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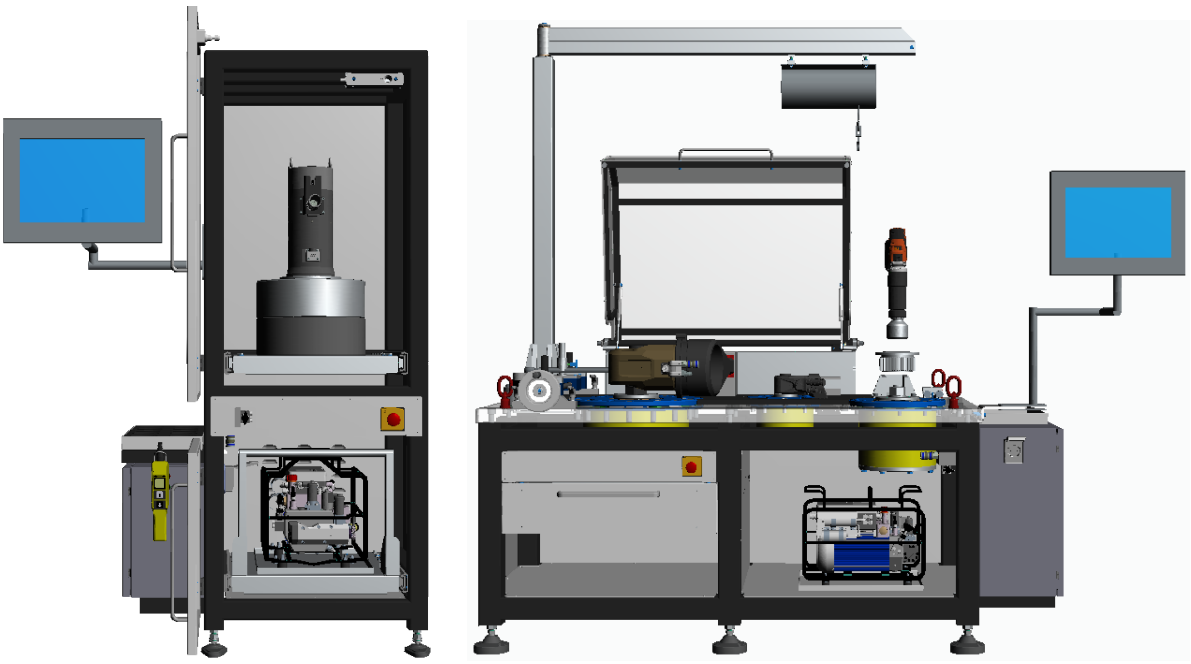
USE AND MAINTENANCE INSTRUCTION MANUAL

TORQUE WRENCH AND TENSIONER TEST BENCH
Model: PLARAD TEST BENCH



ORIGINAL INSTRUCTIONS
KEEP FOR FUTURE REFERENCE

CE

REVISION MATRIX

MANUAL	Revision	Date	Revision	Date	Revision	Date
Contents	0.0	24/04/2024				
Chapter 0	0.0	24/04/2024				
Chapter 1	0.0	24/04/2024				
Chapter 2	0.0	24/04/2024				
Chapter 3	0.0	24/04/2024				
Chapter 4	0.0	24/04/2024				
Chapter 5	0.0	24/04/2024				
Chapter 6	0.0	24/04/2024				
Chapter 7	0.0	24/04/2024				
Chapter 8	0.0	24/04/2024				
Chapter 9	0.0	24/04/2024				
Date	24/04/2024					
Signature						

The customer is responsible for ensuring that, if this document undergoes changes by the Manufacturer, only the updated versions of the Manual are actually kept at the points of use.

THE OFFICIAL LANGUAGE CHOSEN BY THE MANUFACTURER IS ITALIAN.
No responsibility is taken for translations, into other languages, that do not comply with the original meaning.

The Template of the Use and Maintenance Instruction Manual is structured in accordance with:

- Machinery Regulation (EU) 2023/1230
- Low Voltage Directive 2014/35/EU
- UNI EN ISO 12100:2010 General design principles - Risk assessment and risk reduction;
- UNI 10653:2003 Technical Documentation - Quality of product technical documentation;

- UNI 10893:2000 Technical product documentation - Instructions for Use - Articulation and display order of the content;
- EN IEC/IEEE 82079-1:2020 Preparation of information for use (instructions for use) of products - Part 1: Principles and general requirements;
- UNI/TS 11192:2006 Technical product documentation intended for the user - Criteria for classification.
- ISO 20607:2019 Safety of machinery Instruction handbook
- Any specific instructions must be inserted following the application and according to the indications of the type B/C technical standards, if provided.

CONTENTS

0 INTRODUCTION

0.1 PURPOSE OF USE AND MAINTENANCE INSTRUCTION MANUAL

This manual has been created to provide the user with general knowledge of the machine and to allow it to be used safely.
This Instruction Manual is an integral part of the machine and is intended to provide all the information necessary for:

0.1.1 the safe handling of the machine, packed and unpacked;
0.1.2 the correct installation of the machine;
0.1.3 knowledge of the technical specifications of the machine;
0.1.4 in-depth knowledge of its operation and limits;
0.1.5 an indication of the qualifications and specific training required of the operators and maintenance personnel of the machine;
0.1.6 in-depth knowledge of intended, unforeseen and unauthorised uses;
0.1.7 its correct use in safe conditions;
0.1.8 carrying out maintenance and repair operations in a correct and safe manner;
0.1.9 technical assistance and spare parts management;
0.1.10 the disposal of waste produced by the machine;
0.1.11 the disposal of the machine in safe conditions and in compliance with the regulations in force to protect the health of workers and the environment.

This document assumes that, in systems where the machine is intended to be used, the current occupational safety and hygiene regulations are observed.

The competent manager has the obligation, according to the regulations in force, to carefully read the contents of this Instruction Manual and to have it read to the operators and maintenance technicians in charge, for the parts for which they are responsible.

The instructions, documentation and drawings contained in this Manual are of a confidential technical nature, strictly owned by the Manufacturer, therefore, outside the purposes for which it was produced, any reproduction, whether complete or partial, of the contents and/or format, must take place with the prior consent of the Manufacturer.

0.2 RECIPIENTS

This Instruction Manual is intended for the installer, operator/user and qualified personnel authorised to use and service the machine.

The machine is intended for industrial use, reserved for qualified figures, experienced technicians, in particular who:

0.2.1 are 18 or over;

0.2.2 are physically and psychologically suitable to carry out work of particular technical difficulty;

0.2.3 have been properly instructed on the use and maintenance of the machine;

0.2.4 have been deemed suitable by the employer to carry out the task entrusted to them;

0.2.5 are able to understand and interpret the operator manual and safety requirements;

0.2.6 know the emergency procedures and their implementation;

0.2.7 have understood the operating procedures defined by the machine manufacturer.

The term QUALIFIED/SPECIALISED PERSONNEL means personnel who, following training and professional experience, have been expressly authorised to carry out the installation, use and maintenance of the machine.

0.3 STORAGE OF THE INSTRUCTION MANUAL

The Instruction Manual must be carefully stored and must accompany the machine in all changes of ownership that it may have in its life cycle.

Storage must be facilitated by handling it with care, with clean hands and not leaving it on dirty surfaces.

The parts must not be removed, torn or arbitrarily modified.

The Manual must be stored in an environment protected from moisture and heat and in the immediate vicinity of the machine to which it refers.

0.4 UPDATING THE INSTRUCTION MANUAL

The Manufacturer is solely responsible for the Instructions drawn up and validated by the same (Original Instructions); any translations MUST always be accompanied by the Original Instructions, in order to verify the correctness of the translation. In any case, the Manufacturer is not responsible for translations not approved by the Manufacturer itself, therefore if any inconsistency is noted, the original language should be considered and, if necessary, the Manufacturer's sales department should be contacted, who will make the changes deemed appropriate.

The Manufacturer reserves the right to make changes to the design, changes/improvements to the machine and updates to the Instruction Manual without prior notice to Customers.
However, in the event of modifications to the machine installed at the Customer's premises, agreed with the Manufacturer and involving the adaptation of one or more chapters of the Instruction Manual, it will be the responsibility of the Manufacturer to send the Customer the parts of the Instruction Manual affected by the modification, with the new global revised template thereof. It will be the responsibility of the Customer, following the instructions accompanying the updated documentation, to replace the parts that are no longer valid with the new ones in all the copies held.

0.5 HOW TO READ THE INSTRUCTION MANUAL

The Manual is divided into chapters, each of which is dedicated to a specific category of information and therefore addressed to operators for whom the relevant skills have been defined.
Terms, abbreviations and pictograms are used to facilitate the immediate comprehension of the text, the meaning of which is indicated in Paragraph 7.

GRAPHIC WARNINGS ON THE MANUAL

The following graphic warnings are used on the Manual Template:

Indicates a consultation to be carried out on the manual

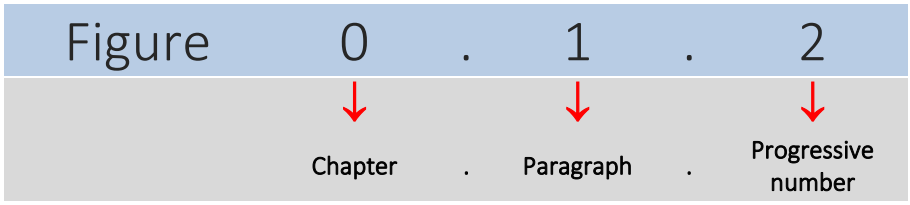
Indicates an important Recommendation to read in the manual

NUMBERING OF THE FIGURES

Each figure is numbered progressively.

The numbering is constructed as follows:

Example Figure 0.1.2



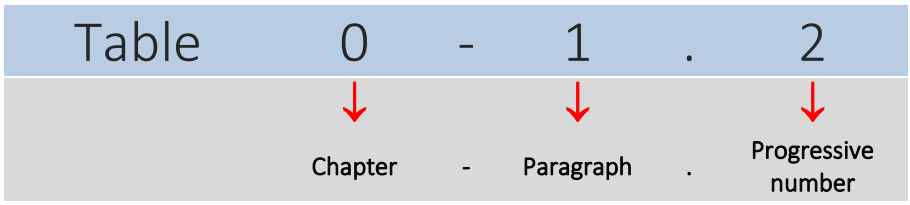
The progressive number restarts from 1 at every new paragraph.

NUMBERING OF THE TABLES

Each table is numbered progressively.

The numbering is constructed as follows:

Example Table 0-1.2



The progressive number restarts from 1 at every new paragraph.

ABBREVIATIONS

Chap. = Chapter

Par. = Paragraph

Sect. = Section

Pag. = Page

Fig. = Figure

Tab. = Table

UNIT OF MEASUREMENT

The units of measurement used are those provided for by the International System (**SI**).

Fundamental quantities	Unit of measurement	Symbol
Time range	second	s
Length	metre	m
Mass	kilogram	kg
Thermodynamic temperature	kelvin	K
Amount of substance	mole	mol
Electrical current intensity	ampere	A
Luminous intensity	Candela	cd
Temperature	celsius	°C

Tab.0.5.1

Mechanical quantities	Unit of measurement	Symbol	Conversion
Frequency	hertz	Hz	1 Hz = 1 s^{-1}
Force	newton	N	1 N = 1 kg m s^{-2}
Pressure	pascal	Pa	1 Pa = 1 N m^{-2}
Work, energy, amount of heat	joules	J	1 J = 1 N m
Power	watts	W	1 W = 1 J s^{-1}

Tab.0.5.2

0.6 DEFINITIONS

MACHINERY REGULATION (EU) 2023/1230 (Article 3 Definitions)

MANUFACTURER

Natural or legal person who designs and/or manufactures a machine or partly completed machine covered by this Directive, and is responsible for the conformity of the machine or partly completed machine with this Directive for the purpose of placing it on the market under its own name or trademark or for personal use. In the absence of a manufacturer as defined above, the natural or legal person who places on the market or puts into service a machine or partly completed machine covered by this Directive shall be considered to be the manufacturer.

PLACING ON THE MARKET

Firstly, a machine or partly completed machine shall be made available within the Community, for consideration or free of charge, for distribution or use.

COMMISSIONING

First use, in accordance with its intended purpose, within the Community of a machine covered by this Directive.

SAFETY COMPONENT

A component intended to perform a safety function, placed on the market separately,
whose failure and/or malfunction endangers the safety of people, and
which is not essential for the purpose for which the machine was designed or which for this function can be replaced with other components.

ANNEX III MACHINERY REGULATION (EU) 2023/1230 (PART A - Definitions)

HAZARD

A potential source of injury or damage to health.

DANGER ZONE

Any zone within and/or around machinery or a related product in which a person is subject to a risk to his or her health or safety.

EXPOSED PERSON

Any person wholly or partially in a danger zone.

OPERATOR

The person or persons installing, operating, adjusting, maintaining, cleaning, repairing or moving machinery.

RISK

Combination of the probability and the degree of an injury or damage to health that can arise in a hazardous situation.

GUARD

A part of machinery used specifically to provide protection by means of a physical barrier.

PROTECTIVE DEVICE

A device (other than a guard) which reduces the risk, either alone or in conjunction with a guard.

INTENDED USE

Use of machinery in accordance with the information provided in the instructions for use.

REASONABLY FORESEEABLE MISUSE

Use of machinery in a way not intended in the instructions for use, but which may result from readily predictable human behaviour.

RESIDUAL RISKS

Risks that remain despite the inherent safe design measures, safeguarding and complementary protective measures adopted.

OTHER DEFINITIONS

ROUTINE MAINTENANCE

Type of maintenance interventions during the life cycle, intended to:

a) maintain the original integrity of the asset;

b) maintain or restore the efficiency of the assets;

c) contain the normal degradation of use;

d) ensure the useful life of the asset;

e) deal with accidental events.

EXTRAORDINARY MAINTENANCE

Type of non-recurring and high-cost interventions, compared to the replacement value of the asset and the annual costs of routine maintenance thereof.

0.7 PICTOGRAMS

General information

Pictograms should be placed in locations where they are readily visible and legible for anyone approaching, allowing for prompt action to avoid the hazard.

Whenever possible, they should be placed in areas where they are unlikely to be damaged, scratched, or affected by chemical exposure, dust, or other factors that could obscure their visibility. The temperature range of use is from -40°C to +80°C as long as there is no uneven distribution of temperatures that adversely affects the thermal expansion of the material.

The surfaces on which the pictograms are applied must be clean, smooth, and free of fats, oils or chemical products that might interfere with their adhesion.

The standard requires that safety pictograms be regularly checked and cleaned to ensure they remain legible and easily understandable at a safe viewing distance. When the products are subjected to extreme environmental conditions or in any case when the safety pictograms no longer comply with the required visibility conditions, they must be replaced.

OPERATOR QUALIFICATION PICTOGRAMS

SYMBOL	DESCRIPTION
	Generic manual worker
	1st Level Machine operator
	Lifting and handling equipment operator
	Mechanical maintenance technician
	Electrical maintenance technician
	Manufacturer's technician

Tab.0.7.1

HAZARD PICTOGRAMS

SYMBOL	DESCRIPTION
	General hazard
	Limb crushing hazard
	Electrical current hazard

Tab.0.7.2

PICTOGRAMS RELATING TO PROHIBITIONS

SYMBOL	DESCRIPTION
	Do not remove the safety devices
	Do not repair or lubricate moving parts
	Do not touch

Tab.0.7.3

OBLIGATION PICTOGRAMS

SYMBOL	DESCRIPTION
	Read the instructions carefully
	Check that guards and protections are efficient
	Protective gloves must be worn
	Protective clothing must be worn

Tab.0.7.4

1. GENERAL INFORMATION

1.1 MANUFACTURER IDENTIFICATION DATA

MANUFACTURER	PLARAD ITALY
ADMINISTRATIVE REGISTERED OFFICE	Via Vecchia Chimica 10, 20070 Cerro al Lambro (MI) - Italy
TELEPHONE	+39 02 9832954
Fax	-
EMAIL	info@plaraditaly.it
CALL CENTER	+39 02 9832954
CONTACTS	info@plaraditaly.it
WEBSITE	www.plaraditaly.it

1.2 CE MARKING OF THE MACHINE

Every machine is identified by a CE plate on which the reference data thereof are indelibly marked. The position of the plate on the machine may vary from machine to machine.

For any communication with the manufacturer or service centres always mention these references.

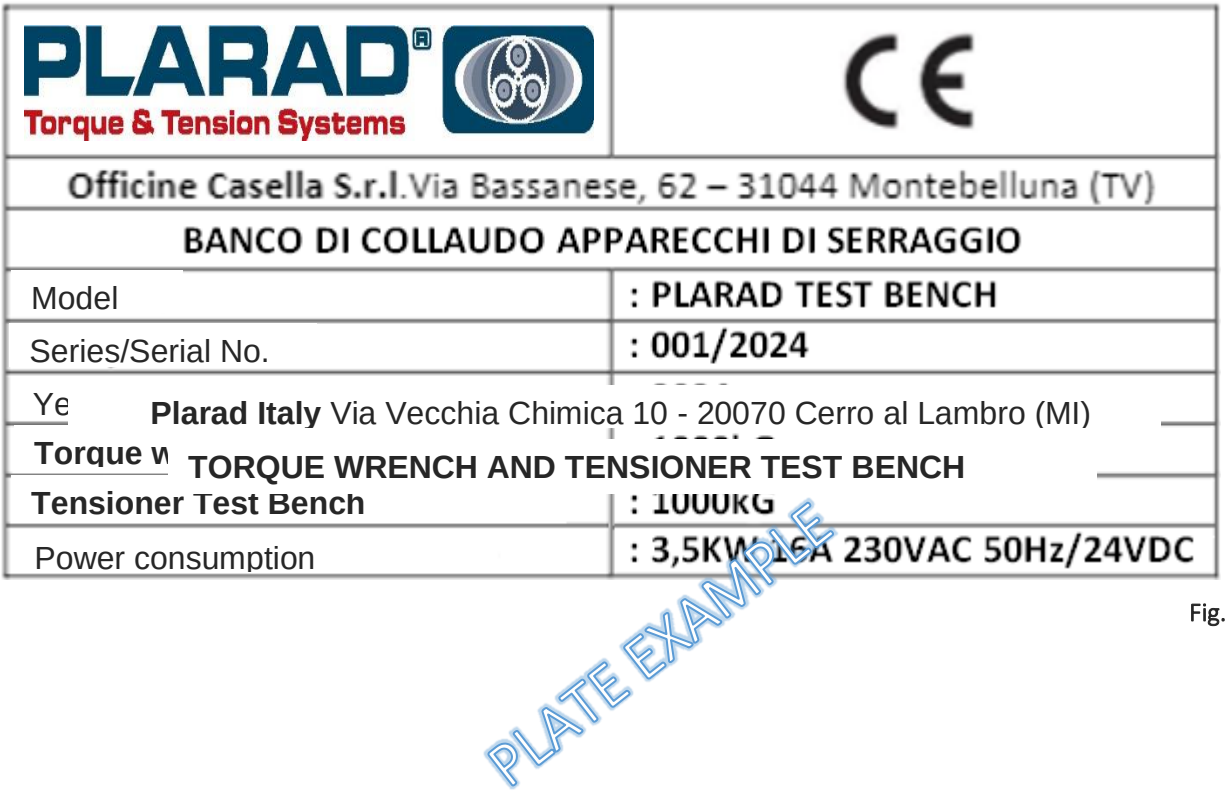


Fig.1.2.1

1.3 DECLARATIONS

EC DECLARATION OF CONFORMITY

(Annex II A MACHINERY REG. (EU) 2023/1230)

THE MANUFACTURER

PLARAD ITALY		
Company		
VIA VECCHIA CHIMICA 10	20070	MI
Address	*Postcode*	*Province*
CERRO AL LAMBRO		ITALY
City		*Status*

DECLARES THAT THE MACHINE

TORQUE WRENCH AND TENSIONER TEST BENCH	PLARAD TEST BENCH
Machine	*Model*
001-2024	2024
Serial No.	*Year of Manufacture*
TORQUE WRENCH AND TENSIONER TEST BENCH	
Trade name	
Manual	
Intended use	

COMPLIES WITH DIRECTIVES

Machinery Regulation (EU) 2023/1230 of the European Parliament and of the Council of 29 August 2023 on machinery and repealing Directive 2006/42/EC.

Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility.

References of harmonised standards

UNI EN ISO 12100:2010; UNI EN ISO 13849-1:2023; UNI EN ISO 13850:2015; UNI EN ISO 13855:2010; UNI EN ISO 13857:2020; UNI EN ISO 14119:2013; UNI EN ISO 14120:2015; CEI EN 60204-1:2018; UNI EN ISO 4413:2012.

Specific technical references:
Italian Legislative Decree 81-2008, Allex V

AND AUTHORISES

Andrea P.I. Da Riz		
Name and surname		
Via Gioz, 48	32100	BL
Address	*Postcode*	*Province*
Belluno	Italy	
City	*Country*	

TO SET UP THE TECHNICAL FILE ON ITS BEHALF

Place and date of the document
Cerro al Lambro (MI), __/__/2024

The manufacturer

DIRECTIVE	Title

(EU) 2023/1230	Directive of the European Parliament and of the Council of 29 June 2023 on machinery and repealing Directive 2006/42/EC.
2014/30/EU	Directive of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility.

PROHIBITION OF COMMISSIONING

The machine cannot be put into service after undergoing constructive modifications or integrations of other components not included in routine or extraordinary maintenance without being declared again in compliance with the requirements of the Machinery Regulation (EU) 2023/1230 and the applicable EC/EU Directives.

Place, date

Cerro al Lambro (MI), __/__/2024

The manufacturer

1.4 SAFETY REGULATIONS

The machine has been manufactured in accordance with the Technical Standards listed below.

STANDARD	Title
UNI EN ISO 12100 :2010	Safety of machinery - General design principles - Risk assessment and risk reduction
UNI EN ISO 13849 1:2023	Safety of machinery - safety-related parts of control systems part 1: general design principles
UNI EN ISO 13850:2015	Machine safety, emergency stop device
UNI EN ISO 13855:2010	Safety of machinery. Positioning of the protective equipment according to the approach speeds of parts of the human body.
UNI EN ISO 13857:2020	Safety of machinery. Safety distances to prevent access to hazard zones by upper and lower limbs.
UNI EN ISO 14119:2013	Safety of machinery - Interlocking devices associated with guards - Principles for design and selection
UNI EN 14120:2015	Safety of machinery. General requirements for the design and construction of fixed and movable guards.
IEC EN 60204 1:2018	Safety of machinery - Electrical equipment of machines Part 1: General rules.
UNI EN ISO 4413:2012	Hydraulic fluid power systems-general rules and safety requirements for systems and their components.

Tab.1.4.1

1.5 TECHNICAL SUPPORT INFORMATION

The Machines are covered by a warranty, as provided for in the general conditions of sale. If during the period of validity there are malfunctions or failures of parts of the machine, which fall within the cases indicated by the warranty, the Manufacturer, after the appropriate checks on the machine, will repair or replace defective parts.

Please note that modifications carried out by the user, without the explicit written authorisation of the manufacturer, void the warranty and release the manufacturer from any liability for damage caused by a defective product.

This applies in particular when the aforementioned changes are made to the safety devices, degrading their effectiveness. The same considerations apply when using non-original spare parts or spare parts other than those explicitly indicated by the manufacturer as “safety devices”.

We therefore advise our customers to consult our Support Service before carrying out the aforementioned operations on the machine.

Any defects obviously and visibly present at the time of delivery of the product (aesthetic defects on exposed parts, breakages, dents, malfunctions, missing parts, etc.) must be immediately reported to the company.

The Manufacturer is not liable for defects not reported by the customer at the time of delivery.

1.6 PROVISIONS FOR WHICH THE CUSTOMER IS RESPONSIBLE

Without prejudice to various contractual agreements, the Customer shall normally be responsible for the following:

1.6.1 arrangements of the premises, including any masonry works and/or ducting required;

1.6.2 power supply of the machine, in accordance with the Regulations in force in the country of use.

2 SAFETY

2.1 GENERAL SAFETY WARNINGS

Before operating the machine, carefully read the instructions contained in this Manual and carefully follow the instructions contained therein.

The manufacturer has made every effort to design this machine to make it as SAFE as possible.
Under this assumption, the machine has been equipped with all the protections and safety devices deemed necessary and accompanied by sufficient information to be able to be used safely and correctly.
To this end, for each human-machine interaction, when necessary, the following information has been indicated:

2.1.1 minimum operator qualification required;

2.1.2 number of operators needed;

2.1.3 status of the machine;

2.1.4 residual risks;

2.1.5 necessary or recommended personal protective equipment;

2.1.6 prevention of human error;

2.1.7 prohibitions/obligations relating to reasonably foreseeable misconduct.

In any case, it is essential to diligently follow the following instructions:

2.1.8 it is absolutely forbidden to operate the machine in automatic mode with the fixed guards disassembled;

2.1.9 it is absolutely forbidden to inhibit the safety devices installed on the machine;

2.1.10 operations with reduced safety must be carried out in strict compliance with the instructions provided in the relevant sections;

2.1.11 after a reduced safety operation, the state of the machine with active guards must be restored as soon as possible;

2.1.12 washing operations must be carried out with the electrical and pneumatic separation devices disconnected;

2.1.13 do not modify parts of the machine for any reason; in case of malfunction, due to failure to comply with the above, the manufacturer is not liable for the consequences. It is advisable to request any changes directly from the manufacturer.

2.1.14 place the machine according to the diagrams provided by the manufacturer, otherwise the latter shall not be liable for any problems;

2.1.15 avoid the use of clothes with handles that may remain attached to parts of the machine;

2.1.16 avoid wearing ties or other loose clothing;

2.1.17 In addition, when necessary, the Manual will specify further recommendations by the user on preventive measures, personal protective equipment, information aimed at preventing human errors and prohibitions relating to behaviour that is not permitted but reasonably foreseeable.

In any case, the user can appropriately supplement the information provided by the manufacturer with additional work instructions to contribute to the safe use of the machine, obviously not in contrast with what is reported in this Instruction Manual.

The manufacturer is exempt from any liability for damage caused by the machine to persons, animals or property in the event of:

2.1.18 use of the machine by inadequately trained personnel;

2.1.19 improper use of the machine;

2.1.20 defects in electrical, pneumatic or other neutral gas supply;

2.1.21 incorrect installation;

2.1.22 deficiencies in scheduled maintenance;

2.1.23 unauthorised modifications or interventions;

2.1.24 use of non-original or non-model-specific spare parts;

2.1.25 total or partial non-compliance with the instructions;

2.1.26 use contrary to specific national regulations;

2.1.27 disasters and exceptional events.

General requirements

Movable parts must always be used according to the manufacturer's instructions, as indicated in this Manual, which must always be available to the operator in the workplace.

All safety equipment placed on the moving parts to prevent accidents and safeguard safety cannot be modified or removed, but must be adequately safeguarded.

The user must promptly inform the employer or his or her direct superior about any defects or faults noted on the moving parts.

Checks and inspections

The checks must be carried out by an experienced person; they must be visual and functional, in order to guarantee the safety of the machine.

They include:

2.1.28 verification of all load-bearing structures, which must not present any cracks, breakage, damage, deformation, corrosion, wear or alteration with respect to the original characteristics;

2.1.29 verification of all mechanical parts;

2.1.30 verification of all the safety devices installed on the machine;

2.1.31 check of all connections with pins and screws;

2.1.32 functional verification of the machine;

2.1.33 checking the status of the machine;

2.1.34 verification of the tightness and efficiency of the pneumatic system.

The results of this verification must be reported on a relevant sheet.

In the event that the technician in charge of carrying out the check finds any cracks or dangerous faults, he or she must:

2.1.35 promptly notify the manufacturer of the machine.

2.1.36 put the machine out of service and carry out the appropriate checks and/or repairs.

2.1.37 make sure that there are no objects between the parts of the machine.

If any faults are detected, they must be eliminated before the machine is put back into operation, and the expert who performs the verification must make a note of the repair on the appropriate sheet, thus giving approval for the use of the machine.

Check that after any maintenance work no object remains between the moving parts.

If worn or defective parts are not promptly replaced, the manufacturer assumes no liability for any accidental damage that may result.

In order to guarantee maximum safety of the machine, it is however FORBIDDEN TO:

2.1.38 tamper with any parts of the machine;

2.1.39 leave the moving parts unattended;

2.1.40 use the machine operating but not in full efficiency;

2.1.41 modify the machine to change the originally established use, without the explicit authorisation of the Manufacturer or without assuming the full responsibility imposed by the Machinery Regulation (EU) 2023/1230;

2.1.42 move the moving parts with manual operations in the event of a power failure.

2.2 INTENDED USE

The machine was designed for testing the tightening equipment inserted into it.

Use of the machine is intended for a single operator who carries out the positioning of the equipment to be tested and the activation of the test cycle.

The machine has two testing stations:

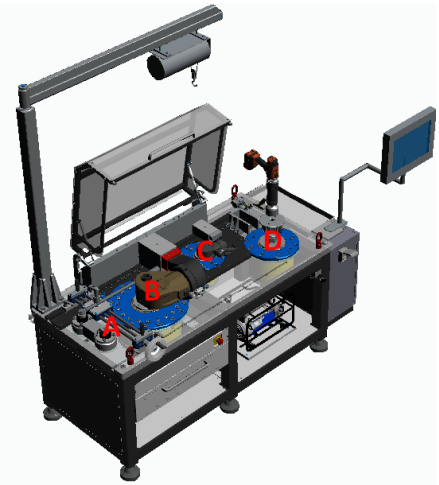


Fig.2.2.1

Tightening wrench testing station

The tightening wrench testing station has 4 testing stations for the different types of tightening wrenches.

The test, carried out with a single testing station, is carried out with the support of the bench software that determines the test method.

A. manual torque wrench testing station; the station provides for the positioning of the torque wrench on the fixing supports and the manual operation of the test force by means of the front handwheel.
B. hydraulic wrench testing station with a maximum force of 50kNm; the station provides for the positioning of the hydraulic wrench, the closure of the guard and the activation of the test through the hydraulic circuit of the station.
C. hydraulic wrench testing station with a maximum force of 5kNm; the station provides for the positioning of the hydraulic wrench, the closure of the guard and the activation of the test through the hydraulic circuit of the station.
D. Electric nutrunner testing station; the station provides for the positioning of the electric nutrunner on the fixing supports and the activation of the force by means of the nutrunner itself.

Tightening wrench testing station tensioner testing station

Tensioner testing station

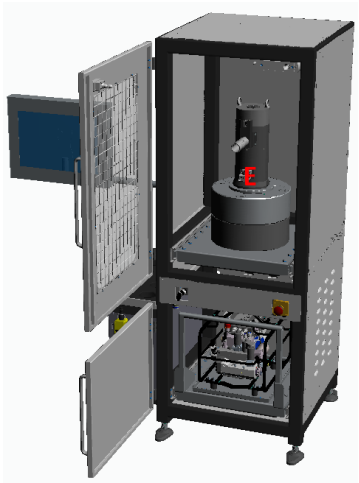


Fig.2.2.2

The tensioner testing station comprises a single testing station for tensioners. The test is carried out through the support of the bench software that determines the test method. B.

E. hydraulic tensioner testing station; the station provides for the positioning of the tensioner, the closure of the guard and the activation of the test through the hydraulic circuit of the station.

The use of products/materials other than those specified by the Manufacturer, which may cause damage to the machine and dangerous situations for the operator and/or persons close to the machine, is considered incorrect and improper.

2.3 CONTRAINDICATIONS FOR USE

The machine must not be used:

2.3.1 For the testing of products not expressly mentioned by the manufacturer;

2.3.2 for uses other than those established by the manufacturer, different from or not mentioned in this manual;

2.3.3 in an explosive atmosphere (ATEX not applicable), corrosive atmosphere or with a high concentration of dust or oily substances suspended in the air;

2.3.4 in an atmosphere where there is a fire risk;

2.3.5 exposed to the elements;

2.3.6 with safety devices excluded or not working;

2.3.7 with electrical jumpers and/or mechanical means that exclude users/parts of the machine itself.

2.4 HAZARD ZONES

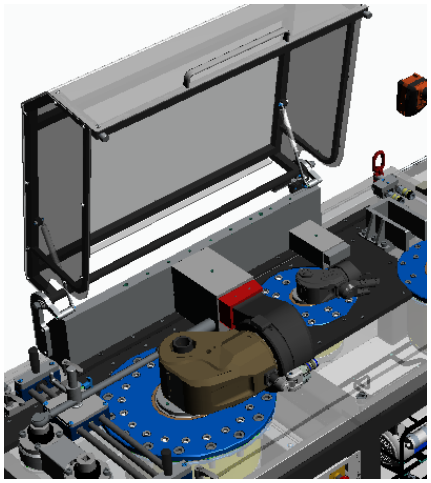


Fig.2.4.1

ZONE 1

Hydraulic wrench testing station area of the tightening wrench testing station.

Hydraulic wrenches are tested in the aforementioned area; the protection of the area involves positioning the wrench on the coupling panel and positioning the reaction arm on the support. Once positioned, the upper guard is closed to activate the test performed by the operator in the safe position using the movement activation command.

There is a possibility of crushing caused by the product being tested falling during the loading steps.

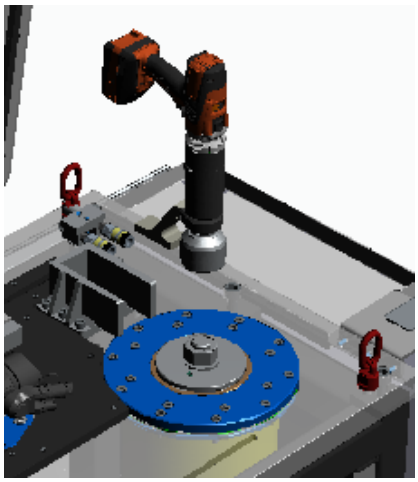


Fig.2.4.2

ZONE 2

Electric nutrunner testing station area of the tightening wrench testing station.

Electric nutrunners are tested in the aforementioned area; the protection of the area involves positioning the nutrunner on the coupling panel and positioning the reaction arm in the locking C-mount. Once positioned, the nutrunner is activated and the test is performed by the operator in the safe position.

There is a possibility of shock and crushing caused by the incorrect positioning of the reaction arm in the C-mount.

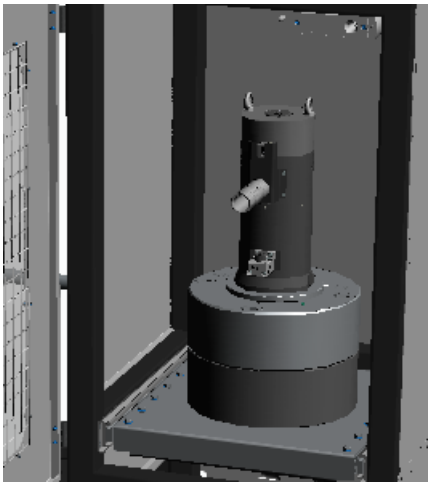


Fig.2.4.3

ZONE 3

Tensioner test area.

Hydraulic tensioners are tested in the aforementioned area; the protection of the area involves positioning the tensioner on the male coupling thread and positioning the tensioner on the support bench. Once positioned, the upper guard is closed to activate the test performed by the operator in the safe position using the movement activation command.

There is a possibility of crushing caused by the product being tested falling during the loading steps.

ZONE 4

Hydraulic systems of the tightening wrench testing station and tensioner testing station.

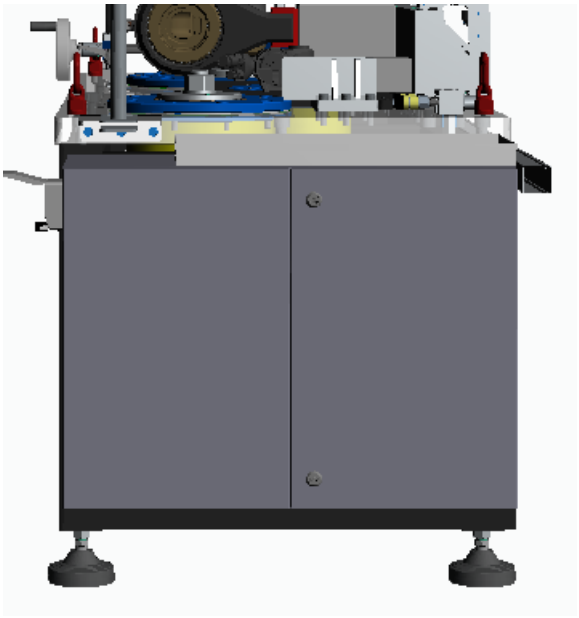
The two stations mentioned have two independent control units carried out in accordance with the requirements of the UNI EN ISO 4413:2012 standard.

The connection of the equipment to be tested is carried out through pipes equipped with quick couplings that prevent, when disconnected, the ejection of the fluid.

The activation of pressurisation is subject to the closure of the guards and is limited by the limit valves to protect the control units themselves.

There is a risk of contact with the ejected fluid in the event of rupture of the pipes or a component of the system.

Fig.2.4.4



ZONE 5

Main electrical panel

Electrical hazard due to direct contact.

The opening of the electrical panel is not possible with the internal equipment live; safety is ensured by the LOTO procedure which involves placing the main switch in position O and placing the padlock.

Any access to the active parts is prevented by the use of products with IP20 rating, protection from the entry of solid objects with a size greater than 12mm, and is possible by the electrical maintenance technician using special tools only if authorised.

Fig.2.4.5

ZONE 6

Product transfer area between wrench testing station and tensioner testing station.

The mentioned area is a manoeuvring area of the products to be tested.

For products to be handled weighing more than 15Kg, the lifting winch, positioned on the manoeuvring arm, should be used.

There is a possibility of crushing caused by the product being tested falling during the loading steps in case of incorrect connection to the hook of the winch itself.

Fig.2.4.6

LAYOUT OF HAZARD ZONES

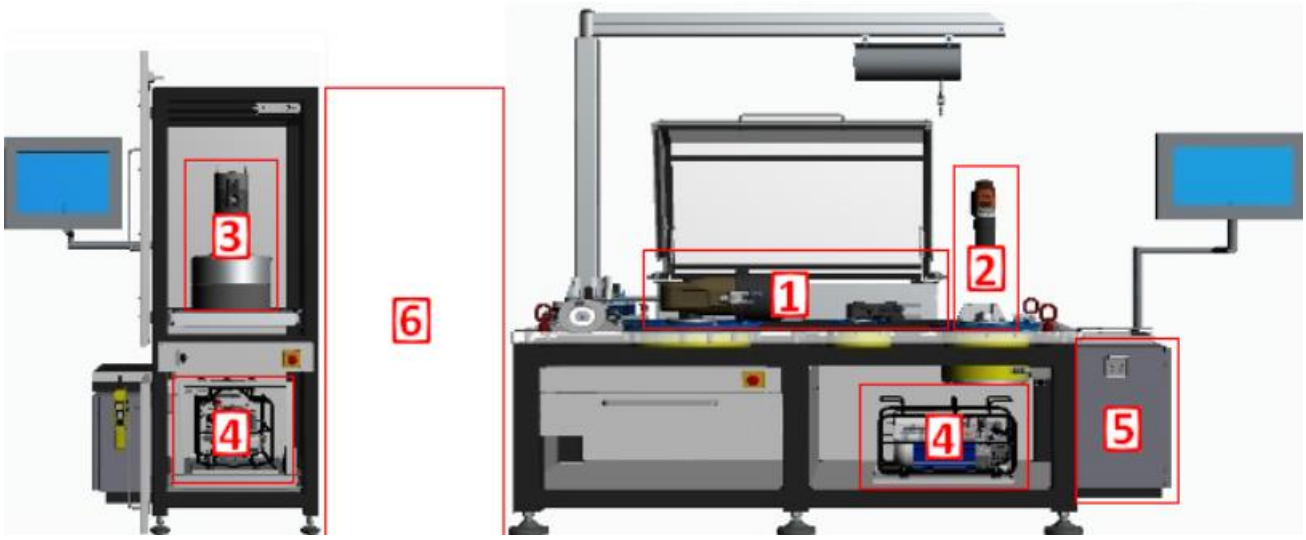


Fig.2.4.7

2.5 SAFETY DEVICES

The following safety devices are installed in the machine:

Emergency stop button:

The emergency stop buttons are placed on the testing stations.

