

SPOOL TOWER SPT 5000



**Kinoton** GMBH  
Filmtheater- und Studiotechnik









**Kinoton** GMBH  
Filmtheater- und Studiotchnik

Spool Tower SFT 5000

## Preface

Dear customer,

Thank you for your interest in the Kinoton Spool Tower SFT 5000. We are confident in our products and the quality of our service.

This operating manual is intended to help you to operate the Spool Tower SFT 5000 correctly and to make use of its possible applications in accordance with the instructions. The operating manual – even in its original language – may only be regarded as a guide. The Kinoton Spool Tower SFT 5000 is a complex machine and its operation requires special knowledge and experience. The Kinoton Spool Tower SFT 5000 is a complex machine and its operation requires special knowledge and experience. The Kinoton Spool Tower SFT 5000 is a complex machine and its operation requires special knowledge and experience.

This operating manual includes useful hints for proper and personal obligations. It does not substitute a manual but supports it.

All information in this manual is given by hand. It is not a contract. However, KINOTON accepts no liability for the accuracy of the information.

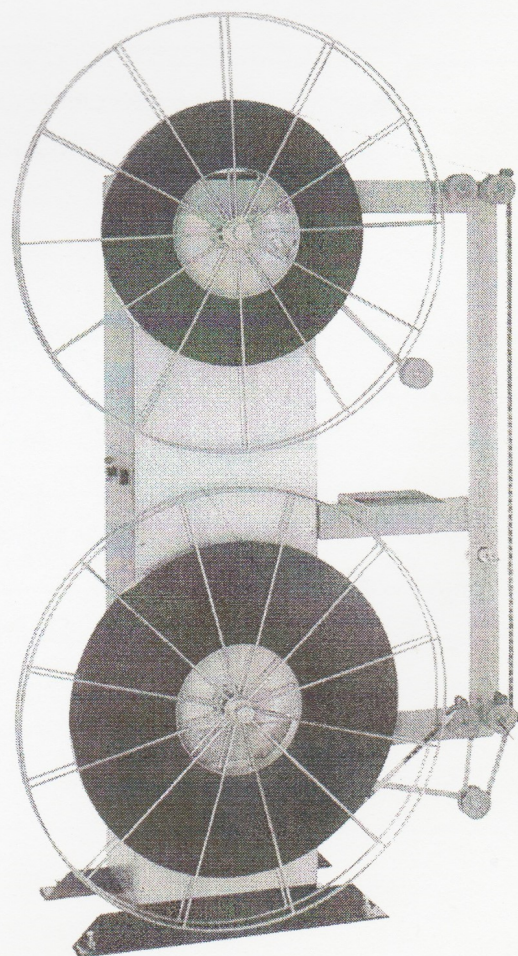
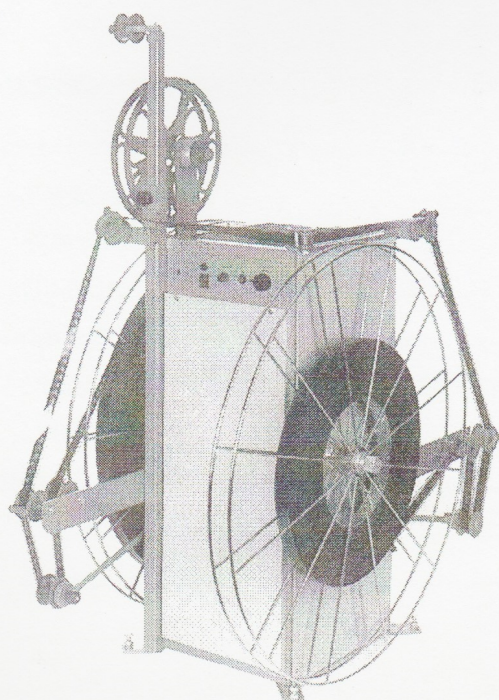
Subject to technical changes. Technical changes without notice.

# Operating Manual

**Spool Tower**

**SPT 5000**

**SPT 5000 K**





## Imprint

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Operating Manual  
SPT 5000  
SPT 5000 K







## **Preface**

Dear customer,

Thank you for your decision to buy the spool tower SPT 5000 and for your confidence in our product.

This operating manual will help you get acquainted with the spool tower SPT 5000 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 spool tower SPT 5000.

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. Technical changes depending on further development do not enable for free retrofitting of the delivered spool tower.

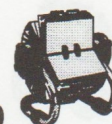


## Changes and own notes



Issue of this manual: December 98

Changes, additions	Chapter, page	Date

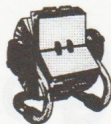




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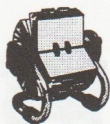
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## **1 Safety**

### **1.1 Safety Notes**

#### **1.1.1 General Hints**

- The operating manual is to be kept with the spool tower at all times.
- Precondition for the safe running and trouble-free operation of spool tower SPT 5000 is working knowledge of the basic safety regulations and agreed use.
- This operating manual contains the most important instructions for running the spool tower SPT 5000 safely.
- The operating manual must be read and absorbed by all persons working with the spool tower SPT 5000, placing particular emphasis on all aspects regarding safety.
- In addition, all current and valid regulations and measures concerning accident prevention must be observed.

#### **1.1.2 Proprietor Obligations**

The proprietor is obliged to allow only those persons to work and / or operate the spool tower SPT 5000 that

- are familiar with safe working and accident prevention along with complete working knowledge of the projector and all additional machines and pieces of system
- 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.

#### **1.1.3 Personnel Obligations**

Those persons who work with the spool tower SPT 5000 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.

#### **1.1.4 Danger when Working with the Spool Tower**

Spool tower are constructed according to the latest engineering and state-of-the art safety standards. The spool tower SPT 5000 is 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 projector cannot be used before faults are rectified.

### **1.1.5 Intended Purpose**

The spool tower SPT 5000 is suitable to store film spools during projection operation and further to rewind, make-up and tear-down films.

Any other or further use is not classified as „intended purpose“. KINOTON GMBH 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.

### **1.1.6 Guarantee and Liability**

On principle the "General Terms of Business" of KINOTON GMBH 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 spool tower SPT 5000
- improper assembly, commissioning, operating and maintenance of spool tower
- operation the spool tower 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 spool tower SPT 5000 without authorization from the manufacturer
- modification of driving power
- faulty monitoring of parts subject to wear and tear
- improperly effected repair work
- emergencies due to influence from outside bodies or force majeure.





## 1.2 Safety instructions

### 1.2.1 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 System.



#### **NOTE**

This symbol indicates where notes, user tips and useful information can be found.

They serve to use the spool tower SPT 5000 to its optimum.

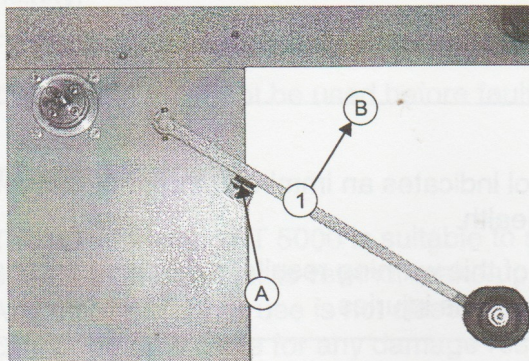
### 1.2.2 Organizational Measures

All existing safety devices must be checked regularly.





### 1.2.3 Protective Devices



#### Film break switch

1. If lever arm ① moves from working position (between A and B) to position A (limit stop), the spool drive will be reduced until the spool comes to a standstill.
2. In the event of a film break lever arm moves to position A.

Figure 1-1 Film break switch

### 1.2.4 Special Hazard Points

#### Mechanical danger by squashing:

- when pinning up film spools

#### Mechanical danger by winding up and trapping in:

- when operating the spool tower
- when threading the film



#### DANGER

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



#### ATTENTION

When operating the spool tower do not stand too near at spool tower because clothes can also get trapped in the spools.  
Film breaking and/or switching off of projection operation can be the consequence.





**Danger because of errors and malfunction:**

- unexpected spool movements
- malfunction of film break switch
- malfunction of drive
- touching the running film



**DANGER**

- Regularly check function of film break switch.
- Never touch running through film during operation.
- Make sure that nobody starts the spoolt tower while somebody is working on it.

**1.2.5 Electric Power Hazards**

Allow work on the electrical supply to be carried out by competent electricians only. The spoolt tower electronics must be checked regularly. Loose connections must be restored immediately.

The access to the control cabinet must always be closed. Only authorized staff have access to the control cabinet.

When working on life parts, switch off main switch and put out the corresponding fuse.

**1.2.6 Modification of Spool tower SPT 5000 Construction**

No alterations, additions or modifications may be made to spool tower SPT 5000 without consent of KINOTON GmbH. This also includes welding of bearing parts.

Only use original spare and wear parts. Parts obtained from third party manufacturers cannot guarantee strain and security standards.

**1.2.7 Cleaning and Disposal**

Substances and materials used must be handled and disposed correctly, especially:

- when cleaning with solvents
- when lubricating the spoolt tower





### 1.2.8 Copyright

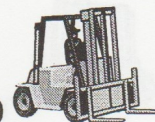
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It contains regulations and operating notes that must not be copied, reproduced or otherwise transmitted, in whole or in part.

Infringement of copyright laws may lead to prosecution.





## 2 Transportation and Installation / Mounting

### 2.1 Transportation

#### 2.1.1 Package

- Spool tower SPT 5000 / SPT 5000.K is completely mounted on a pallet and fixed with screws.
- The pallet with the spool tower is packed in a wooden box.
- The accessories are packed into the box too.
- Weight (gross): approx. 200 kg

#### 2.1.2 Storage

If unit is stored for a longer time:

- Only store in dry rooms.
- Choose a suitable protective coating or leave Spool tower SPT 5000 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.

#### 2.1.3 Delivery

- Spool tower SPT 5000
- Spool tower SPT 5000 K
- Operating Manual



#### NOTE

For further information about accessories like empty spools and deflection roller please contact your local dealer.





## 2.2 Installation



### ATTENTION

- 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.

### 2.2.1 Place of Installation, Place of Operation

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

Place the spool tower, if possible, near the projectors otherwise you have to use compension brackets and / or deflection rollers.

In figure 2-1 and 2-2 you see the requirement of the spool tower SPT 5000 and SPT 5000 K.

### 2.2.2 Unpacking and Installation

1. Open the box and take out the accessories.
2. Remove wooden box around the spool tower.
3. Transport the spool tower on pallet to the place of installation.
4. Release the spool tower from pallet (release screws).
5. Lift up the spool tower from pallet and remove pallet.
6. Horizontally line up the spool tower by levelling the jackscrew.  
Check it with a level.
7. Plug the spool tower with pegs on the floor.



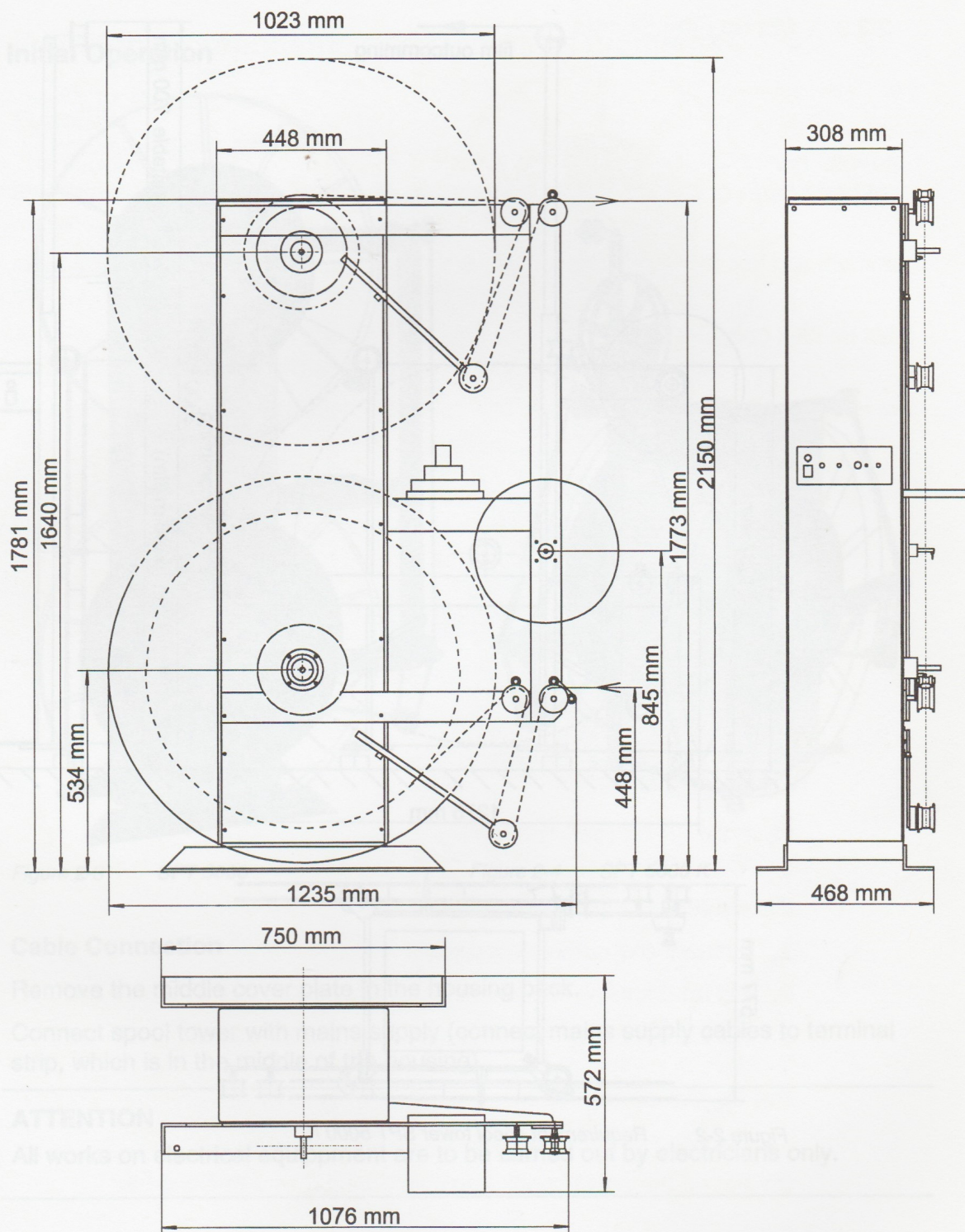
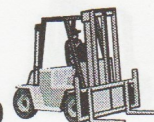


