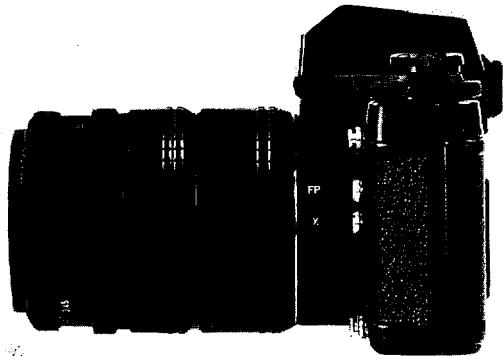


PENTAX®

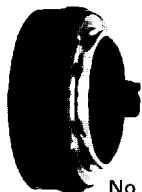
AUTO EXTENSION TUBE SET K
EXTENSION TUBE SET K



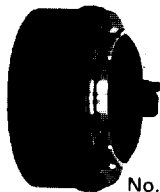
AUTO EXTENSION TUBE SET K



No. 1



No. 2



No. 3

AUTO EXTENSION TUBE K 50mm



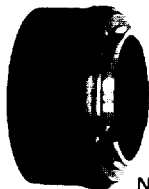
EXTENSION TUBE SET K



No. 1

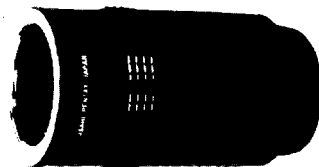


No. 2



No. 3

AUTO EXTENSION TUBE K 100mm



SPECIFICATIONS

Compatible Cameras:	Pentax K-, KAF, KA- and Kf-mount cameras				
Compatible Lenses:	SMC Pentax, SMC Pentax-M, SMC Pentax-A, and SMC Pentax-F				
Auto Extension Tube Set K	No. 1	No. 2	No. 3	Set	
Length:	12mm	19mm	26mm	57mm	
Weight:	64g	74g	82g	220g	
Extension Tube Set K	No. 1	No. 2	No. 3	Set	
Length:	9.5mm	19mm	28.5mm	57mm	
Weight:	57g	65g	73g	195g	
Auto Extension Tube K 100mm	100mm				
Length:	100mm				
Weight:	155g				
Auto Extension Tube K 50mm	50mm				
Length:	50mm				
Weight:	105g				

FUNCTION AND FEATURES

The Auto Extension Tube Set K consists of No. 1 (length 12mm), No. 2 (19mm) and No. 3 (26mm) rings. The Extension Tube Set K consists of No. 1 (9.5mm), No. 2 (19mm) and No. 3 (28.5mm) rings. As the rings in the two sets are of different lengths, you should distinguish carefully between the Auto Extension Tube rings and the Extension Tube rings when checking the close-up reference tables starting on p. 14.

The Auto Extension Tube K's, 50mm and 100mm, have the length of 50mm and 100mm respectively.

The Extension Tube Set K is a simple connecting tube between the lens and the camera and may be more suitable for lenses without an automatic diaphragm or a full-aperture metering mechanism.

Caution: The SMC Pentax-A or Pentax-F lens cannot be used with these Tubes with the lens aperture set at A (Auto); a proper f-stop other than A should be used.

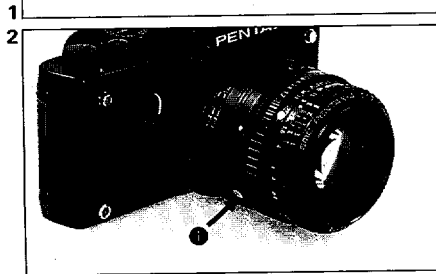
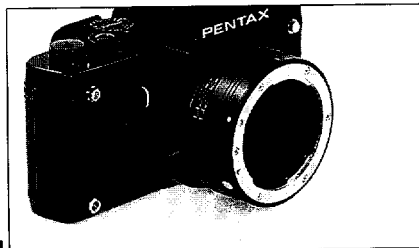
When the KAF-mount camera is combined, its auto-focus function does not work. When shooting a subject or taking macrophotos, for which the Focus Indication cannot be used, focus through the matte area in the viewfinder. (The Focus Indication can be used only when the maximum aperture of the lens in use is f/2.8 or faster and the magnification you can obtain is up to about 1X. With the f/4 lens, you can focus up to about 1/2X.)

HOW TO MOUNT RINGS AND LENS

Detach the lens from the camera body as shown in Illustration 1. Select one of the extension ring according to the close-up reference tables; mount the ring on the camera just as you would a lens. The same procedure is followed if you want to use two or three rings. In this case, the order of the rings in the combination is entirely a matter of choice.

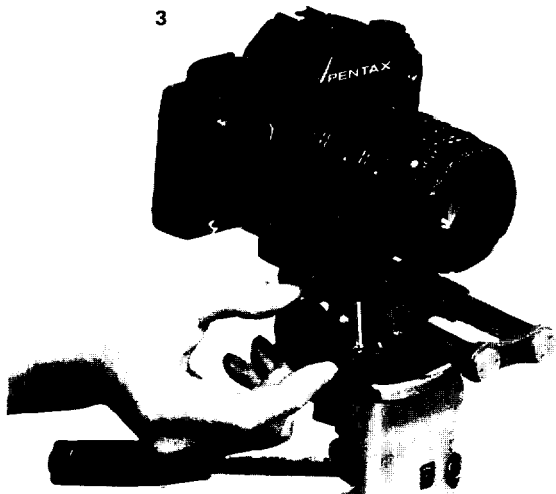
Except when the lens is reversed, the Auto Extension Tube K, 50mm or 100mm, should be used singly, never together for greater magnification.

