

# FILM-TECH

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Bedienungsanleitung · Instruction Manual · Mode d'emploi  
Manual de Instrucciones · Istruzioni per l'uso · Gebruiksaanwijzing  
Bruksanvisning · Käyttöohje



# KODAK CAROUSEL S-AV 1010/1030 Projector



KODAK AUDIOVISUAL PRODUCTS

**Kurzanleitung**  
**Summary**  
**Mode d'emploi résumé**

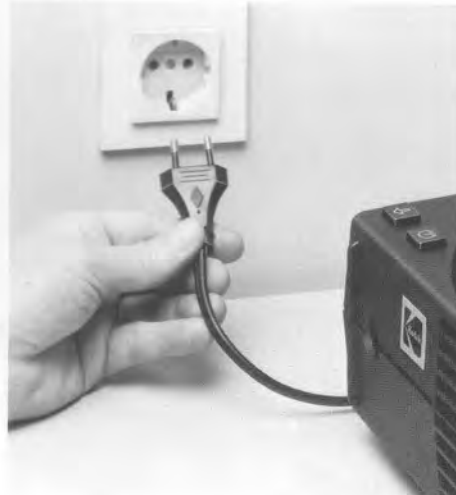
**Esquema resumido**  
**Introduzione**  
**Aanwijzingen in 't kort**

**Igångsättning**  
**Johdanto**

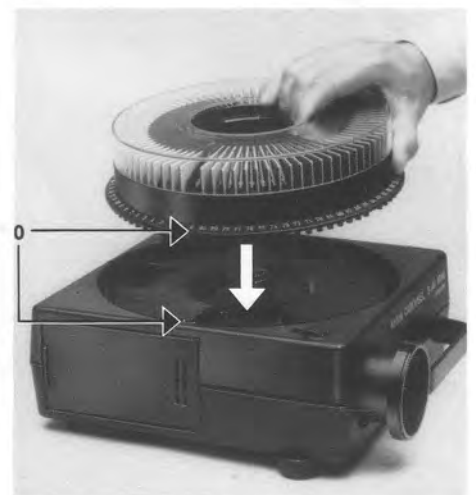
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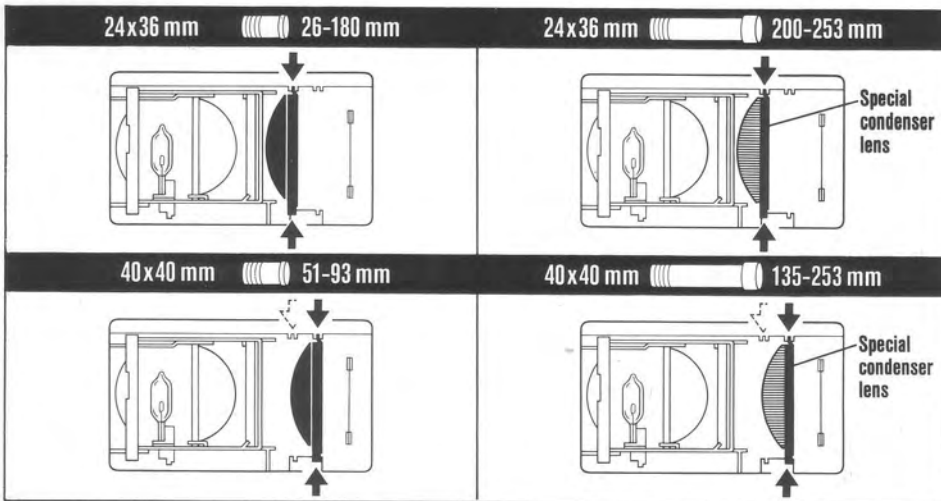
**2.**