Figure 2-1 Requirement of spool tower SPT 5000



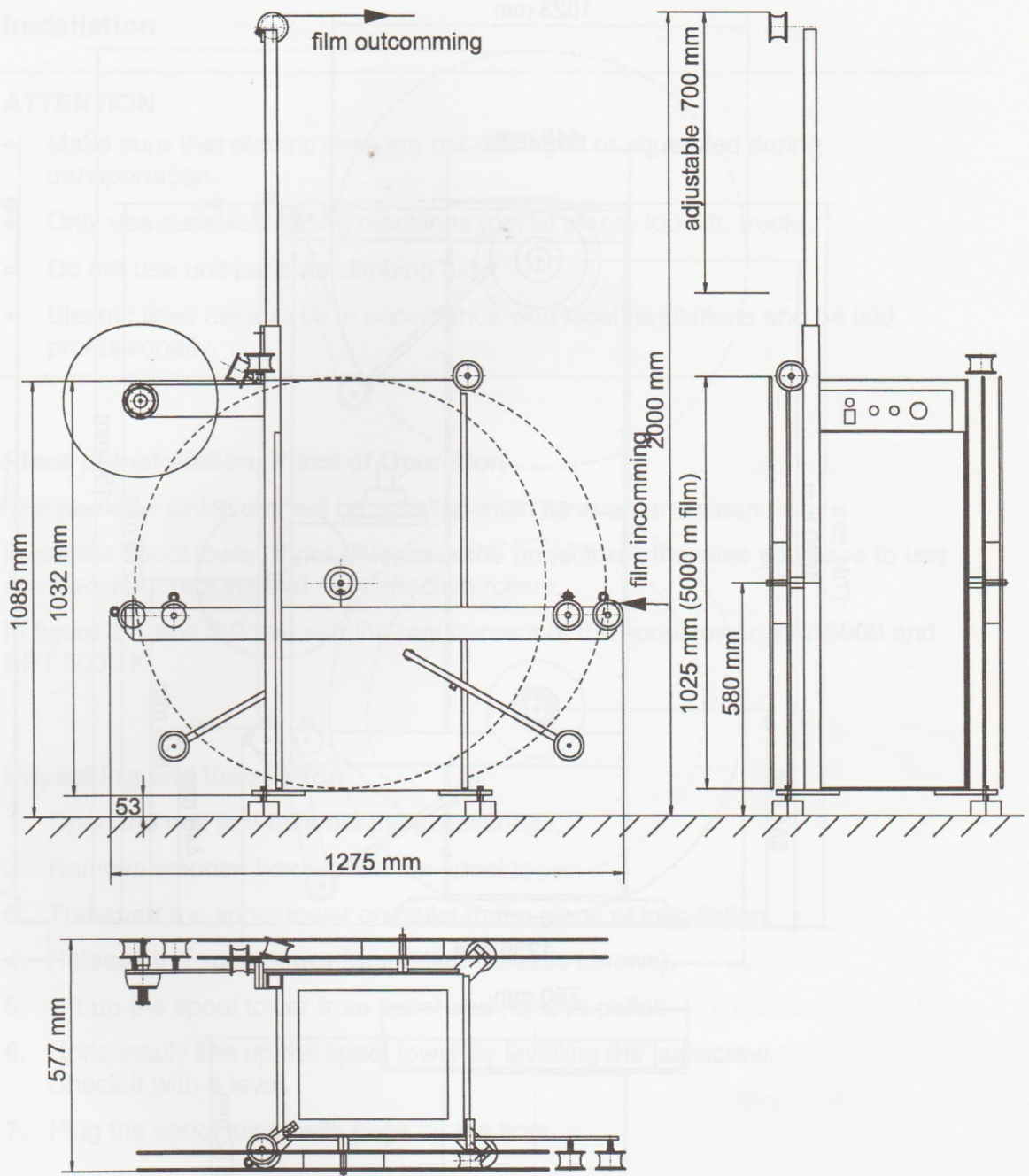
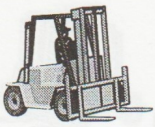


Figure 2-2 Requirement spool tower SPT 5000 K





## 2.3 Initial Operation

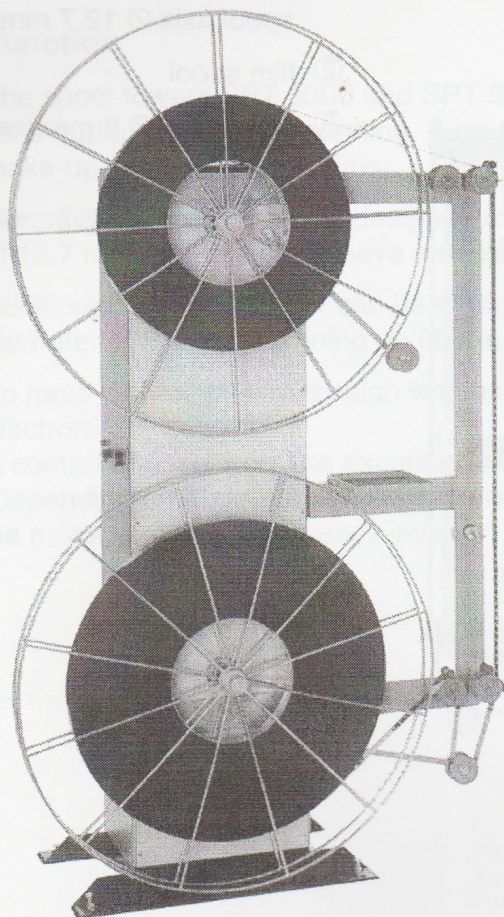


Figure 2-3 SPT 5000

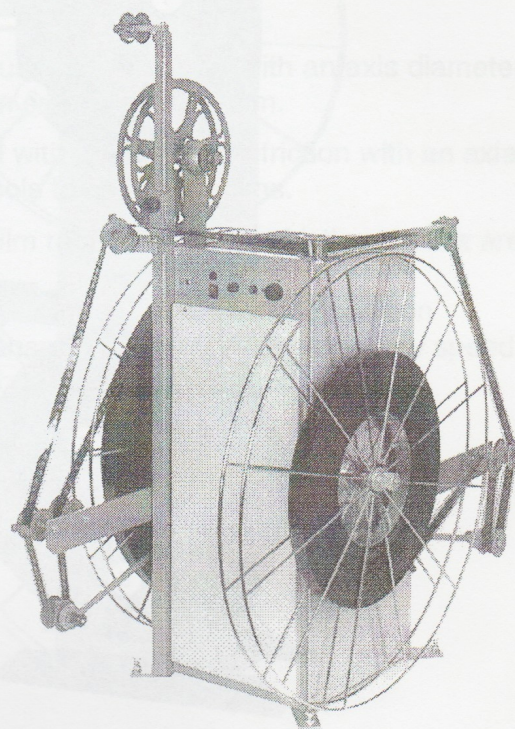


Figure 2-4 SPT 5000 K

### 2.3.1 Cable Connection

Remove the middle cover plate in the housing back.

Connect spool tower with mains supply (connect mains supply cables to terminal strip, which is in the middle of the housing).



#### ATTENTION

All works on electrical equipment are to be carried out by electricians only.



#### NOTE

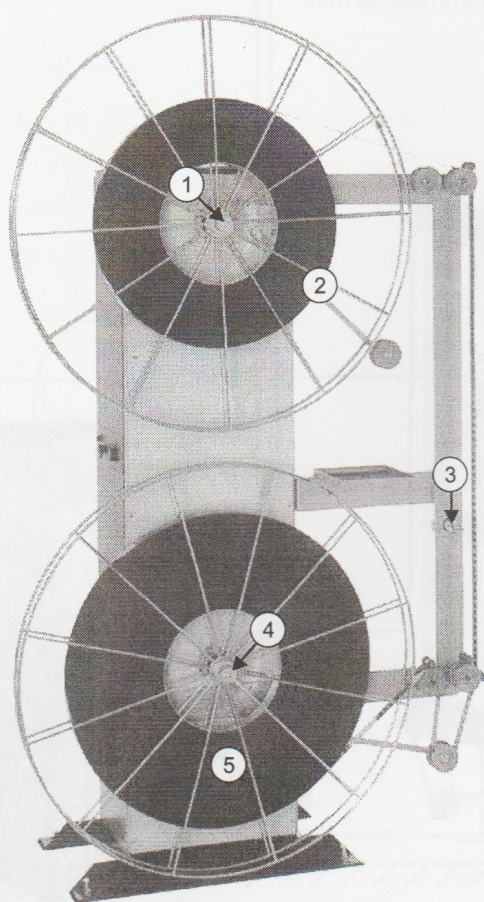
Wiring scheme, see chapter 8.2.1.

Now the spool tower is ready for operation.





### 2.3.2 Pin up Film Spools



- ① knurled nut on  
spool axis  $\varnothing$  12.7 mm
- ② film spool
- ③ spool axis  $\varnothing$  9 mm (option)
- ④ knurled nut on  
spool axis  $\varnothing$  12.7 mm
- ⑤ film spool

Figure 2-5 Spools on spool tower

#### Pin up film spools up to 5000 m

1. Remove the knurled nuts ①/④.
2. Pin up the large film spools ②/⑤ on axes.
3. Fix the spools by screwing knurled nuts onto axes.

#### Pin up film spool 600 m

1. Tilt fixing bar in a way that it is in line with axis.
2. Pin up the small spool onto axis ③ and fix it with fixing bar.





### **3 Function, Components and Operating Elements**

#### **3.1 Function**

The spool towers SPT 5000 and SPT 5000 K are suitable to take-off and take-up films during projection operating. Furthermore they are suitable to rewind and to make-up or to tear-down films.

Normally the spool tower is designed for a use of film spools with an axis diameter of 12.7 mm. These spools have a maximum capacity of 5000 m.

Additional the spool tower can be equipped with a mechanical friction with an axial diameter of 9 mm for pinning up 600 m spools to assemble films.

To have a constant film tension with each film reel diameter the friction motors are electronically controlled.

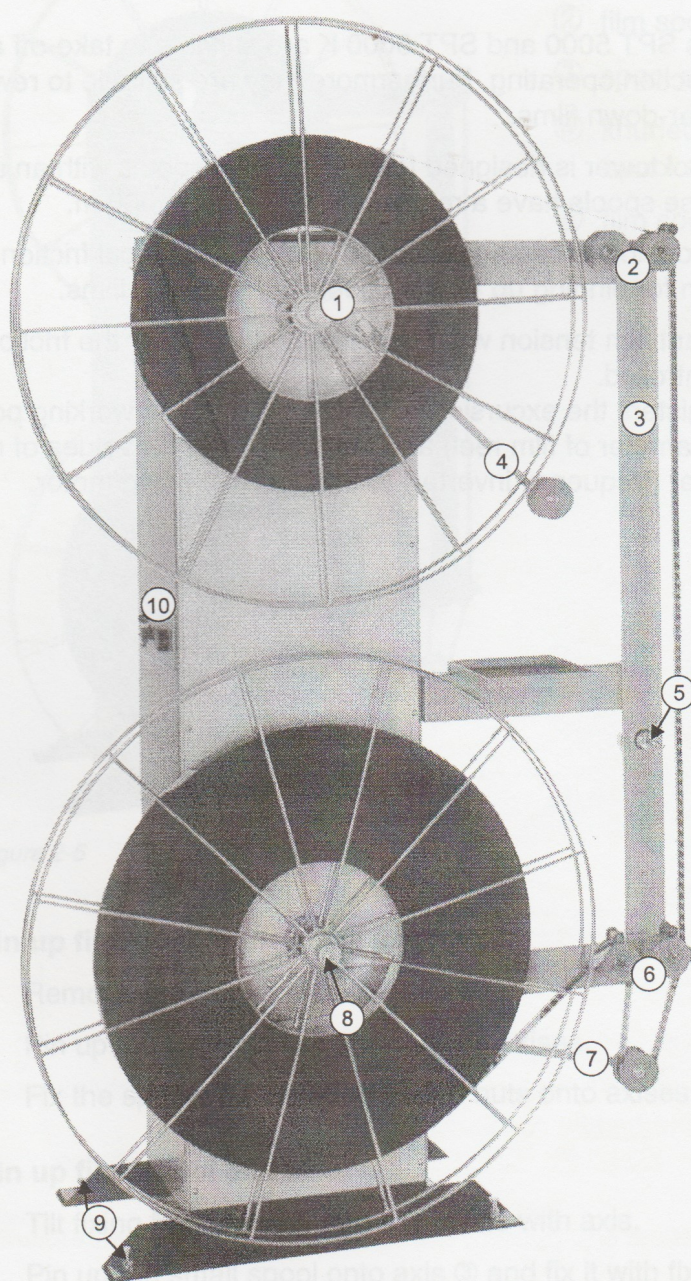
A control unit registers the excursion of lever arm out of its working position (depending on diameter of film reel) and transmits the new values of rotary speed via motor amplifier (frequency inverter) to the corresponding motor.





