CSQ – Visual

User manual

Version 2 and subsequent versions

Issue 2 - February 8, 2017

1 General information

CSQ-Visual is a measuring instrument which, when connected to a press, guarantees the quality control of production processes.
Interfaced with a position transducer and a load cell, it continuously measures the position and instant force. The containment of the force-position curve inside a suitably positioned continuous band of tolerance has been ascertained. An additional check sensor known as a *extra control* can be connected to the *CSQ-Visual.*
It is possible to connect the *CSQ-Visual* to a computer to store all the curves measured and the settings. For this purpose, please refer to the specific WinScope software manual.

1.1 The check theory

When processing a sample piece, the data related to the position of the cylinder and the force exercised by it is recorded and the force-position graph characteristic to the process performed can be traced.
If several processes are performed on similar pieces, the respective force-position curves will also be similar. If, on the other hand, one of the pieces to be processed is different from the sample, the relative curve will also be different from the sample. The way in which the check of the curve can guarantee constant processing quality is intuitive.

1.2 Instrument capacity

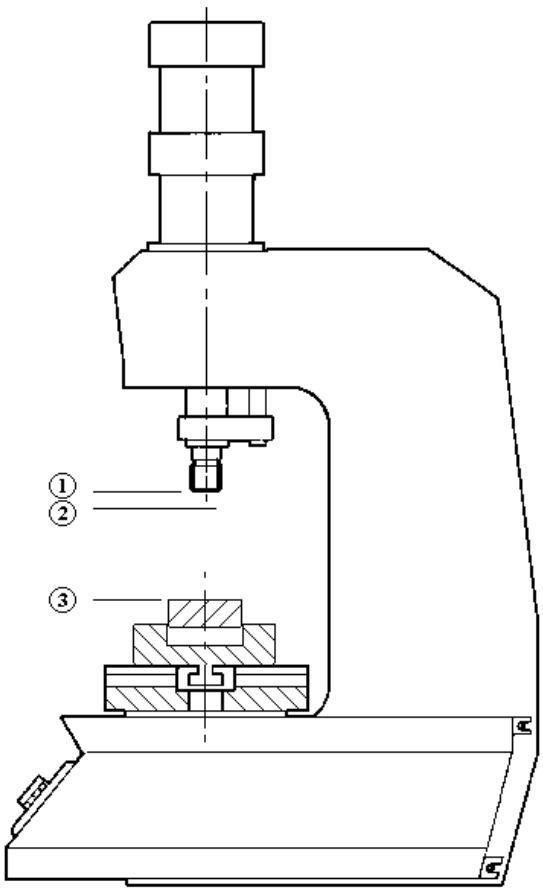
The *CSQ-Visual* works on a continuous tollerance band, controlling the whole force-position curve. It controls the position and force values attained. It controls the stoppage of the press upon reaching a position or force. It enables the management of several different phases for each type of process. All these setting are memorised on works.
The power for the valves, warning lights, tranducers and end limits is supplied by the instrument.
It is possible to connect the *CSQ-Visual* to the computer and, thanks to the *WinScope* program, save the curves, change the settings or print them.

1.3 Operating principles of the instrument

The position of the cylinder is usually detected by a position transducer fastened to the strut of the press.

1.3.1 Absolute and relative positions

The positions referred to the transducer zero are called absolute positions. The positions referred to the start of work are called relative positions. The *CSQ-Visual* can use both absolute and relative positions. To detect the *start position* of the work, use the load cell: when the force measured by the load cell exceeds a programmed value the zero of the relative positions is set. This force value is called the *start force*. The *start position* can be controlled with two limits, minimum and maximum (chapter 5.2).



① Upper dead point
② Absolute position zero
③ Relative position zero

Figure 1

The precision of the zero detected measuring the force cannot be high. It depends on the speed of the cylinder and, above all, on the type of piece to be processed. During the fitting operations, the two pieces have rounded corners, so the initial position varied with the variation in the rounding and the force used to position one piece inside the other.

1.3.2 Check of the force-movement values

The *CSQ-Visual* has different functions. The curve is controlled suing a tolerance band (chapter 6) and limits (chapter 5.2). The limits are: minimum and maximum force and minimum and maximum position; they can be set or disabled and check the maximum value reached during the test. If the maximum position reached does not exceed the minimum position and/or exceeds the maximum, the piece is rejected. In the same way, if the maximum position reached does not exceed the minimum force and/or exceeds the maximum, the piece is rejected. From the theoretic viewpoint there is an ideal curve which is obtained by machining perfect pieces (in practice there can be a sample curve obtained by machining carefully selected pieces). If there are any geometric tolerances or differences in material these will differ from the ideal curve. In practice there is a tolerance band around the sample curve which means, if the curve obtained by the current machining process does not pass through this band, the piece is rejected (due to the definitions and programming of the tolerance band). The piece is only good if the check of the minimum and maximum limits and the check using the tolerance band are successful. The *CSQ-Visual* also controls the return of the cylinder upon completion of the machining process. This return can take place if a certain force (*stop force*) or a determined position (*stop position*) is reached. It is possible to simultaneously set the two force and position values. In this case the first value to be reached will trigger the return of the cylinder. Changing the configuration value it is also possible to check the

return of the cylinder when the curve moves outside the tolerance band. It is always possible to trigger the return of the unit by pressing the 

button on the keyboard (stopping the operation).

2 Installing *CSQ-Visual*

Consult the installation manual.

3 How to start

This chapter teaches the user how to perform basic operations for programming and using the *CSQ-Visual*.
To better explain the operations, we recommend practical tests; to do this it is very useful to have an adequately supple elastic support to simulate repeated machining.

Figure 16

There is a button on the back to switch the instrument on. When it is pressed, the display lights up and, after few seconds, this graph appear:

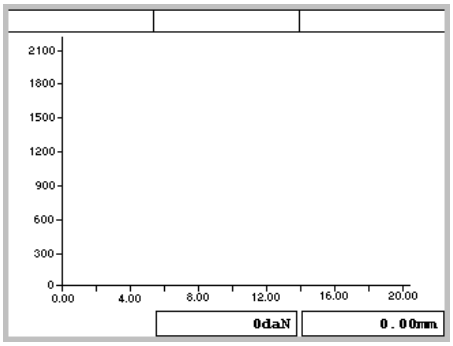


Figure 18

3.1 The *CSQ - Visual* keyboard

Press the MENU button at the bottom of the display to display a rectangle split into four, containing the items that make up the main menu; the title of the menu is printed above this rectangle. To select an item from the menus it is necessary to press the corresponding button below it .

The ESC button stops the press, cancels the operations and enables the return to the menu above; constant pressure for a few seconds enables the return to the initial display.

The button is used to confirm the values to be entered when requested. During the construction of the tolerance band it enables the entry of the position of the active point.

The C button enables the cancellation of any entry errors. If the menu is not displayed, this button enables the display of the cursor.

During the construction of the tolerance band, the  buttons enable the movement of the active point. When the cursor is visible it can be moved using the  buttons.

3.2 Setting up the display

The picture may be too light or too dark. To improve vision it is possible to increase or decrease the contrast of the display using the commands in the **TOOLS > DISPLAY MANAGEMENT** menu.
At the top of the display there are three fields which can display different types of information. To choose what to display in these fields, select the **TOOLS > DISPLAY MANAGEMENT** menu (paragraph 0).
The central part of the display is occupied by the force-position graph. It is possible to change the end scale values using the commands in the **CHANGE WORK > GRAPH SETUP** menu (paragraph 0).

3.3 First approach

After the *CSQ-Visual* has been switched on, it is necessary first of all to **create a new work:** press the 

button, press the  button under the **WORKS MANAGEMENT** item and press the  button under **CREATE NEW WORK**. Now enter, if required, the name of the wok and press the  button.
After creating the work, tell the instrument when to stop the press, entering a **stop value**: press the  button under **EDIT WORK**, press the  button under **CHANGE WORK**, press the  button under **PARAMETERS**, press the  button under **STOP VALUES**, press the  button under **STOP FORCE** (because force and not position is explained in the chapter 5), and enter a value lower than the maximum force which the press can exercise and press  . Lastly, return to the initial display pressing the 

button for a few seconds.
Giving the machine start command, the press will exercise a force which increases to the stop value inserted earlier.
If an excessively high stop force is entered, the press continues working and it is necessary to press the 

to make it return. In this case, the piece is rejected as the work has been interrupted and it is necessary to proceed as indicated in chapter 6.
If the settings of the graph allow, the curve will appear, otherwise the origin and the end scale must be changed as described in paragraph 0.
Chapter 4 presents a detailed explanation of how to create a useful work.

> Note: in the rest of this manual, where you are instructed, for example, to select the **WORK MANAGEMENT > CREATE NEW WORK** command, you must press the 
>
> button and then press the  button under **WORK MANAGEMENT** and, lastly, press the  button under **CREATE NEW WORK**.

3.4 Using the menus

Press the 

button at the bottom of the display to display a rectangle split into four, containing the items that make up the main menu; the title of the menu is printed above this rectangle. To select an item from the menus it is necessary to press the corresponding button below it .
The 

button enables the return to the menu above; constant pressure for a few seconds enables the return to the initial display.

When a menu is displayed or when entering a value, by keeping the MENU button pressed continuously, it is possible to momentarily see the graph and the curve.

When the MENU button is pressed to display the main menu, button 8 can be pressed to change language. Furthermore, if several load cells are connected to the instrument, it is possible, pressing buttons 1 to 6, to hide the curves for the single load cells which will remain active.
When a manual press is connected to the instrument, if the T.D.C. is freed, when the lever is activated the menu is automatically hidden.

3.5 The main menu

The main menu is the first to be displayed using the MENU button.

When the main menu is visible the buttons have special functions, as described in paragraph 0.

The first item on the menu is **WORKS MANAGEMENT**. This item enables the creation and choice of works. It also enables the alteration of work parameters, work options and the band. See chapter 4.

The second item on the main menu is **DISPLAY MEASURED VALUES**. When this command is selected, the window summarising the values measured in the last acquisition is shown. See chapter 8.

The third item is different depending on the configuration of the instrument.

CHANGE WORK
This is a shortcut which leads to the submenu for changing the current work.

PHASES MANAGEMENT
This is another shortcut which leads to the submenu for changing the phases of the current work.

PIECE CODE
This item enables the entry of the code of the piece we are about to machine.

ZERO PIECE COUNTER
By selecting this item and confirming it, the counters of the pieces of the work being used are zeroed.

The fourth item of the main menu is **TOOLS**. Using this menu it is possible to change the appearance of the display or change the configuration of the instrument. See chapter 9.

3.5.1 The special functions of the buttons in the main menu

If the menus are not displayed, press the MENU button to display the main menu together with the windows that show the special function of the buttons.

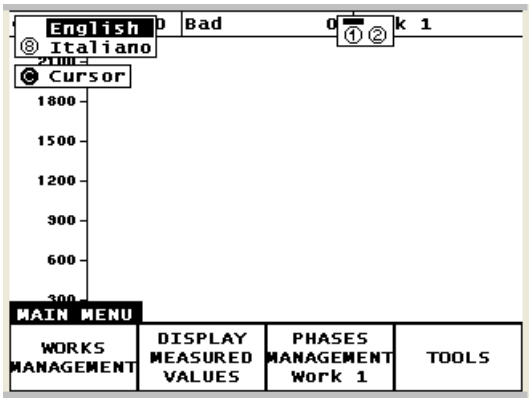


Figure 2

CURSOR

With the  button it is possible to display the cursor to measure the force in a determined point of the curve (chapter 0).

