Film-Tech

The information contained in this Adobe Acrobat pdf file is provided at your own risk and good judgment.

These manuals are designed to facilitate the exchange of information related to cinema projection and film handling, with no warranties nor obligations from the authors, for qualified field service engineers.

If you are not a qualified technician, please make no adjustments to anything you may read about in these Adobe manual downloads.

www.film-tech.com

Kinoton GMBH

ST 2000 (E-K) Endless Loop System
MT 600 / MT 2000 Make-Up Tables

Operating Manual

ST 2000 (E-K) / MT 600 (en)

CINEMA

STUDIO

LARGE FORMAT

SPECIAL VENUE

DIGITAL SYSTEMS

DISPLAY SYSTEMS

Imprint

Printed in Germany, Issue: June 2006

Editor responsible for the contents: KINOTON GmbH
Editing and layout: KINOTON GmbH, -c.auer-, Industriestr. 20a, Germering

Preface

Dear customer,

this operating manual will help you get acquainted with the non-rewind system and to make use of its possible applications in accordance with the requirements.

This operating manual includes important hints for a safe, proper, correct and economic operation.

It will also help you to avoid danger, to reduce failures and to increase life and reliability of the non-rewind system.

This operating manual includes useful hints for proprietor and personnel obligations. It does not substitute, but supports, a thorough training period.

All information in this manual is given by best knowledge and has been checked carefully. However, KINOTON accepts no liability for the accuracy of this information.

Subject to technical changes.

Changes / Notes

Issue of this manual: June 2006

Contents

1 Safety

1.1 General Safety Notes

- The operating manual is to be kept with the devices at all times.
- Precondition for the safe running and trouble-free operation of the endless loop system and the make-up table is working knowledge of the basic safety regulations and agreed use.
- This operating manual contains the most important instructions for running the system safely.
- The operating manual must be read and absorbed by all persons working with the system, placing particular emphasis on all aspects regarding safety.
- In addition, all current and valid regulations and measures concerning accident prevention must be observed.

Proprietor Obligations

The proprietor is obliged to allow only those persons to work and / or operate the devices that

- are familiar with safe working and accident prevention along with complete working knowledge of the platter system and all additional machines and pieces of the system
- to read and understand the safety chapter and the warning instructions thereto in this operating manual.

The proprietor has to check the safe working of his personnel regularly.

Personnel Obligations

Those persons who work with the devices are obliged

- to observe the regulations appertaining and prevention of accident
- to have read and understood the safety chapter and the warning instructions thereto in this operating manual.

Danger when working with the Endless Loop System and the Make-Up Table

Endless loop systems and make-up tables are constructed according to the latest engineering and state-of-the art safety standards. The devices are only to be employed for its intended purpose and is only used when functioning absolutely perfectly.
Serious danger may result from improper use of the system causing injury to the user or a third person, or damage may be done to the system or other items in the vicinity.
Faults that could adversely affect safety must be rectified immediately.
The system cannot be used before faults are rectified.

Intended Purpose

Endless loop systems are only suitable to transport films endlessly while the projector is running. If the endless loop system is coupled with two platters of the non-rewind system these platters can be used with MT 600/2000 make-up table to make-up or tear-down while the film is running endlessly with the endless platter at the top of the unit (ST 2000 E-K). With MT 2000 it is optionally possible to rewind films.

Any other or further use is not classified as “intended purpose”. KINOTON cannot be held liable for any damage resulting from different or extended operation.

Defined intended purpose also includes:

- the observance of all instructions contained in the manual
- adherence to the inspection
- implementation of maintenance and repair work.

Guarantee and Liability

In principle the “General Terms of Business” of KINOTON apply. They are available to the customer on conclusion of sale at the latest.

Guarantee and liability claims for damage to persons and property are invalid if due to one of the following causes:

- improper use of endless loop system and make-up table
- improper assembly, commissioning, operating and maintenance of endless loop system and make-up table
- operation the endless loop system and make-up table with defective and / or non-functioning safety and protection devices
- non-observance of instructions in the manual regarding transportation, storage, assembly, commissioning, operation and maintenance
- modification of endless loop system and make-up table without authorisation from the manufacturer
- faulty monitoring of parts subject to wear and tear
- improperly effected repair work
- emergencies due to influence from outside bodies or force mayeur.

1.2 Important Safety Instructions for US Customers

When using your motion picture equipment, basic safety precautions should always be followed, including the following:

- Read and understand all instructions before using.
- Care must be taken as burns can occur from touching hot parts.
- The appliance switch is provided with the symbols 0 indicating off and I indicating on.
- Do not operate appliance with a damaged cord or if the appliance has been damaged until it has been examined by qualified service personnel.
- Position any cord so that it will not be tripped over, pulled, or contact hot surfaces.
- If an extension cord is necessary, a cord with a current rating at least equal to that of the appliance should be used. Cords rated for less amperage than the appliance may overheat.
- Always disconnect appliance from electrical supply before cleaning and servicing. Never yank cord to pull plug from outlet. Grasp plug and pull to disconnect.

- To reduce the risk of electric shock, do not disassemble this appliance, but call in qualified personnel when service or repair work is required. Incorrect reassembly can cause electric shock when the appliance is used subsequently.
- The use of an accessory attachment not recommended by the manufacturer may cause a risk of fire, electric shock, or injury to persons.
- Connect this appliance to a grounded outlet.
- Disconnect this unit from its source of supply before replacing the projection lamp.
- This appliance may have a polarized plug (one blade is wider than the other). To reduce the risk of electric shock, this plug is intended to fit in a polarized outlet only one way. If the plug does not fit fully in the outlet, reverse the plug. If it still does not fit, contact a qualified electrician. Do not modify the plug in any way.

SAVE THESE INSTRUCTIONS

1.3 Explanations of Symbols and Notes

DANGER

This symbol indicates an imminent threat of danger to life and personal health.
Disregard of this warning results in serious personal injuries to highly dangerous injuries.

ATTENTION

This symbol indicates a possibly dangerous situation.
Disregard of this warning can result in light personal injuries or damage of the system.

▶ **NOTE**

This symbol indicates where notes, user tips and useful information can be found.
They serve to use the endless loop system to its optimum.

1.4 Protective Devices

All existing safety devices must be checked regularly.

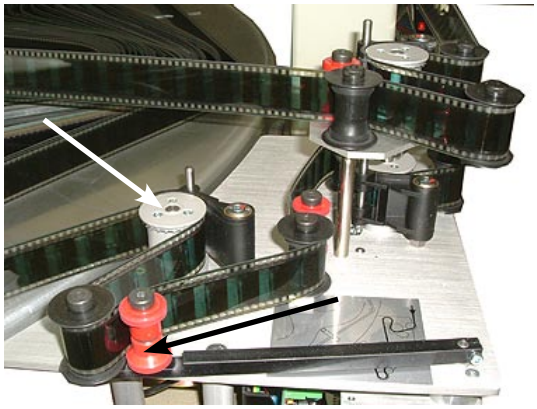
1.4.1 Main Switch

In case of an emergency, you can switch-off the endless loop system with the main switch. Push switch in position “0”. The red lamp in switch gets off.

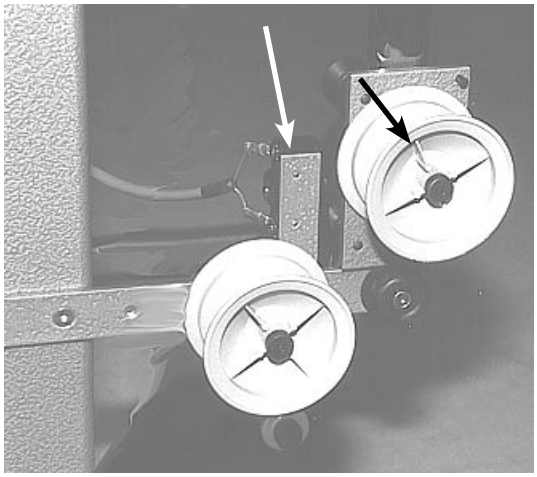
1.4.2 Film Tension Sprocket and Regulator Arm

To tension the run out film, the film tension sprocket (white arrow) turns in opposite direction as the endless platter does (platter turns anticlockwise). When a film break happens, this sprocket turns freely – the unit and the projector stop.

When a film break happens the regulator arm (black arrow) moves to inside (platter direction), then some film sliding processes will be carried out, the film break switch will be closed and the device will be stopped.



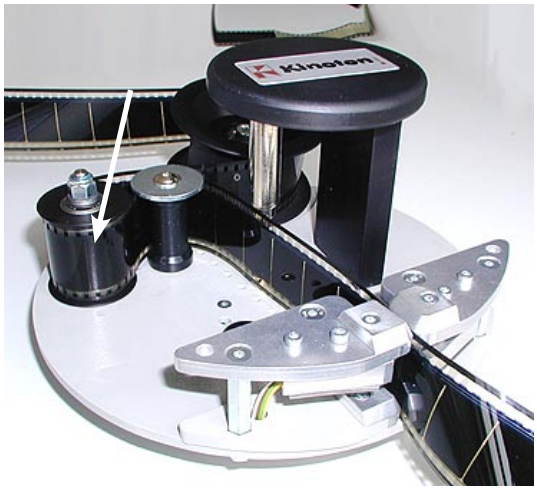
1.4.3 Film Break Switch



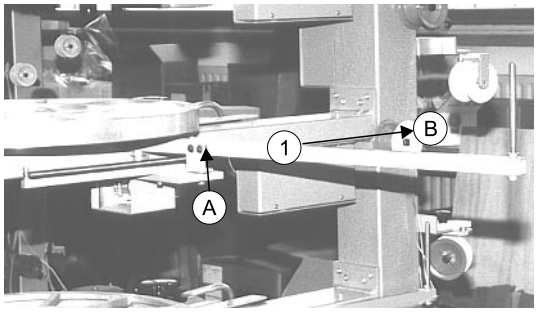
If the film length compensation roller (black arrows) falls down and touches the contact area (white arrow) the film break switch will be activated and the endless loop system and the projector will be stopped.

1.4.4 Braking Roller on IR-Takle-OFF Unit (ST 2000 E-K)

The braking roller on the take-off unit (arrow) provides a constant film tension between the non-rewind system and the projector.



1.4.5 Lever Arm End Position (ST 2000 E-K)

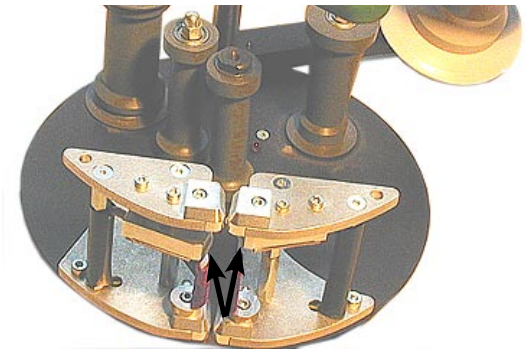


- If the lever arm moves from the working position (between A and B) to position A (limit stop), the platter speed will be reduced until the platter comes to a standstill.
- In the event of a film break the lever arm moves to the end position A.

1.4.6 Light Barriers on IR-Take-Off Unit (ST 2000 E-K)

Light barriers (arrows) sense the position of the film during feed-out.

The values are transmitted to the take-off unit's electronic and then to the control unit in the column.
The control unit works out the correct rotary speed values (depend on the reel diameter) and controls the corresponding platter motor.



1.5 Special Hazard Points

Mechanical danger by squashing:
- when changing films
- when inserting the take-off unit
- when closing and opening insert rings (ST 2000 E-K)
- when putting on the film transport clips (ST 2000 E-K)
- when putting film reels on the make-up table

Mechanical danger by nudging:
- when threading the film around the insert ring (ST 2000 E-K)
- when inserting the take-off unit and threading the film

ATTENTION
Do not nudge your head on platter, while working at a lower one.

Mechanical danger (during wind off and take up):
- when operating the endless loop system, the non-rewind system, the make-up table
- when threading the film

DANGER
Do not work with long loose hair, loose scarves or ties, they may get trapped in the drive mechanism.

ATTENTION
Never hinder a platter from run during supposed operation. This may cause a film break and interruption of show.

Mechanical danger by stumbling and falling:
- when stepping up the ladder

DANGER

Only use a stepladder with a fixation and not any other aid to reach the platter on the top.

Danger because of errors and malfunction:
- unexpected unit movements
- malfunction of film tension switch and film break switch
- malfunction of lever arms
- touching the running platters

DANGER

▲Regularly check function of film tension switch and film break switch.

▲Never touch running platters during operation.

▲Make sure that nobody starts the unit while somebody is working on it.

▲Disable the projector automation

1.6 Electric Power Hazards

DANGER

- Allow work on the electrical supply to be carried out by competent electricians only.
- The unit electronics must be checked regularly. Loose connections must be restored immediately.
- The access to the control cabinet must always be closed. Only authorised staff with a key have access to the control cabinet.
- When working on life parts, separate from mains.

1.7 Modification of System Construction

No alterations, additions or modifications may be made to endless loop system and make-up table without consent of KINOTON. This includes also welding of bearing parts. Only use original spare and wear parts. Parts obtained from third party manufacturers cannot guarantee strain and security standards.

1.8 Cleaning and Disposal of Cleaning and Lubricating Solvents

Substances and materials used must be handled and disposed correctly, especially when cleaning with solvents.

1.9 Copyright

Copyright of this manual remains in possession of KINOTON.

This manual is intended for the user company and its staff only.
It contains regulations and operating notes that must not be copied, reproduced or otherwise transmitted, in whole or in part.

Infringement of copyright laws may lead to prosecution.

2 Transport and Installation / Mounting

2.1 Transportation

Package

- **ST 2000**
  - The column with the foot is positioned in a wooden box. The column is screwed with the box on both ends.
  - The support arm with endless platter, control unit, platter drive and motor is screwed onto two wooden girders which run parallel under the platter.
    These unit is horizontally positioned into the box to the column. Both girders are screwed with their fore-part to the box.
  - The accessories are packed into the box too.
  - Weight (gross): approx. 180 kg
- **ST 2000 E-K**
  - The unit with column, foot and both platter levels is positioned in a box.
  - The support arm with endless platter, control unit, platter drive and motor is screwed onto two wooden girders which run parallel under the platter.
    These unit is horizontally positioned into a wooden box. Both girders are screwed with their fore-part to the box.
  - Additional accessories are packed to the column into the other box.
  - Weight (gross): approx. 400 kg (both boxes)
- The **make-up table** will be delivered packed in a box.
  The accessories like film spools and reel disks are packed in the box too.

Storage

If devices are stored for a longer time:
Only store in dry rooms.
Choose a suitable protective coating or leave devices in the original coating.

▶ **NOTE**

Although most parts are delivered with a protective cover, you have to clean the unit and its components before the first start.

2.2 Delivery or Equipment Variations

- **Endless Loop Systems**
  - ST 2000, 1 endless platter
  - ST 2000 E-K, 1 endless platter and 2 non-rewind platters (ST 100 E) (option)
- **Accessories for ST 2000**
  - roller extension with film length compensation and extension for film break switch
  - encoder for mounting in a projector with maltese cross drive (biphase signal)
  - connecting cable with opto-coupler to connect the system with an electronic projector (option)

- **Accessories (additional) for ST 2000 E-K (option)**
  - 1 IR take-off unit
  - 1 insert ring (35 mm film)
  - 1 guide roller set for associated projector (option)
  - platter covers (option)
- **Make-Up Table**
  - MT 2000 (for 2000 m spools, optional with a second mechanical friction)
  - MT 600 (for 600 m spools, optional with a second mechanical friction)
  - UT 600/2000 (with 2 electronic friction drives, see separate operating manual)
  - Accessories
    - 2 or 1 reel platter
    - 2 or 1 film spool
- Operating manual

▶ **NOTE**

For further information about accessories please contact your local dealer or look at our website www.kinoton.com.

2.3 Installation

ATTENTION

△ The installation must be carried out from service personnel or experts only.

△ Make sure that electric lines are not damaged or squeezed during transportation.· Only use suitable hoisting machines (portal crane, fork-lift, truck).

△ Do not use unit parts as climbing aid.

△ Electric lines have to be in accordance with local regulations and be laid professionally.

△ Pay attention for an adequate high flexible PE line (16^2), so that charging can discharge. Charging is produced from winding and rewinding of the film.

△ Adapting the control operation of the endless loop system it is mandatory to mount and connect an encoder in D-/A-projectors - E-projecors will be connected via a biphase output.

2.3.1 Place of Installation, Place of Operation

The place on which unit will be installed must be even and clean.

