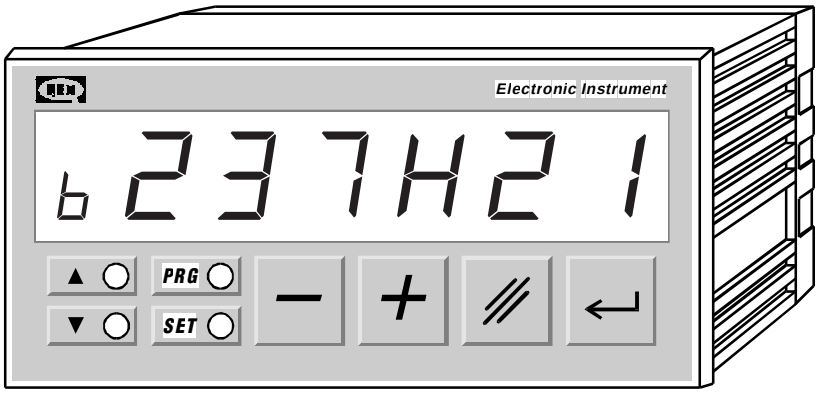
CONTROL OF LAPPING, MILLING AND GRINDING MACHINES WITH A MAXIMUM OF 6 HEADS

HB 237.21



User's Manual

Complement to the "Manual of Installation, Maintenance and Assistance"

This product is an electronic instrument and is thus not to be considered as a machine. Consequently, it is not subject to the requirements stated in EEC Directive 89/392 (Machines Directive). It is hereby specified that, if the QEM instrument is used as a component part of a machine, it must not be switched on if the machine does not comply with the Machines Directive.

The instrument mark does not absolve the Customer fromthe fulfilment of his or her legal obligations regarding the finished product.

Quality in Electronic Manufacturing

INDEX OF SUBJECTS IN THIS MANUAL

CHAP. 1 - INTRODUCTION

- *Complementarity* 1 - 1
- *References* 1 - 2
- *Responsibility and validity* 1 - 3
- *Description of operation* 1 - 4

CHAP. 2 - OPERATOR / MACHINE INTERFACE

- *Keyboard Description* 2 - 1
- *Inputs Description* 2 - 2
- *Outputs Description* 2 - 3

CHAP. 3 - STARTUP

- *Programming (set-up)* 3 - 1
- *Calibrations* 3 - 2

CHAP. 4 - USE

- *Working Programs and Auxiliary Functions* 4 - 1
- *Tables and Graphics of Operation* 4 - 2

CHAP. 5 - ASSISTANCE

- *Diagnostic of inputs and outputs* 5 - 1
- *Instructions on How to Fill Up the Technical Assistance Fax* 5 - 2
- *Guarantee* 5 - 3

This product is an electronic instrument and therefore it must not be considered as a machine. As a consequence, it does not undergo the requirements which have been fixed by the Standard CEE 89/392 (Machines Standard). Therefore we state that if the QEM's instrument is to be used as a compounding part of a machine, it cannot be switched ON if the mentioned machine does not meet the requirements of the Machines Standard.
The instrument's markup does not make the Customer free from the observance of law obligations concerning its own finished product.

CHAPTER 1

INTRODUCTION

Complementarity

References

Responsibility and validity

Description of operation

1 - 1 COMPLEMENTARITY

This manual is to be considered as a complement to the "Manual of installation, maintenance and assistance" which supplies the indications for the performance of wirings, troubleshooting, procedures for startup and maintenance. This manual contains indications for the instrument's use and for a correct programming.
We recommend therefore a careful reading and, in case of misunderstandings, please contact QEM for any further explanation, by sending the Assistance Fax which you find enclosed to the manual.

1 - 2 REFERENCES

The documentation concerning the instruments which are designed and sold by QEM has been divided into various sheets in order to allow an effective and quick reading according to the information being seeked.

User's Manual

Explanation of the software described

It is the present manual, which shows all instructions for the comprehension and the use of the instrument described. It is a manual concerning the instrument's software; it shows all instructions for the comprehension, programming, calibrations and use of the instrument described.
Once you install the instrument by following the instructions shown on the Manual of Installation, maintenance and assistance, with this User's Manual you are supplied with all necessary instructions for the correct use of the instrument and for its programming.

Hardware Structure

Basic information concerning the hardware of the series and possibility of customizations.

It is a sheet enclosed to this User's manual, describing the hardware configuration concerning the series of the instrument described.
It also shows the electrical, technical and mechanical characteristics, of the series and also the possible hardware customizations according to the software version.

Manual of installation, maintenance and assistance

All what you need for Installation, Maintenance and Assistance.