LANGUAGE

Button 8 allows you to change the language used by the instrument. Two languages are available and are loaded with the CSQ Visual Setup software.

CHANNELS

Buttons 1 to 6 allow the choie of whether to show or hide the curves of the single channels when there are moe than one (chapter **0**). The window in the top right-hand corner shows all the channels present and a black hyphen is drawn above each one to indicate that the channel is displayed. In it is possible to see the status of the two channels of a CSQ-Visual with the two force transducers connected: the curve of channel 1 is not visible, while the curve of channel 2 is visible. Even when the curve of a channel is not displayed, this will be controlled anyway.

4 Works

The *CSQ-Visual* memorises all the settings (parameters, band and counters) in a block of the internal memory. It can memorise several blocks which can be assigned different names. Every block can be used for a different work. Every block is called *Work*.
The main menu includes an item called **WORKS MANAGEMENT**. Using this submenu it is possible to create a new work, choose an existing work, changing the work being used or eliminate it.
If a work is present, the **WORKS MANAGEMENT** submenu will have four items (Figure 3
).

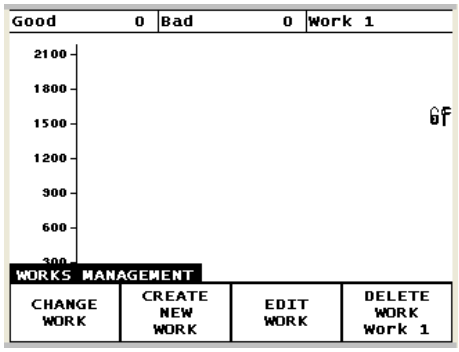


Figure 3

If the automatic work selection is active, to choose a work other than that selected automatically the unlock password in required.

4.1 Creating a new work

To create a new *work* (a block in the instrument's memory) use the **WORKS MANAGEMENT > CREATE NEW WORK** command and assign it a name; if the automatic work selection is active, see chapter 0. The name may be the drawing number, the customer's name or whatever you prefer to identify it easily. If a name is not entered, the work will be automatically named as follows: Work 1, Work 2, Work 3, etc.

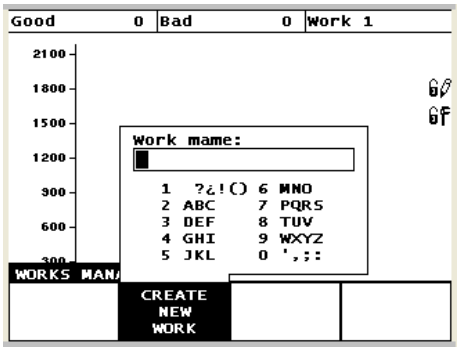


Figure 4

When a new work is created, the new name is requested and then, if a work was already being used, you will be asked if you wish to copy it. If you decide not to copy the work being used, the new one will be empty.

After creating the work, the parameters have to be set up, the options set up and the band built.

4.2 Selecting a work

The **WORKS MANAGEMENT** menu contains the command **CHANGE WORK**. When this command is selected, the list of works present is displayed (Figure 5

). If the clock is present, the date and time of the last work change are shown alongside the name. It is possible to choose a work using the buttons and pressing .

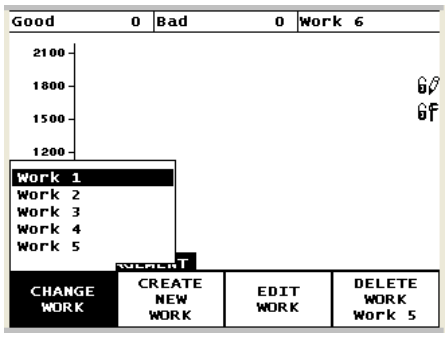


Figure 5

If the list is very long, it is possible to press the numeric buttons to jump from one point to another in the list.

4.3 Changing the work name

To change the name of a work it is necessary first of all to select it as indicated in paragraph 0. After selecting the work with the name to be changed, you have to redisplay the list of works present, using the **WORKS MANAGEMENT > CHANGE WORK** command and, with the black selection line in the work chosen, press the button. The name input window will appear.

4.4 Copying a work

To copy a work it is necessary first of all to select the work to be copied as indicated in paragraph 0. After selecting the work to be copied, it is necessary to create the new work using the **WORKS MANAGEMENT > CREATE NEW WORK** command and, when asked whether you wish to copy the work, answer YES with the button below.

4.5 Eliminating a work

The **WORKS MANAGEMENT** menu contains the command **DELETE WORK**. This command enables the permanent elimination of the work being used. When you wish to eliminate a work, confirmation is required.

4.6 Changing a work

The **EDIT WORK** menu enables the alteration of all the work parameters.
To change the name of a work, see paragraph 0.
In the works **the parameters set to zero will be ignored by the instrument.**
These are the items of the **EDIT WORK** menu:

CHANGE WORK
This menu contains the items used to change the parameters, options and band of the work; this item is also usually present in the main menu. To set the work parameters see chapter 4. If the work comprises several phases, this item is replaced by **PHASE MANAGEMENT**.

PHASE MANAGEMENT
This menu enables the choice of the phase to be changed before accessing the change of the parameters. Furthermore, if the instrument is configured in this sense, it is possible to select whether to exclude a phase and if so which one (paragraph 0).

PIECE COUNTER

In this menu it is possible to zero the piece counter and choose a maximum number of rejected pieces after which to block the instrument. To unlock the instrument the unlock password is required.

AUTO-CHECK

This menu enables the management of the Auto-Check function.

4.7 Management of automatic work selection

When the automatic work selection is active, the CSQ-Visual holds all the selectable works in the memory. These works are initially empty. To make an empty work suitable for use, it is necessary to enter the **WORKS MANAGEMENT > CHANGE WORK** menu and press enter on the work required, then it will be possible to choose the name of the work and, if a work is in use, it will be possible to copy it.

It is possible to create additional works using the unlock password.

It is possible to select a different work from that selected automatically using the unlock password.

4.8 The graph

The **CHANGE WORK** menu contains the **GRAPH SETUP** item which enables changes to the axes of the graph. It is not possible to change these values and make the band completely or partially invisible.

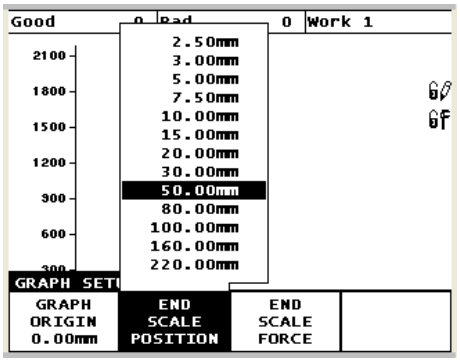


Figure 6

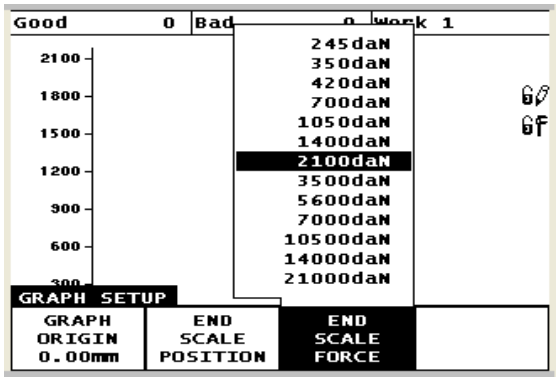


Figure 7

As shown in the two figures above, it is possible to choose the following values:

GRAPH ORIGIN

This is the original value of the horizontal axis of the positions. This parameter makes it possible to hide the whole stroke which is of no interest, such as the approach stroke. If the relative positions are used, the origin is usually set to zero.

END SCALE POSITION

The end scale of the positions indicates the stroke shown in the graph. The end scale can be selected from a list.

If, for instance, an end scale of 20 mm is chosen and the origin is set at 33 mm, the graph will show the whole stroke from 33 mm to 53 mm.

END SCALE FORCE

The end scale of the forces indicates the maximum force shown in the graph. The end scale can be selected from a list.

4.8.1 How to set up the graph

After machining a piece it is possible to display the values measured (chapter 8). These can be used to obtain the axes of the graph.

As graph origin, enter a value slightly lower than the start position measured. As end scale of the positions, enter the value which, added to the position origin entered, is higher than the position reached measured.

As force end scale, choose the value higher than the force reached measured.

4.9 Work options

In the work, besides the general options, there are options for the management of rejects and options for supplementary check. The options can be accessed from the **CHANGE WORK > OPTIONS AND OTHER CHECKS** menu, which contains the following items:

REJECT MANAGEMENT
Enables the definition of the behaviour and class for every type of reject.

OPTIONS
The general work options can be set here

CHANNEL EXCLUSION
This item enables the exclusion of one or more channels (load cells) when present.

SUPPLEMENTARY CHECK MANAGEMENT
This command enables access to the supplementary check management menu, if present.

The general work options are listed below:

USE RELATIVE POSITIONS
By activating this option, relative positions are used in place of absolute positions..

4.10 Phase management

The *CSQ-Visual* can be configured for the management of several phases in the same work.
The phase to be performed is chosen either in sequence or by an external controller (PLC). In the first case it is possible to decide whether or not to perform each single phase.

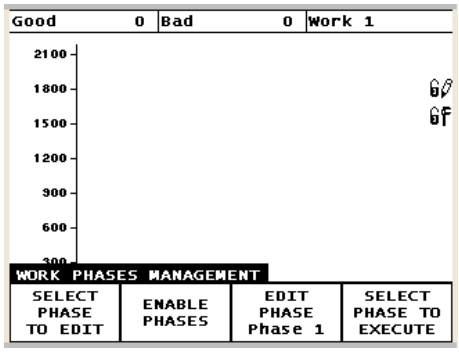


Figure 8

The phase management menu (**Figure 8**
) contains the following items:

SELECT PHASE TO EDIT
This enables the choice of the phase to be changed or displayed; the phase performed will be that envisaged. It is possible to change the phase to be changed or displayed using the buttons when the menus are not visible.

ENABLE PHASES
This command enables the choice of the phases to be carried out.

EDIT PHASE
This is used to change the current phase.

SELECT PHASE TO EXECUTE
This command is used to carry out a phase out of sequence. To carry out a phase out of sequence it is necessary to know the unlock password.

4.10.1 Confirm reject

It is possible to configure the instrument so that when a phase gives a reject result, confirmation is requested (Figure 9

). In this case, if the operator confirms the result, the piece is counted as a reject and the instrument prepares for the first phase of a new piece; if the result is not conformed, the phase can be repeated.

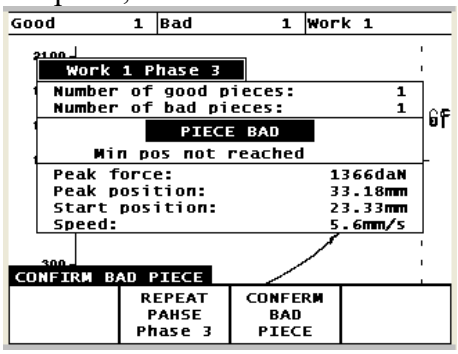


Figure 9

To activate the reject confirmation request function it is necessary to change the **Automatic code selection** as indicated in paragraph 0.

