What do all of those letters and numbers mean on my lenses ?

By Bill Munch

Nearly all camera lenses will have some numbers and letters printed on them. Some of these numbers are part of the basic technical specification of the lens. Others indicate the features and capabilities that the lens is equipped with. A few of these terms will be common for all lenses but some may be manufacturer specific. Let's look at the common terms first, followed by manufacturer specific terminologies.

Common Terms

mm Number

EF 50mm f/1.4 USM

- The "mm" letters on a camera lens refer to the focal length in millimeters. Focal length is the length or distance from the front of the lens to the sensor inside of the camera. The focal length is one of the most important considerations you need to take into account when buying a new lens. Larger mm numbers, such as 200mm or 300mm provide a magnified telephoto view or a telephoto shot. The larger numbers are ideal to use if you are taking a lot of pictures from a long distance. For example, if you want to take a photo of a bird in a tree, you would want to take the shot with a focal length of 300mm or greater depending on where you are situated in relation to the bird.

- Conversely, the smaller the mm number the wider the angle of view within a photograph. Smaller mm numbers are better employed for wide shots. In addition, if a lens has two mm numbers on it, (for example 17-85mm) this indicates that you can take a shot with a 17mm focal length or zoom in all the way to a 85mm length.

Focal Length Prime

EF 50mm f/1.4 USM

- A prime or ‘fixed’ lens is one which doesn’t zoom in and out, but stays fixed at a certain length. The 50mm part means that the lens stays fixed at 50mm. Other popular ones are 24mm, 85mm or 200mm.

Focal Length Zoom

AF-S DX NIKKOR 18-200mm f/3.5-5.6 G ED VR II
EF-S 18-200mm f3.5-5.6 IS

If the name of the lens has two numbers, that means it's a zoom lens. For example: "18-200mm" means that when the lens is at it's 'shortest' or 'widest', it's an 18mm lens. When fully extended, 'zoomed' or 'long', it can go up to 200mm. And of course, it can cover anything in between.

Aperture

EF-S 18-200mm f3.5-5.6 IS

- This is a set of numbers mentioned as a ratio that indicate the widest possible aperture for a lens. In case of a zoom lens, you can see one or two values, while a prime lens will have a single value.
- The ratio determines how your camera is able to handle light, since the aperture size affects how much light enters the camera sensor. In the case of a zoom lens, you will typically see one or two values, such as 1:2.8, (prime) 1:4-5.6 (zoom) or f/2.8 or f/4-5.6.

Aperture Prime

AF Nikkor 50mm f/1.4
EF 20mm f/2.8

This is the maximum aperture of the lens: the widest f-stop that the lens can be set to, which also lets in the greatest amount of light. Lenses with smaller f numbers let in more light and are more useful for low-light photography. Lenses that let in a lot of light are also called fast.

Aperture Zoom

NIKKOR 18-200mm f/3.5-5.6 G ED VR II
Canon EF-S 18-200mm f3.5-5.6 IS

On a zoom lens, there's usually an aperture range (two f/stop numbers) much like the two numbers which tells you the range of the focal length. On the lens that often comes with Canon cameras, the name appears like this: "Canon EF-S 18-200mm f3.5-5.6 IS Lens" 18-200mm is the focal length(s) and the aperture measurements are f/3.5 to f/5.6. This means that when the lens is at it's widest (or shortest), the min f/stop can be down to 3.5. When it's zoomed all the way to 200mm, the min f/stop is f/5.6.

Some zoom lenses only have 1 f/stop in the name, even though it zooms in and out. Exe: "Canon 24-105mm f/4 IS". This means no matter what focal length being used, the aperture can remain at f/4. Which also means that you can use set manual settings and zoom in and out without the exposure of the photo being affected.

Review Common Terms

Focal Length

AF-S DX -Nikkor 18-55mm f/3.5-5.6 G ED VRII

Aperture

Filter Diameter

Be aware of the null symbol on a camera lens. It looks like this: Ø. It is a symbol for a screw filter of that mm number which fits the lens, should you need to replace it. For example, if you notice a Ø58mm written on your lens, it means that a screw-on filter that is 58mm in diameter will fit that particular lens.

Focusing distance.

