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PENTAX[®]

INTERCHANGEABLE LENSES

OPERATING MANUAL



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Careful reading of this operating manual will help you take advantages of all the photographic capacities this equipment has to offer.

Since accessories made by other manufacturers are not produced to the precise Pentax specifications, they may cause difficulties (inferior image quality, vignetting, etc.) or actual damage.

Therefore, we suggest that you use only genuine Pentax accessories on your Pentax cameras and lenses.

Photographs and/or illustrations of the products in this operating manual may differ from the actual product in its details.

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NOMENCLATURE



MAINTENANCE



- Moisture is not good for optical glass elements. Protect your lens from humidity, salty air and dust. It is good practice to put on a filter to protect the lens.
- Since storage in a damp place may cause mildew, keep your lens in as dry a place as possible.

- Cleaning: Do not wipe the lens with a hand-kerchief or other rough cloth which might scratch the lens surface. Dust and dirt should be removed with a blower or lens brush. If the lens becomes dirty, first blow or brush off loose dirt particles, then wipe it with a clear soft cloth or tissue paper with a lens cleaning fluid available on the market (never use solvents such as thinner or alcohol). Wipe in a spiral pattern from the center out, changing the cloth or paper a few times.
- When not using lenses regularly, especially during humid weather, remove it from its case and check for mildew. Dry out the case, if necessary. Light mildew can easily be wiped off. If mildew has formed on the inside of the lens, the lens must be brought to a Pentax service facility as soon as possible.
- Excessive heat, dropping and scratching will also damage lenses.
- Always cover lenses with both front and rear caps when not in use.

INNER BAYONET LENS



To mount:

Align the red dots of the lens and lens mount of the 67, and insert as shown in the photo. Turn the lens to the right until it locks in place with a click. Wiggle the lens back and forth to test whether it is mounted properly.



To dismount:

Press the lens release lever and turn the lens to the left until it stops, then pull out the lens.

OUTER BAYONET LENS



The 67 lenses listed below mount to the outer bayonet of the 67 camera.

To mount:

Loosen the fastener ring surrounding the lens mount until the white dot faces upward. Then, match the lens mount with the outer bayonet of the camera, insert the bayonet tabs and turn the fastener ring to the right as shown in the photo.



Caution:

Check that the lens is mounted securely. If the bayonet tabs have not caught properly, the lens may fall off.

The outer bayonet lenses	
SMC Takumar	600mm f/4
SMC Takumar	800mm f/4
SMC Reflex Takumar	1000mm f/8

DIAPHRAGM



Automatic Diaphragm

With an automatic diaphragm lens, the diaphragm stays fully open until the shutter is released as long as the depth of field preview lever is set to AUTO.



To preview the depth of field or to operate the diaphragm manually, slide the lever downward as shown in the photo. The lever will lock on manual (MAN.). To reengage the automatic diaphragm, press the lever. The lever will spring back to the AUTO position.



Preset Diaphragm

SMC Pentax Shift 75mm lens features a preset diaphragm system, whereby the shooting aperture is preset with a preset ring, so that focusing and composition are performed at full-aperture. Then, the aperture is stopped down for exposure metering and shooting by turning the aperture ring until it matches up with the preset ring. Please also refer to the operating manual furnished with the lens.



Click Stop Diaphragm

The lenses listed below feature a manual diaphragm which is stopped down by rotating the aperture ring to the various click stop f-number settings. Focus with the lens set at maximum aperture then stop down to the shooting aperture before releasing the shutter.

Lenses with Click Stop Diaphragm

SMC Takumar 600mm f/4 SMC Takumar 800mm f/4 SMC Pentax Soft 120mm f/3.5





Aperture values and click stops

The white dot next to the full-open aperture value indicates an aperture which is one full stop slower. The click stops between aperture values are equivalent to the in-between values as shown below. No click stops are provided at the extreme ends of the aperture scale.

Note:

The f/stop range varies from one lens to another.

2 • 2.8 • 4	• 5.6 • 8 • 11	l • 16 •	22 • 32 • 45
2.4 3.4	4.8 6.7 9.5	13.5 19	27 38

Lens function and aperture setting

Selecting the proper aperture value will improve your pictures since the image reproduction capability of your lens varies in accordance with the f/stop in use. Aperture between f/5.6 and 11 will generally provide its highest resolution and contrast throughout the entire image. For the best performance, use apertures within this range, except when you want less or more depth of field or when available lighting is not sufficient.



