PENTAX® 645

INTERCHANGEABLE LENSES

This Instruction Manual will help you make the most efficient use of your lens. Whenever you have a question about the handling, capabilities or care of 645 series lenses, consult the table of contents and turn to the appropriate page of this handy guide.
We hope the advanced design of your 645 lens will enhance your photographic pleasure and creativity.
We suggest you use only Pentax lenses/accessories with your Pentax camera in order to avoid possible malfunctions.

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.

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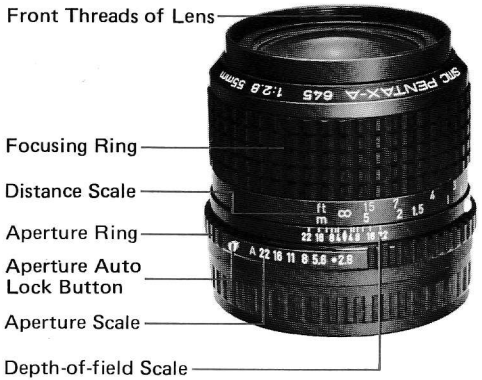
HANDLING SMC PENTAX 645 LENSES



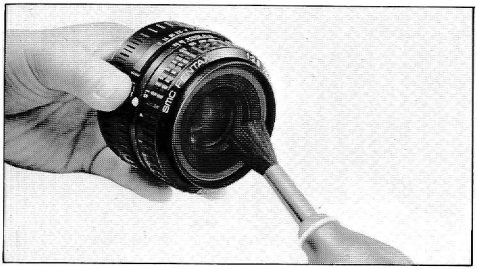
- When your 645 camera is equipped with a Pentax-A 645 lens, you can use multiple AE modes, including Programmed AE, Programmed flash and Shutter-priority AE.

- The LS 75mm f/2.8 and 135mm f/4 lenses are provided with a built-in leaf shutter, but not with "A" (Auto). Therefore, set to respective f-stops. (LS stands for "Leaf Shutter".)

Notes:

There are aperture information contacts on the mount rim of your 645 lens. When mounting/dismounting your lens, handle it with the utmost care in order to avoid scratching or soiling the contacts. If dirt accumulates on the contacts, wipe it away with a clean, dry and soft cloth.

LENS CARE AND STORAGE



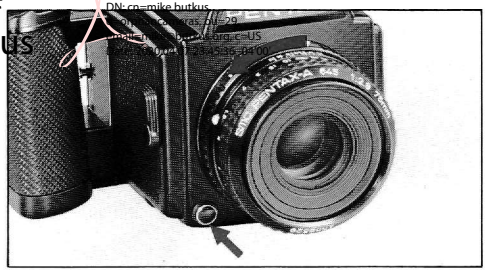
Moisture is not good for optical glass elements — the nucleus of your lens. Since storage in a damp place may cause mildew, keep your lens in as dry a place as possible.

If you don't plan to use your lens for a long time, store it with a desiccant in the case. Also the lens should occasionally be taken out of the case and dried.

Dust and dirt should be removed with a blower or lens brush. If the lens becomes dirty, wipe it with a clean cotton cloth or tissue paper dampened with lens cleaning solution. Wipe in a spiral pattern from the center out, changing the cloth or paper a few times.

When you store your lens in a case, put on the lens front cap and lens mount cap, both provided as standard accessories, to protect against dust. When you remove a lens from your camera body, be careful not to let it roll over or fall down, as this may cause malfunctions. If you are standing the lens on a flat surface, put the lens front down.

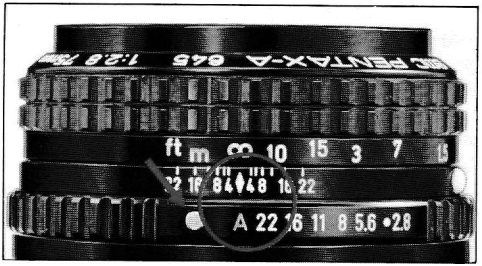
LENS MOUNTING/CHANGING

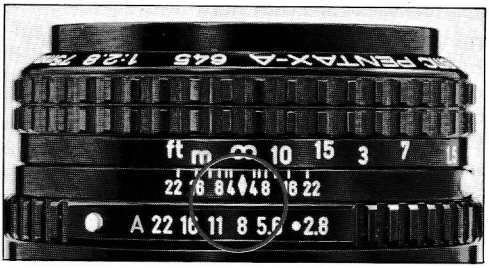


1. **To mount or change your lens,** align the red dots on the camera body and the lens (See A, B). Seat the lens in the body mount and turn it clockwise until the lens locks with a click. Since telephoto or zoom lenses are comparatively heavier and bulkier, remember to hold them firmly.