Place the unit, if possible, near the projector otherwise you have to use compensation brackets and / or guide rollers.

The make-up unit can be moved close to the non-rewind system e. g. for make-up/tear-down operation.

Figure 1 show the measurements of the endless loop system.

Figures 2 and 3 show the measurements of the make-up tables.

.

2.3.2 Measurements

Figure 1: ST 2000 E-K

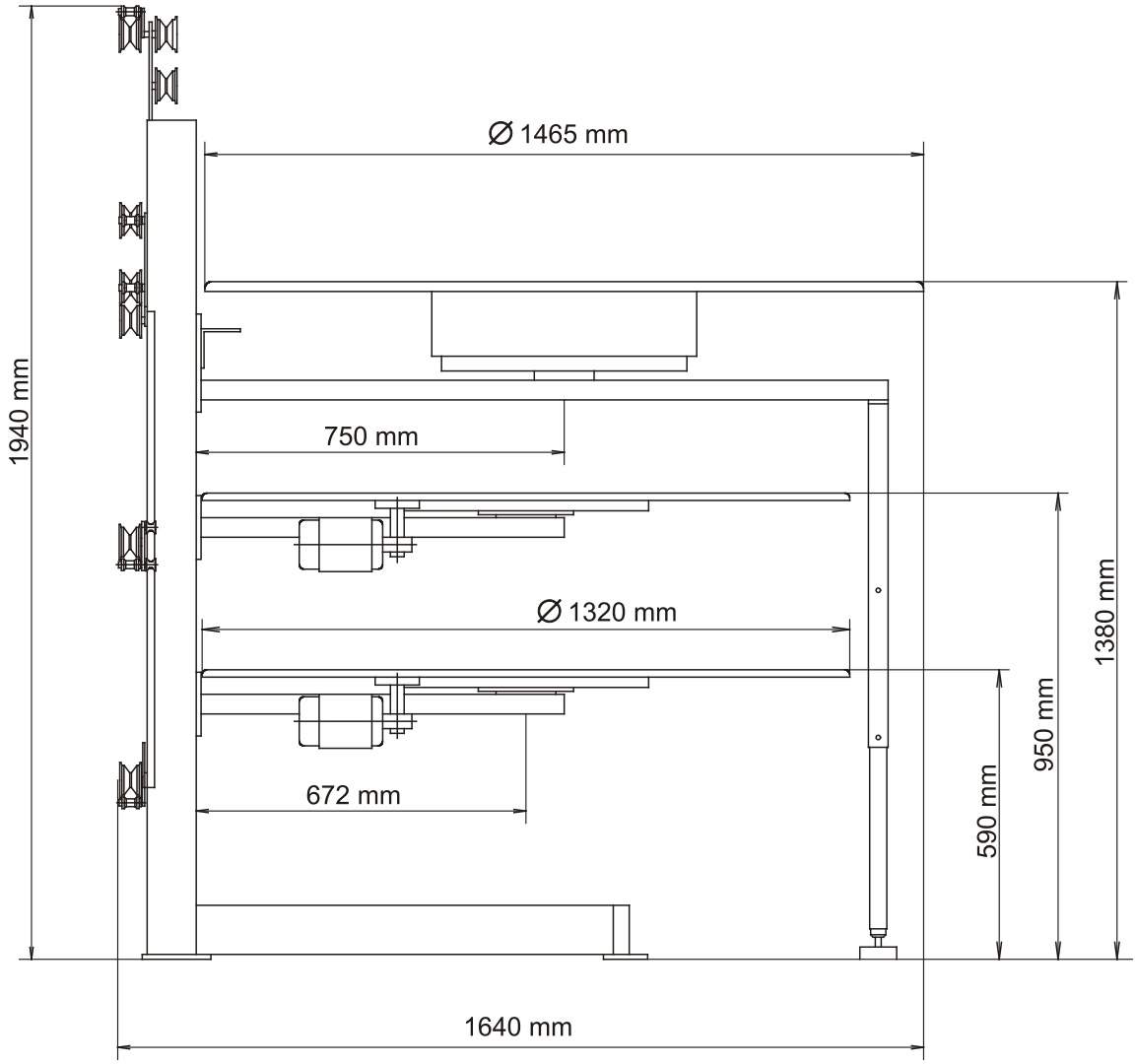


Figure 2: MT 600

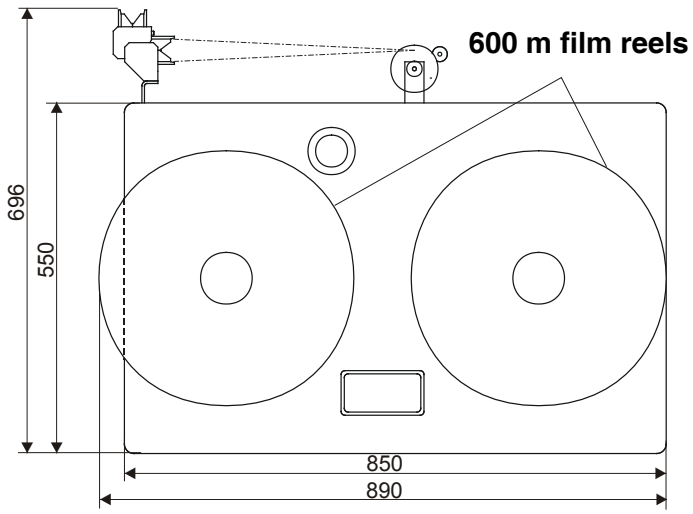
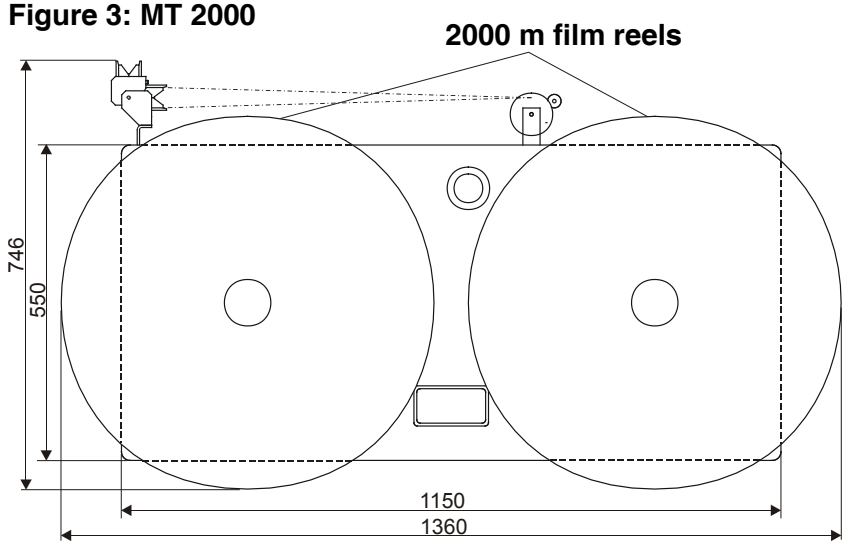


Figure 3: MT 2000



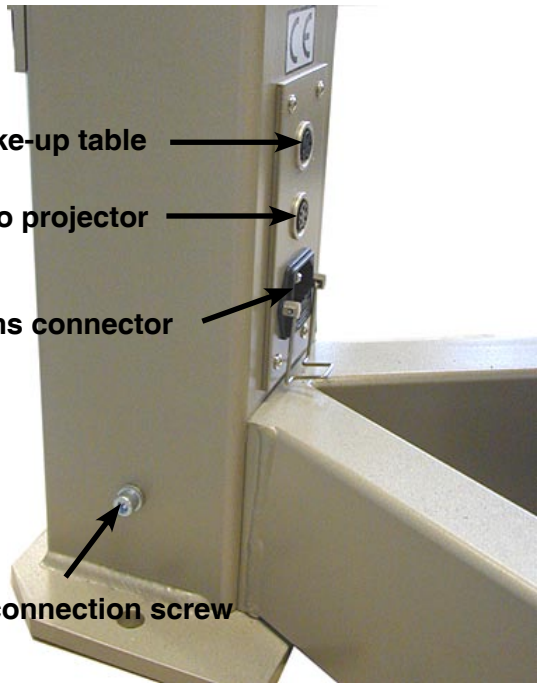
2.4 Mounting

ATTENTION

The following mounting and the electrical connection must be carried out from service personnel or experts only:

- unpacking the endless loop system and accessories
- mounting the endless platter
- mounting the non-rewind platters for ST 2000 E-K
- installing the encoder in D-/A-projectors
- connecting and running the cables to the terminal strip
- connecting to mains
- setting the jumpers for projector type selection

2.5 Connectors on ST 2000 E-K (option)



The non-rewind unit (ST 100 E) has to be connected separately.

You will find the 5-pole projector connector, the 3-pole make-up table connector and the mains connector on the bottom inside the column.

- Connect the non-rewind system to mains and to the projector.
- Connect the PE cable.

2.6 Set of Guide Rollers

A set of guide rollers (corresponding to your projector) will be supplied with the endless loop system. For all KINOTON projectors the set of guide rollers are pilot-drilled fittingly.

For projectors from other producers you have to order the universal set of guide rollers. In this case you have to drill the corresponding holes into the projector's housing for fastening the set of guide rollers.

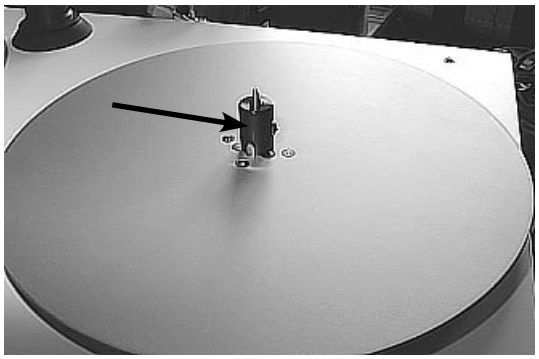
ATTENTION

Observe the components which are in the projector when drilling holes into the projector housing.

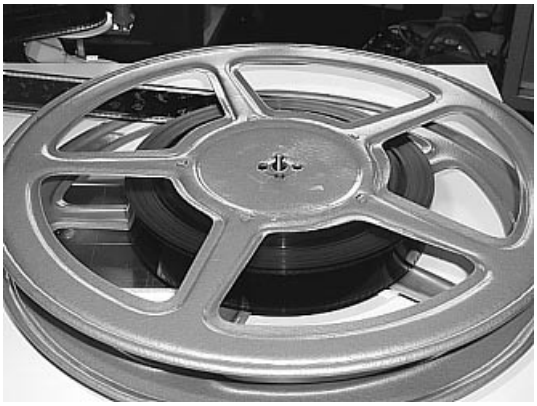
2.7 Mounting the Make-up Table

2.7.1 Reel Disk / Film Spool

- The reel disk is fastened on the corresponding flange
- The Kodak adapter (arrow) will be secured with a setscrew on the shaft.
- The reel disk can be easily put on or put off by holding the Kodak adapter.



- To put on a film spool plug in the corresponding friction flange and then put on the film spool onto the friction shaft.



2.7.2 Connecting the Cables

Connect the make-up table to mains.

Connect the make-up table with the delivered 3-pole cable to the 3-pole plug on the non-rewind system's column.

▶ **NOTE**

See also chapter 2.5.

3 Function, Components and Operating Elements

3.1 Function

3.1.1 ST 2000 Endless Loop System

The endless loop system is suitable to transport a 35 mm film endless while the projector is running for an endless performance.

Operation:

- The film lays on the endless platter like a meander.
- Via a film take-off unit the film is taken out from the reel middle and is threaded through a take-off sprocket and film guide rollers to the projector.
- The film which runs from projector is winded up around guide pins which are arranged on the outside edge around the platter.
- When the film reel reaches a certain thickness at six positions this film package will be moved to the platter inside.
- Due to this meander form it is guaranteed that the film length of the inner reel spire is the same with the outside film spire – the speed of the rotating platter is always the same.

3.1.2 ST 2000 E-K, the Combination of an Endless Loop System and a ST 100 E Non-Rewind System

The upper platter is the endless platter.

The two lower non-rewind platters are suitable to transport films while projector is running or to make-up / tear-down film programs.

Operation:

- The made-up film is placed on a platter (giving level).
- The film is threaded through take-off unit, which is placed in the middle of the same platter.
- From there the film is threaded via guide roller on column to the projector.
- There you can thread film through projector as usual.
- From projector the film are threaded via the movable guide roller on column and then via lever arm to the platter, where the film is made up (taking level).

3.1.3 Make-Up Table

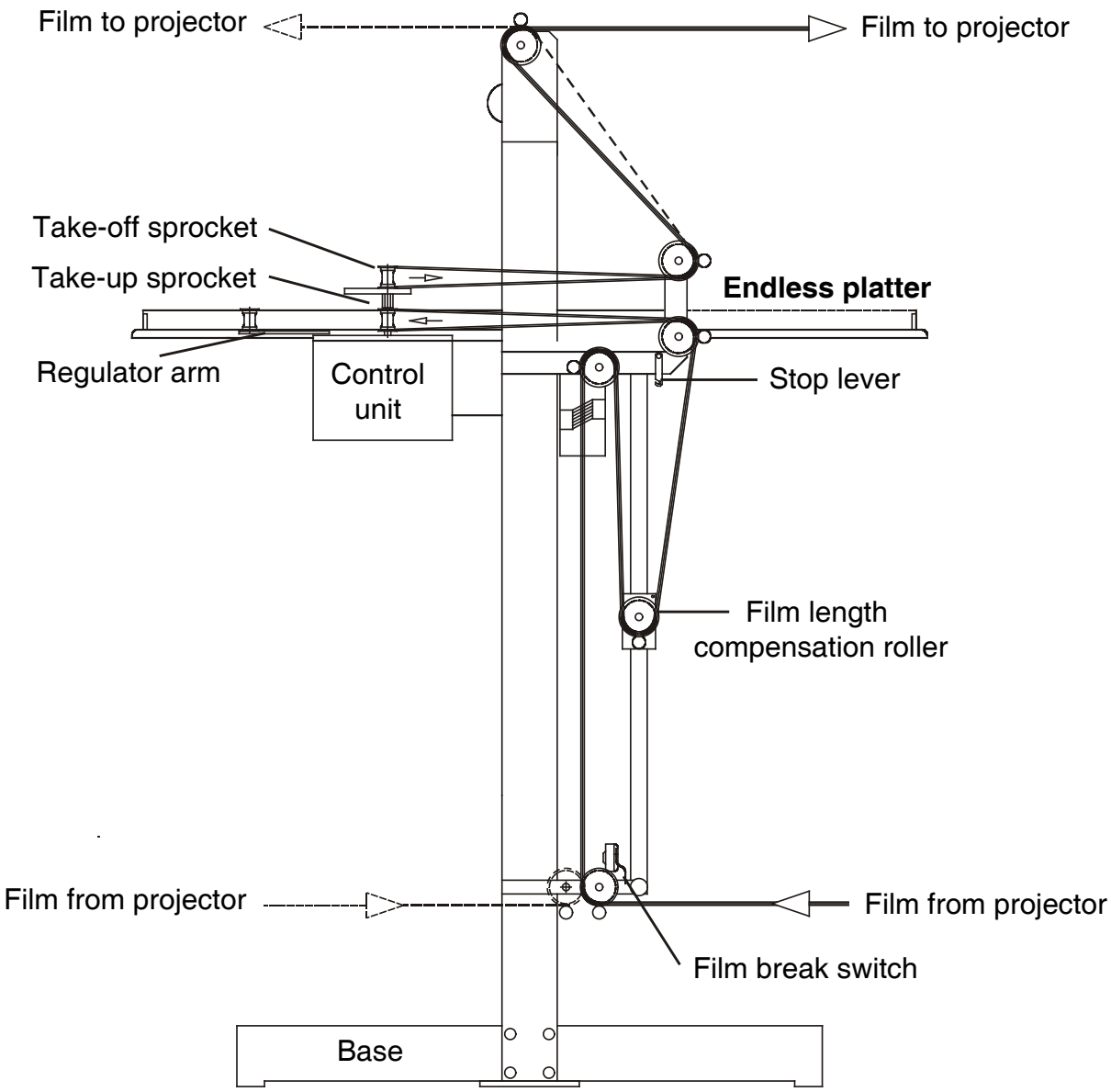
With the make-up table and a free platter of the non-rewind system you can make-up and tear-down film programs.

The **MT 2000** make-up table can operate with 2000 m film reels and is normally equipped with one electronically driven friction. The rotation direction can be switched. Optionally the make-up table can be equipped with a second mechanic friction for rewinding films.