- This is a series of numbers mentioned in feet, usually starting from a few feet and going to infinity. This indicates the distance at which the lens is currently focused. You will see this on zoom lenses.

Manufacturer Specific

Nikon

- ED: Extra-Low Dispersion glass
- High-quality glass that corrects for chromatic aberration, a type of image and color distortion that occurs when light rays of varying wavelengths pass through optical glass and don't converge or focus at the same point. Nikkor lenses with ED glass deliver superior sharpness and contrast, even at maximum aperture. Super ED glass is a new type that is used together with ED glass in some lenses to achieve an even higher degree of freedom from chromatic aberration.

- G: The lens has no aperture control ring and is designed to be used with cameras that allow setting the aperture from the camera body. G lenses also provide Distance information to the camera.

Nikon

- **AF-S: Autofocus Silent**
- **IF: Internal Focus**
- **Focusing is driven by a "Silent Wave" motor in the lens instead of the focus drive motor in the camera. AF-S lenses focus faster than standard AF-Nikkors and almost completely silently. AF-S lenses with a "II" designation weigh less and are generally smaller than their equivalent predecessors.**

Nikon

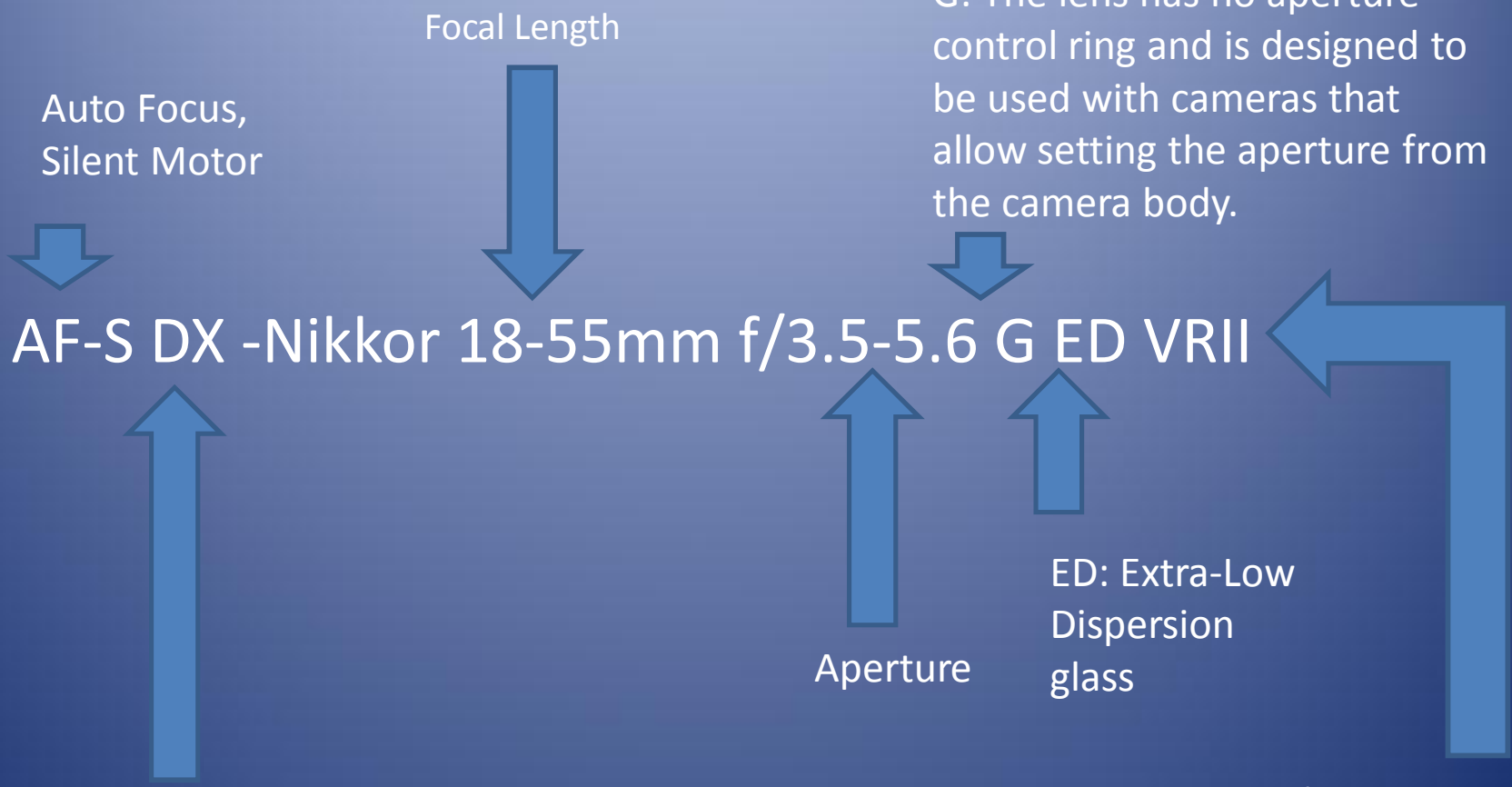
- **VR: Vibration Reduction**
- **An optical innovation that minimizes image blur caused by camera shake and offers the equivalent of shooting at a shutter speed three stops faster, allowing sharper handheld pictures with longer lenses. The system even automatically detects when a photographer pans while photographing a moving subject. VR operation is available only with specific Nikon cameras.**