Attach the lens on the ring as shown in Illustration 2. If you want to detach the lens or one of the rings, push the lock-release button ① on the ring and turn the lens or the ring counterclockwise 65°. Take care not to mistake the lock-release button for the lens lock-release lever on the camera. The lock device on the ring prevents accidental detaching of the lens or ring.



HOW TO FOCUS AND METER

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When used with any of the rings of the Auto Extension Tube Set K, a lens with full-aperture metering capability stays open at full aperture. When using the Extension Tube Set K, the aperture of the lens must be set manually.

The Auto Extension Tube Set K permits full-aperture focusing and metering with the Pentax cameras having K, KAF, KA or Kf mount, just as if the lens were mounted directly on the camera.

When using the Extension Tube Set K, open the aperture completely for focusing and then stop down the aperture to the desired value for shooting. When using this extension tube set with the Pentax cameras having K, KAF, KA or Kf mount, use a stop-down metering system.

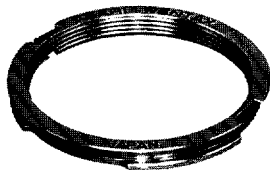
When the magnification in picture-taking increases (to more than 1/2X, for example), you may be unable to focus accurately merely by turning the focusing ring of the lens. In hand-held shooting, you can move the camera away from or close to the subject to get the correct focus. If your camera is on a tripod, you can use the Macro Focus Rail III and slide the camera backwards or forwards for easy focusing, as shown in Illustration 3.

When using any extension rings you must keep in mind that the distance and depth-of-field scales on the lens cannot be used.

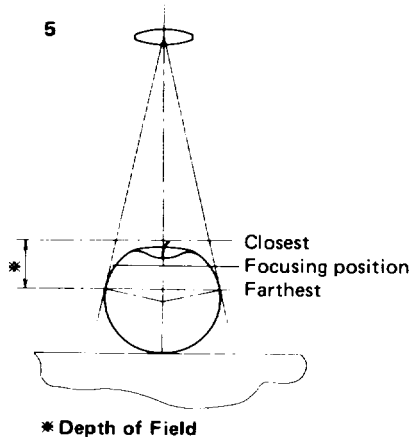
Using Screw-Mount Takumar Lenses

The extension tube can be used with the screw-mount Takumar lens through the mount adaptor K, an optional accessory shown in Illustration 4. (To mount the Takumar lens on the Pentax camera having K, KA or Kf mount, refer to the instructions on the camera.) With this adaptor, the lens can be used for manual diaphragm operation and stop-down metering, instead of automatic diaphragm operation and full-aperture metering.

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Depth-of-field in Close-ups

The shorter the lens-to-subject distance is, the shallower the depth-of-field becomes. You may not be able to secure adequate depth-of-field even at the standard lens' minimum aperture of $f/22$. In any event, the closer you go the more difficult exact focusing becomes.

In close-up work, the depth-of-field has the same depth in its foreground and background. Focus should thus be set at the intermediate point, as shown in Fig. 5, between the closest and farthest points of the area you are covering in your focus.

Exposure When Using a Tripod

In close-up shooting, the aperture is most often stopped down to a small opening (larger aperture number); this lengthens the lens-to-film-plane distance. Exposure time naturally becomes longer. If the shutter speed is slower than 1/30 sec, using a sturdy tripod is recommended.

When you use both the Auto Extension Tube rings No. 1 and 2 with a 50mm f/1.7 standard lens, the total length is 7cm, equivalent almost to the length of an SMC Pentax-A 135mm f/2.8 lens. In such a case, if you are hand-holding the camera shooting at 1/60 sec or more, there is a considerable possibility of camera movement. Use of a tripod is thus recommended.

Using Auto Extension Tubes K, 50mm & 100mm

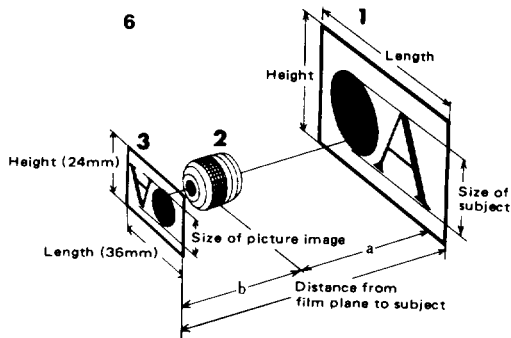
Be sure to use the Auto Extension Tube K, 50mm or 100mm, singly, never doubly for greater magnifications.

Aperture Reading in Finder

In some Pentax models, the aperture numbers of most SMC Pentax lenses are shown in the upper part of the viewfinder. When Auto Extension K rings or Extension K rings are mounted on the camera, the lens aperture numbers do not appear in the finder as the lens is moved farther out to the front.

