CARL ZEISS JENA

Photo Lenses

Contents.

The instruments specified in this list may be obtained through any well known firm of photographic dealers.

Four colour Print from an autochrome photograph. Taken with **Zeiss Protar lens.** Reproduced with Apochromatic **Tessar.**

CARL ZEISS JENA

At the Fountain.

A. Oppenheim, phot.

Types of Zeiss Lenses.

Diagrammatically represented for a focal length of 10 cm. (4 in.)

Tessar F/4.5,
also F/3.5, F/6.3, F/10, F/12.5

Double Protar F/7
also F/6.3 or F/7.7

Protar Lens F/12.5

Double Amatar F/6.8

Protar F/18; also F/9

Magnar F/10
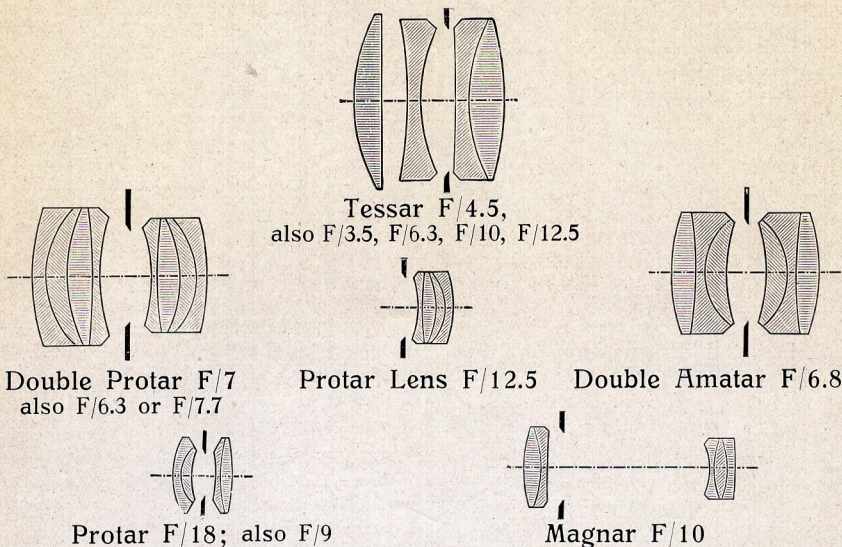
Zeiss Lens Mounts.

The Zeiss Lens Mounts are fitted with Iris Diaphragms, with the exception of the Apochromatic Tessars and the Apochromatic Planars, which are provided, as a rule, with a set of Waterhouse Diaphragms.
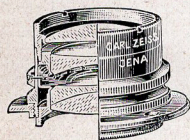
Standard **Mount N** for Stand Cameras with bellow extension.
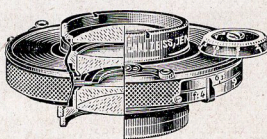
"Compur" and "Compound" Lens Shutter Mount, adapted for the majority of extensible hand cameras, for time and instantaneous exposure.
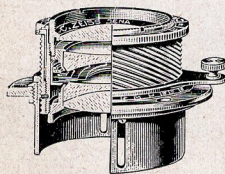
Focussing **Mount A** for folding and other hand cameras with fixed extension. Mount A projects into the camera and has a focussing device for near and far.
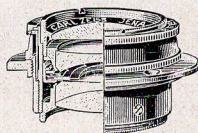
Sunk **Mount B** for reflex and folding cameras with variable extension. Mount B projects into the camera, but has no focussing device for near and far.

Zeiss Lenses are supplied completely mounted only, i. e. either in one of the above mounts or in conjunction with a lens shutter, as it is only under these conditions that we can vouch for their good performance

On the Choice of a Suitable Lens.

In most cases the amateur, no less than the professional photographer, requires the lens which he is about to choose to answer a good deal more than one particular purpose. The desired lens should be available for a wide range of work. It should enable its owner to take instantaneous photographs of every kind, records of sporting events, scenes of familiar and rustic life, portraits, groups, landscapes of every description, both in summer and in winter, seascapes and mountain views; also, he may wish to be able to photograph from air craft, to take views of architectural interest as well as interiors, and he may contemplate the contingency of embarking upon photography in natural colours. He may also wish to use his lens, occasionally at least, for enlarging and projection. Finally, he may deem it desirable not to be debarred from adding, at some future date, a telephoto negative attachment to his primary outfit. The lenses described in the succeeding paragraphs answer these requirements and may accordingly be looked upon as

Universal Lenses.

Each of them has some special characteristics which render it adapted for one purpose more particulary than another. It is, therefore, in every case possible to select a lens which will meet the requirements of a given case in the most adequate manner.

Tessars F/4.5 and F/6.3. These are rapid lenses giving, over a comparatively large angle, exquisitely sharp and brilliant pictures, in consequence of which the negatives admit of being enlarged very considerably. — The back lens of the Tessar cannot be used by itself. This restriction is of no consequence in the case of cameras with single extension, whilst it has not prevented the Tessar from being largely fitted to cameras with double extension, especially since by the introduction of our new Distar Lenses a means has been provided of converting the Tessars into long-focus lenses*).

The choice between Tessar F/4.5 and Tessar F/6.3 is determined by the following considerations: Tessar F/4.5, when working at full aperture, is twice as rapid as Tessar F/6.3. The latter, on the other hand, embraces a wider angle than Tessar F/4.5 stopped down to the same extent, as will be seen from the tables on page 7. So long as the stops are the same in both cases there is a practically insignificant difference in the sharpness of definition in favour of Tessar F/6.3.

There is a wide-spread, but wholly erroneous, impression amongst photographers that the choice between Tessar F/4.5 and Tessar F/6.3 depends upon considerations of *depth of focus*. As a matter of fact, Tessar F/4.5, when stopped down to F/6.3 by means of the iris-diaphragm, has precisely the same depth of focus as Tessar F/6.3. Indeed, any two lenses having the same aperture ratio and focal length have the same depth of focus. Whilst, therefore, Tessar F/4.5 is in no wise inferior in the matter of depth of focus it has the advantage that at full aperture it works with double the rapidity as compared with Tessar F/6.3.

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*) See our Booklet P. 209.

Where rapidity is a matter of primary consideration, possessors of a sufficiently rigid camera provided with a front admitting of the attachment of the somewhat heavier Tessar F/4.5 will do well to let their choice fall on Tessar F/4.5. Preference may, however, be given to Tessar F/6.3 where the primary requirement is that the camera should be as compact and light as possible and to this end fitted, say, with a lens of shorter focus and embracing a larger field; and in some cases the choice may be finally decided by the somewhat lower price of the Tessar F/6.3. Camera-makers generally state in their catalogues the foci of the Tessars F/4.5 and F/6.3 which are suitable for use with their high-grade hand cameras.

Protar F/9. The rapidity of this lens reaches half that of Tessar F/6.3. Excepting in a very bad light it is accordingly available for instantaneous work. Its chief advantage lies in the wide angular field which it embraces*), which renders it particularly valuable in those cases where its general use includes primarily the photography of buildings, interiors, machinery, and panoramic views.

