

# METAL CUTTING BAND SAW

**TBK-4228A(TBK-11A)**

**TBK-4220**

**TBK-4228**



Operation manual

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## 1. SAFETY

### **Warning !**

This manual provides critical safety instruction on the proper setup, operation, maintenance and service of this machine.

Failure to read, understand and follow the instruction given in this manual may result in serious personal injury, including amputation, electrocution or death.

The owner of this machine is solely responsible for its safe use. This responsibility includes buy is not limited to proper installation in a safe environment, personnel training and usage authorization, proper inspection and maintenance, manual availability and comprehension, application of safety devices, blade/cutter integrity, and the usage of personal protective equipment.

The manufacturer will not be held liable for injury or property damage from negligence, improper training, machine modifications or misuse.

**Your machine might not come with a power socket or plug before using this machine, please Do install the socket or plug on the power cable end.**

1. Read through the entire manual before starting machinery. Machinery presents serious injury hazards to untrained users.
2. In order to avoid the machinery topple and fall to cause any dangerous, please pay attention to the barycenter during delivery.
3. Nobody is allowed to stand or move under the machine during lift.
4. You are not allowed to start machine until all adjustment have done.
5. In order to ensure the safety of operator and machinery, please don't move out any warning or instruction label on the machinery.
6. Don't operate the machine in overload condition.
7. Only allow trained and properly supervised person to operate machinery. Make sure operation instructions are safe and clearly understood.
8. Always use ansi approved safety glasses when operating machinery. Everyday eyeglasses only have impact resistant lenses, they are not safety glasses.
9. Always wear an noise approved respirator when operating machinery that products dust.

Wood dust is a carcinogen and can cause cancer and severe respiratory illnesses.

10. Always use hearing protection when operating machinery. Machinery noise can cause permanent hearing damage.
11. Wear proper apparel. Don't wear loose clothing, gloves, neckties, rings, or jewelry which may get caught in moving parts. Wear protective hair covering to contain long hair and wear non-slip footwear.
12. Never operate machinery when tired, or under the influence of drugs or alcohol. Be mentally alert at all times when running machinery.
13. Keep children and visitors away. Keep all children and visitors a safe distance from the work area.
14. Make workshop child proof. Use padlocks, master switches, and remove start switch keys.
15. Never leave when machine is running. Turn power off and allow all moving parts to come to a complete stop before leaving machine unattended.
16. Don't use in dangerous environments. Don't use machinery in damp, wet locations, or where any flammable or noxious fumes may exist.
17. Keep work area clean and well lit. clutter and dark shadows may cause accidents.
18. You must connect your machine to a grounded circuit, or serious electrocution or fire could result.
19. Make sure that the machine is connect to the right power source, to avoid damage the machine.
20. Use a grounded extension cord rated for the machine amperage. Undersized cords overheat and lose power. Replace extension cords if they become damage.
21. Always disconnect from power source before servicing machinery. Make sure switch is in OFF position before reconnecting.
22. Don't change or replace the circuit and wiring in safety equipment, it may cause the machine lock, overload, interrupt. These parts is used to protect the operator and machinery, any adjustment may change the function of it.
23. Maintain machinery with care. Keep blades sharp and clean for best and safest performance. Follow instruction for lubricating and changing accessories.
24. Make sure guards are in place and work correctly before using machinery.
25. Remove adjusting keys and wrenches. Make a habit of checking for keys and adjusting wrenches before turning machinery ON.
26. Check for damaged parts before using machinery. Check for binding and alignment of parts, broken parts, part mounting, loose bolts, and any other condition that may affect machine operation. Repair or replace damaged parts.
27. Use recommended accessories refer to the instruction manual for recommended

accessories. The use of improper accessories may cause risk of injury.

28. Don't force machinery. Work at the speed for which the machine or accessory was designed.
29. Secure workpiece. Use clamps or a vise to hold the workpiece when practical. A secured workpiece protects your hands and frees both hands to operate the machine.
30. Don't overreach. Keep proper footing and balance at all times.
31. Many machines will eject the workpiece toward the operator. Know and avoid conditions that cause the workpiece to "kickback".
32. Always lock mobile bases (is used) before operating machinery.
33. Be aware that certain dust may be hazardous to the respiratory systems of people and animals, especially fine dust. Make sure you know the hazards associated with the type of dust you will be exposed to and always wear a respirator approved for that type of dust.
34. This band saw is used to cutting common metal material, please don't used to cut agricultural / fishery products, wood, food, combustible material, radioactivity metal.
35. Please lock all the covers, the blade guard should be close to the workpiece.
36. Don't open the cover when machine is running.
37. Blade condition, don't operate with dull, cracked or badly worn blade. Inspect blades for cracks and missing teeth before each use.
38. Hand placement, never position fingers or thumbs in line with the cut. Hands could be crushed in vise or by falling machine components or cut by the blade.
39. Entanglement hazards, don't operate this band saw without blade guard in place. Otherwise, loose clothing, jewelry, long hair and work gloves can be drawn into working parts.
40. Blade replacement. When replacing blades, make sure teeth face toward the workpiece. Wear gloves to protect hands and safety glasses to protect eyes.
41. Workpiece handling, wlways support the workpiece with table, vise or other support fixture. Flag long pieces to avoid a tripping hazard. Never hold the workpiece with your hands during a cut.
42. Loss of stability, unsupported workpieces may jeopardize machine stability and cause the machine to tip and fall, which could cause serious injury.
43. Power interruption, unplug machine after power interruption. Machines without magnetic switch can start up after power is restored.
44. Fire hazard, use extreme caution if cutting magnesium. Using the wrong cutting fluid will lead to chip fire and possible explosion.
45. Cutting fluid safety, always follow manufacturer's cutting safety instructions. Pay particular attention to contact, contamination, inhalation, storage and disposal warning.

Spilled cutting fluid is a slipping hazard and a toxicity hazard.

46. Maintenance/service, all inspections, adjustments, and maintenance are to be done with the machine OFF and the power disconnected to the machine. Wait for all moving parts to come to a complete stop.

47. Hot surfaces, due to friction, the workpiece, chips and some machine components can be hot enough to burn you.

## 2. SPECIFICATION

Item	271204	271210	271211
Model	TBK4220	TBK-4228	TBK-4228A
Max. cutting capacity (mm)	● 200	● 280	● 90° 280 ● 45° 170 ● 30° 260
	■ 200x200	■ 280x280	■ 90° 320x280 ■ 45° 170x280 ■ 30° 260x280
Cutting speed (m/min)	50HZ: 27,45,69	50HZ: 27,45,69	50HZ: 27,45,69
	60HZ: 32,54,82	60HZ: 32,54,82	60HZ: 32,54,82
Blade size (mm)	2650 x 27 x 0.9	3505 x 27 x 0.9	3625 x 27 x 0.9
Feed speed	Hydraulic variable speed	Hydraulic variable speed	Hydraulic variable speed
Clamping system	Mechanical (optional: hydraulic clamping system)	hydraulic	Hydraulic
Blade tensioning	Mechanical (optional: hydraulic)	Mechanical (optional: hydraulic)	Mechanical (optional: hydraulic)
Main motor (kw)	1.5	3.0	3.0
Oil pump motor (kw)	0.55	0.55	0.55
Coolant pump motor (kw)	0.04	0.04	0.04
Drive system	Belt	Belt	Belt
N.W/G.W (kg)	340 / 425	695 / 830	600 / 680
Packing size (cm)	165 x 98 x 128	217 x 130 x 160	220 x 140 x 160