Their action causes category 0 stoppage of the test bench.

Fig.2.5.1

Stat.layout	Description	Wiring diagram ref.	features

Fig.2.5.1.1	General emergency placed on wrench testing station	05S1	B10D=100000 cycles, in accordance with EN/IEC 60947-5-1 Appendix C;
Fig.2.5.1.2	General emergency at the tensioner testing station	05S2	B_{10d} = 100000 cycles, compliant with EN/IEC 60947-5-1 Appendix C

Fig.2.5.2

Safety modules;

Positioned in the general electrical panel, they check the safety equipment of the machine.

05K1 Pizzato type mod.CS-AR8 manages the activation of the emergency buttons

06K1 Pizzato type mod.CS-AR8 manages the mobile guard of the hydraulic tightening wrench testing station

07K1 Pizzato type mod.CS-AR8 manages the electric lock of the tensioner testing station

Stat.layout	Description	Wiring diagram ref.	features
Fig.2.5.2.1	Safety module emergency buttons	05K1	PL and Cat. 4 according to UNI EN ISO 13894-1 SIL CL 3 according to EN 60261 PFH_D 9.73 E-11 $MTTF_D$ 1547 years DC High
Fig.2.5.2.2	Safety sensor safety module	06K1	PL and Cat. 4 according to UNI EN ISO 13894-1 SIL CL 3 according to EN 60261 PFH_D 9.73 E-11 $MTTF_D$ 1547 years DC High
Fig.2.5.2.3	Electric lock safety module	07K1	PL and Cat. 4 according to UNI EN ISO 13894-1 SIL CL 3 according to EN 60261 PFH_D 9.73 E-11 $MTTF_D$ 1547 years DC High

Fig.2.5.3

High-encoded RFID sensor

Positioned on the movable guard of the hydraulic tightening wrench testing station, they prevent access to the confined area during pressurisation

The opening of the guard causes category 0 stoppage of the workstation and the de-pressurisation of the hydraulic system.

Type Pizzato mod.STDD310MKD1T

Stat.layout	Description	Wiring diagram ref.	features
Fig.2.5.3.1	Guard sensor 1	06S1	SILCL 3 according to IEC62061 PL and - Cat. 4 according to EN ISO 13849-1 PFH_D 1.20 E-11 $MTTF_D$ 4077 years DC high

Fig.2.5.4

RFID electric lock

Positioned on the mobile guard of the tensioner testing station, they prevent access to the confined area during pressurisation

The guard is opened after category 1 stoppage of the workstation and de-pressurisation of the hydraulic system.

Pizzato type mod.NSD4AZ1SMK-F41

Stat.layout	Description	Wiring diagram ref.	features
Fig.2.5.4.1	electric lock	07S1	SILCL 3 according to IEC62061 PL and - Cat. 4 according to EN ISO 13849-1 Actuator monitoring function locked PFH_D 1.23 E-09 $MTTF_D$ 2657 years DC high Dual channel actuator lock function command PFH_D 2.04 E-10 $MTTF_D$ 2254 years DC high

Fig.2.5.5

Contactors:

controlled by the safety modules, they intervene in case of activation of the safety devices on the machine controls.

06K2 activated by the safety module de-energises the motor of the hydraulic control unit of the wrench test bench and the power socket of the nutrunners

07k2 activated by the safety module de-energises the motor of the hydraulic control unit of the tensioner test bench

Stat.layout	Description	Wiring diagram ref.	features
Fig.2.5.5.1	Wrench testing station architecture contactor	06K2	B_{10d} = 20000000 cycles Contactor with mechanical load according to EN/ISO 13849-1
Fig.2.5.5.2	Tensioner testing station architecture contactor	07K2	B_{10D} = 20000000 cycles Contactor with mechanical load according to EN/ISO 13849-1

Fig.2.5.6

Safety elements on hydraulic power units,

Note: more technical specifications can be found in the use and maintenance manual of the Plarad control unit.

They protect the control unit from overpressure and cause the de-pressurisation of the hydraulic system.

Pressure regulating valve, it acts by mechanically reducing the pressure of the hydraulic system and limits the maximum allowable pressure.

Pressure relief solenoid valve, it determines the de-pressurisation of the hydraulic system when de-energised.

Stat.layout	Description	features
Fig.2.5.6.1	Pressure regulating valve	MTTFD 150 years hydraulic component cycles compliant with UNI EN ISO 4413 and UNI EN ISO 13849-1
Fig.2.5.6.2	Pressure relief solenoid valve	MTTFD 150 years hydraulic component cycles compliant with UNI EN ISO 4413 and UNI EN ISO 13849-1

2.6 SIGNAGE

The signs that must be installed near the machine and its work area are as follows:

HAZARD PICTOGRAMS

SYMBOL	DESCRIPTION
	General hazard
	Limb crushing hazard
	Electrical current hazard
	Danger of falling materials

Tab.2.6.1

PICTOGRAMS RELATING TO PROHIBITIONS

SYMBOL	DESCRIPTION
	Do not remove the safety devices
	Do not repair or lubricate moving parts

Tab.2.6.2

OBLIGATION PICTOGRAMS

SYMBOL	DESCRIPTION
	Read the instructions carefully
	Check that guards and protections are efficient
	Protective gloves must be worn
	Protective clothing must be worn
	Safety footwear must be worn
	Protective goggles must be worn
	It is mandatory to wear a protective helmet (mandatory when handling products with the winch)
	Tab.2.6.3

Tightening wrench testing station

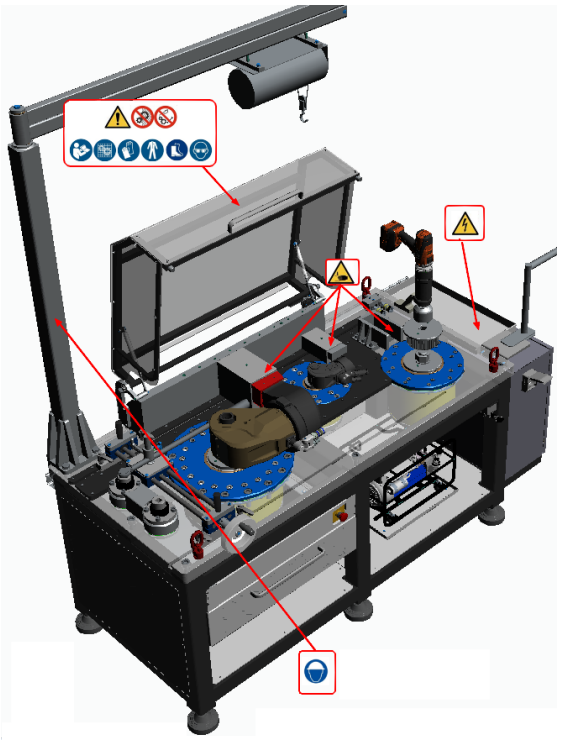


Fig.2.6.1

Tensioner testing station

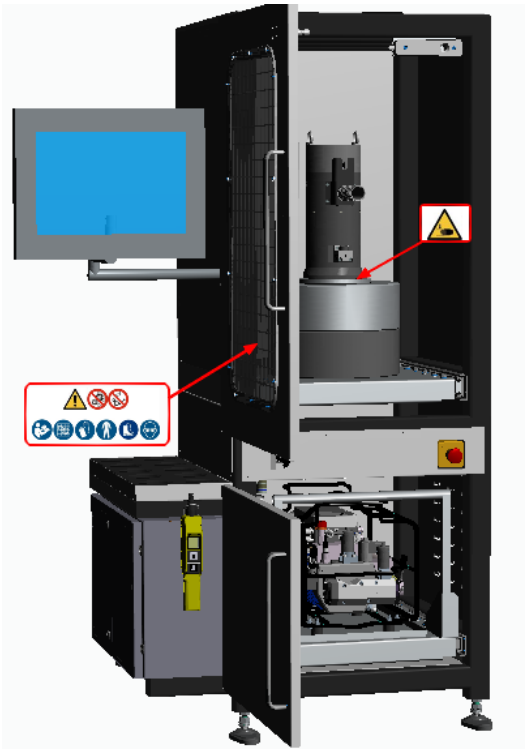


Fig.2.6.2

2.7 RESIDUAL RISKS

It is necessary to take note of the following residual risks that arise when using the machine and that cannot be eliminated.

	WARNING: ELECTRICAL HAZARDS FOR LIVE PARTS Operations on the general machine electrical panel must only be carried out by competent personnel, and in any case with the power supply device of the machine disconnected.
	WARNING: ELECTRICAL RISKS FOR RESIDUAL VOLTAGES See the notes in the description of the electrical equipment.
	WARNING: INSULATION FAILURE Protection against insulation failures must be part of the machine's power supply system and is not provided by the manufacturer.
	WARNING: FAULTY SAFETY DEVICE Do not use the machine for any reason if it is found that any safety device is not working perfectly. Immediately put the line out of service by locking the power supply disconnectors in the isolated circuit position. Only reactivate the machine when all the safety devices are again in perfect working order.
	WARNING: EJECTION OF PRESSURISED FLUIDS Operators must take care with the disconnection of components and hoses, voluntary or accidental, which may result in an ejection of the fluid and materials transported by it.

	Handle de-pressurised hydraulic system components before disassembling the components and pipes.
	WARNING: UNTIMELY RESTARTS Before carrying out any intervention, the operator must ensure that the machine cannot be inadvertently operated by disconnecting all power supplies; the disconnection of the machine's power supplies must be carried out with personal locking means - for example padlocks – and taking the opening wrenches with them. This means that power supplies can be restored only after all the operators have removed the personal locking means, that is, only after all the operators have finished the interventions. This is to prevent an operator from starting the machine without noticing the presence of another operator in the vicinity of hazardous elements.
	WARNING: PERSONAL PROTECTIVE EQUIPMENT Before proceeding with maintenance or adjustment operations, the operator must have available and from time to time use the personal protective equipment provided for by safety regulations and suitable for the type of maintenance to be carried out, such as gloves, goggles, helmet, non-slip shoes, etc.

	WARNING: RISK OF CRUSHING In the tightening wrench testing station, the pressurisation and movement generated by the hydraulic wrench is subject to the closure of the movable guard. There is a danger of crushing during the product loading steps in the event of the product falling. Make sure that a winch is used for wrenches weighing more than 15 Kg, with the appropriate PPE and adequate training.
	WARNING: RISK OF IMPACT In the tightening wrench testing station, the movement generated by the nutrunner is subject to the correct positioning of the reaction arm in the locking C-mount. There is a risk of impact in the event of incorrect positioning of the reaction arm. Ensure the use of appropriate PPE and adequate training.
	WARNING: RISK OF CRUSHING In the tensioner testing station, the pressurisation and movement generated by the tensioner is subject to the closure of the movable guard. There is a danger of crushing during the product loading steps in the event of the product falling. Make sure that a winch is used for tensioners weighing more than 15 Kg, with the appropriate PPE and adequate training.

2.8 RESIDUAL RISKS OF THE HYDRAULIC CONTROL UNIT

The hydraulic control units have residual risks listed in the use and maintenance manual thereof.

Below are the residual risks not resolved by the incorporation of the control unit in the hydraulic wrench test bench

	WARNING: RISK OF CONTACT BURNS Danger of burns due to high surface temperature or hydraulic oil temperature! When the ambient temperature is high and after prolonged operation, the hydraulic unit can reach surface temperatures of up to 80°C. When under pressure, the hydraulic oil heats up. Contact with hot surfaces or hot hydraulic oil can cause severe burns. Cool the hydraulic unit before contact with surfaces and wear personal protective equipment.
	WARNING: RISK OF CONTACT WITH HYDRAULIC OIL Contact with hydraulic oil may cause allergic reactions, skin and eye irritation, nausea and other consequences. ➢ Wear personal protective equipment for all work with hydraulic oil. ➢ Do not eat, drink or smoke in areas where hydraulic oil work is carried out. ➢ Properly clean or dispose of clothing and personal protective equipment contaminated with hydraulic oil immediately after completion of the work. ➢ Follow the safety data sheet of the hydraulic oil used.
	WARNING: RISK OF EXPOSURE TO NOISE The acoustic intensity of 89 dB(A) (3 dB(A) measurement uncertainty) present in the work area may cause hearing damage. As a general rule, wear hearing protection for work. Only stay in the hazard zone for as long as strictly necessary.

3 INSTALLATION

3.1 TRANSPORT AND HANDLING

The machine can be transported by a normal vehicle capable of supporting its weight and dimensions. It is recommended to always use vehicles capable of supporting the weight and size of the machine, in order to avoid damage to it and to people or surrounding things.

The machine can be transported using various forms of shipping (road, rail, ship, air) and must be properly positioned on the flatbed of the vehicle and sufficiently locked by ropes, cables or anchoring dowels, in order to avoid imbalances or damage to both the machine and the vehicle.

The machine must be transported by specialised companies who, with qualified personnel and suitable means, must ensure that the lifting, loading, transport and unloading operations are carried out in complete safety and in compliance with the laws and regulations in force.

The specialised company in charge of transport and/or handling, appointed by the end customer or user, must ensure that the minimum safety requirements reported are respected and possibly implemented, based on experience gained in the sector.

The same rules and the same minimum safety requirements also apply to specialised transport personnel, from the moment of unloading until placement at the installation site at the customer and/or end user's premises.

The machine is supplied packed and prepared for handling with a suitable means of transport identified by the supplier as a forklift lifting system.

The lifting of the machine must take place with all the movable guards closed and respecting the lifting points, indicated on the body of the machine, which consider the centre of gravity of the machine itself.

Having been supplied disassembled in two parts, the machine must be positioned in the place of use according to the layout provided by the manufacturer.

Tightening wrench testing station

Total weight 2000 Kg

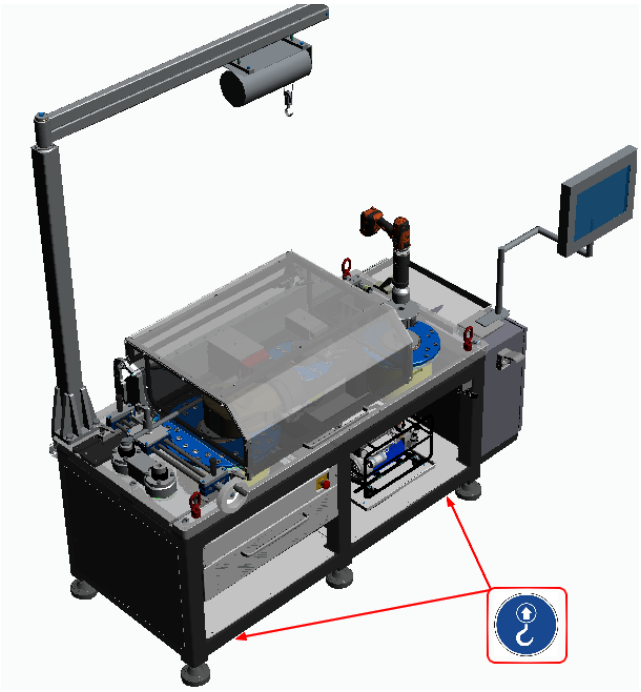


Fig.3.1.1

Tensioner testing station

Total weight 700 Kg

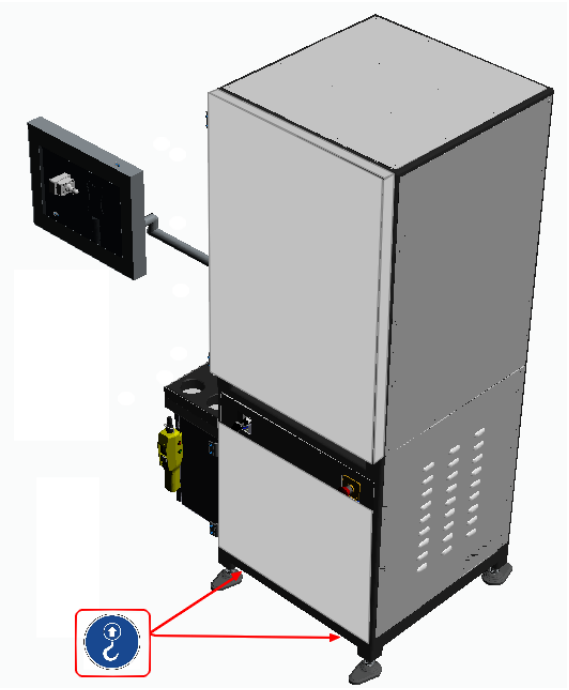


Fig.3.1.2

The persons authorised to move and place the machine must operate safely and be equipped with the appropriate personal protective equipment.

The Manufacturer is not liable for damage caused to animals and property due to the use of lifting systems other than those indicated.

3.2 STORAGE

In case of inactivity, the machine must be stored taking the following precautions:

3.2.1 store the machine in a closed place;

3.2.2 grease the unpainted parts;

3.2.3 protect the machine from impact and strain;

3.2.4 protect the machine from moisture;

3.2.5 prevent the machine from being subjected to extreme temperatures and protect it from high temperature variations;

3.2.6 prevent the machine from coming into contact with corrosive substances.

3.3 ARRANGEMENTS

Arrangements for installation

For installation, it is necessary to provide a manoeuvring area appropriate to the size of the machine and the chosen lifting equipment.

The preparation of the machine must be carried out in such a way as to optimise the ergonomics and safety of the workplace, leaving a sufficient area around it to allow easy use and handling of the material to be processed and for maintenance and adjustment operations.

Preparation of the electrical system

The connection to the electrical system that powers and combines the synchronisation with other machines must be carried out by specialised and qualified personnel in compliance with the wiring diagram and the provisions prescribed in the Laws and/or Technical Standards in force on safety in the workplace and on electrical systems.

To achieve an adequate level of safety, the customer must prepare, for the electrical system to which the machine pertains:

3.3.1 a grounding system according to the provisions of the user's country;

3.3.2 anything required for the correct implementation according to good engineering practice, based on the Laws and Technical Standards on safety in the workplace and on electrical systems.

These arrangements are always at the expense and under the full responsibility of the user.

The Manufacturer is not liable for damage to persons, animals and property caused by non-compliance with this provision.

3.4 ASSEMBLY

The machine is supplied assembled in its parts and it is possible to place it directly in its final location.

3.5 PLACEMENT

The machine was designed to be placed inside the plant.

The placement must be stable and level, as specified in Table 3.5.1.

the spacing between the two parts of the machine must comply with the instructions in this manual.

	Distances between measuring points in metres (m)				
	0,1 m	1 m	4 m	10 m	15 m
Maximum planarity deviation	2 mm	4 mm	10 mm	12 mm	15 mm

Tab.3.5.1

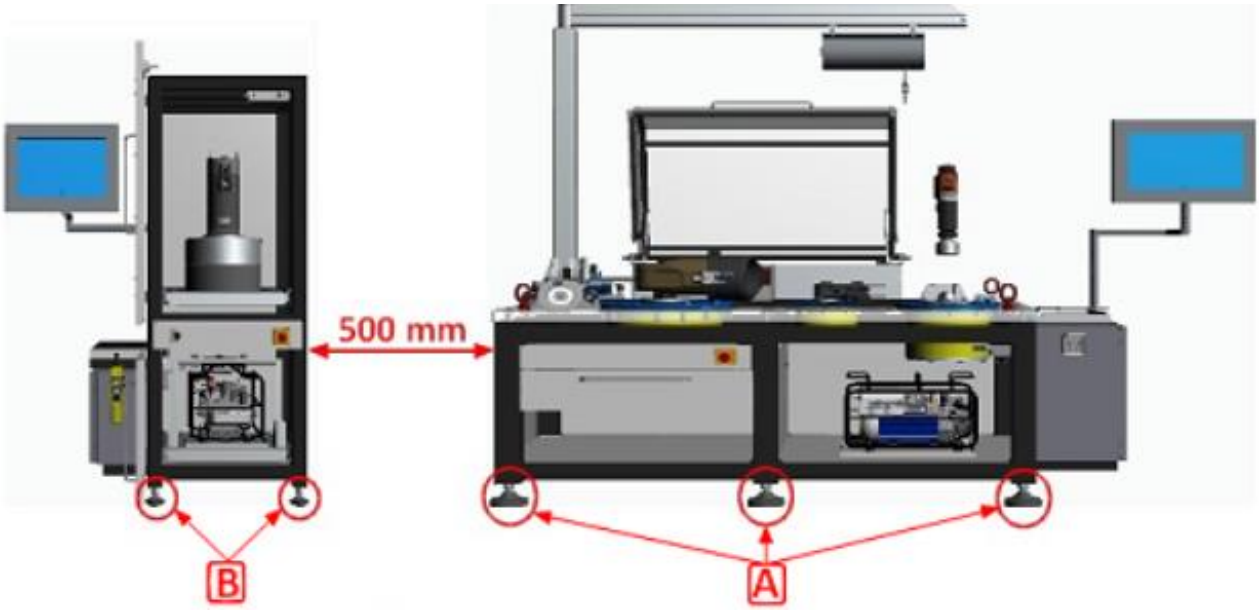


Fig.3.5.2

Once the machine is positioned in the final location, it must be properly levelled and fixed to the ground by means of the adjustment feet (A levelling feet of the tightening wrench testing station and B tensioner testing station) with which it is equipped.