2. **To remove the lens,** turn it counterclockwise while pressing the lens lock lever in toward the camera body.

APERTURE CONTROL (AUTO-APERTURE LOCK)



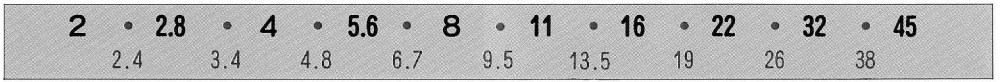


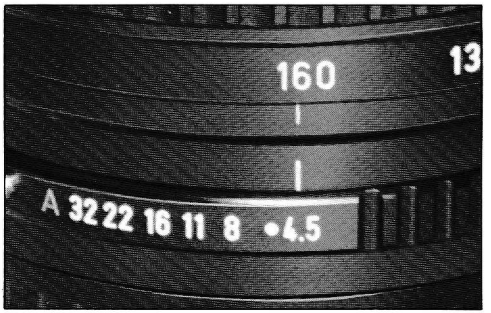
To set the aperture ring of your 645 lens to the A (auto) position (for Programmed AE, Shutter-priority AE or Programmed flash), align the green A with the ◇ index.
To release the ring from the A position, turn it clockwise while pressing the auto aperture lock button.

When you use your 645 lens on a camera other than the 645 or with close-up accessories having no information contacts, select one of those f/stops other than "A" and read well the correlated operating manuals.

Aperture values and click stops

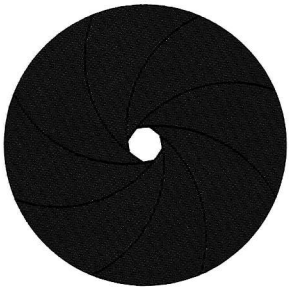
The white dot next to the lens' full-open aperture value indicates an aperture which is one full stop slower, viz, f/4 in the photo (below left) and f/5.6 in the photo (below right).
The click stops (not marked) between adjacent aperture values are equivalent to the in-between values as illustrated.
No click stops are provided at the extreme ends (maximum and minimum f/stop positions) of the aperture scale as the space between adjacent indications is too limited to provide a click stop.
※ The f/stop range varies from one lens to another.





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. Apertures between f/5.6 and 11 will generally provide the 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 aperture setting range of all the SMC Pentax 645 lenses has now been expanded to a minimum aperture smaller than f/22. The use of these smaller f/values increases depth-of-field. It can also add a feeling of motion to your photos since smaller apertures require slower shutter speeds. Except for extreme close-up photography (around 1:1) 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/16, f/22 or smaller.

LENS HOODS

Lens hoods are classified into two types — round and built-in hoods.

Round hoods
They can easily be slipped on or screwed in the front frame of the lens or the filter.

As shown on the next page, the rubber hood can be contracted when not in use. Except the RH-RA 77mm screw-in type hood, a lens cap can be fitted inside the hood.

RH-B 70mm cover-on type	45mm f/2.8
RH-B 58mm screw-in type	for 55mm f/2.8
MH-RA 67mm screw-in type	Macro 120mm f/4
RH-A 58mm screw-in type	for 75mm f/2.8, LS 75mm f/2.8, LS 135mm f/4
RH-RB 77mm screw-in type	35mm f/3.5
RH-A 77mm screw-in type	for Zoom 80 — 160mm f/4.5

RH = Rubber Hood
MH = Metal Hood


PENTAX
1:2.8 75mm


PENTAX

Built-in hoods

Telephoto and ultra telephoto lenses have built-in hoods. Simply pull them out when you want to use them. If it is slightly difficult to extend the hood, try to rotate it gently while pulling it out.