**3.**



**4.**



**5.**



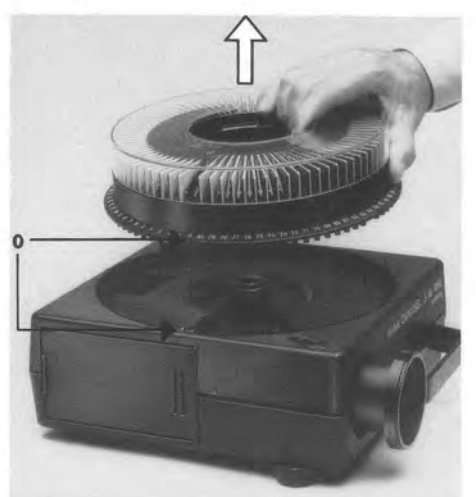
**6.**

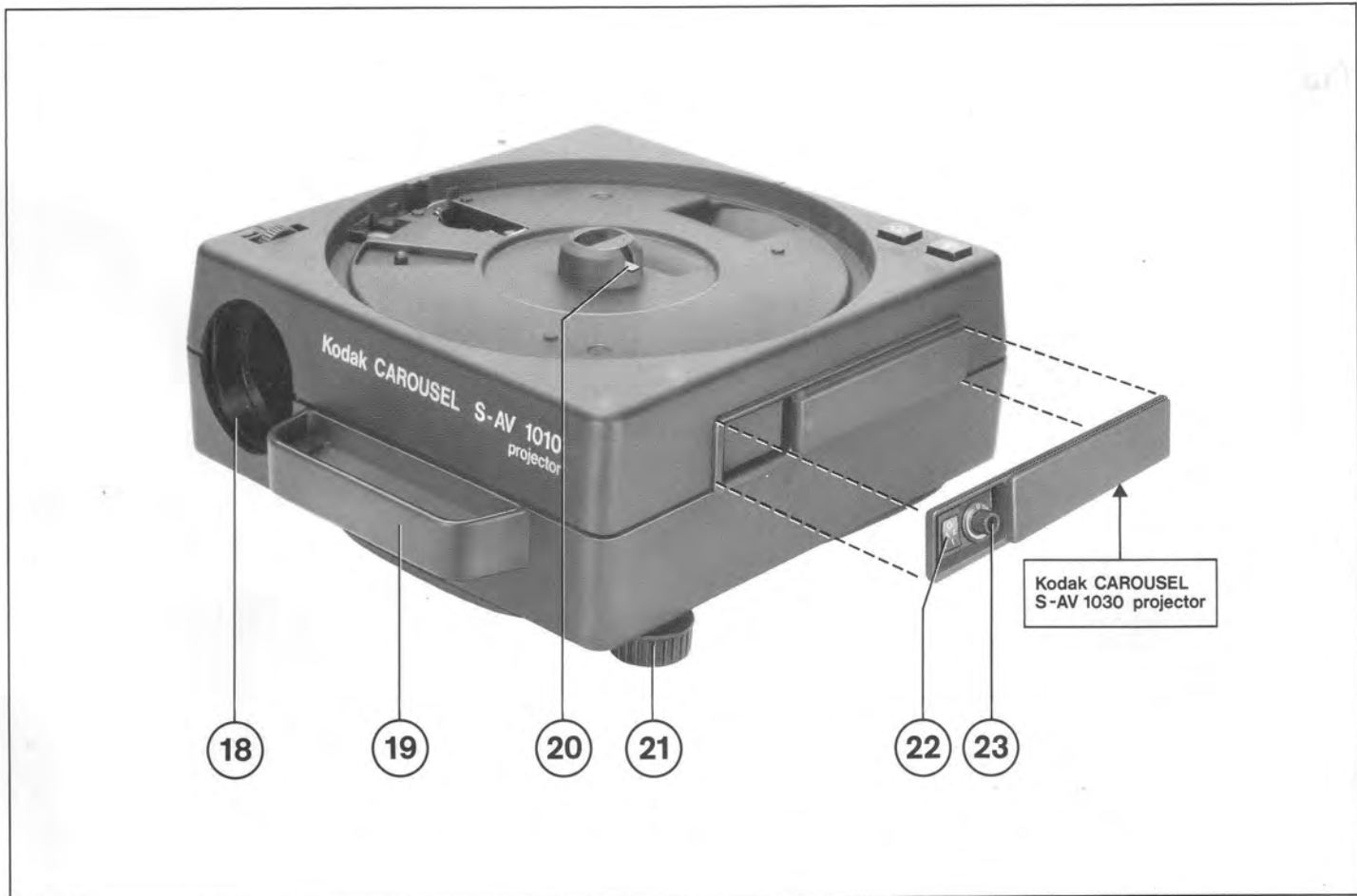
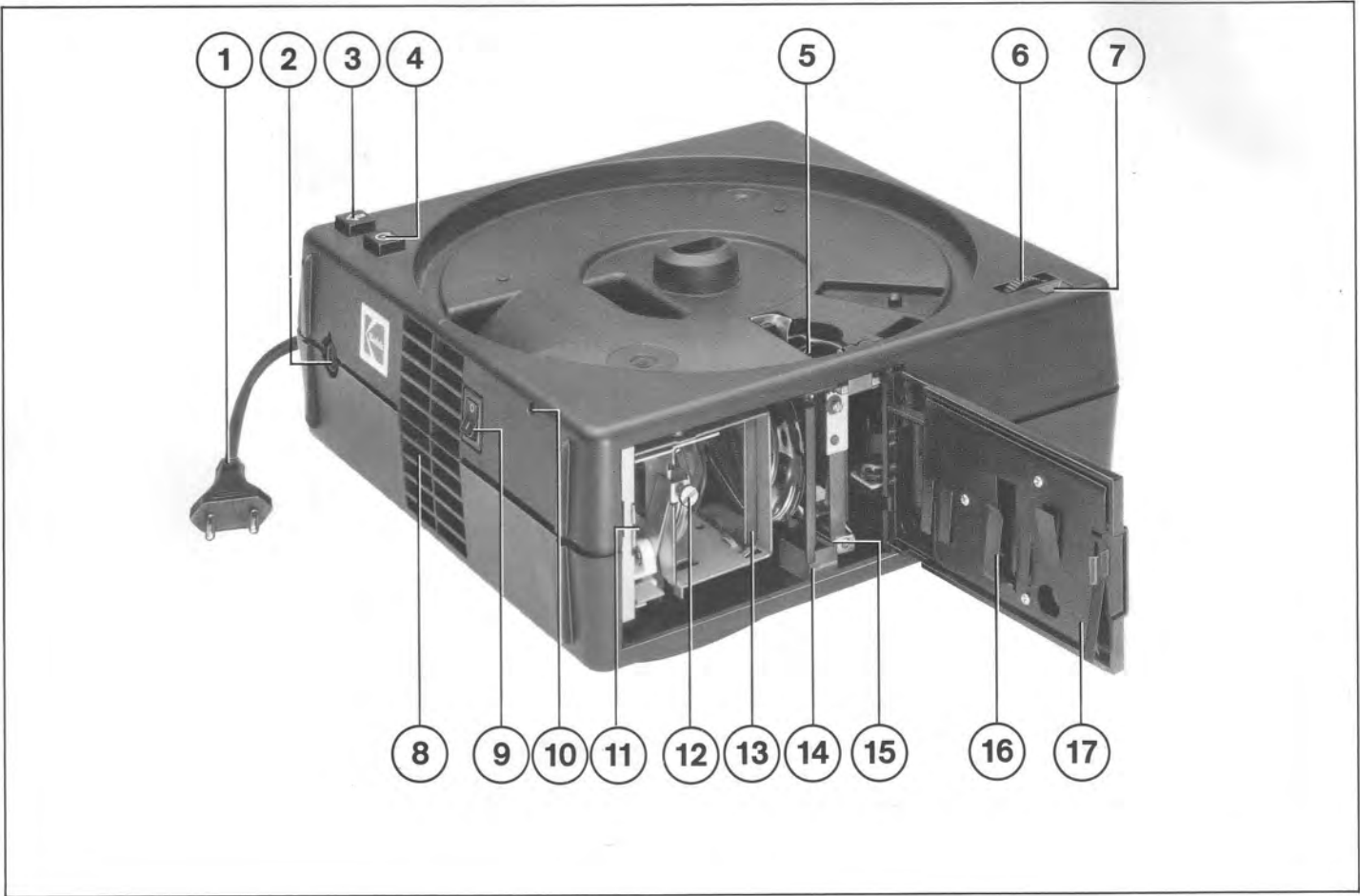


**7.**



**8.**





## Projector features

- 1 *Captive mains lead (approx. 2.2 m)*
- 2 *6-pole socket.*
- 3 *Reverse slide-change button.*
- 4 *Forward slide-change and select button.*
- 5 *Slide gate.*
- 6 *Focusing knob for rack focusing lenses.*
- 7 *Focus position indicator.*
- 8 *Fan vent.*
- 9 *Mains switch.*
- 10 *Mounting hole for receiver of KODAK S-AV Infrared Remote Control*
- 11 *Mirror adjustment (vertical)*
- 12 *Lamp adjustment (horizontal).*
- 13 *Heat filter.*
- 14 *Standard condenser lens (position for 24 x 36 mm slides).*
- 15 *Condenser slots (position for 40 x 40 mm slides)*
- 16 *Holder for spare lamp.*
- 17 *Lamphouse door.*
- 18 *Universal lens carrier for KODAK RETINAR S-AV 1000 and S-AV 2000 lenses or lenses with rack focusing*
- 19 *Carrying handle*
- 20 *Slide tray lock.*
- 21 *Height adjustment foot*
- 22 *Autofocus on-off switch (S-AV 1030 projector only)*
- 23 *Interval timer (S-AV 1030 projector only)*

## Using the instruction manual

Open out the front (page 2) and rear (page 59) cover flaps. These diagrams apply to the following text. One flap can also be used as a book mark.

## Summary

The principal stages of operating the projector are illustrated on the front flap in illustrations 1–8.

## Switching-on the projector

### Important:

KODAK CAROUSEL S-AV 1010 and 1030 Projectors are made for a single mains supply voltage. Check that the label on the underside of the projector agrees with your supply before connecting it to the mains.

### Mains Lead

The projector is fitted with a captive mains lead (approx. 2.2 m) stored on the underside of the projector ①. Unwind the lead before setting up the projector. (Fig. O, page 58)

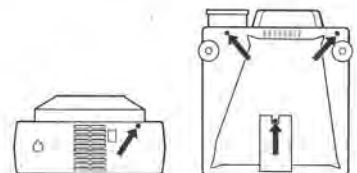
### Setting-up the projector

Place the projector on a firm, vibration free base. The projector may be set at an angle of up to 15° from the horizontal in any direction. Check that the projector can draw in sufficient cold air for cooling and that warm air can be freely expelled. (The projector requires 20 litres of cooling air per second.)