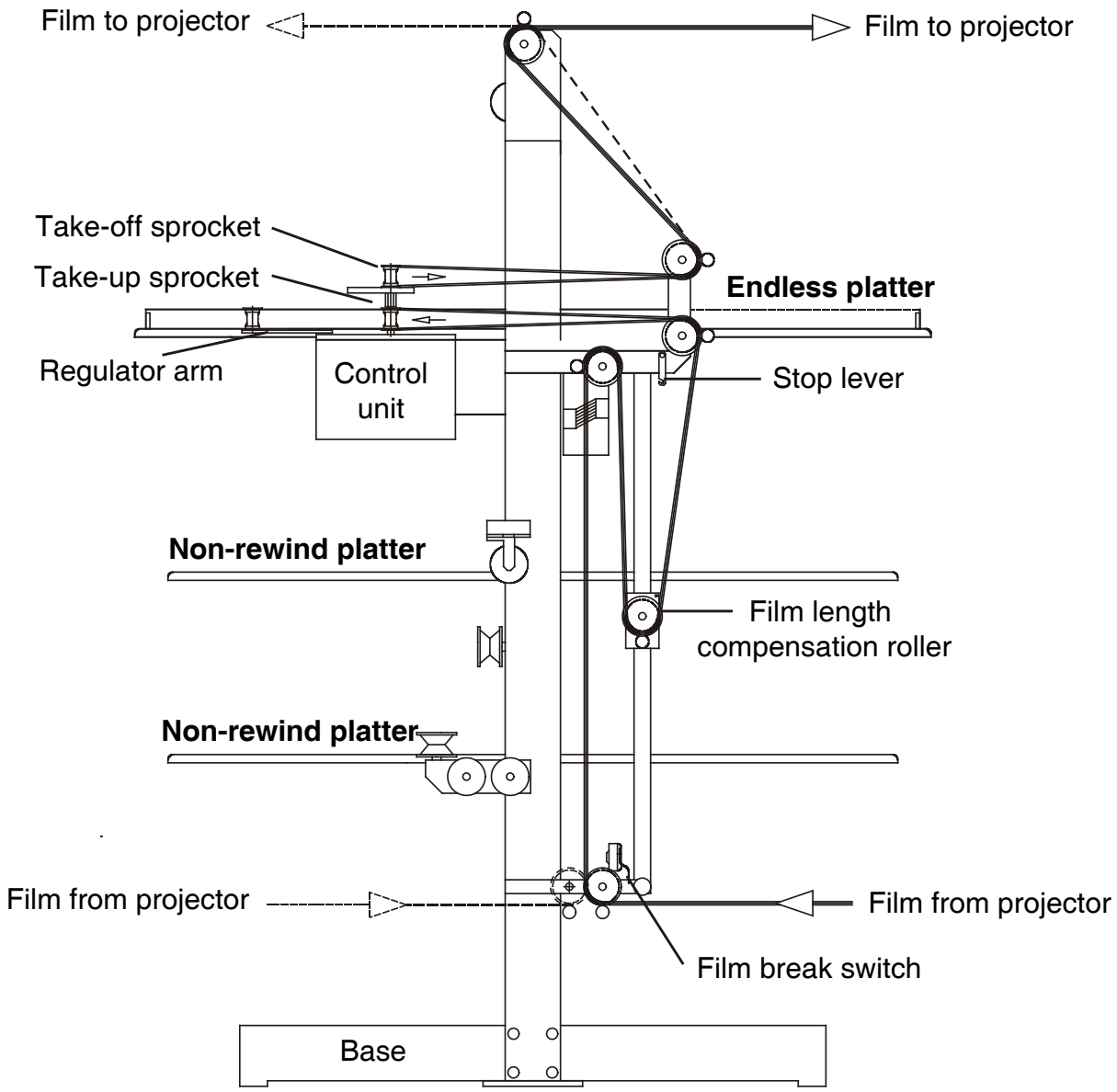
The **MT 600** make-up table can operate with 600 m film reels and is normally equipped with one electronically driven friction. The rotation direction can be switched.

3.2 Components Overview

3.2.1 ST 2000 Endless Loop System



3.2.2 ST 2000 E-K Endless Loop System (option)



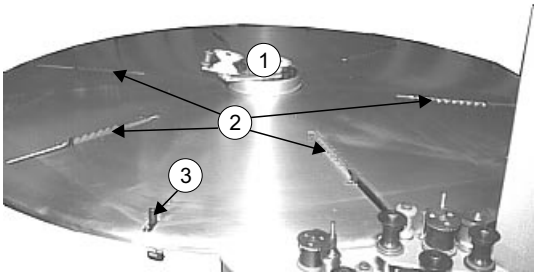
3.2.3 Frame

The chassis is built out of column and base.

The support arm(s), the guide rollers and extension arms are bolted onto the column.

The mains voltage cable and the connecting cables for projector are connected to the corresponding connectors.

3.2.4 Endless Platter



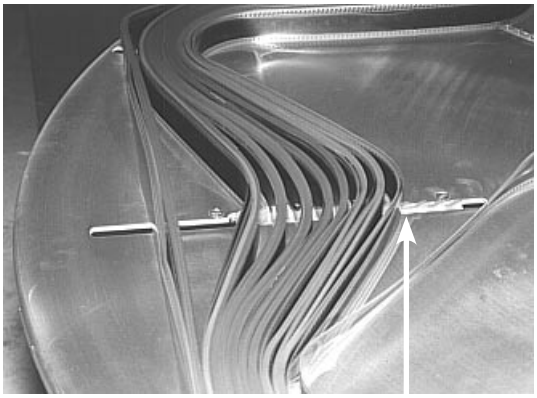
① take-off unit

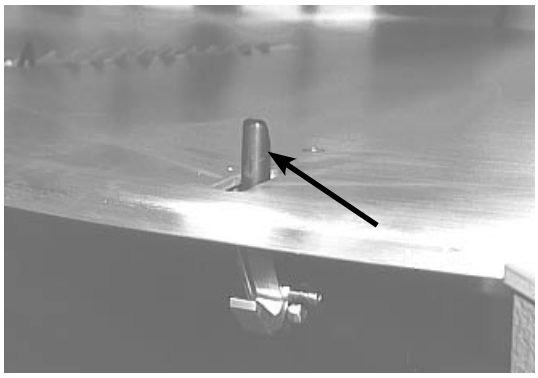
② toothed rails with sliding bolts (6)

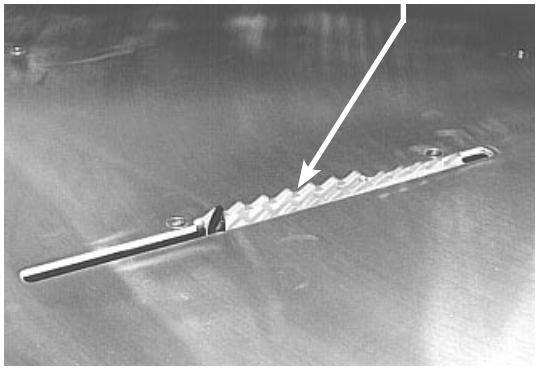
③ guide pin (6)

The platter is equipped with 6 guide pins (black arrow) and 6 sliding bolts (white arrows).

The six guide pins are located uniformly distributed at the outside edge of the platter and serve as support for the incoming film.
Shortly before the sliding bolts move the film reel inwards, the guide pins are being withdraw downwards by the eccentric drive and then, clapping from the outside to the inside, re-erected.







The sliding bolts are located between the guide pins and serve for the forming of the meander shape and for the transport of the film packets to the platter centre.

Aside from the sliding bolts there are stationary toothed rails for fixing the meander shape during the transport stroke. Guided by a cam groove, the sliding bolts move during the way outside under the film reel and lift during the stroke inwards the film reel over the toothed rails to the centre of the platter.

▶ **NOTE**

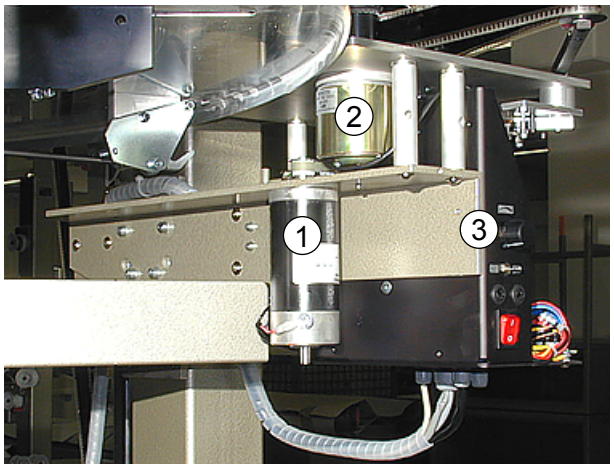
Adjusting the guide pins, see chapter 5.3.2.

3.2.5 Platter Drive, Eccentric Drive and Film Tension Sprocket Drive

▶ **NOTE**

▷ In this chapter you will get an overview of the drive components.

▷ All work on drives should be carried out by experts only

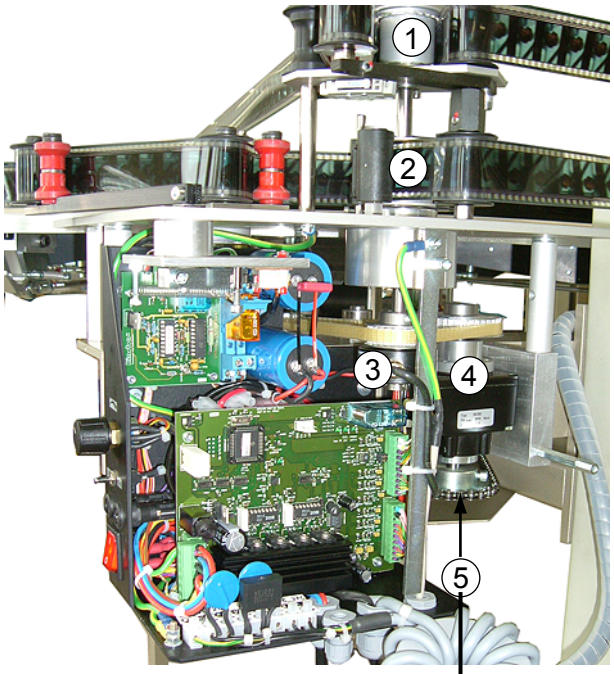


① platter drive motor

② film tension sprocket motor

③ control unit box with operating elements

The platter drive of the endless loop system is effected by a regulated direct current motor.



① take-off sprocket

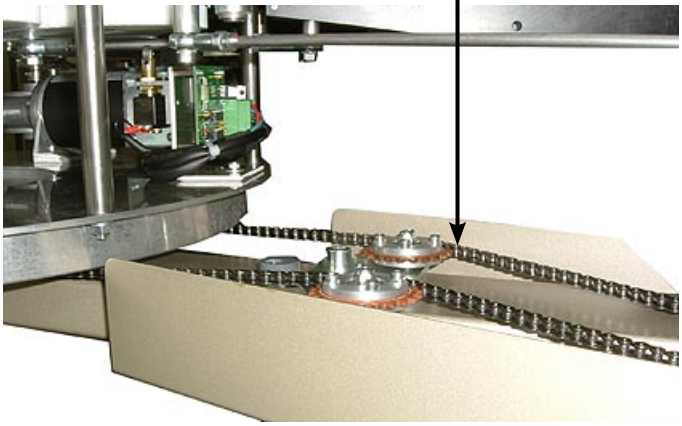
② take-up sprocket

③ encoder

④ platter drive

⑤ platter drive chain

The platter motor (see upper figure) is coupled via a toothed belt to the encoder, the take-off and take-up sprocket. The endless platter is turned continuously by the motor via a drive and a drive chain.
The encoder in the projector and the internal encoder care together for a synchronous film running.



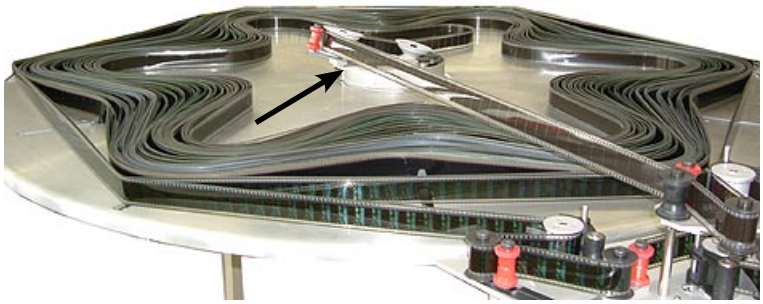
ATTENTION

For the compensation of minor regulating differences, the film must always be guided loosely from the outlet of the endless platter to the projector inlet with only a small slack.

The eccentric motor (white arrow) drives the eccentric mechanics (gears, stroke bars and sliding bolts) (black arrows) which transport the film package to the platter centre.

3.2.6 Film Take-off Unit

The film take-off unit (arrow) is placed in the platter centre and takes off the film out of the inside of the film reel. Then the film runs from the take-off unit to the take-off sprocket.



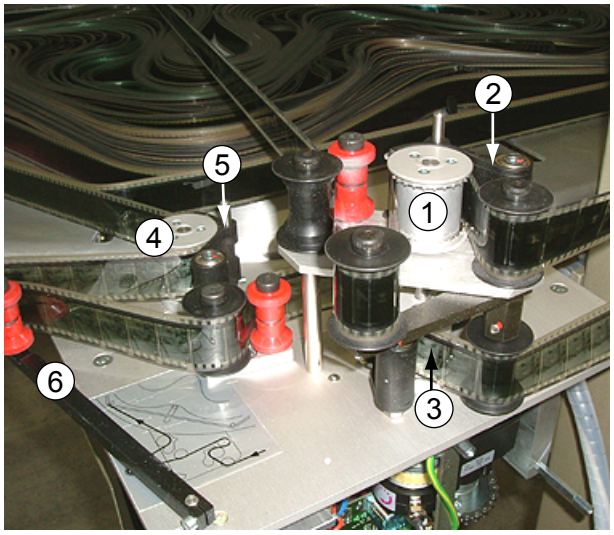
▶ **NOTE**

Threading instruction, see chapter 4.1.3.

3.2.7 Sprockets

3.2.7.1 Take-Off Sprocket / Take-Up Sprocket

The take-off sprocket and the take-up sprocket guide the outrunning or incoming film.



① take-off sprocket

② pad shoe

③ take-up sprocket

④ film tension sprocket

⑤ pad shoe

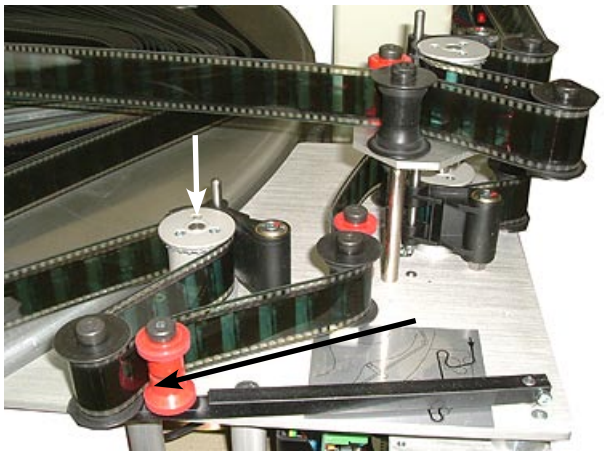
⑥ regulator arm

All sprockets are equipped with a pad shoe.

▶ **NOTE**

Threading instruction, see chapter 4.1.1.

3.2.7.2 Film Tension Sprocket



The film tension sprocket (white arrow) leads the incoming film which runs via the regulator arm (black arrow).

If a film break happens this sprocket turns freely – the system and the projector will be stopped.

The film tension sprocket is driven by an own motor.

▶ **NOTE**

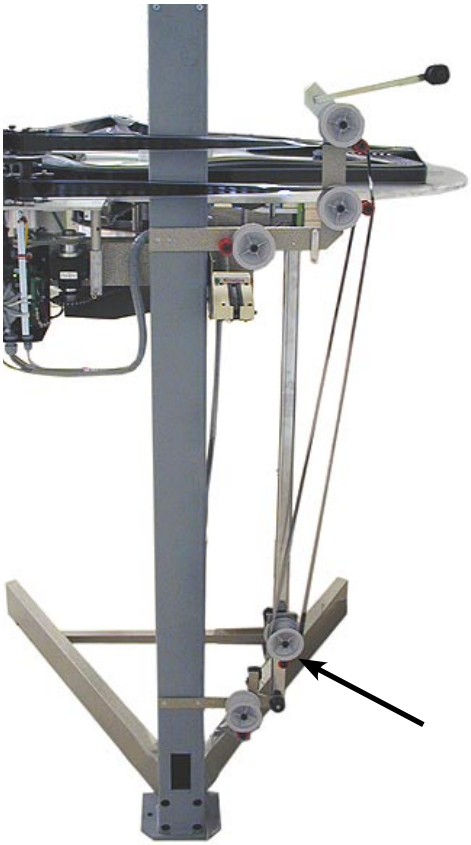
Adjusting the distance between the pad shoe and the sprocket, see chapter 5.3.3.