### 3. IDENTIFICATION

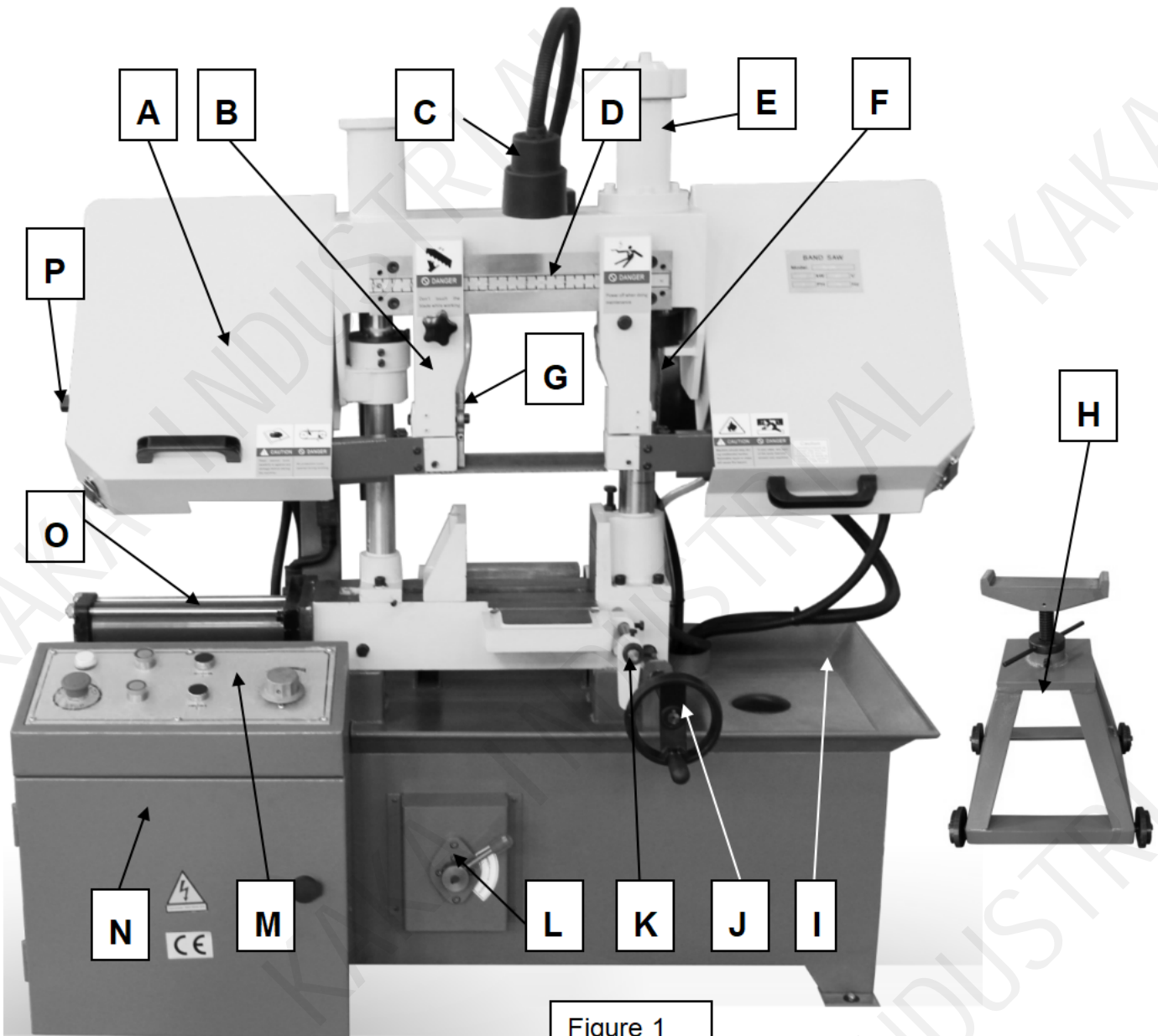


Figure 1

A. Saw frame

B. Arm

C. Light

D. Blade guide scale

E. Column

F. Motor & Belt

G. Coolant valve controls

I. Coolant pan

J. Hand wheel for feeding

K. Work stop

L. Vise clamping (optional)

M. Control panel

N. Electric box

O. Cylinder for vise clamping (optional)

## Control panel

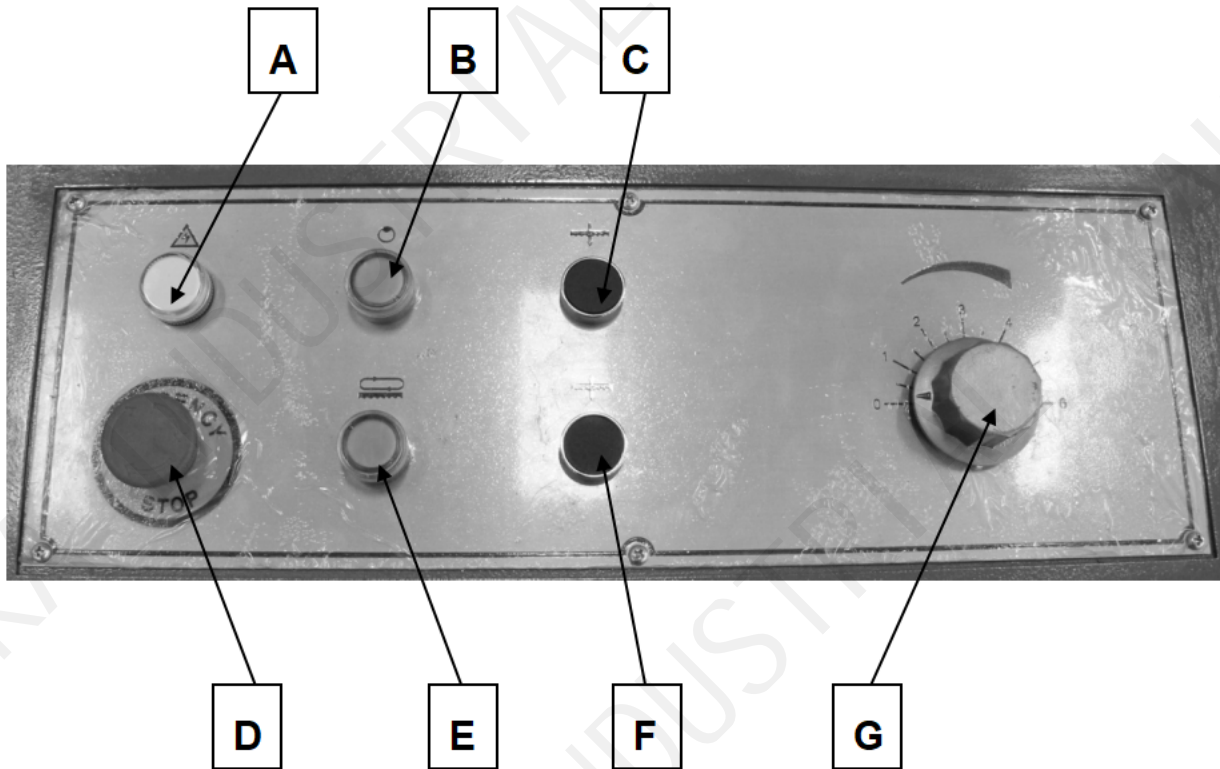
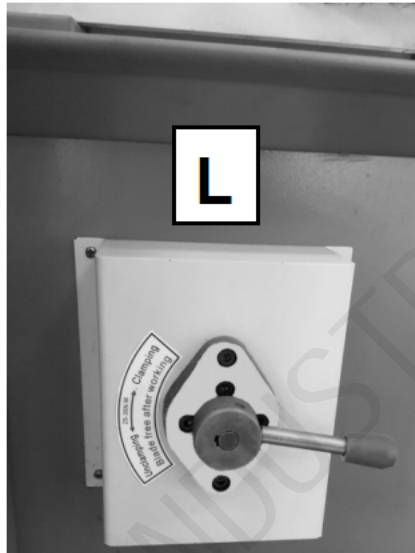


Figure 2

- A. Power light:** when light, indicates that system is energized and machine is ready to operate.
- B. Hydraulic system switch:** turn the hydraulic system on, if you don't start this button, the machine will not work.
- C. Saw frame down:** press this button, the saw frame will go down. If you don't hold this button, the saw frame will not go down. Please press and hold this button, until the saw blade arrive expect position.
- D. Emergency stop/off button:** interrupts power to the system and turns the power **OFF**. Twist the button until it pops out to reenergize the system. Also works as a standard off button.
- E. Start:** press this button, the machine can start working.
- F. Saw frame up:** press this button, the saw frame will go up until it touch the top limit point.
- G. Feed rate dial:** fine turns the feed rate by controlling the hydraulic valve. Range is from 1 being slowest to 6 being fastest.





**A. Unclamping:** turn the handle to this position, the vise will open, please turn the handle to Neutral position when vise arrive your expect psition.

**B. Neutral position:** In unclamping position, the vise go back, when the vise arrive the expect position, please turn handle to neutral position.

**C. Clamping:** turn the handle to this position, the vise will go close to the workpiece, to ensure the vise clamp the workpiece strongly, during cutting, please keep the handle in this position.

## 4. SET UP

### 4.1 Moving & placing base unit

Use a forklift and straps rated for the machine weight to lift the machine off the pallet and onto a suitable location. Looking at the following drawing:

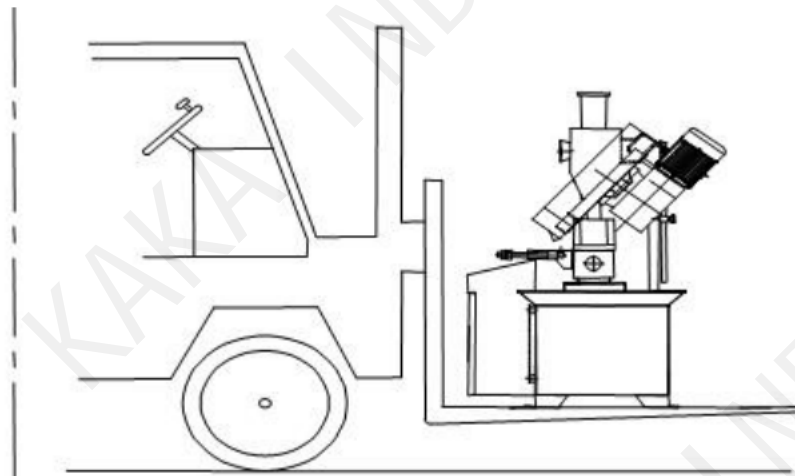


Figure 3

Please install the machine on the horizontal ground. Although not required, we recommend that you mount your new machine to the floor.

### 4.2 Clean up

The unpainted surface are coated with a waxy oil to protect them for corrosion during shipment. Remove this protective coating with a solvent cleaner or degreaser. To clean thoroughly, some parts may need to be removed. For optimum performance from your

machine, make sure you clean all moving parts or sliding contact surfaces that are coated.

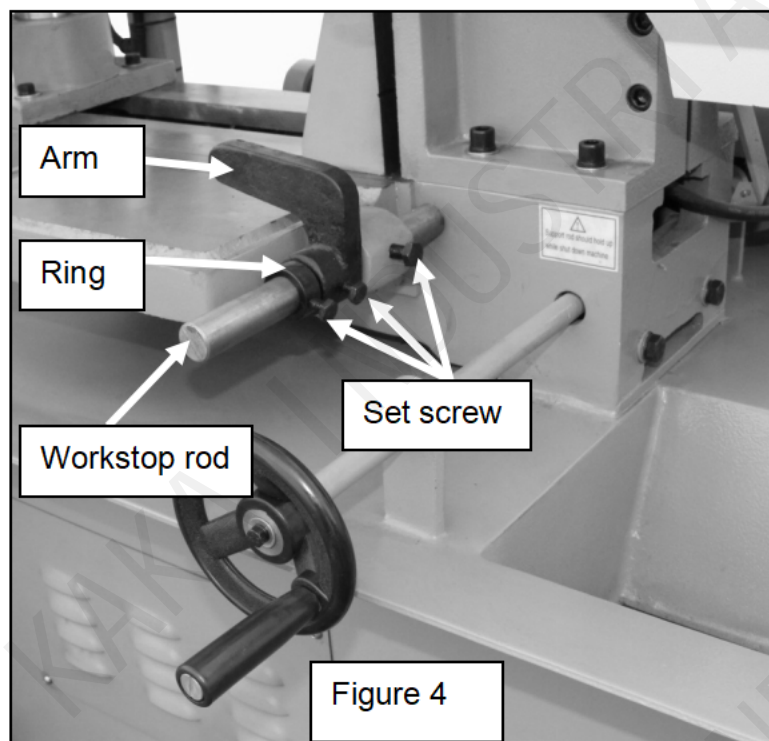
**Note:** Gasoline and petroleum products have low flash points and could cause an explosion or fire if used to clean machinery. Don't use gasoline or petroleum products to clean the machinery.

#### 4.3 Work stop

The work stop is easy to adjust and can be set up on the vise, our work stop has three main parts including the workstop rod, arm and workstop ring.

To install the workstop:

- A. Slid the workstop rod in the hole in the base of the vise and tighten the set screw.
- B. Slid the arm onto the workstop rod and tighten the set screw.
- C. Insert the ring into the rod and tighten the set screw.



#### 4.4 Test run

Starting the machine:

- (1) Read the entire instruction manual.
- (2) Make sure all tools and foreign objects have been removed from the machine.
- (3) Put on safety glasses and secure loose clothing or long hair.
- (4) Connect the band saw to power.
- (5) Raise the band saw and close the feed control knob to keep the saw in place.

(6) Start the band saw while keeping your finger near the EMERGENCY STOP/OFF button (Figure 2) at all times during the test run. The band saw should run smoothly with little or no vibration.

**Note:** If the emergency stop/off button is pressed, it need to be twisted until it pops out or the band saw will not start.

if you suspect any problem, immediately stop the band saw and correct before continuing.

If you need any help with your band saw, call your supplier

## 5. Operations

After prepare all works before cutting, you can operate the machine according to below operation step

Put the workpiece on the worktable, make the workpiece close to the vise, then move the workpiece to the proper position.

Start the pump, tighten the workpiece by vise, press start button, then saw blade and pump will run, saw bow will down, you can adjust the feeding speed by handle, then you can start cutting. After cutting, saw blade will stop, saw bow go up, after saw bow reach setting position, the clamp will lose, in this case one cutting have been finished.

You can judge the speed and feeding is proper according to the shape and color of scrap iron. If the scrap iron is roll with white color, the feeding and speed is good. If the scrap iron is short with blue color, it means the feeding is too quick. If the scrap iron is powder with white, it means the feeding is too slow.

### 5.1 Vise:

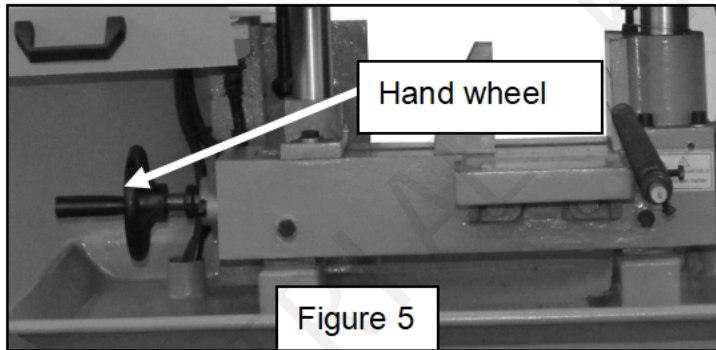
**Note:** Always turn the saw off and allow the blade to come to a complete stop before using the vice ! Failure to follow this caution may lead to injury.

Our band saw have 3 types clamping system, to ensure that you can hold the workpiece tightly.

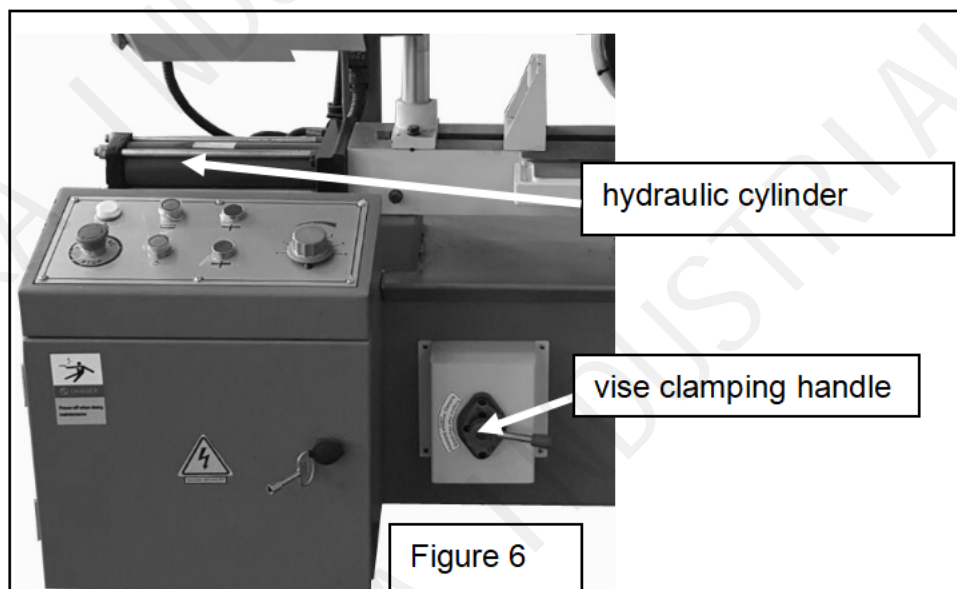
(1) Raise the bow to the maximum height and lock in place.

(2) Clamping the workpiece by hand wheel or hydraulic cylinder

A: You clamp the workpiece by the hand wheel as picture 5.



B: It has a hydraulic cylinder for clamping, you can tighten the vise by the vise clamping handle, as picture 7.

