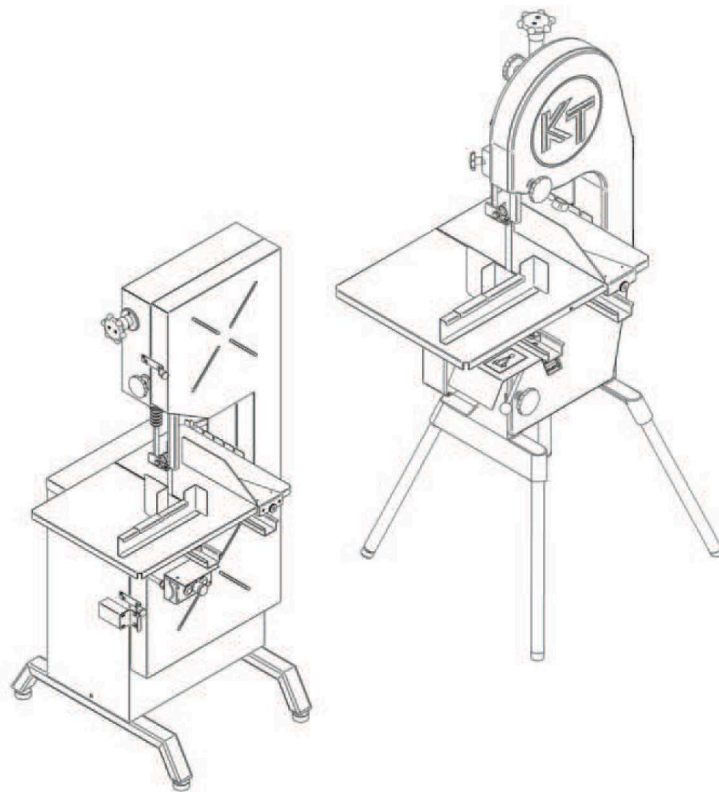


metos

Band saw
Metos KT-325, KT-360, KT-400, KT-460
2021058, 2021059

User manual



BAND SAW USER MANUAL

Caution!

KT Band Saws are standard or 2-speed (high-speed) saws designed to cut meat, bones, poultry and fish. These machines are capable of inflicting damage to the user, unless the right safety precautions are observed. Therefore, it is important that utmost care is taken when using this machine.

- * **DO NOT** use this machine unless you have read and completely understood this manual. Your attention is drawn in particular to the part which concerns safety.
- * **KEEP** hands and fingers away from the moving blade.
- * **DO NOT** use the machine unless all the guards are fixed firmly into place.
- * **DO NOT** leave the machine unsupervised when the blade is in motion.
- * **DO NOT** leave the machine without lowering the blade guard.
- * **DISCONNECT** the power source before changing or cleaning the blades, before adjusting anything or before you leave the machine unsupervised.
- * **REPORT** all faults immediately.

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1. Introduction

KT Band Saws are standard or 2-speed (high-speed) band saws designed specifically for the cutting of fresh, frozen and bones or similar products. Read this instruction manual **BEFORE** using the machine and ensure also that all other users, service mechanics and cleaners have also read and thoroughly understood this manual, and also that they have familiarized themselves with the following:

1. Location and functioning of the guides
2. Dismantling, cleaning and re-assembly of the machine
3. The basic tightening, adjusting and guiding operation of the blade.

All users must be given the correct training in the safe use of band saws, and they must be thoroughly knowledgeable in the correct safety procedures. The parts of this manual which deal with **SAFETY** must be read with particular attention.

1.1 Technical specifications

	KT-325	KT-400	KT-360	KT-460
Motor	1,8 kW	1,8 kW	1,8 kW	1,8 kW
Blade speed 1	16 m/s	20 m/s	20 m/s	20 m/s
Blade speed 2 (High)	-	-	31 m/s	31 m/s
Diameter, blade wheel	325 mm	400 mm	400 mm	400 mm
Cutting width	310 mm	380 mm	325 mm	375 mm
Cutting height (standard / fixed table)	240 mm / 280 mm	370 mm / 420 mm	260 mm / 300 mm	370 mm / 420 mm
Standard table size	675 x 480 mm	870 x 560 mm	675 x 480 mm	870 x 560 mm
Standard table movement	310 mm	415 mm	310 mm	415 mm
Fixed table size	700 x 800 mm	900 x 960 mm	700 x 800 mm	900 x 960 mm
Blade measurements	2345 x 20 mm	3135 x 20 mm	2775 x 20 mm	3135 x 20 mm
Weight of the saw (excluding package)	87 kg	134 kg	185 kg	225 kg

2. General description

This manual refers to the following models:

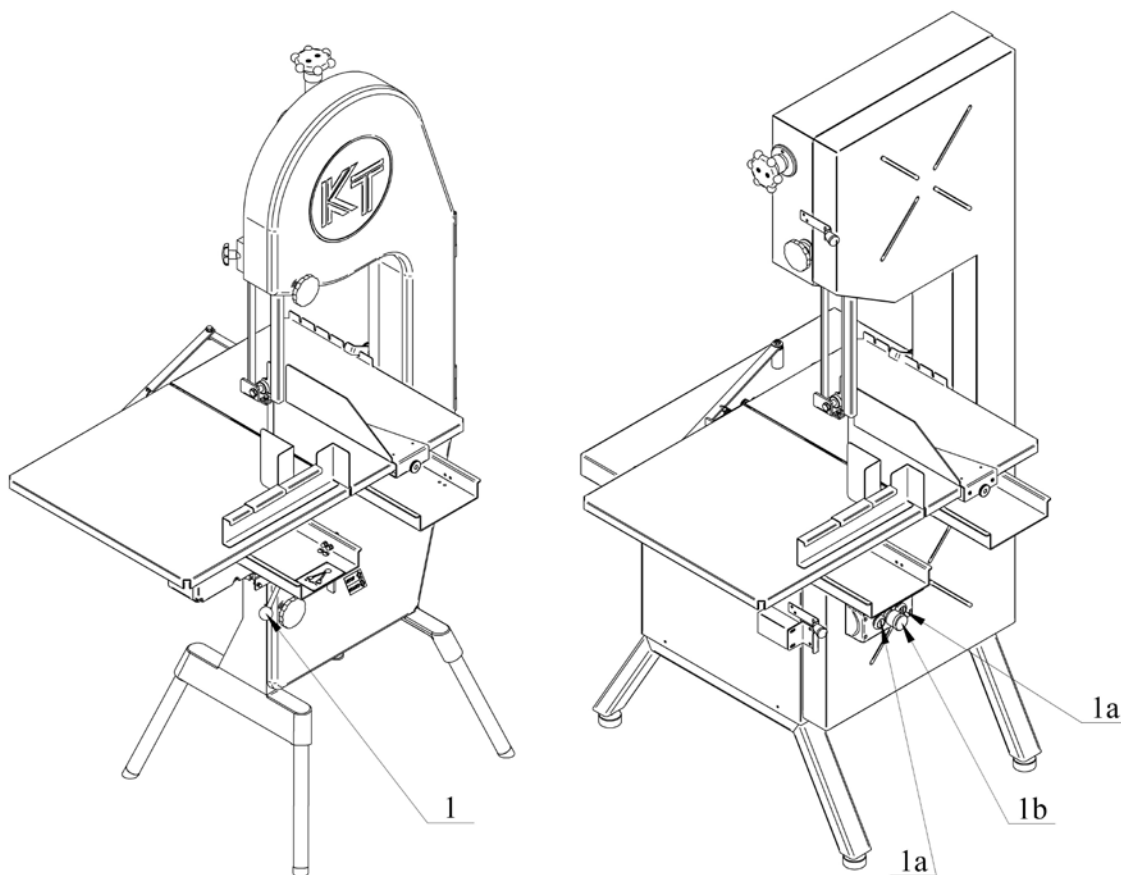
KT-325, KT-400, KT-360, KT-460

All models are available with either a fixed or sliding feed table and they have been constructed following KT product development methods. All models have been designed for the quick and accurate cutting of fresh and frozen meats. All machines function quietly, with minimum vibration. They may also be dismantled for ease cleaning.

The machines are equipped with a safety switch in the cover to ensure that the machines cannot be started if the cover is not correctly shut. For safety reasons the motor incorporates a brake device. It ensures that the blade stops within 4 seconds of the machine being switched off.

Models KT-325 and KT-400 are equipped with an aluminium frame, while models KT-360 and KT-460 are made of stainless steel.

Models KT-325 and KT-400 include a starting/stopping switch (Picture 1, No. 1). In models KT-360 and KT-460 the start/stop buttons (Picture 1, No. 1a & 1b) are located in the control panel. Furthermore models KT-360 and KT-460 are equipped with a main power switch and 24 V control voltage. The starting switch also incorporates an undervoltage circuit breaker to prevent unintentional restarting after the power to the machine has been cut off.



Picture 1.

3. Unpacking

The saw may be stored in the cold store. All models must be thoroughly cleaned before usage. See chapter 7.7.1 for the recommended cleaning agents.

The saws are delivered ready assembled. If the saw or its package has been damaged in the transit, contact your retailer or the manufacturer.

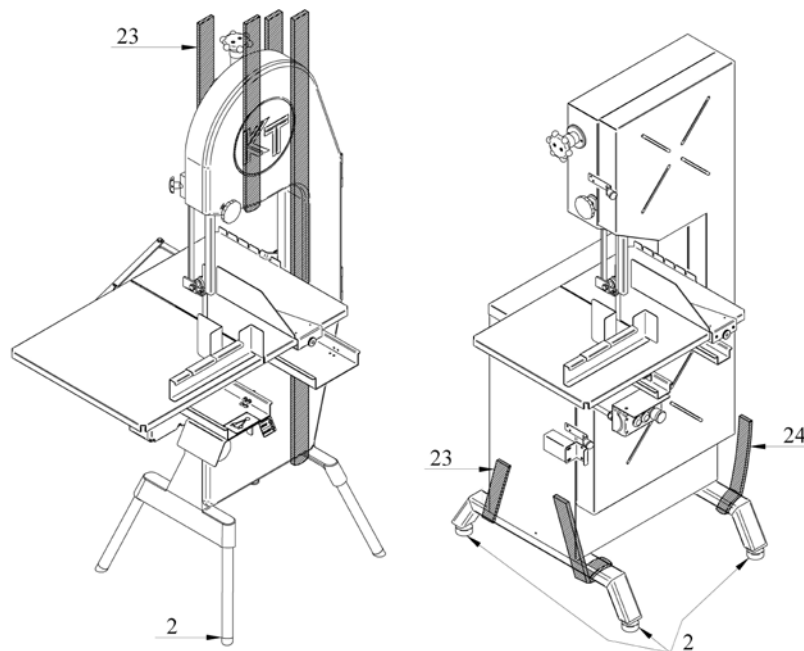
The saw can be lifted from the pallet and moved to its location with a fork-lift truck. When moving the saw, **ENSURE THAT IT IS NOT LIFTED TOO HIGH** and that **ANOTHER PERSON CHECKS THAT THE SAW DOES NOT FALL OVER**.

