

The **Nikon F-mount** is a type of interchangeable [lens mount](#) developed by [Nikon](#) for its [35mm format Single-lens reflex cameras](#). The F-mount was first introduced on the [Nikon F](#) camera in 1959, and features a three-lug [bayonet mount](#) with a 44 mm throat and a flange to [focal plane](#) distance of 46.5 mm. The company continues to use variations of the same lens mount specification for its film and [digital SLR cameras](#).

History^{[\[edit\]](#)}

The Nikon F-mount is one of only two SLR lens mounts (the other being the [Pentax K-mount](#)) which were not abandoned by their associated manufacturer upon the introduction of [autofocus](#), but rather extended to meet new requirements related to [metering](#), [autofocus](#), and [aperture](#) control. The large variety of F-mount compatible lenses makes it the largest system of interchangeable flange-mount photographic lenses in history. Over 400 different [Nikkor](#) lenses are compatible with the system. The F-mount is also popular in scientific and industrial applications, most notably [machine vision](#). The F-mount has been in production for over five decades, making it the only SLR lens mount which has been produced for over 50 years.

System of lenses^{[\[edit\]](#)}

In addition to Nikon's own range of "[Nikkor](#)" lenses, brands of F-mount photographic lenses include [Zeiss](#), [Voigtländer](#), [Schneider](#), [Angénieux](#), [Samyang](#), [Sigma](#), [Tokina](#), [Tamron](#), [Hartblei](#), [Kiev-Arsenal](#), [Lensbaby](#), and [Vivitar](#). F-mount cameras include current models from [Nikon](#), [Fujifilm](#), [Sinar](#), [JVC](#), [Kenko](#) and [Horseman](#). Numerous other manufacturers employ the F-mount in non-photographic imaging applications.

Compatibility^{[\[edit\]](#)}

The F-mount has a significant degree of both [backward](#) and [forward compatibility](#). Many current autofocus F-mount lenses can be used on the original [Nikon F](#), and the earliest manual-focus F-mount lenses of the 1960s and early 1970s can, with some modification, still be used to their fullest on all professional-class Nikon cameras. Incompatibilities do exist, however, and adventurous F-mount users should consult product documentation in order to avoid problems. For example, many electronic camera bodies cannot meter without a **CPU** enabled lens, the aperture of **G** designated lenses cannot be controlled without an electronic camera body, and **non-AI** lenses (manufactured prior to 1977) can cause mechanical damage to later model bodies unless they are modified to meet the **AI** specification. Many manual focus lenses can be converted to allow metering with consumer Nikon bodies by adding a [Dandelion chip](#) to the lens.^[1]

Image circle^{[[edit](#)]}

Most Nikon F-mount lenses cover the standard 36×24 mm area of [35mm format](#) and the [Nikon FX format](#), while **DX** designated lenses cover the 24×16 mm area of the [Nikon DX format](#), and industrial F-mount lenses have varying coverage. DX lenses may produce [vignetting](#) when used on film and FX cameras. However, Nikon lenses designed for film cameras will work on Nikon digital system cameras with the limitations noted above.

Mounting and control rings^{[[edit](#)]}

Unlike most other lens mounts, F-mount lenses lock by turning counter-clockwise (when looking at the front of lens) and unlock clockwise. Nearly all F-mount lenses have zoom and focus controls that rotate in the clockwise direction (as viewed from behind the camera) to increase focal length and focus distance respectively. This convention is also used in [Pentax K-mount](#) and [Sony A-mount](#) lenses but is opposite of the direction normally used by [Canon](#).^{[*[citation needed](#)*]} F-mount lenses also typically have aperture rings that turn clockwise to close.

Compatible lenses^{[[edit](#)]}



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This list is [incomplete](#); you can help by [expanding it](#).

Nikkor^{[[edit](#)]}

Designations^{[[edit](#)]}

Nikon has introduced many proprietary designations for F-mount [Nikkor](#) lenses, reflecting design variations and developments both in lenses and the F-mount itself. There are also "unofficial" designations used by collectors and dealers to differentiate similar lenses.

