

COMBIPHOT AUTOMATIC system camera



AARS-CPL-USEPA
RTP, NC 27711
919-549-8411 x-2181

for photomicrography



LEITZ COMBIPHOT AUTOMATIC system camera

The COMBIPHOT AUTOMATIC system camera is the nucleus of a universal camera system with fully automatic exposure control. It can be used for all formats and any problem in the field of photographic recording. It offers:

Fully automatic exposure control

for all conventional methods of microscopy. For all LEITZ microscopes with FSA tube. For films from 3 to 4000 ASA (6-37 DIN)

Practical operating range

from 1/125 sec to 1 hour

Accurate exposure

through detail measurement. Through picture control during the actual exposure. Through optical controls if the automatic operating range is exceeded

Photography without problems

Operations are cut down to a minimum

Unrestricted choice of camera format

All conventional photomicrographic formats from 35mm to 4x5in can be used.

Rapid film and format change

through interchangeable camera bodies

Largefield photomicrography – normal-field photomicrography

depending on the stand and optical equipment

“Blind” photography

The user observes in the binocular tube as usual and takes his photographs during continued observation through the same tube. The camera format is indicated in the focusing eyepiece.

Optimum sharpness

through the use of precision-matched eyepieces and tubes. After focusing in the tube optimum sharpness in the film plane is automatically ensured.

Guide through the programme



Range of application and camera format determine the choice of the suitable equipment. To begin with, then, it will be necessary to outline the purpose or the stand for which the photomicrographic equipment is needed, e.g.

general photomicrography in medicine, biology, etc. and the choice of format be made accordingly. The optical combinations are tabulated also on this basis. The table below gives a survey of the combinations available:

	Range of applications	Camera attachment: format/camera/factor	Objectives:	Eyepiece combination ... see table p. 8
Group I General photomicrography, e.g. biology, medicine	Largefield photomicrography (field-of-view index larger than 18) with ORTHOPLAN®	24 x 36 / 0.32x 9 x 12 / 1x 4 x 5" / 1x 6.5 x 9 / 0.8x 3 1/4 x 4 1/4" / 0.8x	PI plano-objectives, preferably plano-apochromats	1
	Normal-field photomicrography (up to field-of-view index 18) with all other stands	24 x 36 / 0.32x 9 x 12 / 1x 4 x 5" / 1x 6.5 x 9 / 0.8x 3 1/4 x 4 1/4" / 0.8x	NPI plano-objectives, or conventional systems	2
Group II Photomicrography at standard magnifications	Largefield metallographic photomicrography at standard magnifications. METALLOPLAN	24 x 36 / 0.32x 9 x 12 / 1x 4 x 5" / 1x 6.5 x 9 / 0.8x 3 1/4 x 4 1/4" / 0.8x	PI plano-objectives tube factor 0.8x	3
	Normal-field metallographic photomicrography at standard magnifications. All other stands.	24 x 36 / 0.32x 9 x 12 / 1x 4 x 5" / 1x 6.5 x 9 / 0.8x 3 1/4 x 4 1/4" / 0.8x	NPI plano-objectives or METALLUX® objectives tube factor 1x	4

Camera format

As the table above shows, generally all formats can be used with our system camera. The choice of the suitable format should be guided by the following points:

35mm format

The resolving power of a fine-grain black-and-white 35mm film is high enough to reproduce all the information recorded by the objective. This also applies approximately to highly resolving colour films. An added advantage is that 35mm films are inexpensive and economical in use.

The 35mm format is therefore recommended for most photomicrographic work.

Larger formats

are of interest when the film, etc. is required as an original for reproduction, especially for colour reproduction or illustrative material in metallography, if instant pictures with the POLAROID process are to be produced or photography is carried out only occasionally. The following double page contains detailed information on the various outfits.

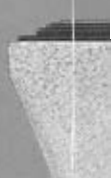
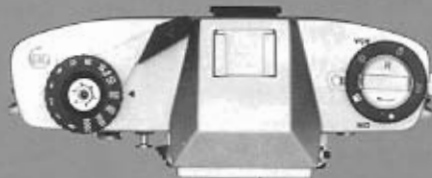
LEICA® MDa
Code No. 500 947

LEICAFLEX® SL
Code No. 10 011

Simple film transport housing
Code No. 543 077

6.5 x 9cm
Code No.

