

# User Manual

Supplement to "Installation, maintenance and servicing manual"



*Quality in Electronic  
Manufacturing*

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## CHAPTER 1

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### INTRODUCTION

*Supplementary nature of manual*

*References*

*Responsibility and validity*

*Description of operation*

## 1 - 1 SUPPLEMENTARY NATURE OF MANUAL

This manual is to be considered as a supplement to the "Installation, maintenance and servicing manual" which contains information on wiring, checking and eliminating faults, start-up and maintenance procedures. This manual gives instructions on the use and correct programming of the instrument.

You are urged, therefore, to read the manual carefully and, if you have any queries, to contact QEM for further explanations by sending the assistance fax contained in the manual.

## 1 - 2 REFERENCES

The documentation relative to the instruments designed and sold by QEM has been divided into different booklets for effective and speedy consultation, according to the type of information required.

<i><b>User manual</b></i>	<i><b>Hardware structure</b></i>	<i><b>Installation, maintenance and servicing manual</b></i>
<p><i>Explanation of software.</i></p> <p>This manual gives all the necessary information for the understanding and use of the instrument described. The manual deals with the instrument software; it gives information on the understanding, programming, calibration and use of the instrument described.</p> <p>Once the instrument is installed following the indications given in the Installation, maintenance and servicing manual, this user manual gives all the necessary information for the correct use and programming of the instrument.</p>	<p><i>Basic information on the standard hardware in the series plus customisation possibilities.</i></p> <p>This booklet is enclosed with the user manual and describes the hardware configuration for the series of instruments described. It also gives the standard electrical, technical and mechanical specifications for the series, together with the possibilities of hardware customisation in relation to the different software versions.</p>	<p><i>All the necessary information for installation, maintenance and assistance.</i></p> <p>In-depth explanations of all essential details for correct installation and maintenance. The aim is to provide you with valid and accurate information for the manufacture of products of recognised quality and reliability. It is also a valid support for whoever needs technical assistance concerning a machine that includes a QEM instrument.</p>

**1 - 3 RESPONSIBILITY AND VALIDITY**

**RESPONSIBILITY**

QEM declines all responsibility for any injury to persons or damage to things resulting from the failure to observe the instructions and rules in this manual and the "Installation, maintenance and servicing manual". It is furthermore specified that the customer/purchaser is bound to use the instrument according to the instructions provided by QEM and, if any doubts arise, to send a written query to QEM. Any authorisation for exceptions or substitutions, if contested, will be deemed valid by QEM only if written consent has been given by QEM.

The reproduction or the transfer of all or part of this manual to third parties is forbidden without QEM's written consent. Any transgression will result in a claim for compensation for the damages sustained. All rights deriving from patent or designs are reserved.

QEM reserves the right to make partial or complete modifications to the characteristics of the instrument described and the corresponding documentation.

**Objective**

The objective of this manual is to give the general rules for the use of the instrument described.

**Recommendation**

Write down all the instrument setting and programming parameters, keeping them in a safe place to facilitate any future replacement or servicing operations.

**VALIDITY**

This manual is applicable to all instruments designed, manufactured and tested by QEM with the same order code. This document is valid in its entirety, save errors or omissions.

<i>Instrument release</i>	<i>Manual release</i>	<i>Modifications to manual</i>	<i>Date of modifications</i>
0	0	New manual	25 / 02 / 97
1	1	Access cleared to manual state menu	18 / 06 / 97
2	2	Modified only software release.	24 / 10 / 97
3	3	Modified transparent software for manual.	24 / 06 / 99
4	3	Modified transparent software for manual.	01 / 06 / 11

## 1 - 4 DESCRIPTION OF OPERATION

The instrument HB 548.43 is an analogic positioner with a quick stop input for interrupting positioning immediately. This input, enabled only in proximity of the arrival quota, is connected to an optic detector which reads a signal on the material drawn by the axis. The axis stop is in phase with the signal to eliminate measurement errors due to stretching or shrinking of the material conveyed.

The instrument has been designed for managing systems for unwinding, welding and cutting nylon bags (ordinary refuse bags).

Substantially the machine is composed of a cylindrical nylon bobbin, a material conveyor system, a welding and cutting area and finally a stacker.

Draw rollers unwind the bobbin bringing the bag (length) to the welding/cutting position where a command is given to cut. The "process" is carried out by a head composed by one welding side and one cutting side, then the bag is closed at one end and cut at a distance of a few millimetres.

The welding part is joined to the cutting part so the latter tends to become hot which could cause snags attaching the cut bag to the rest of the reel. For this reason, once the welding/cutting head has completed the "operation", the bag is conveyed towards the stacker, whilst the rest of the material is reversed slightly in the opposite direction (reverse quota).

All the cut bags are welded at their bottom end where they become thicker. When stacking, after a certain number of bags, the pallet would be higher on the welded side (bag bottoms) and lower on the open side. To avoid this inconvenience, the principle of ramping has been introduced: alternately (one bag yes, one bag no), the length of the bag is increased by the ramping quota so that, during stacking, the welded parts are not directly one above another and the pallets are of the same height on both sides.

the instrument is provided with 30 programs, each one of 5 steps.