Further explanation of all necessary subjects for a correct installation and maintenance.
This is made to allow us to supply valid and safe instructions which shall allow you to perform products with a recognized quality and safe reliability.
It is also a valid support for all those who must face a technical assistrance on an application which includes a QEM's instrument.

1 - 3 RESPONSIBILITY AND VALIDITY

RESPONSIBILITY

QEM is free from any responsibility for damages to people or things due to unobservance of the instructions and prescriptions contained in this manual and in the "Manual of installation, maintenance and assistance". We also state that the customer/purchaser must use the instrument according to the instructions supplied by QEM and in case of doubt he must send a written application to QEM. Any authorization for further use and replacement shall be deemed as valid by QEM, in case of contestation, only if it has been written by QEM.

No reprinting or republishing or delivery to third parties of this manual or of its parts is authorized unless a written authorization is provided by QEM. Any infraction shall provoke a request of indemnization for damages on behalf of QEM.
All rights generated by patents or models are reserved.

QEM reserves the right to partially or integrally modify the characteristics of the instrument described and the enclosed documentation.

Purpose
The purpose of this manual is to indicate the general rules to use the instrument described.

Indication
Write down and carefully store all parameters concerning the settings and programming of the instrument in order to make easier the eventual operations of replacement and assistance.

VALIDITY
This manual can be applied to all designed instruments, built and tested by QEM and having the same ordering code. This document is integrally valid except for mistakes or omissions.

Instrument's Release	***Manual Release***	***Modifications made to the Manual***	***Modifications Date***
0	0	New manual	01 / 03 / 97
1	1	Manual update	22 / 03 / 00

Issued by the Person in Charge for the Documentation: .....

Approved by the Person in Charge for the Product: .....

1 - 4 DESCRIPTION OF OPERATION

The instrument HB 237.21 allows the ON / OFF control of 6 working heads. The heads may be configurated as lapping machines, milling mahcines or grinding machines (according to the set-up configuration). The processing parameters may be stored in 40 programs which can be recalled according to the type of processing you are using. The system is made of a bidirectional encoder linked to the advancement of the material on the conveyor belt and a fixed sensor which detects the piece's presence. It allows to get the image of the various pieces introduced. It is possible to perform the processing at the same time of 12 pieces, which shall be made bearing into consideration the automatic compensaiton of the working levels according to the speed of the belt.
It shall be possible to perform the correction of the intervention point of the heads even during the machine's operation. During normal operation the instrument shall display the belt speed, the meters which have been processed or the number of worked pieces. The model HB 237.21 allows to perform, during the processing, some corrections to the working levels in order to compensate eventual delays in the machine's response. These corrections are made to the levels by bearing into consideration the shifting speed of the belt in order to automatically compensate the working levels according to the speed variations of the same; we recommend then to perform the corrections at the maximum speed of the machine in order to reduce error possibility. In case of use of the heads as lapping heads, it is possible to set in the program the level of delay between the border of panel start for the head descent and the level of advance from the end of the panel for the upwards movement of the head. In case you use the heads as milling heads, it is possible to set in the program the level of delay between the border of panel start and the start of the milling operation and also the length of the milling or the level of advance between the end of the panel and the end of the milling. In case you use the heads as grinding heads, you may set in the program every how many linear meters you must activate the head descent for the compensation of the wear, while the activation time is set as a set-up parameter.

CHAPTER 2

OPERATOR/MACHINE INTERFACE

Keyboard Description

Inputs Description

Outputs Description

2 - 1 KEYBOARD DESCRIPTION

Key	*Function*
↵	**Normal Operation:** not used. **Data entering:** it confirms the data displayed.
///	**Normal Operation:** if pressed for 1 second during the displaying it resets to zero the displayed counters. If pressed under heads' correction it allows to exit the function. **Data entering:** it sets to zero the data displayed.
+	**Normal Operation:** it shows the following displays. Under heads' correction it impulsively increases the selected level. **Data entering:** it impulsively or in a continuous way increases the selected digit on the display (the blinking one).
−	**Normal Operation:** Under heads' correction it impulsively decreases the selected level. **Data entering:** it shifts to the right the selection of the digit on the display.
PRG ○	It is ON during the programming of the set-up parameters.
SET ○	It is ON during the introduction of working programs.
▲ ○	It is ON during the introduction of the parameters for heads' correction.
▼ ○	It is ON in case the count of the encoder is negative (in this case you must invert the phases of the encoder).
• 8	It is ON when the data concerning the heads are displayed (the digit below indicates the number of head which is concerned).
↵ + +	Introduction of the working programs
+ + −	Introduction of the parameters for heads' correction.
↵ + −	Access to the functions protected by password.

2 - 2 INPUTS DESCRIPTION

Characteristics of inputs

Please refer to the chapter "Electrical characteristics" of the software leaflet "Hardware structure" enclosed to this manual.

