Sommario

MMF_P1R44F-024: Start-Up Manual

1. Information

1.1 Release

Document:	mmf_p1r44f-024
Description:	Start-Up Manual p1r44f-024
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Language:	English

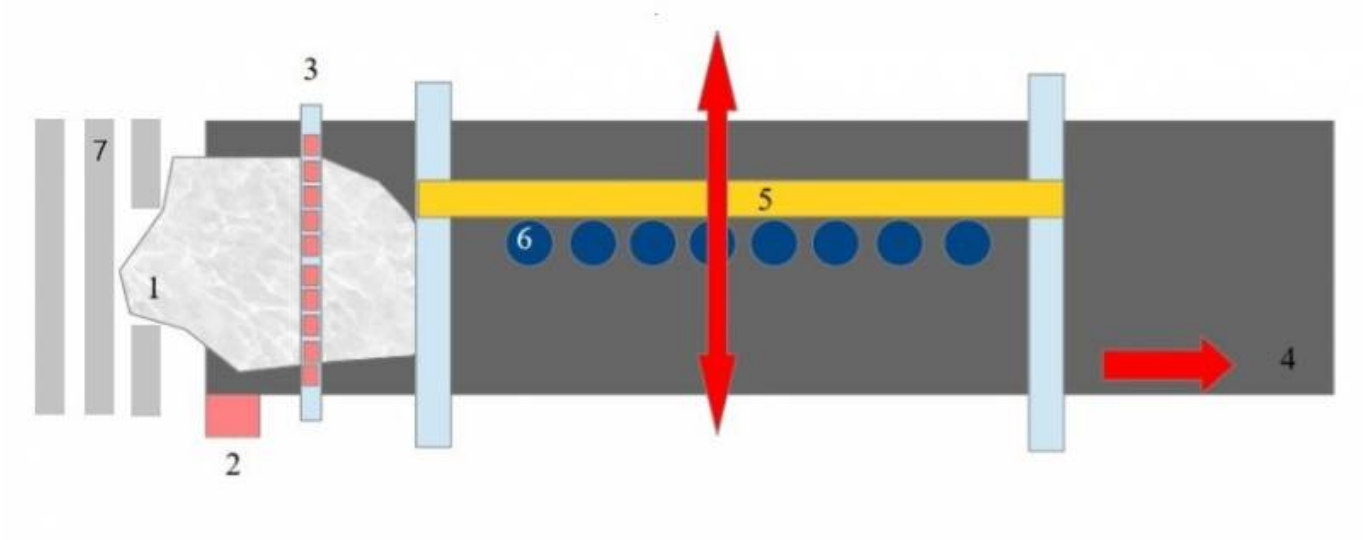
Document Release	Description	Notes	Date
01	New manual		15/01/2023

Specifications

2. Settings

Machine Overview

Machine top view :



n:	Description:
1	Raw Slab
2	Conveyor Encoder
3	Limit Switch Bar
4	Conveyor Belt
5	Mobile Bridge
6	Grinding Heads
7	Inlet Roller

2.1 Belt Settings

Belt Axis Resolution

Procedure	
1	Make a mark on the belt and correspondingly on the fixed part
2	Zero the ENCODER value using the  button
3	Move the belt about 4000 mm approximately
4	Set the PULSE parameter value to the number read in the ENCODER parameter
5	Measure the distance between the mark on the fixed part and the mark on the belt
6	Enter the measurement in the “MEASURE” field

2.2 Setting Bridge

Bridge Alignment / Sensor Bar

To align the bridge with the sensor bar, the homing sensor (or zero sensor) must be aligned with the first sheet detection sensor.

possible to align the homing sensor and the first sensor of the bar, enter the distance between the two sensors in parameter PB12.

Bridge Resolution

= gantry enable/disable button.

= gantry disabled

= gantry enabled

Procedure	
1	By pressing the “ - ” button, the instrument delivers -1 Volt.
2	By pressing the “ + ” button, the instrument delivers +1 Volt.
3	Press the “ - ” button to move the bridge axis towards one end (without actuating the limit switch).
4	Make a mark on the moving part, correspondingly make a mark on the fixed part.
5	Zero the **ENCODER** value using the  button.
6	With the “ +” button, move the axis towards the opposite end (without actuating the limit switch).
7	Measure the distance between the mark on the fixed part and the mark on the moving part with a tape measure.
8	Enter the measurement in the “ MEASURE” field.
9	Copy the number from the “ ENCODER” field to the “ PULSE” field.

Bridge Calibration

Important: parameters must be adjusted: inverter / brushless driver / servo valve to eliminate ramps (ramps will be managed by the instrument)

Calibration

1	Using the “ Resolution” page, move the bridge axis to the center of the stroke.
2	Zero it with the “ = 0” button
3	go to the “ BRIDGE CALIBRATION” page

4	Disconnect the control conductors (+/-10 Volt) Inverter/Driver/Servo Valve
5	Calibrate the Inverter/Driver/Servo Valve devices to have high sensitivity
6	Short-circuit the analog control inputs of the Inverter/Driver/Servo Valve devices
7	Calibrate the Offset of the Inverter/Driver/Servo Valve device so that the bridge axis is still
8	Connect the analog control conductors to the Inverter/Driver/Servo Valve
9	Press the “ A” button, the instrument will automatically calculate the OFFSET voltage
10	Move the bridge axis to 1/5 of the stroke
11	Enter the value 1 V in the “OUT VOLTAGE” field
12	Read the speed
13	Multiply the speed value by 10, then enter it in the “maximum speed” field

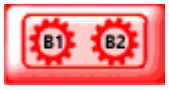
Setting Gantry

Gantry Alignment / Sensor Bar

To align the gantry with the sensor bar, the homing sensor (or zero sensor) on the gantry must be aligned with the first sensor on the sheet detection bar.