Keep air vents on the underside, at the rear of the projector, and on the lamphouse door, free from obstructions.

### Note:

For fastening the projector in a fixed projection position, fixing holes suitable for self-tapping screws can be found in the back of the projector and on the underside (see below).



## Slide mounts

The projector accepts all slides of 5 × 5 cm external size and up to 3.2 mm thick (complying with DIN 108, T. 1). For a professional quality slide presentation with or without autofocus operation, it is important to use similarly mounted slides throughout to avoid frequent focus corrections throughout the show.

Damaged, distorted or warped slides should not be used as they may disrupt the transport mechanism.

## Slide Trays

KODAK CAROUSEL Slide Trays hold up to 80 slides. A KODAK CAROUSEL S-AV 2000 Slide Tray is supplied with the projector.

## Fitting the slide tray (Figures J, K, L)

- Before loading the tray, check that the baseplate is locked in position (Fig. K). When locked, the baseplate cannot be rotated.
- Turn that transparent cover on the slide tray counter-clockwise and lift it off.
- Insert the slides into the tray. (For slide orientation for front projection, see Fig. J).
- Place the tray in its approximate position on the projector and rotate it until it locks in the zero position (Fig. S).

## Lenses

The KODAK RETINAR S-AV 1000 range of lenses, the high-precision KODAK RETINAR S-AV 2000 lenses and rack focusing lenses can be used.

Earlier design 28 mm and 35 mm lenses which used special condensers are not suitable.

Technical data for KODAK RETINAR S-AV 1000 and S-AV 2000 lenses see page 56.

Table of projected picture sizes: see cover flap page 59.

Key to table:

- Scale a = Projection distance in metres
- Scale c = Projected picture width in metres
- Scale  $b_1$  = Picture width of slide  
24 × 36 mm horizontal format
- Scale  $b_2$  = Picture width of slide  
24 × 36 mm vertical format
- Scale  $b_3$  = Picture width of slide  
40 × 40 mm

Example: A projection distance of 10 m with 24 × 36 mm format (scale  $b_1$ ) and a 150 mm lens produces a picture width of 2.30 m.

## Condenser settings

As supplied, the projector is fitted with the standard condenser lens <sup>14</sup> in the position for 24 × 36 mm slides.

For 40 × 40 mm slides, the standard condenser lens is put into the adjacent right-hand slot <sup>15</sup>

When using the 200 mm and 253 mm lenses, the standard condenser lens should be replaced by the special condenser lens supplied with these lenses. The special condenser lens is also recommended when projecting 40 × 40 mm slides with the 135 mm, 150 mm, and 180 mm lenses, giving better overall illumination.

Note: Ensure that the curved side of the standard condenser lens or special condenser lens is always facing the lamp.

(See "Condenser settings" on the front cover flap, Figure 4).

## Mains connection

Check the voltage on the label beneath the projector before you connect it to the mains.

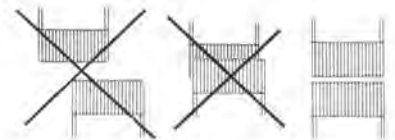
Connect the projector mains lead to the mains supply. Press the mains switch <sup>9</sup>, the lamp will come on and the fan operate.

## Centering the lamp (Fig. N, 58)

The 24 V/250 W lamp is adjusted at manufacture. **Only the correctly adjusted lamp yields maximum of brightness and gives optimum of durability.** Check the adjustment again before using the projector: it may have changed in transit.

- Lenses shorter than 135 mm: After switching off the projector, look through the lens and check the position of the lamp filament.
- 135 mm and longer focal length lenses: Place the pinhole slide enclosed with these lenses in the slide gate. Switch on the projector, fit the lens cap over the lens and observe the lamp filament images projected on the lens cap.

To be correctly adjusted the filaments must be in line and should not overlap (right-hand diagram).



The left-hand diagrams show incorrect adjustments. To correct proceed as follows:

- Open the lamphouse door <sup>17</sup>
- Turn the adjustment screw <sup>12</sup> for horizontal adjustment.
- Move the notched adjuster <sup>11</sup> up or down for vertical adjustment.

## Levelling the projector

The height of the projector can be adjusted by turning the feet <sup>21</sup>. To stop the picture wandering when making fine adjustment, hold one foot whilst turning the other.

# Operation

## Focusing the image

Press the slide advance button (1). The first slide will transport into the slide gate and be projected. Focus the projected image:

- a) With RETINAR lenses, by turning the lens.
- b) With rack focusing lenses, by turning the milled wheel (2).

Make sure that the focus position indicator (7) is near the middle of its range before adjusting the lens. If necessary use the focus button of the Remote Control to bring it to the middle of the range.

Fine focusing during a show can be achieved using the focus button on the KODAK CAROUSEL Remote Control.

## Autofocus (S-AV 1030 Projector only)

The projector has an autofocus device which avoids the need to refocus manually during a slide show.

Before a show, the first slide must be focused manually. First switch on the autofocus (22) and then focus the image on the screen as described above.

In order to avoid large autofocus shifts that are visually disturbing during a slide presentation, it is recommended not to mix glass and glassless mounts in one show.

## Slide-changing

### 1. Using the buttons on the Projector

- Forward slide change:  
Press button (4) (1).
- Reverse slide change:  
Press button (3) (2).
- Individual selection:  
Press button (4) (1) and hold it down. The slide tray can now be turned by hand to any position. Note that after releasing the button the slide tray moves forward one position.

### 2a. With the KODAK CAROUSEL Interval Timer (S-AV 1010 Projector only) (Fig. F, page 57)

The KODAK CAROUSEL Interval Timer is available for automatic slide changing at preset intervals. It can be set from about 4 to 40 seconds. It plugs into the 6-pole socket (2) on the projector.

### 2b. With the built-in interval timer (S-AV 1030 Projector only)

For automatic slide changing, switch the timer on by turning the knob (23) clockwise. It can be set from about 4 to 40 seconds.

To switch off the timer, turn the knob (23) anticlockwise until it clicks.

### 3. Using the KODAK CAROUSEL Remote Control (Fig. D, page 57)

For single projector operation, connect the plug on the remote control cable to the 6-pole socket (2) on the projector.

The remote control operates the following functions:

- Slide change forward. (4)
- Slide change reverse. (3)
- Focusing.

When using autofocus on the KODAK S-AV 1030 Projector there is no need to use the focus control on the KODAK CAROUSEL Remote Control.

KODAK extension cables can extend the remote control cable up to 24 m.

### 4. With the KODAK S-AV Infrared Remote Control, Model TF, type II (Fig. E, page 57)

This consists of a hand-held battery-powered transmitter and a receiver. Forward and reverse slide transport and focus can be controlled without cables up to a distance of about 30 metres from the receiver. The receiver can be attached to the projector (holder is supplied) and is plugged into the 6-pin socket (2).

## Changing the slide tray (Fig. 8, page 2)

Always lift off the slide tray in the zero position. By pressing button (4) the slide tray can be turned by hand to the zero position when the projector is switched on.

In an emergency, e.g. transport failure, the tray can be removed from the projector in any position. To do this, push aside and hold the slide tray lock (20), while lifting off the slide tray. Remove the slide from the slide gate.

Having removed the slide tray, turn it over and rotate the base plate until it locks in position. Otherwise the slide tray cannot be replaced on the projector.

# Other projection modes

## Continuous projection

### With 81 slides

Before putting on the full slide tray, insert an additional 81st slide in the slide gate ⑤.

