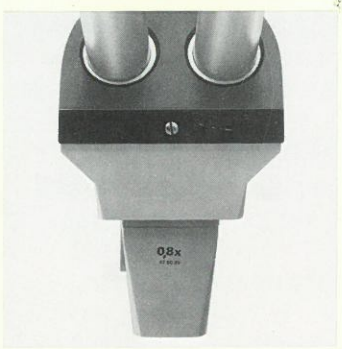
Zeiss Stereomicroscopes D, DR, DRC and DV 4

(Greenough-system)

ZEISS

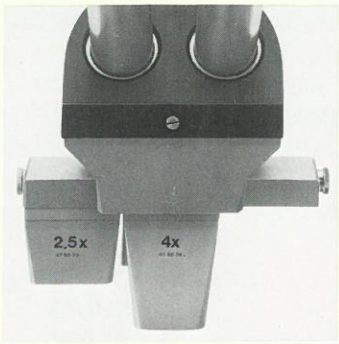
West Germany



Stereomicroscope

D

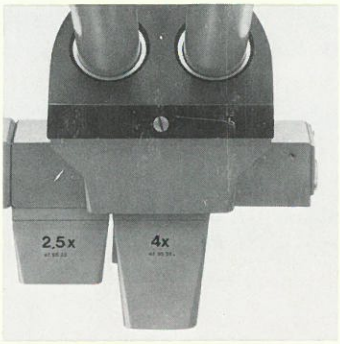
Change of magnification by exchanging pairs of objectives. Magnifications from 3.2x to 200x.



Stereomicroscope

DR

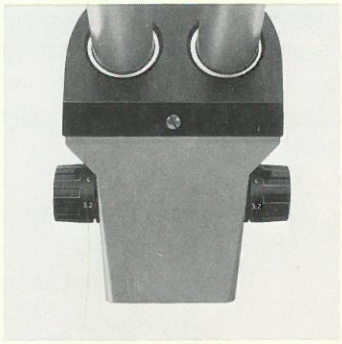
Quick-change device for any two objectives. Magnifications from 3.2x to 200.



Stereomicroscope

DRC

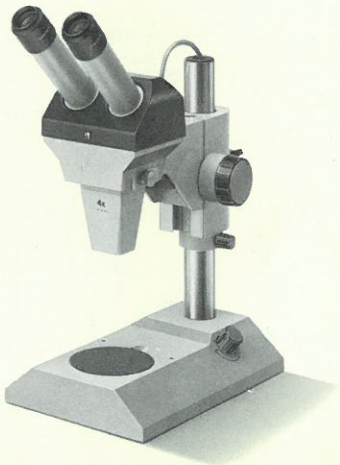
Same as DR, plus camera port. Magnifications from 3.2x to 200x.

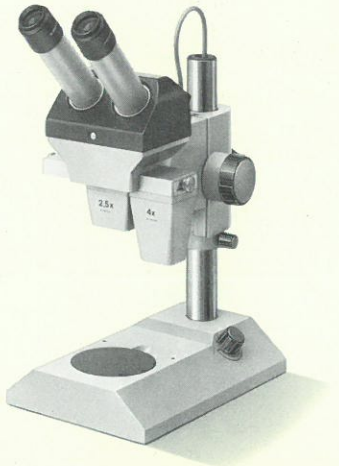


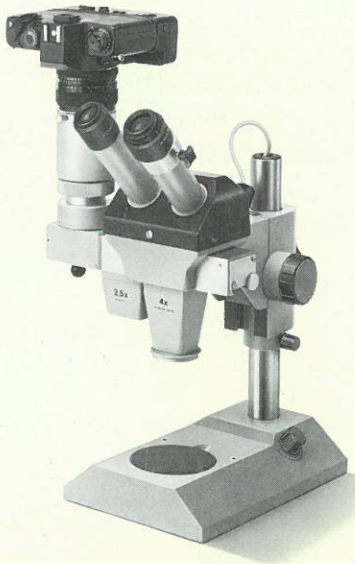
Stereomicroscope

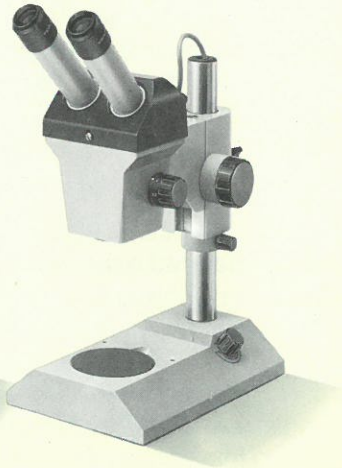
DV 4

Built-in pair of zoom objectives, ratio 1:4. Magnifications from 2x to 200x.









Features

3-dimensional viewing plus magnification
Brilliant clarity and edge-to-edge sharpness through world-renowned Zeiss optics.

Plus photomicrography, cinemicrography, TV
Model DRC with photo tube makes it all possible. Documentation and high-resolution TV transfer through high-quality Zeiss optics.

Magnifications from 2x to 200x
Full line of interchangeable objectives. Wide range of zoom optics. Wide selection of eyepieces over full range of magnifications.

Long working distances
allow great freedom of manipulation, afford easy visual access into recessed areas and cavities, provide ample room for accessories and illuminators.

Always in focus
No need to adjust focus when changing objectives or eyepieces. Sharp focus is maintained even when changing magnification.

Wide field of view
Widefield eyepieces afford a larger field of view than standard eyepieces at the same magnifications.

Same wide field for eyeglass wearers
No need to remove your own corrective lenses. Special high-eyepoint eyepieces are so designed that, with your glasses on, you see the same wide field of view that non-eyeglass wearers enjoy.