Gantry Resolution

= enable/disable gantry button.



= gantry disabled

= gantry enabled

Procedure	
1	Press the " - " button, the tool delivers -1 Volt
2	Press the " + " button, the tool delivers +1 Volt
3	Press the " - " button, move the gantry axis towards one end (do not activate the limit switch)
4	Make a mark on the moving part, and correspondingly, make a mark on the fixed part
5	Zero the **ENCODER** value with the  button
6	Using the " +" button, move the axis towards the opposite end (do not activate the limit switch)
7	Measure the distance between the mark on the fixed part and the mark on the moving part
8	Enter the measurement in the "MEASURE" field

Gantry Calibration

Important: You will need to adjust the parameters of the inverter/Driver Brushless/servo valve to eliminate the ramps (the ramps will be managed by the tool).

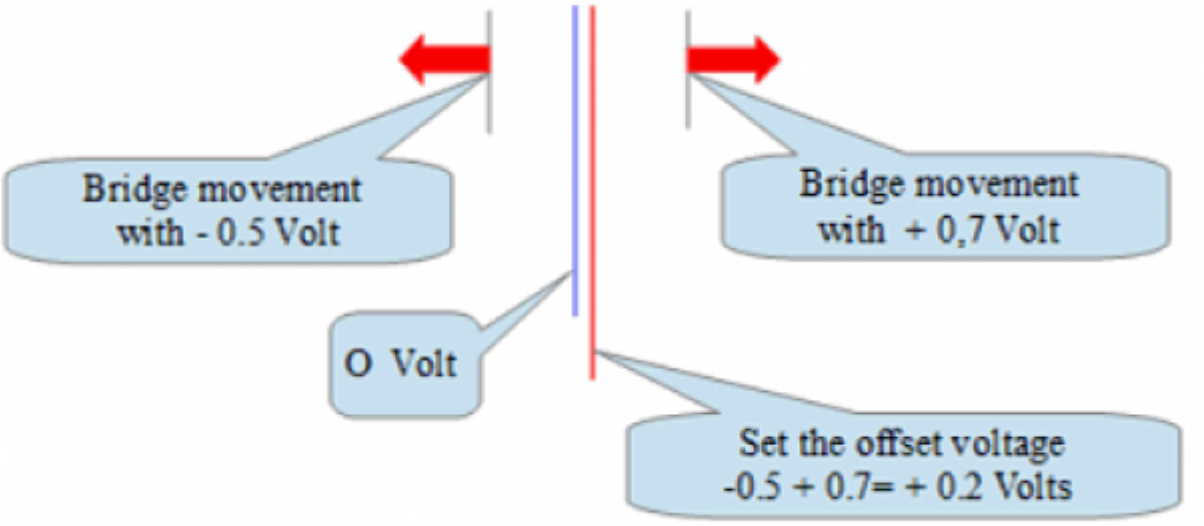
Calibration

1	Using the “RESOLUTION” page, move the gantry axis to the center of its travel
2	Zero it with the “ = 0” button
3	Go to the “GANTRY CALIBRATION” page

4	Disconnect the control conductors (+/-10 Volts) Inverter/Driver/Servo valve
5	Calibrate the Inverter/Driver/Servo valve devices to have high sensitivity
6	Short-circuit the analog control inputs of the Inverter/Driver/Servo valve devices
7	Calibrate the offset of the Inverter/Driver/Servo valve device to keep the gantry axis still
8	Connect the analog control conductors to the Inverter/Driver/Servo valve devices
9	Press the “A” button, the tool will automatically calculate the OFFSET voltage
10	Move the gantry axis to 1/5 of its travel
11	Enter a value of 1 V in the “OUT VOLTAGE” field
12	Read the speed
13	Multiply the speed value by 10 and enter it in the “maximum speed” field

Attention: If the automatic offset voltage calculation procedure (step 9) fails, perform the following manual procedure:
Determine :

with which positive voltage value the gantry moves forward with which negative voltage value the gantry moves backward
Then, set the voltage offset halfway between these two values
Example :


Bridge movement
with - 0.5 Volt
Bridge movement
with + 0,7 Volt
O Volt
Set the offset voltage
-0.5 + 0.7= + 0.2 Volts