## 3.2 Components

### 3.2.1 SPT 5000



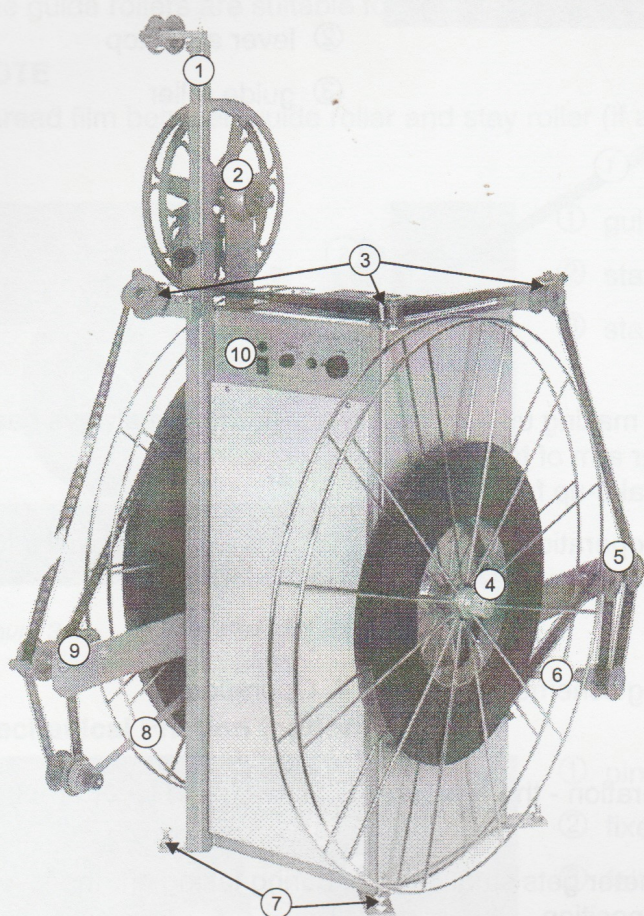
- ① pin up axis 12.7 mm  $\varnothing$   
with spool and knurled  
nut
- ② guide rollers
- ③ roller frame
- ④ lever arm
- ⑤ pin up axis 9 mm  $\varnothing$
- ⑥ guide rollers
- ⑦ lever arm
- ⑧ pin up axis 12.7 mm  $\varnothing$   
with spool and knurled  
nut
- ⑨ pedestals
- ⑩ operating panel

Figure 3-1 Spool tower SPT 5000





### 3.2.2 SPT 5000 K



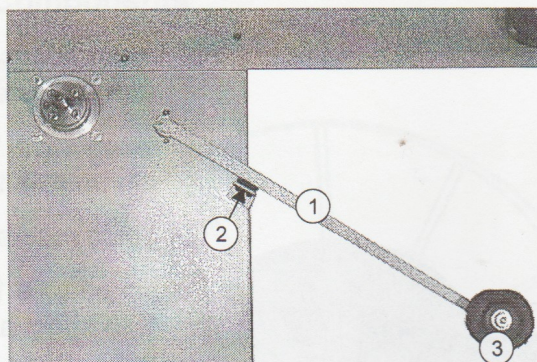
- ① film guidance extension arm, adjustable
- ② mechanical friction with pin up axis 9 mm Ø
- ③ guide rollers
- ④ pin up axis 12.7 mm Ø with spool and knurled nut
- ⑤ guide rollers
- ⑥ lever arm
- ⑦ pedestals
- ⑧ lever arm
- ⑨ guide rollers
- ⑩ operating panel

Figure 3-2 Spool tower SPT 5000 K





### 3.2.2.1 Lever Arm



- ① lever arm
- ② lever arm stop
- ③ guide roller

Figure 3-3 Lever arm

- During rewinding, making up and tearing down, the film always has to be threaded into lever arm of take-off friction. The lever arm of take-up friction stays free.
- During projection operation, the film has to be threaded as well into lever arm of take-off friction as into lever arm of take-up friction.



#### NOTE

See also the threading schemes in chapter 4, Operation.

During projection operation - the film spool is turning - the lever arm ① is hold in its working position:

- The film reel diameter gets smaller, e. g. during taking off, the lever arm moves out of its working position.
- This excursion of lever arm will be registered from hall potentiometer (in spool tower) and sent to control unit.
- The control unit calculates the correct speed and transmits the new values to the corresponding friction motor.
- The motor turns in a way that the lever arm moves back to its working position.

The lever arm moves to its stop ②:

- The film break switch is activated.
- The rotating film spool will be retarded until it is stillstanding.
- To activate spool drive again, the lever arm has to be moved out of its zero-position (stop), therefore manually turn the corresponding spool.



#### ATTENTION

Do not hinder the excursion movement of lever arm.





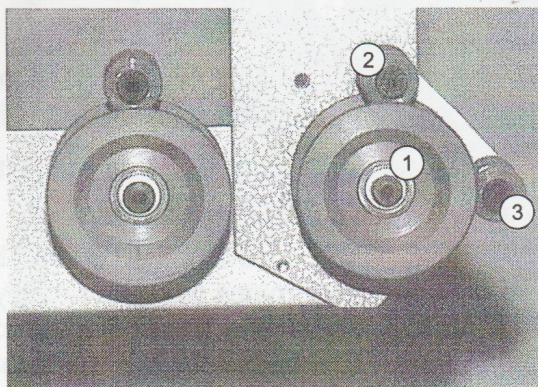
### 3.2.2.2 Guide Rollers

The guide rollers are suitable for film guidance.



#### NOTE

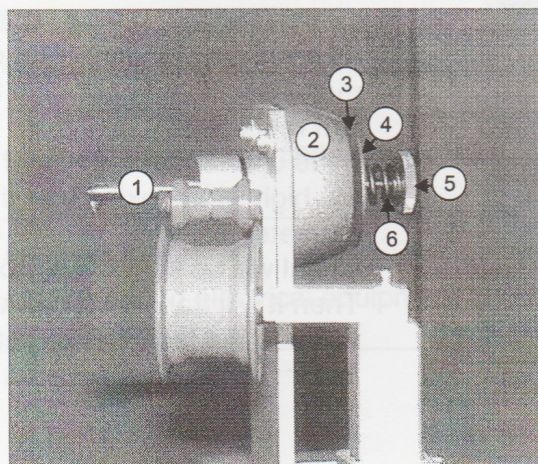
Thread film between guide roller and stay roller (if available).



- ① guide roller
- ② stay roller
- ③ stay roller

Figure 3-4 guide roller with stay roller

### 3.2.2.3 Mechanical Friction (option)



- ① pin up axis 9 mm Ø
- ② fixed disk on friction base
- ③ felt disk
- ④ moveable disk
- ⑤ knurled nut
- ⑥ spring

The spring pushes the moveable disk and the felt disk to a further disk which is solidly connected with friction base.

Figure 3-5 Mechanical friction

#### Adjust:

Adjust the frictions by turning the knurled screw ⑤. The film does not build loops when the spool tower stops:

Turn right → the spring increases pressure (film tension is increased)

Turn left → the spring reduces pressure (film tension is reduced)



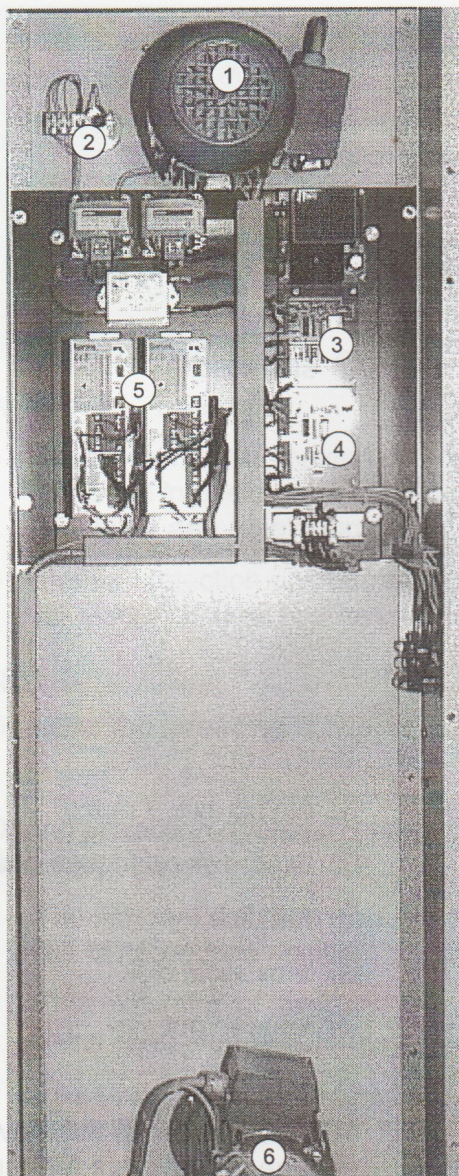
#### NOTE

- Depending on frictions (up 600 meters) the film tension has to be adapted.
- The film tension is inversely proportional to reel diameter:  
Film tension is less, when reel diameter is large (beginning of take off friction).





### 3.2.2.4 Friction Drive



- ① asynchronous motor
- ② hall potentiometer (to lever arm)
- ③ control board for upper friction drive
- ④ control board for lower friction drive
- ⑤ 2 frequency inverter (amplifier) (right unit → upper friction drive)
- ⑥ asynchronous motor with tachometer generator

The control unit on control board determines the motor rotary speed depending on the film reel diameter. The frequency inverter transmits the values from control unit to the motor. At the same time the frequency inverter is setting the rotary field frequency according to the slippage.

The tachometer generator on the lower motor additionally controls the lower film reel speed.

If the upper film reel speed is getting too high when taking up - the reel diameter is getting larger - a "too fast" signal will be sent to control unit. Then it will transmit a reduced speed value to the tachometer generator - the lower friction drive reduces its speed.

Figure 3-6 friction drive



#### NOTE

You will get an overview about wiring in chapter 8.2.1 and 8.2.2.



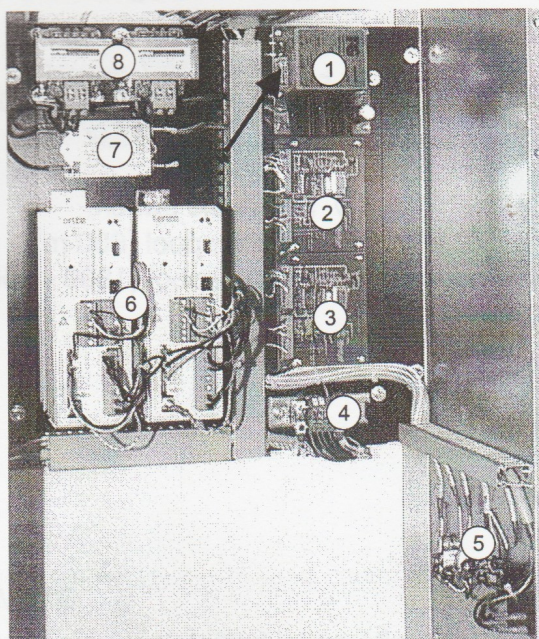
#### ATTENTION

All works and adjustment at control unit and frequency inverter are to be carried out by competent persons only.





### 3.2.2.5 Electronic Equipment



- ① power supply unit
  - ② control board (upper friction)
  - ③ control board (lower friction)
  - ④ mains supply connecting strip
  - ⑤ operating
  - ⑥ frequency inverters
  - ⑦ mains filter
  - ⑧ mains chokes
- arrow: fuse 0,2 AT

Figure 3-7 Electronic equipment



#### NOTE

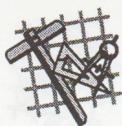
- You will find detailed information about the setting of frequency inverter in chapter 6.4.
- Wiring schemes, see chapter 8.2.1.



#### ATTENTION

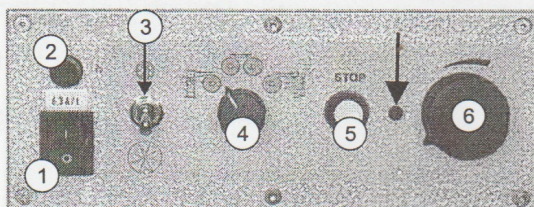
Allow work on electrical equipment to be carried out by electricians only.





### 3.3 Operating Elements

#### 3.3.1 Operating Panel

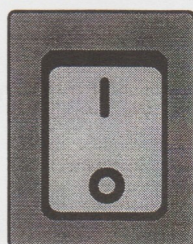


- ① main switch
- ② fuse 6.3 AT
- ③ reversible switch:
  - small spool (600 m)
  - large spool (1800 - 5000 m)

Figure 3-8 Operating panel

- ④ monitoring switch:
    - projection operation
    - make-up, tear-down and rewinding
    - make-up via external friction
  - ⑤ button: STOP
  - ⑥ monitoring switch: speed
- arrow: control lamp

##### 3.3.1.1 Main Switch



**Main switch in position I:**  
Mains power is switched on.  
Main switch illuminates.

**Main switch in position 0:**  
Mains power is switched off.  
Main switch is off.

##### 3.3.1.2 Reversible Switch: Spool Size



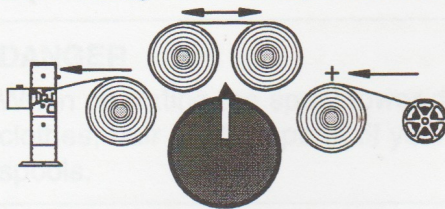
**Switch in position 1**  
Spool 600 m is selected.