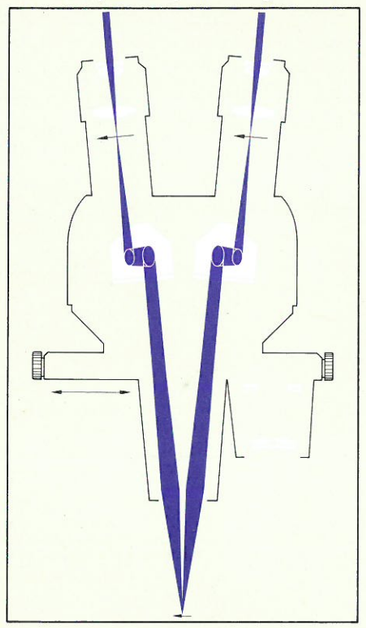
Specimens of all sorts and sizes
can be examined, manipulated, and processed. The Stereomicroscopes, normally mounted on a table stand, can also be attached to special stands, or integrated into machines, inspection stations, control systems, depending on application.

The right illumination for all applications
Even illumination of large surfaces, high-intensity for minute detail at high magnifications, cool illumination for living and heat-sensitive specimens, polarized light for bi-refringent objects, fluorescence excitation – in short, for every field of application, always ideal illumination conditions.

Accessories for special tasks
From simple stage platforms to the elaborate stages of research microscopes. Hand rests for operator comfort.

Utmost stability, extraordinary durability
The robust construction guarantees stability and ruggedness for a lifetime of day-in and day-out use and abuse.

Precision engineering in the Zeiss tradition –
not only guarantees superb quality of all components, but the century-old know-how in designing scientific instruments and the human engineering make working with Zeiss Stereomicroscopes easy and fatigue-free.



Why Greenough system?
The optical principle underlying the four Stereomicroscopes D, DR, DRC, DV 4, the so-called Greenough system, was pioneered by Zeiss as early as 1897. Two separate image systems using two identical objectives are trained on the specimen in the same manner that the unaided human eyes view an object. The optical axes are at an angle of approximately 11° to each other. The prisms in the binocular body present an upright and unreversed image to the eyes of the observer.

In models D, DR and DRC the change in magnification is accomplished by exchanging objective pairs of different initial magnification.

In model DV 4 the change in magnification is accomplished by the zoom magnification changer, the range of which can be extended up or down with additional attachment objectives.

In all models:
Additional magnifications can be obtained by selecting different eyepieces.

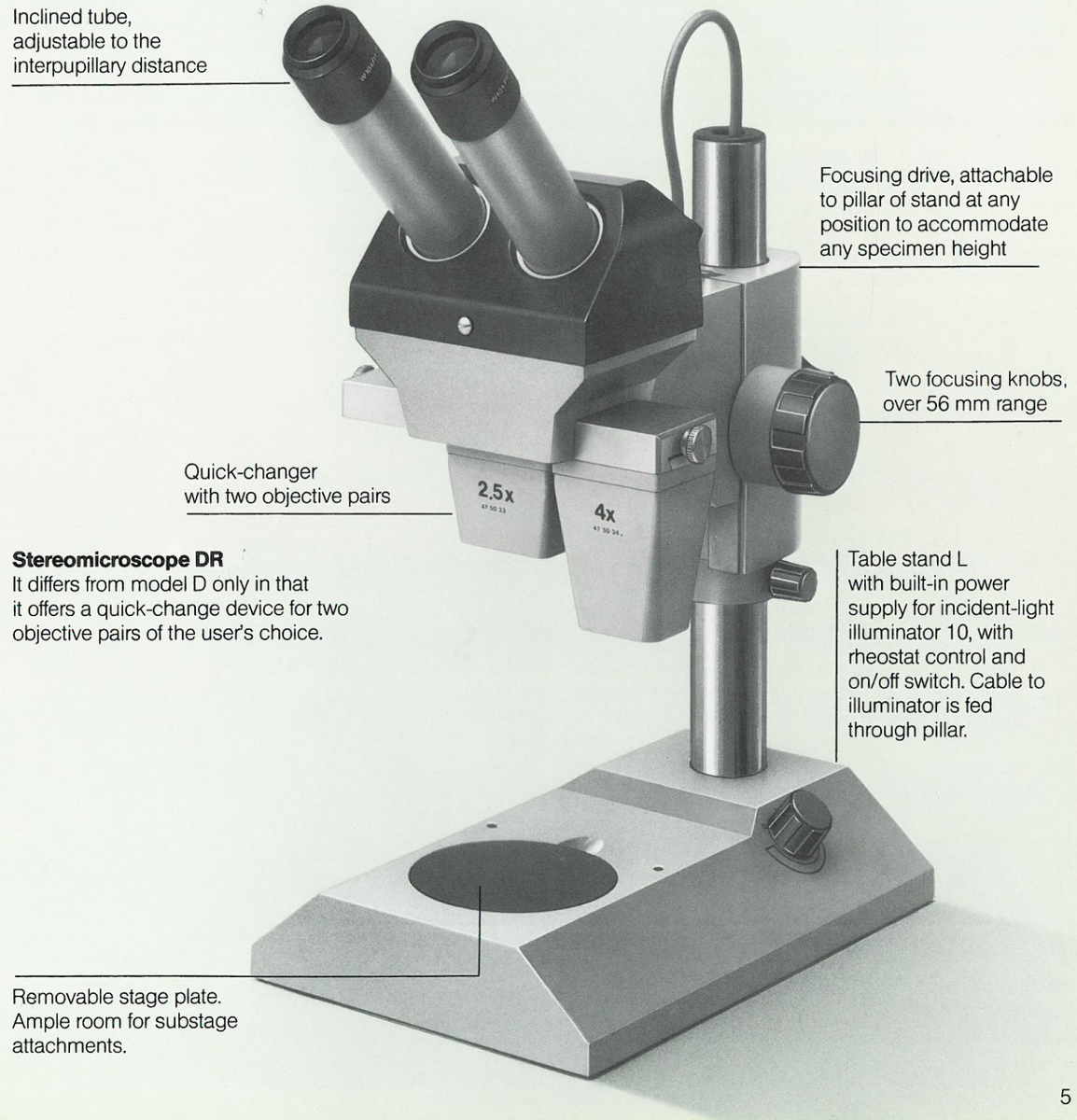
Zeiss also produces the telescope-type Stereomicroscopes IV b, SR and the Epitechnoscope. These models feature: Exchangeable main objectives with varying focal lengths allowing, for instance, extremely long observation distances.