## CHAPTER 2

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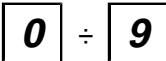












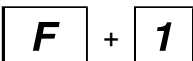
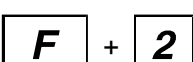
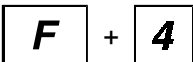
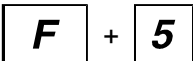
# OPERATOR / MACHINE INTERFACE

*Description of keyboard*

*Description of inputs*

*Description of outputs*

## 2 - 1 DESCRIPTION OF KEYBOARD

Key	Function
	<p><b>Normal operation:</b> pressed after the "F" key, they select the functions available.  <b>Data input:</b> enables entry of data.</p>
	<p><b>Normal operation:</b> programming of the cut quota and the number of cuts.  <b>Data input:</b> not used.</p>
	<p><b>Normal operation:</b> impulse pressure selects the previous display.  <b>Data input:</b> inserts or removes the +/- sign.</p>
	<p><b>Normal operation:</b> impulse pressure selects the successive display.  <b>Data input:</b> inserts the decimal point.</p>
	<p><b>Normal operation:</b> permette di selezionare le funzioni desiderate.  <b>Data input:</b> in writing work programs, allows the display of speed in the recommended percentage.  Allows exit from functions selected with "F" + "Numerical key".</p>
	<p><b>Normal operation:</b> not used.  <b>Data input:</b> cancels the value entered and restores the old value.</p>
	<p><b>Normal operation:</b> not used.  <b>Data input:</b> memorises the data introduced.</p>
	Led not used.
	Led not used.
	Led not used.
	Lights when entering the manual movement function.
	Lights when the "F" key is pressed.
	Access to functions protected by password.
	Choice of work programs.
	Request for count zero reset.
	For resetting P.I.D. adjustment parameters.
	Manual movements.



<i>Key</i>	<i>Function</i>
<b>F</b> + <b>6</b>	Input and output diagnostics.

## 2 - 2 DESCRIPTION OF INPUTS

### Input Characteristics

Refer to the chapter entitled "Electrical Characteristics" in the "Hardware structure" booklet enclosed with this manual.

				<i>Name</i>	<i>Operating logic</i>	<i>Activation mode</i>	<i>Polarizer</i>		
								<i>Description</i>	
11	ON	I	P1	<b>Photocell.</b> If it is enabled in automatic and intervenes during positioning, it resets to zero the analog output with programmable stop functions and terminates positioning. The stop is enabled for reading in automatic if the count is greater than or equal to (preselected quota - stop band). Active on the ascent or descent front (set-up). Minimum duration: 1 millisecond.					
12	ON	C	P1	<b>Start / Stop.</b> Enabled in automatic, on the ascent front, it resets the count to zero and commands positioning on the selected quota. On the descent front it commands any ramp braking if positioning is in progress. Minimum activation time 10 milliseconds.					
13	ON	C	P1	<b>Drive enabled.</b> If disabled during positioning, analog voltage is immediately brought to zero aborting the positioning in progress and disabling the space reaction.					
14	/	C	P1	<b>Manual/Automatic.</b> In function of the logic state of this input, it selects the instrument functions mode: ON = Automatic, OFF = Manual. In manual, it enables axis movement through input I5 (manual forward) or, through the keyboard, introduction of the work program. In automatic it enables positioning at the work quotas. During the passage from manual to automatic, or vice versa, it commands eventual ramp braking if positioning is in progress, interrupting the current procedures.					
15	ON	C	P1	<b>Forward.</b> Enabled in manual, it commands the forward movement of the axis at slow manual speed.					
16	ON	I	P1	<b>Restart.</b> When activated, the instrument resets the program in use: the totaliser (count of operations performed) returns to zero, the first step of the program is used and the count (axisposition) is reset to zero. Used to return to the start of the program currently in use.					

### Key

C = Continuous signal

I = Impulse signal

**Name**

	<i>Description</i>
<b>Vac</b>	<b>Instrument supply voltage.</b> Alternating voltage as per code in your order.
<b>Vac</b>	<b>Instrument supply voltage.</b> Alternating voltage as per code in your order.
<b>GND</b>	<b>Ground connection.</b> Recommended a conductor of Ø 4 mm.
<b>+</b>	<b>Transducers positive power supply.</b> Positive voltage supplied by instrument for instrument and transducers inputs power.
<b>-</b>	<b>Transducers negative power supply.</b> Negative voltage supplied by instrument for instrument and transducers outputs power.

**COUNT INPUTS**

**Name**      **Operating logic**      **Polarizer**

			<i>Description</i>
<b>PHA</b>	<b>N / P</b>	<b>PE</b>	Input "phase A" incremental transducer.
<b>PHB</b>	<b>N / P</b>	<b>PE</b>	Input "phase B" incremental transducer.
<b>Z</b>	<b>N / P</b>	<b>PE</b>	<b>Piece counter block.</b> Activated in automatic, during normal machine functions, it inhibits the piece counter increase.  For details of the count inputs, refer to the chapter "Electrical characteristics" in the "Hardware structure" booklet enclosed with this manual.

**Legenda**

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

2 - 3 OUTPUTS

**Characteristics of outputs**

Refer to the chapter "Electrical characteristics" in the "Hardware structure" booklet enclosed with this manual.

				<i>Name</i>	<i>Operating logic</i>	<i>Polarizer</i>	<i>Activation mode</i>		
									<i>Description</i>
U1	ON	C1	C						<b>Positioning</b> . Enabled in automatic, it is energised when positioning is completed if the count is within the tolerance band or if the stop (I1) has intervened. It is de-energised when a new start is given.
U2	ON	C1	C						<b>Stop not executed</b> . Enabled in automatic, it is energised when positioning is completed without the intervention of the photocell. It is de-energised when a new start is given.
U3	ON	C1	C						<b>Follow-up error</b> . To position an axis, the instrument generates an ideal positioning profile (acceleration ramp, tract at constant speed, deceleration ramp). If the real position of the axis exceeds the ideal profile set as "follow-up error" in set-up, this output is energised to signal the malfunction.
U4	ON	C1	I						<b>Step end</b> . This output is energised for 300 milliseconds to signal that the current step has been completed and therefore the execution of all the programmed operations.
U5	ON	C1	C						<b>Program end</b> . This output is energised to signal that the current program has been executed completely and therefore all the programmed operations. It is de-energised when a new start is given.

