Film-Tech

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Anschütz

Film Projector

ERNEMANN 15

Operation Manual

PREFACE

We welcome you as a member in the circle of the ERNEMANN projector users!
By choosing an ERNEMANN projector, you have purchased a technical up–to–date system which, even in the basic version, offers a large variety of functions.
The equipment designed according to the modular system today already shows the "Technology of tomorrow".
It allows for the greatest possible flexibility, e.g. when expanding the equipment as well as for multiple possibilities in application.

The system described in the present manual can actually be obtained in six versions, thus allowing to meet various application requirements and to fit different room dimensions. Operation is the same for all six versions.

ANSCHÜTZ products meet the security standards required for the respective equipment.

In case that malfunctions appear after the equipment has been modified by other persons than members of ANSCHÜTZ staff, the user will be responsible for repair of the malfunction.

The present manual only fulfills the purpose of an operation manual.

We reserve the right of modifications, even without prior announcement.

The numbers of the illustrations referred to in the text are quoted in brackets.
Example: Manual drive wheel = (2–1/4). The first number denotes the chapter concerned, the second number the illustration and the third the individual part or operating element. The first and the second numbers are separated from one another by a horizontal line. If a third number is stated, it is separated from the previous numbers by a slash.

For making optimum use of the projector, please read this manual before putting the projector into operation.

ESSENTIAL DATA OF THE PROJECTOR ERNEMANN 15

Please enter the data of your projector in the following list: this will help you saving time if you need quick information:

Model: .....

Type: .....

No: .....

Date of purchase: .....

Date of initial operation: .....

Installed by: .....

Lamp house type: .....

Xenon lamp type: .....

Additional equipment: .....

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Annexes:

1 General Introduction

1.1 General

The ERNEMANN 15 system represents a future–oriented progress which is based on the latest trends of projection techniques.

Designed as a modular system, it offers a variety of extension and application possi–bilities: Used for large or small projection distances, the equipment offers a solution for all requirements. It includes "Today already the technology of tomorrow"!

The heart of the ERNEMANN 15 system is the projector mechanism.
It is equipped with:

- Maltese cross gearing
- Central frame line adjustment
- Lens holder
- Format slide
- Curved runner blade
- Optical sound head and
- ERNEMANN solar cell for mono or stereo scanning.

The precise mechanical equipment of Maltese cross gearing, film gate and lens turret guarantees a perfect image steadiness; the sound head guarantees a clear sound due to a newly devel–oped Zeiss HIQ sound optics.

The sound head has been designed in such a way that with stereo optical sound scanning the solar cells – mounted for this purpose – are separated from the film run by means of a fiber–optical light guide. The disagreable noises caused by statically loaded copies are avoided, fact which is especially important when operating in Dolby stereo mode.
The exciter lamp rectifier has been mounted in the central device control (slide–in unit) of the projector.

Decisive advantages are offered by the lens holder which can be operated manually or automatically upon request. The moveable lens holder allows easy film loading.
On option, the 35 mm projector models can be equipped with a fully integrated 16 mm projection device with preamplifier for magnetic and optical sound films (marginal track). The projector equipped in this way can optionally be changed over within a very short time from 35 mm film to 16 mm film (or vice versa).

2 System Description, Basic Equipment

The basic equipment of the ERNEMANN 15 series is as follows:

- Projector mechanism
- Projector stand (rack) with tilting device
- Central device control.

The standard projector mechanism comprises:

- Lens holder for manual operation
- Film gate with format slide for manual operation
- Optical sound device with mono solar cell
- Device for manual image–sound fading.

The projector stand (rack) houses:

- The central device control
- Friction assembly.

1.3 Additional Equipment and Extension Stages

Additional equipment:

The projectors of the ERNEMANN 15 series can be delivered with the following features:

- Remote sharp focusing control
- Remote frame line control
- Film tear control
- Motor–operated lens, format slide and shutter control change
- Speed control 16 ... 25 images/second
- Reverse–running device
- Synchronous motor.

Extension stages:

– **MULTI–ERNOPHON**
for the playback of 4–channel magnetic sound copies (Commag).

– **16 mm projection equipment**
allowing to select between 16 mm and 35 mm projection; two film sizes can be projected with a single system and in a single projection axis.

The avantages are obvious:

– only one optical axis
– no additional projection cabin windows required
– only one central drive
– less wearing parts
– only one anamorphote lens for both film sizes
– only one operating panel
– less space requirement than for 2 individual projectors
– self–regulating frictions for both film sizes
– no spare part storing and maintenance for a 2nd projector
– the change–over between the 2 film sizes is effected within a very short time.

.4 **Automatic Equipment**

The ERNEMANN 15 system has been designed in a way that all projector versions allow automatic control on every extension level, no matter if 2 projectors in change–over mode or a single projector with or without long playing device (platter or spool tower) is automated.

Dependent on application, either single procedures can be automated (partial automatic) or the complete projection including all circuit and control procedures necessary for cinema operation can be automatically controlled.

The first level of automatic control allows to equip all projectors of the ERNEMANN 15 system with a remote sharp focusing and frame line control.

This remote control facility can also be installed subsequently without problems.

Condition for every further automatic extension stage is the perfect film tear and splitting control, which also can be installed subsequently.

A further step towards fully automatic control is the automatic drive resp. change–over of the projectors. The necessary modifications can be made subsequently as well.

The highest extension level is obtained with the automatic format change facility, which demands an automatically controlled lens turret and film gate. It goes without saying that these devices can also be installed subsequently.

For controlling the complete projection procedures, the program automatics of

- Variomatik II
  and
- Cinemat 800
  are available from RAYTHEON ANSCHÜTZ GmbH.

1.5 Technical Data

1.5.1 Mechanical Data

– Projection axis inclination angle:	upwards max. 13° downwards max. 13°
– Film spool dia. for 35 mm film:	acc. to DIN 15521

Note:
Winding on 50 mm bobbin possible when using studio spools with aluminium cheeks

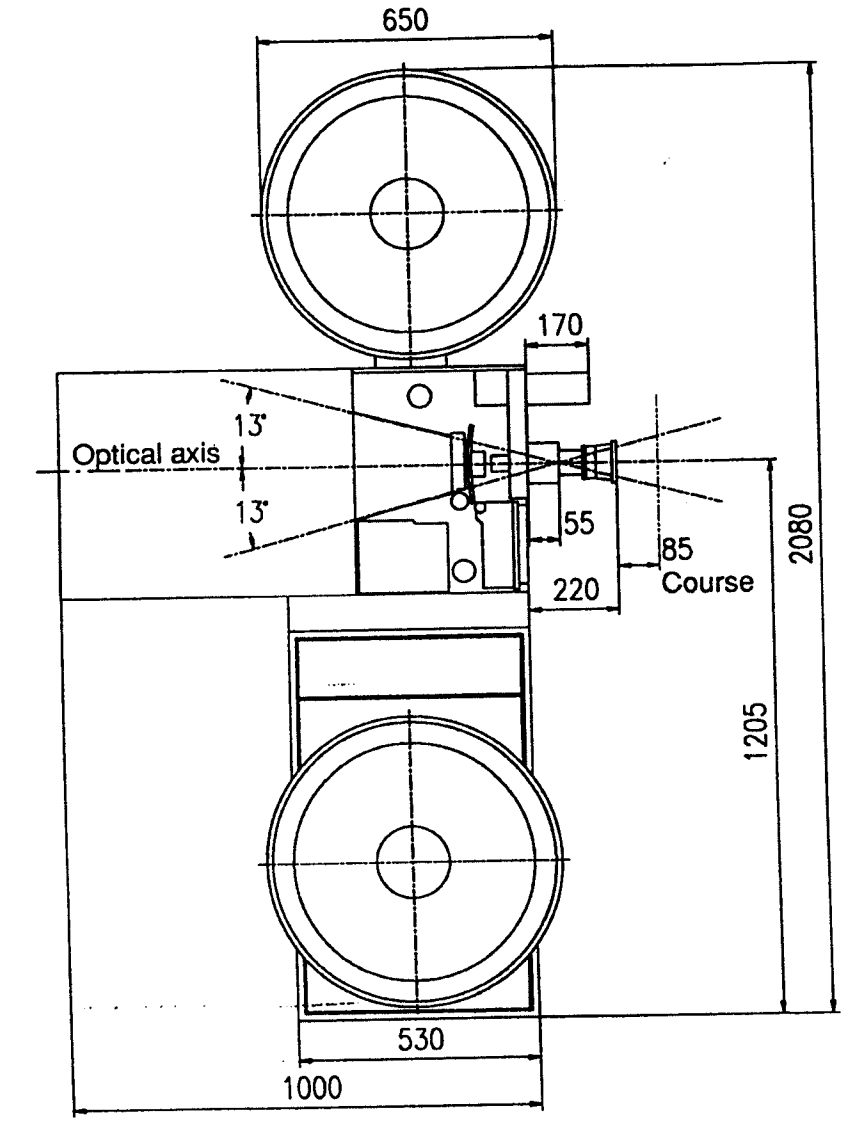
– Friction axle diameter:	9 mm
– Film transport speed:	24 images/s, other frequencies on option
– Flutter and wow (mesured at 3,150Hz):	≤ 0.25%
– Shutter speed at 24 images/s:	1440 r.p.m. ≙ 48 light pulses/s
– Light transmittance of the shutter:	51%
– Image steadiness error with test film BT 35, DIN 15506:	≤ 0.2%
– Average image steadiness error of the projector:	≤ 0.1%
– Oil filling volume of the Maltese cross gearing:	900 cm^3
– Noise level with running projector: (mesured in a height of 1.35 m and 0.6 m away from the projector)	≤ 60 dBA
– Lens turret, maximum mounting diameter:	80 mm

Weight

– Film projector, without spools, total weight	approx. 135 kg
– Lamp house Xenosol 1000	approx. 20 kg
– Lamp house Xenosol 2000	approx. 21 kg
– Lamp house Xenosol 7000	approx. 40 kg

5.2 Electrotechnical Data

Power supply: (connection possibility to 60 Hz sector and other voltages on option)	220V, 50Hz
– Sector fuse:	3.15A, inert
– Power consumption without lamp house:	approx. 0.7 kVA
– Power consumption with lamp house (without DC supply)	
– ignition process:	approx. 1.16 kVA
– continuous operation:	approx. 0.77 kVA
– Control voltage:	24V DC
– Exciter lamp rectifier, current–stabilized:	3.8A
– Exciter lamp:	6V, 5A
– Optical sound scanner:	ERNEMANN solar cell Mono 27–55 Stereo 27–56
– Optical sound	
– signal–to–noise–ratio:	≥ 56 dB
– Solar cell voltage:	25 mV



