



Model H 400 SA

HORIZONTAL BAND-MITERING MACHINE

OPERATORS MANUAL

PARTS LIST

Kalamazoo Machine Tool

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TABLE OF CONTENTS

Installation	5
Outfeed connection	8
Startup & Controls	9
Operation	12
Blade Installation	14
Angle Cutting	19
Maintenance	21
Variable Speed Drive	22
Troubleshooting	23
Blade Selection	26
Parts Illustrations, Schematics	



SPECIFICATIONS

Model	H 400 SA
Blade Drive Motor	4 HP, 1800 RPM, TEFC
Blade Speeds	15-115 meters per minute 60-360 meet per minute
Blade Size	1 1/4" wide x 13' 2" Long
Capacities	
@90°	
round/sq.	12"
rectangular	10 x 15"
@ 45°	
round	9-3/8"
square	8 5/8"
rectangular	7 3/4" x 9"
@ 60°r	
round	6 5/8"
square	5 7/8"
rectangular	3 7/8" x 6 11/16"
Work Height	37"
Vise Jaw Height	6"
Power Requirements	208-220-230 volts - 10 amps 440-460 volts - 5 amps 3 phase60 cycles
Coolant Capacity	3.5 Gal (15 lit)
Gearbox Capacity	.5 gal (2.2 lit)
Hydraulic Capacity	2.75 Gal (13 lit) Viscosity 46

WHEN ORDERING PARTS PLEASE STATE

1. Model Number
2. Serial Number
3. Power Supply (electrical components)
4. Quantity Required

SAFETY INSTRUCTIONS TO THE OWNER OR SUPERVISOR

You must remember that this machine is designed to cut metal with a sharp tool, and you are responsible to see that the machine is in top operating condition and that it is operated **IN A SAFE MANNER!**

YOU MUST:

1. Make sure the machine is properly installed, anchored to floor, and electrical installation is proper.
2. Be sure you are familiar with all operating, safety, and applications information before operating this machine or turning it over to one of your employees.
3. See that all who operate this machine are properly trained and fully aware of all safety practices.
4. Be aware of all unsafe practices that may occur. (See operator safety precautions and applications information)
5. Insist on proper personal protective equipment and practices.
6. Maintain all factory installed safety devices and insure that these are never removed or altered or restricted in any way.
7. Insure that your operators have a safe and orderly work area, with adequate light and operating room.
8. Be certain that your machinery receives responsible and competent maintenance and that your machinery is inspected on a regular basis.

YOU ARE RESPONSIBLE SAFETY INSTRUCTIONS TO THE MACHINE OPERATOR

**You must read and understand all operating, safety,
and applications information before attempting
to use this machine, including safety instructions above.**

1. Use care when uncoiling and installing new bandsaw blades as the teeth are very sharp. It is advisable to wear gloves when handling saw blades.
2. Always wear proper eye protection.
3. Never operate machine unless all guards are in place.
4. Never insert hands or arms into or near cutting area while machine is running.
5. Never load or unload machine while blade is running.
6. Never wear loose clothing, long sleeves, gloves, jewelry, or any other items that may be caught. Confine long hair.
7. Adequately support stock on both sides of machine to prevent falling.
8. Never adjust guide arms when blade is running.
9. Always disconnect power at source when performing maintenance or making adjustments, other than those necessary for the normal operation of machine.
10. Keep cutting area clear of tools or other loose objects.
11. Accumulation of chips can cause problems with safety and use of this machine. Keep the machine clean.
12. Before starting a sawing cycle, be sure vise is securely clamped and machine set-up is correct.
13. Never use this machine to cut workpieces larger than the stated capacity.
14. Never use a blade other than the machine is designed for.
15. Be aware of the possible sawing problems (see APPLICATIONS section of this book)
16. **CAUTION:** If blade becomes jammed, immediately turn off power, loosen vise, extract workpiece from blade, and inspect blade for cracks or broken teeth.

ALWAYS OPERATE MACHINE SAFELY, USING COMMON SENSE AND ALERTNESS

INSTALLATION

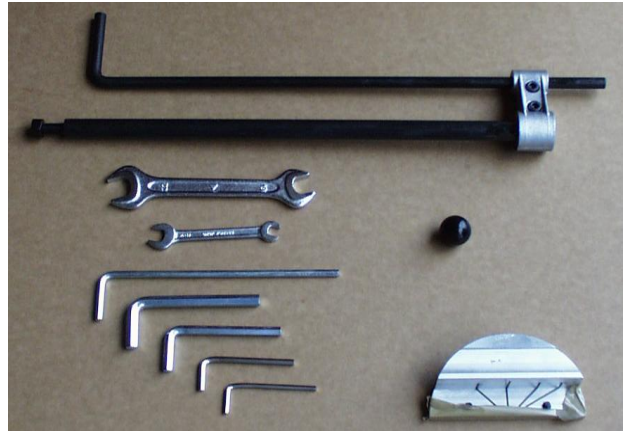
We recommend that you follow these instructions closely and report any problems to your distributor.

Select an installation site that is clear of traffic and obstructions, suitable for proper machine operation and maintenance, including adequate light and clearance.

The first step after uncrating your machine is to see that all items are present and that there is no apparent damage to any part of the machine.

Items included are:

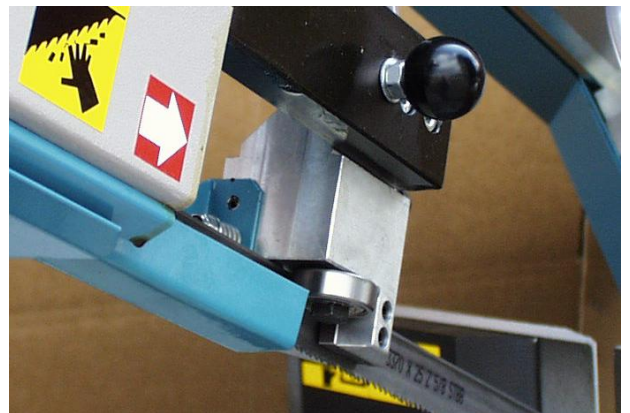
1. Length stop assembly
2. Assortment of wrenches
3. Knob, to be installed in the moving guide arm
4. Filler plate and mounting screws, to be fitted at swiveling point of castiron turntable.



Remove the wooden blocks that support the saw frame and pendant operators console in transit, and carefully remove the machine from it's skid, using the slots provided for forklift in front of machine base.

Remove sawframe support bracket as attached to the sawbed and moving guide arm.

Mount knob #3 as illustrated.



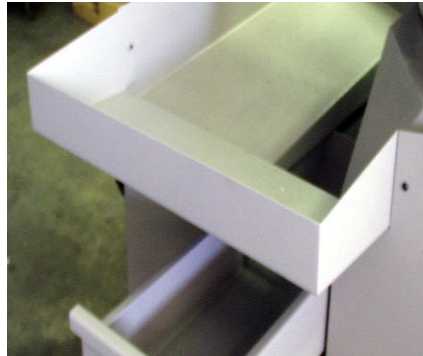
Raise sawframe and install filler plate #4, located where the sawblade comes between the rear vise fence.

Your machine has been carefully packed and has preservative applied to metal surfaces to protect it during transit and storage. It is recommended that all of these surfaces be cleaned at this time.

Mix coolant to approximately 10:1 with water for most sawing applications. For Stainless Steel use a 5:1 mixture. For unusual materials, consult the manufacturer for additional coolant recommendations.

Mix coolant into water in order to mix more easily. Pour coolant directly into the "chips" area at rear of machine.

Mount auxiliary chip/coolant pans on the rear left and rear right sides of machine, as shown below.



Spray Mist Coolant Accessory (optional)

The optional spray mist coolant is designed for natural vegetable coolant oil. Your machine reservoir has been pre-filled for your convenience.

You must connect to air supply as shown, and the system will automatically deliver the desired amount of coolant directly to the blade.

You may turn on/off with switch provided on the RH side of the enclosure. and if desired you may utilize the flood coolant system provided with machine as standard equipment.

Note: It may require some run time for the coolant to fill the lines and reach the spray nozzle.



ELECTRICAL CONNECTION

Electrical connections should be done only by a qualified electrician!

Make sure your power supply matches the machine.

It is recommended that the machine be on a circuit that is **properly fused**, and the machine must be **properly grounded** to comply with OSHA and state electrical codes.

Voltage: If you have something other than 230 volt power supply, you will find packed in the base of the machine you will find a rectangular box containing a power transformer that is specified for your correct operating voltage.

Connect 3-phase supply **L1, L2, and L3** and the yellow/green wire to ground. (After eventually starting the machine up, you will need to check the machine for proper rotation, which **must be checked at the hydraulic system**.)

If rotation is not correct, change any two of the three power leads at point of connection.



Optional Power Transformer

CAUTION! It is essential that this machine be properly grounded. Electrical problems due to improper grounding can be very expensive and are not covered under warranty!

WIRE SIZES

The machine must be serviced by adequate wire or a severe loss of power may occur, leading to poor machine performance. We recommend:

Length of conductor	Wire Gauge Size
50' or less	#14
100" or less	#12
100-150"	#10
150 or longer	NOT RECOMMENDED

Foot Pedal Connection

Note that on the base of the machine, adjacent to the on/off disconnect switch, you will find a female plug receptacle. If you desire to operate with a footswitch, you may wire into the plug at this point. Use of a foot pedal will then actuate a semi-automatic sawing cycle (same as pushing "cycle start" button)

Outfeed Connections

Pictures 1 & 2 show the outfeed tray that comes with your machine as standard equipment. Mount the bottom tray first (as shown in picture #2) and when this is attached with bolts provided, attach top tray as shown in picture #1.

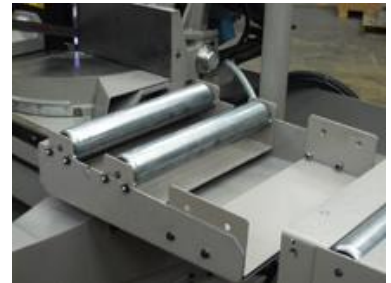
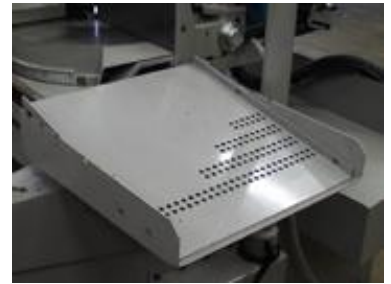
If you have purchased optional custom outfeed conveyors, you may start by attaching the bottom tray only from the standard outfeed tray. The top tray cannot be used.

Next, locate the 3 outfeed rollers, and mount the first two as illustrated. It will be easier if you do not mount the third one (with the wider bracket) at this time.

Next, attach the two legs to your conveyor section, use the jacking bolts to level it, and slide it into the bottom tray already mounted to machine. Secure with bolts provided.

Finally you may slide the final roller into place.

The finished assembly is shown at right.



System Startup

System is initialized by pushing "Power On" button on RH side of operator control.



Start Hydraulics

Push yellow button to start hydraulics. (#9 on subsequent page)

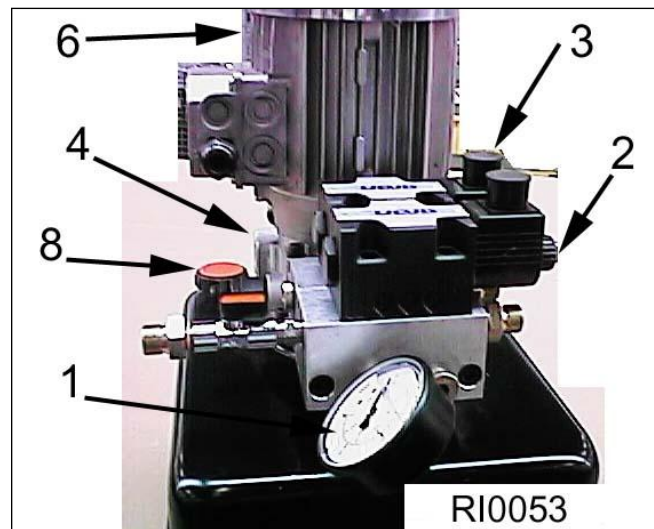
If hydraulics will not start, check red 'E' Stop button, and if it is pushed in you must rotate it ¼ turn to release

HYDRAULICS

You can confirm the hydraulic system is operating correctly by checking for pressure on the gauge (rear of machine) or simply push the vise clamp & unclamp buttons.

Identification of hydraulic components are as follows:

1. System pressure gauge; should be about 250-280 psi (18-20 bar)
2. Valve for sawframe
3. Valve for vise
4. Pump
6. Motor
8. Fill plug



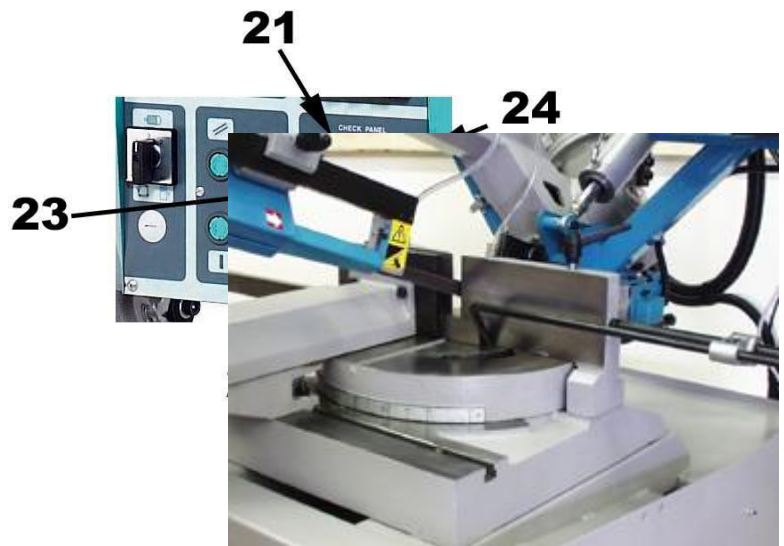
Note: Hydraulic Oil Viscosity 46

Controls



1. On/off power disconnect switch, with lockout
2. Ammeter for blade drive
3. Power 'ON' pilot light
4. Unused on this machine
5. Emergency Stop button. Release by turning ¼" clockwise
6. Vise clamp/unclamp selector switch
7. Sawframe raise/lower selector switch
8. Cycle Start push button
9. Start Hydraulic System push button **Note:** Systems shuts off after a few minutes if unused
10. Unused on this machine
13. Unused on this machine
14. Blade Speed potentiometer

21. Power 'ON' Pilot light
22. Unused on this machine
23. Blade Drive pilot light. Normal condition is illuminated.
24. Blade Cover in place. Must be illuminated for machine to operate; if not illuminated, check cover.
25. Blade Tension indicator. Must be illuminated for machine to operate; if not, check for broken blade or inadequate blade tension.
26. Unused on this machine



Setting up for the cut

Install stock assembly if use desired.

WISE

The machine is provided with a vise that adjustable in the front Tee slot of machine. You should establish the best location of vise to clamp as near as possible to the blade. This is important in obtaining the best quality cut, and it is **CRITICAL** for **SAFE** operation.

Photo at right illustrates three functions.

Handle at far left is the locking lever that locks vise assembly into the tee-slot on machine base.

Handle and knob is a quick release, for moving the vise rapidly from one extreme to the other (in & out). By pushing down on lever, the vise will slide easily fore & aft.

The handle with two knobs turns the vise screw for fine adjustment



Photo at right is close-up view of locking lever and rapid adjust lever.

For proper vise setup & operation:

- Vise unclamp selector switch, to 'unclamp' position
- Adjust the vise jaws to within 1/8" of the workpiece.
- Vise clamp selector switch to 'clamp' position. Vise should be clamped prior to initiating an operating cycle.

or

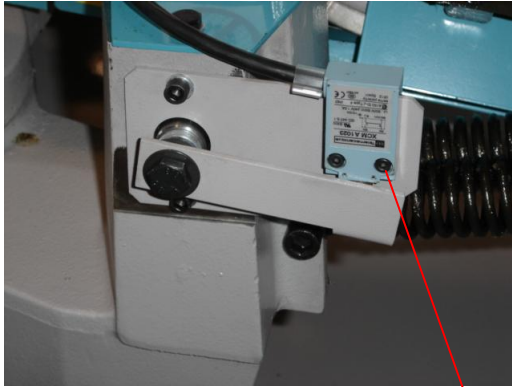
Alternative operation: With vise in 'unclamp position, move vise to within 1/8" of workpiece and vise will automatically clamp when cycle is started and unclamp when saw frame reaches top limit after a complete cycle.



Machine Operation

Ensure that all of the above setup operations have been performed prior to attempting to make a complete sawing cycle.