4.11 Channel management

It is possible to connect up to six force transducers to the *CSQ-Visual* to check the same number of force-movement curves. While every force transducer measures the force of a channel, there is only one position transducer for all the channels. It is possible to exclude one or more channels from the check thanks to the `CHANGE WORK > OPTIONS AND OTHER CHECKS > CHANNEL EXCLUSION` menu. The force of one channel at a time is shown under the graph, using the numeric buttons from 1 to 6, when the menus are not displayed, it is possible to display the current force of every single channel.

To display the curve of certain channels it is necessary to press the MENU button to display the main menu. In this way the status of the channels displayed is shown in a rectangle in the top right-hand corner, followed by a numeric button from 1 to 6.

4.12 Auto-Check

The Auto-Check function is managed by the *CSQ-Visual* as follows: Every time the instrument is switched on, or every *N1* pieces machines, *N2* sample pieces must be machined.

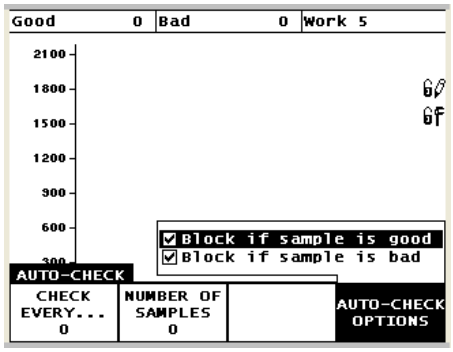


Figure 10

It is possible to decide how many pieces to machine between each Auto-Check. If zero is entered, the Auto-Check function is excluded.
It is possible to decide how many sample to machine.
It is possible to decide whether to block the instrument if a good sample gives a reject result or vice versa.

4.13 Supplementary check management

The *CSQ-Visual* can perform an additional check, in addition to the force and position check, to establish whether the piece is good or a reject.

In the **EDIT WORK > CHANGE WORK > OPTIONS AND OTHER CHECKS > SUPPLEMENTARY CHECK MANAGEMENT** menu, it is possible to establish when and how to perform the supplementary check. The items of this menu are described below:

MEASUREMENT POSITION
This is used to change the position used for the supplementary check. See the options in the next paragraph.

CHECK
This command enables the activation of the actuator linked to the supplementary check, where present. In this way it is possible to check the operation and make any necessary adjustments.

OPTIONS
The options determine when to carry out the supplementary check as described in the next paragraph.

4.13.1 Supplementary check options

The supplementary check options are:

DO NOT CARRY OUT THE SUPPLEMENTARY MEASUREMENT
The supplementary measurement is not carried out.

MEASURE AT START
The supplementary check is carried out when the instrument receives the **START** command.

MEASURE AT STOP
The supplementary check is carried out when the instrument wishes to give the stop command and the piece is good.

MEASURE AT END
The supplementary check is carried out when the press is withdrawn.

MEASURE AT A POSITION
The supplementary check is carried out at a position established with the **MEASUREMENT POSITION** of the **SUPPLEMENTARY CHECK MANAGEMENT.**

MEASURE STARTING FROM A POSITION
The supplementary check is carried out starting at a position established with the **MEASUREMENT POSITION** parameter of the **SUPPLEMENTARY CHECK MANAGEMENT** until the work is completed.

MEASURE UP TO A POSITION
The supplementary check is carried out from when the instrument receives the **START** command up to a position established with the **MEASUREMENT POSITION** parameter of the **SUPPLEMENTARY CHECK MANAGEMENT**.

MEASURE DURING
The supplementary check is carried out during the whole work process.

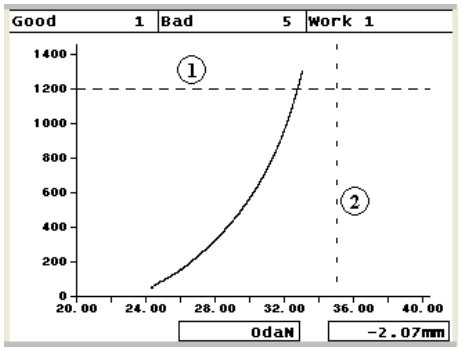
5 Parameters

In the works **the parameters set to zero will be ignored by the instrument.**

5.1 Stop values

After creating a new work, the first thing to do is tell the instrument when to stop the press. To set the stop values, use the **EDIT WORK > CHANGE WORK > PARAMETERS > STOP VALUES** command.

The *CSQ-Visual* can stop the press when the force reaches a determined value (*stop force*) or when the press reaches a determined position (*Stop position*).



① Stop Force
② Stop Position

Figure 11

The press is also stopped when the maximum acquisition time is up. It is possible to increase the maximum acquisition time using the *CSQ-Visual Setup* software.

5.1.1 Notes on stop values

A stop value set to zero is not used.
When both the stop force and stop position are set, the stop will be commanded if either is exceeded.

If the stop values are not indicated (or are not reached by the curve) it is necessary to press ESC to bring the unit back.
It is normal to observe values reached higher than the stop values; this is due to the delayed intervention of the electromechanical parts.
It is possible to keep the press working upon reaching the stop values for a preset time. To set the press stop delay time, use the **EDIT WORK > CHANGE WORK > PARAMETERS > STOP VALUES > STOP DELAY** command.

5.1.2 How to choose the stop values

The stop must be set up differently depending on the type of work. There are three different types of work:

1) Complete fitting, caulking or work up to a mechanical contact.

2) Work up to a position (without mechanical contacts).

3) Flexion and breakage text.

5.1.2.1 Stop with mechanical contact.

In most cases the press is used to perform a stroke up to a mechanical contact. In this case the curve will be similar to that in Figure 12

i.e.: the force will be zero for the whole approach stroke then, when it reaches the piece (at the *start position*) the force will begin to increase until the mechanical contact is reached, where it will increase up to the maximum force of the press (vertical part of the curve).

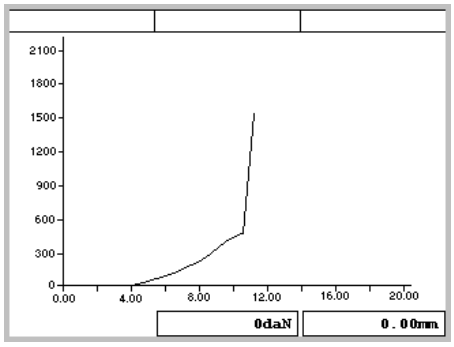


Figure 12

In this case the stop force must be used, inasmuch as the force will always reach the maximum that can be exercised by the press. If we were to use the stop position, this might not be reached if the piece were to be slightly higher than expected or could be reached before completion of the work if the piece were to be too low.
The stop force must be chosen to guarantee the completion of the work.
The stop force must be less than the breakage force of the piece or, even worse, of the instrument.
The stop force must be less than the maximum force that the press can exercise.

5.1.2.2 Stop without mechanical contact.

It is possible to stop the descent of the press stalk in a set position by establishing the stop position. In this case the instrument will switch the valve which controls the descent of the press as soon as the stop position is reached. This valve will take some time to switch and more time will be required before it starts to evacuate the pressurised air in the cylinder: for these reasons the real stop of the press will be in a higher position than the stop position set. The higher the descent the greater the error and the greater the difference between the force needed to do the job and the force of the cylinder.

5.1.2.3 Stop during a flexion and breakage test

The force the piece under examination must withstand must be used as the stop force. In the case of breakage, the stop force will not be reached, so it is also necessary to set the stop position at a value which cannot be reached without the breakage of the piece.

If the piece resists the stop force (Figure 13

), after the test, the maximum position measured by the *CSQ-Visual* will be equivalent to the flexion to which the piece has been subject.

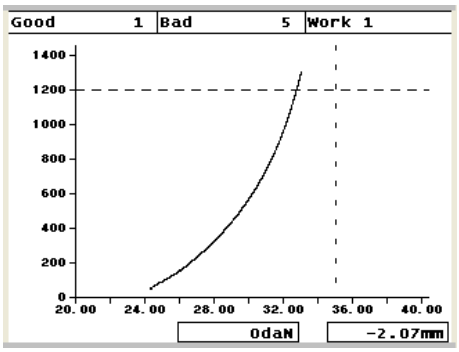


Figure 13

If the piece breaks before the stop force is reached (Figure 14

), at the end of the test, the maximum force measured by the *CSQ-Visual* will be equal to the breakage force of the piece. In this case too the force limits (paragraph 0) can be used to check whether the breakage force is that envisaged.

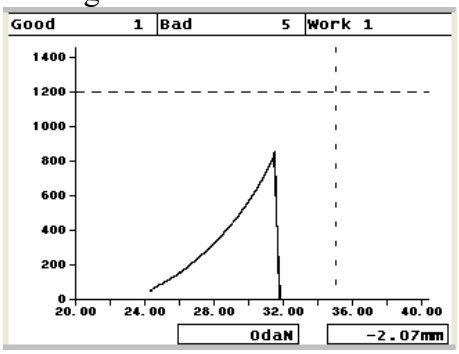


Figure 14

5.2 Limits and thresholds

The limits, together with the band, determine the result of the work.
It is possible to set the maximum force limits, the maximum position limits, the initial position limits and the speed limits.

FORCE LIMITS
These control the force reached during the work process. For a piece to be classed as good, the maximum force reached must be higher than the minimum force limit and lower than the maximum force limit. To set the force limits, use the **EDIT WORK > CHANGE WORK > PARAMETERS > FORCE LIMITS** command.

START FORCE
The start force is the force threshold used to measure the start position. The start position is described in chapter 0. To set the start force, use the **EDIT WORK > CHANGE WORK > PARAMETERS > FORCE LIMITS** command.

POSITION LIMITS
These control the maximum position reached during the work process. For a piece to be classed as good, the maximum position reached must be higher than the minimum position limit and lower than the maximum position limit. If the minimum position limit is not present and the band is not reached by the curve, the reject is indicated due to the minimum position. To set the position limits, use the **EDIT WORK > CHANGE WORK > PARAMETERS > POSITION LIMITS** command.

START POSITION LIMITS
These control the work start position. For a piece to be classed as good, the start position must be higher than the minimum position limit and lower than the maximum position limit. To set the start position limits, use the **EDIT WORK > CHANGE WORK > PARAMETERS > POSITION LIMITS** command. The start position is described in chapter 0.

SPEED LIMITS
These control the average stroke speed. For a piece to be classed as good, the speed must be higher than the minimum speed limit and lower than the maximum speed limit. To set the speed limits, use the **EDIT WORK > CHANGE WORK > PARAMETERS > OTHER LIMITS** command. The speed is described in chapter 0.

FORCE OR POSITION SETPOINT
The *CSQ-Visual* has an auxiliary output which can be activated at a determined absolute position or a determined force have been reached (chapter **Errore. L'origine riferimento non è stata trovata.**). To set the absolute position or force value, use the **EDIT WORK > CHANGE WORK > PARAMETERS > OTHER LIMITS** command. Unlike the limits, this value, even when set to zero, is not excluded.

Limits and thresholds set to zero are not used.

5.2.1 How to choose the limits

The start position limits are used to check the dimensions of the components even before work begins. They can be used to check the dimensions of the pieces to be assembled or to check that al the parts needed for the work process are present.
The method used to choose the limits that check the force and maximum position reached depend of the type of work.

