

Zoom Lens
Zoom-Objektiv
Objectif Zoom
Objetivo Zoom

Vivitar Series



24–48mm
f3.8 VMC

Owner's Manual
Gebrauchsanleitung
Mode d'emploi
Manual del Proprietario



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Before you begin—

Carefully study this Owner's Manual. Keep it with the lens for a guide when questions arise.

Practice with your new Series 1 lens. *Dry runs*—taking pictures without film—will help you get the *feel* of it.

Shoot a roll of film. After you see those first great photos, you'll *know* that you and your new Series 1 lens are ready for an important occasion.

About your Lens

Your new Vivitar Series 1 24mm–48mm f3.8 Zoom Lens is part of an entirely new lens system, unique in concept and created to meet the challenge of tomorrow's photographer today.

A superb general purpose lens, the 24mm–48mm brings you the unparalleled versatility of ultra-wide angle to normal focal lengths, ideal for total creative expression in architectural, landscape, and interior photography.

Vivitar Series 1—your assurance of superb computer-designed optics and the utmost in optical and mechanical reliability.

Getting acquainted with your Lens

- 1 Accessory Thread
- 2 Lens Barrel
- 3 Focusing Ring
- 4 Distance Scales
- 5 Distance Index Line
- 6 Zoom Ring
- 7 Aperture Reference Dot
- 8 Aperture Scale
- 9 Aperture Ring
- 10 Lens Mount

Mounting your Lens

Your new Series 1 lens is designed to mount on your camera with the ease and simplicity of your normal lens.

Remember to keep the front lens cap in place during mounting to prevent accidentally touching the front glass element.

Holding your Lens

You'll find it best to support the camera/lens combination by placing your left hand under the lens (see photo "A"). This leaves your right hand free to operate the camera controls and assures good balance and stability when shooting.

Exposure Control

Turning the Aperture Ring ⑨ changes the size of the lens diaphragm to control the amount of light which passes through the lens when an exposure is made. The size of this opening is indicated by the f-stop position on the Aperture Scale ⑧ which aligns with the aperture Reference Dot ⑦ (see photo "B"). The Aperture Ring has click-stops at each marked f-stop and at each intermediate half-stop except between f16 and f22.

Your new Series 1 lens has Automatic Diaphragm Control. With the lens mounted on your camera, the diaphragm remains open at its maximum aperture regardless of the Aperture Ring setting. When you release the shutter, the diaphragm automatically stops down to your preselected f-stop and instantly reopens after the exposure is completed.

NOTE: Universal Thread Mount lenses have an AUTO/MANUAL

Switch (see photo “C”) which must be set in the “A” (Auto) position for Automatic Diaphragm Control. In the “M” (manual) position, the diaphragm opens and closes as the Aperture Ring is turned. Canon Mount lenses have an AUTO/MANUAL Lever (see photo “D”) which must be set at the clockwise end of its slot for Automatic Diaphragm Control. With the lever at the counterclockwise end of its slot, the lens diaphragm opens and closes as the Aperture Ring is turned.

Exposure Measurements

Exposure measurements obtained from “through-the-lens” metering systems may change as you move the camera to change your view of the subject or as you zoom from one focal length to another. To assure proper exposure readings, select the focal length, compose and focus your photograph before measuring the exposure.

EE Coupled Lenses

Canon Mount lenses have a click-stop at the “O” marked EE position. The Aperture Ring may be set at and removed from this position in the same manner as selecting a specifically marked f-stop.

Zoom and Focusing Operations

To zoom from one focal length to another, turn the Zoom Ring ⑥ until you obtain the image size and composition you desire. For your convenience, the major focal lengths—**24mm**, **28mm**, **35mm**, **40mm**, and **48mm** are marked on the Zoom Ring.

Focusing is accomplished by turning the Focusing Ring ③ until the subject appears sharpest in your camera viewfinder. It is usually a good idea to focus your lens at the longest focal length (48mm). At this focal length, your view of your subject will appear largest in your camera viewfinder for precise focusing. The cam-operated zooming system of your Series 1 lens will maintain the focus as you zoom to your desired focal length. When precise focus is critical, recheck the focus after zooming.

Estimating Distance

Your lens has two Distance Scales ④ engraved on the Focusing Ring ③ which indicate the distance from the subject in focus to the film plane. The white numbers denote this distance in feet while those in green represent distance in meters. The approximate distance is indicated on these scales at the Distance Index Line ⑤. (See photo "E").