- **M/A: A focusing mode on some AF-Nikkor lenses which allows switching from automatic to manual focusing with virtually no lag time by simply turning the focusing ring on the lens.**

Nikon

- **DX: The lens is specifically designed for use on Nikon digital SLR cameras. It produces a smaller image circle for more efficient coverage of the imaging sensor in these cameras, which is smaller than the 35mm film frame**

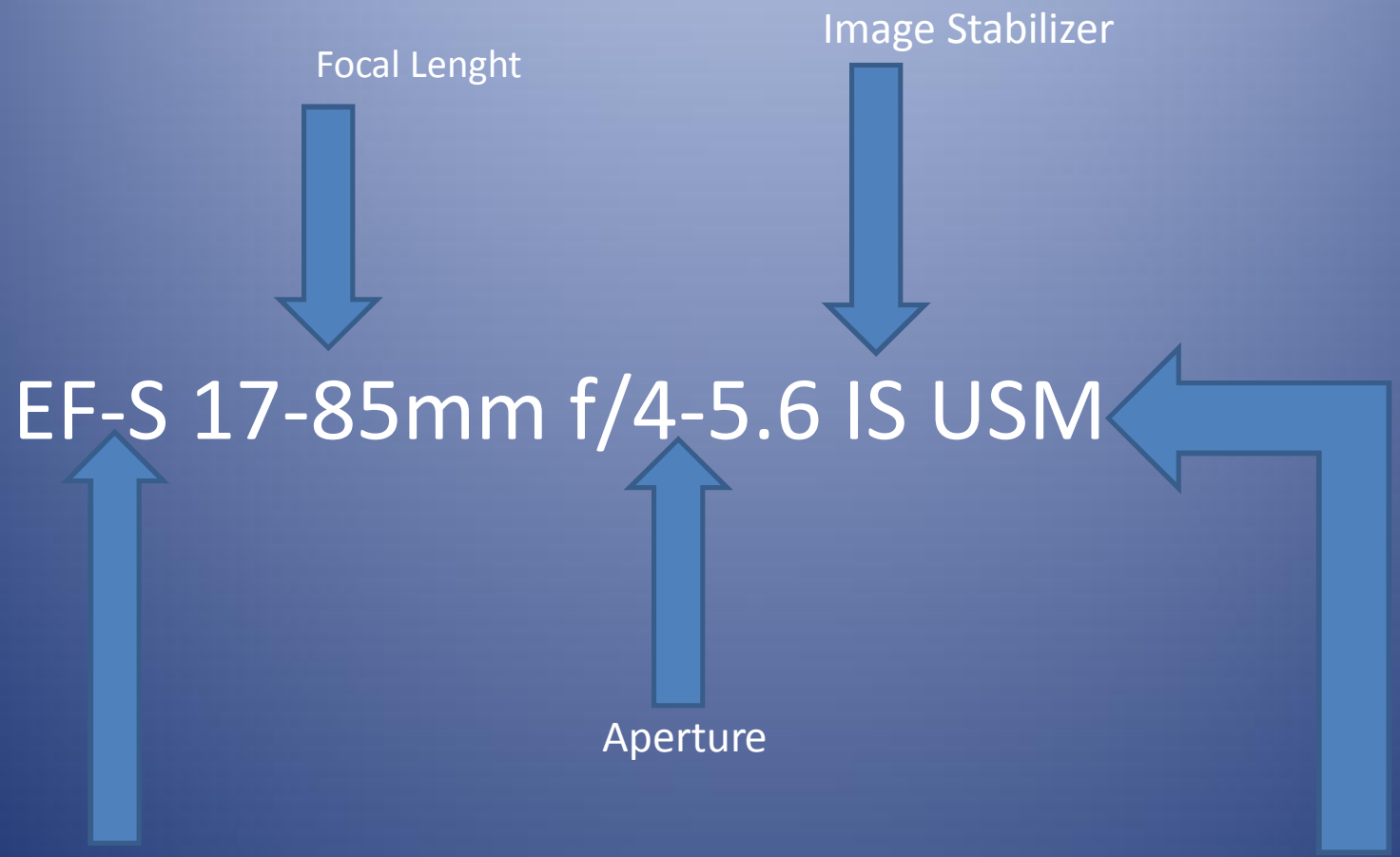
Review Manufacturer Terms Nikon



Canon

- EF: This is a term used by Canon on their auto-focus lenses that fit on their EOS cameras. It stands for electro focus, and is seen on nearly all Canon lenses.
- EF-S: These are lenses with mounts that can fit only on digital SLR cameras with smaller sensors. They are not compatible with cameras having full frame sensors or film cameras.
- USM: This stands for Ultrasonic Motor, built for faster and silent focusing.
- IS: IS stands for Image Stabilization, which is a feature to compensate for shake when taking pictures.
- L: This indicates Canon's top of the line L series lens which offers better image quality and performance.
- DO: Indicates diffraction optics, which are smaller lenses that offer better image quality.

Review Manufacturer Terms Canon



Sigma

- HSM: Lenses with a hypersonic motor that provide faster and silent auto-focus
- OS: Indicates Optical Stabilizer - lenses with stabilization to prevent shake.
- DC: Lenses meant for use with digital SLR cameras with smaller sensors.
- EX: Lenses with superior build for better image quality and performance

Tamron

- USD (Tamron) - “Ultrasonic silent drive”. See USM above.
- SP — ‘Super Performance’, professional lenses
- IF — ‘Internal Focus’
- LD — “Low Dispersion” elements
- XR — Extra Refractive Index glass
