CORNING

Varioptic® Lenses

Marketing Datasheet

Corning® Varioptic® A-58N Variable Focus Lens

Overview

The Corning® Varioptic® A-58N variable focus lens is based on Corning's breakthrough adjustable lens technology, allowing variable focus with absolutely no moving parts. It has been designed primarily for imaging applications needing a large clear aperture: long focal objectives, large sensors, C-Mount objective lenses. The A-58N variable focus lens is used as a component in industrial vision and optical equipment.

Ordering Information

- **Corning® Varioptic® A-58N0 variable focus lens**: has anti-reflective (AR) coatings optimized in the visible range.
- **Corning® Varioptic® A-58N1 variable focus lens**: has AR coatings optimized in the near infrared range.
- **Corning® Varioptic® A-58N9 variable focus lens**: has no AR coating.
- **Corning® Varioptic® A-58NX-P37 variable focus lens**: Packaged A-58Nx – 6-pin, 0.5 mm pitch straight flex cable (X=0,1,9) with on-flex thermistor

Performance Summary

- 15 diopters dynamic range
- Low wave front error
- Functions quietly

Applications

Corning Varioptic A-58N liquid lenses have been used in:

- Scientific & Optical Instrumentation
- Microscopy
- …

Contents

ESD

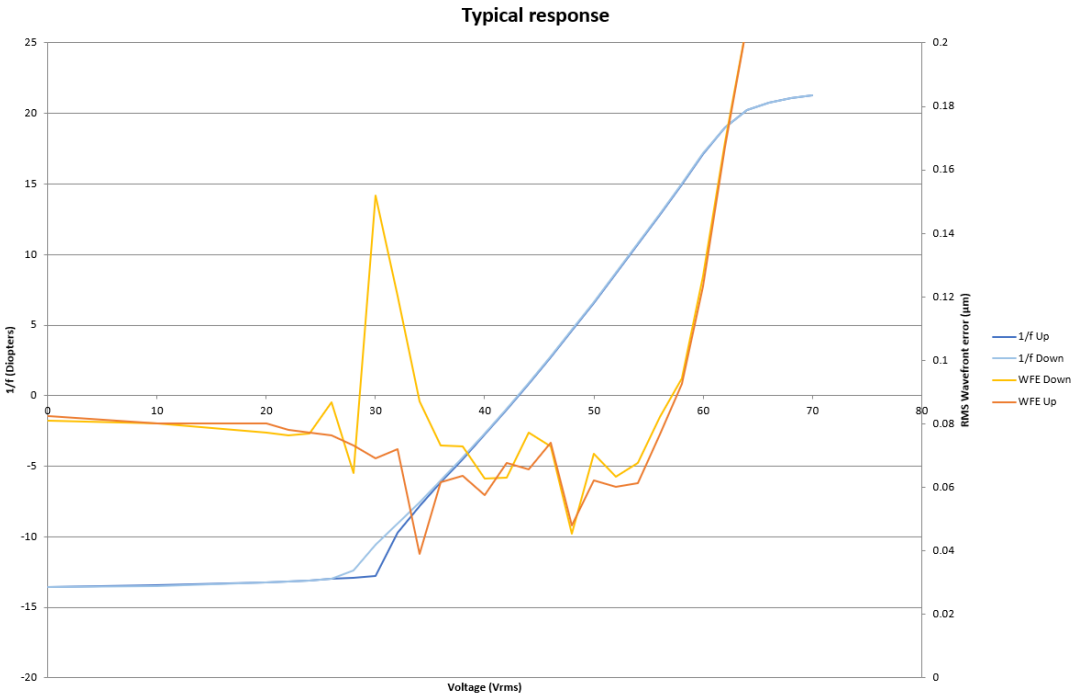
Opto-Electrical Performance

@25°C, @635 nm unless otherwise stated.