Devices must not be put into operation without first being aligned!

Warning: Before commissioning, assemble all covers, screw fittings and safety devices according to requirements and check that they work! Without the protective devices fitted, the machine loses its CE conformity!

3.6 CONNECTIONS

The internal connections of the machine are carried out by qualified personnel appointed by the machine manufacturer.

In the event of displacement or relocation, it is necessary to proceed as indicated below.

Electrical connection **(In case of connection made by the customer)**

All work related to electrical installations must be carried out in accordance with national standards and directives.

The connections must be carried out following the attached wiring diagram and verifying the correct fixing of the terminals.

The connection to the company network must be carried out in compliance with the electrical characteristics of the machine.

THE USER MUST INSERT AN AUTOMATIC DISCONNECTING DEVICE TO INTERRUPT THE POWER SUPPLY LINE OF THE MACHINE'S ELECTRICAL EQUIPMENT.

THE CHARACTERISTICS OF THE DISCONNECTING DEVICE MUST BE AS FOLLOWS:

PERMANENT RATED CURRENT	**:16A (MINIMUM)**
RATED OPERATING VOLTAGE	**:230V (MINIMUM)**
MAGNETOTHERMAL CURVE	**: Type C**
MAXIMUM SHORT-CIRCUIT CURRENT	**:<10KA**

The electrical connection between the machine panel and the power supply line of the customer's electrical distribution must be carried out by personnel trained by the machine manufacturer.

3.7 PRELIMINARY CHECKS

Before starting up the machine, a series of checks and inspections must be carried out in order to prevent errors and accidents:

3.7.1 checking all security systems;

3.7.2 checking protections;

3.7.3 checking signage;

3.7.4 checking the correct connection of all external energy sources;

3.7.5 checking that the hydraulic connections are tight so as not to cause dangerous leaks;

3.7.6 checking that the machine has not been damaged during the assembly process;

3.7.7 checking, with particular care, the integrity of the electrical panels, control panels, electrical cables and pipes;

3.7.8 checking the free movement and free rotation of all moving parts.

3.8 PRELIMINARY ELECTRONIC ADJUSTMENTS OF THE TEST BENCH SETTING

Before starting operation, the mechanical and electronic settings must be checked.

Any mechanical, pneumatic and electronic tampering and failure to comply with the instructions included in this manual will immediately void the warranty and relieve the manufacturer of any civil and criminal liability for damage caused to the machine and people

ATTENTION: The test bench is supplied with electronic and mechanical adjustments set at the factory.

Any changes to the settings and calibrations must be carried out following the instructions in the manual and with the authorisation of the machine manufacturer who will validate the change made.

NOTE: THE PAGES NOT DESCRIBED IN THIS MANUAL CANNOT BE MODIFIED BY THE USER BUT EXCLUSIVELY BY THE MACHINE MANUFACTURER.

Electronic adjustments are made via the operator panel installed near the workstation.

A. Tightening wrench testing station operator panel
B. Tensioner control panel

Access to the setting pages is possible by the manufacturer and the administrator by entering a Password.

Operator action stations for changes in electronic settings

Fig.3.8.1

ELECTRONIC ADJUSTMENTS OF THE TEST BENCH

From the main page, access the SETTINGS page by pressing the button  and entering the USER name and PASSWORD.

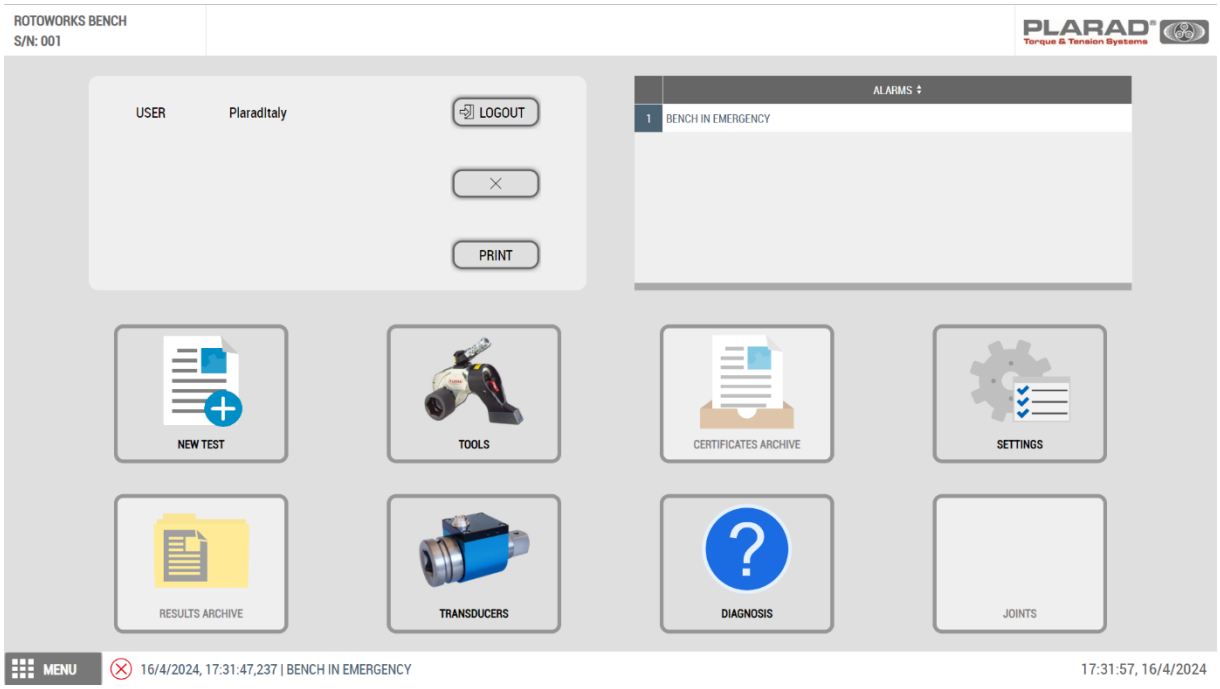


Fig.3.8.2

Access to the setting pages allows you to view the subpages.

By pressing the button 

you can access the page for changing the general data of the test bench and setting the references of the user carrying out the tests and issue certificates.

Changing the data on the page allows you to view, in the certificates issued by the test bench, the data of the company carrying out the test, with the company references and the references of the person carrying out the test.

The page displays the conditions of use of the bench, set by the manufacturer, and the abbreviations of the products tested.

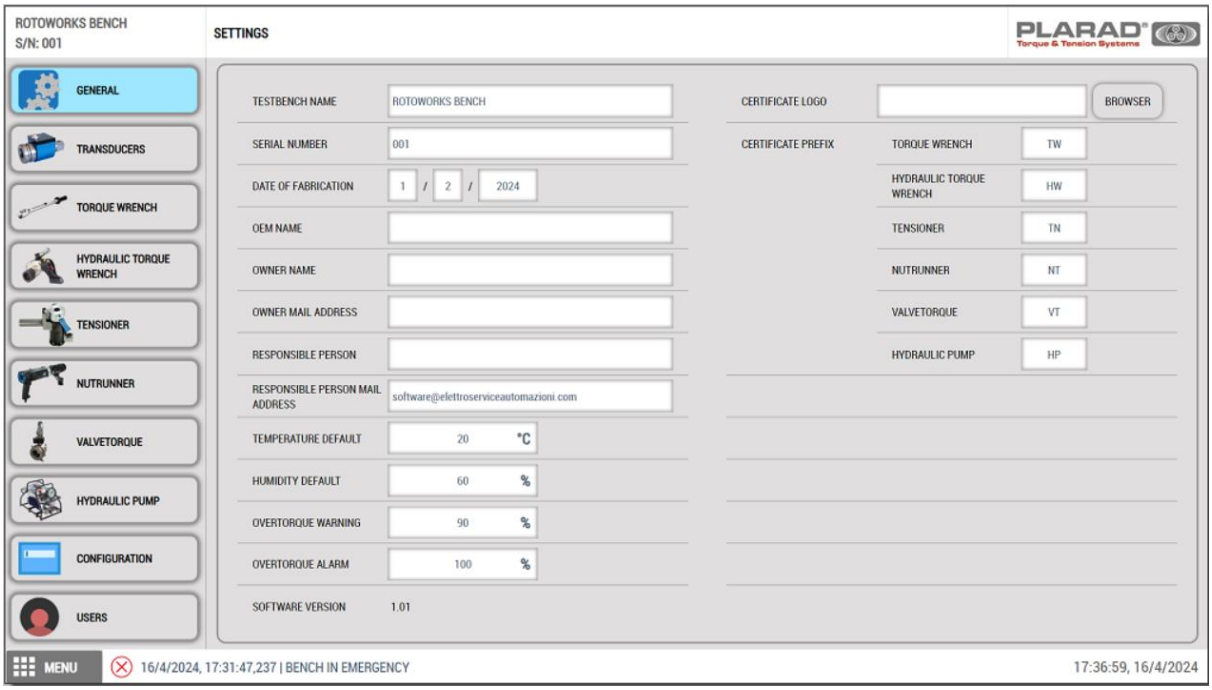


Fig.3.8.3

Press the button 

to access the setting page of the manual torque wrench testing station.

The tolerances of reference values of the product test are changed on this page:

CHECK FIRST PEAK; allows you to set the reference point of the maximum torque set on the wrench. The percentage set determines the reference point, during the unloading of the wrench, of the torque after reaching the peak.

THRESHOLD FOR MEASURE START; determines, by means of a percentage value, the minimum torque measured by the test bench during the start of the test.

WAIT TIME BEFORE NEXT MEASURE; determines the minimum waiting time in order to carry out a new reference test of the set torque.

WAIT TIME BEFORE NEXT SEQUENCE; determines the minimum waiting time in order to carry out a new test with variation of the torque to be measured.

RESOLUTION; allows you to determine the torque measurement class and determine the reading tolerance.

FILTER; allows you to set the tolerances required by the UNI EN ISO 6789-1/2017 standard; the settings can be viewed on the right of the page.

⚠ WARNING: THE MANUFACTURER IS NOT RESPONSIBLE FOR INCORRECT CHANGES TO THE PARAMETERS

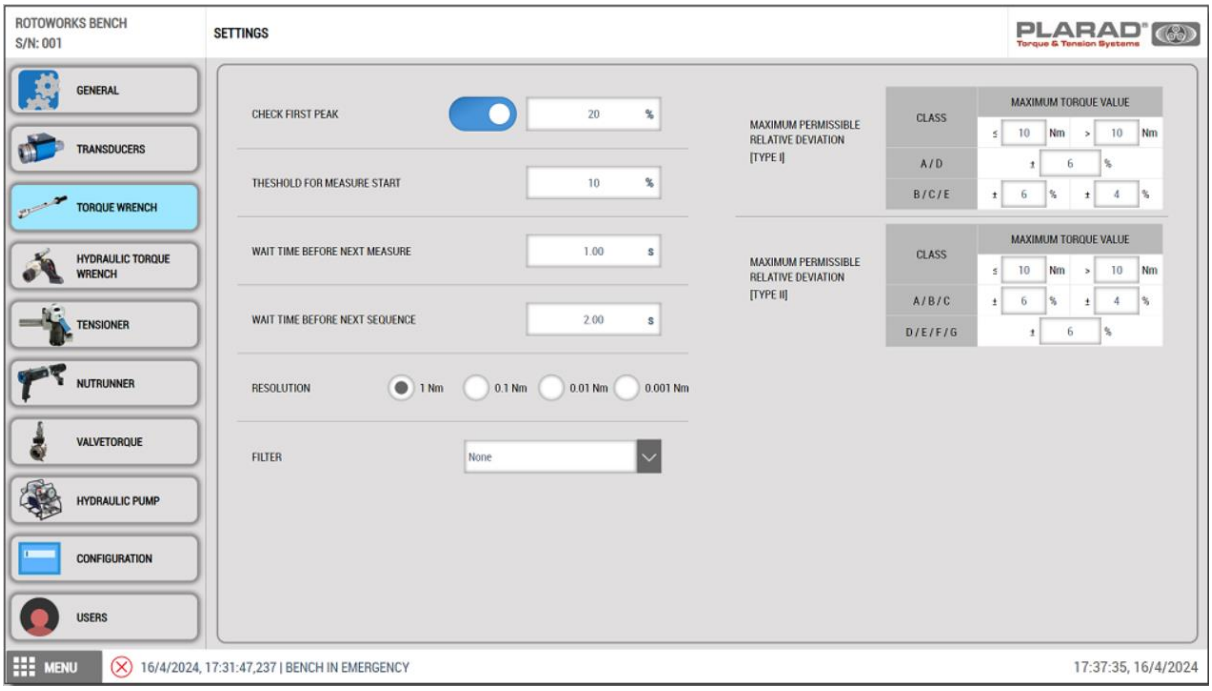
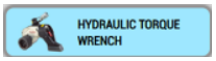


Fig.3.8.4

Pressing the 

button provides access to the hydraulic wrench testing station setting page.

The tolerances of reference values of the product test are changed on this page:

SAFETY MAXIMUM TORQUE; allows you to set the maximum torque applicable to the wrench beyond which the bench sends out a system alarm and stops the test.

TORQUE ACCEPTING TOLLERANCE; determines the reference torque tolerance during the test.

TIME ACCEPTING TOLLERANCE; determines the minimum torque reference time applied by the wrench.

AUTOMATIC ACCEPT; determines whether the bench performs the torque value acquisition automatically or if it needs confirmation from the operator carrying out the test.

RESOLUTION; allows you to determine the torque measurement class and determine the reading tolerance.

FILTER; allows you to set the tolerances required by the UNI EN ISO 6789-1/2017 standard; the settings can be viewed on the right of the page.

⚠ WARNING: THE MANUFACTURER IS NOT RESPONSIBLE FOR INCORRECT CHANGES TO THE PARAMETERS

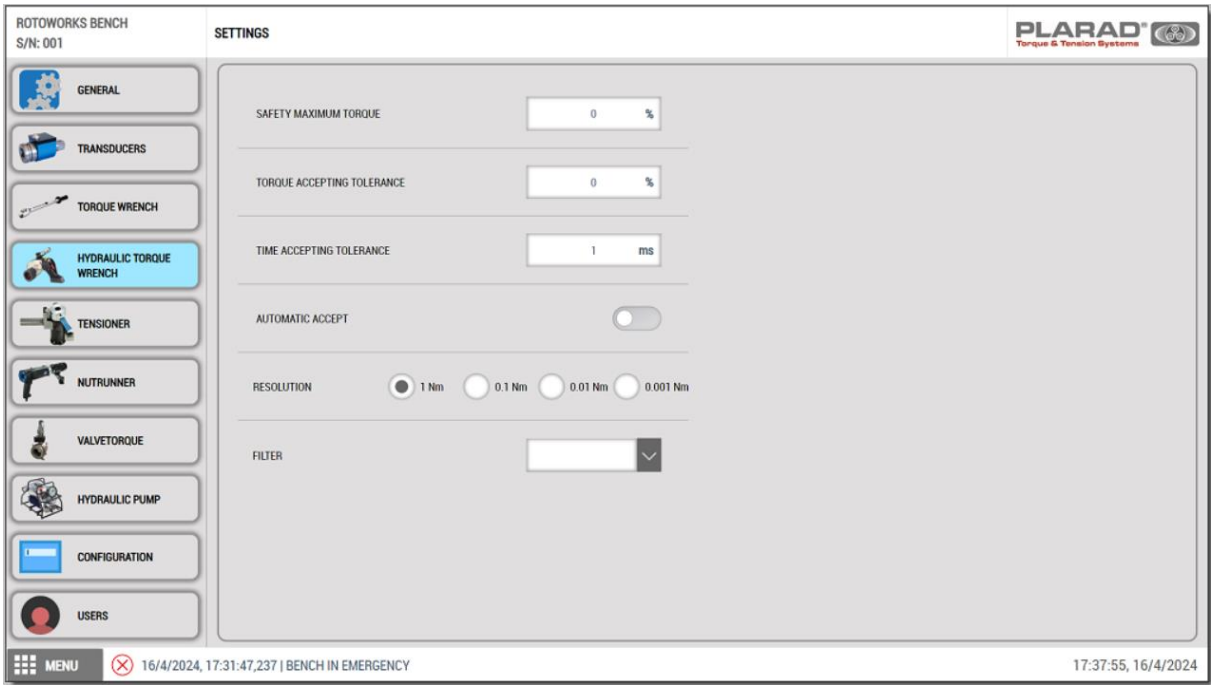


Fig.3.8.5

Pressing the 

button provides access to the tensioner testing station setting page.

The tolerances of reference values of the product test are changed on this page:

$(\Delta\ \boldsymbol{LOAD}\ /\ \Delta\boldsymbol{PRESSURE})\boldsymbol{MAX}$; allows you to vary the percentage value of deviation between torque application, based on the pressure, during the test to determine the possible incorrect coupling or breakage of the coupling system.

RESOLUTION; allows you to determine the torque measurement class and determine the reading tolerance.

LOAD LIMIT; allows you to set the maximum applicable load based on the diameter of the thread and the class of the thread installed. The tie rods supplied by the manufacturer are in CLASS: 12:9 and the machine is set by default for this value.

⚠ WARNING: THE MANUFACTURER IS NOT RESPONSIBLE FOR INCORRECT CHANGES TO THE PARAMETERS

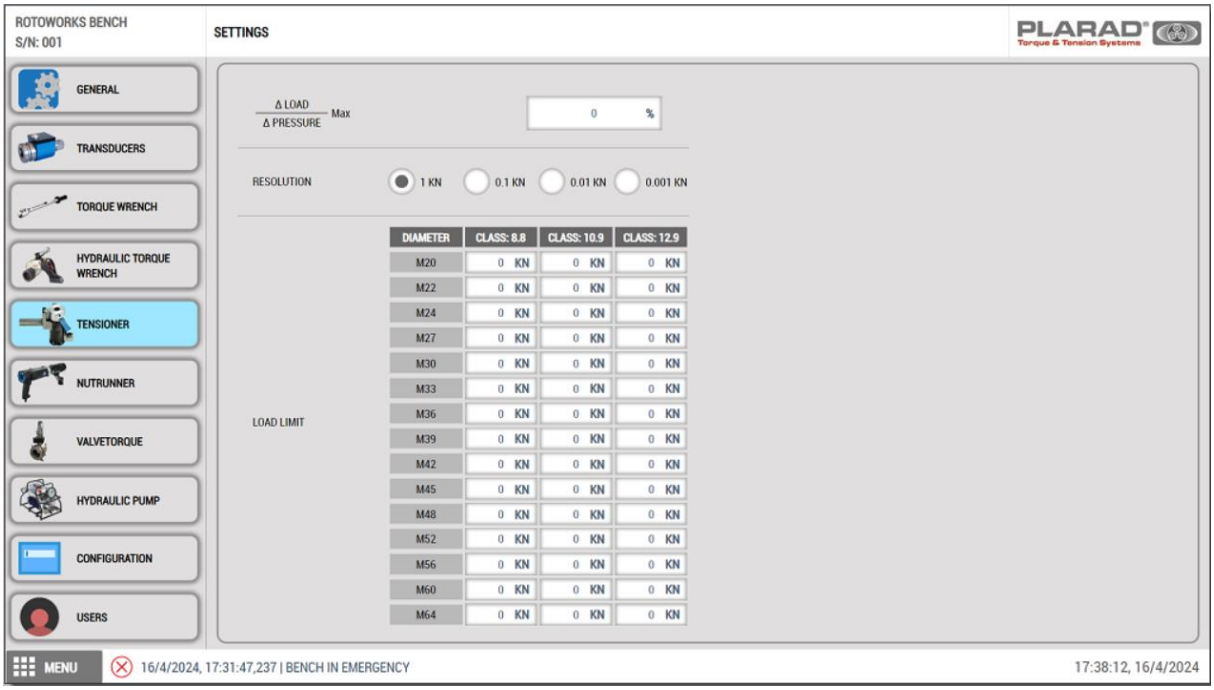


Fig.3.8.6

3.9 PRELIMINARY ELECTRONIC ADJUSTMENTS FOR ENTERING NEW EQUIPMENT

ELECTRONIC ADJUSTMENTS OF THE TEST BENCH FOR ENTERING NEW EQUIPMENT

From the main page, access the TOOLS page by pressing the button  and entering the USER name and PASSWORD.