Minimum aperture

The smallest aperture setting of all SMC Pentax/Takumar 67 lenses is f/22 or smaller. The use of these smaller f/stop increases depth of field. Except for extreme close-ups or special effects, it is advisable not to use an aperture smaller than f/16. Smaller apertures than f/16 may adversely influence focusing, due to the diffraction effect. Avoid unnecessary utilization of apertures f/22 or smaller.

LENS HOOD

Pentax 67 lens hoods come in round and square shapes, plus built-in types. Use only a hood designed for your particular lenses. Otherwise, vignetting may result.

Square hoods

There is a bayonet spring type as for the square hood. Attach it to the lens while depressing the knurled tabs on either side of the hood. Be sure to keep the top and bottom of the hood are in parallel with those of the camera when attaching it.

• When a gelatin filter holder or polarizing filter specially designed for 67 camera are attached to the lens, the spring type square hood cannot be fitted.

Square hood	SMC Pentax 67 lens
PH-SB67mm	90mm F2.8 105mm F2.4
PH-SA77mm	55mm F4
PH-SA82mm	75mm F4.5
PH-SB82mm	45mm F4
PH-SA67mm	Macro135 mm F4

(PH = Plastic hood)



Round lens hoods

They can easily be screwed into the front frame of the lens or of the filter. Some round lens hoods are marked as follows;

hoods are marked as follows;	
Lens	Lens hood
SMC Pentax LS 165mm f/4	RH-RC77mm
[RH	= Rubber hood]
SMC Pentax Soft 120mm f/3.5	RH-RC77mm

SMC Pentax 200mm f/4 MH-RA77mm [MH = Metal hood]



Built-in lens hoods

The lenses listed below have built-in lens hoods. Pull it to use the hood. If you cannot pull it to the front easily, rotate it while pulling it.

Lenses with built-in hoods	
SMC Pentax	165mm f/2.8
SMC Pentax	300mm f/4
SMC Pentax M*	400mm f/4
SMC Pentax	500mm f/5.6
SMC Takumar	600mm f/4
SMC Pentax M*	800mm f/6.7
SMC Takumar	800mm f/4
SMC Reflex Takumar	1000mm f/8

FILTER







Screw-in filters

Simply screwed into the front frame or the rear frame of the lens (M^*400 mm, 600mm, M^*800 mm and 1000mm).

Bayonet type filters

Align the white dots on the filter and lens and turn the filter to the right until it bayonets into place.

Attaching to the lens rear

The lenses listed below accept either screw-in or bayonet type filters on the adapter ring at the rear end of the lens. With the 600mm and 1000mm lenses, first remove the adapter ring by turning counterclockwise and attach a 77mm filter as shown in the photos.

Lens	Filter size		
SMC Pentax M* 400mm f/4	67mm		
SMC Takumar 600mm f/4	77mm		
SMC Pentax M* 800mm f/6.7	67mm		
SMC Takumar 1000mm f/8	77mm		
one canania recent in			



Built-in filters

SMC Pentax Fish-Eye 35mm lens features four built-in filters (UV, Y2, O2 and R2). Turn the filter ring to employ the desired filter.



SMC Pentax Fish-Eye 35mm and SMC Pentax 45mm lenses feature the filter clip, which accepts a gelatin filter as shown in the photo.

Note:

The polarizing filters consist of two glass elements, making them thicker than ordinary filters. For this reason, if they are used on the 55mm f/4 lens, it may cause vignetting (underexposure) at the corners of the picture.

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Lens and filter size/type

The bayonet type filters for 67 lenses do not attach to the following lenses; 55mm f/4.0, Soft 120mm f/3.5, LS 165mm f/4.0 and 200mm f/4.0

Lens		Size (mm)	Screw-in	Bayonet	Built-in
SMC Pentax 67 FE	35mm f/4.5	- d		_	4 types
SMC Pentax 67	45mm f/4	82	_	0	_
SMC Pentax 67	55mm f/4	77	0	- 9	_
SMC Pentax 67	75mm f/4.5	82	_	0	_
SMC Pentax 67 Shift	75mm f/4.5	82	_	0	
SMC Pentax 67	90mm f/2.8	67	0	0	
SMC Pentax 67	105mm f/2.4	67	0	0	——————————————————————————————————————
SMC Pentax 67	165mm f/2.8	67	0	0	_
SMC Pentax 67 LS	165mm f/4	77	0		min all last
SMC Pentax 67	200mm f/4	77	0		SM(<u>PB</u> anks
SMC Pentax 67	300mm f/4	82		0	HO. SHATE TO STATE OF THE STATE
SMC Pentax 67 M*	400mm f/4	67(Rear)	0	0	4-01-
SMC Pentax 67	500mm f/5.6	95	0	_	
SMC Takumar 67	600mm f/4	77(Rear)	0	0	_
SMC Pentax 67M*	800mm f/6.7	67(Rear)	0	0	Pina r jaan l
SMC Takumar 67	800mm f/4	77(Rear)	0	_ O	I (ad ani n
SMC Reflex 67 Takumar	1000mm f/8	77(Rear)	0	0	6 types
SMC Pentax 67 Macro	135mm f/4	67	0	0	1 -
SMC Pentax 67 Soft	120mm f/3.5	77	0	ir M 🕳 🙏	72-0

