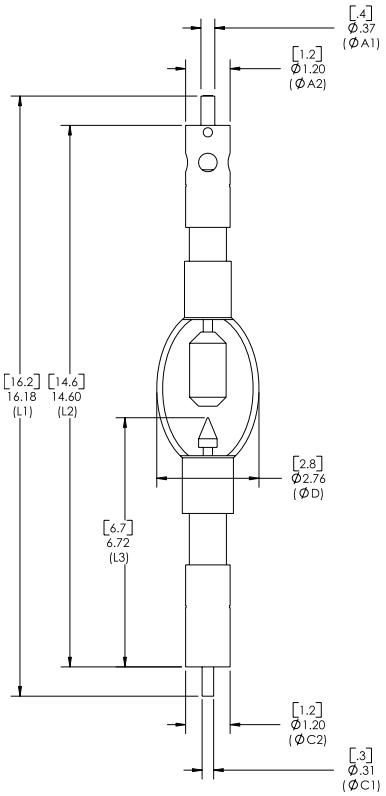


SQP-SX4000HI
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	Ozone Free
Wattage	4000
Voltage	31
Amperage	145
Current Range	110-150
Open Circuit Voltage	110
Luminous Flux	175000
Luminous Intensity	16500
Average Luminance	95000
Overall Length (L1)	16.18
Lamp Length (L2)	14.60
Tip to Shoulder Length (L3)	6.72
Bulb Diameter (D)	2.76
Cathode Pin (C1)	0.31
Cathode Base (C2)	1.20
Anode Pin (A1)	0.37
Anode Base (A2)	1.20
Arc Length	0.30
Lead Wire	Y

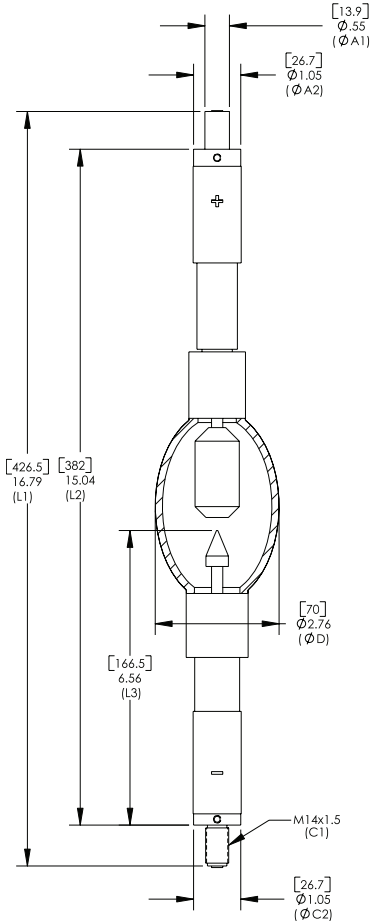


SQP-SX4000HTP
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	Ozone Free
Wattage	4000
Voltage	31
Amperage	130
Current Range	100-140
Open Circuit Voltage	110
Luminous Flux	155000
Luminous Intensity	16000
Average Luminance	90000
Overall Length (L1)	16.79
Lamp Length (L2)	15.04
Tip to Shoulder Length (L3)	6.56
Bulb Diameter (D)	2.76
Cathode Pin (C1)	M14x1.5
Cathode Base (C2)	1.05
Anode Pin (A1)	0.55
Anode Base (A2)	1.05
Arc Length	0.31
Lead Wire	N

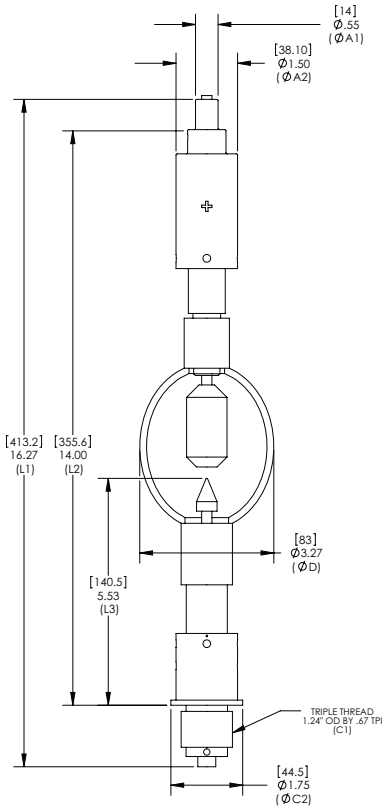


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX4000XT
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	4000
Voltage	31
Amperage	130
Current Range	100-140
Open Circuit Voltage	110
Luminous Flux	155000
Luminous Intensity	16000
Average Luminance	90000
Overall Length (L1)	16.27
Lamp Length (L2)	14.00
Tip to Shoulder Length (L3)	5.53
Bulb Diameter (D)	3.27
Cathode Pin (C1)	Triple Thread
Cathode Base (C2)	1.75
Anode Pin (A1)	0.55
Anode Base (A2)	1.50
Arc Length	0.30
Lead Wire	N