Dynamic Calibration

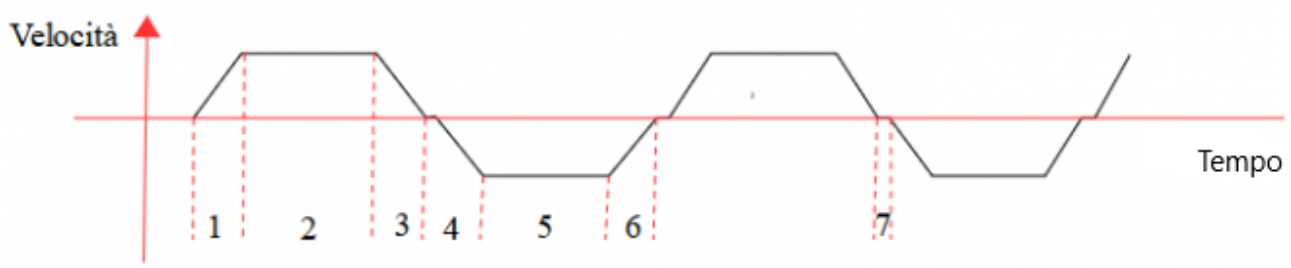
1	Move the gantry to 1/5 (20%) of its travel
2	Press the “ = 0” button
3	Enter a value in the “DELTA” field, equal to 4/5 (80%) of its travel
4	Set T INTEGRAL = 0
5	Set FEEDFORWARD TMP = 100
6	Set PROP.GAIN TMP = 0.02
7	Set TEMPO ACC = 3
8	Set TEMPO DEC. = 3
9	Set MAX ERR. INSEG. = 9999
10	Set the speed value to 30% of the maximum speed
11	Press Start
12	The gantry will start to oscillate

Perform the following activities repeatedly, calmly, with the following goals:

highest possible speed shortest possible acceleration ramps low tracking error Procedure:

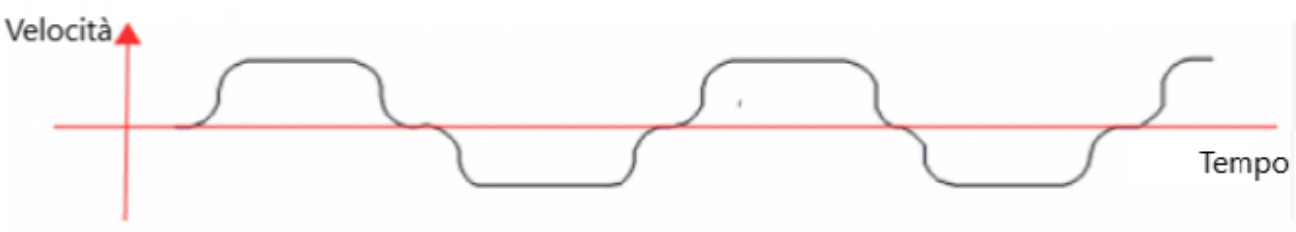
1	Slightly increase the PROP.GAIN TMP parameter (e.g., 0.03...0.04...0.05...)
2	Observe if the tracking error is less than 30 mm
3	Then, slightly decrease TEMPO ACC and TEMPO DEC
4	Slightly increase the PROP.GAIN TMP parameter again
5	Observe if the tracking error is less than 30 mm
6	Increase the speed from 30% to 40%
7	Slightly increase the PROP.GAIN TMP parameter again

Repeat steps 1 to 7 until the axis vibrates. When the axis vibrates, set PROP.GAIN TMP to -10%

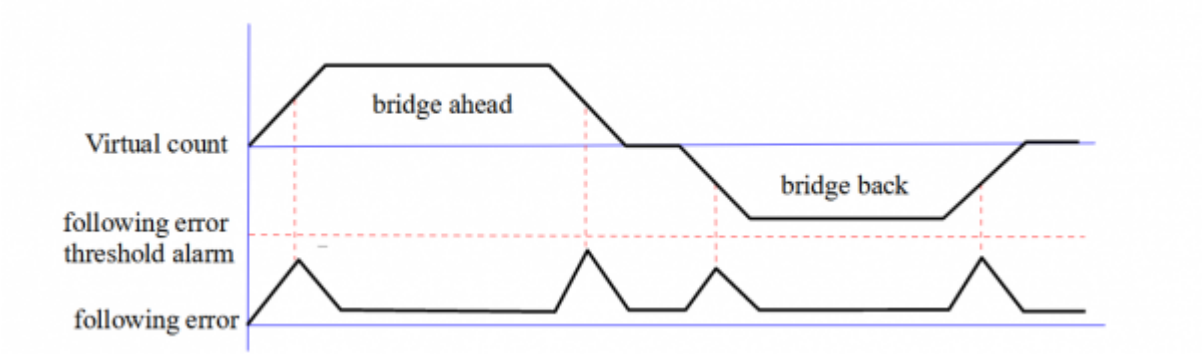


	Description	Parameter
1	Acceleration in the positive direction	PB 06
2	Constant speed	
3	Deceleration	PB 07
4	Acceleration in the negative direction	PB 07
5	Constant speed	
6	Deceleration	PB 07
7	Pause	PB 09

Note: Acceleration/deceleration with “S” ramps (parameter “PG 34”) reduce the number of back-and-forth cycles but contribute to a smoother gantry motion.



Tracking Error Setting:

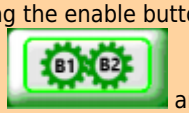


With the gantry in motion, lower the tracking error value (following error) from 9999 to 100. Gradually reduce it from 100 towards 0000. Once you find the value that triggers the alarm, add 15%. Caution: The MAX and min tracking errors must be less than 30.