**Switch in position 2**  
Spool 1800 to 5000 m is selected.

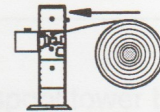




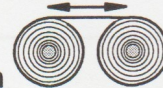
### 3.3.1.3 Monitoring Switch: Operation Mode



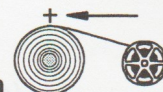
**Switch in position**  
projection operation



**Switch in position**  
rewinding, make-up, tear-down  
Film break switch is active.



**Switch in position**  
make-up with external mechanical friction  
Film break switch is not active.



#### NOTE

You will get detailed information about the single threading schemes in chapter 4.

### 3.3.1.4 Button: STOP

**STOP**



#### Tear-down a program

Press stop button before a certain end of a copy is reached.

The friction drive stops.

The upper friction ("taking friction") will get enable after 10 seconds.

### 3.3.1.5 Monitoring Switch: Speed



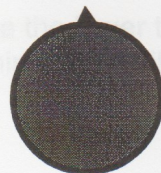
**Switch in left position**

speed → 0

**Switch in right position**

speed → maximum

(approx. 10 min for 4000 m)







### 3.3 Operating Elements

#### 3.3.1 Load Switch



Figure 3.3.1 Load Switch (up)

Switch in 'up' position:  
The film break switch is active.

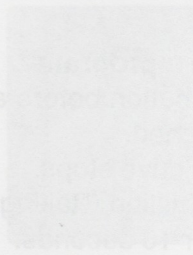
Switch in 'down' position:  
The film break switch is inactive.

NOTE: The film break switch is active only when the film is loaded.

NOTE: The film break switch is active only when the film is loaded.

You will get detailed information about the single threading schemes in chapter 4.

#### 3.3.1.1 Active Film



Press stop button: The film will stop at a certain end of a copy is ready.  
The film will stop at a certain end of a copy is ready.  
The film will stop at a certain end of a copy is ready.

#### 3.3.1.2 Reversible Switch: Spool Size

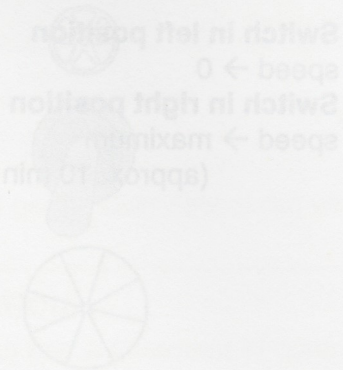


Figure 3.3.1.2 Reversible Switch (left)

Switch in 'left' position:  
Speed → 0

Switch in 'right' position:  
Speed → maximum

(approx. 10 min for 4000 m)

#### 3.3.1.3 Monitoring Switch: Operation Mode



Figure 3.3.1.3 Monitoring Switch (up)

Switch in 'up' position:  
The film break switch is active.

Switch in 'down' position:  
The film break switch is inactive.

NOTE



#### 3.3.1.4 Button: Stop/Start in Active Film



Press stop button: The film will stop at a certain end of a copy is ready.  
The film will stop at a certain end of a copy is ready.  
The film will stop at a certain end of a copy is ready.

#### 3.3.1.5 Monitoring Switch: Speed



Switch in 'up' position:  
Speed → 0

Switch in 'down' position:  
Speed → maximum

(approx. 10 min for 4000 m)





## 4 Operation



### DANGER


When operating the spool tower do not stand too near at spool tower because clothes, hair or other parts of your body can get winded up or trapped into the spools.


### 4.1 Make-up a Program


To make-up a program you have two possibilities:

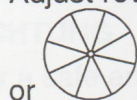
- to make-up with the standard spool drives ( $\varnothing$  12.7 mm)
- to make-up with the external (additional) mechanical friction ( $\varnothing$  9 mm)

#### 4.1.1 Standard Spool Drives (Axis $\varnothing$ 12.7 mm)

1. Switch on power supply of spool tower.  in position "I".

2. Position monitoring switch on .

3. Adjust reversible switch depending on the spool size on  600 m



or 1800 to 5000 m.


4. Put, if necessary, a distance disk on the lower friction axis.
5. Pin up the film spool ( $\varnothing$  12.7 mm) with the first copy on the lower friction axis (take-off friction) and an empty spool on the upper friction axis (take-up friction). Fix both spools by screwing the knurled nuts on axes.
6. Thread film, as you can see in threading scheme, figure 4-1 and 4-2.
7. Activate the lower take-off friction, by turning manually that film spool or by tensioning film until the lever arm reaches its working position (middle position).

#### NOTE

- At the end of a copy or when a film break is detected, the frictions do not switch off automatically.
- After you made up your program, the beginning of the program is in the inside of the upper reel, therefore you have to rewind the whole program (see chapter 4.2).





8. Turn the monitoring switch  anticlockwise in the zero-position (left position) and wait until the green control lamp illuminates. Start and accelerate the spool operation by turning the monitoring switch clockwise. When starting the green control lamp illuminates constantly.



#### ATTENTION

For a safe and gentle film reeling the spool operation will be activated first, when the monitoring switch was turned in zero-position.

9. Splice the film beginning of the next copy with the film end of the first copy.  
10. Wind-up the second copy, see point 5 to 8.  
11. Do also with all other copies.




#### NOTE


- At the end of a copy or when a film break is detected, the take-up and the take-off friction **switch off automatically**.
- After you made up your program, the beginning of the program is in the inside of the upper reel, therefore you have to rewind the whole program (see chapter 4.2).






#### 4.1.2 External Friction (Axis Ø 9 mm)

1. Switch on power supply of spool tower.  in position "I".

2. Position monitoring switch on .

2. Adjust reversible switch depending on the spool size on  600 m


or  1800 to 5000 m.

3. Pin up the film reel (Ø 9 mm) with the first copy on the additional axis and the empty spool on the upper standard axis.

Fix the empty spool by screwing the knurled nut on axis.

Fix the spool on the external axis by tilting the fixing bar.

4. Thread film, as you can see in threading scheme, figure 4-1 and 4-2.

5. Turn the monitoring switch  anticlockwise in the zero-position (left position) and wait until the green control lamp illuminates.


Start and accelerate the spool operation by turning the monitoring switch clockwise.

When starting the green control lamp illuminates constantly.



#### ACHTUNG

For a safe and gentle film reeling the spool operation will be activated first, when the monitoring switch was turned in zero-position.

6. Reduce the speed in time before the end of the copy is reached by pressing the button .

7. Splice the film beginning of the next copy with the film end of the first copy.

8. Wind-up the second copy, see point 4 to 6.

9. Do also with all other copies.



#### NOTE

- At the end of a copy or when a film break is detected, the frictions **do not switch off automatically**.
- After you made up your program, the beginning of the program is in the inside of the upper reel, therefore you have to rewind the whole program (see chapter 4.2).





#### 4.1.3 Threading Schemes "Make-up"

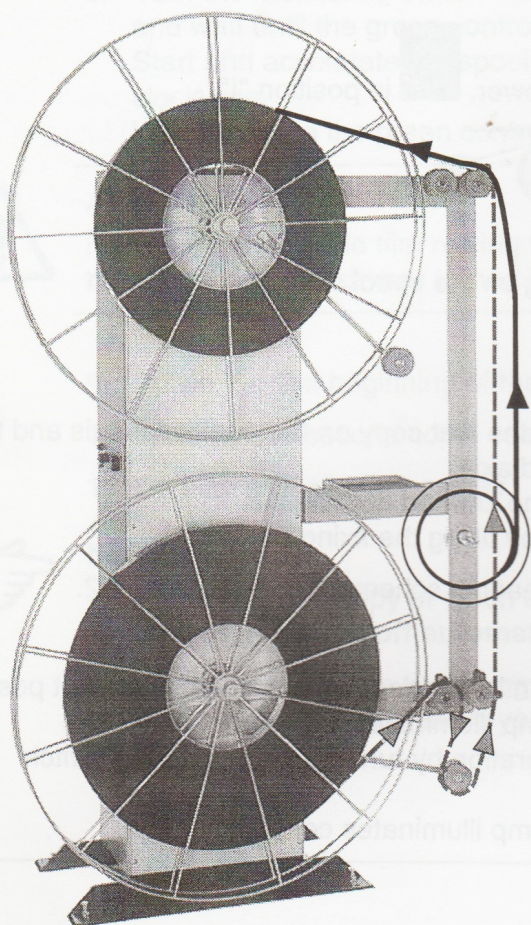


Figure 4-1

SPT 5000

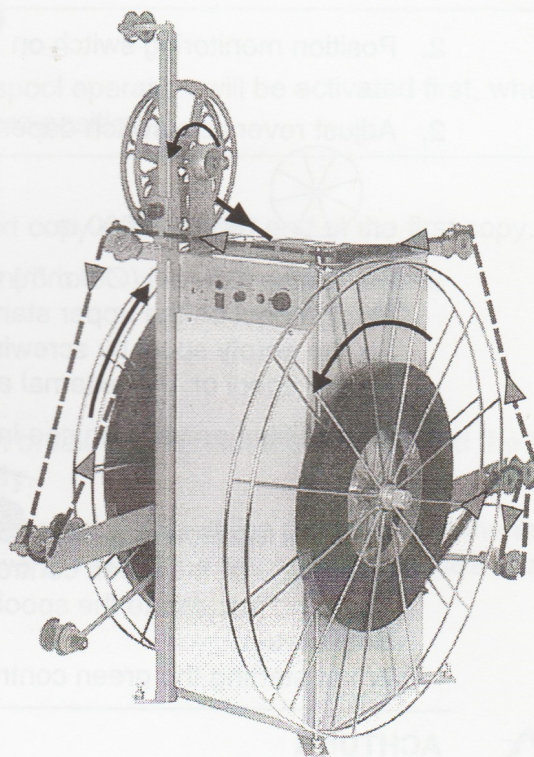
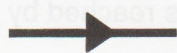


Figure 4-2

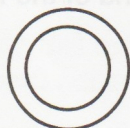
SPT 5000 K



make-up with external friction (axis  $\varnothing$  9 mm)



make-up with standard friction drives (axis  $\varnothing$  12,7 mm)




external friction






## 4.2 Rewinding

1. Switch on power supply of spool tower.  in position "I".

2. Position monitoring switch on .


3. Adjust reversible switch depending on the spool size on  600 m

or  1800 to 5000 m.

4. Always rewind from the lower full spool (take-off friction) to the upper empty spool (take-up friction).

Manually wind up some film layers around the take-up friction.

5. Thread film, as you can see in threading scheme, figure 4-3 and 4-4.


6. Turn the monitoring switch  anticlockwise in the zero-position (left position) and wait until the green control lamp illuminates.

Start and accelerate the spool operation by turning the monitoring switch clockwise.

When starting the green control lamp illuminates constantly.



### ATTENTION

- For a safe and gentle film rewinding this operation will be activated first, when the monitoring switch was turned in zero-position.
- The rewind operation will be activated first, when the spools, e. g. after pressing on  completely stand still.





#### 4.2.1 Threading schemes "Rewinding"

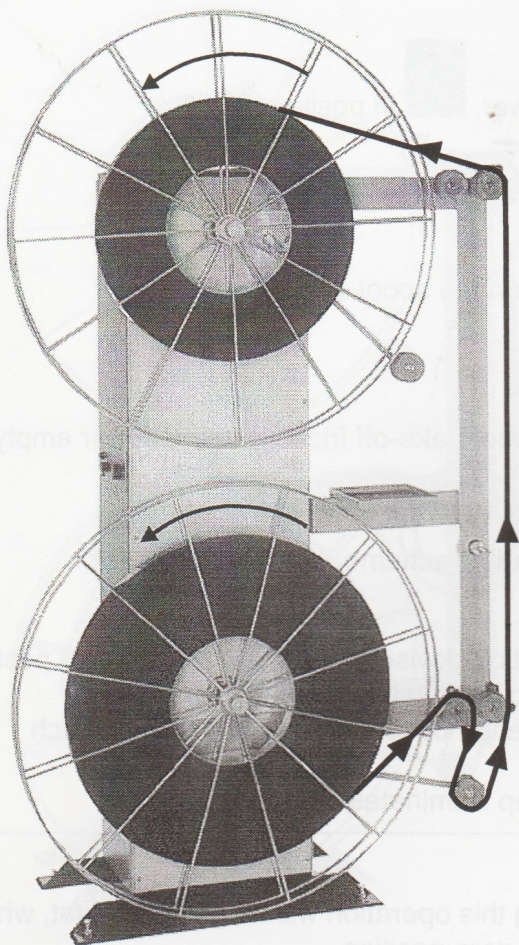


Figure 4-3

SPT 5000

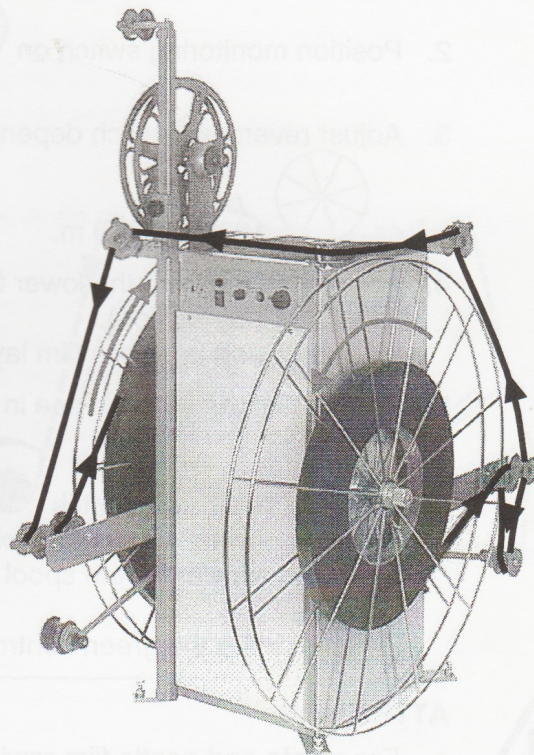



Figure 4-4

SPT 5000 K







### 4.3 Projection Operation

1. Switch on power supply of spool tower.  in position "I".

2. Position monitoring switch on .

3. Adjust reversible switch depending on the spool size on  600 m

or  1800 to 5000 m.

