Visual Point

Version with VP2STEP1 card

Installation manual

Sep. 26, 2019

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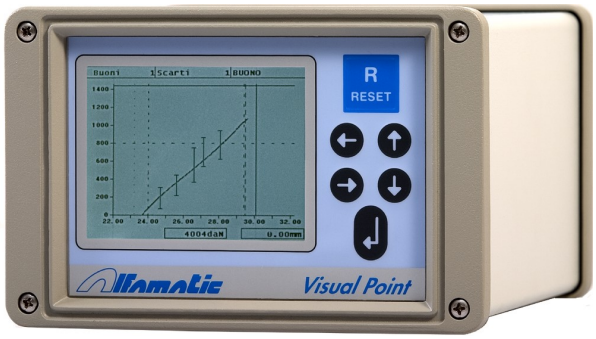
1 Introduction

This manual describes the operations necessary to connect the machine to VISUAL POINT.
There are two versions of VISUAL POINT: for external mounting and for panel mounting.
The panel version is only available with 24VDC power.
The external mounting version is available in versions: 24VDC or 100-240VAC.
Before connecting the instrument, check carefully the supply voltage.



Picture 1

1.1 Important notes for installation

Read this notes, please:

Always check the supply voltage before proceeding with its wiring.

This instrument is not (and could not be) a safety device: the descent of the press must be entrusted to elements outside the instrument. The instrument only synchronizes the descent of the press in order for it to work.

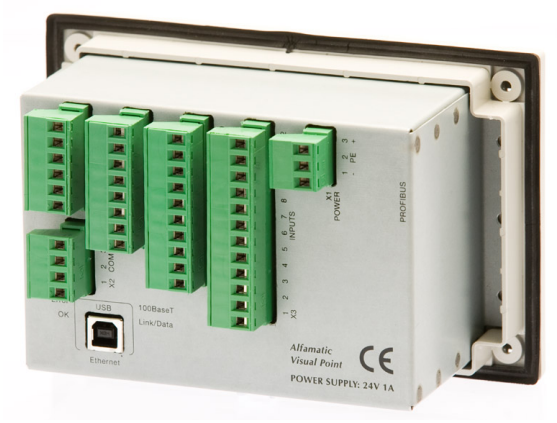
It is very important for the load cell wire terminal, which is not sheathed, to be as short as possible.

When the machine has electric motors, these must be equipped with an anti-interference filter and be controlled using semiconductor devices.

Always connect the container of the instrument to the earth conductor.

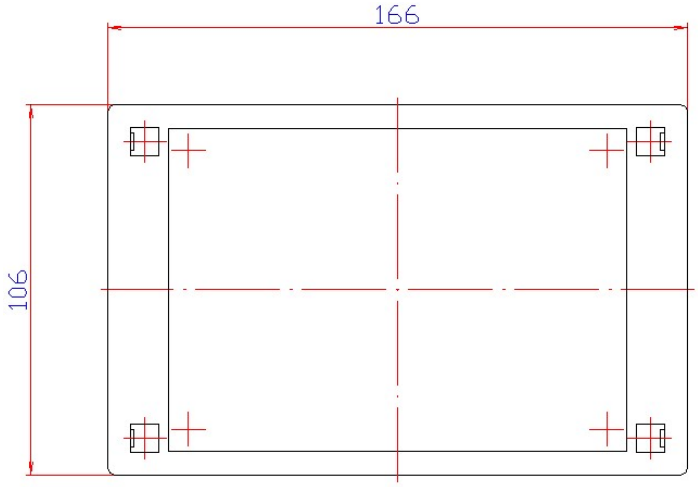
1.2 Dimensions

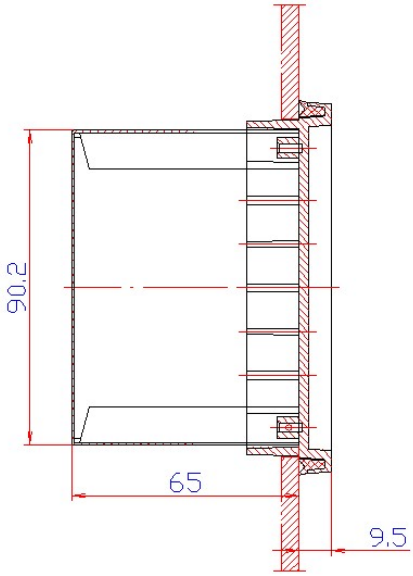
All dimensions in millimeters.