HOLDING THE CAMERA



The most recommended method to minimize the camera shake is to use a good solid tripod. However, it is possible to shoot holding the 67 camera in hand up to the 200mm telephoto lens. To obtain an excellent result with the handheld shooting, please practice the following method. Stand with your legs spread as if you were firing a pistol. As shown in the photo, hold the 67's mount section and lens securely, and support the camera by pressing it to your face. When you are ready to release the shutter, bring your elbows against your body and gently depress the shutter button.



In handheld shooting, the surest way to prevent blur is to select a high shutter speed. When you have to use slower shutter speeds, stabilize your camera/lens with a solid tripod.

HANDLING DISMOUNTED LENSES



Dismounted lenses should be handled carefully. Place them on a level surface to prevent falling over or rolling away.

Generally, smaller lenses should be stood on their front end, with the mount capped like the three lenses in the center of the photo. The SMC Pentax Fish-Eye 35mm lens must stand on its rear end with mount cap to avoid scratching the protruding front element. Long telephoto lenses with tripod should be placed lengthwise on their side as shown in the photo.

SUGGESTION ON USE OF TELEPHOTO LENSES

Note on infinity (∞) indication:

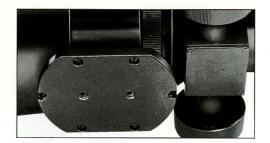
With a powerful telephoto lens, there may be a focus shift between the distance indicated on the lens and the actual camera to subject distance, influenced by temperature conditions. For this reason, the focusing ring is specially designed to rotate slightly past the infinity (∞) indication. So, even when you take pictures at infinity, be sure to confirm good focus through the view finder.

• Shooting landscapes with a telephoto lens: Telephoto lenses are frequently used for photographing distant scenery. Climate conditions such as heat, haze or mist may deteriorate resolution and/or contrast. It is advisable to photograph landscapes when the weather is clear.



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MOUNTING ON A TRIPOD

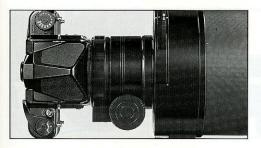


Tripod mount

The long telephoto lenses listed below feature a tripod mount in order to give the lens added support. As even the slightest movement can cause blur with high powered 67 telephoto lenses, a sturdy tripod should be used. Blur is most pronounced at shutter speeds of 1/60 sec. or slower. When using telephoto lenses at these shutter speeds, attach a tripod firmly to the tripod mount. Even better results will be assured if a second tripod is attached to the camera body. The 67's mirror lock-up feature further reduces the possibility of blur.



Lenses with a Tripod Mount	
SMC Pentax M* ED (1F)	400mm f/4
SMC Pentax	500mm f/5.6
SMC Takumar	600mm f/4
SMC Pentax M* FD (1F)	800mm f/6.7
SMC Takumar	800mm f/4
SMC Reflex Takumar	1000mm f/8



Mounting vertically:

To shoot with the camera in vertical position, carefully loosen the fastener ring and position the camera vertically. Then, tighten the fastener ring by turning it to the right. Always check that the bayonet has locked properly.



 When using the M* 400mm and M* 800mm lenses, position the camera vertically or horizontally by loosening the vertical/horizontal position lock screw. For details, refer to the operating manual for these lenses.

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SIGHTING AND FOCUSING WITH LONG TELEPHOTO LENSES





Sight:

With a high powered telephoto lens, it is often difficult to bring a subject into the limited angle of view. Longer 67 telephoto lenses are equipped with a sight as shown in the photo. Aim the lens at the subject using the sight as if you were pointing a rifle at a target to place the subject in the viewfinder.

Focusing:

Focusing with long telephoto lenses (600mm or longer) is accomplished via two focusing knobs at the rear of the lens.

SMC PENTAX LS 165 F/4



This is a multi-functional lens with a built-in leaf shutter. It can be operated in either normal way, just as you operate the ordinary 67 lens without leaf shutter, or the other way by using its leaf shutter. For the detailed operating instructions, please refer to the operating manual which is supplied with the lens.