**Key**

C= Continuous signal

I = Impulse signal

## CHAPTER 3

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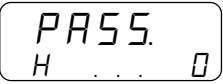
# SETTING UP FOR OPERATION

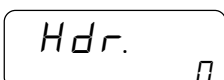
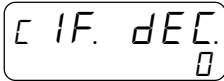
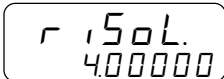
*Set-up*

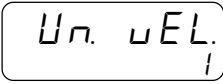
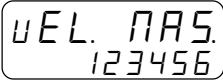
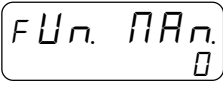
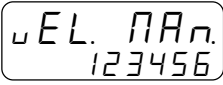
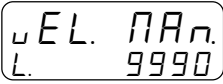
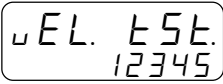
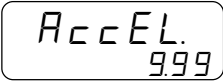
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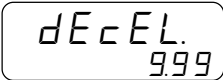
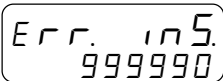
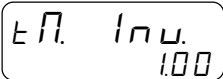
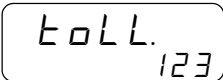
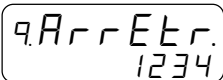
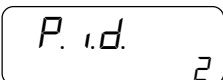

### 3 - 1 SET-UP

Since these parameters set the instrument's operating mode, access is restricted to the installer only; a password must be entered for programming operations as follows:

Description	Keyboard	Display
Access to the set-up programming.	<b>F</b> + <b>0</b>	
Introduce the access code "548" and confirm with <b>ENTER</b> .	<b>5</b> <b>4</b> <b>8</b> <b>↵</b>	<input type="checkbox"/> <b>L5</b> = ON
Exit is possible at any time after introducing the password by pressing the key illustrated.	<b>F</b>	

FUNCTION	DISPLAY	DESCRIPTION
Display method		<p><b>0</b> = Normal display.</p> <p><b>1</b> = Display with HDR 1 system (High definition reading).</p> <p><b>2</b> = Display with HDR 2 system (High definition reading).</p> <p><b>N.B.</b> Refer to the "Installation, maintenance and servicing manual".</p>
Decimal figures Max. 3		<p>Specifies the number of figures after the decimal point, with which to display the count (axis position).</p> <p><b>N.B.</b> Introduction of decimal figures influences the DISPLAY of the count; precision in positioning depends on the number of impulses supplied by the transducer.</p>
Encoder resolution		<p>This parameter indicates by how much the encoder revolution impulses must be multiplied to display the lengths in the required unit of measurement. Values can be introduced from 0.00200 to 4.00000 bearing in mind that the frequency of the PH phases must not exceed the instrument's maximum count frequency.</p> <p><b>N.B.</b> Refer to the "Installation, maintenance and servicing manual".</p>

FUNCTION	DISPLAY	DESCRIPTION
Unit of speed		<p>Specifies if the unit of measure (Um) of axis movement is in minutes or seconds (mm/minute, mm/second, ...).</p> <p><b>0</b>=Um / min.</p> <p><b>1</b>=Um / sec.</p>
Max Speed Max. 999999		<p>This parameter is used to set the maximum axis speed, relative therefore to the analog reference of +/- 10 V; the value always refers to the set unit of measure (um/min. or um/sec.).</p> <p><b>N.B.</b> This parameter <b>MUST</b> be calculated according to the indications given in the paragraph "Analog axis calibration".</p>
Manual movement functions		<p><b>0</b>= Manual movements are with reaction control. This means that the instrument contrasts any axis movement from the reached quota due to external causes (offset, operator, ...).</p> <p><b>1</b>= Manual movements are without reaction controle. This means that the axis can be moved and the position is not recovered.</p>
Manual speed		<p>This parameter is used to set axis speed in manual movements; the value always refers to the set unit of measure (um/min. - um/sec.) and must be less than or equal to the maximum speed.</p>
Slow manual speed		<p>This parameter is used to set axis speed in slow manual movements; the value always refers to the set unit of measure (um/min. - um/sec.) and must be less than or equal to the manual speed.</p>
Test speed		<p>This parameter is used to set axis speed when carrying out the test for calibrating the P.I.D. parameters. The value always refers to the set unit of measure (um/min. - um/sec.) and must be less or equal to the maximum speed.</p>
Acceleration Max. 9.99		<p>This parameter is used to set the acceleration ramp for the axis; the value set determines the time employed by the axis to move from stop to the max speed.</p>

FUNCTION	DISPLAY	DESCRIPTION
Deceleration Max. 9.99		In seconds, determines the time necessary for the axis to slow from maximum speed to zero.
Follow-up error Max. 999999		To govern an axis movement, the instrument generates an ideal profile for positioning. The follow-up error is the maximum different acceptable between the position reached by the axis and the position it should have reached, beyond which the follow-up error is signalled (U3 = ON). The value introduced is in primary encoder impulses multiplied x 4.
Inversion time Max. 9.99		To avoid any mechanical stress due to inversions that are too rapid in the axis' direction of movement, a delay time, expressed in seconds, can be inserted for inversion. This parameter has an influence on functions only when positioning with play recovery.
Tolerance Max. 999		This is the count range for all the positioning quotas that identifies the zone in which positioning has been made correctly. Example. Quota 100.0 and tolerance 1.00; all positionings completed between 101.0 and 99.0 can be considered correct.
Reverse quota Max. 9999		If enabled in the work program, when starting, the axis will reverse by the quota set and then position on the programmed measure.
P.I.D. data		Access to reading and/or writing of P.I.D. data (see special paragraph). <b>0</b> = Access not enabled. <b>1</b> = Access to reading of data. <b>2</b> = Access to reading and writing of data.
Photocell activation front		<b>0</b> = The stop is acquired on the photocell ascent front. <b>1</b> = The stop is acquired on the photocell descent front.
After programming the last function, the display of the first set-up parameter is given again.		