Name	*Logical status of activation*	*Activation mode*	*Polarizer*

				Description
I1	**ON**	**C**	**P1**	**Presence of piece 1.** Fixed sensor which allows to get the image of the pieces introduced.
I2	**ON**	**C**	**P1**	**Presence of piece 2.** Fixed sensor which allows to correct the position of the image of the pieces introduced in an intermediate zone of the conveyor belt.

Legend

C = Continuous Signal.

Name

	Description
+	**Positive of transducers' power supply.** Positive of voltage supplied by the instrument for the supply of the instrument's and transducers' inputs.
-	**Negative of transducers' power supply.** Negative of voltage supplied by the instrument for the supply of the instrument's and transducers' inputs.
GND	**Ground Connection.** We recommend a conductor with Ø 4 mm.
Vac	**Voltage of instrument's power supply.** Alternated voltage according to the code of your order.
Vac	**Voltage of instrument's power supply.** Alternated voltage according to the code of your order.

COUNT INPUTS

Name	Operation Logics	Polarizer	Description
F1	N / P	P1	**Input "phase 1" incremental transducer.**
F1	N / P	P1	**Input "phase 2" incremental transducer.**
			For the characteristics of the count inputs please refer to the chapter "Electrical Characteristics" of the leaflet "Hardware structure" enclosed to this manual.

Legend
N = Transducer with logic NPN.
P = Transducer with logic PNP.

2 - 3 OUTPUTS

Characteristics of outputs
Please refer to the chapter "Electrical Characteristics" of the leaflet "Hardware structure" enclosed to this manual.

Name	Logical status of activation	Polarizer	Activation Mode	Description
U1	ON	C1	C	**Blower's outputs.** The output rtemains energised if there is at least one piece inside the machine (space between the end of stroke of the presence of piece 1 and the length value of the machine).
U2	ON	C1	C	**Instrument's Reset.** This output is activated with the set-up parameter "rA" and it is de-energised after the conveyor belt has performed a complete revolution. This output may be used to block the introduction of pieces after you have switched OFF the equipment or after you changed the parameters of program or set-up, in order to be able to unload the pieces located in the processing which may have a count which does not correspond to the actual position.

Legend
C = Continuous Signal.

Characteristics outputs espansione (U6)

Please refer to the chapter "Electrical Characteristics" of the leaflet "Hardware structure" enclosed to this manual.

Name	*Logical status of activation*	*Polarizer*	*Activation Mode*

				Description
U3		**ON**	**C2**	**C** **Descent of head 1.** It remains energised according to the set-up parameters and to the related parameters of program.
U4	**ON**	**C2**	**C**	**Descent of head 2.** It remains energised according to the set-up parameters and to the related parameters of program.
U5	**ON**	**C2**	**C**	**Descent of head 3.** It remains energised according to the set-up parameters and to the related parameters of program.
U6	**ON**	**C2**	**C**	**Descent of head 4..** It remains energised according to the set-up parameters and to the related parameters of program.
U7	**ON**	**C2**	**C**	**Descent of head 5 .** It remains energised according to the set-up parameters and to the related parameters of program.
U8	**ON**	**C2**	**C**	**Descent of head 6.** It remains energised according to the set-up parameters and to the related parameters of program..

Legend

C = Continuous Signal.

CHAPTER 3

STARTUP

Programming (set-up)

Calibrations

3 - 1 SET-UP

These parameters determine the operation mode of the instrument and therefore their access is reserved to the installer; for the programming we have forecast the introduction of a password as follows:

Description	Keyboard	Display
Access to the set-up programming.	− + ↵ × 1 sec.	H 000
Enter the access code "237" and confirm with **ENTER**.	+ − ↵	PRG ○ = ON

FUNCTION	DISPLAY	DESCRIPTION
Encoder Resolution	L 4.00000	This parameter indicates by how much you must multiply the turn impulses of the encoder in order to obtain the display of the lengths in the desired units of measure. You may enter values from 0.00200 to 4.00000 bearing in mind that the frequency of the phases F1 must not exceed the maximum frequency of the instrument's count. **N.B.** Please refer to the "Manual of installation, maintenance and assistance".
Interaxis of sensors for piece presence Max. 19999	r 10000	It is the distance between the sensors of presence of piece 1 (I1) and the sensor of presence of piece 2 (I2). If the sensor of presence of piece 2 is not present, enter zero value.
Heads' Number Max. 6	n 0	Number of heads used on the equipment.
Interaxis of heads (1÷6) Max. 19999	i1 10000	It is the distance of the heads from the sensor of presence of piece 1. Here shall be displayed only the interaxis concerning the number of programmed heads in the parameter "n".
Machine Length	Ln 19000	It is the distance between the sensor of presence of piece 1 and the blower. Until there is a piece within this value, the output U1 remains energised.
Choice of heads' operation (1÷6)	iF 0	**0** = Head not present. **1** = Lapping Head. **2** = Milling Head. **3** = Grinding Head.