Note:

When such accessories as a gelatine filter holder, polarizing filter or circular polarizing filter are attached on the front thread of your lens, the built-in lens hood cannot be extended.

150mm f/3.5 200mm f/4
A*300mm f/4 ED (IF) A*600mm f/5.6 ED (IF)


Heineken

FILTERS

SMC filters

Special Super-Multi-Coated filters are among the many types offered by Pentax. SMC filters are available in Skylight, Cloudy, UV, Y2, O2, and R2.

Super-Multi-Coating minimizes reflections, thus maintaining the excellent image quality of SMC Pentax lenses.

Hints on using filters

A filter, when attached to your lens, becomes a part of the lens' optical system. Handle it as carefully as you handle the lens. Immediately remove any dust or dirt, and take care not to scratch the filter element.

Although two filters can be used one on top of the other, an unfavorable influence may be seen on the image reproduced. Avoid combined filter use, except with the polarizing filter which can be used in combination with other filters.

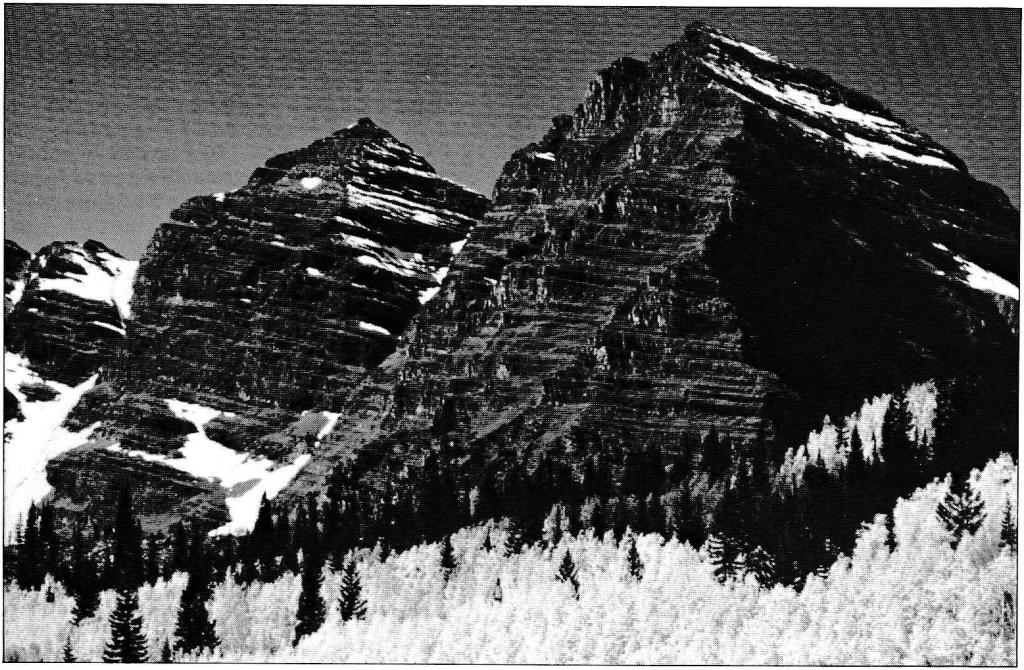
The following screw-on filters can be threaded on the front rim of your lens.

- The A*600mm f/5.6 ED (IF) lens accepts the 49mm size filter, which can be screwed into the filter holder on the rear of the lens.

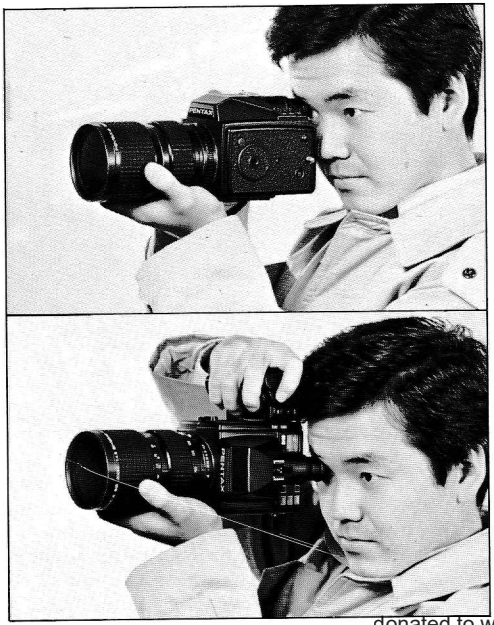
SIZE	APPLICABLE LENSES
58mmϕ	55mm f/2.8, 75mm f/2.8, LS 75mm f/2.8, LS 135mm f/4, 150mm f/3.5, 200mm f/4
67mmϕ	45mm f/2.8, Macro 120mm f/4
77mmϕ	35mm f/3.5, A* 300mm f/4 Zoom 80 ~ 160mm f/4.5

