INSTALLATION MANUAL

PRESS-RIGHT

equipped with a VIO10 board

- Installation manual

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1 Press-Right Installation

This chapter explains the steps required to install and connect *Press-Right* to the equipment and make prepare it for operation.

The *Press-Right* instrument is designed to work on its own or in combination with a PLC (see important information in paragraph 1.4.1).

For operation, the *Press-Right* instrument must be connected to a PLC via a number of input and output signals. In addition to it, the instrument must be connected to a force transducer (typically a load cell) and a position transducer (incremental encoder, potentiometer or transducer with analogue output).

The load cell and the encoder or the potentiometer are powered by the instrument. The instrument also includes also the amplifiers which are necessary to condition signals from the transducers.

Press-Right is supplied with serial ModbusTCP and it can be ordered with a PROFINET or EthernetIP interface.

1.1 Important notes for installation

This manual refers only to the instrument equipped with a VIO10 expansion card.

Press-Right must be powered at 24VDC. It is possible to obtain an optional internal power supply that allows the direct connection to the mains.

This instrument is not (and could not be used as) a safety device: the descent of the press must be governed by elements which are external to it. The instrument simply synchronizes the descent of the press to its operation.

It is very important that the end of the unshielded load cell cable is as short as possible

When the instrument is equipped with motors, motors must be equipped with a noise reducing filter and it must be operated by semiconductor devices.

Always connect the instrument container to a earth conductor.

1.2 Instrument operation

Caution: Press-right is not (and could not be used as) a safety device: the descent of the press must be governed by elements which are external to it. The instrument synchronizes the descent to its operation. Usually, the GO output must be connected in series to the cylinder descent chain. In a nutshell, if the instrument activates the GO enabling output, the cylinder must not descent if it is not safe.

The operation takes place in the following way: when the instrument START input is operated an external command, *Press-Right* activates the GO cylinder descent output, if it is ready and all ENABLE inputs are active. When the GO signal is active, the cylinder must continue until the instrument deactivates the signal.

When the GO output is active and the instrument touches the piece, the instrument activates the BOOSTER output.

Based on the stop parameters achieved (quota, strength, etc.), *Press-Right* deactivates the GO signal.

After deactivating the GO signal, the instrument continues the monitor the curve until either the force and the quota begin to decrease, and the cylinder retracts. The piece it classified as either good or scrap.

If the piece is good, the GOOD output is activated. On the other hand, if the piece is scrap, the REJECTED output is activated.

The proper encoder zeroing occurs using its zero notch and the T.D.C. cylinder retracted signal

1.3 The internal boards

Press-Right consists of two circuit boards:

front PR1MB1 mounts a display, a keyboard and a main CPU.

input and output VIO10 Input and output signals, and transducers are connected to this board.

All boards are manufactured by us.

1.4 Electric Wiring

The following information is used to perform the instrument electrical wiring.

1.4.1 Connect an external controller (PLC)

The PLC connected to *Press-Right* must be a PNP logic type. The instrument inputs and outputs are isolated and protected, and as a result **they do not need any interface relay**. Signals which are essential for operation are START, GO, GOOD and REJECTED.

Remember that, in all cases, it is always necessary to connect the instrument T.D.C. input. The T.D.C. signal can be taken directly from a limit switch operated when the press is in rest position. However, almost every time the press rest signal also serves the PLC; in this case the signal to be transmitted to the instrument can be taken in parallel to the one that is transmitted to the PLC.

1.4.2 VIO10 board wiring

Note: this information applies only to the VIO10 board. Make sure the board is exactly this version.

The wiring relies on several numbered removable terminal boards (X3, X4, X16...). Each terminal in each terminal board is numbered. The seventh terminal of the X18 terminal board will be called X18.7. The numbering of the terminal board is also shown on the board.