Pre-autofocus^{[[edit](#)]}



Nikon F professional SLR camera with eyelevel prism and early NIKKOR-S Auto 1,4 f=5,8cm lens (1959)



A typical F-type ("Pre-AI") lens, the Nikkor 50mm 1:1.4 showing "Nippon Kogaku Japan" engravings, scalloped-metal focus ring, and old-style Meter Coupling Prong (clearly visible to the top right of photo).



Nikon F2SB professional SLR camera with GN Auto Nikkor 1:2,8 f=45mm AI lens



A typical AI lens: A Nikkor 50mm 1:1.4 showing "Nikon" engravings, rubber focus ring, and new-style Meter Coupling Prong distinguished by its cutaway sections. The lens is mounted on a [Nikon FE2](#) camera.

- **A** — Auto Nikkor (also unofficially **F**, **Pre-AI**, **Non-AI** or **NAI**) — Designation for the first generation of F-mount lenses, introduced in 1959. These were all single-coated, and meter coupling was provided by a prong (known as the Meter Coupling Prong) fixed to the lens's aperture ring. The Photomic T through-the-lens light meter introduced in 1965 worked at full aperture, so the maximum aperture of the lens had to be communicated to the meter by mounting the lens with the aperture ring set to $f/5.6$, and then turning the ring to first the

minimum and then the maximum apertures. (The need for this step was eliminated by the AI system below.) Early versions are marked "Nippon Kogaku Japan" and have their focal lengths stated in centimetres, but models produced after about 1965 have focal lengths stated in millimetres. The "Nippon Kogaku Japan" engraving was replaced by "Nikon" from 1971 onwards. *Warning: Mounting a non-AI lens can damage many modern Nikon camera bodies.* AI-cameras that still may use non-AI lenses includes the [Nikon F2A/F2AS](#) with Photomic A (DP-11) or AS (DP-12) finder, [Nikon \(Nikkormat\) EL2](#), as well as [Nikon FM](#) and [FE](#). In addition, the [Nikon Df](#), a DSLR introduced in late 2013, can use non-AI lenses.^[2] The A lenses can be converted to the AI specification; see **AI'd** below.

- **T, Q, P, H, S, O, N, UD, QD, PD** — Appears immediately before or after the "Nikkor" name on F-type lenses (see above), designating the number of optical elements in the design. Short for Tres (3), Quattuor (4), Penta (5), Hex (6), Septem (7), Octo (8), Novem (9), UnDecim (11), QuattuorDecim (14) and Penta-Decem (15).^[3] The terms Unus (1) and Bini (2) were also apparently designated, but never used. Terms P=Penta, H=Hexa, and PD=Penta-Decem (Greek root) were used (instead of Quinque, Sex, and QuinDecim) to avoid ambiguity with Quattuor, Septem and QuattuorDecim. This designation scheme was dropped with the introduction of "Modern" (K-type) Nikkors in 1974.
- **Auto** — Designation for F-type lenses indicating an automatic diaphragm ([aperture](#)). Not to be confused with automatic exposure or [auto focus](#), the designation fell out of use in the early 1970s and was not carried onto K-type lenses.
- **C** — Indicates a *multicoated* F-type lens. Appears with an [interpunct](#) after the number of optical elements (in the form "Nikkor-X·C"). This designation was introduced in 1971 and discontinued in 1974 with the introduction of "Modern" (K-type) Nikkors, when multicoating had become standard practice.
- **K** — "Modern" or "New" Nikkors introduced in 1974. While Pre-AI for compatibility purposes, K-type lenses introduced the new cosmetics that would be used from 1977 onwards for AI-type lenses (see below). The scalloped-metal focus rings were replaced with rubber grip insets, and the use of element number and coating designations was discontinued. The 'K' designation itself is believed to be derived from the Japanese "konnichi-teki", loosely translatable as "modern" or "contemporary".
- **AI** — Manual focus with "Automatic Maximum-Aperture Indexing," introduced in 1977. The AI standard adds a Meter Coupling Ridge to the aperture ring, which encodes the current aperture setting relative to the maximum, and a Lens Speed Indexing Post on the mounting flange, which encodes the maximum aperture itself. The Ridge and Post couple to the camera's [light meter](#). Lenses designated AI-S, Series E, and AF all include these features of AI. Current professional Nikon camera bodies link with the Meter Coupling Ridge, but the Lens Speed Indexing Post is ignored and the maximum aperture value is set electronically by the operator instead. AI-