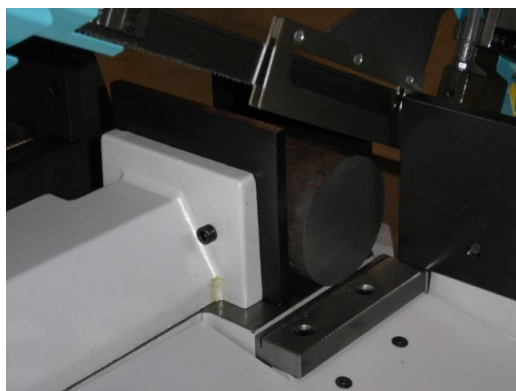
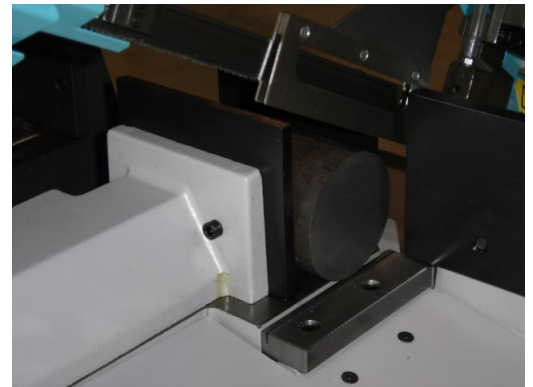
To make adjustment to the material cutoff point, set cutoff actuator so it actuates microswitch when blades goes through the workpiece. The device is spring loaded; no tools needed. The easiest way is to start a sawing cycle, then when the sawframe gets to the desired cutoff point, shut off the feed speed valve to stop sawframe descent, and adjust the actuator.



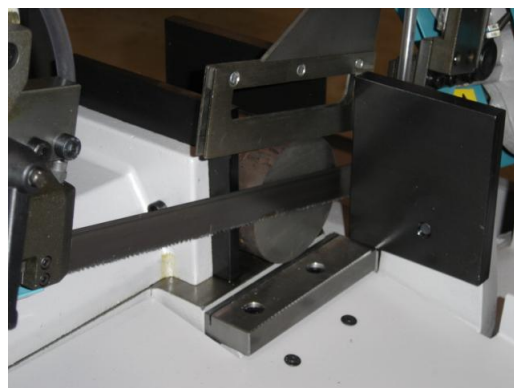
Cutoff actuator shown, adjusted for cutoff position with sawframe down
Note: Spring loaded; no tools needed

Place material to be cut in the vise, under the sawblade.

At all times during sawing the material height sensor will be in contact with the workpiece. When the material height sensor is above the workpiece the sawframe will be descending in rapid approach. When it is in contact with the workpiece the sawframe will be descending in the controlled feed rate, and controlled by the feed speed valve in front of the machine base.



Material height sensor shown with sawframe above workpiece



Material height sensor in contact with workpiece

It is recommended to make a "Free" or "Dry" cycle with material in the vises but not under the blade, to check all operating conditions prior to making an actual saw cut

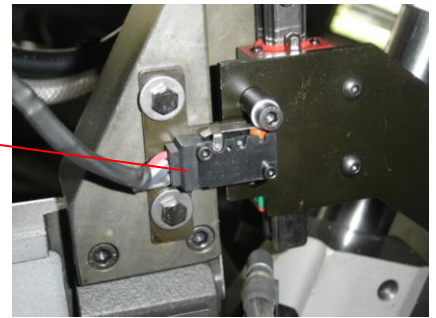
Make sure all set up conditions are correct, including proper adjustment of vise, saw frame travel, correct selection of blade, blade speed, and coolant prior to initiating a sawing cycle.

During this cycle, you will want to adjust the downfeed speed control to the speed you desire, and coolant flow may be adjusted (petcocks located on guide arms)

At the end of this practice cycle, you have the opportunity to observe all functions to see that they are safe and to your satisfaction.

If all conditions are proper, you may now make a cut.

The microswitch for the material sensor is mounted with two socket head cap screws. The switch operates 'normally open' (blue & black wires; the red wire is not used) To replace switch, remove black sheath and use wire connectors for blue & black wires. Red wire may be cut short.



Making a Cut

Clamp Material with vise selector switch

Note: If you material is not clamped when you start cycle, sawwise will clamp automatically

Push Cycle Start button

Adjust downfeed rate as desired

BLADE INSTALLATION

USE GLOVES! THE TEETH ON A BLADE ARE FOR CUTTING!

Please refer to the section on **APPLICATIONS** to select proper blade.

Raise saw frame to the point where the blade clears the fixed vise.

Disconnect machine power to ensure safe blade change.

Loosen LH blade guide adjustable locking handle and move the LH guide close to the RH guide.

Swing away rear bandwheel cover (4 latches) and front guard.



Tension end latch

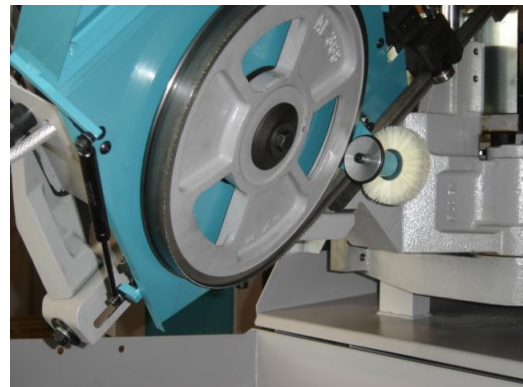


Middle latch (2 of)



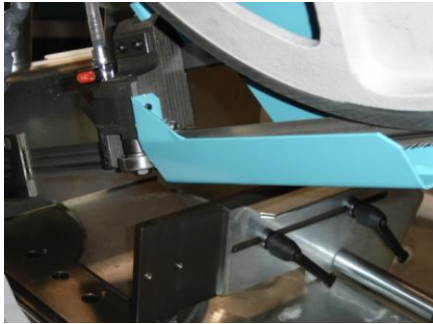
Drive end latch

The gas cylinder on the end of the sawframe will allow cover to be held open for blade changing.

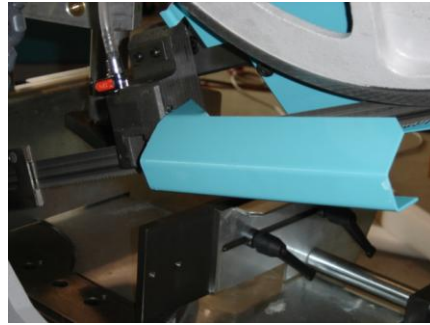


Repositioning of blade guard

Blade guard at RH end of sawframe may be moved out of the way without complete removal.



Shown in normal position



Shown rotated, for blade change

Raise material sensor device and block into place with a small hex key or pin as illustrated.

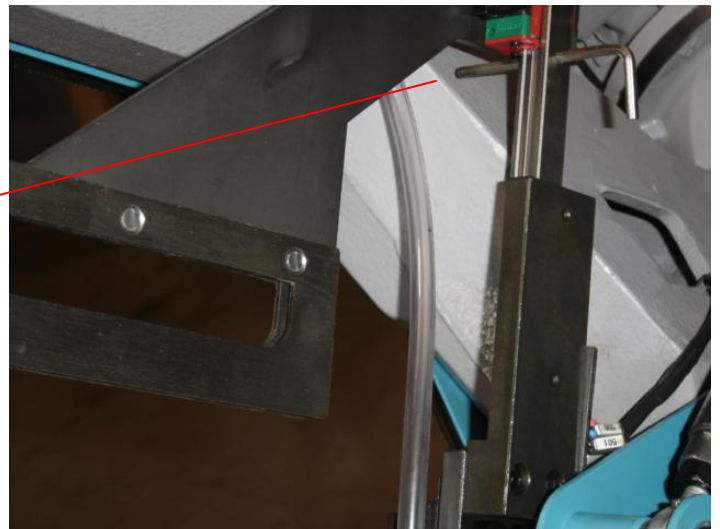
This will assist you by getting the device out of the way.

Turn blade tension screw with hex wrench provided (indicated with arrow) **counterclockwise** until blade is free. Remove blade from bandwheels.

Thoroughly clean areas of bandwheels and guides.

Check the tooth direction of blade, and place onto the two guide brackets in center of sawframe, then over bandwheels and through guides.

Lightly tension blade, checking to see that it is properly against the bandwheel flanges. Replace guards. Continue to tension blade until indicator LED (#25 on operators control) is illuminated.

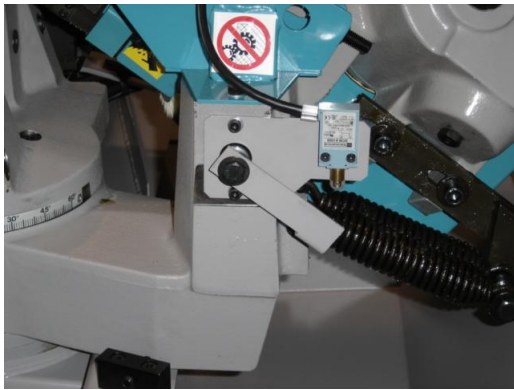


OPERATING THE MACHINE

Ensure that all of the above setup operations have been performed prior to attempting to make a complete sawing cycle.

The first setup adjustment to be made is the material cutoff point. Run the sawframe down until it has reached the point that will completely cut through your material, and set cutoff actuator so it actuates microswitch at cutoff point.

The device is spring loaded; no tools needed.



Cutoff actuator shown with sawframe
In fully raised position

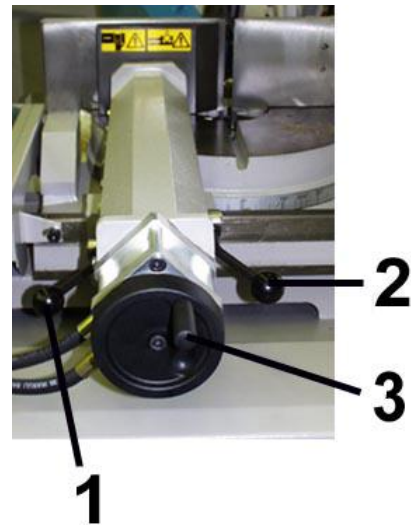


Cutoff actuator shown, adjusted for
cutoff position with sawframe down

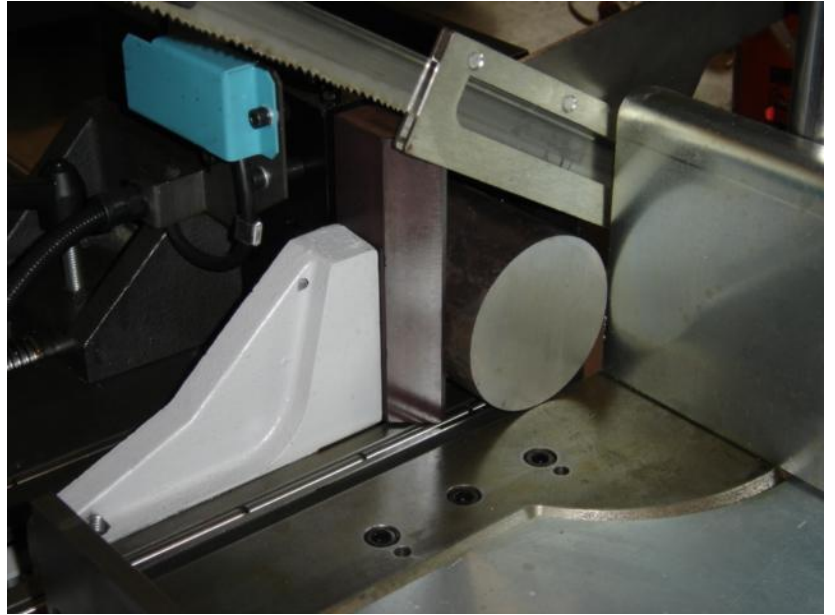
WISE

The machine is provided with a vise that adjustable in the front of machine. You should establish the best location of vise to clamp as near as possible to the blade. This is important in obtaining the best quality cut, and it is **CRITICAL** for **SAFE** operation.

- Push Vise Unclamp key (18)
- Loosen lever (1) to slide vise assembly laterally in front slot to desired position. Reclamp.
- Loosen lever (2) to slide vise jaw in and out from the workpiece. Reclamp
- Adjust the vise jaws to within 1/8" of the workpiece with handwheel (3).
- Push Vise Clamp key (19). Vise should be clamped prior to initiating an operating cycle, but in case this is neglected, vise will automatically clamp when cycle is started and unclamp when saw frame reaches top limit after a complete cycle.

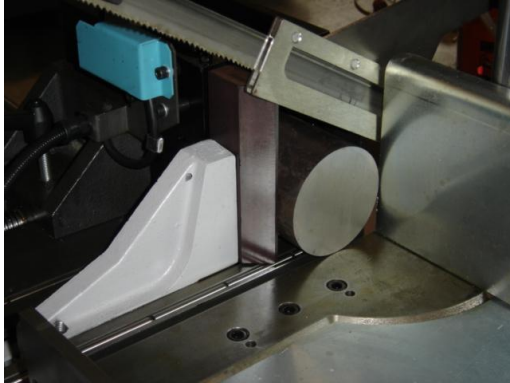


Place material to be cut in the vise, under the sawblade.

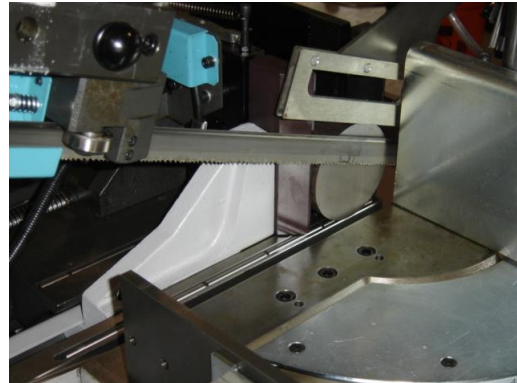


Operation Note

At all times during sawing the material height sensor will be in contact with the workpiece. When the material height sensor is above the workpiece the sawframe will be descending in rapid approach. When it is in contact with the workpiece the sawframe will be descending in the controlled feed rate, and controlled by the feed speed valve in front of the machine base.



Material height sensor shown with sawframe above workpiece



Material height sensor in contact with workpiece

Inspect LH guide assembly to ensure it is as close as possible to the workpiece.

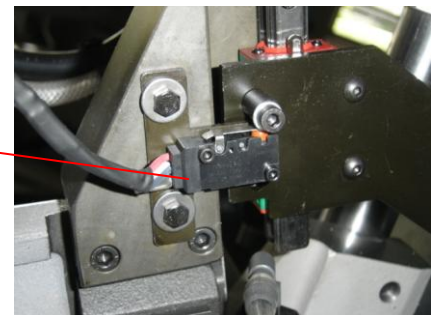


Push Cycle Start button. Check coolant flow and blade speed, and adjust as necessary.

Adjust Feed Speed until you reached desired sawing rate.

Additional notes:

The microswitch for the material sensor is mounted with two socket head cap screws. The switch operates 'normally open' (blue & black wires; the red wire is not used) To replace switch, remove black sheath and use wire connectors for blue & black wires. Red wire may be cut short.



UNDERSTANDING SAWING CONTROLS

Successful sawing requires an understanding of the sawing variables. Many sawing problems can be eliminated with proper understanding of the adjustments available to you on your machine.

BLADE SPEED

The charts contained in the "Applications" section are a result of years of research and testing by the bandsaw blade manufacturer. Pay attention to them. Make sure you use the proper blade speed for the type and size of material you are cutting.

If you have questions, call the factory or your local blade supplier.

The correct blade speed ensures that the material is being removed as quickly as possible. Too slow or too fast yields a chip load less than optimum and may dull the blade prematurely.

Too slow a blade speed will lead to overloading of teeth and crooked cuts.

Observe your chip load.

CHIP LOAD

Careful observation of the chip load is important when sawing. Chips could be nicely curled as shown in illustration.

Too tight a curl may mean too heavy a feed pressure.

Lack of a curl shows too little feed pressure.

Chips that are blue in color could mean too great a blade speed, too heavy feed pressure, or a combination of the two.

FEED SPEED

Feed speed valve controls the rate of saw frame descent. The setting should be so that the saw frame moves only as fast as the material is being removed with a proper chipload.

Open the valve slowly enough that the blade does not crash into the workpiece and damage the blade.

Often it is proper to ease the blade into the workpiece, then gradually open the valve further when the blade is well into the cut.

Angle Cutting

Your machine will make angle cuts from 0-45° left & 60° right.

To set an angle, first loosen lever behind the fixed vise jaw.

Swivel the saw frame until the graduation desired on the swiveling plate match the indicator on the base. Relock handle.

Stops are provided at 60-45-0-45 degrees.