5.2.1.1 Limits when working with a mechanical contact

When there is a mechanical contact, the press will always reach, either the stop force or the maximum force that can be exercised. For this reason, the force limits are used simply to check that the stop force (minimum force limit) is reached and to check that the maximum force that can be supported by the piece being machined (maximum force limit) is not exceeded.
To check the effective force required for the work, the band must be used.
The position limits are used to check that the dimensions of the unit, upon completion of work, are inside the tolerance band.

5.2.1.2 Limits when working without a mechanical contact

In this case, the force limits are not very useful other than to check that the force does not exceed the maximum force supported by the piece being machined. On the contrary, the position limits are vital to check that the position reached is that effectively required. A lower stop position than the minimum required is often set and, thanks to the limits, the real position reached is checked.

5.2.1.3 Flexion and breakage test limits

During the flexion tests the force limits are used simply to check the force that is being applied, while the position limits are used to check the flexion.
During the breakage tests only the force limits are used to check the force that was necessary to break the piece.

5.3 Work options

The following work options can be changed with the **EDIT WORK > CHANGE WORK > OPTION AND OTHER CHECKS > OPTIONS** command.

USE RELATIVE POSITIONS
By activating this option, relative positions are used in place of absolute positions.

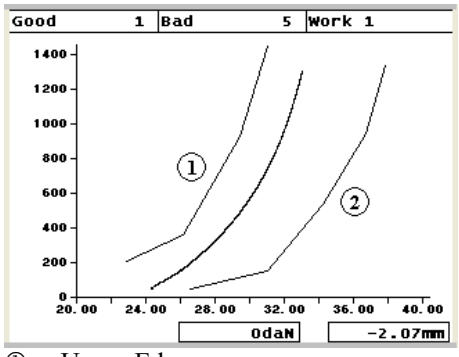
REQUEST PIECE CODE
By activating this option, before each piece is machined its code must be entered. This code is used by the *WinScope* program to memorise the curve and the values measured. The piece code can also be attributed by serial communication or barcode reader. In this case it is not necessary to activate this option.

6 The tolerance band

The band is used to check the curve and consequently for the quality control of the piece.
The band is made up of two lines called the upper edge and lower edge.
For the piece to be classed as good, the force-movement points which represent the curve cannot be above the upper edge and cannot be below the lower edge.

② Lower Edge

shows a curve for a good piece, lying between the two edges of the band.



① Upper Edge
② Lower Edge

Figure 15

Each edge is made up of a sequence of points joined by segments.

6.1 Creating the band

To create a new band, use the **CHANGE WORK > BAND MANAGEMENT > CHANGE BAND** command. If the band does not exist, confirmation is requested for the creation of a new one e la fascia non (**Figure 16**
). If you choose YES a simple band appears on the graph (**Figure 17**
) with two points on every edge. At this point it is possible to change the band (chapter 6.2).

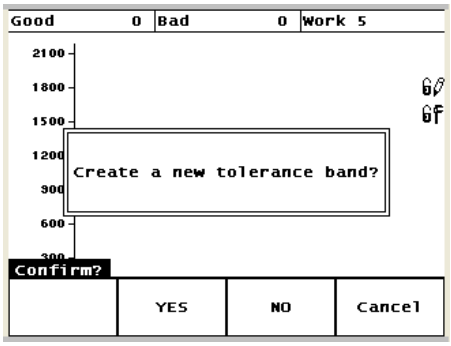


Figure 16

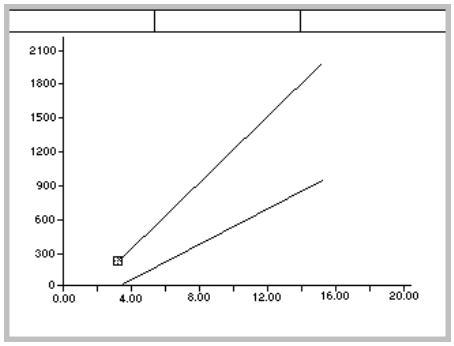


Figure 17

6.2 Changing the band

To change the band, use the **CHANGE WORK > BAND MANAGEMENT > CHANGE BAND** command. When moving the points, take care not to invert the upper edge with the lower edge.

When changing the band, if the MENU button is pressed, the *change band menu* appears, containing the following items:

HELP
This displays the functions of the buttons while changing the band (Figure 19
).

GRAPH SETUP

This is used to change the axes of the graph.

EXIT

This ends the change to the band.

To end the change of the band the ESC button can also be used.

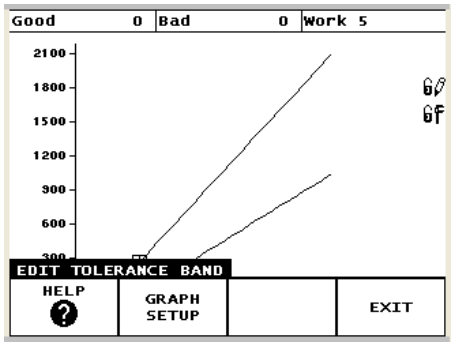


Figure 18

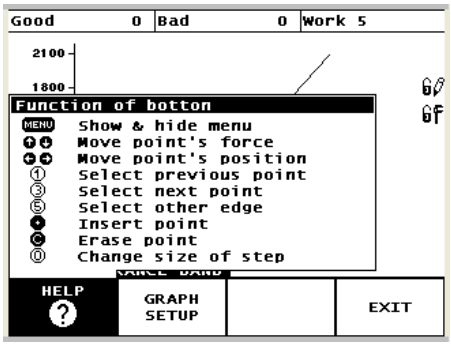


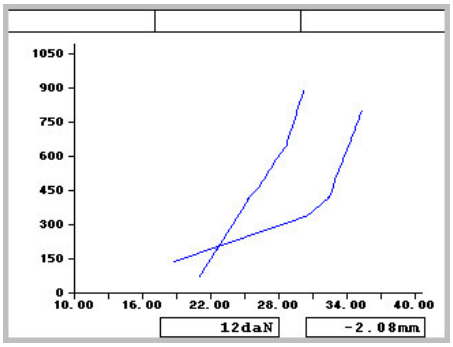
Figure 19

The band is changed by moving the points that determine the two edges. When changing the band, just one of the points of the two edges is highlighted, this point is the active point, i.e.: the one that can be moved. It is possible to change the active point: button **1** activates the point before the current one, on the same edge; button **3** activates the point after the current point, on the same edge once again. To activate the points on the other edge, press button **5**. The force and position of the active point are shown under the graph.

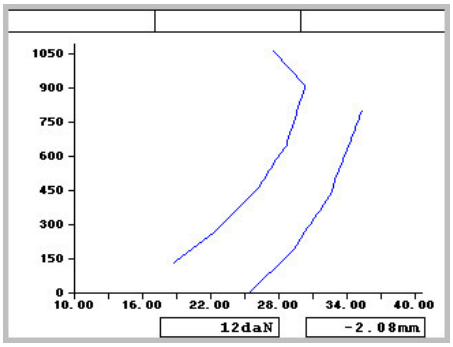
The active point can be moved using the arrow buttons, or by pressing the button and entering the force and position values required. When using the arrow buttons it is possible to change speed by pressing the zero button several times. The speed is the point movement speed.
It is possible to add a point, dividing the segment that follows the active point in two. To do this, press the button with the dot.

It is possible to eliminate a point by activating it and then pressing the C button.

To construct the band, it is necessary to follow certain rules; some examples of incorrect bands are printed below:



Incorrect band because the two edges intersect.



Incorrect band because it has a point to the left of the previous one.

6.3 Eliminating the band

To eliminate the band, use the **CHANGE WORK > BAND MANAGEMENT > DELETE BAND** command.

7 Reject piece

When a reject piece is detected, the instrument locks, preventing the machining of new pieces. In the standard configuration, to re-enable the instrument it is necessary to press the 

button.

Moreover, if the reject basket is present, the piece has to pass across the sensor; the 

button is used to open the protection where present.
If the work comprises several phases, the *CSQ-Visual* can request confirmation of the reject.
If the band is not reached by the curve and the minimum position limit is not present, the reject is indicated due to the minimum position.

7.1 Reject causes

All the possible reject causes are listed below.

MAXIMUM FORCE EXCEEDED
The maximum force reached has exceeded the maximum force limit. The maximum force reached might not coincide with the force of the last point of the curve.

MINIMUM FORCE REACHED
The maximum force reached has exceeded the maximum force limit. The maximum force reached might not coincide with the force of the last point of the curve.

MAXIMUM POSITION EXCEEDED
The maximum force reached has exceeded the maximum position limit. The maximum position reached might not coincide with the position of the last point of the curve.

MINIMUM POSITION REACHED
The maximum position reached has not reached the minimum position or has not reached the band. The maximum position reached might not coincide with the position of the last point of the curve.

HIGH START POSITION
The value of the start position is higher than the start position maximum limit.

LOW START POSITION
The value of the start position is lower than the start position minimum limit.

UNDER THE LOWER EDGE
The curve has passed under the lower edge of the band.

ABOVE THE UPPER EDGE
The curve has passed above the upper edge of the band.

CANCELLED FROM KEYBOARD
The execution of the work has been interrupted by the operator who has pressed the 

button.

EXECUTION INTERRUPTED
The START input has been removed during the execution of the work. This is usually caused by intervention of the emergency devices.

TIME UP
The execution of the work has taken too long. It is possible to increase the maximum time by reducing the frequency of acquisition through the *CSQ Visual Setup* program.

SUPPLEMENTARY BEYOND THE MAXIMUM
The value of the supplementary transducer is above the supplementary maximum limit.

SUPPLEMENTARY BEYOND THE MINIMUM
The value of the supplementary transducer is above the supplementary minimum limit.

SUPPLEMENTARY CONTROL
The supplementary check has caused the rejects.

EXCESSIVELY HIGH SPEED
The average stroke speed is higher than the maximum speed limit.

EXCESSIVELY LOW SPEED
The average stroke speed is lower than the minimum speed limit.

7.2 Reject management

A piece can be good or a reject. The reject can be caused by one or more different causes. These are the *reject causes* and for each one it is possible to indicate the class and behaviour.

CLASS
Every reject cause can be classified as normal or special. This enables the classification of the rejects to separate them. For example, it is possible to separate recoverable rejects from those which cannot be recovered. When there are special rejects, the *CSQ-Visual* activates a separate piece counter. In this way it is possible to know, for instance, how many pieces are rejects as a result of operator error.

BEHAVIOUR
For every reject cause it is possible to immediately stop the press as soon as the reject cause is identified, block the working press and/or request the entry of the unlock password.

To configure the reject causes it is necessary to choose the cause required from the list that appears with the **CHANGE WORK > OPTIONS AND OTHER CHECKS > REJECT MANAGEMENT** command and configure it as required. The first code of the list of causes is **ALL**. By selecting this cause, the choices to be made will be applied to all the causes of the list.

8 Values measured

The CSQ-Visual memorises the force-movement curve and measures certain sizes which can be checked thanks to the limits. The curve memorised can be analysed with the analysis cursor. The sizes measured can be displayed at the end of every work process and can be read by an external controller through a serial connection.

8.1 The window of the values measured

The main menu contains the **DISPLAY VALUES MEASURED** command. This command displays the window of the values measured with the piece counters, with the result and the measured values of the last piece machined This window can be displayed at the end of every work process, changing the option in the **TOOLS > DISPLAY MANAGEMENT > DISPLAY OPTIONS** menu.
When the piece is a reject, the list of the reject causes is displayed.