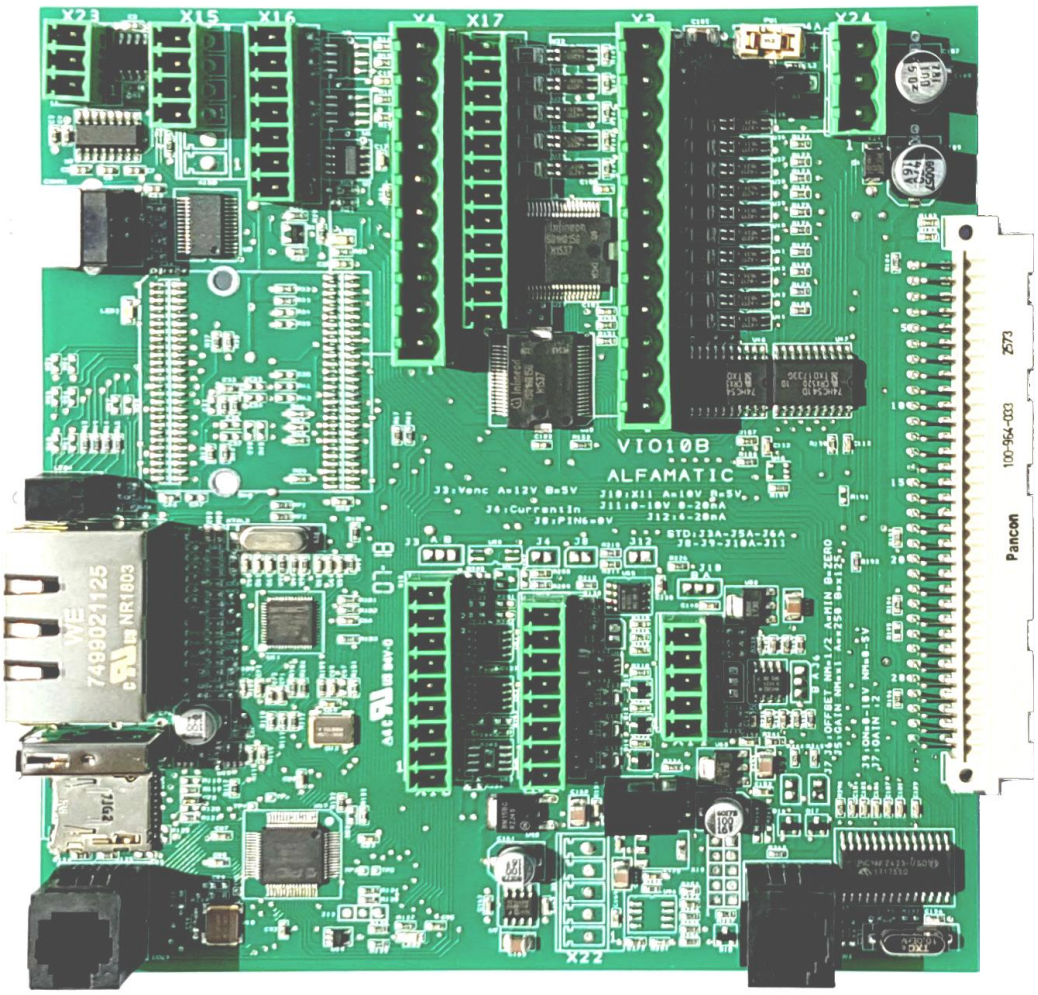


Figure 1

Main power supply terminal board (X24)

The electronic part of *Press Right* and the transducers are powered by 24VDC current via the three-pole X24 terminal board.

Name	Function	Terminal
0VDC:	Negative power supply cable	X24.1
PE	Grounding	X24.2
+24 Vdc	Positive power supply cable	X24.3

If the internal power supply is present, the switch behind the instrument must interrupt the phase and the neutral before reaching the transformer. The power supply output is connected to the X24 terminal board X24.

Input terminal board (X3 and X17)

Inputs are isolated and are compatible with clean contact signals or with 24VDC PNP transistor output. The X17 input terminal board is optional.

Name	Terminal	Default
Input 0	X3.1	START
Input 8	X3.2	
Input 1	X3.3	T.D.C.(1)
Input 9	X3.4	
Input 2	X3.5	
Input 3	X3.6	
Input 4	X3.7	
Input 5	X3.8	
Input 6	X3.9	
Input 7	X3.10	
0VDC:	X3.11	Power supply ground
+24 Vdc	X3.12	Positive power supply cable

(1) The T.D.C. input must always be Input 1.

Name	Terminal	Default
Input 10	X17.7	
Input 11	X17.8	
Input 12	X17.9	
Input 13	X17.10	
Input 14	X17.11	
0VDC	X17.12	.