4. Pin up the full film spool ( $\varnothing 12.7$  mm) on the upper friction axis (take-off friction) and an empty spool on the lower friction axis (take-up friction). Fix both spools by screwing the knurled nuts on axes.
5. Thread film, as you can see in threading scheme, figure 4-5 and 4-6.
6. Activate the frictions, by turning manually the film spool or by tensioning film until the lever arms reach their working positions (middle positions).
7. Start projector.



#### NOTE

At the end of a copy or when a film break is detected, the take-up friction and the take-off friction **switch off automatically**.





#### 4.3.1 Threading Schemes "Projection Operation"

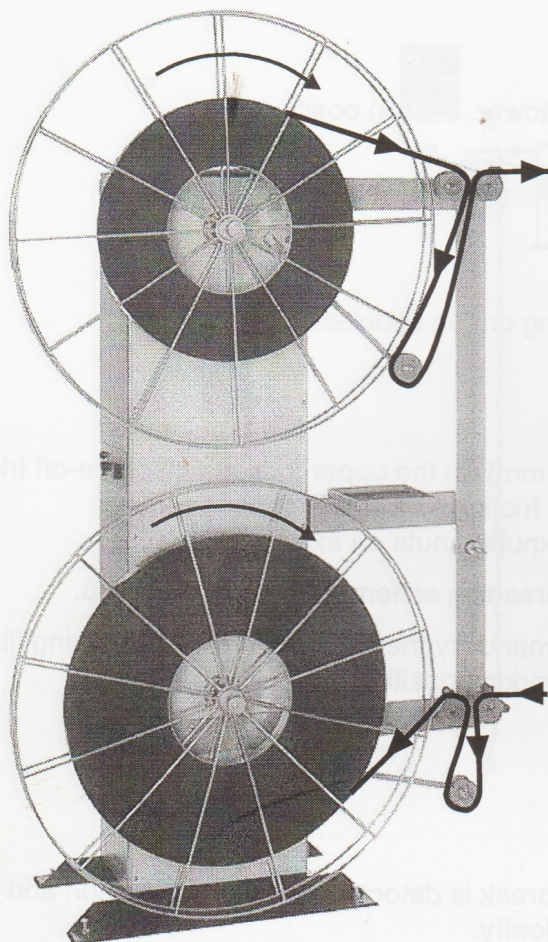


Figure 4-5 SPT 5000

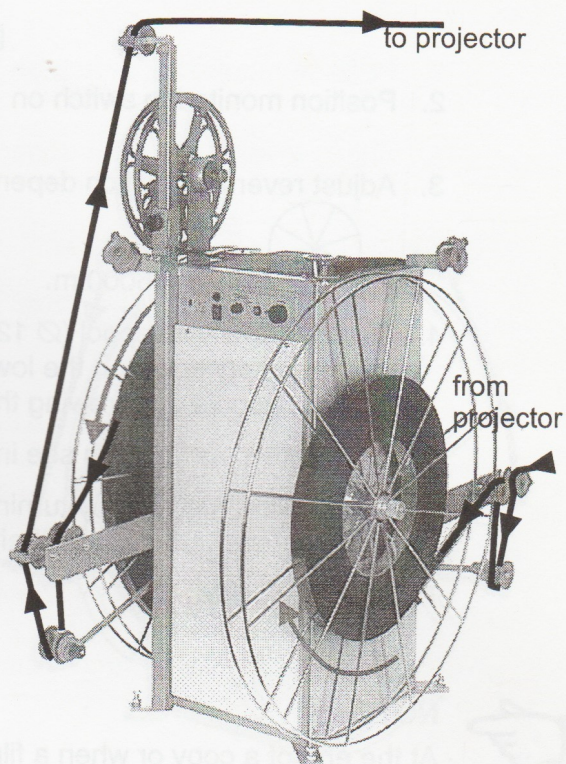




Figure 4-6 SPT 5000 K





#### 4.4 Tear-down

1. Switch on power supply of spool tower.  in position "I".

2. Position monitoring switch on .


3. Adjust reversible switch depending on the spool size.

4. Always rewind from the lower full spool (take-off friction) to the upper empty spool (take-up friction).

Manually wind up some film layers around the take-up friction.

5. Thread film, as you can see in threading scheme, figure 4-7 and 4-8.


6. Activate the lower take-off friction, by turning manually that film spool or by tensioning film until the lever arm reaches its working position (middle position).


7. Turn the monitoring switch  anticlockwise in the zero-position (left position). Start and accelerate the spool operation by turning the monitoring switch clockwise.

When starting the green control lamp illuminates constantly.



#### ATTENTION

- For a safe and gentle tearing down this operation will be activated first, when the monitoring switch was turned in zero-position.
- The tearing down operation will be activated first, when the spools, e. g. after pressing on  completely stand still.

8. Reduce the speed in time before the separating position of the program is reached by pressing the button .

9. Separate the copy from the program.

10. Tear-down program until you reach the second separating position, see point 6 and 7.

11. Do also with all other copies.



#### NOTE

After a stop the upper friction will be enabled (after aprox. 10 seconds), the film can runs out.

To prevent that the film autonomically reels backwards, you have to relax the film tension at the lower lever arm - the lower friction will be deactivated.

You can use this effect, when you have overrun the separating position and you have to go back to this position.





#### 4.4.1 Threading Schemes "Tear-down"

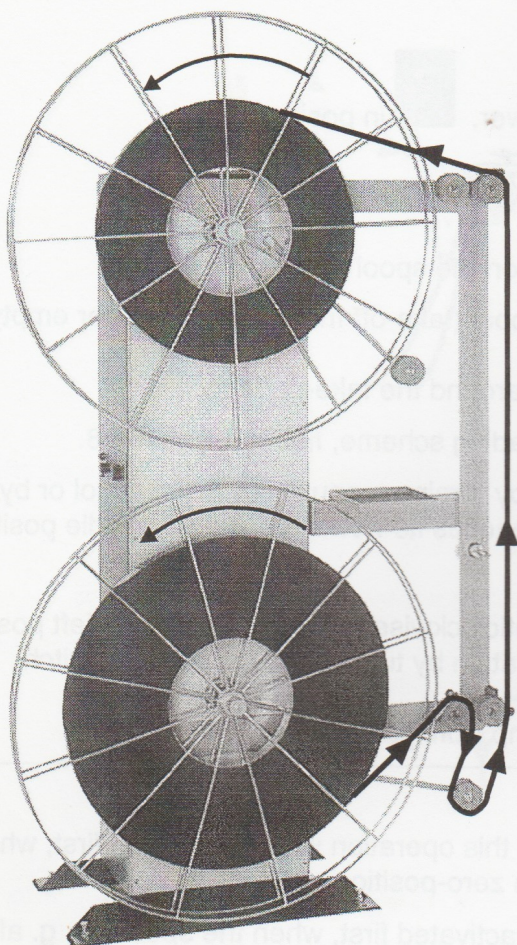


Figure 4-7

SPT 5000

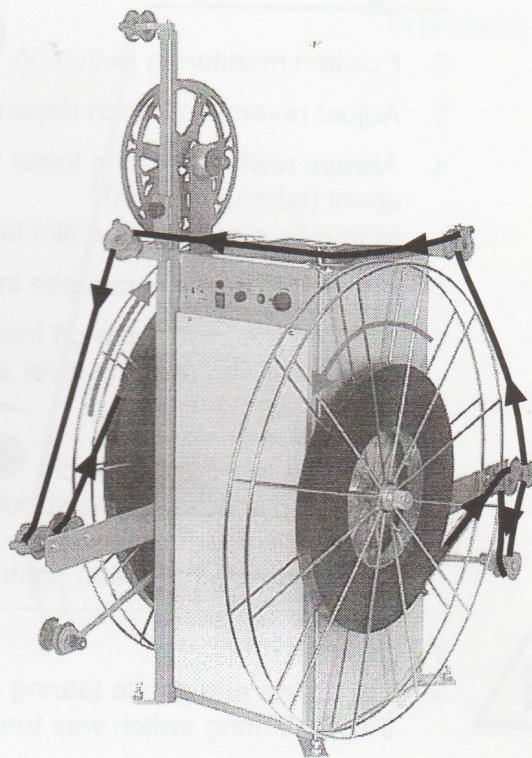


Figure 4-8

SPT 5000 K



## 5 Trouble Shooting

### 5.1 General Hints

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

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

### 5.2 Clearing of Errors

#### 5.2.1 Equipment









If system has spontaneous breakdowns especially with starting lamps you have to check whether all mechanical connections are low impedance, because of electrostatic charging.

In this case put anodized plain washers or tooth lock washers between these connections.

#### 5.2.2 Spool Tower



Friction drive is not running.

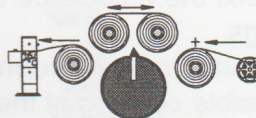
-  Lever arm is not in working position.  
 Check the green LEDs on control board.
-  Turn spool or tension film to move lever arm in working position.
-  Check hall potentiometer. Exchange, if it is defect.
-  Control unit does not react.
-  Separate spool tower for a few seconds from power supply and then switch on again (reset).
-  5000 m spool is pinned up - selected is 600 m spool.
-  Select the right spool with reversible switch .





- ❗ Film is threaded wrong - not threaded in the right lever arm.
- ☞ Thread film in a right way, see threading schemes in chapter 4.

- ❗ Film is threaded for another operation mode as you select with monitoring switch.



- ☞ Select the correct operation mode





## 6 Maintenance and Cleaning / Repair and Adjustments

### 6.1 General Hints



#### ATTENTION

- Allow work on electric supply to be carried out by competent electricians only.
- Make sure that nobody starts spool tower while you are working.  
With all maintenance and cleaning work you must separate spool tower from power supply (switch off main switch).
- All adjustments has 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.

### 6.2 Maintenance Work and Cleaning

Components	as required
guide rollers	listening check: noises because of defect ball bearing Change ball bearing or complete roller.
felt disk of mechanical friction	Exchange a strong dried felt disk with a new oiled one.





## 6.3 Repair

### 6.3.1 Exchange Rollers

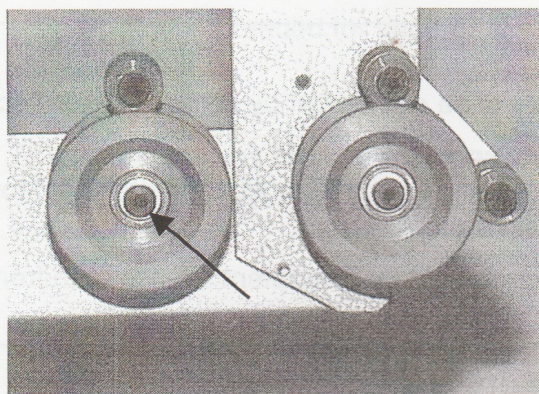


Figure 6-1 Exchange rollers

1. Release hexagon socket screw of the corresponding roller.
2. Pull off defect roller from axis.
3. Put on a new roller and tighten screw.

### 6.3.2 Exchange Felt Disk

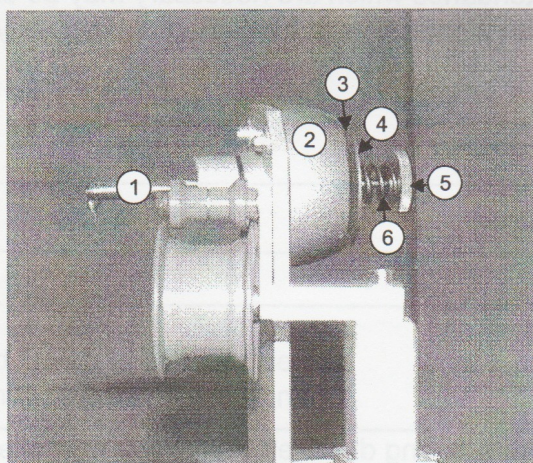


Figure 6-2 Mechanical friction

1. Remove the knurled nut ⑤, the spring ⑥ and then the moveable disk ④.
2. Substitute the old felt disk ③ with a new oiled one.
3. Put moveable disk, spring and knurled nut on axis.
4. Adjust friction.

#### Adjust:

Adjust the frictions by turning the knurled nut ⑤. The film does not build loops when the spool tower stops:

Turn right → the spring increases pressure (film tension is increased)

Turn left → the spring reduces pressure (film tension is reduced)





## 6.4 Adjustments

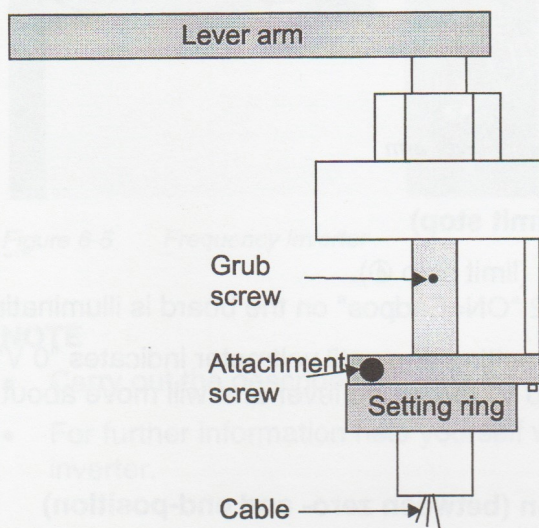
### 6.4.1 Adjust Hall Potentiometer / Lever Arms

- Remove the backside cover of spool tower to reach control boards in it.
- Cramp a voltmeter on corresponding metering point MP1/Upoti and MP2/GND.