3.2.8 Regulator Arm

When the regulator arm (black arrow in upper figure) is moving inwards to a certain position, a transport will be triggered. If a film break happens the lever arm will totally move inwards – the film break switch will be activated and the system and the projector will be stopped.

3.2.9 Film Length Compensation Bracket

The film length compensation bracket consists of a guide roller, which is moveable vertically on a guide rail (arrow). With that differences of film length up to 1.40 m can be compensated. Differences can arise when sticking together film end and beginning.

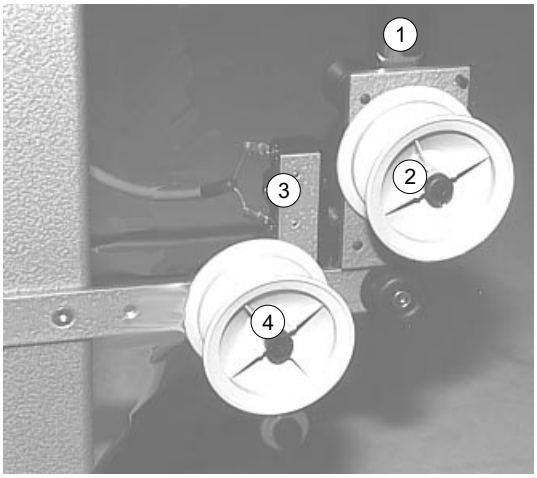


① guide rail

② film length compensation roller

③ film break switch

④ guide roller



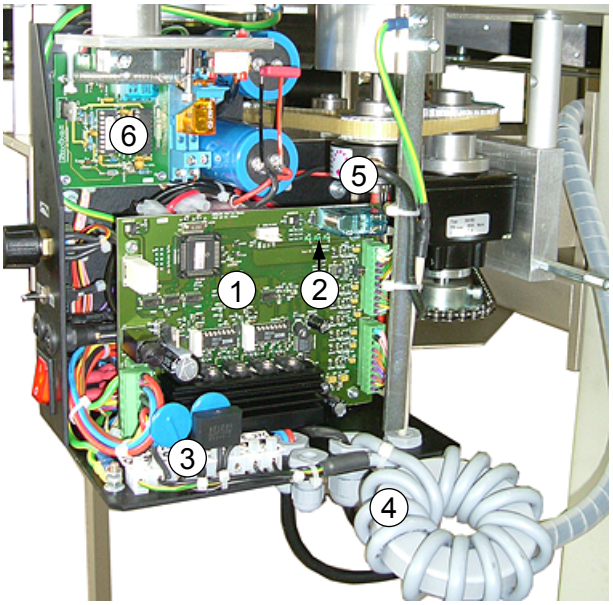
When the film length compensation roller touches the lower stop, e. g. at film break, the film break switch switches off the whole system.

3.2.10 Electronic Control Components

▶ **NOTE**

▷ In this chapter you will get an overview of the electronic components.

▷ All work on electronic components should be carried out by experts only



① main control board

② indicator LEDs

③ internal terminal strip

④ mains filter

⑤ encoder

⑥ film tension sprocket control board

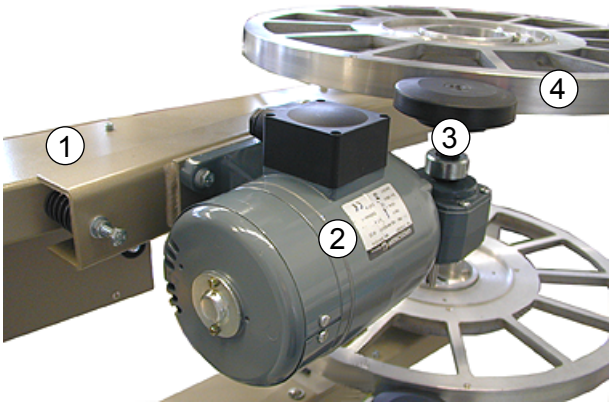
The main control unit (in the box on the column) registers the excursion of the lever arm (depending on film reel diameter) and transmits the new rotary speed values via the motor control unit (in a box under support arm) to the corresponding motor.

▶ **NOTE**

On the main control board you will find 3 indicator LEDs. See chapter 4.11 for more information.

3.2.11 ST 2000 E-K Combined Endless Loop System

Support Arm with Drive



① support arm

② motor

③ friction wheel with drive

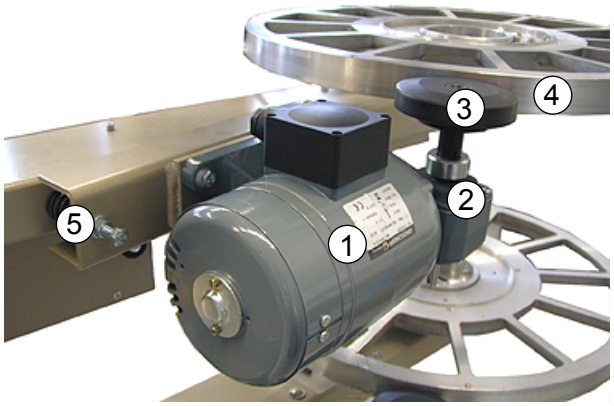
④ film platter driving flange

Each platter is driven from a motor via a friction wheel.

ATTENTION

Do not touch the friction wheel when the motor is running.

Platter Drive Motor



① motor

② drive

③ friction wheel

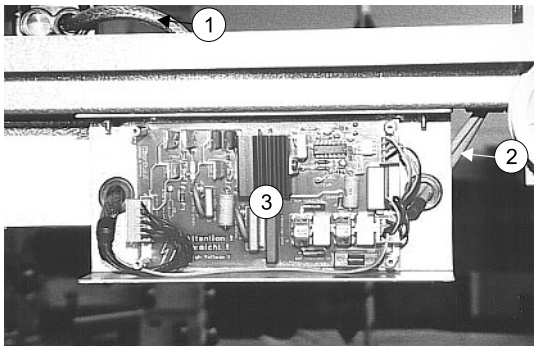
④ film platter driving flange

⑤ friction pressure adjusting unit (screw, spring, counter nut)

▶ **NOTE**

Adjusting the pressure of the friction wheel, see chapter 5.3.5.

Motor Control Unit



① cable running to motor

② cable running to motor control unit

③ board (motor amplifier)

The main control unit (in the box on column) registers the excursion of the lever arm (depending on film reel diameter) and transmits the new rotary speed values via the motor control unit (in a box under support arm) to the corresponding motor.

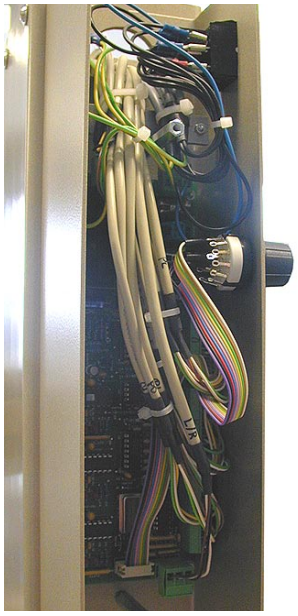
DANGER

▲ Power 220 V: Use a separating transformer when you measure with an oscilloscope.

▲ Allow work on the motor control unit to be carried out by competent service technician only.

Main Control Unit

The main control unit is placed in a box on the upper column.



ATTENTION

Work on the control unit and the motor amplifier are to be carried out by competent service technicians only.

Film Platters

The platters are suitable to store and transport films.

The **insert ring** will be pinned on the take-up platter.

The **take-off unit** on the take-off platter.

Insert Ring (placed on take-up platter) => film from projector

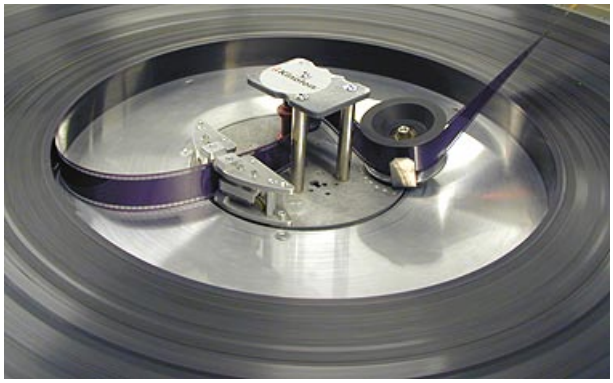
The insert ring - used to reel up a film - will be pinned onto the take-up platter. Spreading the tension jack you can fix the insert ring.

The tension jack has to be spread to remove the insert ring from the reel.

IR Take-Off Unit (placed on take-off platter) => film to projector

The take-off unit is inserted in the middle of “giving platter”.

- The take-off unit registers the film running speed via the current film position scanned by light barriers.
- The film position is recognized via light barriers.
- The main control box transmits the corresponding speed values (depend on film reel diameter) via the motor control unit to the motor of the corresponding platter.



3.3 Operating Elements of the Endless Loop System

3.3.1 Rotary Switch (speed potentiometer)

At maximum position:
The speed of the endless platter will be about twice as projection speed.

3.3.2 Toggle Switch

Switch on AUT position:
Projector encoder is the master and the internal encoder is the slave. When projector is started with a ramp of about 3 seconds and the endless loop system runs synchronously with the same speed.

Switch on MAN position:
The endless platter speed can be adjusted by turning the rotary switch.

3.3.3 Main Switch

Main switch in position I: Current transfer is switched on. The switch lights red.
Main switch in position 0: Current transfer is switched off

3.3.4 Operating Elements of the Non-Rewind Unit (ST 2000 E-K) (option)

All operating elements like main switch, rotary switch and toggle switch are positioned on the control board box on the top of the column.

3.3.4.1 Main Switch

The main switch is positioned on the top of the control unit box.

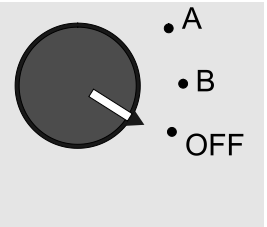
Main switch in position I: Current transfer is switched on. The switch lights red.
Main switch in position 0: Current transfer is switched off.

3.3.4.2 Rotary Switch for Platter Level

▶ **NOTE**
If either a film break switch is integrated in the control unit you must select that level which is not in use.
The switch should not set to OFF, because the free platter level (end-position of lever arm) will trigger a film break signal.

Rotary switch on A or B
Operation with make-up table - platter level, which operates with make-up table is selected.

Rotary switch on OFF
Operation with projector - no platter operates with make-up table.



3.4 Components of the Make-Up Table

① roller holder

② control roller with biphase sensors

③ guide and stay roller

④ reel platter

⑤ operating panel

The make-up table is either used to make-up or tear-down film programs together with the non-rewind system.

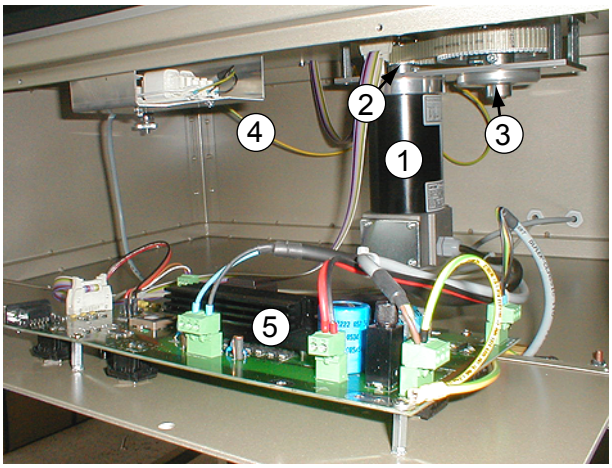
The **MT 600 make-up table** can optionally be equipped with a second mechanical friction. It is possible to operate either with two reels up to 600 m or with one reel up to 2000 m.

The **MT 2000 make-up table** can optionally be equipped with a second mechanical friction. It is possible to operate with two reels up to 2000 m. Optional is also the table light, the shelves and the spools holder.

Due to frontal wheels (fixable with brakes) the make-up table is movable.
The table level can be adjusted by screwing in or out the wheels.

3.4.1 Frictions

Electronic Take-Up Friction (MT 600 / MT 2000)



① friction drive

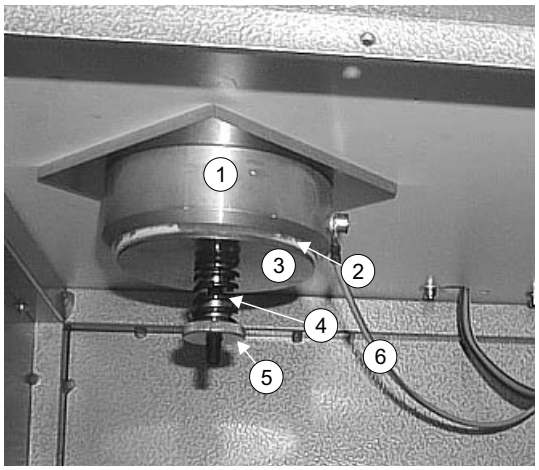
② motor shaft

③ friction shaft

④ earthing cable (important!!)

The electronic friction drives the right reel or reel disk of the make-up table.

Mechanic Take-Off Friction (option for MT 2000 / MT 600)



① friction body

② felt disk

③ disk (moveable on friction shaft)

④ spring

⑤ knurled nut

⑥ earthing wire (very important!!)

The spring pushes the moveable disk and the felt disk to the solid friction body.

Adjustment

When stopping the make-up table the friction should not build loops. If necessary adjust the friction by turning the knurled nut ⑤:
Turn right => the spring increases the pressure (film tension is increased)
Turn left => the spring reduces the pressure (film tension is reduced)

▶ **NOTE**

▷ Depending on spool size (600 m - 2000 m) the film tension has to be adapted.

▷ The film tension is inversely proportional to reel diameter:
Film tension is low, when the reel diameter is large.

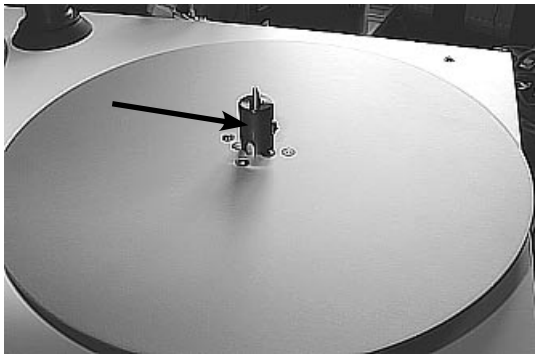
ATTENTION

△ Never use reels which have an inner diameter less than ¼ of the reel diameter because the film tension increases when reel diameter approaches to the inner diameter.

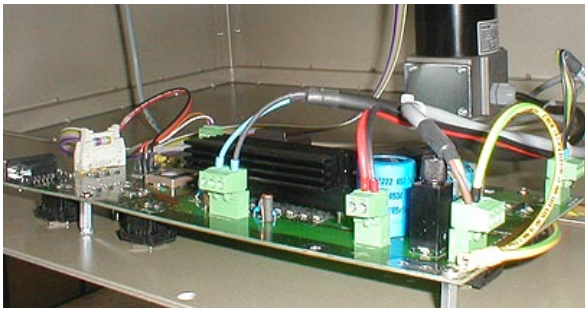
△ All components of the platter system require proper grounding. Without grounding electronic components can be damaged by static discharges caused by the film material.

Friction Shafts (change flanges)

- The reel disk is fastened on the corresponding flange
- The Kodak adapter (arrow) will be secured with a setscrew on the shaft.
- The reel disk can be easily put on or put off by holding the Kodak adapter.
- To put on a film spool plug in the corresponding friction flange and then put on the film spool onto the friction shaft.