The function of each input may be set up. Each input can have one of the following functions:

Name	Preferred input	Function
START	0	Request to start a new cycle. If removed, the acquisition is interrupted.
T.D.C.(1)	1	The "upper dead point" signal, used as a reset signal for a new cycle and in "AND" with the encoder zero point for the "zero" of the absolute dimensions
JOB SELECTOR		These inputs are used to select a job with their binary combination (see 2.1.1).
PHASE SELECTOR		These inputs are used to select a job phase with their binary combination.
BASKET 1	2	Sensor for normal scrap baskets
BASKET 2	3	Sensor for special scrap baskets
BASKET AUTO-CHECK		Sensor for self-test sample baskets
RESET	2	Re-enables the device after a scrap
SESPEND ACQUIRE		It suspends the acquisition of the useful curve on hydraulic or electric presses, in case of incomplete cycle
ENABLE #		See 2.3
TEST SIGNAL #	#1=4	See 2.3
BOOSTER CYL BACK		Used to repeat a cycle
BOOSTER CYL END		Used to repeat a cycle
MAINTENANCE	5	Disables all commands
TABLE IN POS		Manual slide signal in operating position
IMPULSIVE START	Left=6 Right=7	Request to start a new cycle
NO EMERGENCY		No emergency commands
SAFETY		Safe machine operation (protections closed)
DRIVER ATIVATE		Active Driver (electric press)
IN POSITION		Position reached (electric press)

(1) The T.D.C. input must always be Input 1 and, therefore, clamp X3.3.

Output terminal board (X4 and X17)

Outputs for 24VDC utilities. For inductive loads, such as valves and the relay coils, mounting a diode in parallel is necessary to prevent surges. All the X17 terminal board and output 8 of the X4 terminal board are optional.

Name	Terminal	Default
Output 0	X4.1	GOOD
0V	X4.2	Power supply ground
Output 1	X4.3	REJECTED 1
Output 8	X4.4	
Output 2	X4.5	GO
Output 3	X4.6	PROTECTION
Output 4	X4.7	
Output 5	X4.8	
Output 6	X4.9	
Output 7	X4.10	

Name	Terminal	Default
Output 9	X17.1	
Output 10	X17.2	
Output 11	X17.3	
Output 12	X17.4	
Output 13	X17.5	
Output 14	X17.6	

The function of each output may be set up. Each output can have one of the following functions:

Name	Default	Function
GOOD	0	Good piece signal Active after the return of the cylinder, until the following start.
REJECTED 1	1	Normal scrap signal
REJECTED 2	7	Special scrap signal
REJECTED AUTO-CHECK		Sample scrap signal used during self-test
GO	2	Press permission. Active after start, if the device is ready and turned off when the stop value is reached.
DOOR	3	Protection block command
BUZZER	4	Buzzer command.
TEST OUTPUT	6	Activation signal for TEST SIGNAL 1 See 2.3
CONTACT/BOOSTER		Piece contact signal and start of power phase. Note: this signal is only activated if the T.D.C. signal is absent
CHECK POINT OUT #		Output activated at a programmable portion (maximum 3 outputs)
PHASE BIT 0		Active during phase 2 and 4
PHASE BIT 1		Active during phase 3 and 4
MANUAL		Active when a job not included in the list of available jobs, is run
BRAKE		Output for shock absorber command
ENABLE RETURN	5	Consents the return of the active cylinder where a good piece is detected or after reset
ENABLE MANUAL		Command for mechanical press lever electric block
OPEN GREEN BOX		Command to open good piece basket
CLOSE PK TANK		Command to close the tank on PK model thrust units
BLOCK OF THE TABLE		Command to block the manual slide
PULL LEVER		Cylinder command to help cylinder return (for heavy tools)
RESET DRIVER		Driver reset fault (electric press)
ENABLE DRIVER		Enables driver (electric press)

Transducer terminal board (X12)

An incremental encoder, a potentiometer or an analog output encoder may be connected to the X12 terminal board.

On this terminal board, it is also possible to supply power to the transducers. The encoder requires a 12VDC (J3A*) or 5VDC (J3B) power supply voltage. The potentiometer requires a high-precision 10VDC supply voltage.