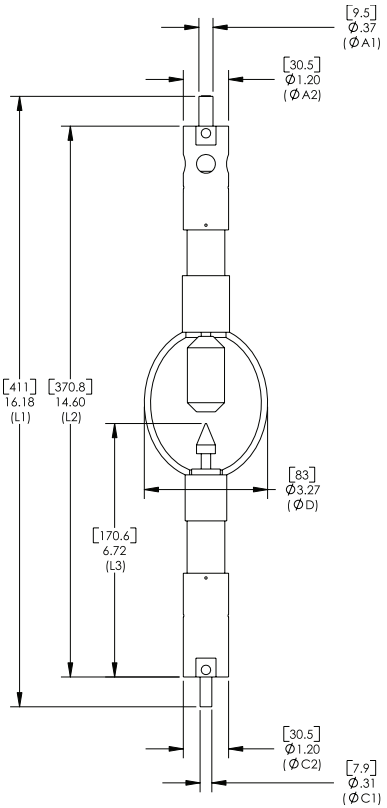


SQP-SX42001
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	Ozone Free
Wattage	4200
Voltage	31
Amperage	135
Current Range	80-150
Open Circuit Voltage	110
Luminous Flux	155000
Luminous Intensity	17000
Average Luminance	90000
Overall Length (L1)	16.18
Lamp Length (L2)	14.60
Tip to Shoulder Length (L3)	6.72
Bulb Diameter (D)	3.27
Cathode Pin (C1)	0.31
Cathode Base (C2)	1.20
Anode Pin (A1)	0.37
Anode Base (A2)	1.20
Arc Length	0.30
Lead Wire	Y

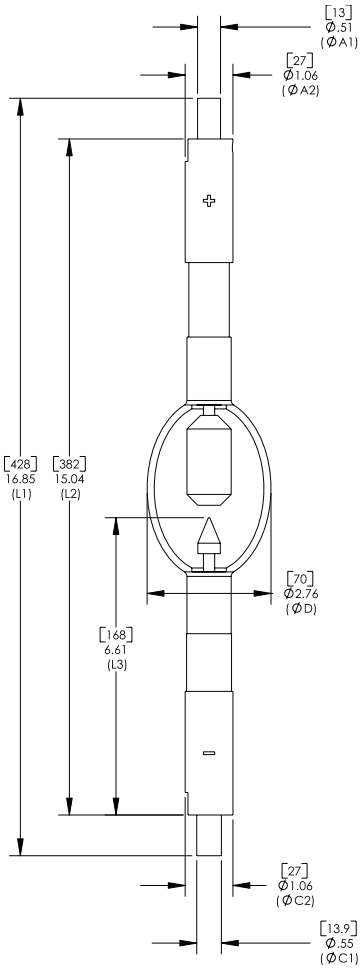


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX42004
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	4200
Voltage	30
Amperage	140
Current Range	80-160
Open Circuit Voltage	110
Luminous Flux	190000
Luminous Intensity	20000
Average Luminance	100000
Overall Length (L1)	16.85
Lamp Length (L2)	15.04
Tip to Shoulder Length (L3)	6.61
Bulb Diameter (D)	2.76
Cathode Pin (C1)	0.55
Cathode Base (C2)	1.06
Anode Pin (A1)	0.51
Anode Base (A2)	1.06
Arc Length	0.30
Lead Wire	Y

