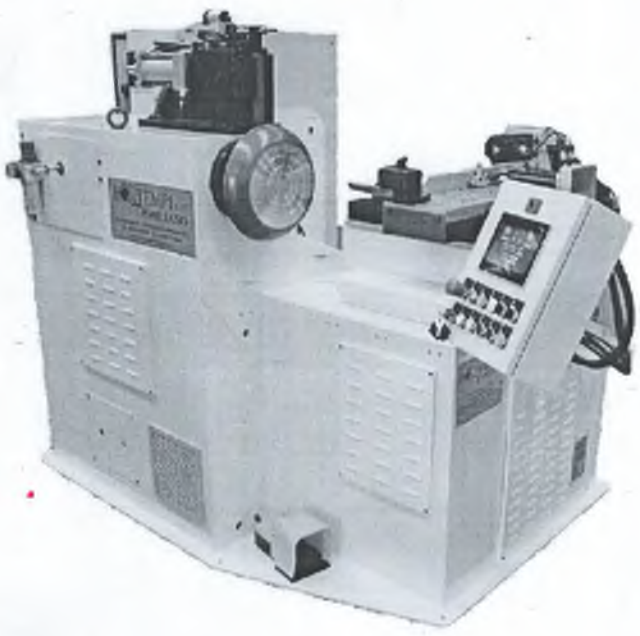
BONTEMPI S.r.l.

HUMAN MACHINE INTERFACE INSTRUCTION MANUAL



Machine: *Lathes machine*
Type: **TBE**
Registration Number: **0074-16**
Year of production: **2016**

ORIGINAL INSTRUCTION

ATTENTION ! BEFORE USING THE MACHINE READ CAREFULLY AND UNDERSTAND WELL THIS MANUAL AND KEEP IT ALWAYS AVAILABLE TO FACILITATE THE CONSULTATION. FOR ANY DOUBT PLEASE CONTACT IMMEDIATELY THE CONSTRUCTOR.

ATTENTION ! EVERY OPERATION NOT EXPRESSLY DESCRIBED OR NOT EXPRESSLY ALLOWED BY THIS MANUAL MUST BE STRICTLY PROHIBITED. EVERY MODIFY OF THE MACHINE AND EVERY INTENDED USE MODIFY IS STRICTLY PROHIBITED.

ATTENTION ! Every manual must be read before using the machine, so who uses or let someone else use the machine implicitly and irrevocably knows that any liability (civil, penal or other kind) can be attributed to the constructor in case of an accident occurred IN PRESENCE of a violation of one or more (without exception) of the disposition in this manual.

Index

1 PUSHBUTTON

1-1 PUSHBUTTON AND PEDAL

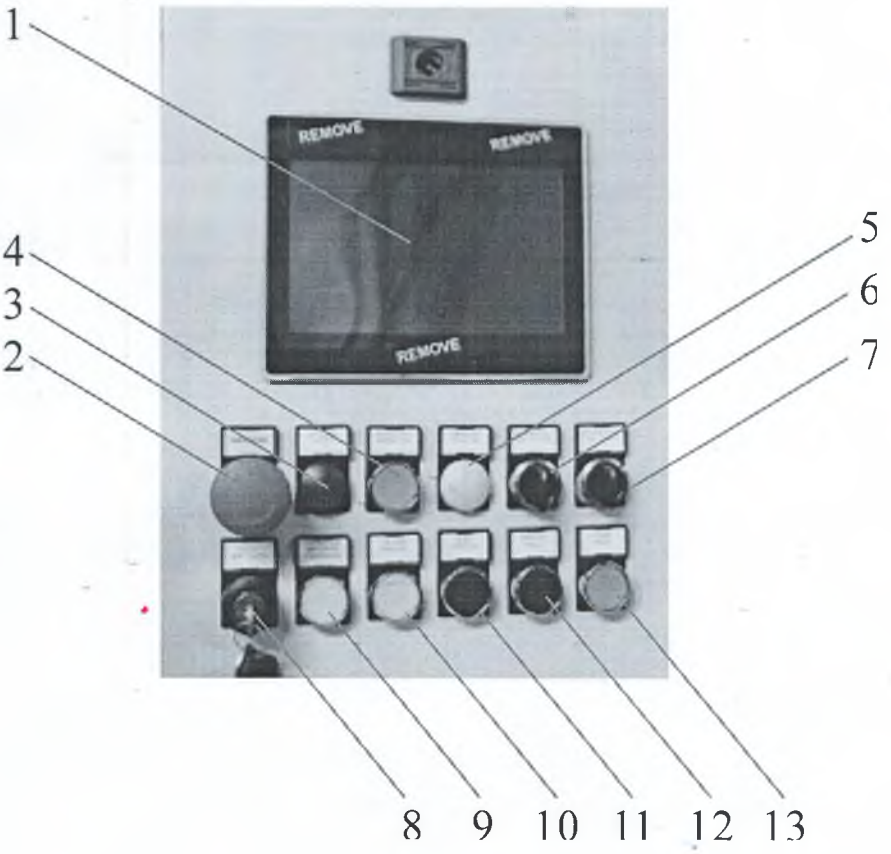


Fig 1.1.1

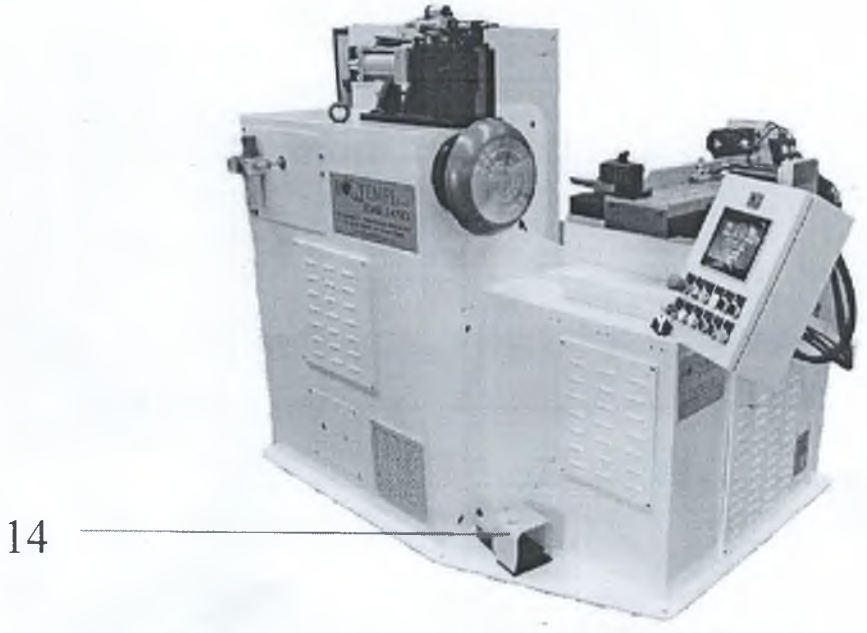


Fig. 1.1.2

1. **Display:** display with touchscreen functionality, allows to display all the necessary pages to program and move the horizontal carriage and the turret
2. **Emergency button:** when pressed, it stops the automatic cycle of all the parts of the machine and interrupts the auxiliary circuit, to ensure the operator safety, avoiding anomalies or accidents. To unlock it, turn slightly counterclockwise
3. **Inserted auxiliary lamp:** fixed green light that reports the correct restore of the auxiliary circuit
4. **Auxiliary restore button:** with the emergency button unlocked, allows you to restore the auxiliary circuit, necessary to work with the machine. Every time you turn on the machine, it must be pressed to restore the auxiliary circuit
5. **Tension presence light:** reports the presence of tension in the machine
6. **X axis movement selector:** allows you to move the horizontal carriage on the X axis direction, as shown subsequently in Fig. 1.1.3
7. **Y axis movement selector:** allows you to move the horizontal carriage on the Y axis direction, as shown subsequently in Fig. 1.1.3
8. **Cycle selector MAN-AUTO:** rotated left this selector enables the manual cycle, allowing you to move the horizontal carriage, change some values of the current recipe and acquire a new program. If rotated in Automatic cycle allows to activate the automatic machine cycle by pressing the Start cycle button.
9. **Spindle rotation light button + vacuum OK:** this button is equipped with an indicator light that iliuminates when the vacuum of the mold of the spindle is over the minimum threshold. Associated with the Start cycle button allows you to rotate the spindle in manual cycle, with the number of RPM set in specific page
10. **Fast manual:** this button, associated to the X and Y axis selectors, allows to move faster the horizontal carriage, but only in manual cycle
11. **Reset position:** this button has a first important function that allows to execute the homing cycle of the horizontal carriage, with which the carriage moves in a predefined initial position and which must be performed every time you turn on the machine; a second function allows, pressing it for 3 seconds, to move the carriage in reset position, outside of any obstruction.
12. **Stop cycle:** if pressed, it stops all the parts of the machine during the automatic cycle, but keeps the auxiliary circuit
13. **Start cycle:** with the MAN-AUTO selector rotated on automatic, allows to start the automatic cycle of the machine; in manual cycle, associated to button 9) allows to rotate the spindle
14. **Pedal:** in manual cycle and at the end of the automatic cycle, corresponding to the stationary spindle, activates the spindle blow to extract the processed product

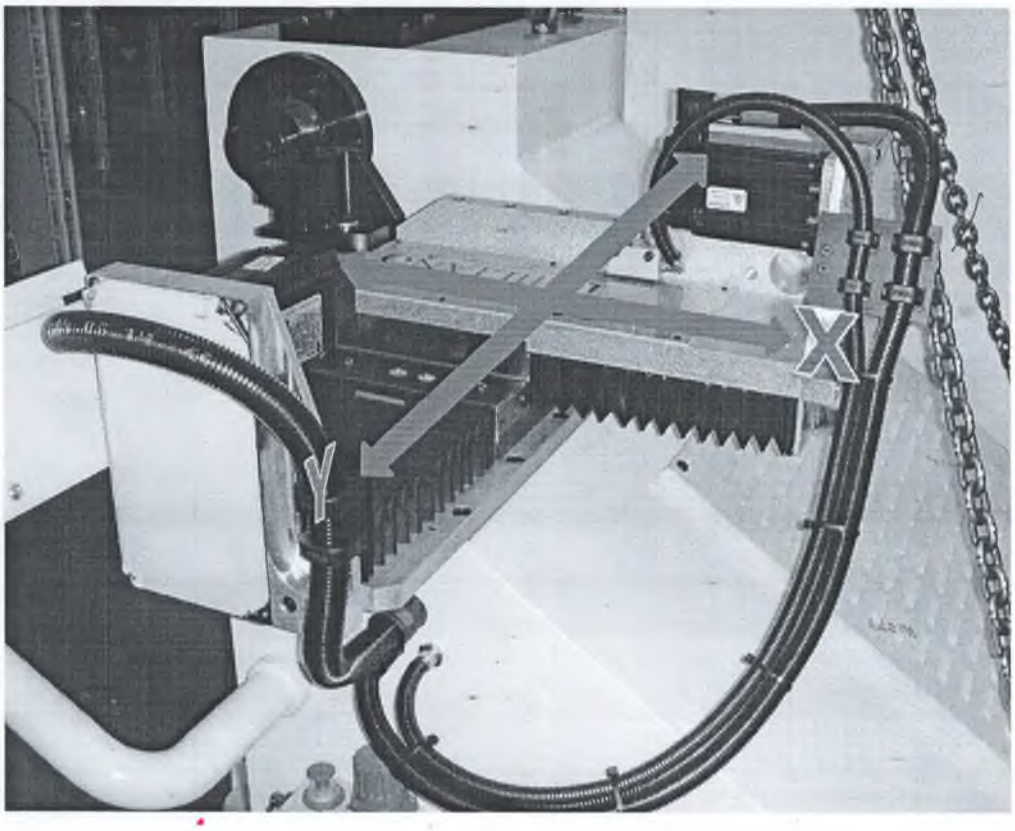


Fig. 1.1.3

2 DISPLAY

The display located on the pushbutton allows you to implement all the necessary adjustments to let the machine work optimally. Inside there is the possibility to manage 3 different users, with different levels of permission to change some parameters. Is composed of several pages that will be explained below.

2-1 MENU

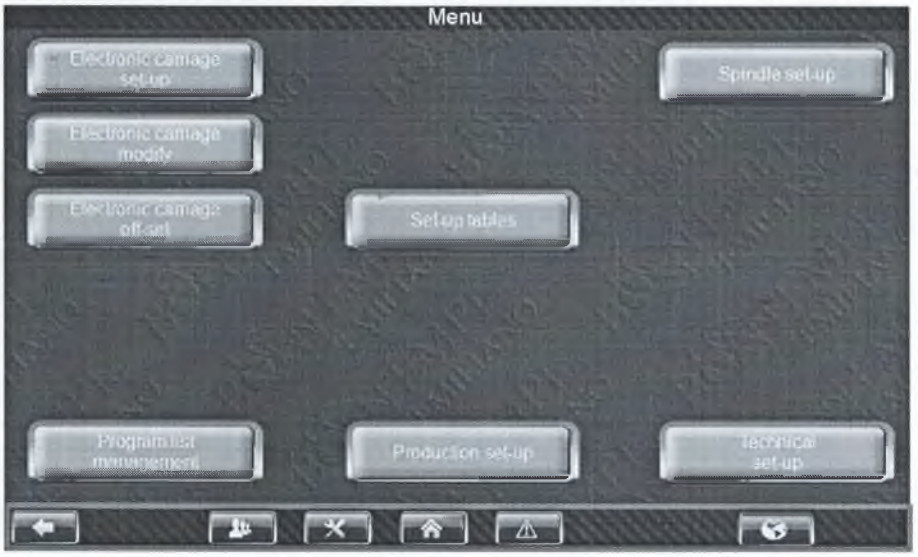


Fig.2.1.1

From the Menu page in Fig. 2.1.1 you can reach all the pages of the display, and from that pages you can turn back to Menu page using a specified button. Below there is a list that explains the icons in the red box, with their use. All that icons are the same in every page of the display to make the navigation inside the pages easier.

-  Returns to the previously displayed page
-  Open the Users Management page
-  Open the Working Page
-  Opens the menu page when you are viewing one of the other pages
-  Opens the Alarm Page: the icon is grey if there's no alarm inside the machine, becomes yellow if the machine reports a warning and becomes red if there's an active alarm inside the machine; it means that there's an anomaly which doesn't allow to work correctly
-  Displayed only in the Menu, allows to change the language in use
- 

Displayed in Set-Up, Off-set and Modify of the carriage, opens a pop-up dedicated to navigation, avoiding to pass from the Menu page every time

2-2 USERS MANAGEMENT

Fig. 2.2.1

The "Users Management" page in Fig. 2.2.1 allows to select the user that have to use the machine. When a power cycle is performed, the user logged is the Toolmaker.
To change user press "Switch Users" button inside the page. Once inside the login pop-up, insert the correct username and the corresponding password and confirm.

OPERATOR (USERNAME: **user 1** PASSWORD: **0000**)
TOOLMAKER (USERNAME: **user 2** PASSWORD: **13579**)

The choice to use 2 different users allows to the operator to visualize only the pages of spindle set-up, production and the Working page.
All the pages dedicated to the program changes and the machine parameters are available only and exclusively for the Toolmaker.

2-3 WORKING PAGE

Fig. 2.3.1

The "Working Page" in Fig. 2.3.1 allows to visualize some information about the instantaneous speed of the spindle (speedometer on the top left) and the amount of vacuum exercised by the mold on the product (speedometer on the top right).
With the switch in the center it is possible to determine the moment in which the horizontal carriage and the upper turret begin their work cycle. Leaving the selectors in place 0, the corresponding carriage or turret is excluded. We have different possibilities:

- **Carriage 1 – Turret 0:** only the horizontal carriage performs the automatic cycle
- **Carriage 0 – Turret 1:** only the upper turret performs the automatic cycle
- **Carriage 1 – Turret 1:** the horizontal carriage and the upper turret begin the automatic cycle at the same time
- **Carriage 1 – Turret 2:** the upper turret waits the end of the horizontal carriage cycle to begin its own cycle
- **Carriage 2 – Turret 1:** the horizontal carriage waits the end of the upper turret cycle to begin its own cycle

In the red box at bottom left there is the possibility to delay the carriages start after the spindle rotation start, to let him reach the designated speed before moving the carriages, delay the return of the turret when it reaches the limit switch, to ensure that all the trim on the edge of the product is uniform. Also it's possible adjust the vacuum threshold; below this value, for safety, the machine will not give the consent to begin the automatic cycle, generating an alarm. In the green box at bottom right it is possible to include or exclude the blow of the carriage, try it manually and, keeping pressed "Manual upper turret" button, you can try an automatic cycle of the turret to check speed, slowdown and the position of the limit switch.

2-4 ALARMS

Fig. 2.4.1

The "Alarms" page in Fig. 2.4.1 is accessible from all the pages via the icon in the red box at the bottom. It contains all the alarms and the warnings that can occur during the use of the machine, depending on the different machine faults. Once the alarms are resolved, they are no longer visible in the page until the problem recurs. In addition some alarms, if clicked, contain an additional explanation page to make the resolution of the problem easier. It's strictly necessary solve any alarm displayed in the panel to let the operator work correctly with the automatic cycle. In the last chapter there's a complete list of the alarms, with causes and some possible solutions.

2-5 SWITCH LANGUAGE

Fig. 2.5.1

In the "Switch language" page in Fig. 2.5.1, which is only accessible from the Menu page with the icon at the bottom right, you can choose in which language you want to use the entire panel.

2-6 PRODUCTION SET-UP

Fig. 2.6.1

The page "Production set-up" in Fig. 2.6.1 displays some data, like the total counter of the pieces produced (resettable), the partial counter (resettable), the average hourly production during the automatic cycle and the time of each cycle. Also it is possible to create production lots, as shown in the red box. In the box corresponding to "Planned production" insert the number of pieces that you need to produce; pressing "Start production control" the system counts each piece processed in automatic cycle, increasing one by one the count of the pieces produced. Pressing "Stop production control" the machine continues the work, but without consider the production lot. Pressing "Reset" the lot count restarts from zero. When the planned production is reached, the machine gives a warning to the operator, displayed in yellow in the Alarms page.