- VC — “Vibration Compensation” — in lens image stabilization (see IS above in the Canon section)
- USD — Ultrasonic Silent Drive

Sony

- Sony Lenses
- DT: Lenses that can be fitted only on digital SLR cameras with smaller sensors.
- SSM: Lenses with Supersonic Wave motors that provide silent and faster auto-focus.
- HS: Lenses with high speed motors that provide faster auto-focus.
- D: A premium range of lenses that provide better image quality and performance

Field of View

- In photography, the field of view is that part of the world that is visible through the camera at a particular position and orientation in space; objects outside the FOV when the picture is taken are not recorded in the photograph. It is most often expressed as the angular size of the view cone, as an angle of view. It is a mathematical formula including focal point and aperture.

PRINCIPLES OF THE LENS

What you should know to choose the right lens for your needs.

ANGLE OF VIEW AND FOCAL LENGTH

FISHEYE 180° **8 mm**

FISHEYE 180° **15 mm**

122° **12 mm**

103.7° **17 mm**

94.5° **20 mm**

84.1° **24 mm**

75.4° **28 mm**

46.8° **50 mm**

34.3° **70 mm**

23.3° **105 mm**

18.2° **135 mm**

12.3° **200 mm**

8.2° **300 mm**

5° **500 mm**

3.1° **800 mm**

Nikon

- **ED: Extra-Low Dispersion glass**
- High-quality glass that corrects for chromatic aberration, a type of image and color distortion that occurs when light rays of varying wavelengths pass through optical glass and don't converge or focus at the same point. Nikkor lenses with ED glass deliver superior sharpness and contrast, even at maximum aperture. Super ED glass is a new type that is used together with ED glass in some lenses to achieve an even higher degree of freedom from chromatic aberration.