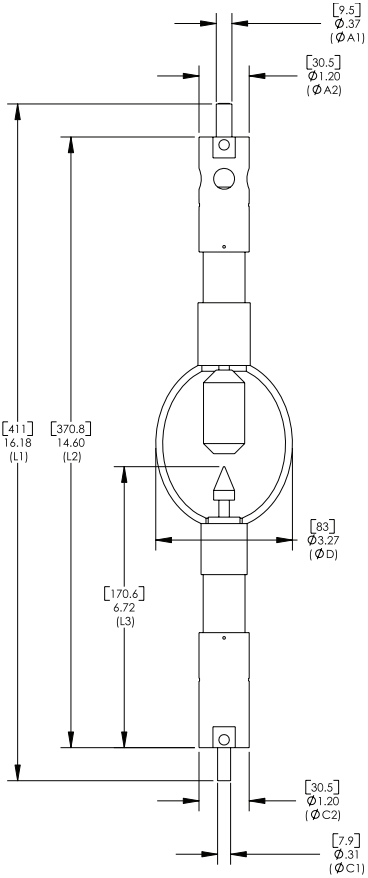


SQP-SX50001
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	Ozone Free
Wattage	5000
Voltage	33
Amperage	150
Current Range	100-160
Open Circuit Voltage	110
Luminous Flux	225000
Luminous Intensity	27000
Average Luminance	95000
Overall Length (L1)	16.18
Lamp Length (L2)	14.60
Tip to Shoulder Length (L3)	6.72
Bulb Diameter (D)	3.27
Cathode Pin (C1)	0.31
Cathode Base (C2)	1.20
Anode Pin (A1)	0.37
Anode Base (A2)	1.20
Arc Length	0.30
Lead Wire	Y

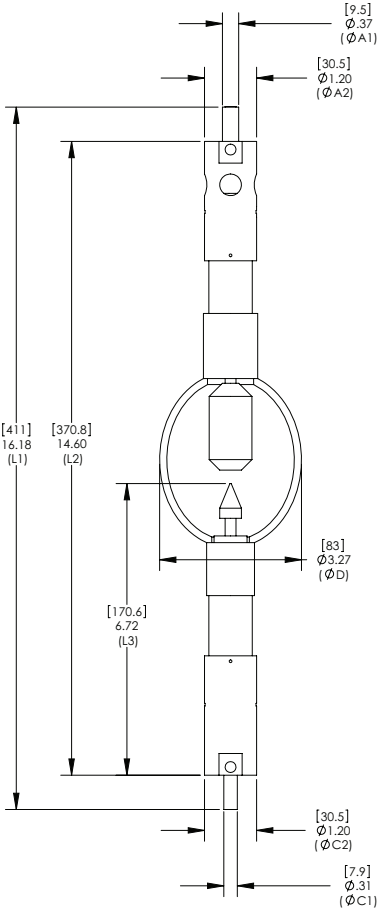


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX50001-OP
Technical Brief

Lamp Specifications

Quartz Type	CLEAR
Wattage	5000
Voltage	33
Amperage	150
Current Range	100-160
Open Circuit Voltage	110
Luminous Flux	225000
Luminous Intensity	27000
Average Luminance	95000
Overall Length (L1)	16.18
Lamp Length (L2)	14.60
Tip to Shoulder Length (L3)	6.72
Bulb Diameter (D)	3.27
Cathode Pin (C1)	0.31
Cathode Base (C2)	1.20
Anode Pin (A1)	0.37
Anode Base (A2)	1.20
Arc Length	0.30
Lead Wire	Y

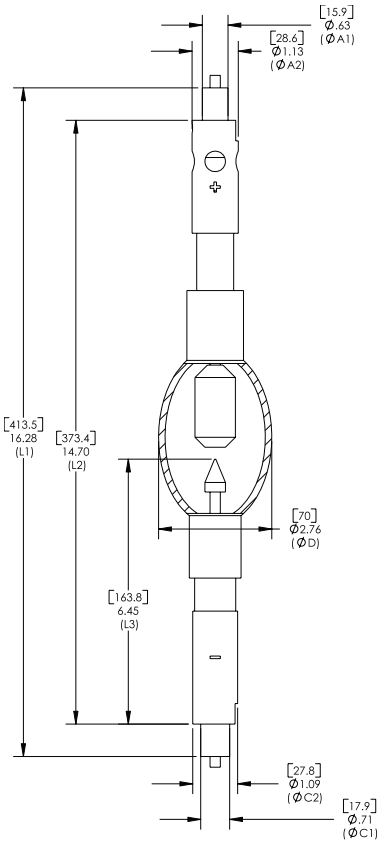


SQP-SX50002
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	Ozone Free
Wattage	5000
Voltage	33
Amperage	140
Current Range	100-160
Open Circuit Voltage	110
Luminous Flux	225000
Luminous Intensity	27000
Average Luminance	95000
Overall Length (L1)	16.28
Lamp Length (L2)	14.70
Tip to Shoulder Length (L3)	6.45
Bulb Diameter (D)	2.76
Cathode Pin (C1)	0.71
Cathode Base (C2)	1.09
Anode Pin (A1)	0.63
Anode Base (A2)	1.13
Arc Length	0.31
Lead Wire	Y