When using ropes for lifting the saw, the lifting points (No. 23 and 24) indicated in the picture 2 are to be used. In models KT-360 and KT-460 the table is to be removed from the saw, before lifting (see chapter 6). **UTMOST CARE MUST BE TAKEN WHEN LIFTING THE SAW.**

4. Installation

4.1 Location

The band saw must be installed away from corridors and doors. The location must have adequate light. The floor must be fairly even, and for the safety of the user, the surface must be non-slippery. The legs of the saw are adjustable (Picture 2, No. 2) to enable it to be positioned securely on the floor.



Picture 2. Lifting points and adjustable legs of the band saw.

4.2 Electrical connection

Please note

1. Ensure that the supply voltage corresponds with the voltage marked on the rating label.
2. The machine must be **CORRECTLY EARTHED**.
3. Only an authorized electrician may connect the electricity supply to the machine and carry out the servicing work.
4. Ensure that the electrical supply has been disconnected before any electrical connections are made, or maintenance or adjusting work is carried out.

4.2.1 Direction of rotation

Check the direction of rotation. After start-up, the machine's blade wheels should rotate in such a way that the blade is moving downwards, towards the table at the cutting point. If the direction of rotation is incorrect, ask an authorized electrician to change the direction of rotation.

4.2.2 Switch diagram

The switch diagram for the band saw are to be found in the appendices of this manual.

5. Operation

5.1 Safety

5.1.1 Safety measures

The importance of following safety procedures in the operation of industrial band saws cannot be over-stressed. Band saws are capable of inflicting bodily damage to operators. However, by using common sense and being careful, as well as by following all safety measures in the operation of band saws, the operator will get the best possible performance out of this versatile machine, and minimize the risk of accidents.

You personal safety is more important than the quick operation of the machine.

It is recommended that only authorized persons who have received the correct training in the operation of industrial band saws may operate them. They must also be aware of the danger factors and safety measures.

When using braided metal gloves, beware of the glove getting **ENTANGLED IN THE TEETH OF THE BLADE**. The gloves used must conform to local hygiene regulations. Your occupational safety inspector can advise you in the use of gloves.

5.1.2 Before use

Before starting up the band saw the operator must:

1. **REMOVE** all rings from his/her fingers.
2. **REMOVE** his/her watch.
3. **REMOVE / SECURE** his tie.
4. **CHECK** that his/her sleeves cannot touch the blade.
5. **CHECK** that the blade is correctly tightened.
6. **CHECK** that the wipers and guides are tightly and correctly fixed.
7. **CHECK** that the cover is securely closed.
8. **CHECK** that the table is safely and correctly mounted.
9. **CHECK** that the sawdust receptacle is in its place.
10. **ADJUST** the protective rail as low as possible.

5.1.3 During use

1. **KEEP** hands and fingers at a **SAFE DISTANCE** from the blade.
2. **DO NOT** use the saw table for any other purpose than that of support for the product you are cutting.
3. **DO NOT** let passers-by talk to, or otherwise disturb the operator when the blade is in motion.
4. **NEVER** leave the machine unsupervised when the blade is in motion.
5. **DO NOT** use too much force when pushing the product to the blade.
6. **USE** the finger protection bar when sawing.
7. **USE HEARING PROTECTION** with models KT-360 and KT-460 at speed I. It is recommended to use hearing protection with all saw types.

5.1.4 After use

1. **STOP** the machine by using the stop button (KT-360, KT-460) or the stop switch (KT-325, KT-400). Also switch off the main power in models KT-360 and KT-460.
2. **DO NOT** leave the machine before the blade has stopped completely.
3. **DISCONNECT** the power supply.

5.2 Starting up

Provided that all the conditions in chapters 5.1.2 and 5.1.3 are fulfilled, the saw may be started.

- **KT-325, KT-400:** Press down the starting switch (Picture 3, No. 1).
- **KT-360, KT-460:** Switch the main power on from the main power switch located at the back of the machine. Open the red stop button (Picture 3, No. 1b) and press the white start button (No. 1a). There are 2 start buttons: **I = Slow speed, II = Fast speed.**

After the start up, allow the machine to reach full speed before starting the cutting operation.

5.3 Stopping

The machine may be stopped as follows:

- **KT-325, KT-400:** By lifting up the stop switch (Picture 3, No. 1).
- **KT-360, KT-460:** By pressing the **RED** stop button (Picture 3, No. 1b).

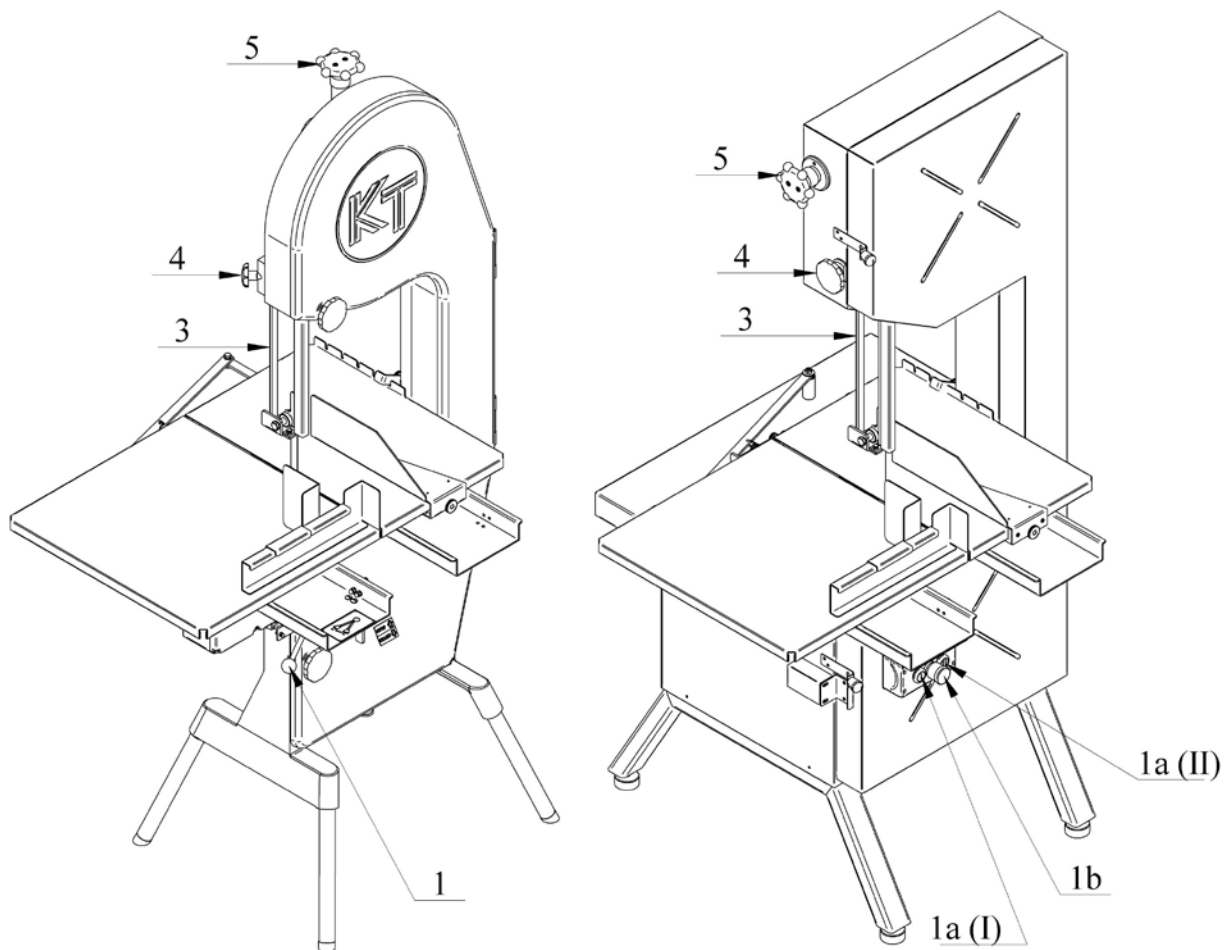
All these methods engage the brake, which stops the movement of the blade in 4 seconds or less.

After the blade has stopped, lower the upper blade guide / protective rail (Picture 3, No. 3) to its lower position by turning the black knob (No. 4) counter-clockwise and simultaneously gently pulling the upper blade guide down. **Avoid touching the blade.**

5.4 Tightening the blade

To tighten the blade turn the adjusting wheel (Picture 3, No. 5) clockwise. Once the adjusting wheel rotates freely and it will not turn any further, the adjustment is correct.

NOTICE! Always have the cover closed when tightening the blade!
See chapter 8.1.1 regarding blade safety.



Picture 3.

5.5 Sawing

The sawing operation should be carried out rhythmically and easily. Do not try to force the product to the blade, let the blade do the work. It is not possible to the operator to work in a safe or efficient manner, if he/she tries to push the product through the blade more quickly than the blade can cut.

5.5.1 Using the blade guide and protective rail

Always hold the mobile upper blade guide (Picture 4, No. 3) / protective rail (No. 10) as close to the cutting point as possible. In this way, the cutting action is more accurate and only the smallest part of the blade, necessary for optimum cutting, is visible.