Polarizing filters and vignetting

The polarizing and circular polarizing filters consist of two glass elements, making them thicker than the ordinary filter. For this reason, if they are used on the 35mm f/3.5 lens, under-exposure may occur at the corners of the picture.



HOLDING TELEPHOTO LENSES



Telephoto lenses are longer and heavier than standard lenses. When using telephotos, take care to prevent camera shake, which may result in blurred pictures. Proper camera/lens holding is the way to avoid camera shake. As shown in the picture at left, hold the focusing ring securely with your left hand, and support the camera by pressing it to your face.

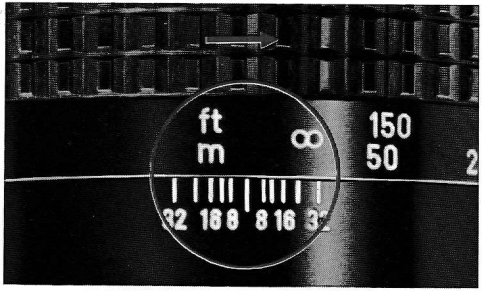
Minimum shutter speed for unblurred pictures
When you are hand-holding your camera, the surest way to prevent blur is to select a high shutter speed. When you have to use a relatively slow shutter speed, stabilize your camera/lens combination with a tripod.

SUGGESTION ON THE USE OF TELEPHOTO LENSES

- Note on ∞ 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 such as cold or hot weather. For this reason, the focusing ring is specially designed to rotate slightly past the ∞ (infinity) indication. So even when you take pictures at inifity, be sure to confirm good focus through the viewfinder.

SMC Pentax A645 300mm f/4 ED (IF)
SMC Pentax A*645 600mm f/5.6 ED (IF)



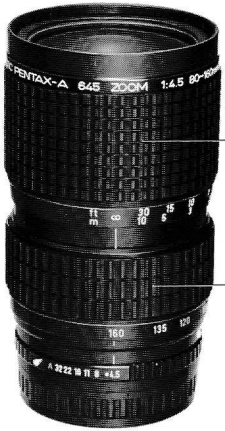
- **Shooting landscapes with a telephoto lens:**

Telephoto lenses are frequently used for photographing distant scenery. Climate conditions (such as heat haze or mist) may deteriorate resolution and/or contrast. So it is advisable to photograph landscapes when the weather is clear.

- **Focusing for close-ups and distant scenes**

Some people believe that telephoto lenses focus more precisely on distant objects than on close-up objects. In fact, focusing precision is almost unaffected by differences in camera-to-subject distance although macro lenses are designed especially for close-up photography. Essentially, the size and the sharpness of the subject do not change with distance. As a general rule, get close enough to see the details of your subject clearly. This will help you take finely focused pictures.

ZOOM LENS



Double action zoom

Double action zoom lenses possess two separate rings: the front ring for focus control, and the rear one for zooming 80 ~ 160mm.

- **Focusing zoom lenses:**

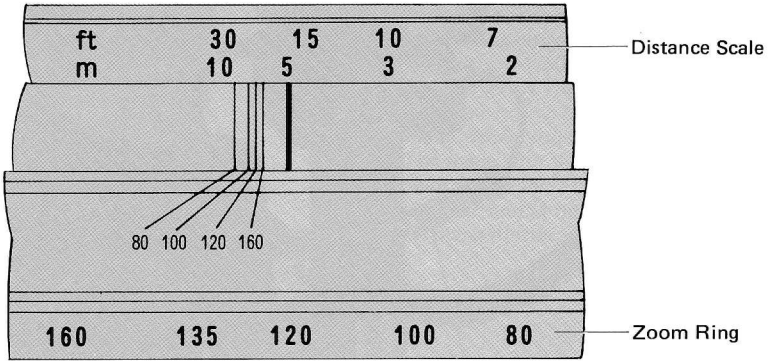
Generally speaking, the greater the lens' focal length, the easier it is to focus. First zoom your lens up to its maximum focal length and focus on the subject. Then zoom back down to obtain the framing you desire. This procedure assures the most accurate focusing.