For automatic slide changing, plug the KODAK Interval Timer into the projector's 6-pole socket ② (S-AV 1010) or switch on the built-in timer (S-AV 1030).

## Tape Control

In slide-tape presentations, forward slide changes are controlled by pulses recorded on tape on a separate AV track. The recorder must be fitted with an AV head, and with a built-in slide control unit (incorporated in the KODAK S-AV Cassette Recorder 200), or have an external slide control unit connected. (Control pulse duration: 0.2 to 0.75 seconds with 50 Hz mains frequency).

The connection to the projector is made via the 6-pole socket ②.

The KODAK Twin Socket, Model B, together with the KODAK CAROUSEL Remote Control, permits remote focusing during tape recorder control. (Fig. G, page 57)

## Projection in parallel

With parallel projection, the projectors linked in parallel are simultaneously operated, either by remote control, interval timer or slide control unit. To do this, one KODAK CAROUSEL Twin Socket, Model B is required for each projector and a connection cable to the twin sockets, (Fig. G, page 57).

# Servicing

## Maintenance

Dirt and dust can have adverse effects on the lubricants used in the projector and thus cause malfunctions. Therefore the projector and the slide tray should be returned to the KODAK Customer Equipment Service Department after approximately 1000 hours of operation. Where the projector is used in very dusty locations (e.g. exhibitions) more frequent servicing may be advisable.

Cleaning of the projector optics, such as the lens, condenser and heat filter should be carried out using a soft lintfree cloth or camel hair brush.

The heat filter fits loosely into its holder to allow room for expansion as it gets warm. If it has been removed for cleaning, make sure that it remains a loose fit.

## Possible problems during operation

- Lamp fails to light, but the fan operates:
  - Defective lamp.
  - Inadequate ventilation, lamp thermal cut-out has operated.
- Projected image insufficiently illuminated:
  - Condenser lens in wrong position.
  - Wrong condenser lens fitted.
  - Lamp not centered.
- Switching on the projector, the lamp fails to light and the fan does not operate:
  - Fuse blown in mains plug
  - Thermal overload cut-out has switched the projector motor off.
  - Inadequate ventilation, fan exit blocked.
  - Power supply not plugged in.
- The lamp lights and the fan runs, but other controls do not function:
  - secondary fuses blown:  
return the projector for repair.
- Slide transport problem:
  - Slide damaged.
  - Slide tray base plate not located in zero position.
  - Slide tray base plate bent.
  - Remote control cable exceeds the permitted 24 m extension.
  - Slide transport pulse too short.



- S-AV 1030 projector only: Autofocus runs continuously
  - Slide mount problem: film plane outside the operating range.

Note: if none of the faults listed above caused the problem, return the projector to your local dealer or KODAK for maintenance or repair.

## Replacing a defective lamp (Fig. M, page 58)

First, let the projector cool by leaving it switched on to allow the fan to cool the lamp. Switch off and unplug the mains lead.

- Open the lamphouse door ⑰.
- Swing out the lamp holder by pulling the adjustment screw ⑫ (Fig. M).
- Remove the defective lamp and insert the new lamp.  
Always handle lamps by the protective sleeve when inserting to avoid getting fingerprints on the glass. When the lamp is in place, remove the sleeve.
- Swing back the lamp holder using the adjustment screw ⑫.
- Re-align the lamp.
- Close the lamphouse door.

A spare lamp can be accommodated in a holder ⑱ on the inside of the lamphouse door.

### Note:

For applications where a long lamp life is called for there are special lamps available, which have an approximate 20% reduction in brightness and an average life of approximately 300 hours. These lamps are supplied by the following companies:

Osram (No. 64657), Philips (Type 6958), Sylvania (L 3333).

- KODAK RETINAR S-AV 1000 and S-AV 2000 Lenses in various focal lengths (see page 56).
- KODAK CAROUSEL S-AV 2000 Slide Tray for 80 slides.
- KODAK S-AV Infrared Remote Control, Model TF, type II. For cordless remote control up to 30m. (Fig. E, page 57)
- KODAK CAROUSEL Remote Control (4 m) (Fig. D, page 57), plus Extension Cables 4 m and 16 m.
- KODAK CAROUSEL Twin Socket, Model B for simultaneous connection of a Remote Control and a slide synchronizer. Also used for parallel connection of projectors, where the Connecting Cable, Model B and one Twin Socket is required per projector (Fig. G, page 57)
- S-AV 1010 projector only: KODAK CAROUSEL Interval Timer, adjustable from approximately 4 to 40 seconds. (Fig. F, page 57).
- KODAK S-AV Cassette Recorder 200 mono audio recorder with built-in auto control track facility; capable of controlling slide changes on one or two projectors independently. With single projector control, automatic tape stops can be programmed. (Fig. H, page 58).
- KODAK CAROUSEL Carrying Case (Fig. P, page 58).

# Technical Data

## Mechanical System

Gravity feed slide change with pressure lever for optimum slide alignment.

Slide format up to 40 × 40 mm.  
Maximum slide thickness 3.2 mm (DIN 108, T. 1).

Universal lens carrier for KODAK RETINAR S-AV 1000 and 2000 lenses and lenses with rack focus.

Slide change time: 1 second.

Height setting to 10° maximum by two screw feet.

The projector will function when tilted up to 15° in any direction.

Glassfibre reinforced plastic body with integral carrying handle.

## Illumination

24 V/250 W halogen lamp (A 1/223) in tiltable base for easy lamp changing.

Effective light intensity of approximately 1000 lumens with 40 × 40 mm slides.

Interchangeable condenser system for slide formats 24 × 36 mm and 40 × 40 mm, and for lenses with longer focal lengths.

## Operating range (Fig. A, page 56)

The permissible operating range of the projector depends on the ambient temperature and the mains voltage.

- a = Ambient temperature
- b = Mains voltage
- c = Nominal voltage
- d = 15% Undervoltage
- e = 10% Overvoltage
- f = Lamp voltage

Should the projector overheat, e.g. due to lack of cooling air or jamming of the slide transport mechanism, built-in thermal cut-outs automatically switch off the projector lamp or motor and then switch them on again, once it has cooled down.

## Electrical system

Set for specific voltages at manufacture, e.g. 220–230 V/50 Hz or 240–250 V/50 Hz (see label underneath the projector for its supply setting).

Total power consumption: 320 W approximately.

Captive mains lead 2.2 m long approximately.

Fuses in secondary circuit:  
1.25 A/250 V slow blow (DIN 41662) (S-AV 1030 projector 2 fuses).

Thermal cut-outs in motor and lamp-house.

The projector meets the following electrical safety requirements:

⚠ VDE 0875 and 0730 (sections 1 and 2 Q) safety class II; ⚡ radio interference suppressed according to EEC Directive 76/889; EEC 10 sections 1 and 2 Q and IEC 65.

## Control system

Push buttons for slide changing: forward (with additional possibility of manual slide selection) and reverse.

6-pole socket DIN 45 322, (Fig. B, page 56), to take CAROUSEL Remote Control, CAROUSEL Interval Timer, KODAK S-AV Infrared Remote Control, Model TF and projector control units.

Connections 2 + 3 = Forward slide change. (Pulse duration 0.2 to 0.75 seconds).

Connections 1 + 3 = Reverse slide change. (Pulse duration 0.3 to 0.85 seconds).

