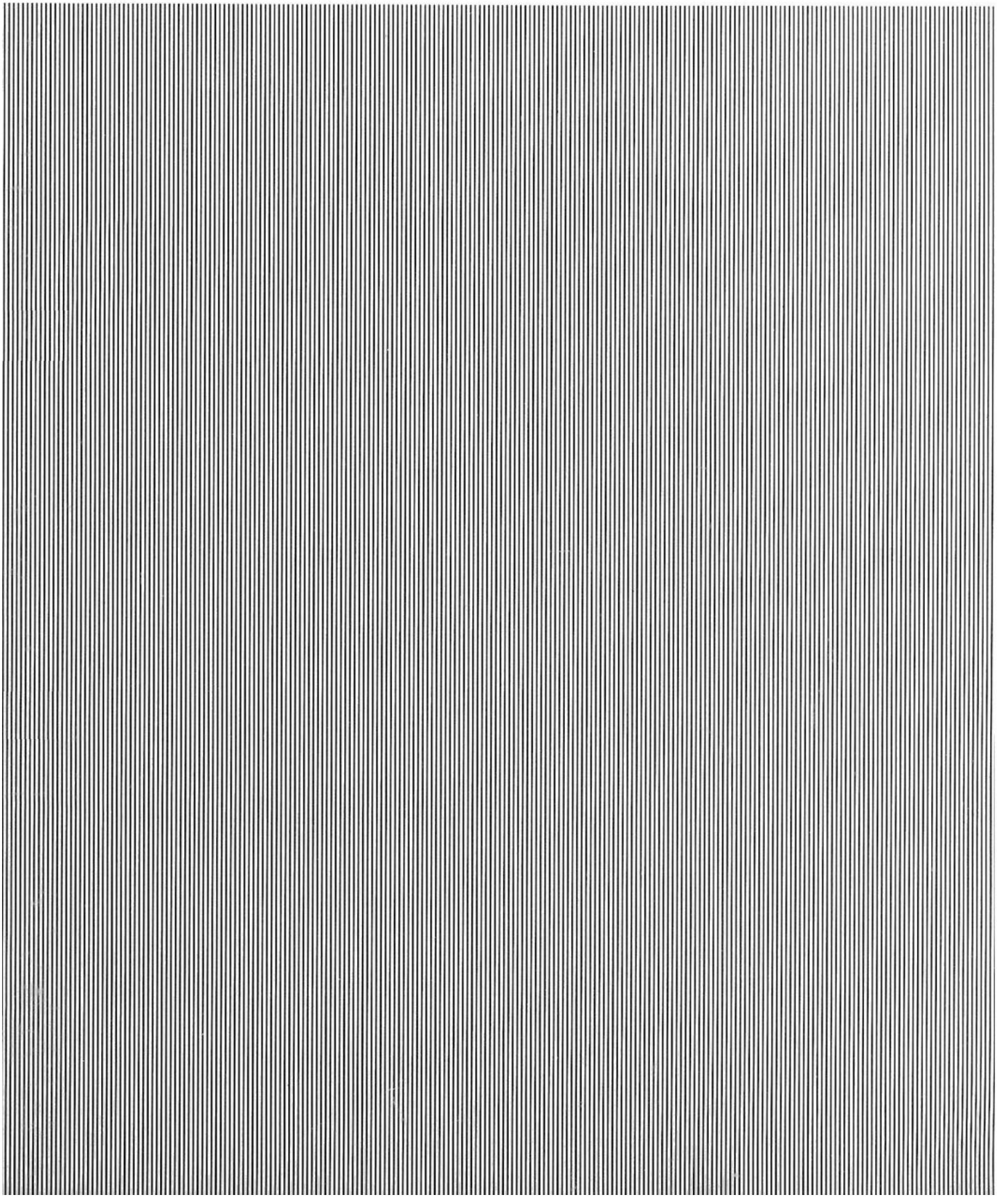
EL-Nikkor Lenses



Photographers have often tended to neglect enlarging lenses in favor of top quality general photographic lenses, this in the mistaken belief that the latter contribute more to the overall quality of the finished photograph. Of late, however, this traditionally held view has begun to change with the realization by photographers that the enlarging lens can and does contribute significantly to the attainment of the desired high-quality enlargement.

This new awareness on the part of photographers has resulted in more serious evaluation of EL-Nikkor lenses, with accordingly high praise for the outstanding performance capabilities of these units. In fact, it can be said that Nippon Kogaku's original work developing high-quality enlarging lenses set the groundwork for subsequent use of small-format originals for critical photo-enlarging work at high magnifications.

Of course, when enlarging or color separating, the best results can only be obtained when the lens used has been specifically designed to match the original format size and magnification, and also has been fully corrected for chromatic aberration. EL-Nikkor lenses are designed for meeting the demanding requirements of photo enlargement, particularly in terms of producing high resolution images from small-format originals. EL-Nikkors are available in thirteen models of varying focal lengths for a wide range of magnifications and format requirements; for details, see Table 1 following.

