

Micro-Nikkor 60mm f/2.8D



Figure A



The lens features a minimum focus distance of 0.219 m (0.72 ft) and can supply distance information to the camera body for instantaneous 3D matrix metering or 3D multi-sensor balanced fill-flash flash control. Before using this product, please carefully read both these instructions and the camera manual so you can get the most out of your lens now and for years to come.

■ For Your Safety

- CAUTIONS**
- Do not disassemble.** Touching the internal parts of the camera or lens could result in injury. In the event of malfunction, the product should be repaired only by a qualified technician. Should the product break open as the result of a fall or other accident, remove the camera battery and/or disconnect the AC adapter and then take the product to a Nikon-authorized service center for inspection.
- Turn the camera off immediately in the event of malfunction.** Should you notice smoke or an unusual smell coming from the equipment, immediately unplug the AC adapter and remove the camera battery, taking care to avoid burns. Continued operation could result in fire or injury. After removing or disconnecting the power source, take the equipment to a Nikon-authorized service center for inspection.
- Do not use in the presence of flammable gas.** Operating electronic equipment in the presence of flammable gas could result in explosion or fire.
- Do not look at the sun through the lens or the camera viewfinder.** Viewing the sun or other bright light source through the lens or viewfinder could cause permanent visual impairment.
- Keep out of reach of children.** Particular care should be taken to prevent infants from putting the batteries or other small parts into their mouths.
- Observe the following precautions when handling the lens and camera.**
 - Keep the lens and camera dry. Failure to observe this precaution could result in fire or electric shock.
 - Do not handle the lens or camera with wet hands. Failure to observe this precaution could result in electric shock.
 - Keep the sun well out of the frame when shooting backlit subjects. Sunlight focused into the camera when the sun is in or close to the frame could cause a fire.
 - If the lens will not be used for an extended period, attach the front and rear lens caps and store the lens out of direct sunlight. If left in direct sunlight, the lens could focus the sun's rays onto flammable objects, causing fire.

■ Parts of the Lens

- Meter coupling ridge
- CPU contacts
- Aperture indexing post
- Aperture scale
- Aperture-direct-readout scale
- Aperture ring
- Aperture/mounting index
- Focus limit switch
- Focus distance indicator window
- A-M mode ring release button
- EE servo coupling post
- Minimum aperture lock lever
- Lens barrel
- A-M mode index
- Focus ring
- A-M mode ring
- Reproduction ratio indicator
- Focus distance indicator
- Depth-of-field indicators
- Focus distance mark

■ Notices

- Keep the CPU lens contacts clean and be careful not damage the CPU contacts.
- Do not attach the following accessories directly to the lens: PK-1 or PK-11 auto extension rings, BR-4 or BR-2 auto rings, or K1 or K2 rings (the PK-11A and BR-2A can be used in place of the PK-11 and BR-2, respectively). Failure to observe this precaution will result in damage to the CPU contacts or other parts of the lens. Other lens accessories may not be compatible with the camera; be sure to consult the camera manual before use.
- On some cameras, the lens can not be mounted with aperture locked at the minimum value. Be sure to release the aperture lock before attaching the lens. See "The Minimum Aperture Lock Lever" for details.
- The lens can not be used with the DX-1 viewer for Nikon F3AF cameras.

■ Focus

This lens supports A-M mode selection. To choose the A-M mode, rotate the A-M mode ring while pressing the A-M mode ring release button. Select **A** for autofocus and **M** for manual focus. Autofocus is not supported with close-up attachment lenses; select **M** when using a close-up attachment lens. Note that selecting **M** when the lens is mounted on a Nikon N2020 (sold in the U. S. A. and Canada only) or F-501 may cause the camera to malfunction.

■ The Focus Limit Switch

For faster focusing, slide the focus limit switch from **FULL** to **LIMIT**. At short focus distances, selecting **LIMIT** will restrict focus to distances in the vicinity of 0.3 m to 0.219 m (1 ft. to 0.72 ft.), while selecting **LIMIT** at longer focus distances will restrict focus to positions between approximately 0.3 m (1 ft) and ∞ .