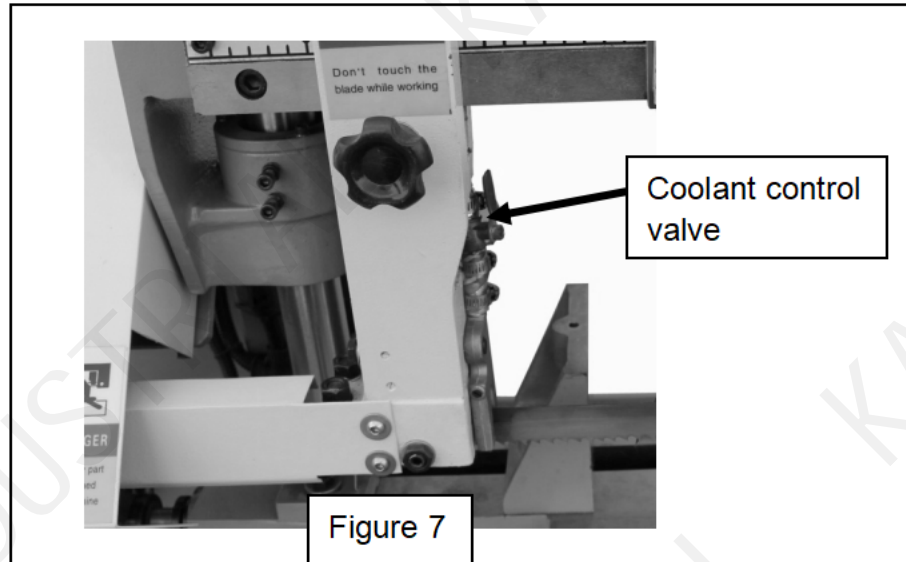


## 5.2 Coolant system

Our band saw has a built-in coolant system that extends the life of your band saw blades by lowering the temperature of the blade and workpiece.

- (1) Access the reservoir by removing the front panel.
- (2) Thoroughly clean and remove any foreign material that may have fallen inside the reservoir during shipping.
- (3) Fill the reservoir with your chosen cutting fluid solution and replace the front panel.
- (4) Adjust the valves on the coolant hoses to control the flow of coolant (see picture 8).

Make sure that the pressure is not so high that coolant spills on the floor and creates a slipping hazard.



(5) Turn the coolant pump on before making your cut.

(6) Monitor the coolant level frequently to keep the system working properly, to ensure the oil is above top water level, you had better is in 2/3 top water level. Note: Coolant pump can't working without coolant oil, or will damage the pump. If the coolant oil have been iced over, please don't work, you need to thaw the coolant oil before operation, or it will damage the pump.

### 5.3 Cutting fluid

While simple in concept and function, many issues must be taken into account to find and use the correct cutting fluid. Always follow all products warnings and contact the fluid manufacturer for unanswered question.

Use the selections below to choose the appropriate cutting fluids:

- A. For cutting low alloy, low carbon, and general-purpose category metals with a bi-metal blade-use a water soluble cutting fluid.
- B. For cutting stainless steels, high carbon, and high alloy metals, brass, copper and mild steels-use, "neat cutting oil" (commonly undiluted mineral oils) that have extreme pressure additives (EP additives).
- C. For cutting cast iron, cutting fluid is not recommended.

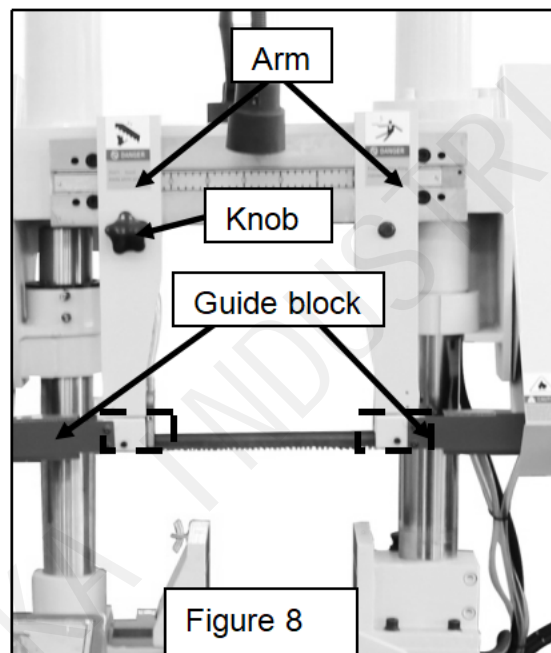
**Note:** Too much flow at the cutting fluid nozzle will make a mess and can make the work area unsafe; and not enough fluid at the cut will heat the blade, causing the blade teeth to load up and break.

## 5.4 Blade guide

The rear blade guide should be as close to the workpiece as possible. This will help ensure straight cuts by keeping the blade from twisting and drifting off the cut line.

To adjust the rear blade guide:

- (1) Loosen the knob shown in figure 8 and slide the rear blade guide as close to the workpiece as possible, then tighten the knob.
- (2) The front blade guide has 4 blocks that makes contact with the blade to help clear away chips and extend blade life (see figure 9)

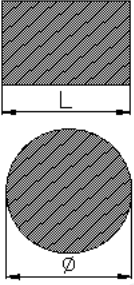
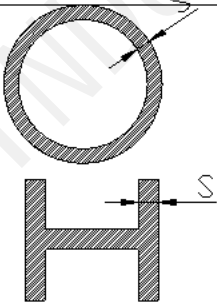


## 5.5 Blade selection

Selecting the right blade for the job depends on a variety of factors, such as the type of material being cut, hardness of the material, material shape, machine capacity, and operator technique.

We suggest you do some research for your specific situation so you get the best blade to match your needs.

Here we offer a variety of selections for your reference as below chart:

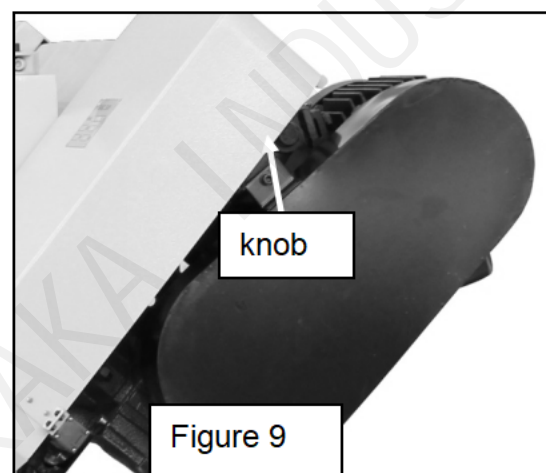
Shape	Size	Suggestion tooth
	Less than 40mm	8 or 6/10T
	40-80mm	6T or 4/6T
	80-200mm	4T or 3/4T
	200-300mm	3T or 2/3T
	300-460mm	1.25T or 1.4/2.5T
Shape	Size	Suggestion tooth
	Less than 1.5mm	14T or 10/14T
	1.5-3mm	10T or 8/12T
	3-6mm	8T or 6/10T
	6-10mm	6T or 5/8T
	10-15mm	4T or 4/6T
	More than 15mm	3T or 3/4T

## 5.6 Blade speed

Our TBK-4220/TBK-4228/TBK-4228A have 3 speed setting, choose the closest available speed according to material type. During operation, pay attention to the chips being produced from the cut to properly set the feed rate.

To change blade speeds.

1. disconnect the machine from power
2. remove knob shown in figure 9 and open pulley cover
3. loosen knurled belt tension knob, the motor will drop and V-belt will slacken.
4. Move V-belt to desired pulley combination.
5. Tighten belt tension knob to tension belt.



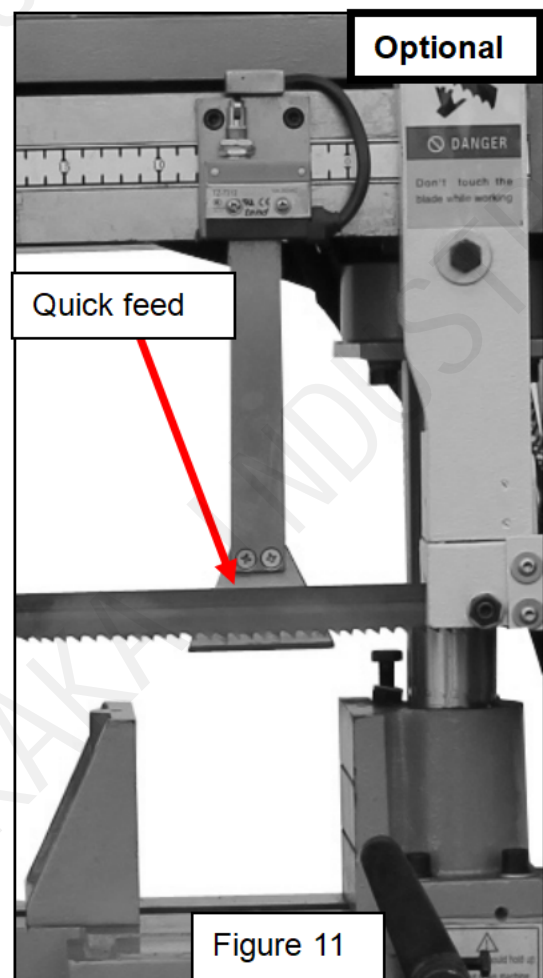
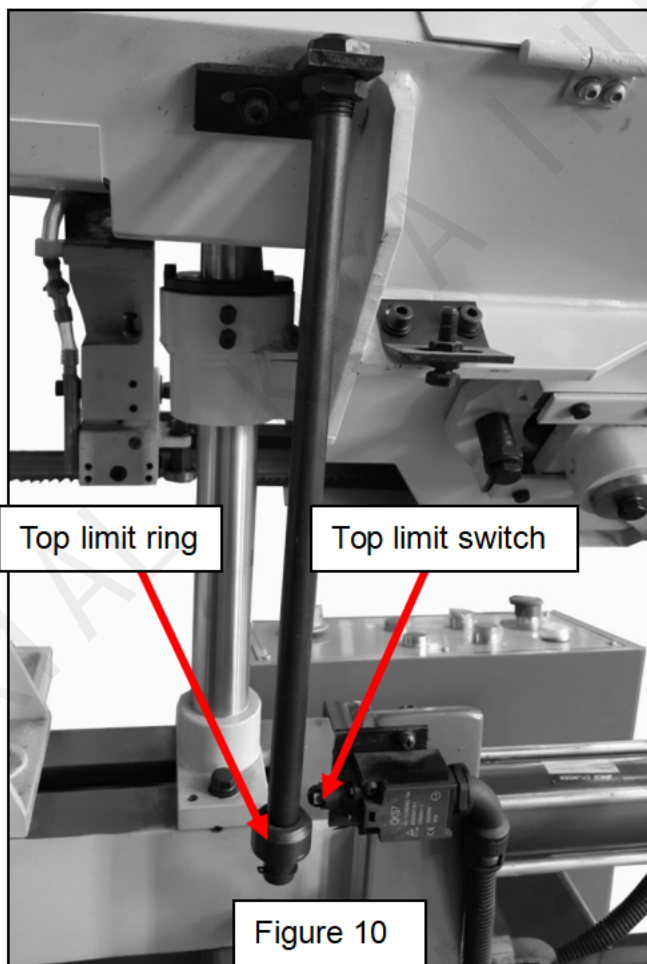
6. Close and secure belt cover with knob

### 5.7 Feed rate

The speed at which the saw blade will cut through a workpiece is controlled by blade type, feed rate, and feed pressure. The feed rate is controlled by feed rate dial.

To set the feed rate:

1. Raise the bow to the highest position. You can set the highest position through adjust the position of top limit ring, when the bow raise, the top limit ring touch the top limit switch, the bow will stop raising. (see figure 10)
2. Set the feed rate dial to the desired feed rate. Range is from 1 being slowest to 6 being fastest. We have a optional accessory: quick feed. The quick feed is a little lower than blade, the bow will feed down quickly with quick feed, when the quick feed touch the cutting material, the bow will feed down according to the feed rate which you set. The quick feed can save a lot of time for operator.













## 5.8 Telltale chips

The best method for choosing the cutting speed and feed rate for a cutting operation is to inspect the chips created by the cut. These chips are indicators of what is commonly referred to as the “chop load”. Refer to the chip inspection chart below to evaluate chip characteristics and determine whether to adjust feed rate pressure, blade speed, or both.

Usually, you can use high blade speed and feed rate for easy-cutting material; low blade speed and feed rate for hard material.