2-7 SPINDLE SET-UP

Fig. 2.7.1

The "Spindle Set-up" page in Fig. 2.7.1 shows some parameters related to the rotation of the spindle of the Lathe Machine TBE.

Inside this page there's a column on the left, in which we can decide if the spindle has to rotate with or without the vacuum, and eventually exclude the vacuum in the mold. In this way the machine cannot absolutely work in automatic cycle. Selecting the spindle rotation without the vacuum, the spindle always rotates at the fixed speed of 100 RPM; this helps to avoid accidents and helps the toolmaker to check the correct rotation of the spindle.

In the right column there are 2 different rotation speeds of the spindle, which are the speed for the automatic cycle; specifically the Speed 1 must always be lower than Speed 2 to use the Dynamic speed (explained below). Also we can decide the acceleration and deceleration.

In the central column there is a speedometer which shows the actual speed of the spindle during the rotation; also there's a selection of different speeds of the spindle:

- **Speed 1:** selecting this speed, the spindle works in manual cycle (using 2 buttons) and in automatic maintaining always the same set speed 1
- **Speed 2:** selecting this speed, the spindle works in manual cycle (using 2 buttons) and in automatic maintaining always the same set speed 2
- **Dynamic:** selecting this speed the spindle works in automatic cycle changing its speed from Speed 1 to Speed 2, using an acceleration ramp. This one goes from Step 1 to the last step of the cycle.
- **Double speed:** is an attribute that can be associated to a step of the horizontal carriage; when the carriage arrives in a specified step, the spindle changes its speed from Speed 1 to Speed 2 or vice versa. It's different from Dynamic speed, that modifies its speed with an acceleration ramp that begins in step 1 of the cycle and stops once reached the last step.

2-8 TECHNICAL COMMANDS

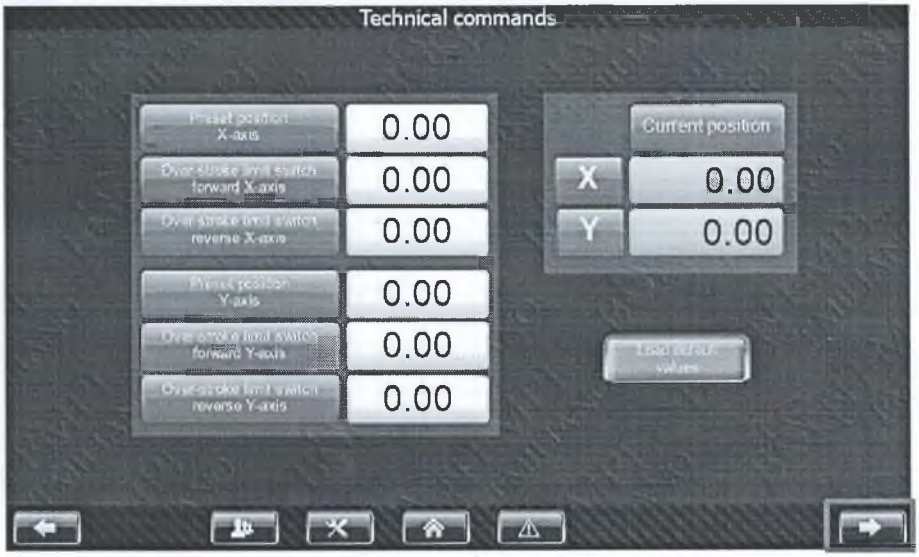


Fig. 2.8.1

The page "Technical commands" in Fig. 2.8.1 can be reached only by the administrator and lists the technical parameters of the horizontal carriage, including the Preset position and the software limit switches (forward and reverse) of X and Y axis. Also, pressing the icon in the red box at bottom right, you can move to the second page of the technical commands, represented subsequently in Fig. 2.8.2.

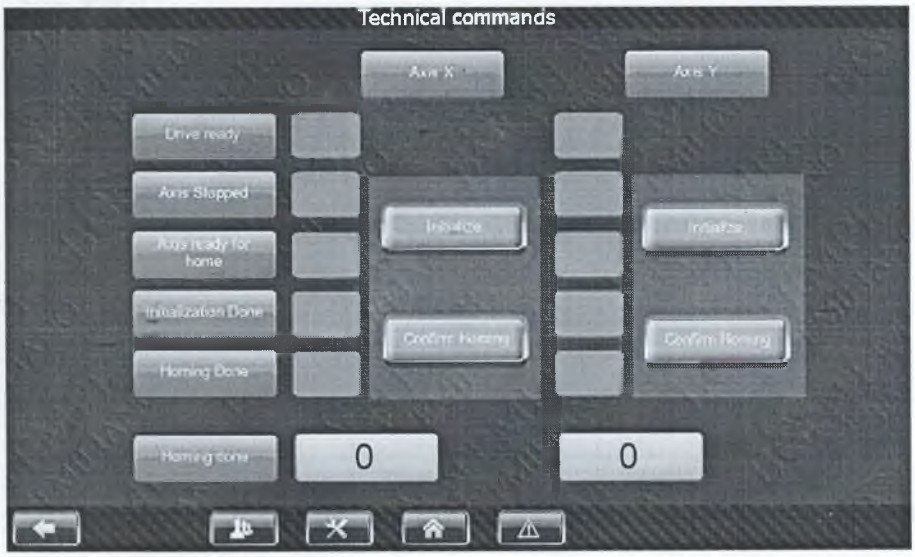


Fig. 2.8.2

The page "Technical commands 2" or "Homing page" in Fig. 2.8.2 is used when a motor or a belt is broken and the carriage loses its own position. In this page it is possible to use a procedure to restore the correct position and keep the recipes unchanged.

3 POWER MACHINE

3-1 POWER SUPPLY

Fig. 3.1.1

In order to use the machine it is necessary to implement the electrical and pneumatic connections. Once verified, turn on the power switch shown in fig. 3.1.1.
Making sure that the emergency button is unlocked and holding the machine in manual cycle, Press the "Restore Auxiliary" blue button in Fig. 3.1.2. If the auxiliary green lamp lights up, the machine is ready for tooling (resolving any alarms) and later for use. If this situation is not happening, it will be necessary control the Alarms page and, after resolving any anomalies, try again to restore the Auxiliary circuit. Once restored, press the "Reset position" button to reset all the remaining alarms.

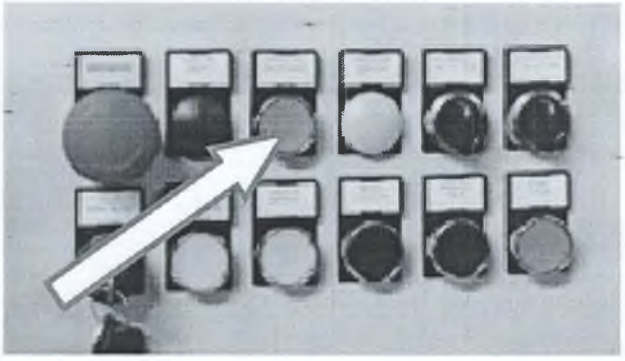


Fig. 3.1.2

4 CREATE NEW PROGRAM

4-1 ELECTRONIC CARRIAGE SET-UP

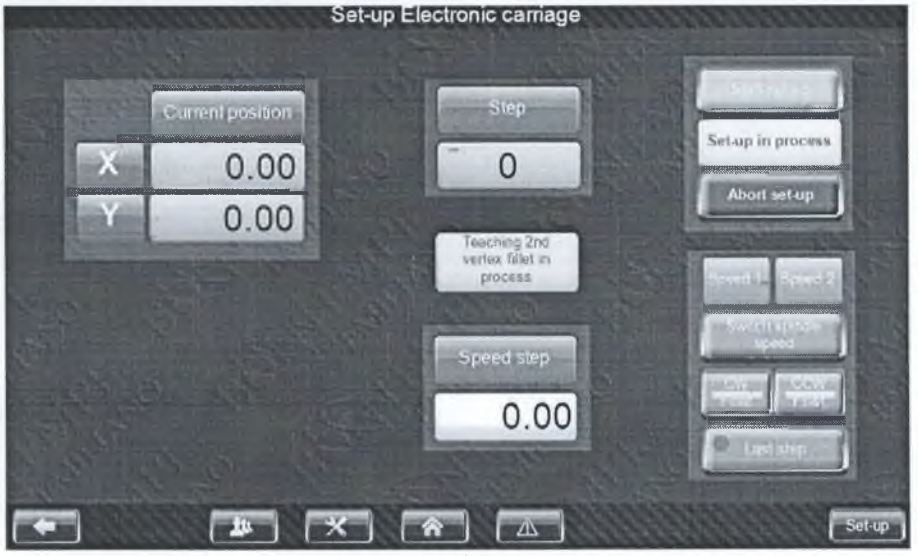


Fig. 4.1.1

The page "Set-up electronic carriage" in Fig. 4.1.1 is important in order to perform an Horizontal carriage cycle that ensures a correct finished product. In the next section a practical example is listed, with the step by step procedure to understand better the acquisition procedure, which must always be performed in manual cycle, as well as any change of the working cycle. Inside this page there are different choices for the Toolmaker:

1. **Start Set-up:** green button in the right column that allows to start the acquisition cycle. Pressing this button will clear all the values in the horizontal carriage tables, so if you have previously created a program or if you have made changes to an existing program, always remember to save in the "Program list management" page before performing this procedure, as explained in the next chapter
2. **Abort Set-up:** red button in the right column that, if pressed, aborts the acquisition cycle, forcing the toolmaker to repeat again the acquisition procedure
3. **Switch spindle speed:** button that allows, in a certain step, to change which speed of the spindle you need to use. This selection is used for working cycle involving the Double speed, selectable in the Spindle set-up page
4. **Fillet CW/CCW:** button that allows to execute a radius from one step to the next one. Selecting Fillet CW/CCW you can choose if the radius will go clockwise or counterclockwise, which has also associated a specific angle from 0 to 90°
5. **Last step:** button that must be pressed when you reach the last step of the recipe, at the end of all the work on the pan. Once pressed this button and acquired the last step,

the acquisition procedure is completed and you just have to transfer data to work in automatic cycle.

6. **Speed step:** it determines the speed of each step of the work cycle, and is different depending if is a work step or a fast external movement
7. **Step:** shows the step in which the toolmaker is making the acquisition procedure

4-2 PRACTICAL EXAMPLE

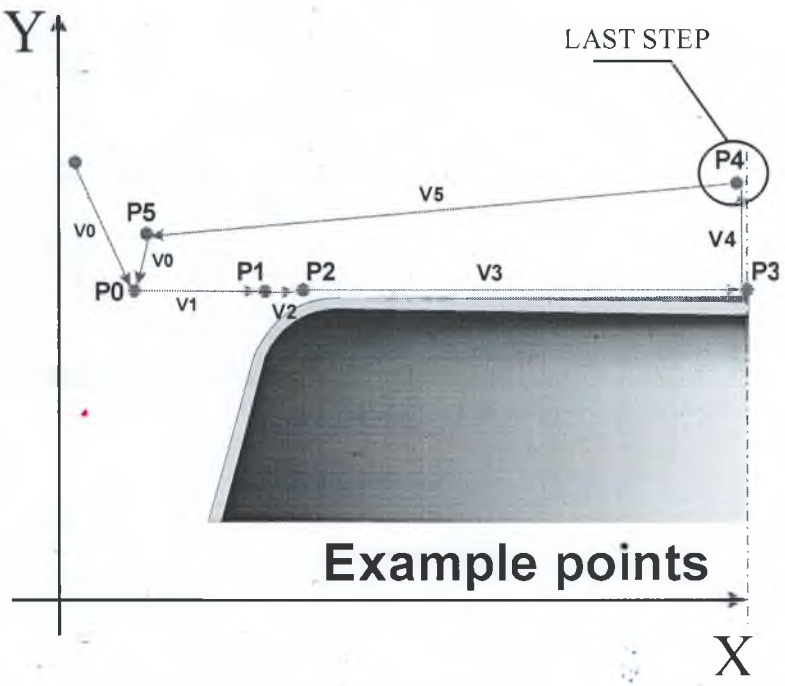


Fig. 4.2.1

The example displayed in Fig. 4.2.1 shows a basic working on the shape of the pan. As can be seen from the figure there are some key points, which goes from P0 to P5. These are the points (or steps) we're going to determine with the carriage acquisition procedure.

- **P0:** Starting point of the automatic cycle
- **P1:** Approach point to the pan
- **P2:** Entry point of the tool into the pan
- **P3:** End point of the work(in this case is the center of the pan)
- **P4:** Exit point of the tool from the pan (in which select Last Step)
- **P5:** Last point, created automatically from the machine, really close to the point P0

During a first acquisition we suggest to catch the points so they don't touch the pan; we will proceed after to modify the quotes of the steps.

In addition to the points is important determine the correct speeds of the cycle.

- **V0:** speed from P5 to P0 Medium Speed
- **V1:** speed from P0 to P1 High Speed
- **V2:** speed from P1 to P2 Low Speed
- **V3:** speed from P2 to P3 Low Working Speed

- **V4:** speed from P3 to P4 High Speed
- **V5:** speed from P4 to P5 High Speed

If necessary, you can define points on paper and then acquire using the page of Carriage acquisition. Below is explained the step by step procedure to acquire at the best all the steps that characterize the machine cycle.

STEP 0:

1. Put the selector in Manual cycle
2. Open the page "Electronic carriage set-up"
3. Press the displayed button "Start set-up"
4. Using the "X e Y axis movement" selectors indicated by the green arrows in Fig. 4.2.2 move to the point P0 as shown in Fig. 4.2.1. P0 must allow the operator to set or remove the pan from the spindle without causing collisions with the horizontal carriage.
5. Set the V0 speed (medium speed) in the "Step Speed" box
6. Confirm the position of P0 pressing 2 times the green "Start cycle" button indicated by the red arrow in Fig. 4.2.2

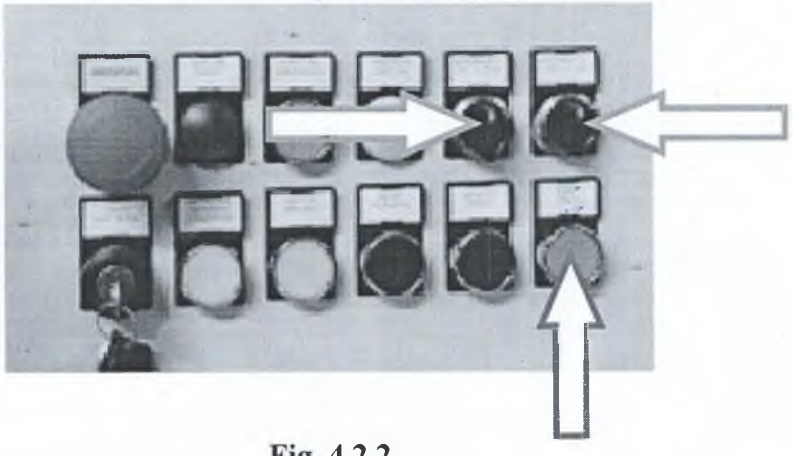


Fig. 4.2.2

STEP 1:

1. Using the "X e Y axis movement" selectors indicated by the green arrows in Fig. 4.2.2 move to the point P1 as shown in Fig. 4.2.1. P1 is the step in which you reach the pan, it never has to touch the product
2. Set the V1 speed (high speed) in the "Step Speed" box
3. Confirm the position of P1 pressing 2 times the green "Start cycle" button indicated by the red arrow in Fig. 4.2.2

STEP 2:

1. Using the "X e Y axis movement" selectors indicated by the green arrows in Fig. 4.2.2 move to the point P2 as shown in Fig. 4.2.1. P2 is the step in which the tool begins to touch the pan, so always keep low speed
2. Set the V2 speed (low speed) in the "Step Speed" box
3. Confirm the position of P2 pressing 2 times the green "Start Cycle" button indicated by the red arrow in Fig. 4.2.2

STEP 3:

1. Using the "X e Y axis movement" selectors indicated by the green arrows in Fig. 4.2.2 move to the point P3 as shown in Fig. 4.2.1. P3 is the working step in which you have removal of material; is important use the correct working speed, depending from the kind of trim that you need
2. Set the V3 speed (low working speed) in the "Step Speed" box
3. Confirm the position of P3 pressing 2 times the green "Start Cycle" button indicated by the red arrow in Fig. 4.2.2

STEP 4:

1. Using the "X e Y axis movement" selectors indicated by the green arrows in Fig. 4.2.2 move to the point P4 as shown in Fig. 4.2.1. P4 is the exit step which determines the end of the work on the pan, so you can move with high speed
2. Set the V4 speed (high speed) in the "Step Speed" box
3. Select the displayed button "Last Step"; if selected properly, a yellow lamp will light up on the button
4. Confirm the position of P4 pressing 2 times the green "Start Cycle" button indicated by the red arrow in Fig. 4.2.2
5. The program is already transferred.

To create a radius during the acquisition, once reached the required step, press Fillet CW or Fillet CCW depending from the direction in which the toolmaker wants to make the radius. That will be the First vertex of the radius. Before confirming the step, is necessary insert the angle of the radius. We suggest to acquire placing 90° as a measurement of the radius, and only in the modify phase, lower the angle to reach the desired processing. Once confirmed the step, always remember that the next step corresponds to the 2° vertex of the radius.

N.B. During the acquiring procedure can happen that the toolmaker selects some attribute in some steps which don't require that kind of attribute (Ex: Last Step in P2). In this case is necessary press the "Stop cycle" button on the pushbutton to abort the selection. If you already confirmed the step with the Start Cycle button, will be necessary repeat the acquiring procedure or make some changes using the "Modify electronic carriage" page.

4-3 TEST CYCLE

Once completed the acquiring procedure, the toolmaker can try the automatic cycle. To do so, enter in the Working page as shown in Fig. 4.3.1

Fig. 4.3.1

To try the horizontal carriage excluding the upper turret, which will be regulated after, put in position 1 the "Inclusion elect. Carriage" selector , leaving in position 0 the "Inclusion upper turret" selector. Check that the vacuum of the mold of the spindle is enough to try an automatic cycle and check in Spindle set-up page that you have set the correct rotation speed for that kind of work. At this point, turn the selector in Automatic cycle and press the green Start cycle button.