Name	Terminal	Description
Phase Z	X12.1:	Zero notch signal
Phase B	X12.2:	PHASE B signal
Phase A	X12.3:	PHASE A signal
+VDC	X12.4:	Power supply: J3A with 12V or 5V with J3B
0VDC:	X12.5:	Ground wire
AIN-	X12.6:	Negative analog input cable (for convenience, it can be grounded with J8
+10VDC	X12.7:	Analog transducer power supply
AIN+	X12.8:	Positive analog input cable

Electrical characteristics of a X12.4 terminal with J3A*

Output voltage	12V ±10%
Continuous output current	200mA
Protection	Current, Temperature

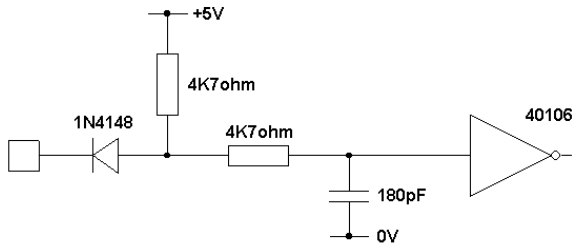
Electrical characteristics of a X12.4 terminal with J3B

Output voltage	5V ±10%
Continuous output current	200mA
Protection	Current, Temperature

Electrical characteristics of a X12.7 terminal

Output voltage	10V
Continuous output current	10mA
Protection	Current, Temperature

X12.1, X12.2 and X12.3 input terminal circuit



X12 analog input selection

	J4	J9	J11	J12
Input 0-10 V *	OPEN	IN	IN	OPEN
Input 0-5 V	OPEN	OPEN	IN	OPEN
Input 0-20 mA	IN	IN	IN	OPEN
Input 4-20 mA	IN	IN	OPEN	IN

** default*

Load cell terminal board (X11)

Input for resistive bridge load cell with a sensitivity of 2 mV/V, or 0-10V or 0-5V differential analog input. On this terminal board, the transducer power supply is also available.

Name	Terminal	Description	Gefran TU	AEP TC4
IN+	X11.1	Positive input	Yellow	Yellow
IN-	X11.2	Negative input	Red	White
0V	X11.3	Shielded cable sleeve	Stocking	Stocking
0V	X11.4	Power supply ground	Green	Black
+VDC	X11.5	J10A=10V J10B=5V	White	Red

Electrical characteristics of 10V voltage X11.5 terminal

Output voltage	10V ±10%
Continuous output current	60mA
Protection	Current, Temperature

Electrical characteristics of 5V voltage X11.5 terminal

Output voltage	5V ±10%
Continuous output current	100mA
Protection	Current, Temperature

X11 analog input selection

	J5	J6	J7	J10
2mV/V 10V load cell Compression operation *	A	A	OPEN	A
2mV/V 10V load cell Compression and Traction *	B	OPEN	OPEN	A
2mV/V 5V load cell Compression and Traction *	A	OPEN	OPEN	B
Input 0-10V	OPEN	B	IN	A
Input 0-5V	OPEN	B	OPEN	B