designated lenses also improved on the original Meter Coupling Prong, adding cutaways which allow more ambient light to fall on the aperture ring, increasing visibility on cameras which optically projected the setting inside the viewfinder.

- **AI'd** — An unofficial designation for lenses converted partially (Meter Coupling Ridge only) or completely from non-AI to AI. This is accomplished by replacing the aperture ring and the metering prong (using a long-discontinued kit procured from Nikon) or by modifying the original part. Some independent camera repair technicians continue to offer such conversions.
- **AI-S** — The successor to AI, the AI-S specification added two mechanical enhancements — standardized aperture control, and the Focal Length Indexing Ridge — required for the [shutter priority](#) and other auto-aperture exposure modes of the [Nikon FA](#), [F-301/N2000](#), [F-501/N2020](#), and [F4](#) cameras. Later cameras did not require these features, and interoperate with AI and AI-S lenses identically. The term AI-S is now commonly used to refer to manual focus lenses, and Nikon continues to produce eight [prime lens](#) models in its AI-S line. All Nikon AF lenses with aperture rings (non-G) also meet the AI-S specification, except for their lack of a Meter Coupling Prong (which can be added).
 - *Standardized aperture control.* AI-S lens apertures move in a standardized fashion in relation to their stop-down levers. The levers of AI and pre-AI lenses were intended only to close the aperture to its manual setting. The advance of aperture control by the camera body itself, by partial actuation of the stop-down lever, meant more precision was required for consistent exposure. This feature is indicated by a Lens Type Signal notch in the lens mount. Although later Nikon cameras cannot control the apertures of AI-S lenses as the F4, they control the apertures of AF lenses using the same method of partial lever actuation and standardized response.
 - *Focal Length Indexing Ridge.* AI-S lenses with a focal length of 135mm or longer are indicated by a ridge on the lens mount, used by FA, F-501, and F4 to engage high-speed-biased Program Autoexposure.

Electromechanical and data communication[\[edit\]](#)

- **AF** — The original [autofocus](#) designation, indicating focus driven by a motor inside the camera body. All AF lenses have an integrated [CPU \(microprocessor\)](#). Used in the form "AF Nikkor", this should not be confused with the original autofocus lenses for the [F3AF](#) camera, which were designated "AF-Nikkor" and are considered predecessors to AF-I lenses.
- **AF-N** — Indicates the "New" version of an AF lens. The change from plastic focus rings on early AF lenses to the a new "rubber inset focus ring" (**RIFR**) is often indicated by the AF-N designation. Introduced in 1990.
- **AF-I** — Autofocus-Internal. Driven by a [coreless DC motor](#). Used only in long telephoto lenses (300 mm *f*/2.8 through 600 mm *f*/4.0) starting in 1992. Introduced in 1992.