**3 - 2 CALIBRATIONS**

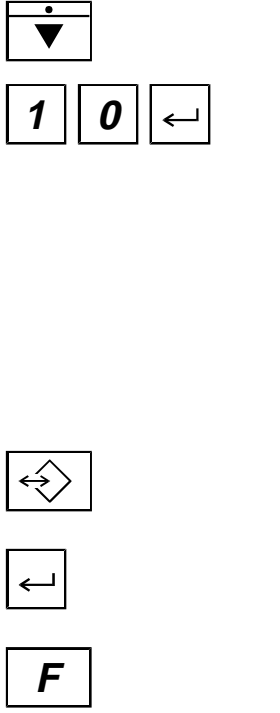

**PROCEDURE FOR CALIBRATING THE ANALOG OUTPUT**

**Setting some set-up parameters.**

Settings are made in set-up of the parameters relative to decimal figures, transducer resolution and units of speed.

Description	Keyboard	Display
<p><b>Access to the calibrating procedure</b>                      Activate the enabled drive input (I3 = ON).                      Introduce the password "123".</p>	<p><b>F</b> + <b>0</b></p>	<p>PASS. H . . . 0</p>
<p>The double arrow key can be used to select three different displays:                      "tu" (output voltage), "OF" (count offset) "GA" (ring gain).</p>	<p><b>1</b> <b>2</b> <b>3</b> <b>←</b></p>	<p><input type="checkbox"/> L5 = ON</p>
<p><b>Checking connections</b></p>	<p><b>▼</b></p>	<p>tu 000 00</p>
<p>First of all, check that the tachometer dynamo is connected correctly to the drive. Select the display relative to "Output voltage (tu)" and use the numerical keyboard to introduce a voltage value, then confirm with <b>ENTER</b>. We recommend entering a rather low voltage value (ex. 0.5 V) and to observe if the motor is turning at about 1 / 20 of its maximum speed (if the drive accepts a maximum voltage of 10V).</p>	<p><b>▼</b></p>	<p>OF 345 123</p>
<p>Supplying a positive voltage from the keyboard, the motor should turn "forwards" with a speed proportional to the value entered, and the displayed count must show an increase.</p>	<p><b>▼</b></p>	<p>tu 000 00</p>
<p><b>N.B. The voltage value entered from the keyboard is supplied by the analog output without an acceleration ramp.</b></p>	<p><b>0</b> ÷ <b>9</b> <b>←</b></p>	<p>OF 345 123</p>
<p><b>Offset calibration</b>                      Select the display "step offset (OF)" and follow the indications below:                      the operator can use the numerical keys and sign to enter any value which, when confirmed with <b>ENTER</b>, will immediately be given in output.</p>	<p><b>▼</b></p>	<p><b>0</b> ÷ <b>9</b> <b>←</b></p>


*Follows on next page.*

Description	Keyboard	Display
<p><b>Calculating the speed</b></p> <p>The instrument is now able to calculate and display the value of the maximum speed to enter as the "Maximum speed (VEL.MAS.)" parameter in set-up.</p> <p>Select the display relative to "entered output voltage (tu)". Using the numerical keyboard, introduce a voltage of 10 volt (corresponding with maximum motor speed).</p> <p><b>N.B. The voltage value entered from the keyboard is supplied by the analog output without an acceleration ramp.</b></p> <p>If the axis cannot be moved at maximum speed, enter a voltage of 1 volt. The speed displayed by the instrument must then be multiplied by 10.</p> <p>With the axis in movement, press the key illustrated.</p> <p>The top display will show the count frequency (detected in encoder phases). The bottom display will show the value for the maximum speed to be entered in the set-up parameter "Maximum speed".</p> <p>A filter can be entered on this display by holding down the <b>ENTER</b> key.</p> <p>To exit the function at any time, press key illustrated.</p> <p><b>Complete the set-up.</b></p>		





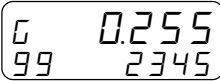




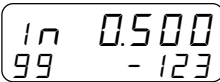






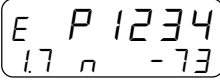


**PROCEDURE FOR P.I.D. CALIBRATION**

P.I.D. calibration must be made after that of the analog output (calculation of the maximum speed). Before starting P.I.D. calibration, set the following parameters in set-up: "Decimal figures", "Encoder resolution", "Unit of speed", "Maximum speed", "Test speed", "Acceleration/deceleration ramps" and "inversion time".

Enter calibration functions for P.I.D. (see below) and, setting the value "0" when asked to enable P.I.D. (only data writing), reset to zero the parameters for "Integral time" and "Deriving time", setting the feed-forward value on 100%.

Description	Keyboard	Display
Enter calibration functions for P.I.D.	<b>F</b> + <b>4</b>	<input type="checkbox"/> L5 = ON
The operator can choose whether to calibrate P.I.D. or only to modify the parameters. Set value "0" to modify the parameters or set "1" to enable calibration.	<b>0</b> o <b>1</b> <b>←</b>	Ab iL iE. P. i.d. 0
A request will be made to enter the test quota, that is the movement made by the axis in both directions during the calibration phases. When the entered value is confirmed with <b>ENTER</b> , the axis moves forwards by the quota set, using the set ramps for acceleration and deceleration and, once it reaches that quota, after the inversion time, it returns to its start quota; this oscillation occurs throughout the whole calibration phase.	<b>0</b> ÷ <b>9</b> <b>←</b>	126456 2345
Select the display relative to feed forward (the values introduced are in percentage 100 = 100%). If the maximum speed has been calculated correctly, the value for feed forward should be around 100%. The bottom left displays indicate the error value which must be reduced to about "0" (if the error is negative the displays will flash). The maximum error value will be found on the ramps while it will be relatively constant along the linear path. Modify the feed-forward value to return the error to zero in the positioning phase and with constant speed.	 <b>0</b> ÷ <b>9</b> <b>←</b>	FF 110.0 99 2345
<b>N.B.</b> The feed-forward value must be increased if the error is positive when the axis moves forward; in the same way, it must be increased if the error is negative when the axis moves backwards. Contrary-wise, it must be decreased if the error is negative when the axis moves forward and decreased if the error is positive when the axis moves backwards.		

