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MDI_P1R44F-009 : Installer Manual

1. Informations

1.1 Release

			
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01	New manual		30/11/2022

Specifications

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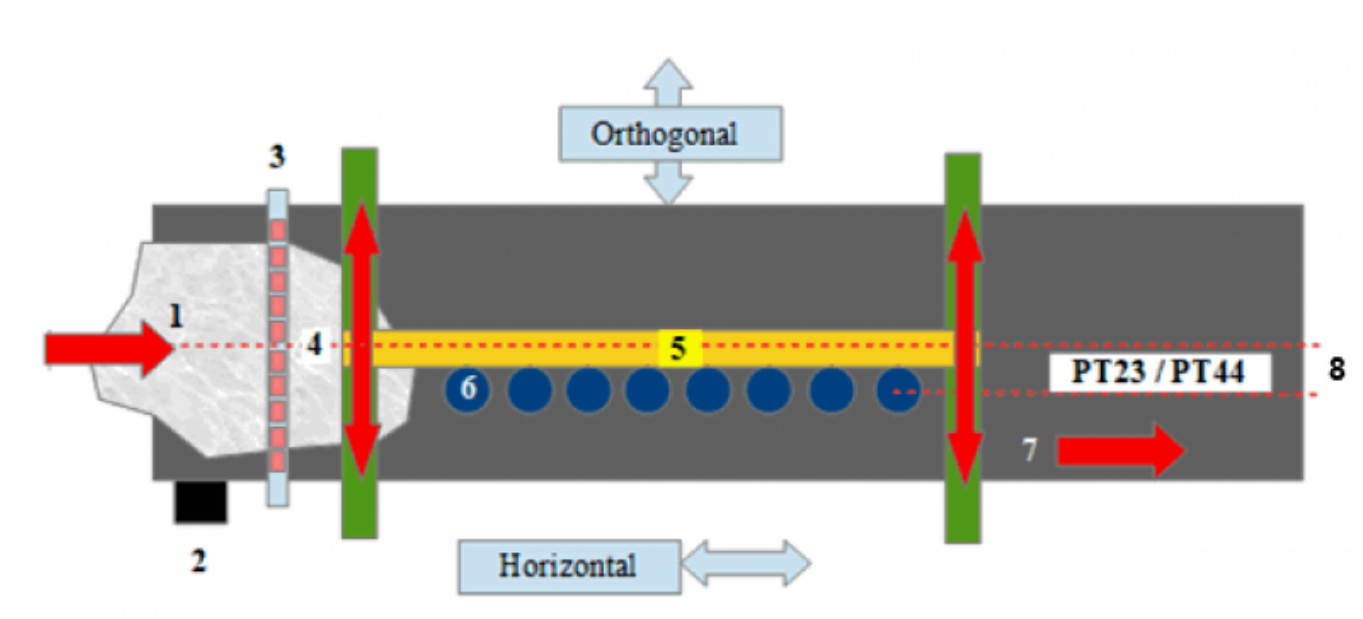
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2. Setup