HOW TO USE CLOSE-UP REFERENCE TABLES

1. Area to be photographed
2. Picture-taking lens
3. Picture area on film



Magnification

The magnification value equals,

$$\frac{\text{Size of Picture Image}}{\text{Size of Subject}} \quad \text{that is,}$$

$$\frac{\text{Width or Length of Picture Area}}{\text{Width or Length of Area to be Photographed}}$$

As the picture area of the Pentax K Series camera is 24 x 36mm, the magnification is;

$$\frac{24\text{mm}}{\text{Width of Area to be Photographed}} \quad \text{or}$$

$$\frac{36\text{mm}}{\text{Length of Area to be Photographed}}$$

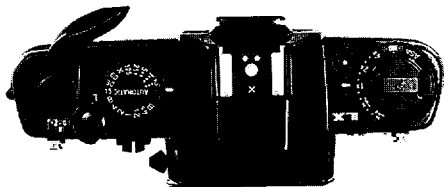
Care is required in enlarging as the enlarging multiplies the magnification ratio.

Area to be Photographed

The area to be photographed is the actual 2-dimensional measurement (width x length) of the subject when it is photographed so as to fill the entire picture area.

Distance from Film Plane to Subject

The Pentax K Series cameras do not in-



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dicates the exact position of the film plane, but the position is roughly at the rear edge of the camera top, as shown in Illustration 7. The distance from the film plane to the subject can be determined from the close-up reference tables in this booklet and the distance as measured with a steel tape from the film plane to the subject.

Exposure Factors

Pentax K series cameras have a built-in TTL exposure meter which measures the light actually passing through the lens and gives the correct exposure based on that measurement. For normal photographic purposes, you need not resort to the exposure factors given in the tables if you rely on the TTL meter. However, you must keep in mind that close-up work

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requires longer exposures than would be required for shooting at normal distances.

How to Use Close-up Reference Tables

There are three ways to use the close-up reference tables: you can decide the magnification first, the area to be photographed first, or the film-plane-to-subject distance first. Make your choice of one of these three methods, then check the adjacent columns.

Magnification Set First

The magnification should be determined first if you want a certain sized subject to appear as a certain size on the film.

For example, if you want a subject measuring 10cm to appear as 3cm on the film, if you are shooting with a 50mm f/1.7 lens, the magnification is $3/10 = 0.3x$. According to

Table 4, you should use the No. 1 tube and set the distance anywhere on the scale between the closest distance and the infinity marks.

To get an accurate lens extension, use the simple mathematic formula given here. In Figure 6, "a" is the distance between the subject and the first nodal point in the lens—the point at which the light enters the lens to cross the principal axis. "b" is the distance from the second nodal point—the point at which the light crossing the principal axis leaves the lens—to the film plane. "f" is the actual focal length of the lens.

"b - f," or the distance of the required lens extension, can be sought from "mf." To determine the distance between the subject

and the film plane, seek "a" from $m = \frac{f}{a - f}$
and then "b" from $b = ma$.

Focusing is done by adjusting the distance between the lens and subject.

"f"—the actual focal length of the lens—will differ slightly from its nominal or stated focal length. Ask your local Pentax Service Center or dealer if you need more details.

Area to be Photographed Set First

After you have decided the size of the area to be photographed, next determine the size this will occupy on the film. For example, if you want to photograph an area measuring 10 x 15cm with a 50mm f/1.7 lens so that it completely fills the 24 x 36mm frame of the negative, Table 3 will tell you the No. 1 exten-

sion tube must be used and the distance scale set anywhere between the closest distance and infinity marks.

Distance of Film-Plane-to-Subject Set First

If you cannot bring the lens as close to the subject as you want, determine the film-to-subject distance first. For a given magnification, this film-to-subject distance differs from one focal-length lens to another. Choose a proper lens according to the close-up tables. For close-up and macro shots from a distance, use a longer focal-length lens.

Ultra-Close-ups: Larger than Life Size

No matter which lens you use, when the actual size of the subject equals the size of the picture image on the film, "a" equals "b." Thus, "a," the distance from the subject to the

first nodal point in the lens, is equal to "b," the distance from the second nodal point to the film plane. If you want ultra-close-ups larger than life size on the film attach the lens backwards on the extension ring by using the accessory, Reverse Adaptor K 49mm or K 52mm. For details, check the close-up tables on pp. 30–37.

Lenses Best Suited for Close-ups

In general, lens performance deteriorates and close-up focusing becomes more difficult under the following conditions: with faster lenses, with SLR wide-angle lenses having shorter focal lengths, and with telephoto lenses having shorter barrels. Particular care must be taken when shooting under these conditions.

Lenses not included in the close-up tables

are not appropriate for close-up work with extension rings. The 50mm f/1.2 and 50mm f/1.4 lenses are not suitable for close-ups of flat subjects such as documents, but it can be used for regular close-ups in which the area of the subject does not reach out to the edges of the picture format.

As the SMC Pentax Macro 50mm f/4 and 100mm f/4 lenses are especially designed for maximum performance at magnifications of 1/5–1/10x, the use of these lenses is recommended if you want critically-focused close-ups. These lenses can be used for distance shots and have a minimum of distortion. ("Distortion" is an aberration in which straight lines do not appear straight in the photograph.) They are thus most suitable for close-ups of documents.

MAGNIFICATIONS WITH AUTO EXTENSION TUBES K 50mm & 100mm

The table below shows the magnifications obtainable when the Auto Extension Tubes K 50mm and 100mm are combined with some telephoto lenses.