5.5.2 Using the pushing plate bar and portioning plate

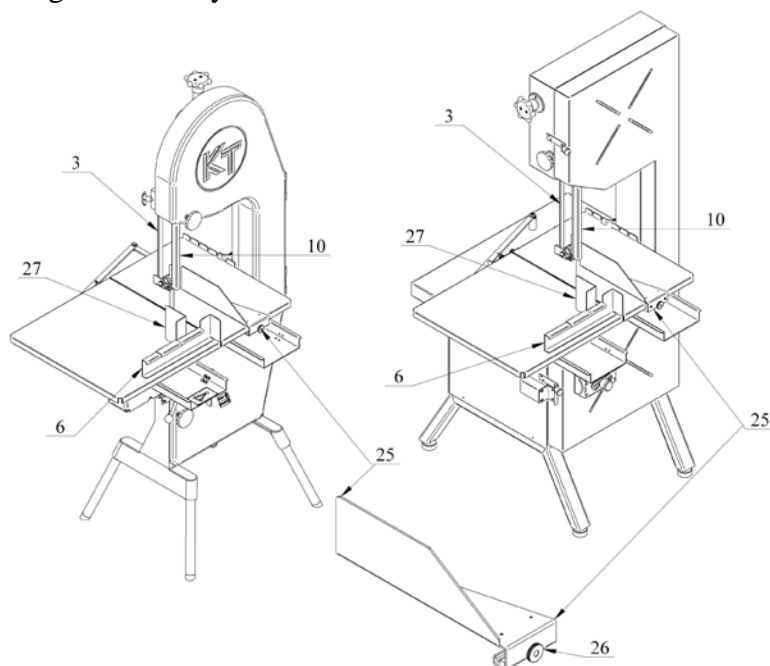
Whenever the cutting action allows it, use the pushing plate / finger protection bar (No. 6). With this action you can reduce the risk of accidents. The saw is equipped with a portioning plate (No. 25) to adjust the thickness of the slices produced. The portioning plate can be adjusted by unscrewing the finger nut (No. 26) and sliding the plate along the edge of the table until the desired thickness has been achieved. The finger nut (No. 26) must then be retightened.

The saw is equipped with a pusher plate (No. 27) for the last slice, to be used when the product is very near the blade.

ALWAYS KEEP FINGERS AND HANDS AT A SAFE DISTANCE FROM THE BLADE.

Do not use the cutting table for any other purpose, such as opening packages, unwrapping, removing hooks or cutting by hand. The machine has not been designed for such jobs. Operator error may lead to serious accidents.

If the cutting operation becomes ponderous, slows down or straight cutting cannot be maintained, the reason may be a damaged or deteriorated blade which must be replaced. See chapter 8.1.1 regarding blade safety.



Picture 4.

6. Removing the table

Open the locking device (Picture 5, No. 7). Gently pull the table towards you and release the table stopper (No. 8).

The table is removed for cleaning. It can be stood on one end, and the overlapping joint on the underside edge of the table can be brushed clean.

7. Cleaning

7.1 Stopping

Stop the machine and **REMOVE THE PLUG FROM THE SOCKET.**

7.2 Covers

Open the cover (models KT-325 and KT-400) by turning the locking knobs (Picture 5, No. 9) counter-clockwise. In models KT-360 and KT-460 open the cover by gently pressing the locking knobs outwards to release the locking pins (No. 9) from the groove.

7.3 Blade guard

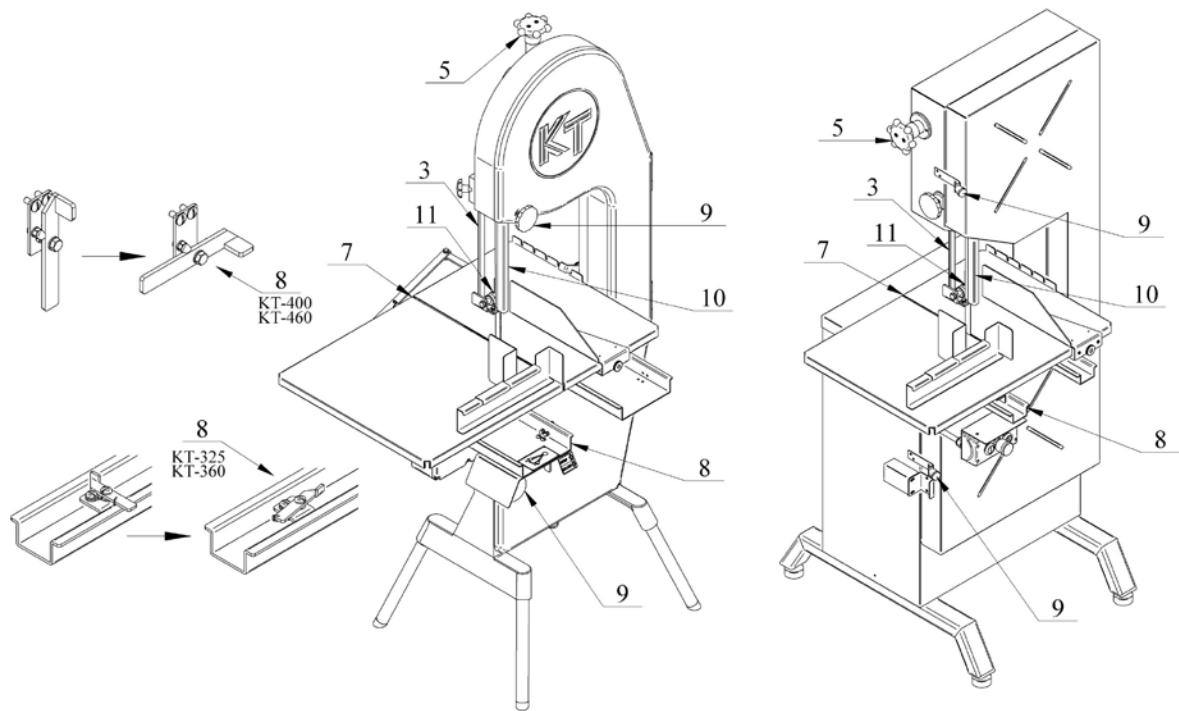
Release the blade guard (protective rail) (No. 10) from the moving upper blade guide (No. 3) by loosening the finger nut (No. 11) and then lift it away.

7.4 Blade

Release the tension on the blade by turning the handwheel (No. 5) and remove the blade. **See chapter 8.1.1 regarding blade safety.**

7.5 Sawdust receptacle

Remove the receptacle from the lower part of the machine (below the lower blade wheel).

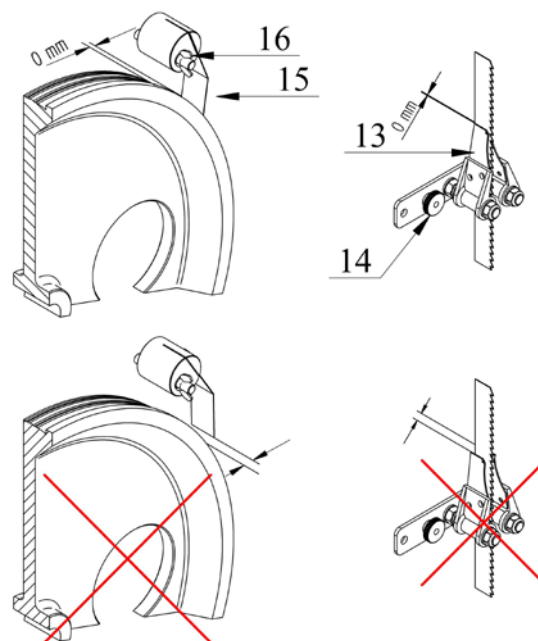


Picture 5

7.6 Blade wipers, wheel wipers

Release the blade wiper (Picture 6, No. 13) by unscrewing the finger nut (No. 14) and remove the blade wiper. When reinstalling the wiper, make sure that it is in contact with the blade (see illustration)

Release the wheel wiper (No. 15) by unscrewing the wing nut (No. 16) and remove the wheel wiper. When reinstalling the wiper, make sure that it is in contact with the wheel (see illustration).



Picture 6

7.7 Washing

You can now wash the machine components either with warm water and detergent, using the brush supplied with the machine (see list of recommended detergents, chapter 7.7.1) or in a purpose built washing machine.

DO NOT USE PRESSURISED HOSE!

Regardless of cleaning methods used, to remove coarse dirt (large amount of waste) it is necessary to clean by hand or use warm water (40 °C – 50 °C) with a low-pressure hose.

After this the cleaning procedure may be started by hand:
Add the detergent to hand-warm water (about 20 °C).

Always rinse after washing.

It is important to follow the instructions for all cleaning methods, and disinfect as necessary.

If detergent, rinsing water or disinfectant remains in the saw, it must be dried in an appropriate matter.

7.7.1 Recommended detergents

Detergent: Kärcher RM 81

Disinfectant: Kärcher RM 32, RM 35

Regardless of detergent or method used, ensure that you observe the manufacturer's instructions. Observe the recommended concentrations and soaking times to avoid damaging your saw.

7.8 Reassembly

After washing, the machine may be reassembled by following the instructions in chapters 7.2 – 7.6 in reverse order.

If the blade does not move in the correct position, see **chapter 8.1 regarding replacing the blade**.

8. Maintenance

In addition to daily cleaning the saw does not require much maintenance. The manufacturer recommends the following procedures:

Check weekly:

Condition of blade guides (Chapter 8.3), blade supporting rollers (Chapter 8.4), blade wipers and blade wheel wipers (Chapter 8.5), blade wheel and the table bearings.

Check that all adjustments and components of the saw are in a good condition to ensure the safe operation of the saw.

If there are faults in the electrical components, contact an authorized electrician, the importer or the manufacturer.

If the saw does not stop within 4 seconds, the brake is worn and must be replaced immediately. Contact the importer or the manufacturer.

The saw has no parts which need lubrication.

8.1 Replacing the blade

8.1.1 Blade safety

Instructions for unpacking the blades

- !** Ensure that all other personnel are at a safe distance.
- !** **ALWAYS USE GLOVES WHEN HANDLING BLADES!**
(with obeying an appropriate hygiene)

Place the bundle of blades to the floor and press your hand firmly down on the bundle where the tie is. A packaged blade is always **SPRING-LOADED** and there is a danger that careless handling may cause it so **SUDDENLY SPRING OPEN** and cause an **ACCIDENT**.

Hold the bundle **AT ARM'S LENGTH**.

Untie the bundle carefully holding it away from yourself and at arm's length.