FUNCTION	DISPLAY	DESCRIPTION
Enabling the heads at zero speed	u0 0	**0** = When the machine goes under the threshold of zero speed (parameter "o") the heads remain in position. **1** = When the machine goes under the threshold of zero speed (parameter "o") the heads are lifted and they go down again when the machine starts again and the speed exceeds the threshold.
Threshold of zero speed	o 0010	It is the number of encoder impulses (primary impulses) which are read in the time unit of 1 second, under which the instrument considers the machine in stopped conditions.
Threshold of filter speed	uM 10.0	It is the threshold of the speed variations, expressed in meters/ minute within which it is introduced the filter for the display.
Average number of readings under stabilization	,S 99	It indicates every how many reading in stabilization it is calculated the speed to be displayed if the changes of the readings are lower than the thresholds programmed in the parameter "uM".
Number of checks input I1	,I 99	The instrument checks the status of the input every millisecond. This parameter indicates for how many checks and then for how many milliseconds the input must keep the logical status so that the instrument gets the change.
Automatic Reset	rA 0	**0** = The instrument stores in memory the levels of the pieces under processing and it keeps them even after the switching OFF. **1** = The instrument, at the restart, energises the output U2 (instrument's reset). **2** = The instrument energises the output U2 (instrument's reset).when exiting the setting of the set-up parameters or the program change.
Time of activation of grinding wheels	t 10.00	It is the time expressed in seconds, for the activation of the head configurated as grinding wheel when reaching the meters which are set in the program data.
Reference speed	uEL. 30.0	It is the speed expressed in mt/min, of the comparison of parameters "heads correction" and "Offset of piece presence input".
Output U1 operating mode	u1 0	**0** = Head 1 down. **1** =Activated if there is at least 1 piece in the machine (distance from the sensor of piece presece and machine lenght).

FUNCTION	DISPLAY	DESCRIPTION
Offset of piece presence input I1 Max.= 999 Min.= -999	oF. 20	It is the difference of input I1 intervention in rise and fall. The value introduced anticipates (positive value) or delays the end of the piece respect of the fall of input I1. It is cerrespondent to the reference speed.

Those visualizations appear only if the parameter "Interaxis of sensors for piece presence" it's <> 0

Number of checks input I2	,2 99	The instrument checks the status of the input every millisecond. This parameter indicates for how many checks and then for how many milliseconds the input must keep the logical status so that the instrument gets the change.
Tolerance for sensor for piece correction I2 (min.1, Max.9999)	Cor. 100	It is the tolerance of the sesnsor for piece correction respect of the piece beginning. If the piece position is different for more than this value, the instrument does not correct the position and the LCF led starts bllinking for 5 sec. This parameter must be setted to a value lower than the minimum measure of the pieces.

Once the programming of the last funciton is achieved, you return to the display in use before entering the set-up (led PRG = OFF).

3 - 2 CALIBRATIONS

DISPLAY OF THE LENGTH OF THE PIECE IN USE AND ENCODER'S FREQUENCY

Description	Keyboard	Display
Await the de-energising of output U2 and access to the calibration of the encoder's resolution.	− + ↵ × 1 sec.	H 000
Enter the access code "321" and confirm with **ENTER**.	+ − ↵	
The frequencymeter is displayed.		F 123
Press the key indicated.	↵	
It is displayed the count (clock pulses multiplied by the encoder's resolution (set-up)). The count is set to zero at every access at the calibration and on every upwards front of input I1. the count is enabled with the activation of input I1 and it is blocked upon the de-activation of the same.		C 123456
To reset to zero the count press the key indicated.	−	
By pressing the key indicated, the display returns to the displaying of the frequencymeter.	↵	
N.B. When you enter the function "Calibration of the resolution of the belt's encoder" it is blocked the management of the comparison of the outputs so that the pieces already under processing are regularly achieved, while those which entered after entering the function "Calibration of the resolution of the belt's encoder" are not counted.		
To exit in any moment press **CLEAR**.	//	