The “RESET FOLL.ERR” button allows you to recalculate the maximum and minimum following error.
Press it each time you change the parameters for dynamic calibration.

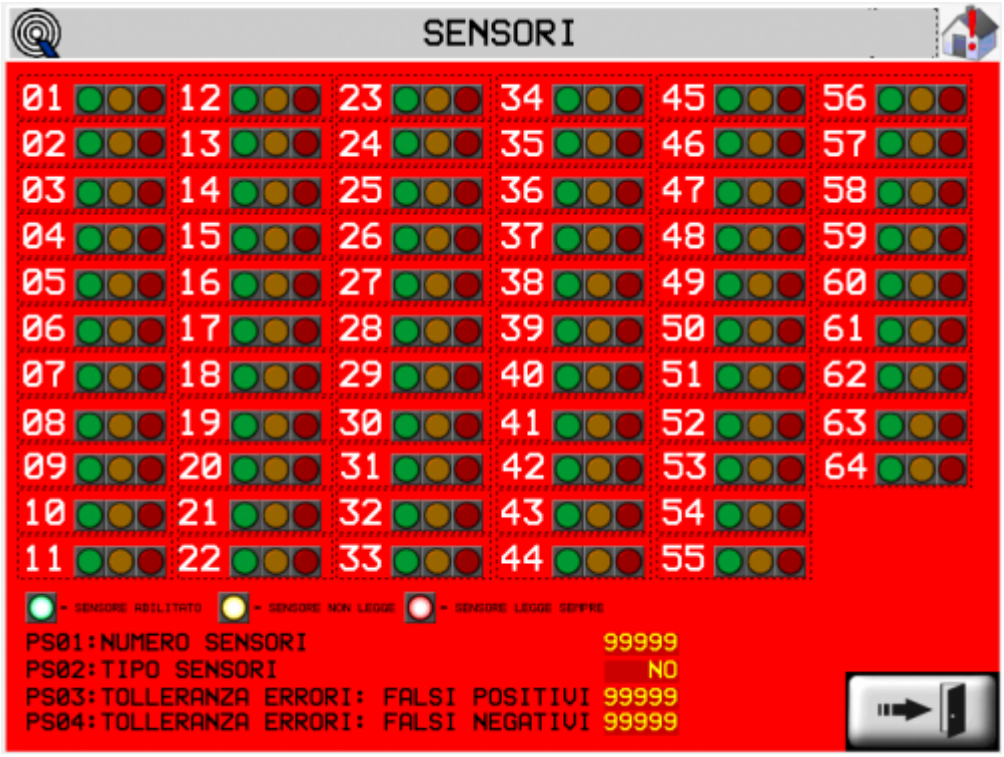
Perform the same procedure on the slave gantry calibration page if you are using a second (slave) motor.

Then enable the gantry by pressing the enable button 

Check that the button turns green 

and try moving the master gantry, ensuring that the slave gantry moves in sync with the master.

2.3 Setup sensors



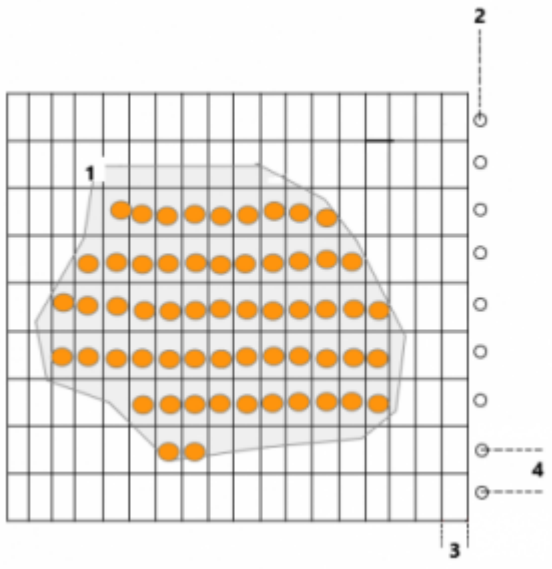
Position the sensors or limit switches in such a way that the center of the carriage's travel corresponds to the center of the sensors (see main image).

Set the number of sensors (parameter PS01) on the SENSORI page and the type of limit switch (parameter PS02).

Configure the tolerance values in parameters PS03 and PS04. ERROR TOLERANCE: FALSE POSITIVES: Indicates the number of steps or scans required in the event of a severe error (sensor reads 1 instead of 0) before an alarm is triggered. A tolerance value of zero is special and indicates that no error search is performed, so with a value of 0, there will never be an alarm. ERROR TOLERANCE: FALSE NEGATIVES: Indicates the number of steps or scans required in the event of a resolvable error (sensor reads 0 instead of 1) before a warning is triggered. A tolerance value of zero is special and indicates that no error search is performed, so with a value of 0, there will never be a warning.

Set parameter PG05: Orthogonal Step (distance between limit switches) and parameter PG06: Horizontal Step (space determined by the encoder) on the generic SETUP page. To determine parameter PG05: Orthogonal Step, measure from the first sensor to the last one and divide the measurement by the number of sensors. Usually, PG05 = PG06.