8.1.2 Mounting the blade

ATTENTION! IF THE BLADE HAS BROKEN DURING THE CUTTING OPERATION, OPEN THE COVER VERY CAREFULLY AND STAND BEHIND THE COVER – THE BROKEN BLADE MAY SPRING OUT OF THE SAW.

- a. Remove the plug from the socket
- b. Loosen the blade by turning the handwheel (Picture 7, No. 5)
- c. Open the cover
- d. Remove the blade guard (No. 10)
- e. Remove the blade
- f. Mount the new blade in reverse order (See the correct position of the blade, picture 7)

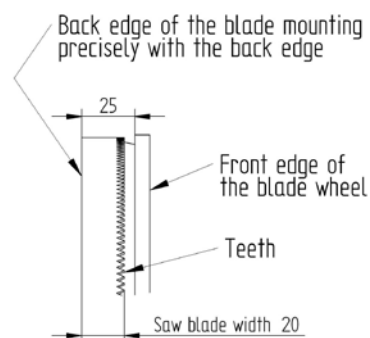
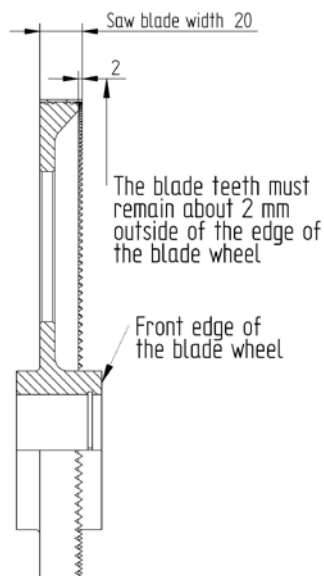
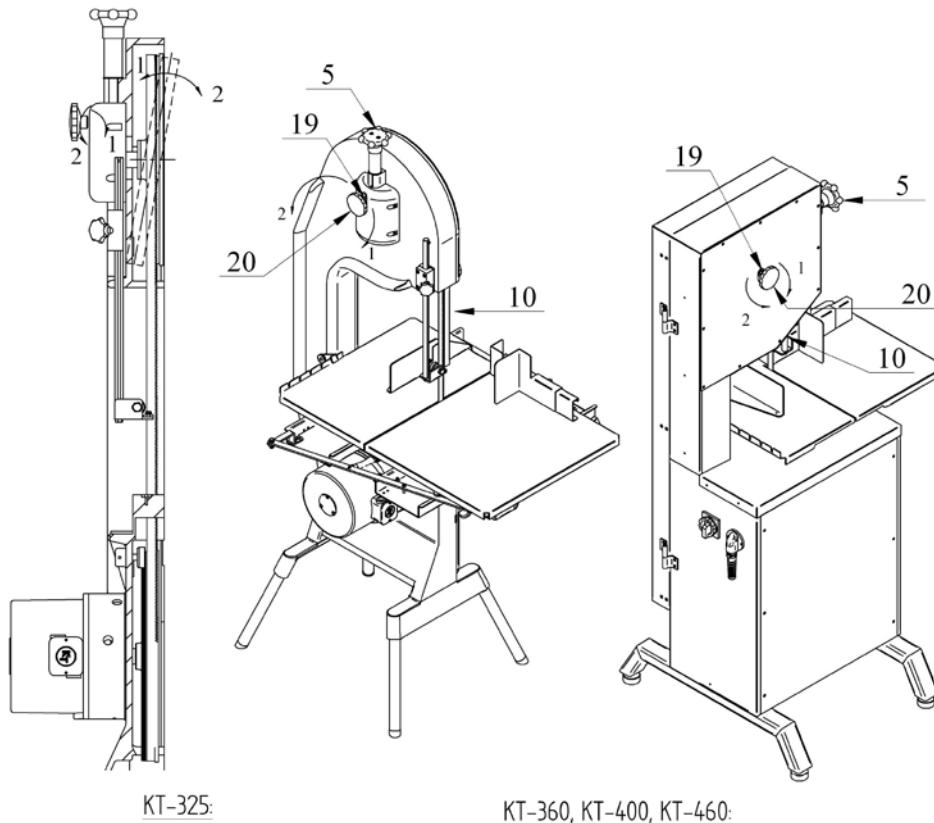
When mounting the blade ensure that the teeth are pointing downwards at the cutting point – in direction of the movement. If the teeth are pointing the wrong way, remove the blade from the machine and turn it inside out – this ensures that the teeth are pointing in the right direction.

When mounting the blade ensure also that it is correctly placed with regard to all the guides and wipers. An incorrectly mounted blade fails before its time and may cause damage to the guide and wiper structure.

If the blade does not move in the correct position, adjust the upper blade wheel (Chapter 8.1.3).

8.1.3 Adjusting the upper blade wheel

- Remove the plug from the socket
- Loosen the blade slightly by turning the handwheel (Picture 7, No. 5)
- Release the lock (No. 19) in the adjusting wheel
- Rotate the adjusting wheel (No. 20). Direction 1: the blade comes outwards, direction 2: the blade goes inwards (see illustration)
- Retighten the locking mechanism (No. 19) of the adjusting wheel
- Retighten the blade



Picture 7

8.2 Choosing the blade

The machine's optimum performance is dependant on choosing the right blade for the right operation.

The following blades are used in KT Band Saws:

<i>Model</i>	<i>Length (mm)</i>	<i>Width (mm)</i>	<i>Thickness (mm)</i>
KT-325	2345	20	0,6
KT-360	2775	20	0,6
KT-400 / KT-460	3135	20	0,6

Basic rules for choosing the right blade:

Fresh meat with bone	4 teeth / inch (Multipurpose blade)
Frozen meat / fish	3 teeth / inch
Carcass splitting	3+3 economy blade

8.3 Blade guides

The blade guide pieces (Picture 8, No. 22) are positioned in the upper guide (No. 3) and immediately under the table (models KT-325, KT-400), or in the blade guide situated underneath the table (models KT-360, KT-460).

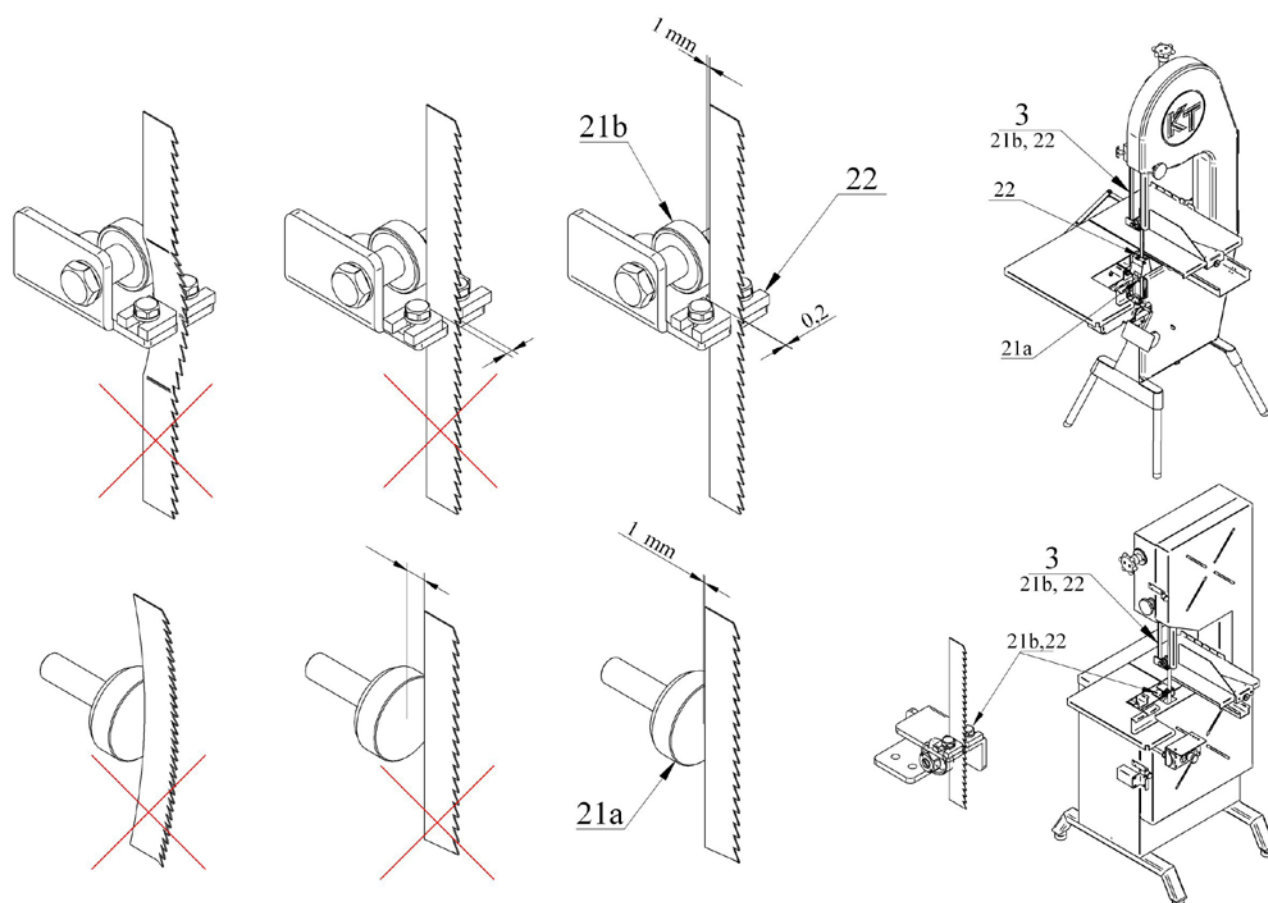
The blade guides are made of hard alloy and they should be adjusted periodically and replaced when necessary. The blade guide pieces (No. 22) **MUST NOT STICK** to the blade, nor should they **PUSH** the blade away from its natural line of movement (see illustration). The guides should be positioned near the blade, but not touch it. Worn, or badly adjusted guides may make the blade "wander", if the adjustment is too loose, or the blade may fail or overheat, if the adjustment is too tight.

8.4 Blade supporting rollers

The supporting rollers are positioned in the upper guide (Picture 8, No. 3) and above the lower wheel (models KT-325, KT-400, No. 21a), or in the blade guide situated underneath the table (models KT-360, KT-460, No. 21b).