If there are several reject causes, it is possible to scroll the list using the and buttons.
If the work comprises several phases, the values measured refer to the last phase. To display the values of the other phases it is possible to use the and buttons.

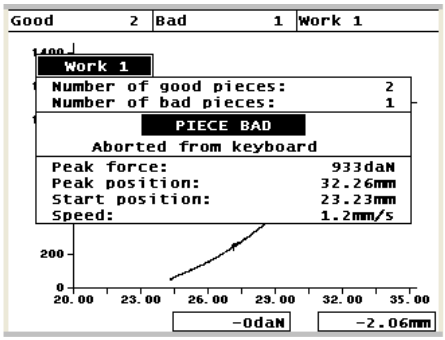


Figure 20

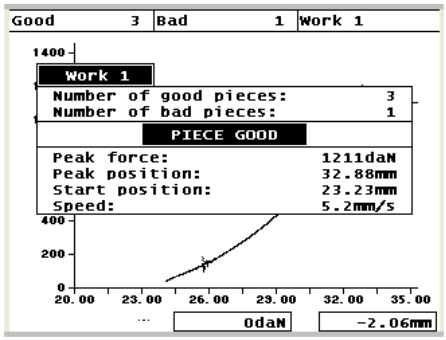


Figure 21

NUMBER OF GOOD PIECES

This is the number of good pieces produced. Every work has its own counter. To zero the good piece counter.

NUMBER OF BAD PIECES

This is the number of reject pieces produced. Every work has its own counter. It is possible to block the press if this counter reaches a maximum preset number. To zero the bad piece counter and set a maximum number.

SPECIAL REJECTS

This is the number of bad pieces caused by causes classified as special. Every work has its own counter. To zero the bad piece counter, see chapter 0. To set the classes of the reject causes.

PEAK FORCE

This indicates the maximum force reached during the last acquisition. It can be checked with the force limits.

PEAK POSITION

This indicates the maximum position reached during the last acquisition. It can be checked with the position limits.

START POSITION

This is the absolute work start position. It can be checked with the start position limits.

SPEED

The speed measured in the average work speed. The speed is calculated by dividing the stroke between the start position and the maximum position reached by the time taken to travel this stretch. It is possible to check the speed between two limits, minimum and maximum.

MINIMUM FORCE CP2-CP3

This is the minimum force measured between checkpoints 2 and 3. The position of checkpoint 2 coincides with the penultimate point of the upper edge of the band. The position of checkpoint 3 coincides with the last point of the upper edge of the band.

MAXIMUM FORCE CP2-CP3

This is the maximum force measured between checkpoints 2 and 3. The position of checkpoint 2 coincides with the penultimate point of the upper edge of the band. The position of checkpoint 3 coincides with the last point of the upper edge of the band.

8.2 Analysis cursor

It is possible to know the force in a determined position using the cursor. The cursor is shown on the graph as a vertical line. When the cursor is displayed, the force of the curve in the position indicated by the cursor and its current position are shown under the graph.

To display the cursor press the  button when the menus are not displayed.

The cursor can be moved to the left or right using the  buttons.

If you wish to move the cursor to a determined position, press the  button and entire the required position value.

9 Configuration of the instrument “The tools menu”

The configuration of the *CSQ-Visual* and the functions which are not linked to the single works are accessible from the **TOOLS** menu. When the *CSQ-Visual* is supplied already connected to the machine, it is not necessary to execute the configuration.

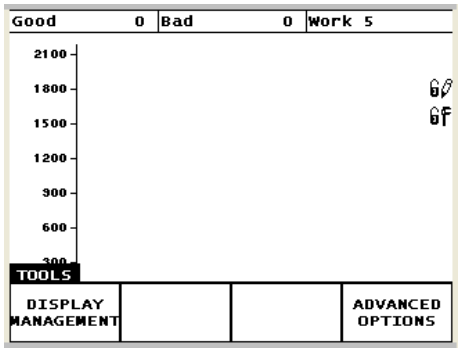


Figure 22

This menu contains the following submenus:

DISPLAY MANAGEMENT
This is used to change the display.

PRESET POSITION
This item, when the machine type option is active, is used to force the current position to a preset position as described in chapter 9.2.

ADVANCED OPTIONS
This enables the configuration of the instrument and the calibration of the transducers (chapter 11).

9.1 Display management

In the **DISPLAY MANAGEMENT** menu it is possible to regulate the contrast and change the display.
The display can appear too light or too dark. This is why it is possible to reduce or increase the contrast of the display using the **REDUCE** and **INCREASE** commands.

9.1.1 Top values line

There are three fields at the top of the display which can contain the values preferred.
This menu enables the choice of what to display in each of the three fields.

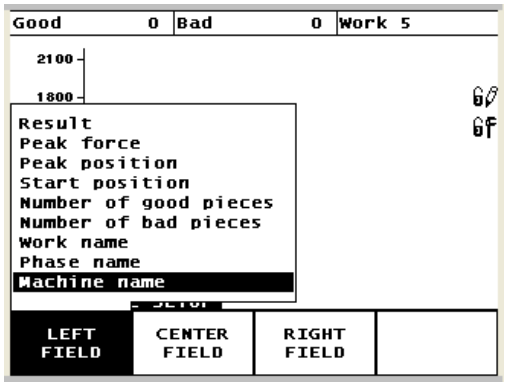


Figure 23

9.1.2 Display options

The display options change the display.

DO NOT DISPLAY THE VALUES MEASURED

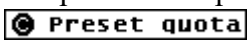
At the end of acquisition, a window usually appears, containing the values measured and the result of the work. By activating this option, the window will not appear automatically but the **DISPLAY MALES MEASURED** command in the main menu must be chosen.

OVERLAP CURVES

By activating this option, all the curves will be overlapped with each other, creating a strip which represents the dispersion of the forces.

9.2 Preset position

The present position function is useful when it is necessary to change the tool with one of a different length: it is possible to rest on a rigid reference piece with the new tool and force the position value to a preset value.

To preset the position, enter the present value and select the preset option (the message 

will appear on the display), start the press on the reference piece and press the 

button.

9.3 Instrument configuration

After installation, it is necessary to configure the *CSQ-Visual*.

Thanks to the many configuration options, the *CSQ-Visual* can adapt to suit your needs.

The configuration can be changed only using the hardware password.

To configure the *CSQ-Visual*, access the **TOOLS > ADVANCED OPTIONS** menu.

The **ADVANCED OPTIONS** menu contains the following submenus:

ACCESSORIES AND ID

In this submenu it is possible to set the time, if the clock is present, and assign a name and address to identify the instrument.

The assignment of a name to the instrument enables the *WinScope* software to recognise the instrument and use the relative settings, as well as facilitating identification if it is included in a network. The address is useful when using slow serial communication: the CSQ-Visual can be equipped with an RS485 serial port which enables the parallel connection of several instruments to a single master. In this case, every instrument must have a univocal address (number from 1 to 100) to distinguish it.

DIAGNOSIS

In this submenu it is possible to check the operation of the inputs and outputs. It is also possible to calibrate the transducers and choose the unit of measure to use. For calibration see chapter 11.

PASSWORD

In this submenu it is possible to change the passwords, eliminate them and manage the list of users if the instrument is configured in this way. The operation is described in chapter 10.

MACHINE TYPE

In this submenu it is possible to activate and choose all the operation options.

9.4 The *Machine type* menu

The **MACHINE TYPE** menu enables access to the main configuration of the instrument. This menu is accessed using the **TOOLS > ADVANCED OPTIONS > MACHINE TYPE** command.

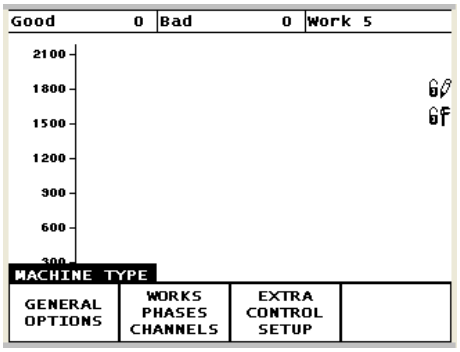


Figure 24

The **MACHINE TYPE** menu contains the following items, which will be described in the subsequent paragraphs:

GENERAL OPTIONS

This enables the configuration of the *CSQ-Visual* according to the type of press connected and the activation of certain functions.

CHANNELS PHASES WORKS

This enables the set-up of the selection mode for works, operation in several phases and operation with several load cells.

SUPPLEMENTARY INPUT OPTIONS

The *CSQ-Visual* can run a supplementary check on the piece. This menu enables the configuration of the supplementary check.

9.4.1 General options

Certain general options depend on the type of press connected, other activate special functions. The general options are accessible from the **TOOLS > ADVANCED OPTIONS > MACHINE TYPE** menu.

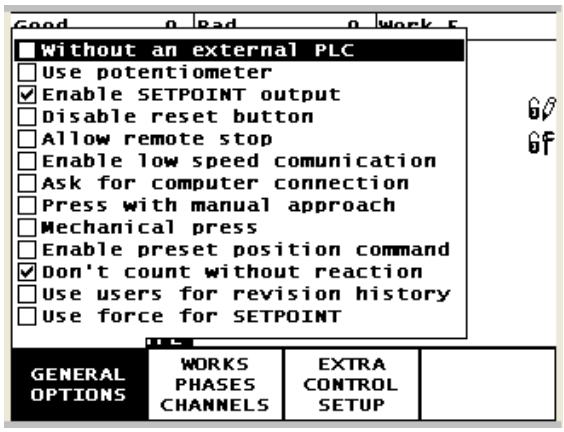


Figure 25

SELF-SUFFICIENT INSTRUMENT

Activate this option if the *CSQ-Visual* is not managed by an external controller (PLC). When this option is activated, the **SPECIAL OPTIONS** menu appears, enabling the choice of the input and output functions.

USE POTENTIOMETER

This option must be activated if an analogue transducer is used instead of the incremental encoder as the position transducer.

ENABLE SETPOINT OUTPUT

By activating this option, the instrument SETPOINT output is enabled. This output can be used for various functions. See the specific manual of the machine. For the connection of the SETPOINT output see chapter **Errore. L'origine riferimento non è stata trovata.**.

DISABLE RESET FROM KEYBOARD

Usually, when a piece is a reject, the *CSQ-Visual* does not allow the machining of a new piece without resetting first.

It is possible to reset the instrument using the 

button or activating the appropriate input. This option prevents resetting using the button.

ACCEPT STOP FROM EXTERNAL SIGNAL

The *CSQ-Visual* usually terminates the acquisition and stops the press. If the **START** signal is eliminated during acquisition, the *CSQ-Visual* stops the press and indicates a reject due to unexpected interruption. By activating this option, when the **START** input is deactivated, the *CSQ-Visual* terminates acquisition and checks the curve, signalling the piece as a reject.

SLOW SERIAL COMMUNICATION

The serial port of the *CSQ-Visual* is used for communication with the *WinScope*. Management program. By activating this option it is possible to use the serial to manage the instrument. For the use of serial communication, see the relative manual.

CONNECTION TO THE COMPUTER COMPULSORY

By activating this option the *CSQ-Visual* prevents the machining of pieces if it is not communicating with the *WinScope* program. This option is useful for storing all works in the computer memory.