Table 1. EL-Nikkor Lenses

LENS	MAX. APERTURE	FORMAT SIZE
50mm	f/2.8	24 x 36mm
50mm	f/4	24 x 36mm
63mm	f/3.5	32 x 45mm
75mm	f/4	56 x 56mm
80mm	f/5.6	56 x 56mm
		56 x 72mm
105mm	f/5.6	65 x 90mm (2-1/2" x 3-1/2")
135mm	f/5.6	90 x 120mm (4" x 5")
150mm	f/5.6	100 x 150mm (4" x 5")
180mm	f/5.6	130 x 180mm (5" x 7")
210mm	f/5.6	160 x 210mm (5" x 7")
240mm	f/5.6	180 x 240mm (8" x 10")
300mm	f/5.6	270 x 330mm (10" x 12")
360mm	f/5.6	300 x 400mm (11" x 14")

EL-Nikkor Lens Features

The design of enlarging lenses is quite different from that of general photographic lenses, necessitated by the demanding requirements of photoenlarging/photoengraving applications. Of the many factors considered, magnification stands out as significant, particularly when we consider that a 35mm original negative requires a magnification of 10X to produce a 10" x 12" print. The spectral sensitivity of the photosensitive printing paper also requires adequate consideration. And, of course, image displacement (as a result of chromatic aberration) when color separating demands the strictest control to ensure exact reproduction with faithful tones and full contrast. EL-Nikkor lenses are designed taking all these factors (and more) into full consideration. The result is a full range of enlarging lenses of the highest optical quality, fully capable of reproducing details and retaining the excellence of the original negative.

1) Brightness

EL-Nikkors are constructed with large maximum apertures to save on exposure time, which is advantageous when enlarging. Additionally, they are designed so that the front and rear elements are large in diameter for maximum light transmissions, not only at the center of the field, but also at the periphery.

2) General Aberration Correction

Optical aberrations are corrected for a short focusing distance corresponding to the standard magnifying power of the lens, with correction extending over an area larger than that of the original format size. Also, distortion is held to absolute minimum for faithful reproduction of the original. Lastly, EL-Nikkors produce a flat image plane that does not shift focus, even when the lens is stopped down.

3) Chromatic Aberration Correction

Nikon EL-Nikkor lenses have optical elements made of the same type of glass as Apo-Nikkor lenses, our apochromatic lenses for photoengraving applications. With this glass, EL-Nikkors exhibit similarly high levels of chromatic aberration correction for superb results when color separating for photoengraving, or simply when photoenlarging. It should be noted that when working at the standard magnification setting, EL-Nikkors have a smaller amount of chromatic aberration than Apo-Nikkors owing to the shorter focal length.

4) Correction for Near-ultraviolet Range

There is considerable difference between the spectral sensitivity of the human eye (favoring energy from 400nm to 700nm) and that of photosensitive paper (highly responsive to ultraviolet energy from 350nm to 450nm). To ensure that focusing, as performed by the naked eye, is accurate for the sensitivity range of the paper, EL-Nikkor lenses are corrected for chromatic aberration to 380nm and feature optical glass carefully selected for minimum ultraviolet absorption. Finally, an anti-reflection coating for the wavelength of 400nm is applied as an additional measure to ensure maximum transmission of energy in the ultraviolet range. In sum, exact focus is maintained for color and black-and-white reproduction.

5) Image Resolution

EL-Nikkor lenses produce a flat image plane that does not shift focus as the lens is stopped down, nor as illumination of a different primary wavelength is used; thus, faithful reproduction is assured, even at the full aperture setting. Maximum image resolution is obtained when the lens is stopped down two or three stops, but will begin to decrease if the lens is stopped down further.

Lens Barrel Construction

The lens elements of EL-Nikkor lenses are housed in a black-finished barrel, with the easy-to-grip aperture control ring fitted at the front end for ease of access and operation. All standard f/numbers in the operation range of the diaphragm are engraved on the ring in bold, white figures, with identical sets of numbers provided on opposite sides of the ring. As an aid when operating in the darkroom, equidistantly spaced click-stop positions corresponding to each of the standard f/numbers are provided. For lenses of longer focal length (i.e., 180mm and longer), intermediate markings for 1/3-stop positions are provided between the standard f/number figures; this is especially convenient for critical photoengraving work.

Mounting on the Enlarger

The seven EL-Nikkor lenses from 50mm to 135mm focal length are designed for mounting on most popular enlargers, and are thus fitted with the common Leica-type (39mm diameter, VP = 26) mount; within this range, the 80mm, 105mm and 135mm have a mounting ring which provides two mounting sizes for greater flexibility in attaching to some Durst and Omega models. Also, an extension ring is available for mounting the 50mm f/2.8 lens on Leitz Focomat models. Mounting lenses on certain other enlargers may call for an adapter ring or mounting flange, which in some cases must be specially prepared to meet the requirements of the lens/enlarger combination.