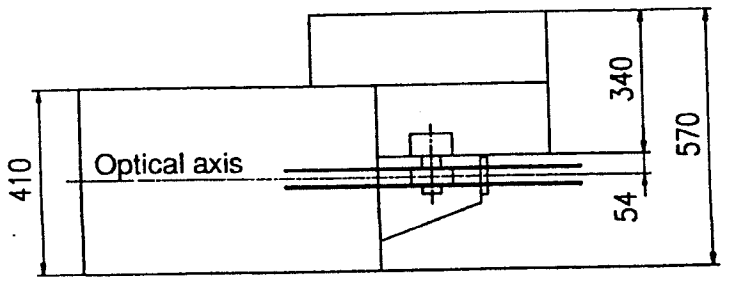


Fig. 1–1: Vertical Friction Assembly, 2000 m – Dimensions in mm –

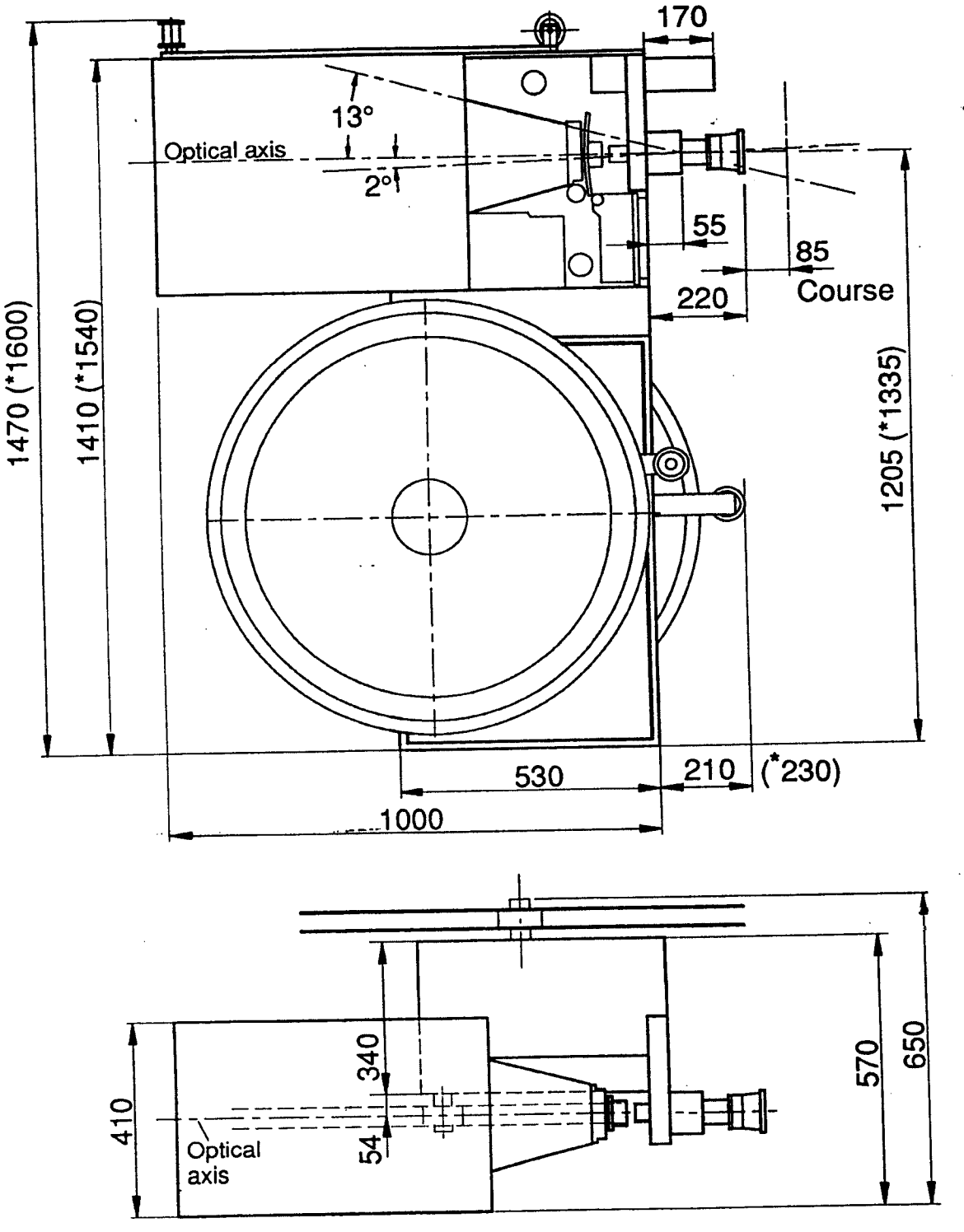


Fig. 1–2: Vertical Friction Assembly, 4000 m / *5000 m – Dimensions in mm –

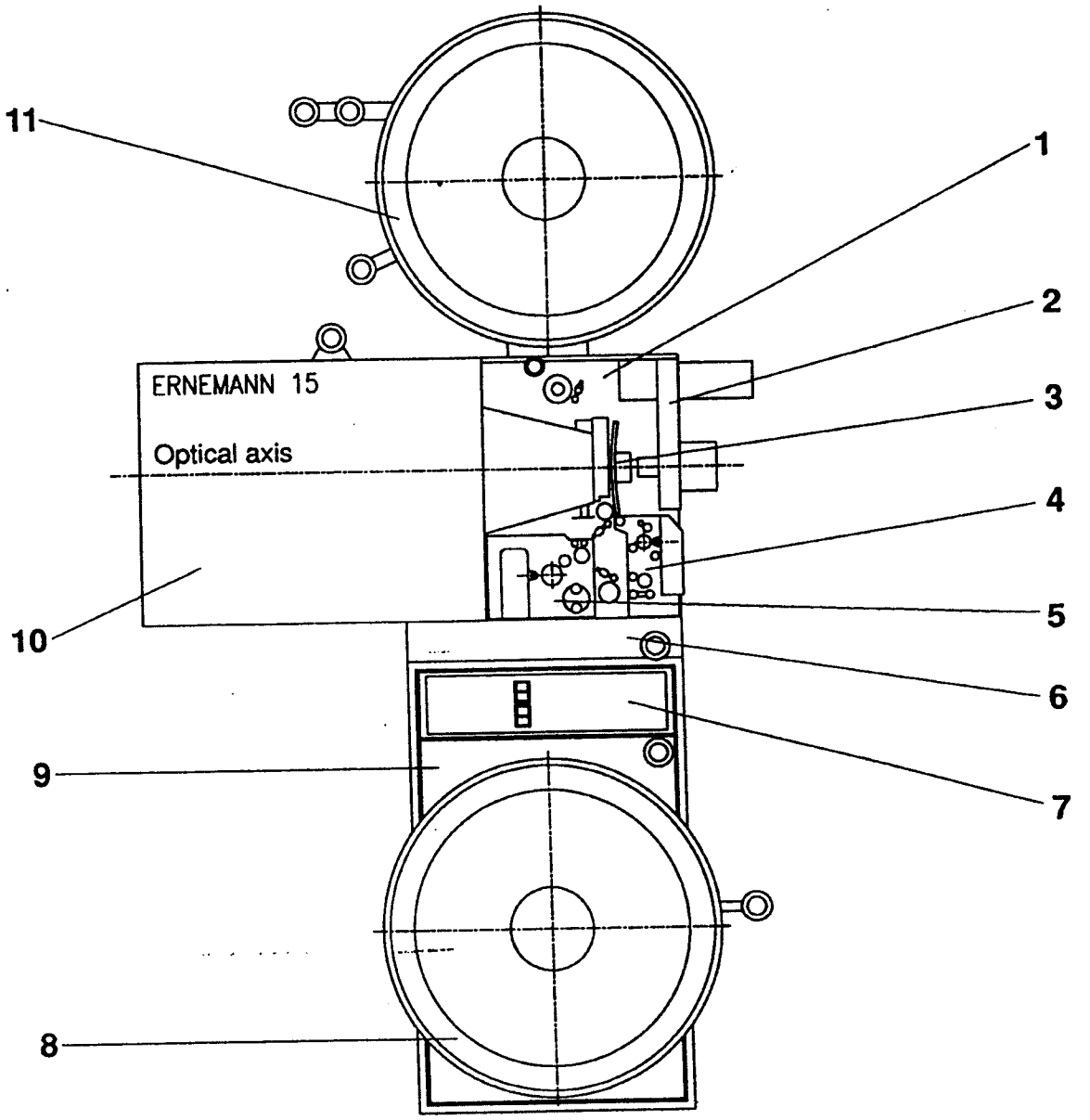


Fig. 1–3: ERNEMANN 15 with Vertical Friction Assembly, 2000 m
– Overall View –

1 Projector mechanism
2 Lens turret
3 Film gate
4 Sound unit, 16 mm
5 Sound unit, 35 mm
6 Tilting device
7 Central device control
8 Take–up friction assembly
9 Projector stand
10 Lamp house
11 Feed friction assembly

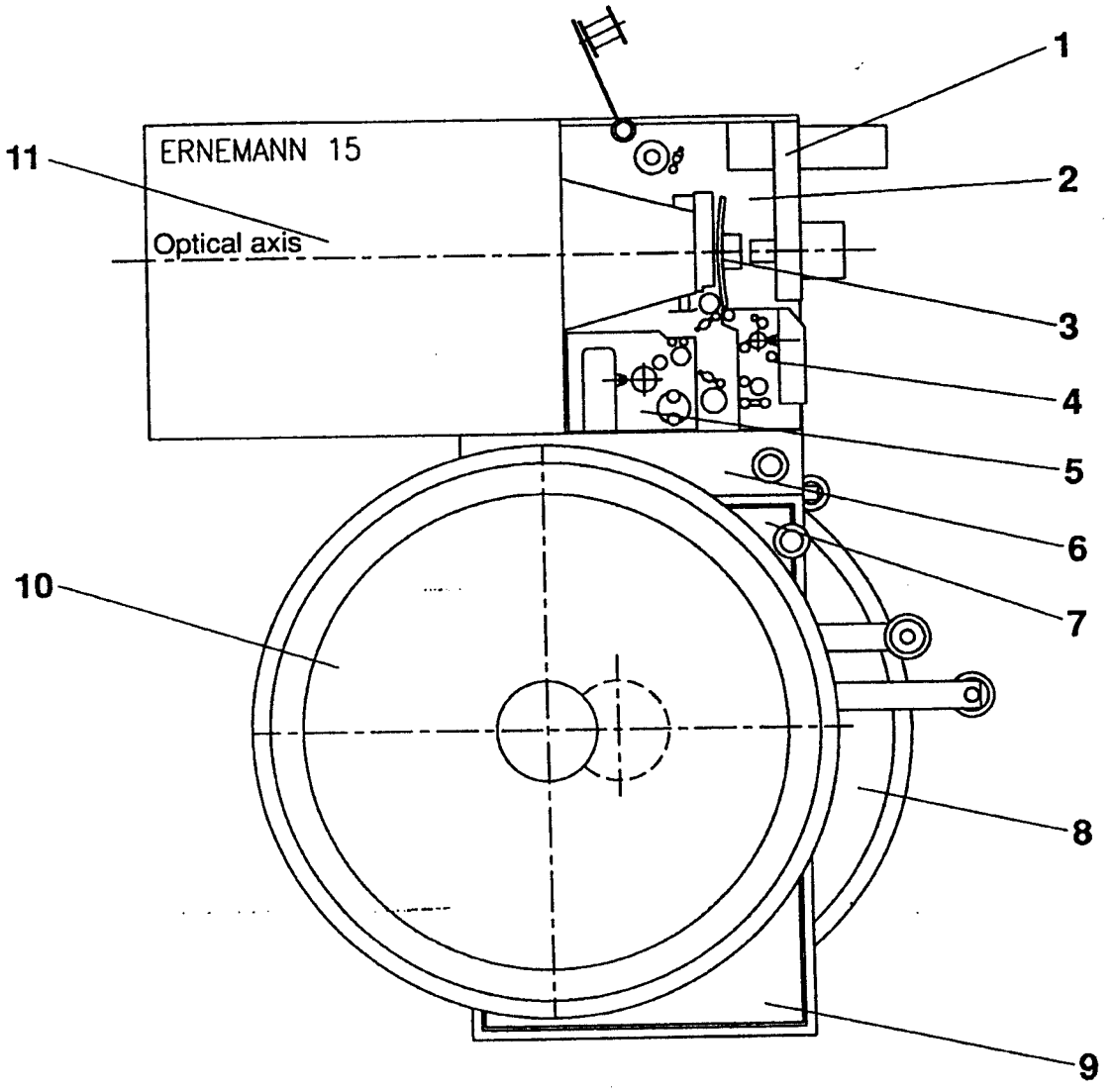


Fig. 1–4: ERNEMANN 15 with Vertical Friction Assembly, 4000 m
– Overall View –

1 Lens turret
2 Projector mechanism
3 Film gate
4 Sound unit, 16 mm
5 Sound unit, 35 mm
6 Tilting device
7 Central device control
8 Feed friction assembly
9 Projector stand
10 Take–up friction assembly
11 Lamp house

2 Operation

Before you start, you should acquaint yourself with the operating elements of the projector and the film gate.

Though projector operation is very simple, it is recommended to observe the following instructions and the order of the various steps: thus, you will avoid malfunctions or damages.

1. As a first step, inform yourself about the projector (Projector Mechanism, Fig. 2–1) and the film gate (Fig. 2–2).

2. Then, get familiarized with the film run through the projector and practise film threading (Sections 2.1 to 2.3).

3. When the film has been threaded and perfect run has been checked, the system can be started via the central device control (see Section 2.4).