HEADS CORRECTIONS

Description	Keyboard	Display
Access to the function of heads' correction.	− + + × 1 sec.	1Cd-999 ▲○ = ON
It is required the introduction of the correction level for descent of head 1. By entering a positive value you advance the energising of the outputs compared to the interaxis which was set in set-up (max. 9999 min. -999). The operator may enter the desired value and confirm with **ENTER**.	+ − ↵	
It is required the introduction of the correction level for upwards movement of head 1. By entering a positive value you advance the de-energising of the output compared to the interaxis which was set in set-up (min. -120; max. 120). The operator may enter the desired value and confirm with **ENTER**.		1CS-120
N.B. If the head is not enabled or you are under grinding wheel operation mode, the display is referred to the following head.		
By pressing the key indicated, without performing any change, you switch to the display of the level of the following head. The operator may enter the desired value and confirm with **ENTER**.	↵	
N.B. The correction values introduced refer to the reference speed introduced in setup. The minimum frequency in which it is performed the calculation of the correction is 3 Hz.	+ − ↵	2Cd-999
To exit press the key indicated. The display shows again the displaying in use.	⫽ × 1 sec.	▲○ = OFF

CHAPTER 4

USE

Working programs and auxiliary functions

Tables and diagrams of operation

4 - 1 WORKING PROGRAMS AND AUXILIARY FUNCTIONS

ENTERING THE WORKING PROGRAMS

Description	Keyboard	Display
Access to the programs' introduction.	+ ↵ × 1 sec.	P 1 SET = ON
The operator may enter the desired program and confirm it with **ENTER**.	+ − ↵	
It is required the introduction of the heads to be enabled. The first digit on the right corresponds to head 1. Here shall appear only the head which were enabled in set-up. The operator may enable the desired heads by setting the value 1 and confirming with the key **ENTER**.	+ − ↵	A 000000
Lapping head If in set-up the parameter " IF" is set to 1 (lapping head) it is required the introduction of the delay, expressed in millimeters, between the panel start and the descent of the head. The operator may enter the desired value and confirm with **ENTER**.	+ − ↵	1 1 2000
It is required the introduction of the advance, expressed in millimeters, between the endof the panel and the upwards movement of the head. The operator may enter the desired value and confirm with **ENTER**.	+ − ↵	1 u 3000
Milling head If in set-up the parameter " IF" is set to 2 (milling head) it is required the introduction of the distance, expressed in millimeters, between the panel start and the start of the milling operation of the head's milling. The operator may enter the desired value and confirm with **ENTER**.	+ − ↵	2 1 2000
If the milling operation is made at the end of the piece you must disable this parameter by pressing the key indicated. By pressing again the key indicated the parameter is enabled again.	− × 2 sec.	2 1 no
Upon confirmation with **ENTER** it is required the introduction of the distance, expressed in millimeters, between the end of the panel and the end of the milling of the head. The operator may enter the desired value and confirm with **ENTER**.	+ − ↵	2 u 3000
If the milling processing is made at the start of the piece you must disable this parameter pressing the key indicated. Pressing again the key indicated the parameter is enabled again.	− × 2 sec.	2 u no
Upon confirmation with **ENTER** it is required the introduction of the length, expressed in millimeters, of the milling head. L'The operator may enter the desired value and confirm with **ENTER**.	+ − ↵	2 L 4000

To be continued on next page.

Description	Keyboard	Display
Grinding wheel If in set-up the parameter " IF" is set to 3 (grinding head) it is required the introduction of the linear meters after which you must activate the solenoid valve to compensate the wear of the grinding wheel (max. 9999). The operator may enter the desired value and confirm with **ENTER**. If you set the value 0 the head is disabled. N.B. If it is enabled the introduction of the sign, at the moment of the introduction of the parameter itself, the led related to the decimal point of the fifth digit shall blink and the operator shall have to choose if the data to be entered is positive or negative by pressing the key (+), and then he shall have to enter the desired value. The introduction of the negative sign involves the odification of the type of intervention of th ehead on the piece, i.e. an advance level becomes a delay level and a delay level becomes and advance level. - Descent of positive head = delay - Desecent of negative head = advance - Positive head upwards = advance - Negative head upwards = delay	+ − ↵	in 5000

RESET OF PROCESSING

Description	Keyboard	Display
Access to the function of processing reset.	− × 2 sec.	rESLAu
It is displayed the fact that the instrument is ready for the processing reset.		
To perform the reset of the processing press the key indicated.	↵ × 2 sec.	
To abort the procedure of processing reset press the key indicated	///	
N.B. By processing reset we mean the setting to zero of the image of all pieces located on the conveyor belt; the meters processed and the number of pieces manufactured are not reset to zero.		