Wait until the procedure is completed correctly , checking the positions of the horizontal carriage with the pan on the mold. If necessary, at the end of the process you can press again Start cycle to rerun the automatic cycle.

4-4 OFF-SET

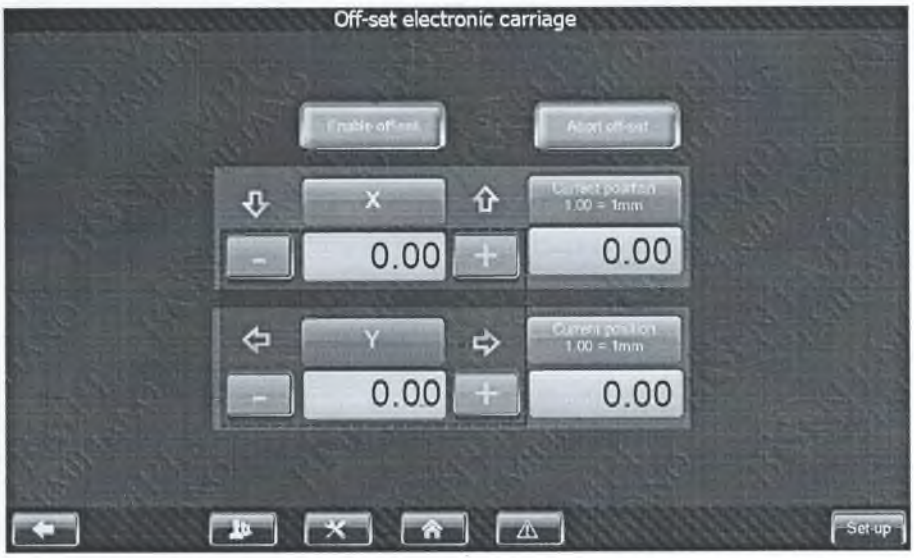


Fig. 4.4.1

With the "Off-set electronic carriage" page in Fig. 4.4.1 is possible move all the steps of the cycle of a certain value (in mm) simultaneously. To use it correctly, follow the procedure below.

1. Rotate the selector to Manual cycle
2. Enter in the "Off-set electronic carriage " page from the Menu
3. Press the displayed button Enable Off-set
4. If, after mistakenly pressed the Enable off-set button, the toolmaker thinks that the procedure is not necessary, press Abort Off-set
5. Select the box corresponding to X axis or Y axis
6. Enter the desired value (Ex: 0.5 mm) inside the selected box.
7. Press the arrow corresponding to the direction in which you want to move all the cycle position
8. Make sure you have correctly changed the position of the cycle

At this point, check again if the automatic cycle is correct or needs more changes, using a Test cycle (Par. 4-3)

4-5 CARRIAGE MODIFY

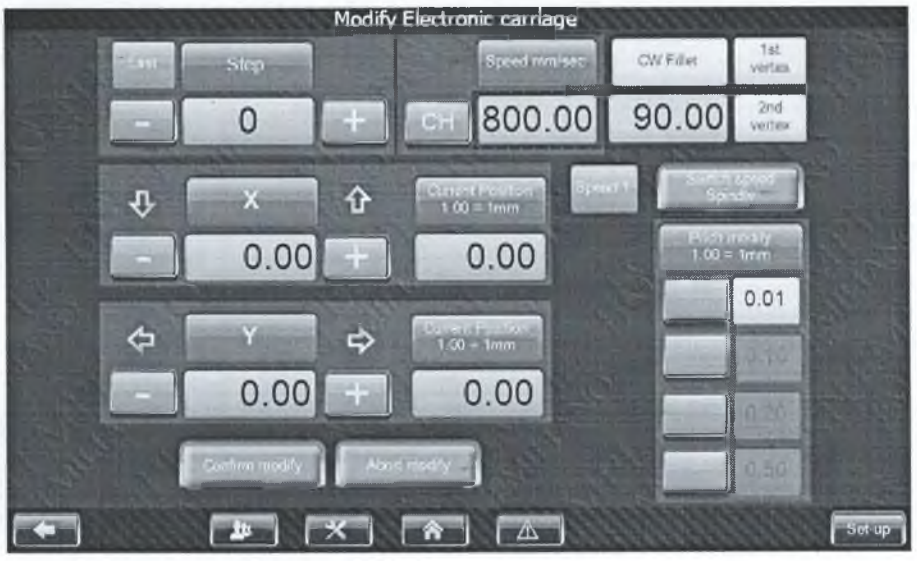


Fig. 4.5.1

The "Modify electronic carriage" page in Fig. 4.5.1 allows to implement several changes to individual steps of the recipe, in case where the changes in Off-set are no longer usable to obtain an optimal product. To make a correct modify, follow the procedure below.

1. Rotate the selector to Manual cycle
2. Enter in "Modify electronic carriage" page from the Menu
3. Select the step to modify using "+ e -" buttons at the sides of the step
4. Select the Pitch modify value in the column at bottom right, which determines how much you modify the current value using the corresponding arrow to choose the correct direction
5. If necessary, change the value of X and Y of the selected step by pressing the arrows corresponding to the direction you want to move the step
6. If necessary, press CH at the top and press on the speed value in order to change it (in case you have a radius in the selected step, press CH to change the angle of the radius)
7. If necessary, Switch the spindle speed from Speed 1 to Speed 2 pressing "Switch speed spindle"
8. Once finished the step modify, press Confirm modify at the bottom to confirm, Abort Modify if you want to abort all the changes in the step
9. If it is considered necessary modify other steps, repeat again the procedure

Once the process is finished, the toolmaker can repeat the test cycle in automatic to check the proper functioning of the changes, as explained above in paragraph 4-3

4-6 STEPS TABLE MODIFY

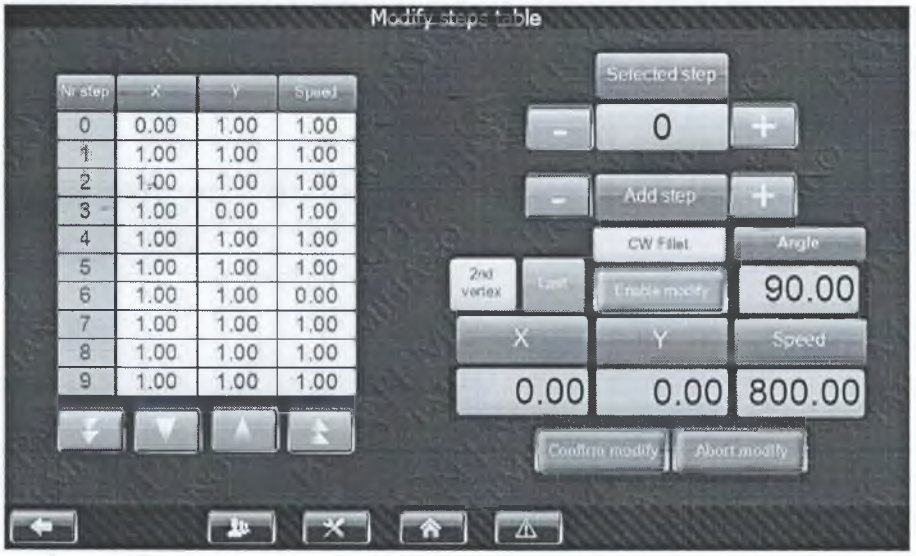


Fig. 4.6.2

The page "Modify steps table" in Fig. 4.6.2 allows to add, delete and modify the steps of the recipe previously acquired. To make some changes, follow the procedure below.

1. If it is considered necessary add or delete a step, enter the number of the step selected in the corresponding box under "Selected Step"
2. Once written the number of the step that you want to add or delete, press + to add a step (the command duplicate the selected step, moving down all the other subsequently steps) or – to delete it
3. To edit a step, select it in the box corresponding to "Selected Step" using the buttons "+ and –"
4. Press "Enable modify" to enable the changes of position, speed and, if necessary, even the angle of the radius
5. In the boxes corresponding to X e Y you can write the new value of the position of the step selected for the modify
6. Once completed the changes, press "Confirm modify" to accept the modify and "Abort modify" to restore the previous values of the step

N.B. Is not possible duplicate or delete step 0, the step that contains the attribute LAST STEP and the last step generated automatically from the machine. If it is decided to delete a step that contains a vertex of the radius, ALWAYS remember to delete even the following step, which contains the other vertex of the radius.

5 RECIPES MANAGEMENT

5-1 SAVE RECIPE

Fig. 5.1.1

The "Programs list management" in Fig. 5.1.1 presents a list on the left side, which can be displayed using the little arrow inside the red box.

To save a new recipe, press the arrow and select a position to save a new recipe already acquired and modified. Pay attention not to overwrite a recipe that can be used in the future. Write an appropriate name inside the dedicated space "Name recipe", and then press "Save". Wait a few moments to allow the completion of the procedure. When the recipe is saved, press the corresponding button to confirm that the save has been successfully made.

5-2 LOAD RECIPE

Changing the product to be processed corresponds to a change of the recipe. To Load a pre-existent recipe, select it from the list, and check that inside the "Name recipe" box there is the correct recipe. Once checked, press "Load" to load the program of the product to be produced. Wait a few seconds until the loading is complete, so press the corresponding button to confirm that the load has been successfully made

6 UPPER TURRET

6-1 TOOLING

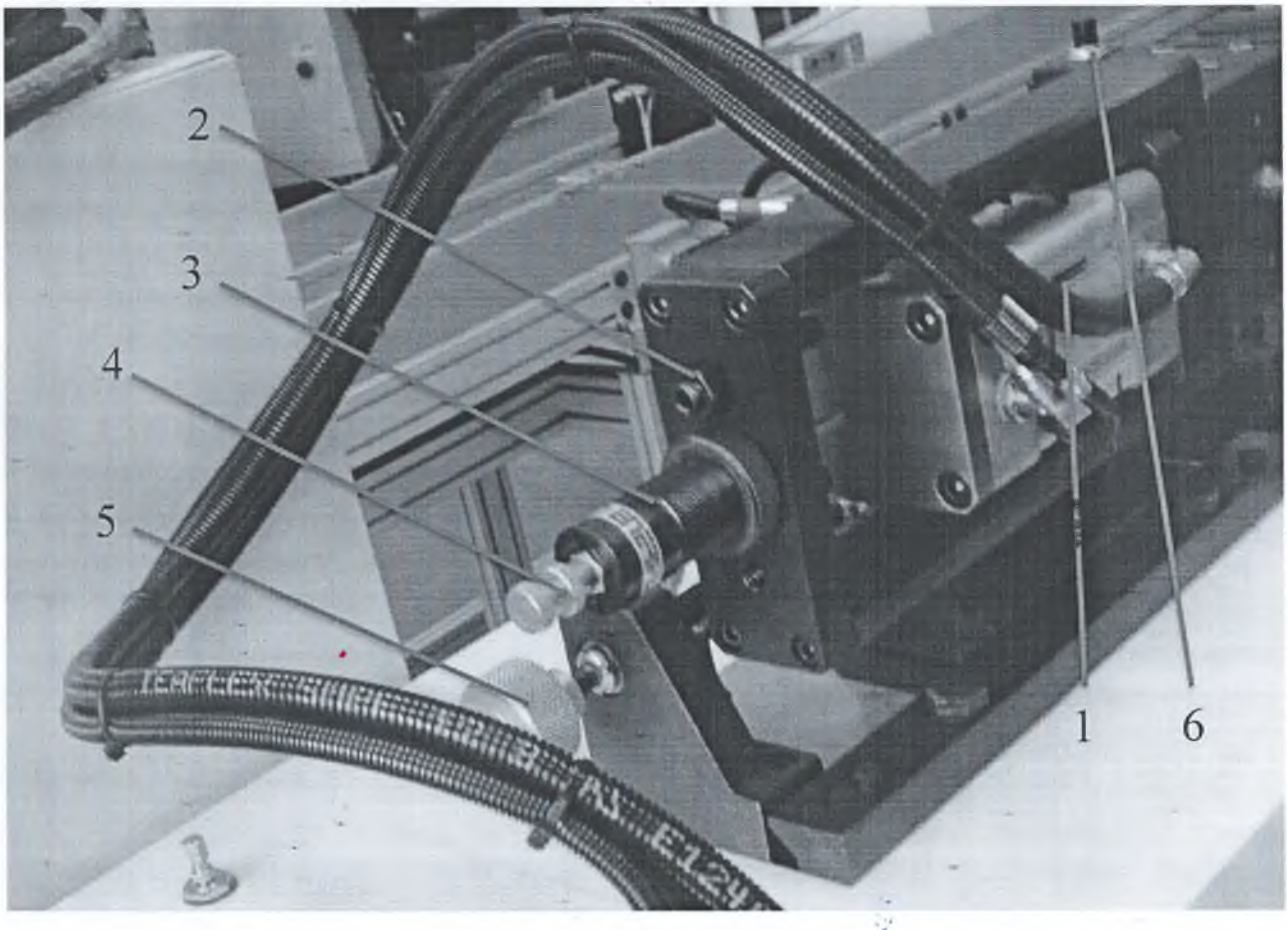


Fig. 6.1.1

The upper turret in Fig. 6.1.1 is used to work the edge of the product using specific tools. It may be inclined to perform specific processes that require it. Every time the product is changed, even the turret needs an appropriate tooling of the mechanicals and electronic parts explained below.

1. **Limit switch CSH 253:** this magnetic limit switch sets the maximum depth at which the cylinder can move. For a precise operation it works in combination with a mechanical stop (2).
2. **Mechanical stop:** must be positioned in a way that, when the limit switch CSH 253 is reading, the mechanical stop has to be in mechanical stop on the cylinder, ensuring a uniform processing on all the products of the same type, which couldn't be guaranteed only with the use of the limit switch, because without the mechanical stop, sometimes the cylinder could move a little further or a little back

3. **Hydraulic brake (part 1):** this brake allows to slow down the cylinder to make it work at the right speed on the product; screwing the black hydraulic cylinder will anticipate the brake, unscrewing it will postpone the brake.
4. **Hydraulic brake (part 2):** this part of the hydraulic brake allows to determine how intensively the cylinder slows down, determining so its working speed; tighten the screw will increase the braking force, slowing the cylinder more; loosen the screw will decrease the braking force, increasing the cylinder speed
5. **Handwheel adjusting screw:** loosening the screws of the turret assembly, this screw allows to move forward or backward the entire group, to move the tool near the pan and reduce the processing time.
6. **Height adjustment screw:** this screw is used to raise or lower the entire turret assembly to place it at the correct height for the process; to make this possible, is necessary loosen the screw in Fig. 6.1.2 and after this, screw or unscrew the screw indicated by the arrow.

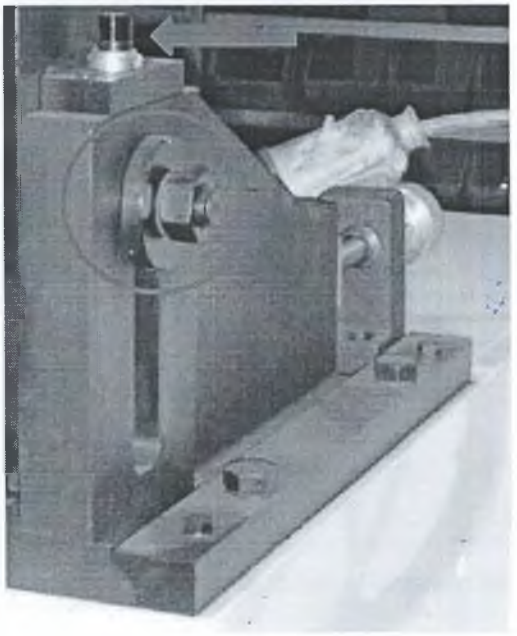


Fig. 6.1.2

In the Working page there is a "Manual upper turret" button that allows to test manually the cycle of the upper turret with the spindle stationary. Once verified the process, is possible proceed with a Test Cycle in automatic.

6-2 TEST CYCLE

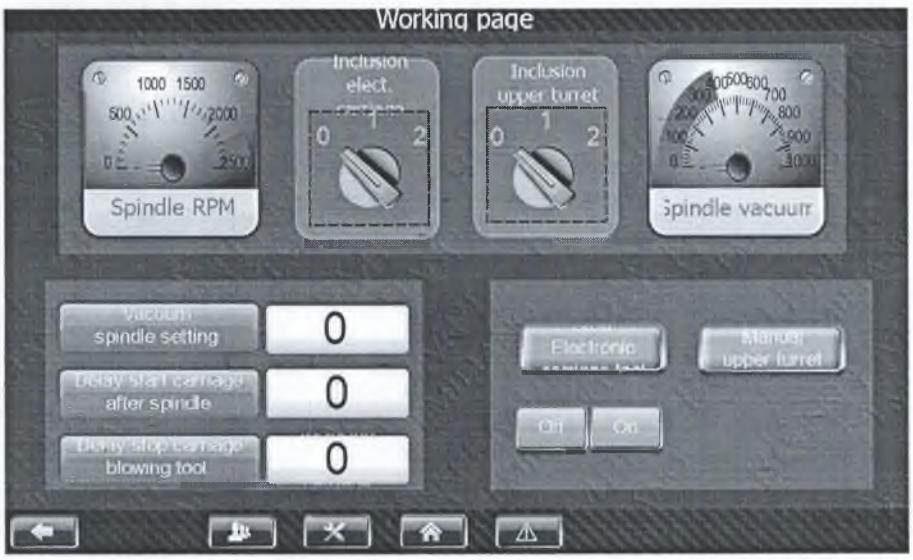


Fig. 6.2.1

To try the upper turret excluding the horizontal carriage, which has been previously adjusted, put in position 1 the "Inclusion upper turret" selector , leaving in position 0 the "Inclusion elect. carriage" selector. Check that the vacuum of the mold of the spindle is enough to try an automatic cycle and check in Spindle set-up page that you have set the correct rotation speed for that kind of work. At this point, turn the selector in Automatic cycle and press the green Start cycle button.