- **AF-D** — Designation for an AF lens (as above) with "D" functionality (see "D" below). Introduced in 1992.
- **AF-S** — Autofocus-Silent. Uses a "Silent Wave Motor" (**SWM**) ([ultrasonic motor](#)) to focus quietly and quickly. Similar to Canon's "USM" technology. Introduced in 1996.
- **AF-P** — Autofocus using a low cost [stepper motor](#). Introduced in 2015.
- **CPU** — Central Processing Unit. The lens is fitted with electrical contacts for digital communication with the camera. All AF and AI-P lenses are CPU lenses. Some non-professional Nikon cameras require CPU lenses for metered operation. This designation appears in specifications but not lens names.
- **D** — Distance. Indicated after the [f-number](#) in the name, and also occasionally designated AF-D. The integrated CPU electronically communicates focus distance information, which is incorporated into the camera's exposure calculations in 3D Matrix Metering mode, and also D-TTL and I-TTL flash autoexposure. All AF-I, AF-S, and G-type lenses are also D-type.
- **E** — [Electromagnetic diaphragm](#). The aperture diaphragm of an E lens is controlled digitally by the camera, and actuated electromagnetically by a system housed within the lens, rather than employing the F-mount's traditional mechanical diaphragm linkage. This system first appeared in certain Perspective Control lenses, designated PC-E (with designs that preclude a mechanical linkage). E-type lenses aperture control is only supported by all DSLRs with [CMOS image sensor](#) except the [Nikon D90](#). For all other cameras the lens aperture stays maximum open with normal autofocus and metering. E Lenses with manual aperture control like PC-E lenses allow manual diaphragm operation on all cameras, with possible unreliable metering on DSLRs without E-type support.^[4] Otherwise E lenses are similar to G lenses. Not to be confused with **Series E** lenses.
- **G** — Designation for lenses without an aperture ring, indicated after the [f-number](#) in the name. G lenses retain the mechanical diaphragm coupling of other Nikkors, but the aperture setting can only be controlled by the camera body. Only autofocus bodies with command dials are capable of controlling G lenses. Older autofocus bodies will work with G lenses in shutter priority and program modes with full opened aperture.^{[5][6]} Some recent G lenses feature a weatherproofing [gasket](#) around the mounting flange. G lenses otherwise have the same characteristics as D lenses.
- **P or AI-P** — "AI with Program." CPU-enabled variation of AI-S. Includes only the 45/2.8P, 500/4P and 1200-1700/5.6-8P Nikkor lenses. [Zeiss ZF.2](#) and [Voigtländer SL II](#) lenses are also AI-P designs, although they are not designated as such. Not to be confused with early lenses marked "Nikkor-P" meaning a 5-element lens (see pre-autofocus designations above).

Optical design[\[edit\]](#)

- **Aspherical** — [Aspheric lens](#) elements. Also **Hybrid** used: Thin molded aspheric elements coupled to a conventional glass element. This designation appears in specifications but not lens names.
- **CRC** — Close Range Correction. Improved performance at close focus distances. Achieved by internal focus movements that move differently relative to the movement of the other focusing elements. This designation appears in specifications but not lens names.
- **DC** — Defocus Control. DC lenses have a separate control ring for spherical aberration, which affects primarily the appearance of out-of-focus areas, also known as [bokeh](#). At extreme settings, DC lenses can generate an overall soft-focus effect. Includes only the AF DC-Nikkor 105mm *f*/2D and AF DC-Nikkor 135mm *f*/2D.
- **ED** — "Extra-low [Dispersion](#)" glass incorporated to reduce [chromatic aberration](#). Lenses using ED elements usually carry a gold ring around the barrel to indicate the fact (although on some low-end lenses gold foil is used instead), and older lenses were also marked "NIKKOR*ED". In addition to normal ED glass, "Super ED" glass is used in some lenses.
- **FL** — [Fluorite](#). Designates a lens which includes one or more elements constructed of [fluorite](#) instead of glass. Currently includes only the AF-S 800mm *f*/5.6E FL ED VR, available since 2013, and the AF-S 400mm *f*/2.8E FL ED VR, available since 2014.
- **GN** — [Guide Number](#). Assists in flash exposure on cameras without automatic flash metering. The flash's guide number is set on the lens, and the aperture is accordingly coupled to the lens's focus ring for correct exposure. The only GN lens, the supercompact GN Auto Nikkor (it was the second smallest Nikon F-mount lens ever made), was built during the late 1960s and early 1970s.
- **HRI** — High [refractive index](#) elements. Contains elements with a refractive index >2. This designation appears in specifications but not lens names.
- **IF** — Internal Focus. Focusing is accomplished through the movement of internal lens groups, eliminating extension and rotation of the front lens element, allowing focus to be driven quickly by a small motor. IF lenses also allow the use of a [polarizing filter](#) without the need to readjust it after focus.
- **Micro** — Micro-Nikkor lenses are capable of high reproduction ratios, typically 1:2 or 1:1, for [macro photography](#). The first Micro-Nikkor lenses were created for producing [microforms](#) of [Kanji](#) text.^{[[?](#)]}
- **N** — Indicates the Nano Crystal Coat, a relatively new type of lens coating that originated in Nikon's semiconductor division. Lenses with this coating feature the logo of an "N" inside an elongated hexagon on the name plate.