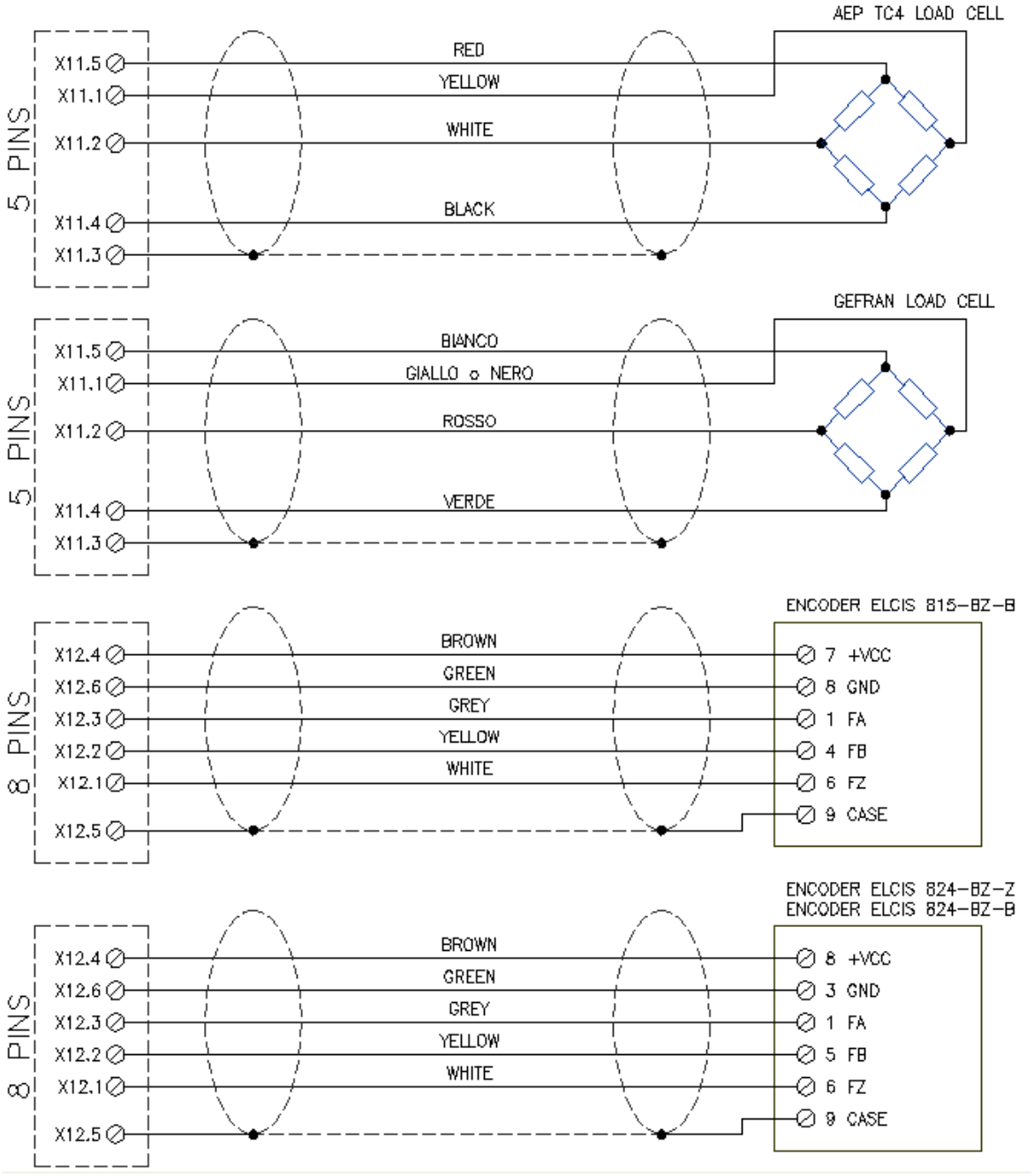
* *default*

Optional 422 encoder terminal (X18)

This terminal board is used to connect an encoder with 422 signals.

Name	Terminal	Description
0V	X18.1:	Signal reference Voltage
ENC_C-	X18.2:	Clock signal - towards servo drive CN5
ENC_C+	X18.3:	Direction signal + towards servo drive CN5
ENC_A-	X18.4:	Clock signal + towards servo drive CN5
ENC_A+	X18.5:	Analogue output 1
ENC_B+	X18.6:	Analogue output 2
ENC_B-	X18.7:	Signal reference Voltage
+VDC	X18.8:	Power supply: J3A with 12V or 5V with J3B
0VDC:	X18.9:	Sleeve

Typical transducer connection



Optional internal serial port terminal board (X23)

If an internal serial connection or a RS485 port must be used, it is possible to connect to the X15 terminal board via the D-Sub connector. *Press Right* automatically recognizes and selects the RS232 or RS485 port; however, two serial ports may not be used at the same time. The RS485 serial port can be used only to connect to a PLC.

Name	Terminal	Description
0V	X23.1	GND Serial Reference
A+485	X23.2	RS485 interface signal
B-485:	X23.3	RS485 interface signal

Optional analog output terminal board (X16)

On the X16 terminal board, there are two analog outputs. Analog output 1 can be used to operate a proportional valve to adjust the cylinder operating pressure.

Name	Terminal	Description
CLK+	X16.1	Do not connect
CLK-	X16.2	Do not connect
DIR+	X16.3	Do not connect
DIR-	X16.4	Do not connect
ANA2:	X16.5	Analogue output 2
ANA1:	X16.6	Analogue output 1
0V	X16.7	Signal reference Voltage

2 Particular functions

This chapter describes the particular functions of inputs and outputs.

2.1 Configure the job automatic selection

Press Right supports the automatic selection of jobs by combining inputs or via a bar-code scanner.

The selection via inputs may be useful to automatically recognize the piece or the tool mounted.

To enable the automatic selection of jobs, enter in the instrument the maximum number of selectable jobs and how to select them.