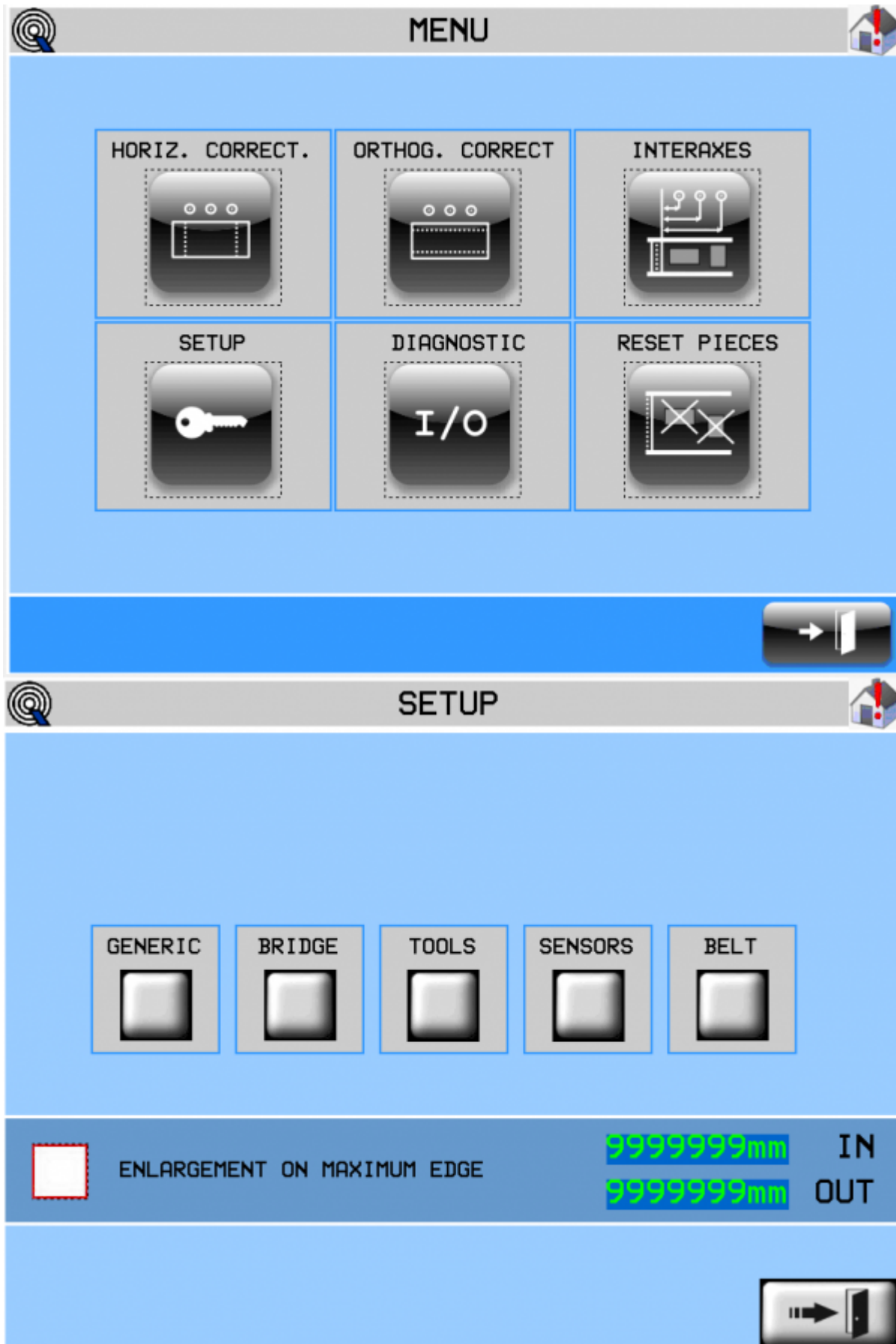
Machine view from above:



n:	Description:
1	Raw slab
2	Belt Encoder
3	Limit sensor bar
4	Center of the sensors / centre of the bridge axis travel
5	Bridge
6	Polishing heads
7	Belt direction
8	Orthogonal Offset

2.1 Setup access

Access to setup can be done from the MENU page, by entering the password **035**.