Double Amatar F/6.8. The rapidity of this type of lens falls little short of that of Tessar F/6.3. In the matter of the angle which it embraces it occupies an intermediate position between Tessar F/6.3 and Protar F/9*). From the Tessar F/6.3 it differs mainly in that its back component can be used by itself as a long focus lens having a greatest rapidity of about F/14. It should, however, be noted that, to obtain perfectly sharp pictures, the back lens requires to be stopped down a little, so that it is suitable for snapshots under favourable conditions only. The Double Amatar is well adapted for cameras with double extension, unless preference is given to a Tessar in combination with Distar Lenses, or to one of the somewhat higher-priced Double Protars.

Double Protar. This type of lens works at F/6.3, F/7 or F/7.7, according as it is made up of like or unlike Protar Lenses. In point of rapidity it is therefore comparable to Tessar F/6.3 and the Double Amatar, whilst in the matter of covering power it is a close rival of the latter*). Over the Double Amatar it has, however, the advantage that its components, used separately as long-focus lenses, give sharp pictures at their full aperture F/12.5, so that in many cases they may be used for instantaneous work. The Double Protar commends itself to possessors of a good hand camera with double extension. It affords a means of confining the composition of the picture within its most effective limits on a given plate size when there is little option in the choice of a suitabe standpoint, and its long-focus components ensure freedom from perspective distortion in many otherwise difficult cases, without having to forego the advantages of instantaneous exposure. By adding to the Double Protar a third Protar Lens having a slightly different focal length and supplementing the resulting Convertible Set by a wide-angle lens proper, say a Protar F/18, a universal outfit may be secured which provides a complete range of foci for a given plate size and which satisfies very exacting requirements as regards rapidity (see page 9, lower half).

*) See Column 3 on pages 7 and 8, and Column 11 on page 9

Special Lenses.

In addition to the all-round lenses already commented on, the following have been computed to satisfy special requirements:

For Cinematograph Cameras: *The short-focus lenses of Tessar F/3.5* (see page 11), in addition to those of Tessars F/4.5.

For Portraiture: *The long-focus lenses of Tessar F/3.5* (see page 11), in addition to those of Tessars F/6.3 and F/4.5.

For Wide-angle Views proper of Architecture and Interiors: The short-focus lenses of *Protar* F/18 (see page 8).

For Process Work: *The Apochromatic Planars and Apochromatic Tessars,* in addition to the long-focus lenses of Protar F/18 (see Booklet P. 204 E).

For Tele-photographic Work: *Magnars* F/10, when it is desired to take snapshots; otherwise the tele-photo combinations described on pages 12 and 13.

Choice of a Suitable Focal Length.

The size of plate or film having been decided upon, there remains only a restricted range of foci from which a selection may be made. For all ordinary purposes it may be accepted as a useful rule that the focal length should be equal to the diagonal of the plate. Thus in the case of a $1/4$-plate the diagonal is $5^1/2$ inches; and, by the given rule, the required lens should have a focal length of 5 to 6 inches. It will be seen that in this case the length of the plate is to the focus as 4:5, and a similar ratio will obtain between the width of the scene taken in by the lens and the distance of a central object therein. For example, at a distance of five yards, a scene four yards wide will appear on the plate; whilst at ten yards the plate will show a picture of objects occupying a space 8 yards wide, and at a thousand yards the scene included in the picture is 800 yards wide.

This rule, *Focus equal to diagonal,* requires frequent modification. Portraits, groups and scenes of daily life demand rather longer foci in order to secure a good pictorial effect, and the studio cameras as well as stand and reflex cameras generally used for these purposes may be readily fitted with larger lenses. On the other hand, in many cases, for instance when photographing architectural objects, machinery and, above all, interiors, it is neccessary to employ lenses embracing very wide angles; and, in consequence, the focal length of the required lens is very much shorter than would follow from the rule.

The subjoined Tables of Lenses, giving the plate sizes for the various lens series and foci, have been arranged in accordance with the principles here outlined. The scheduled plate sizes must not be taken to exhaust the resources of the respective lenses. In the majority of cases the limits of uniform sharpness extend beyond the figures given, even when the lenses are used with large stops. In order to provide a measure of the extent to which the limits of the plates may be pushed, the diameter of the largest sharply defined picture which is obtainable with small stops is given in a separate column of the Tables.

Focal length cm. | in.	Plate size for which recommended in.	Diameter of Circle covered with small stops in.	in Standard "N" Mount	in "B" Mount	in "A" Mount	with "Compur" or "Compound" Shutters[1]
				Codewords		

Tessar F/4.5*
Extra Rapid Universal Lens for Amateur and Professional Photographers

cm. | in.	in.	in.	Standard "N"	"B"	"A"	Compur/Compound
4 | 1½	1¼×1⅝	2	Fodicari	—	—	—
5.5 | 2¼	1¾×1⅜	2½	Fodicas	—	Fodicetur	—
6.5 | 2½	2×1¾	3	Fodicassem	Foliforme	Folleatos	Fogbank
7.5 | 3	2⅝×1¾	3½	Fodicate	Foliga	Fodico	Fogbell
9 | 3½	3¼×2¼	4	Fodicatior	Foligno	Fodiebat	Fogdog
10.5 | 4	3½×2½	5	Fodicatis	Folilet	Fodiemus	Fogeler
12 | 4¾	3½×2½	5½	Fodicato	Folimort	Fodienda	Foggage
13.5 | 5¼	4¼×3¼	6	Fodicatum	Folinha	Fodiendus	Foggetta
15 | 6	5×4	7	Fodicatura	Folio	Fodiens	Foggettino
16.5 | 6½	5½×3½	8	Fodicavere	Folioing	Fodientem	Foggia
18 | 7	6½×4¾	8¾	Fodicavi	Foliolado	Fodientia	Foggiammo
21 | 8¼	7½×5	10½	Fodicem	Foliolas	Fodina	Foggiante
25 | 10	8×5	12¼	Fodicemur	Foliolate	Fodinarum	Foggiarono
30 | 12	8½×6½	14½	Fodicent	Foliole	Fodinis	—
36 | 14	9×7	17	Fodicentur	—	—	—
40 | 16	9×7	20	Fodicere	—	—	—
50 | 20	12×10	24	Fodicet	—	—	—

Tessar F/6.3*
Rapid Universal Lens for Amateur and Professional Photographers

cm. | in.	in.	in.	Standard "N"	"B"	"A"	Compur/Compound
4 | 1½	1¼×1⅝	2⅜	Fodior	—	—	—
5.5 | 2¼	1¾×1⅜	3½	Fodiremo	—	—	—
6.5 | 2½	2×1¾	3¾	Fodissemus	—	Fodrum	Foggiati
7.5 | 3	2⅝×1¾	4½	Fodissent	Foliolum	Foedabam	Foggiatore
9 | 3½	3¼×2¼	5	Fodit	Foliomer	Foedabant	Foggiava
12 | 4¾	3½×2½	6½	Foditis	Foliosa	Foedabis	Foggier
13 | 5	4¼×3¼	7½	—	—	—	Foggieremo
13.5 | 5¼	4¼×3¼	8	Foditur	Foliosame	Foedabor	Fogginess
15 | 6	5×4	8¼	Fodivano	Folioses	Foedae	Foggiolla
16.5 | 6½	5½×3½	9	Fodoli	Foliosim	Foedamus	Foggun
18 | 7	6½×4¾	10½	Fodorum	Foliosior	Foedandi	Fogless
21 | 8¼	7½×5	12¼	Fodrai	Foliosum	Foedandos	Foglia
25 | 10	8×5	15	Fodrammo	—	—	Fogliamo
30 | 12	8½×6½	17¼	Fodrando	—	—	Fogliasti
36 | 14	9×7	21	Fodrarium	—	—	Fogliatura
50 | 20	10×8	28	Fodrati	—	—	—
60 | 24	12×10	33½	Fodravano	—	—	—