- **Distortion peculiar to zoom lenses:**

Distortion is a kind of aberration which, for instance, makes a straight line at the periphery of the image appear as a slightly curved one. Zoom lenses are slightly more prone to distortion than ordinary single focal length lenses because they have more elements and more a complicated mechanism. The degree of distortion varies according to the focal length in use.

INFRARED INDEX

SMC Pentax A 645 Zoom 80–160mm f/4.5



- As the diagram above is life-size, use it as a guide to infrared photography. After focusing the lens, turn the focusing ring until the distance scale in focus aligns with the line indicating the amount to be shifted of each focal length.

SMC PENTAX 645 LS (LEAF-SHUTTER) 75mm AND 135mm LENSES

The LS 75mm f/2.8 and 135mm f/4 lenses are multi-functional lenses with a built-in leaf shutter, featuring its own shutter speed settings from 1/500 to 1/60 sec., for flash synchronisation which are extremely convenient for overcoming the flash synch problems inherent in the focal plane shutter. In addition, it produces easy and efficient multiple exposures and includes a built-in X-flash terminal along with a cable release contact. Two basic applications are as follows: (For detailed operating instructions, refer to the instructions accompanying the lens).

1. Used as a normal lens at any aperture with fully automatic diaphragm action but without A [auto] function.
2. Used with the leaf shutter cocked (camera's shutter speed automatically set at 1/8 sec.) and the lens' lever set to "o" mark it provides flash at speeds from 1/500 to 1/60 sec. (the minimum speed for flash is 1/60 sec.).

Hook an electronic flash to the lens' X-synch terminal. When you trip the shutter your exposure will be made with the leaf shutter in the lens.

- Not usable for TTL flash operation.
- MF, EP and M flash bulbs are suitable for the focal plane shutter, not for the leaf shutter.

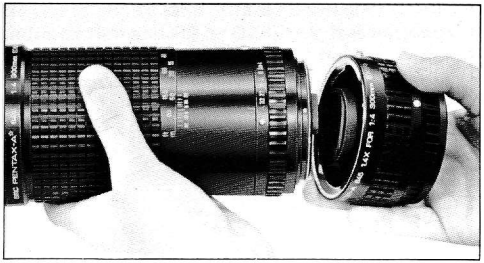
SMC PENTAX A★645 300mm f/4 ED [IF]

This telephoto lens reduces chromatic aberration with an extra low dispersion (ED) optical elements. Extra low dispersion glass attains performance levels not possible with conventional optical glass.
The rear element group moves inside the barrel. The length and the balance of the lens do not change as you focus. This makes focusing smoother and faster.

When combined with the optional Rear Converter-A 645 1.4X, this lens serves as a 420mm f/5.6 telephoto lens. Since the Rear Converter also has the A aperture control, it enables you to use various exposure modes such as Programmed AE.

ED = Ultra-achromatic lens using extra-low-dispersion glass elements.
IF = Inner focus

REAR CONVERTERS



Mounting the Rear Converter

Insert the Rear Converter into the lens with the two red indices aligned and lock them by turning about 60 degrees clockwise. To remove, turn them counterclockwise while depressing the lock button.

When these Rear Converters are used, the focal length of the master lens is multiplied by 1.4 or 2 respectively, and the actual aperture becomes smaller by one stop or two stops respectively.