⚠ WARNING: THE MANUFACTURER IS NOT RESPONSIBLE FOR INCORRECT CHANGES TO THE PARAMETERS

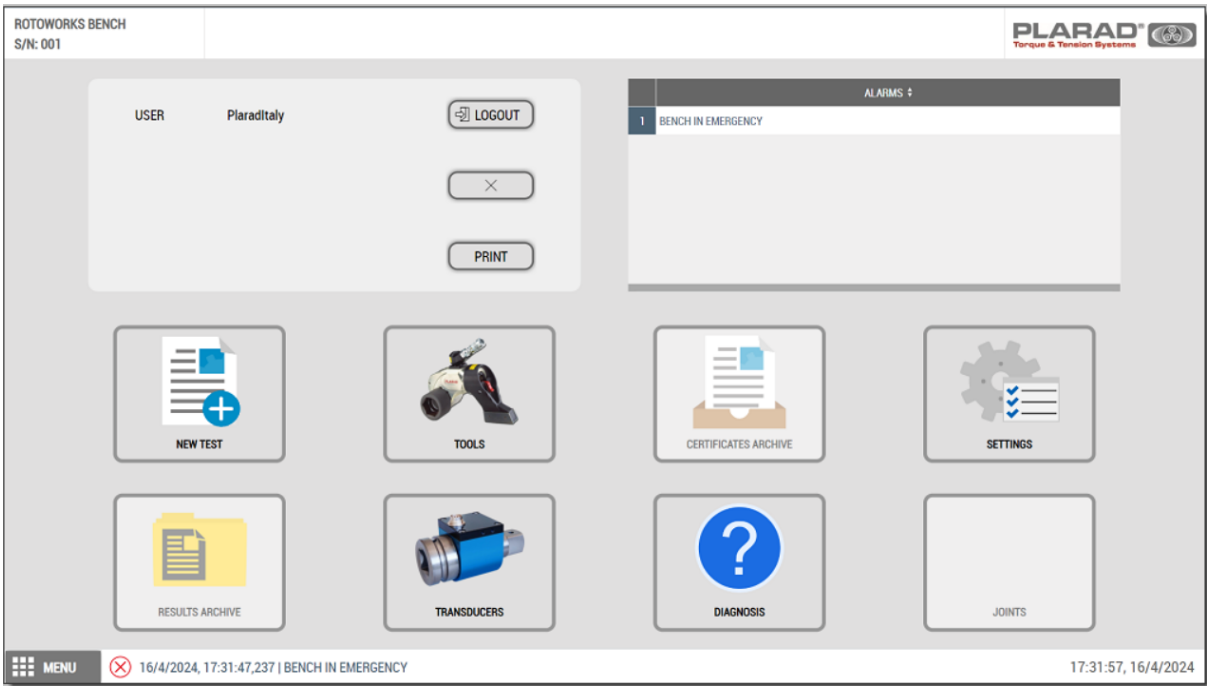


Fig.3.8.7

The list of equipment (TOOLS) entered in the archive is displayed on the page.

From this page you can select:

NEW TOOL which lets you enter new equipment (TOOL).

EDIT TOOL which lets you change the data of entered equipment (TOOL).

DELETE TOOL which lets you delete data of entered equipment (TOOL).

Fig.3.8.8

You can press the buttons NEW TOOL or EDIT TOOL to access the data entry/variation page of the TOOLS.

On this page, you can change the following parameters:

TYPE; identifies the type of equipment to be tested.

TOOL NAME; allows you to enter the identification allocated to the equipment.

DESCRIPTION; allows you to enter the description of the equipment.

SERIAL NUMBER; allows you to enter the serial number of the equipment.

MANUFACTURER; allows you to enter the data of the manufacturer of the equipment.

MODEL; allows you to enter the model of the equipment.

TORQUE RANGE; defines the minimum and maximum torque exerted by the equipment.

UNITS; allows you to enter the unit of measurement of the torque exerted.

TYPE; defines the type of equipment to be tested NOTE: check if defined by the equipment.

CLASS; defines the accuracy class of the bench measurement.

CALIBRATION INTERVAL; defines the test deadline and the interval for a subsequent test.

TRANSDUCER; assigns the transducer that performs the test.

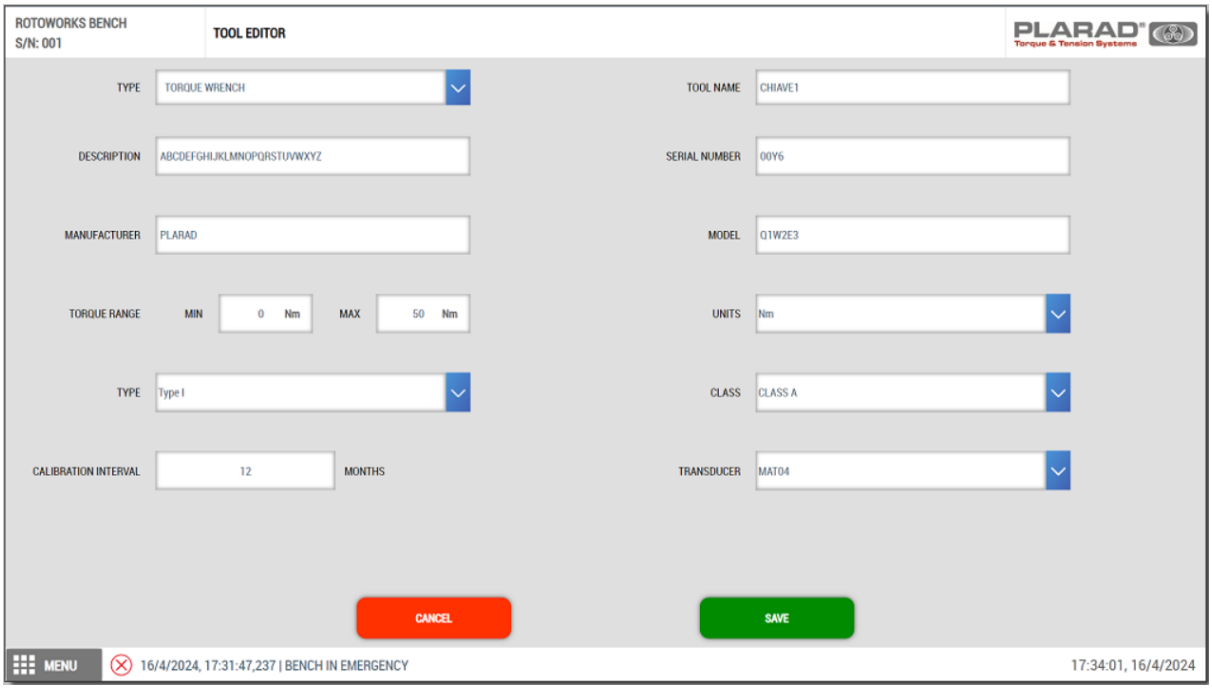


Fig.3.8.9

3.10 PRELIMINARY ELECTRONIC ADJUSTMENTS FOR ENTERING NEW TRANSDUCERS

ELECTRONIC ADJUSTMENTS OF THE TEST BENCH FOR ENTERING NEW TRANSDUCERS

From the main page, access the TOOLS page by pressing the button  and entering the USER name and PASSWORD.

⚠ WARNING: THE MANUFACTURER IS NOT RESPONSIBLE FOR INCORRECT CHANGES TO THE PARAMETERS

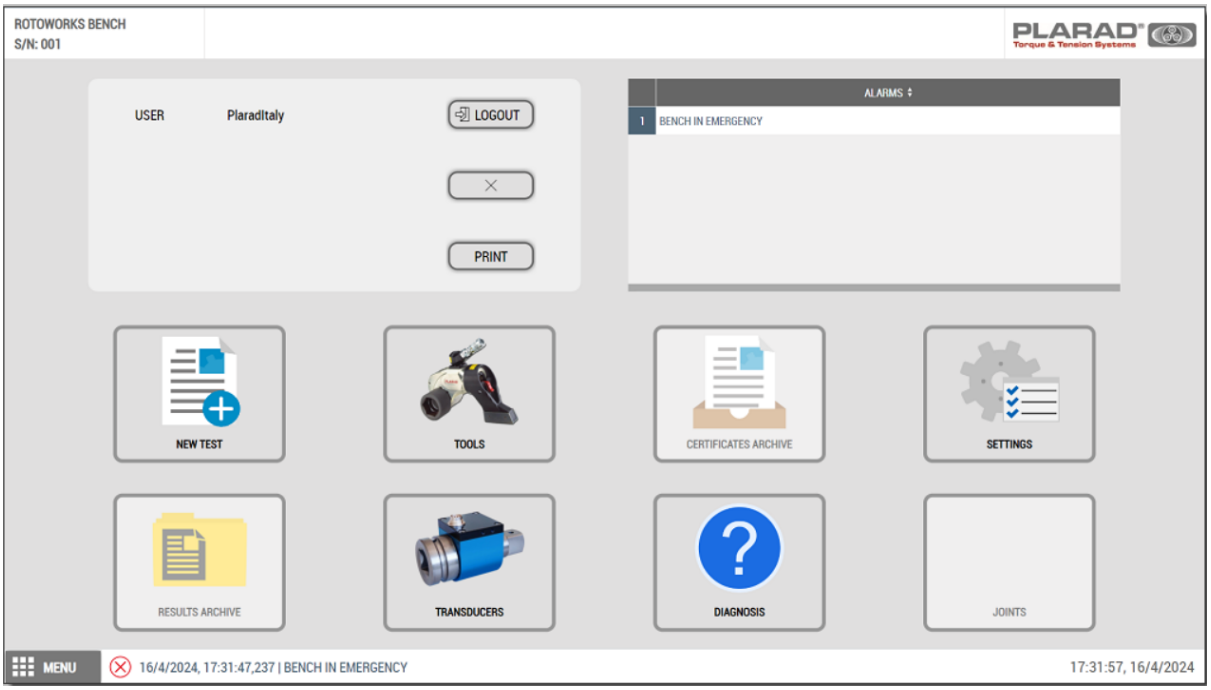


Fig.3.8.10

This page displays the list of measurement transducers (TRANSDUCER) entered in the archive.

From this page you can select:

NEW TRANSDUCER which lets you enter a new transducer (TRANSDUCER).

EDIT TRANSDUCER which lets you change the data of an entered transducer (TRANSDUCER).

DELETE TRANSDUCER which lets you delete the data of an entered transducer (TRANSDUCER).

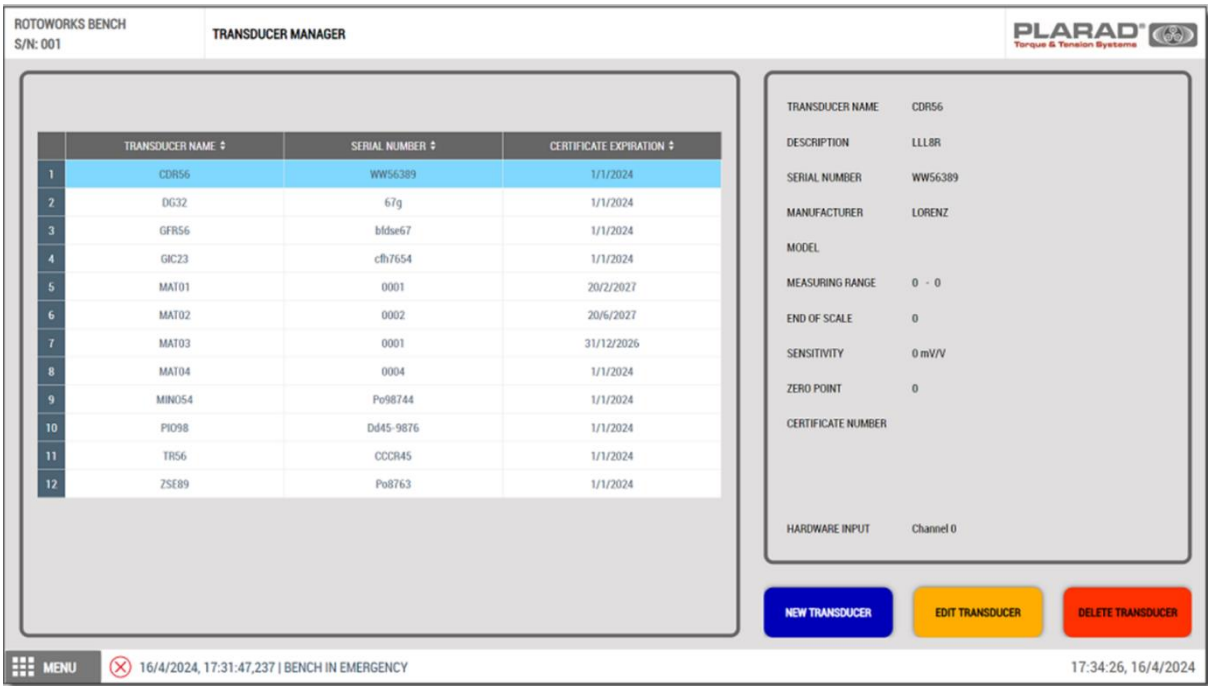


Fig.3.8.11

You can press the buttons NEW TRANSDUCER or EDIT TRANSDUCER to access the data entry/variation page of the TRANSDUCER.

On the **INFORMATION** page, the general data of the transducer can be displayed and changed.

TRANSDUCER NAME; allows you to allocate the name of the associated transducer.

DESCRIPTION; allows the transducer description to be entered.

SERIAL NUMBER; allows you to enter the serial number of the transducer.

MANIFACTURER; allows you to enter the data of the manufacturer of the transducer.

MODEL; allows you to enter the model of the transducer.

OEM NAME; allows you to enter the data of the original manufacturer of the instrument.

OEM MAIL; allows you to enter the email of the original manufacturer of the instrument.

PRODUCTION DATE; allows you to enter the production date.

CALIBRATION DATE; allows you to enter the calibration date of the instrument.

⚠ WARNING: THE DATE MUST BE CHANGED WITH EACH RECALIBRATION OF THE INSTRUMENT

VALUE NAME;

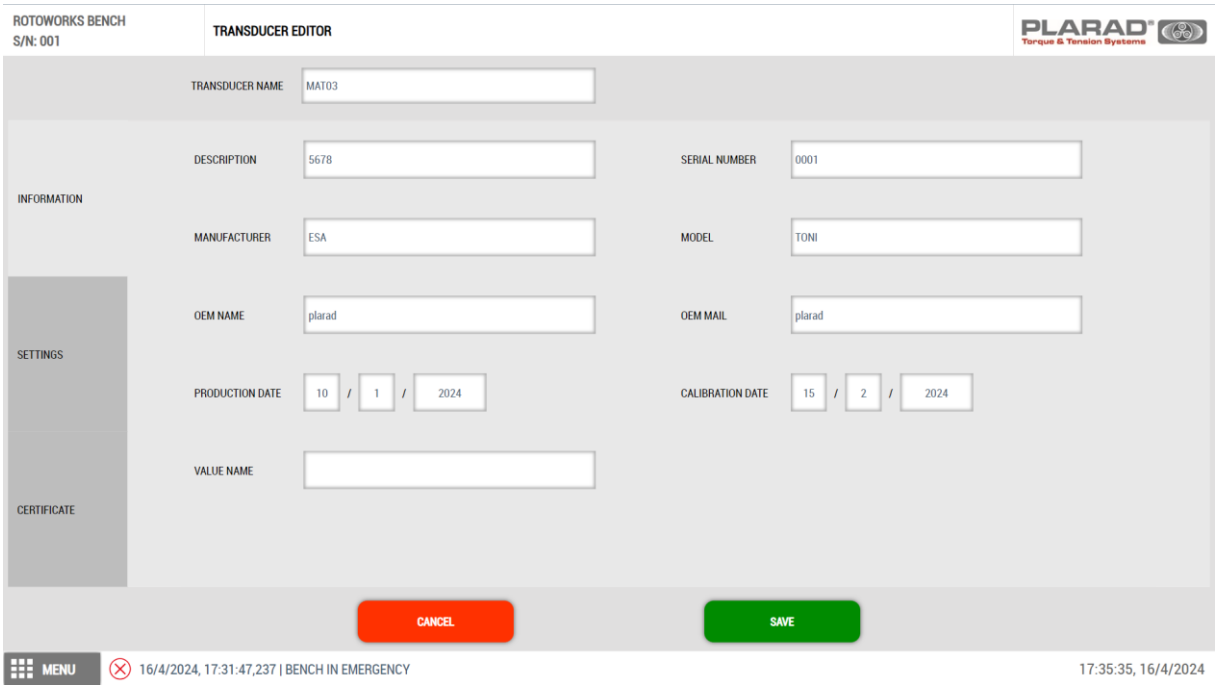


Fig.3.8.12

You can press the buttons NEW TRANSDUCER or EDIT TRANSDUCER to access the data entry/variation page of the TRANSDUCER.

On the **SETTINGS** page the transducer data can be displayed and changed.

END OF SCALE; allows you to assign the full scale of the transducer.

UNITS; shows the detected unit of measurement of the transducer.

SENSITIVITY; allows you to assign the conversion sensitivity, of the torque measurement signal, of the transducer.

ZERO POINT; makes it possible to compensate for the reading error of the transducer.

WORK RANGE; allows you to enter the reading field of the transducer.

ACCURACY; allows you to enter the deviation value between the actual torque and the torque measured by the transducer.

HARDWARE INPUT; allows you to enter the instrument measurement channel based on the installation position of the transducer in the test bench.

⚠ WARNING: THE DATE MUST BE CHANGED WITH EACH RECALIBRATION OF THE INSTRUMENT

VALUE NAME;

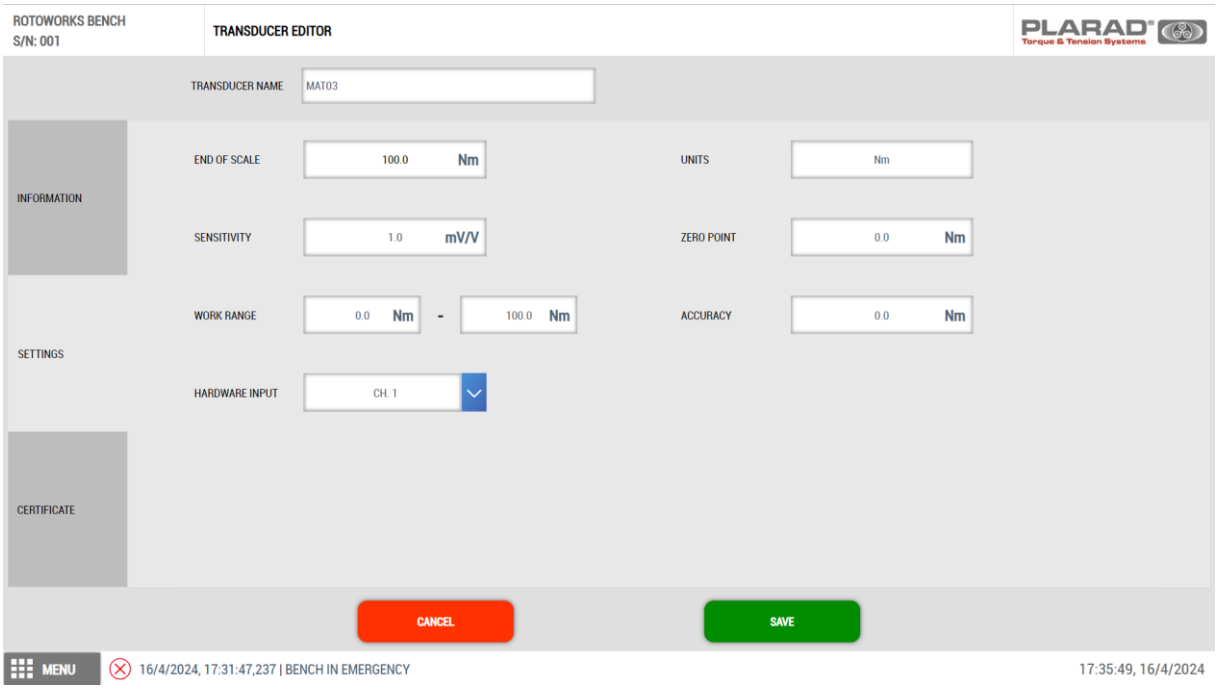


Fig.3.8.13

You can press the buttons NEW TRANSDUCER or EDIT TRANSDUCER to access the data entry/variation page of the TRANSDUCER.