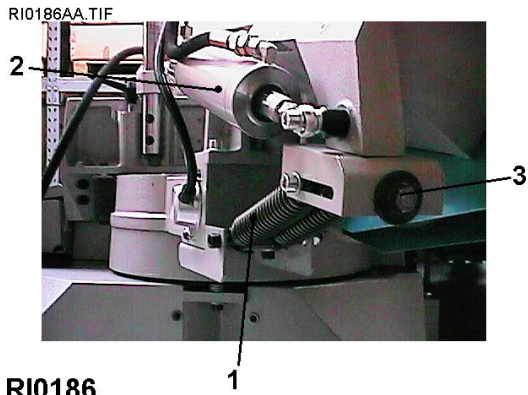
It may be necessary to readjust the moving vise jaw and the when miter cutting, as failure to do so may result in interference with the blade.



Head Weight

From time to time you may wish to change the sawframe counterbalance weight. The following illustration contains the following components. The hydraulic cylinder controls the downfeed speed. The springs compensate for the changing weight of the sawframe as it descends. The adjustment knob will provide either more or less head weight. Turn clockwise to reduce head weight.

1. Counterweight springs
2. Hydraulic Cylinder
3. Adjustment knob



MAINTENANCE

DAILY

- Clean all chips from machine
- Replenish coolant level
- Inspect all blades for sharpness
- Check blade tension and adjust as necessary

WEEKLY

- Remove and clean out coolant tank and replenish with fresh coolant mixture

Yearly

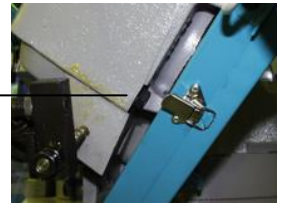
- Remove and replace gearbox oil

Oil Level

With sawframe in UP position, oil should be visible on end of dip stick illustrated (1)
With dipstick removed, this is also the hole through which oil is added.

Drain plug

Drain plug is found at bottom rear of gearbox. See illustration for drain plug removal (2)



RECOMMENDED OIL EQUIVALENTS

LUBRICATIONS CHART	
Location	Viscosity
Gearbox	100
Hydraulic System	46
Air Regulator/Oiler System	32

Variable Speed Drive Will Not Operate

There are a number of reasons that can cause the drive to not start or prematurely trip out. Following is a checklist of points to check:

-If a problem has occurred during operation, at times you can put the machine back into operation by recycling the power (turn off disconnect switch on operators console, leave it off for 2 minutes, and turn back on).

If this light is out because the internal protector of the motor has tripped, you must let the motor cool for awhile before restarting.

If the light is out because the drive has been overloaded, you should examine how the machine is being used. Some reasons for this can be:

- Dull Sawblade
- Sawblade too fine for the job being done. You need at least 3 teeth in the cut and not more than 7 (in a perfect world). You should try for this formula whenever possible.
- Too many teeth in the cut at once. This relates to the above; if you are laying a piece flat when you could stand it on end, this can contribute to the problem.
- Too slow a blade speed. If the chips aren't being removed fast enough the drive will become overloaded.
- Too fast downfeed rate. Slow it down.
- Too heavy with sawframe headweight. Adjust the spring tension to lighten the sawframe headweight.

-The main switch disconnect switch on the operators console trips out. If this disconnect switch shuts off machine power it could be an indication that this is set too low. Remove cover plate (two phillips head screws top center & bottom center) and you will see the pot for setting amperage. If the setting is too low, set it higher.. See picture at right

-Open cover of operators console, and you will see in the upper right hand corner the A/C drive, labeled ALTIVAIR. When you turn on power, you will see the rdy message. When the drive is in operation, you will see rdy (ready) on the panel.

When the drive has a problem, instead of rdy you will see most likely one of the following:

- OLF - which means the drive has been overloaded for some reason (reassess how you are using the machine)
- OSF - which means the supply voltage is too high (check your voltage)
- USF - which means the supply voltage is too low (check your voltage)

The most frequent problems with machines are voltage too high, voltage too low, and overloading the drive.



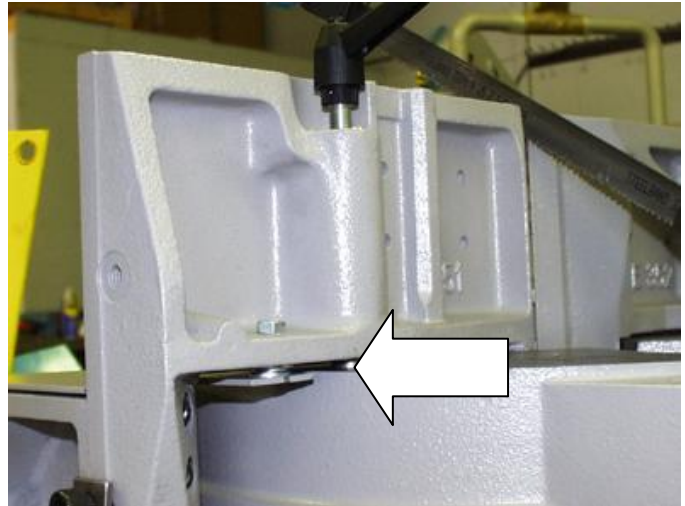
TROUBLESHOOTING

Aside from obvious machine malfunctions, most sawing problems can be attributed to improper practices or applications, and will result in blade problems or unsatisfactory cuts or cutting times.

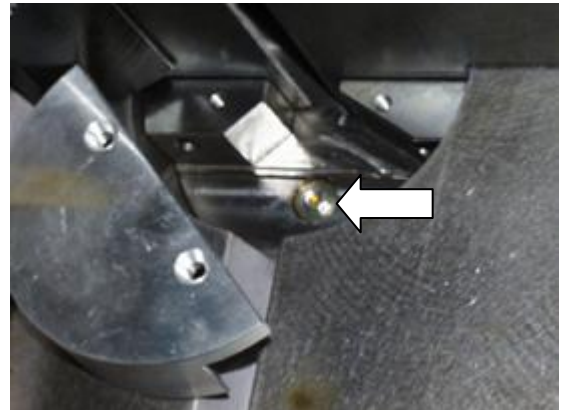
1. Improper application, i.e. an application not suited to a bandsawing machine
2. Improper blade selection, including
 - wrong pitch
 - wrong type
4. Material improperly clamped in machine vise
5. Improper use of coolant
6. Feed rate too heavy
8. Improper training of saw operator

Sawframe Will Not Swivel

Beneath the locking handle is a steel plug that contacts the swiveling turntable. It's about 20mm in diameter, and it's possible that rust & corrosion can lock it up. Remove the backfence and clean out this area.



Remove the aluminum insert and you find a grease fitting in item. Grease this. You may also want to clean any junk you find in this area, and use some light oil in the area. **Note:** If you do not have a grease gun for this type of fitting, please note it is called a "flush-style" grease fitting (with an M8 thread). You will also find tips (adapters) are available that will attach to your standard manual grease gun.



You can also take off the other backfence and clean out this area.

You must consider the coolant you are using, and how you mix it. You need a good grade of water soluble synthetic, and mix it leaner than 10:1.

VEGETABLE BASED COOLANT

OF NATURAL ORIGINS CALLED NATUR EP 700 SERIES, WITH THE PRECISE AIM OF IMPROVING DRAMATICALLY THE WORKING ENVIRONMENT CONDITIONS AND IN THE MEANWHILE TO SUPPLY CUTTING TOOLS PERFORMANCES HIGHER TO THAT ACHIEVABLE WITH THE USE OF TRADITIONAL CUTTING NEAT MINERAL OILS. NATUR 700 SERIES IS WHOLLY FREE FROM ANY LUBRICANT MINERAL OIL AND IT IS COMPOSED TOTALLY BY SYNTHETIC ESTERS DERIVED FROM RAW MATERIALS OF NATURAL ORIGINS. ODOURLESS, LIGHT-COLOURED, THESE PRODUCTS ARE WHOLLY BIODEGRADABLE AND ABSOLUTELY NON-TOXIC, THE USE OF NATUR 700 SERIES AVOIDS TOTALLY THE RISK DUE TO THE USE OF MINERAL OILS AND CONSEQUENTLY THE PERIODICAL MEDICAL VISIT.

IN ADDITION, NATUR 700 EP SERIES HAS AN EXCEPTIONAL LUBRICANT POWER COMBINED WITH EXTREME PRESSURE PREROGATIVES AND A GOOD COOLING ACTION WHICH KEEPS IT SUITABLE TO OBTAIN MAXIMAL RESULTS WITH STRONG FEEDS AND WITH THE TYPE OF WORKING TOOL, AVOIDING GASSINGS AND SEIZING-UP.

NATUR 700 EP SERIES HAS EVEN THE PREROGATIVE TO REDUCE SMOKES, HAS LOW VOLATILITY WHICH REDUCES NOTEWORTHY STEAM REDUCTION, SUCH AN EXCELLENT CHEMICAL STABILITY TO AVOID POLYMERISATION OR DEGRADATION OF THE USING PRODUCT; LAST, BUT NOT THE LEAST, NATUR 700 EP HAS THE CHARACTERISTIC OF AUTO EXTINGUISHING IMMEDIATELY AT THE ARISING OF A FIRE TRIGGER.

NATUR 707 EP IS A NEAT FLUID WITH COMPLEX ADDITIVATION, WITH VERY HIGH ANTIWELDING POWER AND CONSPICUOUS EXTREME PRESSURE RESISTANCE, AND, USED WITH TOOLS OR CERAMIC METAL INSERTS, IT ALLOWS TO DOUBLE THE FEED SPEED IN COMPARISON WITH THE USUAL PARAMETERS OF USAGE. THE USE OF NATUR 707 EP AVOIDS SMOKES THAT WOULD DEVELOP WITH TRADITIONAL OILS DURING THE INCREASING FEED SPEEDS MENTIONED ABOVE. FURTHERMORE, NATUR 707 EP IS SUITABLE TO BE USED ON GEAR-CUTTING MACHINES USING BOTH CUTTING SYSTEMS SUCH AS "GLEASON" AND SLOTTING MACHINE SUCH AS "FELLOWS". NATUR 707 EP IS ALSO WHOLLY FREE OF CHLORINE AND ITS DERIVATIVES.

PRODUCT SPECIFIC GRAVITY

AT 15 ° C KG/L

VISCOSITY CST AT 40 ° C FLASH POINT ° C.

NATUR 707 EP 0.928 68 290

POSSIBLE MACHINE PROBLEMS

MOTOR FAILS TO DEVELOP FULL POWER

1. Power line overloaded
2. Undersize wire
3. Low voltage from power company

MOTOR OVERHEATS

1. Motor overloaded
2. High or low power supply voltage
3. Air circulation over motor restricted

COOLANT FLOW INADEQUATE

1. Valve closed or clogged
2. Coolant tank empty
3. Crimped or restricted coolant line
4. Defective valve
5. Defective or clogged pump
6. Clogged pump filter inside main tank

CANNOT MAKE SQUARE CUT

1. Dull blade
2. Wrong blade for application;
3. Blade installed with teeth backwards
4. Vise not set at 90 °
5. Material not clamped squarely

BLADE WILL NOT CUT AT ALL

Blade mounted with teeth in wrong direction
Blade running wrong direction

MOTOR WILL NOT RUN

1. Low voltage
2. Fuse blown or circuit breaker open
5. Open circuit in wiring
6. Motor defective

MOTOR WILL NOT START; FUSES BLOW

1. Short circuit in line or cord
2. Short circuit in motor terminal box
3. Fuses too light
4. Defective motor

MOTOR STALLS EASILY

1. Low voltage supply
2. Inadequate wiring
3. Excessive pressure being used while sawing
4. Dull blade (in conjunction with above)

PREMATURE DULLING OR BREAKING OF SAWBLADE

1. Cutting speed too fast for material being cut
2. Feed rate too fast
3. Excessive feed pressure
4. Improper blade for material being cut
5. Cutting without proper coolant
6. Wrong coolant for job
7. Fusion of chips in sawblade (coolant problem)
8. Fusion of chips in sawblade (incorrect pitch)
9. Material loose in vise
10. Workpiece not properly clamped in vise, and moving during the cut

TEETH STRIPPING FROM BLADE

1. Excessive feed pressure
2. Feed speed too fast
3. Blade speed too slow
4. Gullets of teeth overloading, blade pitch too fine
5. Blade pitch too coarse
6. Workpiece not firmly clamped in vise jaws
7. Workpiece clamped incorrectly. When possible, flat and/or rectangular pieces should be placed on side, to allow cutting through thinnest possible section

CROOKED CUTS

1. Excessive feed pressure
2. Incorrect blade tension
3. Blade speed too slow
4. Too fine pitch of sawblade
5. Blade dull
6. Guides improperly set; gap too wide between carbides
7. Guides set too far from workpiece
8. Vise jaws not square to blade
9. Bandwheel flanges work, causing loss of set to one side of saw teeth

SAW BLADE "KICKS"

Chips have fused in teeth (see 8 & 9 above)

Material to Cut		Bi-Metal Band	S.F.P.M.	Cut Rate Sq. In./Min.	Feed Pressure	Tool life Sq. In./Ft.	Material Characteristics
Low Carbon	1010-1019	Matrix II	300-350	11 to 15	Medium/Light	650 to 800	Free Machining
Medium Carbon	1020-1050	Matrix II	190-225	7 to 9	Medium/Light	425 to 700	Free Machining
High Carbon	1055-1095	Matrix II	145-170	6 to 8	Medium	300 to 400	Free Machining
Free Machining	1109-1113	Matrix II	300-350	12 to 15	Medium/Light	700 to 850	Free Machining
Free Machining	1115-1213	Matrix II	200-250	8 to 10	Medium/Light	500 to 750	Free Machining
Manganese	1320-1340	M42/M51	175-220	6 to 8	Medium	330 to 375	Work Hardening
Nickel	2015-2517	M42/M51	225-250	6 to 7	Medium	250 to 300	Work Hardening
Nickel	2320-2350	M42/M51	145-170	5 to 6	Medium	250 to 300	Work Hardening
Nickel	2512-2515	M42/M51	175-200	4 to 5	Medium	250 to 300	Work Hardening
Nickel-Chrome	3115-3150	M42	125-160	6 to 9	Medium	275 to 350	Tendency to Chip Weld
Nickel-Chrome	3215-3240	M42/M51	110-140	5 to 8	Medium	250 to 300	Work Hardening
Nickel-Chrome	3415-3450	M42/M51	90-125	4 to 6	Medium/Heavy	250 to 300	Work Hardening
Molybdenum	4023-4037	Matrix II	230-270	6 to 8	Medium	350 to 375	Abrasive
Molybdenum	4042-4063	Matrix II	180-220	5 to 7	Medium/Heavy	325 to 350	Abrasive
Chrome-Moly	4120-4140	M42/M51	185-210	5 to 7	Medium	275 to 350	Work Hardening/Abrasive
Chrome-Moly	4320-4340	M42/M51	180-230	5 to 7	Medium	250 to 325	Work Hardening/Abrasive
Nick-Chro-Moly	8020-8750	M42	175-230	5 to 7	Medium	275 to 425	Good Cutting Characteristics
Nick-Chro-Moly	9310-9850	M42/M51	160-220	4 to 6	Medium/Heavy	175 to 300	Work Hardening
Nickel-Moly	4615-4640	M42/M51	210-240	5 to 7	Medium	275 to 300	Work Hardening
Nickel-Moly	4812-4820	M42/M51	175-190	4 to 6	Medium/Heavy	225 to 275	Work Hardening
Chrome	5120-5160	M42	190-230	6 to 8	Medium	225 to 350	Good Cutting Characteristics
Chrome	50100-52100	M42/M51	150-185	4 to 6	Medium	200 to 275	Abrasive
Chro-Van-Silicon	6115-6120	M42	160-225	3 to 6	Medium	200 to 275	Abrasive
Silicon	9255-9262	M42	175-210	8 to 16	Medium	175 to 250	Extremely Abrasive
Stainless	201-304	M42/M51	80-125	2 to 4	Medium/Heavy	275 to 300	Work Hardening
Stainless	308-348	M42/M51	55-80	1 to 2	Medium/Heavy	100 to 250	Work Hardening
Stainless	410-430	M42/M51	110-150	2 to 4	Medium	125 to 250	Work Hardening/Abrasive
Stainless	440 & 17-series	M42/M51	75-110	1 to 2	Medium/Heavy	125 to 175	Work Hardening/Abrasive
Tool Steel	M1,M2,M3,T1,T2	M42/M51	120-150	3 to 5	Medium/Heavy	125 to 175	Work Hardening/Abrasive
Die Steel	O-1, O-2, O-6, O-7	M42/M51	175-210	3 to 5	Medium/Heavy	225 to 350	Work Hardening/Abrasive
Die Steel	A-2, A-4	M42/M51	180-220	3 to 4	Medium/Heavy	200 to 250	Work Hardening/Abrasive
Die Steel	D-2, D-3, D-4	M42/M51	90-120	2 to 3	Medium/Heavy	125 to 175	Work Hardening/Abrasive
Hot Work Steel	H12, H13, H21	M42	160-200	4 to 5	Medium	275 to 325	Abrasive
Hot Work Steel	H22, H24, H25	M42	130-175	2 to 4	Medium/Heavy	175 to 225	Abrasive
Monel		M42/M51	60-90	.5 to 4	Medium/Heavy	50 to 100	Extremely Work Hardening
Inconel		M42/M51	50-80	.5 to 4	Medium/Heavy	25 to 70	Extremely Work Hardening
Hastelloy		M42/M51	50-80	.5 to 4	Medium/Heavy	55 to 100	Extremely Work Hardening
Titanium		M42/M51	40-60	.5 to 4	Medium/Heavy	25 to 60	Extremely Work Hardening
Aluminum	2011-7075	Matrix II	325-400	14 to 25	Medium/Light	175 to 275	Abrasive/Chip Build-up
Copper		Matrix II	275-350	6 to 8	Medium/Light	250 to 600	Good Cutting Characteristics
Bronze		Matrix II	225-300	14 to 18	Medium/Light	200 to 425	Good Cutting Characteristics
Brass Red		Matrix II	225-300	14 to 18	Medium/Light	225 to 400	Good Cutting Characteristics
Brass, Naval		Matrix II	275-350	10 to 14	Medium/Light		Good Cutting Characteristics
Cast Iron		Matrix II	165-225		Medium		
Cast Steel		Matrix II	110-225		Medium		
Structurals		Matrix II	175-250		Medium/Light		Tooth Breakage Potential

Material	24 W	18/14	14/10	12/8	10/6	8/5	6/4	4/3	3/2	4 H	3 H	1.5/1
Thin Gauge												
1/8" - 1/4"												
1/4" - 1/2"												
1/2" - 1"												
1" - 3"												
3" - 6"												
6" - 9+"												
Wide Material Range Selection												
1/2" - 3"												
1" - 6"												
3" - 9+"												
Interrupted Cut Tubing/Structural Selection*												
Thin Tube												
Extrusions												
Normal Wall												
Heavy Wall												

*Note: There are two specialty brands available for interrupted cut applications: wavy set 'New Wave' for thin tube and extrusions or extra set 'Kerf Plus' in order to reduce pinching when cutting structural shapes.