* without



Tube connection
0.32x (for LEICA-M)
Code No. 543 269



Tube connection
0.32x (for LEICAFLEX)
Code No. 543 270



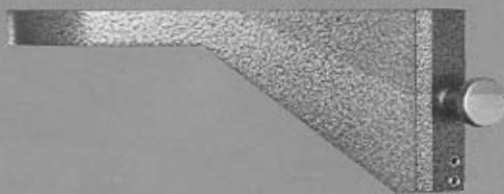
Tube connection 0.32x
(for film transport housing)
Code No. 543 268

Tube connection 0.32x
for MINOLTA
Code No. 543 263
(not shown)

Electrical
shutter unit



Holder for system camera
on the ARISTOPHOT®
Code No. 543 198



Adapter ring
(essential for high-point
photographic eyepieces)
Code No. 543 218

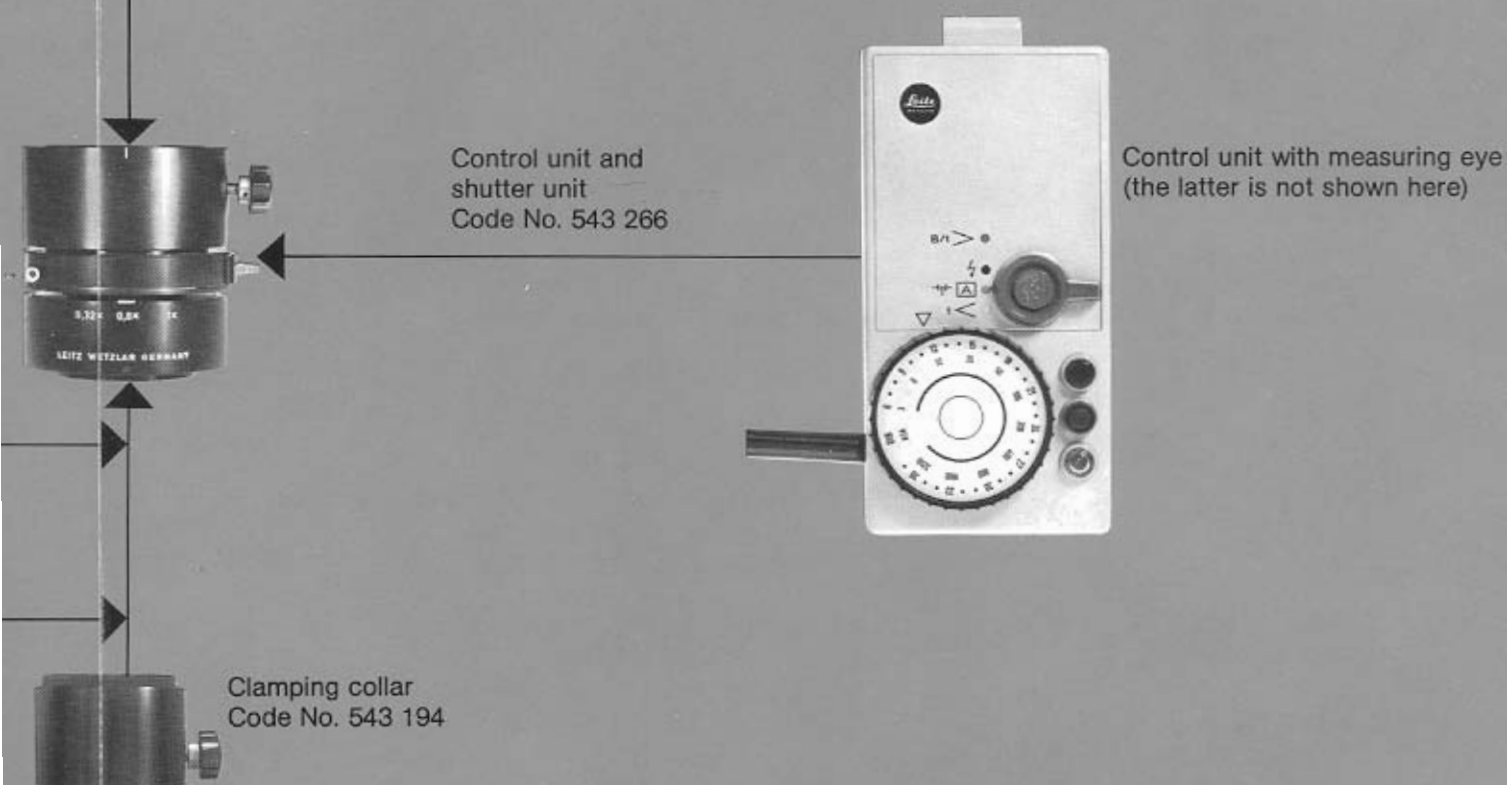


6.5 x 9cm camera attachment
Code No. 543 272*

* without groundglass frame

POLAROID CB 100
camera attachment for 3 1/4 x 4 1/4"
Code No. 543 271

9 x 12cm (4 x 5") camera attachment
Code No. 543 234
Groundglass frame and hood
Code No. 543 237
1x camera lens
Code No. 543 273



Technical conception

The technical conception is based on the principle of accommodating all photographic formats with a minimum number of components. A central shutter unit has thus been designed to which all the camera bodies contained in the programme can be attached. A separate control unit operates the automatic mechanism. The camera lenses and eyepieces have been chosen for optimum photographic utilization of the microscopic field of view.

The shutter unit as central component

The shutter unit is an element of the basic outfit. The camera attachments are grouped around it. It contains the automatic, anti-vibration-mounted central shutter. The measuring eye connected with the control unit is attached on the right. A built-in beam splitter deflects 50% of the total light flux in a direction of the measuring eye, 50% directly to the camera. Only about 3.5% of the field of view is used for the measurement; it is therefore possible to expose even small