On the **CERTIFICATE** page, the data of the transducer calibration certificate can be displayed and changed.

CERTIFICATE NUMBER; allows you to enter the number of the transducer calibration certificate.

CERTIFICATE EXPIRATION; allows you to enter the date of preparation of the transducer calibration certificate.

MAXIMUM MEASURING ERROR; allows you to enter the maximum reading error indicated in the transducer calibration certificate.

MEASURE UNCERTAINTY WINDOW; allows you to enter the uncertainty value of the measurement used for the calibration of the instrument indicated in the certificate.

⚠ WARNING: THE DATA MUST BE CHANGED WITH EACH RECALIBRATION OF THE INSTRUMENT

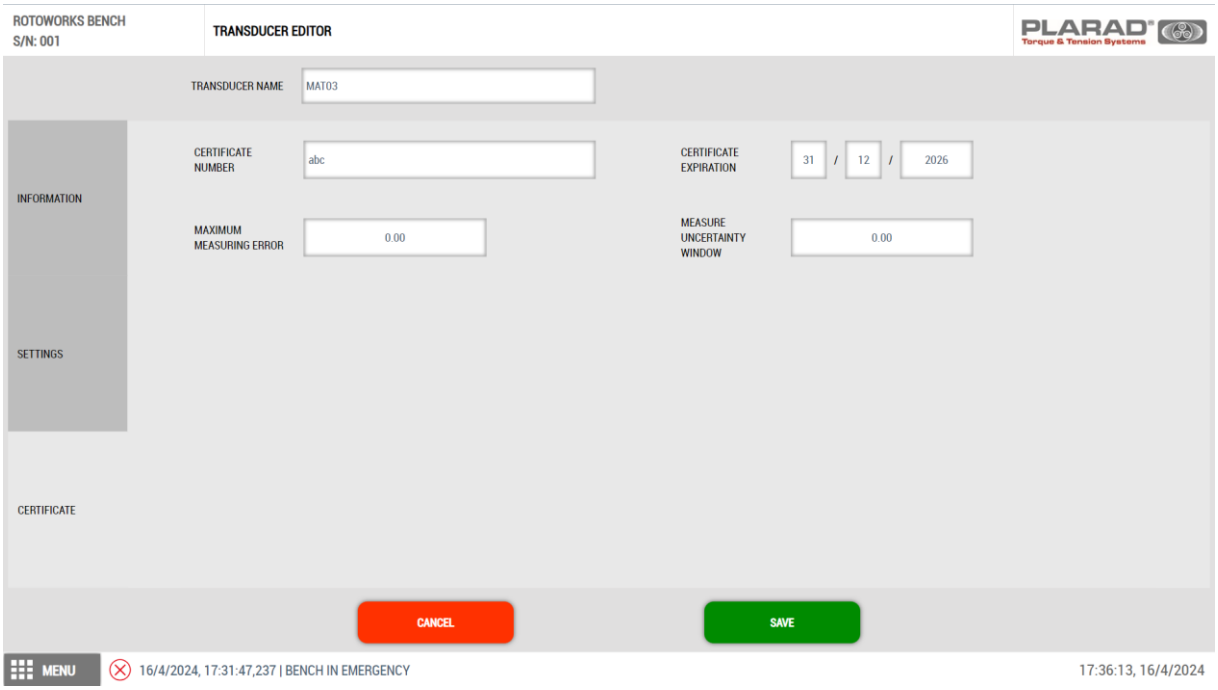


Fig.3.8.14

⚠ WARNING: the operation must be carried out by trained personnel and with the machine not activated.

3.11 REPLACEMENT OF MEASUREMENT TRANSDUCERS

The wrench testing station has the following transducers located in the testing stations

A. Torque wrench testing station torque measurement transducers
B. Hydraulic wrench testing station torque measurement transducers up to 50kNm of force
C. Hydraulic wrench testing station torque measurement transducers up to 5kNm of force
D. Electric nutrunner testing station torque measurement transducers

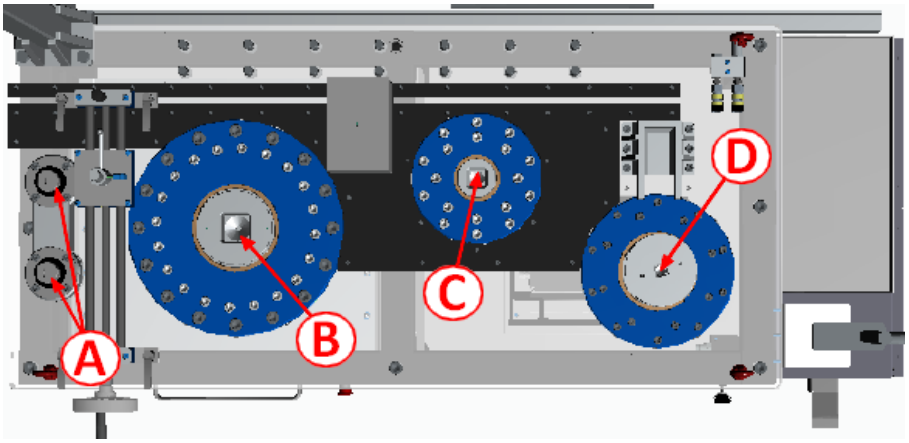
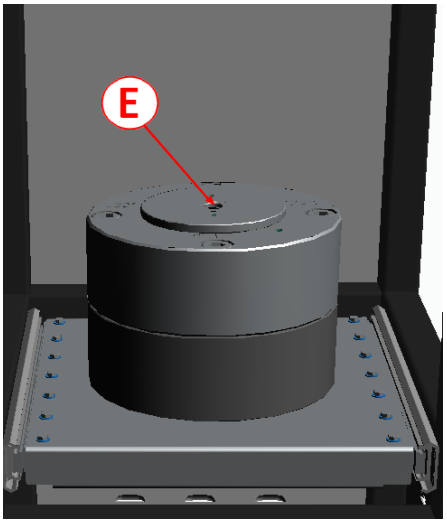


Fig.3.9.1



The tensioner measuring station has a single torque measuring transducer located at position E.

Fig.3.9.2

The transducer is replaced through the disassembly of the transducer cover rings, the electrical disconnection, the removal of the old transducer, the insertion of the new transducer and the electrical connection, the mechanical fastening according to the instructions of the transducer manufacturer and the reassembly of the cover ring.

The tightening of the set screws must comply with the torques specified by the transducer manufacturer.

WARNING: The transducer replacement operation must be carried out by the manufacturer or by personnel specifically trained by the manufacturer and with a de-energised machine.

Following the replacement of the transducer, its electronic setting must be carried out as described in paragraph 3.10 PRELIMINARY ELECTRONIC ADJUSTMENTS FOR ENTERING NEW TRANSDUCERS

3.12 NO-LOAD TESTS

Before carrying out the load operations, carry out at least one no-load test in order to check that there are no faults.

The no-load test consists of powering the machine with electricity, activating the machine, without inserting the part to be tested, and carrying out the cycle.

4 MACHINE DESCRIPTION

4.1 OPERATING PRINCIPLE

The machine carries out testing of tightening equipment of various kinds.

The test bench consists of two stations, through the indications of the management software, for testing the following equipment.

Manual torque wrenches

Torque wrenches are tested in the tightening wrench testing station.

The torque wrench testing station (A) provides a manual adjustment system for the installation of torque wrenches of different sizes.

The activation of the force necessary for the test takes place manually through the front handwheel after setting the software on the control panel located in the workstation.

Fig.4.1.1

Hydraulic wrenches with a maximum force of 50 kNm

Hydraulic wrenches with a maximum force of 50kNm are tested in the tightening wrench testing station.

The testing station (B) provides for the connection, through hoses, with the control unit, the closure of the upper guard and the activation of the control unit through the remote control.

The activation force, to be varied to achieve the torque, is adjusted by means of the adjustment valve located on the front after setting the software on the control panel located in the workstation.

Note: the workstations are set up for testing wrenches with a square output shaft. For testing wrenches with a recessed hexagon an adapter must be installed, which is to be requested from the manufacturer based on the model of the wrench.

Fig.4.1.2

Hydraulic wrenches with a maximum force of 5 kNm

Fig.4.1.3

Hydraulic wrenches with a maximum force of 5kNm are tested in the tightening wrench testing station.

The testing station (C) provides for the connection, through hoses, with the control unit, the closure of the upper guard and the activation of the control unit through the remote control.

The activation force, to be varied to achieve the torque, is adjusted by means of the adjustment valve located on the front after setting the software on the control panel located in the workstation.

Note: the workstations are set up for testing wrenches with a square output shaft. For testing wrenches with a recessed hexagon an adapter must be installed, which is to be requested from the manufacturer based on the model of the wrench.

Electric nutrunners

Fig.4.1.4

Electric nutrunners are tested in the tightening wrench testing station.

The testing station (D) provides for the positioning of the nutrunner on the test nut and the activation of the nutrunner.

In the event of testing a nutrunner with 230V 50Hz line power, it must be connected to the conditioned power plug located near the workstation.

The activation force is adjusted on the nutrunner itself after setting the software on the control panel located in the workstation.

Hydraulic control units

Fig.4.1.5

Hydraulic control units are tested in the tightening wrench testing station.

The testing station (E) requires the hydraulic control units to be tested by disconnecting the hydraulic control unit hose from the machine station and connecting it to the delivery of the unit to be tested**.** The control unit to be tested is activated using the command on the unit to be tested.

The action must be carried out making sure that no hydraulic wrenches are connected to the output connections.

The delivery pressure is adjusted by means of the adjustment valve located on the control unit to be tested after setting the software on the control panel located in the workstation.

Hydraulic tensioners

Fig.4.1.6

Hydraulic tensioners are tested in the tensioner testing station.

The testing station (F) provides for the connection, through hoses, with the control unit, the closure of the upper guard and the activation of the control unit through the remote control.

The activation force, to be varied to achieve the torque, is adjusted by means of the adjustment valve located on the front after setting the software on the control panel located in the workstation.

All the tests described take place with the software indications, visible on the operator panel, which records the values and generates a test validation report.

Arrangement of testing stations

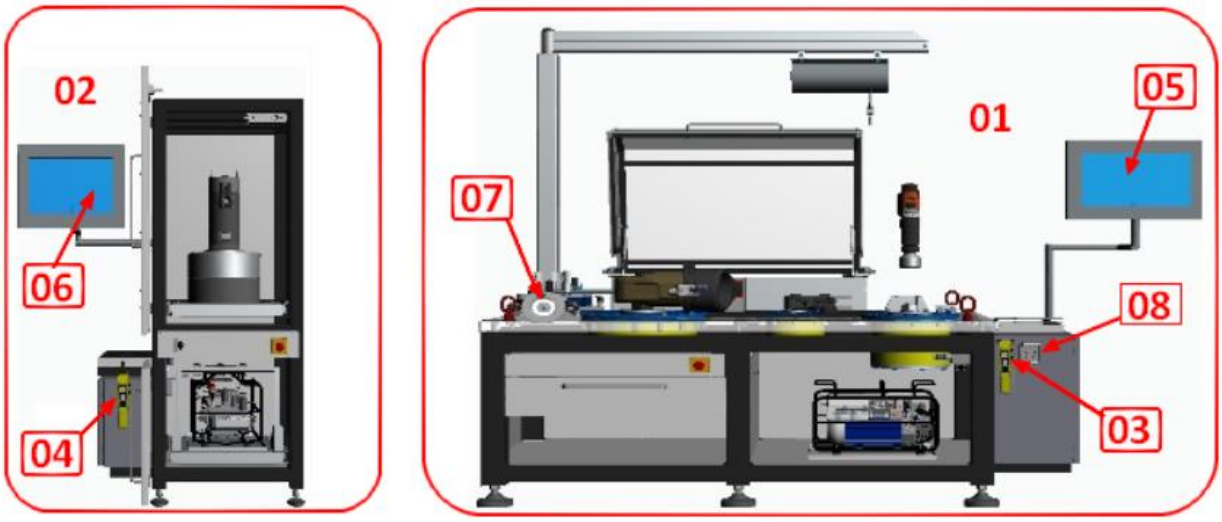


Fig.4.1.7

01 Tightening wrench testing station

02 Tensioner testing station

03 Hydraulic control unit remote control

04 Hydraulic control unit remote control

05 Tightening wrench testing station control panel

06 Tensioner testing station control panel

07 Torque wrench testing station drive handwheel

08 Conditioned power supply plug

4.2 ENVIRONMENTAL CONDITIONS

The machine is intended for an environment with specific cleaning temperature, humidity, electromagnetic pollution and lighting conditions, in particular was designed and built to work at temperatures ranging from 20°C to 40°C, at relative humidity between 35% and 65%.

The working environment for which the machine is intended must be clean and free from dust, as any dust can jeopardise correct operation.

The industrial environment in which it is to operate must have the standard conditions regarding electromagnetic pollution.

Temperature conditions	:	5-40°C
Humidity conditions	:	35 – 65% Rh (non-condensing)
Environmental conditions	:	Clean and dust-free environment
Electromagnetic conditions	:	Normal industrial environment

The machine is not suitable for working in environments with an explosive / corrosive /excessively dusty atmosphere.

4.3 LIGHTING

The lighting of the installation environment must comply with the laws in force in the country where the machine is installed and must in any case guarantee good visibility at all points, not create dangerous reflections and allow the clear reading of the control panels, as well as the identification of the emergency buttons.

The machine is not equipped with an independent light source to guarantee values between 200 and 300 lux in every internal point of the machine. However, this lighting value must be ensured in the final machine location to guarantee good visibility of non-illuminated components.

4.4 VIBRATIONS

Under conditions of use that comply with the indications for correct use, the vibrations are not such as to cause hazardous situations to arise.

4.5 NOISE EMISSIONS

The machine was designed and built in such a way that the risks due to the emission of airborne noise is reduced to a minimum level. The acoustic intensity of 89 dB(A) (3 dB(A) measurement uncertainty) present in the work area may cause hearing damage.

– As a general rule, wear hearing protection for work.
– Only stay in the hazard zone for as long as strictly necessary.

4.6 TECHNICAL DATA

The main technical data relating to the machine are specified below

Supply voltage	: 230VAC
Frequency	: 50Hz
Power cable	: 1P+N+PE
Controls supply voltage	: 24V DC
Engaged power	: 3.5kW
Rated current	: 16A
Diameter of main supply conductors	: 2.5mm^2
Pressurisation system supply fluid	: hydraulic oil
Hydraulic circuit operating pressure	: 700 bar
Tightening wrench testing station weight	: 2000 Kg
Tensioner testing station weight	: 700 Kg

4.7 MAIN COMPONENTS

The machine consists of the following components:

A. tightening wrench testing station mod. PLARAD TEST BENCH by PLARAD ITALY
B. electrical control panel order 061/24 by Elettroservice Automazioni Srl
C. Plarad electric hydraulic unit mod.XE1eco
D. Electric lifting winch
E. tensioner testing station mod. PLARAD TEST BENCH by PLARAD ITALY
F. Plarad electric hydraulic unit mod.XE1eco

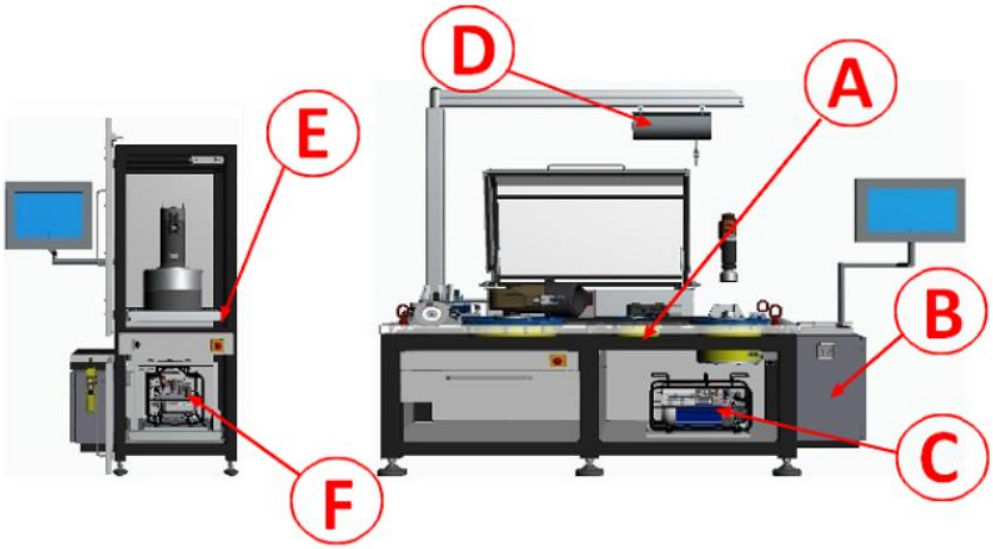


Fig.4.7.1

4.8 PANELS AND BUTTONS

The machine has the following control panels:

A. tightening wrench testing station control panel; the settings, adjustments and start of the station test are carried out using this panel.

B. tensioner testing station control panel; the settings, adjustments and start of the station test are carried out using this panel.

C. Wired control of the tensioner testing station hydraulic control unit; when the test is started, it pressurises the wrench to operate the tensioner.

D. Wireless remote control of the wrench testing station hydraulic control unit; it is used only in case of hydraulic wrench testing and when the test is started it pressurises the wrench to operate the wrench.

Fig.4.8.1

4.9 STANDARD SUPPLY

The machine is supplied ready for commissioning.

It is supplied with:

A. Use and Maintenance Instruction Manual;

B. Instruction manual of the partly completed machines included (Plarad hydraulic control units);

C. Wiring diagram;

D. EC Declaration of Conformity;

E. Plate with special CE marking.

4.10 ELECTROMAGNETIC ENVIRONMENT

The machine is designed to operate correctly in an industrial electromagnetic environment, falling within the limits of Emission and Immunity provided for by the following harmonised standards:

CEI EN 61000-6-2

Electromagnetic compatibility (EMC) Generic standards - Immunity requirements for industrial environments.

CEI EN 61000-6-4

Electromagnetic compatibility (EMC) Generic standards - Emission for industrial environments

5 USING THE MACHINE

5.1 COMMISSIONING

After powering the machine, carry out a thorough visual inspection of the entire machine and make sure that there are no objects inadvertently left on top of it, people or materials that could hinder normal operation.

Check that all the machine safety features are enabled and, if necessary, restore them, in particular:

a) emergency stops unlocked;

b) correct operation of the protections;

c) efficiency of the protective casings.

Connect the machine to the electrical system and activate it using the main disconnector  .

Wait for the main screen to appear on the control panel screens and check that there are no alarms in the alarms window (A).