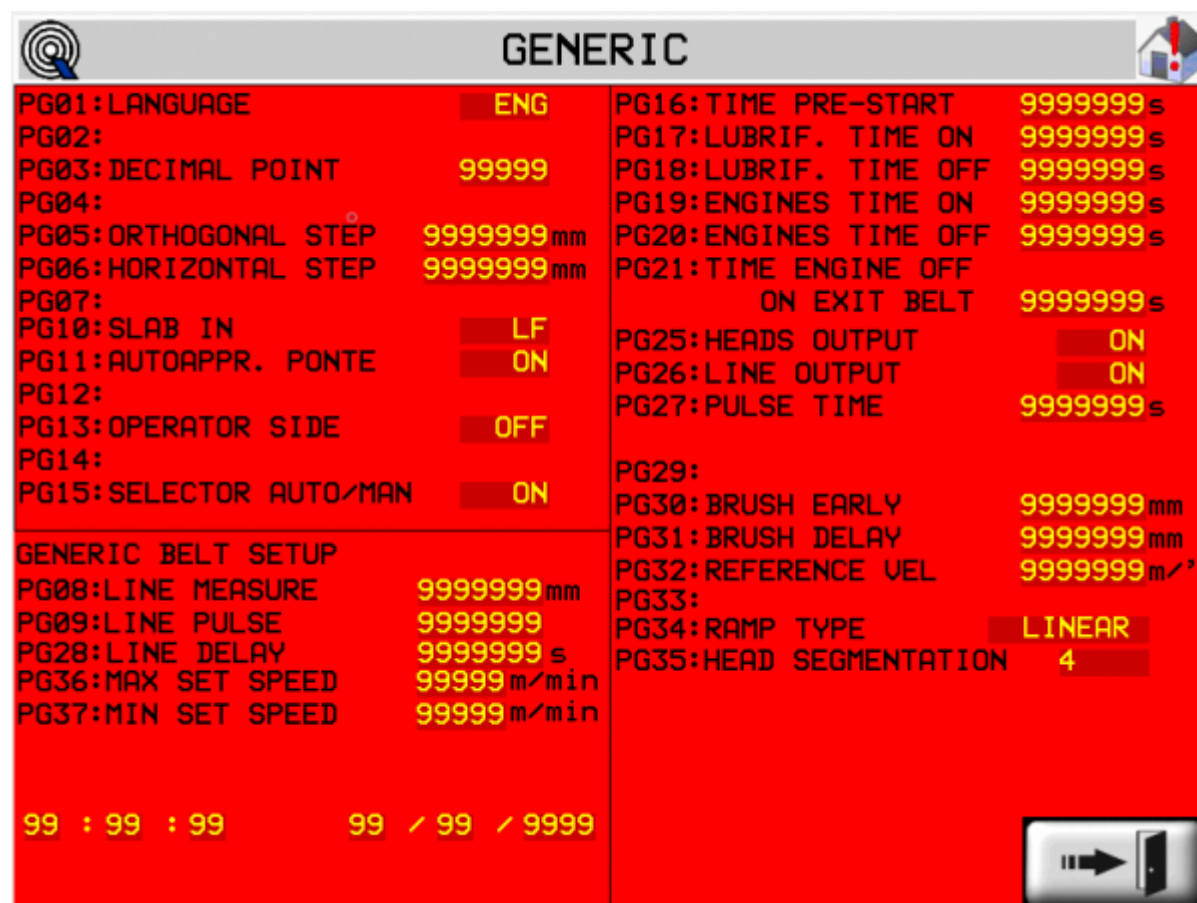


2.1.1 SETUP Introduction

Parameter list divided into

GENERIC 	generic parameters
BRIDGE 	parameters associated with the bridge
TOOLS 	parameters associated with heads
SENSORS 	parameters associated with the sensor bar
BELT 	parameters associated with the conveyor belt
ENLARGEMENT ON MAXIMUM EDGES:	allows you to polish the horizontal edges better. This parameter is useful when you're working with fairly straight edges (not jagged)