■ Reproduction Ratio

The reproduction ratio is the ratio of the apparent size of an object to its true size. If, for example, the image on the film (image sensor) is one-fifth of actual size, the reproduction ratio is 1: 5. If desired, the reproduction ratio can be selected using the reproduction ratio indicator. To shoot at a reproduction ratio of 1: 5, for example, select manual focus and rotate the focus ring until the focus distance mark aligns with the number "5" in the reproduction ratio indicator, then move the camera forward or back until the subject is in focus. The "Close-up Photography" table shows the reproduction ratios for different focus distances.

■ Focusing Screens

The cameras below support a variety of focusing screens for use with different lenses or in different situations. The following screens are suited for use with this lens (when using B2/B3, E2/E3, or K2/K3 screens with cameras not listed here, refer respectively to columns B, E, or K):

Camera	Screen EC-B/EC-E	A/L	B	C	D	E	G1	G2	G3	G4	H1
F6		●				●					
F5+ DP-30	●	●	●				●				
F5+ DA-30	(+0.5)	(+0.5)	(+0.5)			(+0.5)	(+0.5)				
F4+ DP-20/ F4+ DA-20							○	●			
F3	●	●				○	●				○

Camera	Screen H2	H3	H4	J	K	P	M	R	T	U	F
F6				●							
F5+ DP-30				●							
F5+ DA-30				(+0.5)							
F4+ DP-20/ F4+ DA-20				●	●					△	●
F3				●	●	●				△	●

● Recommended.
○ Vignetting visible in viewfinder (photographs are not affected).
△ Split-screen display does not improve focus accuracy.
(): Figures in parentheses give the exposure compensation for center-weighted metering. Select "Other screen" for Custom Setting b5 ("Screen comp") when adjusting exposure compensation for the F6; note that with screens other than B or E, "Other screen" must be selected even when the value for exposure compensation is 0. Users of the F5 and F4 can adjust exposure compensation using Custom Setting 18 or the focusing screen exposure compensation dial, respectively; see the camera manual for details.

Empty cell: Not suited to use with this lens. Note that type M screens can however be used for photomicrography and macro photography at magnifications of 1: 1 or higher.

■ Depth of Field

The depth-of-field indicators on either side of the focus distance mark show the approximate depth of field (or in other words, the extent of the area in which objects behind or in front of the subject appear to be in focus). Note that the indicators do not provide accurate information at short focus distances; to determine depth of field, refer to the depth of field table. If the camera offers depth-of-field preview (stop down), depth of field can also be previewed in the viewfinder.

■ The Minimum Aperture Lock Lever (Figure A)

Lock aperture at f/32 when shooting in programmed auto or shutter-priority auto mode.

1 Rotate the aperture ring to the minimum aperture setting (f/32).

2 Slide the lock lever toward the aperture ring so that the white dot on the lock lever aligns with the orange dot.

To release the lock, slide the lever in the opposite direction.

■ Close Ups and Reproduction Work

To prevent blur caused by camera shake, mount the camera on a tripod and use a cable release or remote cord. Close ups are generally associated with extremely shallow field depths; for greater depths of field, stop down the lens, choose longer exposure times, and position the camera so that the focal plane is parallel to the portion of the subject you wish to photograph. See the following table for information on metering exposure with the lens oriented normally (use stop-down metering when the lens reversed), but note that the exposure metering system for the F-401s/N4004s does not function with bellows or with the PK-11A, PK-12, or PK-13.