For control purposes, connections 6 + 3 can supply approx. 20 V d.c. at a maximum current of 750 mA.

S-AV 1030 Projector:  
Automatic slide focusing using infrared radiation reflected by the slide. Autofocus operates for any slide resting in the projection gate. Autofocus on-off by switch ②

**Circuit diagram** KODAK CAROUSEL S-AV 1010 Projector, page 52

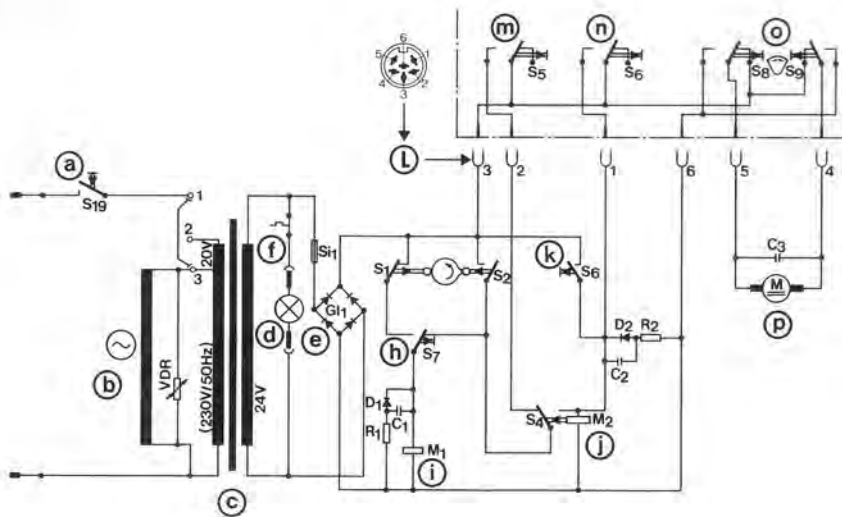
**Circuit diagram** KODAK CAROUSEL S-AV 1030 Projector, page 54

## Dimensions (Fig. C, page 56)

Height without slide tray: 107 mm  
Height with slide tray: 158 mm  
Length including carrying handle: 301 mm  
Overall width: 277 mm  
Weight without slide tray: 6370 g approx.  
Weight of empty slide tray: 420 g approx.

Equipment subject to minor technical changes.

KODAK, CAROUSEL, and RETINAR are trade marks.



### Schaltplan (S-AV 1010)

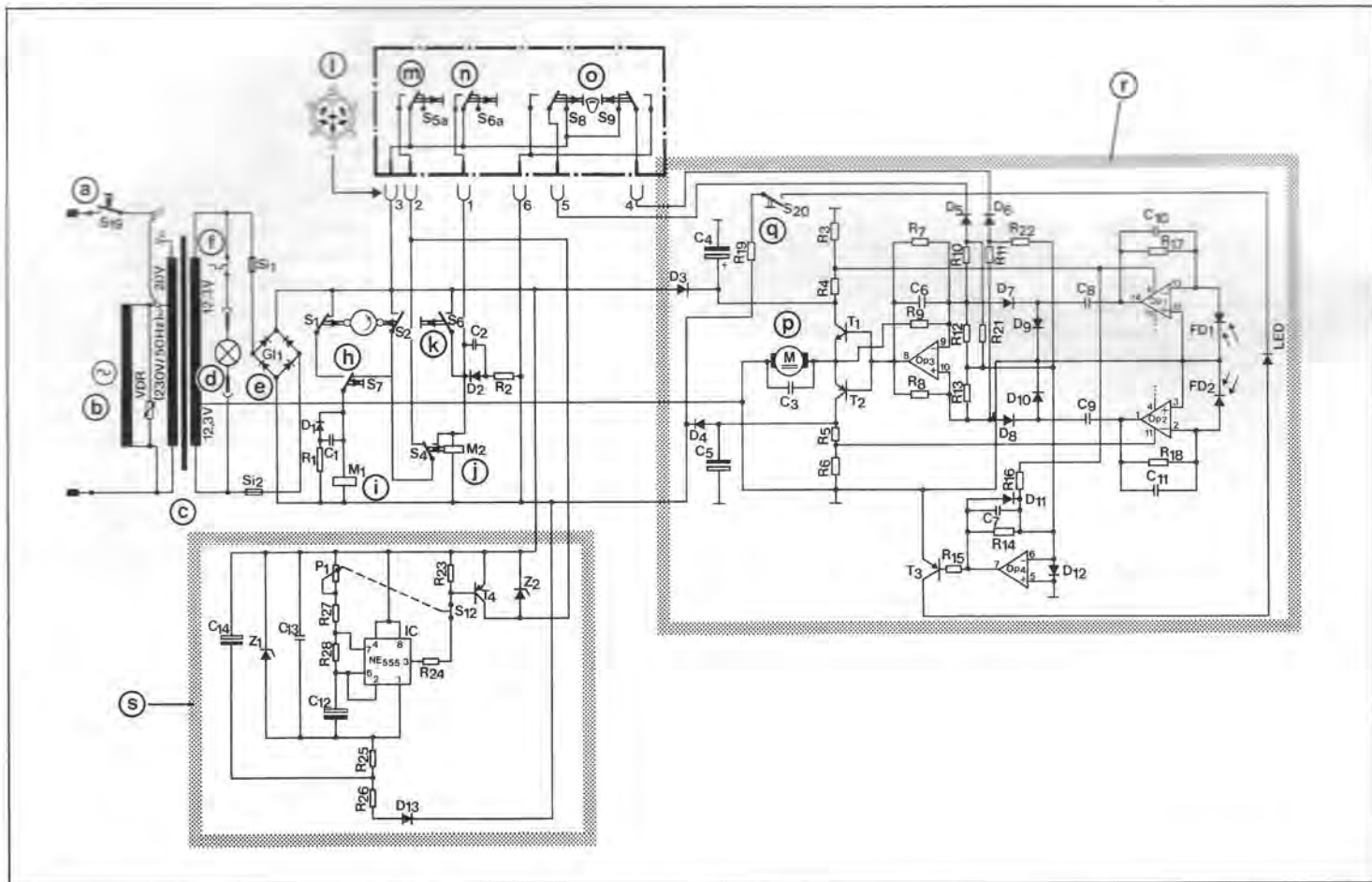
- a = Netzschalter
- b = Spaltpolmotor
- c = Netztransformator
- d = Lampe
- e = Gleichrichter
- f = Wärmeschutzschalter
- h = Diatransport vorwärts und freie Diawahl
- i = Kupplungsmagnet
- j = Umschaltmagnet, abgefallen = vorwärts, angezogen = rückwärts
- k = Diatransport rückwärts
- l = 1-6 = Steckbuchse Mab 6 nach DIN 45322, (siehe auch Abb. B, Seite 56.) Buchsenbelegung unter „Technische Daten“
- m = Fernbedienung vorwärts
- n = Fernbedienung rückwärts
- o = Fernbedienung Fokussierung
- p = Fokussiermotor, funkentstört

### Circuit diagram (S-AV 1010)

- a = Mains switch
- b = Shaded pole motor
- c = Mains transformer
- d = Lamp
- e = Rectifier
- f = Thermal overload cut-out
- h = Forward slide change and select
- i = Clutch solenoid
- j = Reversing solenoid, released = forward, energised = reverse
- k = Reverse slide change
- l = 1-6: 6-pole socket DIN 45322, see Fig. B, page 56 and connection details in "Technical Data"
- m = Remote control forward
- n = Remote control reverse
- o = Remote control focus
- p = Focusing motor, interference suppressed