Notes:

- Electronic flash units synchronize at all leaf shutter speed settings from 1/60 to 1/500 sec.
- Since the slowest shutter speed is 1/60 sec., the leaf shutter is not suitable for flash bulbs.
 Please use the camera's shutter for synchronizing with flash bulbs.

SMC PENTAX MACRO 135 MM F/4



Originally designed to deliver optimum performance in close-up photography and copy work, this macro lens is also suitable for general purpose photography from 0.75m (approx. 1/3.2 X magnification) to infinity (∞).



Magnifications and Exposure Factors

A reading of 3.2 on the magnification scale indicates a magnification of 1/3.2. With close-up, the volume of light reaching to the film decreases in proportion to magnification increase. When metering with a handheld light meter, exposure must be increased as per the chart below. However, exposure compensation is not required when using the TTL Pentaprism.

Macro Exposure Factors

Magnification	~ 1/10	1/8 - 1/4	1/3.7 - 1/3.2	
Exposure factor	X 1	X 1.5	X2	

SMC REFLEX TAKUMAR 1000 F/8







A diaphragm is not employed with the reflex lens. The light adjustment is made by built-in ND (Neutral Density) filters. Depth of field can not be controlled with this lens.

ND Filter	X1	X2	X2.8	X4
Equivalent F-number	f/8	f/11	f/13.5	f/16

The Reflex Takumar 1000mm also has three types of filters built-in (Skylight, Y2 and R2). To use the filter, rotate the filter ring next to the ND filter ring until the desired filter aligns with the index. There is also a blank setting, which features a neutral glass. To attach other types of filters, please refer to page 12.

INFRARED PHOTOGRAPHY



Infrared photography with infrared film and R2 or O2 filters requires a compensation for the difference between visible light focus and infrared focus. As shown in the photo, note the subject to camera distance on the distance scale as you focus through the viewfinder and turn the focusing ring until that distance setting aligns with the red infrared index. The photos show an example in which the subject to camera distance is set at infinity (∞). In regard to exposure control required in infrared photography, please refer to the instructions of the film.



Notes:

Focus compensation will not be required when using an infrared color film.

CASES FOR 67 LENSES

Cases for the 67 lenses are coded as follows:

Code	Applicable lenses							
S90-100	45mm f/4, 90mm f/2.8, 105mm f/2.4, Rear Converter 1.4X							
S90-140	55mm f/4, 75mm f/4.5, 165mm f/2.8 LS 165mm f/4.0, Macro 135mm f/4, Rear Converter 2X							
S110-160	200mm f/4							
S110-210	300mm f/4							
S120-150	Shift 75mm f/4.5							

NOTES ON LENS ACCESSORIES

- The Auto Extension Tube Set is not suitable for use with the 200mm f/4,M* 400mm f/4, 500mm f/5.6 or M* 800mm f/6.7 lens, since the combination causes vignetting as you get closer to the subject.
- For the same reason, the Rear Converters 2X and 1.4X are not suitable for use with 500mm, 600mm, 800mm or Reflex 1000mm lenses.
- When the Pentax circular polarizing filter or gelatin filter holder 77mm is used on the 55mm f/4 lens, vignetting may occur.
- The Quick Focusing Rings cannot be used with the 55mm f/4, LS 165mm f/4, 200mm f/4 and Soft 120mm f/3.5.
- The Rear Converter 1.4X cannot be attached to the LS 165mm f/4 lens. While the Rear Converter 2X can be attached and operate as normal lens, the LS 165mm lens's leaf shutter does not function in this combination.

LENS SPECIFICATIONS

Lens		•lene	onstruction of	tion of the land o	de of view	in focusing	9 Miri	Matini	ur diameter	gin meid	nt loi)	cilled o	• Periode
SMC Pentax Fish-Eye	35mm f/4.5	7-11	FA	180°	0.45	1.5	22	102	73	900	31.7	#	
SMC Pentax	45mm f/4	8-9	FA	89	0.37	1.2	22	91.5	57.5	485	17.1	82	
SMC Pentax	55mm f/4	7-8	FA	78	0.35	1.2	22	92.5	78.5	725	25.5	77 .	
SMC Pentax	75mm f/4.5	4-5	FA	61	0.70	2.3	22	91.5	81	560	19.7	82	
SMC Pentax Shift	75mm f/4.5	8-9	М	61	0.70	2.3	32	97	106.5	950	33.5	82	
SMC Pentax	90mm f/2.8	5-7	FA	53	0.65	2.1	22	91.5	49	480	17.1	67	
SMC Pentax	105mm f/2.4	5-6	FA	46	1.00	3.3	22	91.5	60	590	20.8	67	
SMC Pentax Soft	120mm f/3.5	3-4	М	40.5	0.75	2.5	22	89	63.5	520	18.3	77	
SMC Pentax Macro	135mm f/4	3-5	FA	36.5	0.75	2.5	32	91.5	95	620	21.8	67	
SMC Pentax	165mm f/2.8	5-6	FA	30	1.6	5.3	22	91.5	98.5	830	29.2	67	+