portions of the image area accurately. The exposure factors for the various groups of camera format are fed via a switch lever on the shutter unit. Once the factor has been fed to the shutter unit, it need be changed only with the format. The exposure is initiated by pressure on the cable release, and the shutter closes automatically at the end of the exposure.

Control unit with measuring eye

The fully transistorized control unit is accommodated in a handy plastic housing. A large disc for setting the film speed from 3 to 4000 ASA (6-37 DIN) is mounted on the front panel; it can be set at intervals of 1.25x ASA (1 DIN). Warning lights for "shutter open", "exposure time too short", "exposure time too long", tell the user reliably

about perfect function within the operating range or whether this is being exceeded. In practice the operating range of the automatic mechanism extending from 1/125 sec to about 60min at 3 ASA (6 DIN), i.e. 5 min at 50 ASA (18 DIN), will hardly ever be exceeded. If longer exposure times should be required, it is possible to switch over to manual operation. The highest shutter speed of 1/125 sec is determined by the design of the shutter. If necessary, the light intensity can be reduced by the insertion of grey filters so that the exposure time will again be within the operating range of the automatic mechanism.

The control unit is independent of the mains supply. It is powered by 4 1.5v monocells. A built-in measuring instrument indicates the state of charge of the batteries.

The interchangeable camera bodies

All camera bodies are interchangeable; instant locking devices ensure rapid change-over from black-and-white to colour or between the available formats from 35mm to 9 x 12cm or 4 x 5" respectively.