Chip appearance	Chip description	Chip color	Blade speed	Feed rate/pressure	Other actions
	Thin & curled	Silver	Good	Good	
	Hard, thick & short	Brown or blue	Increase	Decrease	
	Hard, strong & thick	Brown or blue	Increase	Decrease	
	Hard, strong curled & thick	Sliver or light brown	Good	Decrease slightly	Check blade pitch
	Hard, coiled & thin	Silver	Increase	Decrease	Check blade pitch
	Straight & thin	Silver	Good	Increase	
	Powdery	Silver	Decrease	Increase	
	Coiled, tight & thin	Silver	Good	Decrease	Check blade pitch

## 5.9 Blade tension

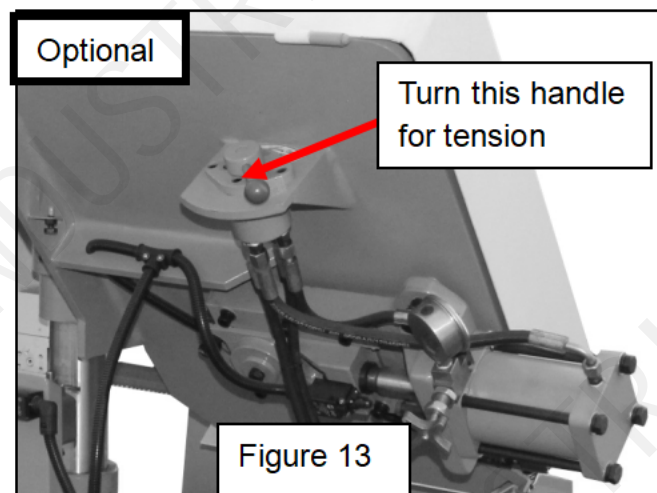
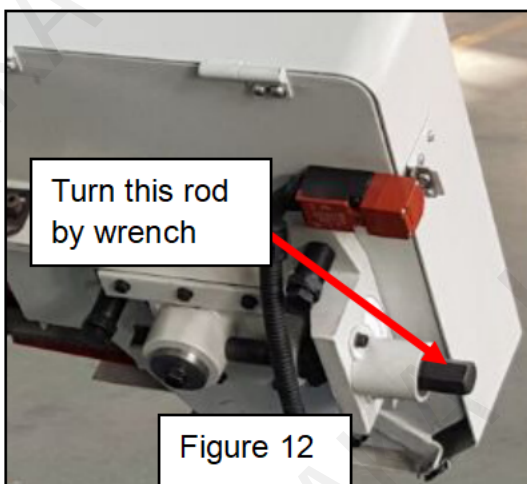
Proper blade tension is essential to long blade life, straight cuts, and efficient cutting. Our band saw feature a blade tension to assist you with blade tensioning.

Two major signs that you don't have proper blade tension are: (1) the blade stalls in cut and slips on the wheels; (2) the blade frequently breaks from being too tight.

**Note: Loosen blade tension at the end of each day to prolong blade life.**

A: Turn the blade tension handle clockwise to tension the blade. (See figure 12)

B: For optional accessory, you can use hydraulic cylinder to tension the blade, also there is a graduated scale on the blade tension indicator to determine blade tension in PSI



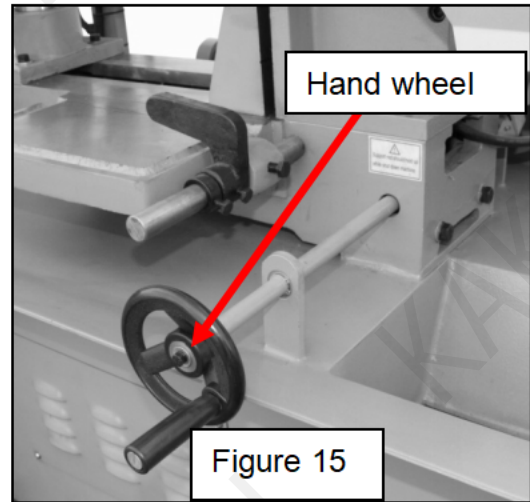
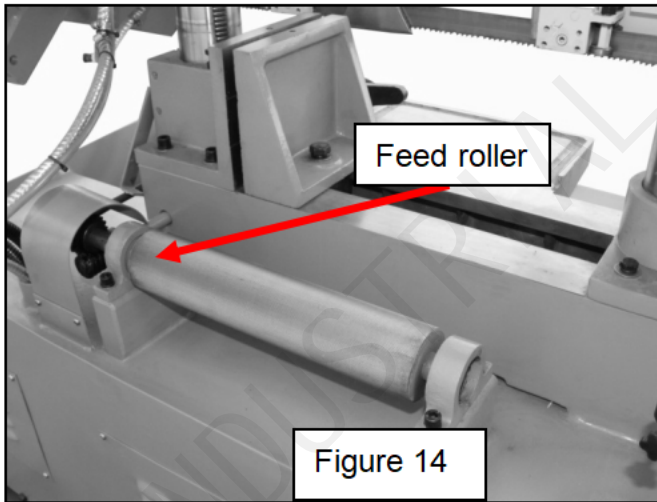
## 5.10 Manual workpiece feeder

Maybe some customers want to cut big & heavy material, it will be difficult to feed the material by hand, so our TBK-4220/TBK-4228 have a manual workpiece feeder, you can feed the workpiece by the hand wheel easily.

The detail operation information as below:

- (1) Put the workpiece onto the roller (see figure 14).
- (2) Turn the hand wheel clockwise to drive the roller run, and move the workpiece forward, until the workpiece touch the workstop, then clamp the vise. Or turn the hand wheel

counterclockwise to move the workpiece back.(see figure 15)



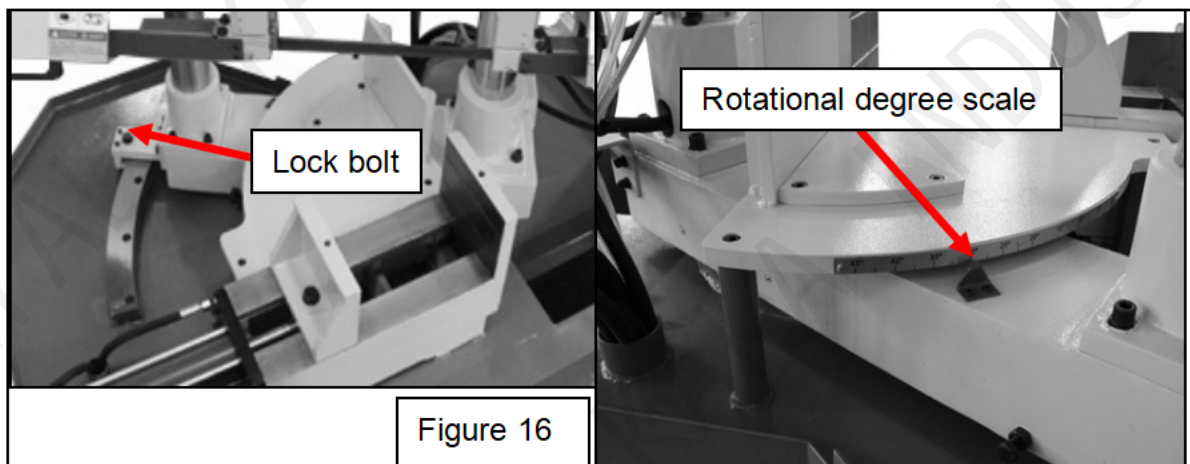
**Note:** Our TBK-4220 / TBK-4228 have this manual workpiece feeder, TBK-4228A does not have it.

### 5.11 Cutting angle

The TBK-4228A has a locking turret that can be adjusted from  $0^{\circ}$  -  $45^{\circ}$

To change the angle:

1. Raise the bow to the highest position and lock in place.
2. Loose the lock bolt on guide, rotate the turret to the desired angle, then retighten the lock bolt. (see figure 16)



## 6. Maintenance

MAKE SURE THAT THE UNIT IS DISCONNECTED FROM THE POWER SOURCE BEFORE ATTEMPTING TO SERVICE OR REMOVE ANY COMPONENT!

### Schedule:

For optimum performance from your machine, follow this maintenance schedule and refer to any specific instructions given in this section.

### Daily check:

- A. Loose mounting bolts
- B. Damaged saw blade
- C. Worn or damaged wires
- D. Any other unsafe condition
- E. Clean after each use: Please clean the chip on time and carefully, otherwise it will block the blade tooth, influence cutting result and blade using life.
- F. Proper blade tension: Every day when cutting is finished, please loosen the blade to prolong the usage life.
- G. Coolant level: Please check if the cooling fluid is clean enough or not, check if oil is enough or not, ensure that the fluid and oil is always enough.

### Monthly check:

Make lubricant is enough on guide surface and lubricating points, bearing in idle blade wheel should be add with lubricating grease half a year.

Check gear box fluid level, change the gear box oil if not enough (every four months, if being used daily)

Please wipe the anti-rust oil onto the guide and working area, to avoid rusting.

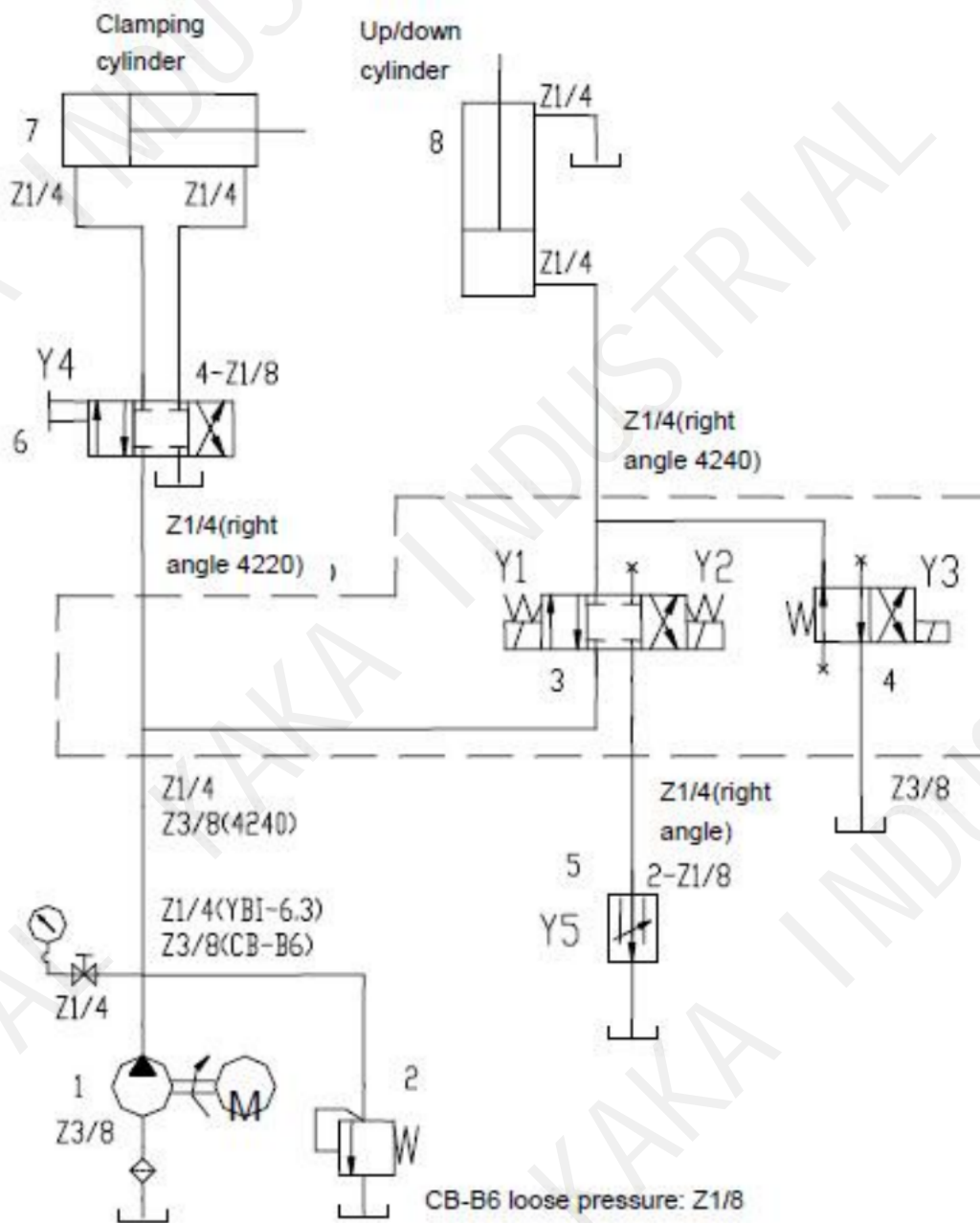
In order to prolong the life of saw blade, after changing new blade, please cutting with low speed and feed, ensure there is no burr in teeth, then you can cut with normal operation.

## 7. HYDRAULIC SYSTEM

Please check the oil is enough by fluid, if the oil is not enough, please inject the hydraulic oil.

For example, please use #46 hydraulic oil in summer and #32 hydraulic oil in winter.