Representation of the plate detection process



1	Plate
2	Limit Switches / Sensors
3	Space determined by the encoder (PG06)
4	Distance between limit switches (PG05)

Check the functionality of the plate detection limit switches on DIAGNOSTIC 2 page. If the limit switches detect the presence of

the plate, the LEDs will light up.

2.4 Setting heads

Abrasives Setting / Plate Height

To enable the function for controlling abrasive thickness and plate height, set parameter PG 12 and the “Enable Abrasives CTRL” option to ON. Set PG 37: distance between the plate height reading sensor and the limit switches.

Plate Height

Calibrate the plate height reading input on the “altezza lastra” page.

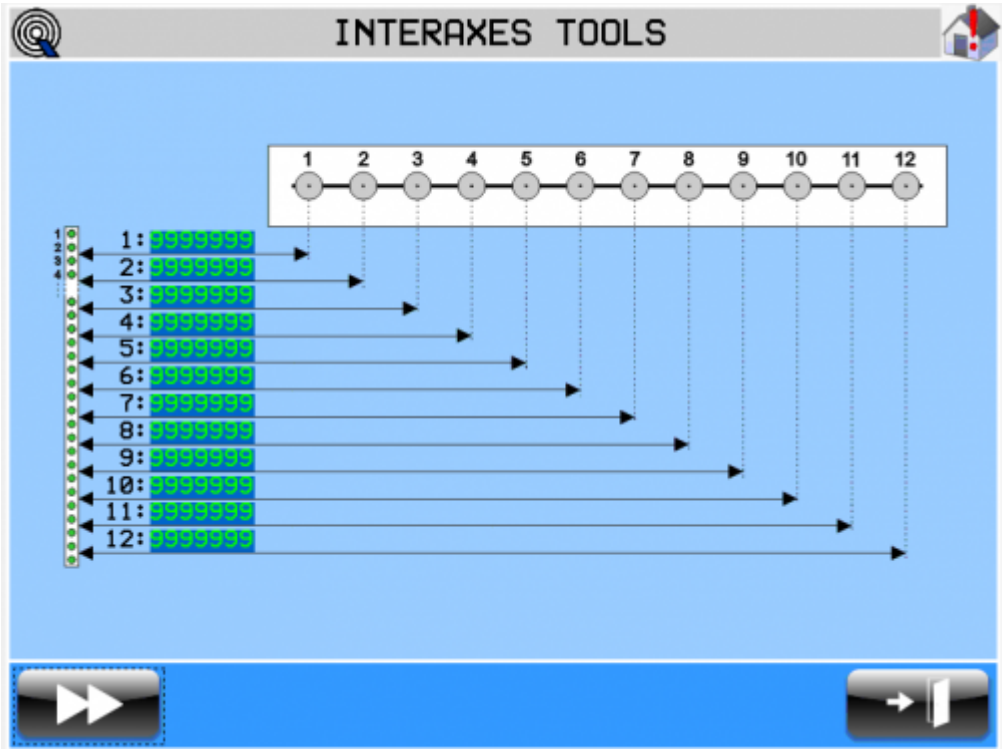
Abrasives Consumption

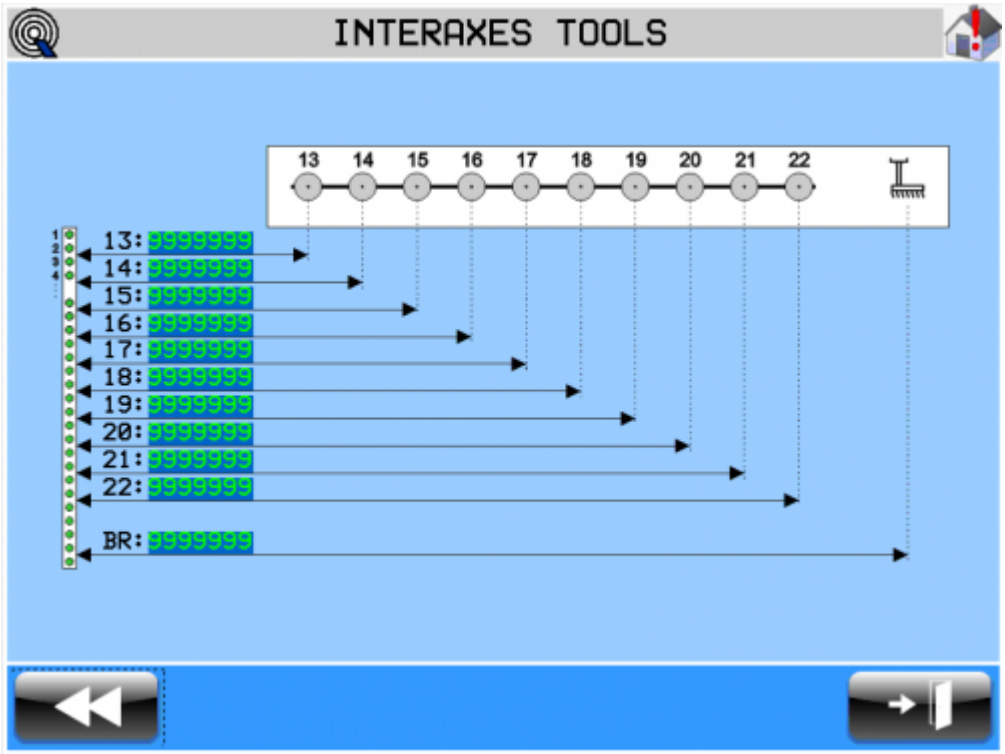
Calibrate the input for abrasive thickness reading on the “consumo abrasivi” page.