Depth of Field

Depth of field is the area of acceptable sharpness in front of and behind the subject in focus. This depth is determined by the aperture you have selected and the distance from the subject in focus to the film plane. As you get closer to your subject, or as you open the lens diaphragm (e.g. from f22 to f3.8), the depth of field becomes shallower (see photo "F"). By stopping the lens down (e.g. from f3.8 to f22) or moving farther away from your subject, this depth of field or zone of acceptable sharpness can become greater. (See photo "G")

Another factor in determining depth of field is the focal length you select. As a rule, the shorter the focal length of a lens, the greater the zone of acceptable sharpness becomes. As you zoom your Series 1 lens from 48mm to 24mm, the depth of field becomes greater. For example, with the lens set at 28mm at f8, and focused at 7 m (20'), the zone of acceptable sharpness is 2.3 m (7.3') to infinity. Compare this to a zone of acceptable sharpness of 4.1 m (12.3') to 27.1 m (56.2 ft.) with the lens at the 48mm setting, focused at 7 m (20'), aperture setting at f8. By using the wide angle focal lengths, you can record fast action or other situations where you may not have time to focus properly for each exposure.

For more selective focal length/aperture/focusing distance information, please refer to the Depth of Field Tables beginning on page 43.

Depth of Field Preview

Pressing your camera's depth of field preview button stops down the lens diaphragm to your pre-selected aperture, allowing you to see the depth of field in the viewfinder prior to taking the picture.

NOTE: The AUTO/MANUAL Switch on Universal Thread Mount lenses may be used for previewing depth of field by moving the switch to the "M" (Manual) position.

Taking care of your Lens

1—It's a good idea to keep a filter (such as a Vivitar VMC Skylight filter) on your lens at all times. This not only improves the quality of some photographs, it also protects the front lens element from scratches.

2—When attaching threaded accessories (filters, lens hoods, etc.) to your lens, carefully align the accessory with the Accessory Thread ① to prevent damage.

3—Keep your lens dust free by making sure both front and rear lens caps are in place when the lens is not in use.

4—Clean your lens with an air brush, anti-static brush, or wipe it lightly with a camel-hair brush or lens tissue. In EXTREME cases, use a clean, soft cotton cloth moistened with denatured alcohol. *Never rub the lens surface with your finger, clothing, or any other*

abrasive material. Cleaning your lens in this manner will scratch the lens coating and can cause damage to the element surface.

5—Always store your lens in a cool, dry place. In extremely humid climates, EXTRA care should be taken when storing your lens. Avoid storing the lens in a plastic bag. Taking your lens from one temperature extreme to another can cause condensation which can affect the lens elements, much as it creates mildew on clothing or leather goods. Let your lens adapt to room temperature before storing. It is a good idea to store your lens with a fresh silica gel packet to prevent moisture from forming on or inside the lens. Do not keep your lens in the trunk, glove compartment, or other “hot spots” of your car.

Specifications

Aperture Range: f3.8–f22

Construction: 10 elements, 9 groups

Angles of Acceptance: 82° at 24mm,
49° at 48mm

Weight: 550 g (19.4 oz)

Length (at infinity): 74 mm (2.9")

Diameter: 80 mm (3.1")

Accessory Size: 77mm

Lens Coating: VMC (Vivitar Multicoating)

Closest Focusing Distance from Film Plane:
60 cm (2')

Maximum Reproduction Ratio: 1:10.7

Zoom Ratio: 2:1

Focus/Zoom Control: 2 rings

Accessories Included: Front and rear lens caps



Specifications subject to change without notice.

Lengths and weights may vary slightly depending on lens mount.