3.4.2 Control Board



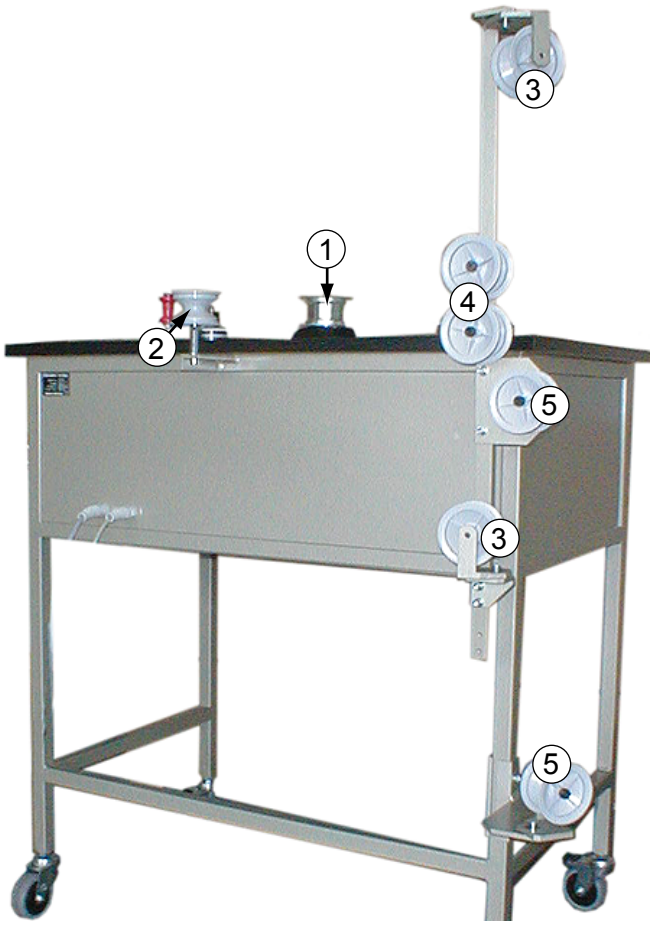
ATTENTION

Work on the electrical equipment is only be carried out by competent service technicians.

▶ **NOTE**

See also wiring scheme in chapter 7.3.

3.4.3 Film Guide Rollers



① control roller with biphase sensors

② guide and stay roller for film running to a platter

③ adjustable guide rollers

④ guide rollers

⑤ additional roller for operation with platter level D/E (only ST 400/500 E)

Roller Holder

The roller holder is equipped with adjustable rollers ③ - one on the upper end and one on the lower end. The two mid rollers are fixable mounted.

Via the roller holder the film can be led to all platters of the non-rewind system.

Control Roller

If the control roller turns itself Hall sensors register the rotation direction and rotation speed. The signal is used to calculate the film speed.

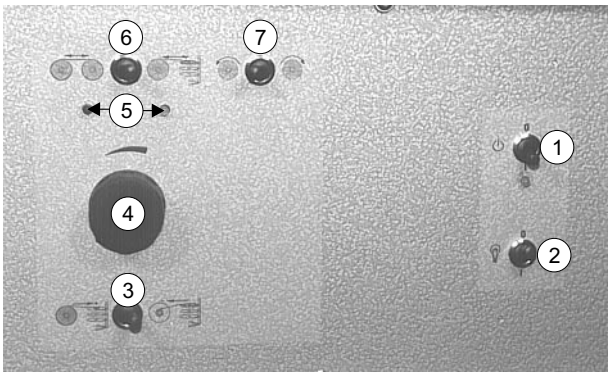
ATTENTION

Never put a film with a magnetic sound track on the make-up table, because the control roller is equipped with solenoids and therefore the sound track can be destroyed.

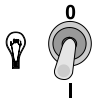
▶ **NOTE**

Threading scheme, see chapter 4.1.5.

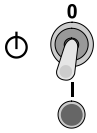
3.5 Operating Elements of the Make-Up Table



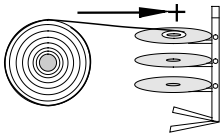
① main switch
Switches power ON/OFF.



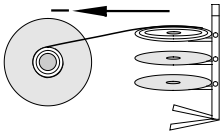
② light switch
Switches light ON/OFF (option).



③ toggle switch: Selects make-up or tear-down operation



make-up operation from make-up table to a platter



tear-down operation from a platter to make-up table

④ rotary switch

- Selects the continuous rewind speed
- Starts the rewind operation

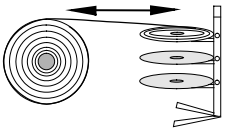
▶ **NOTE**

To stop and reset the make-up table, turn the potentiometer to its left stop.

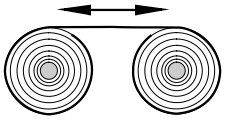
⑤ indicator lamps red and green

- The red lamp illuminates at an error.
- The green lamp illuminates at start.
- The green lamp blinks at operation.

⑥ toggle switch: Selects operation mode.

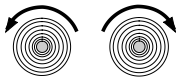


Non-rewind system operates with make-up table (making up or tearing down).



Make-up table rewinds.
(only possible with 2 friction shafts)

⑦ toggle switch: Selects rotation direction.

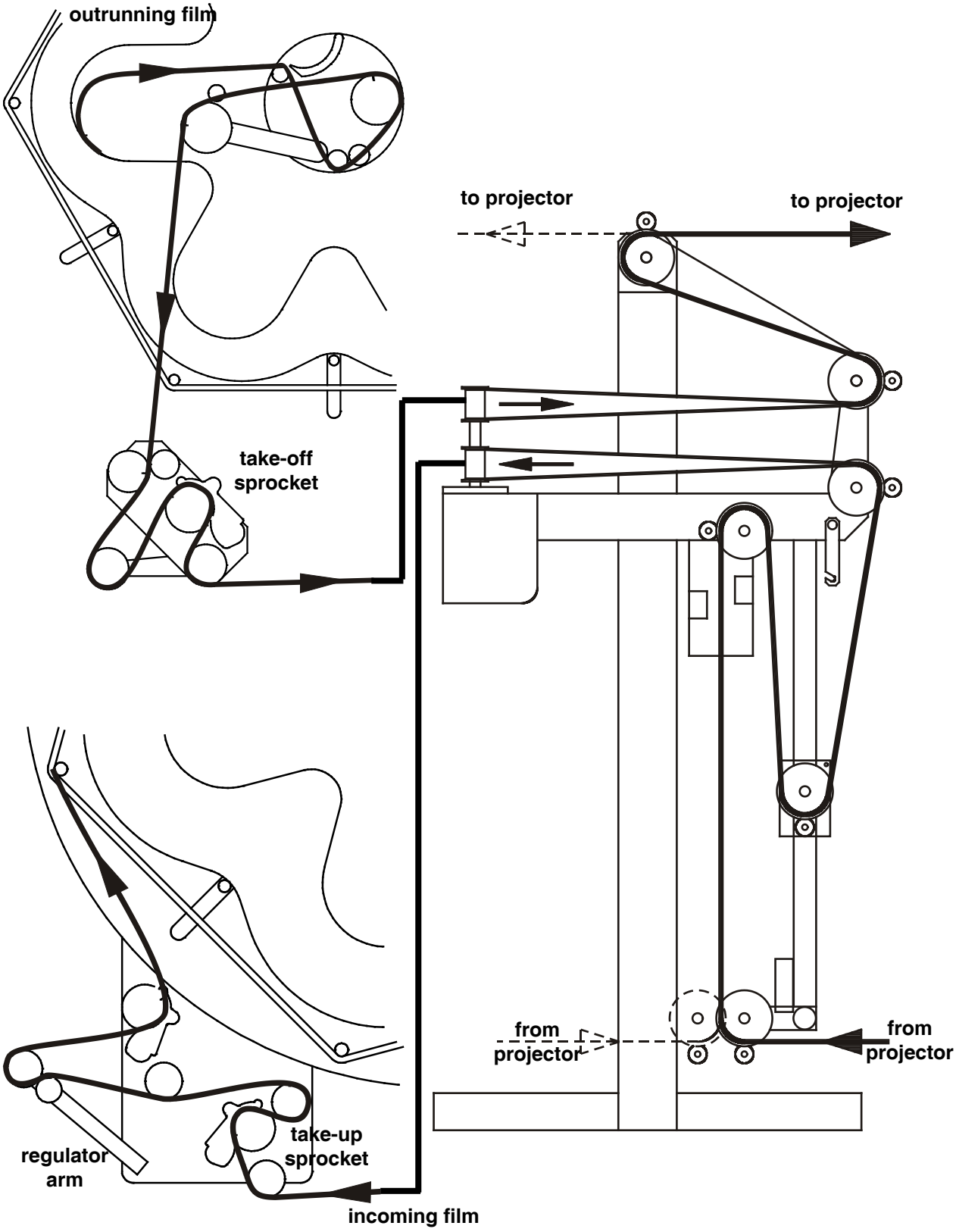


RIGHT or LEFT

4 Operation and Troubleshooting

4.1 Threading Schemes

4.1.1 Endless Loop System

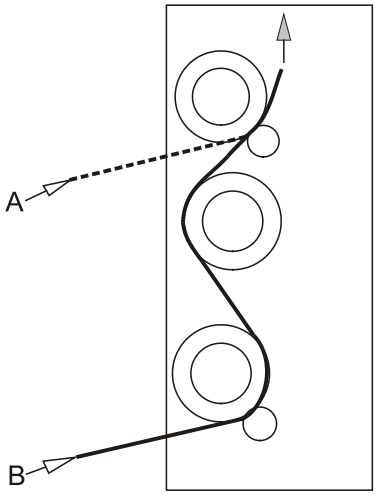


4.1.2 Non-Rewind System (ST 2000 E-K)

▶ **NOTE**

▷ In principle, you always have to thread the film from the take-off unit to the next guide roller on the column and then to the guide rollers on the top of the column.

▷ From projector you have to thread the film into the adjustable guide roller on column and then to the lever arm to the “taking” platter.



4.1.3 ST 2000 Take-Off Unit

See figure how to thread the film through the take-off unit.

4.1.4 ST 2000 E-K IR Take-Off Unit

Thread film:

1 between the light barriers

2 around small guide roller and around braking roller

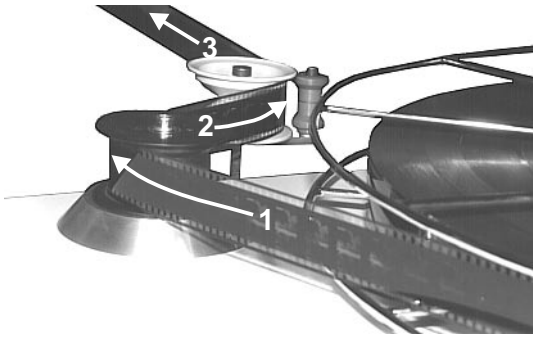
3 around big guide roller

4 to the column guide roller

▶ **NOTE**

Observe the dots on the base. They show you how to thread the film.

4.1.5 Threading Scheme for Make-Up Table



1. from or to reel disk or film spool via the control roller
2. from or to the control roller via the guide roller
3. from or to the roller holder and from there to or from the non-rewind system

▶ **NOTE**

The film must always be threaded via the control roller although the rotation direction is free selectable.

ATTENTION

△ Never spool a film with a magnetic sound track on the make-up table, because the control roller is equipped with four solenoids and therefore the sound track can be destroyed.

△ Special solution (encoder roller) can be delivered if films with magnetic sound tracks will be used.

4.2 Endless Loop System Operates with Projector (and/or Make-Up Table)

4.2.1 ST 2000

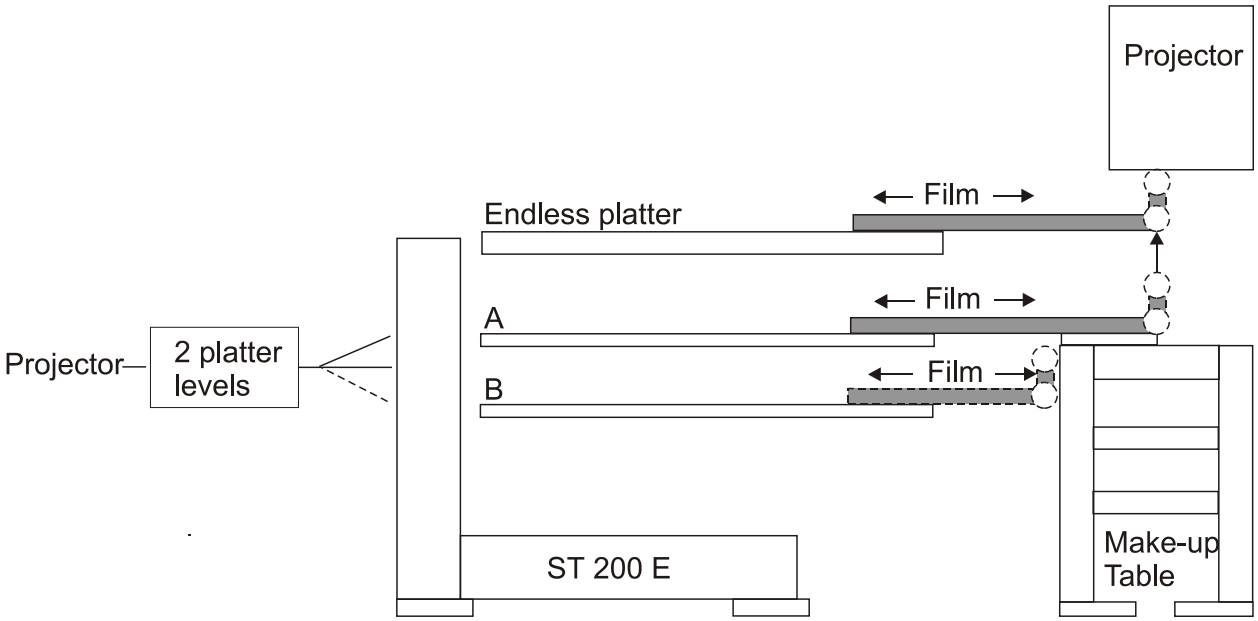
Operation with a projector only:

- Projector runs with endless platter

Operation with a make-up table (passive friction) only:

- Endless platter runs with mechanical friction of the make-up table.

4.2.2 ST 2000 E-K



Operation with a projector and the make-up table:

- Projector runs with endless platter.
- Make-up table runs with any free platter (rotary switch must be positioned on this platter).

Operation with projector only:

- Projector runs with endless platter or with both non-rewind platters.

▶ **NOTE**

If a film break switch is integrated in the control unit you have to select that level, which is not in use.

Operation with endless and non-rewind platters:

- The endless platter runs with one of the non-rewind platters for make-up operation.

Operation with make-up table only:

- Make-up table runs with platter A or B (rotary switch must be positioned on this platter).

4.3 Switch-On / Switch-Off

Switch-On

- Switch-on the external power supply and the control box in the performance room.
- Switch-on the endless loop system's / non-rewind system's main switch (position "I").

☛The key lamp illuminates red.

- If necessary switch-on the make-up table's main switch (position "I").

☛The indicator LED under the toggle switch illuminates orange.

Switch-Off

- Switch-off the endless loop system's / non-rewind system's main switch (position "0").

☛Red lamp gets off.

- Switch-off the make-up table's main switch (position "0").

☛Orange LED gets off.

- Switch-off the external power supply and the control box.

4.4 Making Up the Program onto the Endless Platter

The single film reels can be wound up or off from resp. to:

- one of the two non-rewind platters (only possible with ST 2000 E-K):
  A program, already assembled on one non-rewind platter can be run via the projector to the endless platter during a first performance. When the whole film is on the endless platter you can run and project the further performances endlessly.
- a make-up table (but only with passive mechanical friction!)
- a film spool on projector (if the necessary guide rollers are available)
- a rewinder (passive friction)

4.4.1 Making Up Manually

▶ **NOTE**

This operation mode refers to the assembling of the film, act by act, directly on the endless platter without a projector or the non-rewind system. The film is guided via an appropriate feed friction and adequate deviation rollers to the inlet of the endless loop system.

- Switch-off the main switch (position "0") on endless loop system.

☛The switch lamp is off.

- Turn the rotary speed switch completely left.
- Set the toggle switch to position MAN.
- Pull the film coming from the feed friction and thread it via take-up sprocket to the endless platter.

- Tightly guide the film along 3 to 4 guide pins and fix it approximately in the centre of the platter by means of a splicing tape.

▶ **NOTE**

The platter turns clockwise!

☛ The feed friction has to be adjusted in a way the film length compensation roller stops approximately to the middle of the guide rail.

ATTENTION

If the friction is too loose, the roller will go down and switches off the whole system by means of a film break switch!

- Switch-on the main switch (position “I”) on endless loop system.

☛ The switch lights red.