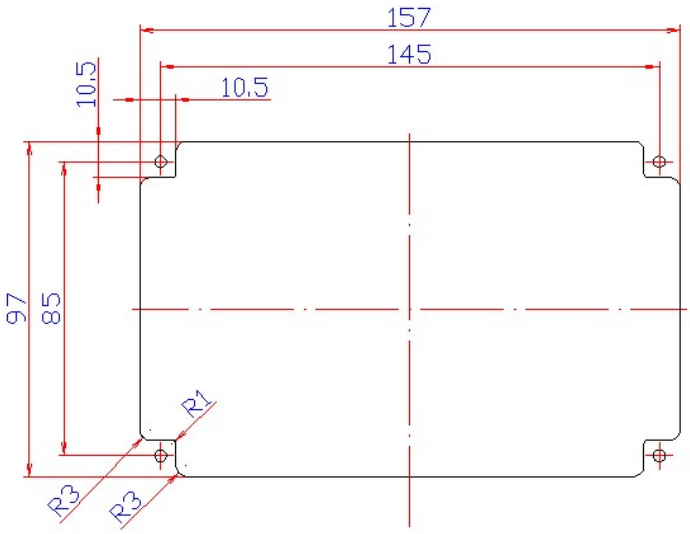
Panel mounting

To the depth indicated, you have to add the dimension of the teminal blocks and of cables whith minimum lenght of 55mm



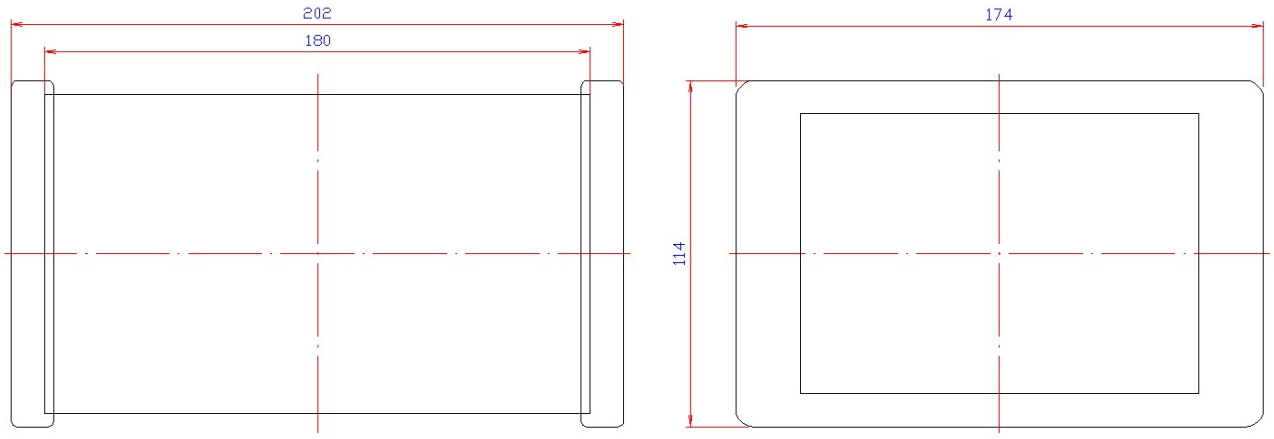


Hole dimensions:



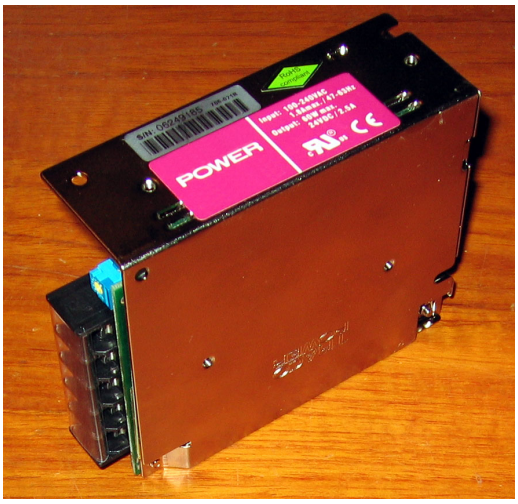
External mounting

To the depth indicated, you have to add the dimension of cables whith minimum lenght of 80mm



2 Implementing VISUAL POINT

The VISUAL POINT is divided into two sections with each other opto-isolated. The first section features the control logic and electronics interface to transducers. The second section features the electronics for digital inputs and outputs.
The two sections have separate power supplies, both at 24VDC.
Both sections can be supplied with a common power source.
The internal power supplier (Picture 2) allows the direct connection of the instrument to the net electrical supply.
Tensions accepted range from 100VAC up to 240VAC both 50Hz and 60Hz.



Picture 2

2.1 Operating of the instrument

<u>Attention:</u> the VISUAL POINT is not (and could not be) a safety device: the descent of the press <u>must be</u> entrusted to external elements. The VISUAL POINT synchronises the descent for its operation. The GO Output is usually connected serially to the chain of the cylinder descent. In short, if the CSQ-Visual activates the GO enabling output, the cylinder must not descend if it is not safe

Operation takes place as follows: when the START input is activated by an external command, the VISUAL POINT, if ready, activates the protection descent output (PROTECTION) where present and enables the cylinder descent (GO). When the protection is closed, a safety device must activate the cylinder until the VISUAL POINT removes the cylinder descent enabling signal (GO). The VISUAL POINT then commands the arrest of the press, removing the GO signal, controls the curve until the force begins to diminish or is activated by way of the T.D.C. input (withdraw cylinder signal). Only then does it indicate whether or not the piece is good or a reject.

If the piece is good, the GOOD output is activated and the PROTECTION output, where present, is deactivated. If the piece is a reject, the REJECTED output is activated intermittently and the PROTECTION output, where present, is left active. When the operator presses the reset button, which can be external or always active, the instrument maintains the REJECTED output as fixed and removes the PROTECTION output.

The RESET input can be connected directly to +24 V and left always active, so that the instrument is always ready to execute a new cycle.

The START input has to be held active throughout the cycle, otherwise the instrument communicates "cycle interrupted" and the piece is rejected.

You can connect a sensor piece presence (ENABLE) that enables the start only when the appropriate input is active. To use this signal is necessary to activate the option in the configuration of the instrument.

The proper “setting to zero” of the encoder is done using the zero mark and the signal the press ram is back to the TDC. The reset is executed by the instrument when the TDC switch is activated the encoder goes through the zero notch. So for the proper zeroing it needs to be ensured the presence of the zero mark in the interval where the TDC switch is active.

There is an exit SETPOINT that is activated when the starting point is measured or when you reach a preset value (see paragraph 2.9).

The work (or recipe, or program) that the instrument must use, can be selected with some inputs: see Chapter 2.10. The work selected changes every time you change the input selection status. After the start signal, the work selected is maintained until the end of the cycle.

2.2 Information for connection to an external controller (PLC)

To connect the VISUAL POINT to a PLC, the latter must have PNP positive logic. The inputs and outputs of the instrument are opto-isolated from the instrument’s control electronics. The power supply of the instrument’s inputs and outputs must be the same that powers the inputs and outputs of the PLC. We recommend the use of at least one output (START signal) and three inputs of the PLC (GO, GOOD and REJECTED). If necessary, with the press controlled directly by the instrument, it is possible to use a single input to know whether the piece is good (GOOD output) and a single output to control the start of the pressing cycle (START input).
Remember that, in all cases, it is always necessary too connect the T.D.C. input of the VISUAL POINT. The T.D.C. signal can be acquired directly by a limit switch activated with the press in the resting position. However, the signal indicating that the press is in the resting position is almost always used by the PLC. In this case the signal to be given to the instrument may be taken parallel to that delivered to the PLC.