Turn on the oil pump to make the clamping cylinder to the clamping position, system pressure to 2.5 Mpa.



## 8. TROUBLE SHOOTING

Symptom	Possible Cause (s)	Corrective Action
Excessive Blade Breakage	<ol style="list-style-type: none"> <li>1. Material loose in vise</li> <li>2. Incorrect speed or feed</li> <li>3. Blade teeth spacing too large</li> <li>4. Material too coarse</li> <li>5. Incorrect blade tension</li> <li>6. Teeth in contact with material before saw is started</li> <li>7. Blade rubs on wheel flange</li> <li>8. Misaligned guide bearings</li> <li>9. Cracking at weld</li> </ol>	<ol style="list-style-type: none"> <li>1. Clamp work securely</li> <li>2. Adjust speed or feed</li> <li>3. Replace with a small teeth spacing blade</li> <li>4. Use a blade of slow speed and small teeth spacing</li> <li>5. Adjust where blade just does not slip on wheel</li> <li>6. Place blade in correct with work after motor is started</li> <li>7. Adjust wheel alignment</li> <li>8. Adjust guide bearings</li> <li>9. Weld again, note the weld skill</li> </ol>
Premature Blade Dulling	<ol style="list-style-type: none"> <li>1. Teeth too coarse</li> <li>2. Too much speed</li> <li>3. Inadequate feed pressure</li> <li>4. Hard spots or scale on material</li> <li>5. Work hardening of material</li> <li>6. Blade twist</li> <li>7. Insufficient blade</li> </ol>	<ol style="list-style-type: none"> <li>1. Use finer teeth</li> <li>2. Decrease speed</li> <li>3. Decrease spring tension on side of saw</li> <li>4. Reduce speed, increase feed pressure</li> <li>5. Increase feed pressure by reducing spring tension</li> <li>6. Replace with a new blade, and adjust blade tension</li> <li>7. Tighten blade tension adjustable knob</li> </ol>

Symptom	Possible Cause (s)	Corrective Action
Unusual Wear on Side/Back of blade	<ol style="list-style-type: none"> <li>1. Blade guides worn</li> <li>2. Blade guide bearings not adjusted properly</li> <li>3. Blade guide bearing bracket is loose</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace</li> <li>2. Adjust as per operators manual</li> <li>3. Tighten</li> </ol>
Teeth Ripping from Blade	<ol style="list-style-type: none"> <li>1. Tooth too coarse for work</li> <li>2. Too heavy pressure, too slow speed</li> <li>3. Vibrating work piece</li> <li>4. Gullets loading</li> </ol>	<ol style="list-style-type: none"> <li>1. Use finer tooth blade</li> <li>2. Decrease pressure, increase speed</li> <li>3. Clamp work piece securely</li> <li>4. Use coarse tooth blade or brush to remove chips</li> </ol>
Motor running too hot	<ol style="list-style-type: none"> <li>1. Blade tension too high</li> <li>2. Drive belt tension too high</li> <li>3. Gears need lubrication</li> <li>4. Cut is binding blade</li> <li>5. Gears aligned improperly</li> </ol>	<ol style="list-style-type: none"> <li>1. Reduce tension on blade</li> <li>2. Reduce tension on drive belt</li> <li>3. Check oil bath</li> <li>4. Decrease feed and speed</li> <li>5. Adjust gears so that worm is in center of gear</li> </ol>
Bad Cuts	<ol style="list-style-type: none"> <li>1. Feed pressure too great</li> <li>2. Guide bearing not adjusted properly</li> <li>3. Inadequate blade tension</li> <li>4. Dull blade</li> <li>5. Speed incorrect</li> <li>6. Blade guide spaced out too much</li> <li>7. Blade guide assembly loose</li> <li>8. Blade truck too far away from wheel flanges</li> </ol>	<ol style="list-style-type: none"> <li>1. Reduce pressure by increasing spring tension on side of saw</li> <li>2. Adjust guide bearing, the clearance can not be greater than 0.001mm</li> <li>3. Increase blade tension by adjust blade tension</li> <li>4. Replace blade</li> <li>5. Adjust speed</li> <li>6. Adjust guides space</li> <li>7. Tighten</li> <li>8. Re-track blade according to</li> </ol>

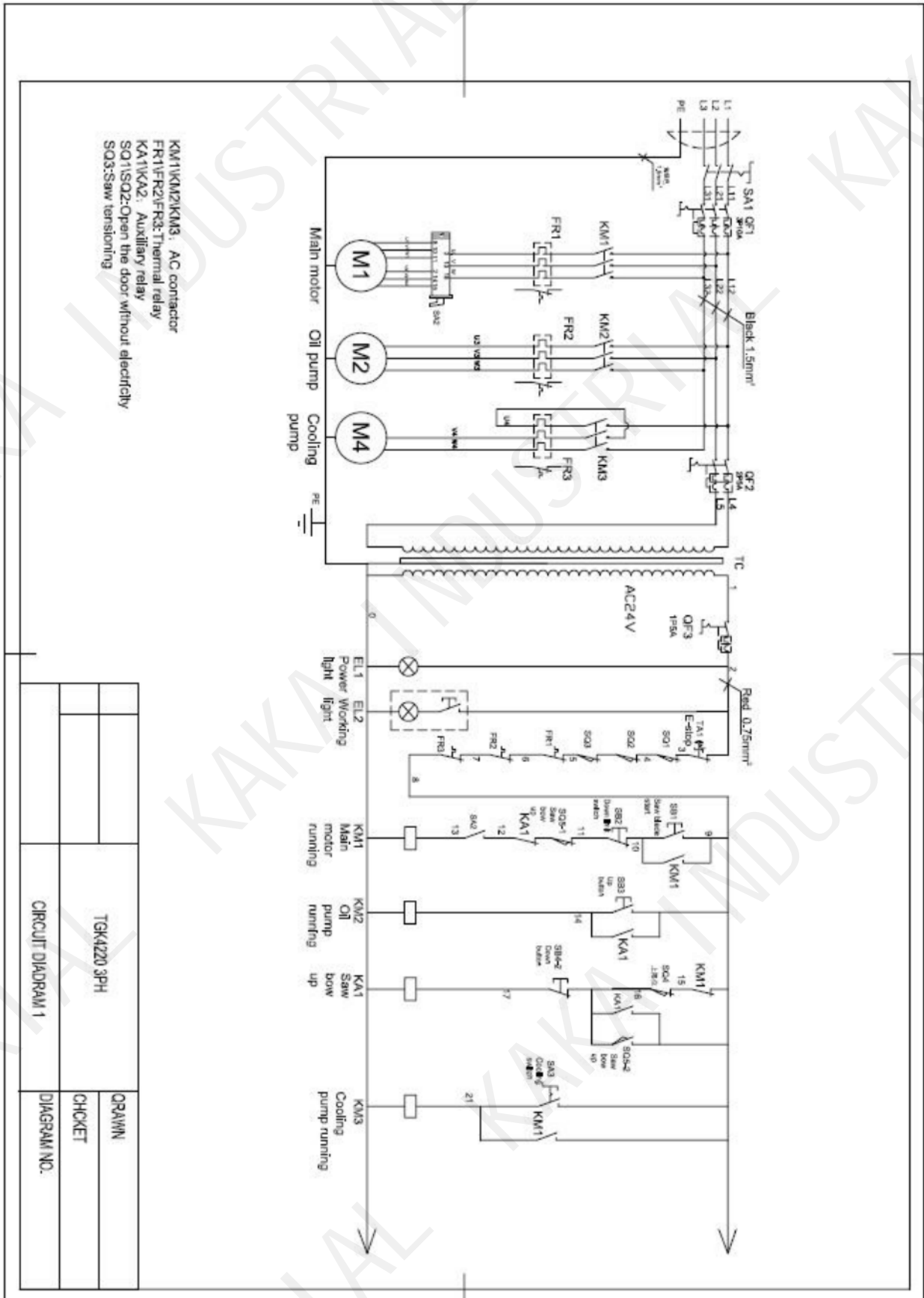
		operating instructions
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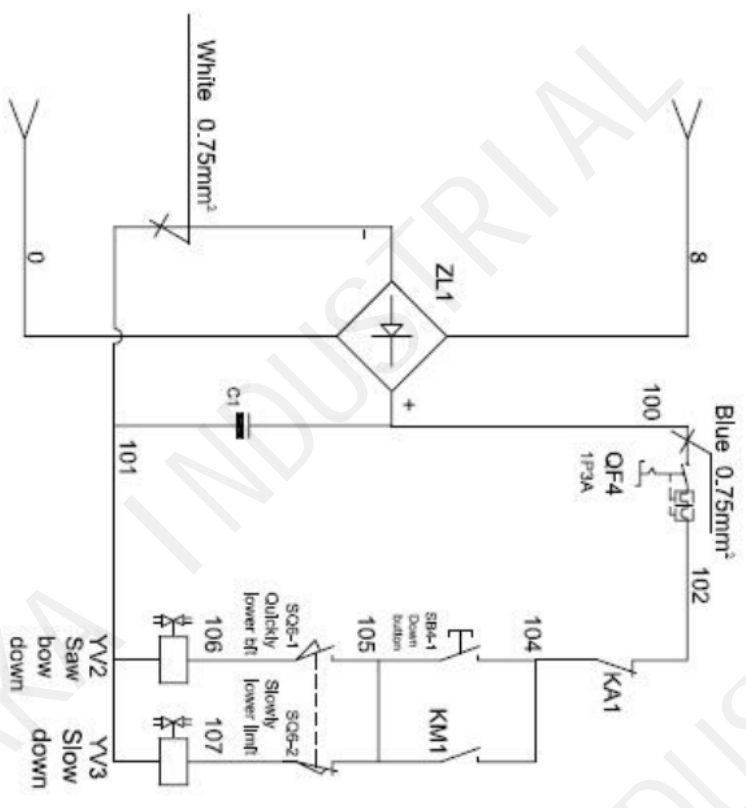
Symptom	Possible Cause (s)	Corrective Action
Bad Cuts (Rough)	<ol style="list-style-type: none"> <li>1. Too much speed or feed</li> <li>2. Blade is too coarse</li> <li>3. Blade tension loose</li> </ol>	<ol style="list-style-type: none"> <li>1. Decrease speed or feed</li> <li>2. Replace with finer blade</li> <li>3. Adjust blade tension</li> </ol>
Blade is twisting	<ol style="list-style-type: none"> <li>1. Cut is binding blade</li> <li>2. Too much blade tension</li> </ol>	<ol style="list-style-type: none"> <li>1. Decrease feed pressure</li> <li>2. Decrease blade tension</li> </ol>