#### NOTE

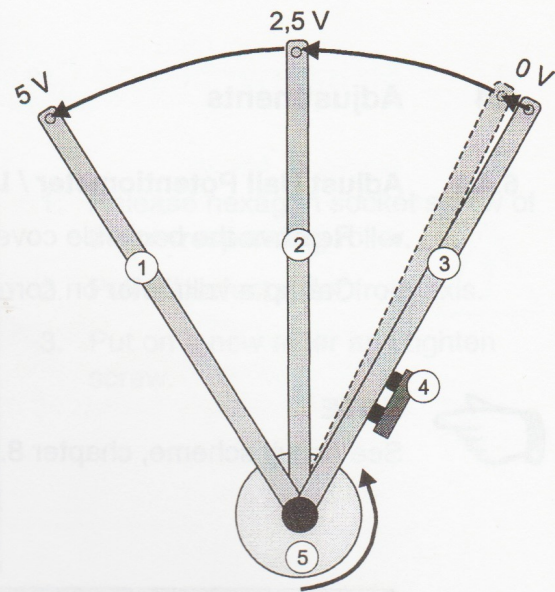
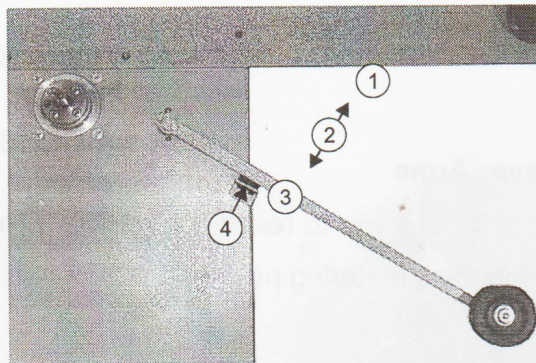
See circuit scheme, chapter 8.2.2.



- Remove cover of hall potentiometer.
- Release jamming screw (hexagon socket screw 3) of potentiometer.
- The grub screw (hexagon socket screw 1,5) has to be tightened.
- While turning setting ring you can carry out the following adjustments.

Figure 6-3 Adjust hall potentiometer





- ① lever arm in end-position
- ② lever arm in working position
- ③ lever arm in zero-position (limit stop)
- ④ limit stop
- ⑤ hall potentiometer

Figure 6-4 Adjust hall potentiometer / lever arm

#### Lever arm in zero-position (limit stop)

Lever arm is in zero-position ③ (limit stop ④).

The corresponding green LED2 "ON=Endpos" on the board is illuminating.

Turn hall potentiometer ⑤ with setting ring until voltmeter indicates "0 V".

The voltmeter has to indicate "0 V" too, when lever arm will move about 1 cm out of zero-position (see figure 6-4).

#### Lever arm in working position (between zero- and end-position)

Move lever arm in working position ②.

If the lever arm in working position the LED2 is getting off.

During lever arm is moving from zero-position ③ to working position ② the voltmeter indicates ascending values up to "2,5 V" when reaching working position ②.

#### Lever arm in end-position (at housing)

Move lever arm to column in end-position ①.

During lever arm is moving from working position ② to end-position ① the voltmeter indicates ascending values up to "5 V" when reaching end-position ①.



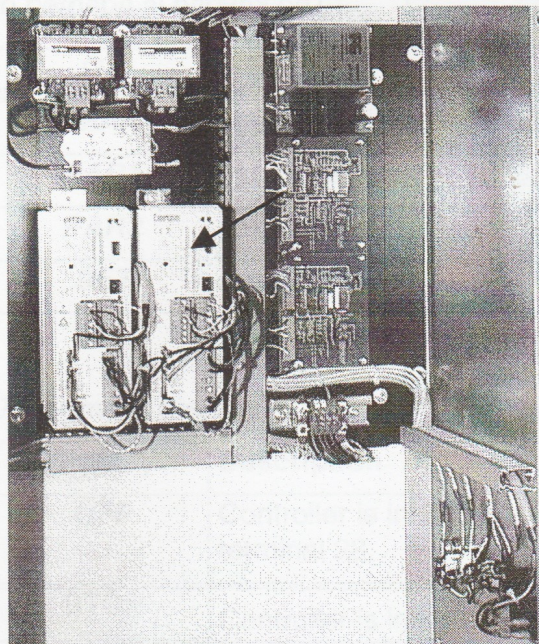
#### NOTE

Repeat the described adjustment for the other hall potentiometers/lever arm. Both values have to be absolutely equal.





## 6.5 Set Frequency Inverter



The frequency inverters (arrow) are mounted in spool tower.

With the aid of a LCD keypad (adaptable) (option) you can set the operation parameters of asynchronous motor.

During operation without keypad the operation state is displayed with two LEDs.

Figure 6-5 Frequency inverter



### NOTE

- Carry out the described settings for both frequency inverters.
- For further information help yourself with the operating manual about frequency inverter.



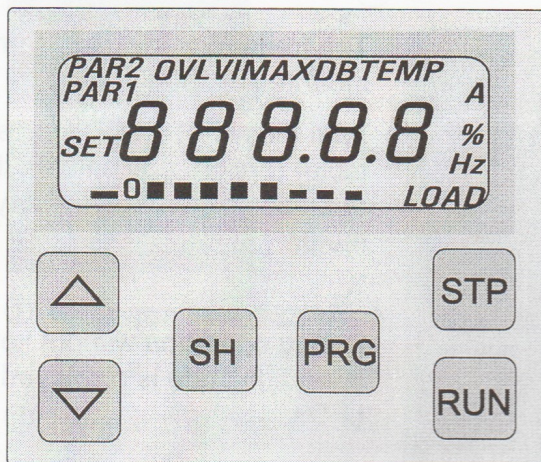
### NOTE

For more information about display and fault indications see the operating manual for frequency inverter.





### 6.5.1 LCD Keypad



The keypad is adapted on the inverter.

You can read the settings on display.

Figure 6-6 LCD Keypad

#### Function of keys

Key	Function
	increase display value
	reduce display value
	change between operating and code level
	change between code and parameter level
	inhibit controller
	enable controller
+	quickly increase display value (scoll up)
+	quickly reduce display value (scoll down)
+	save changes of values






### Display

Display	Description
<b>OV</b>	overvoltage
<b>IMAX</b>	set current limit exceeded
<b>PAR1</b>	parameter set 1 is active, PAR1 blinking: programing is possible
<b>PAR2</b>	parameter set 2 is active, PAR2 blinking: programing is possible
<b>SET</b>	set value selection via keyboard

### 7-Segment display

Display	Description
<b>OFF</b>	Controller is inhibited because a LOW signal is applied to terminal 28.
<b>STOP</b>	Controller is inhibited because  is pressed.
<b>AS_LC</b>	Autostart-Lockout
<b>STO</b>	The parameter is saved.
<b>DC_b</b>	DC injection is braking actively
<b>LU</b>	undervoltage
<b>SET1</b>	Parameter set 1 is overwritten by factory settings.
<b>SET2</b>	Parameter set 2 is overwritten by factory settings.
<b>rEAd1</b>	Parameter set 1 is overwritten by the data of the keypad.
<b>rEAd2</b>	Parameter set 2 is overwritten by the data of the keypad.
<b>STOE</b>	Parameter sets 1 and 2 are uploaded to keypad.



### NOTE

For more information about display and fault indications see operating manual for frequency inverter.





### 6.5.2 Adjust via Keypad



#### NOTE

Set same value for both parameter levels (PAR1 and PAR2).

#### Set terminal configuration

What to do	Display
Switch-on projector.	OFF
tip	<b>C001 / PAR1</b>
press	until <b>C007</b> appears
press	<b>-0- / PAR1</b> blinks
press	until <b>-16-</b> appears
+  press (save)	<b>ST0</b> and then <b>C007</b>

#### Set minimum field frequency

What to do	Display
tip	<b>C001 / PAR1</b>
press	until <b>C011</b> appears
press	<b>50 Hz / PAR1</b> blinks
press	until <b>60 Hz</b> appears
+  press (save)	<b>ST0</b> and then <b>C011</b>
press	<b>60 Hz / PAR1</b>
press	<b>50 Hz / PAR2</b>
press	until <b>60 Hz</b> appears
+  (save)	





### Set field frequency

What to do	Display
tip	<b>C001 / PAR1</b>
press	until <b>C011</b> appears
press	<b>50 Hz / PAR1</b> blinks
press	until <b>60 Hz</b> appears
+  press (save)	<b>ST0</b> and then <b>C011</b>
press	<b>60 Hz / PAR1</b>
press	<b>50 Hz / PAR2</b>
press	until <b>60 Hz</b> appears
+  press (save)	

### Set acceleration time

What to do	Display
tip	<b>C001 / PAR1</b>
press	until <b>C012</b> appears
press	<b>5.0 s / PAR1</b> blinks
press	until <b>0.02 s</b> appears
+  press (save)	<b>ST0</b> and then <b>C012</b>
press	<b>0.02 s / PAR1</b>
press	<b>5.0 s / PAR2</b>
press	until <b>0.02 s</b> appears
+  press (save)	





### Set deceleration time

What to do	Display
<b>PRG</b> tip	<b>C001 / PAR1</b>
<b>△</b> press	until <b>C013</b> appears
<b>SH</b> press	<b>5.0 s / PAR1</b> blinks
<b>▽</b> press	until <b>0.02 s</b> appears
<b>PRG</b> + <b>SH</b> press (save)	<b>ST0</b> and then <b>C013</b>
<b>SH</b> press	<b>0.02 s / PAR1</b>
<b>SH</b> press	<b>5.0 s / PAR2</b>
<b>▽</b> press	until <b>0.02 s</b> appears
<b>PRG</b> + <b>SH</b> press (save)	

### Set V/f rated-frequency

What to do	Display
<b>PRG</b> tip	<b>C001 / PAR1</b>
<b>△</b> press	until <b>C015</b> appears
<b>SH</b> press	<b>50 Hz / PAR1</b> blinks
<b>△</b> press	until <b>60 Hz</b> appears
<b>PRG</b> + <b>SH</b> press (save)	<b>ST0</b> and then <b>C015</b>
<b>SH</b> press	<b>60 Hz / PAR1</b>
<b>SH</b> press	<b>50 Hz / PAR2</b>
<b>△</b> press	until <b>60 Hz</b> appears
<b>PRG</b> + <b>SH</b> press (save)	




**Set V<sub>min</sub>**

What to do	Display
press	until <b>C016</b> appears
press	<b>8.00 / PAR1</b> blinks
press	until <b>0.00</b> appears
+  press (save)	<b>ST0</b> and then <b>C016</b>
press	<b>0.00 / PAR1</b>
press	<b>8.00 / PAR2</b>
press	until <b>0.00</b> appears
+  press (save)	

**End of program**

Press and then .

**6.5.3 Code Table**

Code	Name	Parameter (Factory setting is printed boldly)	Your settings
C001	Operating mode	-0- <b>Set value selection via terminal 8</b> -1- Set value selection via keypad	
C002*	Parameter set	-0- <b>Function is executed</b> -1- PAR1 with factory setting overwritten -2- PAR2 with factory setting overwritten -3- PAR1/PAR2 with data of keypad overwritten -4- PAR1 with data of keypad overwritten -5- PAR2 with data of keypad overwritten -6- PAR1/PAR2 transmitted to keypad	
C004	Switch on display	-0- <b>Field frequency f<sub>d</sub></b> -1- Inverter loaded -2- Motor current	





Code	Name	Parameter (Factory setting is printed boldly)	Your settings
C007*	Terminal configuration	Term: E4 E3 E2 E1 <b>-0- R/L GSB JOG 1/2/3</b> -1- R/L PAR JOG 1/2/3 -2- R/L QSP JOG 1/2/3 -3- R/L PAR GSB JOG1 -4- R/L QSP PAR JOG1 -5- R/L GSB Trip-Set JOG1 -6- R/L PAR Trip-Set JOG1 -7- R/L PAR GSB Trip-Set -8- R/L QSP PAR Trip-Set -9- R/L QSP Trip-Set JOG1 -10- R/L Trip-Set UP DOWN -11- R/L GSB UP DOWN -12- R/L PAR UP DOWN -13- R/L QSP UP DOWN -14- L/QSP R/QSP GSB JOG1 -15- L/QSP R/QSP PAR JOG1 -16- L/QSP R/QSP JOG 1/2/3 -17- L/QSP R/QSP PAR GSB -18- L/QSP R/QSP PAR Trip-Set -19- L/QSP R/QSP GSB Trip-Set -20- L/QSP R/QSP Trip-Set JOG1 -21- L/QSP R/QSP UP DOWN -22- L/QSP R/QSP UP JOG1	16
C008	Relay function	-0- Ready to operate <b>-1- TRIP fault indication</b> -2- Motor is running -3- Motor is running / CW rotation -4- Motor is running / CCW rotation -5- Field frequency $f_d = 0$ -6- $f_{dset}$ reached -7- $Q_{min}$ reached -8- $I_{max}$ reached -9- Overtemperature ( $v_{max} - 10^\circ C$ ) -10- TRIP or $Q_{min}$ oder IMP	
C010	Minimum field frequ.	<b>0.0 Hz</b> 0.0 to 480 Hz	2,5
C011	Maximum field frequ.	<b>50 Hz</b> 30 to 480 Hz	60
C012	Acceleration time	<b>5.0 s</b> 0.05 to 999 s	0,02
C013	Deceleration time	<b>5.0 s</b> 0.05 to 999 s	0,02
C014	V/f characteristics	<b>-0- linear characteristics <math>V \sim f_d</math> with Auto-Boost</b> -1- square characteristic $V \sim f_d^2$ with Auto-Boost -2- linear characteristic $V \sim f_d^2$ with constant $U_{min}$ boost -3- square characteristic $V \sim f_d^2$ with constant $V_{min}$ boost	