- **NIC** — Nikon Integrated Coating, a proprietary multicoating. Appears in specifications but not lens names.
- **PC** — [Perspective Control](#). Lens features shift [movements](#) (and also tilt movements on some models) to control perspective and depth-of-field. Newer PC lenses are designated PC-E (see designation E above). Not to be confused with early lenses marked "Nikkor-P·C" meaning a five-element coated lens (see pre-autofocus designations above).
- **PF** — Phase [Fresnel](#). To counteract chromatic aberration. It replaces several lens elements, thus reducing the size and weight of a lens.^[8]
- **Reflex** — Designates a [catadioptric](#) (mirror) lens.
- **RF** — Rear Focusing. Quite similar to internal focusing. Focusing is accomplished through the movement of rear lens groups, eliminating extension and rotation of the front lens element, allowing focus to be driven quickly by a small motor. RF lenses also allow the use of a [polarizing filter](#) without the need to readjust it after focus.
- **SIC** — Super Integrated Coating, a proprietary multicoating. Appears in specifications but not lens names.
- **UV** — Lenses designed for imaging [ultraviolet](#) light.
- **VR** — [Vibration Reduction](#). Uses a moving optical group to reduce the photographic effects of camera shake. Some VR lenses also support a [panning](#) mode, detecting horizontal movement of the lens and minimizing only vertical vibration. The second generation of VR is called **VR II**, which is designed to offer another 1-stop advantage over original VR, but lenses with this feature are still designated simply "VR."

Alternate product lines^[edit]

- **DX** — Lens designed for the smaller [Nikon DX format](#). [Vignetting](#) may occur if used on a [35mm format](#) or [Nikon FX format](#) camera in full-frame mode, although some DX lenses cover the full 135 frame at longer focal lengths.
- **IX** — Lenses designed for use with the now-defunct Pronea [APS](#) SLR. These are all autofocus zoom lenses. They are not compatible with cameras outside of the Pronea system unless [mirror lock-up](#) is used^[9]
- **Series E** — A line of lower-cost lenses manufactured during the 1980s for Nikon's amateur SLRs. They sacrificed some construction quality and employed simpler optical designs. Early Series E lenses were built to the AI specification. Later Series E lenses were upgraded to the AI-S specification, and are identifiable by a metal ring on the barrel. None of this family of lenses were branded *Nikkor*, instead carrying the text "Nikon Lens Series E."

Esoteric[[edit](#)]

- **Bellows** — Lens designed exclusively for use on a [bellows](#) unit, primarily for [macro photography](#). Also called **short mount**. Since some Nikon bellows allow for a [front rise](#), they allow a limited variety of lenses to be used similarly to a PC lens (see *Optical design* above).
- **Fisheye-Nikkor** — Lenses producing either a circular image on the film plane/imager or a partially circular image. Can be as wide as 220° or typically 180°. Fisheye lenses are based upon an equidistant projection formula, or an orthographic projection (OP).