Accessories which can also be fitted later, such as observation tubes, phototubes, drawing equipment.

For further information see brochures 41-610-e and 41-604-e.

Stereomicroscopes
D, DR

Stereomicroscope D
A very reasonably priced model for applications which primarily require only a single magnification.
The desired magnification is obtained by inserting a single objective pair and combining it with the appropriate eyepieces.
It is possible to quickly switch to other magnifications by exchange of either objective pair or eyepieces.



Inclined tube, adjustable to the interpupillary distance

Focusing drive, attachable to pillar of stand at any position to accommodate any specimen height

Two focusing knobs, over 56 mm range

Quick-changer with two objective pairs

Stereomicroscope DR
It differs from model D only in that it offers a quick-change device for two objective pairs of the user's choice.

Table stand L with built-in power supply for incident-light illuminator 10, with rheostat control and on/off switch. Cable to illuminator is fed through pillar.

Removable stage plate. Ample room for substage attachments.

Optical Systems for Zeiss Stereomicroscopes

Objective pairs for D, DR, DRC

The two objectives are contained in a single metal mount. This unit is referred to as an objective pair. It has a dovetail mount which slides into the track of the objective slides.

Objective pairs:

Primary magnification/ numerical aperture	
D 0.8x/0.025	47 50 39
D 1x/0.03	47 50 38
D 1.6x/0.04	47 50 32
D 2x/0.05	47 50 37
D 2.5x/0.05	47 50 33
D 4x/0.07	47 50 34
D 6.3x/0.075	47 50 35
D 8x/0.12 in preparation	47 50 36

The objective pairs D 1x, D 1.6x, D 2x and D 2.5x are short-mounted, while objective pairs D 0.8x, D 4x, D 6.3x, and D 8x all require a longer mount, resulting in two different working distances (see table).

Depending on the type of accessory used, a different adapter ring must be selected:
Adapter ring for short objectives D 43 50 22

Adapter ring for long objectives D 43 50 23.

Total Magnifications, Object Field Diameters, Working Distances

Objective Pairs		D 0.8x	D 1.0x	D 1.6x	D 2x	D 2.5x	D 4x	D 6.3x	D 8x
Eyepieces		**Total magnification = m and object field diameter = d** (approximate values)							
4x/30	m	3.2x	4x	6.4x	8x	10x	16x	25.2x	32x
	d	38 mm	30 mm	19 mm	15 mm	12 mm	8 mm	5 mm	4 mm
10x/20	m	8x	10x	16x	20x	25x	40x	63x	80x
	d	25 mm	20 mm	12.5 mm	10 mm	8 mm	5 mm	3 mm	2.5 mm
10x/25 widefield high-eyepoint	m	8x	10x	16x	20x	25x	40x	63x	80x
	d	31 mm	25 mm	16 mm	12 mm	10 mm	6.3 mm	4 mm	3 mm
16x widefield	m	12.8x	16x	25.6x	32x	40x	64x	100x	128x
	d	20 mm	16 mm	10 mm	8 mm	6.4 mm	4 mm	2.5 mm	2 mm
25x widefield	m	20x	25x	40x	50x	62.5x	100x	158x	200x
	d	12 mm	10 mm	6 mm	5 mm	4 mm	2.5 mm	1.6 mm	1.3 mm

Working distance (= distance from specimen to lower edge of objective mount) – decreases as accessories are added to objective

With all eyepieces	63 mm	88 mm	88 mm	88 mm	88 mm	63 mm	63 mm	63 mm
Name of objective mount	long	short	short	short	short	long	long	long

Eyepieces

Interchangeable among all Zeiss Stereomicroscopes

Simple eyepieces
Fixed eyelens for standard image field
for:
persons with emmetropic eyes

Focusing eyepieces
Focusable eyelens
for:
compensation of refraction differences in either eye of the observer.
Eyepiece micrometer discs can be brought into sharp focus for the individual eye.

Can be matched with fixed eyepiece of the same magnification and type for persons with one emmetropic eye.

Widefield eyepieces
Field of view larger than with normal eyepieces.

High-eyepoint eyepieces
for:
eyeglass wearers
Eyeglass wearers do not have to remove their glasses while using the microscope, which is a great convenience when switching between viewing through the microscope and direct observation, or making notes. Important for persons with astigmatism or strong corrective eyeglasses. Keeping the eyeglasses on, observers benefit from their correction and, at the same time, they get the same wide field of view as non-eyeglass wearers.
Of course, persons with normal vision can use the same eyepieces with the same benefits.

Type of Eyepieces

Eyepiece 4x/30	46 36 01
Eyepiece 10x/20	46 40 01–9903
Focusing eyepiece 10x/20 foc	46 40 04–9904
Widefield high-eyepoint eyepiece 10x/25 Br	46 40 02–9901
Focusing widefield high-eyepoint eyepiece 10x/25 Br foc	46 40 03
Widefield high-eyepoint eyepiece 16x/16 Br	46 42 02
Widefield eyepiece 25x/10,5	46 44 01
Focusing widefield eyepiece 25x/10,5	46 44 04–9902

For insertion into focusing eyepieces:

Eyepiece crossline	47 40 60
Eyepiece micrometer 10 : 100, 22.5 mm dia. 10 mm/100 increments	47 40 61
Eyepiece micrometer 10 : 100, 26 mm dia. 10 mm/100 increments	47 40 66
Eyepiece net micrometer, 22.5 mm dia. 10 x 10 mm/20 x 20 squares	47 40 62