- Slowly turn the speed rotary switch to the right until the desired speed is reached (max. 50 frames/seconds).

☛ If the film is finished, the film length compensation roller falls down and switches off the equipment.

▶ **NOTE**

Before start again, the main switch must be switched off for about 10 seconds so that the fault storage can be cleared.

4.4.2 Making Up Automatically

▶ **NOTE**

This operation mode refers to reeling up the program, completely assembled in advance, via the projector during the first performance.

- Switch-off the main switch (position “0”) on endless loop system.

☛ The switch lamp is off.

- Set the toggle switch to position AUT.
- Pull the film coming from the feed friction and thread it via take-up sprocket to the endless platter.
- Tightly guide the film along 3 to 4 guide pins and fix it approximately in the centre of the platter by means of a splicing tape.

▶ **NOTE**

The platter turns clockwise!

- Switch-on the main switch (position “I”) on endless loop system.

☛ The switch lights red

- Start the projector.

☛ The endless loop system will start automatically via the electronic control (biphase coupling).

4.5 Endless Projection Operation

- Switch-off the main switch (position “0”) on endless loop system.

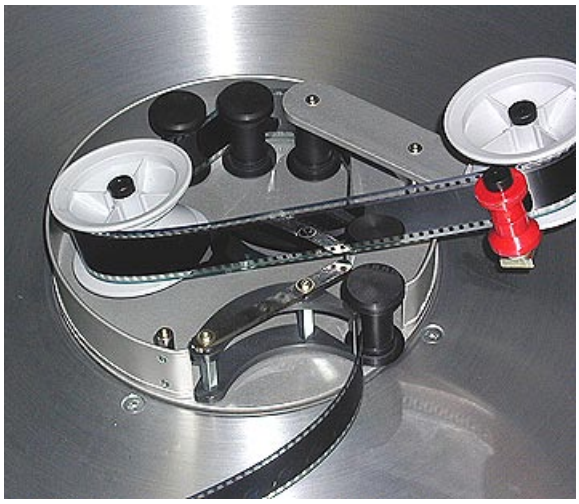
☛ The switch lamp is off.

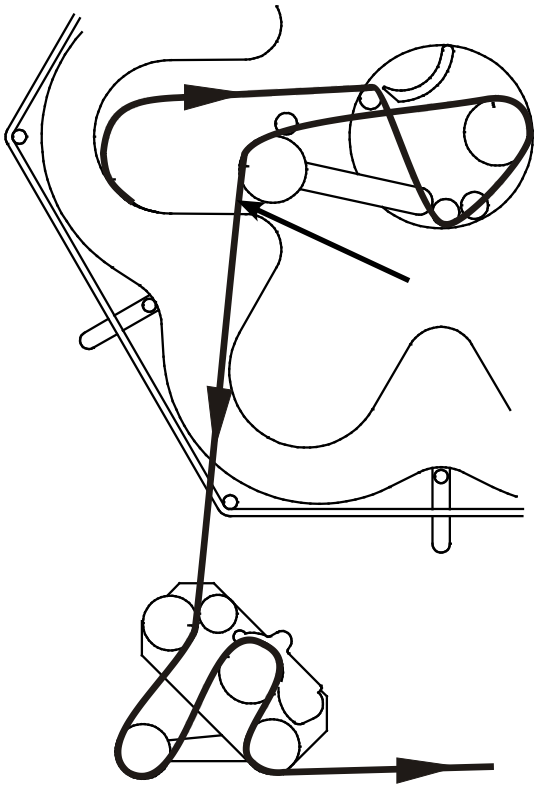
- Set the toggle switch to position AUT.
- Wind the rest of the film completely onto the endless platter by manual pulling the film.

ATTENTION

Take care that the end of the film does not fall down!

Film to projector





- Thread the beginning of the film into the film take-off unit and through the take-off sprocket and then via guide rollers to the projector.

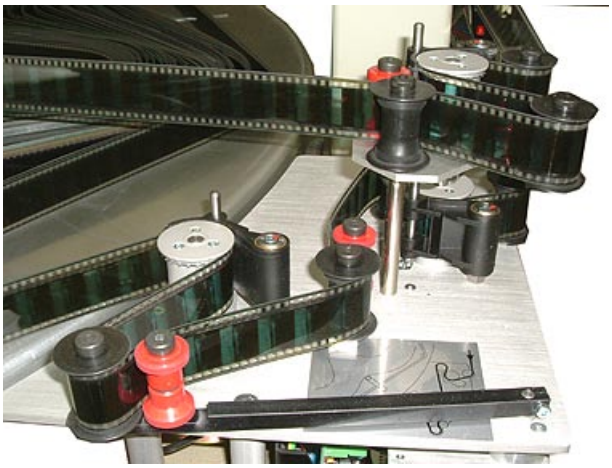
▶ **NOTE**

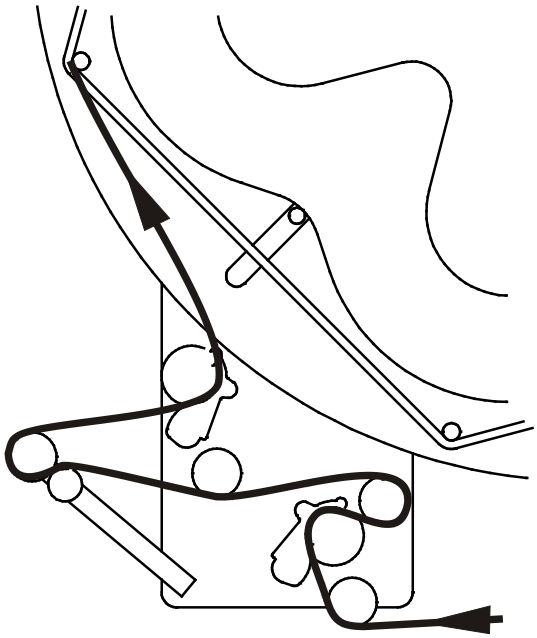
▷ Before threading pull off so much film that the beginning of the film can be guided back to the endless platter.

▷ The film coming from the inside of the film reel should form a right angle to the support arm, as shown in the right figure (arrow). If necessary correct it at the take-off sprocket.

- Thread film through the projector (see the corresponding operating manual).

Film from projector





- Guide the film to the take-up sprocket of the endless platter.
- Thread the film via rollers to the film length compensation roller and then to the take-up sprocket.
- Thread the film through the rollers of the lever arm, then through the film tension roller and to the platter edge.
- Stick together the film beginning and the end.

▶ **NOTE**

If necessary, you can shift the film on the take-up sprocket and respective shorten or adding of black film.

- Clockwise turn the platter, so the film is loosely run from the outlet of the endless platter with a little slack to the inlet of the projector.
- Switch-on the main switch (position “I”) on endless loop system.

☛ The switch lamp lights red.

- Start the projector (master).

☛ The endless loop system will start automatically (slave).

ATTENTION

Observe, the film length compensation roller does not activate the film break switch. In this case the equipment will not start.

4.6 Tearing Down the Program from the Endless Platter

The endless film reel can be wound off to:
- one of the two non-rewind platters (only possible with ST 2000 E-K):
- a film spool on projector (if the necessary guide rollers are available)

- Run the projector until the film beginning has arrived the outer edge of the endless platter.
- Switch-off the main switch (position “0”).

☛The switch lamp is off.

- Set the toggle switch to position AUT.
- Take off the film beginning from the endless platter and lead it to the film “taking” platter of the non-rewind system (if available) or to the take-up friction of the projector.

ATTENTION

△ Take care that the film does not fall down.

△ Lift the film length compensation roller and hang it on the stop lever so the film break switch will be released; otherwise the endless loop system will not start.

- Switch-on the main switch (position “I”).

☛The switch lights red.

- Start the projector respective the the non-rewind system.

ATTENTION

△ The complete film must be placed inside of the guide pins, therefore move the lever arm during operation about 5 seconds to the inside stop. By this a film transport stroke will be released.

△ Mind the danger of being injured by the freely rotating sprocket!

▶ **NOTE**

The film could be taken up to a make-up table. As a relatively high film tension is being produced by the friction of the make-up table, this method is not recommend.

4.7 Projection Operation with Non-Rewind Platters (ST 2000 E-K)

▶ **NOTE**

At projection operation the platter selection rotary switch must be positioned to “OFF”.

☛ The film reel is positioned on the platter – beginning of film reel is inside.

- Plug the take-off unit.
- Open the tension jack of the insert ring and put it down on the “reel-up” platter.

☛ The platter selection switch **must be position on OFF**.

- Thread the beginning of the film into the take-off unit, then into the guide rollers of the column.

☛ The platter is activated and turns itself.

- Run film to the projector.
- Run film from the projector over the adjustable guide roller on the column back to a platter.
- Thread film into the guide rollers of the corresponding lever arm.
- Wind-up the film with two to three winding over the insert ring.
- Turn the platter manually.

☛ The film will be stressed.

☛ The lever arm will automatically move into its working position.

☛ The projector is ready for start.

ATTENTION

△ The film must always be threaded between guide roller and red stay roller.

△ Check all runs and rollers if the film is threaded correctly.

4.7.1 Changing the program (film reel)

- After finishing the program, fix the end of the film with a tape.
- Fasten a film transport clip over the film reel and the insert ring.
- Remove the secured film from the platter.
- Put your new program onto the platter and remove the film transport clip.

4.8 Operation of Non-Rewind Platters with Make-Up Table

ATTENTION

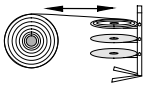
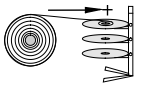
△ Never spool a film with a magnetic sound track on the make-up table, because the control roller is equipped with four solenoids and therefore the sound track can be destroyed.

△ Special solution (encoder roller) can be delivered if films with magnetic sound tracks will be used.

4.8.1 Make-Up Operation

▶ **NOTE**

At make-up operation, the platter selection rotary switch must be positioned to this platter which operates with the make-up table.

- Connect the make-up table to the non-rewind system (3-pole connector).
- Switch on the make-up table (switch position “I”).
- Adjust the upper toggle switch to position  (operation with non-rewind system).
- Adjust the lower toggle switch to position  (make-up operation).
- Adjust the desired rotating direction by setting the upper right toggle switch  (left or right).

☛ The first reel, for example a trailer, is put on the right side of the make-up table.

- Pin an insert ring on a platter of non-rewind system.
- Lead film via the control roller and then via the associated guide rollers on the roller holder to the selected platter of the non-rewind system.

ATTENTION

Never lead film via the lever arm of the non-rewind system to the make-up table.

- Wind the film (two to three winding) around the insert ring on the “reel-up” platter.
- Activate the corresponding platter A or B by turning the rotary switch on the platter system.
- Turn the potentiometer clockwise to the desired reel speed, the make-up operation starts.

☛ While starting the green LED illuminates continuously. During operation the green LED blinks.

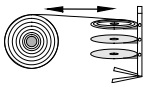
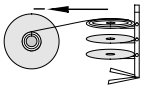
☛ Should the red LED illuminate there is a malfunction or a fault.

- To reset the table turn the potentiometer to the stop position and restart the platter system as soon as the green LED illuminates.
- Repeat this process until your program is finished.

4.8.2 Tear-Down Operation

▶ **NOTE**

At tear-down operation, the platter selection rotary switch must be positioned to this platter which operates with the make-up table.

- Connect the make-up table to the non-rewind system (3-pole connector).
- Switch on the make-up table (switch position “I”).
- Adjust the upper toggle switch to position  (operation with non-rewind system).
- Adjust the lower toggle switch to position  (tear-down operation).
- Adjust the desired rotating direction by setting the upper right toggle switch  (left or right).

☛ The program for separating is positioned on a platter.

- Lead film to the make-up table via the guide roller on the column.

ATTENTION

Never lead the film via the lever arm of the non-rewind system to the make-up table.

- Activate the corresponding platter A or B by turning the rotary switch on the platter system.
- Turn potentiometer clockwise to the desired reel speed, the make-up operation starts.

☛ While starting the green LED illuminates continuously. During operation the green LED blinks.

☛ Should the red LED illuminate there is a malfunction or a fault.

▶ **NOTE**

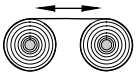
Troubleshooting, see chapter 4.10.

- By the time the process ends, reduce the reel speed. Stop reeling and open the slice between the acts by peeling off the tape.
- Repeat this process until your program is separated.

4.9 Rewind Operation with Make-Up Table

▶ **NOTE**

The rewind operation is only possible with an optional second friction.

- Switch on make-up table (switch position “I”).
- Adjust the upper left toggle switch to position  (rewind operation).
- Adjust the possible rotating direction by setting the upper right toggle switch  (left or right).

ATTENTION

To reverse the rotation the drive has to stand still.

- Turn potentiometer clockwise to the desired reel speed, the rewind operation starts.

☛ While starting the green LED illuminates continuously. During operation the green LED blinks.

☛ Should the red LED illuminate there is a malfunction or a fault.

▶ **NOTE**

Troubleshooting, see chapter 4.10.

4.10 Troubleshooting

Currently technology and programs guarantee a perfect process of the system, nevertheless there could be errors because of malfunction, wrong procedures and other things.

In this chapter you get information about possible errors and error messages and about possible clearing of these errors.

4.10.1 Clearing of Errors

Igniting the xenon bulb and rewinding the film generate charges. Therefore a high flexible and reliable PE connection between lamphouse and projector and between projector and non-rewind system is very important.

4.10.2 Endless Loop System

Endless loop system is not starting

1. Film break switch or film tension roller switch contact is closed.

- The film length compensation roller has to be lifted. If necessary thread film correctly via regulator arm roller.

2. Regulator arm is positioned on the right stop.

- If the lever arm contacts after a transport cycle is finished, three transport cycles will be triggered at intervals becoming shorter and shorter. After these actions the equipment will be stopped. This fault routine can only be cancelled by switching off and on again.

Endless loop system is not running

1. Igniting the xenon lamp for too long time can trigger running the endless loop system without starting the projector. In this case the film break switch will be activated.

2. Unreliable operation

- Endless loop system and make-up table must be connected to the same phase and ground for a reliable operation. Use twin power outlets for both devices.

4.10.3 Non-Rewind System (ST 2000 E-K)

1. Lever arm is not in working position.

- Turn platter to move lever arm in working position.
- Check hall potentiometer. If necessary the service technician should change it.

2. Unreliable operation

- Endless loop system and make-up table must be connected to the same phase and ground for a reliable operation. Use twin power outlets for both devices.

4.10.4 Make-Up Table

Make-up Table is not running => the red LED illuminates.

1. Rotation direction was set wrong.

- Adjust the rotation direction corresponding to operation mode.

2. Rotation direction was changed during operation.

- Turn rotary switch left to its stop => the red LED gets off and the green LED illuminates. To start again turn rotary switch clockwise.

3. Malfunction because of wrong operation.

- Turn rotary switch left to its stop => the red LED gets off and the green LED illuminates. To start again turn rotary switch clockwise.

4. Unreliable operation

- Non-rewind system and make-up table must be connected to the same phase and ground for a reliable operation. Use twin power outlets for both devices.

4.11 LED Error Indication

The LEDs (arrow) are positioned on the main control board. They could help to localize a possible problem.

LED “test forward running” (left LED)

- ☛ If both encoder (internal and in projector) are connected correctly and if platter turns forward the LED illuminates continuously.
- ☛ If platter turns backward the LED do not illuminate.

LED “eccentric control ON” (mid LED)

- ☛ This LED illuminates when the eccentric control board is switched that means a transport cycle is carried out (30 to 36 V voltage).

▶ **NOTE**

The switching duration is factory-set to 8 (=1.146 platter turns). This value is enough to carry out one transport cycle.

- ☛ The duration of one transport cycle is determined by the internal encoder and depends therefore on the actual speed of the platter or is 16 seconds maximum due to a timer.
- ☛ At the end of a sliding procedure, which is shorter than the time for supplying the voltage (30 to 36 V) the eccentric control will be stopped by a stop switch.

LED “regulator arm is ACTIVE” (right LED)

- ☛ The LED is illuminating, if the regulator arm has reached the release position for the sliding procedure by the growth of the film pack.
- ☛ There will be no sliding process, if the platter stands still, if a stop switch is active and if an internal fault has opened the line to the projector.

▶ **NOTE**

If an internal fault is the reason, it can be cancelled by switching the endless loop system off and on again.

5 Cleaning and Maintenance / Adjustments

5.1 General Hints

ATTENTION

△ Allow work on electric supply to be carried out by competent electricians only.

△ Make sure that nobody starts the system while you are working. With all maintenance and cleaning work you must separate non-rewind system from power supply (switch off main switch).