Parameter	*Unit*	*Symbol*	*Typ*	*Notes*
Aperture size	mm	$Ø_e$	5.8	(1)
Low optical power	m^{-1}	P_L	-5	
Voltage for P_L	V	V_L	36.5	
High optical power	m^{-1}	P_H	+10	
Voltage for P_H	V	V_H	52	
Optical power @ 0V	m^{-1}	P_o	-13	
Wave Front Error, rms	nm	WFE_{rms}	80	(2); (5)
Voltage @ 0 diopter	V	V_{0D}	42	(5)
Hysteresis	m^{-1}	H	0.1	(3); (5)
Slope	$(m.V)^{-1}$	S	0.95	(4); (5)
Transmission @ 587 nm	%	T_{587}	97	

Notes:

(1) Pupil size on the bottom part of the lens.
(2) Measured on typical pupil size (5 mm) and on [P_L;P_H] – Above P_H, spherical aberration becomes significant.
(3) Hysteresis in static mode, voltage increasing from 0 to V_{max}, and from V_{max} to 0. Hysteresis is the maximum difference between the rising curve and the falling curve on [P_L;P_H].
(4) Parameter is compiled on [P_L;P_H].
(5) Parameter measured with a 2 V sampling.



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Electrical Specifications

It is recommended that the lens be used only with a qualified driver.
For laboratory tests, a square signal can be applied using a laboratory function generator, providing that the signal contains no DC voltage. Use of DC voltage or DC/AC voltage combinations will lead to abnormal behavior and limited lifetime of the adjustable lens.

A dedicated compact IC has been designed to drive Corning Varioptic Lenses, namely the Maxim MAX14574. For details, please contact your local sales channel.

Important note:

Corning Varioptic Lenses are sensitive to electrostatic discharge (ESD). Use caution when handling.

Temperature Range

Parameter	*Unit*	*Min*	*Typ*	*Max*	*Notes*
Operating temperature range	°C	-20°C	25	+50°C	
Storage temperature range	°C	-40°C	25	+85°C	

Remarks:

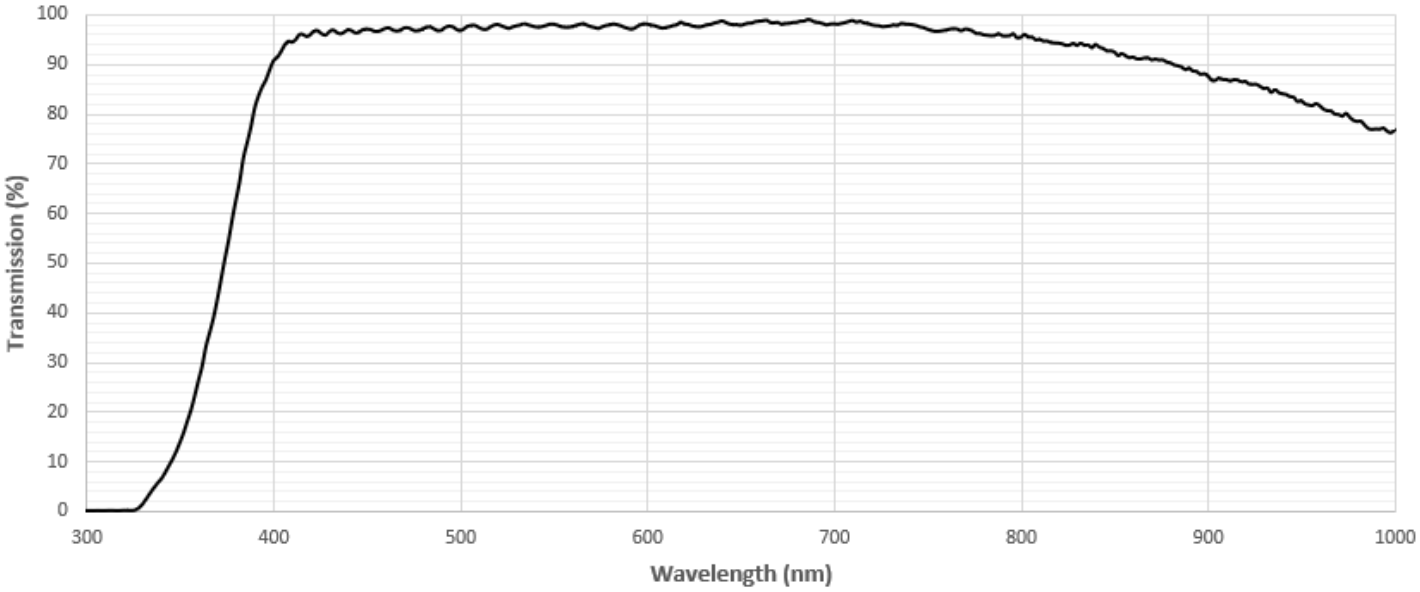
- Corning Varioptic Lenses are not designed to be soldered. For electrical connection, please refer to the application notes.
- Storage above maximum storage temperature will reduce lifetime of the lens. Temporary or permanent damage may occur if the maximum temperature is exceeded.