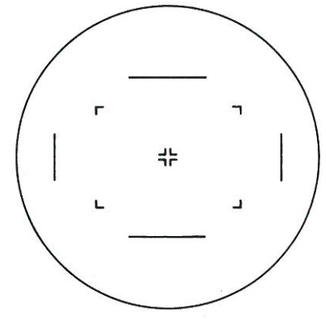
For photography:

Photo reticule with camera format outlines, 26 mm dia. for focusing widefield high-eyepoint eyepiece (46 40 03). When used in 10x and 16x eyepieces, it displays the camera format outlines in the image field. Can only be used with specific camera-objective-focal lengths, e. g. f = 63 mm for 35 mm.	47 40 67

Reticules 22.5 mm dia. for eyepieces	10x/20 foc.	(46 40 04–9904)
	25x/10.5 foc.	(46 44 04–9902)
26 mm dia. for eyepieces	10x/25 Br. foc.	(46 40 03)
	25x/10.5 foc.	(46 44 04–9902)

Recommended accessories:

Eyepiece clamping ring 33 mm dia. To prevent rotation of the eyepiece when focusing the reticule.	46 49 12
Eyecups To insure that the eye is firmly positioned above the eyepiece. Eyeglass wearers note: eliminates the possibility of eyeglasses coming into contact with the eyepiece lens.	46 49 00



Format outlines of photo reticule

Zeiss Stereomicroscope **DRC**

The DRC is designed for visual observation and for documentation, such as photomicrography, cinemicrography, and TV microscopy. Here the high resolution obtainable with the Greenough system really pays off.

The laterally attached phototube is solidly constructed and offers the stability needed for even large-format camera systems. The camera never gets in the way of the viewing tube. All controls are readily accessible.

By sliding a knob, the light of one of the stereo paths is fed directly into the camera. Monocular observation of the specimen can continue during exposure by viewing through the second tube.

For photomicrography, the following basic equipment is required (the same holds true for use of movie and TV cameras):

1 eyepiece for the phototube
1 objective lens for the camera
1 camera body or adapter ring/dovetail-to-filter thread mount.

In the case of single-lens reflex cameras the exposure field and focus adjustment are controlled through the viewfinder. A focusing screen with a clear area is practical for this purpose.

In other camera systems, the framing and focusing are done through the viewing tube of the Stereomicroscope. For this purpose, the following are required:
1 focusing widefield high-eyepoint eyepiece 10x/25 46 40 03 with photo reticule 47 40 67

The photo reticule indicates the format outlines only for a specific focal length of the camera lens, e. g. f = 63 mm for the 35 mm format.

Selection of the camera depends on the desired format and the degree of automation.

Example:
For use with a commercially available 35 mm single-lens reflex camera (24 x 36 mm) with standard lens (most common focal length 50 mm) – the following is required:

Widefield high-eyepoint eyepiece 46 40 02-9901
Attachment ring for 40 mm dia. tube 47 60 05
Adapter ring/dovetail-to-filter thread mount.

The adapter connects the camera via the thread mount of the camera lens (please indicate thread diameter).

A vignetting of the image can occur when using the camera's standard lens. It is, therefore, advisable to determine in advance the suitability of the camera with a given lens.

For utmost optical quality and elimination of possible vignetting, we recommend:
Zeiss objective lens f = 63 mm in T-2 mount 47 60 29

Attachment of a 35 mm single-lens reflex camera housing to this objective lens is accomplished with:
T-2 adapter for camera universal thread (M 42 x 1)
T-2 adapter for camera bayonet
(style depends upon camera model).

Cameras with behind-the-lens exposure meter will function well in connection with Zeiss Stereomicroscopes, provided they can accommodate the relatively longer exposure times required for photomicrography (which may arise up to several seconds). The photo reticule indicates a format for a focal length of the camera lens f = 63 mm.

Zeiss Attachment Camera System MC 63 for the highest image quality and greatest ease of operation
The advantages of the MC 63 Camera Systems developed specifically for photomicrography are:

Optimal integration of microscope and camera.

High resolution. Exceptionally bright images.

Focusing through the binocular tube for both observation and camera.

Considerably larger field than other attachment cameras.

Unusually stable and compact.

Automatic exposure control with manual override.