2.2 Generic Setup



GENERIC

PG01: LANGUAGE **ENG**

PG02: **99999**

PG03: DECIMAL POINT **99999**

PG04: **999999** mm

PG05: ORTHOGONAL STEP **999999** mm

PG06: HORIZONTAL STEP **999999** mm

PG07: **LF**

PG10: SLAB IN **ON**

PG11: AUTOAPPR. PONTE **ON**

PG12: **OFF**

PG13: OPERATOR SIDE **OFF**

PG14: **ON**

PG15: SELECTOR AUTO/MAN **ON**

PG16: TIME PRE-START **999999** s

PG17: LUBRIF. TIME ON **999999** s

PG18: LUBRIF. TIME OFF **999999** s

PG19: ENGINES TIME ON **999999** s

PG20: ENGINES TIME OFF **999999** s

PG21: TIME ENGINE OFF ON EXIT BELT **999999** s

PG25: HEADS OUTPUT **ON**

PG26: LINE OUTPUT **ON**

PG27: PULSE TIME **999999** s

PG29: **999999** mm

PG30: BRUSH EARLY **999999** mm

PG31: BRUSH DELAY **999999** mm

PG32: REFERENCE VEL **999999** m/s

PG33: **LINEAR**

PG34: RAMP TYPE **4**

PG35: HEAD SEGMENTATION **4**

GENERIC BELT SETUP

PG08: LINE MEASURE **999999** mm

PG09: LINE PULSE **999999**

PG28: LINE DELAY **999999** s

PG36: MAX SET SPEED **99999** m/min

PG37: MIN SET SPEED **99999** m/min

99 : 99 : 99 **99 / 99 / 9999**

Parameter name	Unit of measure	Default	Range	Description
PG01 : LANGUAGE	-	ITA	1 ÷ 2	1 : ITALIAN 2 : ENGLISH
PG03 : DECIMAL POINT	-	1	0 ÷ 3	It is the position of the decimal point in the quotas display.
PG05 : ORTHOGONAL STEP	mm	50.0	-	Distance between the limit switches of the sensor bar. It acquires the shape of the slab.
PG06 : HORIZONTAL STEP	mm	50.0	-	Space set by encoder. It acquires the shape of the slab.
PG08 : LINE MEASURE	mm	1	0 ÷ 999999	Indicates the space, in units of measurement, covered by the conveyor belt to obtain the encoder pulses set on the <i>pulse</i> parameter.
PG09 : LINE PULSE	-	1	0 ÷ 999999	Indicates the pulses multiplied by 4 provided by the conveyor belt encoder to obtain the space set in the <i>measure</i> parameter. <i>The ratio between measure and pulse is the resolution of the encoder and must have values between 1 and 0.000935.</i>
PG11 : SELF-LEARNING. BRIDGE	-	OFF	0 ÷ 1	Enables the self-learning option of the minimum and maximum height of the slab to optimize the swiveling of the bridge.
PG13 : OPERATOR SIDE	-	FWD	0 ÷ 1	Indicates at the cycle stop event where the bridge must be positioned. FWD = on the maximum quota, BWD = on the minimum quota.
PG15 : AUTO / MAN SELECTOR	-	ON	0 ÷ 1	Enable manual / automatic selector.
PG16 : PRESTART TIME	s	3.0	0 ÷ 9999.9	Time between the start command and the actual starting of the machine (the warning signal is active during this time). If it's less than the motor activation time, the greater time of the two is applied.
PG17 : LUBRIF. TIME ON	s	0.0	0 ÷ 9999.9	Lubrication output time ON.
PG18 : LUBRIF. TIME OFF	s	0.0	0 ÷ 9999.9	Lubrication output time OFF.
PG19 : ENGINES TIME ON	s	1,000	0 ÷ 99.999	Pause time between the activation of one motor and the next (in sequential activation).
PG20 : ENGINES TIME OFF	s	0.200	0 ÷ 99.999	Pause time between the deactivation of one motor and the next (in sequential deactivation).
PG21 : TIME ENGINE OFF ON EXIT BELT	s	0.000	0 ÷ 99.999	Waiting time to start the sequential deactivation of the motors, starting when there are no more pieces on the belt.

Parameter name	Unit of measure	Default	Range	Description
PG25 : HEAD OUTPUT	-	CONST	CONST ÷ PULSE	Operating mode of the head activation output. CONST = the output remains active for the entire time the head is used, PULSE = the output remains active for a set time (PG27).
PG26 : LINE OUTPUT	-	CONST	CONST ÷ PULSE	Operating mode of the conveyor belt activation output. CONST = the output remains active for the entire time the conveyor belt is used, PULSE = the output remains active for a set time (PG27).
PG27 : PULSE TIME	s	0.000	0 ÷ 99.999	Activation time of the head and conveyor belt outputs if they are enabled as impulsive.
PG28 : LINE DELAY	s	0.000	0 ÷ 99.999	Conveyor belt activation delay time after the bridge has started.
PG30 : BRUSH EARLY	mm	0.0	-9999.9 ÷ 9999.9	Advance space for brush descent.
PG31 : BRUSH DELAY	mm	0.0	-9999.9 ÷ 9999.9	Delay space for brush ascent.
PG32 : REFERENCE VEL	m / '	0.0	0 ÷ 9999.9	Reference speed for the use of the advances and delays of the brush. If set to 0, no speed proportion is made but the set quotas are used.
PG34 : RAMP TYPE	-	1	0 ÷ 1	Type of ramp. 0 = linear ramp. 1 = S ramp
PG35 : HEAD SEGMENTATION	-	4	4 - 6	Segmentation of the head machining area
PG36 : MAX SET SPEED	m/min	50	0 ÷ 999.9	Maximum belt settable speed
PG37 : MIN SET SPEED	m/min	0.0	0 ÷ 999.9	Minimum belt settable speed