2.3 Wiring instructions

The VISUAL POINT features several input and output options.
As inputs: load cell, position transducer and command signals.
As outputs: signals for controlling the valve that enables the descent of the press ram, the valve for closing the safety guard and protection flags.
The input signals can be: simple contact or 24Vdc positive logic, with PNP transistor output.
The outputs of VISUAL POINT, when activated, provide a voltage of 24Vdc. The maximum load of each output is 15 watts. For higher loads is necessary to use relays support. The total maximum load supported by the instrument, when equipped with the internal power supplier, is 50 watts.

The wiring is supported by removable terminal blocks (X3, X4...). Every terminal on every terminal block is numbered (**Errore. L'origine riferimento non è stata trovata.**). For example, when terminal X4.7 is indicated, reference is made to the seventh terminal of terminal block X4. The numbers are also printed on the printed circuit of the card.

2.3.1 Main power terminal block (X1)

The electronics of the VISUAL POINT and the transducers are powered at 24VDC via the X1 three-pole terminal block.

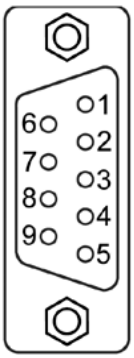
Name	Function	Terminal
0VDC	Negative power	X1.1
PE	Earth connection	X1.2
+24VDC	Positive power	X1.3

If the internal power feeder is fitted, the switch behind the instrument has to interrupt the phase and neutral before reaching the power feeder. The power feeder output must be connected to terminal block X1.

This terminal is not feeding the input and output section, which is separated by opto-isolators from the electronics of the instrument. To feed the section of input and output, connect to the power supplier the terminal blocks X3.11 and X3.12.

2.3.2 Serial port terminal (CONN1)

Only present in version with cabinet for external mounting.
On the back of the VISUAL POINT is a D-Sub 9-male for the RS232 serial connection. The connector pin-out is as follows:



Pin 2: RX input line of *Visual Point*.
Pin 3: TX output line from *Visual Point*.
Pin 5: GND Mass signals

2.3.3 Serial Port terminal (X2)

Only present in version for panel mounting.

On the back of VISUAL POINT for panel mounting is the X9 terminal block to connect serial RS232. The connector pin-out is as follows:

Name	Terminal	Function
	X9.1	Do not use
TX	X9.2	Output – signal toward the computer RX, connect to pin nr 2 of the male D-SUB 9 connector on the PC
RX	X9.3	Input – signal coming from computer TX, connect to pin nr 3 of male connector DSUB 9 of PC
A+	X9.4	RS485 A+
B-	X9.5	RS485 B-
0V	X9.6	Signal ground, connect to nr. 5 pin connector D-SUB 9 male of computer

2.3.4 Inputs terminal block (X3)

The inputs are optoinsulated and compatible with clean contact signals or 24 VDC PNP transistor outputs.

Name	Function	Terminal	Note
IN0	START	X3.1	
IN1	T.D.C.	X3.2	
IN2	RESET RED BASKET	X3.3	
IN3	ENABLE JOB SELECTOR E	X3.4	
IN4	EMERGENCE OK JOB SELECTOR D	X3.5	
IN5	GREEN BASKET JOB SELECTOR C	X3.6	
IN6	JOB SELECTOR B	X3.7	
IN7	JOB SELECTOR A	X3.8	
IN8	Do not use	X3.9	Do not use
IN9	Do not use	X3.10	Do not use
0VP	Power I/O ports	X3.11	Negative power supply for inputs and outputs
+24P	Power I/O ports	X3.12	Positive power supply for inputs and outputs

Maximum current of each input 10 mA

Input functions:

Function	Description
START	Request for new cycle start
T.D.C.	“Top dead point” signal, used to reset for a new cycle and in AND with the zero notch of the encoder for the zero of the absolute positions
RESET	Re-enables the instrument after a reject (rejects basket)
ENABLE	Start enable
EMERGENCE OK	Safety device OK
JOB SELECTOR	Work selection
RED BASKET	Bad pieces basket sensor
GREEN BASKET	Good pieces basket sensor

2.3.5 Outputs terminal block (X4)

Outputs for 24VDC loads. For inductive loads such as valves and relays, it is necessary to have a diode parallel to the coils to eliminate peaks in voltage.