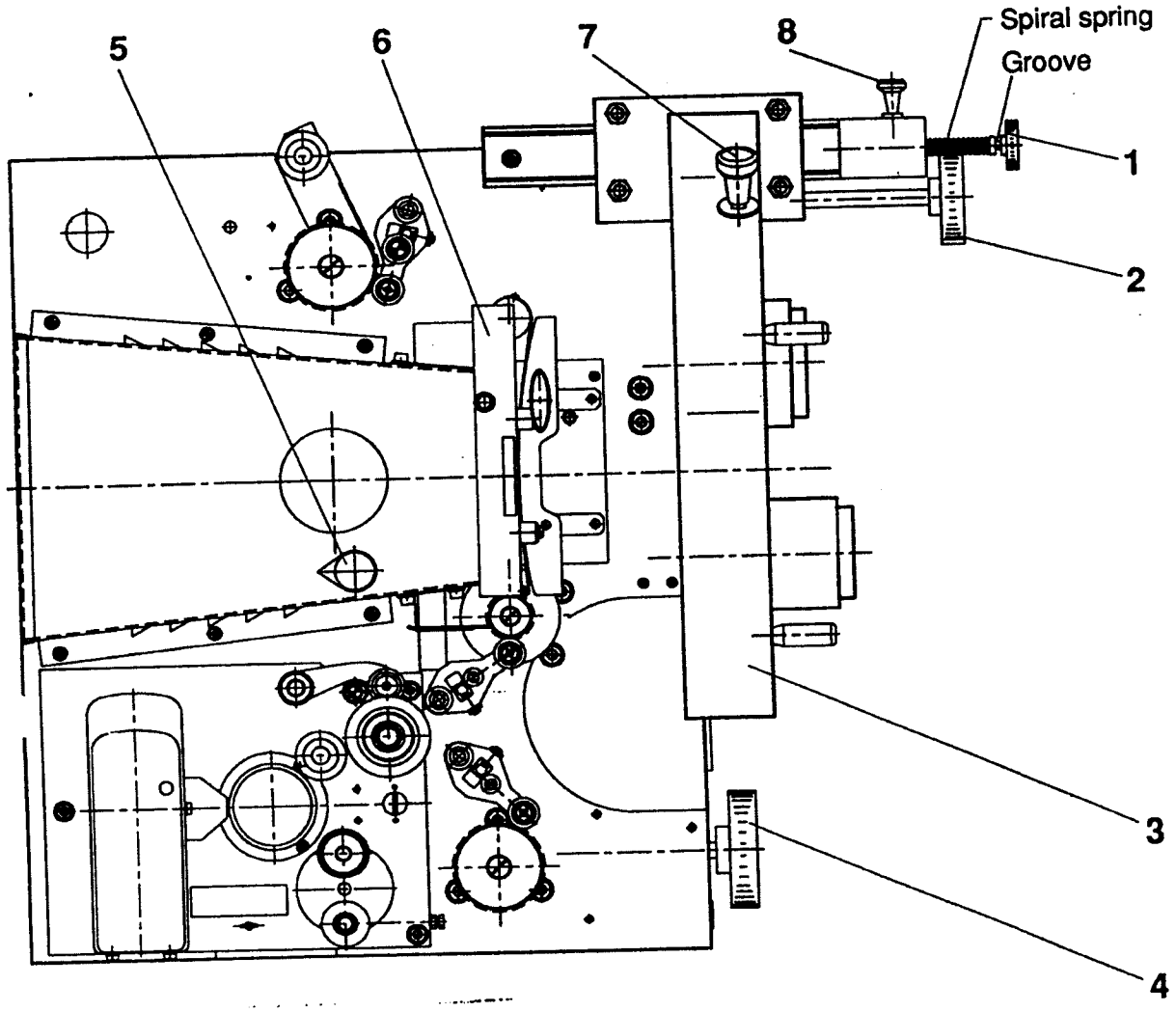


Fig. 2–1: Projector Mechanism

1 Sharp focusing adjuster
2 Frame line adjuster
3 Lens turret equipped with max. 3 lenses
4 Manual drive wheel
5 Shutter
6 Film gate
7 Locking knob for locking the lens turret; with the locking knob pulled, the lens turret is released and e.g. can be turned into another lock–in position
8 Unlocking knob of lens holder (upon actuation, the lens holder will spring to the right at the front on the sliding rail)

a: Film gate closed

b: Film gate opened

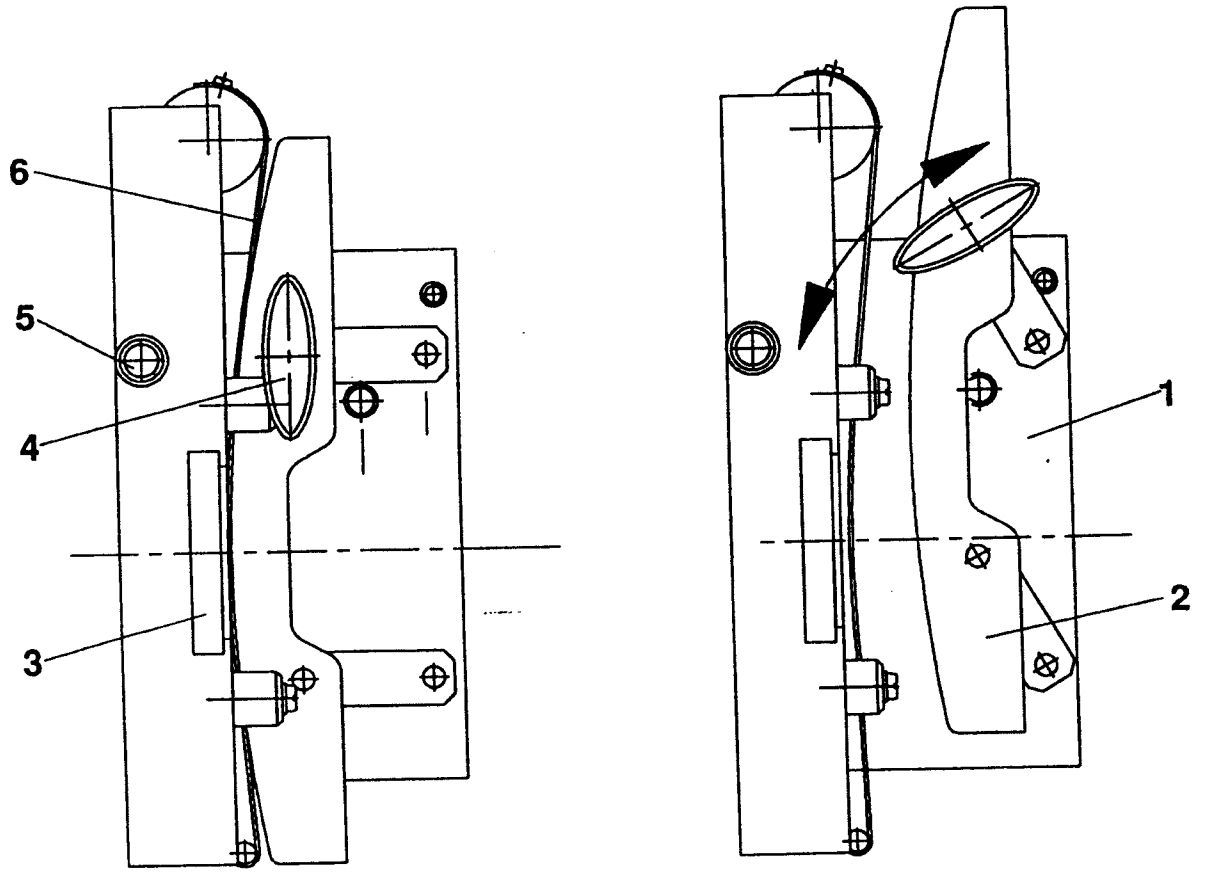


Fig. 2–2: Film Gate

1 Base plate
2 Pressure pad (two)
3 Format slide
4 Swivel knob for opening the film gate
5 Adjusting screw for tensioning the pressure pad tensioners
6 Pressure pad tensioner (two)

.1 **Preparation for Projection**

After having acquainted yourself with the projector, the next step will be to observe the film run through the projector.
The film run is the same for all ERNEMANN 15 series projectors.

However, depending on the fact if you have purchased a system with:

- friction assembly 2000 m
  or
- friction assembly 4000 m

there will be differences in feeding the film from the feed spool to the projector and from the projector to the take–up spool.

Dependent on the friction assembly used, the deviation rollers are fastened in a different way in order that the film may be taken to, and away from, the projector without problems.

For film threading, unwind about 4 m of film from the full feed spool. This length is necessary to feed the film to the take–up reel after it has run through the projector. Take care not to dirty the film on the floor.

Film run always starts at the top of the projector. Fig. 2–3 shows all film guide rollers and describes the film run.

Compare this diagram to your projector and thread the film according to the line described.

2.2 Film Run through the Projector

General Information

The film is fed to the projector from the feed spool (1–3/11).

Via the guide rollers and the feed sprocket, the film runs through the curved runner blade which, together with the adjustable pressure pad straps and a laterally spring–mounted pressure pad guarantees an excellent vertical and horizontal image steadiness.

The disk type shutter with its advantageous light efficiency factor cares for an optimum exploitation of the Xenon light.

When the projector is in idle position, the protector flap in the light beam avoids heat damages of the film.

From the sprocket wheel, the film passes through the optical sound head, where the film run is changed from intermittent to steady mode.

The favourable arrangement of brake roller, sound drum and swivel compensator allows a film run without flutter and wow.

When using a film tearing indicator, a signal transmitter scans the passing film and signals eventual film tearing to the control unit which then will stop the projector.
After having repaired the torn film, the projector can be restarted.

Film tear control:
Film tear control is via limit switch on the control lever or splitting switch, ERNOWIND spool tower.

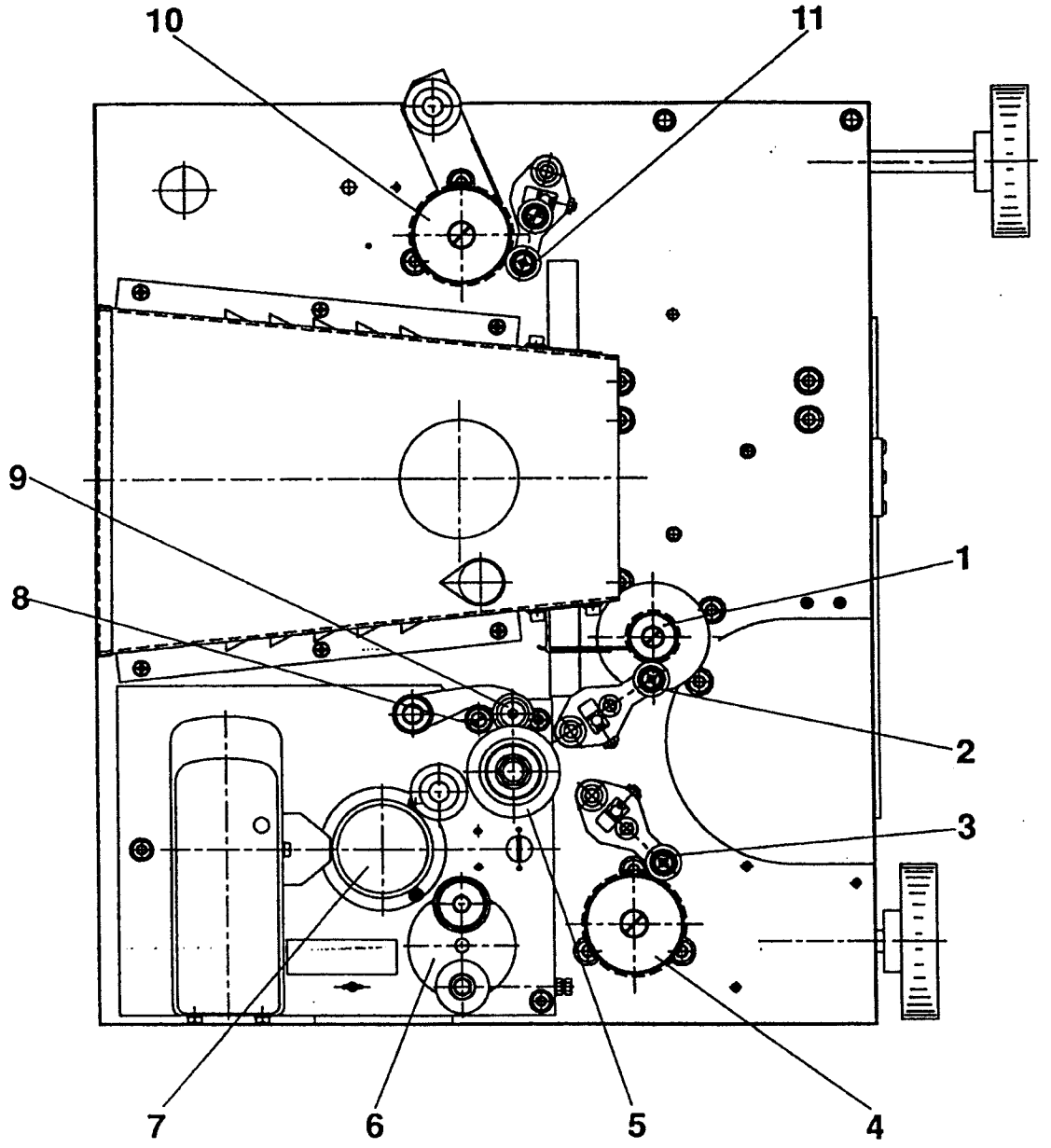


Fig. 2–3: Projector Mechanism with Identification of Rollers

1 Sprocket wheel
2 Pressure roller (for sprocket wheel)
3 Pressure roller (for take–up sprocket)
4 Take–up sprocket
5 Brake roller
6 Swivel compensator
7 Sound drum
8 Guide roller
9 Rubber pressure roller
10 Feed sprocket
11 Pressure roller (for feed sprocket)

2.3 Film Threading

Attention:	When threading the film, the sound track must always show to the projector outside, towards the operator!