Transmission Performance

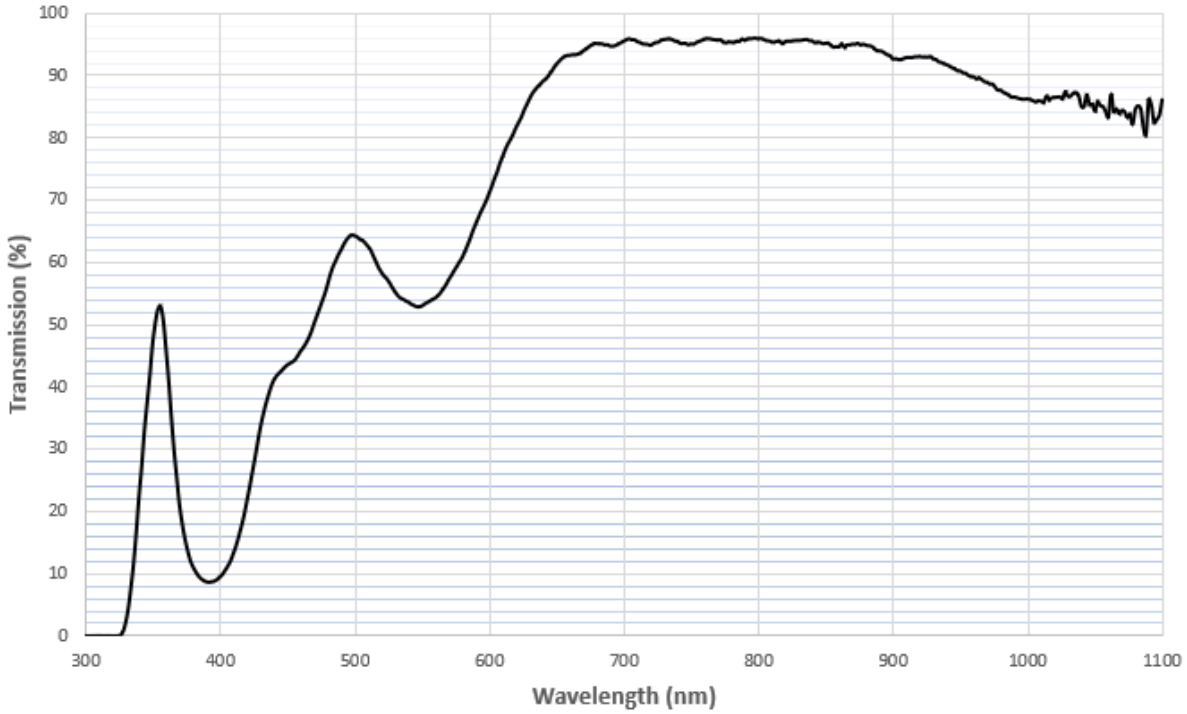
The two outer surfaces of the glass windows of the lenses have AR coatings. These AR coatings have been optimized for different wavelengths.