*Continues on next page.*

Description	Keyboard	Display
<p>Select the display relative to proportional gain.</p> <p>Introduce the value "0.001". Initially the axis is very slow. It does not respect the acceleration/deceleration ramps, the maximum speed and position are not reached. This means that the set value is too low. Increase the value until the system becomes unstable (oscillations with the axis in movement and vibrations when it is still).</p>	  ÷  	
<p>Select the display relative to the integral time (expressed in seconds).</p> <p>Starting from the basis of 0.500 seconds, gradually reduce the time until arriving at a value where the axis improves its dynamic performance and remains stable (it does not oscillate). If the integral time entered is not sufficient, there will be low frequency oscillations, whilst if its value is too high the oscillations will be high frequency.</p>	  ÷  	
<p>Select the display relative to the derived time (expressed in seconds).</p> <p>Starting from the basis of 0.001 seconds, the time must be gradually increased until arriving at a value where the axis improves its dynamic performance and remains stable (it does not oscillate). This function is excluded if the value "0" is set.</p>	  ÷  	
<p>Pressure on the key illustrated will display the maximum error of positive space "P" and negative space "n" calculated by the instrument every 50 milliseconds and the value, in volts, of analog voltage A1 (display at bottom left). If the voltage is negative, the displays will flash.</p>		
<p>To exit the function at any time, press key <b>F</b>; the instrument will return to the normal displays.</p>		 = OFF

## CHAPTER 4

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




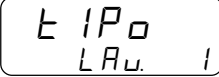

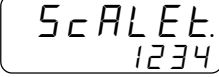



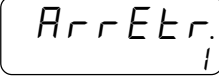



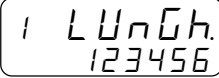







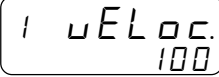



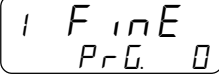

### USE

*Work programs and auxiliary functions*










*Operation graphs and tables*

**4 - 1 WORK PROGRAMS AND AUXILIARY FUNCTIONS**


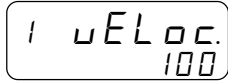





**HOW TO ENTER THE STANDARD WORK PROGRAM**

Description	Keyboard	Display
Enter the work program writing.		
A request is made to enter the program number (max. 30) to be modified. The operator can introduce the value and confirm with <b>ENTER</b> .	 ÷  	
A request is made to enter the type of process. Entry of the value 1 selects the standard program. The operator can introduce the value and confirm with <b>ENTER</b> .	 	
The display shows the ramping quota representing the value, expressed in units of measurement, by which alternate pieces are increased to avoid overlapping of the welded ends. The operator must confirm with <b>ENTER</b> .		
A request is made to enable reverse movement. If the setting is 0, at every start, positioning is made at the set length, while with a setting of 1, at each start, positioning at set length is preceded by a reverse (value set in set-up) to allow the material to be detached from the residue of welding the previous bag. the operator can introduce the value and confirm with <b>ENTER</b> .	 o  	
A request is made to enter the length of the piece. The number that appears in the top left display (1) indicate the number of the step being entered. The operator can introduce the value and confirm with <b>ENTER</b> .	 ÷  	
A request is made to enter the number of pieces to be cut. The operator can introduce the value and confirm with <b>ENTER</b> .	 ÷  	
A request is made to enter the positioning speed expressed as a percentage of the maximum speed. The operator can introduce the value and confirm with <b>ENTER</b> .	 ÷  	
A request is made to enter the program end. The operator can introduce value 1 and confirm with <b>ENTER</b> . If he enters the value 0, then data entry continues with the next step (max. 5).	 o  	
To exit at any time, press this key.		
<b>NOTE: All changes made to the work program with the instrument in automatic mode will be executed at the first start after exiting the menu.</b>		

**ENTRY OF WORK PROGRAM WITH PHOTOCELL**








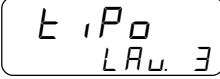

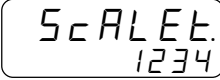

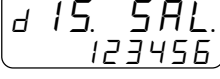



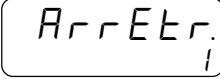







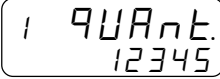



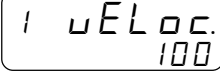



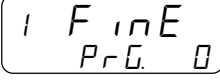

Description	Keyboard	Display
Access to program entry.		Introd. PrG. 12
A request is made to enter the program number (max. 30) to be modified. The operator can introduce the value and confirm with <b>ENTER</b> .	0 ÷ 9 	
A request is made to enter the type of process. Entry of the value 2 selects the program with photocell. The operator can introduce the value and confirm with <b>ENTER</b> .	2 	t IPo L Au. 2
The display will show the braking space. This is the distance to be covered after intercepting the reference mark read by the axis photocell. The distance must be great enough to allow the axis to stop. The operator must confirm with <b>ENTER</b> .		SP. FrEn. 123456
The display shows the field for enabling the photocell to read. The photocell is enabled in the band between (length - SP FrEn. - Ab. LEtt. F and length - SP. FrEn. + Ab. LEtt. F). At the time of enabling the photocell, this is already enabled and positioning is completed after the braking space. The operator must confirm with <b>ENTER</b> .		Ab. LEtt. F 123456
The display shows the ramping quota which represents the value, expressed in units of measurement, of the increased length of alternate pieces to avoid overlapping the welded edges. The operator must confirm with <b>ENTER</b> .		ScALeE. 1234
A request is made to enable reverse. By setting 0, at each start positioning will be made along the set length, while by setting the value 1, at each start, positioning along the set length is preceded by a reverse movement (value set in set-up) to detach the material from the residue of welding the previous bag. The operator can introduce the value and confirm with <b>ENTER</b> .	0 o 1 	ArrEEt. 1
A request is made to enter the length of the piece. The number that appears on the top left display (1) indicates the number of the step being entered. The operator can introduce the value and confirm with <b>ENTER</b> .	0 ÷ 9 	1 LUnGh. 123456
A request is made to enter the quantity of pieces to be cut. The operator can introduce the value and confirm with <b>ENTER</b> .	0 ÷ 9 	1 QUAnt. 12345