1. Unlock the lens holder (2–1/8):	It will slide to the right at the front on the rail.
2. Open the film gate (2–2):	Turn the swivel knob (2–2/4) clockwise, parallel–guided film gate opens (see Fig. 2–2/a and 2–2/b).
3. Swing out the pressure rollers:	Rollers: (2–3/2), (2–3/3), (2–3/9) and (2–3/11).
4. Adjust the frame line:	– Turn manual drive wheel (2–1/4) until sprocket wheel (2–3/1) stands still. – Turn the frame line setting knob (2–1/2) until the cross mark on sprocket wheel (2–3/1) is in horizontal or vertical position. – If the setting is correct, the sprocket wheel – after another turn – stops in the (+) position (see cross mark on sprocket wheel).
5. Film threading (unwind approx. 4 m of film from the feed spool)	Feed the film according to the film run diagram: – via feed roller to feed sprocket (2–3/10) – around feed sprocket (2–3/10) to pressure roller (2–3/11) – via the pressure roller (2–3/11) to the film gate (Fig. 2–2) – through the film gate to sprocket wheel (2–3/1) – position a film frame line on the (+) mark of sprocket wheel – (2–3/1) – from sprocket wheel (2–3/1) to pressure roller (2–3/2) – around pressure roller (2–3/2) to brake roller (2–3/5), lift the spring arm for this purpose – via brake roller (2–3/5) to sound drum (2–3/7) – via sound drum (2–3/7) to swivel compensator (2–3/6) – via swivel compensator (2–3/6) to take–up sprocket (2–3/4) – having passed take–up sprocket (2–3/4), the film is led to the take–up friction (1–3/8) via the guide rollers. Due to the intermittent film transport, a loop has to be formed between feed sprocket and the film gate as well as between the film gate and the brake roller when threading the film, as shown in the illustrations of Annexes 1 to 4.

Close the film gate (Fig. 2–2):	Turn the swivel knob (2–2/4) counterclockwise, the parallel–guided film gate closes (see Fig. 2–2/a and 2–2/b).
Reposition pressure rollers:	Swing pressure rollers (2–3/2), (2–3/3), (2–3/9) and (2–3/11) in again.
Check the film run:	Turn the manual drive wheel (2–1/4) clockwise and check film for correct run. The upper and lower film loops have to move freely. If necessary, reposition the film at feed sprocket (2–3/10) and take–up sprocket (2–3/4).
Close the lens holder:	Press the sharp focusing adjustment button (2–1/1) on the lens turret until it locks.

2.4 Setting into Operation

After the film has been threaded and the correct film run has been checked, the system can be started via the central device control (Fig. 2–4).
The control elements have the following functions:

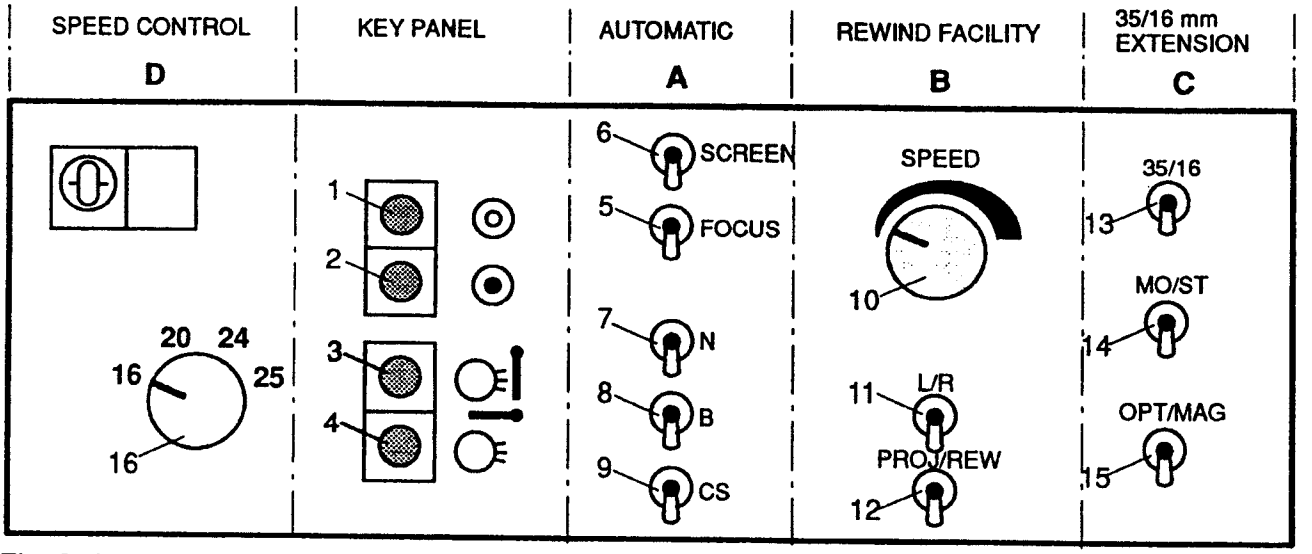


Fig. 2–4: Central Device Control
– Operating and Control Panel –

1 Key 1, system "STOP"
2 Key 2, motor "START"
3 Key 3, protector flap "CLOSED" sound "OFF"
4 Key 4, protector flap "OPEN" sound "ON"

5 Remote sharp focusing adjustment
6 Remote frame line adjustment
7 Lens and shutter change, format 1 : 1.37
8 Lens and shutter change, format 1 : 1.66
9 Lens and shutter change, format 1 : 2.35
} **A** = AUTOMATIC

10 Speed control – rewind facility
11 Change–over switch – feed friction assembly, left / right
12 Change–over switch – projection / rewind
} **B** = REWIND FACILITY

13 Change–over switch – film format, 35 mm / 16 mm
14 Change–over switch – MONO / STEREO
15 Change–over switch – optical sound / magnetic sound
} **C** = 35/16 mm EXTENSION

16 Change–over switch – 16, 20, 24 or 25 images/second } **D** = SPEED CONTROL

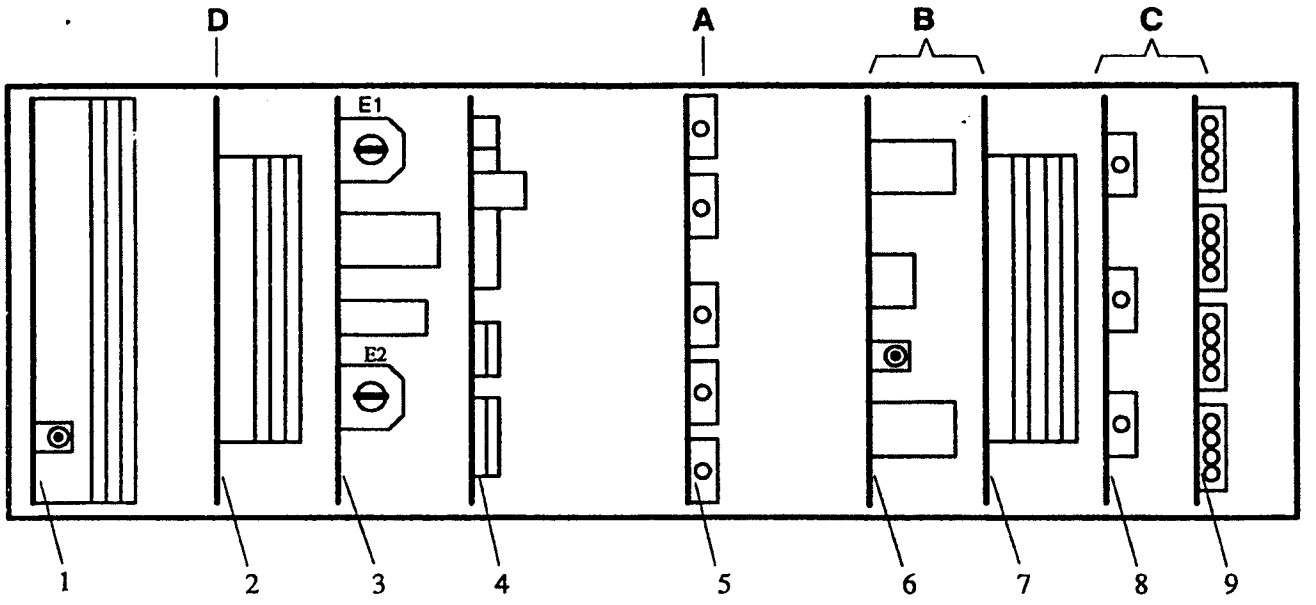


Fig. 2–5: Central Device Control

1 Exciter lamp rectifier
2 Friction control – take–up friction assembly
3 Relay PCB + power supply unit
4 Computer PCB
5 Automatic PCB
6 Control – rewind facility
7 Friction control – feed friction assembly
8 Change–over field – 35 mm / 16 mm
9 Pre–amplifier – 35 mm / 16 mm

2.5 Starting the Projection System

- Switch on power supply

(The information given in brackets refers to extension functions)

1. Press key (2–4/1) — System "STOP"
   (After 5 seconds, friction assembly "OFF")
2. Press key (2–4/2) — Motor "START"
   (ERNOWIND or spool tower "START")
3. Press key (2–4/3 — Protector flap "CLOSED" – sound "OFF"
   (Reset of disturbance message after film tear)
4. Press key (2–4/4) — Protector flap "OPEN" – sound "ON"
   (Automatic START of complete system)

.6 Stopping the Projector

1. Press key (2–4/1): Protector flap closes.
Sound goes off and
the projector will stop.

Independently from step **1.**,
press key (2–4/3),
if required: By this, only the protector flap is closed,
the projector continues running.

Attention:
Power supply must not be interrupted before the running–out period of the Xenon lamp ventilator is terminated (10 min. approx.) !

If the projector is not in use, all pressure rollers should be swung out to avoid pressure marks on the running surfaces.

2.7 Function Controls

- **Frame line adjustment**

– Check the frame line position, and, if necessary, adjust by means of frame line adjuster (2–1/2).

- **Sharp focusing**

– Check the image sharpness and, if necessary, correct by means of sharp focusing adjuster (2–1/1).

- **Film pressure adjustment**

– The film pressure is adjusted in the runner blade.
The film passes through the projector between the curved pressure pads (2–2/2) and the pressure pad straps (2–2/6).

Thus, a friction is generated which is an important factor for film transport.

Film traction should be kept as low as possible.

Adjustment is to be done as follows:
– Turn the adjusting screw (2–2/5) to the left stop
– Turn the adjusting screw (2–2/5) clockwise until the image perfectly "stands".

Attention:
A too strong film pressure will cause unnecessary wearing!

- **Format change**
  If films with different formats are to be projected within one session, the

– 2–fold or 3–fold lens turret and the
– format slide (2–2/3) allow quick adaptation.

The change–over is to be effected as follows:
– Unlock the lens turret by pulling the locking knob (2–1/7); simultaneously.
– Turn the lens turret by both handles and swing the wanted lens into the beam path.
– Release the locking knob (2–1/7) again.
  (For exact positioning of the lens concerned, 2 or 3 lock–in positions are available acc. to the number of lenses.)
– Set the wanted format by means of the format slide (2–2/3).

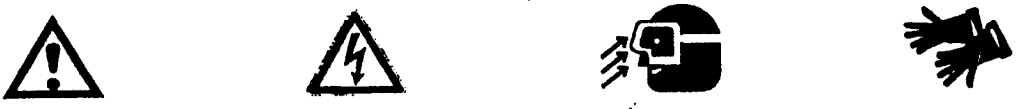
- **Change–over**
  (Operation with 2 projectors):
  Shortly before the end of the film spool of the 1st film projector,
  upon appearance of the first change–over mark:

– **Press KEY 2**
  – (2nd film projector starts).