PRESS WITH MANUAL APPROACH

This option must be activated if the press controlled by the *CSQ-Visual* has the piece approach lever and automatic work stroke, such as the presses of the *tromboline*.

KNEE OR RACK PRESS

This option must be activated if the press controlled by the *CSQ-Visual* is completely mechanical.

ALLOW TOOL LENGTH PRESET

By activating this option it is possible to force the value of the position transducer to a preset value by pressing a button. This function is described in chapter 9.2.

COUNT ONLY IF PIECE IS TOUCHED

By activating this option, the *CSQ-Visual* will not increase the piece counter if it has not measured a start position and has not met the piece.

USER ID MANAGEMENT FOR CHANGES

With this option it is necessary to create a list of users with relative identification codes. In this way the *CSQ-Visual* will memorise the identity of the person who has changed the parameters of the instrument.

USE FORCE FOR THE SETPOINT

By activating this option, the set point output is activated at a force value instead of an absolute position value. For the connection of the SETPOINT output see installatin manual.

9.4.2 Configuration of works, phases and channels

The menu which enables the configuration of the way of managing works, the number of phases and the number of channels is accessible from the **TOOLS > ADVANCED OPTIONS > MACHINE TYPE** menu.

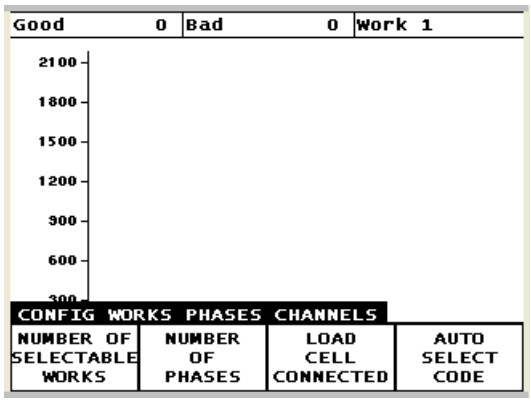


Figure 26

The items of this menu are:

NUMBER OF SELECTABLE WORKS

The work to be performed can be chosen through a combination of inputs or by command issued through serial communication. In this case, it is necessary to indicate how many works can be selected from the outside.

NUMBER OF PHASES

Every work can perform up to four phases.

NUMBER OF CHANNELS

It is possible to connect up to six load cells to the *CSQ-Visual*. This command is used to indicate how many load cells are connected. To connect several load cells an optional card is needed.

AUTOMATIC SELECTION CODE

The **AUTOMATIC SELECTION CODE** is a value which specifies how the *CSQ-Visual* has to manage the selection of the work and the phases.

The value to be entered must be calculated mathematically, starting from zero, as follows:

add 1 if the selection of the **phase** to be performed takes place from outside using digital inputs.

add 2 if you wish the **phase** number to be made available on the digital outputs of the instrument.

add 4 if you wish to allow the operator to perform a **phase** out of sequence.

add 8 if you wish the performance of a **phase** out of sequence to be possible without using the unlock password.

add 16 if you wish the reject **phase** to be subject to operator conformation.

add 64 if you wish the selection of **works** to be made using serial communication or the optional expansion card.

add 128 if you wish the selection of the **phase** to be made using the optional expansion card.

add 256 if you wish, with the automatic selection of works, for it to be possible to select another work but for just one cycle.

add 512 if you wish, with the automatic selection of works, for it to be possible to select another work from those selected automatically.

9.5 Configuring the supplementary check

The *CSQ-Visual* can carry out a supplementary check which determines whether the piece must be classed as good or a reject. The supplementary check is an ON/OFF signal which must be connected to the terminal block of the instrument inputs.

The *CSQ-Visual* can carry out the supplementary check (reading the input status) in a determined moment of the work.

The *CSQ-Visual* can also activate an output before carrying out the supplementary check and, after a preset time, read the input status.
The **SUPPLEMENTARY CHECK MANAGEMENT** enables the configuration of the input and the assignment of a descriptive name to the same.

9.6 Diagnosis

The diagnosis function enables: the display of the input status, the display and forcing of the outputs and the calibration of the transducers.
Given the complexity of these operations, they should only be performed by qualified personnel.
The inputs and outputs activated are highlighted with a black rectangle.

To force the outputs, move the cursor using the  to the output required and press the  button. The hardware password must be known in order to be able to force an output.
The **HELP** menu displays the typical use of the inputs and outputs. This window also displays the instrument firmware version.

9.7 Firmware version

To know the version of firmware of the instrument enter diagnosis ad choose help **TOOLS > ADVANCED OPTIONS > DIAGNOSIS > HELP**.

10 Password

Three different passwords can be entered into the *CSQ-Visual*: the first enables changes to works, the second enables changes to the hardware configuration values (**9724**), the third is the unlock password (**9724**) and is requested in particular conditions.
The passwords prevent changes to the operation values and are requested if access to a changes menu is required.
The passwords can be changed: to do this, you need to know the old password.
When the work password has been entered, the display shows the  symbol.
When the hardware password has been entered, the display shows the  symbol.
These symbols indicate that it is possible to change the operation values without having to enter the relative password again.
By choosing **REACTIVATE PASSWORD** the symbols disappear and the password is requested again for subsequent changes to the operation values.
To eliminate a password it is necessary to change the existing one with an empty one, pressing enter when requested

10.1 User management

The *CSQ-Visual* can memorise a list of users with relative identification codes. This possibility depends on the configuration of the instrument.
When the *CSQ-Visual* manages the users, the identity of the user who changes the work parameters is memorised in a list. This list can be displayed with the **EDIT WORK > CHANGE WORK > HISTORY OF CHANGES** command. The list contains a line for every change. It is possible to select a line of the list to return to a previous point in the work history. Using the *WinScope* software it is possible to display the list with every single change.

11 Calibration

From the **DIAGNOSIS** menu it is possible to calibrate the transducers connected to the *CSQ-Visual*. This operation has to be carried out by specially appointed and qualified personnel.
The hardware password is required for calibration.

11.1 Force transducer calibration

The **offset** is the value subtracted from the output value of the analogue-digital converter.
The **gain** is the multiplication factor that regulates the force value displayed. If the gain is higher than three, it is best to change the unit of measure and the number of decimals.
The best method for calculating the gain of the force transducer is by way of a calibrated reference load cell. Alternatively, it is possible to enter a theoretic gain.

11.1.1 Calibration using a calibrated load cell

To calculate the gain and offset, this procedure can be used:
- Temporarily enter 1.0 as the gain and 0 as the offset.
- Do not exercise any force on the load cell.
- Enter the force value displayed as offset.
- Remove the stop values (see par.5).
- Position the calibrated load cell under the cylinder.
- Start the press and manually regulate the force until the display of the *CSQ-Visual* shows 1000daN.
- At exactly 1000daN, read the real force value measured by the calibrated instrument.
- Divide the value read by 1000 and enter it as the gain.
- Check this calibration.

11.1.2 Calibration using theoretic values

If you do not have a calibrated load cell, this procedure can be followed:
- Temporarily insert 0 as the offset.
- Do not exercise any force on the load cell.
- Enter the transducer value displayed as offset.
- Now enter the gain calculated theoretically using the formula:

For 2mV/V load cells and CSQVIO card:
Gain = 0.248 * (nominal value of the load cell in tons)
Examples:
for a 2.5t load cell the gain is 0.620 in daN without decimals
for a 5t load cell the gain is 1.240 in daN without decimals
for a 10t load cell the gain is 0.248 in KN with one decimal
for a 20t load cell the gain is 0.496 in KN with one decimal

For 2mV/V load cells and IOT card:
Gain = 0.45 * (nominal value of the load cell in tons)
Examples:
for a 2.5t cell the gain is 21.125 in daN without decimals
for a 5t load cell the gain is 2.250 in daN without decimals
for a 10t load cell the gain is 0.450 mm KN with one decimal
for a 20t load cell the gain is 0.900 in KN with one decimal

11.2 Position transducer calibration

It is possible to use an incremental encoder, a potentiometer or a 0.10V analogue transducer (only with the CSQVIO card) as a position transducer.

The incremental encoder is best as the precision does not depend on the useful stroke and is not influenced by electrical disturbance.

11.2.1 Encoder

The encoder is connected to a counter which multiplies the physical resolution of the transducer by four.
The **offset** is a number of steps subtracted from the value by the counter.
The **gain** is the multiplication factor that regulates the position value displayed.
It is important to understand that the position is aligned at a position which does not correspond with the upper dead point. The alignment position is determined by the concurrence of the T.D.C. signal (cylinder withdrawn) and the presence of the encoder signal at the zero notch.
Only if the encoder is replaced can the alignment position vary.
When the *CSQ-Visual* is switched on, the position displayed is zero whatever the position of the lever: only at the first passage for the zeroing position are the positions reset. This means that a negative position must be indicated for the return of the cylinder.

11.2.2 Analogue input

The *CSQ-Visual* has a 0-10V analogue input with a 12-bit analogue-digital converter.
The **offset** is the digital value subtracted from the output value of the analogue-digital converter.
The **gain** is the multiplication factor that regulates the position value displayed.
The theoretic value of the gain to obtain the hundredths of a millimetre is obtained from the following formula:
Gain = (Nominal stroke in millimetres) / 40.96

11.3 Encoder alignment

The alignment is performed by the instrument when the T.D.C. stop device (cylinder withdrawn) is activated and the encoder zero notch is presented at the same time. For alignment to take place correctly, ensure the presence of the zero notch in the interval in which the stop device is active.

If the encoder is fitted or replaced or if the upper dead point of the cylinder is moved, the encoder has to be correctly repositioned. To do this, first zero the position offset as explained in paragraph 0. After zeroing the offset, it is possible to follow the instructions in the following paragraphs.

11.3.1 For Alfamatic Tromboline presses

Switch the instrument on and remove the cover from the encoder, rack and stop device of the upper dead point by loosening the two screws. Keeping the stop device pressed, lower the cylinder using the press lever. In this way, the position will change on the instrument display, returning to zero at a certain point. This is the exact position of the zero notch of the encoder. Now pull back the encoder to release the pinion from the rack, hold it in this position and return the cylinder back to the upper dead point. Keeping the encoder released from the rack, lower the cylinder by about one millimetre. Now you can release the encoder. Raise the cylinder to the upper dead point and check that the instrument indicates a position between –3 and –1 millimetres. To check the exact positioning, switch the instrument off and on again. Now the position must be zero. Lower the cylinder using the lever and return it to the upper dead point. Now the instrument must display a slightly negative position (a few millimetres).

11.3.2 For standard presses

Firstly, press the emergency button on the press, switch on the instrument and open the cover of the rack unit, which is closed by two self-threading Philips screws. The encoder pinion can be seen inside. Loosen the two screws that fasten the encoder in place and move it upwards. In this way, the position will change on the instrument display, returning to zero at a certain point. This is the exact

position of the zero notch of the encoder. Now move the encoder down by about one millimetre so the display indicates –1 millimetre. Pull back the encoder to release the pinion from the rack to return the encoder to the original position without the instrument changing the position. It is necessary to fasten the encoder in place and display a position with a value between –3 and –1 millimetres.

12 Connection to the computer

The *CSQ-Visual* can be connected to a computer. It is possible to connect the instrument to the computer by USB, RS232 serial or Ethernet port (optional).
The instrument is accompanied by the *WinScope* program, which extends the potential of the instrument.