When the machine is on, but not cutting, the blade must be 1 mm **AWAY** from the supporting rollers (No. 21a & b).

The supporting rollers are very durable and they will be operable for a long time, but if they do not rotate or if a groove has appeared in them, they must be replaced.



Picture 8

8.5 Blade wipers, wheel wipers

Both the blade wiper and wheel wipers are also in constant use, and should be checked and replaced when necessary in order to ensure correct cutting action.

8.6 Wear and tear

To ensure longevity of the blade and to achieve the manufacturer's aim of optimum cutting action, it is imperative that the wipers, blade guides and supporting rollers are maintained in good condition.

9. Noise emission values

Declaration of noise emission values:

Machine	Measurement results L_{pA} [dB]			A-weighted sound power level L_{WA} [dB]
	<i>Average value</i>	<i>Maximum value</i>	<i>Relation</i>	
KT-325	81,9	82,4	20 μ Pa	89,4
KT-400	81,9	82,4	20 μ Pa	89,4
KT-360 Speed 1	86,2	86,4	20 μ Pa	93,5
KT-360 Speed 2	83,6	84,1	20 μ Pa	91,1
KT-460 Speed 1	86,2	86,4	20 μ Pa	93,5
KT-460 Speed 2	83,6	84,1	20 μ Pa	91,1

Hearing protection must be used with models KT-360 and KT-460 at speed I.

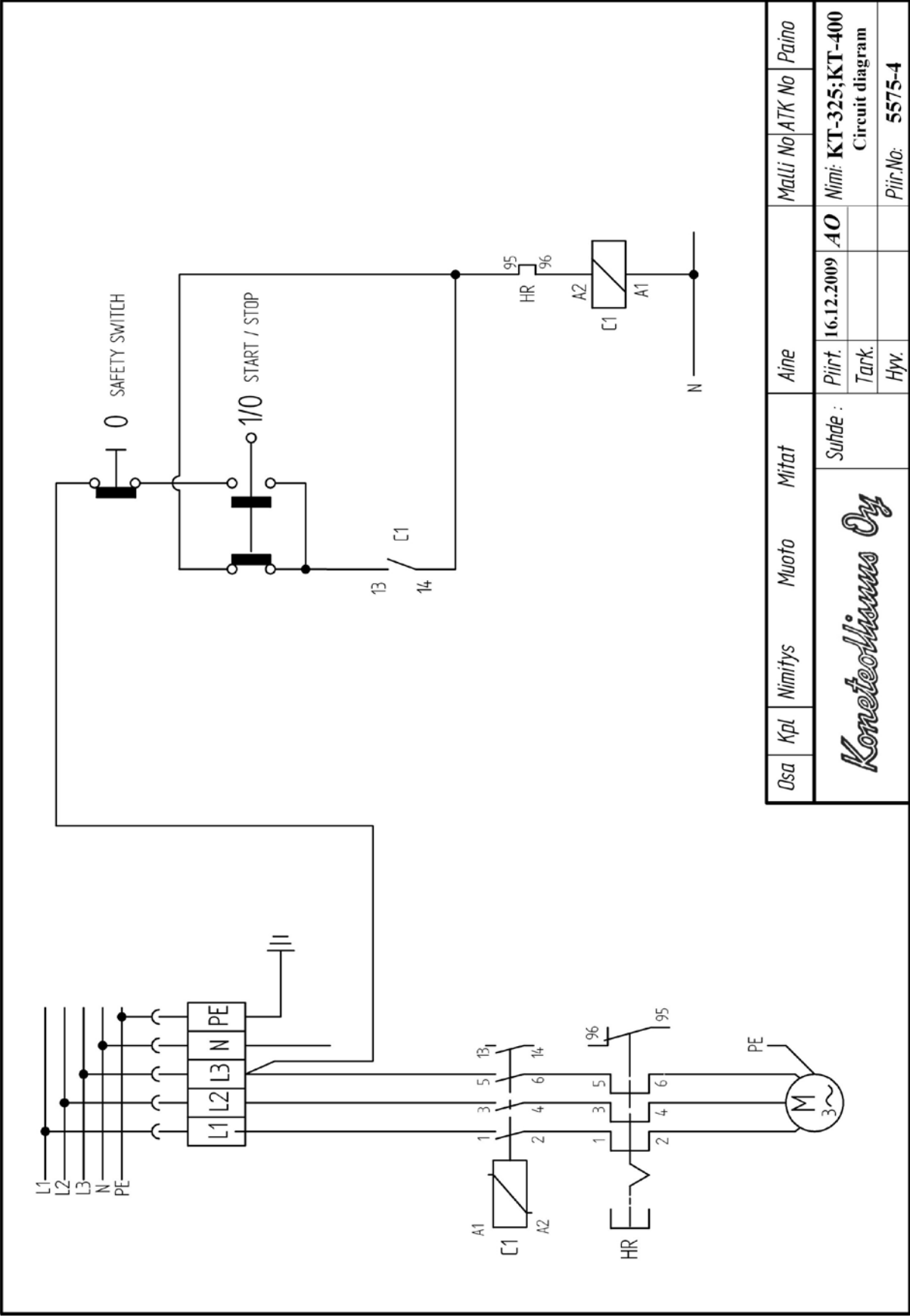
It is recommended to use hearing protection with all saw types.

APPENDIX 1 Fault finding

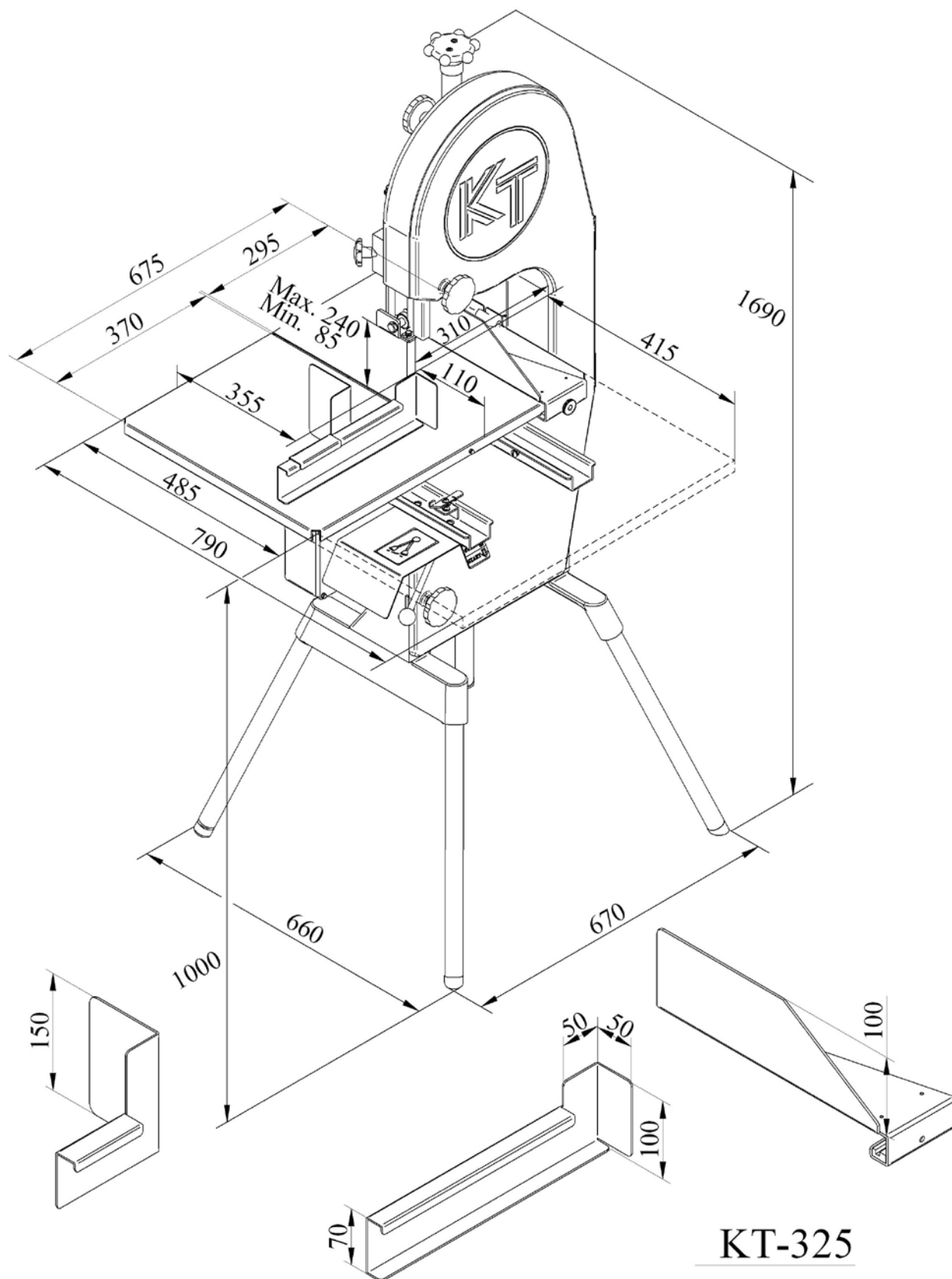
FAULT	CAUSE	REMEDY
The blade or the welding breaks	<ol style="list-style-type: none"> 1. Side guides badly adjusted 2. An unused blade has continual tension 3. Incorrect tightening 4. Blade changes direction (does not cut straight) 5. Welding fault 	<ol style="list-style-type: none"> 1. Readjust to the correct gap (Chapter 8.3) 2. Release tension if machine is unused for a while 3. Turn handwheel until it rotates freely (Chapter 5.4) 4. See item regarding this 5. Return blade
Surplus in the back part of the blade	<ol style="list-style-type: none"> 1. One or both blade supporting rolls adjusted too far away 2. Upper blade wheel aligned incorrectly 	<ol style="list-style-type: none"> 1. Adjust rolls to an evenly pressure and check that they have correct gap 2. Realign the upper wheel (See chapter 8.1.3)
Blade changes direction	<ol style="list-style-type: none"> 1. Pressure while cutting 2. Side guides adjusted incorrectly 3. Guides wear unevenly 4. Upper blade wheel aligned incorrectly 	<ol style="list-style-type: none"> 1. Use less pressure 2. Readjust with correct gap 3. Incorrect tension, tighten the blade again (Chapter 5.4) 4. Realign the upper blade wheel (Chapter 8.1.3)
Teeth come loose or break during cutting	<ol style="list-style-type: none"> 1. Pressure while cutting 2. Upper wheel overaligned 3. Incorrect amount of teeth 	<ol style="list-style-type: none"> 1. Use less pressure 2. Realign the upper blade wheel (Chapter 8.1.3) 3. Use correct blade
Blade twists	<ol style="list-style-type: none"> 1. Side guides adjusted incorrectly 2. Moving blade guide too high 3. Teeth get damaged due to touching the table 4. Bad quality blade 	<ol style="list-style-type: none"> 1. Adjust to the correct gap 2. Adjust the bar so that it is just above the meat 3. Adjust the blade guide pieces 4. Only use good quality blades
Table will not return to its original position	<ol style="list-style-type: none"> 1. The spring is worn 2. Table bearings have stuck 	<ol style="list-style-type: none"> 1. Replace the spring 2. Replace bearings
Machine will not start	<ol style="list-style-type: none"> 1. Electrical cord is loose from the plug 2. Cord is broken 3. Contactor is broken 4. Safety switch is broken 	<ol style="list-style-type: none"> 1-4. Contact an authorized electrician or the manufacturer

For safety reasons disconnect the machine from the power supply before carrying out any adjustments.