Perform this operation for all abrasives.

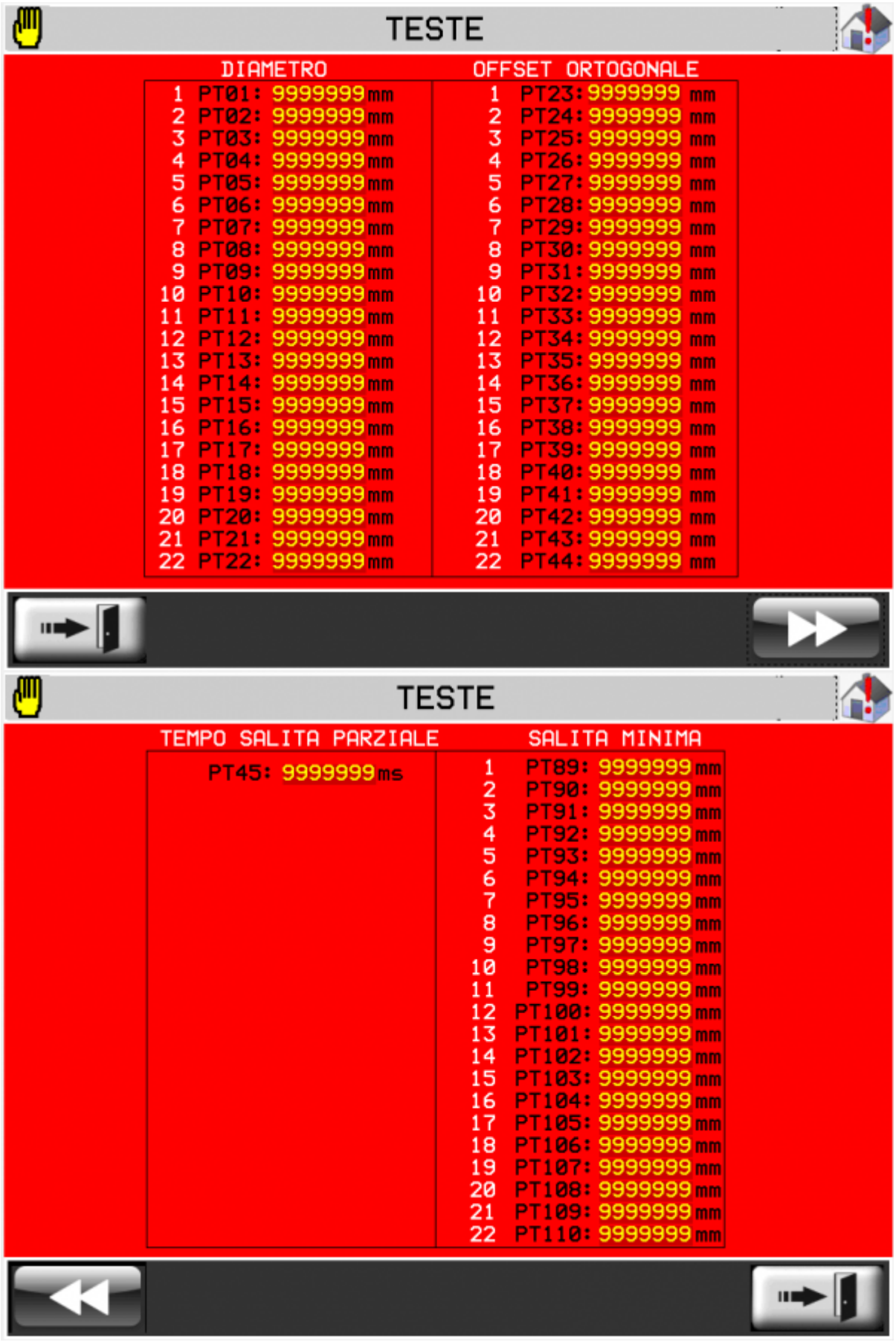
Interaxis

On the INTERASSI page, enter the distance (mm) of the grinding heads from the acquisition sensor (limit switch) for each head and the brush.

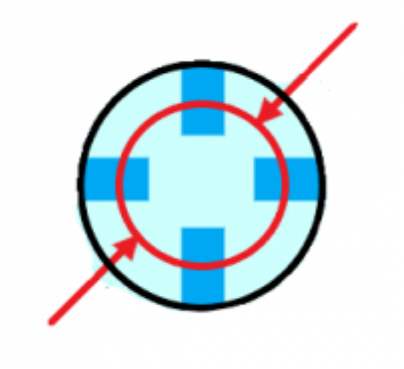




Head Parameters



Set the diameter of the heads:
PT 01 ÷ 22



The diameter of the head goes through the center of the tools.