Wait until the procedure is completed correctly , checking the positions of the upper turret with the pan on the mold. If necessary, at the end of the process you can press again Start cycle to rerun the automatic cycle.

If the tool is at the right height but it doesn't work enough the product, the magnetic limit switch and the mechanical stop must be adjusted together; if the processing speed is too high or too low, or the slowdown occurs too early or too late, is necessary adjust the Hydraulic brake to ensure an optimal process. After making some adjustment, try again the automatic cycle to verify the work.

7 HOMING CYCLE

This machinery **doesn't need** the homing everytime the operator makes a power cycle. It needs the homing just in case there is a motor or a belt broken. Follow the procedure:

1. Turn off the power switch on the machinery to work safely
2. Change the broken device with a new one
3. Tighten the belt as shown in the use and maintenance manual
4. Once changed and restored all the broken parts, make a power cycle on the machinery
5. Restore the auxiliary circuit and press the Reset position button to restore all the alarms (only Make homing visualized)
6. Press on the Make Homing alarm; the display moves to the homing page shown below

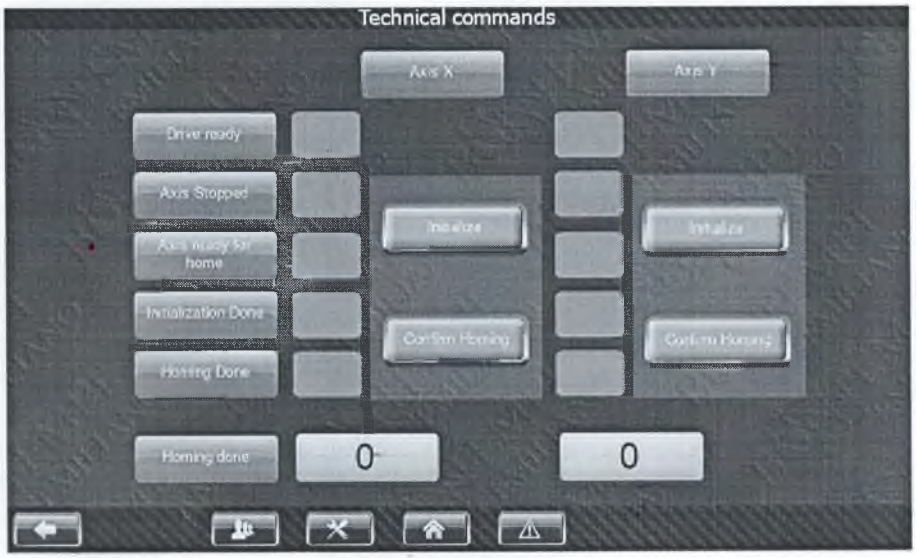
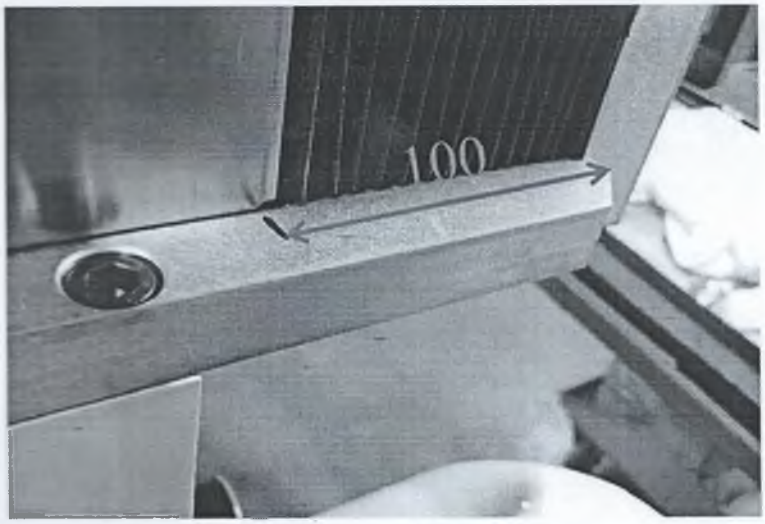


Fig.7.1.1

7. The carriage doesn't move in all the directions with the selectors, so press the emergency button to move it manually
8. Put manually the 2 carriages on the notch, as shown in the pictures below



Correct position of Y axis on the notch

Correct position of X axis on the notch

9. Restore again the auxiliary circuit
10. On the display, in the Homing page, press the Initialize button for the axis in which has changed something; the yellow box corresponding to "Initialization Done" goes on
11. Wait a while and press Confirm Homing; the yellow box corresponding to "Homing Done" goes on

If the procedure has been made correctly, the recipe will be about the same. For the safety of the operator, please make a little off-set before performing the automatic cycle.

8 ALARMS DESCRIPTION

DESCRIPTION	CAUSE	SOLUTIONS
Emergency Connect in aux.voltage	Emergency button pressed Security module in alarm	Unlock the button and restore auxiliary circuit Check the electrical connections
Overload cut-out engaged	Motor blocked mechanically or failure Faulty electrical connections	Restore the overload cut-out Check cables connections Check the motor
Inverter spindle fault	Inverter fault	Perform a power cycle Check the inverter and, if necessary, contact technical assistance
Anomaly homing cycle	A carriage axis has not completed Homing	Check homing limit switches
Anomaly zero speed of spindle	Inverter doesn't communicate to the system that is stationary	Check connection of the inverter cables Perform a power cycle
Make homing	Homing not executed yet	If there's only this alarm, perform homing cycle
Anomaly driver	Driver fault	Check error codes, Perform a power cycle and, if necessary, contact technical assistance
Axis error	Anomaly in the axis working	Check error codes on the driver, Perform a power cycle and, if necessary, contact technical assistance
Compressed air missing	Pressure switch fault or not adjusted well Air pressure missing	Check the presence of air pressure, check the pressure switch
Software Over stroke limit switch pressed	Carriage limit switch pressed	Check limit switch position, check if the carriage is not on the software limit switch
Spindle vacuum alarm	Not enough vacuum for automatic cycle, vacuum lost during the automatic cycle	Clean filters Check the vacuum of the spindle, check the mould

Sim.\Sym.	Sigla\Item	Funzione\Use Type
	EV1 QG 14	FAN COIL SYSTEM BOARD
	EV2 BM 14	FAN-COIL SYSTEM BREAKING RESISTOR
FILTRO	FL1 QG 6	FILTER DRIVES CARRIAGE
	FU1 QG 5	POWER FUSE POWER PACK
	FU4 QG 6	SUPPLY FILTER DRIVES CARRIAGE
	FU5 QG 6	SUPPLY INVERTER SPINDLE MOTOR
	FU10 QG 5	POWER SUPPLY EMERGENCY CIRCUIT
	FU11 QG 5	SUPPLY 24VDC programmable logic controller
	FU12 QG 5	SUPPLY 24VDC ACTUATIONS
	FU13 QG 5	POWER SUPPLY OPERATOR PANEL
	FU14 QG 5	SUPPLY FAN COOLING ELECTRICAL PANEL

Sim.\Sym.	Sigla\Item	Funzione\Use Type
	FU15 QG 5	SUPPLY FAN COOLING BREAKING RESISTANCE
	FU16 QG 5	POWER SUPPLY programmable logic controller
	FU17 QG 5	POWER SUPPLY MODULE COMMAND MOTOR
AC DC	GD1 QG 5	POWER PACK
	HL1 PG 14	ON VOLTAGE
	HL2 PG 14	AUXILIARES ON
	K100S QG 13	MODULE CHECK EMERGENCY
K1R M1	KC1 QG 19	COMMAND FAN SPINDLE MOTOR
	KM1S QG 13	CONTACTOR CONTROL EMERGENCY - DIRECT-
	KM2S QG 13	CONTACTOR CONTROL EMERGENCY - DIRECT-
M 3~	M1 BM 6	MOTOR FAN spindle

Sim.\Sym.	Sigla\Item	Funzione\Use Type
M 3~	M2 BM 7	SPINDLE MOTOR
M 3~	M3 BM 10	AXIS X MOTOR HORIZONTAL CARRIAGE
M 3~	M4 BM 11	AXIS Y MOTOR HORIZONTAL CARRIAGE
	QS1 QG 5	MAIN DISCONNECTOR
	R1 BM 7	BRAKING RESISTOR INVERTER MOTOR SPINDLE
P>	S1 BM 17	Pressure switch compressed air
	S2 BM 18	PC UPPER TURRET POS FORWARD
B F	SA1 PG 17	CYCLE MAN - AUTO
F	SA2 PG 18	MOVEMENT X CCW - 0 - CW
F	SA3 PG 18	MOVEMENT Y CCW - 0 - CW
	SB1 PG 12	EMERGENCY

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Dis.N	TME-BE 5-1 RA
CAD	SPAC
Nome File	TME-BE 5-1 RA
Data	04-03-2014
Impianto	TORNIO TIPO TME-BE KINETIX 5500
Denominazione	LEGENDA FUNZIONI LEGENDA FUNCTIONS
Revisione	1-1
Commessa	L_____
Esecutore	S.G.
	28
FOGLIO	27
SEGUE	28

Sim.\Sym.	Sigla\Item	Funzione\Use Type
	SB2 PG 12	RESET EMERGENCY
	SB3 PG 17	START CYCLE
	SB4 PG 17	OFF CYCLE
	SB5 PG 17	RESET POSITION
	SB6 PG 18	FAST MANUAL
	SB8 BM 18	PEDAL PIECE RELEASE
	SH1 PG 18	ROTATION spindle
	YV1 BM 19	E.V. SUCTION spindle
	YV2 BM 19	E.V. RELEASE BLOEW PIECE IN SPINDLE
	YV3 BM 19	S.V. BLOW tool
	YV4 BM 19	S.V. FORVARD UPPER TURRET

Sim.\Sym.	Sigla\Item	Funzione\Use Type

Sim.\Sym.	Sigla\Item	Funzione\Use Type

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Dis.N TME-BE 5-1 RA
CAD SPAC
Nome File TME-BE 5-1 RA
Data 04-03-2014

Impianto
TORNIO TIPO TME-BE
KINETIX 5500

Denominazione
LEGENDA FUNZIONI
LEGENDA FUNCTIONS

Revisione 1-1
Commessa
Esecutore S.G.

28

FOGLIO 28
SEGUE /

Fg/Sh	Descrizione	Description
1	LEGENDA FOGLI	LEGENDA PAGES
2	PRESCRIZIONI GENERALI	GENERAL REQUIREMENTS
3	LEGENDA SIMBOLI	LEGENDA SYMBOLS
4	TRASFORMATORE	TRANSFORMER
6	ALIMENTAZIONI	SUPPLIES
7	INVERTER MOTORE MANDRINO	INVERTER MOTOR SPINDLE
9	INVERTER MOTORE MANDRINO	INVERTER MOTOR SPINDLE
10	AZIONAMENTO MOTORE ASSE X CARRO ORIZZONTALE	DRIVE MOTOR X AXIS HORIZONTAL CARRIAGE
11	AZIONAMENTO MOTORE ASSE Y CARRO ORIZZONTALE	DRIVE MOTOR Y AXIS HORIZONTAL CARRIAGE
12	CIRCUITO DI EMERGENZA	CIRCUIT OF EMERGENCY
13	CIRCUITO DI EMERGENZA	CIRCUIT OF EMERGENCY
14	AUSILIARI	AUXILIARES
15	PLC	programmable logic controller
16	ALIMENTAZIONE PLC E DISPLAY	SUPPLY PLC AND DISPLAY
17	INGRESSI PLC	PLC INPUT
18	INGRESSI PLC	PLC INPUT
19	USCITE PLC	PLC OUTPUT
20	USCITE PLC	PLC OUTPUT
21	INGRESSI ANALOGICI PLC	ANALOGIC INPUT PLC
22	CONNETTORI AZIONAMENTI	CONNECTORS ACTUATED
23	MORSETTIERA GENERALE	MAIN TERMINAL BLOCK
24	PULSANTIERA GENERALE - FRONTE	GENERAL PUSH BUTTON - FRONT
25	PULSANTIERA GENERALE - RETRO	GENERAL PUSH BUTTON - BACK
26	LAY OUT COLLEGAMENTI PLC AZIONAMENTI	LAY-OUT LINKS PLC DRIVES
27	LEGENDA FUNZIONI	LEGENDA FUNCTIONS
28	LEGENDA FUNZIONI	LEGENDA FUNCTIONS

ELECTRICAL SCHEME FOR LATHE TYPE TBE

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Dis.N TME-BE 5-1 RA
CAD SPAC
Nome File TME-BE 5-1 RA
Data 04-03-2014

Impianto: TORNIO TIPO TME-BE KINETIX 5500
Denominazione: LEGENDA FOGLI / LEGENDA PAGES

Revisione 1-1
Commessa
Esecutore S.G.

28

FOGLIO 1
SEGUE 2

GENERAL REQUIREMENTS CONCERNING THE CONDUCTOR

The conductor must be identifiable at each end.
The conductor must be identified by the colors like below:

BLACK:	power circuit AC
RED:	command circuit AC
WHITE:	command circuit DC
ORANGE:	interlock circuit powered by external voltage
BLU:	Circuit of the neutral conductor
YELLOW-GREEN:	circuit of grounding conductor

The cables from one terminal to another must be without junctions or welding.
The safety circuit conductors must have a section not less 1mmq.
The interlock circuit conductors must have a section not less 1,5 mmq
The power circuit conductors must have a section not less 1,5 mmq.

NOTE

The electric scheme shows the indications for the connection of all the components of the machine some of which can be optional, for this cases the indications are to consider like a predisposition for any addition futures changes

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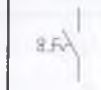
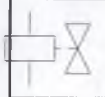
Dis.N. TME-BE 5-1 RA	Impianto	TORNIO TIPO TME-BE KINETIX 5500	Revisione 1-1		FOGLIO 2
CAD SPAC			Commessa		
Nome File TME-BE 5-1 RA	Denominazione	PRESCRIZIONI GENERALI GENERAL REQUIREMENTS	Esecutore S.G.	28	SEGUE 3
Data 04-03-2014					

Sim.\Sym.	File	Descrizione\Description
	E10	*VENTILATOR*
	F30	*Fuse*
	G2	*Three phase AC-DC current converter*
	H5	*LIGHT WARNING*
	M2	*Asynchronous three phase motor*
	Q720	*Four phase maneuver Switch/Disconn*
	Q83	*Three phase disconnect with fuse*
	R10	*resistor*
	S2	*Push-button command NO*
	S7	*Foot actuated command NO*
	S8	*Actuated by pressure (pressure switch) NO*

Sim.\Sym.	File	Descrizione\Description
	S10	*Limit switch NO*
	S26	*Key command with stable position NO*
	S28	*3 position selector NO neuter 0*
	S75	*Push-botton with lamp NO*
	S81C	*Emergency button in stable position turn to unlock NC*
	Y1	*Open solenoid valve (closing)*
	KM1	*Contactor coil*
	BLK10	*Safety unit Preventa*
	BLK18	*Modulo Contactron direct run*
	BLK24	*Three phase power transformer star/star*

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Dis.N	TME-BE 5-1 RA
CAD	SPAC
Nome File	TME-BE 5-1 RA
Data	04-03-2014

Impianto: *TORNIO TIPO TME-BE KINETIX 5500*

Denominazione: LEGENDA SIMBOLI / *LEGENDA SYMBOLS*

Revisione: 1-1

Commessa: L_____

Esecutore: S.G.

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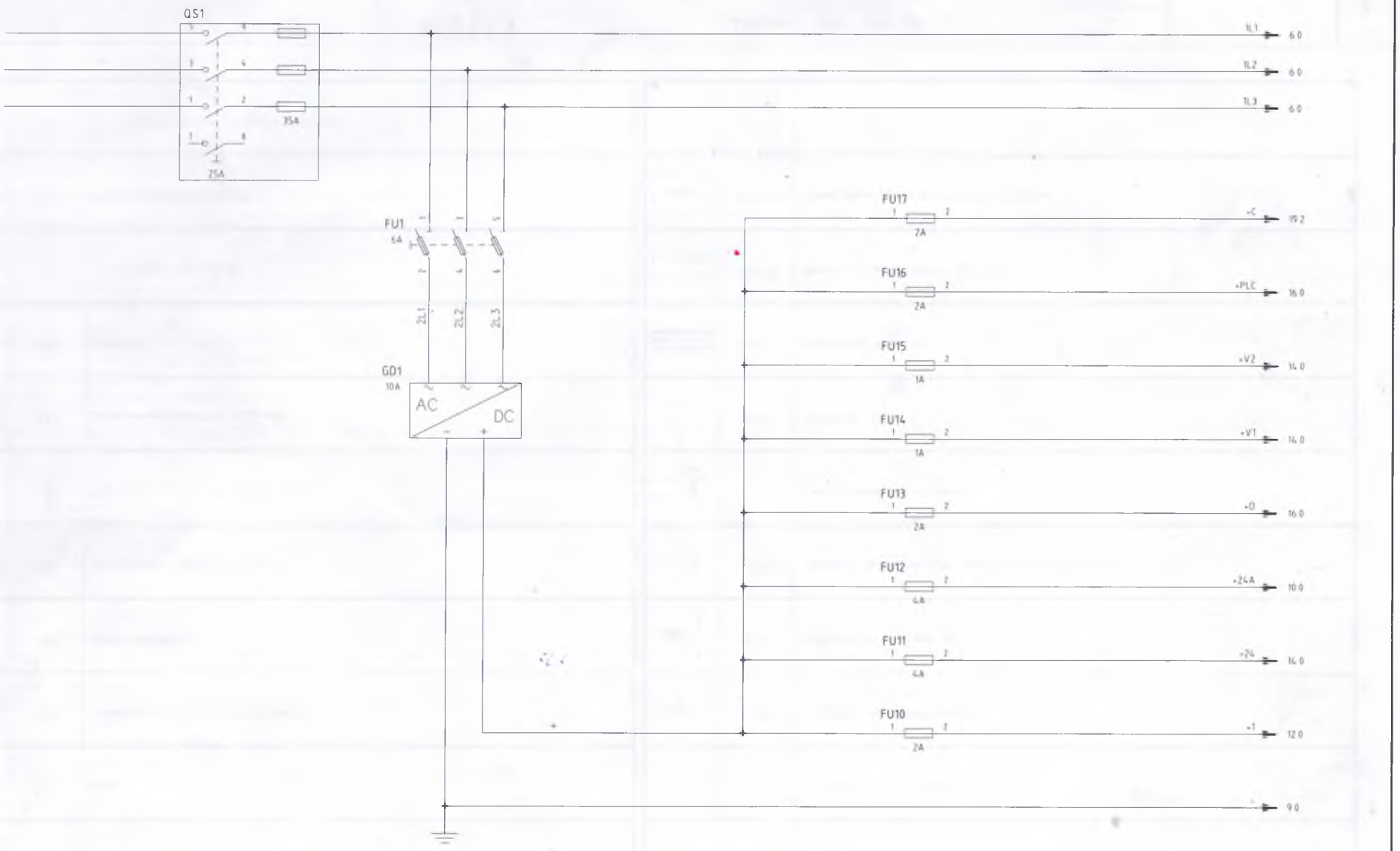
FOGLIO 3