<https://en.m.wikipedia.org/wiki/File:Nikkor.jpeg>

- **LW** — Amphibian lens. Produced for [Nikonos](#) system, featuring a Nikonos lens mount, waterproof, but not designed for underwater use. Ideal for suffers, speleogists.
- **Medical** — Nikkor designation for a [macro](#) lens with a built-in ring light strobe system, designed for clinical and scientific applications.
- **Noct** — "Night." Specialty low-light lens designed for maximum sharpness at the widest aperture setting. The name has been applied only to the Noct-Nikkor 58mm *f*/1.2.
- **OP** — Orthographic Projection. Fisheye lens that produces an image which maintains the same brightness in the image as in the object, with no [falloff at the edges](#).^[3]
- **UW** — Underwater lenses. Produced for the [Nikonos](#) systems.

Manual-focus lenses[[edit](#)]

Manual-focus [prime lenses](#)[[edit](#)]



13mm *f*/5.6 AI-S

- 6 mm *f*/2.8 Circular Fisheye (220°)
- 6 mm *f*/5.6 Circular Fisheye (220°) (requires [MLU](#))
- 7.5 mm *f*/5.6 Circular Fisheye (requires [MLU](#))
- 8 mm *f*/2.8 Circular Fisheye
- 8 mm *f*/8.0 Circular Fisheye (requires [MLU](#))

- 10 mm *f*/5.6 OP Circular Fisheye (requires [MLU](#))
- [13 mm *f*/5.6](#)
- 15 mm *f*/3.5
- 15 mm *f*/5.6
- 16 mm *f*/2.8 Full Frame Fisheye (180°)
- 16 mm *f*/3.5 Full Frame Fisheye (170°)
- 18 mm *f*/4.0
- 18 mm *f*/3.5



Nikon 28mm *f*/2.8 manual-focus lens

- 20 mm *f*/1.8
- 20 mm *f*/2.8
- 20 mm *f*/3.5 UD
- 20 mm *f*/3.5
- 20 mm *f*/4.0
- 21 mm *f*/4.0 (requires [MLU](#))
- 24 mm *f*/2.0
- 24 mm *f*/2.8
- 28 mm *f*/2.0
- 28 mm *f*/2.8
- 28 mm *f*/3.5



Nikon 50mm f/1.4 manual-focus lens

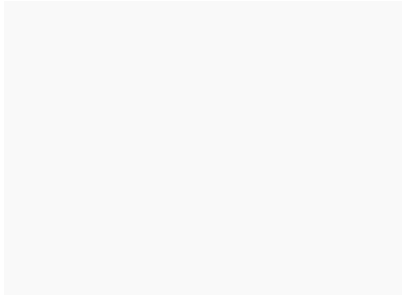
- 35 mm *f*/1.4
- 35 mm *f*/2.0
- 35 mm *f*/2.8
- 45 mm *f*/2.8 GN
- 45 mm *f*/2.8 P
- 50 mm *f*/1.2
- 50 mm *f*/1.4
- 50 mm *f*/1.8
- 50 mm *f*/2.0
- 55 mm *f*/1.2



Nikon 85mm f/2 manual-focus lens

- 58 mm *f*/1.2 Noct
- 58 mm *f*/1.4
- 85 mm *f*/1.4
- 85 mm *f*/1.8
- 85 mm *f*/2.0
- 105 mm *f*/1.8
- 105 mm *f*/2.5

- 105 mm *f*/4.0 (pre-set)
- 120 mm *f*/4.0 IF Medical



Nikon 135mm *f*/2.8 manual-focus lens

- 135 mm *f*/2.0
- 135 mm *f*/2.8
- 135 mm *f*/3.5



Nikon 200mm *f*/4 manual-focus lens

- 180 mm *f*/2.8 ED
- 200 mm *f*/2.0 ED-IF
- 200 mm *f*/4.0 Q
- 200 mm *f*/4.0



200 mm *f*/5.6 Medical Nikkor, mounted on a [Nikon F](#) with high-speed motor drive.