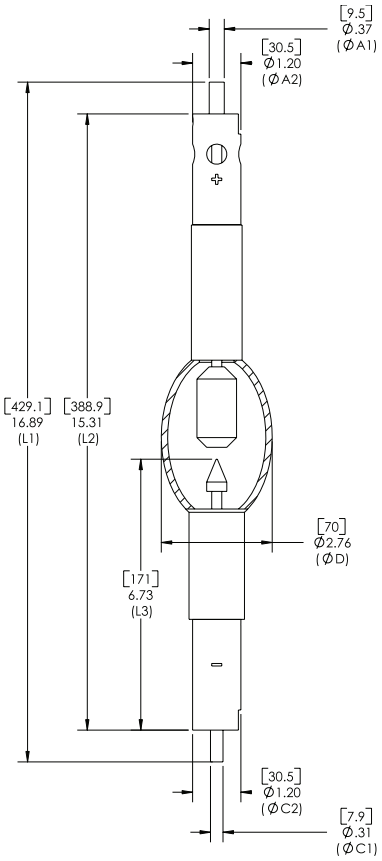


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX50003
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	5000
Voltage	33
Amperage	150
Current Range	100-160
Open Circuit Voltage	110
Luminous Flux	225000
Luminous Intensity	27000
Average Luminance	95000
Overall Length (L1)	16.89
Lamp Length (L2)	15.31
Tip to Shoulder Length (L3)	6.73
Bulb Diameter (D)	2.76
Cathode Pin (C1)	0.31
Cathode Base (C2)	1.20
Anode Pin (A1)	0.37
Anode Base (A2)	1.20
Arc Length	0.29
Lead Wire	Y

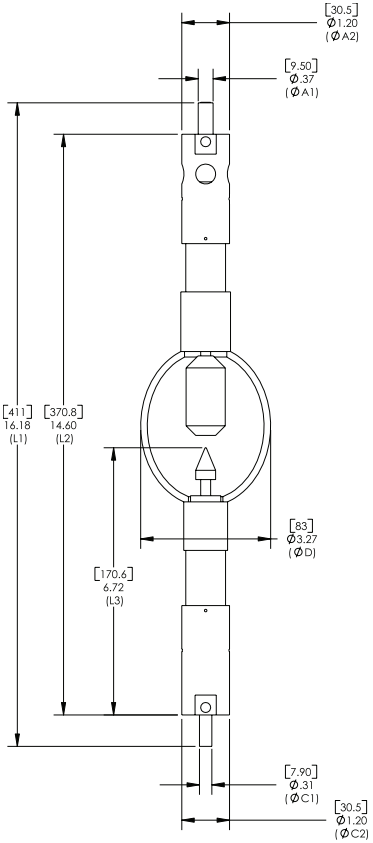


SQP-SX60001
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	Ozone Free
Wattage	6000
Voltage	43
Amperage	140
Current Range	110-165
Open Circuit Voltage	110
Luminous Flux	280000
Luminous Intensity	40000
Average Luminance	105000
Overall Length (L1)	16.18
Lamp Length (L2)	14.60
Tip to Shoulder Length (L3)	6.72
Bulb Diameter (D)	3.27
Cathode Pin (C1)	0.31
Cathode Base (C2)	1.20
Anode Pin (A1)	0.37
Anode Base (A2)	1.06
Arc Length	0.39
Lead Wire	Y

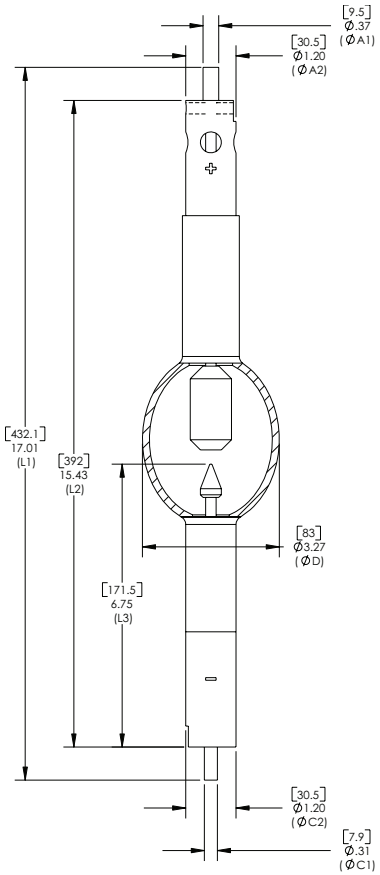


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX60002
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	6000
Voltage	37
Amperage	160
Current Range	110-170
Open Circuit Voltage	110
Luminous Flux	280000
Luminous Intensity	40000
Average Luminance	105000
Overall Length (L1)	17.01
Lamp Length (L2)	15.43
Tip to Shoulder Length (L3)	6.75
Bulb Diameter (D)	3.27
Cathode Pin (C1)	0.31
Cathode Base (C2)	1.20
Anode Pin (A1)	0.37
Anode Base (A2)	1.20
Arc Length	0.39
Lead Wire	Y