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

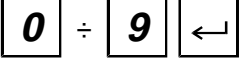



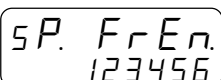

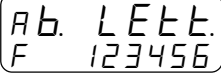

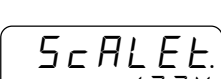


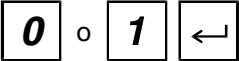
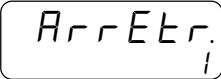
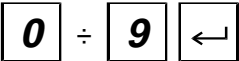
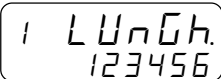
Description	Keyboard	Display
<p>A request is made to enter the positioning speed expressed as a percentage of the maximum speed. The operator can introduce the value and confirm with <b>ENTER</b> (if the speed entered is greater than the recommended value, the speed display will start to flash).</p>		
<p>By pressing the shown key it is possible to display the speed in the recommended percentage. When the key is pressed again, the display will return to showing the positioning speed.</p>		
<p>A request is made to enter end of program. The operator can introduce the value 1 and confirm with <b>ENTER</b>. If he introduces the value 0 data entry will continue with the next step (max. 5).</p>		
<p>To exit at any time press the shown key.</p>		
<p><b>NOTE: All the changes made to the work program with the instrument in automatic mode will be executed with the first start following exit from the menu.</b></p>		



**ENTRY OF A WORK PROGRAM WITH DOUBLE WELDING**

Description	Keyboard	Display
Access to program entry.		
A request is made to enter the number of the program (max. 30) to be modified. The operator can introduce the value and confirm with <b>ENTER</b> .	 ÷  	
A request is made to enter the type of process. Entry of the value 3 selects the program with double welding. The operator can introduce the value and confirm with <b>ENTER</b> .	 	
The display shows the ramping quota which represents the value, expressed in units of measurement, of the increased length of alternate pieces to avoid overlapping the welded edges. The operator must confirm with <b>ENTER</b> .		
The display shows the welding distance. This is the value which, at the start following that of measured positioning, commands a reverse by this distance to make another welding close to the previous one. Only after the second welding does the piece counter increase and awaits a new start to unwind another bag. The operator must confirm with <b>ENTER</b> .		
A request is made to enable reverse. By setting 0, at each start, positioning will be made along the set length, while by setting the value 1, at each start, positioning along the set length is preceded by a reverse movement (value set in set-up) to detach the material from the residue of welding on the previous bag. The operator can introduce the value and confirm with <b>ENTER</b> .	 o  	
A request is made to enter the length of the piece. The number that appears on the top left display (1) indicates the number of the step being entered. The operator can introduce the value and confirm with <b>ENTER</b> .	 ÷  	
A request is made to enter the quantity of pieces to be cut. The operator can introduce the value and confirm with <b>ENTER</b> .	 ÷  	
A request is made to enter the positioning speed expressed as a percentage of the maximum speed. The operator can introduce the value and confirm with <b>ENTER</b> .	 ÷  	
A request is made to enter end of program. The operator can introduce the value 1 and confirm with <b>ENTER</b> . If he introduces the value 0 data entry will continue with the next step (max. 5).	 ÷  	
To exit at any time press the shown key.		
<b>NOTE: All the changes made to the work program with the instrument in automatic mode will be executed with the first start following exit from the menu.</b>		

**ENTRY OF A WORK PROGRAM WITH DOUBLE WELDING AND PHOTOCCELL**

Description	Keyboard	Display
Access to program entry.		
A request is made to enter the number of the program (max. 30) to be modified. The operator can introduce the value and confirm with <b>ENTER</b> .		
A request is made to enter the type of process. Entry of the value 4 selects the program with double welding and photocell. The operator can introduce the value and confirm with <b>ENTER</b> .		
The display shows the braking space. This is the distance to be covered after intercepting the reference mark read by the axis photocell. The distance must be great enough to allow the axis to stop. The operator must confirm with <b>ENTER</b> .		
The display shows the field for enabling the photocell to read. The photocell is enabled in the band between (length - SP FrEn. - Ab. LEtt. F and length - SP. FrEn. + Ab. LEtt. F). At the time of enabling the photocell, this is already enabled and positioning is completed after the braking space. The operator must confirm with <b>ENTER</b> .		
The display shows the ramping quota which represents the value, expressed in units of measurement, of the increased length of alternate pieces to avoid overlapping the welded edges. The operator must confirm with <b>ENTER</b> .		
The display shows the welding distance. This value, with the start following the one for measured positioning, commands a reverse movement of this distance to make a second welding operation close to the previous one. Only after the second welding does the piece counter increase, then waits for a new start to unwind another bag. The operator must confirm with <b>ENTER</b> .		
A request is made to enable reverse. By setting 0, at each start, positioning will be made along the set length, while by setting the value 1, at each start, positioning along the set length is preceded by a reverse movement (value set in set-up) to detach the material from the residue of welding the previous bag. The operator can introduce the value and confirm with <b>ENTER</b> .		
A request is made to enter the length of the piece. The number that appears on the top left display (1) indicates the number of the step being entered. The operator can introduce the value and confirm with <b>ENTER</b> .		