SEGUE 4



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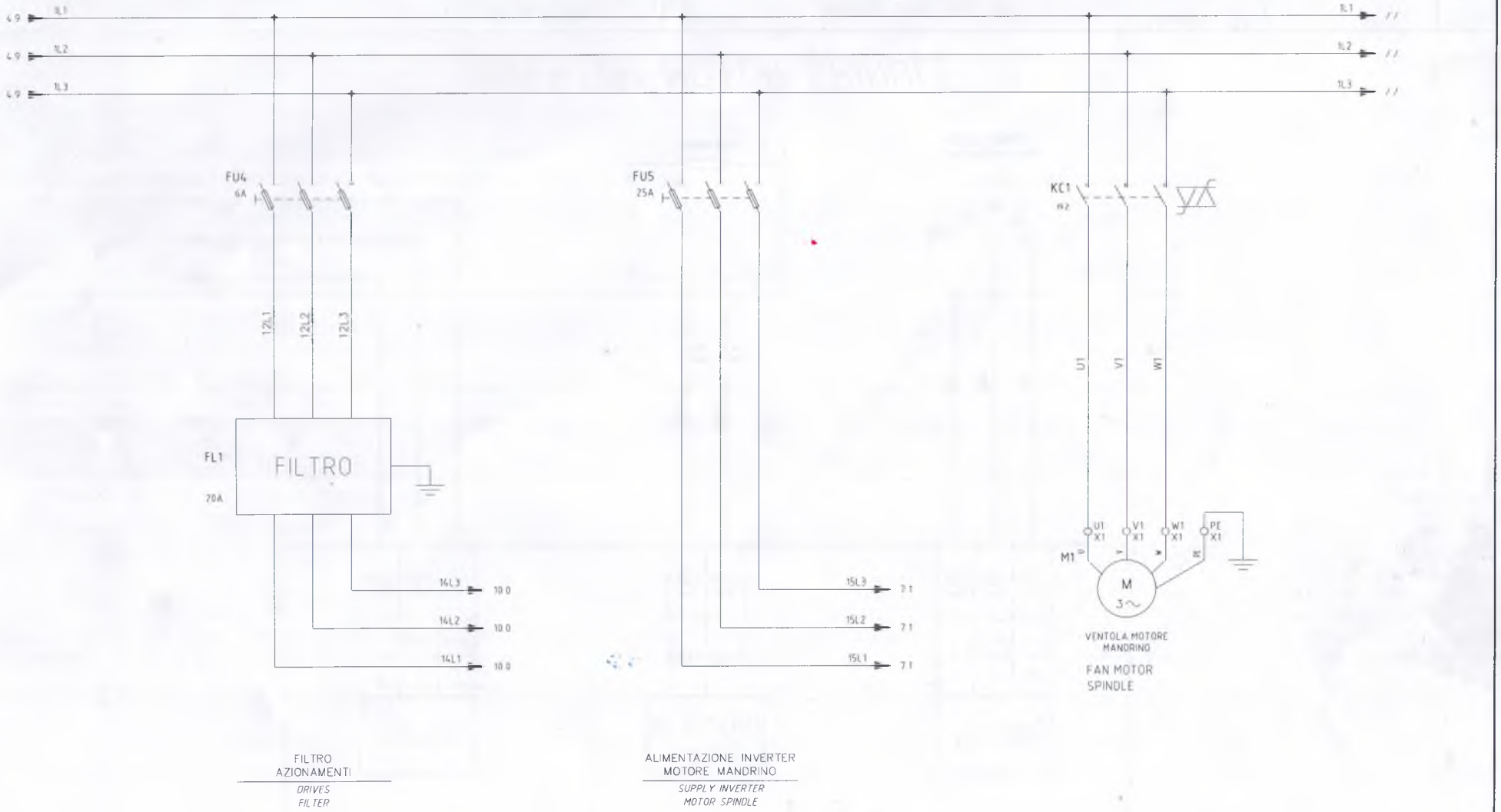
Dis.N TME-BE 5-1 RA	Impianto	Revisione		FOGLIO
CAD SPAC	TORNIO TIPO TME-BE KINETIX 5500	1-1		4
Nome File TME-BE 5-1 RA	Denominazione	Commessa		SEGUE
Data 04-03-2014	TRASFORMATORE TRANSFORMER	Esecutore S.G.	28	6



FILTRO AZIONAMENTI
DRIVES FILTER

ALIMENTAZIONE INVERTER MOTORE MANDRINO
SUPPLY INVERTER MOTOR SPINDLE

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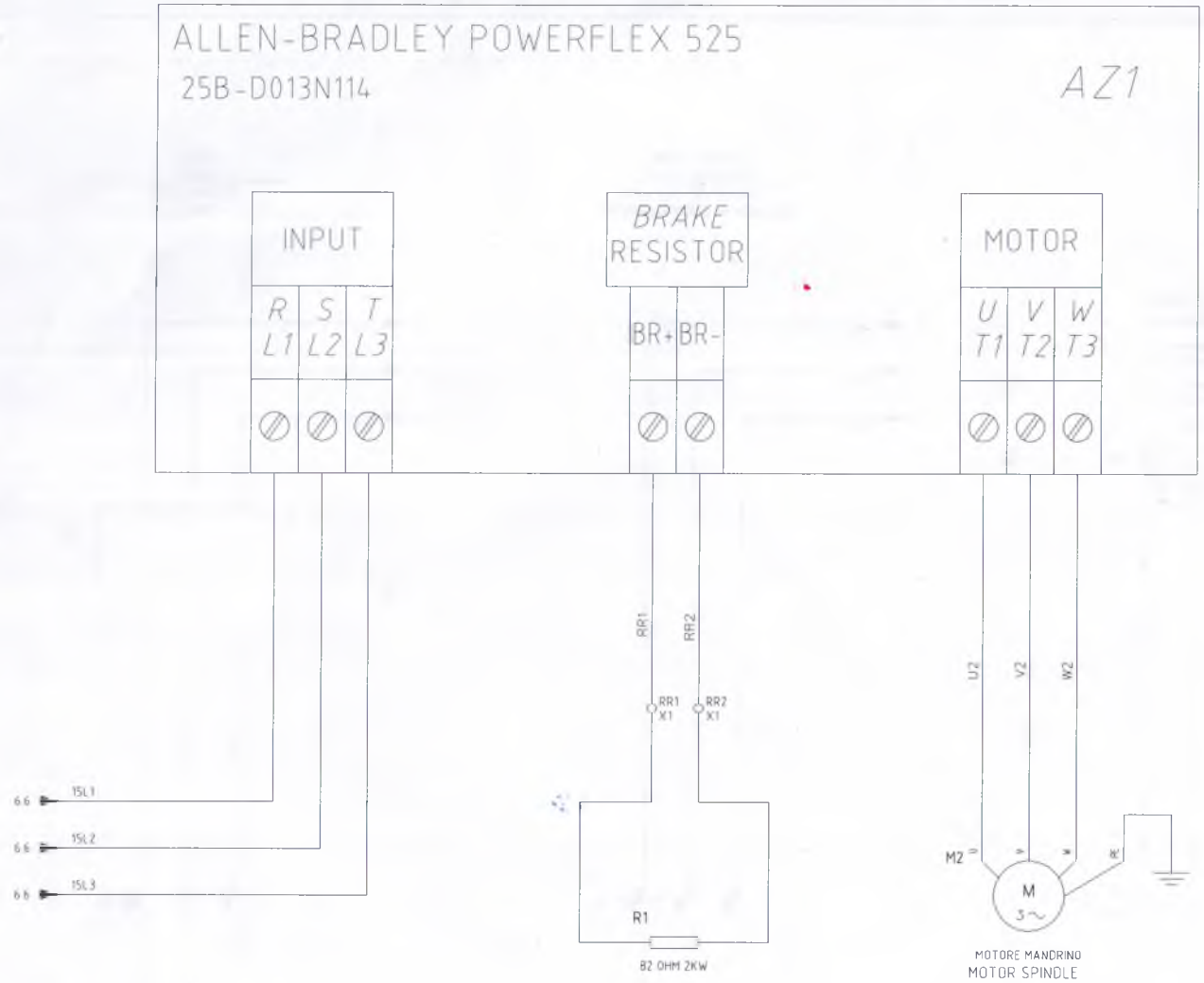
Dis.N. TME-BE 5-1 RA	Impianto	Revisione		FOGLIO
CAD SPAC	TORNIO TIPO TME-BE KINETIX 5500	1-1		6
Nome File TME-BE 5-1 RA	Denominazione	Commessa		SEGUE
Data 04-03-2014	ALIMENTAZIONI *SUPPLIES*	Esecutore S.G.	28	7



INVERTER MOTOR SPINDLE

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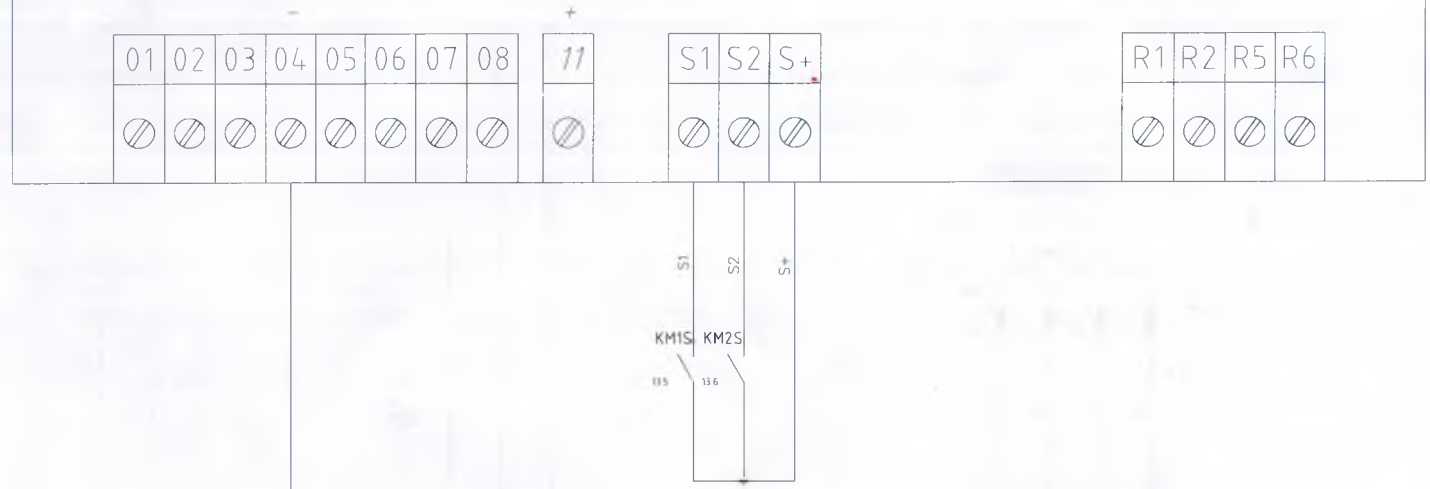
CAD SPAC			Commessa L_____		SEGUE 9
Nome File TME-BE 5-1 RA	Denominazione	INVERTER MOTORE MANDRINO / INVERTER MOTOR SPINDLE	Esecutore S.G.	28	
Data 04-03-2014					

ALLEN-BRADLEY POWERFLEX 525

25B-D013N114

AZ1



INVERTER MOTOR SPINDLE

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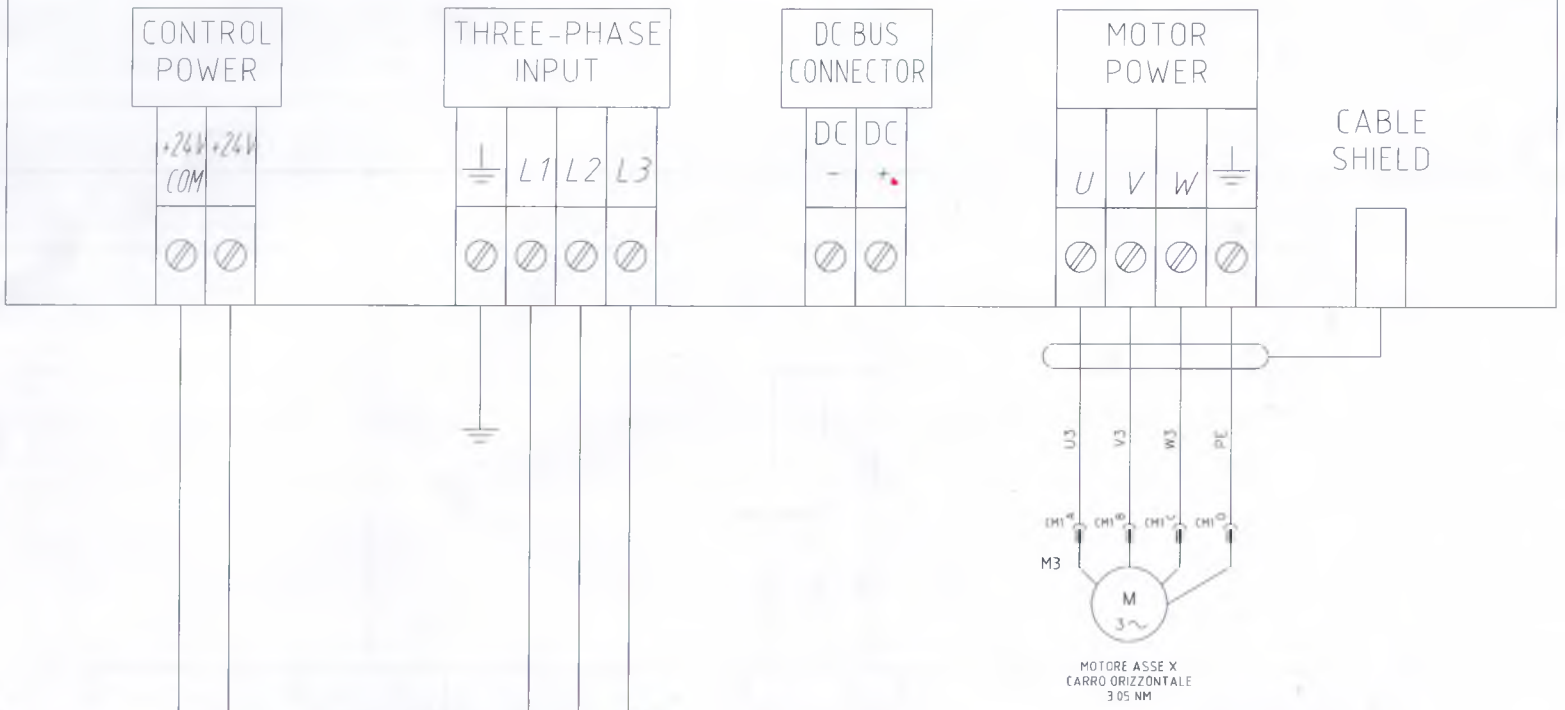
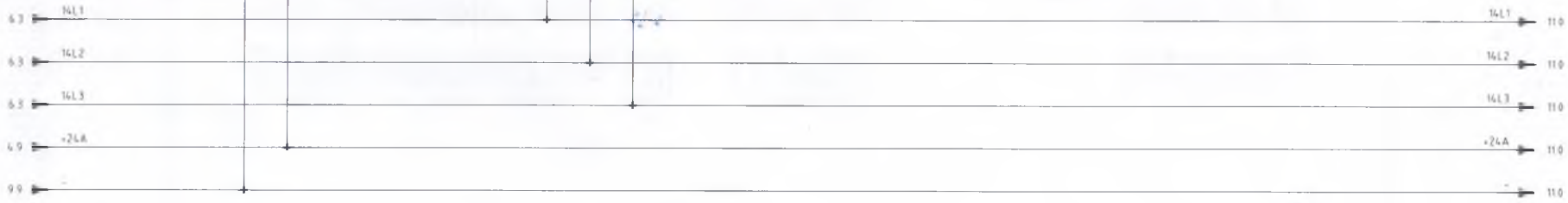
ALLEN-BRADLEY