Name	Function	Terminal	Note
OUT0	GOOD	X4.1	
OUT1	REJECTED	X4.2	
OUT2	GO	X4.3	
OUT3	PROTECTION BUZZER	X4.4	
OUT4	CONTACT/BOOSTER SETPOINT PULLUP	X4.5	
OUT5	TANK RETURN	X4.6	
OUT6		X4.7	
OUT7		X4.8	
	NU	X4.9	Do not use
0VP	Power outlet	X4.10	This terminal can be used as the return of the utilities connected to the outputs. It is connected internally to terminal X3.11.

Nominal current of each output	1 A

Output functions:

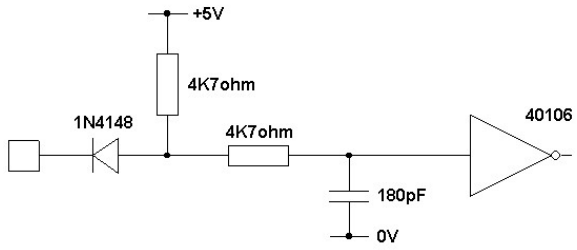
Function	Description
GOOD	Good piece signal. Active after the return of the cylinder until the next start.
REJECTED	Rejected piece signal. Active after the return of the cylinder until the next start. The output is intermittent until the reset signal.
GO	Enables the press. Active after the start if the instrument is ready and deactivated upon reaching the stoppage value.
PROTECTION	Command for the closure of the protection.
BUZZER	Command for acoustic signal.
CONTACT/BOOSTER	Conctact signal or start work stroke signal.
SETPOINT	Force or position trigger. See Chapter 2.8
PULLUP	Command for return cylinder.
TANK	Segnale chiusura serbatoio del cilindro Alfamatic tipo PK
RETURN	Enable return of cyinder

2.3.6 Encoder and 0-10V input terminal block (X12)

An incremental encoder and a 0-10V signal can be connected to the X12 terminal block. A 12VDC power supply is available for the encoder. A very high-precision 10VDC power supply is available for the potentiometer.

Name	Terminal	Function
Phase Z	X12.1	Encoder zero signal
Phase B	X12.2	Encoder phase B signal
Phase A	X12.3	Encoder phase A signal
+12V	X12.4	12 V encoder power (200mA max)
0V	X12.5	Screened wire sheath
0V	X12.6	0V of the encoder and potentiometer
+10V	X12.7	10 V potentiometer power (10mA max)
POT	X12.8	0-10V input.

Electrical features of terminals X12.1, X12.2 and X12.3



2.3.7 Load cell terminal block (X6)

Input for load cell with resistive jumper with a sensitivity of 2mV/V. The power for supply the load cell is also available on this terminal block.

Name	Terminal	Function
IN+	X11.1	Positive input
IN-	X11.2	Negative input
0VL	X11.3	Screened wire sheath
0V	X11.4	0V
+10V	X11.5	Power (60mA max)