Mounting on the Process Camera

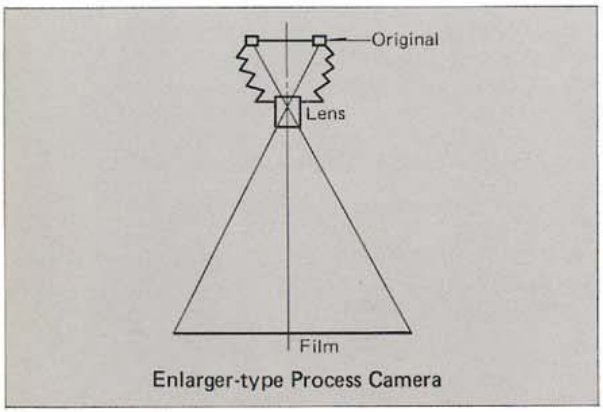
When mounting a photoengraving lens on a process camera, the front end (marked with the lens name) must be positioned facing the larger of the images, or the original. Thus, when enlarging, the lens faces the image; when reducing, it faces the original.

1) Enlarger-type Process Camera

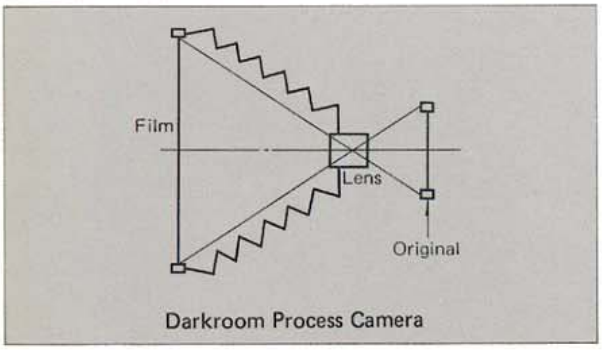
Attach the lens in the usual manner, with its rear mount toward the camera. The six lenses from 150mm to 360mm focal length are supplied with a flange to facilitate sturdy attachment to the camera using nuts and bolts.

2) Darkroom Process Camera

The eight lenses from 105mm to 360mm focal length are fitted with a front mounting thread for attachment to the camera. The remaining five lenses from 50mm to 80mm focal length, on the other hand, have no such provision; instead, these units require the use of an accessory mounting ring connected to the filter attachment threads provided.



Enlarger-type Process Camera



Darkroom Process Camera

To gain access to the front mounting threads provided on the eight longest focal length lenses, simply remove the front ornamental ring, as shown in the photos 1 and 2. The front threads on the 150mm to 360mm lenses accept attachment of the mounting flange provided with the lens, thus assuring sturdy mounting on the camera (Photo 3).


Photo 1


Photo 2


Photo 3

EL-Nikkor 50mm f/2.8

Additional Applications

In addition to ordinary color or black-and-white negative enlargement and photoenlarging/photoengraving of transparencies, EL-Nikkor lenses are suitable for use in many other photographic applications. With their superb optical performance, these lenses are ideal for special projection and close-up photography situations. And, as they are fully corrected for the near-ultraviolet range, EL-Nikkors are capable of recording phosphorescent (e.g., cathode ray tube—CRT—display) and fluorescent images. Also, these lenses can be used as an optical system for transmission of television images, or as a relay lens in combination with other optical devices.

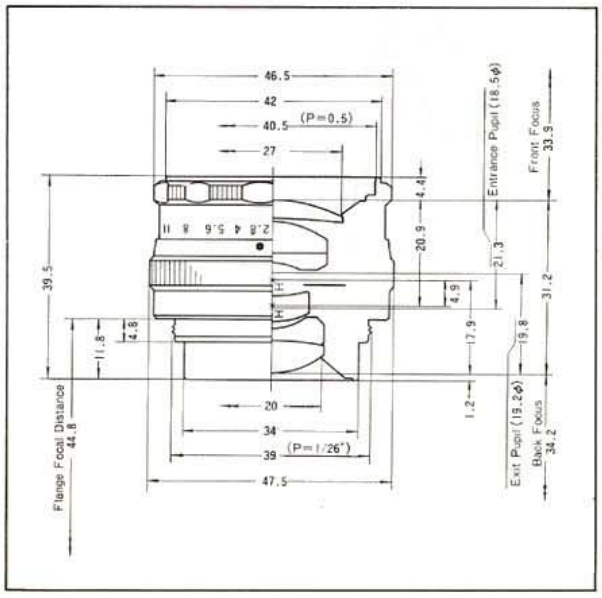
Suitability for Photoengraving

Considering the strict chromatic aberration correction and high magnification capability of EL-Nikkor lenses, it is easy to understand why these units have taken their place beside Apo-Nikkor lenses for photoengraving applications; specifically, EL-Nikkor lenses have become popular choice units for color separation/direct screening processing calling for magnifications greater than 1X. In fact, with small-format originals, EL-Nikkors will produce better results than the comparatively long focal length Apo-Nikkor units. However, when choosing the proper EL-Nikkor for such special applications, best results will be obtained when a slightly longer focal length model is selected (i.e., 35mm format originals generally require a 50mm lens; for color separating, however, a 63mm or 80mm lens will prove better). This last point is understandable when we consider the type of illumination in use, the requirement for masking and the length of the overall working distance.