Specifications

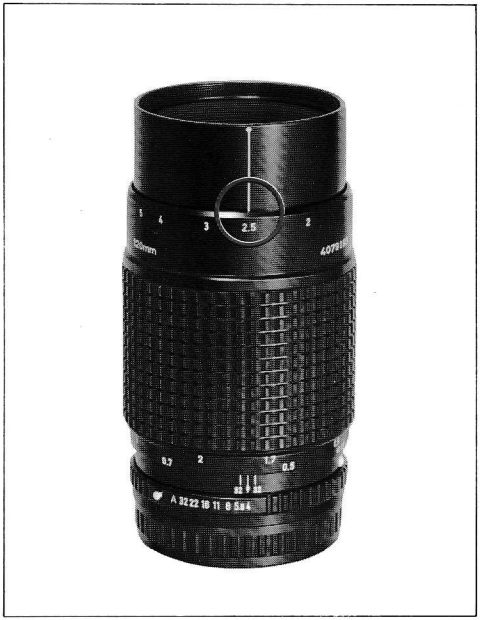
Rear Converter A645 1.4X for 300mm f/4
For lenses: 300mm (120mm, 200mm, 600mm)
Lens construction: 5 elements in 4 groups
Metering system: Full-aperture
Diaphragm system: Automatic diaphragm coupling
Dimensions: 77 x 31mm
Weight: 265g

Rear Converter A645 2X
For lenses: 35 – 600mm
Lens construction: 6 elements in 4 groups
Metering system: Full-aperture
Diaphragm system: Automatic diaphragm coupling
Dimensions: 77 x 60mm
Weight: 350g

- For details, refer to the Rear Converters' operating manuals.

SMC PENTAX-A 645 MACRO 120mm f/4

Originally designed to deliver optimum performance in close-up photography and copying work, this macro lens is also suitable for general-purpose photography from 1X (life-size) at 0.39 meters to infinity (∞). As marked with a circule in the photo at right, magnification indexes are indicated with denominators, i.e., "2.5" means 1/2.5 magnification. When you have determined the magnification first, refer to the distance scale on the lens and focus by moving the whole camera back and forth.

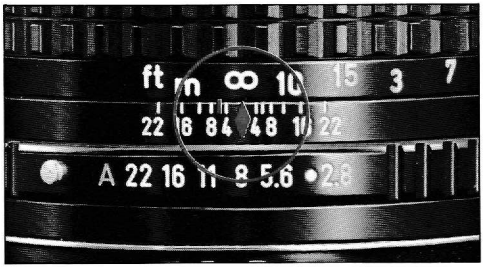


Cautions

- There is no infrared index on this lens because there is no space enough to put it by the aperture/distance index. So, when taking infrared photos, stop down the lens to f/8 or more.
- Using this lens with Auto Extension Tubes or Helicoid Extension Tube is not recommended, for it may cause "vignetting."

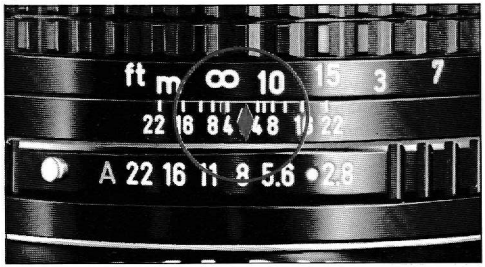
INFRARED INDEX MARK

If you intend to take infrared photographs using infrared film and R2 or O2 filters, it is necessary to compensate for the difference between visible light focus and infrared focus. As shown on the right, note the subject-to-camera distance on the lens distance scale as you focus through the viewfinder and turn the focusing ring until that distance setting aligns with the red infrared index. The picture shows an example in which the subject-to-camera distance is set at infinity (∞). As for exposure control required in infrared photography, refer to the instructions contained in the film package. Focus compensation is not required when using infrared color films.



↑ Focus through the viewfinder.

↓ Then align with the red infrared index.



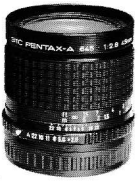
LENS CASES

All the Pentax lens cases have code numbers on the bottom, which indicate the type of case. Please designate the appropriate code number when ordering, by referring to the following list.