2198-H025-ERS

AZ2





DRIVE COMMAND MOTOR X AXIS HORIZONTAL CARRIAGE

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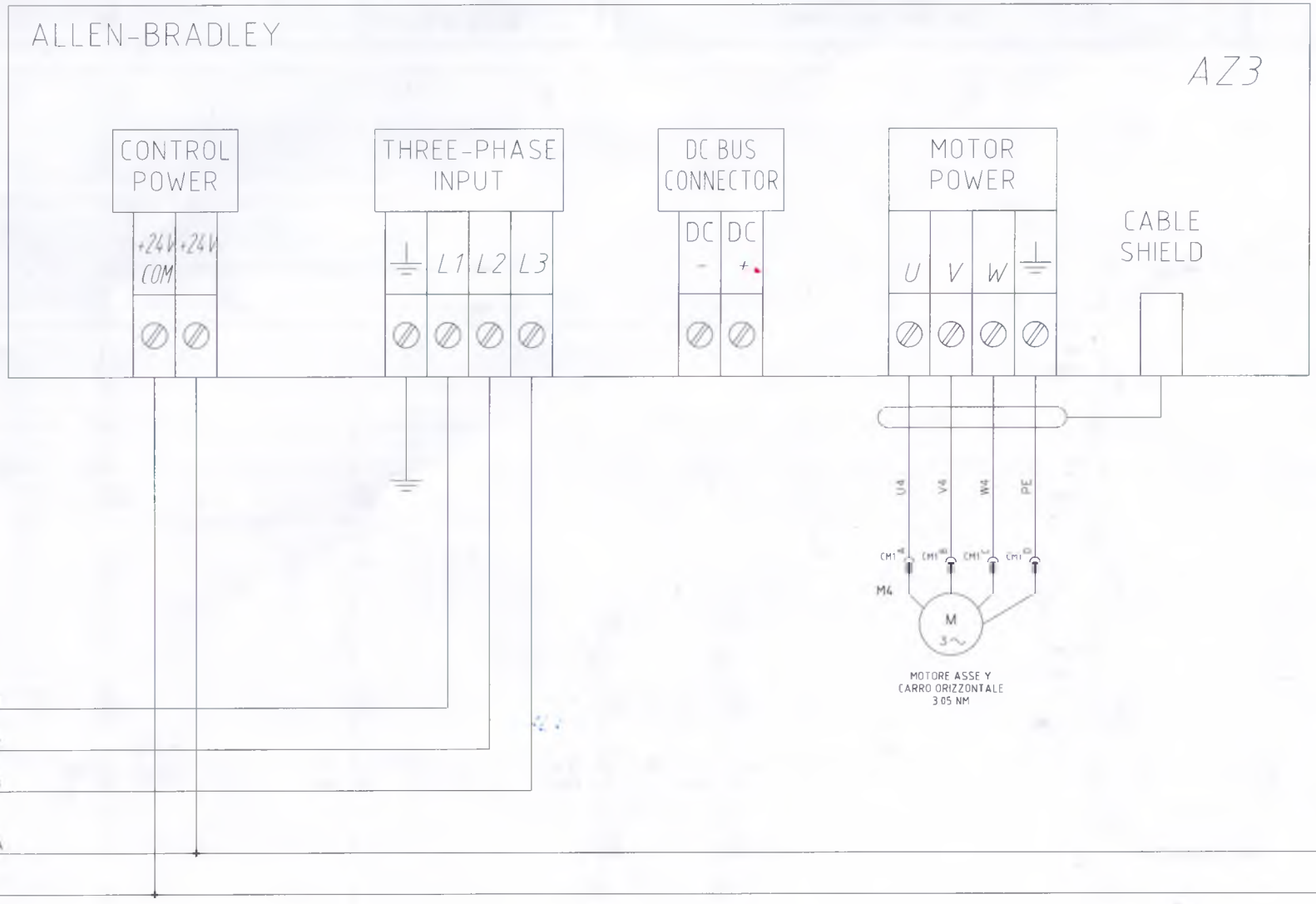
Dis.N. TME-BE 5-1 RA	Impianto: TORNIO TIPO TME-BE KINETIX 5500	Revisione: 1-1		FOGLIO: 10
CAD: SPAC		Commessa: L_____		SEGUE: 11
Nome File: TME-BE 5-1 RA	Denominazione: AZIONAMENTO MOTORE ASSE X CARRO ORIZZONTALE / DRIVE MOTOR X AXIS HORIZONTAL CARRIAGE	Esecutore: S.G.	28	
Data: 04-03-2014				



DRIVE COMMAND MOTOR Y AXIS HORIZONTAL CARRIAGE

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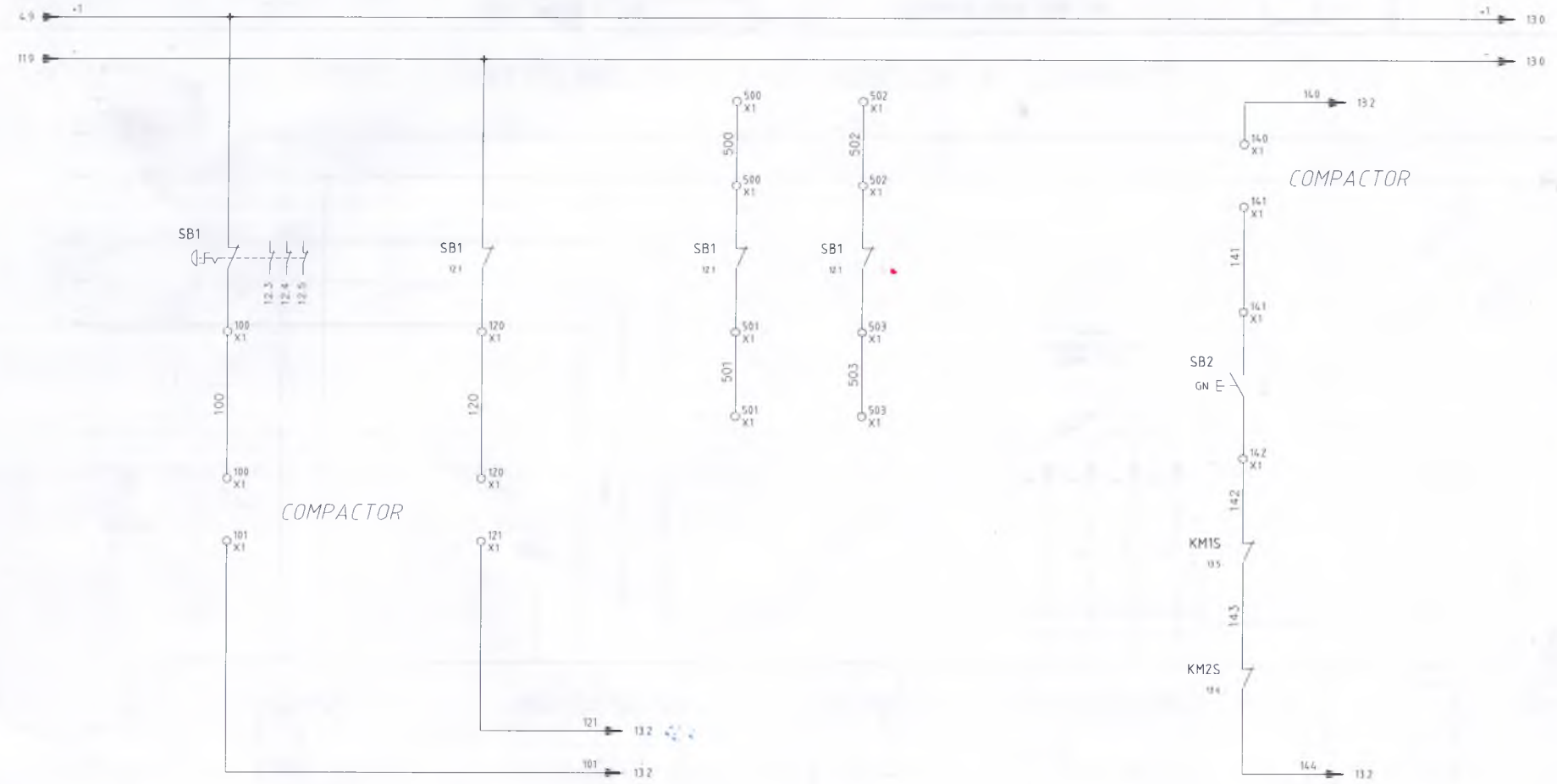
Dis.N. TME-BE 5-1 RA	Impianto TORNIO TIPO TME-BE KINETIX 5500	Revisione 1-1		FOGLIO 11
CAD SPAC		Commessa L_____		SEGUE 12
Nome File TME-BE 5-1 RA	Denominazione AZIONAMENTO MOTORE ASSE Y CARRO ORIZZONTALE / DRIVE MOTOR Y AXIS HORIZONTAL CARRIAGE	Esecutore S.G.	28	
Data 04-03-2014				



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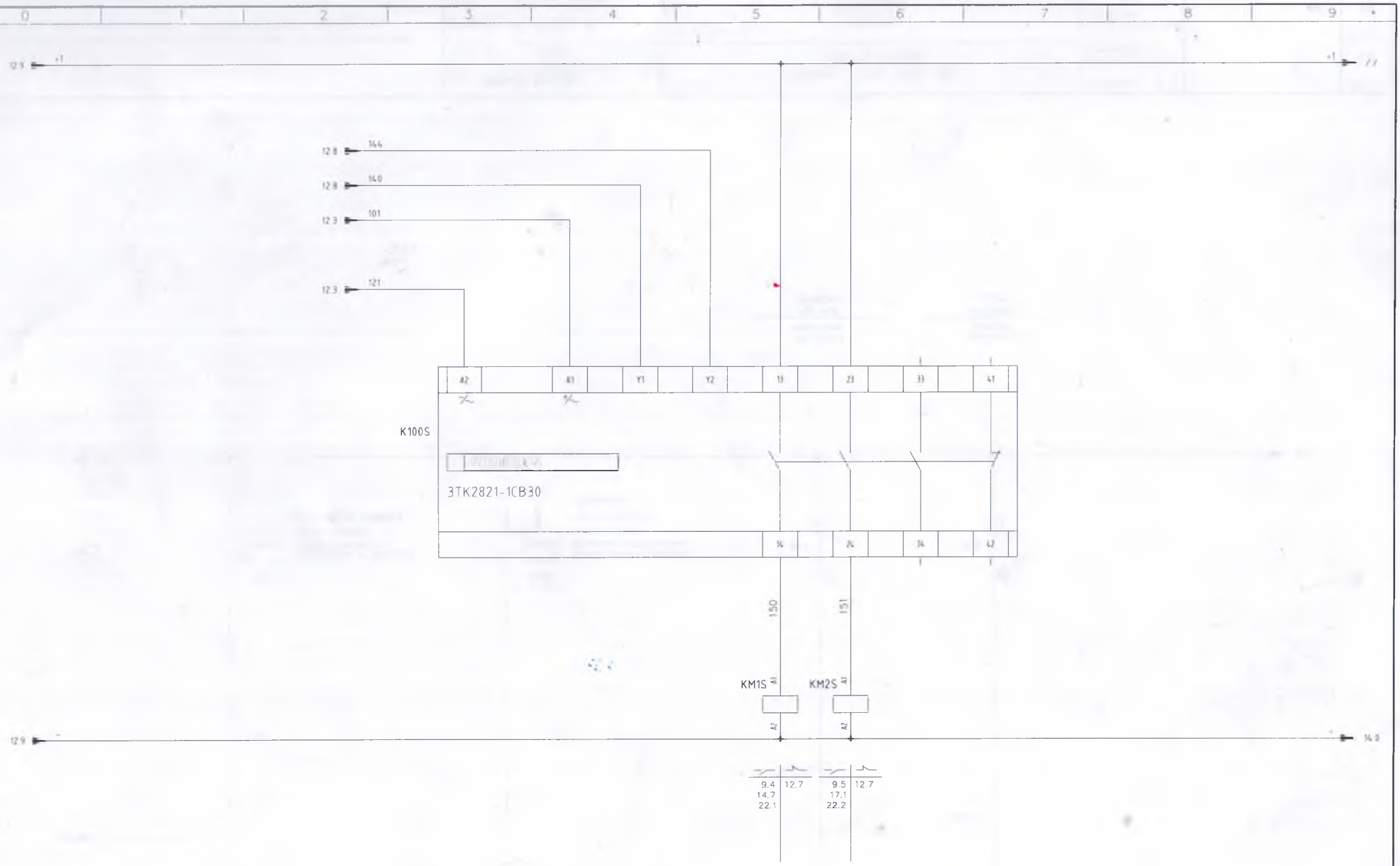
Dis.N TME-BE 5-1 RA	Impianto	Revisione		FOGLIO
CAD SPAC	TORNIO TIPO TME-BE KINETIX 5500	1-1		12
Nome File TME-BE 5-1 RA	Denominazione	Commessa		SEGUE
Data 04-03-2014	CIRCUITO DI EMERGENZA / CIRCUIT OF EMERGENCY	Esecutore S.G.	28	13



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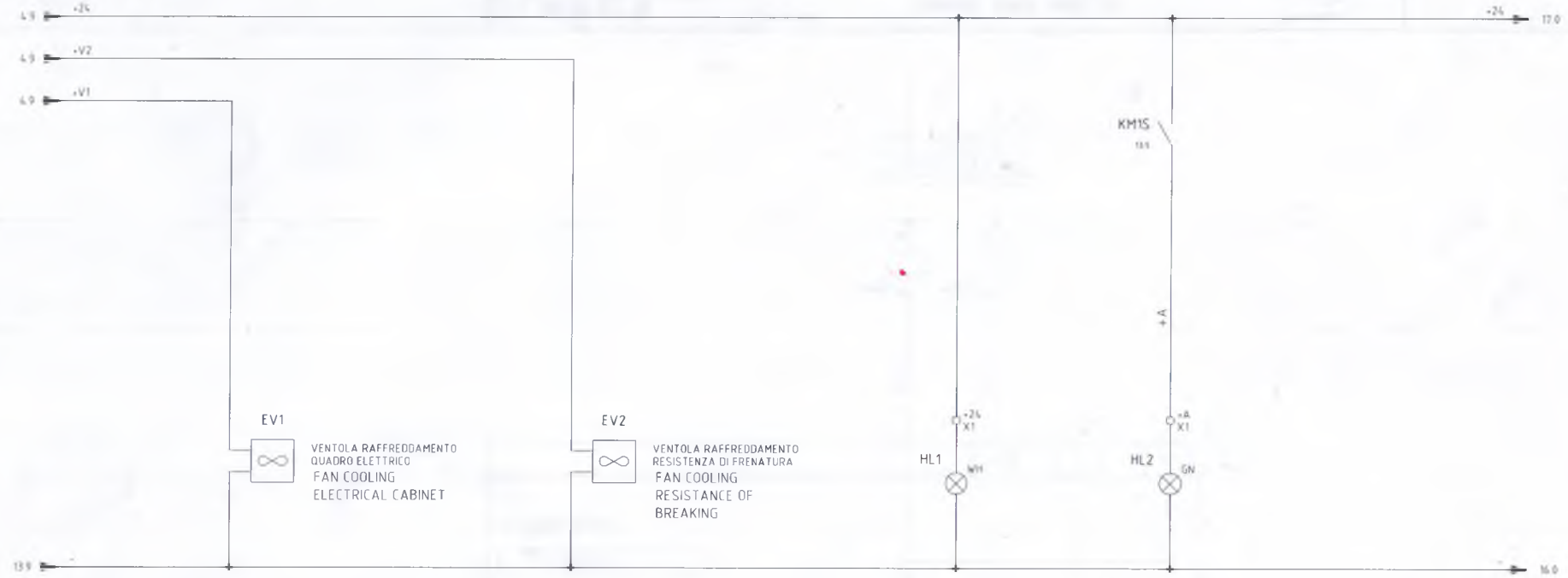
Dis.N TME-BE 5-1 RA	Impianto	TORNIO TIPO TME-BE KINETIX 5500	Revisione 1-1	FOGLIO 13
CAD SPAC			Commessa L_____	
Nome File TME-BE 5-1 RA	Denominazione	CIRCUITO DI EMERGENZA / CIRCUIT OF EMERGENCY	Esecutore S.G.	SEGUE 14
Data 04-03-2014			28	



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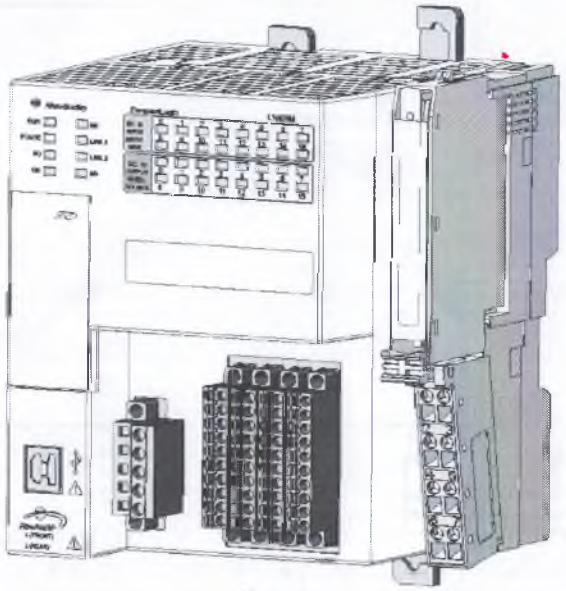
Dis.N TME-BE 5-1 RA	Impianto TORNIO TIPO TME-BE KINETIX 5500	Revisione 1-1		FOGLIO 14
CAD SPAC		Commessa L_____		SEGUE 15
Nome File TME-BE 5-1 RA	Denominazione AUSILIARI / AUXILIARES	Esecutore S.G.	28	
Data 04-03-2014				