Accessories for EL-Nikkor Lenses

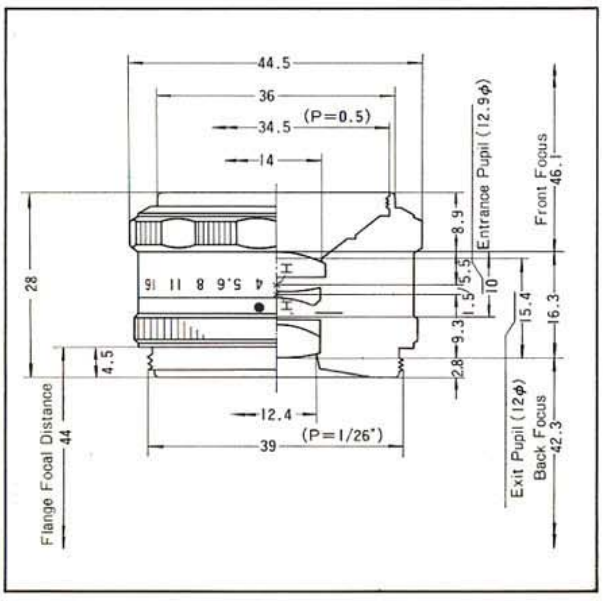
Accessory rings are available to facilitate mounting EL-Nikkor lenses onto different types of enlargers and process cameras. For the EL-Nikkor 50mm f/2.8, 50mm f/4, 63mm f/3.5, 75mm f/4 and 80mm f/5.6 lenses, accessory mounting rings connect to the front filter attachment thread for reverse mounting of the lens on the process camera. An additional ring is available for mounting the 210mm f/5.6 onto the Durst-type enlarger.

Focal length	52.1mm
Maximum aperture ratio	1:2.8
Minimum f/stop	f/16
Lens construction	6 elements in 4 groups
Correction wavelength range	380 ~ 700nm
Standard magnification	8X
Usable magnification range	2X ~ 20X
Picture angle	46°
Vignetting	0% (at f/4)
Distortion	–0.1% (at 8X)
Image size	345.6mmϕ (at 8X)
Original size	43.2mmϕ (24 x 36mm format)
Overall working distance	527.5mm (at 8X)
Weight	100g
Diameter	47.5mm
Length	39.5mm
Rear mount size	39mm (1/P = 26)
Front mount size	(mounting adapters available)
Attachment size	40.5mm (P = 0.5mm)
Flange diameter	—



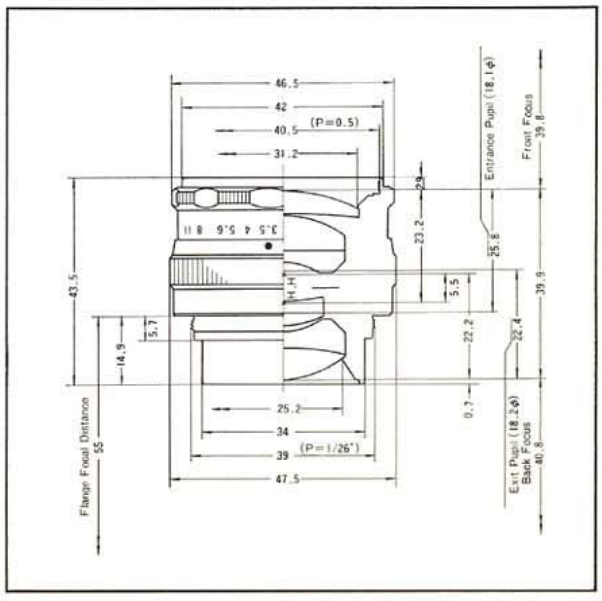
EL-Nikkor 50mm f/4

Focal length	51.6mm
Maximum aperture ratio	1:4
Minimum f/stop	f/16
Lens construction	4 elements in 3 groups
Correction wavelength range	380 ~ 700nm
Standard magnification	8X
Usable magnification range	2X ~ 20X
Picture angle	46°
Vignetting	0% (at f/8)
Distortion	−0.17% (at 8X)
Image size	345.6mmϕ (at 8X)
Original size	43.2mmϕ (24 x 36mm format)
Overall working distance	522.5mm (at 8X)
Weight	100g
Diameter	44.5mm
Length	28mm
Rear mount size	39mm (1/P = 26)
Front mount size	(mounting adapters available)
Attachment size	34.5mm (P = 0.5mm)
Flange diameter	—