Also note that their other data are shown in red (50mm, 100mm) on the tables in the following pages.

Lens	K 50mm		K 100mm	
	∞	Min. distance scale	∞	Min. distance scale
SMC Pentax A* 85mm f/1.4, M 85mm f/2	0.59X	0.70X	Incompatible	
SMC Pentax A & M 100mm f/2.8	0.50X	0.63X	1.00X	1.13X
SMC Pentax A & M Macro 100mm f/4	0.50X	1.00X	1.00X	1.50X
SMC Pentax M 120mm f/2.8	0.42X	0.55X	0.83X	0.96X
SMC Pentax A* 135mm f/1.8, A 135mm f/2.8	0.38X	0.51X	0.75X	0.86X
SMC Pentax 135mm f/2.5, M 135mm f/3.5	0.37X	0.49X	0.74X	0.86X
SMC Pentax M 150mm f/3.5	0.33X	0.44X	0.67X	0.77X
SMC Pentax A* 200mm f/2.8, A & M 200mm f/4	0.26X	0.40X	0.52X	0.66X
SMC Pentax A* 300mm f/2.8	0.17X	0.30X	0.35X	0.50X
SMC Pentax-F* 300mm f/4.5	0.17X	0.39X	0.35X	0.61X
SMC Pentax A* & M* 300mm f/4	0.17X	0.27X	0.35X	0.44X

CLOSE-UP TABLE

• Figures in bold face are for the Auto Extension Tubes, regular weight figures in parentheses are for the Extension Tubes. (—) indicates that the preceding bold face figures also apply to Extension Tubes.

- The Tables 1–14 show the close-up data when each lens is set at its minimum focus distance and used in the normal position.
- The Tables 16–23 show the data when each lens is used in the reverse position; the distance scale does not affect the data, wherever it is set. (Use the A-Macro 50mm f/2.8 lens with its distance scale at its minimum, also when reversed.)

Table 1: A/M 28mm f/2 & f/2.8

(Distance scale at 0.3m)

Magnification	Tubes to be used	Picture area (mm)	Film-to-subject distance (mm)	Exposure factor
0.13(—)	Not used	181 × 272(—)	300(—)	× 1.1(—)
0.55(0.46)	1	44 × 66 (52 × 78)	147(154)	× 1.6(1.5)
0.80(0.79)	2	30 × 45 (—)	138(—)	× 1.9(—)
1.04(1.12)	3	23 × 35 (21 × 32)	137(—)	× 2.3(2.4)

Table 2: A/M 35mm f/2 & f/2.8

(Distance scale at 0.3m)

Magnification	Tubes to be used	Picture area (mm)	Film-to-subject distance (mm)	Exposure factor
0.17(—)	Not used	142 × 212(—)	300(—)	×1.2(—)
0.51(0.44)	1	47 × 70 (55 × 82)	174(182)	×1.8(1.7)
0.71(—)	2	34 × 51 (—)	161(—)	×2.2(—)
0.91(0.98)	3	26 × 40 (24 × 37)	158(157)	×2.6(2.8)

Since the 50mm f/1.2 and f/1.4 lenses are not suited for magnifications greater than 0.65X, using the Tube No. 3 is the limit that can be recommended.

**Table 3: A 50mm f/1.2, F/A/M 50mm f/1.4 & f/1.7,
A/M 50mm f/2**

(Distance scale at 0.45m)

Magnification	Tubes to be used	Picture area (mm)	Film-to-subject distance (mm)	Exposure factor
0.15(—)	Not used	159 × 239 (—)	450(—)	× 1.2(—)
0.38(0.33)	1	63 × 94 (72 × 108)	253(270)	× 1.7(1.6)
0.52(—)	2	47 × 70 (—)	224(—)	× 2.0(—)
0.65(0.70)	3	37 × 55 (34 × 52)	210(207)	× 2.3(2.4)
0.75(0.70)	1 + 2	32 × 48 (34 × 52)	205(207)	× 2.5(2.4)
0.88(—)	1 + 3	27 × 41 (—)	201(—)	× 2.8(—)
1.02(1.06)	2 + 3	24 × 35 (23 × 34)	200(201)	× 3.2(3.3)
(1.25)	1 + 2 + 3	(19 × 29)	(203)	× (3.9)

Table 4: A*-85mm f/1.4, M-85mm f/2

(Distance scale at 0.85m)

Magnification	Tubes to be used	Picture area (mm)	Film-to-subject distance (mm)	Exposure factor
0.13(—)	Not used	189 × 284(—)	850(—)	×1.4(—)
0.26(0.24)	1	91 × 136(102 × 153)	504(542)	×1.8(1.7)
0.34(—)	2	70 × 105(—)	434(—)	×2.1(—)
0.42(0.45)	3	57 × 85 (53 × 80)	392(382)	×2.4(2.5)
0.48(0.45)	1 + 2	50 × 75 (53 × 80)	373(382)	×2.6(2.5)
0.56(—)	1 + 3	43 × 64 (—)	354(—)	×3.0(—)
0.64(0.67)	2 + 3	37 × 56 (36 × 54)	341(338)	×3.3(3.4)
0.70	50mm	34 × 52	335	×3.6
(0.78)	1 + 2 + 3	(31 × 46)	(329)	(3.9)
1.27	100mm	19 × 28	329	×6.7