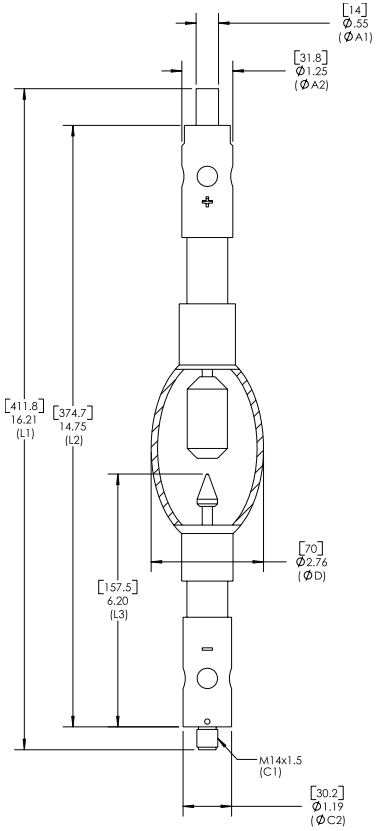


SQP-SX60003
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	Ozone Free
Wattage	6000
Voltage	37
Amperage	160
Current Range	110-170
Open Circuit Voltage	110
Luminous Flux	280000
Luminous Intensity	40000
Average Luminance	105000
Overall Length (L1)	16.21
Lamp Length (L2)	14.75
Tip to Shoulder Length (L3)	6.20
Bulb Diameter (D)	2.76
Cathode Pin (C1)	M14x1.5
Cathode Base (C2)	1.19
Anode Pin (A1)	0.55
Anode Base (A2)	1.25
Arc Length	0.39
Lead Wire	N

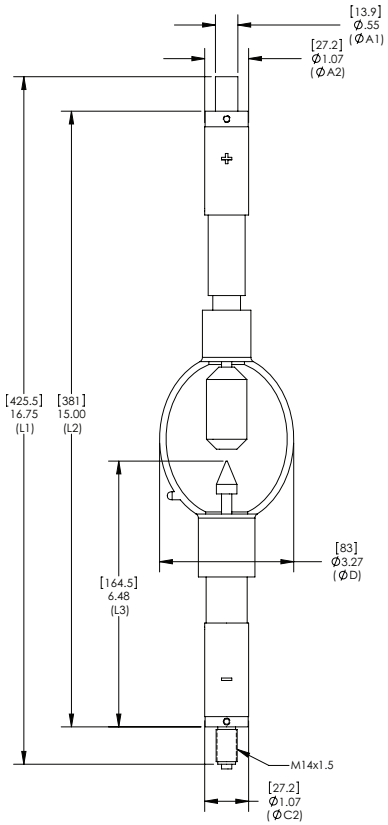


SQP-SX6000HTP
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	Ozone Free
Wattage	6000
Voltage	37
Amperage	160
Current Range	110-170
Open Circuit Voltage	110
Luminous Flux	280000
Luminous Intensity	40000
Average Luminance	105000
Overall Length (L1)	16.75
Lamp Length (L2)	15.00
Tip to Shoulder Length (L3)	6.48
Bulb Diameter (D)	3.27
Cathode Pin (C1)	M14x1.5
Cathode Base (C2)	1.07
Anode Pin (A1)	0.55
Anode Base (A2)	1.07
Arc Length	0.39
Lead Wire	N

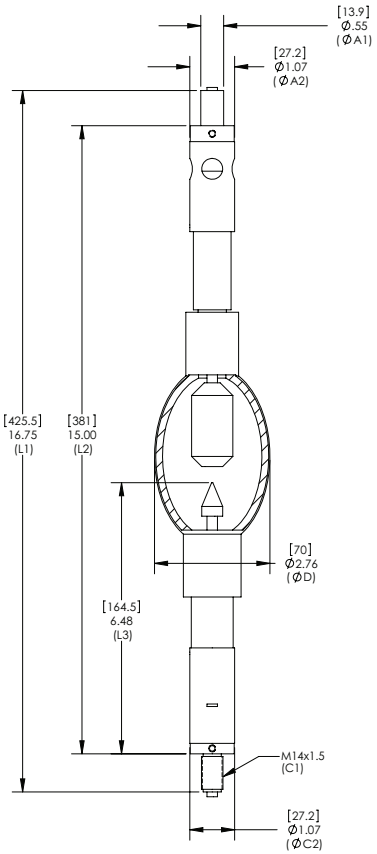


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SXD6000HTP
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	6000
Voltage	38
Amperage	160
Current Range	110-170
Open Circuit Voltage	110
Luminous Flux	300000
Luminous Intensity	45000
Average Luminance	108000
Overall Length (L1)	16.75
Lamp Length (L2)	15.00
Tip to Shoulder Length (L3)	6.48
Bulb Diameter (D)	2.76
Cathode Pin (C1)	M14x1.5
Cathode Base (C2)	1.07
Anode Pin (A1)	0.55
Anode Base (A2)	1.07
Arc Length	0.39
Lead Wire	N