### Schéma de connexions (S-AV 1010)

- a = Commutateur marche/arrêt
- b = Moteur asynchrone
- c = Transformateur
- d = Lampe
- e = Redresseur
- f = Disjoncteur thermique
- h = Marche avant et projection d'une vue sélectionnée
- i = Electro-aimant d'inversion de la marche
- j = contacteur ouvert = marche avant, contacteur fermé = marche arrière
- k = Marche arrière
- l = 1-6 = prise à 6 broches, voir ill. B, page 56 et connexions, chapitre «Caractéristiques techniques»
- m = Commande à distance, marche avant
- n = Commande à distance, marche arrière
- o = Commande à distance, mise au point
- p = Moteur de mise au point, antiparasité



Schaltplan (S-AV 1030)

- a = Netzschalter
- b = Spaltpolmotor
- c = Netztransformator
- d = Lampe
- e = Gleichrichter
- f = Wärmeschutzschalter
- h = Diatransport vorwärts und freie Diawahl
- i = Kupplungsmagnet
- j = Umschaltmagnet, abgefallen = vorwärts, angezogen = rückwärts
- k = Diatransport rückwärts
- l = 1-6 = Steckbuchse Mab 6 nach DIN 45322, (siehe auch Abb. B, Seite 56.) Buchsenbelegung unter „Technische Daten“.
- m = Fernbedienung vorwärts
- n = Fernbedienung rückwärts
- o = Fernbedienung Fokussierung
- p = Fokussiermotor, funkentstört
- q = Autofocus Ein/Aus
- r = Automatische Fokussierung
- s = Impulsgeber

Circuit diagram (S-AV 1030)

- a = Mains switch
- b = Shaded pole motor
- c = Mains transformer
- d = Lamp
- e = Rectifier
- f = Thermal overload cut-out
- h = Forward slide change and select
- i = Clutch solenoid
- j = Reversing solenoid, released = forward, energised = reverse
- k = Reverse slide change
- l = 1-6: 6-pole socket DIN 45322, see Fig. B, page 56 and connection details in "Technical Data"
- m = Remote control forward
- n = Remote control reverse
- o = Remote control focus
- p = Focusing motor, interference suppressed
- q = Autofocus on-off switch
- r = Autofocus
- s = Interval timer

Schéma de connexions (S-AV 1030)

- a = Commutateur marche/arrêt
- b = Moteur asynchrone
- c = Transformateur
- d = Lampe
- e = Redresseur
- f = Disjoncteur thermique
- h = Marche avant et projection d'une vue sélectionnée
- i = Electro-aimant d'inversion de la marche
- j = contacteur ouvert = marche avant contacteur fermé = marche arrière
- k = Marche arrière
- l = 1-6 = prise à 6 broches, voir ill. B, page 56 et connexions, chapitre «Caractéristiques techniques»
- m = Commande à distance, marche avant
- n = Commande à distance, marche arrière
- o = Commande à distance, mise au point
- p = Moteur de mise au point, antiparasité
- q = Mise au point automatique marche/arrêt
- r = Mise au point automatique
- s = Minuterie incorporée

# KODAK RETINAR S-AV 1000 und S-AV 2000 Objektive

## KODAK RETINAR S-AV 1000 and S-AV 2000 Lenses

<b>KODAK RETINAR S-AV 1000 Lenses</b>		55 mm	85 mm	100 mm	150 mm*	180 mm*	75-120 mm
Vergütung Coating	Couche Revestimiento	●	●	●	●	●	●
24x36 mm	40x40 mm						
Länge Length	Longueur Longitud	125 mm	125 mm	125 mm	156 mm	190 mm	148 mm
Front-Ø Front tube Ø	Tube Ø devant Tubo delantero Ø	73 mm	73 mm	73 mm	63 mm	63 mm	61 mm
Gewicht Weight	Poids Peso	174 g	108 g	108 g	206 g	205 g	239 g
Lichtstärke Aperture	Aperture Abertura	f/2.8	f/2.8	f/2.8	f/3.5	f/3.5	f/3.5
Anzahl Linsen Elements	Elements Número de lentes	5	3	3	3	3	7
Bildwinkel Field angle	Champ Angulo de proyección	48°	36°	30°	32°	26°	32°-20°
<b>KODAK RETINAR S-AV 2000 Lenses</b>		26 mm (26.4 ± 0.3)	36 mm (35.4 ± 0.3)	51 mm (50.6 ± 0.5)	93 mm (92.8 ± 0.5)	135 mm* (134.4 ± 0.7)	150 mm* (149.8 ± 0.7)
Vergütung Coating	Couche Revestimiento	MC	MC	MC	MC	MC	MC
24x36 mm	40x40 mm						
Länge Length	Longueur Longitud	151 mm	125 mm	125 mm	125 mm	125 mm	146 mm
Front-Ø Front tube Ø	Tube Ø devant Tubo delantero Ø	73 mm	78 mm	78 mm	78 mm	78 mm	73 mm
Gewicht Weight	Poids Peso	721 g	457 g	389 g	320 g	437 g	605 g
Lichtstärke Aperture	Aperture Abertura	f/2.8	f/2.8	f/2.8	f/2.5	f/2.8	f/2.8
Anzahl Linsen Elements	Elements Número de lentes	9	7	6	5	5	5
Bildwinkel Field angle	Champ Angulo de proyección	77°	61°	56°	33°	23°	21°
		200 mm** (200.5 ± 1)	253 mm** (252.5 ± 1)	45 mm PC (45.2 ± 0.5)	60 mm PC (59.8 ± 0.5)	93 mm PC (93.1 ± 0.5)	85-210 mm ZOOM
Vergütung Coating	Couche Revestimiento	MC	MC	MC	MC	MC	MC
24x36 mm	40x40 mm						
Länge Length	Longueur Longitud	164 mm	214 mm	142 mm	138 mm	138 mm	176 mm
Front-Ø Front tube Ø	Tube Ø devant Tubo delantero Ø	73 mm	73 mm	72.5 mm	72.5 mm	72.5 mm	68 mm
Gewicht Weight	Poids Peso	618 g	870 g	447 g	359 g	389 g	769 g (1320 g)
Lichtstärke Aperture	Aperture Abertura	f/3.5	f/4	f/2.8	f/2.8	f/2.8	f/3.9
Anzahl Linsen Elements	Elements Número de lentes	5	5	6	6	5	15
Bildwinkel Field angle	Champ Angulo de proyección	16°	13°	50°	39°	26°	27°-12°

\* Für die Projektion von 40x40 mm Dias empfehlen wir, den Spezialkondensator (CAT 706 0833) einzusetzen.

\*\* Spezialkondensator grundsätzlich notwendig (liegt dem Objektiv bei).

\* For projection of 40x40 mm slides the use of the special condenser lens (CAT 706 0833) is recommended.