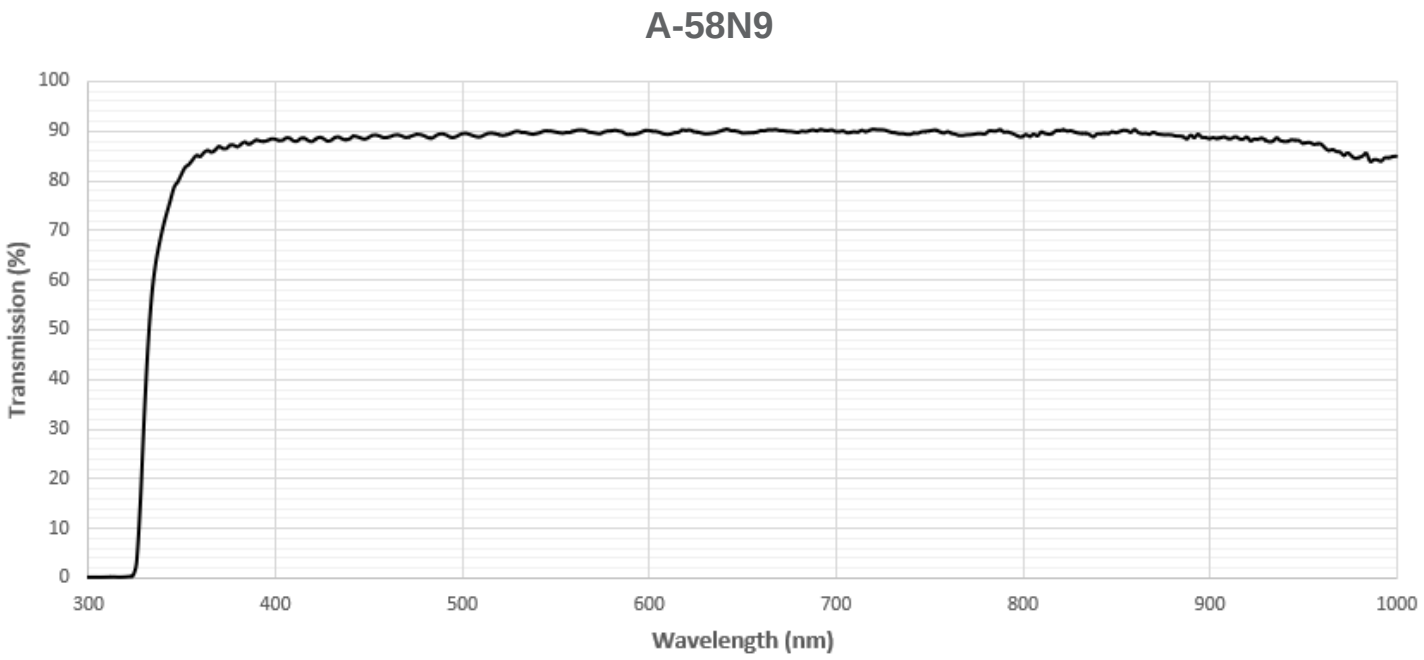
Transmission curve of the complete lens, for the different AR coatings:

A-58N0

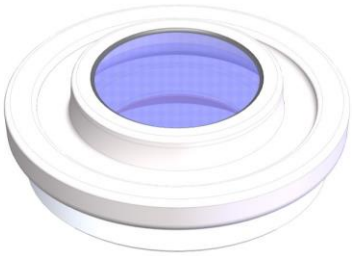


A-58N1

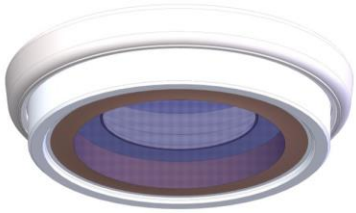




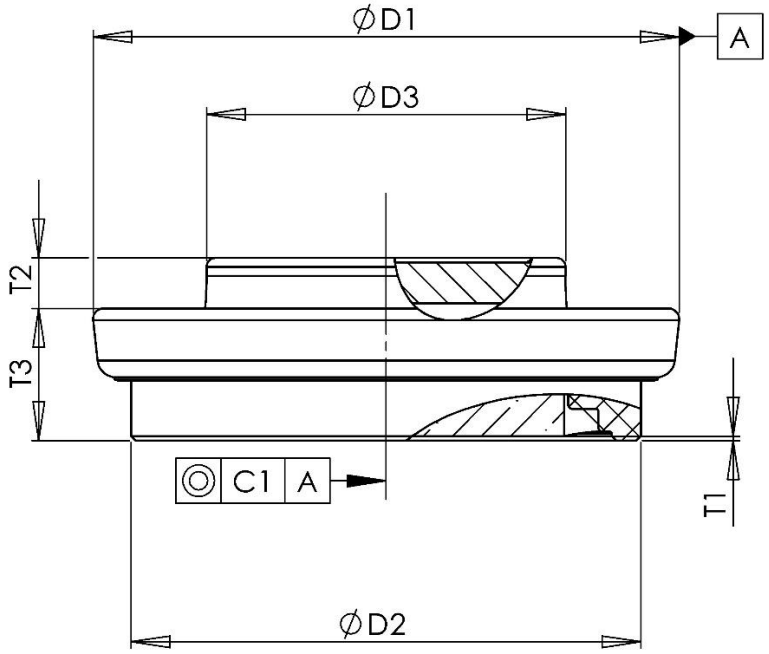
Mechanical Dimensions



Top view of the lens



Rear view of the lens

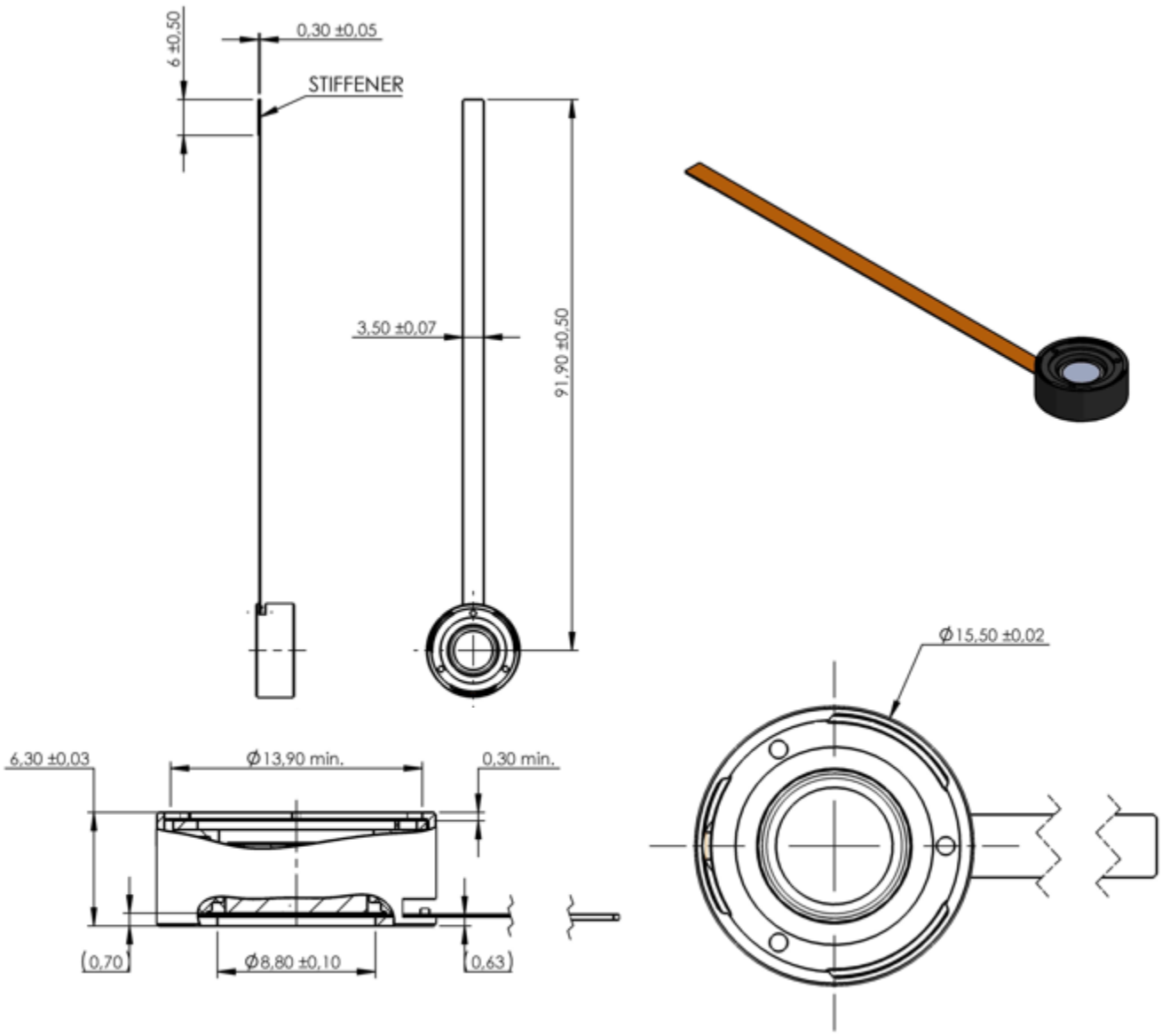


Parameter	*Unit*	*Symbol*	*Typ*	*Max*	*Notes*
External diameter	mm	D1	13		
Recess diameter	mm	D2		11.32	
Front area diameter	mm	D3	8		
Recess depth	mm	T1		0.18	
Thickness, front area	mm	T2	1.47		(1)
Thickness, flat to bottom	mm	T3	3.09		(1)
Concentricity, optical axis to B	mm	C1		Ø0.04	

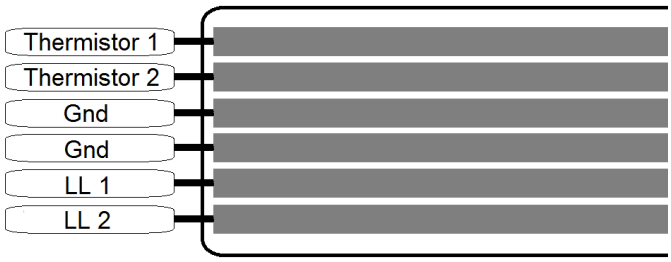
Notes:

(1) Temperature dependent. A 70 µm minimum free space in front of cap should be left available for thermal expansion Δ_{T2+T3} (T) = 1µm/°C.