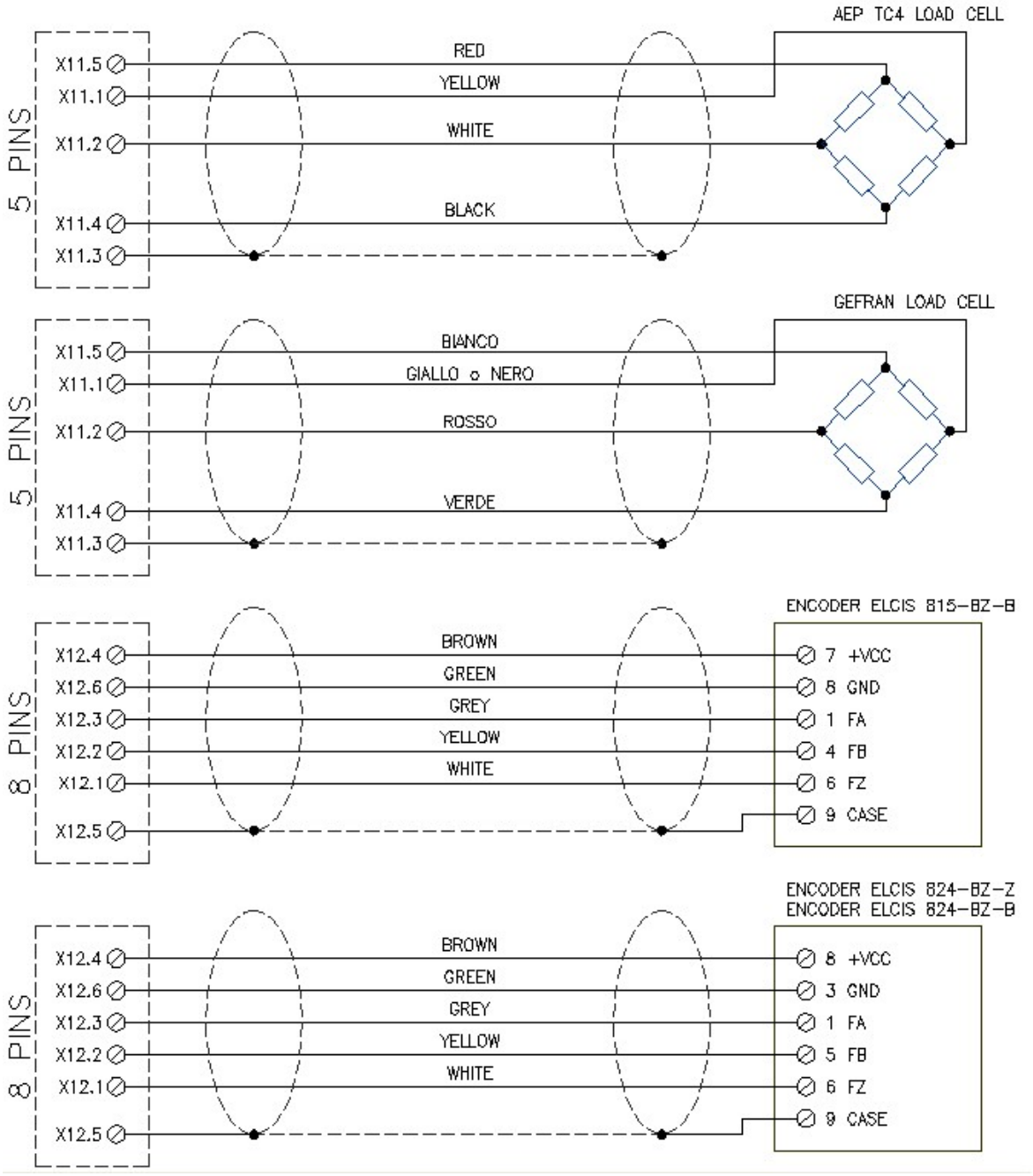
It is extremely important for the end of the wire of the load cell which is not covered by a sheath to be as short as possible.

2.3.8 Analog output terminal block (X10)

Name	Terminal	Function
NU	X10.1	Do not use
NU	X10.2	Do not use
NU	X10.3	Do not use
NU	X10.4	Do not use
NU	X10.5	Do not use
NU	X10.6	Do not use
NU	X10.7	Do not use
0V	X10.8	REF analog outputs
ANA1	X10.9	0-10V output 1
ANA2	X10.10	0-10V output 2