  When the second change–over mark appears:

– **Press KEY 4**
  – Protector flap of 2nd film projector is opened
  – Sound is faded in
  – Protector flap of 1st film projector is closed
  – Sound of 1st film projector is switched off.

3 Attendance and Maintenance



Attention!
Prior to starting work, the film projector must be electrically isolated.
When work is performed on the opened lamp house, the safety regulations must absolutely be observed! Even the cold Xenon lamp is under pressure and may burst.
A protective mask and protective gloves must be put on!

You must regularly carry out the works described below.
Thus, your projector will keep

- a permanent readiness for operation
- its operation safety
- its longevity.

3.1 Cleansing Agents

In case of slight dirt:

- Soft brushes (small – medium – large), e.g. for dedusting the mirror surface
- Soft leather cloth
- Cleaning clothes of various sizes, not pilling
- Brush (e.g. soft toothbrush).

In case of obstinate dirt:

- Alcohol
- Distilled water.

3.2 Daily Works

- Check pressure rollers for easy run
- Remove heavy going rollers
  (To remove the rollers, screw off screws or knurled knobs)
- Clean film gate, runner blade, pressure pad straps, sprockets and guide rollers from adhesive dirt and abrasion particles.

After cleaning:

– Apply one drop of projector oil to each axle

Attention: Plastic rollers must not be oiled!

– Re–assembly of rollers to be made in reverse order
– Check rollers for easy run.

3 **Weekly Works**

– Remove all rollers and clean them
– Clean plastic rollers, but do not oil !
– Oil axles (as described under "Daily Works", Section 3.2)
– Check pressure pad straps and replace completely, if worn.
– Mirrors, lenses and projection screens are carefully to be freed from dust with a soft brush in order that a constant optimum light efficiency might be ensured.

Cleaning in case of heavy contamination:– Moist dirt with alcohol or distilled water and carefully clean and polish with a clean, non–pilling cloth. No other cleansing agents must be used !

Note:

Improper cleaning of the mirror may cause damages of the mirror coating and of the antireflex coating!

Do not touch the mirror surface with your fingers!

Utmost caution is advised with cold–light mirrors!

Possible finger marks or contaminations are carefully to be removed with pure alcohol.

Exchange of air filter

The paper air filter mounted laterally on the lamp house is to be checked for contamination weekly and to be exchanged, if necessary!

3.4 Possible Malfunctions and Remedies

The following hints only refer to the film projector. For hints concerning additional equipment as amplifiers, rectifiers etc., please refer to the operating instructions delivered with the respective equipment.

MALFUNCTION	POSSIBLE CAUSE	REMEDY
Projector does not run	– main power switch not ON	– check
Signal lamp in projector mechanism not alight	– main distributor fuse defective – fuse in control slide–in unit defective	– replace defective fuse – replace defective fuse
Projector stops	– driving motor overheated	– let motor cool down * CALL FOR SERVICE !
Lamp house overheated	– air filter clogged	– renew air filter
(Only for automatic type projectors) Lens turret doesn't work	– projector start key has not been pressed	– press projector start key
Image position: – immediately after projector start – during projection	– wrong film threading – bad joint	– actuate frame adjustment – actuate frame adjustment, renew joint before next session

MALFUNCTION	POSSIBLE CAUSE	REMEDY
Image steadiness: – quick height variations	– displaced perforation – perforation damage – insufficient friction between runner blade/film/ pressure pad straps – much abrasion particles in the film gate – extremely worn pressure pad straps – beating sprocket wheel – Maltese cross error	– no remedy, bad film – repair perforation – increase pressure pad strap tension – clean film gate – replace pressure pad straps – replace sprocket wheel * CALL FOR SERVICE !
Oil leaks a e projector mechanism	– defect sealing – worn sealing material – oil leakage from bearings	– fill in oil immediately * in all cases of oil leakage, CALL immediately FOR SERVICE !
Sound interruption - no sound at all - irregular sound interruptions - howling sound	Optical sound head – defective exciter lamp – no lamp voltage – bad exciter lamp contact – stuck brake roller	– replace exciter lamp * CALL FOR SERVICE ! – check contacts – dismount brake roller, clean axle and felt disk, oil slightly and remount roller
Sound volume loss	– dirty sound optics – blackened exciter lamp – insufficient exciter lamp current – Incorrect slit image setting	– clean – replace exciter lamp * CALL FOR SERVICE ! * CALL FOR SERVICE !

3.5 Oil Change

The first oil change in the projector mechanism is to be effected after 500 h of operation. Then, oil is to be changed every 1.000 h of operation as described below:

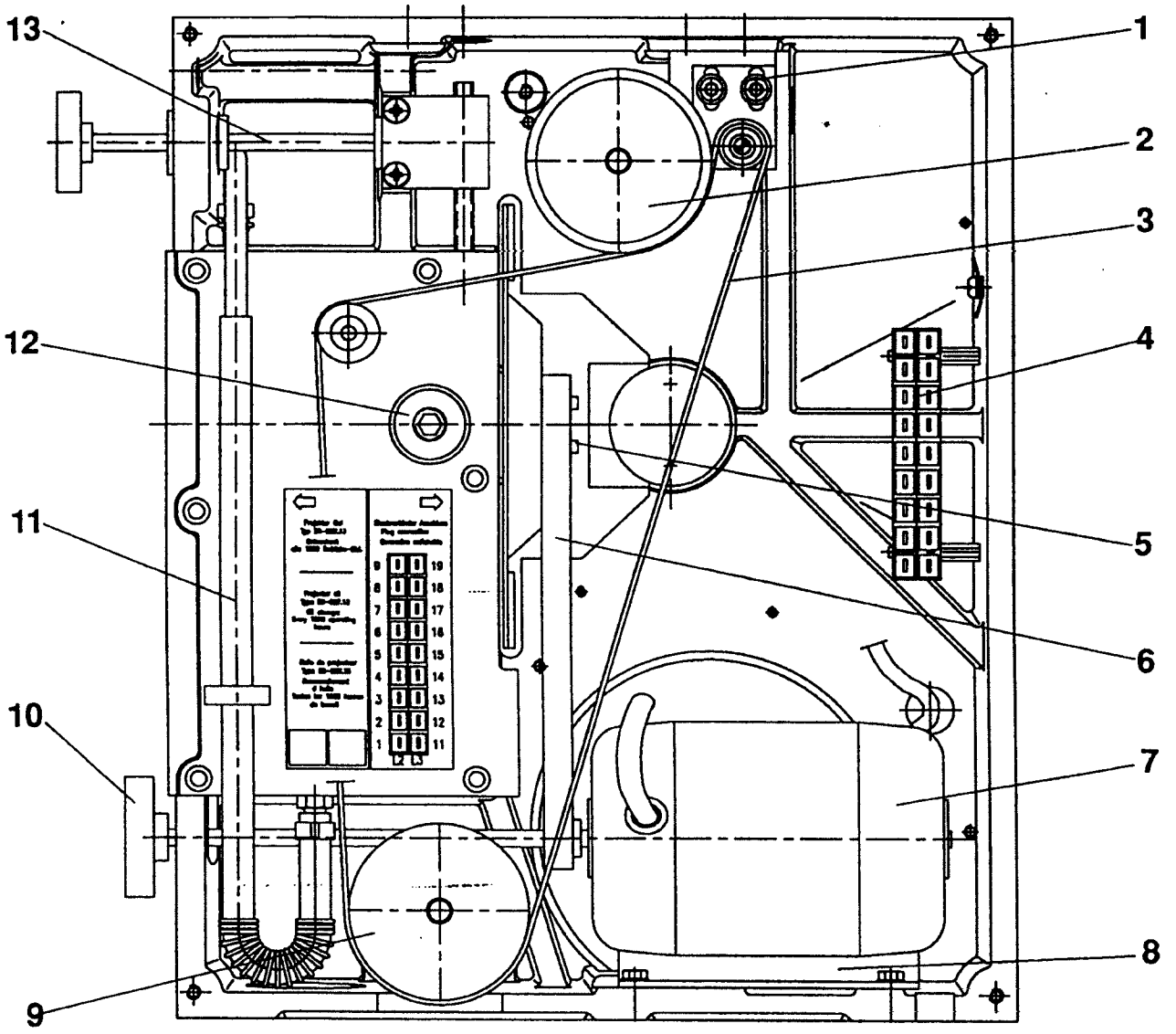
Attention!

Before starting work, isolate the device electrically!

1. Remove the projector rear cover.
2. Unscrew magnetic screw (3–1/12) and clean from abrasion particles.
3. Remove draining hose (3–1/11) from its support and place it above a recipient for draining.
4. After oil has been drained, place hose back on the tube end and the support.
5. Screw the filling hose (part of the projector accessories) to the oil flask.
6. Fill in the complete content of the flask via the magnetic screw hole.
7. Screw–in the magnetic screw.
8. Remount the projector rear cover.
9. Care for the waste oil disposal according to the regulations.

Oil filling volume:	0.9 l
Projector oil, Order No.:	5027–13
Oil filling hose, Order No.:	12–27.27

Attention: Only use the special oil for ERNEMANN 15 projectors as specified by the order number. Any other oil will cause accelerated wearing.



1.3–1: Projector – Rear Side (opened)

	Belt tensioner	8	Motor support / belt tensioner
	Drive wheel (for feed sprocket)	9	Drive wheel
	Toothed belt		(for take–up sprocket)
	(for feed and take–up sprockets)	10	Manual drive wheel
	Terminal strip	11	Oil level control and draining hose
	Drive wheel (gearing)	12	Magnetic screw
	Main drive belt	13	Shaft
	Drive motor		(for frame line adjustment with handwheel)

3.6 Control of Drive Belts

Free toothed belt and wheels from dirt regularly.

Main drive belt

– The main drive belt (3–1/6) has to be checked for correct tension every 1.000 h of operation.

  Tension is correct if the main drive belt can be pressed down (use thumb, medium force) 5 mm approx. between the toothed wheel on the motor shaft and the toothed wheel on the shutter axle.

– Belt tension can be adjusted by changing the position of the drive motor (3–1/7). For this purpose, loosen the fastening screws of the drive motor, adjust the drive motor (oblong holes in motor base) and then re–tighten the fastening screws.

> **Attention:** A too strong belt tension will cause unnecessary wearing of the bearings!

In case of wearing, the main drive belt is to be replaced
Order No.: NB 08–015–26

Drive belts for feed and take–up sprocket

– Check the belt tension between gear driving wheel (3–1/5) and take–up sprocket driving wheel (3–1/9) (cf. Section 3.6 – Main drive belt –).

– Adjustment is effected by shifting the belt tensioner (3–1/1). For this, loosen the fastening screws of the belt tensioner, and – after adjustment – re–tighten them again.

7 **Maintenance of the Xenon Lamp House**




Attention!
Before opening the lamp house, isolate the film projector electrically.
When working on the open lamp house, the security regulations have absolutely to be observed!
Even a cold Xenon lamp is under pressure and may burst. Protection gloves and a face protection mask have to be used in any case!

– Clean the lamp house inside as described under Section 3.3 ("Weekly Works").

Air filter exchange
The paper air filter mounted laterally on the lamp house must be checked for dirt weekly and, if necessary, replaced!

– Check all DC connections for tight fit and tighten, if necessary.

Attention:
Loose connections on the Xenon lamp will cause the lamp socle to overheat: This may cause unnecessary wearing of the Xenon lamp and the loss of the warranty.

- Measures to be taken

  – if the light efficiency of the Xenon lamp decreases

  – if the Xenon lamp is to be replaced

  – if the mirror is to be replaced

  – and instructions regarding the necessary adjustments for a perfect screen illumination will be found in the manufacturer's information for the Xenon lamp concerned.

4 Assembly / Adjustment

Attention!

Before starting work, disconnect the film projector.
When working on the open lamp house, it is absolutely necessary to observe the security regulations! Even the cold Xenon lamp is under pressure and may burst.
A face protection mask and protection gloves must be used!