# 9. Electrical drawing & breakdown/part list

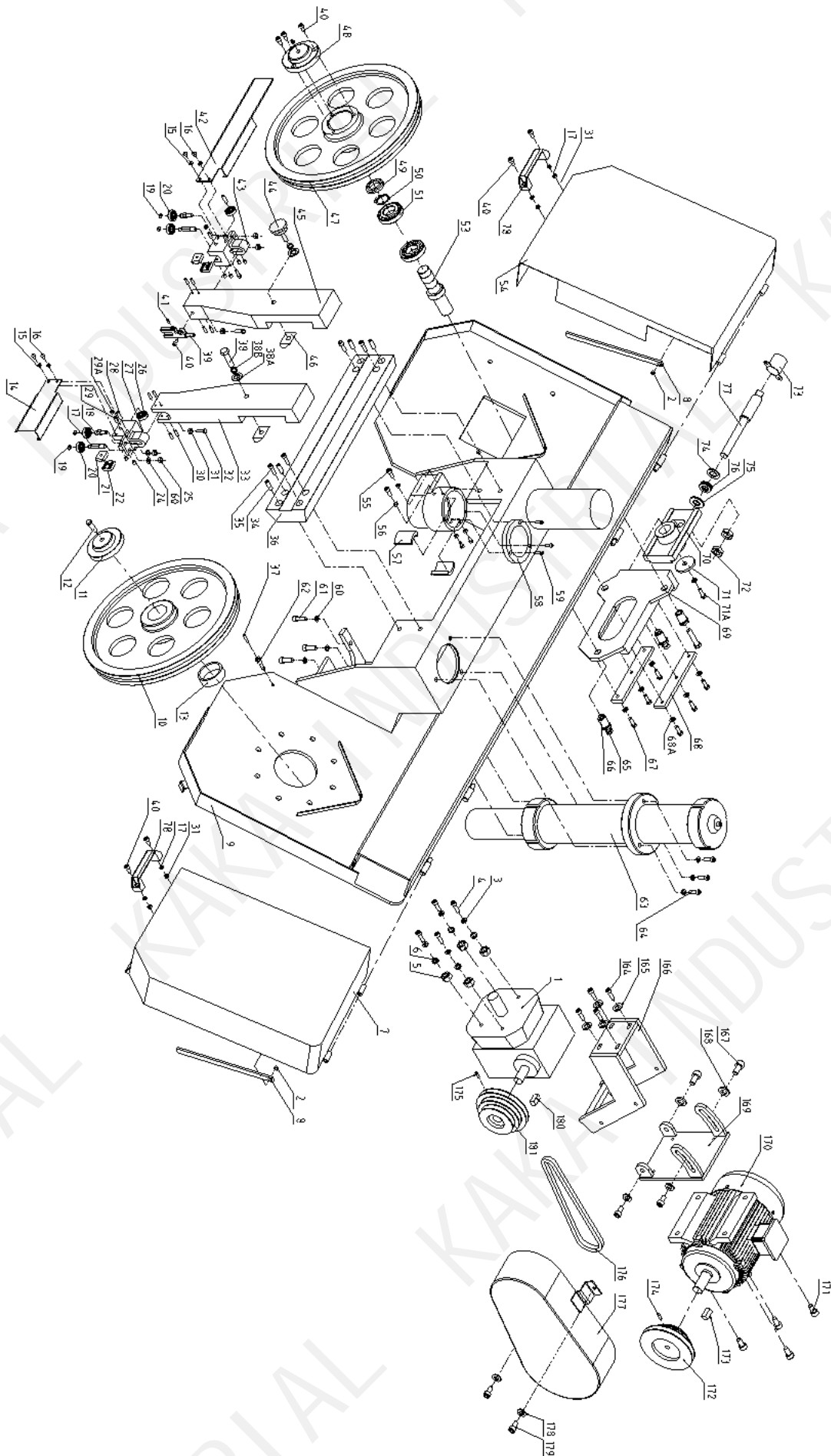
## 9.1 Electric drawing TBK-4220

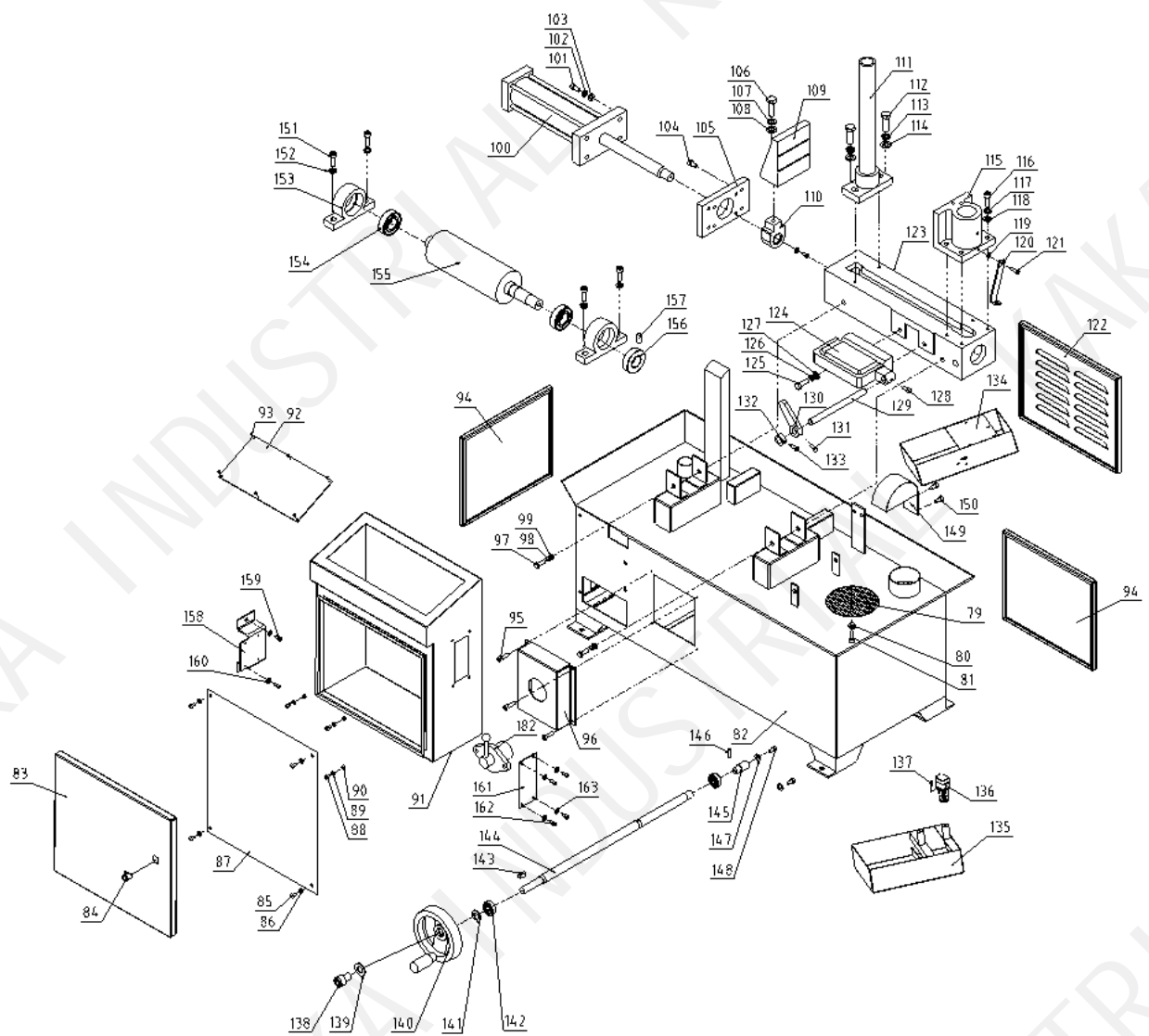




		TGKA220 3PH	DRAWN
			CHECKED
		CIRCUIT DIAGRAM 2	DIAGRAM NO.

# 9.1 Breakdown TBK-4220





## 9.1 Part list TBK-4220

Part No.	Description	Q'ty	Part No.	Description	Q'ty
1	Reducer	1	29A	Cap screw M10x30	2
2	Nut M8	2	30	Set screw M6X10	2
3	Washer 12	4	31	Nut M6	6
4	Hex bolt M12x40	4	32	Hex bolt M6x35	2
5	Nut M12	4	33	Right arm	1
6	Lock washer 12	4	34	Set screw M8X20	4
7	Right blade cover	1	35	Cap screw M10x30	4
8	Bracket for blade cover	2	36	Column	1
9	Bow frame	1	37	Copper pipe $\varnothing$ 6x100	1
10	Drive wheel	1	38	Hex bolt M10x50	1
11	End cap for drive wheel	1	38A	Washer 10	2
12	Hex bolt M12x45	1	38B	Lock washer 10	2
13	Bush	1	39	Coolant valve	1
14	Right blade guard	1	40	Cap screw M6x16	8
15	Flat washer 6	4	41	Set screw M6X5	3
16	Button head screw M6X10	4	42	Right blade guard	1
17	Shaft I	2	43	Left bearing bracket	1
18	Shaft II	2	44	Knob M10x60	1
19	External retaining ring 10	4	45	Left arm	1
20	Bearing 6000-2Z	4	46	Gib	2
21	Left blade guide block	2	47	Idler wheel	1
22	Right blade guide block	2	48	End cover for idler wheel	1
24	Set screw M6X10	8	49	Nut M30x1.5	1
25	Nut M10	8	50	Ext retaining ring 30	1
26	Bearing 6000-2Z	2	51	Bearing 32006	2
27	Right bearing bracket	2	53	Shaft	1
28	Roll pin 10x55	2	54	Left blade cover	1
29	Cap screw M10x30	2	55	Bolt M6x20	4

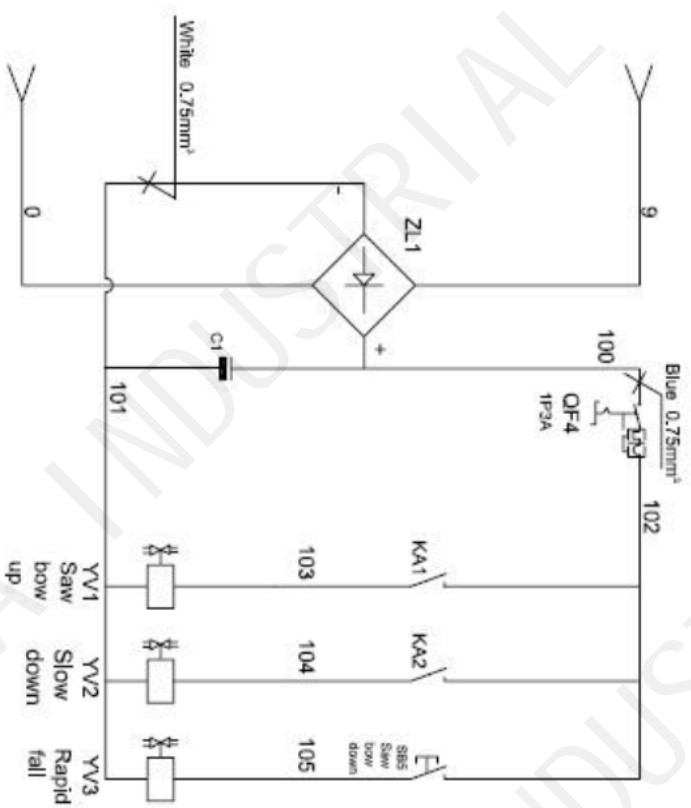
Part No.	Description	Q'ty	Part No.	Description	Q'ty
56	Nut M6	4	84	Lock	1
57	Left cover	2	85	Bolt M8x50	4
58	Seat	1	86	Washer 8	4
59	Cap screw M5x16	3	87	Panel	1
60	Washer 10	3	88	Bolt M8x50	4
61	Cap screw M10x25	3	89	Washer 8	4
62	Connector	1	90	Nut M8	4
63	Up/down cylinder	1	91	Electric box	1
64	Cap screw M8x40	3	92	Control plate	1
65	Hex bolt M12x70	3	93	Bolt M4x8	4
66	Bolt	3	94	Side plate	1
67	Cap screw M6x16	6	95	Cap screw M5x10	1
68	Plate	2	96	Front panel	1
68A	Washer 6	6	97	Hex bolt M10x30	4
69	Block	1	98	Lock washer 10	4
70	Slid block	1	99	Washer 10	4
71	End cap for idler wheel	1	100	Cylinder for clamp	1
71A	Hex bolt M10x25	1	101	Bolt M10x50	4
72	Nut M18	1	102	Lock washer 10	4
74	Washer 18	1	103	Washer 10	4
75	Spring A35.5/2	8	104	Bolt M8x25	4
76	Bearing 51104	1	105	Plate	1
77	Shaft	1	106	Hex bolt M12x40	1
78	Handle	2	107	Lock washer 12	1
79	Filter screen	1	108	Washer 12	1
80	Nut M6	1	109	Vise jaw (front)	1
81	Hex bolt M6x20	1	110	Brush	1
82	Stand	1	111	Left column	1
83	Door	1	112	Hex bolt M10x35	1

Part No.	Description	Q'ty	Part No.	Description	Q'ty
113	Lock washer 10	1	141	External retaining ring 17	1
114	Washer 10	1	142	Bearing 61803-2Z	2
115	Vise jaw bracket (rear)	1	143	Key 5x15	1
116	Bolt M10x50	4	144	Worm shaft	1
117	Lock washer 10	4	145	Worm	1
118	Washer 10	4	146	Bolt M8x16	1
119	Nut M8	1	147	Bolt M8x16	1
120	Bracket	1	148	Washer 8	1
121	Hex bolt M8x30	1	149	Cover	1
122	Back cover	1	150	Bolt M6x10	2
123	Vise base	1	151	Bolt M10x30	4
124	Extend table	1	152	Lock washer 10	4
125	Hex bolt M12x35	2	153	Block	2
126	Lock washer 12	2	154	Bearing 6205-2Z	2
127	Washer 12	2	155	Roller	1
128	Hex bolt M8x20	1	156	Worm shaft	1
129	Work stop rod	1	157	Pin	1
130	Stop block	1	158	Bracket	1
131	Hex bolt M6x16	1	159	Bolt M6x10	2
132	Ring	1	160	Washer 10	2
133	Hex bolt M6x16	1	161	Plate	1
134	Oil reservoir	1	162	Bolt M4x8	4
135	Coolant reservoir	1	163	Washer 4	4
136	Pump	1	164	Bolt M8x25	4
137	Bolt M5x10	1	165	Washer 8	4
138	Bolt M6x12	1	166	Bracket	1
139	Washer 6	1	167	Bolt M12x30	4
140	Hand wheel $\varnothing$ 125x15	1	168	Washer 12	4