2.3 Setup Belt

Belt axis resolution

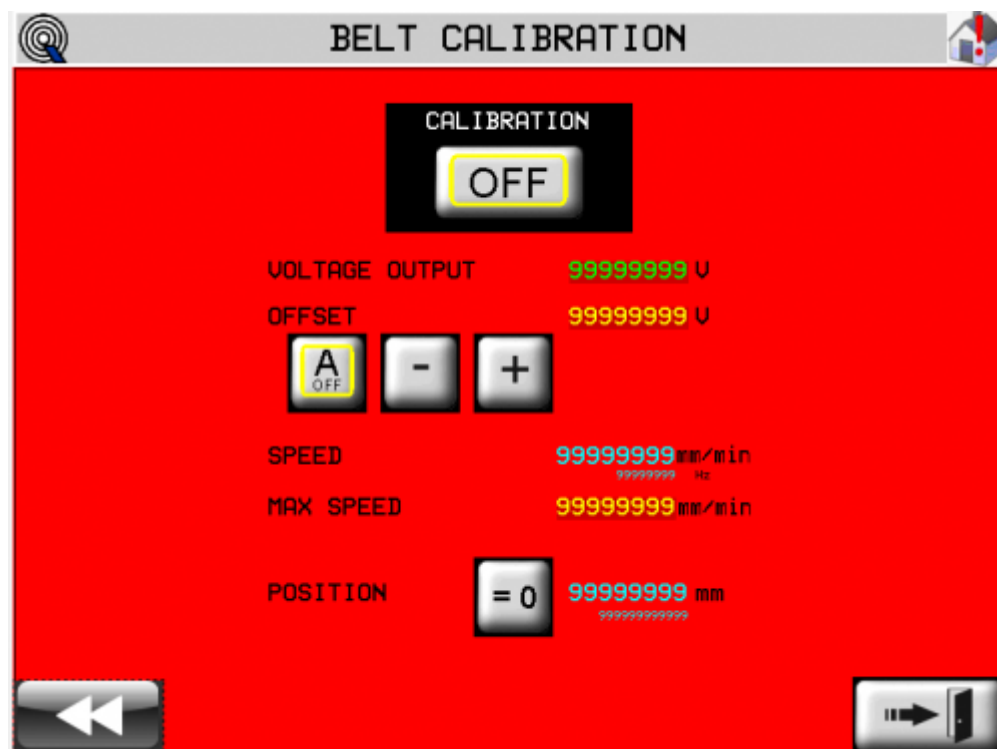


Parameter name	Unit of measure	Default	Range	Description
MEASURE	mm	0.1	0 ÷ 99999.9	Indicates the space, in units of measure, covered by the belt to obtain the encoder pulses set on the <i>pulse</i> parameter.
PULSE	-	1	0 ÷ 999999	Indicates the pulses multiplied by 4 provided by the belt encoder to obtain the gap set in the measure parameter. The ratio between measure and pulse is the resolution of the encoder and must have values between 1 and 0.000935.



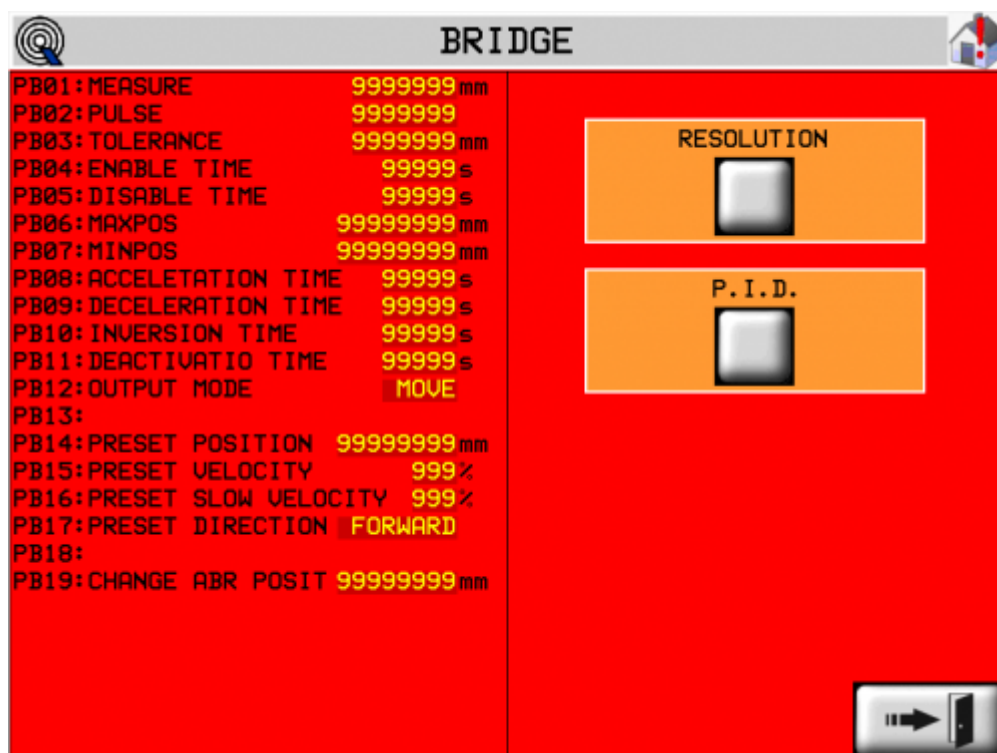
Press  to go to Belt setup page.