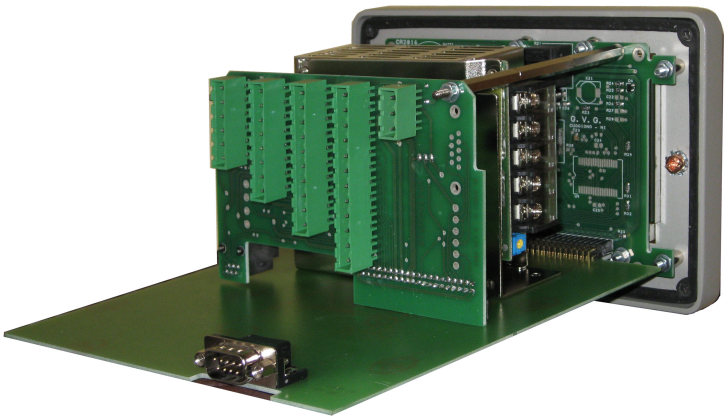
2.4 Typical connection

Wiring an encoder ELCIS and a load cell AEP:



picture 3

2.5 Instructions for assembling the instrument with cabinet



picture 4

To open the container with VISUAL POINT unscrew the four screws in the corners of the back and front panel.
Dismantle the groups of terminal blocks.
Pull out the electronic boards from the front (Figure 10).
Mount the cable and plugs needed (Pg 9).
Put the wires in the cable and start wiring as the wiring diagram.
To know the number of groups of terminal blocks, you can look at the Figure 5.
After the wiring insert the card.
Insert the terminal groups respecting their length and their sense of inclusion.

2.6 Switching on the instrument

After the wiring is possible to feed the tool and follow the following steps:

- Turn on the instrument. The display lights up.
- Go to the menu **Configurazione > Information > Show advanced settings**.
- Go to the menu **Configurazione > Machine** and activate the right options (see user manual).
- Proceed with the calibration of the instrument (see user manual).
- Verify that the sensors and related utilities, are working properly, through the **Diagnostics** menu (see user manual).

2.7 Aligning the encoder

If it is replaced or if the encoder is shifted TDC is necessary to reposition the way the encoder. To do that, there is a clear share of the offset as described in the user manual to see and follow the instructions below.

2.7.1 For standard presses Alfamatic

First press the mushroom emergency press, turn on the instrument and open the top cover of the rack lock, which is closed by two self-tapping screws with head a cross. Inside you can see the pinion the encoder. Unscrew the two screws that secure the encoder and move upwards in this way, the display of the instrument will change the share that at some point, will come to zero. This is the exact position of the rear of the encoder zero. Move now the encoder of about one inch at the bottom so that the display indicates -1 mm. Pulling back the encoder is able to release the pinion by the rack, so you can set the encoder to its original position without the change the quota. In practice you should be able to fix the encoder and see how to share a value between -3 and -1 mm.
To verify the correct positioning, turn off and on the instrument at this point, the share should be

zero. Starting the press and make it back to the TDC: At this point the tool has a negative view of a few millimeters.

2.8 SETPOINT output

The VISUAL POINT SETPOINT has an exit which is normally activated when the share is measured starting (see user manual) and is off when the value of arrest. This can be used to start the phase of work, after the phase approach.
Changing the configuration can be done so that the output SETPOINT be activated when you reach a strength or a set.
Always changing the configuration can be done so that the output SETPOINT not be turned off to the arrest of the cylinder, but only when the press is completely backwards session (TDC active input) and, with the scrap piece, not because of the reset . In practice, this configuration allows you to connect to the SETPOINT a decelerator or force that keeps the piece into place.
Notes:
SETPOINT output is activated only when the input TDC is not active.
The exit is on SETPOINT without signal START.

2.9 Work selection by inputs

The VISUAL POINT supports the automatic selection of work using the combination of the inputs. This selection can be useful for automatically recognising the piece or the tool fitted.
The work number is obtained from the binary combination of the inputs. The binary code of the first work is zero, i.e.: no input active. The maximum number of selectable works, if enough inputs are available, is 16 (with binary codes from 0 to 15).
The wiring is connected to a terminal block inside the instrument marked X3.
The highest inputs must be used for selection.
The sensors are connected to the inputs WORKSEL reported in paragraph 2.3.2. The entrance WORKSEL A is the least significant.
After the wiring it it necessary to instruct the instrument on how many works can be selected; to do this you must change the configuration value.