Camera	Accessory	Metering
F90X, N90's, F90-Series/N90', F70-Series/N70', F50-Series/N50', F4 series, F-801/N8008', F-801s/N8008s (CPU-AI)	PK-11A,12,13/PN-11/TC-201/TC-14A	Full-aperture
F3 series, FE, FM, EL2, Nikkorat FT3, F2 Photomic A, F2 Photomic AS (AI)	PK-2, 3/PN-1/Bellows	Stop-down ¹
F3 series, FE, FM, EL2, Nikkorat FT3, F2 Photomic A, F2 Photomic AS (AI)	PK-11A, 12, 13/PN-11/TC-201/TC-14A	Full-aperture
F3 series, FE, FM, EL2, Nikkorat FT3, F2 Photomic A, F2 Photomic AS (AI)	PK-2, 3/PN-1/Bellows	Stop-down ¹
F-501/N2020 ¹ , FE2, FA, FM2, FG, FG-20, EH, F-301/N2000' (AI)	PK-11A,12,13/PN-11/TC-201/TC-14A	Full-aperture (or light intensity feedback)
	PK-2, 3/PN-1/Bellows	Stop-down ¹
	PK-11A,12, 13/PN-11/TC-201/TC-14A/ Bellows	Stop-down ¹
Non-AI	PK-2, 3/PN-1	Stop-down ¹
	PK-2, 3/PN-1	Full-aperture ²

¹ See camera manual for instructions.
² Lens modification required. After attaching modified lens, perform maximum aperture indexing manually.
³ Sold in U. S. A. only.
⁴ Sold in U.S. A. and Canada only.

■ Exposure Compensation

Extending macro and other close-up lenses for higher reproduction ratios decreases the amount of light reaching the film (or image sensor), changing the effective f-number (see "Exposure Factor", below). While through-the-lens (TTL) metering and flash control automatically compensate for this drop in brightness by adjusting exposure, flash level, and the exposure indicator according to the amount of light actually passing through the lens, exposure and flash levels set using external exposure meters must be adjusted manually with reference to the exposure factor. For example, if the shutter speed read from an external exposure meter is 1/8 s, the drop in illumination at a reproduction ratio of 1 : 1 can be compensated for by slowing shutter speed by one stop to 1/4 s and increasing aperture by 1/3 EV, or by slowing shutter speed by two stops to 1/2 s and increasing aperture by 1/3 EV.

■ Exposure Factor

The lens f-number indicates the brightness of the subject at a focus distance of infinity; higher reproduction ratios result in reduced image brightness. The actual brightness is referred to as the "effective f-number", and the amount that exposure compensation has to be raised to account for the loss in brightness as the "exposure factor". Although the effective aperture of this lens changes with focal length (reproduction ratio), the aperture shown in the camera viewfinder or control panel is automatically adjusted to take this into account, with the result that the exposure factor can be ignored if you reference these displays when setting aperture to the value reported by an external exposure meter. The aperture dials for cameras in the F-401 series also automatically adjust for the exposure factor; manual compensation is not required. This adjustment is not however performed by the lens aperture ring or the aperture displays for the F5 and other cameras with a viewfinder aperture window, and consequently you must take the exposure factor into account when using these displays. The following table shows the exposure factors and the amount by which aperture must be increased at reproduction ratios above 1 : 10. Changes to aperture can be kept to a minimum by also adjusting shutter speed.

Reproduction ratio	Exposure factor	Increase aperture by	Aperture shown in camera control panel (effective aperture)
			Max. (f/2.8) f/8 f/16 Min. (f/32)
1: 10	1.15	1/6 EV	3.2 11 16 32
1: 7	1.23	1/3 EV	3.2 11 16 32
1: 5	1.32	1/3 EV	3.2 11 16 32
1: 4	1.41	1/2 EV	3.2 11 16 32
1: 3	1.57	2/3 EV	3.5 11 22 45
1: 2.5	1.71	2/3 EV	3.5 11 22 45
1: 2	1.92	1 EV	4 11 22 45
1: 1.8	2.04	1 EV	4 11 22 45
1: 1.6	2.21	1+1/6 EV	4.2 11 22 45
1: 1.4	2.42	1+1/3 EV	4.2 11 22 45
1: 1.3	2.57	1+1/3 EV	4.5 11 22 45
1: 1.2	2.73	1+1/2 EV	4.5 16 32 64
1: 1.1	2.94	1+1/2 EV	4.8 16 32 64
1: 1	3.20	1+2/3 EV	5 16 32 64