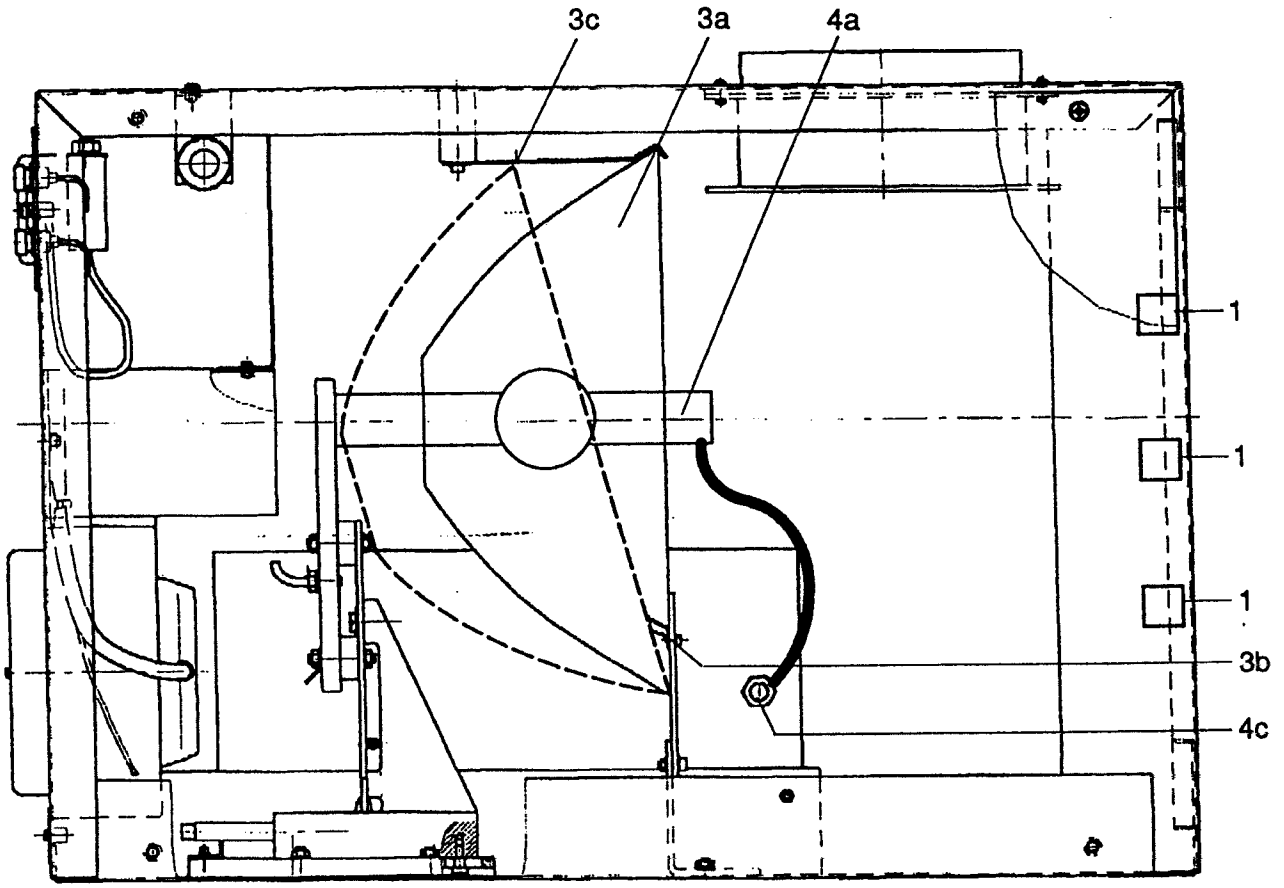


Fig. 4–1: Lamp House XENOSOL 2000, Assembly of Mirror and Xenon Lamp

4.1 Assembly / Xenon Lamp XENOSOL 2000

1) Open the doors on the right and on the left.
2) Place the Xenon lamp on the support
   and screw it on by means of 4 screws M8 x 20 DIN 912 (Pos. 1).

3) Insert the mirror.

Attention: Never touch the mirror coating with your fingers!

a) The mirror has been marked by "Top" (this side up).

b) Place the mirror – from behind and inclined – on the lower holders.

c) Press the upper mirror holder to above, and push the mirror to the front until the latter locks into place.

4) Mount the Xenon lamp

a) Screw the Xenon lamp with protective covering into the holder.

b) Carefully remove the protective covering.

c) Screw on the DC connection.

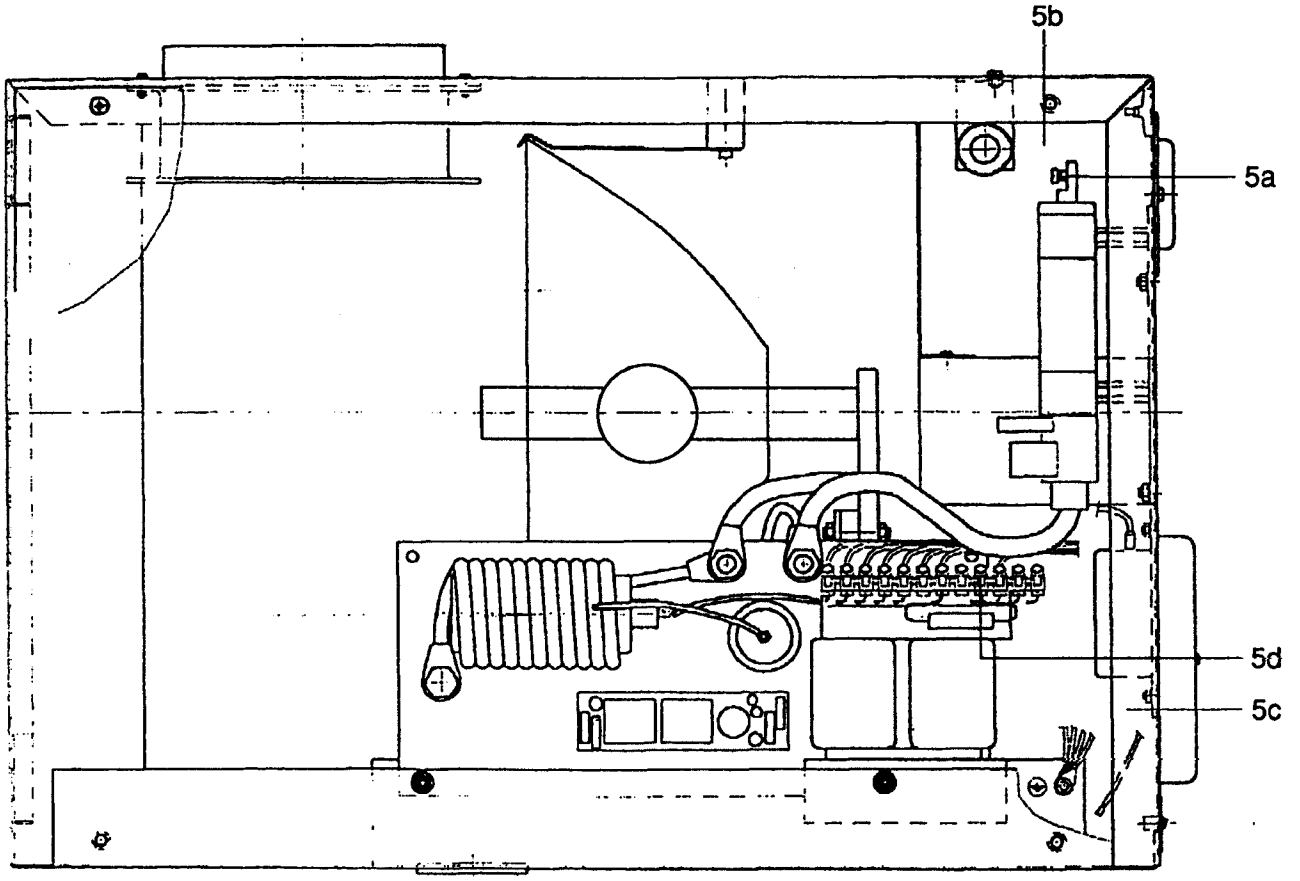


Fig. 4–2: Lamp House XENOSOL 2000, Position of the DC and AC Connections

5) Establish electrical connections

a) DC connection, negative (– DC)

b) DC connection, positive (+ DC)

c) Apply AC voltage with plug contact 1–2

d) Apply AC voltage to terminal 9.

4.2 Adjustment / Xenon Lamp XENOSOL 2000

The Xenon lamp "XENOSOL 2000" has been checked and pre–adjusted at the works, together with the film projector.

After starting the Xenon lamp, a round light spot is to be seen on the film gate in the shutter casing.

If this light spot is not centered with regard to the film gate, the Xenon lamp can be re–adjusted by means of the spindles:

H = Height
F = Focus
S = Side.

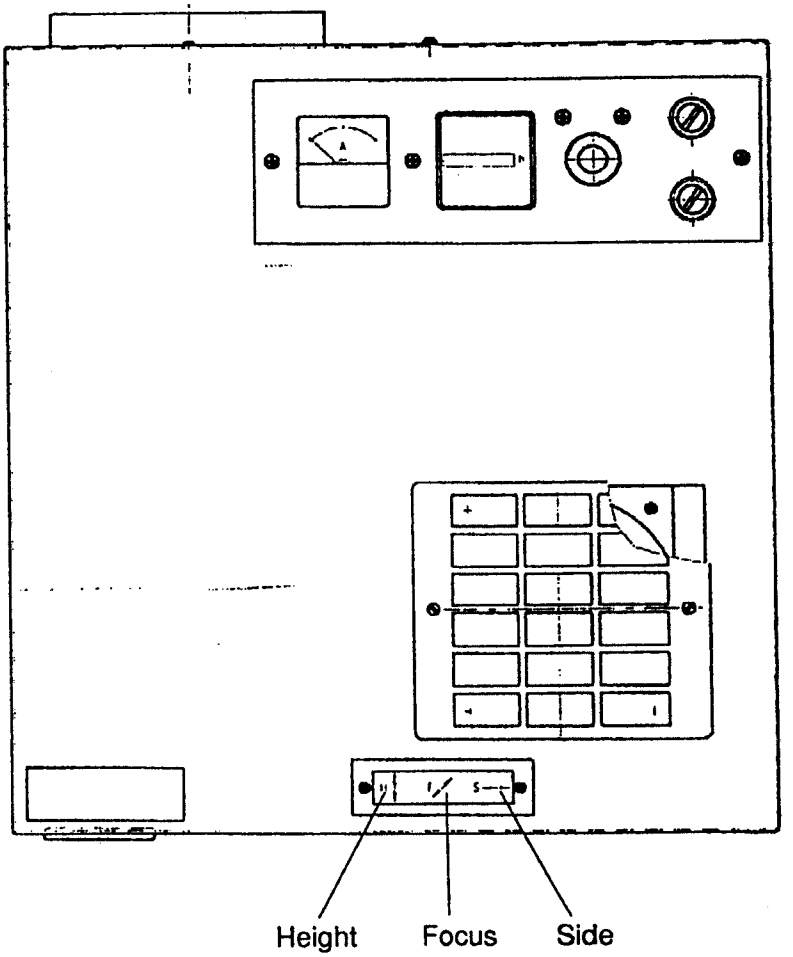


Fig. 4–3: Lamp House XENOSOL 2000, Position of the Spindles for adjusting the Xenon Lamp

5 Spare Parts

5.1 Spare Parts of Film Projector ERNEMANN 15

Drawing No.	Ident. No.	Designation	Quan–tity	Illustration
Sprockets:				
12–27.01–1	3 632 419	sprocket wheel	1	(2–3/1)
12–27.01–15	3 534 012	feed– and take–up sprocket	2	(2–3/4), (2–3/10)
Guide– and pressure rollers:				
12–27–86–5	2 033 611	pressure roller	3	(2–3/2, /3, /11)
14.114.00–5	3 534 090	feeder roller	1	–
16–33.19	3 632 530	rubber pressure roller	1	(2–3/9)
16–29.10–2	3 534 216	guide roller	1	(2–3/8)
16–29.05–2	3 534 204	brake roller	1	(2–3/5)
16–29.05–6	1 533 031	felt, for brake roller	1	–
16–29.06	3 632 447	spring–mounted roller	1	–
16–29.08	3 632 452	swivel roller, small	1	(2–3/6)
16–29.07	3 632 451	swivel roller, big	1	(2–3/6)
50–89.00–1	1 536 510	half roller, for big deviation roller	12	–
42–28.00–10	2 032 327	small deviation roller	4	–
Other spare parts:				
NB 08–015–23	1 502 654	toothed belt, for feed– and take–up friction bearing	1	(3–1/3) (3–1/6)
NB 08–015–26	1 539 027	main driving belt	1	–
42–28 X02	2 032 892	friction disk, for film winding device	1	
24–06 X01	3 632 513	pair of pressure pad straps	2	(2–2/6)
27–55	3 632 453	solar cell, mono	1	–
27–56	3 632 455	solar cell, stereo	1	–
5027–13	3 632 224	gear oil, 0.9 l, for projector	1	–
12–27.27	3 632 310	oil filling hose	1	–
12–11.15–U45	3 630 146	exciter lamp with socket	1	–