Belt calibration



Parameter name	Unit of measurement	Default	Range	Description
VOLTAGE OUTPUT	V	0.0	0 ÷ 10.0	Control voltage Inverter/Driver
OFFSET	V	0.0000	-99.9999 ÷ 99.9999	Voltage value to obtain from the analog output 0 Volt
SPEED	mm/'	-	-	Speed of the belt
MAX SPEED	mm/'	5000	0 ÷ 9999999	Speed of the belt with the 10 Volt command
POSITION	mm	-	-	Belt position

2.4 Setup Bridge



BRIDGE

PB01: MEASURE 9999999 mm
 PB02: PULSE 9999999
 PB03: TOLERANCE 9999999 mm
 PB04: ENABLE TIME 99999 s
 PB05: DISABLE TIME 99999 s
 PB06: MAXPOS 99999999 mm
 PB07: MINPOS 99999999 mm
 PB08: ACCELERATION TIME 99999 s
 PB09: DECELERATION TIME 99999 s
 PB10: INVERSION TIME 99999 s
 PB11: DEACTIVATION TIME 99999 s
 PB12: OUTPUT MODE MOVE
 PB13:
 PB14: PRESET POSITION 99999999 mm
 PB15: PRESET VELOCITY 999 %
 PB16: PRESET SLOW VELOCITY 999 %
 PB17: PRESET DIRECTION FORWARD
 PB18:
 PB19: CHANGE ABR POSIT 99999999 mm

RESOLUTION

P. I. D.

Navigation buttons: Left arrow, Right arrow, Home icon.

Parameter name	Unit of measurement	Default	Range	Description
PB01 : MEASURE	mm	0.1	0 ÷ 99999.9	Indicates the space, in units of measure, covered by the bridge to obtain the encoder pulses set on the <i>pulse</i> parameter.
PB02 : PULSE	-	1	0 ÷ 999999	Indicates the pulses multiplied by 4 supplied by the encoder of the bridge to obtain the space set in the parameter <i>measure</i> . The ratio between measure and pulse is the resolution of the encoder and must have values between 1 and 0.000935.
PB03 : TOLERANCE	mm	5.0	0 ÷ 99999.9	It defines a count range around the positioning quotas. If the positioning ends within this range, it is correct.
PB04 : ENABLE TIME	s	0.200	0.000 ÷ 9.999	Bridge movement activation advance.
PB05 : DISABLE TIME	s	0.200	0.000 ÷ 9.999	Bridge movement deactivation delay.
PB06 : MAXIMUM QUOTA	mm	99999.9	-99999.9 ÷ 99999.9	Maximum quota reachable from the bridge.
PB07 : MINIMUM QUOTA	mm	-99999.9	-99999.9 ÷ 99999.9	Minimum quota reachable from the bridge.
PB08 : ACCELERATION TIME	s	1.00	0.00 ÷ 9.99	It is the time required to go from 0 speed to maximum speed.
PB09 : DECELERATION TIME	s	1.00	0.00 ÷ 9.99	It is the time required to go from maximum speed to 0 speed.
PB10 : INVERSION TIME	s	0.50	0.00 ÷ 9.99	It is used to avoid mechanical stress due to rapid reversals of the movement direction
PB11 : DEACTIVATION TIME	s	0	0 ÷ 99999	Rest time of the bridge after which the enabling output of the axis is deactivated.
PB12 : OUTPUT MODE	-	STILL	MOVE, STILL	Axis enable output operating mode. MOVE : The output activates before the movement of the axis and deactivates when it has finished, according to the times set on parameters PB04 and PB05. STILL : The output activates before movement and deactivates when the state passes to emergency.
PB14 : PRESET POSITION	mm	0.0	-99999.9 ÷ 99999.9	Quota loaded on the count when the axis activates and then releases the Homing sensor.
PB15 : PRESET VELOCITY	%	5	1 ÷ 100	It is the homing sensor search speed.
PB16 : PRESET SLOW VELOCITY	%	2	1 ÷ 100	It is the speed for the release of the homing sensor.
PB17 : PRESET DIRECTION	-	BACKWARD	FORWARD, BACKWARD	Direction to search for the homing sensor.
PB19 : CHANGE ABR POSITION	mm	0.0	-99999.9 ÷ 99999.9	Bridge positioning value when it is requested to interrupt the cycle to change the abrasive.