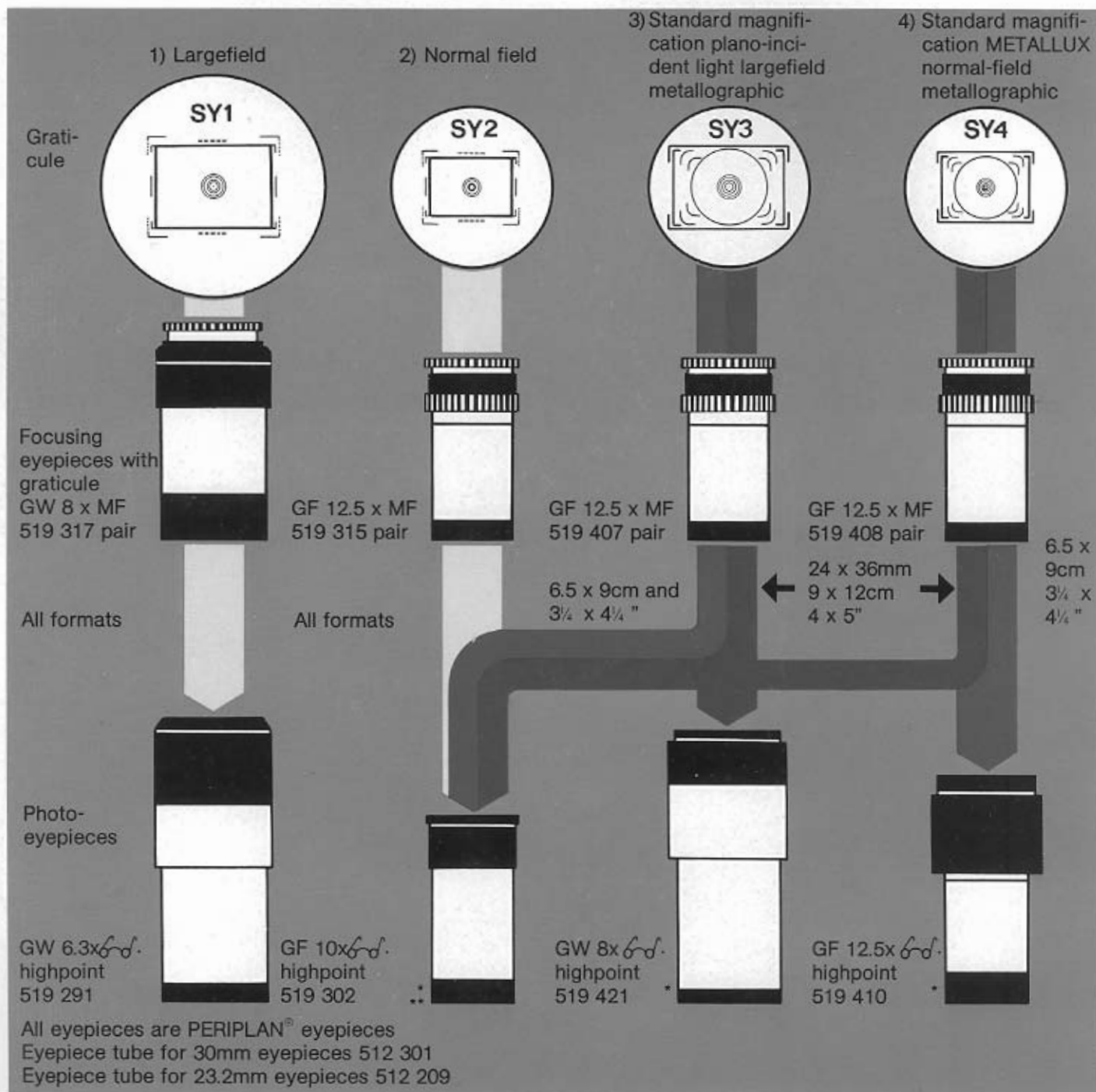
Three different camera bodies, the LEICA MDa, with recording device on request (or any other LEICA with bayonet changer), the LEICAFLEX, or a film transport housing are available. For the medium format a 6.5 x 9cm camera body for sheet film and plates is supplied.

For exclusive or frequent instant photography the CB100 camera attachment for 3/4 x 4/4" POLAROID sheet film is recommended.

For the large format a 9 x 12cm or 4 x 5" camera attachment with international back is available. On this camera double darkslides, 545 POLAROID sheet film darkslides, 226 POLAROID 3/4 x 4/4" roll film cassettes etc. can be used. For details see p. 9.