DISPLAYS

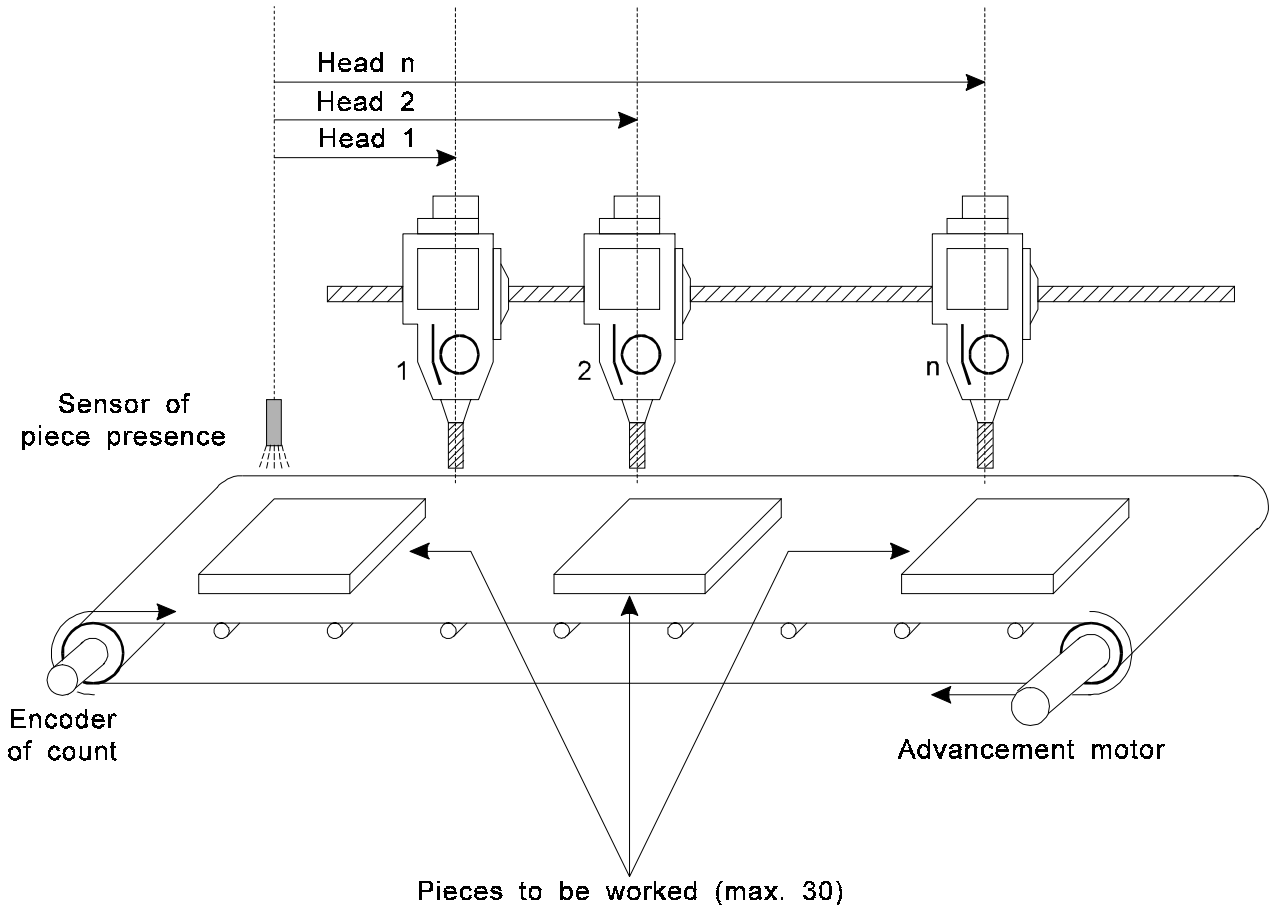
Description	Keyboard	Display
Belt speed expressed in meters/minute.		S 10.6
Processed linear meters.	+	nL 5432
By pressing the key indicated the counter of the processed meters appears.	/// × 1 sec.	
Number of worked pieces.	+	nP 1432
By pressing the key indicated the counter of the worked pieces is set to zero.	/// × 1 sec.	

DISPLAY OF GRINDING WHEELS COUNTERS

Description	Keyboard	Display
Access to the display of the grinding wheels counters.	− + ↵ × 1 sec.	H 000
Enter the access code "123" and confirm with **ENTER**.	+ − ↵	
Decremental counter of the grinding wheel 1		n 1 9999
Pressing the key indicated it is loaded on the counter the value of the linear meters introduced in the working program.	/// × 1 sec.	
Decremental counter of the grinding wheel 2.	+	n 2 9999
To exit press the key indicated.	↵ × 2 sec.	