Set the orthogonal offset, which is the distance between the center of the head and the middle line of the bridge: PT 23 ÷ 44

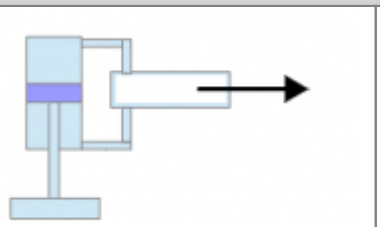
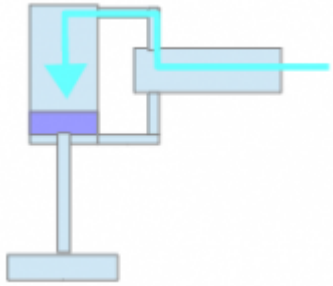
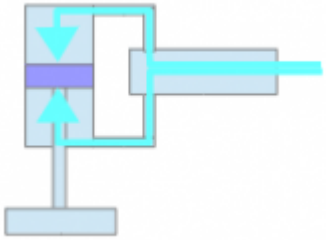
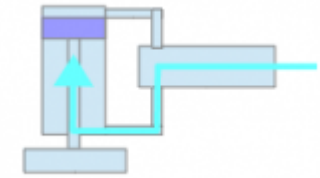
Set the partial Rise time: PT 45

Set the minimum rise (if abrasive reading is enabled): PT 89 ÷ 110

Head-Material Comparison Criteria

There are 8 control points for each head. If all points detect material, the head will lower. Only one unread point is enough to raise the head.

Lift/Descent Solenoid Valves

“Closed center” lift/descent solenoid valves for heads		Parameters:
	Valve	
	Down cylinder	
	Closed center	PT 45
	Up cylinder	PG 04

By setting the partial head lift time (parameters 45 ÷ 66), the lift output is de-energized after that time, and mechanically, when the lift and descent are de-energized, the upper chamber is in communication with the lower chamber of the cylinder, blocking it in that position (closed center). Full ascent will only be done when the head no longer needs to work, after the time set in parameter PG 04.

2.5 Setting Bridge Travel and Learned Quotes

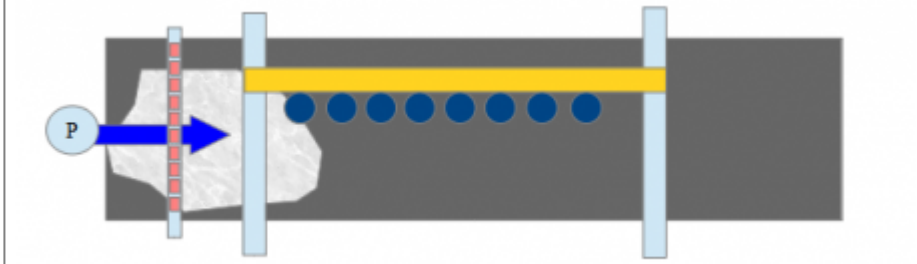
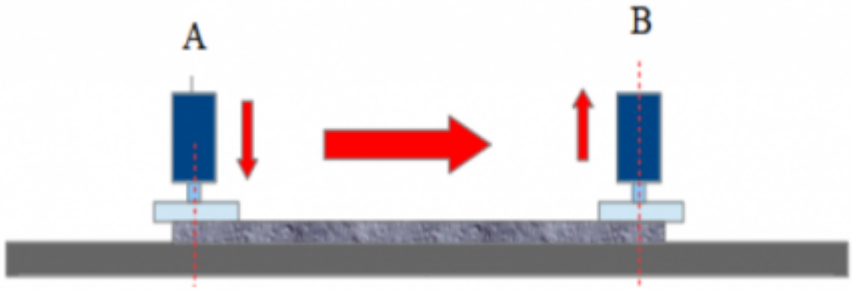
Check the bridge's behavior with learned quotes.
Enter a value in parameter PG 35: distance between the head's edge and center of the head
Enter a value in parameter PG 36: distance between the bridge and center of the head.
These two parameters influence the position of the bridge during “learned quotes” automatic mode.
If the bridge's movement is incorrect, change the parameters to adjust the bridge's oscillation.