Spare Parts / Lamp House XENOSOL 2000

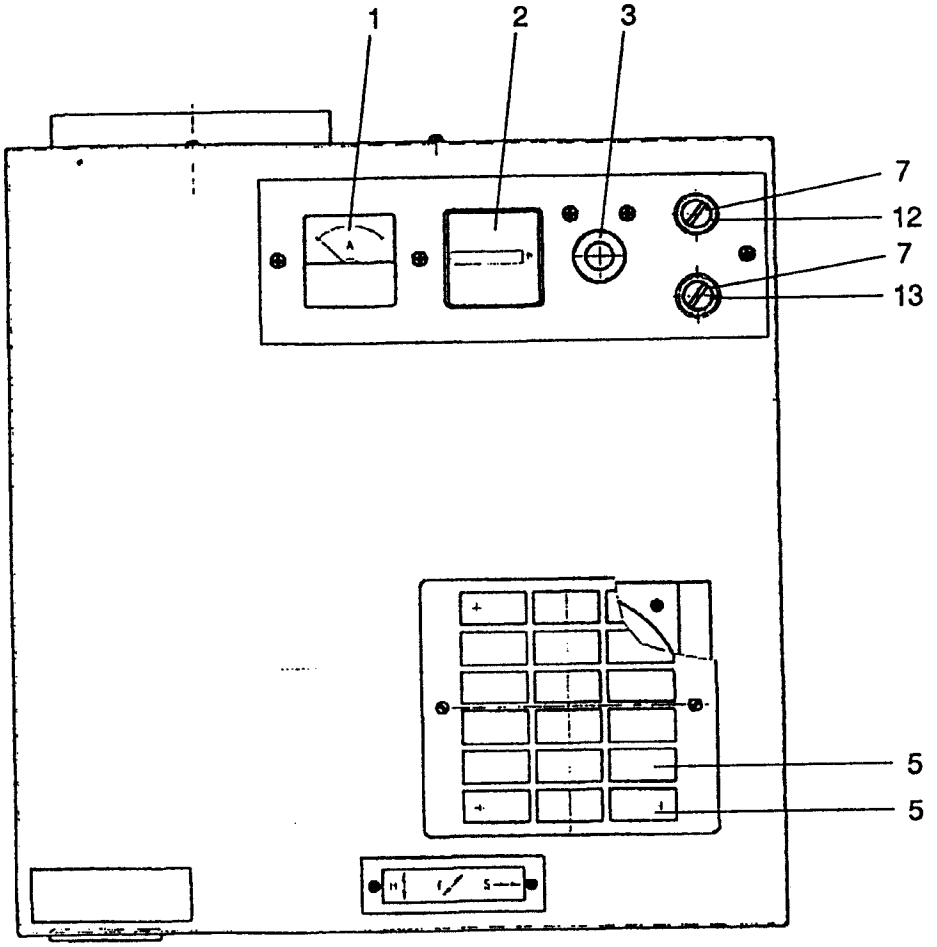


Fig. 5–1: Lamp House XENOSOL 2000, Rear View, Position of Spare Parts

Pos.	Ident. No.	Drawing No.	Designation
1	1.507 981	23–081.15–001	Ammeter
2	1.502 595	NB07–015.00–022	Operating hours counter (50Hz)
3	1.794 016	1.10102.001	Push–button SW
5	1.796 257	FP 120	Spare filter for fan (rear panel)
7	1.760 230	DIN 41674	Cap of fuse holder
12	1.762 008	DIN 41571	Fuse, 1A
	1.762 009	DIN 41571	Fuse, 2.5A

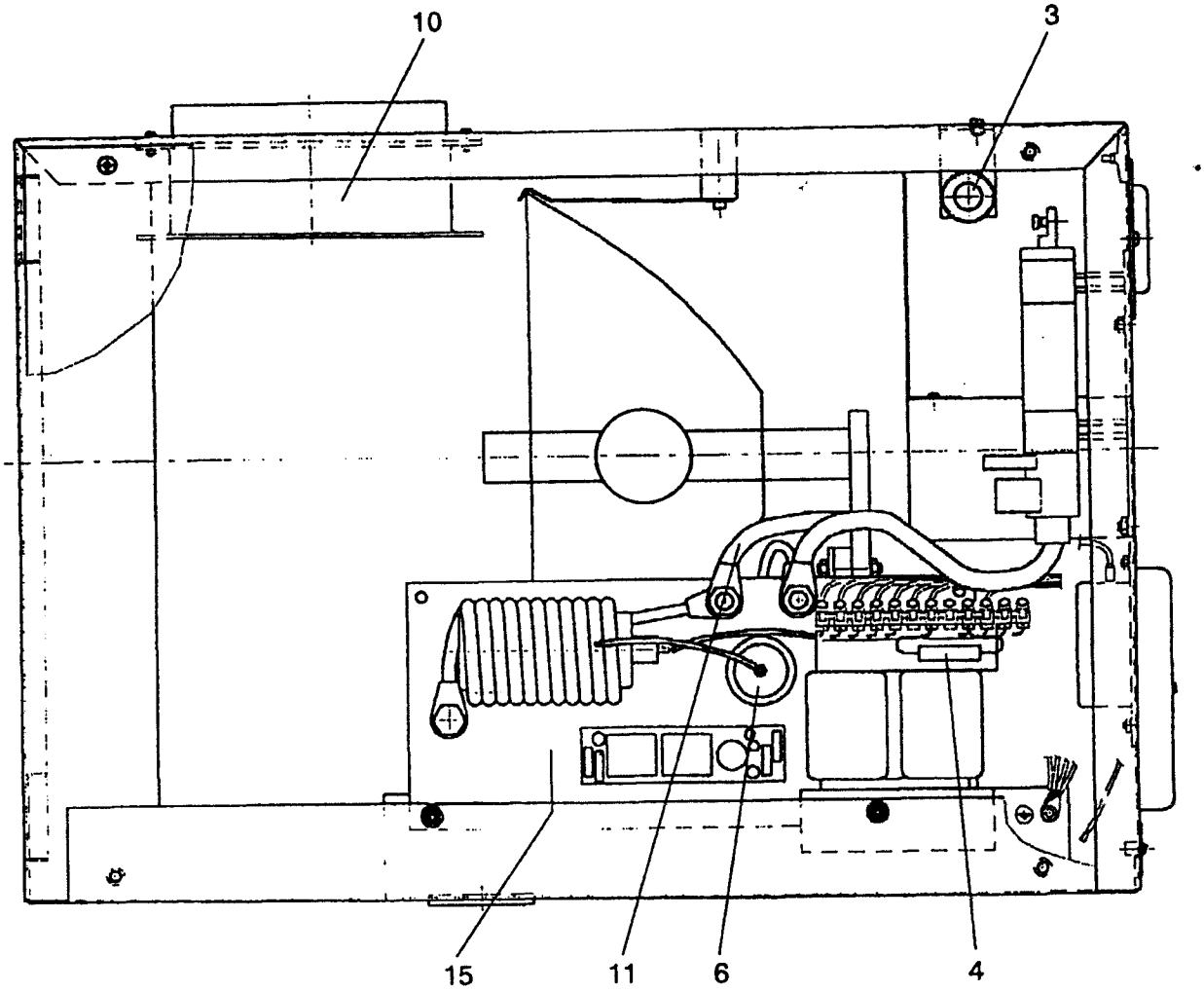


Fig. 5–2: Lamp House XENOSOL 2000, Side View, Device opened, Position of Spare Parts

Pos.	Ident. No.	Drawing No.	Designation
3	1.794 016	1.10102.001	Push–button SW
4	1.735 170	B82500–C–A8	Anti–interference choke 330 µH
6	2.030 090	06–11–04	Spark gap B
10	1.796 253	G2E133DM77–01	Fan, 230V, 50/60Hz
11	3.632 601	23–081.18	Shunt
15	1.796 251	Type 445A	Igniter

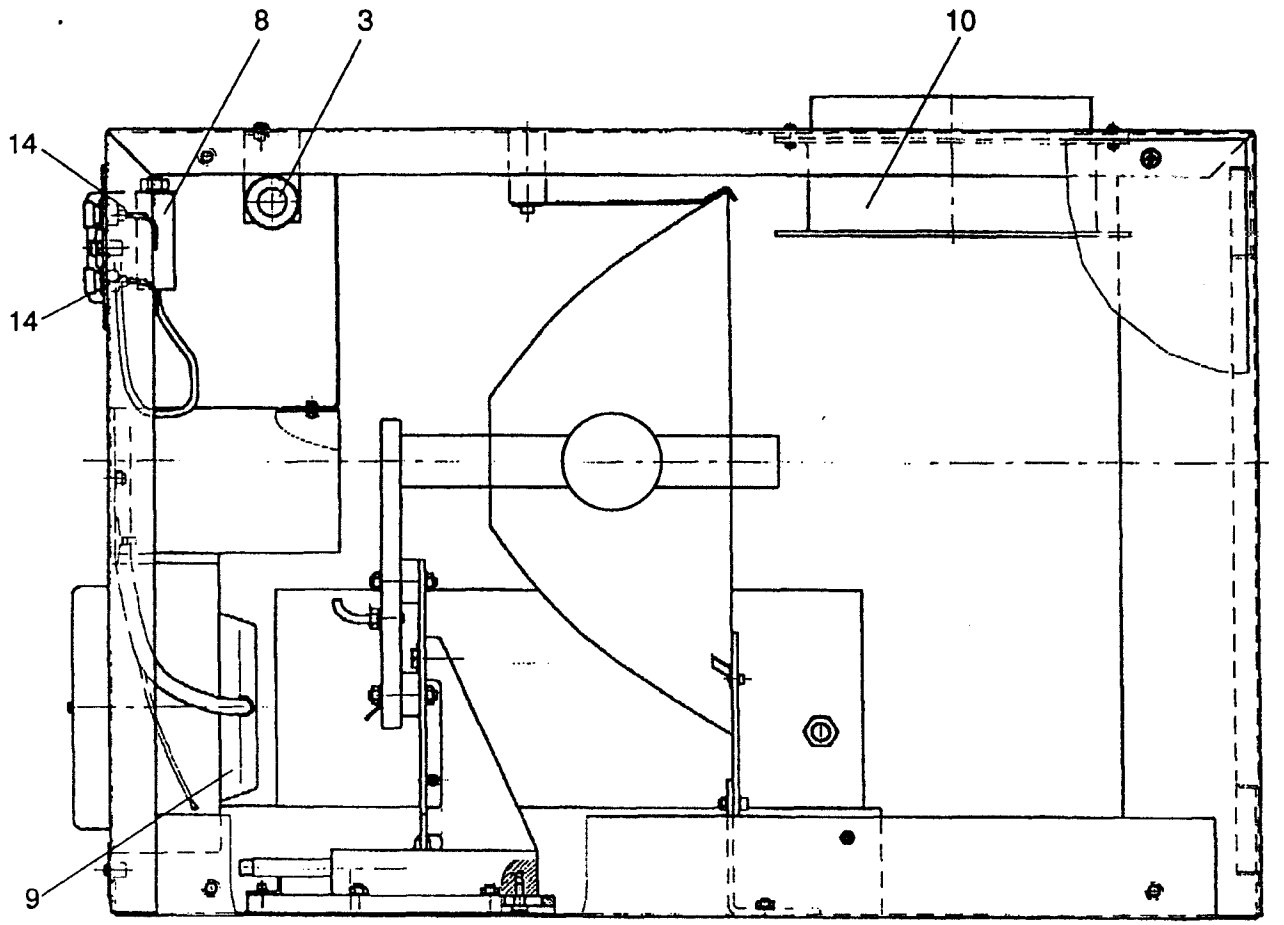


Fig. 5–3: Lamp House XENOSOL 2000, Side View, Device opened, Position of Spare Parts

Pos.	Ident. No.	Drawing No.	Designation
3	1.794 016	1.10102.001	Push–button SW
8	1.735 169	MLR 25	Capacitor, 2 µF
9	1.796 252	W2E143AA09–01	Radial fan
10	1.796 253	G2E133DM77–01	Fan, 230V, 50/60Hz
	1.760 895	19466	Fuse socket