■ Lens Care

- Use a blower to remove dust and lint from the lens surfaces. To remove smudges and fingerprints, apply a small amount of ethanol or lens cleaner to a soft, clean cotton cloth or lens-cleaning tissue and clean from the center outwards using a circular motion, taking care not to leave smears or touch the glass with your fingers.
- The use of ether may cause smudges to develop on multi-coated lenses. Such smudges can be removed by cleaning the lens again using a cotton cloth dampened with a small amount of ethanol.
- Never use organic solvents such as paint thinner or benzene to clean the lens.
- A lens hood or NC filter can be used to protect the front lens element.
- Attach the front and rear caps when the lens is not in use.
- Keep the lens dry. Rusting of the internal mechanism can cause irreparable damage.
- If the lens will not be used for an extended period, store it in a cool, dry location to prevent mold and rust. Do not store in direct sunlight or with naphtha or camphor moth balls.
- Leaving the lens in extremely hot locations could damage or warp parts made from reinforced plastic.

■ Compatible Accessories

- 62 mm screw-on filters
- 62 mm screw-on Lens Hood HN-22
- Soft Case CL-0815

■ Specifications

Mount	F mount
Focal length	60 mm
Maximum aperture	f/2.8
Lens construction	8 elements in 7 groups
Angle of view	39° 40'
Distance information	Output to camera
Minimum aperture lock	Provided
Focus distance indicator	Graduated in meters and feet from 0.219 m (8 3/8 in.) to infinity (∞)
Minimum focus distance	0.219 m (0.72 ft) from focal plane at all zoom positions
Reproduction ratio indicator	1 : 10 to 1 : 1 (life size)
Aperture scale	f/2.8-f/32 on both standard and aperture-direct-readout scales
Diaphragm	Fully automatic
Aperture range	f/2.8 - 32
Metering	• CPU/AI cameras: Full aperture • Other cameras: Minimum aperture
Filter-attachment size	62 mm (P = 0.75 mm)
Dimensions	Approx. 70 mm maximum diameter × 74.5 mm (distance from camera lens mount flange); overall length 82.8 mm
Weight	Approx. 440 g (15.5 oz)

Nikon reserves the right to change the specifications of the hardware described in this manual at any time and without prior notice.

■ Depth of Field (Metric)