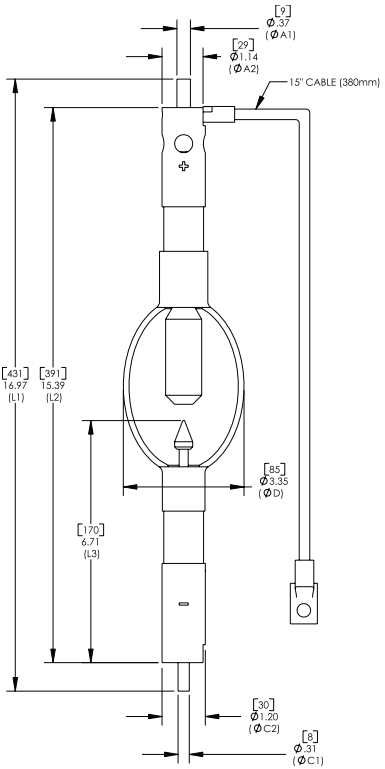


SQP-SX70001
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	Ozone Free
Wattage	7000
Voltage	42
Amperage	160
Current Range	110-180
Open Circuit Voltage	110
Luminous Flux	350000
Luminous Intensity	35000
Average Luminance	100000
Overall Length (L1)	16.97
Lamp Length (L2)	15.39
Tip to Shoulder Length (L3)	6.71
Bulb Diameter (D)	3.35
Cathode Pin (C1)	0.31
Cathode Base (C2)	1.20
Anode Pin (A1)	0.37
Anode Base (A2)	1.14
Arc Length	0.46
Lead Wire	Y

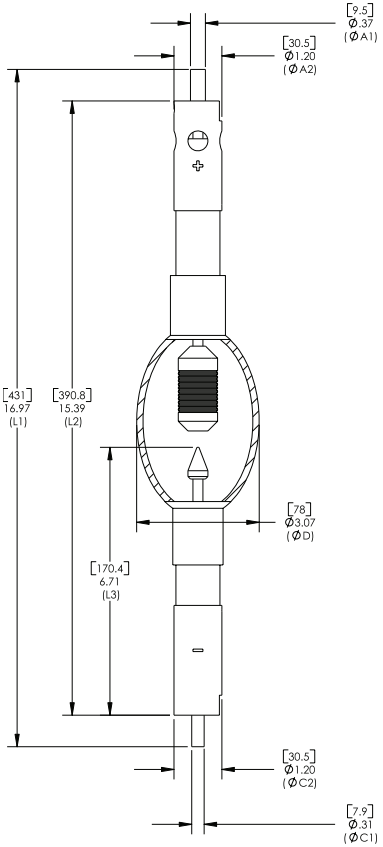


SQP-SX70001-I
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	Ozone Free
Wattage	7000
Voltage	42
Amperage	160
Current Range	110-180
Open Circuit Voltage	110
Luminous Flux	351000
Luminous Intensity	36000
Average Luminance	110000
Overall Length (L1)	16.97
Lamp Length (L2)	15.39
Tip to Shoulder Length (L3)	6.71
Bulb Diameter (D)	3.07
Cathode Pin (C1)	0.31
Cathode Base (C2)	1.20
Anode Pin (A1)	0.37
Anode Base (A2)	1.20
Arc Length	0.41
Lead Wire	Y

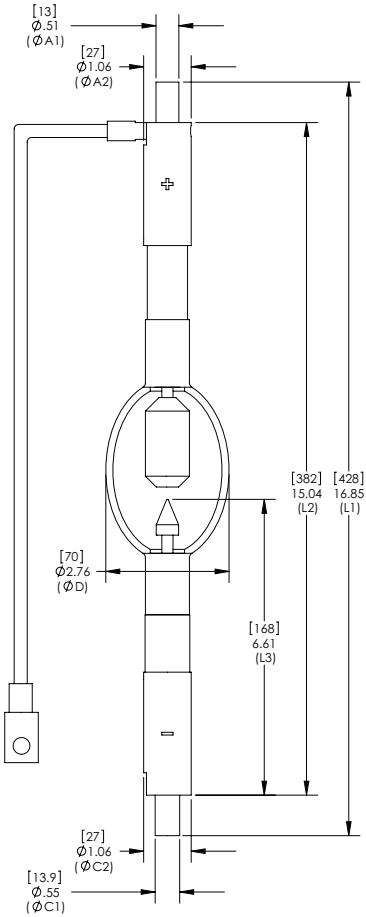


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX70002
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	7000
Voltage	46
Amperage	150
Current Range	110-180
Open Circuit Voltage	110
Luminous Flux	350000
Luminous Intensity	35000
Average Luminance	100000
Overall Length (L1)	16.85
Lamp Length (L2)	15.04
Tip to Shoulder Length (L3)	6.61
Bulb Diameter (D)	2.76
Cathode Pin (C1)	0.55
Cathode Base (C2)	1.06
Anode Pin (A1)	0.51
Anode Base (A2)	1.06
Arc Length	0.46
Lead Wire	Y