Filmprojektor ERNEMANN 15
Film Projector ERNEMANN 15
Projecteur cinématographique ERNEMANN 15

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Anschütz–
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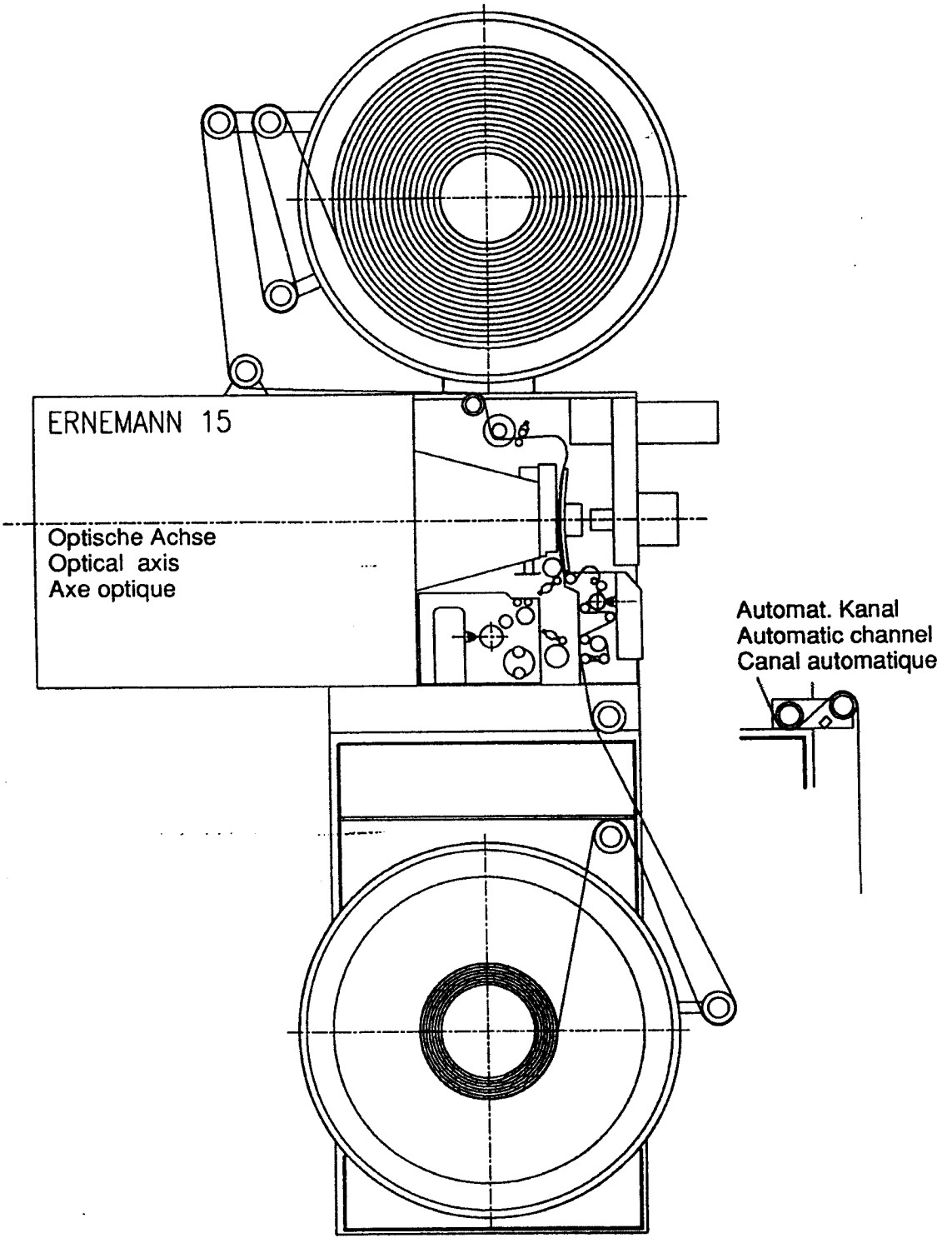

- Filmlauf 16 mm, mit Wickeleinrichtung 2000m
- Film run 16 mm, with friction assembly 2000 m
- Passage du film 16 mm, avec dispositif de bobinage 2000 m

Filmprojektor ERNEMANN 15
Film Projector ERNEMANN 15
Projecteur cinématographique ERNEMANN 15

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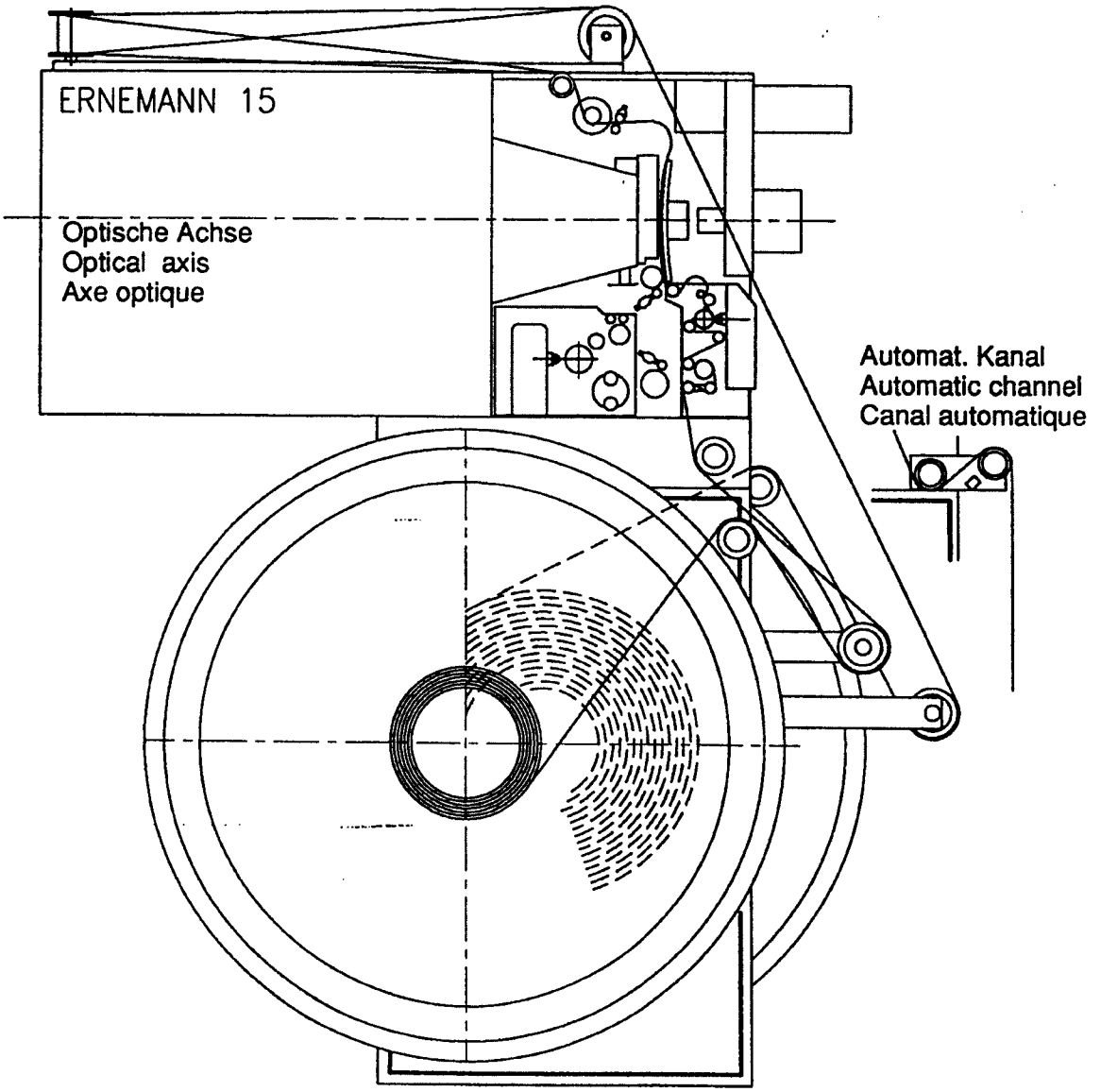

- Filmlauf 16 mm, mit Wickeleinrichtung 4000 m / *5000 m
- Film run 16 mm, with friction assembly 4000 m / *5000 m
- Passage du film 16 mm, avec dispositif de bobinage 4000 m / *5000 m

Filmprojektor ERNEMANN 15
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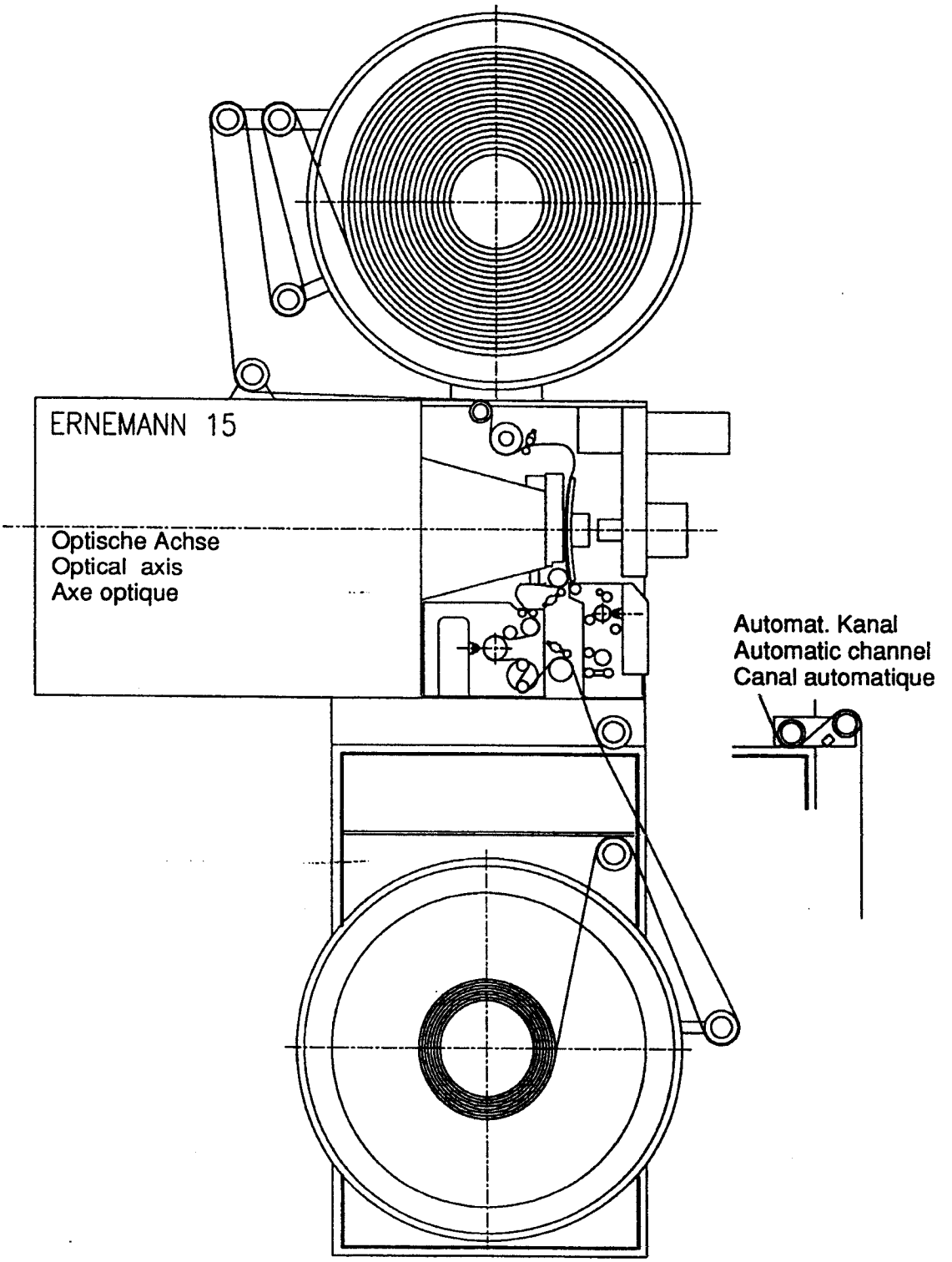

- Filmlauf 35 mm, mit Wickeleinrichtung 2000 m
- Film run 35 mm, with friction assembly 2000 m
- Passage du film 35 mm, avec dispositif de bobinage 2000 m