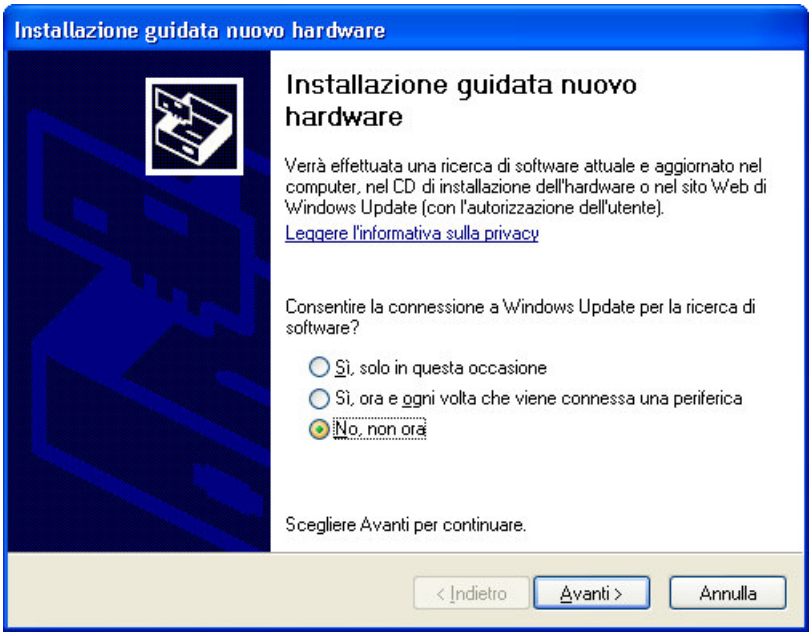
12.1 USB connection

If a USB connection is used, a standard type A/B USB cable is required.

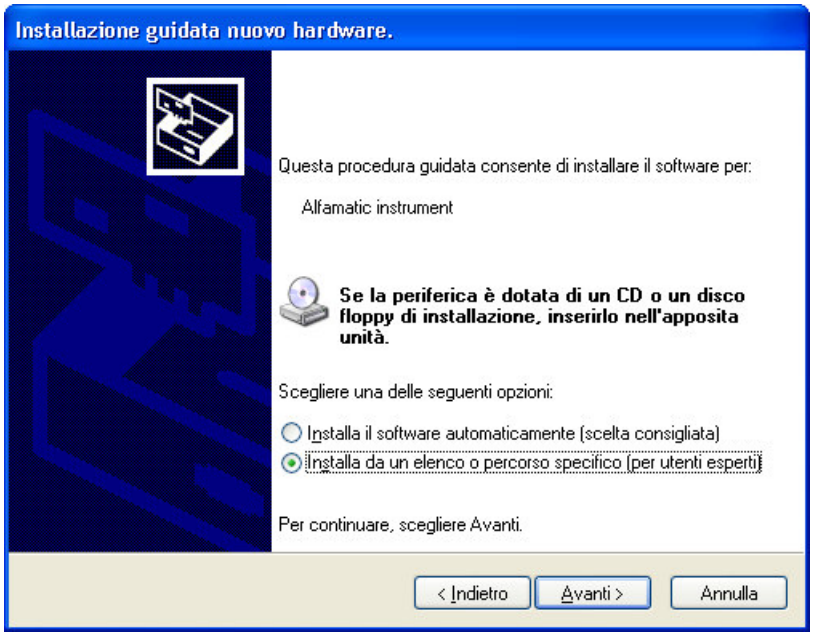
When connecting the *CSQ-Visual* to the computer for the first time, the operating system will search for the drivers to correctly manage the peripheral.
After installing the drivers, the instrument will be automatically displayed in the *WinScope* **Connection** menu.

12.1.1 Installing the USB driver in Windows XP

When connecting the *CSQ-Visual* to the computer using a USB connection for the first time, the following window is displayed:

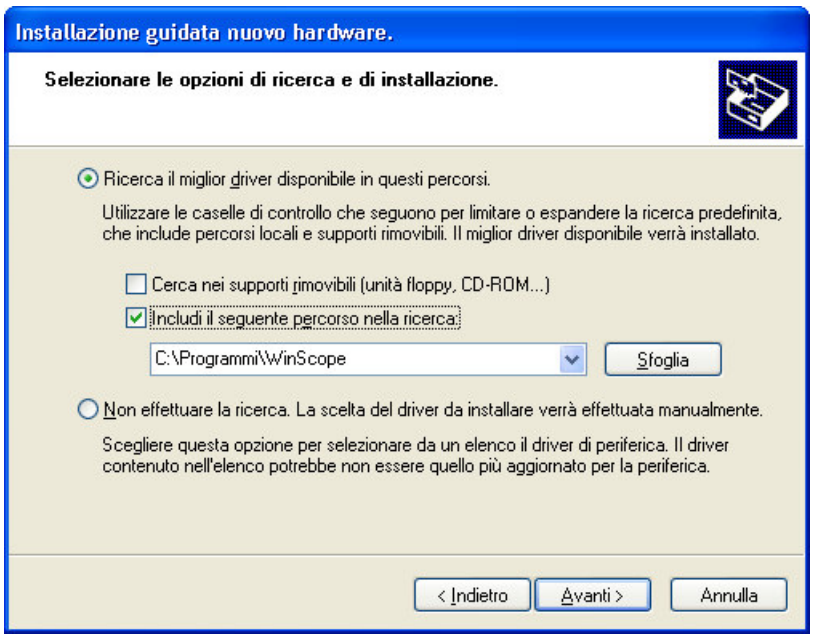


Select “No, not now” and click Next. The following window appears:



Select “Install from a specific path” and press Next.

In the next window it is necessary to specify the path where the drivers are present. Use search to find the drivers. The driver files are copied on the hard disk when WinScope is installed and are contained in the same folder as the program. The drivers are also found on the CD supplied with the instrument in the **USBdriver** folder.

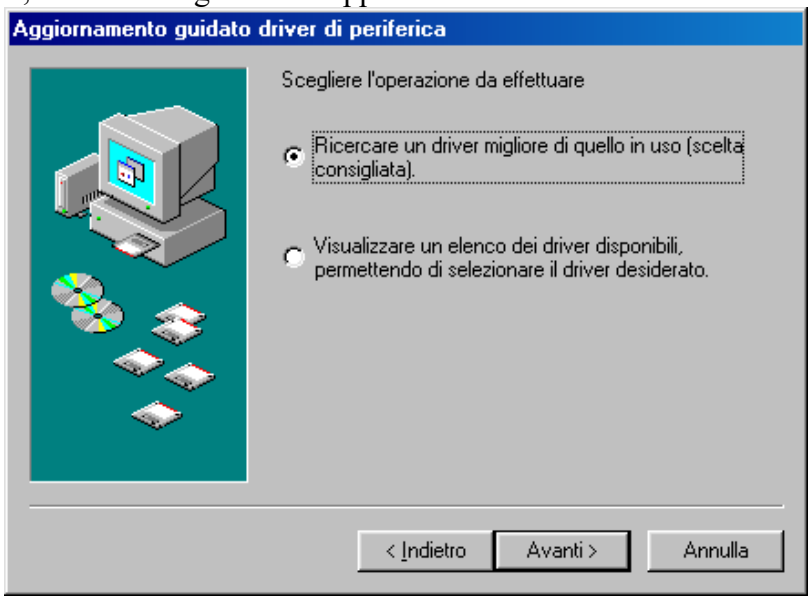


After entering the path, press Next and wait. If the following window appears, click Continue.

12.1.2 Installing the USB driver in Windows 98

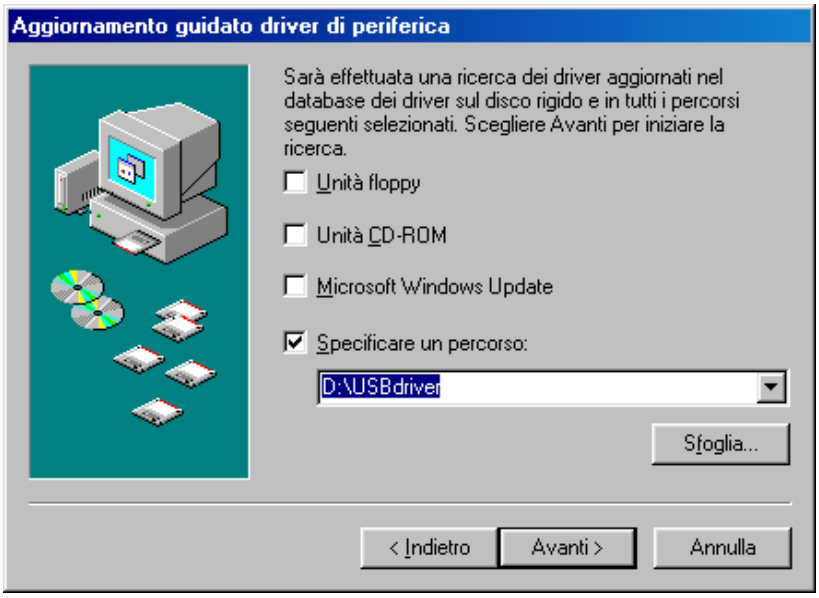
When connecting the *CSQ-Visual* to the computer using a USB connection for the first time, the following window is displayed:

After selecting Next, the following window appears:



Select the first option and press Next.

In the next window it is necessary to specify the path where the drivers are present. Use search to find the drivers. The driver files are copied on the hard disc when WinScope is installed and are contained in the same folder as the program. The drivers are also found on the CD supplied with the instrument in the **USBdriver** folder.



After entering the path, press Next and wait for installation.

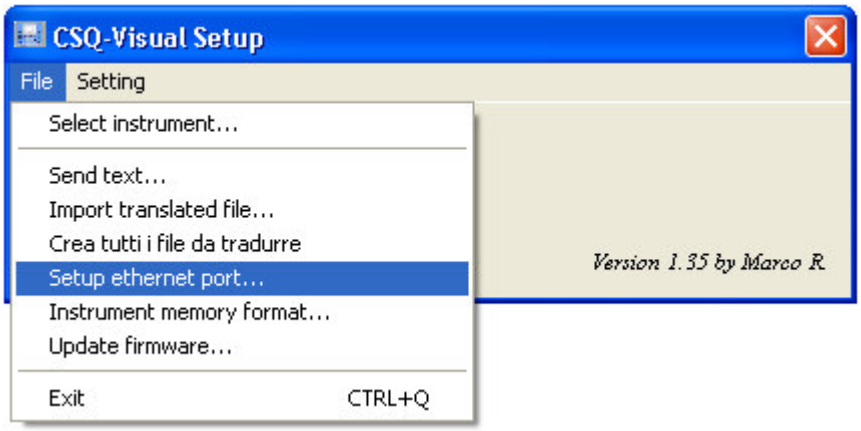
12.2 RS232 serial port connection

The serial cable is of the *null-modem* type and is supplied with the appliance. Connect one end of the cable (they are the same) to a free serial port on the computer (usually marked as **10101**) and the other end of the cable to the serial port of the instrument Y1. When using the serial connection it is necessary to add the computer port used in the list of ports for use in *WinScope* using the **Preferences** command in the **File** menu.