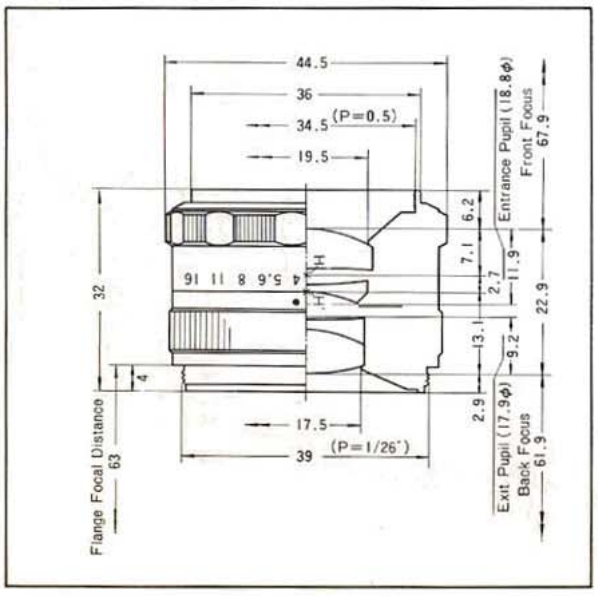
EL-Nikkor 63mm f/3.5

Focal length	63mm
Maximum aperture ratio	1:3.5
Minimum f/stop	f/16
Lens construction	6 elements in 4 groups
Correction wavelength range	380 ~ 700nm
Standard magnification	8X
Usable magnification range	2X ~ 20X
Picture angle	46°
Vignetting	0% (at f/4)
Distortion	+0.4% (at 8X)
Image size	441.6mmϕ (at 8X)
Original size	55.2mmϕ (32 x 45mm format)
Overall working distance	637.9mm (at 8X)
Weight	130g
Diameter	47.5mm
Length	43.5mm
Rear mount size	39mm (1/P = 26)
Front mount size	(mounting adapters available)
Attachment size	40.5mm (P = 0.5mm)
Flange diameter	—



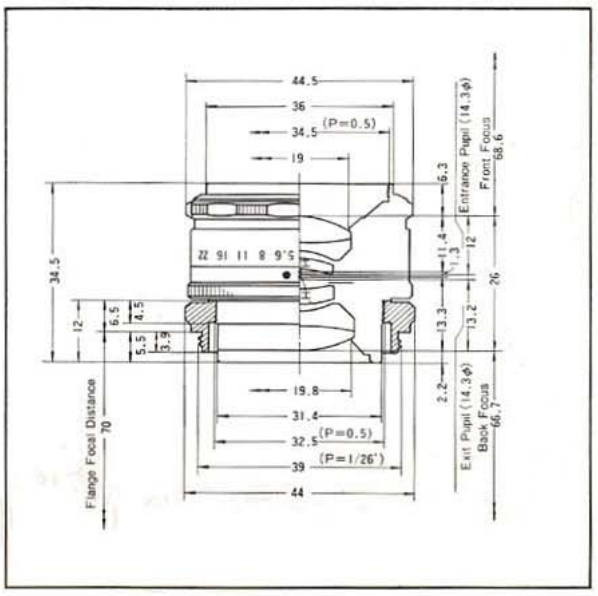
EL-Nikkor 75mm f/4

Focal length	75mm
Maximum aperture ratio	1:4
Minimum f/stop	f/45
Lens construction	4 elements in 3 groups
Correction wavelength range	380 ~ 700nm
Standard magnification	5X
Usable magnification range	2X ~ 10X
Picture angle	52°
Vignetting	0% (at f/8)
Distortion	−0.25% (at 5X)
Image size	400mmϕ (at 5X)
Original size	80mmϕ (56 x 56mm format)
Overall working distance	540mm (at 5X)
Weight	80g
Diameter	44.5mm
Length	32mm
Rear mount size	39mm (1/P = 26)
Front mount size	(mounting adapters available)
Attachment size	34.5mm (P = 0.5mm)
Flange diameter	—



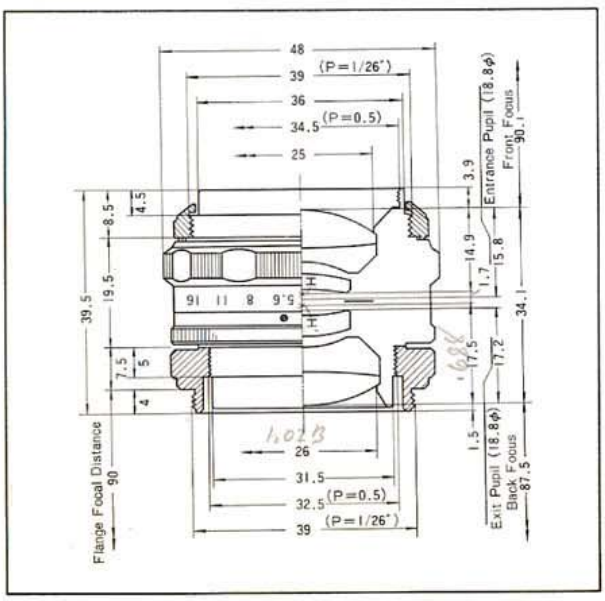
EL-Nikkor 80mm f/5.6

Focal length	80mm
Maximum aperture ratio	1:5.6
Minimum f/stop	f/45
Lens construction	6 elements in 4 groups
Correction wavelength range	380 ~ 700nm
Standard magnification	5X
Usable magnification range	2X ~ 15X
Picture angle	57°40'
Vignetting	0% (at f/8)
Distortion	−0.035% (at 5X)
Image size	500mmϕ (at 5X)
Original size	100mmϕ (56 x 72mm format)
Overall working distance	576mm (at 5X)
Weight	150g
Diameter	44.5mm
Length	34.5mm
Rear mount size	39mm (1/P = 26); 32.5mm (P = 0.5mm)
Front mount size	(mounting adapters available)
Attachment size	34.5mm (P = 0.5mm)
Flange diameter	—