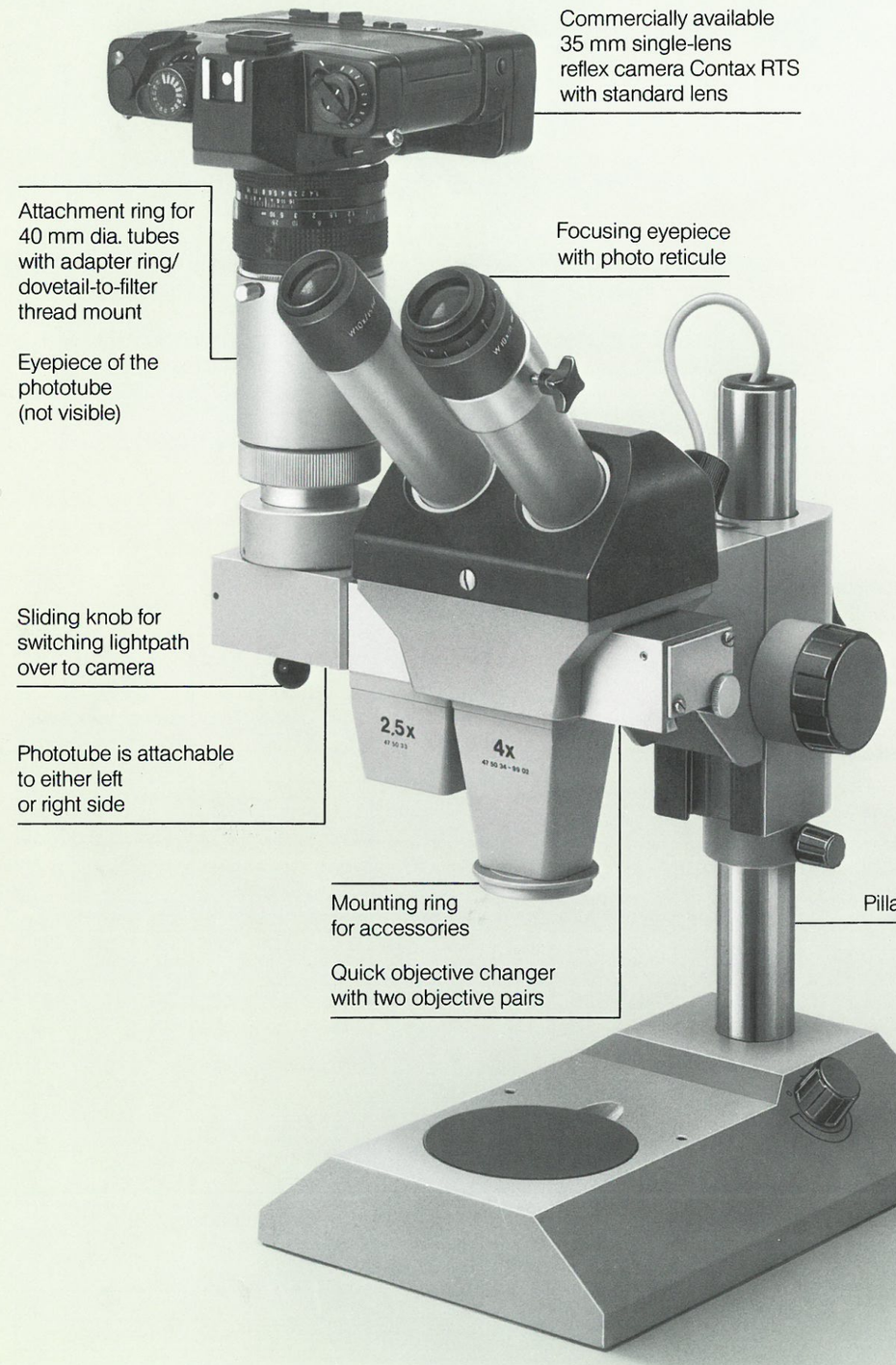
Exposure metering and control are adapted to the light levels available in microscopy.

Can handle all available film speeds and offers automatic reciprocity failure compensation.

Automatic film advance.

For further information see brochure 41-401.

Stereomicroscope DRC is ideally suited for photomicrography with various kinds and formats of cameras which can be attached to a phototube



Zeiss Stereomicroscope **DV 4**

Permanently built-in zoom objective pair for rapid, continuous magnification change (ratio 1:4).

Click-stop at factors
1x, 1.2x, 1.6x, 2x, 2.5x, 3.2x, 4x.

Attachment objectives 0.5x and 2x extend the range of the zoom objective pair.

Attachment objective 0.5x
reduces magnification by one half

increases the working distance to 128 mm

doubles the depth of field.

Attachment objective 2x
doubles the magnification range

reduces the working distance to 24 mm and increases the stereoscopic effect

increases the resolution

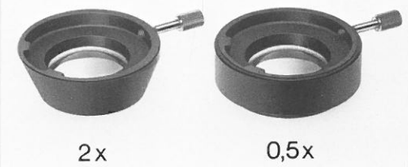
Magnifications, Object Field Diameters, Working Distances

Zoom position		1x			1.6x			2.5x			4x		
Zoom objective pair			●			●			●			●	
With attachment objective 0.5x		●			●			●			●		
With attachment objective 2x				●			●			●			●
Numerical aperture		0.014	0.028	0.056	0.018	0.036	0.072	0.023	0.045	0.09	0.028	0.056	0.11
Eyepieces		**Total magnifications = m and object field diameters = d** (approx. values)											
4x/30	m x	2	4	8	3.2	6.4	12.8	5	10	20	8	16	32
	d mm	60	30	15	38	19	9.5	24	12	6	15	7.5	4
10x/20	m x	5	10	20	8	16	32	12.5	25	50	20	40	80
	d mm	40	20	10	25	12,5	6.3	16	8	4	10	5	2.5
10x/25 Br widefield, high eyepoint	m x	5	10	20	8	16	32	12.5	25	50	20	40	80
	d mm	50	25	12.5	30	15	7.5	20	10	5	12.5	6.3	3
16x/16 Br widefield	m x	8	16	32	12.8	25.6	51.2	20	40	80	32	64	128
	d mm	32	16	8	20	10	5	13	6.4	3.2	8	4	2
25x/10.5 widefield	m x	12.5	25	50	20	40	80	31.3	62.5	125	50	100	200
	d mm	20	10	5	12.5	6.3	3	8	4	2	5	2.5	1.3

Working distance (= distance from specimen to lower edge of objective mount) – decreases as accessories are added to objective