Table 5: A/M 100mm f/2.8

(Distance scale at 1.0m)

Magnification	Tubes to be used	Picture area (mm)	Film-to-subject distance (mm)	Exposure factor
0.13(—)	Not used	190×285(—)	1000(—)	×1.4(—)
0.25(0.22)	1	97×146(108×162)	628(671)	×1.8(1.7)
0.32(—)	2	76×114(—)	545(—)	×2.1(—)
0.39(0.41)	3	62×93 (58×87)	495(482)	×2.4(2.5)
0.44(0.41)	1+2	55×82 (58×87)	470(482)	×2.7(2.5)
0.51(—)	1+3	47×71 (—)	446(—)	×3.0(—)
0.58(0.60)	2+3	42×62 (40×60)	429(424)	×3.4(3.5)
0.63	50mm	38×57	420	×3.6
(0.70)	1+2+3	(34×51)	(411)	×(4.0)
1.13	100mm	21×32	399	×6.9

Table 6: M-120mm f/2.8

(Distance scale at 1.2m)

Magnification	Tubes to be used	Picture area (mm)	Film-to-subject distance (mm)	Exposure factor
0.13(—)	Not used	187×281(—)	1202(—)	×1.5(—)
0.23(0.21)	1	105×158(115×173)	805(853)	×1.9(1.8)
0.29(—)	2	84×126(—)	705(—)	×2.2(—)
0.35(0.37)	3	69×104(65×98)	641(623)	×2.5(2.6)
0.39(0.37)	1+2	62×93 (65×98)	609(623)	×2.7(2.6)
0.45(—)	1+3	54×81 (—)	575(—)	×3.0(—)
0.50(0.53)	2+3	48×72 (46×69)	551(544)	×3.3(3.5)
0.55	50mm	44×66	538	×3.6
(0.60)	1+2+3	(40×60)	(523)	×(4.0)
0.96	100mm	25×37	492	×6.7

Table 7: A*-135mm f/1.8, A-135mm f/2.8

(Distance scale at 1.2m)

Magnification	Tubes to be used	Picture area (mm)	Film-to-subject distance (mm)	Exposure factor
0.15(—)	Not used	161 × 242(—)	1200(—)	×1.6(—)
0.23(0.22)	1	102 × 154(111 × 166)	867(914)	×1.9(1.8)
0.28(—)	2	84 × 127(—)	769(—)	×2.0(—)
0.33(0.35)	3	72 × 108(68 × 102)	702(684)	×2.2(2.3)
0.37(0.35)	1 + 2	65 × 97 (68 × 102)	667(684)	×2.4(2.3)
0.42(—)	1 + 3	57 × 86 (—)	629(—)	×2.6(—)
0.47(0.49)	2 + 3	51 × 77 (49 × 74)	600(592)	×2.8(2.9)
0.51	50mm	47 × 71	584	×2.9
(0.56)	1 + 2 + 3	(43 × 65)	(566)	(3.2)
0.86	100mm	28 × 42	520	×4.7

Table 8: 135mm f/2.5, M-135mm f/3.5

(Distance scale at 1.5m)

Magnification	Tubes to be used	Picture area (mm)	Film-to-subject distance (mm)	Exposure factor
0.12(—)	Not used	206×308(—)	1500(—)	×1.5(—)
0.21(0.19)	1	117×175(128×192)	1012(1074)	×2.0(1.9)
0.26(—)	2	93×140(—)	886(—)	×2.3(—)
0.31(0.33)	3	77×116(73×110)	805(783)	×2.6(2.7)
0.35(0.33)	1+2	69×104(73×110)	764(783)	×2.8(2.7)
0.40(—)	1+3	60×90 (—)	720(—)	×3.2(—)
0.45(0.47)	2+3	53×80 (51×77)	688(678)	×3.6(3.7)
0.49	50mm	49×74	670	×3.9
(0.54)	1+2+3	(44×67)	(650)	×(4.3)
0.86	100mm	28×42	600	×7.3

Table 9: M-150mm f/3.5

(Distance scale at 1.8m)

Magnification	Tubes to be used	Picture area (mm)	Film-to-subject distance (mm)	Exposure factor
0.11()	Not used	229 × 344(-)	1802(-)	× 1.5(-)
0.19(0.17)	1	130 × 195(144 × 216)	1193(1278)	× 1.9(1.8)
0.23()	2	104 × 156(-)	1036(-)	× 2.2(-)
0.28(0.29)	3	86 × 129(82 × 123)	934(908)	× 2.5(2.6)
0.31(0.29)	1 + 2	77 × 116(82 × 123)	882(908)	× 2.7(2.6)
0.36()	1 + 3	67 × 101()	826()	× 3.0(-)
0.41(0.42)	2 + 3	59 × 89 (57 × 85)	785(773)	× 3.4(3.5)
0.44	50mm	55 × 82	761	× 3.6
(0.49)	1 + 2 + 3	(50 × 75)	(735)	× (4.0)
0.77	100mm	31 × 47	663	× 6.7

Table 10: A* 200mm f/2.8 ED, A/M 200mm f/4

(Distance scale at 2.0m)