Protar F/9
Instantaneous and Wide Angle Lens of Moderate Rapidity

cm. | in.	in.	in.	Standard "N"	"B"	"A"	Compur/Compound
7.5 | 3	2⅜×2⅜	6	Foedant	Foliote	—	—
9.5 | 3½	3¼×2½	7½	Foedarem	Folioteras	—	—
12 | 4¾	4¼×3¼	9½	Foedari	Folious	Foedavero	Foglie
15 | 6	5×4	12	Foedarum	Folipara	Foedavit	Foglietta
17 | 6¾	6½×4¾	13½	Foedassem	Foliparos	Foedem	Foglifero
20 | 8	7×5	15½	Foedati	Folium	Foedemur	Fogliforme
23 | 9	8½×6½	18	Foedatiore	Folk	—	Foglino
27 | 10¾	8½×6½	21¼	Foedatos	—	—	Fogliona
32 | 12¼	10×8	24¾	Foedaturi	—	—	Foglioso

[1]) For lenses mounted in Ibso Shutters see page 10.
*) Respecting **Distar Lenses** for supplementary attachment to Tessars on cameras with double extension, see our Booklet P 209, also page 15 of this catalogue.

Focal length		Plate size for which recommended	Diameter of Circle covered with small stops	in Standard "N" Mount	in "B" Mount	with "Compur" or "Compound" Shutters[1]
cm.	in.	in.	in.	Codewords		

Protar F/18
Wide Angle Lens for Panoramic Views, Architecture and Interiors

4	1½	2¼×1¼	4	Foedent	—	—
6	2⅓	3¼×2¼	6	Foederabo	—	—
8.5	3½	4¼×3¼	8½	Foederamus	Folkfree	—
11	4½	6½×4¾	11	Foederans	Folking	—
14	5½	7½×5	14	Foederat	Folkland	—
18	7	8½×6½	16	Foederatio	Folklore	—
21	8¼	10×8	21¼	Foederem	Folkloric	—
27	10½	12×10	26¾	Foederent	Folkmoot	—
32	12½	14×10	31⅓	Foederis	—	—
39	15½	15×12	33½	Foederor	—	—
46	18	15×12	40	Foederum	—	—
63	25	20×16	46	Foedi	—	—
95	37½	24×20	69	Foediora	—	—

Double Amatar F/6.8
Rapid Symmetrical All-round Lens
The back lens is available for use with cameras having double extension

15 / 15	9	6 / 6	3½	3½×2½	6¼	Foediores	Folkmote	Foglirono
20 / 20	12	8 / 8	4¾	4¼×3¼	8½	Foediorum	Folkright	Foglissero
23 / 23	13.5	9 / 9	5¼	4¼×3¼	9¼	Foeditas	Folks	Fogliuto
25 / 25	15	10 / 10	6	5×4	10¼	Foedius	Folksong	Foglivano
27 / 27	16.5	10¼ / 10½	6½	5½×3½	11¼	Foedo	Folkunger	Fogna
30 / 30	18	12 / 12	7	5½×3½	12½	Foedorum	Folla	Fognammo
33 / 33	19.5	13 / 13	7⅞	6½×4¾	14	Foedraal	Follaba	Fognante
36 / 36	21	14 / 14	8¼	7×5	15	Foedum	Follabase	Fognarono

Protar Lens F/12.5
Single Lens of Moderate Rapidity with Front Stop for Landscaping and Portraits

					without Tube Mount*)	
18	7	6½×4¾	9	Foeneos	Foetal	Folle
22	8¾	7×5	11½	Foeniculi	Foeteam	Folleam
29	11½	8½×6½	15	Foenile	Foetabas	Folleant
35	14	10×8	18	Foenilium	Foetebimus	Folleare
41	16	12×10	21	Foenisez	Foetebo	Folleata
48	19	14×11	24½	Foenoris	Foetebunt	Folleatir
59	23	15×12	30½	Foenus	Foetemus	—
69	27	18×14	35½	Foesne	Foetendos	—

[1] For lenses mounted in Ibso Shutters, see page 10.
*) Like the lenses of our other series, Protar Lenses are not supplied without tube-mounts. They require to be fitted to one of our mounts A, B, N or to a shutter by us, as it is only in this way that we can accept responsibility for the good performance of the lenses. The cost of adaptation varies according to circumstances, as stated in the Price List.

Focal Length (centimetres)			Focal Length (inches)			Rel. Ap. F/	Plate Size for which recommended		Diameter of Circle covered with small stops		in Standard Mount N	with "Compur" or "Compound" Shutters
Front Lens	Back Lens	whole System	Front Lens	Back Lens	whole System		centim.	inches	cent.	inch.	Codeword	Codeword

Double Protar F/6.3 to F/7.7
Rapid Universal Lens consisting of two Protar Lenses of similar or dissimilar foci

18	18	10.5	7	7	4	6.3	6.5×8	3½×2½	17	6¾	Foetens	Fogonero
22	18	11.5	8¾	7	4½	7	8×10.5	4¼×3¼	18	7	Foetenti	Fogones
29	18	13	11½	7	5	7.7	9×12	4¼×3¼	20	8	Foetere	Fogonillo
22	22	13	8¾	8¾	5	6.3	9×12	4¼×3¼	20	8	Foetescit	Fogos
29	22	14.5	11½	8¾	5¾	7	10×13	5×4	23	9	Foetescunt	Fogisidade
35	22	15.5	14	8¾	6	7.7	10×15	5¾×4	25	10	Foetel	Fogring
29	29	17	11½	11½	6¾	6.3	12×16	6½×4¾	26	10¼	Foetida	Fogsmoke
35	29	18.5	14	11½	7¼	7	13×18	7½×5	29	11½	Foetidabo	Fogueado
41	29	20	16	11½	8	7.7	13×18	7½×5	31	12¼	Foetidans	Fogueamos
35	35	20.5	14	14	8	6.3	13×18	7½×5	32	12¾	Foetidem	Foguease
41	35	22	16	14	8¾	7	13×21	8×5	34	13½	Foetidor	Fogueen
48	35	23.5	19	14	9¼	7.7	16×21	8½×6½	37	14½	Foetor	Foguero
41	41	24	16	16	9½	6.3	16×21	8½×6½	37	14½	Foetoribus	Fohismus
48	41	26	19	16	10¼	7	18×24	9×7	40	16	Foetosi	Foible
59	41	28	23	16	11	7.7	18×24	9×7	44	17¼	Foetosorum	—
48	48	28	19	19	11	6.3	18×24	9×7	44	17¼	Foetosos	Follebas
59	48	31	23	19	12¼	7	18×24	9×7	48	19	Foetutina	—
69	48	33	27	19	13	7.7	21×26	10×8	52	20½	Fofinho	—
59	59	34	23	23	13½	6.3	21×26	10×8	54	21¼	Fofos	—
69	59	37	27	23	14½	7	24×30	12×10	58	23	Fog	—
69	69	40	27	27	16	6.3	24×30	12×10	63	25	Fogaban	—

Sets of Protars.