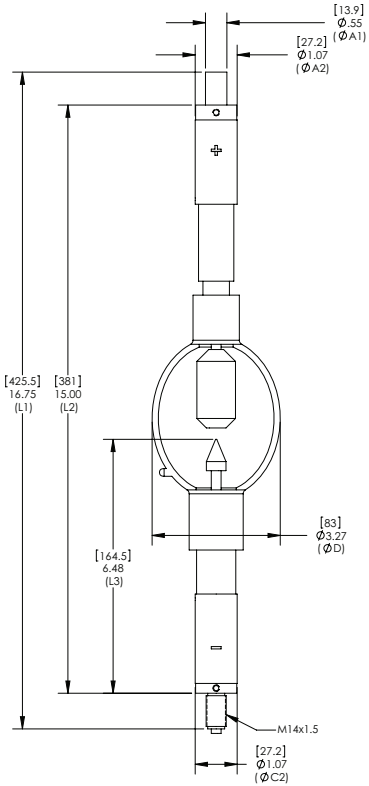


SQP-SX7000HI
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	Ozone Free
Wattage	7000
Voltage	42
Amperage	160
Current Range	110-180
Open Circuit Voltage	110
Luminous Flux	36000
Luminous Intensity	38000
Average Luminance	110000
Overall Length (L1)	16.97
Lamp Length (L2)	15.39
Tip to Shoulder Length (L3)	6.71
Bulb Diameter (D)	3.07
Cathode Pin (C1)	0.31
Cathode Base (C2)	1.20
Anode Pin (A1)	0.37
Anode Base (A2)	1.20
Arc Length	0.41
Lead Wire	Y

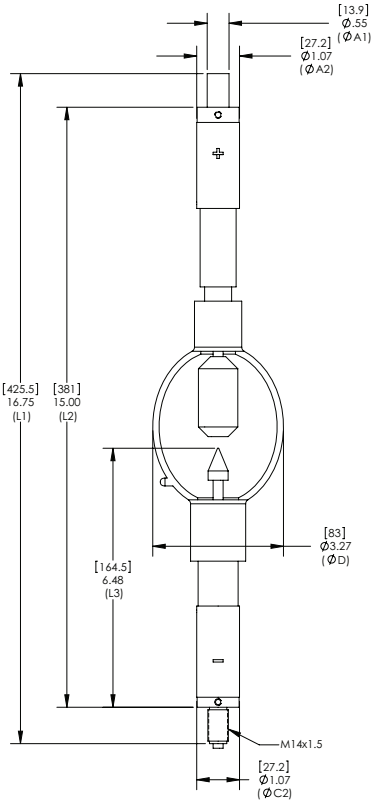


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX7000HTP
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	7000
Voltage	43
Amperage	160
Current Range	110-180
Open Circuit Voltage	110
Luminous Flux	351000
Luminous Intensity	36000
Average Luminance	110000
Overall Length (L1)	16.75
Lamp Length (L2)	15.00
Tip to Shoulder Length (L3)	6.48
Bulb Diameter (D)	3.27
Cathode Pin (C1)	M14x1.5
Cathode Base (C2)	1.07
Anode Pin (A1)	0.55
Anode Base (A2)	1.07
Arc Length	0.42
Lead Wire	N

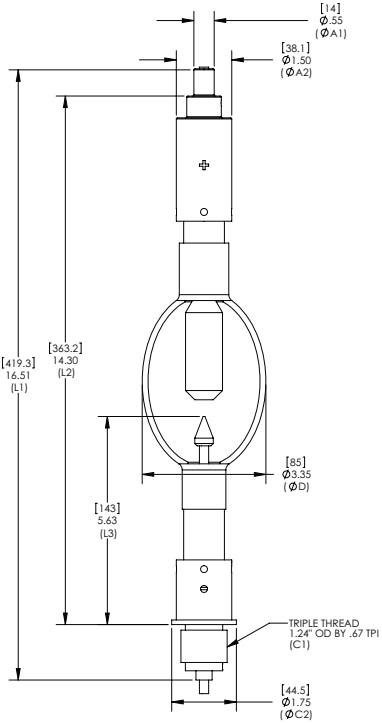


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX7000XT
Technical Brief

Lamp Specifications

Quartz Type	Ozone Free
Wattage	7000
Voltage	43
Amperage	160
Current Range	110-180
Open Circuit Voltage	110
Luminous Flux	351000
Luminous Intensity	36000
Average Luminance	110000
Overall Length (L1)	16.51
Lamp Length (L2)	14.30
Tip to Shoulder Length (L3)	5.63
Bulb Diameter (D)	3.35
Cathode Pin (C1)	Triple Thread
Cathode Base (C2)	1.75
Anode Pin (A1)	0.55
Anode Base (A2)	1.50
Arc Length	0.46
Lead Wire	N