Magnification	Tubes to be used	Picture area (mm)	Film-to-subject distance (mm)	Exposure factor
0.14(—)	Not used	175×262(—)	1900(—)	×1.7(—)
0.20(0.19)	1	120×180(129×193)	1474(1538)	×2.1(2.0)
0.24(—)	2	102×153(—)	1332(—)	×2.3(—)
0.27(0.29)	3	88×132(84×126)	1230(1200)	×2.6(2.7)
0.30(0.29)	1+2	80×121(84×126)	1173(1200)	×2.8(2.7)
0.34(—)	1+3	72×108(—)	1110(—)	×3.0(—)
0.37(0.38)	2+3	65×97 (63×94)	1061(1046)	×3.3(3.4)
0.40	50mm	60×91	1032	×3.5
(0.43)	1+2+3	(55×83)	(998)	×(3.9)
0.66	100mm	37×55	890	×6.0

Table 11: A*-300mm f/2.8 ED (IF)

(Distance scale at 3.0m)

Magnification	Tubes to be used	Picture area (mm)	Film-to-subject distance (mm)	Exposure factor
0.11 (—)	Not used	216 × 325 (—)	3000 (—)	× 1.0 (—)
0.16 (0.15)	1	153 × 229 (163 × 244)	2324 (2429)	× 1.2 (—)
0.18 (—)	2	130 × 195 (—)	2089 (—)	× 1.4 (—)
0.21 (0.22)	3	114 × 170 (109 × 163)	1916 (1865)	× 1.5 (—)
0.23 (0.22)	1 + 2	104 × 156 (109 × 163)	1819 (1865)	× 1.6 (1.5)
0.26 (—)	1 + 3	93 × 140 (—)	1708 (—)	× 1.7 (—)
0.29 (—)	2 + 3	84 × 127 (82 × 122)	1619 (1592)	× 1.9 (2.0)
0.30	50mm	79 × 118	1566	× 2.0
(0.33)	1 + 2 + 3	(73 × 109)	(1504)	(2.2)
0.50	100mm	48 × 72	1285	× 3.4

Table 12: F* 300mm f/4.5 ED (IF)

(Distance scale at 2.0m)

Magnification	Tubes to be used	Picture area (mm)	Film-to-subject distance (mm)	Exposure factor
0.17(—)	Not used	144×216(—)	2000(—)	×1.3(—)
0.22(0.21)	1	109×164(115×172)	1685(1737)	×1.6(1.5)
0.25(—)	2	96×144(—)	1565(—)	×1.8(—)
0.28(0.29)	3	85×128(82×123)	1472(1444)	×1.9(2.0)
0.30(0.29)	1+2	79×119(82×123)	1419(1444)	×2.1(2.0)
0.33(—)	1+3	72×108(—)	1357(—)	×2.3(—)
0.37(0.38)	2+3	66×99(64×96)	1306(1290)	×2.5(—)
0.39	50mm	62×93	1276	×2.6
0.42(—)	1+2+3	58×86(—)	1239(—)	×2.8(—)
0.61	100mm	40×59	1112	×4.3

Table 13: A*/M* 300mm f/4

(Distance scale at 4m)

Magnification	Tubes to be used	Picture area (mm)	Film-to-subject distance (mm)	Exposure factor
0.09(—)	Not used	266 × 399(—)	4000(—)	× 1.6(—)
0.13(0.12)	1	182 × 273(195 × 293)	3002(3154)	× 1.8(—)
0.16(—)	2	154 × 231(—)	2668(—)	× 2.0(—)
0.18(0.19)	3	133 × 200(127 × 191)	2425(2354)	× 2.2(2.3)
0.20(0.19)	1 + 2	122 × 183(127 × 191)	2289(2354)	× 2.4(2.3)
0.22(—)	1 + 3	108 × 163(—)	2136(—)	× 2.6(—)
0.25(—)	2 + 3	98 × 147(94 × 142)	2014(1976)	× 2.8(2.9)
0.26	50mm	91 × 137	1941	× 3.0
(0.29)	1 + 2 + 3	(84 × 126)	(1855)	× (3.2)
0.44	100mm	55 × 83	1554	× 4.8

- When shooting with A-Macro 50mm f/2.8 at the magnification greater than 0.5X, set the distance scale at its minimum side.

Table 14: A-Macro-50mm f/2.8, M-Macro-50mm f/4

(Distance scale at 0.234m)

Magnification	Tubes to be used	Picture area (mm)	Film-to-subject distance (mm)	Exposure factor
0.50(—)	Not used	48 × 72(—)	237(—)	×2.1(—)
0.72(0.68)	1	33 × 50(35 × 53)	216(218)	×2.7(2.6)
0.85(—)	2	28 × 42(—)	211(—)	×3.1(—)
0.99(1.03)	3	24 × 37(23 × 35)	210(—)	×3.5(3.7)
1.08(1.03)	1 + 2	22 × 33(23 × 35)	210(—)	×3.8(3.7)
1.21(—)	1 + 3	20 × 30(—)	212(—)	×4.3(—)
1.34(1.39)	2 + 3	18 × 27(17 × 26)	215(216)	×4.8(5.0)
1.44	50mm	17 × 25	217	×5.2

Table 15: A/M Macro 100mm f/4

(Distance scale at 0.45m)