4 - 2 TABLES AND DIAGRAMS OF OPERATION

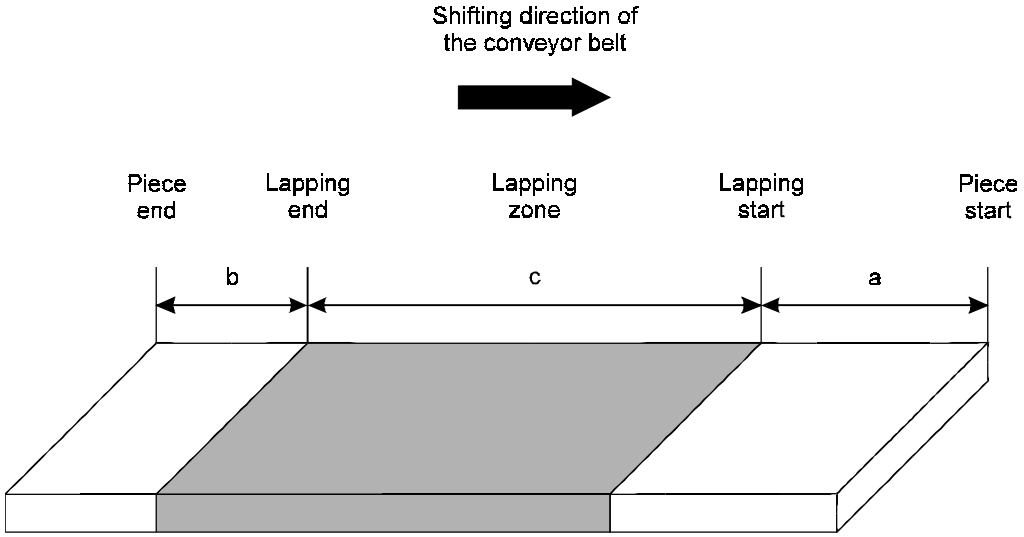
APPLICATION WITH PROCESSING HEADS FOR LAPPING, MILLING AND GRINDING HEADS



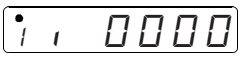
Set-up parameters.
1 = Interaxis head 1
2 = Interaxis head 2
n = Interaxis head nº (max. 6)

The interaxis of the last head on the equipment must be lower than 20 m.

USE OF HEADS AS LAPPING HEADS



Example.
If the head 1 is configurated as lapping head, when the operator set the working program he must set two parameters.



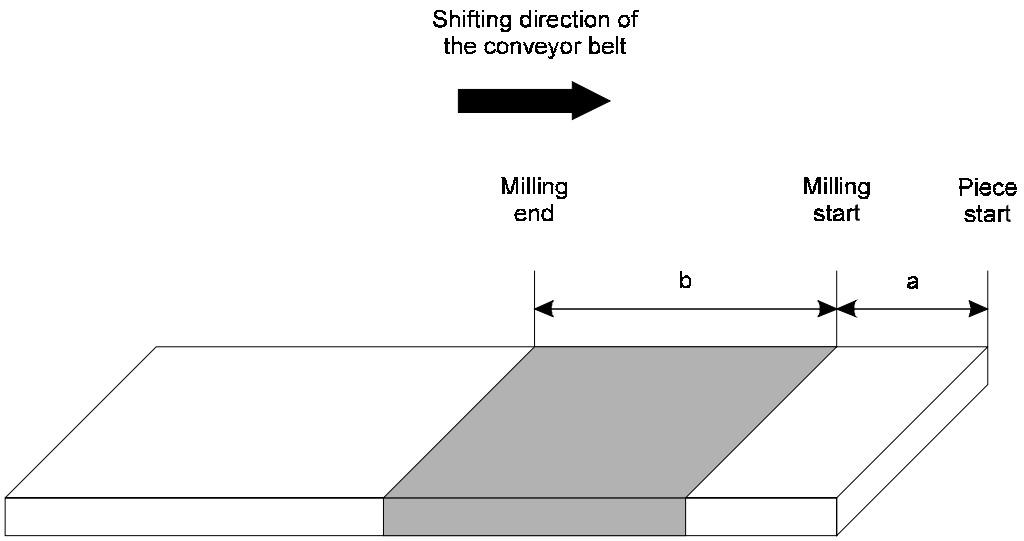
The operator must enter the level "a" which identifies the delay of head descent from the piece start.

The operator must enter the level "b" which identifies the advance of head upwards compared to the piece end.

USE OF HEADS AS MILLING HEADS

The use of the head as milling head may be performed in two ways.
1) Milling at the piece start.
2) Milling at the piece end.

Case nº 1.