Depth of Field Tables

Tiefenschärfetabellen

Tableaux de profondeur de champ

Tablas de profundidad de campo

24mm

ft. \ f	3.8	5.6	8	11	16	22
2.0	1.85 ~ 2.19	1.78 ~ 2.30	1.71 ~ 2.46	1.62 ~ 2.70	1.50 ~ 3.27	1.38 ~ 4.45
2.5	2.25 ~ 2.83	2.15 ~ 3.02	2.03 ~ 3.32	1.91 ~ 3.82	1.73 ~ 5.17	1.57 ~ 9.39
3.0	2.63 ~ 3.50	2.49 ~ 3.82	2.33 ~ 4.34	2.16 ~ 5.28	1.93 ~ 8.47	1.73 ~ 36.45
4.0	3.35 ~ 5.01	3.12 ~ 5.71	2.86 ~ 7.06	2.59 ~ 10.14	2.26 ~ 41.93	1.97 ~ ∞
5.0	4.00 ~ 6.75	3.67 ~ 8.13	3.30 ~ 11.29	2.95 ~ 22.58	2.51 ~ ∞	2.15 ~ ∞
7.0	5.15 ~ 11.18	4.59 ~ 15.78	4.02 ~ 35.94	3.49 ~ ∞	2.88 ~ ∞	2.41 ~ ∞
10.0	6.55 ~ 22.07	5.66 ~ 53.66	4.80 ~ ∞	4.05 ~ ∞	3.24 ~ ∞	2.64 ~ ∞
20.0	9.62 ~ ∞	7.76 ~ ∞	6.20 ~ ∞	4.98 ~ ∞	3.79 ~ ∞	2.98 ~ ∞
∞	17.71 ~ ∞	12.01 ~ ∞	8.41 ~ ∞	6.12 ~ ∞	4.20 ~ ∞	3.06 ~ ∞

m \ f	3,8	5,6	8	11	16	22
0,6	0.55 ~ 0.66	0.54 ~ 0.69	0.51 ~ 0.73	0.49 ~ 0.80	0.45 ~ 0.97	0.42 ~ 1.30
0,7	0.64 ~ 0.78	0.61 ~ 0.83	0.58 ~ 0.90	0.55 ~ 1.02	0.50 ~ 1.31	0.46 ~ 2.05
0,8	0.72 ~ 0.91	0.68 ~ 0.98	0.64 ~ 1.09	0.60 ~ 1.26	0.54 ~ 1.77	0.49 ~ 3.63
1,0	0.87 ~ 1.19	0.82 ~ 1.31	0.76 ~ 1.53	0.70 ~ 1.93	0.62 ~ 3.55	0.55 ~ ∞
1,2	1.01 ~ 1.50	0.94 ~ 1.70	0.86 ~ 2.09	0.78 ~ 2.96	0.68 ~ 10.74	0.60 ~ ∞
1,5	1.21 ~ 2.01	1.10 ~ 2.41	1.00 ~ 3.31	0.89 ~ 6.38	0.76 ~ ∞	0.65 ~ ∞
2,0	1.50 ~ 3.07	1.34 ~ 4.16	1.18 ~ 8.03	1.03 ~ ∞	0.86 ~ ∞	0.72 ~ ∞
3,0	1.98 ~ 6.49	1.71 ~ 15.01	1.45 ~ ∞	1.23 ~ ∞	0.98 ~ ∞	0.80 ~ ∞
7,0	3.12 ~ ∞	2.49 ~ ∞	1.96 ~ ∞	1.56 ~ ∞	1.18 ~ ∞	0.92 ~ ∞
∞	5.40 ~ ∞	3.66 ~ ∞	2.56 ~ ∞	1.86 ~ ∞	1.28 ~ ∞	0.93 ~ ∞

28mm

ft. \ f	3.8	5.6	8	11	16	22
2.0	1.88 ~ 2.15	1.82 ~ 2.23	1.76 ~ 2.34	1.68 ~ 2.51	1.58 ~ 2.87	1.47 ~ 3.48
2.5	2.30 ~ 2.75	2.21 ~ 2.89	2.11 ~ 3.10	2.00 ~ 3.42	1.85 ~ 4.17	1.69 ~ 5.75
3.0	2.70 ~ 3.38	2.59 ~ 3.60	2.44 ~ 3.96	2.29 ~ 4.52	2.08 ~ 6.00	1.88 ~ 10.17
4.0	3.47 ~ 4.75	3.27 ~ 5.22	3.04 ~ 6.04	2.80 ~ 7.55	2.48 ~ 13.25	2.19 ~ 263.14
5.0	4.18 ~ 6.27	3.88 ~ 7.15	3.55 ~ 8.83	3.22 ~ 12.61	2.79 ~ 48.30	2.43 ~ ∞
7.0	5.45 ~ 9.89	4.95 ~ 12.36	4.41 ~ 18.68	3.89 ~ 54.11	3.27 ~ ∞	2.77 ~ ∞
10.0	7.07 ~ 17.43	6.23 ~ 27.24	5.39 ~ 115.14	4.62 ~ ∞	3.76 ~ ∞	3.09 ~ ∞
20.0	10.82 ~ 158.97	8.93 ~ ∞	7.26 ~ ∞	5.91 ~ ∞	4.54 ~ ∞	3.59 ~ ∞
∞	22.68 ~ ∞	15.39 ~ ∞	10.77 ~ ∞	7.83 ~ ∞	5.39 ~ ∞	3.92 ~ ∞