The optical combinations

6 eyepiece combinations depending on the stand and purpose of their use are available. The table below makes it easy for the user to select the combination most suitable from him. All optical combinations have been chosen so that the focusing eyepieces in the visual eyepiece tube have a magnification 1.25x higher than the magnification in the photo tube. This eliminates unsharp pictures owing to faulty accommodation of the eye.



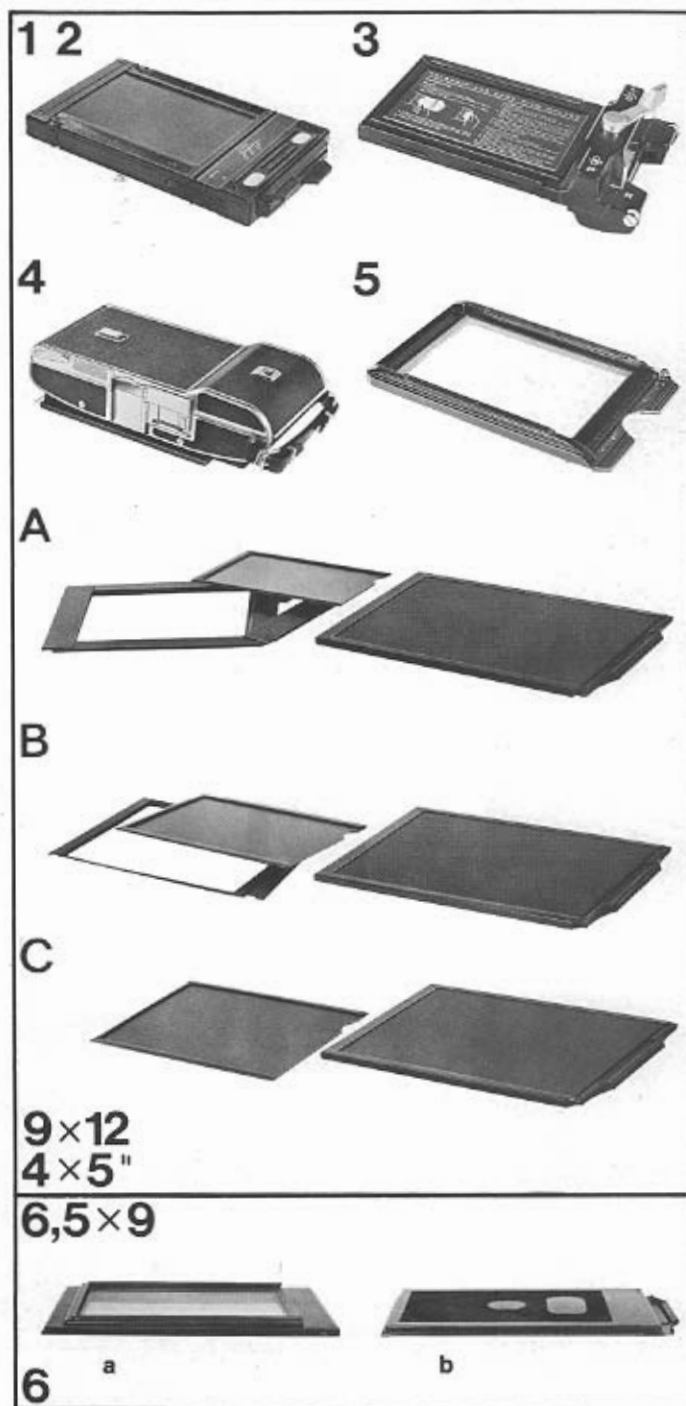
Accessories for the camera formats

9 x 12cm (4 x 5")
6.5 x 9cm

The 9 x 12cm (4 x 5") camera attachment, Code No. 543 234 has an international back and 1x interchangeable camera lens, Code No. 543 273. A Linhof groundglass frame with hood, Code No. 543 237, forms part of the outfit.