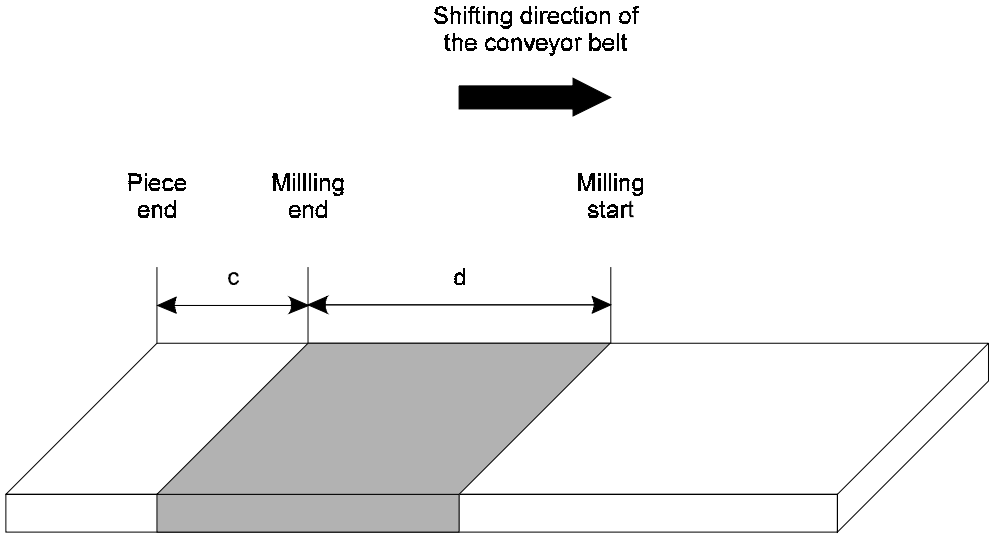
Example.
If the head 2 is configurated as milling head and you wish to perform a milling at the piece start, when the operator shall set the working program he must set the following parameters.

The operator must enter the level "a" which identifies the delay of descent of the end from the piece start.

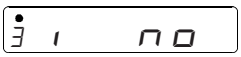
This parameter must be disabled (press the key (-) for 2 seconds).

The operator must enter the level "b" which identifies the length of the milling to be performed.

Case nº 2.



Example.
If the head 3 is configurated as milling head and you wish to perform a milling at the piece end, when the operator sets the working program he must set the following parameters.



This parameter must be disabled (press the key (-) for 2 seconds).

The operator may enter the level "c" which identifies the distance between the piece end and the milling end.

The operator must enter the level "d" which identifies the length of the milling to be performed.

The case nº 2 has been created for an easy comprehension, but you may consider it similar to case n.º 1, with the only difference that the level "a" of case nº 1, according to case nº 2 should be calculated as:
a = (piece length - c - d)

CHAPTER 5

ASSISTANCE

Diagnostic of inputs and outputs

Instructions on How to Fill Up the Technical Assistance Fax

Guarantee

5 - 1 DIAGNOSTIC OF INPUTS AND OUTPUTS

The instrument offers a diagnostic of the logical status of digital inputs and outputs; according to the segments of the display which are ON, it is possible to understand whether an input arrives to the instrument and whether the output has been energised.
As for the status of the inputs, if it is displayed the upper segment of the first display from the left, it means that the input 1 has been activated; if it is displayed the upper segment of the second display from the left, it means that the input 2 has been activated, and so on.
As for the digital outputs, please consider as valid the description made for the inputs, but consider the lower segments of the display (from the first to the sixth for outputs U3 through U8) and the upper segments of the first and second display for outputs U1 and U2.

Description	Keyboard	Display
Access to the display of the diagnostic for inputs/outputs.	+	
Status of inputs and outputs. When the upper segments of the display and/or lower ones are ON, it means that the related inputs or outputs have been acquired, as previously described		U1 U2 I1 I2 U3 U4 U5 U6 U7 U8

5 - 2 INSTRUCTIONS ON HOW TO FILL UP THE FAX FOR TECHNICAL ASSISTANCE

In order to be able to provide a quick, specific and quality assistance, we need your help.
If you need QEM's assistance to face the eventual troubleshooting in your applications and even though you performed all instructions indicated in the manual of "Installation, maintenance and assistance", the problem still continues, please fill up every blank of the fax enclosed to the manual of Installation, maintenance and assistance and send it to QEM's Assistance Department.
In this way you shall allow our technicians to get the necessary elements to understand your problem (avoiding thus expensive telephone calls).
We thank you for your cooperation and here at QEM's we really wish you a good job.

REMARK

If you must send an instrument to be repaired, please strictly follow our instructions indicated here below:
- If possible, use the original packaging; in any case the packaging must protect the instrument against shocks due to transport.
- Insert into the package a detailed description of the malfunction you found and the part of wiring diagram which includes the instrument. In case the problem you discovered concerns data storage, please also include the instrument's programming (set-up, working levels, auxiliary parameters, etc.).
- If you need it, please explicitely require the quotation of charges for the repairing: if you do not ask for it, the charges shall be calculated as a whole.
- Our technicians shall give priority to the repairing of those instruments which have been sent according to the items listed above.

5 - 3 GUARANTEE

The guarantee is conform to the definitions of the general sales conditions.

REMARKS