Soft...Soft focus ND...Controlled by ND filters #...UV, Y2, O2 & R2 filters built in

LS...Leaf shutter built in FA...Fully automatic

M...Manual

##...Skylight, Y2 & R2 filters built in

ED...Extra-low Dispersion IF...Inner Focus +...Hood built in 26

Lass		Jete Continuente de Militario (H.) Manufaria (H.) Mentali and the second continuente de la continuente											Filled Site (Inferio	
SMC Pentax LS	165mm f/4	4-5	FA	30	1.6	5.3	32	92.5	77	780	27.5	77	•	
SMC Pentax	200mm f/4	4-5	FA	25	1.5	4.9	32	92.5	135	795	28.0	77		
SMC Pentax	300mm f/4	5-5	FA	17	5.0	16.4	45	93	186	1,430	50.0	82	+	
SMC Pentax M*ED (II	=) 400mm f/4	10-10	FA	12.5	2.8	9.2	45	133	305	3,700	130.3	67	+	
SMC Pentax	500mm f/5.6	4-4	FA	10.2	8.0	26.2	45	107	398	3,200	112.7	95	+	
SMC Takumar	600mm f/4	6-7	М	8.5	12.0	39.3	45	170	370	6,000	211.3	77	+	
SMC Pentax M*ED (II	9) 800mm f/6.7	9-10	FA	6.4	8.0	26.2	45	150	565	6,500	228.9	67	+	
SMC Takumar	800mm f/4	7-7	М	6.4	20.0	65.6	45	236	611	17,700	623.2	77	+	
SMC Reflex Takumar	1000mm f/8	7-10	ND	5.1	35.0	114.8	-	180	352	6,600	232.4	##77	+	

SPECIFICATIONS ARE SUBJECT TO CHANGE AT ANY TIME WITHOUT NOTIFICATION OR ANY OBLIGATION ON THE PART OF THE MANUFACTURER.

WARRANTY POLICY

All Pentax lenses purchased through authorized bona fide photographic distribution channels are guaranteed against defects of material or workmanship for a period of twelve months from date of purchase. Service will be rendered and defective parts will be replaced without cost to you within that period, provided your lens has not been abused, altered, or operated contrary to instruction. The manufacturer or its authorized representatives shall not be liable for any repair of alterations except those made with its written consent and shall not be liable for damages from delay or loss of use or from other indirect or consequential damages of any kind. whether caused by defective material or workmanship or otherwise; and it is expressly agreed that the liability of the manufacturer or its representatives under all guarantees or warranties, whether expressed or implied, is strictly limited to the replacement of parts as hereinbefore provided.

PROCEDURE DURING 12-MONTH WARRANTY PERIOD

Any Pentax lens which proves defective during the 12-month warranty period should be returned to the dealer from whom you purchased your lens or to the manufacturer. If there is no representative of the manufacturer in your country, send your lens to the manufacturer, with postage prepaid. In this case, it will take a considerable length of time before your lens can be returned to you owing to the complicated customs procedures. If your lens is covered by warranty, repairs will be made and parts replaced free of charge, and your lens will be returned to you upon completion of servicing. If your lens is not covered by warranty, regular charges of the manufacturer or of its representatives will apply. Shipping charges are to be borne by the owner. If your Pentax lens was purchased outside of the country where you wish to have it serviced during the warranty period.

regular handling and servicing fees may be charged by the manufacturer's representatives in that country. Notwithstanding this, your lens returned to the manufacturer will be serviced free of charge according to this procedure and warranty policy. In any case, however, shipping charges and customs clearance fees are to be borne by the owner. To prove the date of your purchase when required, please keep the receipts or bills covering the purchase of your lens for at least a year. Before sending your lens for servicing, please make sure that you are sending it to the manufacturer's authorized representatives or their approved repair shops. unless you are sending it directly to the manufacturer. Always obtain a quotation for the service charge, and only after you accept the quoted service charge, instruct the service station to proceed with the servicing.

The local warranty policies available from Pentax distributors in some countries can supersede this warranty policy. Therefore, we recommend that you review the warranty card supplied with your product at the time of purchase, or contact the PENTAX distributor in your country for more information and to receive a copy of the warranty policy.