PERFORMANCE COMPENSATION

The correct tooth pitch, tooth design, feed rate and band speed (s.f.p.m.) are critical to providing maximum cut rate, tool life, finish and cut accuracy. In certain unique situations it may be desirable to sacrifice one or more of these parameters in order to improve another. You must keep in mind that when you deviate from normal recommendations in order to improve an area with an 'X' that you will sacrifice results in the unmarked boxes.

To Improve	Cut Rate	Tool Life	Finish	Accuracy
Finer Pitch			X	
Coarser Pitch	X			
Reduce Feed			X	X
Increase Feed	X			
Medium Feed		X		
Positive Rake	X	X		
0° Rake Angle			X	

TOOTH PITCH SELECTION

Determine the **actual range of materials** which you normally cut. Select the material size range row which covers the highest % of your materials. Follow *across* the row to the shaded blocks. Follow *up* the columns to find the recommended tooth pitch. Select from two choices for each material range. The *finer* tooth pitch is the normal cut rate, *conservative* recommendation. The *coarser* tooth pitch is more *aggressive* providing faster cutting rates. Always follow the correct feed and speed recommendations.

Select *conservative* if most of your material is at the smaller end of your selected range, if your saw is in poor condition or is undersized for the application. Select *aggressive* if most of your material is at the larger end of your selected range, your saw is properly sized and is in good condition.

Note: Using a tooth pitch one step below material size recommendations will reduce production by as much as 50%

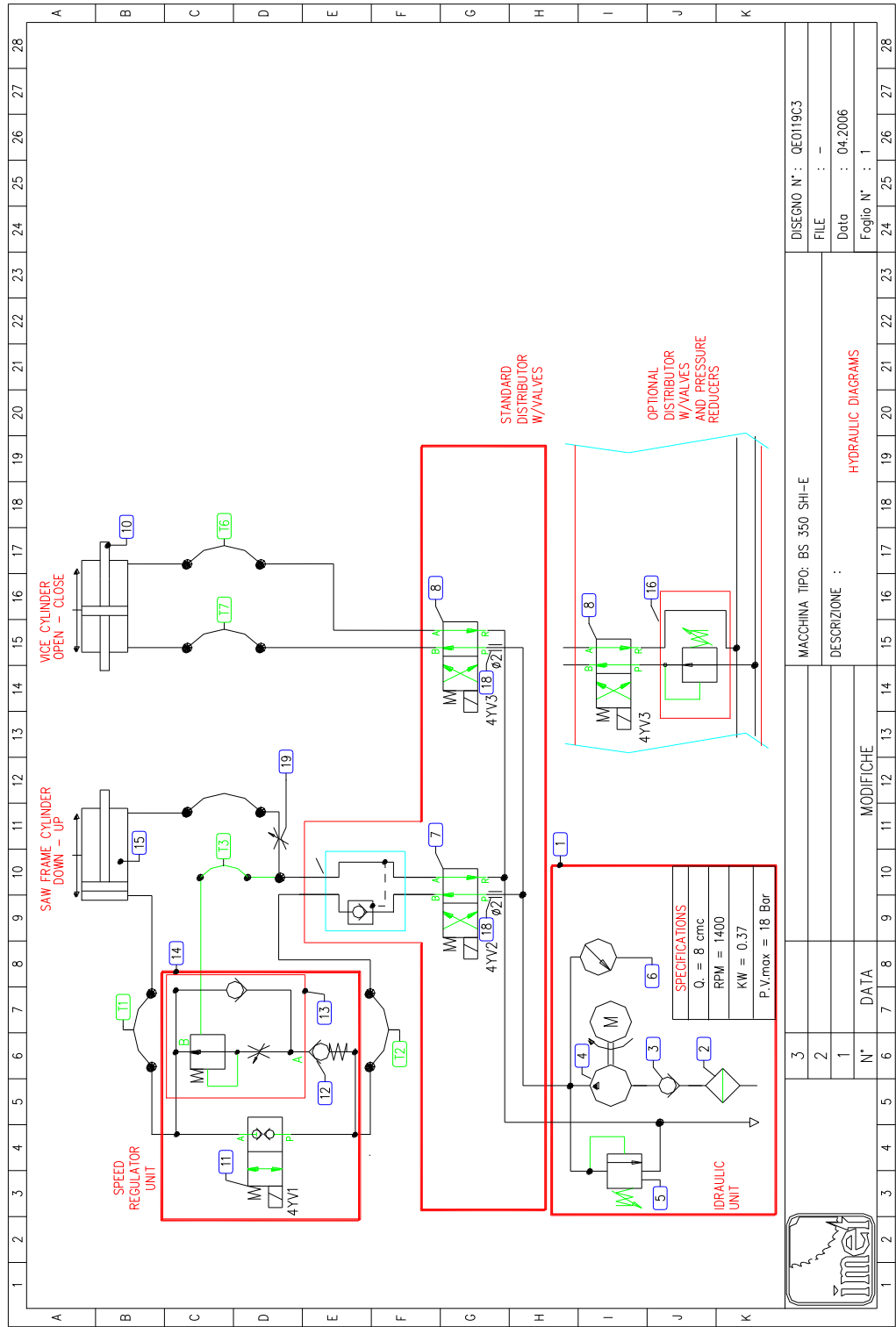
TOOTH STYLE SELECTION

Several tooth face designs are available for most tooth pitches and material types; select the appropriate tooth design.

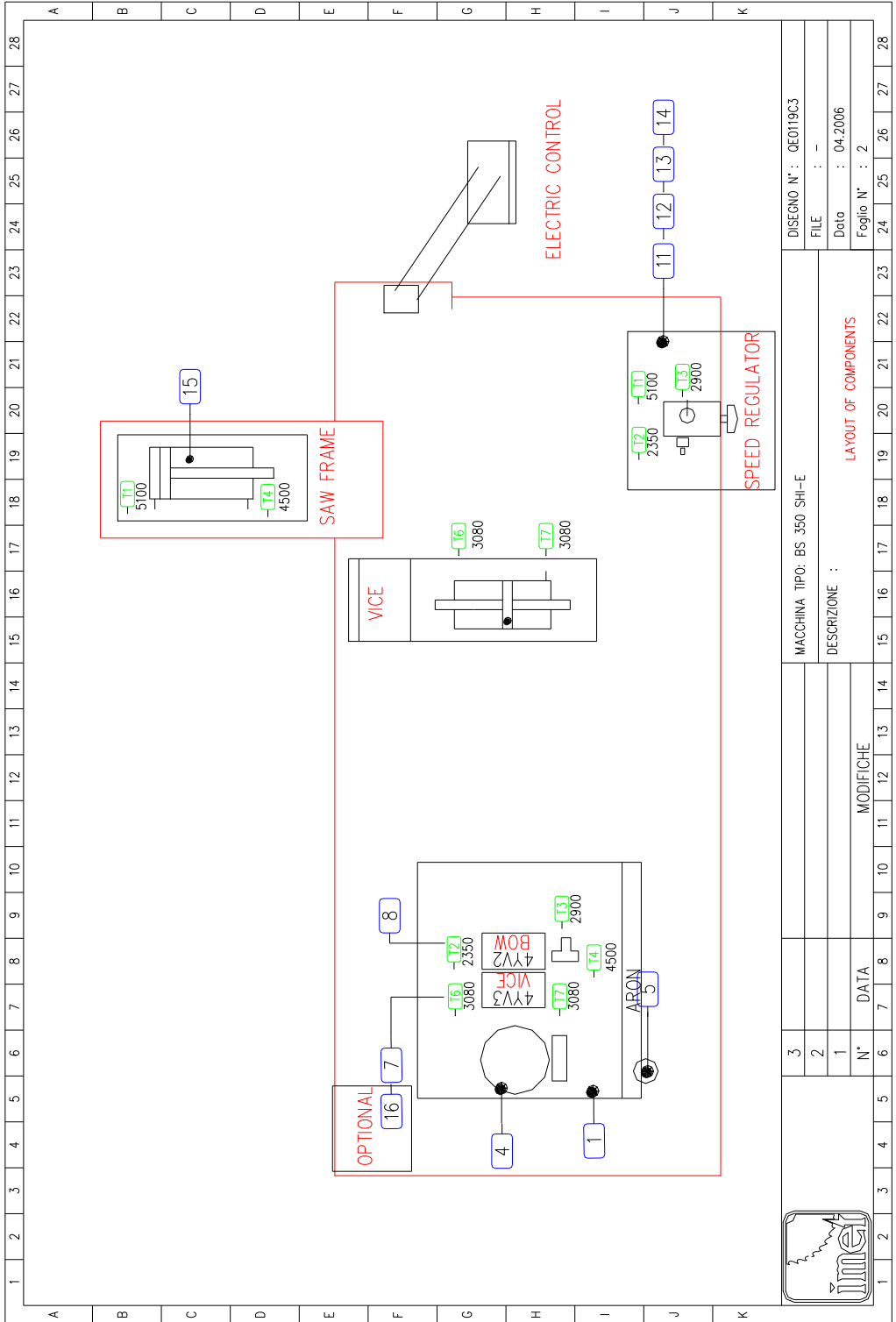
Aggressive 7° tooth face (M11 and M42) for improved band life when cutting solids at reduced feed pressures.

Aggressive 12° tooth face (M51) for improved performance cutting hard or hardening solids at reduced feed pressures.

Tough, forgiving 0° tooth face for cuts on structural shapes, tubing or for maintenance department applications.




3	MACCHINA TIPO: BS 350 SH-E	DESCRIZIONE :	MACCHINA TIPO: BS 350 SH-E	23	24	25	26	27	28
2				21	22	23	24	25	26
1				19	20	21	22	23	24
N*	MODIFICHE			17	18	19	20	21	22
6	DATA			15	16	17	18	19	20
7				13	14	15	16	17	18
8				11	12	13	14	15	16
9				9	10	11	12	13	14
10				7	8	9	10	11	12
11				5	6	7	8	9	10
12				3	4	5	6	7	8
13				1	2	3	4	5	6
14									
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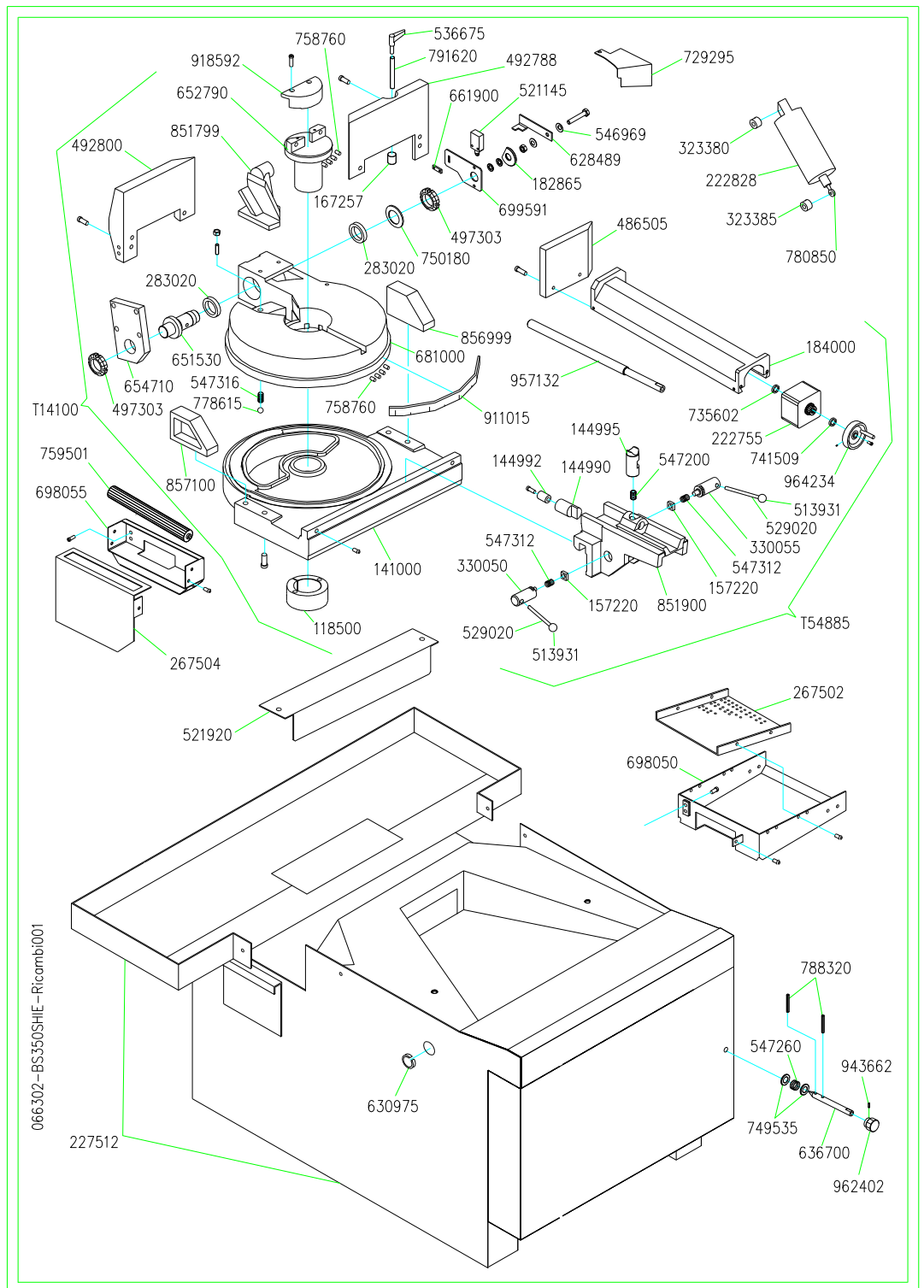