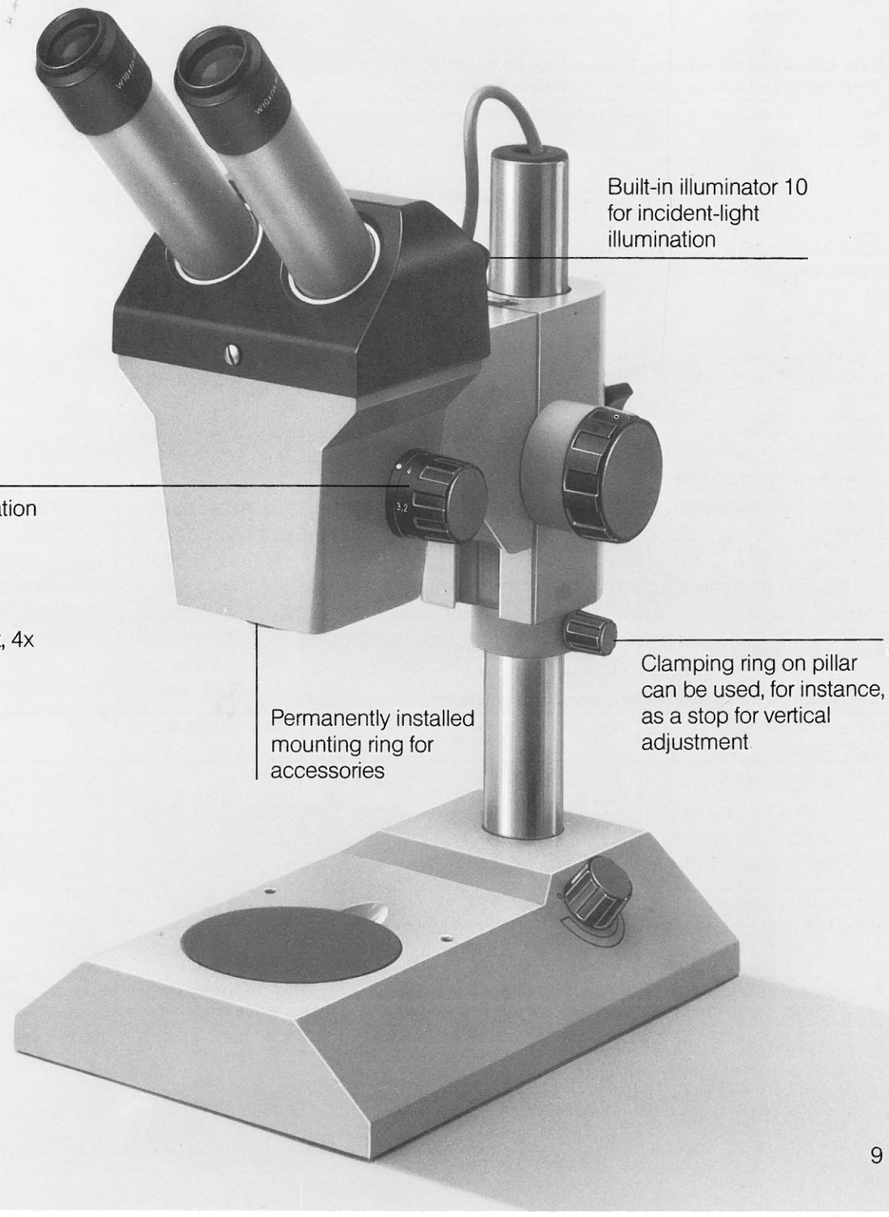
Zoom objective pair	77 mm	
With attachment objective 0.5x	128 mm	
With attachment objective 2x	24 mm	Accessories cannot be mounted on the attachment objective

The ideal instrument for applications requiring frequent magnification change.
The field of view can always be adjusted to the size of the specimen.
The rapid change-over from survey to detail viewing – and vice versa – makes examinations and preparations easier.



2x 0,5x

Attachment objectives for magnification change by the factor 0.5x or 2x in any selected position



Built-in illuminator 10 for incident-light illumination

Control knob for magnification change (1:4)
For all click-stop positions the magnification factors are clearly indicated:
1x, 1.2x, 1.6x, 2x, 2.5x, 3.2x, 4x

Permanently installed mounting ring for accessories

Clamping ring on pillar can be used, for instance, as a stop for vertical adjustment

Illuminators

Low-voltage Illuminators with Power Supplies for 50...60 Hz

Name of Illumination Equipment	Type of Illumination	Mode of Attachment		Light Source
Lamp housing 10	incident light, darkfield collimated, focusable, tiltable filter holder for 32 mm dia.	lamp housing on microscope carrier	–	6 V/10 W Halogen
Lamp housing 10 S	incident light, collimated, focusable, can be freely manipulated filter holder for 32 mm dia.	with lamp carrier [1]	self-supporting metal tube	6 V/10 W Halogen
Incident-light lamp housing	incident light, colliminated, focusable, can be freely manipulated filter holder for 32 mm dia.	with lamp carrier [1]	self-supporting metal tube	6 V/15 W bulb with pre-centered filament
Equipment for transmitted light	transmitted light (clear glass stage plate)	stage for installation on stand with locating holes		illumination from lamp housing 10 reflected by mirrors

Illuminators and Illuminating Equipment with Schott KL 150, 15 V, 150 W, Halogen Light Source, Connection for Light Conductor and Built-in Power Supply

Name of Illumination Equipment	Type of Illumination	Mode of Attachment		Connect. to Schott Fiber Light Source
Four-point ring illuminator	incident light, darkfield shadow-free four-point ring illumination	on the objective mount [3]	–	with the 8 mm dia./1 m flex. light conductor of the illuminator
Equipment for transmitted-light darkfield	transmitted light, darkfield transmitted light, brightfield (opaque glass stage plate)	stage for installation on stand with locating holes		via the 8 mm dia./1 m flex. light conductor of the attachable four-point ring illuminator
3.5 mm dia./750 mm (ea.) goose-neck light conductor single double triple Focusing attachment with 4 color filter mounts and filters	incident light, diverging cone, 70° can be freely manipulated focusable filter with housing	on housing of the Schott fiber light source	self-supporting metal tube mounted on end of light conductor	direct mechanical connection
Flexible light conductor 8 mm dia./1 m, with connecting piece for vertical illuminator and focusing attachment	incident light, diverging cone, approx. 70° can be freely manipulated incident light, focusable can be freely manipulated 18 mm dia. filter	with lamp carrier [1]	additional support necessary self-supporting metal tube	direct mechanical connection
Equipment for vertical illumination	directed vertical illumination, centerable shadow-free	on objective mount [2]	–	via flexible 8 mm dia./1 m light conductor

Illuminators for Diffused Surface Illumination with Power Supply for 50...60 Hz

Name of Illumination Equipment	Type of Illumination	Mode of Attachment		Light Source
Surface illuminator S	diffused broad-area incident-light illumination, 115x45 mm, can be manipulated freely. transmitted light:	with lamp carrier [1] –	self-supporting metal tube clamp-on device below stage	2 pieces 33-TL 4 W
Ring-shaped fluorescent tube Mic-o-Lite	diffused broad-area incident-light illumination, shadow-free	on the objective mount [2]	–	Ring light W-31 white, soft light W-45 white, similar to daylight
Ring-shaped fluorescent tube Mic-o-Lite for UV excitation	broad-area incident-light illumination for UV excitation, shadow-free	on the objective mount [2]	–	Ring light FUV-36

[1] Lamp carrier can be clamped onto the pillar of the microscope stand or any pillar 32 mm in diameter.