Focus distance	Depth of field							Reproduction ratio	
	f/2.8	f/4	f/5.6	f/8	f/11	f/16	f/22		f/32
0.219	0.219 - 0.219	0.218 - 0.219	0.218 - 0.219	0.218 - 0.219	0.218 - 0.219	0.218 - 0.219	0.218 - 0.219	0.218 - 0.219	0.1
0.22	0.220 - 0.220	0.219 - 0.220	0.219 - 0.220	0.219 - 0.220	0.219 - 0.220	0.219 - 0.220	0.219 - 0.220	0.219 - 0.220	1/1.1
0.225	0.225 - 0.225	0.225 - 0.225	0.225 - 0.225	0.225 - 0.225	0.225 - 0.225	0.225 - 0.225	0.224 - 0.225	0.224 - 0.225	1/1.3
0.23	0.230 - 0.230	0.230 - 0.230	0.230 - 0.230	0.229 - 0.230	0.229 - 0.230	0.229 - 0.230	0.229 - 0.230	0.229 - 0.230	1/1.4
0.235	0.235 - 0.235	0.235 - 0.235	0.234 - 0.235	0.234 - 0.235	0.234 - 0.235	0.234 - 0.235	0.234 - 0.235	0.234 - 0.235	1/1.5
0.24	0.239 - 0.240	0.239 - 0.240	0.239 - 0.240	0.239 - 0.240	0.239 - 0.240	0.239 - 0.240	0.239 - 0.240	0.239 - 0.240	1/1.7
0.25	0.249 - 0.250	0.249 - 0.250	0.249 - 0.250	0.249 - 0.250	0.249 - 0.250	0.249 - 0.250	0.248 - 0.251	0.248 - 0.251	1/1.9
0.27	0.269 - 0.270	0.269 - 0.270	0.269 - 0.270	0.269 - 0.270	0.269 - 0.271	0.268 - 0.271	0.267 - 0.272	0.267 - 0.273	1/2.3
0.30	0.299 - 0.300	0.299 - 0.300	0.299 - 0.301	0.298 - 0.301	0.298 - 0.302	0.297 - 0.302	0.296 - 0.304	0.294 - 0.305	1/2.8
0.35	0.349 - 0.351	0.349 - 0.351	0.348 - 0.352	0.347 - 0.352	0.346 - 0.354	0.344 - 0.355	0.342 - 0.358	0.339 - 0.361	1/3.7
0.40	0.398 - 0.401	0.397 - 0.402	0.396 - 0.403	0.395 - 0.404	0.393 - 0.406	0.391 - 0.409	0.387 - 0.413	0.382 - 0.419	1/4.6
0.50	0.496 - 0.503	0.495 - 0.504	0.493 - 0.506	0.491 - 0.509	0.487 - 0.513	0.487 - 0.519	0.475 - 0.528	0.466 - 0.541	1/6.3
0.70	0.692 - 0.708	0.688 - 0.711	0.684 - 0.716	0.677 - 0.724	0.669 - 0.734	0.657 - 0.750	0.641 - 0.773	0.620 - 0.809	1/9.7
1	0.981 - 1.020	0.973 - 1.029	0.963 - 1.041	0.948 - 1.059	0.929 - 1.085	0.903 - 1.126	0.868 - 1.189	0.825 - 1.293	1/14.7
2	1.914 - 2.096	1.880 - 2.138	1.835 - 2.202	1.774 - 2.298	1.696 - 2.421	1.597 - 2.709	1.477 - 3.189	1.336 - 3.281	1/31.4
∞	38.3 - ∞	27.1 - ∞	19.2 - ∞	19.5 - ∞	9.6 - ∞	9.8 - ∞	4.9 - ∞	3.5 - ∞	1/∞

■ Depth of Field (Imperial)