EL-Nikkor 105mm f/5.6

Focal length	105mm
Maximum aperture ratio	1:5.6
Minimum f/stop	f/45
Lens construction	6 elements in 4 groups
Correction wavelength range	380 ~ 700nm
Standard magnification	5X
Usable magnification range	2X ~ 10X
Picture angle	56°
Vignetting	0% (at f/8)
Distortion	+0.009% (at 5X)
Image size	650mmϕ (at 5X)
Original size	130mmϕ (65 x 90mm format)
Overall working distance	756mm (at 5X)
Weight	220g
Diameter	48mm
Length	39.5mm
Rear mount size	39mm (1/P = 26)
	32.5mm (P = 0.5mm)
Front mount size	39mm (1/P = 26)
Attachment size	34.5mm (P = 0.5mm)
Flange diameter	—



EL-Nikkor 135mm f/5.6

Focal length	135mm
Maximum aperture ratio	1:5.6
Minimum f/stop	f/45
Lens construction	6 elements in 4 groups
Correction wavelength range	380 ~ 700nm
Standard magnification	5X
Usable magnification range	2X ~ 10X
Picture angle	54°
Vignetting	0% (at f/8)
Distortion	+0.025% (at 5X)
Image size	800mmϕ (at 5X)
Original size	160mmϕ (4" x 5" format)
Overall working distance	972mm (at 5X)
Weight	260g
Diameter	57mm
Length	47.2mm
Rear mount size	39mm (1/P = 26)
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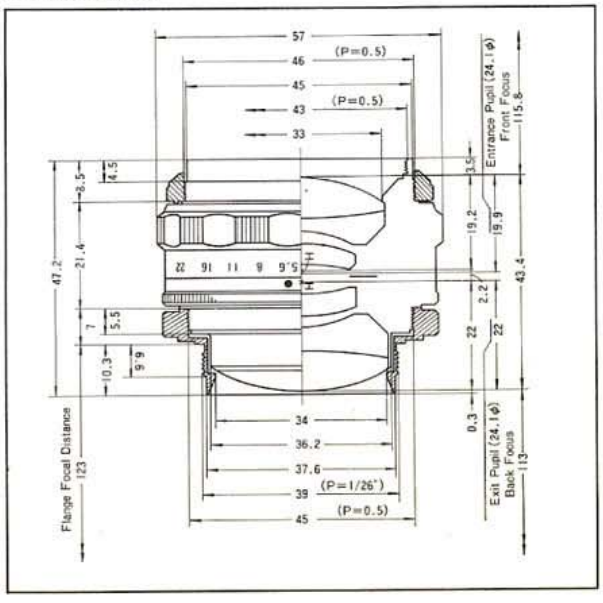
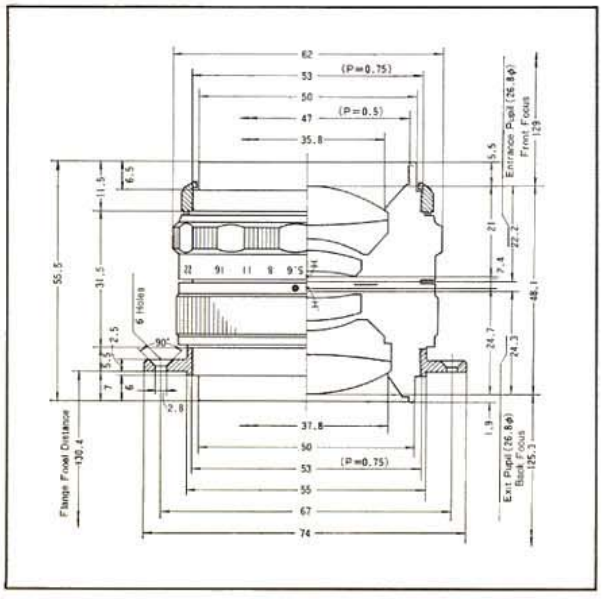
Front mount size	46mm (P = 0.5mm)
Attachment size	43mm (P = 0.5mm)
Flange diameter	—