PLC DISPOSITION



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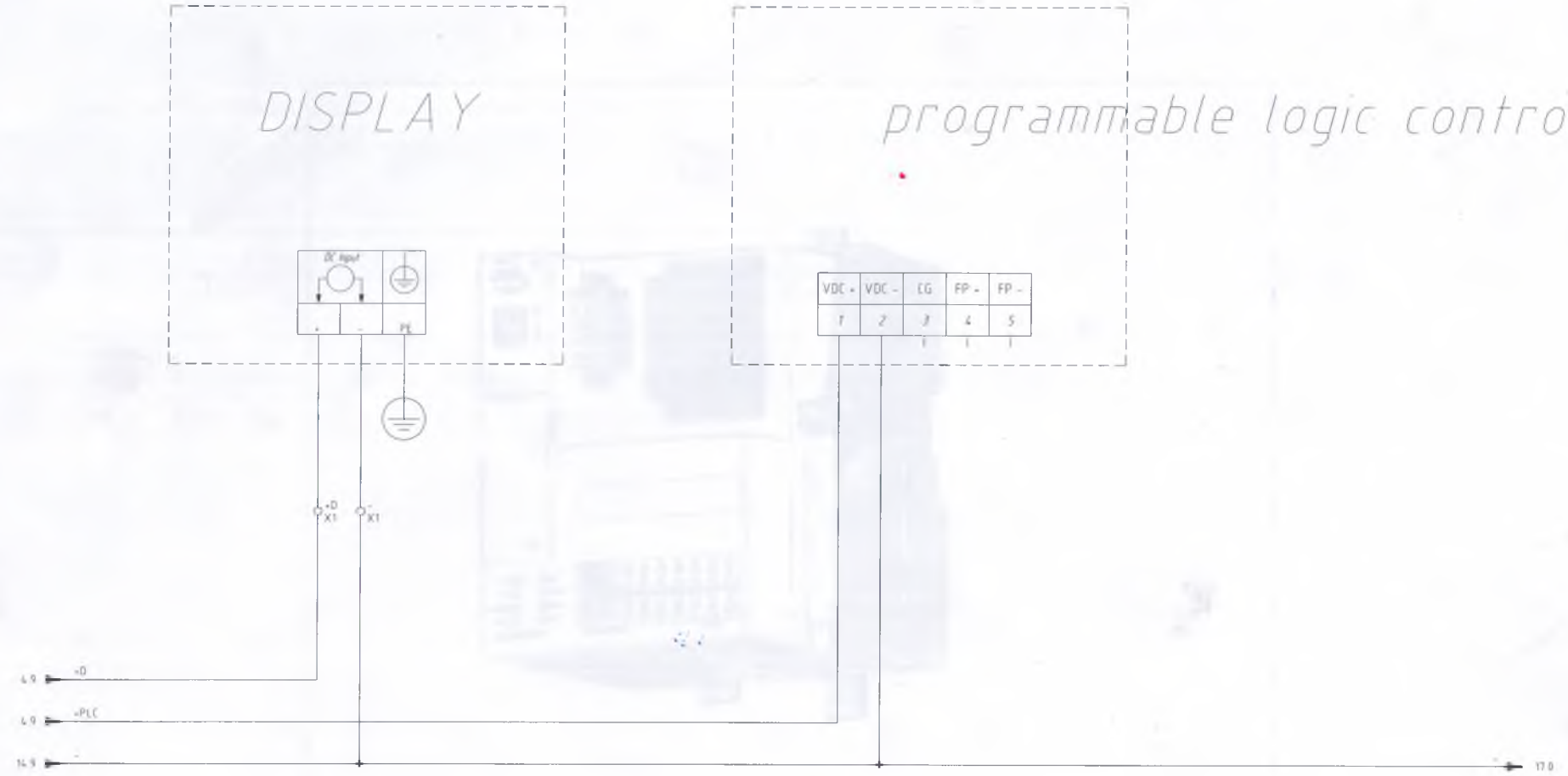
Dis.N. TME-BE 5-1 RA	Impianto	TORNIO TIPO TME-BE KINETIX 5500	Revisione 1-1	FOGLIO 15
CAD SPAC			Commessa L_____	SEGUE 16
Nome File TME-BE 5-1 RA	Denominazione	PLC programmable logic controller	Esecutore S.G.	28
Data 04-03-2014				



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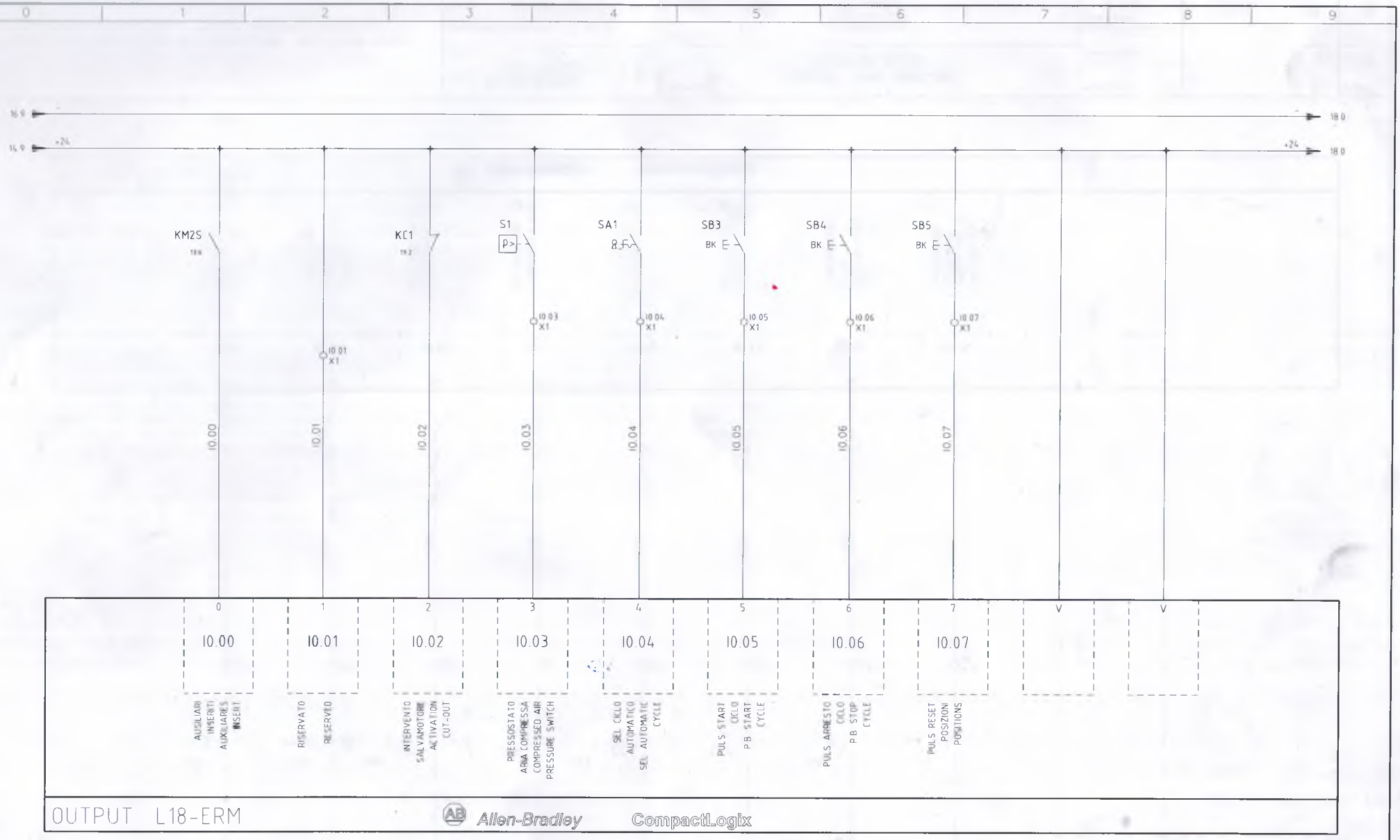

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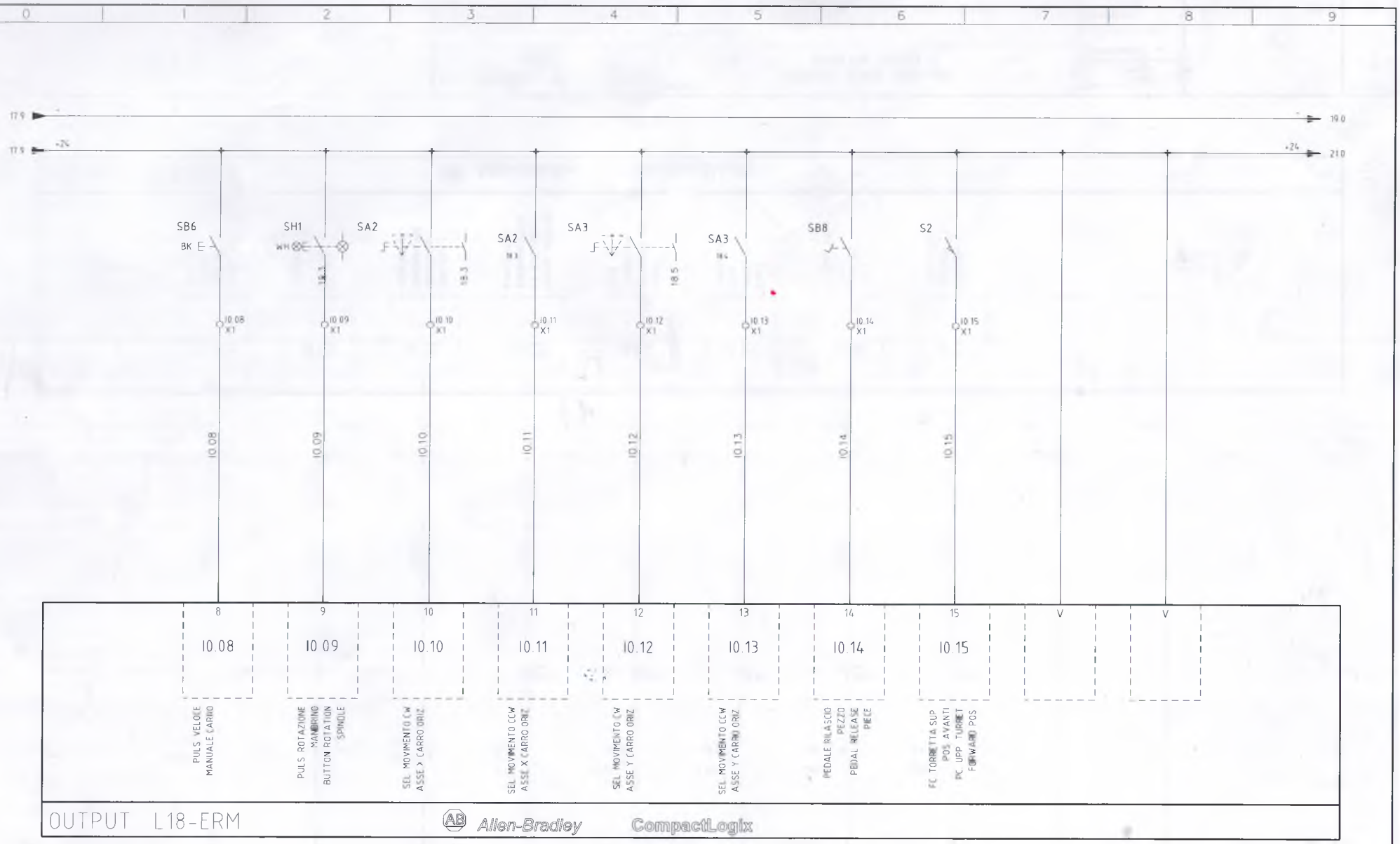
Dis.N. TME-BE 5-1 RA	Impianto	TORNIO TIPO TME-BE KINETIX 5500	Revisione 1-1	FOGLIO 17
CAD SPAC			Commessa	SEGUE 18
Nome File TME-BE 5-1 RA	Denominazione	INGRESSI PLC / PLC INPUT	Esecutore S.G.	28
Data 04-03-2014				



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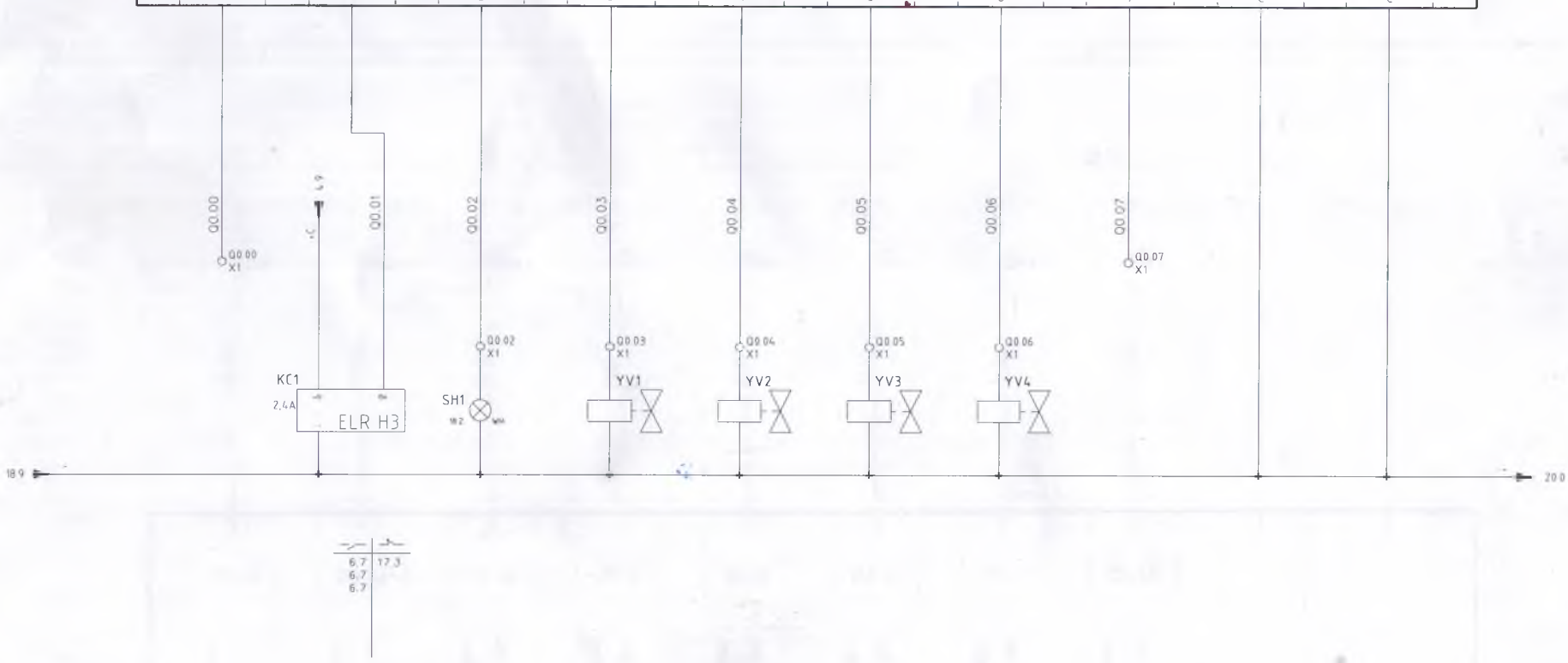
Dis.N. TME-BE 5-1 RA	Impianto	TORNIO TIPO TME-BE KINETIX 5500	Revisione 1-1		FOGLIO 18
CAD SPAC			Commessa		SEGUE 19
Nome File TME-BE 5-1 RA	Denominazione	INGRESSI PLC PLC INPUT	Esecutore S.G.	28	
Data 04-03-2014					

OUTPUT L18-ERM

Allen-Bradley CompactLogix

0	1	2	3	4	5	6	7	C	C
RISERVATO RESERVED	COMANDO VENTOLA MOTORE MANDRINO COMMAND FAN MOTOR SPINDLE	LAMPADA VUOTO MANDRINO OK LAMP VACUUM	E.V. ASPIRAZIONE MANDRINO S.V. SUCTION MANDREL	E.V. SOFFIO RILASCIO PEZZO MANDRINO	E.V. SOFFIO UTENSILE E.V. BLOW TOOL	E.V. AVANTI TORRETTA SUPERIORE	LIBERO FREE		
Q0.00	Q0.01	Q0.02	Q0.03	Q0.04	Q0.05	Q0.06	Q0.07		



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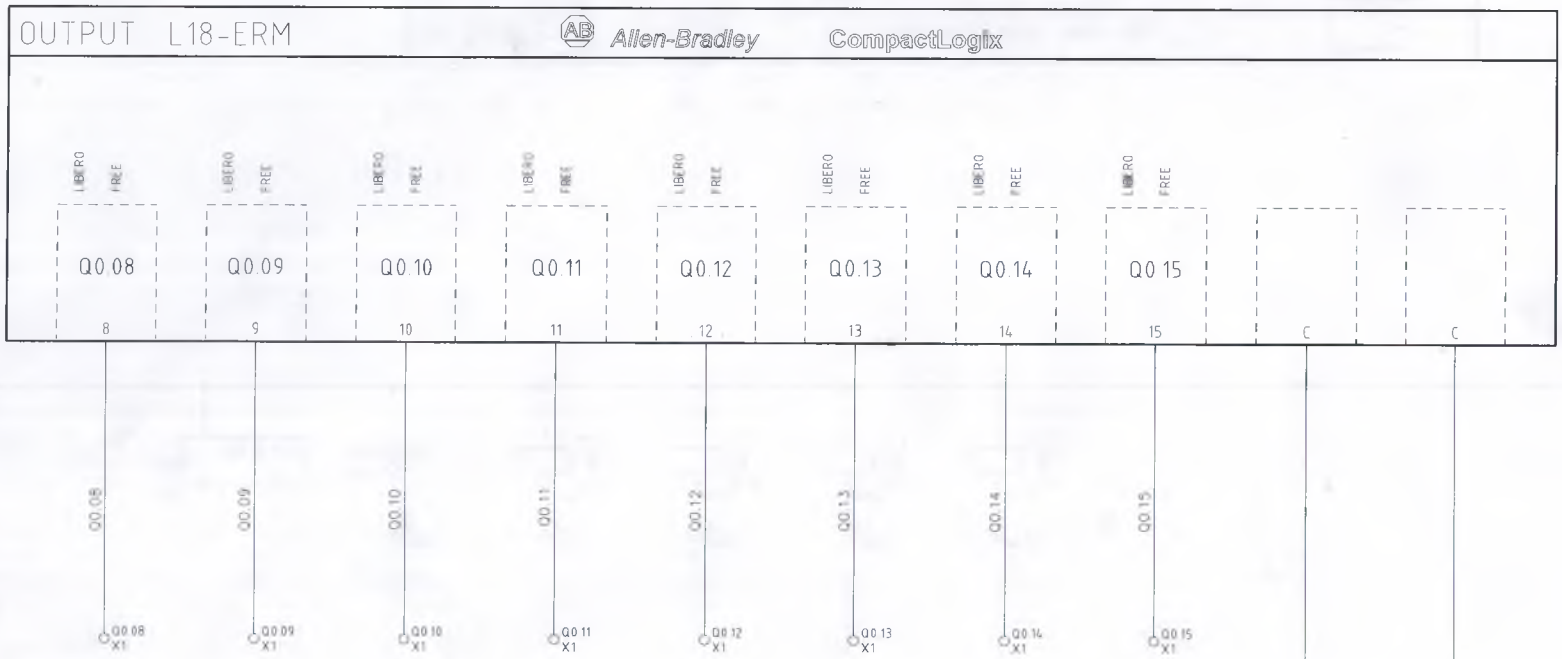
Dis.N. TME-BE 5-1 RA	Impianto	TORNIO TIPO TME-BE KINETIX 5500	Revisione 1-1		FOGLIO 19
CAD SPAC			Commessa L_____		
Nome File TME-BE 5-1 RA	Denominazione	USCITE PLC PLC OUTPUT	Esecutore S.G.	28	SEGUE 20
Data 04-03-2014					