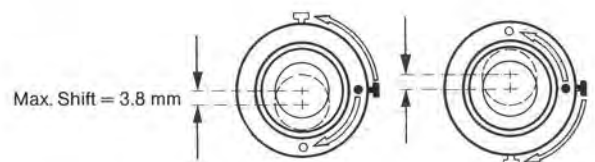
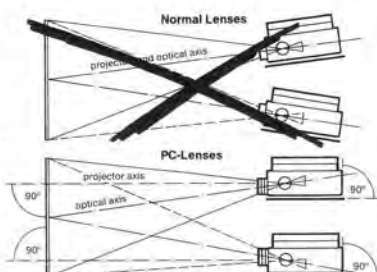
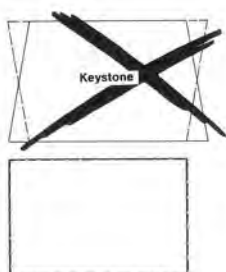
\*\* Use of the special condenser lens necessary and enclosed with the lens.

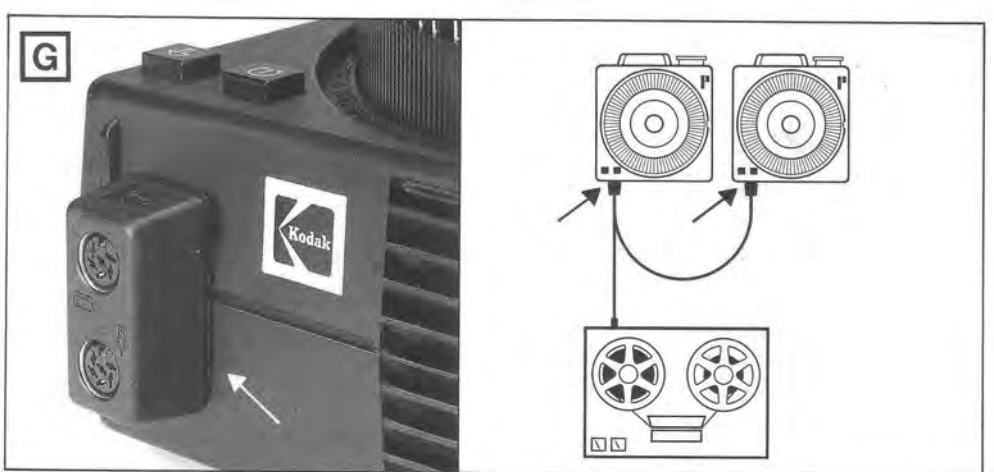
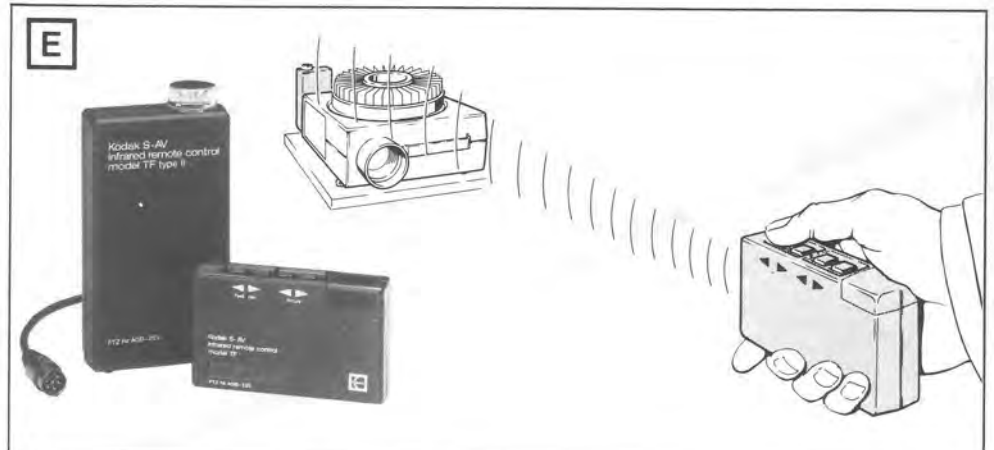
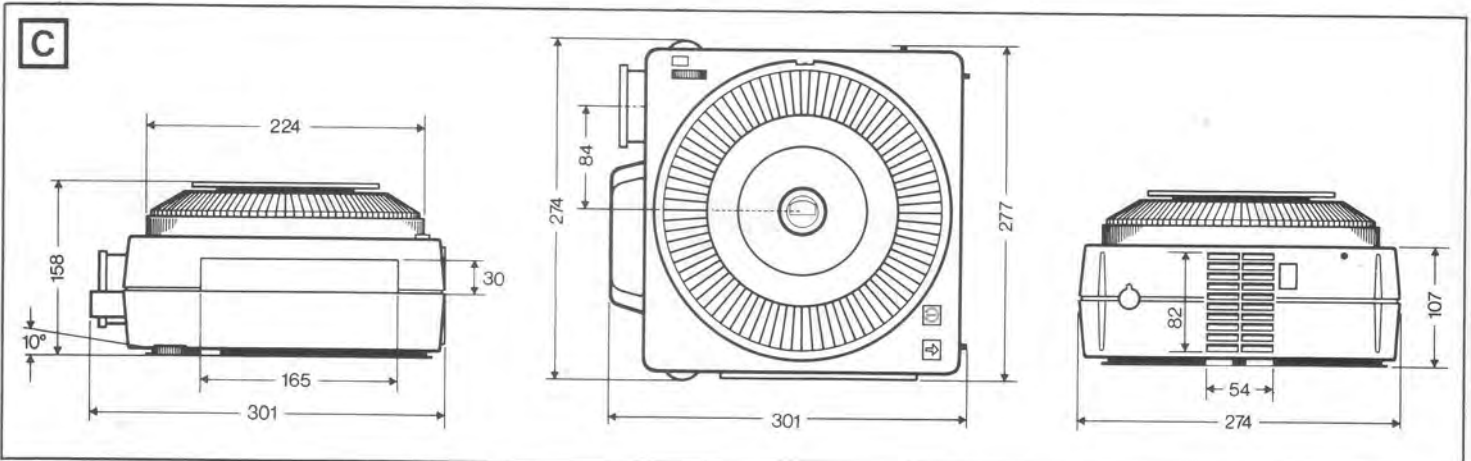
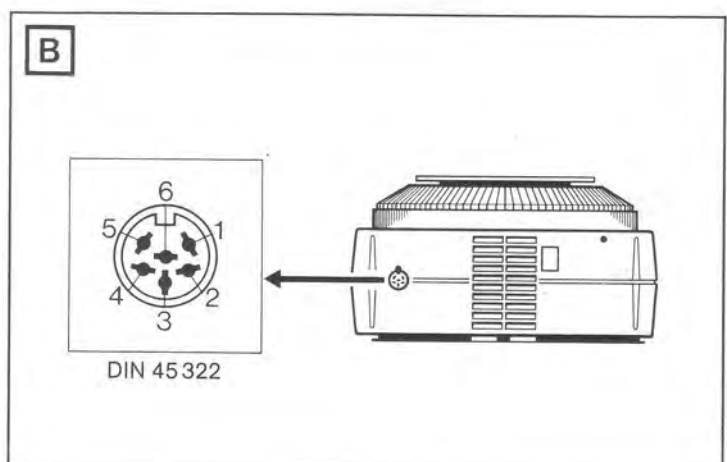
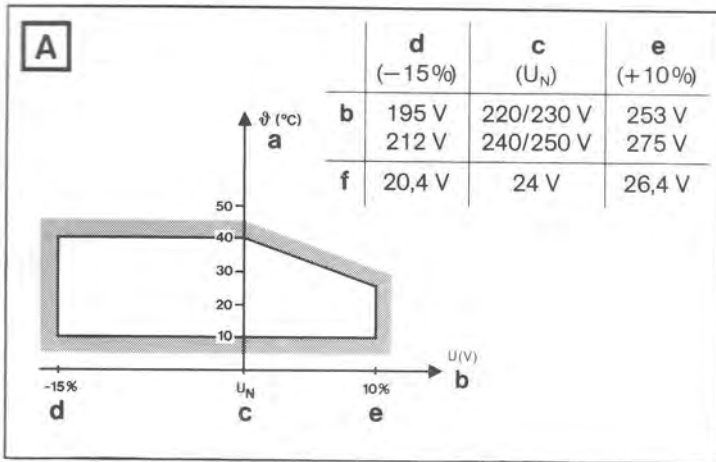
\* Pour la projection de diapositives 40x40 mm il est recommandé d'utiliser un condenseur KODAK CAROUSEL (CAT 706 0833).