S80-80	55mm f/2.8 75mm f/2.8 LS 75mm f/2.8 Rear Converter A645 1.4X
S80-120	35mm f/3.5 45mm f/2.8 150mm f/3.5 LS 135mm f/4 Rear Converter A645 2X
S80-160	200mm f/4 Macro 120mm f/4
S90-160	80—160mm f/4.5
S110-230	300mm f/4 ED

645 LENSES AND THEIR CONSTRUCTIONS

35mm f/3.5

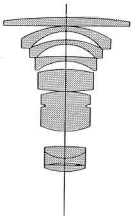


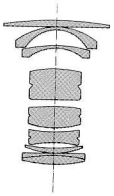
45mm f/2.8

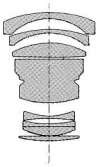
55mm f/2.8

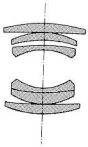
75mm f/2.8

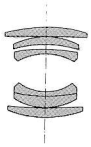
LS 75mm f/2.8



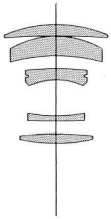




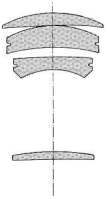




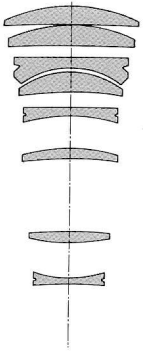
LS 135mm f/4



150mm f/3.5



200mm f/4

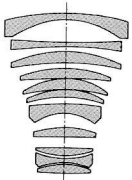


300mm f/4 ED [IF]

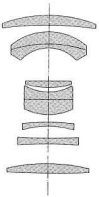
Zoom
80 ~ 160mm f/4.5

Macro
120mm f/4

Rear Converter-A 645 1.4X



160mm



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LIST OF SMC PENTAX A 645 SERIES LENSES

• Type	• Lens	• Minimum Aperture	• Angle of View	• Lens Construction (Groups-Elements)	• Diaphragm	• Minimum Focusing Distance m	• Minimum Focusing Distance ft.	• Maximum Diameter & Length (ømm x mm)	• Weight gr.	• Weight oz.	• Filter Size (mm)
ULTRA WIDE ANGLE	SMC Pentax-A 645 35mm f/3.5	22	90°	8-9	FA	0.3	0.98	80x67	470	16.6	77
WIDE ANGLE	SMC Pentax-A 645 45mm f/2.8	22	76°	8-9	FA	0.45	1.50	74x66.5	400	14	67
	SMC Pentax-A 645 55mm f/2.8	22	65°	7-8	FA	0.45	1.50	74x60.5	410	14.4	58
STANDARD	SMC Pentax-A 645 75mm f/2.8	22	50°	5-6	FA	0.6	2.10	74x37.5	240	8.4	58
	SMC Pentax 645 LS 75mm f/2.8	22	50°	5-6	FA	0.75	2.50	76x49.5	365	12.8	58
MEDIUM TELEPHOTO	SMC Pentax 645 LS 135mm f/4	32	29°	5-5	FA	1.25	4.1	76x69	470	16.4	58
	SMC Pentax-A 645 150mm f/3.5	32	26°	4-4	FA	1.4	4.50	74x71.5	435	15.4	58
	SMC Pentax-A 645 200mm f/4	32	20°	4-4	FA	2.0	6.56	74x116	570	20.1	58
TELEPHOTO	SMC Pentax-A*645 300mm f/4 ED (IF)	32	13.5°	8-8	FA	3	10.00	93x208	1360	47.6	77
ULTRA TELEPHOTO	SMC Pentax-A*645 600mm f/5.6	45	6.6°	11-12	FA	5	16.4	156x353	4800	169.3	49
ZOOM	SMC Pentax-A645 80~160mm f/4.5 Zoom	32	47°~24.5°	11-11	FA	1	3.50	82.5x131	1010	35.7	77
MACRO	SMC Pentax-A645 120mm f/4	32	32.5°	7-9	FA	0.39	1.3	78.5x110	695	24.7	67

- Most of Pentax 67 lenses are usable via Adapter 645 for 67 lenses. • FA = Fully Automatic
- Multiply 645 lens focal length by 0.6 to obtain approximate focal length of 35mm-format lens.

SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT 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.
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 accredited repair shops, unless you are sending it directly to the manufacturer. Always obtain a quotation of the service charge, and only after you accept the quoted service charge, instruct the service station to proceed with the servicing.

This warranty policy does not apply to Pentax lenses purchased in the U.S.A., U.K., or Canada. The local warranty policies available from Pentax distributors in those countries supersede this warranty policy.

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