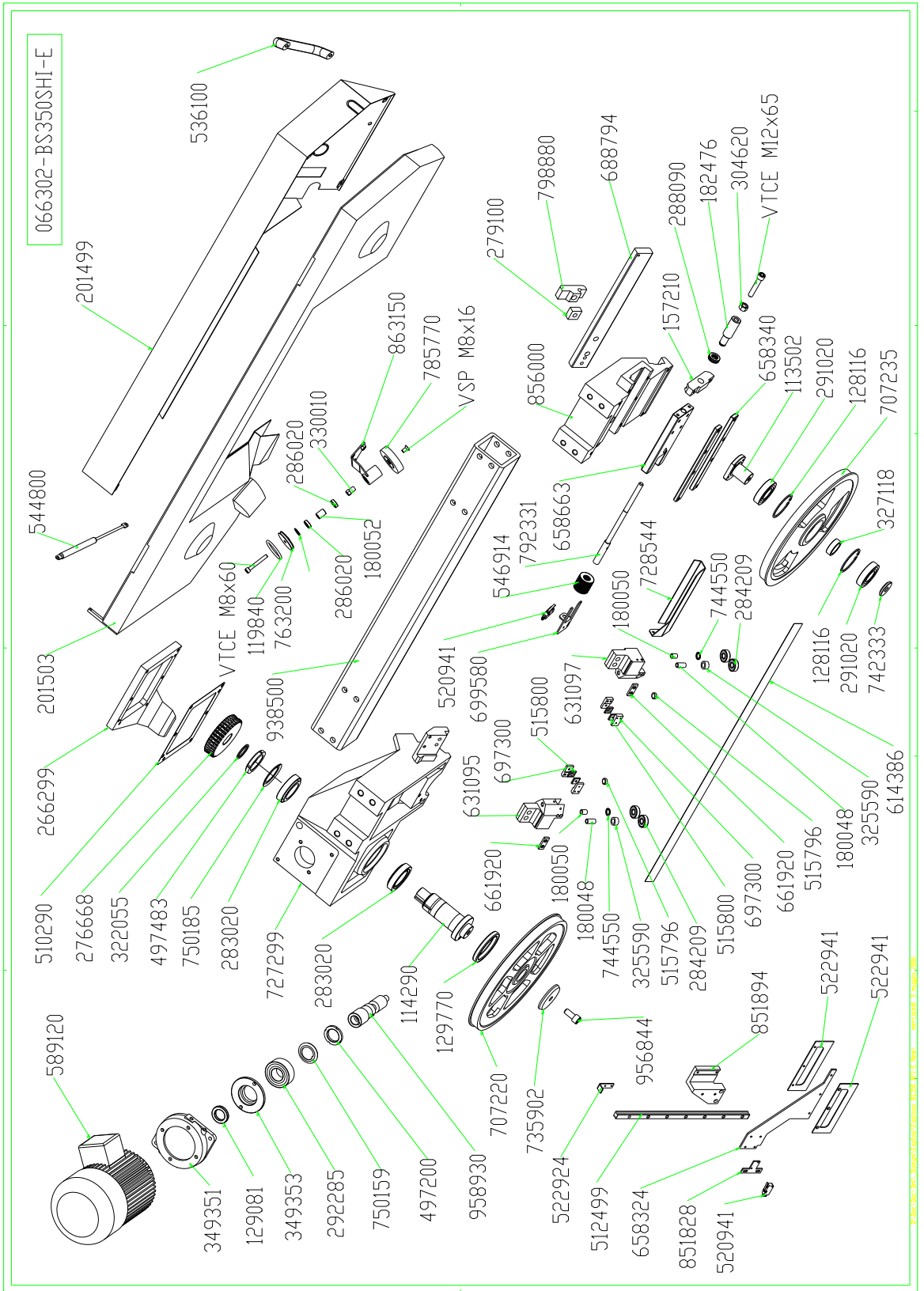
3	MACCHINA TIPO: BS 350 SH-E	DESGNO N° : 0E019C3
2	DESCRIZIONE :	FILE : -
1	DATA	Data : 04.2006
N°	MODIFICHE	Foglio N° : 2

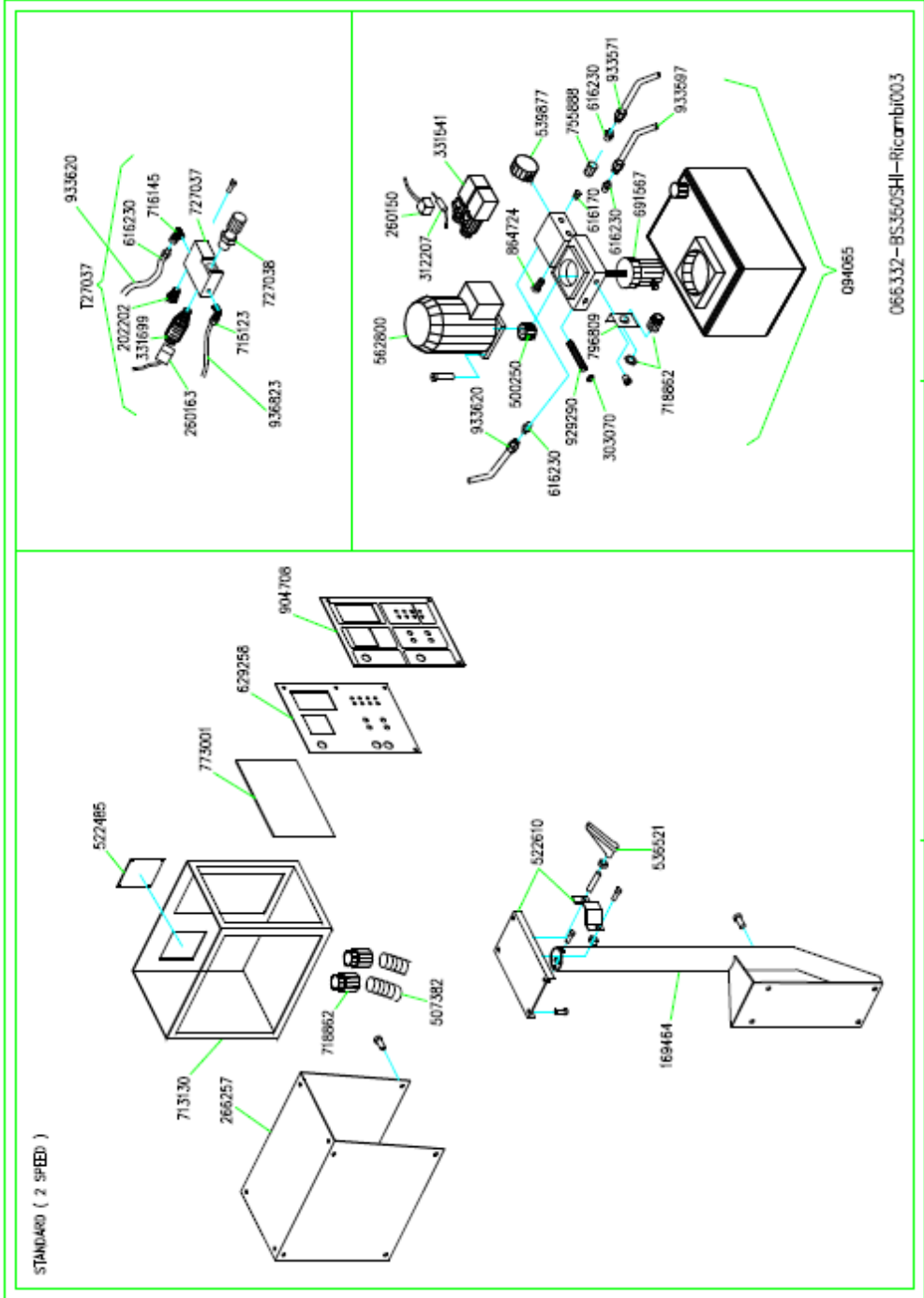
LAYOUT OF COMPONENTS	
15	26
16	27
17	28

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28						
REF.	DESCRIPTION							SPECIFICATION							FACTORY	TYPE	PART NUMBER	Q.TY															
A	1	COMPLETE HYDRAULIC UNIT	MODULAR ELEMENTS w/MOTOR 6POLES 0.25KW							IMET																							
B	1	OIL FILTER	MODULAR ELEMENTS w/MOTOR 4POLES 0.25KW							HYTOS																							
C	3	ONE-WAY CHECK VALVE	D. 80 X 28																														
	4	HYDRAULIC PUMP	CARTRIDGE TYPE																														
	5	MAX. PRESSURE CONTROL VALVE	9.2 cc MARZOCCHI - 5.9 cc HYTOS																														
	6	PRESSURE GAUGE	0 - 50 BAR							WIKA																							
D	7	DIRECTIONAL CONTROL VALVE/ONE POSITION	0 - 40 BAR							ARON																							
	8	DIRECTIONAL CONTROL VALVE/ONE POSITION	4/2 - Tensione 24Vd.c.							ARON																							
			4/2 - Tensione 24Vd.c.																														
E	10	ACTING VICE CYLINDER								IMET																							
	11	DIRECTIONAL CONTROL VALVE/TWO WAY-TWO POS.	CARTRIDGE TYPE							COMATROL																							
	12	ONE-WAY CHECK VALVE	CARTRIDGE TYPE							COMATROL																							
F	13	SPEED REGULATOR	FLOW RATE = 3 LT/MIN							ARON																							
	13	-	FLOW RATE = 3 LT/MIN							HYTOS																							
G	14	COMPLETE SPEED REGULATOR UNIT								IMET																							
	15	DOUBLE ACTING SAW FRAME CYLINDER	D. 50							GHETTI																							
	16	OPTIONAL	PRESSURE REGULATOR VALVE							IMET																							
	17	PILOT CHECK VALVE (only from 12/98)	MIN PRESS.1 BAR							ARON o ATOS																							
H	18	-	D2411							IMET																							
	19	ON/OFF Cock	1/4" female/female							AIGNEP																							
I	T1	FLEXIBLE LINE FOR SAW FRAME CYLINDER	R7 1/4 L.5100							PBC																							
	T2	FLEXIBLE LINE FOR SPEED REGULATOR	R6 3/8" L.2350							PBC																							
	T3	FLEXIBLE LINE FOR SPEED REGULATOR	R7 3/16" L.2900							PBC																							
J	T4	FLEXIBLE LINE FOR SAW FRAME CYLINDER	R6 3/8" L.4500							PBC																							
	T6	FLEXIBLE LINE FOR VICE CYLINDER	R6 3/8" 3450							PBC																							
K																																	

			MACCHINA TIPO: BS 350 SH-E		DESCRIZIONE :		GENERAL LIST OF COMPONENTS		DISEGNO N° : OE01963	
3									FILE : -	
2									Data : 04.2006	
1									Foglio N° :	
N°	DATA		MODIFICHE							







Part# **Description**

113502--BS 280 FRONT BAND WHEEL
SHAFT--
114290--BS350 BACK BAND WHEEL
SHAFT--
118500--BS350 CENTRAL PIN RING--
119574--OR RING 3275 2,62X69--
119840--OR RING 6400 3,34X47--
127810--SEEGER RING A17 RTD TABLE--
128030--SEEGER RING J22 / BS350
BRUSH--
128116--SEEGER INNER RING J72--
129696--SEAL RING 40X55X7--
129770--SEAL RING 75X95X12--
136827--LENGTH STOP ROD D.20
BS340/280--
141000--FLOOR STAND SIRIO--
144990--VICE LOCKING CONN.ROD
BS350--
144992--VICE NUT D.20 BS350--
144995--VICE THREADED BRASS NUT
BS350--
157210--BAND TENSIONER BLOCK
280350NEW--
157220--VICE ROD FOR BS 350--
172180--BASE LOCKING BUSH D20
BS280--
179458--SPACER D.6,5X10X14--
180048--LEFT BAND GUIDE BUSH
BS350--
180050--RIGHT BAND GUIDE BUSH
BS350--
180052--SPACER D16 BS350--
181950--CYLINDRICAL BUSH BS350 SHI-
-
182433--TEMPERATED BUSH 10X15X12-
-
182466--TEMPERATED BUSH 12X18X12-
-
182476--BAND STRETCHER BUSH--
184000--VICE CARRIAGE BS350--
188051--HIWIN HGW15CAZ0C
CARRIAGE--
201499--TUBE GUARD 12" BS350--
201503--BAND GUARD-2 PIECES- BS350-
-
205328--HYDRAULIC UNIT W/MOTOR--
205600--ARM BASE HINGE BS280AFI-E--

205900--EL.CONTROL BOX HINGE
BS280AFIE--
216270--KEY 8X7X25 UNI6604--
222830--CYLINDER SHI D.50--
227512--BASE FOR BS350 GH/SHI/SHI-E-
-
260150--4WAYS CONNECTOR--
265792--CAM HOLDER COVER BS350
GH--
265818--ELECTRIC BOARD COVER
350SHIE--
266299--GEAR BOX COVER--
267502--UNLOADING ROLLER COVER
BS350--
267504--LOADING ROLLER COVER
BS350SHIE--
276668--BRONZE WHEEL BS350 ME Z37-
-
279100--WEDGE FOR BANDGUIDE ROD
BS350--
280060--VICE ADJUSTING WEDGE
BS350--
280765--HK1616 CARRIAGE
CONNECTION--
283020--CARR.CONN. 32010X 50X80X20-
-
284209--BEARING 6201.2ZR 12X32X10--
286020--BRUSH/PUMP CARRIAGE
CONNECTION--
288090--BEARING 51103 ..X..X.--
291020--CARRIAGE CONNECTION 6207
35X72--
292285--CARR.CONN. 3207A 35X72X27--
322055--WHEEL ADJUSTING SPACER
350--
323380--CYLINDER BACK SPACER 350--
323385--CYLINDER FRONT SPACER 350-
-
327118--PULLEY SPACER D.35X42
BS280--
327201--HEXAGONAL SPACER 7X65--
327281--COOLANT DISTRIBUTOR
BS280--
330010--HEXAGONAL BRUSH
CONNECTION--
330050--VICE LOCKING ECCENTRIC
BS350--
330055--VICE RAPID MOVING
ECCENTRIC 35--

[331427--LONG ELECTRIC PUMP](#)
[230400460--](#)
[331925--HOSE CLAMP W2 12-20--](#)
[332100--HOSE CLAMP HOP9--](#)
[349351--MOTOR/REDUCTION FLANGE](#)
[BS350--](#)
[349353--ENDLESS SCREW FLANGE](#)
[BS350--](#)
[486505--VICE CARRIAGE JAW BS350--](#)
[492788--RIGHT JAW BS350--](#)
[492800--LEFT JAW BS350 SHI-E--](#)
[497200--RING KM7 M35X1,5--](#)
[497303--LOCKING RING KM9 M45X1,5--](#)
[497483--RING KM10 M50X1,5 BS340PR--](#)
[499850--RING M45X1,5--](#)
[510200--ELECTROPUMP SEAL](#)
[D.130X102--](#)
[510290--REDUCTION GASKET BS350--](#)
[511290--SAW FR.CYL.GASKET](#)
[MDB2X400501--](#)
[512499--GUIDE HIWIN LGR15R417C](#)
[20/37--](#)
[513931--BLACK HANDLE D.12x40--](#)
[514762--BLACK HANDLE DIA. 30-M8--](#)
[515753--OILER M8 CH10--](#)
[515780--SPECIAL INSERT D15,95X6,4--](#)
[515800--SQUARE CARBURE PAD 19,3X4](#)
[F.4--](#)
[520941--STROKE-END ABV161660--](#)
[521000--STROKE END SWITCH](#)
[TELEMEC.--](#)
[521145--STROKE END SWITCH](#)
[TELEMEC.--](#)
[521580--LEGRAND PLASTIC STRING--](#)
[521652--OIL HOSES SUPPORT FOR BS](#)
[350--](#)
[521903--TURNING ARM SUPPORT](#)
[BS350SHI-E--](#)
[521920--UNDER BASE METAL SHEET,](#)
[BS 350--](#)
[522100--REDUCTION SPRINGS FIXED](#)
[GUARD--](#)
[522630--TUBE SUPPORT FOR BS 350--](#)
[522924-----](#)
[522941-----](#)
[529020--CYLINDER LOCKING LEVER--](#)
[536100--HANDLE UGN565.2-26-160-SW--](#)
[536419--HANDLE M8X20 TYPE 63--](#)
[536521--TURNING HANDLE M10 TYPE80-](#)

[536675--TURNING HANDLE M12X45](#)
[TYPE 80--](#)
[544800--GAS SPRING 082597 SIR/VEL](#)
[AF-E--](#)
[546938--SPINDLE CUP SPRING](#)
[40X20,4X2,5--](#)
[546957--CUP SPRING 31,5X16,3X2--](#)
[546969--CUP SPRING 25X12,2X1,5--](#)
[547200--SPRING 12X19X2--](#)
[547210--SPRING 14,5X22X2--](#)
[547260--SPRING 22,8X22X1,5--](#)
[547263--HEAD SELECTOR SPRING](#)
[SIRIO--](#)
[547316--BASE SPRING](#)
[BS280PLUS/340/350--](#)
[547652--SAW FRAME RETURN SPRING](#)
[340280--](#)
[548950--VICE CYLINDER SPRING](#)
[VTF500--](#)
[589120--3PH MOTOR 2-4P V400 BS350--](#)
[614515-5/7--BAND 3370X27X09 SVGLB](#)
[M42 5/7--](#)
[616170--BRASS THREADED](#)
[CONNECTION M4-4--](#)
[616230--OIL THREADED CONNECTION](#)
[1/4--](#)
[616628--CONNECTION 1/2"X 1/2"--](#)
[620382--HYDRAULIC OIL 46 CST--](#)
[621898--REDUCTION OIL BS280](#)
[EP100CST--](#)
[628489--STROKE-END PLATE BOW](#)
[DOWN--](#)
[630700--CABLE GLAND PG13,5 MIRKO--](#)
[630975--CABLE GLAND SB1750-22--](#)
[631095--BACK BAND GUIDE BS350--](#)
[631097--FRONT BAND GUIDE BS350--](#)
[631150--LOWER BAND GUIDE BS350--](#)
[631155--FRONT BAND GUIDE BS350--](#)
[632788--BRASS. SPACER D.10--](#)
[646550--SPRINGS CONNECTION PIN](#)
[L.90--](#)
[651530--OSCILLATING PIN FOR BS 350--](#)
[652790--PLATFORM CENTRAL PIN](#)
[BS350--](#)
[654710--REDUCTION PLATE BLOCKING](#)
[PLATE--](#)
[658270--SPRINGS CONNECTION PLATE](#)
[BS350--](#)
[658324--APPROACHING PLATE BS280--](#)