To do this, select from the menu `TOOLS > ADVANCED OPTIONS > MACHINE TYPE > CHANNEL PHASE JOBS` and change the value **Number of selectable jobs**; then, indicate the selection mode by changing the **Automatic Selection Code**.

After changing the configuration, the instrument will create the selected jobs, initially empty; to make an empty job available, use the command `JOB MANAGEMENT > CHANGE WORK` and press Enter on the desired job; then, choose the name of the work. The item `CREATE NEW JOB` in the `JOB MANAGEMENT` menu, allows the creation of extra jobs that can be used regardless of the automatically selected job; to create a extra job and use a job selected automatically, the unlock password is required.

2.1.1 Selection via inputs

When the selection is made via the inputs, the instrument changes the input status. The device ignores the job change command when the start signal is active.

The job number depends on the binary combination of inputs. The first job has a zero binary code, i.e. no active input. The maximum number of selectable jobs is 64 (with a binary code from 0 to 63), if sufficient inputs are available.

To enable the job selection must:

enter the maximum number of selectable jobs can in the **CHANNEL PHASE JOB** menu.

Define the function of the inputs used as **JOB SELECTOR**.

The wiring of the inputs leans on the X3 terminal board.

2.2 Connecting an external reset

When a deviation is detected, the instrument freezes, preventing the execution of other pieces. To resume operation, reset the scrap. To normally reset the scrap, use the front 

button. You can disable this button from the instrument configuration menu.

To reset the scrap, it is possible to use the RESET input.

2.3 Additional controls

Up to six additional controls can be connected to the instrument.

Three of them are used to start of the press while the other three are used to sort the good pieces from the scrap, or other consents to start.

The first three are called ENABLE, the second three are called TEST SIGNAL. Additional controls can be renamed from the instrument setup menu.

Additional controls may be excluded from each job.

The TEST SIGNAL 1 control may also be associated with a useful output signal to activate the control system.

To use additional controls, the instrument should be set up to select which inputs are connected to the signals.

After the input configuration, a name may be set for each of the six signals.

The enabling signals are checked when the START signal is activated: if an enabling signal is missing, the instrument displays the message "No enabling signal".

Test signals affect the good or scrap result: if a test signal is not activated, the piece is rejected.

The moment when the presence or absence of each test input is verified, may be individually set up.

The moment when the test signals are checked, can be selected in the job options. Note that only Test input 1 includes all the options.

at the start the signal is checked when the start input is activated
at the stop the signal is checked when the stop input is activated
at the end the signal is checked when the cylinder returns
at the quota the signal is checked at a certain quota
up to a quota the signal is checked from start to a certain quota
from a quota the signal is checked from a certain quota to a stop
continuous the signal is checked from start to stop
enabling the signal is used as a start enabling signal