- D: Distance
- D-type AF-Nikkor lenses relay subject-to-camera distance information to Nikon SLR cameras that feature 3D Color Matrix Metering, 3D Matrix Metering, and 3D Multi-Sensor Balanced Fill-Flash.

- **G: The lens has no aperture control ring and is designed to be used with cameras that allow setting the aperture from the camera body. G lenses also provide Distance information to the camera.**

- AI-P: A manual-focus Nikkor lens with a built-in CPU which transfers data from the lens to the camera's metering systems.

Nikon

- Focus is accomplished through movement of internal lens elements, without effecting the overall outside length of the lens, an advantage when using a position-sensitive filter such as a polarizer or split neutral-density.

- **AF-S: Autofocus Silent**
- **IF: Internal Focus**
- **Focusing is driven by a "Silent Wave" motor in the lens instead of the focus drive motor in the camera. AF-S lenses focus faster than standard AF-Nikkors and almost completely silently. AF-S lenses with a "II" designation weigh less and are generally smaller than their equivalent predecessors.**

- DC: Defocus Control
- A lens which allows the photographer to control the degree of spherical aberration in the foreground or background by rotating the lens' DC ring. This will create a rounded out-of-focus blur that is ideal for portrait photography. With the DC control set at zero, a DC-Nikkor lens operates in the same way as a non-DC lens with the same focal length and maximum aperture.

- CRC: Close Range Correction
- Improves image quality at close focusing distances. The lens elements are configured in a "floating element" design wherein each lens group moves independently to achieve focusing. This ensures superior lens performance even when shooting at close distances.

Nikon

- PC: Perspective Control
- A lens whose axis can be shifted laterally relative to the film plane, allowing the camera to be repositioned to reduce the convergence of vertical lines in architectural photography.

- ASP: Aspherical lens elements
- Aspherical lenses minimize coma and other types of lens aberrations, even when used at the widest aperture. They are particularly useful in correcting distortion in wide-angle lenses and help contribute to a lighter, more compact design by reducing the number of standard (spherical) elements necessary.
- N - Nano Crystal Coat: Nano Crystal Coat is a lens coating which provides an extremely high reduction in reflections over a wide wavelength range by reducing the reflection of light that comes in perpendicular to the lens compared with conventional anti-reflection coatings. Furthermore, the Nano Crystal Coat reduces ghosts and flare that are caused by light obliquely coming through the lens-a problem difficult to remove with conventional coatings
- RF: Rear Focusing
- A focusing system in which only the rear lens group moves to achieve focus. This design technique makes autofocusing operation smoother and faster.

- **VR: Vibration Reduction**
- **An optical innovation that minimizes image blur caused by camera shake and offers the equivalent of shooting at a shutter speed three stops faster, allowing sharper handheld pictures with longer lenses. The system even automatically detects when a photographer pans while photographing a moving subject. VR operation is available only with specific Nikon cameras.**

- M/A: A focusing mode on some AF-Nikkor lenses which allows switching from automatic to manual focusing with virtually no lag time by simply turning the focusing ring on the lens.

Nikon

- AI: Automatic Indexing
- AI became standard on Nikon cameras and Nikkor lenses in 1977. Non-AI lenses coupled to the camera's meter through a system that required a pin on the camera to be mated to a slotted prong on the lens before the lens was mounted, then the aperture ring on the lens had to be turned from one extreme to the other to index the meter to the maximum aperture
- of the lens. AI eliminates this entire procedure because meter coupling and indexing occur automatically when the lens is mounted on the camera. Most AI lenses made until a few years ago were also supplied with the coupling prong so they would be compatible with either metering system.

- AI-S: Automatic Indexing (modified)
- AI-S coupling is a refinement of AI and became standard in 1982. The diaphragm action in an AI-S lens is compatible with Nikon cameras that allow the aperture to be controlled from the camera, as is required for programmed and shutter-priority automatic exposure control. All AF-Nikkor lenses, as well as most manual-focus Nikkor lenses made since 1982, are AI-S.

- **DX: The lens is specifically designed for use on Nikon digital SLR cameras. It produces a smaller image circle for more efficient coverage of the imaging sensor in these cameras, which is smaller than the 35mm film frame**