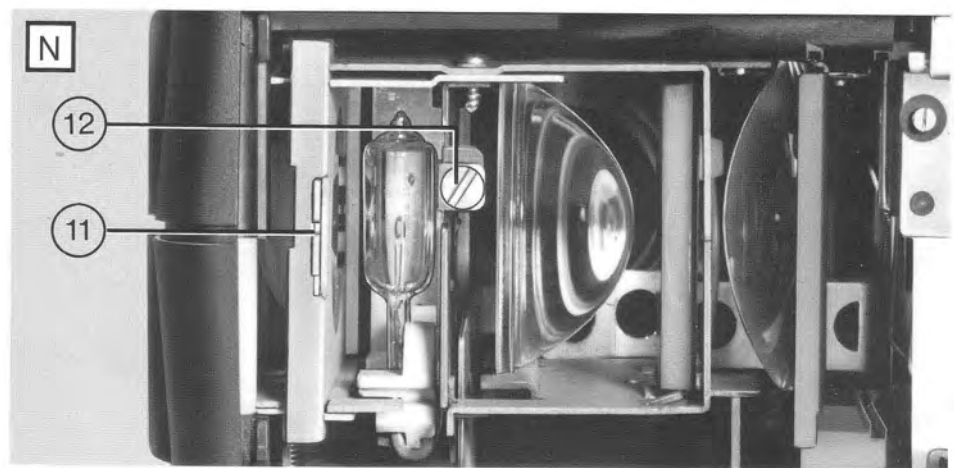
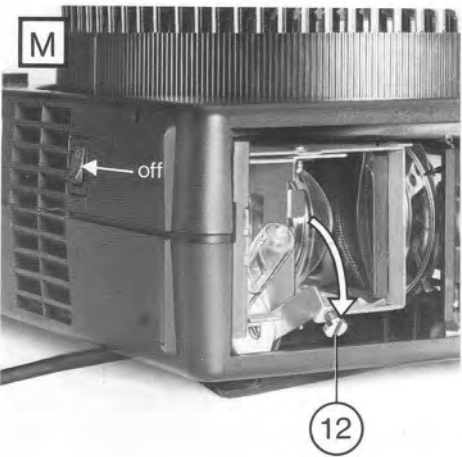
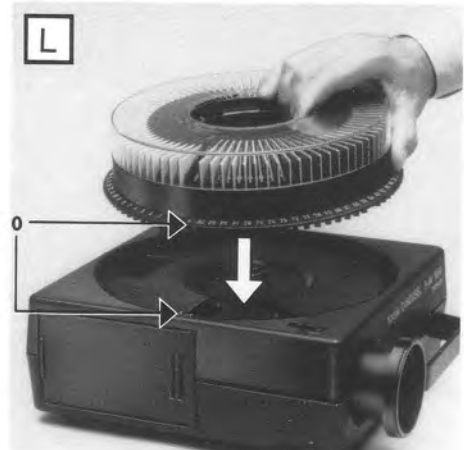
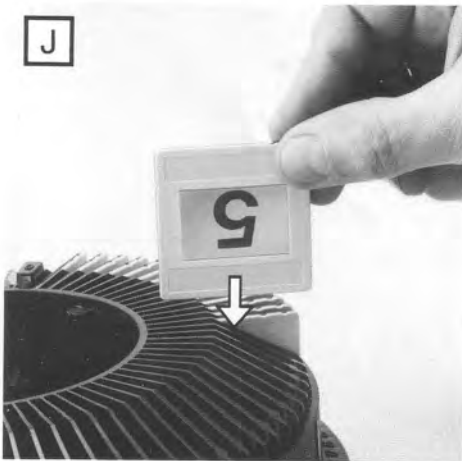
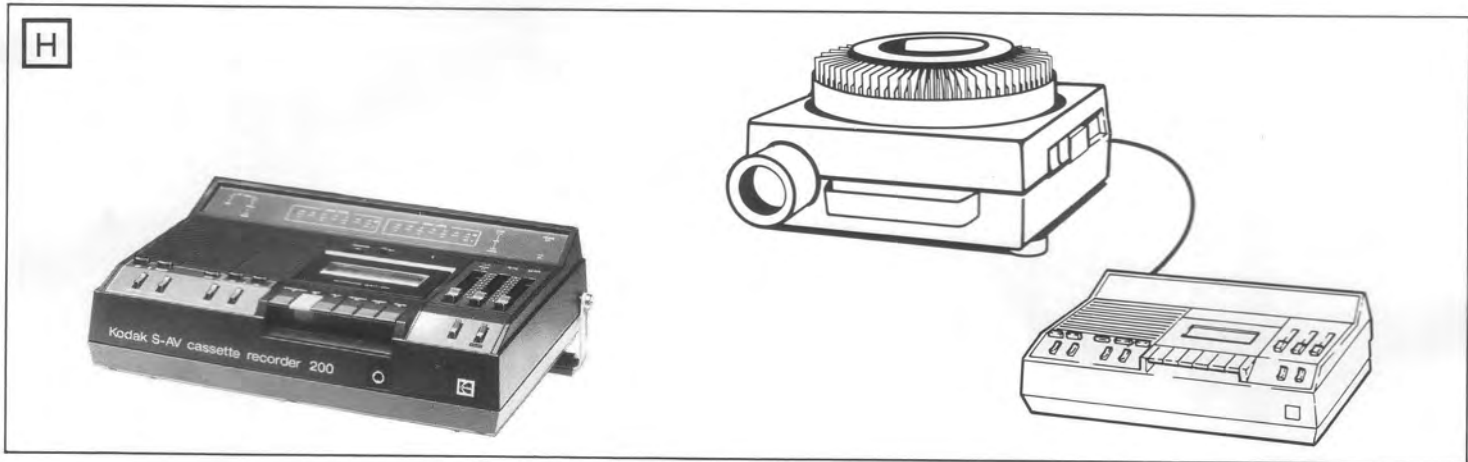
\*\* Il est nécessaire d'utiliser le condenseur fourni avec l'objectif.

\* Para la proyección de diapositivas de 40x40 mm se recomienda el uso de la lente condensadora especial (No. CAT 706 0833).

\*\* Es necesario el uso de la lente condensadora especial que se incluye con el objetivo.







**Projectionsbildbreiten**  
**Projected picture sizes**  
**Dimensions des vues projetées**  
**Anchura de la imagen proyectada**