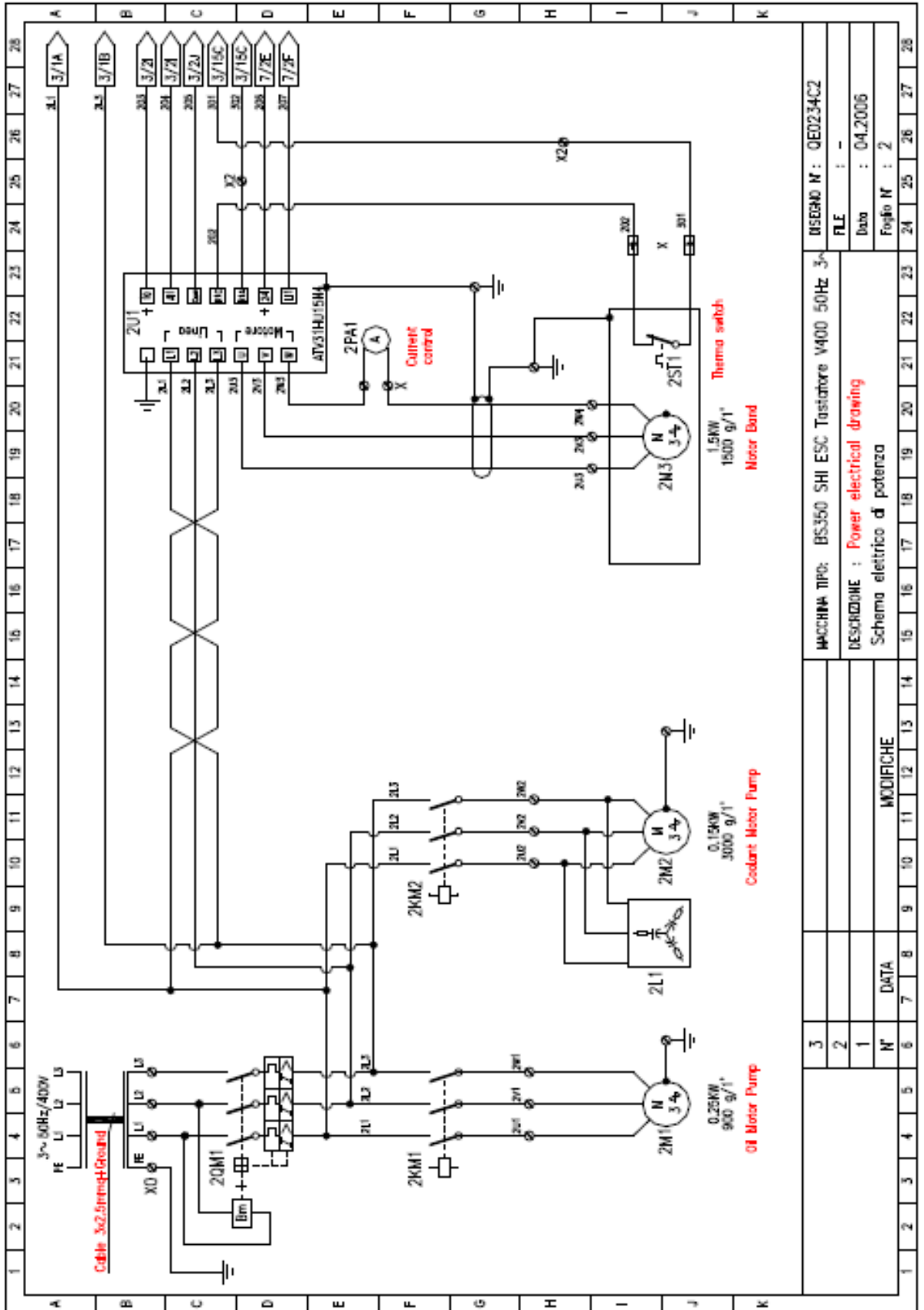
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658340--BAND TENSIONING GUIDE
PLATE BS--
658663--FRONT BAND TENS.PLATE
80X20--
661890--ROLLERS HOLDER FIXING
PLATE 35--
661900--PLATE FOR LOWER
BANDGUIDE VTF--
661915--PLATE FOR BANDSTRETCHER
2XM3--
661920--BRUSH LOCKING PLATE
BS280/60PL--
667765--DOUBLE PLATE RPD0055-4,8--
673860--BANDGUIDE STROKE-END
PLATE--
681000--SWIVELING LATFORM BS350--
688794--MOVING FRONT BAND GUIDE
PLATE--
690814--COOLANT SPRAY GUN--
694925--RUBB.HOSE CONNECTOR
D.14X1/2"--
696080--NYLON RUBB.HOSE
CONNECTOR GES6--
696224--NYLON RUBB.HOSE
CONNECTOR R1/8--
696346--NYLON PUSH-ON CONNECTOR
R1/2--
697300--PAD SUPPORT FOR BAND
GUIDE 350--
697836--ELECTROPUMP SUPPORT--
698050--UNLOAD.W40 ROLLER HOLDER
BS350--
698055--W40 LOADING ROLLER
HOLDER 350--
699580--BAND FRONT STROKE-END
HOLDER--
699591--STROKE-END HOLDER
NEWAUT--
707220--PULLEY D.360 BS350--
707235--PULLEY D.360 BS350--
712020--BOX FOR KEYBOARD--
713108--EL.CONTROL PANEL BS350
SHI-E--
716145--ELBOW CONNECTION G-
AMF=5020A1--
716823--OIL CONNECTION D.6 1/4"--
718999--OIL CONNECTION D.8 1/4"CON.-
-
719061--OIL CONNECTION D.8
1/4"CILE321--

719073--OIL CONNECTION D.6 1/8"--
722000--3WAY CONNECTION 1/2"--
722345--CONNECTION T-4FFM-L=4050
1/4"--
725445--ALUMINIUM LENGTH STOP
DEVICE--
726786--LENGTH STOP ROD D.20
BS340/280--
727044--CMP.UNIT SPEED REGULATOR
ARON--
727299--FRAME REDUCER BS350--
727803--REDUCTION PG16F PG13.5M--
728544--FRONT BAND COVER BS350--
729295--PLATFORM FRONT COVER
BS350--
734694--COPPER WASHER 1/4--
734698--COPPER WASHER 1/8--
735602--SUPPORT WASHER
SS22X32X2--
735902--BACK PULLEY WASHER BS350--
738976--WASHER 45X12X5--
741509--SUPPORT WASHER
SS20X28X2--
742333--WASHER 45X35X10,5--
742431--BURNISHED WASHER 35X10X6-
-
744100--WASHER 20X11,5--
744500--SUPPORT WASHER
SS9X15X1,2--
744550--SUPPORT WASHER
SS13X19X1,5--
744611--PRINTED WASHER 5X15X1,2--
744715--PRINTED WASHER 6X18X2--
744820--PRINTED WASHER 8X24X2--
744987--PRINTED WASHER 12X30X4--
750011--KNURLED SCHNORR WASHER
D.8--
750159--WASHER MB7 M35X1,5--
750180--SAFETY WASHER MB9
M45X1,5--
755801--COCK 6310 1/8"MF--
755888--COCK ART.400 1/4" FEM/FEM.--
755995--COCK 405 1/2"MF--
758760--ROLLER 6X6 BS350--
763200--BRUSH DRIVE WHEEL FOR BS
350--
778615--BALL D.12 BS280--
780850--UNIBALL JOINT SMG10 M10--
785770--NYLON BRUSH D.100X20--
788270--ELASTIC PIN 5X10 DIN7343--

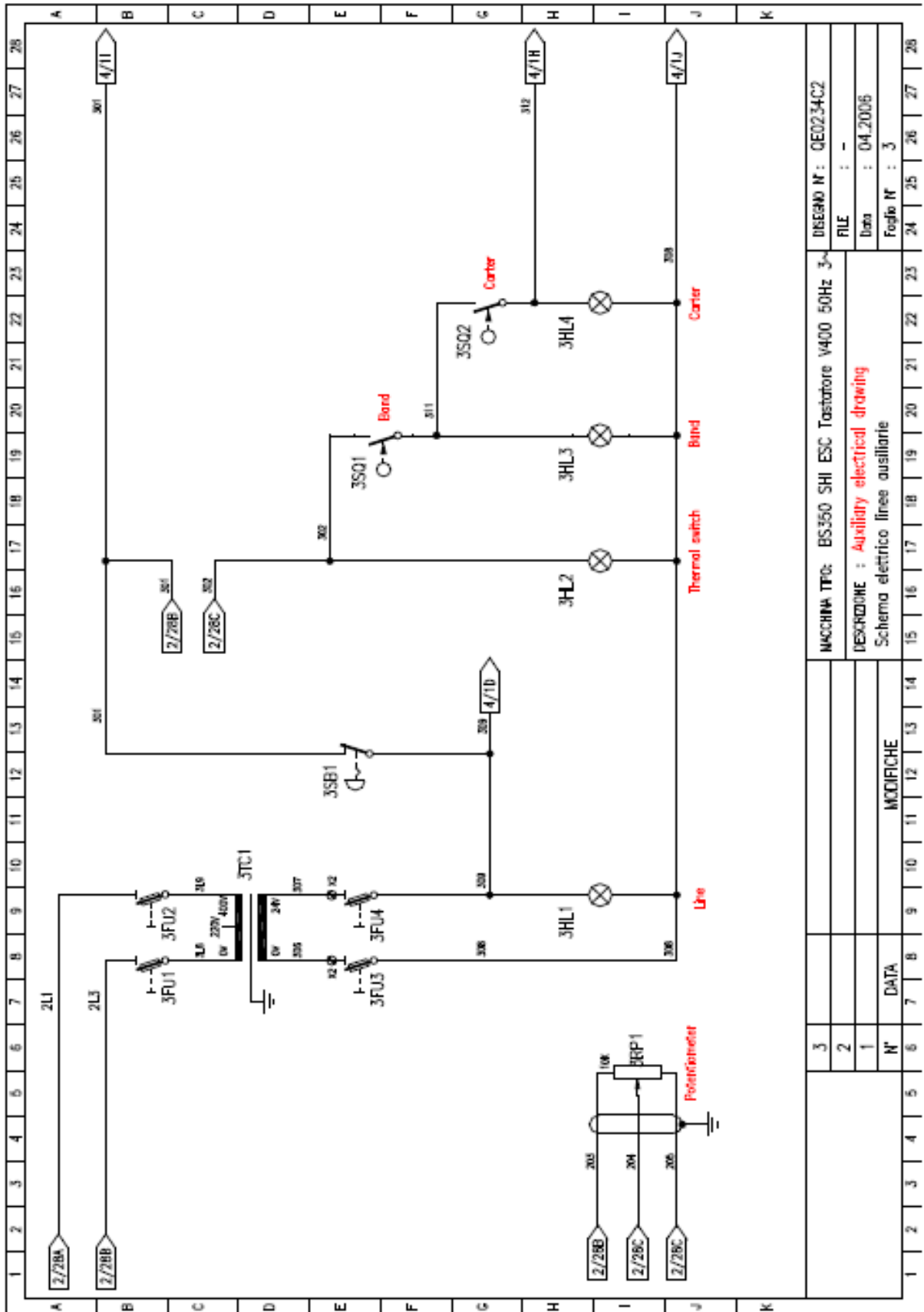
788320--ELASTIC PIN 5X40 DIN 7343--
789065--ELASTIC PIN 6X20 DIN7343--
791620--CYLINDRICAL PIN 10X45
UNI6364--
791945--CYLINDRICAL PIN 8X26
DIN1472--
792331--BAND TENSIONING ROD 280350
NEW--
796809--BRACKET 1"--
796930--REGULATOR SUPPORT PLATE--
798880--BANDGUIDE LOCKING
BRACKET BS35--
851799--CYLINDER FRONT SUPPORT
BS350--
851828-----
851894----
851900--VICE CARRIAGE SUPPORT
BS350--
856999--RIGHT JAW SUPPORT BS350--
857100--LEFT JAW SUPPORT BS350
SH/GH--
863150--BRUSH SUPPORT BS350--
864724--OIL PLUG+GASKET 1/4"--
865362--PLUG+BAR ALS 2-18--
911015--PLATFORM GRADUATED PLATE
BS350--
918592--PLATE BOSS FOR BS 350--
918677--EL. KEYBOARD TRON 8+8--
929345--TIE ROD M12X140 BS350--
933571--TUBE R6 3/8"--
933577--TUBE R6 3/8" 3080--
933597--TUBE R6 3/8" 2350--
933800--SPRINGS FIXING TUBE BS350--
935493--PLASTIC TUBE 13X19 ARIANNA-
-
936823--TUBE R7 1/4" 5100--
937763--TUBE R7 3/16" 2900--
938500--TUBULAR SAW FRAME BS350--
940000--PILOT CHECK VALVE
ATOS=HRO13--
940895--ELECTRIC PUMP TANK DELTA
20--
956843--LEFT SCREW TE M14X30--
957132--VICE SCREW BS 350 SHI--
958930--ENDLESS SCREW BS350 GH--
962402--WHEEL 733-50 12H7X20 M5--
964234--WHEEL 19912520H7PFT-O--

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
A	B	C	D	E	F	G	H	I	J	K																	
		DEVICE DESIGNATIONS																									
AT	Mdn control																										
B	Proximity switch																										
C	Capacitor																										
FU	Fuse block																										
KM	Control master relay																										
HL	Pilot light																										
L	Filter suppressor																										
M	Motor																										
PA	Ampermeter																										
OM	Circuit breaker																										
RP	Potentiometer																										
SA	Selecter switch																										
SB	Pushbutton																										
SQ	Limit switch																										
SP	Pressure switch																										
ST	Thermic switch																										
TC	Control circuit transformer																										
TV	Voltage transformer																										
U	Controller A.C.																										
V	Rectifier diode																										
VC	Rectifier bridge																										
X	Terminal block																										
XS	Plug																										
XP	Receptacle																										
YV	Solenoid valve																										
		CODE TO NUMBER AUXILIARY CONDUCTORS (ABCD)																									
		AB = page's number																									
		CD = progressiv's conductor's number																									
		CODE TO INSTALLING FOR ELECTRIC EQUIPMENT (A B C)																									
		A = page's number																									
		B = device designation																									
		C = progressiv's number																									
		CODE TO LOCATE OF RELAY CONTACTS (A . B)																									
		A = page's number																									
		B = column's number																									
		CODE TO REFER LINE (A / B)																									
		A = page's number																									
		B = column's number and letter's line																									
		DESCRIPTIONS																									
		MACHINA TIPO: BS350 SHI 2V Testatore V400 50HZ 3~																									
		FILE : -																									
		Data : 04.2006																									
		Pagina N° : 1																									
		DESCRIZIONE : Device designations																									
		Legenda simbologia elettrica																									
		DATA																									
		MODIFICHE																									
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
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		1																									
		N°																									