[2] Required for models D, DR, DRC: Adapter ring 435022 or Adapter ring 435023.
For model DV 4: Directly attachable to objective mount and to attachment objective 0.5x.
No attachments can be used with attachment objective 2x.

Attachment for transmitted light. By means of two mirrors the incident-light illumination is converted to transmitted light. Two pins firmly lock the transmitted-light attachment on the base of stands L and LO.

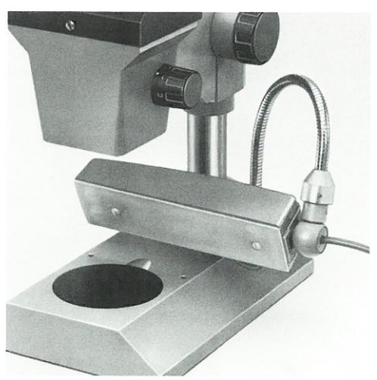
Illuminator 10 S on flexible lamp carrier which is attached to the pillar of the stand.

Incident-light illumination with fiber optic goose-neck light conductors including focusing attachment. Connects to Schott fiber light source KL 150 B with brightness control. Mechanically fastened to the lamp carrier.

Attachment for transmitted-light darkfield accepts four-point ring illuminator with optical fibers tied into KL 150 B. Simple slider allows quick change from transmitted-light darkfield to transmitted-light brightfield. Mounts into the opening in the bases of stands L and LO.

Incident-light darkfield with four-point ring illuminator attached to stereotube in front of objective. Connects to Schott fiber light source KL 150 B.

Vertical illumination attached to the objective. Connects to Schott light source KL 150 B by means of fiber optics.



Surface illuminator S with flexible lamp carrier.

Accessories

Polarizing Equipment

For examination of bi-refringent, transparent specimens.

For example:
Strain and stress in plastics or glass.

Natural and synthetic fibers, threads, and textiles.

Crystals and rock sections.

Many bi-refringent plant and animal tissue components.

The polarizing equipment consists of:
Incident-light halogen illuminator 10.

Equipment for transmitted light.

Polarizing attachment for transmitted light with slider for polarized light and non-polarized transmitted light.

Analyzer.

Recommended accessory:
Analyzer with λ plate.

Stage plate with carrier 32

The stage plate with carrier 32 (47 52 38) clamped to the pillar of stand L or LO and can be used as a microscope stage.
Shown: attachable mechanical stage 25 x 75 mm (41 33 02).

For transmitted light we offer:

Equipment for transmitted-light illumination in conjunction with incident-light illuminator 10.

Surface illuminator S is mounted directly below the stage. Provides high illumination aperture for large magnifications.

In addition, various stages of the Zeiss Standard Microscope line can be attached. For transmitted-light illumination the surface illuminator S can also be used.

Ball stage

Circular 135 mm dia. stage plate with hemispherical base which fits into the opening in the stands L and LO. Specimens can be tilted in all directions from horizontal as far as 25°, and rotated as desired around the vertical axis. For both reflected and transmitted light.

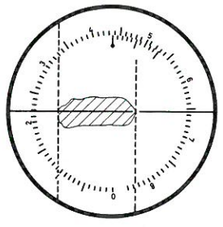
Special eyepiece reticules, special eyepieces

A variety of special eyepiece reticules is available. They can be inserted into the focusing eyepieces.

Special eyepieces for measurement and special tests are available.

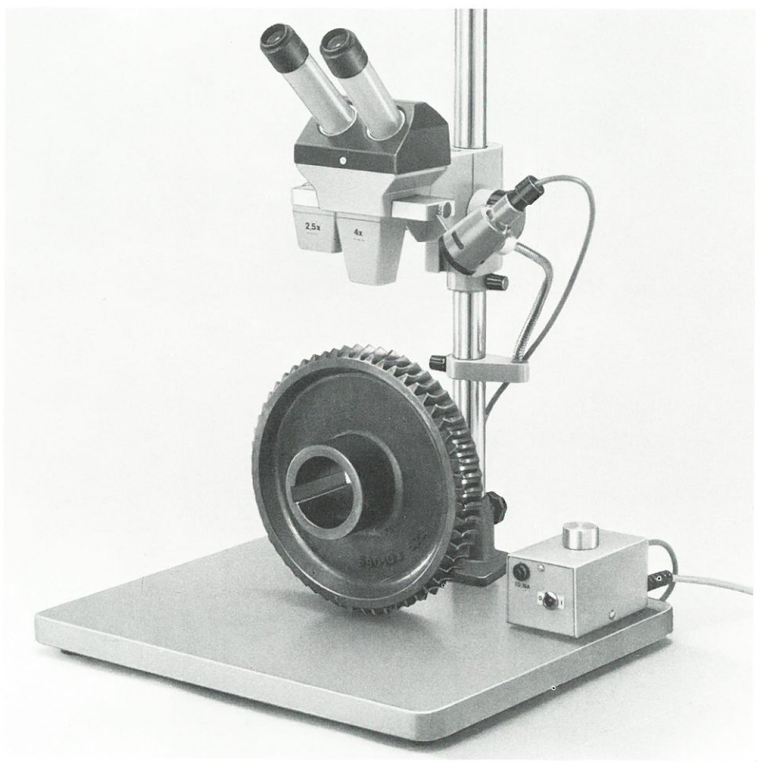
For example, eyepiece screw micrometer with internal readouts with eyepiece Kpl 8x 46 39 83.