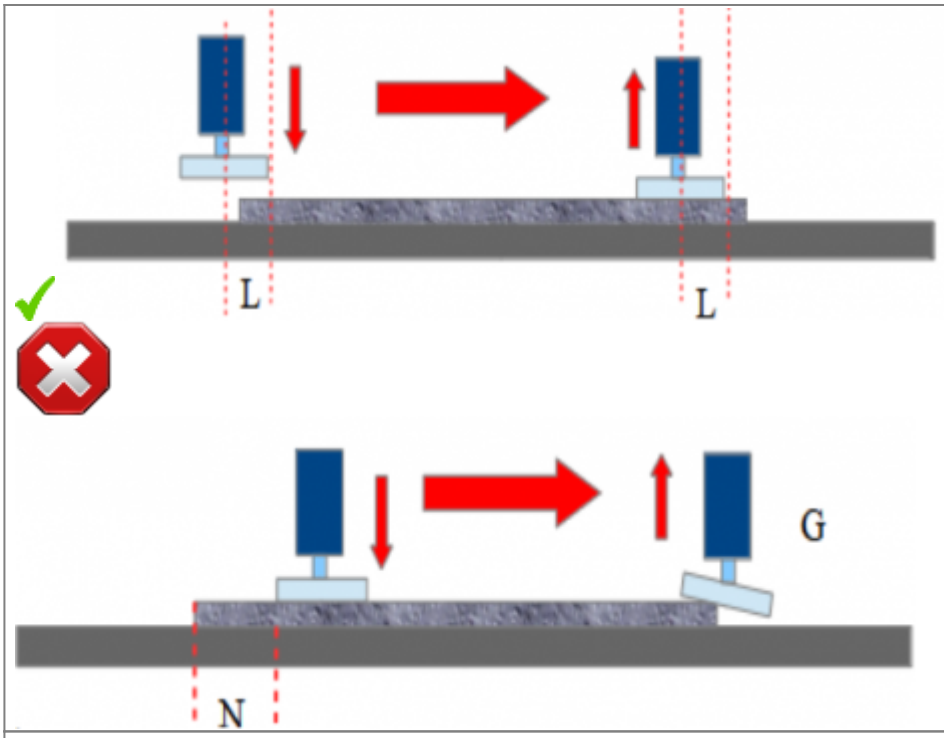
2.6 Correction Settings

Set the same pressure for all heads.

Orthogonal / Horizontal Correction

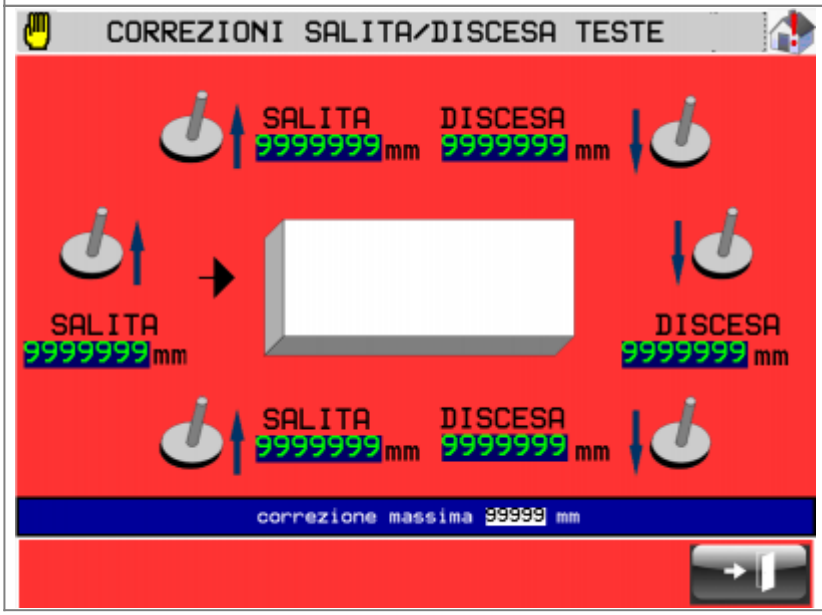
Remove abrasives and ensure that the heads, when descending, cannot damage the belt. Set the belt and bridge to a low speed.

	The blue arrow indicates the slab entering the grinding machine. P is the observation point, observe the behavior of the first head
	Check lift/descent at the edges of the slab

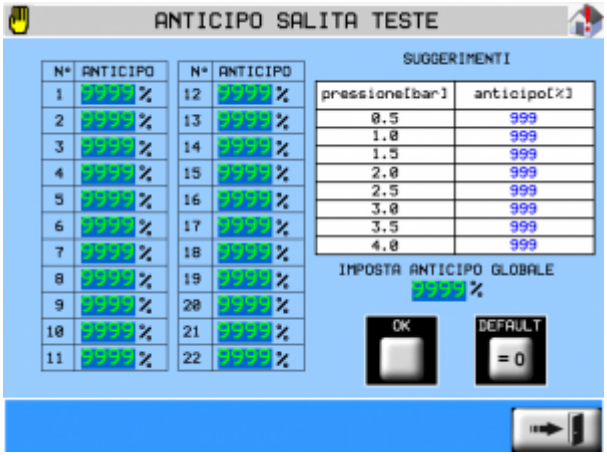


The head should descend inside the slab and rise as soon as it reaches the edge.
If the head descends/rises too early or too late, you need to adjust the correction page.

Page to act on to advance/delay the lift or descent of the heads



Raise the speed of the bridge and belt, then check that the lift and descent remain correct.
In case they change, check the advance of lift or descent on the dedicated page and modify if necessary.



3. Assistance

For supplying you fast service, at the lowest cost, we need your support.

	
Follow all instructions provided in the MIMAT manual	If the problem remains, fill out the “Request Form for assistance” on the page Contacts at www.qem.it site. Our technicians will get elements essential for the understanding of your problem.

Repair

To provide you with an efficient service, please read and adhere to the instructions given here

Shipping

It is recommended to pack the instrument with materials that are able to cushion any falls.

		
Use the original package: it must protect the instrument during transport.	Attach: 1. A description of the anomaly; 2. A part of the electric scheme where the equipment is inserted 3. The planning of the equipment (set up, quotas of job, parameters...). 4. Request a quote for repair; if not required, the cost will be calculated in the final balance.	A full description of the problem, will help identify and resolve your problems fast. A careful packaging will avoid further inconveniences.