Code	Name	Parameter (Factory setting is printed boldly)	Your settings
C015	V/f rated-frequency	<b>50 Hz</b> 30 to 960 Hz	60
C016	V <sub>min</sub> setting	Factory setting depending on type 0 to 40%	0%
C017	Threshold Q <sub>min</sub>	<b>0 Hz</b> 0 to 480 Hz	
C021	Slip compensation	<b>0 %</b> 0 to 12 %	
C022	I <sub>max</sub> limit motor mode	<b>150 %</b> 30 to 150 %	
C023	I <sub>max</sub> limit generator mode	<b>80 %</b> 30 to 110 %	
C034*	Master current	<b>-0- 0 to 20 mA</b> <b>-1- 4 to 20 mA</b>	
C036	Voltage for DC injection brake	Factory setting depending on type 0 to 40%	
C037	JOG value 1	<b>20 Hz</b> 0 to 480 Hz	
C038	JOG value 2	<b>30 Hz</b> 0 to 480 Hz	
C039	JOG value 3	<b>40 Hz</b> 0 to 480 Hz	
C050*	Output frequency	-Display-	
C052*	Motor voltage	- Display -	
C054*	Motor current	- Display -	
C056*	Inverter load	- Display -	
C061*	Heatsink temperature	- Display -	
C093*	Inverter type	820x	
C099*	Software version	821x.	
C106	Holding time for DC injection brake	<b>0 s</b> 0 to 50 s	





Code	Name	Parameter (Factory setting is printed boldly)	Your settings
C108*	Gain for C11	<b>220</b> 0 to 255	
C111	Monitor signal	-0- <b>Field frequency</b> -1- Inverter load -2- Motor current -3- DC bus voltage	
C120	L <sup>2</sup> x t switch-off	<b>0 %</b> 0 to 100 %	
C142	Start options	-0- Autom. start is inhibited, flying restart circuit is not active <b>-1- Autom. Start, if terminal 28 HIGH, flying restart circuit is not active</b> -2- Autom. start is inhibited, flying restart circuit is active -3- Autom. Start, if terminal 28 HIGH, flying restart circuit is active	
C161*	Present fault	-Display-	
C162*	Previous fault	- Display -	
C163*	Last but one fault	- Display -	
C164*	Last but two faults	- Display -	
C170*	Selection of TRIP reset	-0- <b>Trip-Reset with key  or LOW signal at terminal RFR</b> -1- Auto-TRIP-reset	
C171*	Delay of Auto-TRIP-reset	<b>0 s</b> 0 to 60 s	
C178*	Operating time	- Display -	
C179*	Running time	- Display -	



#### NOTE

The codes marked with \* are the same in the two parameter sets and are only displayed in parameter set 1.





## 7 Lists of Parts and Wearing Parts

### 7.1 Mechanics

Name	Fig.	Pos.	Piece	Ident No
film spool 600 m / Ø 9 mm			01	0040 060 00050
film spool 1800 m / Ø 12.7 mm			01	0040 060 00765
film spool 2000 m / Ø 12.7 mm			01	0040 060 00777
film spool 3200 m / Ø 12.7 mm			01	0040 060 00778
film spool 4000 m / Ø 12.7 mm			01	0040 060 00780
film spool 5000 m / Ø 12.7 mm			01	0040 060 00773



#### NOTE

If you need some other parts, please call KINOTON.

### 7.2 Elektrical Equipment

Name	Fig.	Pos.	Piece	Ident No
control board IPD-80-04 on top	7-1	<b>1</b>	01	1000 216 97088
control board IPD-80-04 on bottom		<b>2</b>	01	1000 216 97089
frequency inverter	7-1	<b>3</b>	01	1000 219 87002
mains filter	7-1	<b>4</b>	01	1000 119 97002
mains choke	7-1	<b>5</b>	01	1000 148 37001
fuse 0.2 A t	7-1	<b>6</b>	01	4822 253 30012
friction motor asynchronous motor	7-2	<b>7</b>	01	1000 361 87011
hall potentiometer	7-2	<b>8</b>	01	1000 105 97006
tachometer generator	7-2	<b>9</b>	01	1000 361 97001
fuse 6,3 A t			01	4822 253 30031



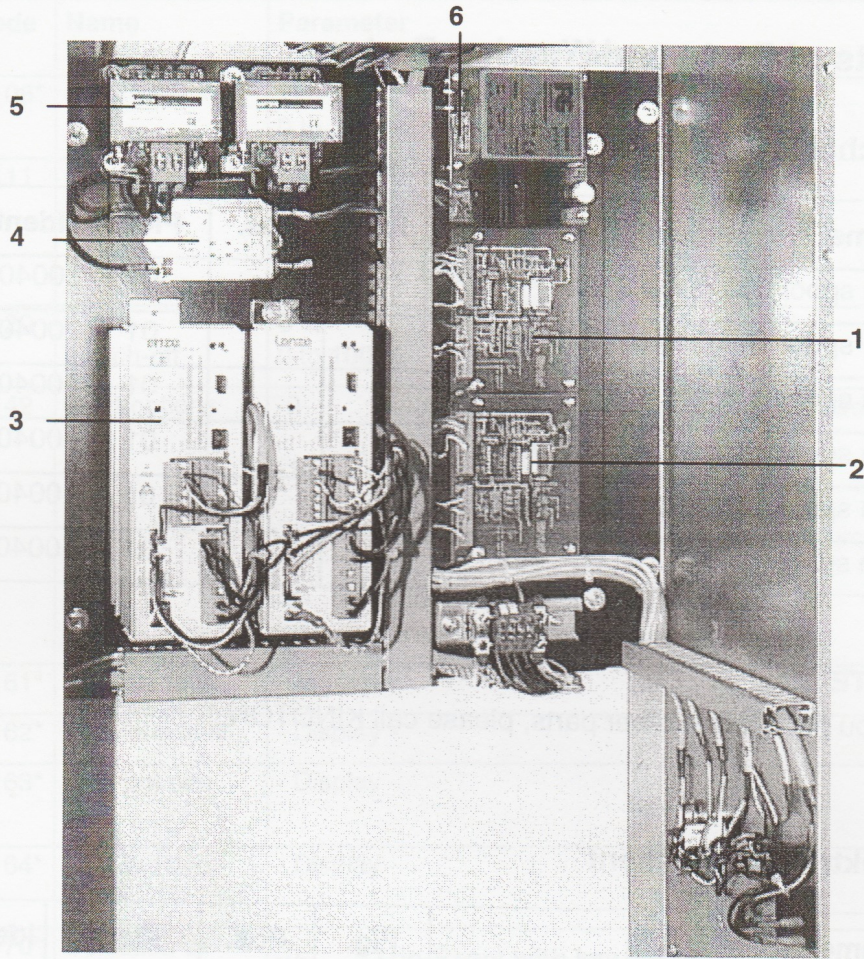


Figure 7-1



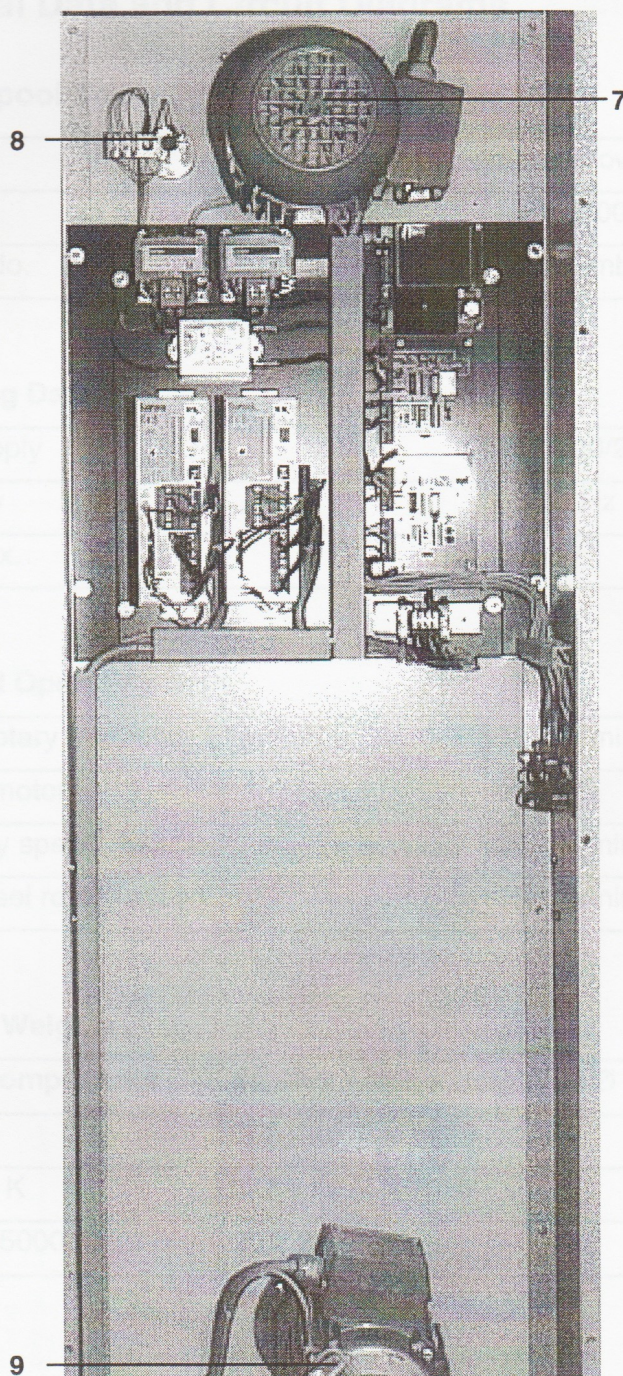
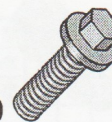


Figure 7-2



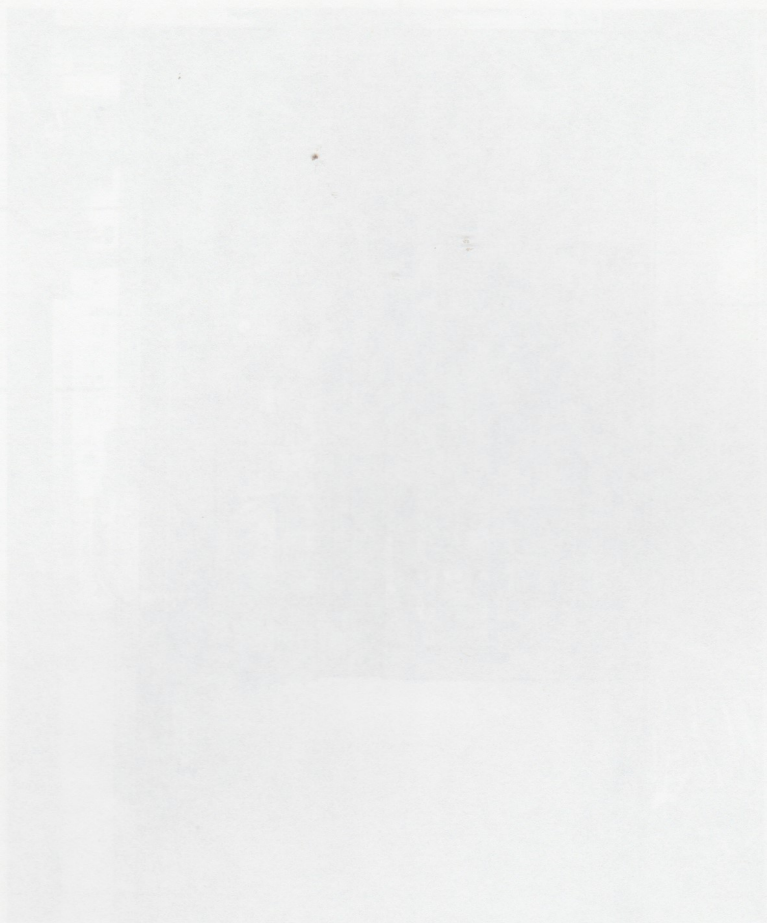


Figure 7-1

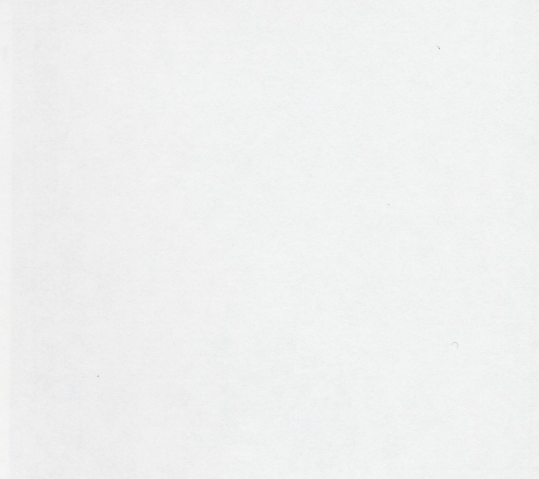


Figure 7-2





## 8 Technical Data and Circuit Diagrams

### 8.1 Data of Spool Tower

Name	Spool Tower
Type	SPT 5000 / SPT 5000 K
Machine No.	See numberplate at base

#### 8.1.1 Connecting Data

Power supply	110/120/230/240 V AC
Frequency	50/60 Hz
Power max.	360 W

#### 8.1.2 Power and Operating Data

Nominal rotary frequency of motor	1360 r/min
Power of motor	180 W
Reel rotary speed max.	256 m/min
Nominal reel rotary speed	190 m/min