2.4.1 Calibrations

The calibration pages are divided into:

	setting the resolution of the axis
	axis calibration procedure for adjusting the feedback and for setting the offset and maximum speed

Bridge axis resolution



Parameter name	Unit of measure	Default	Range	Description
MEASURE	mm	0.1	0 ÷ 99999.9	Indicates the space, in units of measure, covered by the bridge to obtain the encoder pulses set on the <i>pulse</i> parameter.
PULSE	-	1	0 ÷ 999999	Indicates the pulses multiplied by 4 provided by the bridge encoder to obtain the gap set in the measure parameter. The ratio between measure and pulse is the resolution of the encoder and must have values between 1 and 0.000935.

Bridge calibration



BRIDGE TUNING



CALIBRATION

OFF

VOLTAGE OUTPUT

99999999 V

OFFSET

99999999 V

A
OFF

-

+

VELOCITY

99999999 mm/s
99999999 Hz

MAX VELOCITY

99999999 mm/s

POSITION

= 0

99999999 mm
999999999999

POSITIONER

STOP

DELTA

99999999 mm

SET VELOCITY

99999999 mm/s

ACC. TIME

99999999 s

DEC. TIME

99999999 s

FEEDFORWARD

99999999 %

PROP. GAIN

99999999

INTEGRAL TIME

99999999 s

MAX FOLL. ERROR

99999999 mm

FOLLOW ERROR

999999999999 mm

FEEDFORWARD REGISTRY 999999999999
PROPORTIONAL REGISTRY 999999999999
INTEGRAL REGISTRY 999999999999



Parameter name	Unit of measurement	Default	Range	Description
VOLTAGE OUTPUT	V	0.0	-10.0 ÷ 10.0	Control voltage Inverter/Driver
OFFSET	V	0.0000	-99.9999 ÷ 99.9999	Voltage value to obtain from the analog output 0 Volt
VELOCITY	mm/'	-	-	Speed of the bridge
MAX VELOCITY	mm/'	5000	0 ÷ 9999999	Speed of the bridge with the 10 Volt command
POSITION	mm	-	-	Bridge position
DELTA	mm	0.0	-	Bridge swing space
SET VELOCITY	mm/'	0	-	Speed of the bridge
ACC TIME	s	0.00	-	Acceleration time
DEC TIME	s	0.00	-	Deceleration time
FEEDFORWARD	%	100.0	0.0 ÷ 200.0	It is the percentage coefficient which, multiplied by the speed, generates the feed-forward part of the regulation output.
PROP. GAINS	-	0.000	0.000 ÷ 9.999	It is the coefficient which, multiplied by the following error, generates the proportional part of the regulation output.
INTEGRAL TIME	s	0.000	0.000 ÷ 9.999	It is the time that produces the integration coefficient of the following error. The integration of this error multiplied by this coefficient generates the integral part of the regulation output.
MAX FOLLOW ERROR	mm	99.9	0.0 ÷ 99999.9	Defines the maximum acceptable deviation between the theoretical position and the real position of the axis, beyond which an alarm is generated
FOLLOW ERROR	mm	-	-	It is the instantaneous value of the following error.