Set B₀ for ¼-plate or 5×4 in.
consisting of Single Lenses f = 7, 8¾, 11½ in.

In Standard Mount, without case   Codeword: *Folialim*
With Comp. Shutter, without case   Codeword: *Foliatume*

Single Lens Focus	11½	8¾	7	11½/8¾	11½/7	8¾/7 in
Combined Focus	11½	8¾	7	5¾	5	4½ in

Set C for ½-plate or 7½×5 in.
consisting of Single Lenses f = 14, 11½, 8¾ in.

In Standard Mount, without case   Codeword: *Foliatiora*
With Comp. Shutter, without case   Codeword: *Folichom*

Single Lens Focus	14	11½	8¾	14/11½	14/8¾	11½/8¾ in
Combined Focus	14	11½	8¾	7¼	6	5¾ in

Set D for whole plate or 9×7 in.
consisting of Single Lenses f = 18, 16, 14, 11½ in.

In Standard Mount, without case   Codeword: *Foliatorum*
With Comp. Shutter, without case   Codeword: *Folicula*

Single Lens Focus	19	16	14	11½	19/16	19/14	16/14	16/11½	14/11½ in
Combined Focus	19	16	14	11½	10½	9¼	8¾	8	7¼ in

The Protar Sets afford a very complete equipment, especially if supplemented as indicated in the subjoined Table.

Protar Set	Yellow Glass Screens (p. 14)		Wide Angle Protar F/18 (p. 18)
	Five Times	Ten Times	
B₀	Folette	Folgaz	Foederamus
C	Folga	Folgazano	Foederans
D	Folgado	Folidandra	Foederat

Zeiss Lenses Paired for Stereoscopic Work
Fitted to Stereo Compound Shutters.

Paired lenses with Stereo Comp.*)			Paired Lenses with Stereo Comp.*)							
Focus	No. of Shutter	Codeword	Focal length (centimetres)			Focal length (inches)			No. of Shutter	Codeword
cm. | inch.			Front Lens	Back Lens	Whole System	Front Lens	Back Lens	Whole System		
Tessar F/4.5			**Double Protar**							
9 3½	0/I	Foicaras	18	18	10.5	7¼	7¼	4	0	Foiran
12 4¾	1	Foicaremos	22	18	11.5	8¾	7¼	4½	0	Foireau
13.5 5¼	1/III	Foicaria	29	18	13	11½	7¼	5	1a	Foiremos
15 6	2	Foicassem	22	22	13	8¾	8¾	5	0	Foiriamos
Tessar F/6.3			29	22	14.5	11½	8¾	5¾	1a	Foirolle
9 3½	0/I	Foicou	35	22	15.5	14	8¾	6	2	Foisas
12 4¾	0/I	Foil	29	29	17	11½	11½	6¾	1a	Foisonna
13.5 5¼	0/	Foiled								
15 6	0/	Foiling								
Double Amatar F/6.8										
9 3½	0/I	Foilstone								
12 4¾	0/	Foimentie								
13.5 5¼	0/	Foin								
15 6	0/	Foinette								
Protar F/9										
12 4¾	1/II	Foinier								
15 6	1/II	Foir								

The Double Protars are paired **as a whole** for stereo work. If it be also desired that the components should be paired, this is subject to an additional charge.

*) When ordering a stereo shutter, the desired distance between lens centres should be stated.

Zeiss Lenses mounted in Ibso Shutters.

The Ibso Shutters belong to the category of automatic shutters, in that the release of the lever for making the exposure causes the shutter to rewind automatically for the next exposure, whilst the "Compur" and "Compound" Shutters require two distinct acts to operate it, one for giving the exposure and the other for rewinding the spring. This renders the shutters of the "Comp." type less liable to vibration than the Ibso Shutters.

The following Zeiss lenses are mounted in Ibso Shutters as well as in Compur Shutter:

Tessar F/6.3 in Ibso Shutter			Double Amatar F/6.3 in Ibso Shutter		
Focus cm.	inch.	Codeword	Focus cm.	inch.	Codeword
9	3½	Fognassi	9	3½	Fogniamo
12	4¾	Fognato	12	4¾	Fognino
13	5	Fognature	13.5	5¼	Fogno
13.5	5¼	Fognerai	15	6	Fognone
15	6	Fogneremo	16.5	6½	Fogonadura
16.5	6½	Fognero			

For Prices see separate List!

Special Lenses.

Focal Length		Plate Size for which recommended	Diameter of Circle covered with small stops	In Standard Mount	In "B" Mount	In "A" Mount
cm.	in.	in.	in.		Codewords	

Tessar F/3.5 for Cinematographic Cameras.

3.5	$1\frac{3}{8}$	$\frac{3}{4} \times \frac{1}{2}$	1	*Folcemmo*	*Follaran*	*Folcire*
5	2	$1 \times \frac{3}{4}$	$1\frac{1}{2}$	*Folcenti*	*Follares*	*Folciremmo*
7.5	3	$1\frac{1}{4} \times 1\frac{1}{8}$	$2\frac{1}{4}$	*Folcette*	*Follaria*	*Folciuto*
10	4	$1\frac{3}{4} \times 1\frac{3}{4}$	$3\frac{3}{4}$	*Folciranno*	*Follarlen*	*Fold*

Tessar F/3.5 for Portraiture

21	$8\frac{1}{4}$	$3\frac{1}{2} \times 2\frac{1}{2}$	6	*Foldage*	—	—
25	10	5×4	7	*Folderols*	—	—
30	12	$6\frac{1}{2} \times 4\frac{3}{4}$	$8\frac{1}{4}$	*Folding*	—	-

Apochromatic Tessars for Process Work

		for full size reproduction up to	Aperture			
32	$12\frac{1}{2}$	12×10	F/ 9	*Focone*	—	—
46	18	18×14	F/10	*Focorum*	—	—
64	25	24×20	F/10	*Focosetta*	—	—
84	33	32×28	F/10.5	*Focosine*	—	—
117	46	36×32	F/12.5	*Focot*	—	—
180	71	60×48	F/15	*Foculabam*	—	—

Apochromatic Planars for Process Work

		for full size reproduction up to	Aperture			
42	$16\frac{1}{2}$	18×14	F/ 7.2	*Foculabant*	—	—
59	$23\frac{1}{4}$	22×18	F/ 9	*Foculamini*	—	—
80	$31\frac{1}{2}$	30×26	F/10	*Foculamur*	—	—
105	$41\frac{1}{2}$	34×30	F/10	*Foculans*	—	—
130	51	40×36	F/12,5	*Foculantia*	—	—

Complete Outfits for Process Workers.

Reversing Prisms and Mirrors   **Revolving Collars**
Focussing Microscopes.   **Filter Troughs.**

Full particulars will be found in our Prospectus P. 204.

Focussing Glasses.

Magnifying 6×, 10×, or 10×. Magnifer "A" is mounted in an adjustable socket and serves for focussing the image on the screen (6 or 10×) and for examining negative copies (10 or 16×).

Magnifying Power	Diameter of Lenses		Focal Length		Magnifier "A"
	mm.	in.	cm.	in.	Codeword
6×	21	$\frac{7}{8}$	4	$1\frac{5}{8}$	*Fodaveras*
10×	11	$\frac{7}{16}$	$2\frac{1}{2}$	1	*Fodavero*
16×	9	$\frac{3}{8}$	$1\frac{1}{2}$	$\frac{5}{8}$	*Fodavimus*

Apparatus for Viewing Stereoscopic Pictures.