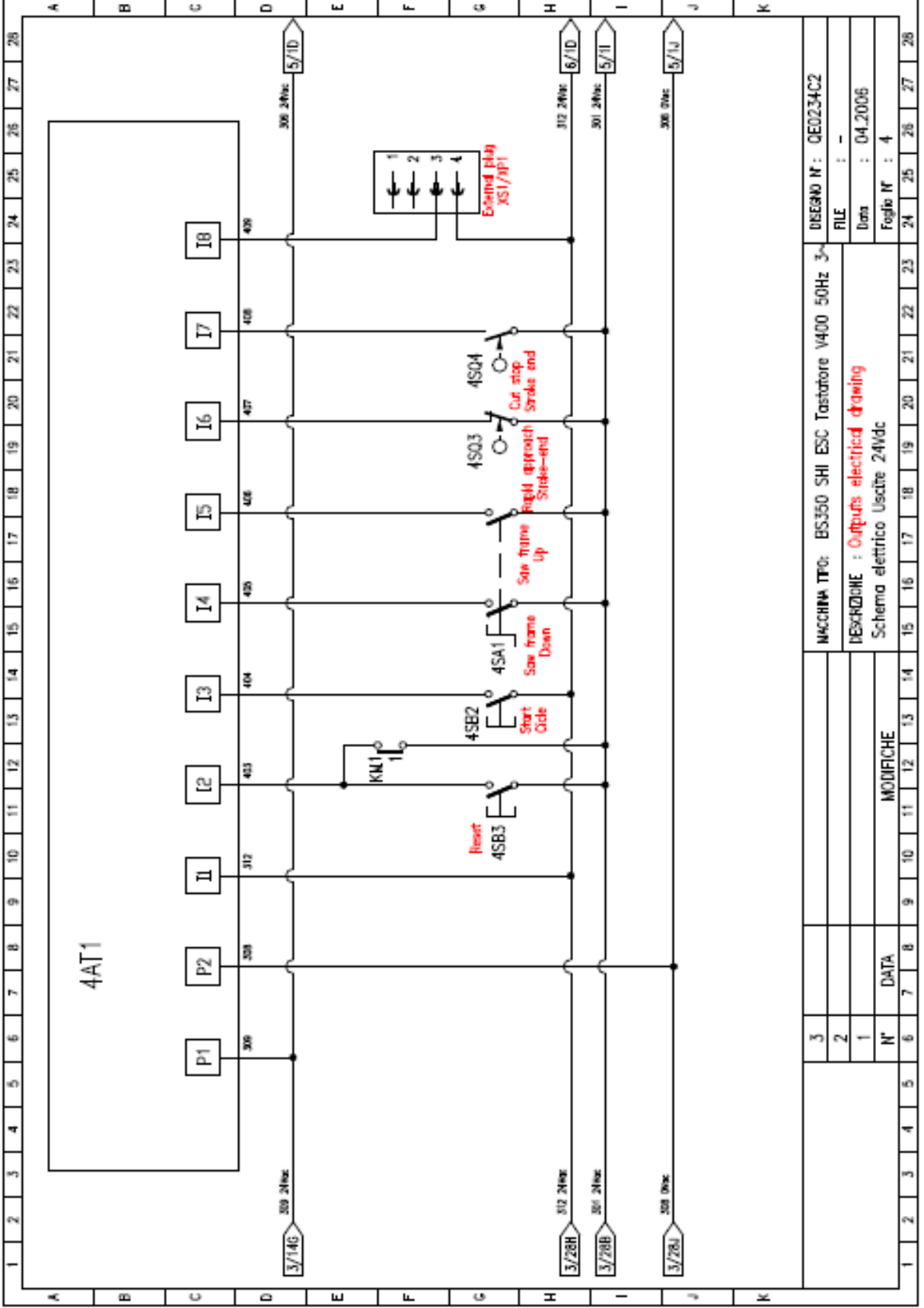


MACCHINA TIPO:	BS350 SHI ESC Testatore V400 50Hz 3~
DESCRIZIONE :	Schema elettrico di potenza
DESCRIZIONE :	Power electrical drawing
FILE :	-
Data :	04.2006
Foglio N° :	2
DESCRIZIONE N° :	QED0234C2

3	
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1	
N°	DATA
	MODIFICHE



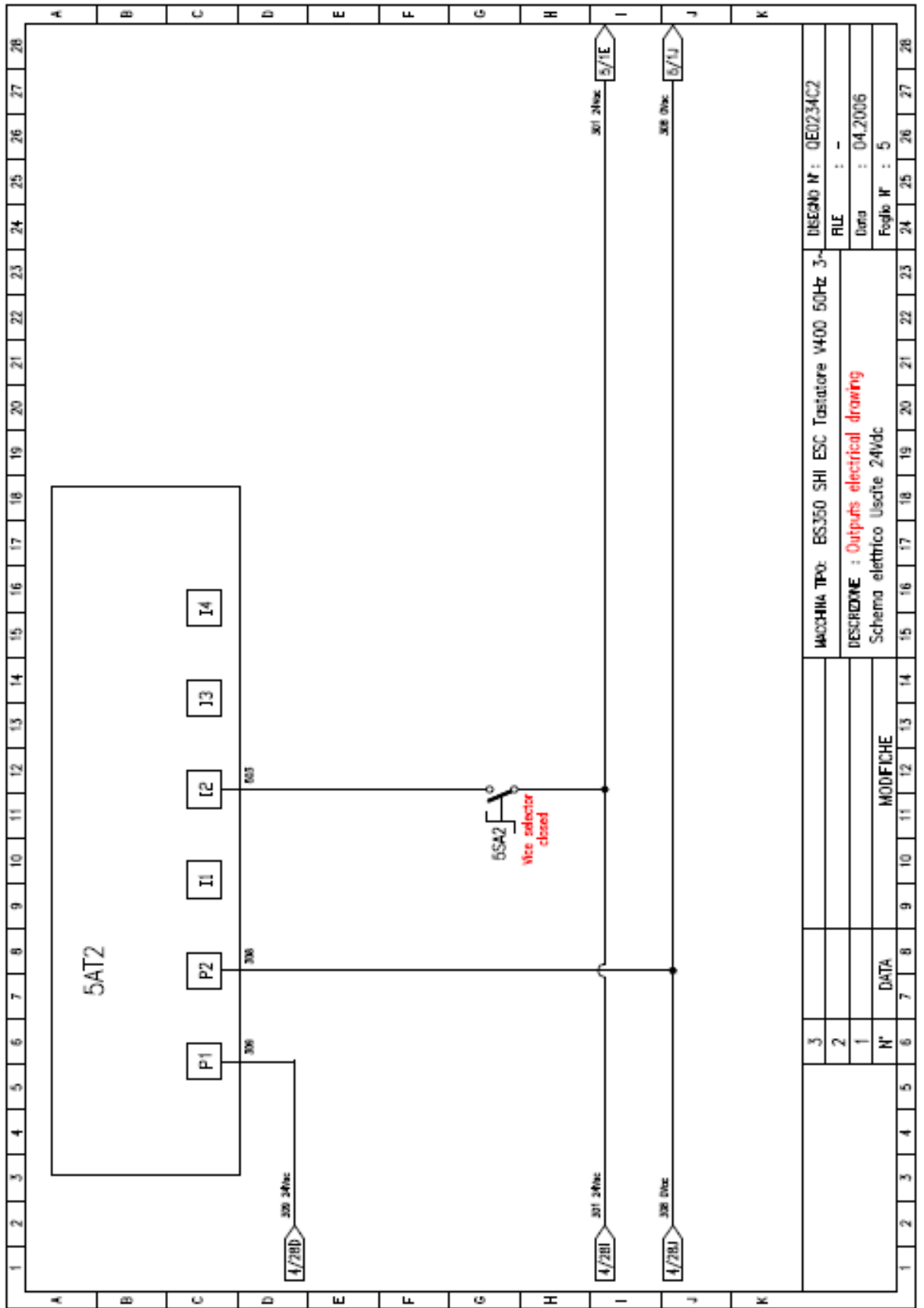
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2														FILE : -	
1	DESCRIZIONE : Auxiliary electrical drawing													Data : 04.2006	
N°	MODIFICHE													Foglio N° : 3	
	DATA														



3	MACCHINA TIPO: BS350 SHI ESC Tastatore V400 50Hz 3~	DISEGNO N°: CE0234C2
2		FILE : -
1		Data : 04.2006
N°	DATA	Foglio N° : 4

DESCRIZIONE : Outputs electrical drawing		
Schema elettrico Uschte 24Vdc		

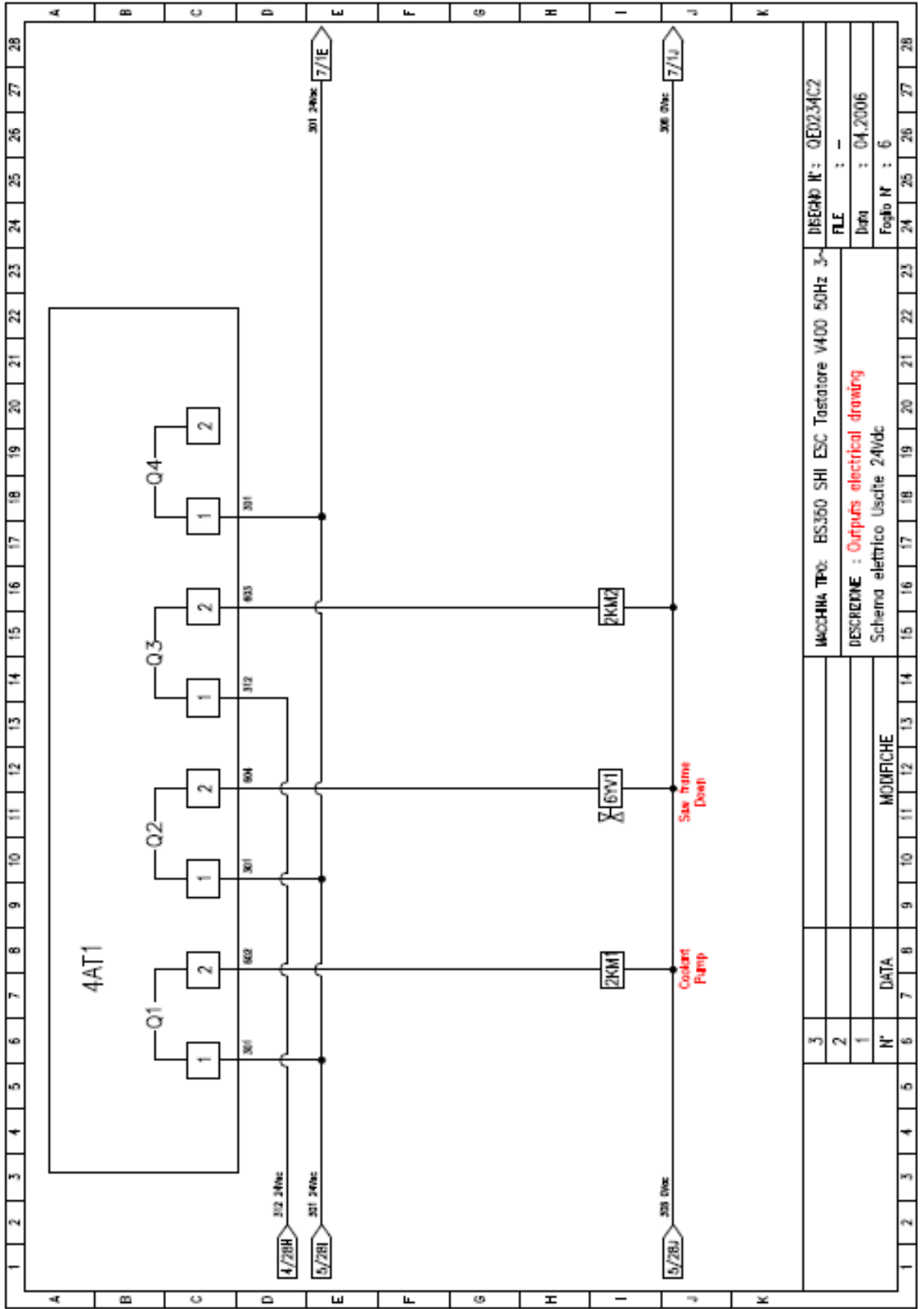
MODIFICHE		
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MACCHINA TPO: ES350 SHI ESC Tastatore V400 50Hz 3~
 DESCRIZIONE : Outputs electrical drawing
 Schema elettrico Uscite 24Vdc

DESIGN N° : QE0234C2
 FILE : -
 Data : 04.2006
 Foglio N° : 5

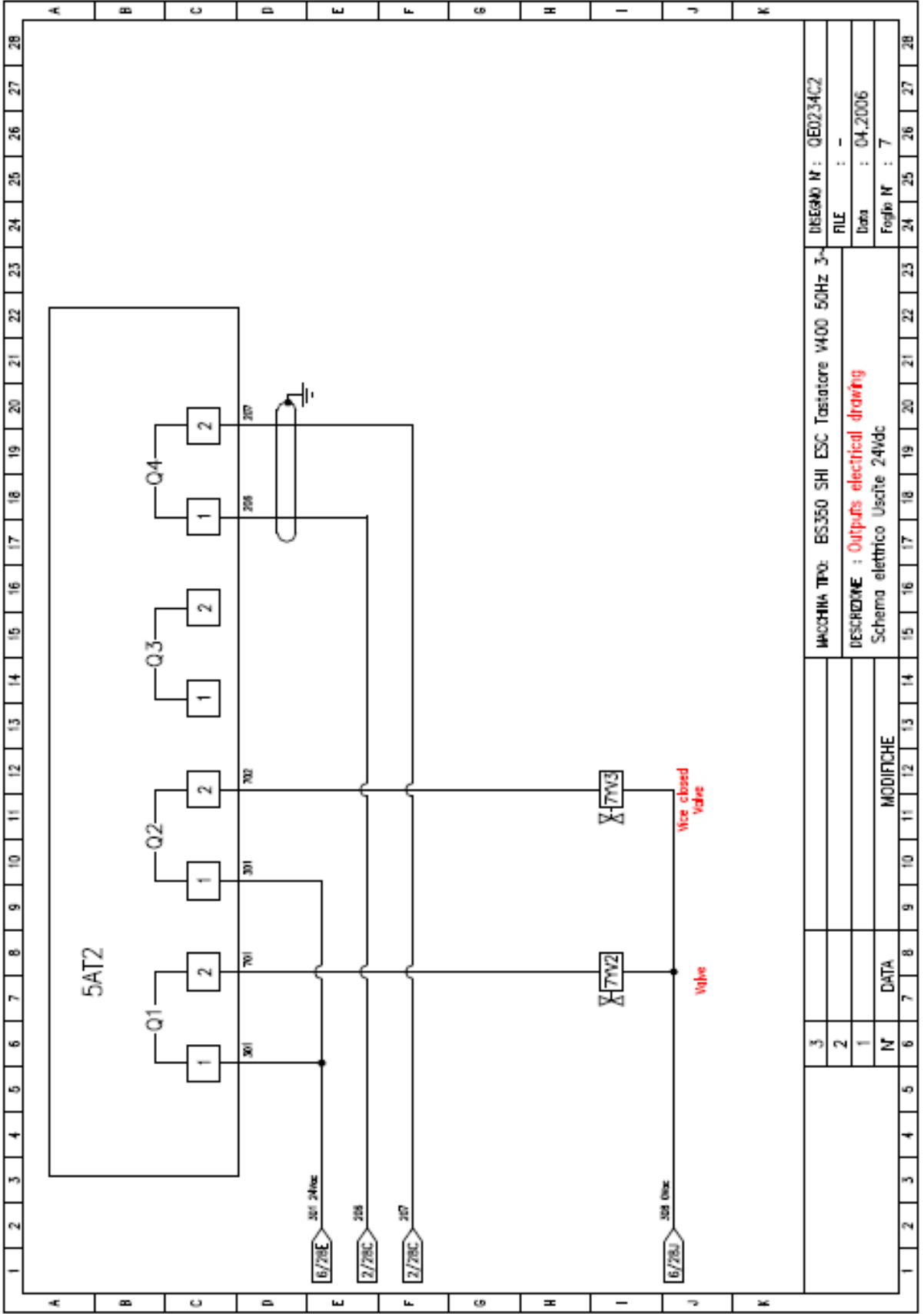
MODIFICHE	
3	
2	
1	
N°	DATA



DISEGNO N°: QED234C2
 FILE : -
 Data : 04.2006
 Foglio N° : 6

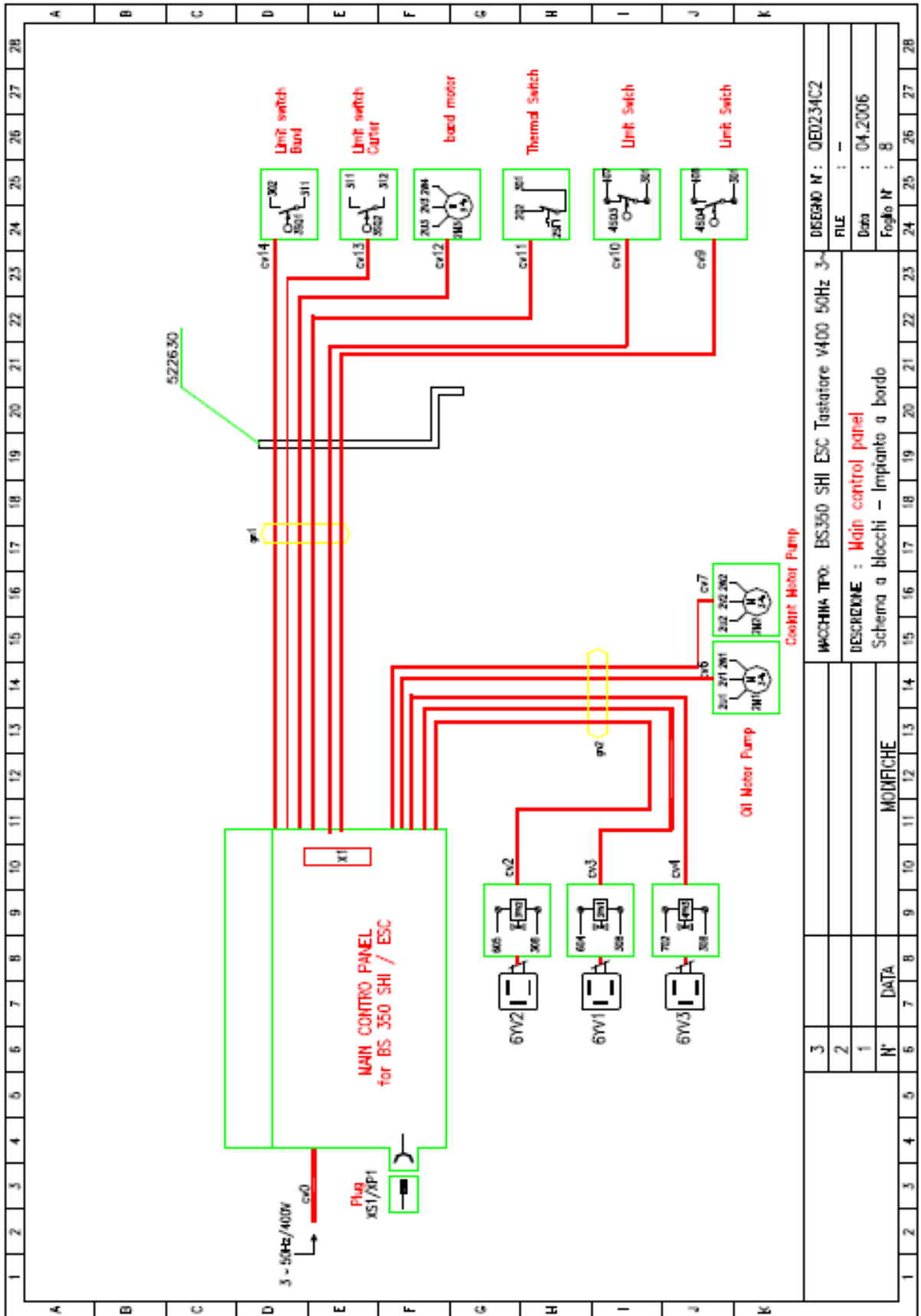
MACCHINA TPO: BS350 SHI ESC Tastatore V400 50Hz 3~
 DESCRIZIONE : **Outputs electrical drawing**
 Schema elettrico Uschte 24Vdc