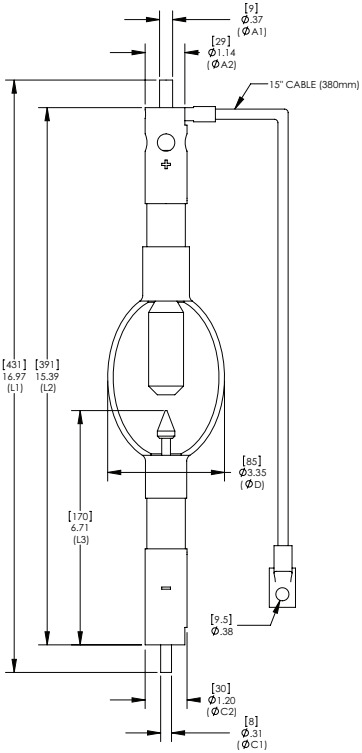


SQP-SX80001
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	Ozone Free
Wattage	8000
Voltage	45
Amperage	175
Current Range	110-185
Open Circuit Voltage	120
Luminous Flux	360000
Luminous Intensity	40000
Average Luminance	110000
Overall Length (L1)	16.97
Lamp Length (L2)	15.39
Tip to Shoulder Length (L3)	6.71
Bulb Diameter (D)	3.35
Cathode Pin (C1)	0.31
Cathode Base (C2)	1.20
Anode Pin (A1)	0.37
Anode Base (A2)	1.14
Arc Length	0.46
Lead Wire	Y

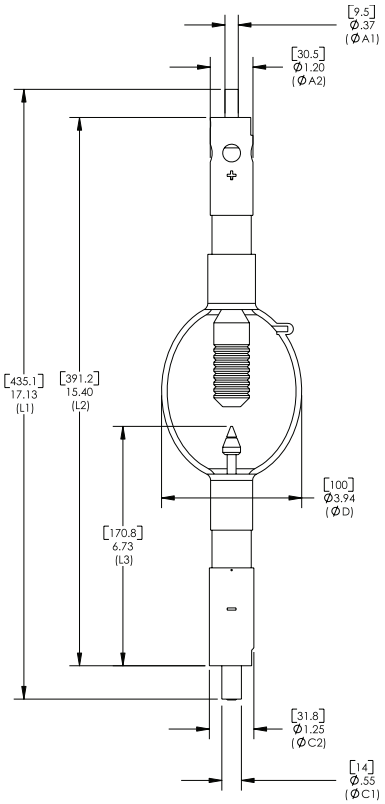


SUPERIOR QUARTZ PRODUCTS, INC.

SQP-SX100003
Technical Brief

Lamp Specifications

Quartz Type	CLEAR
Wattage	10000
Voltage	50
Amperage	200
Current Range	160-210
Open Circuit Voltage	150
Luminous Flux	500000
Luminous Intensity	47500
Average Luminance	90000
Overall Length (L1)	17.13
Lamp Length (L2)	15.40
Tip to Shoulder Length (L3)	6.73
Bulb Diameter (D)	3.94
Cathode Pin (C1)	0.55
Cathode Base (C2)	1.25
Anode Pin (A1)	0.37
Anode Base (A2)	1.20
Arc Length	0.55
Lead Wire	Y



SQP-SX10000FXT
Technical Brief

SUPERIOR QUARTZ PRODUCTS, INC.

Lamp Specifications

Quartz Type	CLEAR
Wattage	10000
Voltage	53
Amperage	200
Current Range	160-210
Open Circuit Voltage	150
Luminous Flux	500000
Luminous Intensity	47500
Average Luminance	90000
Overall Length (L1)	16.54
Lamp Length (L2)	13.71
Tip to Shoulder Length (L3)	5.63
Bulb Diameter (D)	3.94
Cathode Pin (C1)	1.25-0.2p-0.6L-ACME-3G
Cathode Base (C2)	1.94
Anode Pin (A1)	0.55
Anode Base (A2)	1.94
Arc Length	0.56
Lead Wire	N