△ All adjustments to be carried out by competent service men from KINOTON.

Because of using maintenance-free elements, the consumption of material and the expenditure of time for maintenance work and attendance are reduced to a minimum.

This maintenance work and attendance which are necessary may be observed especially from operators. These works have to be carried out regularly and carefully.

5.2 Maintenance and Cleaning

Component	as required
film platter	Clean the platter with a linen cloth, before putting a new film reel.
platter drive chain	Lubricate with Esso universal oil.
toothed belts	Lubricate with a well adhesive oil.
take-off unit	Clean the film guidance with pressurized air.
IR take-off unit	Before film change clean it with pressurized air.
guide rollers	Listening check: Noises because of defect ball bearing => change ball bearing or complete roller
friction wheel drive	Function check: Observe the right and functional pressure of the friction wheel. If grease comes out of the drive or the bearing bushing has a play, the whole drive has to be changed (service).
film platter	Clean the platter with a linen cloth, before putting a new film reel.

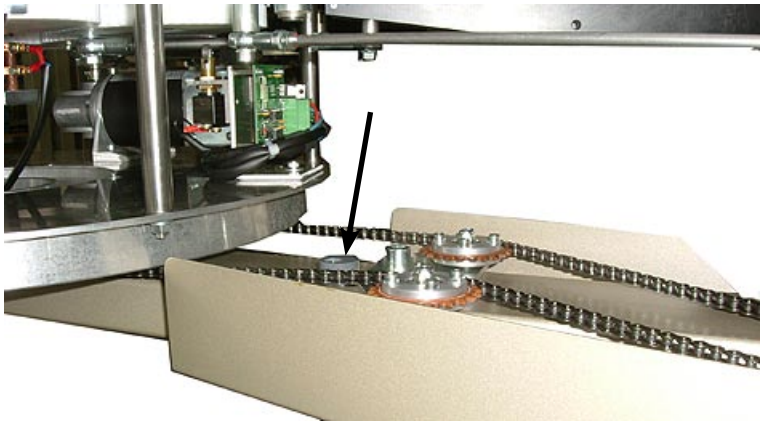
▶ **NOTE**

Due to a lot of dust, which adhere on rollers and film guide components and because of electrostatic charging, we recommended to use a film cleaner.

5.3 Repair

5.3.1 Tension the Drive Chain of Endless Platter

Because the chain runs horizontally, it wears faster. So the chain must be stressed regularly.

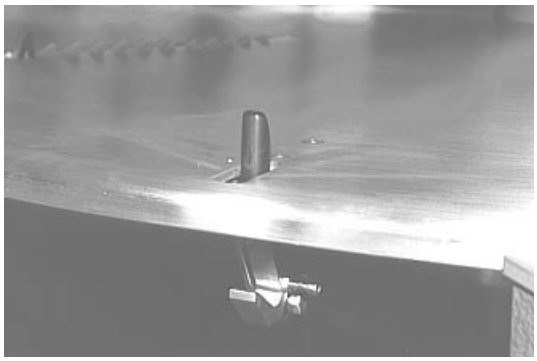


- Adjust the chain with the aid of the turnbuckle (arrow). Hold the turnbuckle screw with an Allen key and move it with the aid of a spanner.

☛ The chain has to be adjusted in a way you can move the chain a little bit with your thumb.

5.3.2 Adjusting the Guide Pins on the Endless Platter

By loosening the fixing screws, the guide pins can slightly be displaced axially to the film reel.



▶ **NOTE**

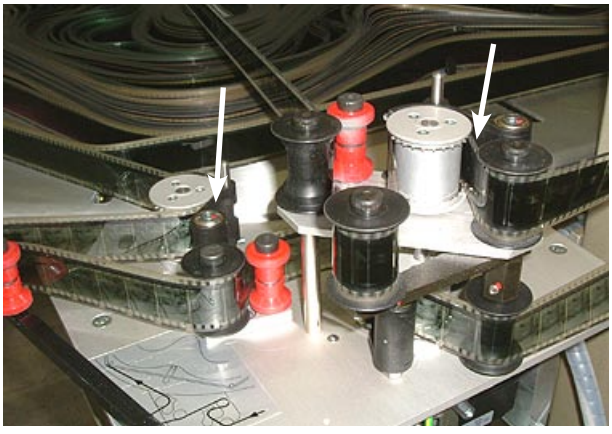
▷ The position of the guide pins is factory-set in a way the thickness of a film packet (normal film) will have about 5 to 6 mm between the transport phases.

▷ Using a thicker film the guide pins can be moved 1 to 2 mm towards the platter centre

▷ Using a thinner film the film packet will be thicker than 6 mm. In this case move the pins 1 to 2 mm towards the outside.

5.3.3 Adjusting the Distance between Pad Shoe and Sprocket

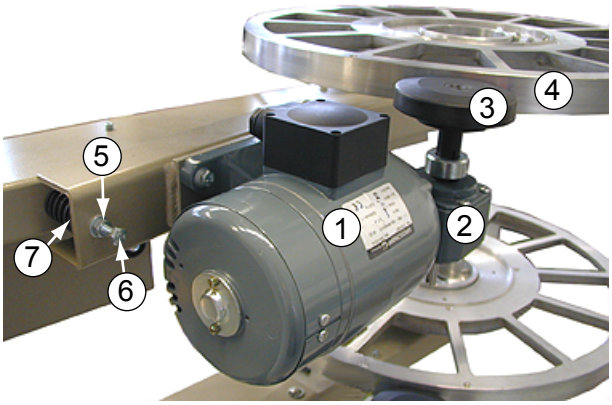
- Adjust the distance screw on pad shoe in a way that a play of two film thickness is between the pad shoe and the sprocket (arrows) - the two film layers should be moved through the closed sprocket easily without a resistance.
- After adjustment, remove the films and tighten the locking screw again.



5.3.4 Changing a Guide Roller

- Release the Allen screw or the hexagon head cap screw of the corresponding roller and pull the defect roller from its shaft.
- Put on a new roller and tighten the screw.

5.3.5 Adjusting the Friction Wheel Pressure of the Non-Rewind Platter (ST 2000 E-K)



① motor
② drive
③ friction wheel
④ platter drive flange
⑤ lock nut
⑥ adjusting screw
⑦ pressure spring

Adjust the pressure in a way a reliable function is guaranteed. If the platter is stopped manually the friction wheel should slip and the motor should turn.
- If the pressure is too high, the drive can be damaged and the friction wheel wears fast.
- If the pressure is too low, the lever arm triggers the film break switch when projector has been started.

Adjusting:

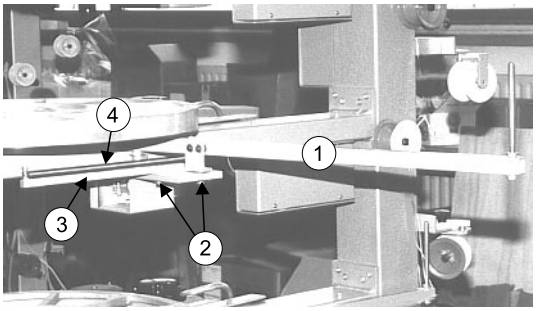
- Release the lock nut ⑤.
- Turn the setting screw ⑥ clockwise - the pressure spring ⑦ relaxes, the friction wheel with motor moves nearer to the flange.
- If the friction pressure is correct, fix this adjustment with the lock nut ⑤.

5.3.6 Adjusting the Lever Arm Spring of the Non-Rewind Platter (ST 2000 E-K)

▶ **NOTE**

▷ The spring tension is factory-set.

▷ The closeness of a film reel depends on lever arm spring tension . If reels are wound up too loose, it is necessary to increase the spring tension.



① lever arm in zero-position

② Allen screws

③ spring bar

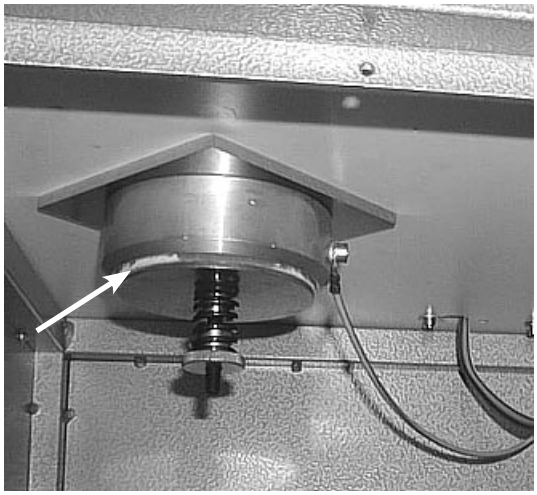
④ spring

- Release the two Allen screws and remove them.
- Fasten the spring bar ③ with spring ④ on one of the outer threaded hole.
- Tighten the screws ② again.

▶ **NOTE**

The adjustment of the lever arm Hall potentiometers should be carried out by service technicians only.

5.3.7 Changing and Lubricating the Felt Disk of the optional Mechanical Friction of the Make-Up Table



- Remove the front plate of the make-up table.
- Remove the knurled nut, spring, friction plate and felt disk on the friction shaft (arrow).
- Once in a year the felt disk should be put in a Cardan oil bath.
- If the felt disk is worn (surface is hardened) it has to be changed. The new felt disk has to be oiled too.
- Mount the friction again.
- Thread a film and adjust the friction by turning the knurled nut such the film gets no loops when stopping the rewinding:
  - Right turn => spring increases the pressure (friction increases)
  - Left turn => spring decreases the pressure (friction decreases)

6 Parts and Wearing Parts

6.1 Endless Loop System (ST 2000 (E-K))

Part	Figure	No.	Code Number
guide roller half grey	1, 4	1	5322 705 30909
stay roller	1, 4	1A	5322 705 30967
pad shoe right 35 mm nut spring left	2	2	5322 525 30003 5322 462 50027 5322 492 40001
spring for film holder pins	3	3	1000 492 37022
encoder for D-/A-projector from Kinoton encoder for foreign projector			1000 218 67006 1000 218 67007

6.2 Non-Rewind System (ST 100 E on ST 2000 E-K)

Part	Figure	No.	Code Number
guide roller half grey	1, 4	1	5322 705 30909
stay roller	1, 4	1A	5322 705 30967
braking roller complete with shafts and disks braking roller	4	1B	1000 525 67030 1000 525 67027
platter ∅ 1240 mm standard version	1	4	5322 705 30939
insert ring ∅ 400 mm insert ring ∅ 600 mm bolt 7 mm expansion lever with cone head and holder	5 5	5 5A	5322 705 30936 5322 705 30934 5322 705 30938 1000 705 37001
IR take-off unit complete	6	6	5322 705 30910
shaft for movable guide roller (thread 6 mm)			5322 705 30911
shaft for fit roller (thread 10 mm)			5322 705 30958
stay roller on lever arm			1000 404 57045

6.3 Electronic Parts

Part	Code Number
delay fuse 2 A	4822 253 30025
delay fuse 2.5 A	4822 253 30026
delay fuse 6.3 A	4822 253 30031
connecting cable non-rewind system / projector	1000 321 27008

6.4 MT 600/2000 Make-Up Table

Part	Figure	No.	Code Number
reel platter Kodak core			0040 060 00065 1000 705 37013
half guide roller grey stay roller			5322 705 30909 5322 705 30967
guide roller shaft thread 6 mm guide roller shaft thread 10 mm			5322 705 30911 5322 705 30958
felt disk for mechanical friction	7	7	5322 532 50028
spring for mechanical friction	7	7A	5322 492 50064
knurled nut for mechanical friction	7	7B	5322 505 10049
delay fuse 2.5 AT			4822 253 30026