The Zeiss Stereoscope and the **Verant Stereoscope.**

Descriptions of these will be found in our Booklet P. 222.

Telephotographic Lenses.

A telephotographic objective consists of a positive component, a tube mount, and a negative lens. The tube mount places the two components into a mutual position whereby the negative lens is made to form on the focussing screen an amplified picture of the image formed by the positive component. This renders the requisite extension of the camera shorter than if it were required to take from the same standpoint a similar-sized view of the same object with an ordinary lens.

We make two distinct classes of telephoto lenses, as described below.

1. Rapid Magnar Telephoto Lens F/10.

Unlike telephoto combinations, which alone were in use formerly, the Magnar does not afford a continuous range of foci, since its positive and negative components are not corrected independently, hence their mutual position and the camera extension can be varied only within verry narrow limits without prejudice to the quality of the resulting picture. On the other hand, the rapidity of the Magnar is sufficiently great to render it in many cases available for snapshots. It is suitable for photographing, with a hand camera, animals in the wild state, details from a balloon, for taking portraits and scenes of daily life and similar purposes. Of this type we make one size only, viz.

Magnar F/10, f = 45 cm. = 18 in. for $\frac{1}{4}$-plate folding cameras with an extension of about 15 cm. = 6 in. Codeword: *Foiselle*

(For detailed particulars respecting the Magnar, see Booklet P. 221).

2. Less Rapid Telephoto Combinations.

In these combinations the positive component is furnished by a standard camera lens, such as a Tessar, Protar, Double Amatar, or Double Protar, whilst one of the Tele-negative Lenses specified below supplies the negative component. The focal length of the latter should, as a general rule, not be less than about 1/3 that of the positive component. For the reception of the components we supply the following Tele Tubes:

Tele Tubes I and Ia are intended for cameras with fixed extension and lenses in "A" Mounts. The latter provide a means of focussing the resulting telephoto combination for different distances. These tube mounts are designed for amplifications of about 3 to 4.

Tele Tube I is adapted for Tele Negative Lenses of $4\frac{1}{2}$ cm. ($1\frac{3}{4}$ in.) and 6 cm. ($2\frac{3}{8}$ in.) focus and for camera lenses of 11 to 18 cm. ($4\frac{1}{2}$ to $7\frac{1}{8}$ in.) focus having a flange screw not exceeding 51.5 mm. ($2\frac{1}{32}$ in.) in diameter.

Tele Tube Ia is used with Tele Negative Lenses of 6 cm. ($2\frac{3}{8}$ in.) and $7\frac{1}{2}$ cm. (3 in.) focus and camera lenses of $16\frac{1}{2}$ cm. ($6\frac{1}{2}$ in.) to about 21 cm. ($8\frac{1}{4}$ in.) focus having a flange screw not exceeding 67.5 mm. ($2\frac{5}{8}$ in.) in diameter

Tele Tube II is intended for cameras with variable extension and lenses in standard or "B" Mounts or fitted to shutters, with foci from 11 to 18 cm. ($4\frac{1}{2}$ to $7\frac{1}{8}$ in.) in combination with Tele Negative Lenses of $4\frac{1}{2}$ cm. ($1\frac{3}{4}$ in.) and 6 cm. ($2\frac{3}{8}$ in.) focus. — The tube has a sliding sleeve for adjusting for distance and magnification, the latter ranging from $3\frac{1}{2}$ to 8.

Tele Tubes III and IV for large hand cameras and for stand cameras and variously mounted lenses with foci exceeding 18 cm. ($7\frac{1}{8}$ in.) in combination with the appropriate tele-negative lens. The tube-mount is fitted with a helical focussing adjustment for different distances and camera extensions.

Tele Negative Lenses.

No.	Focus cm.	Focus in.	Diameter of Lens mm.	Diameter of Lens in.	To screw into Tele Tube Mounts Nos.	Codeword
1	3	$1\frac{1}{4}$	15	$\frac{5}{8}$	I, II	Foitable
2	$4\frac{1}{2}$	$1\frac{3}{4}$	24	1	I, II, III	Foja
3	6	$2\frac{3}{8}$	30	$1\frac{1}{4}$	I, Ia, II, III	Fojano
4	$7\frac{1}{2}$	3	37	$1\frac{1}{2}$	Ia, III, IV	Fojonico
5	10	4	50	2	IV	Fojuela

Tele Tube Mounts.

No.	Diameter of Tube mm.	Diameter of Tube in.	Tube Length variable	Requisite Lens Mount	Codeword
I	42	$1\frac{3}{4}$	Travel of "A" Mount	"A" Mount	Fokken
Ia	48	$1\frac{7}{8}$	Travel of "A" Mount	"A" Mount	Fokkerust
II	42	$1\frac{3}{4}$	12 mm. ($\frac{1}{2}$ in.)	Standard or "B" Mount or Shutter	Fokking
III	49	2	20 mm. ($\frac{13}{16}$ in.)	Standard or "B" Mount or Shutter	Fokte
IV	82	$3\frac{1}{4}$	30 mm. ($1\frac{1}{4}$ in.)	Standard or "B" Mount or Shutter	Folade

Telephoto Attachments for Hand Cameras.[1]

Tube Mount No.	Focus of existing Doublet cm.	Focus of existing Doublet in.	Focus of suitable Negative Lens cm.	Focus of suitable Negative Lens in.	Plate well covered under average conditions in.	Camera Extension	Tele Attachment (Tube and Amplifying Lens) Codeword
I	12	$4\frac{3}{4}$	$4\frac{1}{2}$	$1\frac{3}{4}$	$3\frac{1}{2}\times2\frac{1}{2}$	fixed	Foladina
II	12	$4\frac{3}{4}$	$4\frac{1}{2}$	$1\frac{3}{4}$	$3\frac{1}{2}\times2\frac{1}{2}$	variable	Folaga
I	15	6	6	$2\frac{3}{8}$	$4\frac{1}{4}\times3\frac{1}{4}$	fixed	Foland
II	15	6	6	$2\frac{3}{8}$	$4\frac{1}{4}\times3\frac{1}{4}$	variable	Folaria
Ia	18	7	6	$2\frac{3}{8}$	$5\frac{1}{2}\times3\frac{1}{2}$	fixed	Folaro
III	18	7	6	$2\frac{3}{8}$	$5\frac{1}{2}\times3\frac{1}{2}$	variable	Folata
Ia	21	$8\frac{1}{4}$	$7\frac{1}{2}$	3	7×5	fixed	Folatrant
III	21	$8\frac{1}{4}$	$7\frac{1}{2}$	3	7×5	variable	Folatre

[1] When ordering, the lens which is to serve as the positive component should be fully and accurately identified if it be not practicable to send it.

Full particulars respecting Tele Lenses for Hand Cameras will be found in our Prospectus P 220.

Yellow Glass Screens.

1410

These screens are made of Jena glass of a kind which strongly absorbs the violet and ultra-violet light only. They are recommended for copying coloured pictures, for landscapes with dark groups of trees and white buildings, landscapes with distant views and clouds, high mountain scenery, and winter landscapes (see Booklet P. 219).