2.5 Setup Tools



TOOLS



	DIAMETER	ORTHOGONAL OFFSET	TIME TO PARTIAL LIFT
1	PT01: 9999999 mm	PT23: 9999999 mm	PT45: 9999999 s
2	PT02: 9999999 mm	PT24: 9999999 mm	PT46: 9999999 s
3	PT03: 9999999 mm	PT25: 9999999 mm	PT47: 9999999 s
4	PT04: 9999999 mm	PT26: 9999999 mm	PT48: 9999999 s
5	PT05: 9999999 mm	PT27: 9999999 mm	PT49: 9999999 s
6	PT06: 9999999 mm	PT28: 9999999 mm	PT50: 9999999 s
7	PT07: 9999999 mm	PT29: 9999999 mm	PT51: 9999999 s
8	PT08: 9999999 mm	PT30: 9999999 mm	PT52: 9999999 s
9	PT09: 9999999 mm	PT31: 9999999 mm	PT53: 9999999 s
10	PT10: 9999999 mm	PT32: 9999999 mm	PT54: 9999999 s
11	PT11: 9999999 mm	PT33: 9999999 mm	PT55: 9999999 s
12	PT12: 9999999 mm	PT34: 9999999 mm	PT56: 9999999 s
13	PT13: 9999999 mm	PT35: 9999999 mm	PT57: 9999999 s
14	PT14: 9999999 mm	PT36: 9999999 mm	PT58: 9999999 s
15	PT15: 9999999 mm	PT37: 9999999 mm	PT59: 9999999 s
16	PT16: 9999999 mm	PT38: 9999999 mm	PT60: 9999999 s
17	PT17: 9999999 mm	PT39: 9999999 mm	PT61: 9999999 s
18	PT18: 9999999 mm	PT40: 9999999 mm	PT62: 9999999 s
19	PT19: 9999999 mm	PT41: 9999999 mm	PT63: 9999999 s
20	PT20: 9999999 mm	PT42: 9999999 mm	PT64: 9999999 s
21	PT21: 9999999 mm	PT43: 9999999 mm	PT65: 9999999 s
22	PT22: 9999999 mm	PT44: 9999999 mm	PT66: 9999999 s

PT68: LIFT DELAY
9999999 s


Parameter name	Unit of measurement	Default	Range	Description
PT01 / PT22 : DIAMETER	mm	0.0	0 ÷ 99999.9	Head diameter.
PT23 / PT44 : ORTHOGONAL OFFSET	mm	0.0	0 ÷ 99999.9	It is the distance between the working head and the midline of the bridge.
PT45 / PT66 : TIME TO PARTIAL LIFT	s	0.500	0 ÷ 999.999	It is the activation time of the output for the partial ascent.
PT68 : LIFT DELAY	s	0.000	0 ÷ 999.999	Delay for the total ascent of the heads.

2.6 Setup Sensors



SENSORS



01	09	17	25	33	41	49	57
02	10	18	26	34	42	50	58
03	11	19	27	35	43	51	59
04	12	20	28	36	44	52	60
05	13	21	29	37	45	53	61
06	14	22	30	38	46	54	62
07	15	23	31	39	47	55	63
08	16	24	32	40	48	56	64

PS01: BAR SENSORS NUMBER 99999

PS02: TYPE SENSORS NO



Parameter name	Unit of measure	Default	Range	Description
PS01 : SENSORS NUMBER	-	32	8 ÷ 64	Number of sensors present on the acquisition bar.
PS02 : SENSORS TYPE	-	NO	NO ÷ NC	Slab Acquisition Input Logic. NO = Normally Open NC = Normally Closed

3. Support

Request for assistance

In order to be able to provide you a quick service, at the minimum cost, we need your help.

	
Follow all the instructions provided in the manual MIMAT	If the problem persists, fill in the “Assistance request form” on the page Contacts of the site www.qem.it. Our technicians will obtain essential elements for understanding your problem.

Repair

In order to provide you with an efficient service, please read and follow the instructions here [reported](#)

Shipping

It is recommended to pack the instrument with materials that can absorb any falls.

		
Use the original packaging: it must protect the instrument during transport.	Attach: 1. A description of the anomaly; 2. Part of the wiring diagram where the instrument is inserted 3. Programming the instrument (set up, work quotas, parameters ...).	A thorough description of the problem will allow us to quickly identify and resolve your problem. Careful packaging will avoid further inconveniences.

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