Figure 1

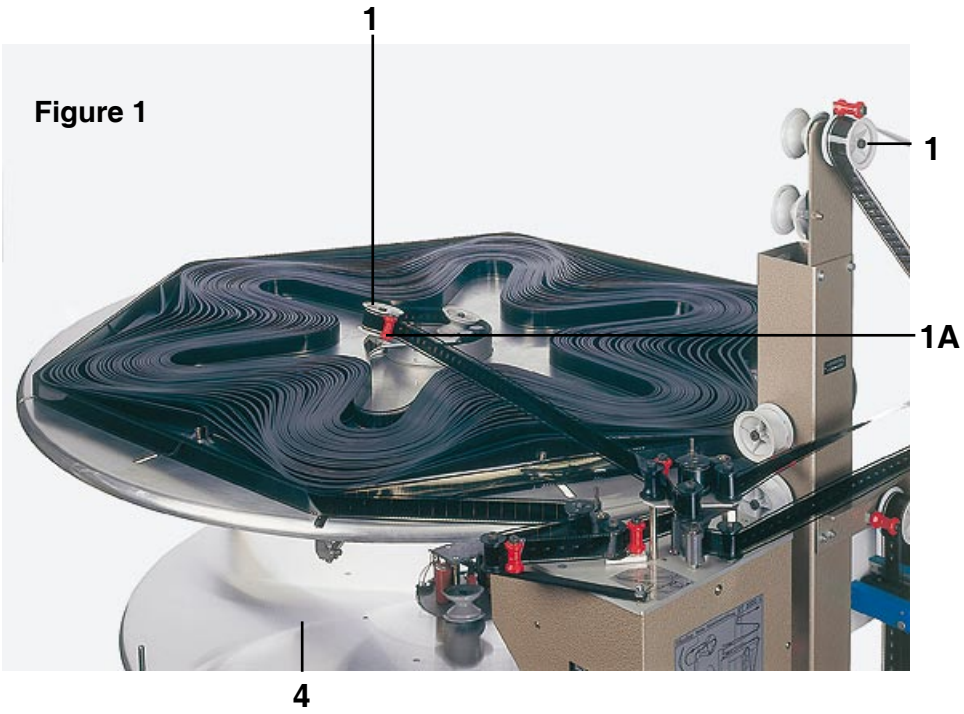


Figure 2

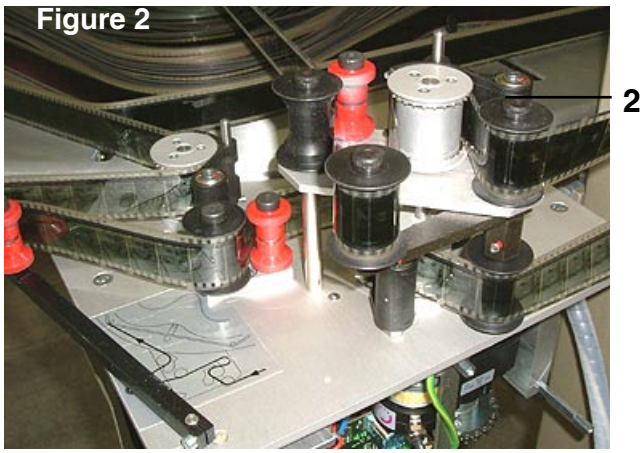


Figure 3

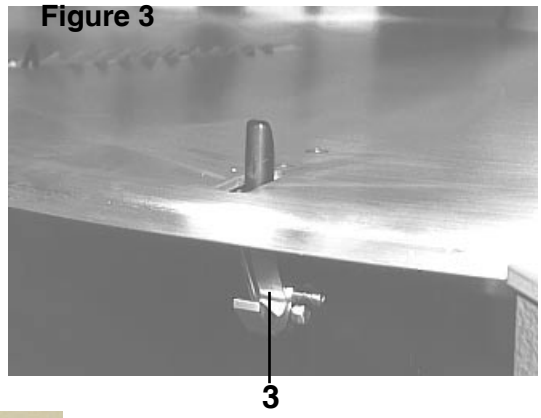


Figure 4

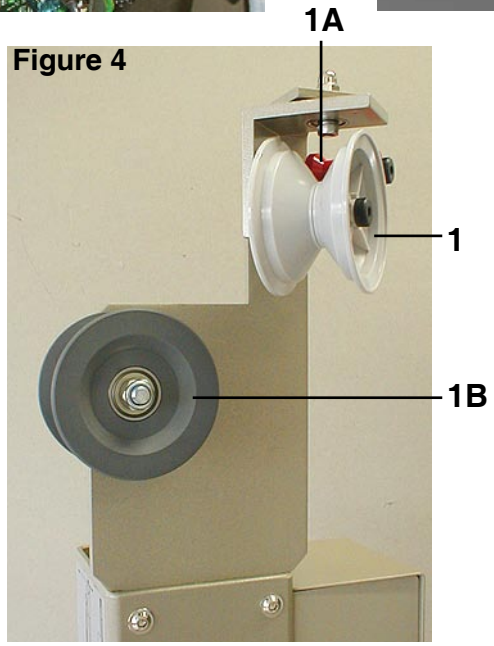


Figure 5

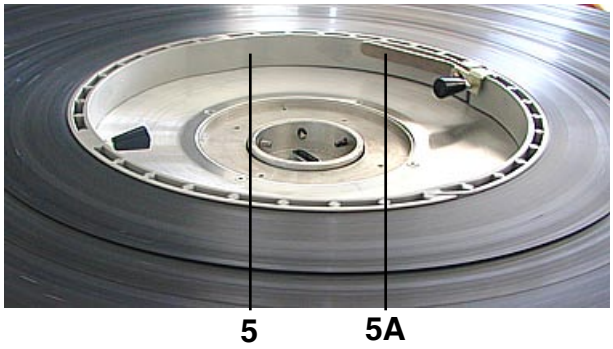


Figure 6

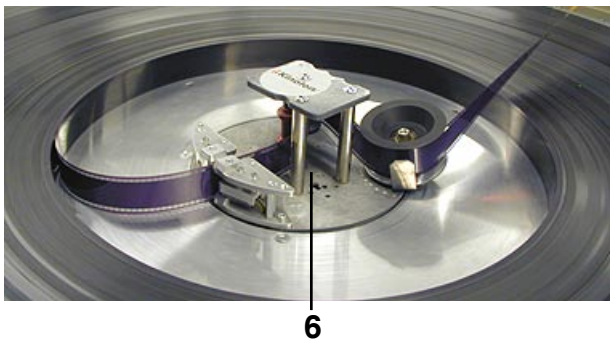
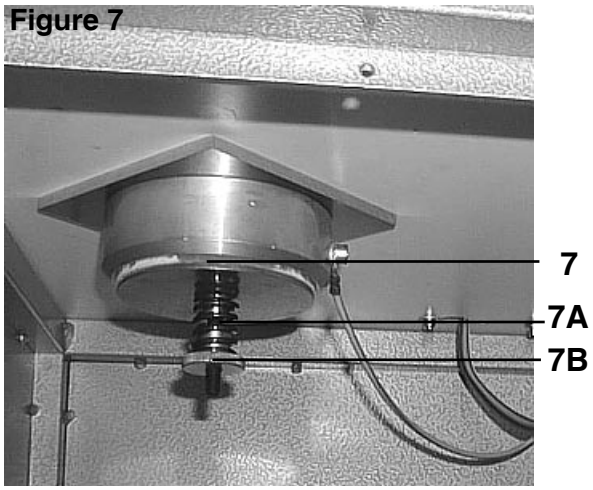


Figure 7



7 Technical Data

7.1 Data of Endless Loop System

Name	Endless Loop System
Type	ST 2000 / ST 2000 E-K
Machine No.	See data plate on base

Connection Data

Mains voltage	230 V
Frequency	50 Hz or 60 Hz
Pre-fuse	6.3 A
Power max.	500 VA

Power and Operating Data

Endless platter drive motor:	
Nominal rotary frequency	5000 rpm
motor power	90 VA
Reel rotary speed max.	1 m/min
Eccentric drive motor:	
Nominal rotary frequency	3000 rpm
motor power	100 VA
Film tension motor:	
Nominal rotary frequency	3000 rpm
motor power	20 VA
Non-rewind platter drive motor:	
Nominal rotary frequency	3000 rpm
motor power	100 VA
Reel rotary speed max.	400 m/min
Nominal rotary speed	27.4 m/min

Sizes and Weights

Components	**Ratio of Sizes**	**Weights**
ST 2000 E-K	1650 mm x 1495 mm x 1940 mm	approx. 400 kg
Endless platter	Ø 1465 m	
Non-rewind platter	Ø 1320 m	
Distance between the platters	300 mm	

7.2 Data of Make-Up Table

Connecting Data

Mains voltage	230 V AC
Frequency	50 Hz / 60 Hz
Power input max.	250 VA

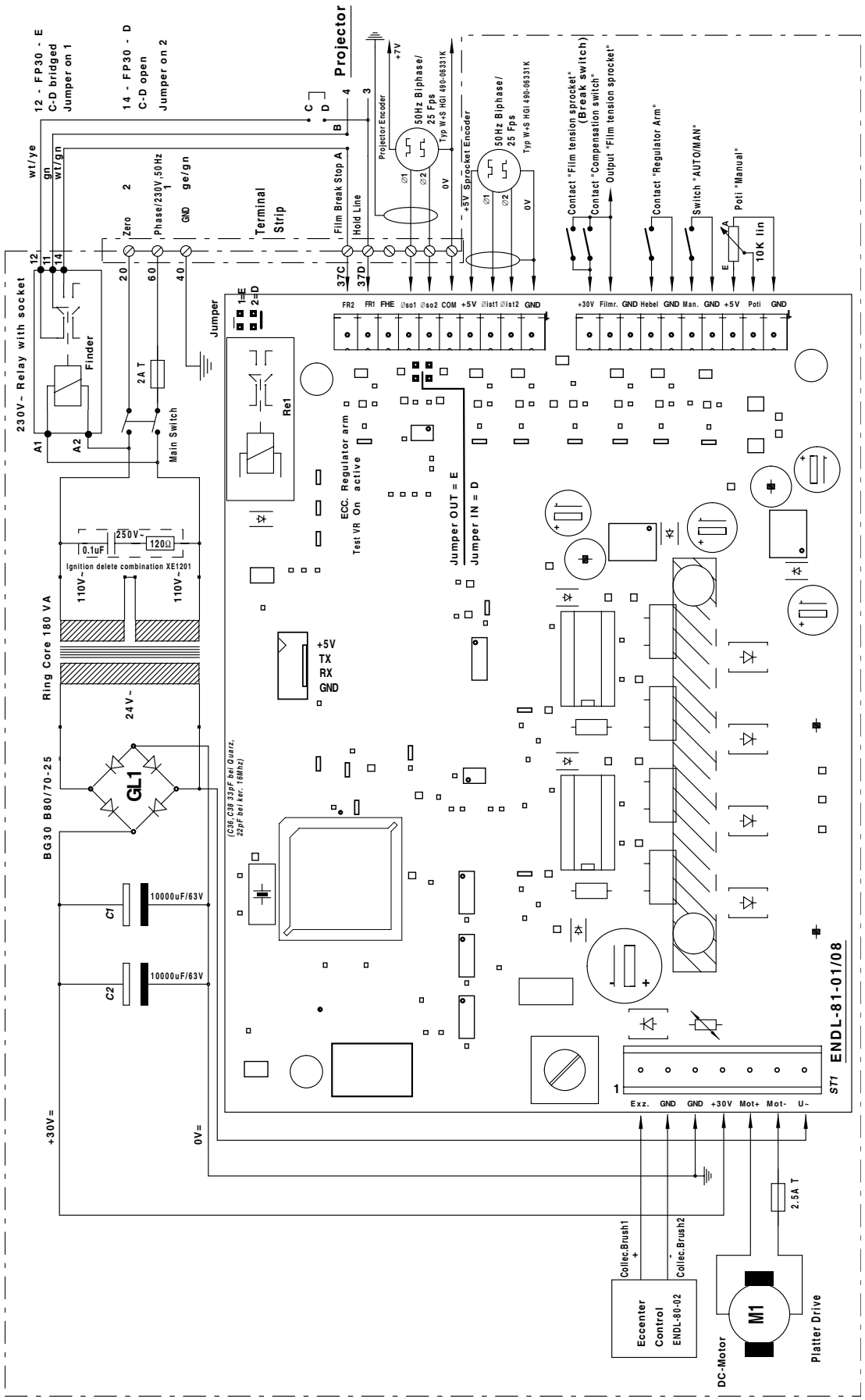
Power and Operating Data

Nominal rotary frequency of motor	3000 rpm
motor power	200 VA
Reel rotary speed max.	400 m/min

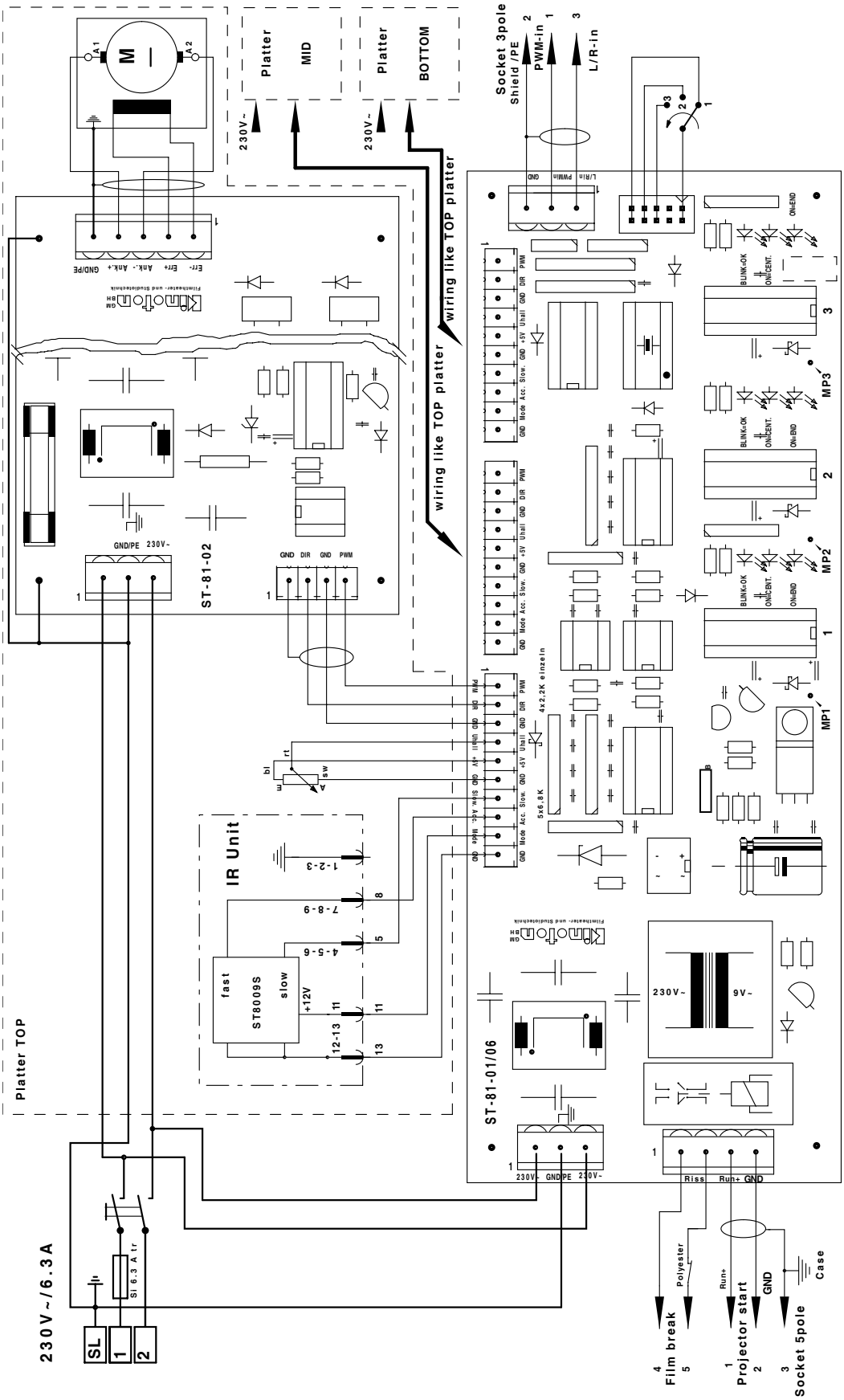
Sizes and Weights

Components	**Ratio of Sizes**
MT 600	696 mm x 890 mm
MT 2000	746 mm x 1350 mm
Reel platters	Ø 1320 m
Film spool	up to 2000 m

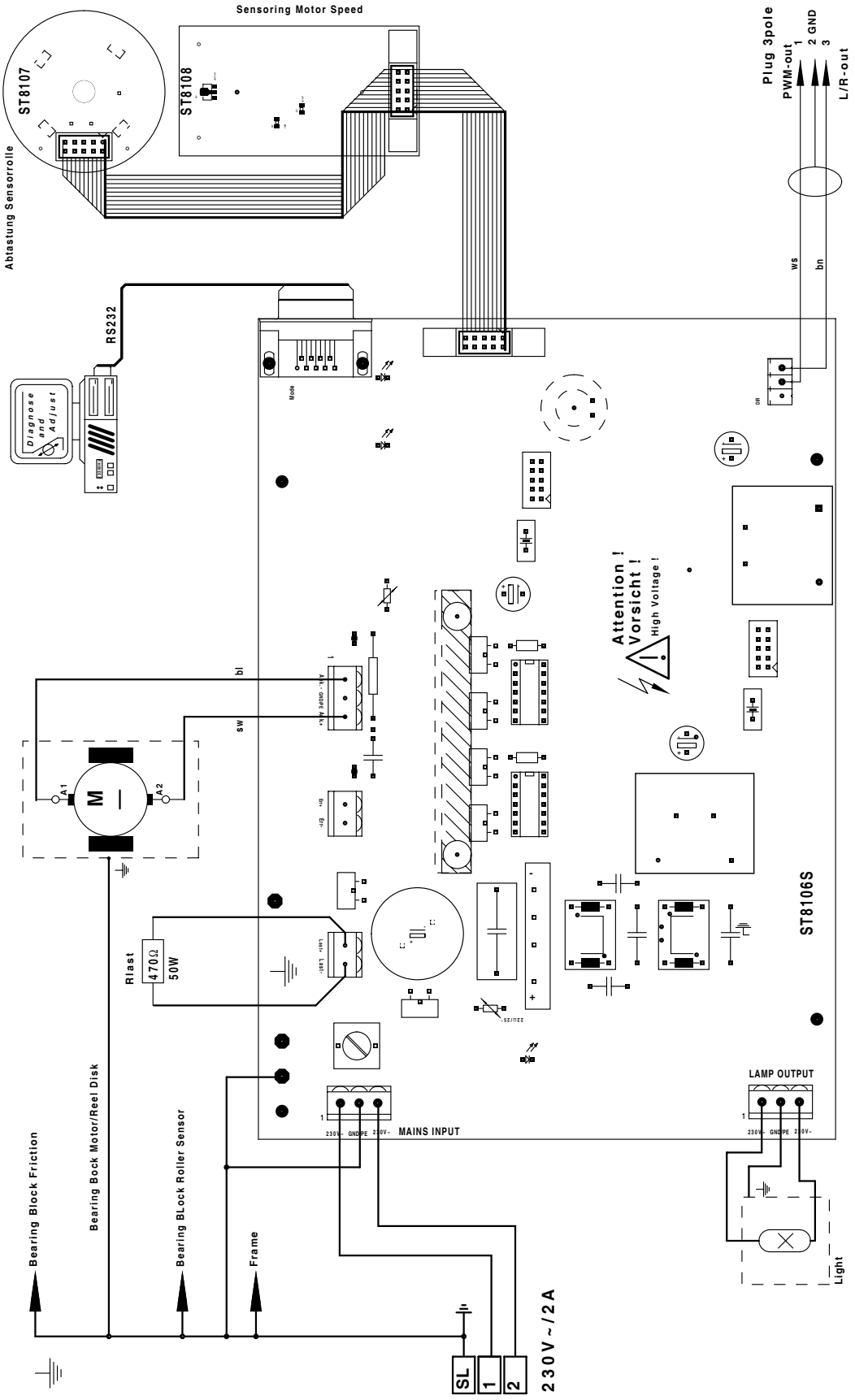
7.3 Wiring Scheme of ST 2000 (E-K) (Main Control Board)



7.4 Wiring Scheme for ST 2000 E-K (ST 100 E Main Control Board)



7.5 Connecting Plan for Make-Up Table



EC Declaration of Conformity

Messrs.: **Kinoton GmbH, Industriestr. 20 a, 82110 Germering**

company name, address

Machine: Endless Loop Systems

designation

ST 2000 / ST 2000 E-K — type

347 — serial number

version

Relevant EC stipulations:

Machine regulation **89/392/EWG**

if need be other relevant EC regulations **73/23/EWG**

89/336/EWG

Standards:

if need be harmonized standards EN 50081 part 1, EN 50082 part 1 and part 2

EN 60034-5

if need be national standards DIN 19090 part 1 and 2, VDE 0530

and technical specifications

It is herewith certified that the machine specified above satisfies the above-listed EC regulations.

Germering, 11. 12. 95

place ,date

signature

Herbert Zipfel

prename, name

Production Manager

function