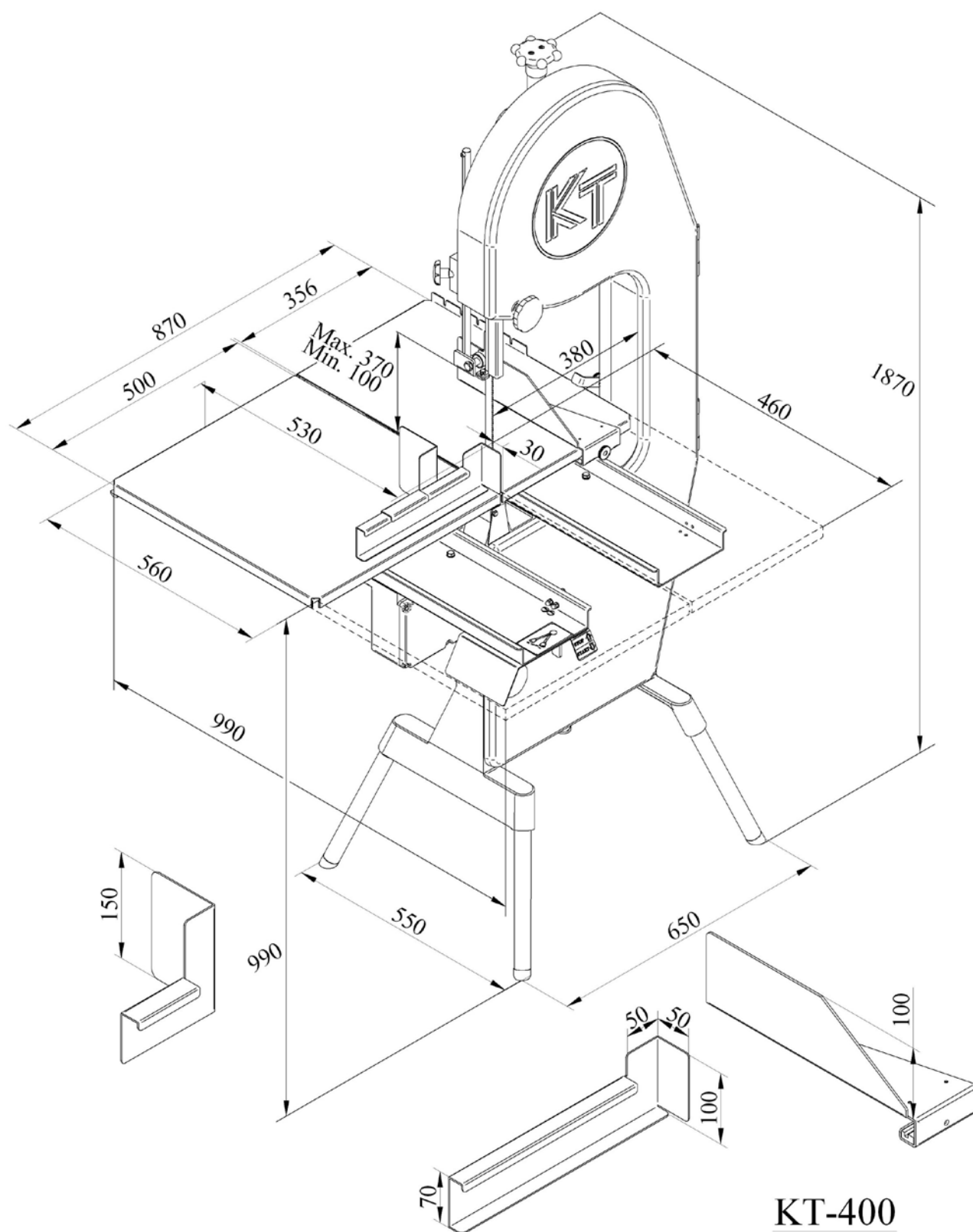
APPENDIX 2 Switch diagram KT-325, KT-400