Measuring distance is traversed with a movable measuring line. The measured result can be read directly inside the field of view.



Eyepiece screw micrometer scale

Special stands



Universal Stand
Universal Stand with base plate 260 x 325 x 82 mm. Openings for mounting 3 pillars 32 mm in dia.; various heights may be selected. Numerous supplementary attachments and accessories.
Suitable for large specimens of substantial working height.
Also suitable for mounting heavy accessories, e. g. still cameras, TV cameras, etc., to minimize the weight load and effects of vibration on the microscope itself.

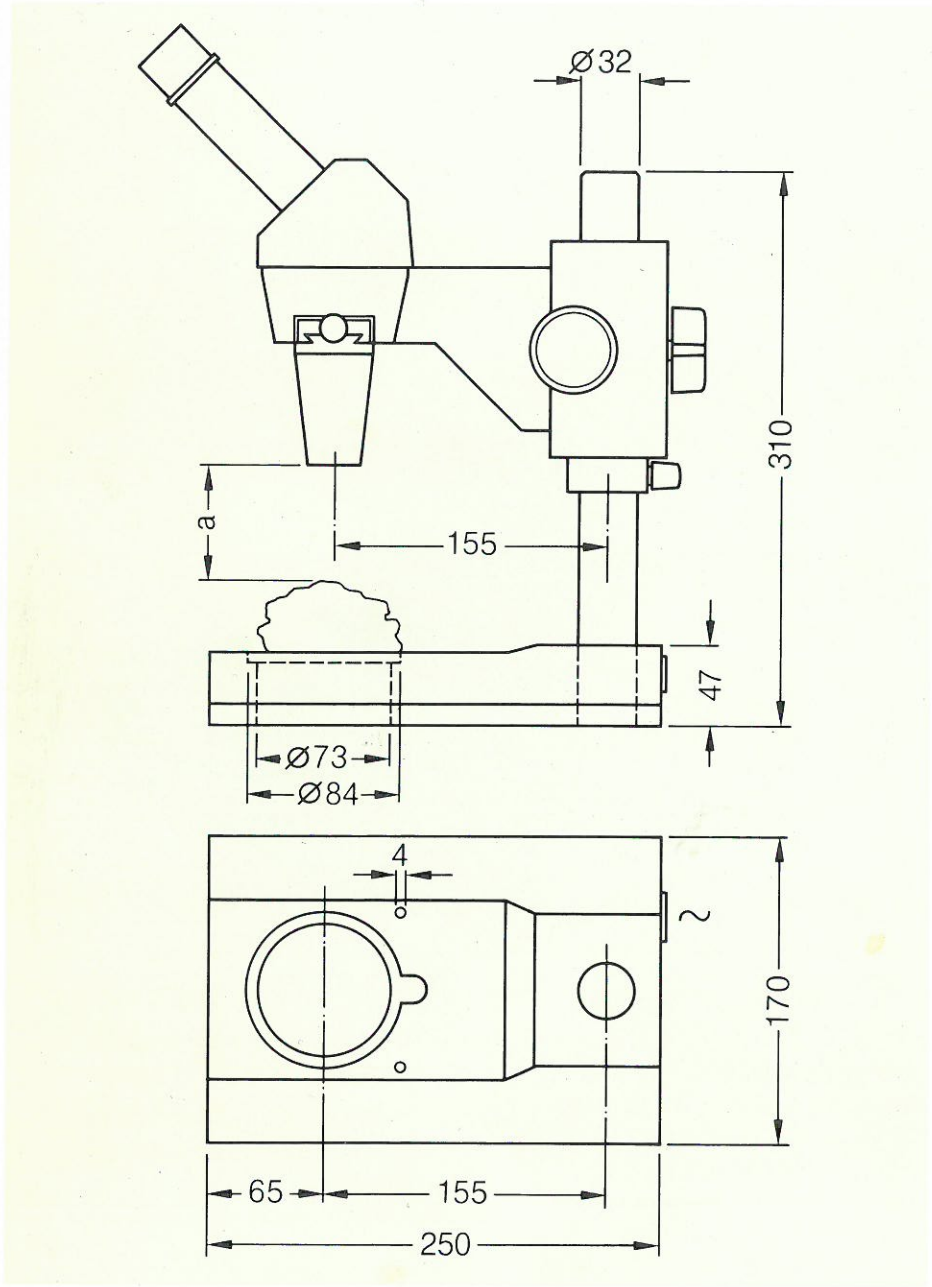
Copying Stand
Solid wooden base 39 x 44 cm with 32 mm dia. pillars, total height 61 cm above base.

Microscope with rack-and-pinion focus and accessories can be clamped onto the pillar.
Pillar can be easily removed from base.

Recommended, for example, for examining specimens exceeding 150 mm in height (see illustration).

Stands

Carl Zeiss
D-7082 Oberkochen
West Germany



Stereomicroscopes D, DR, DRC, and DV 4 are generally used with stands L and LO as table-top instruments. Both stand models have identical external dimensions (see accompanying specifications).

Stand L:
Column stand with built-in power supply 120 V for 6 V/10 W illuminator, and socket for cable.

Stand LO:
Same dimensions as stand L, but without power supply.

The microscope body is freely rotatable around the pillar axis.

In the stand base, there is an 84 mm dia. opening, which is generally covered by the stage plate for positioning the specimens.

Illumination accessories can be secured in this opening (see pages 10 and 11). Two bore holes serve for the mounting of stage clips as well as for fixing the equipment for transmitted-light illumination.

Loosening the clamping screw on the rack-and-pinion control, the microscope can be detached from the pillar and mounted to any other stand or device with a 32 mm dia. mounting pin.

Examples of special stands can be found on page 13.

We reserve the right to change design or extent of instrumentation in the course of advanced development.