Lens Mount No.	Adapted for**) outside diameter (to slip over) mm.	Marked × Retarding 5 times Codeword	Marked ×× Retarding 10 times Codeword	Lens Mount No.	Adapted for inside diameter (to slide in.) mm.	Marked × Retarding 5 times Codeword	Marked ×× Retarding 10 times Codeword
Coo	19.3	*Follebise*	*Follegio*	I	23.5	*Folego*	*Folgaria*
Coo a	21	*Follebita*	*Folleiro*	II	28.5	*Foleria*	*Folgaron*
Co	27	*Foilebo*	*Folleme*	III	33.5	*Folette*	*Folgaz*
Co*	28.5	*Follebunt*	*Follemos*	IV	38.5	*Folga*	*Folgazano*
Co a	29.8	*Folleg*	*Follenda*	VI	47.1	*Folgabais*	*Folgazei*
				VII	53.1	*Folgado*	*Folidandra*
				X	65.1	*Follendir*	*Follendos*

Ducar Filters for Autochrome Photography.

1409

These filters slip upon the front of the lens mounts and are so constructed that they displace the sharply focussed image automatically into the back plane of the plate, thereby dispensing with any alteration to the camera (see Booklet P. 196.

Designation No.	Adapted for Tessar* Focus cm.	Adapted for Tessar* Focus in.	Inside Diam. of Hood mm**)	Outside Diam. of Hood mm**)	Codeword	Designation No.	Adapted for Tessar* Focus cm.	Adapted for Tessar* Focus in.	Inside Diam. of Hood mm**)	Outside Diam. of Hood mm**)	Codeword
00/5.5	5,5	2¼	17.5	—	*Folgo*	II/12	12	4¾	28.5	—	*Folgura*
C/5.5	5,5	2¼	16.5	—	*Folhetins*	C/12	12	4¾	—	29.8	*Foliado*
R/5.5	5,5	2¼	—	18.5	*Folhicos*	II/13.5	13.5	5¼	28.5	—	*Folhado*
I/6.5	6,5	2½	23.5	—	*Folgorano*	III/13.5	13.5	5¼	33.5	—	*Follastro*
C/6.5	6,5	2½	16.5	—	*Folhoso*	IV/13.5	13.5	5¼	38.5	—	*Folhame*
Z/6.5	6,5	2½	—	18.5	*Follarse*	C/13.5	13.5	5¼	—	27	*Foliages*
Z/7.5	7,5	3	—	19.3	*Foliar*	II/15	15	6	28.5	—	*Folharia*
I/7.5	7,5	3	23.5	—	*Folgorata*	III/15	15	6	33.5	—	*Foliamos*
C/7.5	7,5	3	16.5	—	*Folhuda*	IV/15	15	6	38.5	—	*Folhea*
Ca/7.5	7,5	3	—	21	*Foliaba*	C/15	15	6	—	28.5	*Foliaguda*
G/7.5	7,5	3	to screw in	26.3	*Follaseis*	II/16.5	16.5	6½	28.5	—	*Folianse*
						III/15.5	16.5	6½	33.5	—	*Folheador*
Z₁/7.5	7,5	3	25.5	—	*Follaste*	VI/16.5	16.5	6½	47.1	—	*Folhearas*
I/9	9	3½	33.5	—	*Folgorino*	IV/18	18	7	38.5	—	*Folhease*
C/9	9	3½	16.5	—	*Folibamos*	VI/18	18	7	47.1	—	*Folheatura*
Z/9	9	3½	—	31.5	*Foliacea*	IV/21	21	8¼	38.5	—	*Folheca*
P/10.5	10.5	2⅛	—	31.5	*Foliacion*	VII/21	21	8¼	53.1	—	*Folhenta*
I/12	12	2¾	23.5	—	*Folguin*						

*) Ducar Filters can be supplied for other lenses, provided their focal length does not depart more than about 3⁰/₀ from that of the scheduled Tessar.

Lenses of other make should be sent for adaptation, which may or may not occasion an additional charge, according to circumstances.

) When ordering Ducar Filters for Zeiss lenses purchased on a previous occasion the **manufacturing number engraved on the mount should be stated in every instance since the diameters of the lens mounts frequently deviate from the standard gauges to suit the dimensions of shutters and cameras.

Zeiss Distar Lenses.

These Supplementary Lenses have the effect of extending the focal length of the Tessars by $1/3$, $2/3$ or $3/3$ of their original amount, when fitted to cameras with double extension.

Tessars combined with Distar Lenses acquire the all-round utility of Convertible Sets (see Booklet P 209).

Distar Lens	Codeword	For Lens Mount of external diameter		Available for [1] use with	
				Photo Lens	in mount to take
2/C₀	Fodiam	27.0 mm.	about 1⅛ in.	Tessar F/6.3, f = 13.5 cm. = 5¼ in. or Triotar F/6.3, f = 13.5 „ = 5¼ „	shutter size No. 0
3/C₀	Fodiamus	27.0 „			
3.5/C₀	Fodiatis	27.0 „			
2/C₀*	Fodica	28.5 mm.	about 1⅛ in.	Tessar F/6.3, f = 15 cm. = 6 in.	shutter size No. 0
3/C₀*	Fodicabam	28.5 „			
3.5/C₀*	Fodicabant	28.5 „			
2.5/C₀a	Fodicantor	29.8 mm.	about 1⅛ in.	Tessar F/4.5, f = 12 cm. = 4¾ in.	shutter size No. 0a
3.5/C₀a	Fodicare	29.8 „			
4.5/C₀a	Fodicarent	29.8 „			
1.5/II	Fodicabare	32.0 mm.	about 1¼ in.	Tessar F/4.5, f = 12 cm. = 4¾ in. „ F/6.3, f = 13.5 „ = 5¼ „ „ F/6.3, f = 15 „ = 6 „ „ F/6.3, f = 16.5 „ = 6½ „ Triotar F/6.3, f = 16.5 „ = 6½ „	shutter size 1 or Zeiss tube No. II
2.5/II	Fodicabis	32.0 „			
3/II	Fodicabo	32.0 „			
2/III	Fodicabunt	36.8 mm.	about 1½ in.	Tessar F/4.5, f = 13.5 cm. = 5¼ in. „ F/6.3, f = 16.5 „ = 6½ „	shutter size 1a or Zeiss tube No. III
3/III	Fodicamini	36.8 „			
3.5/III	Fodicamur	36.8 „			
2/IV	Fodicanda	41.8 mm.	about 1⅝ in.	Tessar F/4.5, f = 13.6 cm. = 5¼ in. „ F/4.5, f = 15 „ = 6 „ „ F/6.3, f = 18 „ = 7⅛ „ [2] „ F/6.3, f = 21 „ = 8⅛ „ [3] Triotar F/6.3, f = 21 „ = 8⅜ „ [3]	shutter size 2 or Zeiss tube No. IV
3/IV	Fodicandis	41.8 „			
3.5/IV	Fodicandum	41.8 „			
1.5/VI	Fodicans	50.9 mm.	about 2 in.	Tessar F/4.5, f = 16.5 cm. = 6½ in. „ F/4. , f = 18 „ = 7½ „	shutter size 2a or Zeiss tube No. VI
2.5/VI	Fodicantem	50.9 „			
3/VI	Fodicanti	50.9 „			

[1] For more detailed particulars of each combination see Card P 202.
[2] 2/IV and 3/IV only are recommended.
[3] 2/IV only is recommended.