Magnification	Tubes to be used	Picture area (mm)	Film-to-subject distance (mm)	Exposure factor
0.50(--)	Not used	48 × 72(--)	450(--)	× 2.5(--)
0.62(0.60)	1	39 × 58(40 × 60)	424(428)	× 2.9(2.5)
0.69(--)	2	35 × 52(--)	415(--)	× 3.2(--)
0.76(0.79)	3	31 × 47(31 × 46)	408(407)	× 3.5(3.9)
0.81(0.79)	1 + 2	29 × 44(31 × 46)	405(407)	× 3.7(3.9)
0.88(--)	1 + 3	27 × 41(--)	402(--)	× 4.0(--)
0.95(0.98)	2 + 3	25 × 38(25 × 37)	401(--)	× 4.3(4.9)
1.00	50mm	24 × 36	401	× 4.5
(1.07)	1 + 2 + 3	(22 × 33)	(401)	× (4.9)
1.50	100mm	16 × 24	418	× 7.4

HOW TO USE REVERSE ADAPTORS K, 49mm & 52mm

When using the Reverse Adaptor K, 49mm or 52mm, screw it into the SMC Pentax lens. Then, reversing the lens, attach the Reverse Adaptor to the Auto Extension Tube K or the Extension Tube K. In this case, note that the manual diaphragm and stop-down metering mechanism will operate instead of the automatic diaphragm and full-aperture metering mechanism. Also note that when this Adaptor is used, the elements of most lenses do not move even if you turn the focusing ring, and therefore only the close-up conditions such as magnification, picture area, etc. shown in the table are applicable.



Table 16: A/M 28mm f/2 & f/2.8

Magnification	Tubes to be used	Picture area (mm)	Film-to-subject distance (mm)	Exposure factor
1.75(—)	Not used	13.7 × 20.6(—)	146(—)	× 5.0(—)
2.16(2.08)	1	11.1 × 16.6(11.6 × 17.3)	155(153)	× 7.1(6.6)
2.41(—)	2	10.0 × 15.0(—)	160(—)	× 8.4(—)
2.65(2.74)	3	9.1 × 13.6(8.8 × 13.2)	166(168)	× 9.9(10.5)
2.82(2.74)	1 + 2	8.5 × 12.8(8.8 × 13.2)	171(168)	× 11.0(10.5)
3.07(—)	1 + 3	7.8 × 11.7(—)	177(—)	× 12.7(—)
3.31(3.40)	2 + 3	7.3 × 10.9(7.1 × 10.6)	183(185)	× 14.5(15.2)
3.48	50mm	6.9 × 10.3	188	× 15.8
3.73(—)	1 + 2 + 3	6.4 × 9.7(—)	194(—)	× 17.8(—)
5.22	100mm	4.6 × 6.9	235	× 32.7

Table 17: A/M 35mm f/2 & f/2.8

Magnification	Tubes to be used	Picture area (mm)	Film-to-subject distance (mm)	Exposure factor
1.21(—)	Not used	19.9 × 29.8(—)	158(—)	× 3.6(—)
1.55(1.48)	1	15.5 × 23.2(16.2 × 24.3)	164(163)	× 5.0(4.5)
1.75(—)	2	13.7 × 20.6(—)	168(—)	× 5.9(—)
1.95(2.02)	3	12.3 × 18.5(11.9 × 17.8)	173(175)	× 6.9(7.3)
2.09(2.02)	1 + 2	11.5 × 17.2(11.9 × 17.8)	177(175)	× 7.7(7.3)
2.29(—)	1 + 3	10.5 × 15.7(—)	183(—)	× 8.8(—)
2.49(2.56)	2 + 3	9.6 × 14.5(9.4 × 14.1)	188(191)	× 10.1(10.5)
2.63	50mm	9.1 × 13.4	193	× 11.0
2.83(—)	1 + 2 + 3	8.5 × 12.7(—)	199(—)	× 12.4(—)
4.06	100mm	5.9 × 8.9	238	× 22.5

- The 50mm f/1.2 and f/1.4 lenses are not suited for magnifications near 1X, so use them for greater-than-1.5X magnifications.

Table 18: A-50mm f/1.2

Magnification	Tubes to be used	Picture area (mm)	Film-to-subject distance (mm)	Exposure factor
1.10 (1.05)	1	21.8 × 32.7 (22.8 × 34.2)	199 (199)	× 2.8 (2.7)
1.24 (—)	2	19.4 × 29.2 (—)	200 (—)	× 3.3 (—)
1.37 (1.42)	3	17.5 × 26.3 (16.9 × 25.4)	204 (205)	× 3.8 (4.0)
1.47 (1.42)	1 + 2	16.4 × 24.7 (16.9 × 25.4)	206 (205)	× 4.2 (4.0)
1.60 (—)	1 + 3	15.0 × 22.5 (—)	210 (—)	× 4.8 (—)
1.74 (1.78)	2 + 3	13.8 × 20.8 (13.5 × 20.2)	215 (216)	× 5.4 (5.6)
1.83	50mm	13.1 × 19.7	218	× 5.8
1.97 (—)	1 + 2 + 3	12.2 × 18.3 (—)	223 (—)	× 6.5 (—)
2.79	100mm	8.6 × 12.9	258	× 11.4