With this camera attachment all darkslides for international back can be used. The following are available:

	Code No.
1 Linhof 9 x 12cm double darkslide	543 050
2 Linhof 4 x 5" double darkslide	543 051
3 545 4 x 5" Polaroid sheet film cassette (film holder)	543 052
4 Polaroid 226 3/4 x 4/4" rollfilm cassette	*
Here the 1x camera lens must be replaced by a 0.8x camera lens	543 274
5 Frame adapter for 9 x 12cm grooved cassette	542 055
The following accessories can be used on this frame adapter:	
A 6.5 x 9cm adapter	543 026
6.5 x 9cm sheet film adapter**	543 028
9 x 12cm grooved darkslide	543 046
B 3/4 x 4/4" adapter	543 027
3/4 x 4/4" sheet film adapter**	543 029
9 x 12cm grooved darkslide	543 046
C 9 x 12cm sheet film adapter**	543 031
9 x 12cm grooved darkslide	543 046
6 Accessories for the 6.5 x 9cm camera attachment	
a Groundglass screen in frame	563 172
b Darkslide with standard double groove	563 020
Hood (not shown)	563 173



* The Polaroid rollfilm cassette is available from Messrs Linhof, Munich 25, under their Code No. 021 459.

** When plates are used the sheet film adapter is not required.



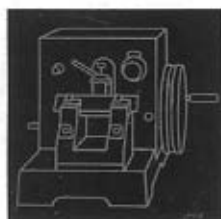
Production range



Microscopes

Microscopes of modern design for all investigations in transmitted, incident, and polarized light, fluorescence microscopes with incident-light or transmitted-light excitation.
Microscope accessories, such as phase contrast device, interference contrast equipment, heating and cooling stages, universal rotating stages.
Instruments for special aspects of microscopy such as micromanipulator, transmitted-light interference microscope, stereo-microscopes, comparison microscopes.

Equipment for photomicrography.
Television microscopes.
ORTHOMAT® W fully automatic microscope camera.
4x5" large-format camera with fully automatic exposure control.



Microtomes

Microtomes for research and routine laboratories;
in freezing chamber as HISTOKRYOTOM



Physical research instruments based on optical methods

Digital photometer
MPV microscope photometer
CLASSIMAT® device for optical electronic image analysis.
Scanning electron microscope
Monochromators
Micro-refractometer

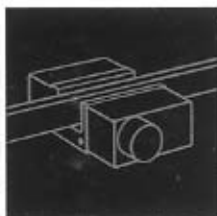
Materials testing instruments

MINILOAD hardness tester
Dilatometers
Heating microscopes



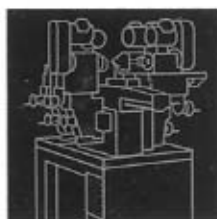
Optical mechanical precision measuring instruments

Measuring microscopes
Linear measuring instruments
Angle measuring instruments
Contour measuring projectors
Alignment- and direction testers
Optical installations and attachments
Incident-light interference microscopes



Linear and angle measuring instruments with digital display

Type 200 Universal Linear Comparator
Vertical Linear Precision Gauge, digital model
UWM Universal Measuring Microscope, digital model
Optical Master Dividing Head, digital model
Cam Tester, digital model
Automatic Cam Measuring Machine



Photoelectric incremental linear and angle transducers

Photoelectric measuring tubes

PRECICOMB®

Machine tools composed of LEITZ modular units

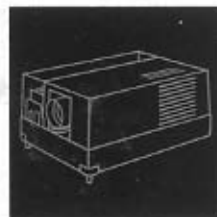


Photographic equipment

LEICA® 35mm camera
LEICA lenses and accessories
LEICAFLEX® 35mm single-lens reflex camera
LEICAFLEX lenses and accessories
Accessories for scientific and technical photography
Enlargers
LEICINA® SUPER 8mm cine-camera

BINOCULARS

TRINOVID® for sport, travel, hunting.



Projectors

PRADOVIT® COLOR automatic 35mm projector
PRADO® UNIVERSAL versatile classroom projector
Episcopes
Epidiascopes
Large lecture hall projectors
Micro-projectors
Overhead projectors.

* = Registered Trademark

POLAROID = Trademark of Polaroid GmbH; LINHOF = Trademark of Linhof KG;

Design subject to alterations without notice.

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