m \ f	3,8	5,6	8	11	* 16	22
0,6	0,56 ~ 0,64	0,55 ~ 0,67	0,53 ~ 0,70	0,51 ~ 0,75	0,48 ~ 0,85	0,44 ~ 1,03
0,7	0,65 ~ 0,76	0,63 ~ 0,80	0,60 ~ 0,85	0,57 ~ 0,92	0,53 ~ 1,09	0,49 ~ 1,42
0,8	0,73 ~ 0,89	0,70 ~ 0,93	0,67 ~ 1,01	0,63 ~ 1,12	0,58 ~ 1,39	0,53 ~ 2,00
1,0	0,89 ~ 1,14	0,85 ~ 1,23	0,80 ~ 1,37	0,74 ~ 1,60	0,67 ~ 2,25	0,60 ~ 4,62
1,2	1,04 ~ 1,42	0,98 ~ 1,56	0,92 ~ 1,80	0,84 ~ 2,23	0,75 ~ 3,82	0,66 ~ 36,55
1,5	1,26 ~ 1,87	1,17 ~ 2,13	1,07 ~ 2,61	0,97 ~ 3,69	0,84 ~ 12,59	0,73 ~ ∞
2,0	1,58 ~ 2,75	1,44 ~ 3,36	1,29 ~ 4,80	1,15 ~ 10,64	0,97 ~ ∞	0,82 ~ ∞
3,0	2,13 ~ 5,17	1,88 ~ 7,95	1,63 ~ 29,42	1,40 ~ ∞	1,14 ~ ∞	0,94 ~ ∞
7,0	3,54 ~ ∞	2,88 ~ ∞	2,32 ~ ∞	1,87 ~ ∞	1,42 ~ ∞	1,12 ~ ∞
∞	6,91 ~ ∞	4,69 ~ ∞	3,28 ~ ∞	2,39 ~ ∞	1,64 ~ ∞	1,19 ~ ∞

35mm

ft. \ f	3.8	5.6	8	11	16	22
2.0	1.92 ~ 2.09	1.88 ~ 2.14	1.83 ~ 2.21	1.78 ~ 2.30	1.70 ~ 2.48	1.61 ~ 2.74
2.5	2.36 ~ 2.66	2.31 ~ 2.74	2.23 ~ 2.86	2.15 ~ 3.02	2.02 ~ 3.36	1.90 ~ 3.89
3.0	2.80 ~ 3.24	2.71 ~ 3.36	2.61 ~ 3.55	2.49 ~ 3.82	2.32 ~ 4.40	2.15 ~ 5.40
4.0	3.64 ~ 4.45	3.49 ~ 4.71	3.31 ~ 5.11	3.12 ~ 5.72	2.84 ~ 7.18	2.58 ~ 10.50
5.0	4.43 ~ 5.75	4.21 ~ 6.20	3.95 ~ 6.92	3.67 ~ 8.13	3.29 ~ 11.56	2.93 ~ 24.20
7.0	5.91 ~ 8.62	5.51 ~ 9.69	5.06 ~ 11.66	4.60 ~ 15.69	4.00 ~ 38.24	3.47 ~ ∞
10.0	7.89 ~ 13.77	7.18 ~ 16.81	6.42 ~ 23.96	5.68 ~ 52.01	4.78 ~ ∞	4.03 ~ ∞
20.0	12.91 ~ 45.47	11.08 ~ 117.35	9.33 ~ ∞	7.82 ~ ∞	6.18 ~ ∞	4.96 ~ ∞
∞	35.25 ~ ∞	23.92 ~ ∞	16.75 ~ ∞	12.18 ~ ∞	8.37 ~ ∞	6.09 ~ ∞