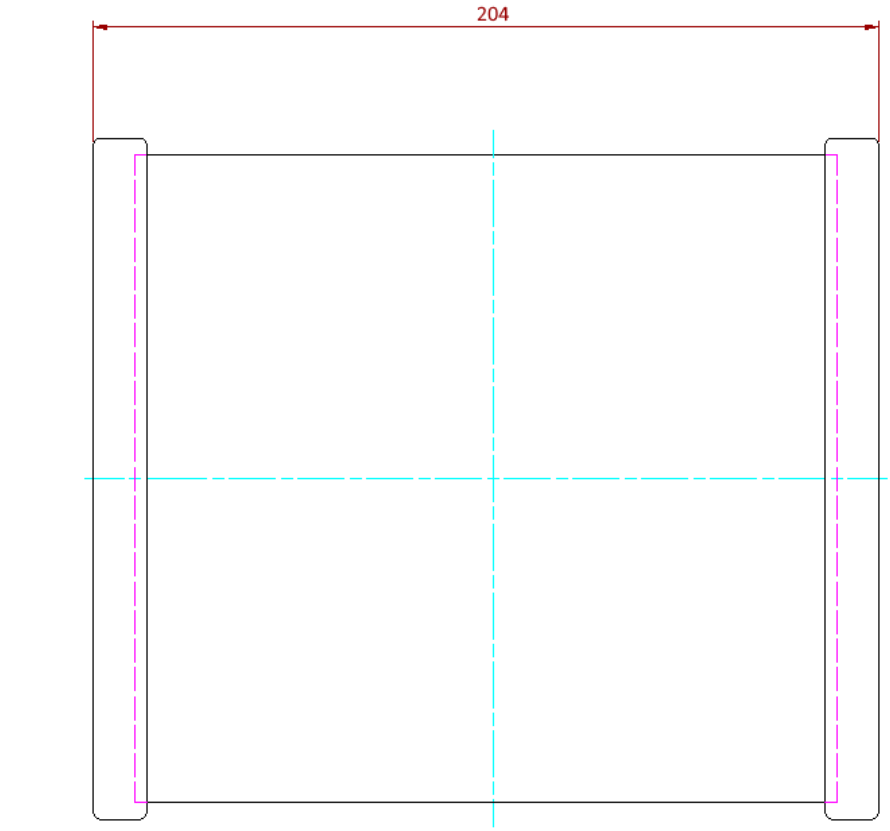
3 Instructions to install Press-Right

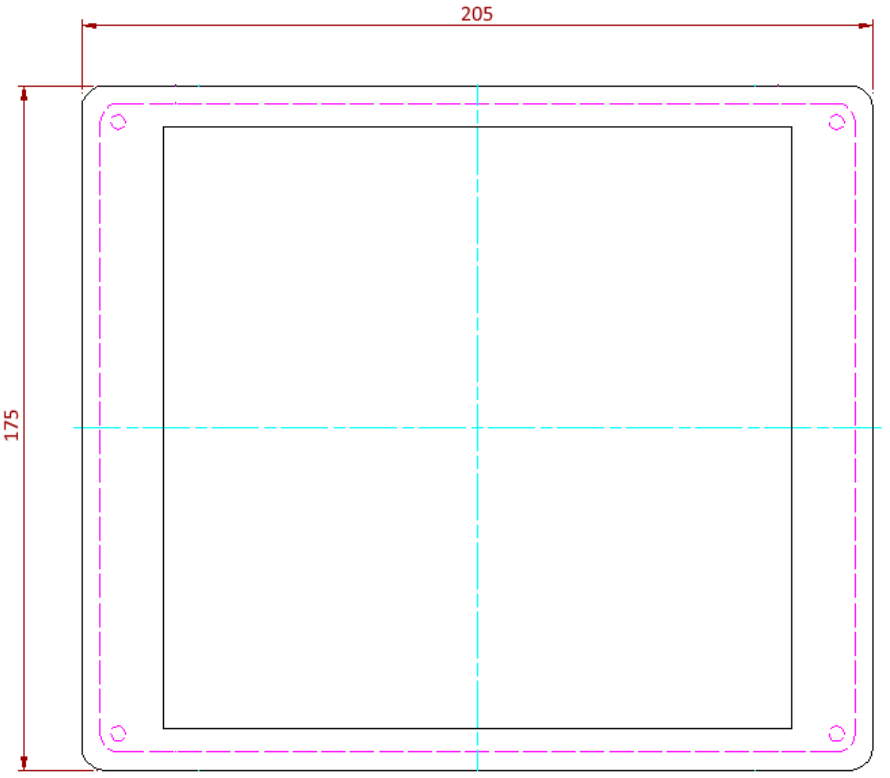
The Press-Right instrument is supplied in a metal case which can be attached to an support arm.

It is possible to request the version with pre-assembled support arm. The support arm can be rotated.

3.1 Dimensions

The overall dimensions of the cable glands and cables must be added to the depth indicated in the following drawing (about 55 mm).





3.2 Montaggio strumento

Always disconnect the instrument from the power supply before opening it.

Open the instrument by unscrewing the four screws at the corners of the front panel (Figure 2).

Figure 2

Remove the internal boards by a few centimeters (Figure 3). Then release the boards from the front panel.

Figure 3

Remove all the boards from the container and remove the terminal assemblies.

To fasten the instrument, it is possible to drill a hole on the sides or above or a central lower position of the container (first, remove all boards).

Mount conduits and plugs.

Insert the cables in the conduits and start wiring.

It is very important that the end of the unshielded load cell cable is as short as possible

Once the wiring is completed, mount the boards

Finally, mount the terminal assemblies, paying attention to mount them in the correct direction.

Make sure that the cables are not be pressed onto the bottom of the instrument.

Once the wiring is completed, it is possible to power the instrument and follow the steps below:

- Set up the instrument.
- Check the operation of inputs and outputs, using the commands from the **DIAGNOSTICS** menu.
- Calibrate the transducers.

4 Mounting the transducers

The figure shows that the encoder and the load cell must be mounted.