#### 8.1.3 Sizes and Weights

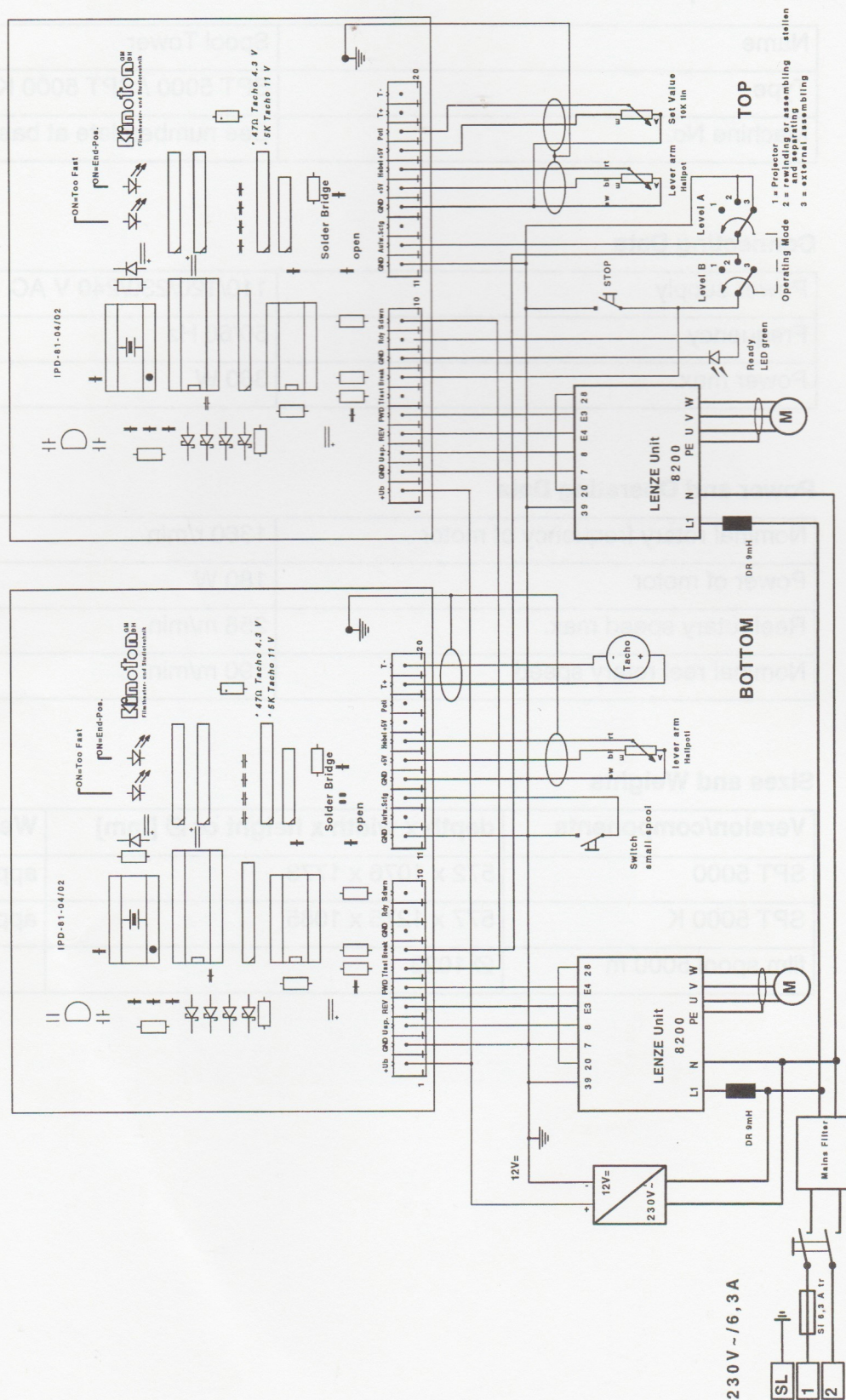
Version/components	depth x width x height or Ø [mm]	Weight [kg]
SPT 5000	572 x 1076 x 1773	approx. 90
SPT 5000 K	577 x 1275 x 1085	approx. 80
film spool 5000 m	Ø 1023	



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## 8.2 Circuit Diagrams

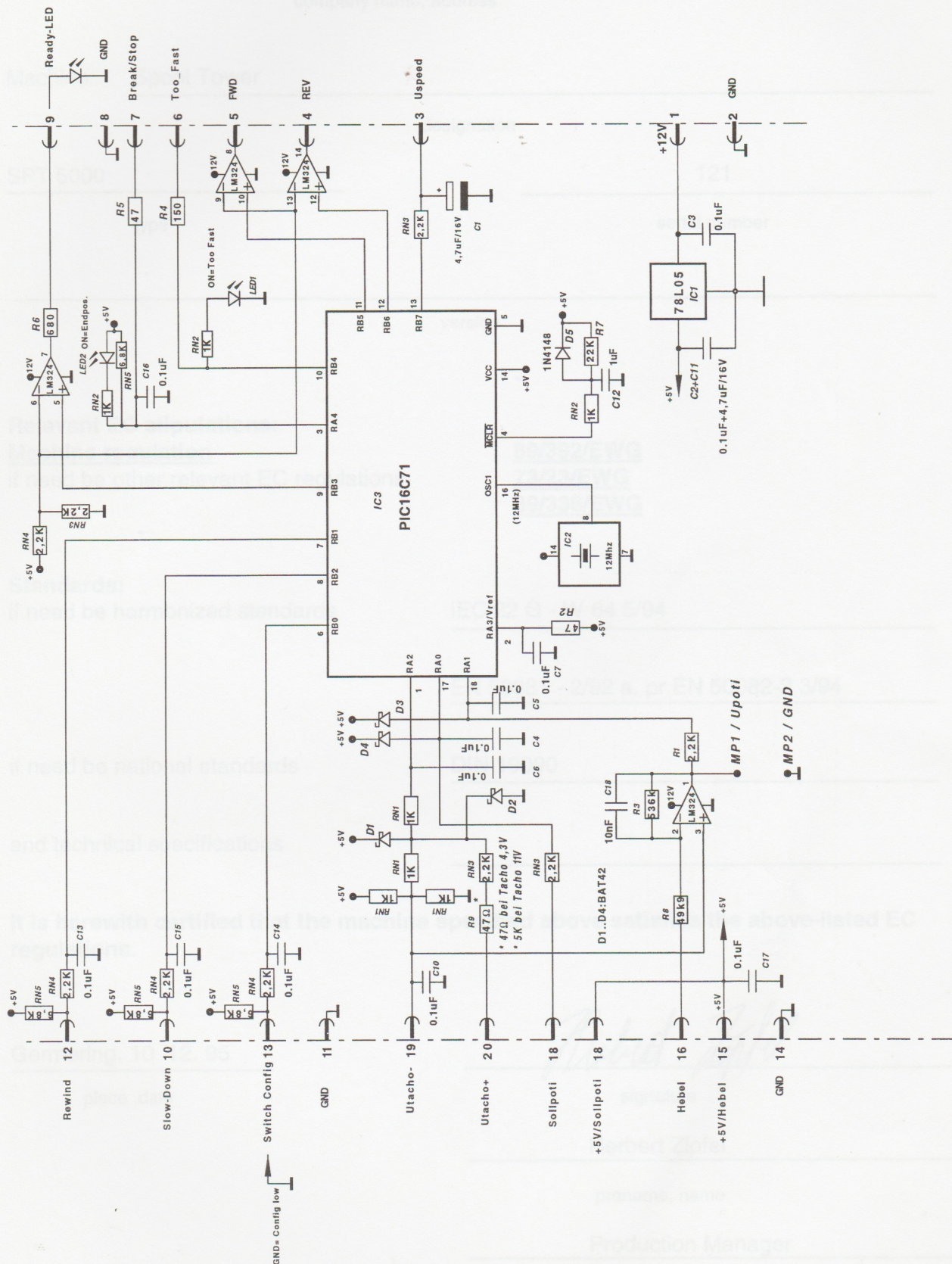
### 8.2.1 Spool Tower Control





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### 8.2.2 Wiring of Control Board



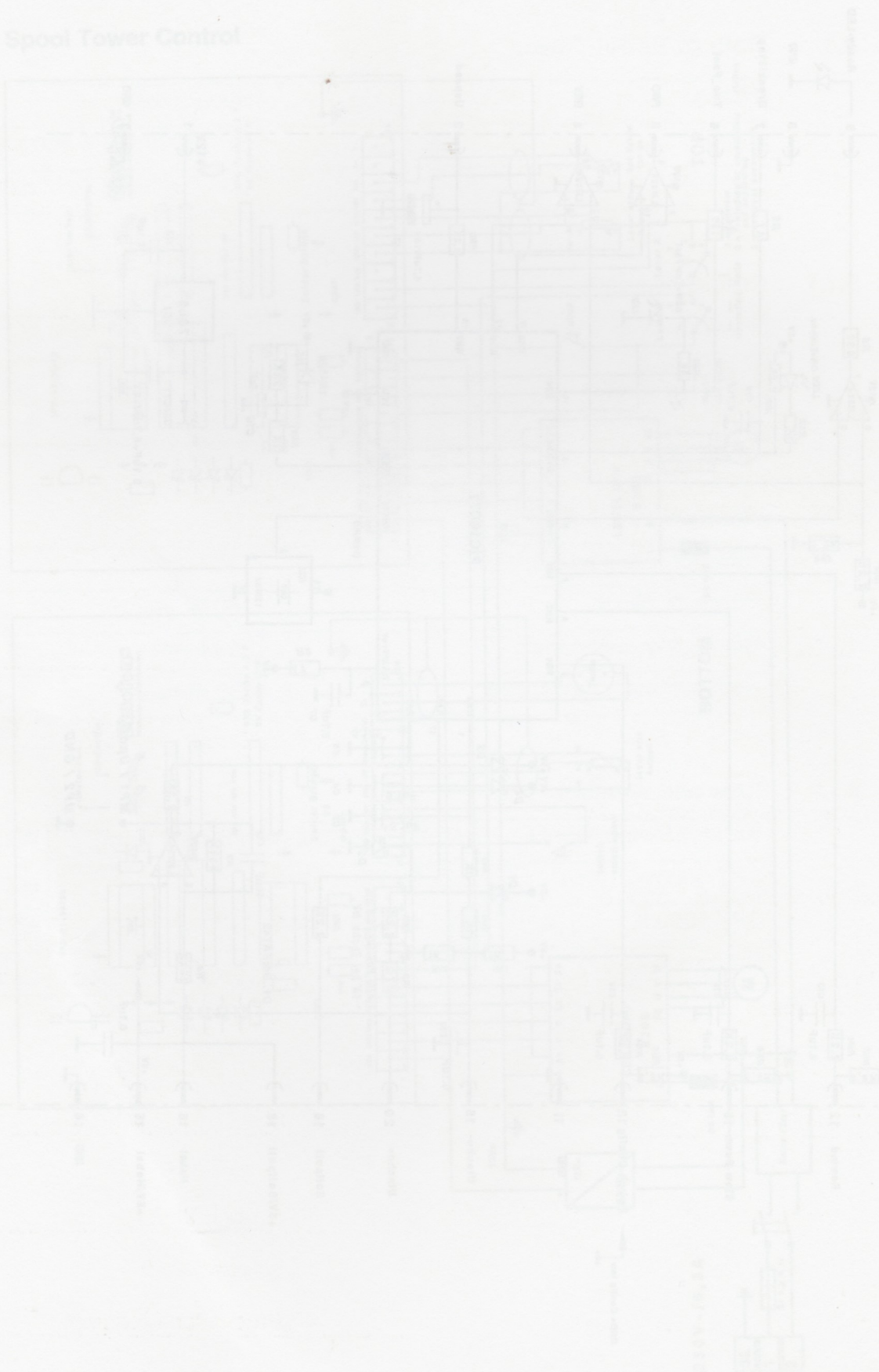




## 8.2 Circuit Diagrams

## 8.2.2 Wiring of Control Board

### 8.2.1 Spool Tower Control





## EC Declaration of Conformity

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

company name, address

Machine: Spool Tower

designation

SPT 5000

type

121

serial number

version

### Relevant EC stipulations:

#### Machine regulation

if need be other relevant EC regulations

89/392/EWG

73/23/EWG

89/336/EWG

### Standards:

if need be harmonized standards

IEC 22 G - W 64 5/94

EN 50081 - 2/92 a. pr EN 50082-2 3/94

if need be national standards

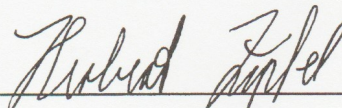
DIN 19090

and technical specifications

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

Germering, 10. 12. 95

place ,date



signature

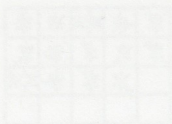
Herbert Zipfel

prename, name

Production Manager

function





# EC Declaration of Conformity

Messrs.: Kinton GmbH, Industriest. 30 a, 83110 Gernheim

company name, address

Machine: Spool Tower

designation

121

89T 8000

serial number

type

version

Relevant EC regulations:

Machine regulation

It need no other relevant EC regulations

89/392/EWG

73/23/EWG

89/338/EWG

Standards:

It need no harmonized standards

IEC 22 G - W 64 6/94

EN 50081 - 2/95 a. or EN 50082-2-3/94

It need no national standards

DIN 19930

and technical specifications

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

Gernheim, 10.12.92

place, date

signature

Herbert Zigel

business name

Production Manager

function









**Kinoton** GMBH  
Filmtheater- und Studiotchnik ■

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