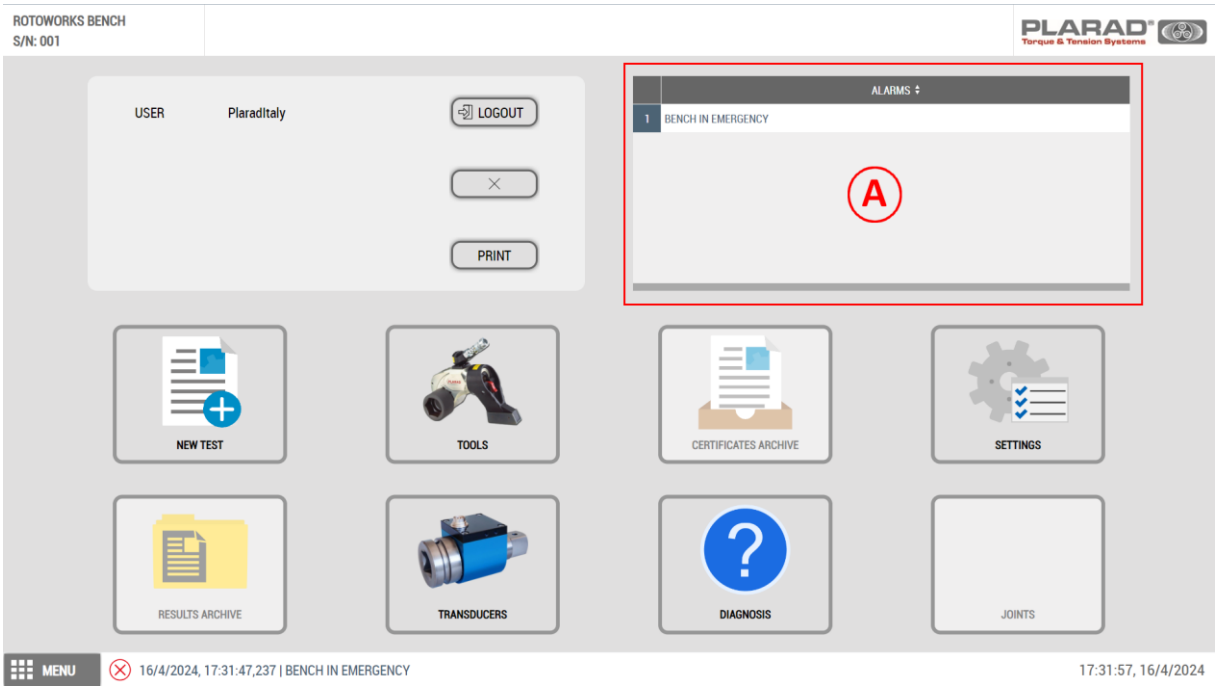


Fig.5.1.1

Also indicate which accessories/tools are needed to modify the test benches.

5.2 TORQUE WRENCH TESTING

Fig.5.2.1

The test of the manual torque wrenches is carried out in the tightening wrench testing station.

Check the compatibility of the wrench coupling panel with the torque measurement transducers.

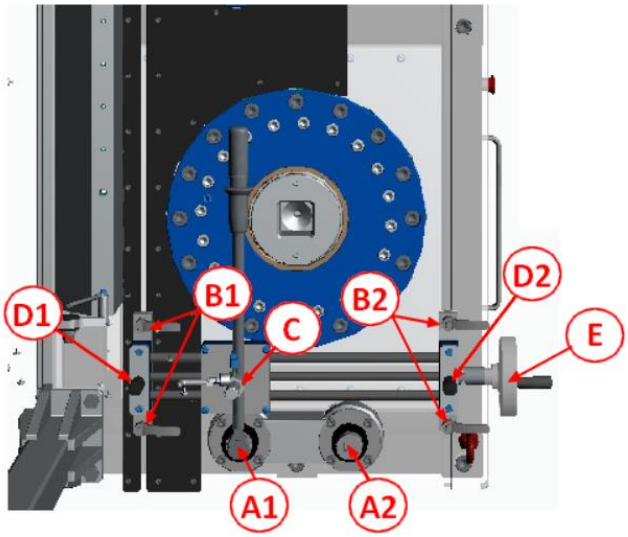


Fig.5.2.2

Proceed to the position chosen (A1 or A2) and secure the shank of the wrench to the carriage that exerts the force on the wrench.

The fastening includes:

- loosening the fasteners (B1 and B2) and moving the carriage, on which the shank support (C) is installed, on the centre of the shank itself with the knobs (D1 and D2). When the position is reached, locking the carriage with the fasteners (B1 and B2);
- positioning the carriage (C), operating the front knob (E), so that the shank is parallel to the axis of the testing station;
- opening the fastener on the carriage and inserting the wrench by placing the panel in the transducer (A1 or A2) and locking the wrench.

NOTE: the torque wrench test must be carried out with the remaining testing stations free of products and with the protection guard of the hydraulic testing stations raised.

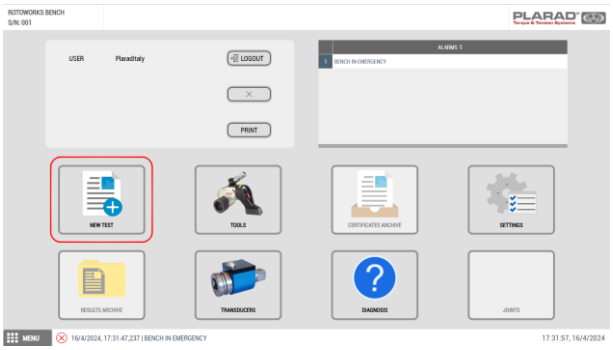
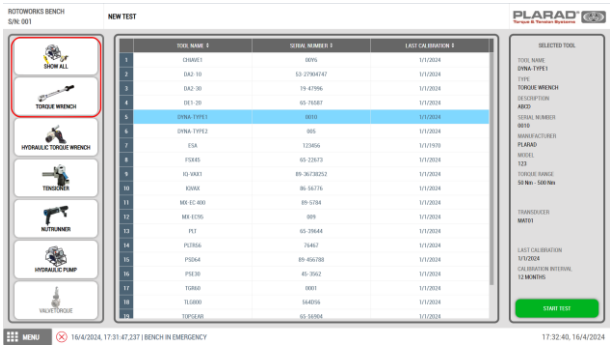


Fig.5.2.3

Access the torque wrench test screen from the main page of the Software with the NEW TEST key  .



Select the SHOW ALL button 

to display the complete legend of the products entered or TORQUE WRENCH 

to display only the torque wrenches.

Scroll through the list and choose the model to be tested. If it is not listed, enter it as described in paragraph 3.9 PRELIMINARY ELECTRONIC ADJUSTMENTS FOR ENTERING NEW EQUIPMENT.

Fig.5.2.4

After selecting the product to be tested, the relevant test screen is displayed on the panel.

On this page, the wrench rotation direction is checked, which must correspond to that set mechanically on the wrench and the test sequence required for the test.

Mechanically set the value corresponding to the first test sequence on the wrench and start the test with the START TEST button 

.

Turn the knob until the wrench clicks. The increase in torque and the achievement of the maximum torque set are displayed by the graph.

The screen displays the status of the torque measurement and signals the possible failure of the test.

To proceed with the next test measurement, reposition the wrench in the starting position to reset the wrench and use the knob again for the next test required by the software. The test identifies the number of measurements to be made and on completion indicates the need for the mechanical variation of the torque on the wrench for the next sequence of measurements.

The PAUSE TEST key 

stops the measurement without deleting the test and the RESET TEST key 

deletes the test carried out.

Fig.5.2.5

Pressing the RESULT key 

displays the data of the test carried out.

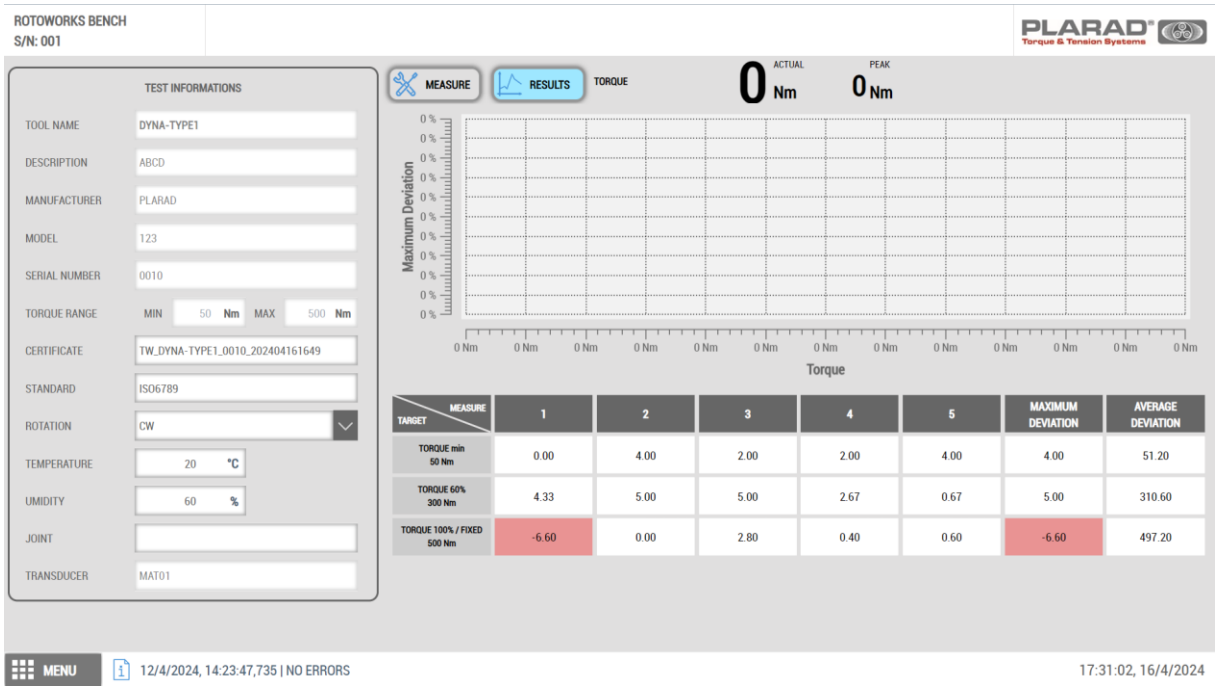


Fig.5.2.6

Pressing the RESULT ARCHIVE key 
displays the results of the tests carried out.

Pressing the CERTIFICATES ARCHIVE key 
displays the certificate of the test carried out and it can be downloaded for the user of the wrench.

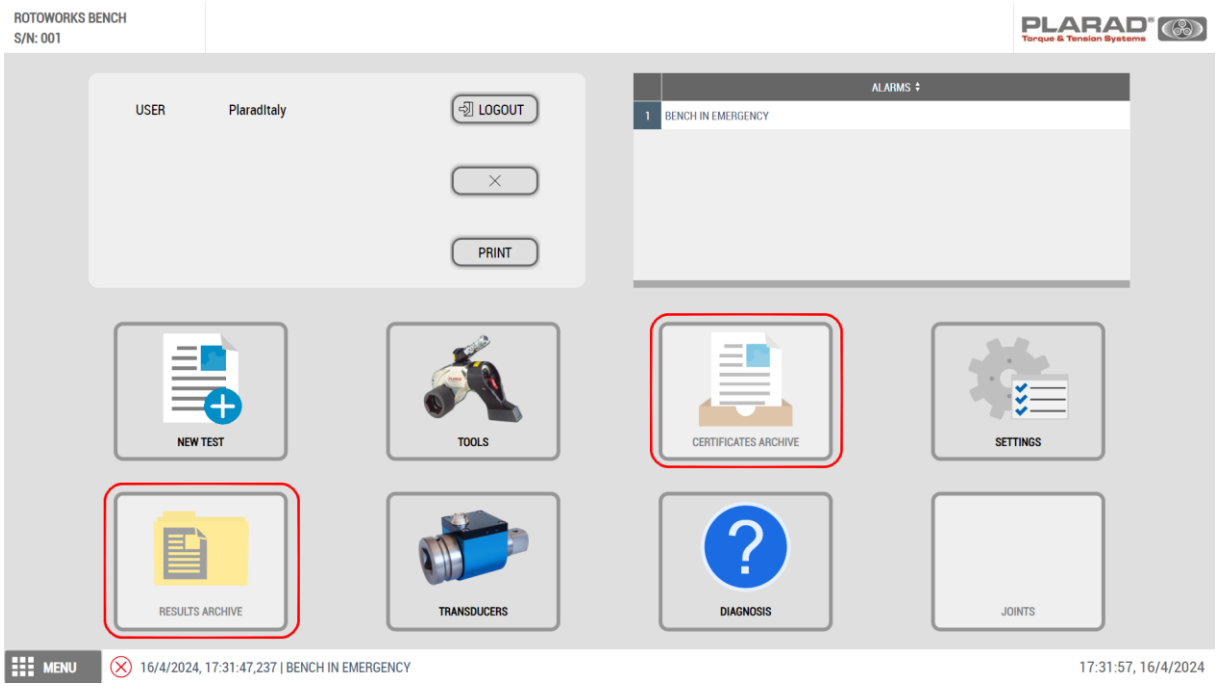


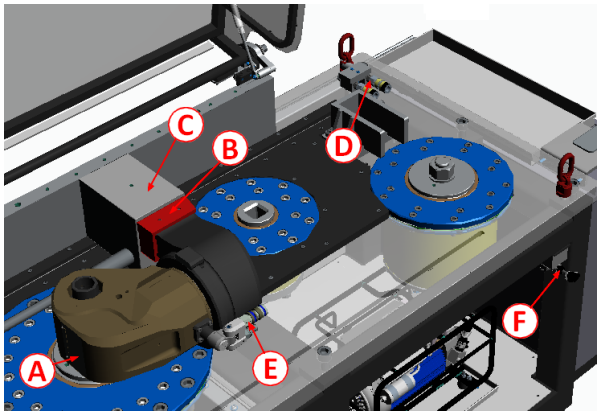
Fig.5.2.7

5.3 TESTING HYDRAULIC WRENCHES WITH A MAXIMUM FORCE OF 50 kNm

Fig.5.3.1

Hydraulic wrenches are tested in the tightening wrench testing station.

Check the compatibility of the wrench coupling panel with the torque measurement transducers.



Proceed to the position in the chosen position (A) and place the reaction foot (B) of the wrench on the support (C). The positioning of the wrench must be parallel to the axis of the testing station.

The positioning of wrenches weighing more than 15 Kg must be carried out with the winch present in the workstation.

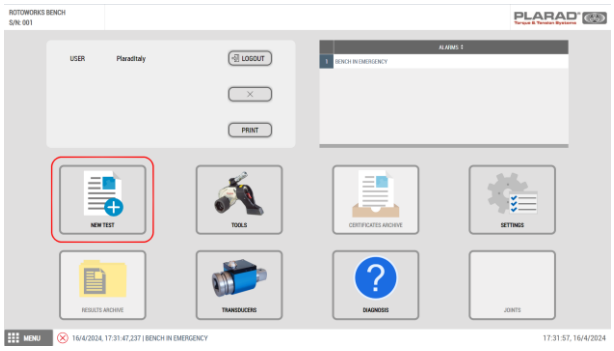
If the positioning does not respect the indicated parallelism, the support must be replaced with the correct one supplied with the test bench.

With the wrench in place, make the hydraulic connection, with the hoses supplied, between the quick couplings (D and E) and completely loosen the pressure regulation valve (F).

NOTE: To decrease the pressure, the knob must be unscrewed by turning it anticlockwise.

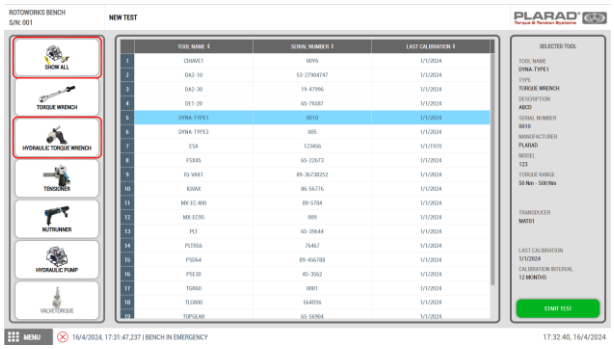
NOTE: the hydraulic wrench test must be carried out with the remaining testing stations free of products and with the protection guard of the hydraulic testing stations closed.

Fig.5.3.2



Access the hydraulic wrench test screen from the main page of the Software with the NEW TEST key  .

Fig.5.3.3



Select the SHOW ALL button  to display the complete legend of the products entered or TORQUE WRENCH  to display only the torque wrenches.

Scroll through the list and choose the model to be tested. If it is not listed, enter it as described in paragraph 3.9 PRELIMINARY ELECTRONIC ADJUSTMENTS FOR ENTERING NEW EQUIPMENT.

Fig.5.3.4

After selecting the product to be tested, the relevant test screen is displayed on the panel.

On this page, the wrench rotation direction is checked, which must correspond to that set on the wrench and the test sequence required for the test.

Start the test with the START TEST button  .

Activate the closing of the hydraulic wrench with the wired remote control  located near the test area and increase the force with the pressure regulator (F) described above.

The pressure is increased by keeping the remote control button pressed and slowly screwing the regulator clockwise.

The screen displays the status of the torque measurement and signals the possible failure of the test.

To proceed with the next test measurement, use the remote control to loosen the wrench and unscrew the regulator anticlockwise to decrease the pressure and repeat the test for the next measurement.

The test identifies the number of measurements to be taken. The PAUSE TEST key  stops the measurement without deleting the test and the RESET TEST key  deletes the test carried out.

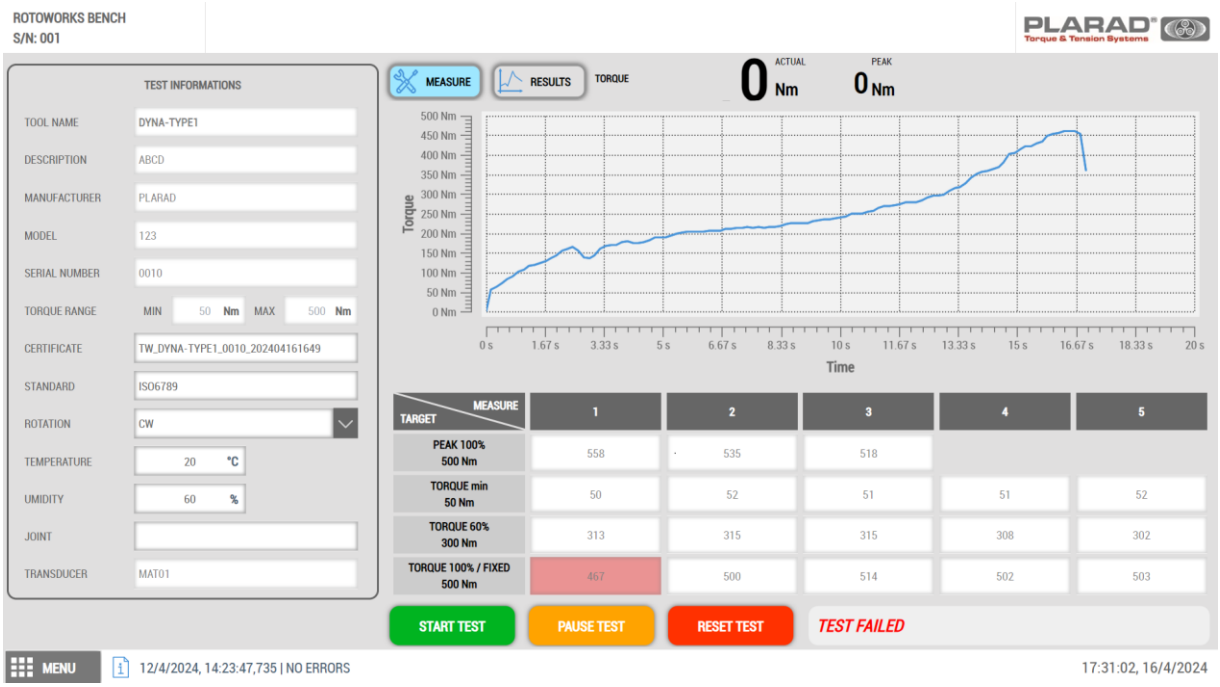


Fig.5.3.5

Pressing the RESULT key 

displays the data of the test carried out.