<b>Part No.</b>	<b>Description</b>	<b>Q'ty</b>	<b>Part No.</b>	<b>Description</b>	<b>Q'ty</b>
169	Motor seat	1	176	Belt	1
170	Motor	1	177	Belt cover	1
171	Hex bolt M8x35	4	178	Washer 8	2
172	Pulley for motor	1	179	Bolt M8x12	2
173	Key 8x30	1	180	Key 8x30	1
174	Bolt 8x10	1	181	Pulley for reducer	1
175	Bolt 8x16	1	182	Vise clamping handle	1

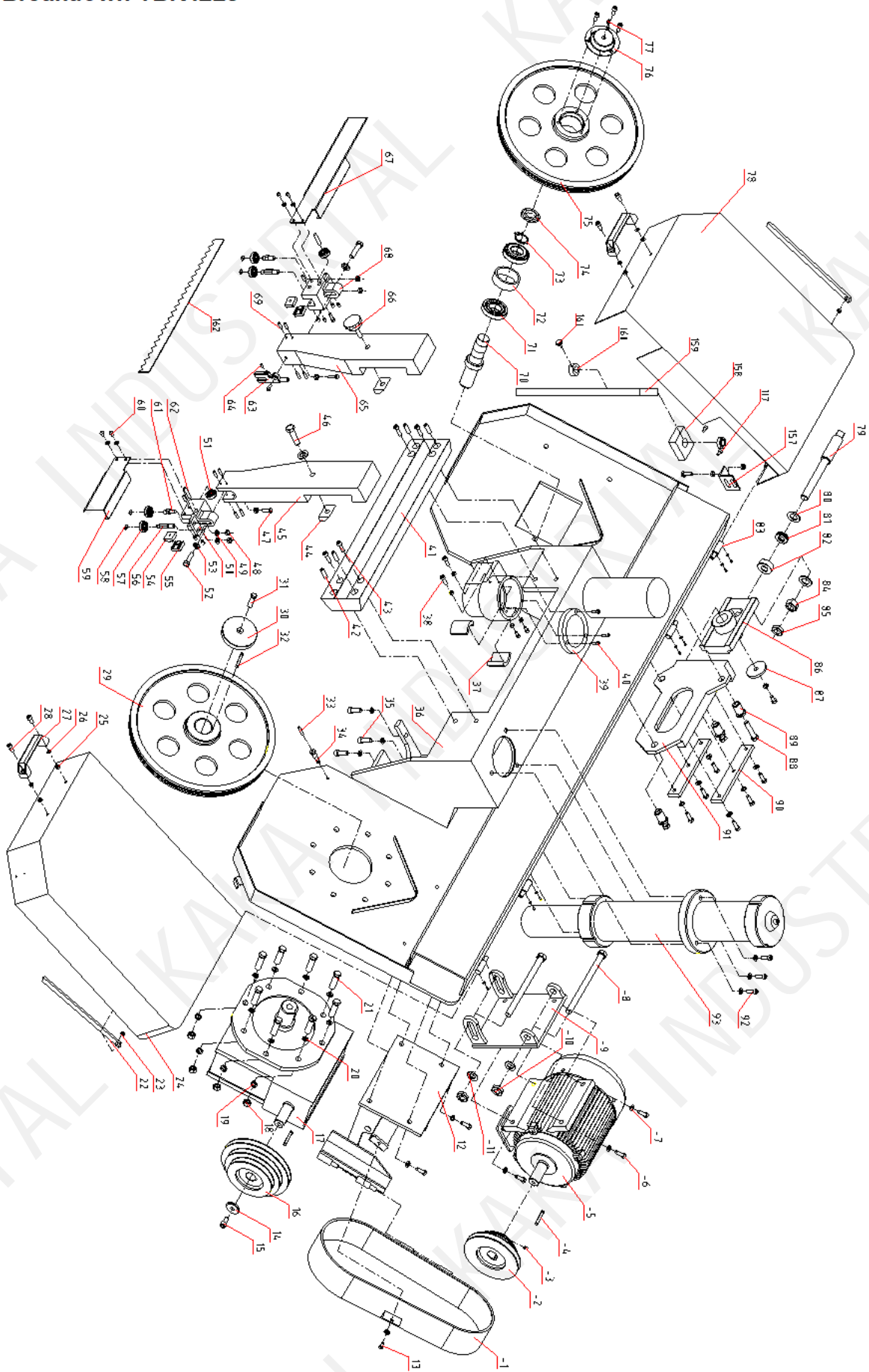


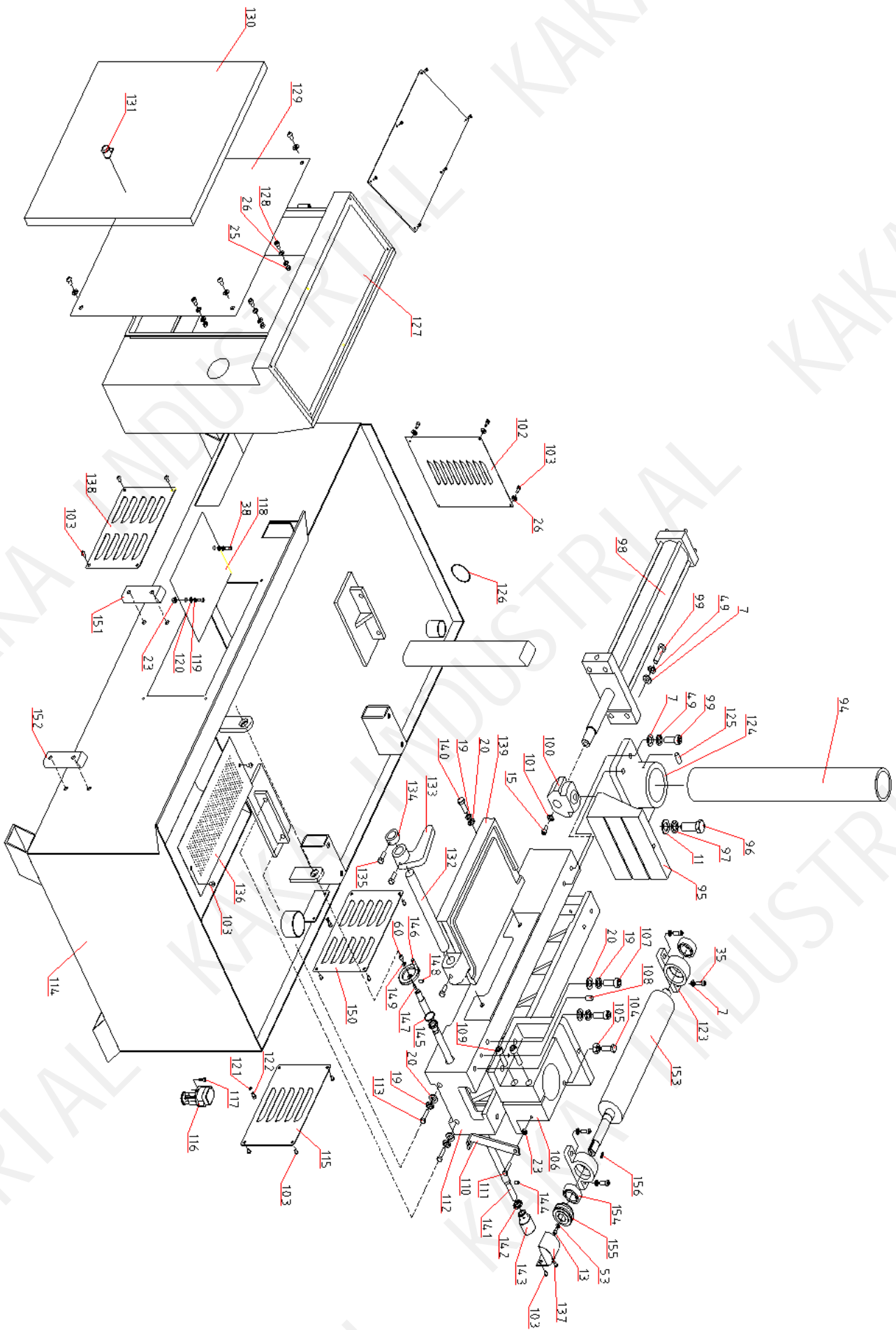




		TGKA228/TGKA228A 3PH	DRAWN
			CHECKET
		CIRCUIT DIAGRAM/ 2	DIAGRAM NO.

## 9.2 Breakdown TBK4228





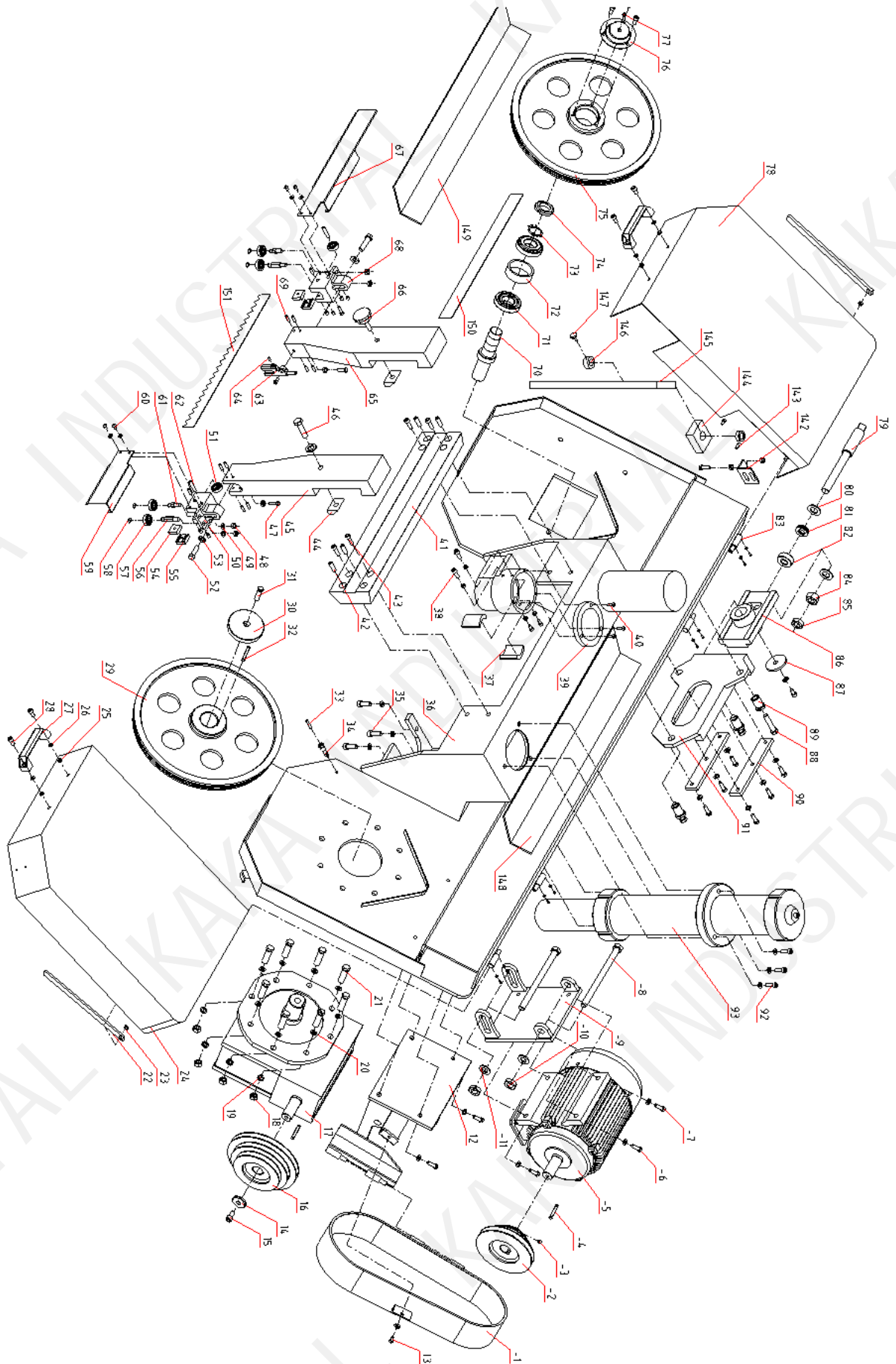
## 9.2 Part list TBK4228

Part No.	Description	Q'ty	Part No.	Description	Q'ty
1	Belt cover	1	29	Drive wheel	1
2	Pulley for motor	1	30	End cap for drive wheel	1
3	Bolt M8x10	1	31	Hex bolt M16x35	1
4	Key 8x50	2	32	Key 14x60	1
5	Reducer	1	33	Copper pipe $\varnothing$ 6x100	1
6	Hex bolt M10x30	4	34	Joint	1
7	Washer 10	28	35	Cap screw M10x30	7
8	Bolt M6x210	2	36	Bow frame	1
9	Bracket	1	37	Cover	2
10	Nut M16	5	38	Cap screw M8x25	8
11	Washer 16	5	39	Seat	1
12	Motor seat	1	40	Cap screw M5x12	3
13	Bolt M8x16	4	41	Column	1
14	Washer	1	42	Bolt 12x30	4
15	Bolt M10x20	10	43	Cap screw M12x40	4
16	Pulley for reducer	1	44	Gib	1
17	Reducer	1	45	Right arm	1
18	Nut M12	8	46	Hex bolt M12x60	1
19	Lock washer 12	21	47	Hex bolt M6x35	2
20	Washer 12	23	48	Nut M10	6
21	Hex bolt M12x45	8	49	Lock washer 10	16
22	Bracket for blade cover	2	50	Right bearing bracket	1
23	Nut M8	11	51	Bearing 6000-2Z	2
24	Right blade cover	1	52	Hex bolt M8x45	2
25	Nut M10	10	53	Washer 8	3
26	Washer 6	44	54	Left blade guide block	2
27	Knob 120mm	2	55	Right blade guide block	2
28	Cap screw M6x16	7	56	Shaft	2