When ordering Distar Lenses for use with existing Tessars or Triotars, the whole of the particulars engraved on the lens mount should be stated as well as the exact outside diameter of the front lens mount. This is necessary in view of frequent deviations in the dimensions of the mounts occasioned by differences in the measurements of shutters. It is also necessary to state the longest extension of which the camera is capable, measured from the lens stop to the focussing screen.

A Table of Working Data is supplied with each Distar Lens.
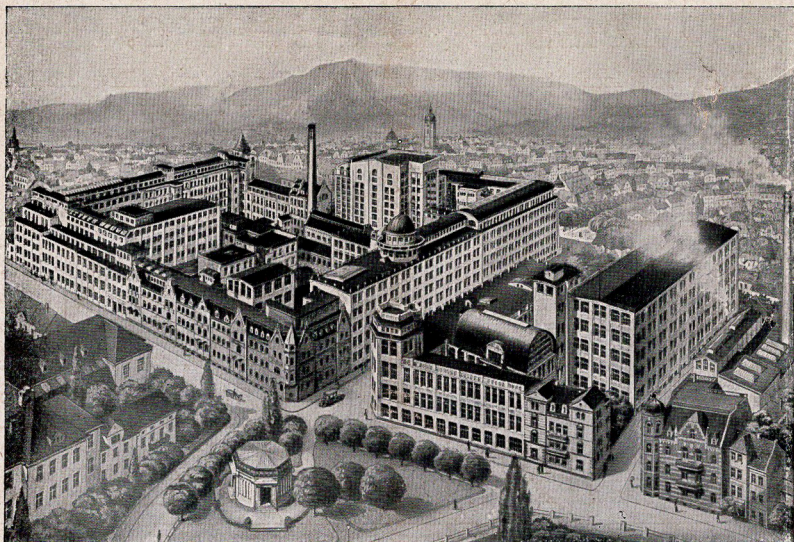
CARL ZEISS, JENA

Zeiss Optical Instruments

Photo-optical Instruments	Field Glasses Opera Glasses Telescopes	Spectacle Glasses Punktal Glasses
Microscopes	Photo-micrographic Apparatus	Projection Apparatus
Optical Measuring Instruments	Surveying Instruments	Astronomical Instruments
Clinical and Ophthalmic Instruments	Magnifiers	Automobile Head Lights

Price Lists free on application.

Price List No. 2
CARL ZEISS - JENA
Photographic Lenses
Effective September 1st, 1922

Series	No.	Focal Length cm.	in.	For Cameras	In Standard Mount N	In Sunk Mount B	In Focusing Mount A	In Comp. Shutter
	10	4	1½	1⅛x 1¼"	$ 35.00	....	$40.00	.....
	11	5.5	2¼	1¾x 1¾"	35.00	....	40.00	.....
Ic	11a	6.5	2½	1¾x 2 "	35.00	$ 37.50	40.00	$50.00
	11b	7.5	3	1¾x 2⅜"	35.00	37.50	40.00	50.00
F/4.5	12	9	3½	2¼x 3¼"	37.50	40.00	42.50	52.50
	13a	10.5	4⅛	2¼x 3½"	37.50	40.00	42.50	52.50
For	13	12	4¾	2½x 3½"	40.00	42.50	45.00	55.00
Instantaneous	14	13.5	5¼	3¼x 4¼"	45.00	47.50	50.00	62.50
Photographs	15	15	6	4 x 5 "	52.50	55.00	57.50	72.50
	15b	16.5	6½	3¼x 5½"	57.50	62.50	67.50	80.00
Portraiture	15a	18	7	4¾x 6½"	67.50	72.50	77.50	90.00
	16	21	8¼	5 x 7½"	87.50	92.50	97.50	110.00
Color	17	25	10	5 x 8 "	125.00	130.00	135.00	150.00
Photography	18	30	12	6½x 8½"	180.00	187.50	195.00	210.00
	18a	36	14	7 x 9 "	245.00	....	....	.....
	19	40	16	8 x10 "	290.00	....	....	.....
	20	50	20	10 x12 "	400.00	....	....	.....
	0	4	1½	1⅛x 1¼"	$ 30.00	....	....	.....
IIb	1	5.5	2¼	1¾x 1¾"	30.00	....	....	.....
	1b	6.5	2½	1¾x 2½"	30.00	....	$35.00	$45.00
F/6.3	1a	7.5	3	2⅜x 2⅜"	30.00	$ 32.50	35.00	45.00
	2	9	3½	2¼x 3¼"	32.50	35.00	37.50	47.50
For	3	12	4¾	2½x 3½"	35.00	37.50	40.00	50.00
Hand	4	13.5	5¼	3¼x 4¼"	37.50	40.00	42.50	52.50
Cameras	5	15	6	4 x 5 "	42.50	45.00	47.50	57.50
	5b	16.5	6½	3¼x 5½"	47.50	50.00	52.50	65.00
Landscapes	5a	18	7	4¾x 6½"	55.00	57.50	60.00	75.00
	6	21	8¼	5 x 7½"	70.00	72.50	75.00	90.00
	7	25	10	5 x 8 "	97.50	....	....	120.00
	8	30	12	7 x 9 "	135.00	....	....	160.00
	9	36	14	8 x10 "	180.00	....	....	210.00
	10	50	19¾	10 x12 "	280.00	....	....	.....
	11	60	23⅜	12 x15 "	375.00	....	....	.....
	0	7.5	3	2⅜x 2⅜"	$ 25.00	$ 27.50	$30.00	.....
IIIa	00	9.5	3½	2½x 2⅜"	25.00	27.50	30.00	$42.50
	1	12	4¾	3¼x 4¼"	27.50	30.00	32.50	45.00
F/9	2	15	6	4 x 5 "	30.00	32.50	35.00	47.50
	3	17	6¾	4¾x 6½"	35.00	37.50	40.00	52.50
For	4	20	8	5 x 7 "	45.00	47.50	50.00	62.50
Interiors	5	23	9	6½x 8½"	52.50	55.00	......	72.50
and	6	27	10¾	6½x 8½"	65.00	....	....	87.50
Architecture	7	32	12¾	8 x10 "	87.50	....	....	110.00

These prices include Excise War Tax.