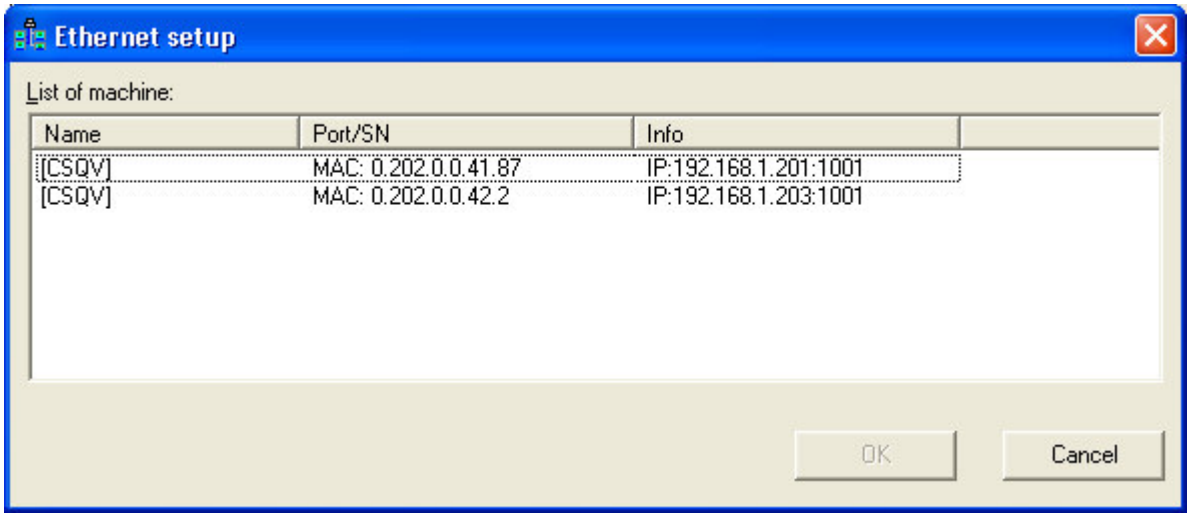
12.3 Ethernet connection

To use the Ethernet port (optional) it is necessary to assign the instrument a univocal IP address. To do this, you need the *CSQ-Visual Setup* software on the CD supplied with the instruments. Then,

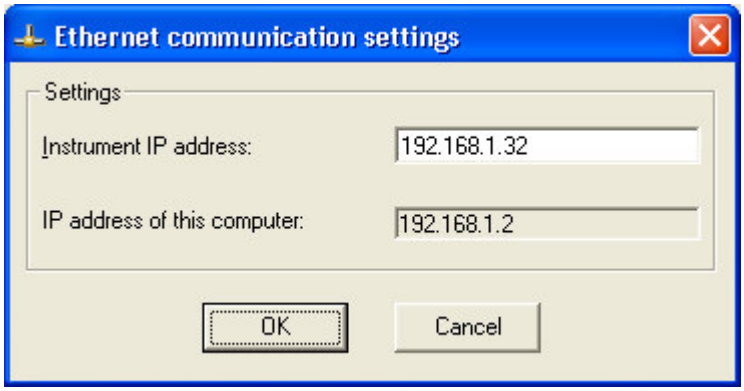
after assigning an IP address to the instrument, it must be added to the list of ports for use in *WinScope* using the **Preferences** command in the **File** menu.
Select the **Set up Ethernet port** command from the **File** menu.



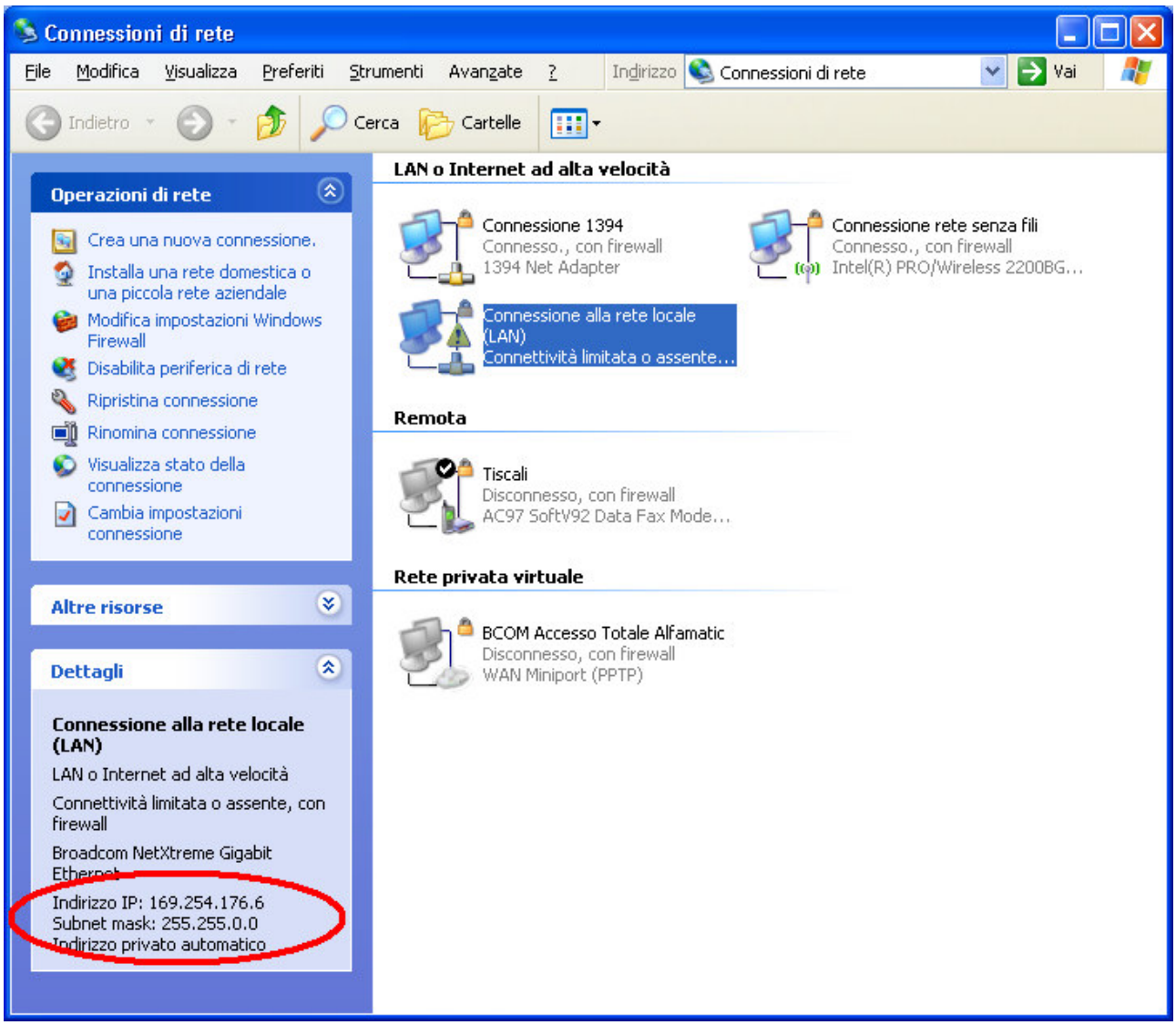
Select the instrument to which the IP address must be assigned, from the list that appears.



If the list is empty, check the computer Firewall status, if present. The Firewall can disable the Windows XP control panel.
If you are unable to distinguish the instrument to configure, just switch it off, call the list again and see which one is missing.
After selecting the instrument, the following window appears and it is possible to assign an IP address.



In this window, the IP address of this computer might not be that of the card to which the instrument is connected. Check the address by displaying all the network connections on the Windows control panel:



If the address of the card to which the instrument is connected is different from that displayed in the window, it is necessary to type in the correct computer address.
If, after assigning the IP address the message “IP address is unreachable with your network” appears, check that the subnet mask allows the instrument to be seen as belonging to the same subnet.

13 Technical data and problem-solving

Before contacting the technical assistance service, please consult this chapter.

13.1 Problem-solving

Consult the table below to find the information contained in the manual quickly.

Subject	Solution
The tool does not allow changes to the graph set-up.	It is not possible to change the graph origin and scale ends with values that would make the tolerance band even just partially invisible.
The instrument does not communicate with the computer.	See paragraphs 13.2.
The display is illegible.	The contrast of the display can be changed.
The curve acquired is not displayed.	Check that the graph origin and scale ends are sufficiently correct, comparing them with the values measured.
The empty force is not zero.	If the empty force does not depend on the weight of the equipment, check the anti-rotation post as explained in paragraph **13.2**
The press does not start and the instrument displays an error message.	See paragraph 13.6
The press stops before reaching the stop values.	Check whether the immediate stop is activated. Check whether the maximum acquisition time is up.
The display and control of the curve is interrupted immediately at the stop value.	If only the stop force is set, the curve is checked until the force starts to diminish. To check the curve until the position starts to diminish too, enter a stop position.

13.2 The instrument does not communication trough the USB port

To use the USB port it is necessary, first of all, to install the drivers supplied with the CD of the instrument on the computer.
It is not possible to use the USB port if the instrument has already communicated through the Ethernet port. To rest the USB port, wait five minutes or switch the instrument off and on again.

13.3 The instrument does not communication trough the RS232 port

The computer cannot communicate using the RS232 serial port if the *CSQ-Visual* has been configured for *slow serial communication*.
It is not possible to use the RS232 serial port if the instrument is connected by USB port to a computer, even if they are not communicating.
It is not possible to use the RS232 serial port if the instrument has already communicated through the Ethernet port. In this case, to rest the RS232 serial port , wait five minutes or switch the instrument off and on again.

13.4 The instrument does not communication trough the Ethernet port

Check whether there is a firewall in the computer or the network. If there is firewall, check that this does not block WinScope. Also check that the IP address of the instrument is reachable.

13.5 The empty force is not zero

The tool or an adapter is usually screwed to the load cell. There is an anti-rotation post o prevent it from unscrewing. This post must never create any force between the central part of the cell and the edge.
There must be a gap of at least half a millimetre between the post and the edge of the cell, as shown in the figure below.

Figure 27

If everything is fine, consider that that force transducer (load cell) also measures the weight of the tool. It is possible to align the force to empty by changing the force offset (chapter 0).

13.6 Messages

The particular conditions, the *CSQ-Visual* can display the following messages:

Message	Description
Tool not resting on piece	The instrument is configured so that the consent at the start of the press is only given if the load cell measures at least 30daN.
Wait for the transferral of the curves	The “remote enable” is active.
Instrument blocked by the computer	The computer is transferring the data.
Work selected unusable	Select another work.
Reset for the reject piece	Press the RESET button or throw the piece in the rejects basket, if present.
Memory error	The internal memory of the instrument has not been programmed.
Computer settings update	Wait for the computer to transfer the work changed.

Serious errors:

Figure 28

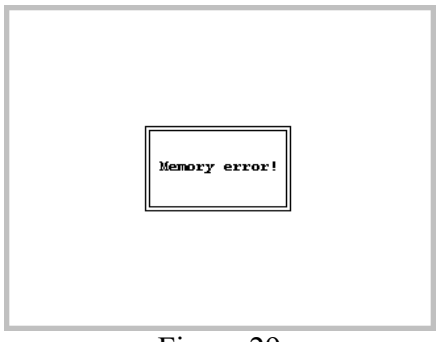


Figure 29