Table 19: F/A 50mm f/1.4

Magnification	Tubes to be used	Picture area (mm)	Film-to-subject distance (mm)	Exposure factor
0.88(0.83)	1	27.4×41.1(29.0×43.5)	201(202)	× 2.7(2.6)
1.01(—)	2	23.7×35.6(—)	200(—)	× 3.2(—)
1.15(1.19)	3	21.0×31.4(20.1×30.2)	201(202)	× 3.7(3.9)
1.24(1.19)	1+2	19.3×29.0(20.1×30.2)	203(202)	× 4.1(3.9)
1.38(—)	1+3	17.4×26.2(—)	206(—)	× 4.6(—)
1.51(1.56)	2+3	15.9×23.8(15.4×23.1)	209(211)	× 5.2(5.4)
1.61	50mm	14.9×22.4	212	× 5.7
1.74(—)	1+2+3	13.8×20.7(—)	217(—)	× 6.3(—)
2.57	100mm	9.4×14.0	250	×11.2

- This lens is not suited for magnifications near 1X, so use it for greater-than-1.5X magnifications.

Table 20: M-50mm f/1.4

Magnification	Tubes to be used	Picture area (mm)	Film-to-subject distance (mm)	Exposure factor
0.91(0.86)	1	26.3 × 39.4(27.8 × 41.7)	197(198)	× 2.7(2.5)
1.05()	2	22.8 × 34.3()	197()	× 3.2(-)
1.19(1.24)	3	20.2 × 30.3(19.4 × 29.1)	198(199)	× 3.7(3.9)
1.29(1.24)	1 + 2	18.7 × 28.0(19.4 × 29.1)	200(199)	× 4.1(3.9)
1.42(-)	1 + 3	16.9 × 25.3()	203()	× 4.6(-)
1.56(1.61)	2 + 3	15.4 × 23.1(14.9 × 22.4)	207(208)	× 5.2(5.5)
1.66	50mm	14.5 × 20.7	210	× 5.7
1.80(-)	1 + 2 + 3	13.4 × 20.0(-)	215(-)	× 6.4(-)
2.64	100mm	9.1 × 13.6	249	× 11.3

Table 21: F/A/M 50mm f/1.7, A/M 50mm f/2

Magnification	Tubes to be used	Picture area (mm)	Film-to-subject distance (mm)	Exposure factor
1.04(0.95)	1+2	23.0×34.5(25.3×38.0)	204(—)	× 3.9(3.6)
1.18(—)	1+3	20.3×30.5(—)	206(—)	× 4.5(—)
1.31(—)	2+3	17.6×26.4(18.3×27.4)	209(208)	× 5.3(5.1)
1.41	50mm	17.0×25.6	210	× 5.5
1.54(—)	1+2+3	15.5×23.3(—)	214(—)	× 6.2(—)
2.30	100mm	10.1×15.2	245	×11.0

- When shooting with this lens at magnifications greater than 0.5X, set the focus distance to its minimum side.

Table 22: A-Macro-50mm f/2.8

(Distance scale at 0.234m)

Magnification	Tubes to be used	Picture area (mm)	Film-to-subject distance (mm)	Exposure factor
0.77(—)	Not used	31.2 × 46.9(—)	214(—)	× 2.7(—)
0.99(0.95)	1	24.2 × 36.2(25.4 × 38.0)	210(—)	× 3.5(3.3)
1.13(—)	2	21.3 × 32.0(—)	211(—)	× 4.0(—)
1.26(1.30)	3	19.1 × 28.7(18.4 × 27.6)	213(214)	× 4.5(4.7)
1.35(1.30)	1 + 2	17.8 × 26.7(18.4 × 27.6)	215(214)	× 4.9(4.7)
1.48(—)	1 + 3	16.2 × 24.3(—)	218(—)	× 5.6(—)
1.61(1.66)	2 + 3	14.9 × 22.3(14.5 × 21.7)	222(224)	× 6.2(6.5)
1.71	50mm	14.1 × 21.1	226	× 6.4
1.84(—)	1 + 2 + 3	13.1 × 19.6(—)	230(—)	× 7.4(—)
2.65	100mm	9.1 × 13.6	265	× 12.0

- Reversing the Macro 100mm f/4 lens is not recommended, since it can only provide magnifications far less than 1X, even with the Tubes 1 + 2 + 3 and the K 100mm combined.

Table 23: M-Macro-50mm f/4

Magnification	Tubes to be used	Picture area (mm)	Film-to-subject distance (mm)	Exposure factor
0.82(0.78)	1	29.1 × 43.7(30.9 × 46.4)	209(211)	× 3.3(3.2)
0.96(—)	2	25.0 × 37.5(—)	208(—)	× 4.1(—)
1.10(1.14)	3	21.9 × 32.9(21.0 × 31.5)	208(—)	× 4.7(4.9)
1.19(1.14)	1 + 2	20.1 × 30.2(21.0 × 31.5)	209(208)	× 5.1(4.9)
1.33(—)	1 + 3	18.0 × 27.1(—)	212(—)	× 5.8(—)
1.46(1.51)	2 + 3	16.4 × 24.6(15.9 × 23.8)	215(217)	× 6.4(6.7)
1.56	50mm	15.4 × 23.1	218	× 6.9
1.70(—)	1 + 2 + 3	14.1 × 21.2(—)	222(—)	× 7.7(—)
2.53	100mm	9.5 × 14.2	255	× 13.0

- In the case of the Macro 50mm f/4, magnifications increase as a whole.

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