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2																													
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N°																													



3	MACCHINA TIPO: BS350 SHI ESC Tastatore V400 50Hz 3~	DESIGN N° : QED234C2
2		FILE : -
1		Data : 04.2006
N°	DESCRIZIONE : Outputs electrical drawing	Foglio N° : 7
	Schema elettrico Uscite 24Vdc	

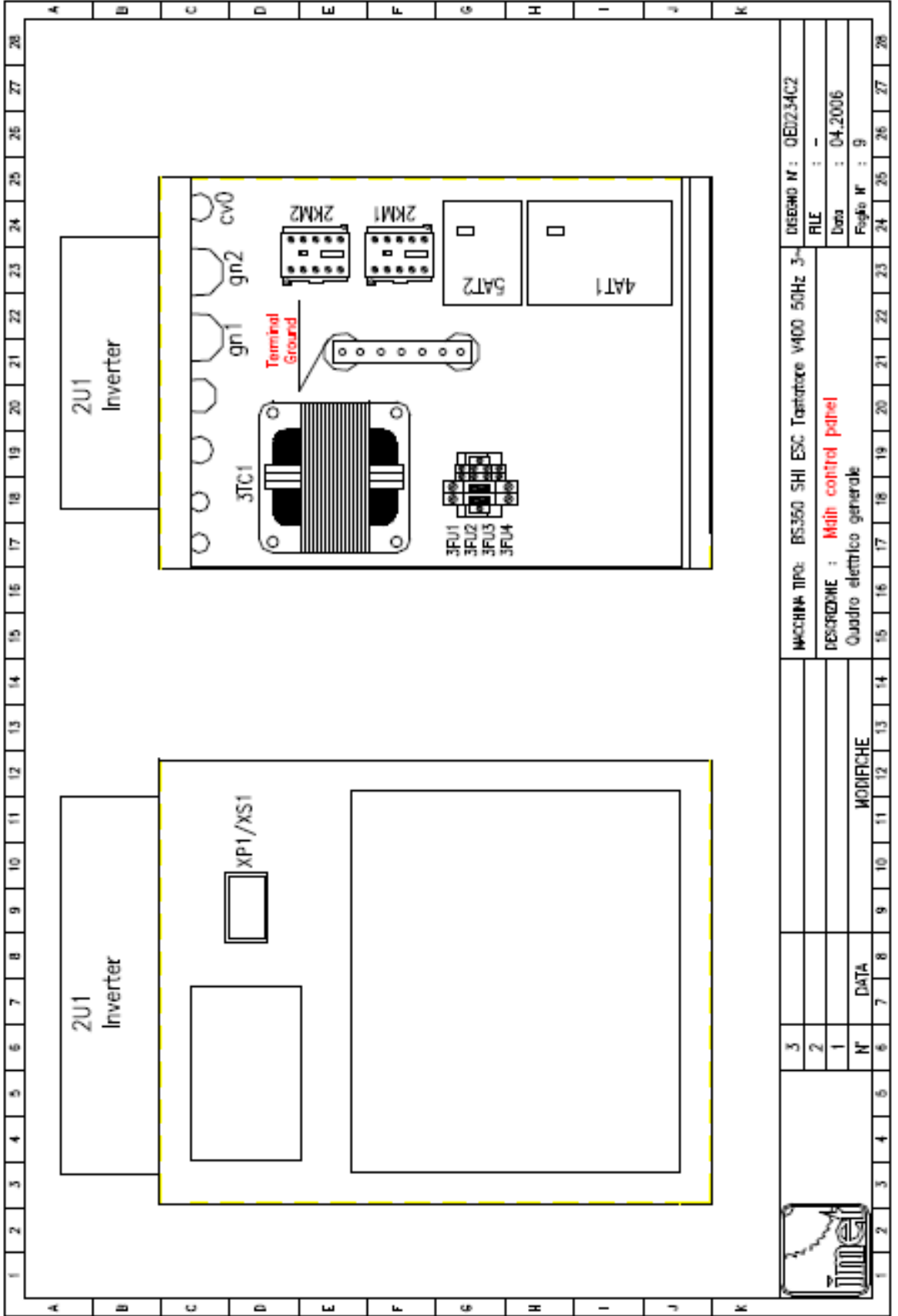
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3	DESCRIZIONE	BS350 SHI ESC Tastatore V400 50Hz 3~	DESEGN N :	QE0234C2
2	FILE			
1	Data			04.2006
N°	DATA			Foglio N° : 8

DESCRIZIONE : Main control panel				
Schema a blocchi - Impianto a bordo				
MONTIFICHE				

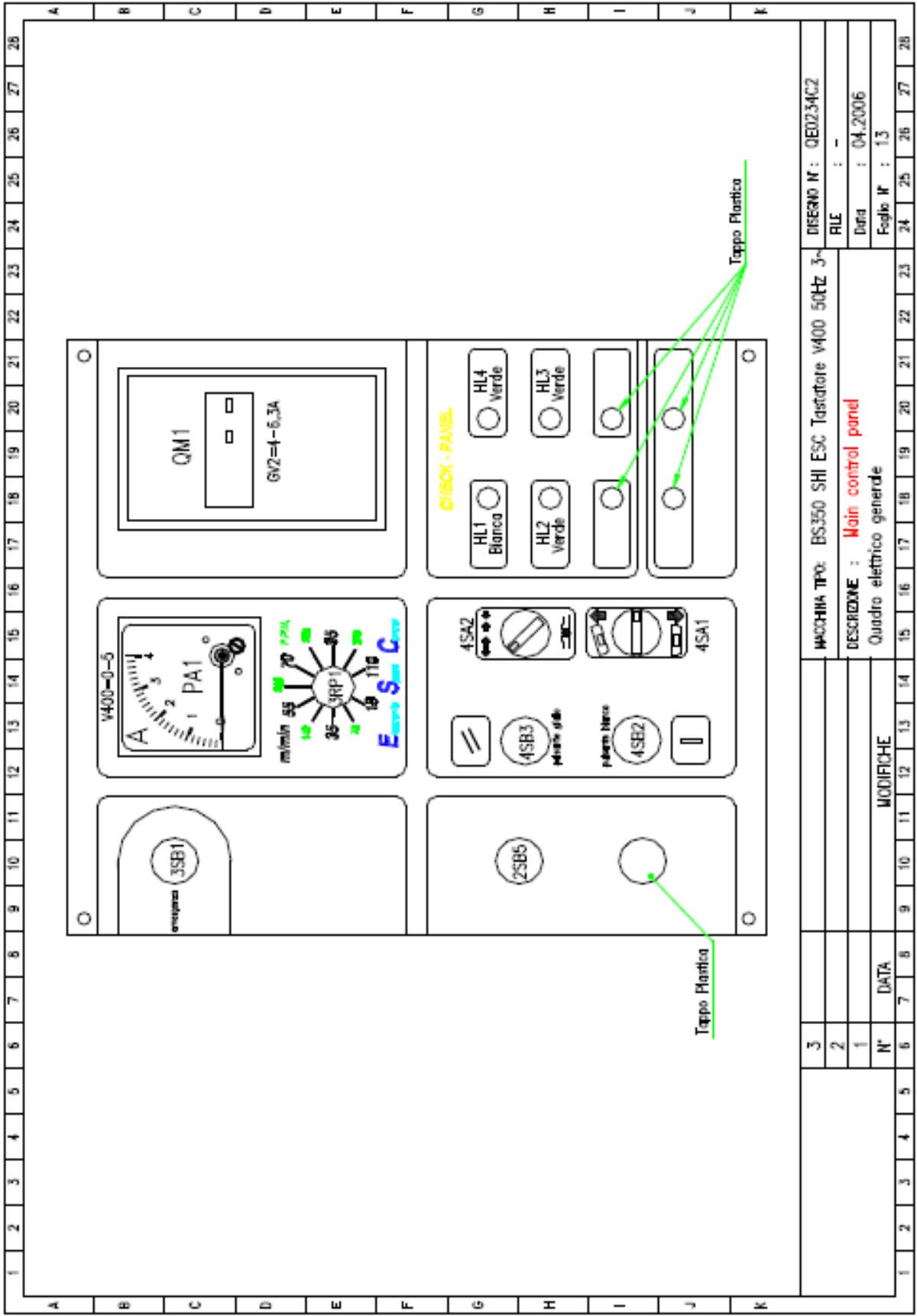
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											MACCHINA TIPO: BS.350 SHI ESC Tornatore V400 50Hz 3~				DISSEGNO N°: OE0234C2			
											DESCRIZIONE: Mish control panel Quadro elettrico generale				FILE: -			
															Data: 04.2006			
															Foglio N°: 9			

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
REF.	DEVICE	SPECIFICATIONS	FUNCTION	FACTORY	TYPE	ITEM N°	Q.TA'																				
35B1	Pushbutton (Emergency)	Cleaning rotation,	Emergency stop button	-	-	-	1																				
45B3	Pushbutton	-	Reset	-	-	-	1																				
45B3	Normally contact	-	Reset	-	-	-	1																				
45B2	Pushbutton	-	Start	-	-	-	1																				
45B2	Normally contact	-	Start	-	-	-	1																				
45A1	Selector	-	Bitrol	-	-	-	1																				
45A1	Normally contact	-	Band	-	-	-	1																				
45A2	Selector	-	Vice	-	-	-	1																				
45A2	Normally contact	-	Vice	-	-	-	1																				
3501	Limit switch	PI67 with cable	Control center closed	TELEMECANIQUE	XCMR1032 90a	521000	1																				
3502	Limit switch	PI00	Control band position	-	ABV121260	520941	1																				
4503	Limit switch	No - Nc	---	--	ABV121260	520941	1																				
4504	Limit switch	No - Nc	---	--	XCMR1023	---	1																				
25T1	Thermal switch	Classe B	Overcurrent protection motor band	TEBNIK	-	-	3																				
JTC1	Control circuit transformer	50W V230-400/24V 50-60Hz	High quality supply	C.E.	TN V450	932500	1																				
2M1	Control master relay	4KW-9A-24vac	Power coolant motor pump	C.G.E.	MC9-10 24V-MC1A 10 24V	260750	1																				
2M2	Control master relay	4KW-9A-24vac	Power coolant motor pump	LOWATO	MC9-10 24V-MC1A 10 24V	260750	1																				
2U1	Frequency drive unit	1.5KW-100V/3 Phase	Control speed motor band	TELEMECANIQUE	ATV31HU15M1	521200	1																				
5Y2	Solenoid valve 2/2	Size M22 - 24Vdc	Control fast	COMATROL	EMH 06C5 24C 00	331699	1																				
5Y1	Solenoid valve 4/2	CETOP 3 - 24Vdc	Control feed	ARON	AD3 EA15 AR20	331541	1																				
5Y3	Solenoid valve 4/2	CETOP 3 - 24Vdc	Control opening vice	ARON	AD3 EA15 AR20	331541	1																				
3		MACCHINA TIPO: BS350 SHI ESC Tastatore V400 50Hz 3~		DEGRAD N° : QEO234C2																							
2				FILE : -																							
1				Data : 04.2005																							
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DESCRIZIONE : General list of electrical equipments															Elenco generale componenti elettrici												

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28																																																																																																																																												
REF.	DEVICE	SPECIFICATIONS	FUNCTION	FACTORY	TYPE	ITEM N°	OLIV.																																																																																																																																																																
XS1	PLUG NOT SUPPLIED	4 Pole/10A-Ground	Remote control	ILME	CK334-CKM04	786746	1																																																																																																																																																																
XP1	Receptacle	4 Pole/10A-Ground	Remote control	ILME	CK314-CKF04	698750	1																																																																																																																																																																
X1	Terminal block	For board circuit	Connection external equipments	E.S.	GM6/3	556902	8																																																																																																																																																																
X2	Terminal block	For board circuit	Connection external equipments	E.S.	GM6/3	556902	8																																																																																																																																																																
cx2	Flexible cable	N07V-K 2x1 mmq.	Connection				1																																																																																																																																																																
cx3	Flexible cable	N07V-K 2x1 mmq.	Connection				1																																																																																																																																																																
cx4	Flexible cable	N07V-K 2x1 mmq.	Connection				1																																																																																																																																																																
cx6	Flexible cable	N07V-K 4x1.5mmq.	Connection			205065	1																																																																																																																																																																
cx7	Flexible cable	N07V-K 4x1.5mmq.	Connection			205065	1																																																																																																																																																																
cx8	Flexible cable	N07V-K 2x1 mmq.	Connection				1																																																																																																																																																																
cx9	Flexible cable		Connection				1																																																																																																																																																																
cx10	Flexible cable		Connection				1																																																																																																																																																																
cx11	Flexible cable	N07V-K 2x1 mmq.	Connection				1																																																																																																																																																																
cx12	Flexible cable	4x1.5mmq. scarmato	Connection				1																																																																																																																																																																
cx13	Flexible cable	N07V-K 2x1 mmq.	Connection				1																																																																																																																																																																
cx14	Flexible cable	N07V-K 2x1 mmq.	Connection				1																																																																																																																																																																
gn1	Flexible tube	PVC 1"	Connection external equipments	TEAFLEX	PAS-G29B	507382	1																																																																																																																																																																
gn2	Flexible tube	PVC 1"	Connection external equipments	TEAFLEX	PAS-G29B	507382	1																																																																																																																																																																
<table border="1"> <tr> <td colspan="15">MACCHINA TIPO: BS350 SH ESC Trattore V400 50Hz 3~</td> <td colspan="13">DESCRIZIONE : General list of electrical equipments</td> </tr> <tr> <td colspan="15">DESCRIZIONE : General list of electrical equipments</td> <td colspan="13">Elenco generale componenti elettrici</td> </tr> <tr> <td colspan="15">MODIFICHE</td> <td colspan="13"></td> </tr> <tr> <td colspan="15">DATA</td> <td colspan="13">MODIFICHE</td> </tr> <tr> <td colspan="15">N°</td> <td colspan="13"></td> </tr> </table>																												MACCHINA TIPO: BS350 SH ESC Trattore V400 50Hz 3~															DESCRIZIONE : General list of electrical equipments													DESCRIZIONE : General list of electrical equipments															Elenco generale componenti elettrici													MODIFICHE																												DATA															MODIFICHE													N°																											
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DISEGNO N° :	QED234C2
RILE :	-
Data :	04.2006
Foglio N° :	13

MACCHINA TIPO :	BS350 SHI ESC Tastatore V400 50Hz 3~
DESCRIZIONE :	Quadro elettrico generale

N°	MODIFICHE
3	
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N°	DATA
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