A-58NX-P37


6 ±0,50
0,30 ±0,05
STIFFENER
3,50 ±0,07
91,90 ±0,50
Ø15,50 ±0,02
6,30 ±0,03
Ø13,90 min.
0,30 min.
(0,70)
Ø8,80 ±0,10
(0,63)

Electrical contact for A-58NX-P37



The following 0.5 mm pitch, 6-pin FPC connectors are compatible with the FPC tip:

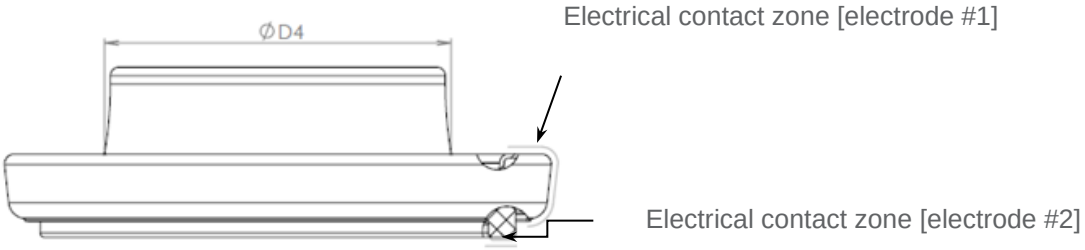
- 525590652 from Molex
- 5034800600 from Molex

FPC-A-37 is populated with a 0402 thermistor (Reference: ERTJ0ES104F from Panasonic).

Integration

Integration of A-58N

Electrical connection is done like a coin battery: on top and bottom part of the lens. The location of electrical contacts is shown in the drawing below:

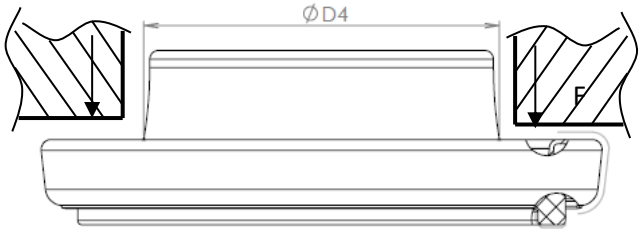


A 5 Ω max contact resistance is recommended for appropriate electrical connection.

For more details about electrical connection, please refer to the Corning Varioptic Lenses application notes.

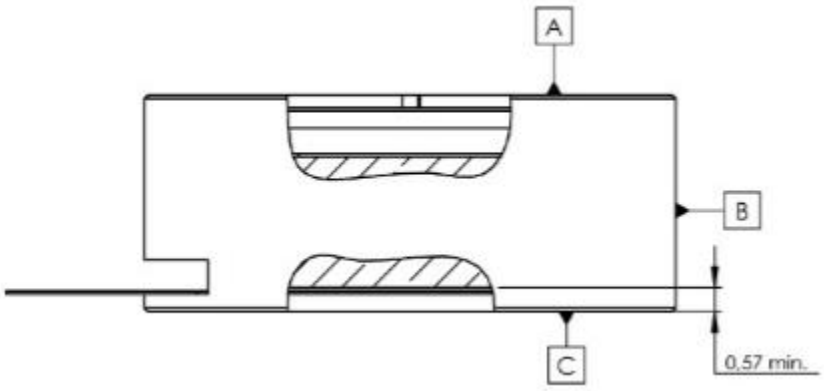
The upper part of the lens acts as a membrane to compensate temperature variations.

The central area of the lens inside a ØD4= 9 mm diameter disc / 0.07 mm thickness disc should be left free for any mechanical parts. The area outside this disc can be used to maintain the lens with a maximum force of 10 N uniformly distributed.



Integration of A-58Nx-P37

All surfaces A, B and C can be used as a mechanical reference (see the drawing below).



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