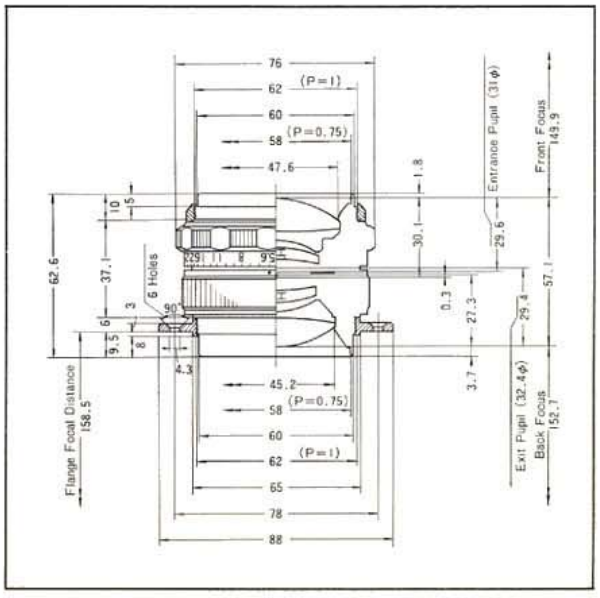
EL-Nikkor 150mm f/5.6

Focal length	150mm
Maximum aperture ratio	1:5.6
Minimum f/stop	f/45
Lens construction	6 elements in 4 groups
Correction wavelength range	380 ~ 700nm
Standard magnification	4X
Usable magnification range	2X ~ 8X
Picture angle	54°
Vignetting	0% (at f/8)
Distortion	+0.01% (at 4X)
Image size	760mmφ (at 4X)
Original size	190mmφ (4" x 5" format)
Overall working distance	937.5mm (at 4X)
Weight	300g
Diameter	62mm
Length	55.5mm
Rear mount size	53mm (P = 0.75mm)
Front mount size	53mm (P = 0.75mm)
Attachment size	47mm (P = 0.5mm)
Flange diameter	74mm



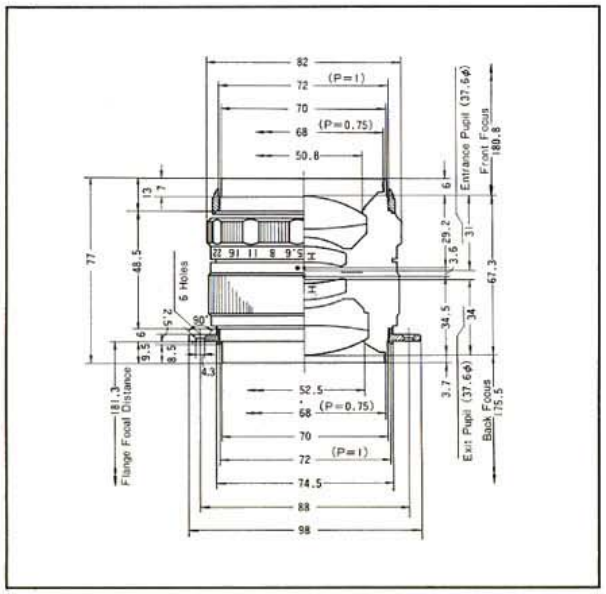
EL-Nikkor 180mm f/5.6

Focal length	180mm
Maximum aperture ratio	1:5.6
Minimum f/stop	f/45
Lens construction	6 elements in 4 groups
Correction wavelength range	380 ~ 700nm
Standard magnification	4X
Usable magnification range	2X ~ 8X
Picture angle	54°
Vignetting	0% (at f/8)
Distortion	–0.01% (at 4X)
Image size	920mmφ (at 4X)
Original size	230mmφ (5" x 7" format)
Overall working distance	1,125mm (at 4X)
Weight	430g
Diameter	76mm
Length	62.6mm
Rear mount size	62mm (P = 1mm)
Front mount size	62mm (P = 1mm)
Attachment size	58mm (P = 0.75mm)
Flange diameter	88mm



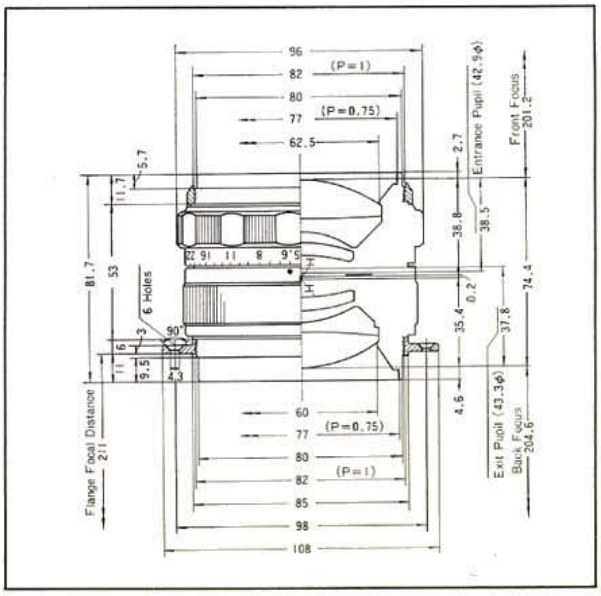
EL-Nikkor 210mm f/5.6

Focal length	210mm
Maximum aperture ratio	1:5.6
Minimum f/stop	f/45
Lens construction	6 elements in 4 groups
Correction wavelength range	380 ~ 700nm
Standard magnification	4X
Usable magnification range	2X ~ 8X
Picture angle	54°
Vignetting	0% (at f/8)
Distortion	+0.01% (at 4X)
Image size	1,080mmϕ (at 4X)
Original size	270mmϕ (5" x 7" format)
Overall working distance	1,315.5mm (at 4X)
Weight	600g
Diameter	82mm
Length	77mm
Rear mount size	72mm (P = 1mm)
Front mount size	72mm (P = 1mm)
Attachment size	68mm (P = 0.75mm)
Flange diameter	98mm