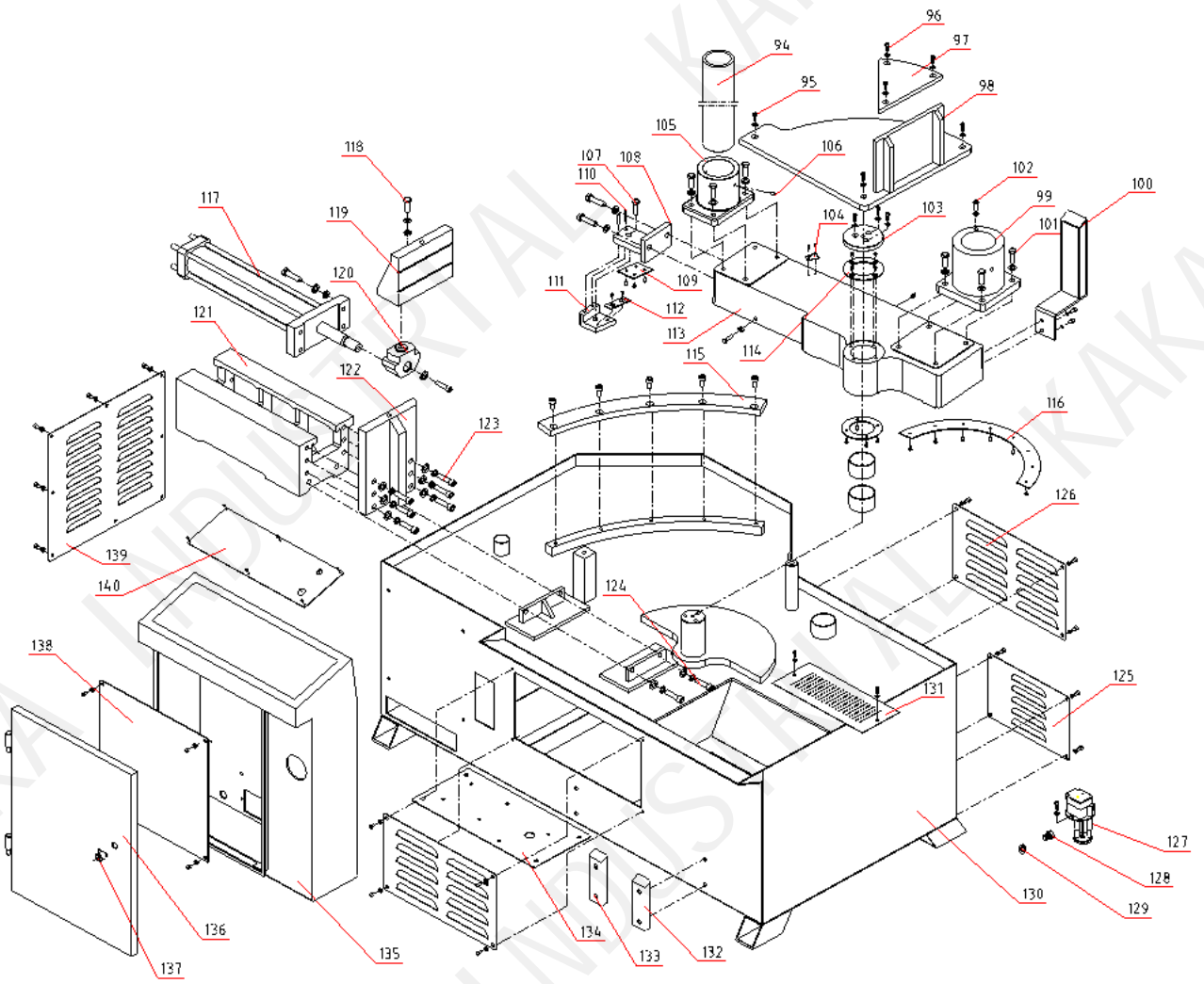
Part No.	Description	Q'ty	Part No.	Description	Q'ty
57	Bearing 6000-2Z	4	85	Nut M20	1
58	External retaining ring 10	4	86	Slid block	1
59	Right blade guard	1	87	End cap	1
60	Cap screw M6x12	5	88	Hex bolt M12x70	3
61	Shaft	2	89	Bolt	3
62	Pin $\varnothing$ 10x60	1	90	Plate	2
63	Coolant valve	1	91	Block	1
64	Set screw M6X5	4	92	Cap screw M10x45	5
65	Left arm	1	93	Up/down cylinder	1
66	Handle M12x60	1	94	Left column	1
67	Right blade guard	1	95	Vise jaw (front)	1
68	Left bearing bracket	1	96	Bolt M16x40	1
69	Set screw M6x10	16	97	Lock washer 16	1
70	Shaft	1	98	Cylinder for clamp	1
71	Bearing 32007	2	99	Bolt M10x45	11
72	Bush	1	100	Bush	1
73	Ext retaining ring 35	1	101	Washer 10	1
74	Nut M35x1.5	1	102	Side plate	1
75	Idler wheel	1	103	Bolt M6x10	24
76	End cover for idler wheel	1	104	Bolt M10x45	5
77	Oil cup M10x1	1	105	Nut M10	1
78	Left blade cover	1	106	Vise jaw bracket (rear)	1
79	Shaft	1	107	Bolt M12x45	4
80	Washer 20	2	108	Pin 8x30	2
81	Bearing 51104	1	109	Bolt M12x80	2
82	Bush	1	110	Bracket	1
83	Pin	4	111	Bolt M8x30	3
84	Nut M20	1	112	Vise base	1

Part No.	Description	Q'ty	Part No.	Description	Q'ty
113	Bolt M12x45	8	139	Extend table	1
114	Stand	1	140	Bolt M12x40	6
115	Back plate	1	141	Worm shaft	1
116	Pump	1	142	Bearing 61803-2Z	2
117	Bolt M5x8	4	143	Worm shaft	1
118	Fix plate for pump	1	144	Spring pin	1
119	Lock washer 8	4	145	External retaining ring	1
120	Washer 8	6	146	Handle $\phi$ 125 x $\phi$ 15	1
121	O-ring $\phi$ 1.8 x $\phi$ 9.5	2	147	Key 5x15	1
122	Bolt M10x1	2	148	Bolt M6x8	1
123	Block	2	149	Washer 6	1
124	Seat for column	1	150	Plate	1
125	Lock washer 6x22	2	151	Hydraulic oil gauge	1
126	Ring	1	152	Coolant fluid gauge	1
127	Electric box	1	153	Roller	1
128	Bolt M6x20	4	154	Bearing 6205-2Z	2
129	Panel	1	155	Worm	1
130	Door	1	156	Key 3x22	1
131	Lock	1	157	Bracket	1
132	Work stop rod	1	158	Bottom limit bracket	1
133	Stop block	1	159	Top limit block	1
134	Ring	1	160	Shaft	1
135	Bolt M8x16	2	161	Ring	1
136	Filter screen	1	162	Handle M6x15	1
137	Cover	1	163	Saw blade	1
138	Front plate	1			

### 9.3 Breakdown TBK-4228A







### 9.3 Part list TBK-4228A

Part No.	Description	Q'ty	Part No.	Description	Q'ty
1	Belt cover	1	29	Drive wheel	1
2	Pulley for motor	1	30	End cap for drive wheel	1
3	Bolt M8x10	1	31	Hex bolt M16x35	1
4	Key 8x50	2	32	Key 14x60	1
5	Motor	1	33	Copper pipe $\varnothing$ 6x100	1
6	Hex bolt M10x30	4	34	Joint	1
7	Washer 10	28	35	Cap screw M10x30	7
8	Bolt M6x210	2	36	Bow frame	1
9	Bracket	1	37	Cover	2
10	Nut M16	5	38	Cap screw M8x25	8
11	Washer 16	5	39	Seat	1
12	Motor seat	1	40	Cap screw M5x12	3
13	Bolt M8x16	4	41	Column	1
14	Washer	1	42	Bolt 12x30	4
15	Bolt M10x20	10	43	Cap screw M12x40	4
16	Pulley for reducer	1	44	Gib	1
17	Reducer	1	45	Right arm	1
18	Nut M12	8	46	Hex bolt M12x60	1
19	Lock washer 12	21	47	Hex bolt M6x35	2
20	Washer 12	23	48	Nut M10	6
21	Hex bolt M12x45	8	49	Lock washer 10	16
22	Bracket for blade cover	2	50	Right bearing bracket	1
23	Nut M8	11	51	Bearing 6000-2Z	2
24	Right blade cover	1	52	Hex bolt M8x45	2
25	Nut M10	10	53	Washer 8	3
26	Washer 6	44	54	Left blade guide block	2
27	Knob 120mm	2	55	Right blade guide block	2
28	Cap screw M6x16	7	56	Shaft	2

Part No.	Description	Q'ty	Part No.	Description	Q'ty
57	Bearing 6000-2Z	4	85	Nut M20	1
58	External retaining ring 10	4	86	Slid block	1
59	Right blade guard	1	87	End cap	1
60	Cap screw M6x12	5	88	Hex bolt M12x70	3
61	Shaft	2	89	Bolt	3
62	Pin $\phi$ 10x60	1	90	Plate	2
63	Coolant valve	1	91	Block	1
64	Set screw M6X5	4	92	Cap screw M10x45	5
65	Left arm	1	93	Up/down cylinder	1
66	Handle M12x60	1	94	Left column	1
67	Right blade guard	1	95	Cap screw M8x20	5
68	Left bearing bracket	1	96	Cap screw M8x16	9
69	Set screw M6x10	16	97	Plate	1
70	Shaft	1	98	Angle table	1
71	Bearing 32007	2	99	Seat	1
72	Bush	1	100	Bracket	1
73	Ext retaining ring 35	1	101	Cap screw M12x45	4
74	Nut M35x1.5	1	102	Hex bolt M10x40	3
75	Idler wheel	1	103	End cap	1
76	End cover for idler wheel	1	104	Pointer	1
77	Oil cup M10x1	1	105	Seat for column	1
78	Left blade cover	1	106	Pin 6x22	2
79	Shaft	1	107	Hex bolt M12x60	2
80	Washer 20	2	108	Connect bracket	1
81	Bearing 51104	1	109	Friction plate I	1
82	Bush	1	110	Pin 6x40	2
83	Pin	4	111	Lock block	1
84	Nut M20	1	112	Friction plate II	1

Part No.	Description	Q'ty	Part No.	Description	Q'ty
113	Swivel base	1	133	Hydraulic oil gauge	1
114	Friction washer	2	134	Plate	1
115	Angle guide	1	135	Electric box	1
116	Friction plate III	1	136	Door	1
117	Cylinder for vise clamping	1	137	Lock	1
118	Hex bolt M16x40	1	138	Panel	1
119	Vise jaw (front)	1	139	Side plate	1
120	Bush	1	140	Control panel	2
121	Vise base	1	141	Bush $\phi$ 60 x $\phi$ 65 x 40	1
122	Vise jaw (rear)	1	142	Bottom limit bracket	1
123	Cap screw M12x50	7	143	Cap screw M5x20	2
124	Hex bolt M12x40	4	144	Top limit block	1
125	Back plate I	1	145	Shaft	1
126	Back plate II	2	146	Ring	1
127	Pump	1	147	Handle M6x15	1
128	O-ring $\phi$ 1.8 x $\phi$ 9.5	2	148	Front cover	1
129	Bolt M10x1	2	149	Back cover	1
130	Stand	1	150	Scale	1
131	Filter screen	1	151	Saw blade	1
132	Coolant fluid gauge	1			

**Note:** This manual is only for your reference. Owing to the continuous improvement of the machine, changes may be made at any time without obligation on notice. Please note the local voltage for operating this machine.