Series	LENS No.	Focal length cm.	Focal length in.	For Cameras	In Standard Mount N	In Sunk Mount B	In Focusing Mount A	In Comp. Shutter
	0	4	1½	1¼x 2¼"	$ 27.50	......	......	......
	00	6	2½	2¼x 3¼"	27.50	......	......	......
	1	8.5	3½	3¼x 4¼"	27.50	$30.00	......	......
	2	11	4½	4¾x 6½"	30.00	32.50	......	......
V	3	14	5½	5 x 7½"	32.50	35.00	......	......
	4	18	7	6½x 8½"	40.00	42.50	......	......
	5	21	8¼	8 x10 "	50.00	52.50	......	......
	6	27	10½	10 x12 "	65.00	67.50	......	......
F/18	7	32	12½	10 x14 "	80.00	......	......	......
	7a	39	15½	12 x15 "	100.00	......	......	......
	8	46	18	12 x15 "	120.00	......	......	......
	9	63	25	16 x20 "	180.00	......	......	......
	10	95	37½	20 x24 "	295.00	......	......	......
	2	9	3½	2½x 3½"	$ 37.50	$40.00	$42.50	$52.50
IX	3	12	4¾	3¼x 4¼"	40.00	42.50	45.00	55.00
	4	13.5	5¼	3¼x 4¼"	42.50	45.00	47.50	57.50
Double	5	15	6	4 x 5 "	45.00	47.50	50.00	60.00
Amatar	6	16.5	6½	3¾x 5½"	50.00	52.50	55.00	67.50
	7	18	7	3¼x 5½"	57.50	60.00	62.50	75.00
F/6.8	8	19.5	7¾	4¾x 6½"	65.00	67.50	70.00	85.00
	9	21	8¼	5 x 7 "	72.50	75.00	77.50	92.50
	1	18	7	4¾x 6½"	$ 32.50	$35.00	$27.50	45.00
VII	2	22	8¾	5 x 7 "	35.00	37.50	30.00	47.50
	3	29	11½	6½x 8½"	42.50	45.00	35.00	55.00
Protar	4	35	14	8 x10 "	52.50	55.00	42.50	67.50
	5	41	16	10 x12 "	67.50	......	57.50	85.00
F/12.5	6	48	19	11 x14 "	85.00	......	72.50	102.50
	7	59	23	12 x15 "	115.00	......	102.50	135.00
	8	69	27	14 x18 "	147.50	......	130.00	172.50
		In.						
	1.1	7 / 7	4	3¼x 3¼"	$ 57.50	$60.00	$62.50	$70.00
	2.1	8¾/ 7	4½	3¼x 4¼"	62.50	65.00	67.50	75.00
	3.1	11½/ 7	5	4 x 5 "	70.00	72.50	75.00	82.50
	2.2	8¾/ 8¾	5	4 x 5 "	65.00	67.50	70.00	77.50
	3.2	11½/ 8¾	5¾	4¾x 6½"	72.50	75.00	77.50	85.00
VIIa	4.2	14 / 8¾	6	4¾x 6½"	80.00	82.50	85.00	95.00
	3.3	11½/11½	6¾	5 x 7 "	77.50	80.00	82.50	90.00
Double	4.3	14 /11½	7¼	5 x 7½"	87.50	90.00	92.50	102.50
	5.3	16 /11½	8	5 x 8 "	102.50	......	......	120.00
Protar	4.4	14 /14	8	5 x 8 "	95.00	97.50	100.00	110.00
	5.4	16 /14	8¾	6½x 8½"	110.00	......	......	127.50
F/6.3	6.4	19 /14	9¼	6½x 8½"	127.50	......	......	145.00
	5.5	16 /16	9½	6½x 8½"	125.00	......	......	142.50
to	6.5	19 /16	10¼	7 x 9 "	140.00	......	......	157.50
	7.5	23 /16	11	7 x 9 "	172.50	......	......	192.50
F/7.7	6.6	19 /19	11	7 x 9 "	155.00	......	......	172.50
	7.6	23 /19	12¼	8 x10 "	187.50	......	......	207.50
	8.6	27 /19	13	8 x10 "	220.00	......	......	245.00
	7.7	23 /23	13½	8 x10 "	217.50	......	......	237.50
	8.7	27 /23	14½	10 x12 "	250.00	......	......	275.00
	8.8	27 /27	16	10 x12 "	275.00	......	......	300.00

(The Focusing Mount A column for Series VII is marked "In Cell Only.")

		For Cameras	In Standard Mount N			In Comp. Shutter
Set of Protars B.	No. 1, 2, 3	4 x 5 "	*$100.00	......	......	112.50
Set of Protars C.	No. 2, 3, 4	5 x 7 "	* 115.00	......	......	130.00
Set of Protars D.	No. 3, 4, 5, 6.......	7 x 9 "	* 220.00	......	......	237.50

*The case is subject to a separate charge.

Pairs of Lenses Mounted in Stereo-Comp. Shutters

Series	Focal length cm.	in.		Series	Focal length cm.	in.	
1c F/4.5	9	3½	$110.00	Protar F/9	12	4¾	$ 90.00
" "	12	4¾	115.00	" "	15	6	95.00
" "	13.5	5¼	127.50	Double Protar VII 1.1	10.5	4	145.00
" "	15	6	145.00	" " VII 2.1	11.5	4½	152.50
IIb F/6.3	9	3½	97.50	" " VII 3.1	13	5	165.00
" "	12	4¾	102.50	" " VII 2.2	13	5	157.50
" "	13.5	5¼	110.00	" " VII 3.2	14.5	5¾	170.00
" "	15	6	120.00	" " VII 4.2	15.6	6	192.50
Double Amatar F/6.8	9	3½	110.00	" " VII 3.3	17	6¾	182.50
" " "	12	4¾	115.00				
" " "	13.5	5¼	120.00				
" " "	15	6	125.00				

Special Lenses

Lens Series	No.	Focal length cm.	in.	In Standard Mount N	In Sunk Mount B	In Focusing Mount A
Ic F/3.5	0	3.5	1⅜	$32.50	$35.00	$37.50
" "	0a	4	1 9/16	32.50	35.00	37.50
" "	1	5	2	35.00	37.50	40.00
" "	1a	7.5	3	40.00	42.50	45.00
" "	2	10	4	47.50	50.00	52.50

In Standard Mount N

Series	Focal length cm.	in.	$
Ic F/3.5	21	8¼	140.00
" "	25	10	180.00
" "	30	12	235.00

In Standard Mount N

Series	Focal length cm.	in.	$
VIII Apochromat	32	12½	$125.00
"	46	18	167.50
"	64	25	260.00
"	84	33	375.00
"	117	46	620.00
"	180	71	1425.00

In Standard Mount N

Series	Focal length cm.	in.	$
Apochromat Planar	42	16½	$335.00
" "	59	23¼	370.00
" "	80	31½	695.00
" "	105	41½	1100.00
" "	130	51	1200.00
" "	170	67½	2875.00

Focusing Lens				
A 6X	$11.50	Zeiss Stereoscope f = 15 cm. (6 in.)	$22.50
A10X	11.50	" " f = 10 cm. (4 in.)	27.50
A16X	11.50	" " f = 15 and 10 c. m. (6 and 4 in.)	32.50
B 6X	9.00	Zeiss Verant Stereoscope f = 9 cm. (3½ in.)	37.50

Telephoto Lenses

Magnar F/10=45 cm. (18 inches) $75.00

Tele Negative			Tube Mount		Telephoto Attachment (1)		
f = 3 cm. = 1⅕ in.	$ 14.00		I	$ 8.50	f = I /4½ cm. = 1¾ in.	$27.50
f = 4½ " = 1¾ "	17.50		Ia	14.00	f = II /4½ " = 1¾ "	35.00
f = 6 " = 2⅛ "	22.50		II	16.50	f = I /6 " = 2½ "	32.50
f = 7½ " = 3 "	35.00		III	25.00	f = II /6 " = 2½ "	40.00
f = 10 " = 4 "	60.00		IV	47.50	f = Ia/6 " = 2½ "	37.50
					f = III /6 " = 2½ "	52.50
					f = Ia/7½ " = 3 "	50.00
					f = III /7½ " = 3 "	62.50

(1) Including the usual cost of adaptation.

The instruments specified in this list may be obtained through any well known firm of photographic dealers.

The prices quoted are strictly net for prompt cash and do not include the cost of packing, shipping, etc.

HAROLD M. BENNETT

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