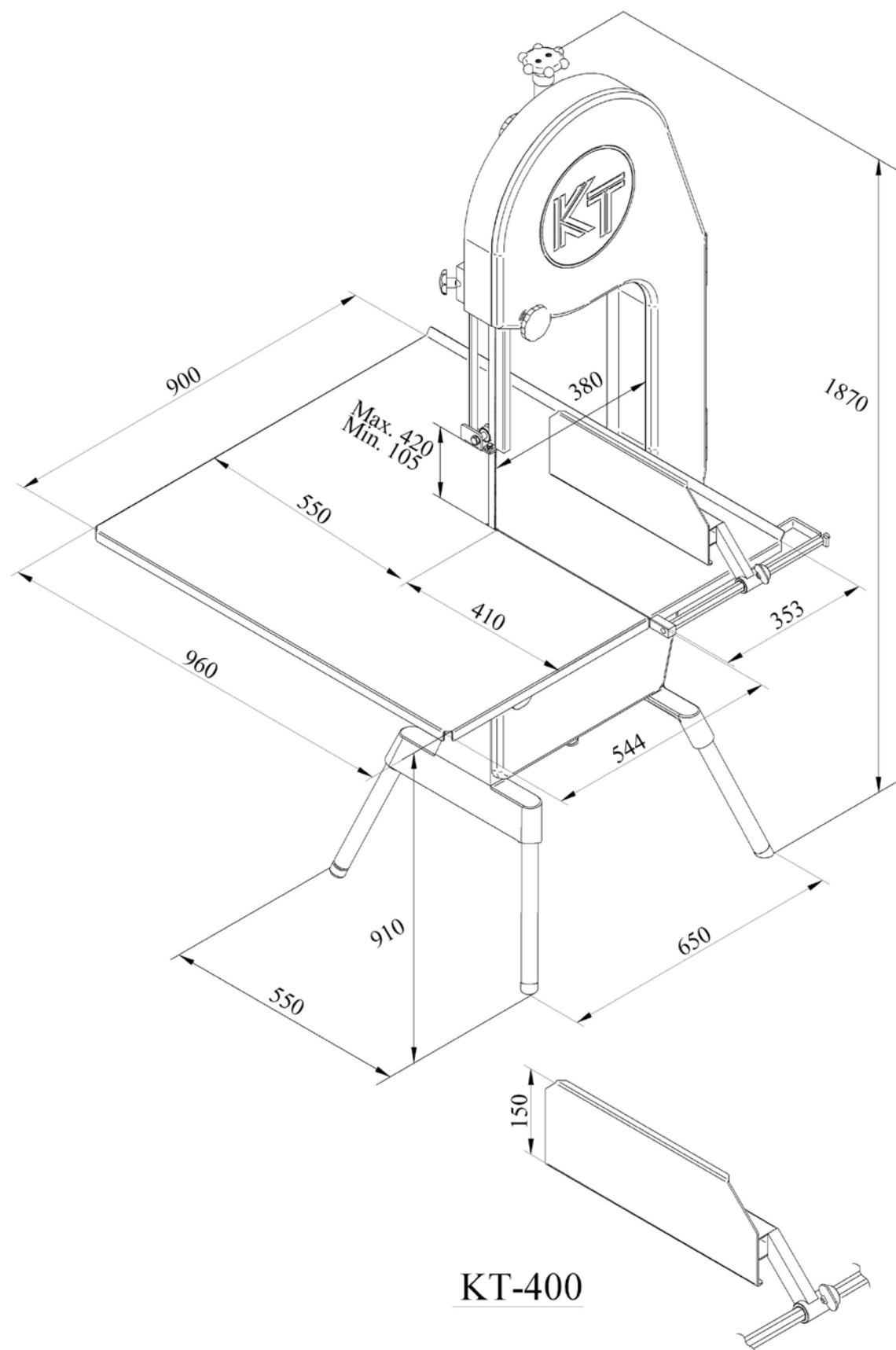


APPENDIX 3 Dimensional drawing KT-325



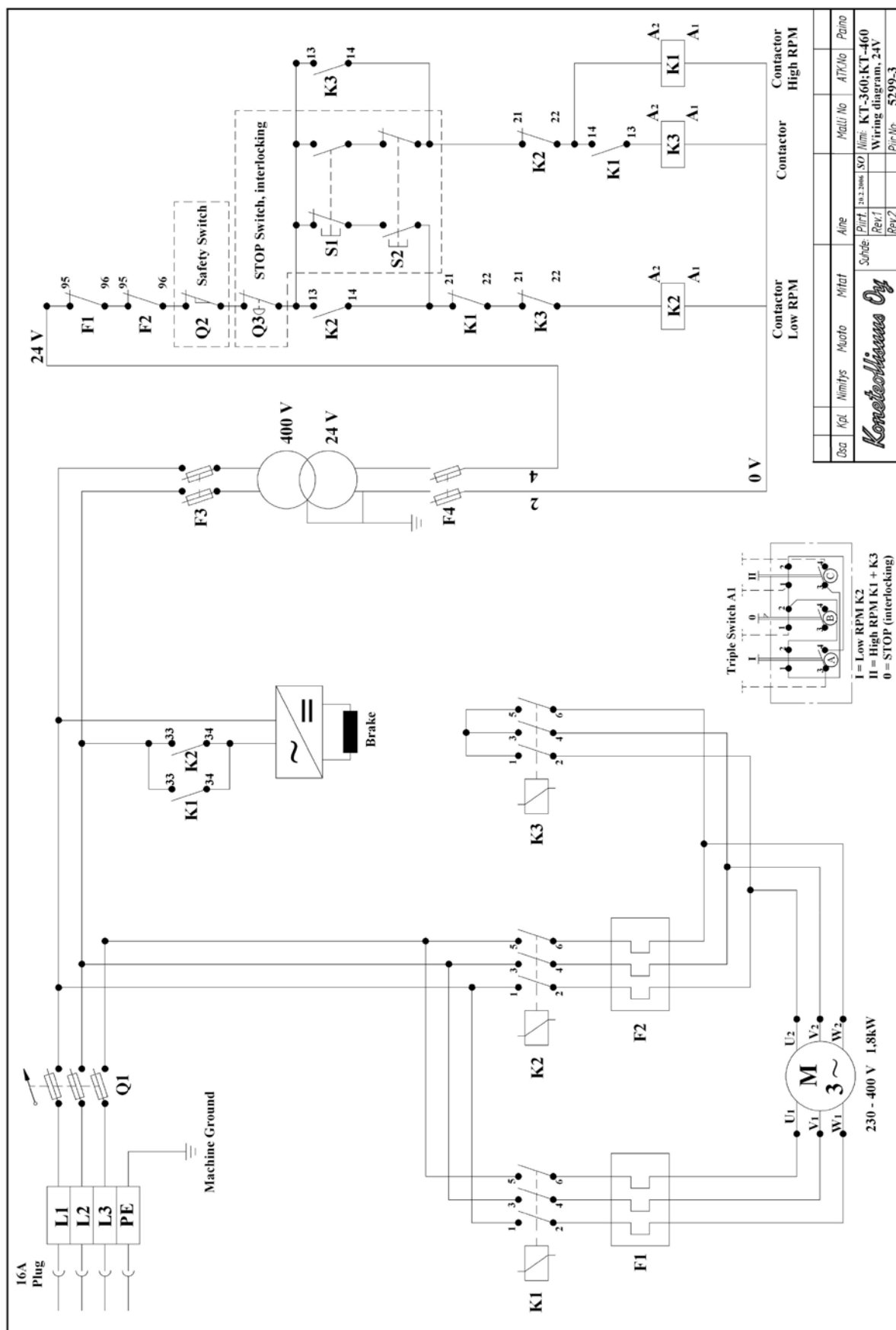
Band saw KT-325 with a sliding feed table

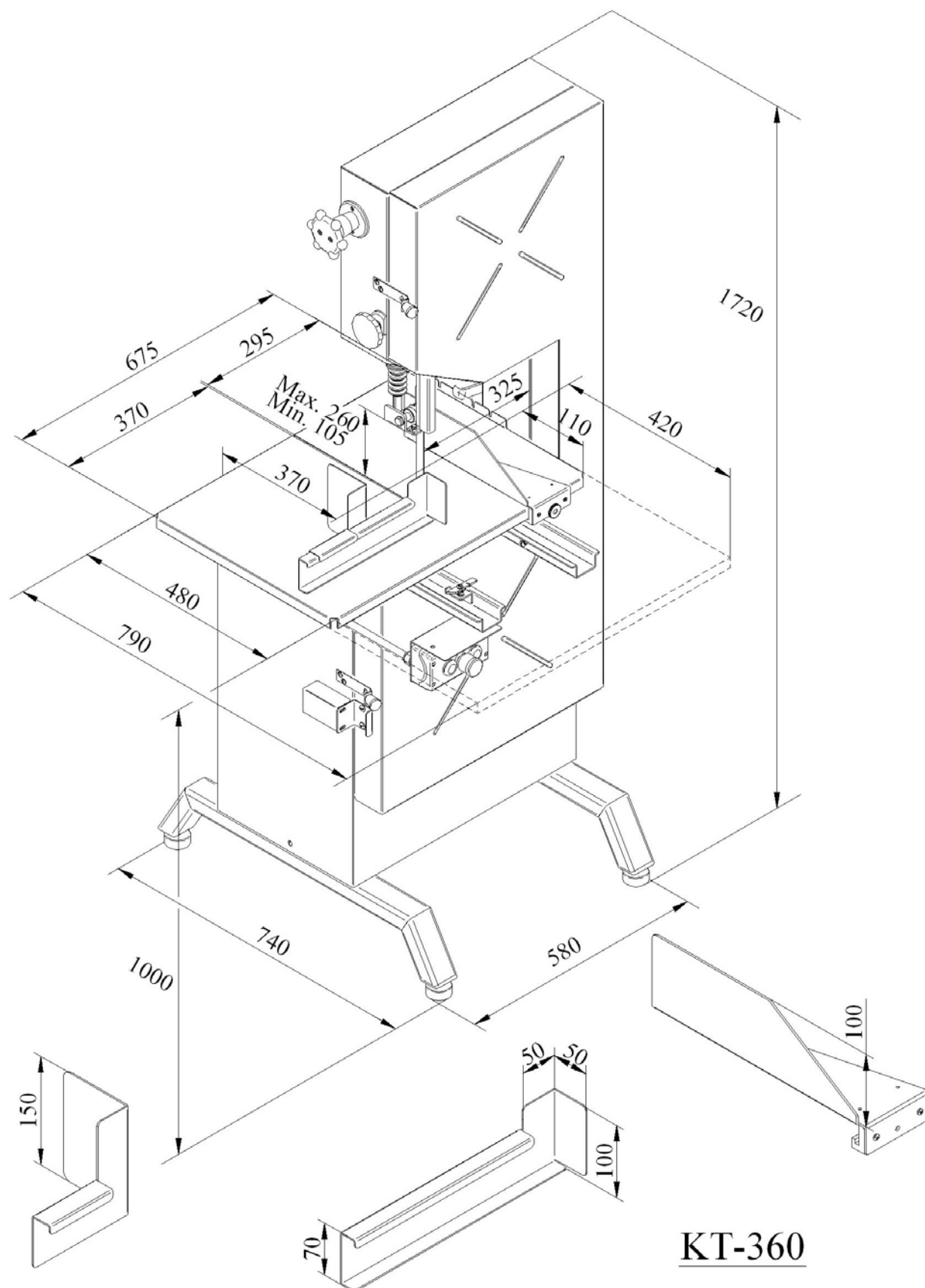
APPENDIX 5 Dimensional drawing KT-400**Band saw KT-400 with a sliding feed table**