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Description	Keyboard	Display
<p>A request is made to enter the quantity of pieces to be cut. The operator can introduce the value and confirm with <b>ENTER</b>.</p>	<p><b>0</b> ÷ <b>9</b> <b>←</b></p>	<p>1 QUANT. 12345</p>
<p>A request is made to enter the positioning speed expressed as a percentage of the maximum speed. The operator can introduce the value and confirm with <b>ENTER</b> (if the speed entered is greater than the recommended value, the speed display will start to flash).</p>	<p><b>0</b> ÷ <b>9</b> <b>←</b></p>	<p>1 uELoc. 100</p>
<p>By pressing the shown key it is possible to display the speed in the recommended percentage. When the key is pressed again, the display will return to showing the positioning speed.</p>	<p><b>F</b></p>	<p>1 uELoc. CON.100</p>
<p>A request is made to enter end of program. The operator can introduce the value 1 and confirm with <b>ENTER</b>. If he introduces the value 0 data entry will continue with the next step (max. 5).</p>	<p><b>0</b> o <b>1</b> <b>←</b></p>	<p>1 FinE PrG. 0</p>
<p>To exit at any time press the shown key.</p>	<p><b>↔</b></p>	
<p><b>NOTE: All the changes made to the work program with the instrument in automatic mode will be executed with the first start following exit from the menu.</b></p>		

**CHOICE OF THE WORK PROGRAM TO BE EXECUTED**

Description	Keyboard	Visualizzazione
<p>Access to program choice functions.</p>	<p><b>F</b> + <b>1</b></p>	<p>SCELEA PrG. 12</p>
<p>A request is made to enter the number of the program (max. 30) to be executed. The operator can introduce the value and confirm with <b>ENTER</b>.</p>	<p><b>0</b> ÷ <b>9</b> <b>←</b></p>	<p><input type="radio"/> L5 = ON</p>
<p>The choice of a program aborts completely the execution of the program previously in use.</p>		
<p>To exit the function, press the key shown. The display will return to the one in use.</p>	<p><b>F</b></p>	<p><input type="radio"/> L5 = OFF</p>

### COUNT RESET TO ZERO


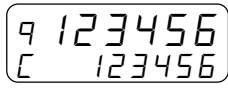

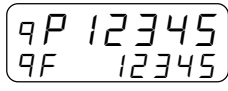

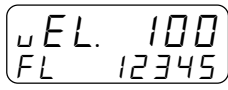

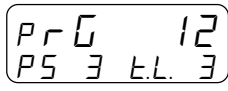
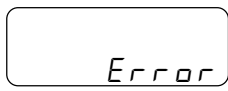

Description	Keyboard	Display
Enter the count reset function, as long as positioning is not in progress.	<b>F</b> + <b>2</b>	
Press the key shown to reset the count to zero.		<input type="checkbox"/> <b>L5</b> = ON
Press any key to exit the function. The screen will return to the display in use.		<input type="checkbox"/> <b>L5</b> = OFF

### MANUAL MOVEMENT OF THE AXIS

The instrument offers certain functions for manual management of the axis. From the keyboard it is possible to move the axis in the two directions and with two different speeds. After selecting the manual axis movement function, using key 7 the axis can be moved "back" (the count decreases), using key 9 the axis can be moved "forwards" (the count increases). Key 8 is used to select the manual movement speed (slow or fast).

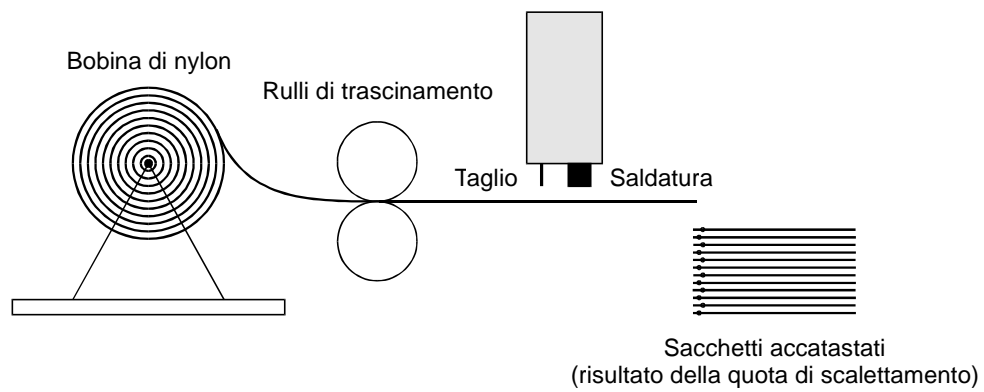
Description	Keyboard	Display
Enter manual functions (L4=OFF) and select the display relative to axis movements.	<b>F</b> + <b>5</b>	
The bottom left display shows the speed selected with key 8 (L = slow, F = fast).	<b>7</b> <b>8</b> <b>9</b>	<input type="checkbox"/> <b>L4</b> = ON
The bottom right display shows the count (axis position).		
During manual movements the limits set with minimum and maximum quotas (set-up) are enabled.		
To exit manual functions, press the key illustrated. The screen will return to the display in use.	<b>F</b>	<input type="checkbox"/> <b>L4</b> = OFF