Focus distance	Depth of field							Reproduction ratio	
	f/2.8	f/4	f/5.6	f/8	f/11	f/16	f/22		f/32
8 3/8 in.	8 3/8 in. - 8 3/8 in.	8 1/8 in. - 8 1/8 in.	8 1/8 in. - 8 1/8 in.	8 1/8 in. - 8 1/8 in.	8 1/8 in. - 8 1/8 in.	8 1/8 in. - 8 1/8 in.	8 1/8 in. - 8 1/8 in.	8 1/8 in. - 8 1/8 in.	1/1.2
9 in.	9 in. - 8 3/8 in.	9 in. - 8 1/8 in.	9 in. - 8 1/8 in.	9 in. - 8 1/8 in.	9 in. - 8 1/8 in.	9 in. - 8 1/8 in.	9 in. - 8 1/8 in.	9 in. - 8 3/8 in.	1/1.4
9 1/2 in.	9 1/2 in. - 9 1/2 in.	9 1/2 in. - 9 1/2 in.	9 1/2 in. - 9 1/2 in.	9 1/2 in. - 9 1/2 in.	9 1/2 in. - 9 1/2 in.	9 1/2 in. - 9 1/2 in.	9 1/2 in. - 9 1/2 in.	9 1/2 in. - 9 1/2 in.	1/1.5
9 3/4 in.	9 3/4 in. - 9 3/4 in.	9 3/4 in. - 9 3/4 in.	9 3/4 in. - 9 3/4 in.	9 3/4 in. - 9 3/4 in.	9 3/4 in. - 9 3/4 in.	9 3/4 in. - 9 3/4 in.	9 3/4 in. - 9 3/4 in.	9 3/4 in. - 9 3/4 in.	1/1.7
10 in.	10 in. - 9 3/4 in.	10 in. - 9 3/4 in.	10 in. - 9 3/4 in.	10 in. - 9 3/4 in.	10 in. - 9 3/4 in.	10 in. - 9 3/4 in.	10 in. - 9 3/4 in.	10 1/2 in. - 9 3/4 in.	1/2.0
1 ft	1 ft - 11 1/8 in.	1 ft - 11 1/8 in.	1 ft - 11 1/8 in.	1 ft - 11 1/8 in.	1 ft 1/8 in. - 11 1/8 in.	1 ft 1/8 in. - 11 1/8 in.	1 ft 1/8 in. - 11 1/8 in.	1 ft 1/8 in. - 11 1/8 in.	1/2.9
1 1/4 ft	1 ft 3 in. - 1 ft 2 3/8 in.	1 ft 3 1/8 in. - 1 ft 2 3/8 in.	1 ft 3 1/8 in. - 1 ft 2 3/8 in.	1 ft 3 1/8 in. - 1 ft 2 3/8 in.	1 ft 3 1/8 in. - 1 ft 2 3/8 in.	1 ft 3 1/8 in. - 1 ft 2 3/8 in.	1 ft 3 1/8 in. - 1 ft 2 3/8 in.	1 ft 3 1/8 in. - 1 ft 2 3/8 in.	1/4.3
1 1/2 ft	1 ft 6 1/8 in. - 1 ft 2 3/8 in.	1 ft 6 1/8 in. - 1 ft 2 3/8 in.	1 ft 6 1/8 in. - 1 ft 2 3/8 in.	1 ft 6 1/8 in. - 1 ft 2 3/8 in.	1 ft 6 1/8 in. - 1 ft 2 3/8 in.	1 ft 6 1/8 in. - 1 ft 2 3/8 in.	1 ft 6 1/8 in. - 1 ft 2 3/8 in.	1 ft 7 3/8 in. - 1 ft 4 3/8 in.	1/5.6
2 ft	2 ft 3/8 in. - 1 ft 11 1/8 in.	2 ft 3/8 in. - 1 ft 11 1/8 in.	2 ft 3/8 in. - 1 ft 11 1/8 in.	2 ft 3/8 in. - 1 ft 11 1/8 in.	2 ft 3/8 in. - 1 ft 11 1/8 in.	2 ft 3/8 in. - 1 ft 11 1/8 in.	2 ft 1 1/8 in. - 1 ft 10 3/8 in.	2 ft 2 1/8 in. - 1 ft 9 3/8 in.	1/8.2
3 ft	3 ft 3/8 in. - 2 ft 11 1/8 in.	3 ft 1/8 in. - 2 ft 11 1/8 in.	3 ft 1 1/8 in. - 2 ft 10 3/8 in.	3 ft 1 1/8 in. - 2 ft 10 3/8 in.	3 ft 2 1/8 in. - 2 ft 9 3/8 in.	3 ft 3 1/8 in. - 2 ft 8 3/8 in.	3 ft 5 1/8 in. - 2 ft 7 1/8 in.	3 ft 9 in. - 2 ft 6 3/8 in.	1/13.3
7 ft	7 ft 4 3/8 in. - 6 ft 7 3/8 in.	7 ft 6 1/8 in. - 6 ft 6 1/8 in.	7 ft 8 3/8 in. - 6 ft 4 3/8 in.	8 ft 1 1/8 in. - 6 ft 1 1/8 in.	8 ft 8 1/8 in. - 5 ft 10 3/8 in.	9 ft 8 3/8 in. - 5 ft 5 1/8 in.	11 ft 7 3/8 in. - 5 ft 1/8 in.	16 ft 4 in. - 4 ft 6 3/8 in.	1/33.6
∞	125 ft - ∞	88 ft - ∞	63 ft - ∞	44 ft - ∞	31 ft - ∞	22 ft - ∞	16 ft - ∞	11 ft - ∞	1/∞

■ Close-up Photography (Metric)

Accessory	Close-up photography			Close-up photography (lens reversed) ¹		
	Reproduction ratio	Subject field	Focus distance	Reproduction ratio	Subject field	Focus distance
No.						