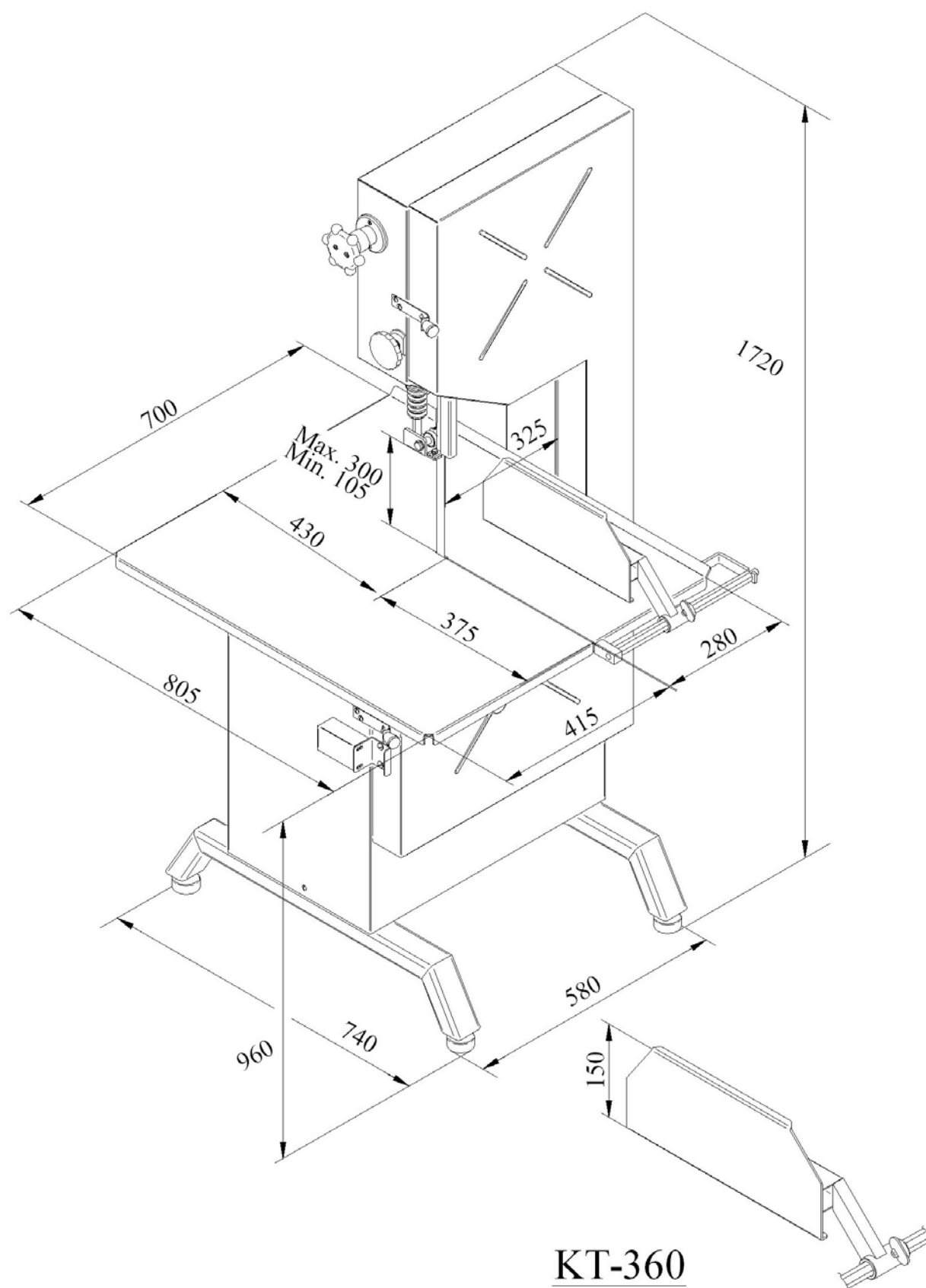


Band saw KT-400 with a fixed table

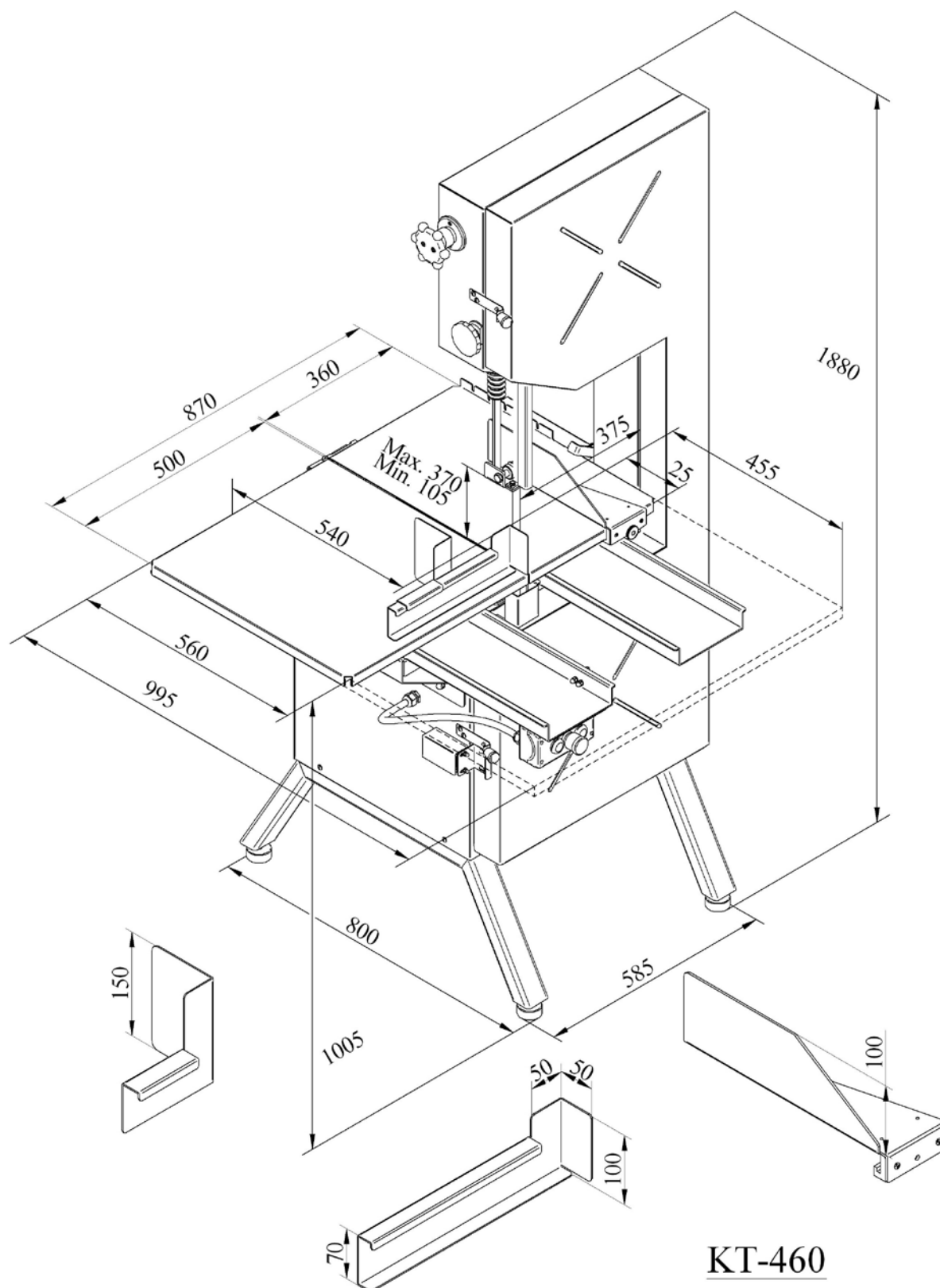
APPENDIX 7 Switch diagram KT-360, KT-460

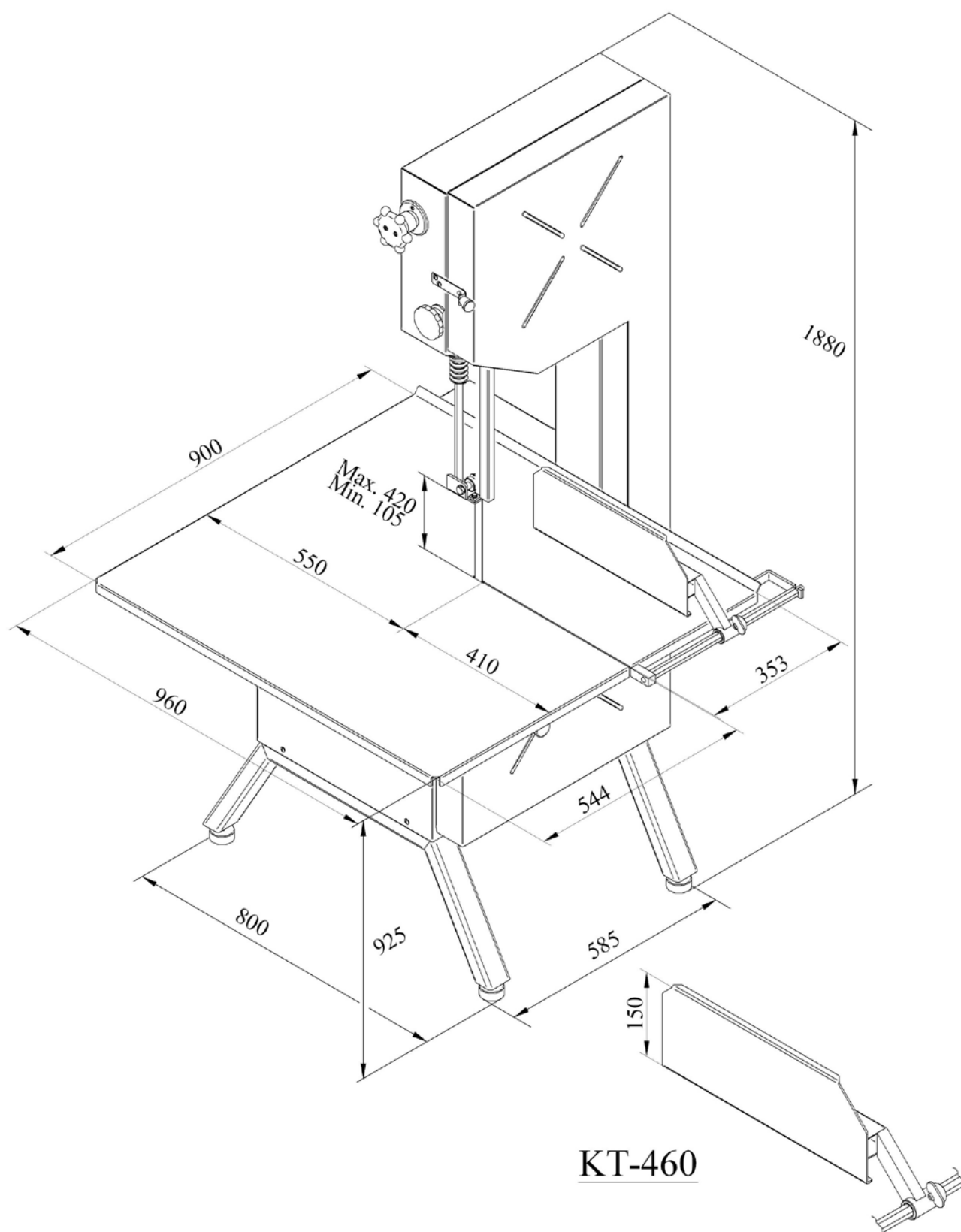


APPENDIX 8 Dimensional drawing KT-360**KT-360****Band saw KT-360 with a sliding feed table**



Band saw KT-360 with a fixed table

APPENDIX 10 Dimensional drawing KT-460**Band saw KT-460 with a sliding feed table**



Band saw KT-460 with a fixed table



KONETEOLLISUUS OY

EC DECLARATION OF CONFORMITY

We hereby declare that the following machinery complies with the essential health and safety requirements of the Machinery Directive 2006/42/EC.

Manufactured by KONETEOLLISUUS OY
Address below

Technical File Held At KT
Address below

Machine Description: Band saw
Type: below

Serial No 139000-150000

This machinery confirms with the example of machinery that has undergone EC Type Examination by: VTT Valmistustekniikka, Box 17011, Kanslerinkatu 8 G, 33101 TAMPERE, FINLAND

Type examination certificate numbers:

KT-210	VAL 067/208/01
KT-325, KT-400	VAL 035/208/01
KT-360, KT-460	VAL 036/208/01
KT-750	VAL 041/208/01

This machinery has been designed and manufactured in accordance with the following harmonised European Standards:

EN 12268:2003+A1:2010 Food processing machinery: Band saw machines. Safety and hygiene requirements.

EN 12100-1:2003+A1:2009, 12100-1:2003+A1:2009 Safety of machinery - Basic concepts, general principles for design

EN 60204- 1:2006+A1:2009 Safety of Machinery - Electrical equipment of machines - Specification for general requirements

EN 1088:1995+A2:2008 Safety of Machinery - Interlocking devices associated with guards. Principles for design and selection

EN ISO 13857:2008 Safety of Machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs

EN 953:1997+A1:2009 Safety of machinery - Guards. General requirements for the design and construction of fixed and movable guards.

EN ISO 14121-1:2007 Safety of machinery - Risk assessment. Part 1: Principles.

Furthermore, this machinery has been designed and manufactured in accordance with the following standards and directives:

SFS 5107, Slaughterhouse and meat dressing machines. Machines and equipment for cutting. Occupational safety.

E.M.C. Electro-magnetic compatibility directive 2004/108/EC

Signed

Date 2011-01-01

Name

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The crossed-out wheeled bin means that within the European Union the product must be taken to separate collection at the product end-of life. This applies to your device but also to any enhancements marked with this symbol. Do not dispose of these products as unsorted municipal waste.