- 200 mm *f*/5.6 Medical
- 300 mm *f*/2.0 ED-IF
- 300 mm *f*/2.8 ED (pre-set)
- 300 mm *f*/2.8 ED-IF
- 300 mm *f*/4.5 P
- 300 mm *f*/4.5 H
- 300 mm *f*/4.5 ED
- 300 mm *f*/4.5 ED-IF
- 400 mm *f*/2.8 ED-IF
- 400 mm *f*/3.5 ED-IF
- 400 mm *f*/4.5 (lens head; requires CU-1 or AU-1 focus unit)
- 400 mm *f*/5.6 ED
- 400 mm *f*/5.6 ED-IF
- 500 mm *f*/4.0 P ED-IF
- 500 mm *f*/5.0 Reflex
- 500 mm *f*/8.0 Reflex
- 600 mm *f*/4.0 ED-IF
- 600 mm *f*/5.6 (lens head; requires CU-1 or AU-1 focus unit)
- 600 mm *f*/5.6 ED (lens head; requires CU-1 or AU-1 focus unit)
- 600 mm *f*/5.6 ED-IF
- 800 mm *f*/5.6 ED-IF
- 800 mm *f*/8.0 (lens head; requires CU-1 or AU-1 focus unit)
- 800 mm *f*/8.0 ED (lens head; requires CU-1 or AU-1 focus unit)
- 800 mm *f*/8.0 ED-IF
- 1000 mm *f*/6.3 Reflex
- 1000 mm *f*/11.0 Reflex
- 1200 mm *f*/11.0 (lens head; requires CU-1 or AU-1 focus unit)
- 1200 mm *f*/11.0 ED (lens head; requires CU-1 or AU-1 focus unit)
- 1200 mm *f*/11.0 ED-IF
- 2000 mm *f*/11.0 Reflex

Macro

- 45 mm *f*/2.8 ED PC-E Micro
- 55 mm *f*/2.8 Micro
- 55 mm *f*/3.5 Micro
- 55 mm *f*/4.0 UV Micro (prototype only)



Nikon F with 105 mm *f*/4.0 Micro Nikkor.

- 85 mm *f*/2.8D PC Micro
- 85 mm *f*/2.8D PC-E Micro
- 105 mm *f*/4.5 UV Micro
- 105 mm *f*/4.0 (bellows lens)
- 105 mm *f*/4.0 Micro
- 105 mm *f*/2.8 Micro
- 135 mm *f*/4.0 (bellows lens)
- 200 mm *f*/4.0 IF Micro
- 200 mm *f*/4.0D ED-IF AF Micro

Series E lenses[\[edit\]](#)



Nikon Series E 50mm *f*/1.8 lens

- 28 mm *f*/2.8
- 35 mm *f*/2.5
- 50 mm *f*/1.8
- 100 mm *f*/2.8
- 135 mm *f*/2.8
- 36–72 mm *f*/3.5

- [70–210 mm f/4.0](#)
- 75–150 mm f/3.5

Perspective control (PC) lenses [\[edit\]](#)



The [PC-E Nikkor 24mm f/3.5D ED Lens](#) of 2008 adds the tilt function to Nikkor's traditional shift function



The 35mm f/3.5 PC-Nikkor, introduced in 1961. Note the small clearance between the shifting section of the lens and the camera body. The lens cannot be mounted on later camera bodies with protruding prisms.

Nikon PC lenses, like other [perspective control lenses](#), offer adjustments that duplicate certain [view camera movements](#). The 28mm and 35mm PC lenses support [shifting](#) the lens in relation to the film or sensor plane, while Nikon's 24mm, 45mm, and 85mm PC-E lenses also support [tilting](#).

Nikon currently offers four different PC lenses for sale: the three PC-E Nikkors (2008), and the 85mm PC-Nikkor (1999). The 45 mm and 85 mm "Micro" lenses offer close focus (0.5 magnification) for [macrophotography](#). The PC-[E](#) lenses (the "E" designates an electromagnetic diaphragm) offer automatic aperture control with all DSLRs with [CMOS image sensor](#) except the [Nikon D90](#). With earlier DSLRs and all "analog" film camera models, a PC-E lens operates like a PC lens. The PC Micro-Nikkor 85 mm f/2.8D lens offers only preset aperture control, actuated mechanically by pressing a plunger.