**DISPLAYS**

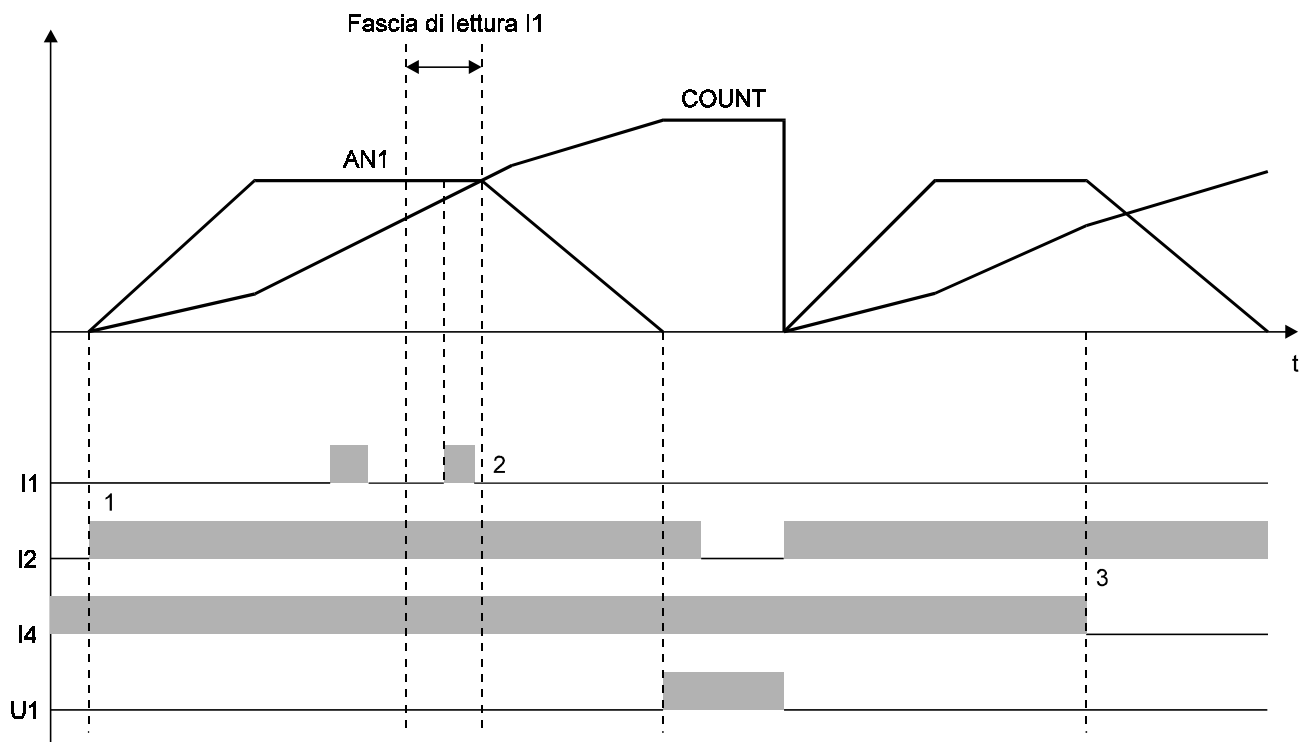
Description	Keyboard	Display
<p><b>Top right Display</b> Current quota. <b>Bottom right Display</b> Count.</p>		
<p><b>Top right Display</b> Preselected quantity. <b>Bottom right Display</b> Quantity processed.</p>		
<p><b>Top right Display</b> Speed as a percentage. <b>Bottom right Display</b> Photocell reading band (the message " n b." will appear if this is not enabled).</p>		
<p><b>Top right Display</b> Number of current program. <b>Bottom left Display</b> Number of steps in progress. <b>Bottom right Display</b> Type of work to be carried out.</p>		
<p>If the operator enters a value outside acceptable limits.</p> <p>a) If the data shown is greater than the allowed maximum, depending on the number of characters set (example: if the data is to be shown in a single figure, the value will be shown between 0 and 9, or -9 and 9 when the sign is foreseen.</p> <p>b) The data shown is not within the limits set by the user (example: manual speed less than maximum speed).</p>		  

## 4 - 2 WORK GRAPHS AND TABLES

## EXAMPLE OF FUNCTIONS



## FUNCTIONS DIAGRAM



- 1) When the instrument starts, it resets the count to zero, deactivates outputs U1 and U2 and begins positioning.
- 2) When the count enters the stop reading band, input I1 is activated bringing the analog output to zero and, with the axis at a standstill, activating output U1; the repeat counter increases. If positioning were completed without activating input, output U2 would be activated for an unperformed stop. The repeat counter is enabled when input Z is OFF.
- 3) If manual (I4=OFF) is activated during positioning, the axis will brake and positioning is aborted.

## CAPITOLO 5

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### **ASSISTANCE**

*Input and output troubleshooting*

*How to complete the technical assistance fax form*



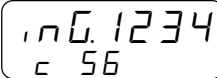

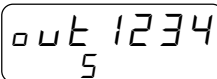


*Warranty*



### 5 - 1 INPUT AND OUTPUT TROUBLESHOOTING

The instrument provides diagnostics of the logic status of the digital input and outputs; according to the numbers displayed, it is possible to understand whether an input arrives at the instrument and if an output has been energised. The first display after access to the diagnostics function refers to the inputs status; if number 1 is displayed, input 1 has been activated; display of the number 2 means that input 2 has been activated and so on. Input Z (transducer zero impulse) is signalled with a C; if this is shown, there is no zero impulse; if not shown, the zero impulse is supplied to the instrument.

The successive display refers to the logic status of the digital outputs. The same correspondence (each number corresponds with its equal output); for example, the presence of the number 4 indicates that the instrument is energising output 4.

Description	Keyboard	Display
Access to diagnostics functions. The input status ( <i>inG</i> ) will be displayed.	 + 	
Press the <b>ENTER</b> key to pass to display of outputs status ( <i>out</i> ).		
To exit the program choice function, press key displayed.		

### 5 - 2 HOW TO COMPLETE THE TECHNICAL ASSISTANCE FAX FORM

***We need your help if we are to provide you with a quick, efficient and high-quality service. Whenever you need the assistance of QEM in dealing with any technical problems that may arise in your applications and, even though all the instructions in the "Installation, maintenance and servicing manual" have been followed, the problem persists, we invite you to complete all parts of the fax form enclosed with the installation, maintenance and servicing manual, and to send it to the QEM assistance office. In this way, our service engineers will have all the essential information for understanding your problem (avoiding long and costly telephone calls). Thanking you for your kind co-operation, QEM wishes you all the best in your work.***

**NOTE**

- If you have to send us an instrument for repair, please read carefully the following points.
- When possible, use the original packing; in any event, the packaging must protect the instrument from bumps during transport.
  - Be sure to enclose in the pack a detailed description of the problem you have encountered, together with the part of the wiring diagram that concerns the instrument. If the problem has been found in the data memory, please enclose also the instrument programming (set-up, work quotas, auxiliary parameters ...).
  - If necessary, ask us specifically for an estimate on the repairs. If no estimate is requested, the cost will be calculated on completion.
  - Our service engineers will give priority to instruments that are sent in accordance with the instructions given in these notes.

### 5 - 3 WARRANTY

The warranty conditions are as stated in the general conditions of sale.

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## NOTES

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