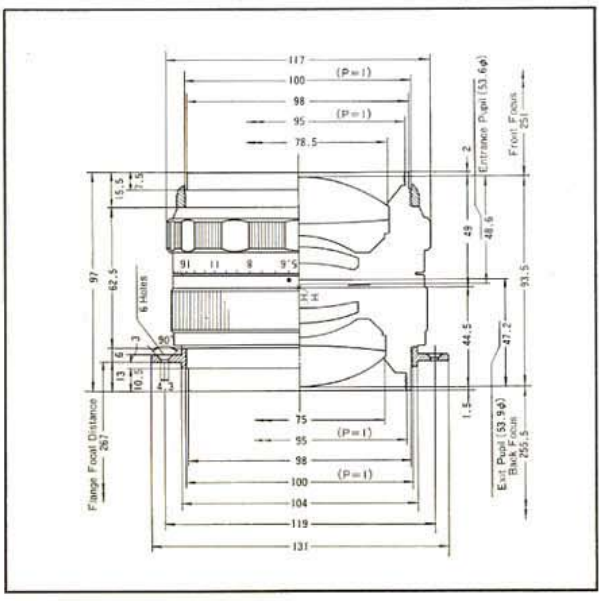
EL-Nikkor 240mm f/5.6

Focal length	240mm
Maximum aperture ratio	1:5.6
Minimum f/stop	f/45
Lens construction	6 elements in 4 groups
Correction wavelength range	380 ~ 700nm
Standard magnification	3X
Usable magnification range	1X ~ 6X
Picture angle	54°
Vignetting	0% (at f/8)
Distortion	−0.02% (at 3X)
Image size	990mmϕ (at 3X)
Original size	330mmϕ (8" x 10" format)
Overall working distance	1,280mm (at 3X)
Weight	910g
Diameter	96mm
Length	81.7mm
Rear mount size	82mm (P = 1mm)
Front mount size	82mm (P = 1mm)
Attachment size	77mm (P = 0.75mm)
Flange diameter	108mm



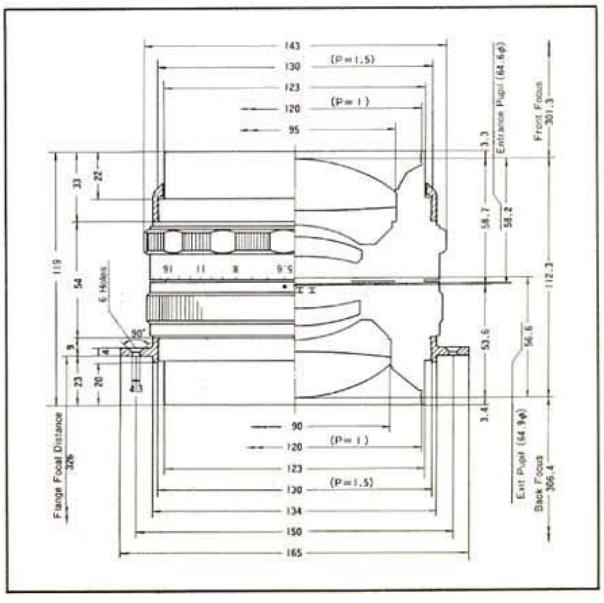
EL-Nikkor 300mm f/5.6

Focal length	300mm
Maximum aperture ratio	1:5.6
Minimum f/stop	f/45
Lens construction	6 elements in 4 groups
Correction wavelength range	380 ~ 700nm
Standard magnification	2X
Usable magnification range	1X ~ 4X
Picture angle	52°
Vignetting	0% (at f/8)
Distortion	−0.03% (at 2X)
Image size	880mmϕ (at 2X)
Original size	440mmϕ (10" x 12" format)
Overall working distance	1,350mm (at 2X)
Weight	1,550g
Diameter	117mm
Length	97mm
Rear mount size	100mm (P = 1mm)
Front mount size	100mm (P = 1mm)
Attachment size	95mm (P = 1mm)
Flange diameter	131mm



EL-Nikkor 360mm f/5.6

Focal length	360mm
Maximum aperture ratio	1:5.6
Minimum f/stop	f/45
Lens construction	6 elements in 4 groups
Correction wavelength range	380 ~ 700nm
Standard magnification	2X
Usable magnification range	1X ~ 4X
Picture angle	52°
Vignetting	0% (at f/8)
Distortion	−0.02% (at 2X)
Image size	1,000mmϕ (at 2X)
Original size	500mmϕ (11" x 14" format)
Overall working distance	1,620mm (at 2X)
Weight	2,700g
Diameter	143mm
Length	119mm
Rear mount size	130mm (P = 1.5mm)
Front mount size	130mm (P = 1.5mm)
Attachment size	120mm (P = 1mm)
Flange diameter	165mm



The equipment shown in this leaflet represents the latest available at the time of this printing. Designs and specifications are subject to change without notice.

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