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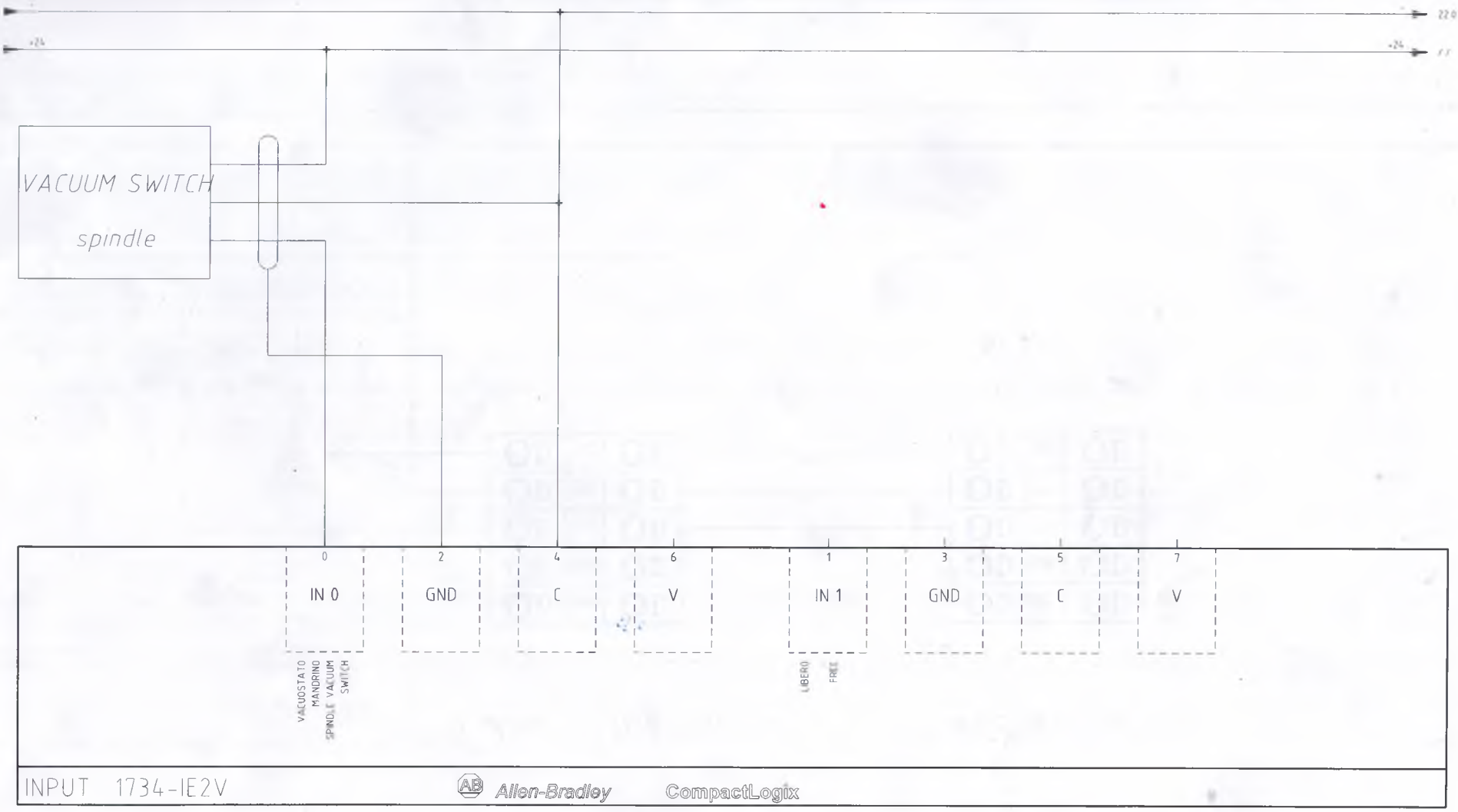
Dis.N TME-BE 5-1 RA	Impianto TORNIO TIPO TME-BE KINETIX 5500	Revisione 1-1		FOGLIO 20
CAD SPAC		Commessa L_____		
Nome File TME-BE 5-1 RA	Denominazione USCITE PLC PLC OUTPUT	Esecutore S.G.	28	SEGUE 21
Data 04-03-2014				



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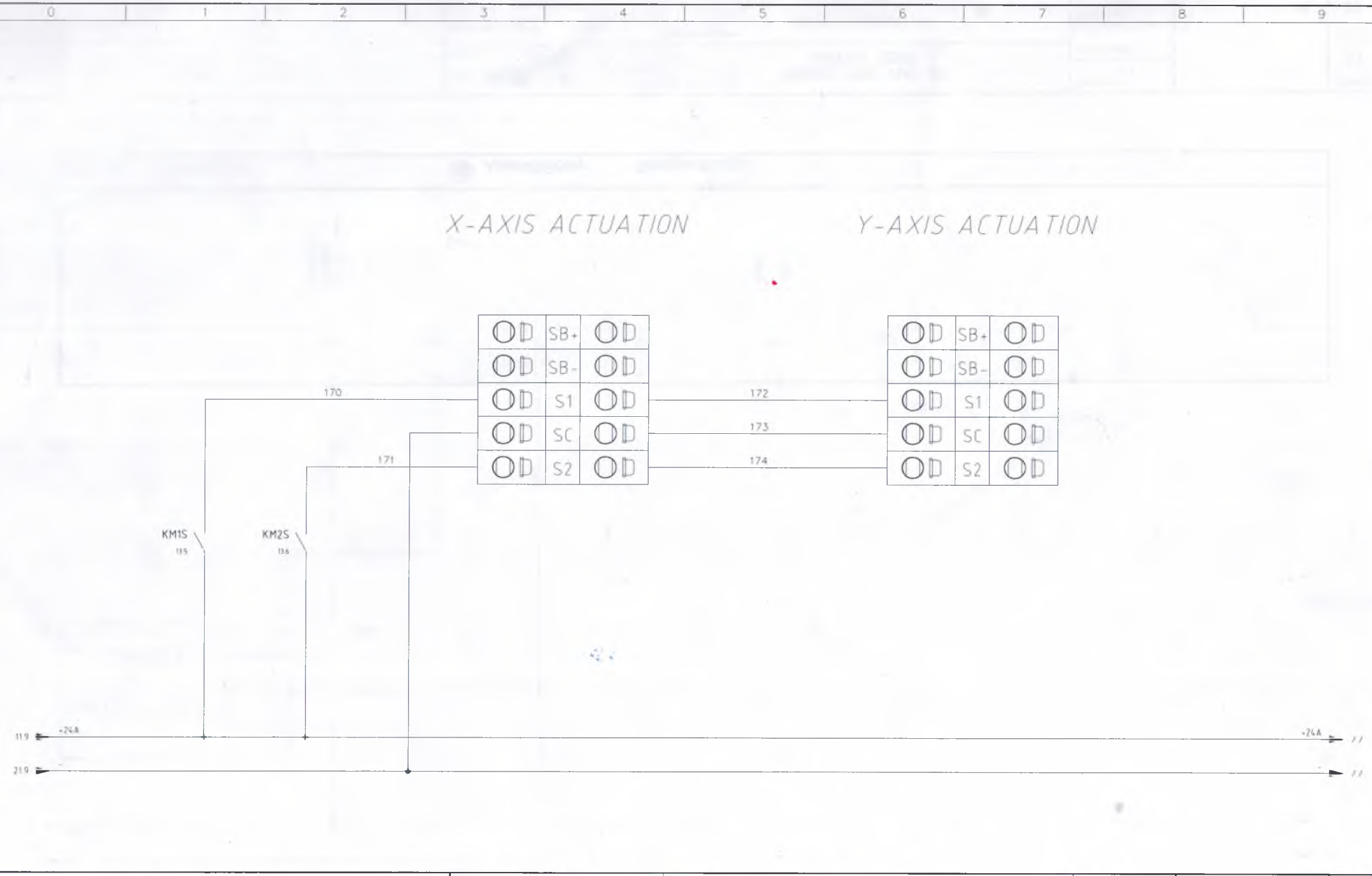
Dis.N. TME-BE 5-1 RA	Impianto	TORNIO TIPO TME-BE KINETIX 5500	Revisione 1-1		FOGLIO 21
CAD SPAC			Commessa L_____		SEGUE 22
Nome File TME-BE 5-1 RA	Denominazione	INGRESSI ANALOGICI PLC ANALOGIC INPUT PLC	Esecutore S.G.	28	
Data 04-03-2014					



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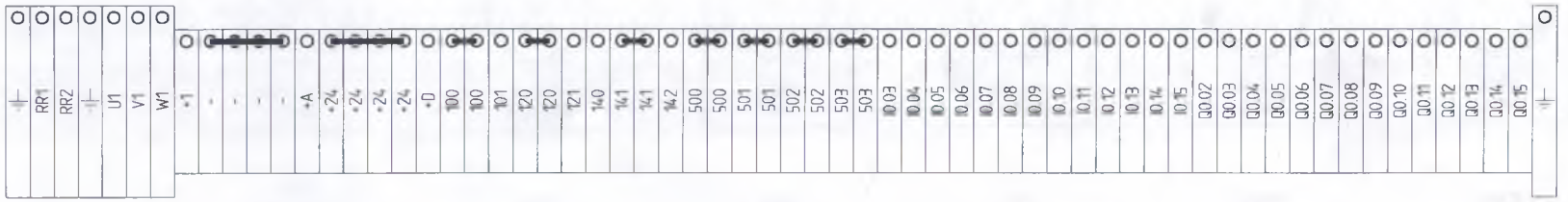
Dis.N. TME-BE 5-1 RA	Impianto	TORNIO TIPO TME-BE KINETIX 5500	Revisione 1-1		FOGLIO 22
CAD SPAC			Commessa L_____		SEGUE 23
Nome File TME-BE 5-1 RA	Denominazione	CONNETTORI AZIONAMENTI CONNECTORS ACTUATED	Esecutore S.G.	28	
Data 04-03-2014					

QG - X1

MAIN TERMINAL BLOCK



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Dis.N. TME-BE 5-1 RA	Impianto: TORNIO TIPO TME-BE KINETIX 5500	Revisione: 1-1		FOGLIO: 23
CAD: SPAC		Commessa: L_____		SEGUE: 24
Nome File: TME-BE 5-1 RA	Denominazione: MORSETTIERA GENERALE / MAIN TERMINAL BLOCK	Esecutore: S.G.	28	
Data: 04-03-2014				

MAIN PUSH BUTTONS

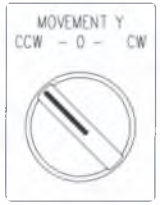
SB1

HL2

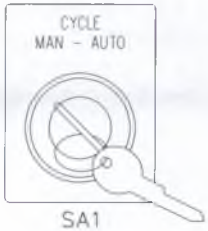
SB2

HL1

SA2



SA3

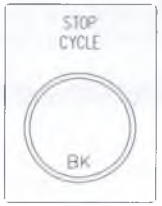


SA1

SH1

SB6

SB5



SB4

SB3

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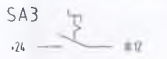
Dis.N. TME-BE 5-1 RA	Impianto	TORNIO TIPO TME-BE KINETIX 5500	Revisione 1-1		FOGLIO 24
CAD SPAC			Commessa L_____		SEGUE 25
Nome File TME-BE 5-1 RA	Denominazione	PULSANTIERA GENERALE - FRONTE GENERAL PUSH BUTTON - FRONT	Esecutore S.G.	28	
Data 04-03-2014					

MAIN PUSH BUTTONS

MOVEMENT Y
CCW - 0 - CW

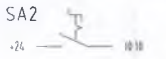
SA3



	wireA	pinA	pinB/C	wireB/C
NO	+24			10 13

MOVEMENT X
CCW - 0 - CW

SA2



	wireA	pinA	pinB/C	wireB/C
NO	+24			10 11

VOLTAGE
ON

HL1 WH

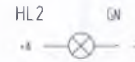
RESTORE
EMERGENCY

SB2 GN

	wireA	pinA	pinB/C	wireB/C
NO	174			175

AUXILIARES
ON

HL2 GN



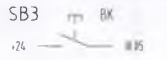
EMERGENCY

SB1

	wireA	pinA	pinB/C	wireB/C
NC	-			120
NC	500			501
NC	502			503

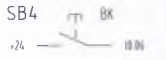
START
CYCLE

SB3 BK



STOP
CYCLE

SB4 BK

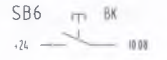


RESET
POSITION

SB5 BK

FAST
SPEED

SB6 BK



ROTATION
SPINDLE

SH1 WH

	wireA	pinA	pinB/C	wireB/C
HL	0 0 02A			-

CYCLE
MAN - AUTO

SA1

	wireA	pinA	pinB/C	wireB/C
NC	-			120
NC	500			501
NC	502			503

BACK VIEW.

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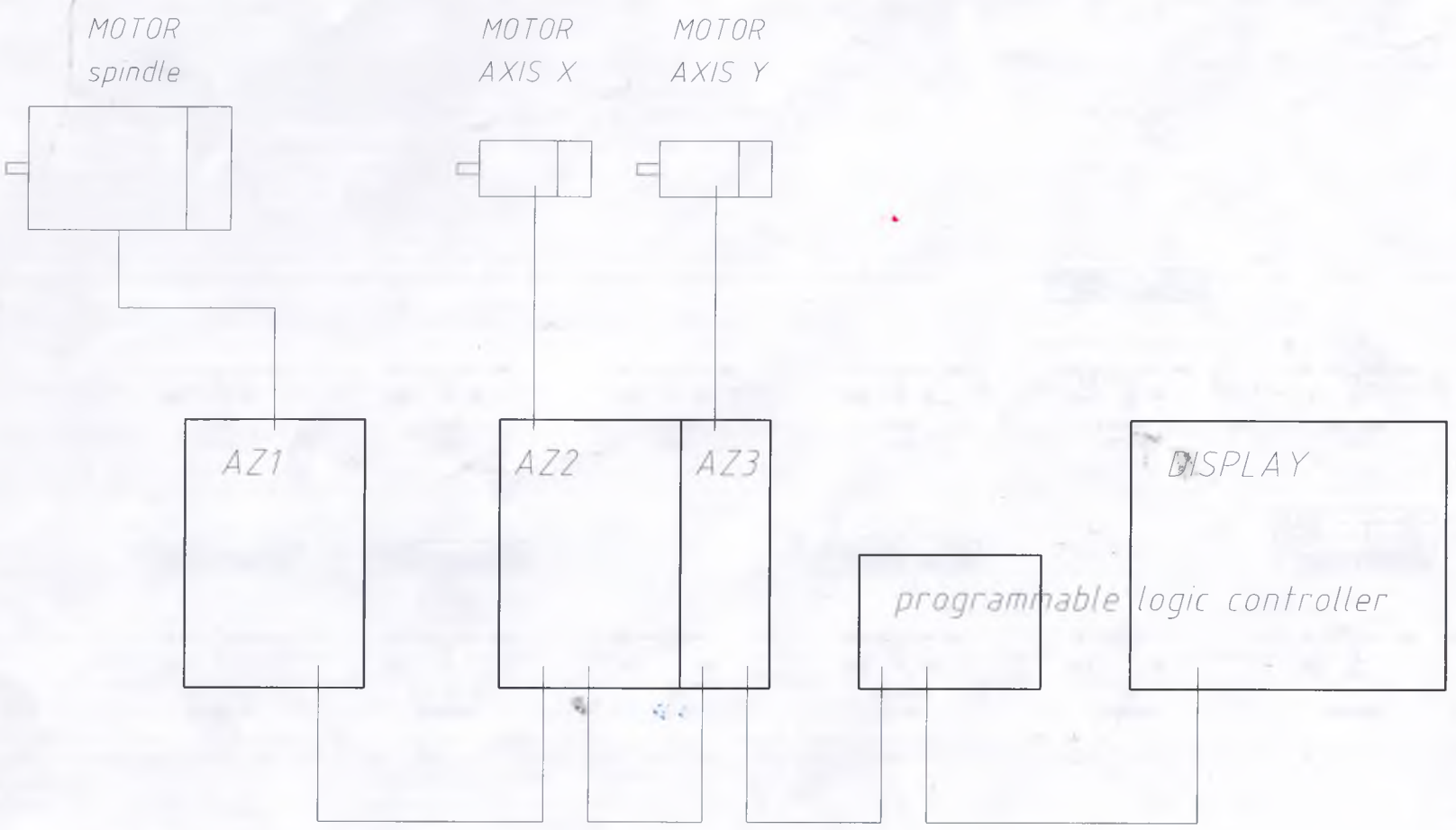
Dis.N.	TME-BE 5-1 RA
CAD	SPAC
Nome File	TME-BE 5-1 RA
Data	04-03-2014
Impianto	TORNIO TIPO TME-BE KINETIX 5500
Denominazione	PULSANTIERA GENERALE - RETRO GENERAL PUSH BUTTON - BACK
Revisione	1-1
Commessa	L_____
Esecutore	S.G.
	28
FOGLIO	25
SEGUE	26



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Dis.N TME-BE 5-1 RA	Impianto TORNIO TIPO TME-BE KINETIX 5500	Revisione 1-1		FOGLIO 26
CAD SPAC		Commessa L_____		SEGUE 27
Nome File TME-BE 5-1 RA	Denominazione LAY OUT COLLEGAMENTI PLC AZIONAMENTI / LAY-OUT LINKS PLC DRIVES	Esecutore S.G.	28	
Data 04-03-2014				