m \ f	3.8	5.6	8	11	16	22
0.6	0.58 ~ 0.63	0.56 ~ 0.64	0.55 ~ 0.66	0.53 ~ 0.69	0.51 ~ 0.74	0.49 ~ 0.82
0.7	0.67 ~ 0.74	0.65 ~ 0.76	0.63 ~ 0.79	0.61 ~ 0.83	0.58 ~ 0.91	0.54 ~ 1.03
0.8	0.75 ~ 0.85	0.73 ~ 0.88	0.71 ~ 0.92	0.68 ~ 0.98	0.64 ~ 1.10	0.60 ~ 1.29
1.0	0.93 ~ 1.09	0.90 ~ 1.14	0.86 ~ 1.21	0.82 ~ 1.31	0.76 ~ 1.55	0.69 ~ 1.97
1.2	1.09 ~ 1.33	1.05 ~ 1.41	1.00 ~ 1.52	0.94 ~ 1.70	0.86 ~ 2.12	0.78 ~ 3.06
1.5	1.33 ~ 1.72	1.27 ~ 1.85	1.19 ~ 2.06	1.11 ~ 2.41	0.99 ~ 3.39	0.89 ~ 6.81
2.0	1.71 ~ 2.42	1.60 ~ 2.70	1.47 ~ 3.19	1.34 ~ 4.14	1.18 ~ 8.41	1.03 ~ ∞
3.0	2.37 ~ 4.10	2.16 ~ 4.99	1.94 ~ 7.03	1.72 ~ 14.59	1.45 ~ ∞	1.22 ~ ∞
7.0	4.29 ~ 19.73	3.63 ~ 157.15	3.02 ~ ∞	2.50 ~ ∞	1.96 ~ ∞	1.56 ~ ∞
∞	10.75 ~ ∞	7.29 ~ ∞	5.10 ~ ∞	3.71 ~ ∞	2.55 ~ ∞	1.86 ~ ∞

40mm

ft. \ f	3.8	5.6	8	11	16	22
2.0	1.94 ~ 2.07	1.91 ~ 2.11	1.87 ~ 2.16	1.83 ~ 2.22	1.76 ~ 2.35	1.68 ~ 2.52
2.5	2.39 ~ 2.62	2.35 ~ 2.68	2.29 ~ 2.76	2.22 ~ 2.88	2.12 ~ 3.10	2.00 ~ 3.43
3.0	2.84 ~ 3.18	2.78 ~ 3.27	2.69 ~ 3.40	2.59 ~ 3.59	2.45 ~ 3.96	2.30 ~ 4.52
4.0	3.72 ~ 4.34	3.60 ~ 4.52	3.45 ~ 4.79	3.28 ~ 5.19	3.04 ~ 6.03	2.80 ~ 7.52
5.0	4.55 ~ 5.55	4.37 ~ 5.86	4.15 ~ 6.34	3.91 ~ 7.07	3.57 ~ 8.78	3.23 ~ 12.51
7.0	6.13 ~ 8.17	5.80 ~ 8.88	5.41 ~ 10.07	4.99 ~ 12.10	4.43 ~ 18.42	3.92 ~ 51.42
10.0	8.29 ~ 12.64	7.68 ~ 14.47	7.00 ~ 17.98	6.30 ~ 25.94	5.42 ~ 103.89	4.66 ~ ∞
20.0	14.08 ~ 34.95	12.36 ~ 54.47	10.65 ~ 219.21	9.09 ~ ∞	7.34 ~ ∞	5.98 ~ ∞
∞	46.09 ~ ∞	31.28 ~ ∞	21.89 ~ ∞	15.92 ~ ∞	10.95 ~ ∞	7.96 ~ ∞

m \ f	3.8	5.6	8	11	16	22
0.6	0.58 ~ 0.62	0.57 ~ 0.63	0.56 ~ 0.65	0.55 ~ 0.67	0.53 ~ 0.70	0.51 ~ 0.75
0.7	0.67 ~ 0.73	0.66 ~ 0.74	0.65 ~ 0.77	0.63 ~ 0.79	0.60 ~ 0.85	0.57 ~ 0.93
0.8	0.76 ~ 0.84	0.75 ~ 0.86	0.73 ~ 0.89	0.71 ~ 0.93	0.67 ~ 1.01	0.63 ~ 1.12
1.0	0.94 ~ 1.07	0.92 ~ 1.10	0.89 ~ 1.15	0.85 ~ 1.22	0.80 ~ 1.37	0.75 ~ 1.60
1.2	1.12 ~ 1.30	1.08 ~ 1.35	1.04 ~ 1.43	0.99 ~ 1.55	0.92 ~ 1.79	0.85 ~ 2.22
1.5	1.37 ~ 1.66	1.31 ~ 1.75	1.25 ~ 1.89	1.18 ~ 2.11	1.07 ~ 2.60	0.98 ~ 3.66
2.0	1.77 ~ 2.31	1.68 ~ 2.49	1.57 ~ 2.79	1.45 ~ 3.30	1.30 ~ 4.74	1.15 ~ 10.31
3.0	2.50 ~ 3.78	2.31 ~ 4.31	2.11 ~ 5.33	1.90 ~ 7.58	1.64 ~ 26.99	1.41 ~ ∞
7.0	4.72 ~ 13.80	4.09 ~ 25.81	3.48 ~ ∞	2.94 ~ ∞	2.34 ~ ∞	1.89 ~ ∞
∞	14.05 ~ ∞	9.53 ~ ∞	6.67 ~ ∞	4.85 ~ ∞	3.34 ~ ∞	2.43 ~ ∞

48mm

ft. \ f	3.8	5.6	8	11	16	22
2.0	1.95 ~ 2.05	1.93 ~ 2.07	1.90 ~ 2.11	1.87 ~ 2.15	1.82 ~ 2.23	1.76 ~ 2.34
2.5	2.42 ~ 2.58	2.39 ~ 2.62	2.35 ~ 2.68	2.29 ~ 2.76	2.21 ~ 2.90	2.12 ~ 3.09
3.0	2.89 ~ 3.12	2.84 ~ 3.19	2.77 ~ 3.28	2.70 ~ 3.39	2.58 ~ 3.62	2.46 ~ 3.93
4.0	3.79 ~ 4.23	3.70 ~ 4.36	3.59 ~ 4.53	3.46 ~ 4.77	3.27 ~ 5.45	3.06 ~ 5.96
5.0	4.67 ~ 5.38	4.53 ~ 5.58	4.36 ~ 5.88	4.17 ~ 6.31	3.88 ~ 7.18	3.59 ~ 8.65
7.0	6.36 ~ 7.79	6.10 ~ 8.24	5.78 ~ 8.93	5.44 ~ 9.97	4.95 ~ 12.44	4.47 ~ 17.84
10.0	8.72 ~ 11.74	8.23 ~ 12.81	7.65 ~ 14.59	7.05 ~ 17.69	6.23 ~ 27.62	5.48 ~ 87.85
20.0	15.38 ~ 28.73	13.88 ~ 36.31	12.29 ~ 56.22	10.76 ~ 62.38	8.94 ~ ∞	7.45 ~ ∞
∞	64.74 ~ ∞	43.93 ~ ∞	30.75 ~ ∞	22.36 ~ ∞	15.38 ~ ∞	11.18 ~ ∞

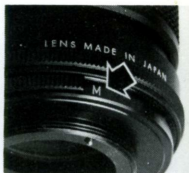
m \ f	3.8	5.6	8	11	16	22
0.6	0.59 ~ 0.61	0.58 ~ 0.62	0.57 ~ 0.63	0.56 ~ 0.64	0.55 ~ 0.67	0.53 ~ 0.70
0.7	0.68 ~ 0.72	0.67 ~ 0.73	0.66 ~ 0.75	0.65 ~ 0.76	0.63 ~ 0.80	0.60 ~ 0.84
0.8	0.77 ~ 0.83	0.76 ~ 0.84	0.75 ~ 0.86	0.73 ~ 0.89	0.70 ~ 0.94	0.67 ~ 1.00
1.0	0.96 ~ 1.05	0.94 ~ 1.07	0.92 ~ 1.10	0.89 ~ 1.15	0.85 ~ 1.23	0.80 ~ 1.36
1.2	1.14 ~ 1.27	1.11 ~ 1.30	1.08 ~ 1.36	1.04 ~ 1.43	0.98 ~ 1.56	0.92 ~ 1.77
1.5	1.40 ~ 1.61	1.36 ~ 1.67	1.31 ~ 1.76	1.25 ~ 1.88	1.17 ~ 2.14	1.08 ~ 2.56
2.0	1.83 ~ 2.21	1.76 ~ 2.33	1.67 ~ 2.50	1.58 ~ 2.77	1.44 ~ 3.38	1.31 ~ 4.62
3.0	2.62 ~ 3.51	2.48 ~ 3.83	2.31 ~ 4.34	2.12 ~ 5.24	1.88 ~ 8.05	1.66 ~ 23.36
7.0	5.20 ~ 10.77	4.64 ~ 14.50	4.06 ~ 27.13	3.52 ~ ∞	2.89 ~ ∞	2.38 ~ ∞
∞	19.73 ~ ∞	13.39 ~ ∞	9.37 ~ ∞	6.82 ~ ∞	4.69 ~ ∞	3.41 ~ ∞



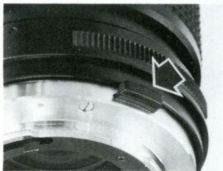
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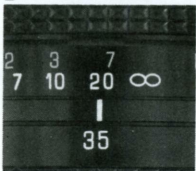
B



C



D



E



F



G

Vivitar Series

1

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