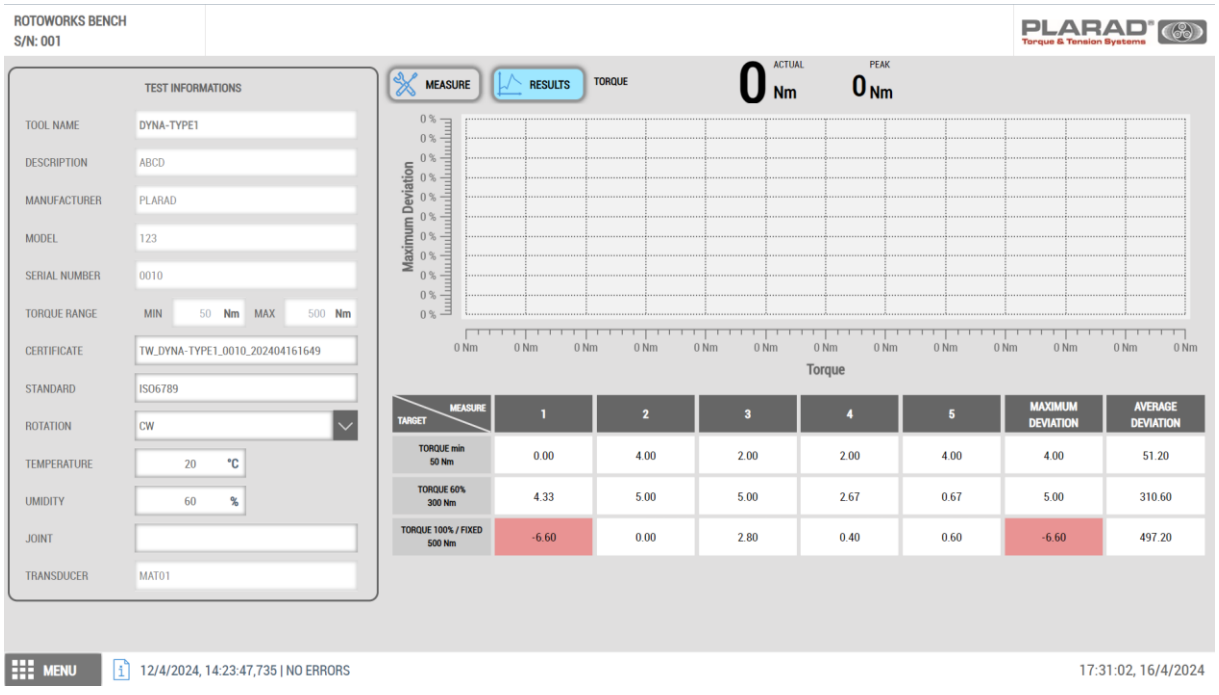
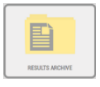


Fig.5.3.6

Pressing the RESULT ARCHIVE key 
displays the results of the tests carried out.

Pressing the CERTIFICATES ARCHIVE key 
displays the certificate of the test carried out and it can be downloaded for the user of the wrench.

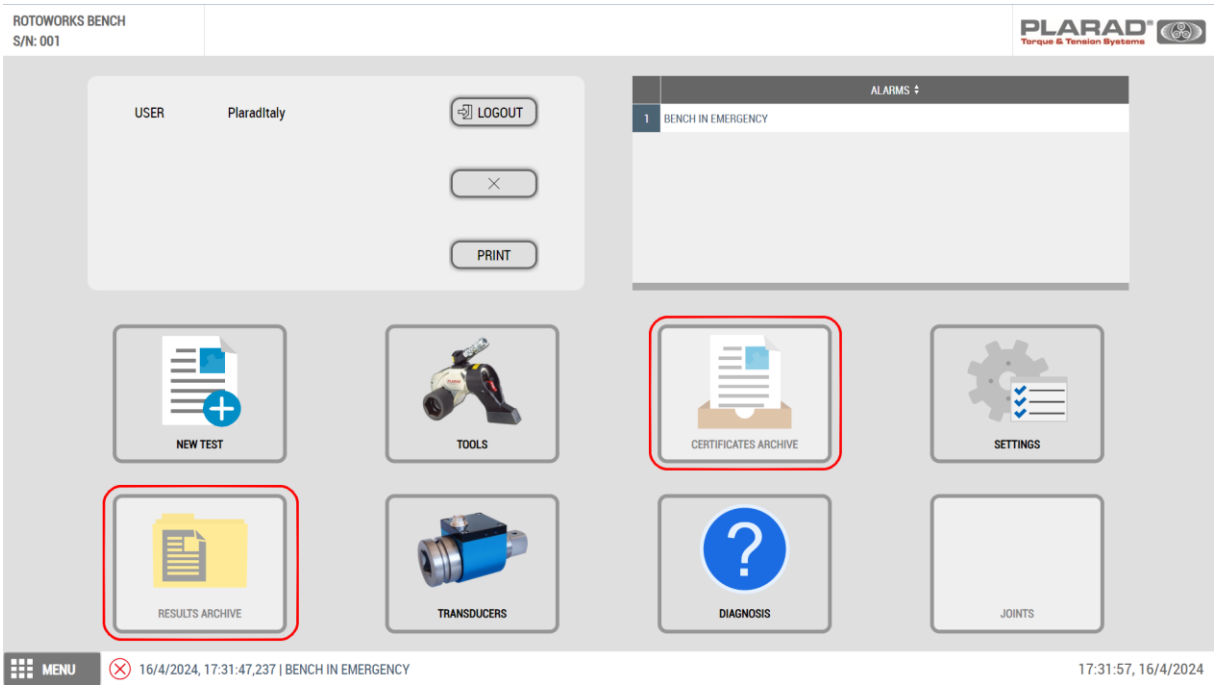


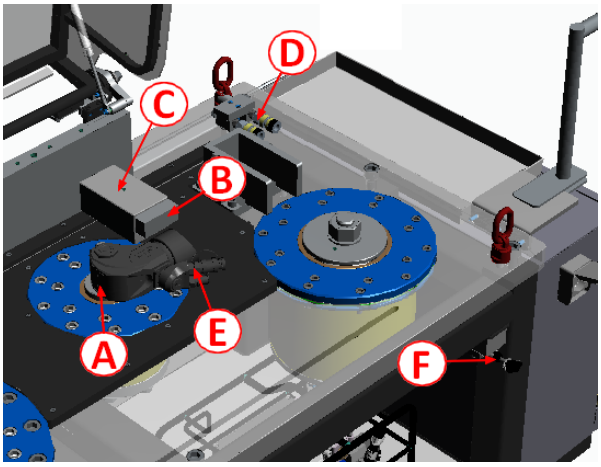
Fig.5.3.7

5.4 TESTING HYDRAULIC WRENCHES WITH A MAXIMUM FORCE OF 5 kNm

Fig.5.4.1

Hydraulic wrenches are tested in the tightening wrench testing station.

Check the compatibility of the wrench coupling panel with the torque measurement transducers.



Proceed to the position in the chosen position (A) and place the reaction foot (B) of the wrench on the support (C). The positioning of the wrench must be parallel to the axis of the testing station.

The positioning of wrenches weighing more than 15 Kg must be carried out with the winch present in the workstation.

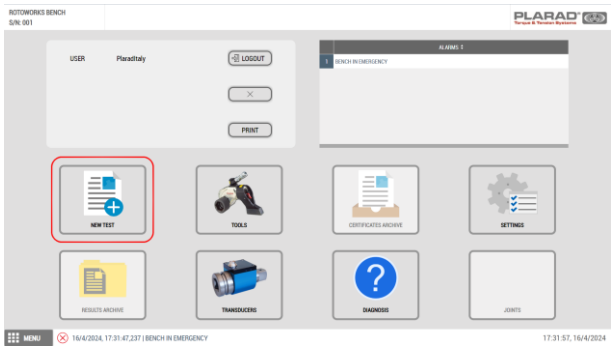
If the positioning does not respect the indicated parallelism, the support must be replaced with the correct one supplied with the test bench.

With the wrench in place, make the hydraulic connection, with the hoses supplied, between the quick couplings (D and E) and completely loosen the pressure regulation valve (F).

NOTE: To decrease the pressure, the knob must be unscrewed by turning it anticlockwise.

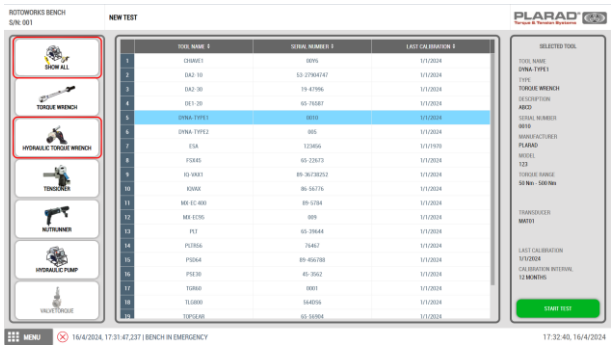
NOTE: the hydraulic wrench test must be carried out with the remaining testing stations free of products and with the protection guard of the hydraulic testing stations closed.

Fig.5.4.2



Access the hydraulic wrench test screen from the main page of the Software with the NEW TEST key  .

Fig.5.4.3



Select the SHOW ALL button  to display the complete legend of the products entered or TORQUE WRENCH  to display only the torque wrenches.

Scroll through the list and choose the model to be tested. If it is not listed, enter it as described in paragraph 3.9 PRELIMINARY ELECTRONIC ADJUSTMENTS FOR ENTERING NEW EQUIPMENT.

Fig.5.4.4

After selecting the product to be tested, the relevant test screen is displayed on the panel.

On this page, the wrench rotation direction is checked, which must correspond to that set on the wrench and the test sequence required for the test.

Start the test with the START TEST button  .

Activate the closing of the hydraulic wrench with the wired remote control  located near the test area and increase the force with the pressure regulator (F) described above.

The pressure is increased by keeping the remote control button pressed and slowly screwing the regulator clockwise.

The screen displays the status of the torque measurement and signals the possible failure of the test.

To proceed with the next test measurement, use the remote control to loosen the wrench and unscrew the regulator anticlockwise to decrease the pressure and repeat the test for the next measurement.

The test identifies the number of measurements to be taken. The PAUSE TEST key  stops the measurement without deleting the test and the RESET TEST key  deletes the test carried out.

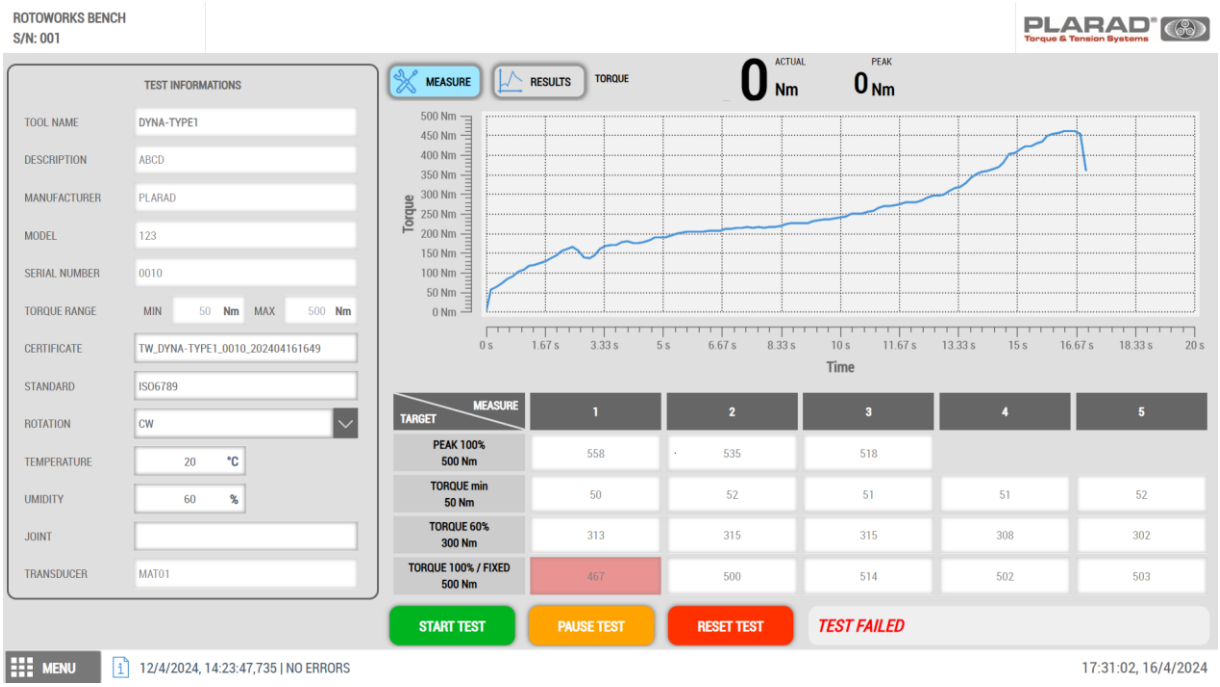


Fig.5.4.5

Pressing the RESULT key 

displays the data of the test carried out.

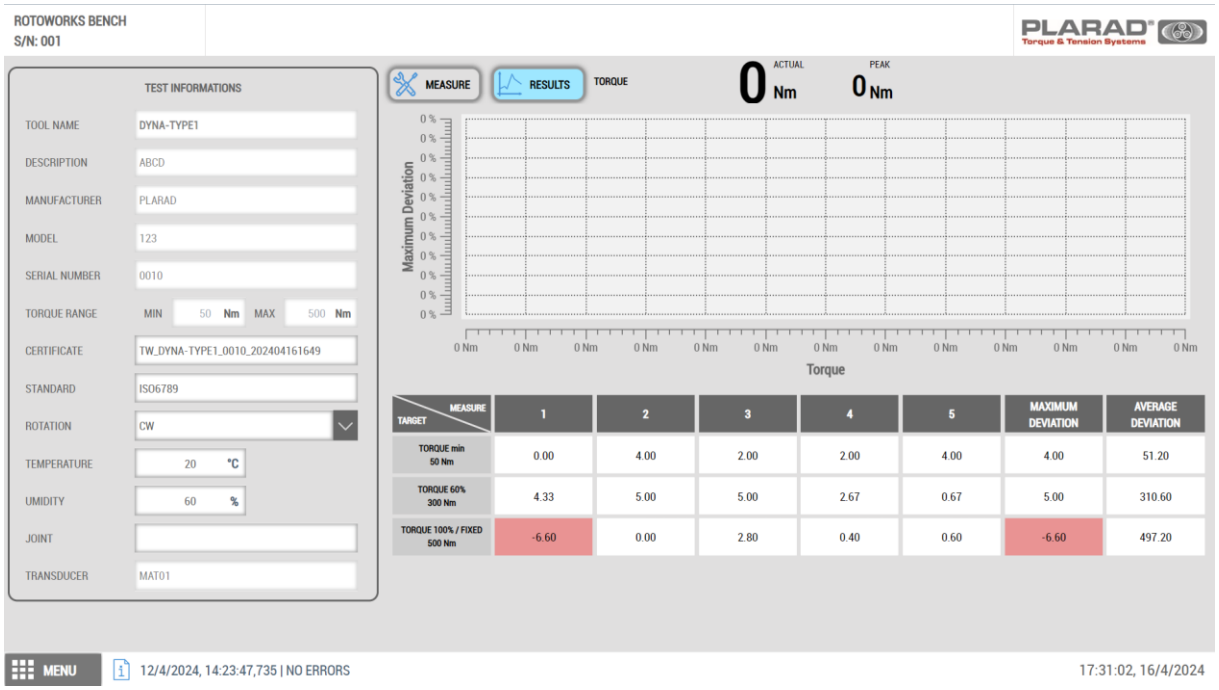


Fig.5.4.6

Pressing the RESULT ARCHIVE key 
displays the results of the tests carried out.

Pressing the CERTIFICATES ARCHIVE key 
displays the certificate of the test carried out and it can be downloaded for the user of the wrench.

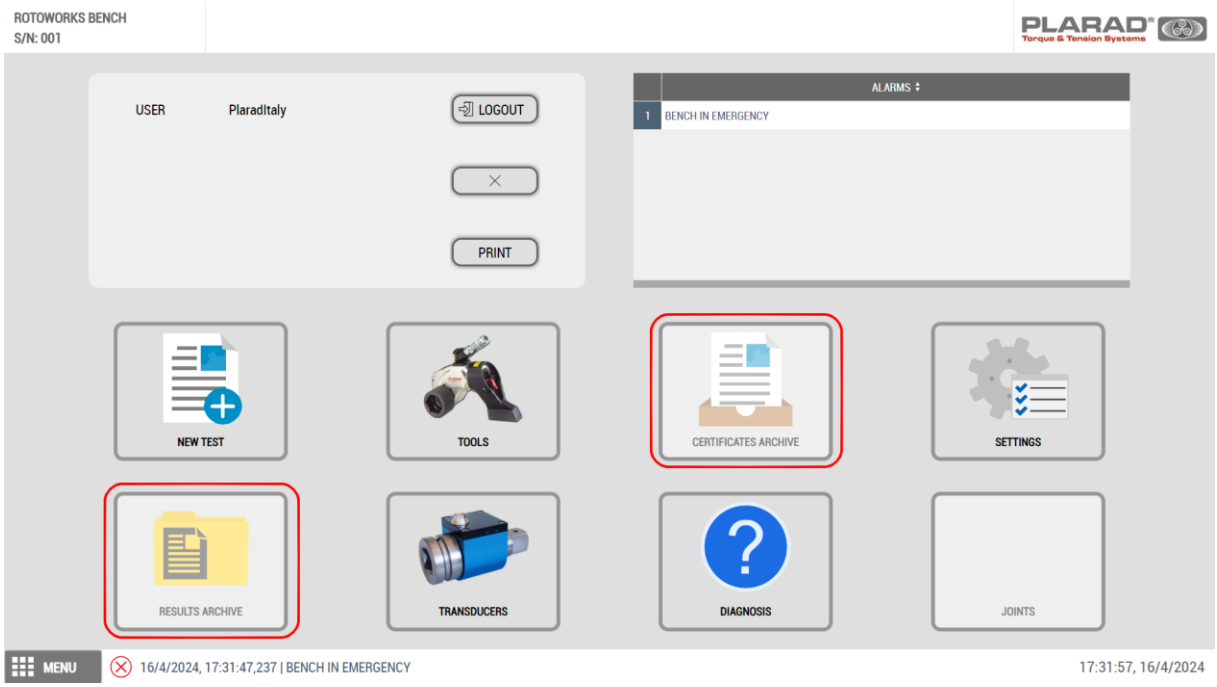

ROTOWORKS BENCH
S/N: 001
USER
PlaradItaly
LOGOUT
PRINT
ALARMS
1
BENCH IN EMERGENCY
NEW TEST
TOOLS
CERTIFICATES ARCHIVE
SETTINGS
RESULTS ARCHIVE
TRANSDUCERS
DIAGNOSIS
JOINTS
MENU
16/4/2024, 17:31:47,237 | BENCH IN EMERGENCY
17:31:57, 16/4/2024

Fig.5.4.7

5.5 TESTING ELECTRIC NUTRUNNERS

Fig.5.5.1

Electric nutrunners are tested in the tightening wrench testing station.

Install the bushing corresponding to the tightening nut positioned in the testing station.

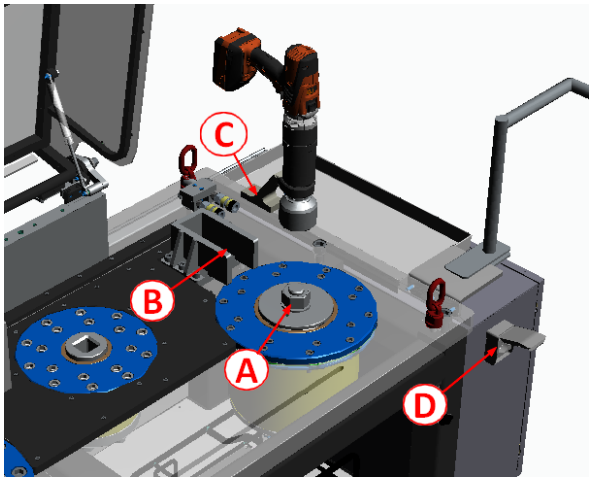


Fig.5.5.2

Proceed with the positioning of the nutrunner by inserting the bushing into the test nut (A) and making sure that the reaction foot (C) is fully inserted into the foot locking support (B).

If the foot does not position itself correctly, disassemble the 6 support locking screws support and change its position securing it again with the 6 screws.

The test must be carried out with the nutrunner perpendicular to the testing station and with the reaction foot adhering to the surface.

For electrically wired nutrunners, the nutrunner plug must be connected to the conditioned plug (D).

NOTE: the electric nutrunner test must be carried out with the remaining testing stations free of products and with the protection guard of the hydraulic testing stations closed.

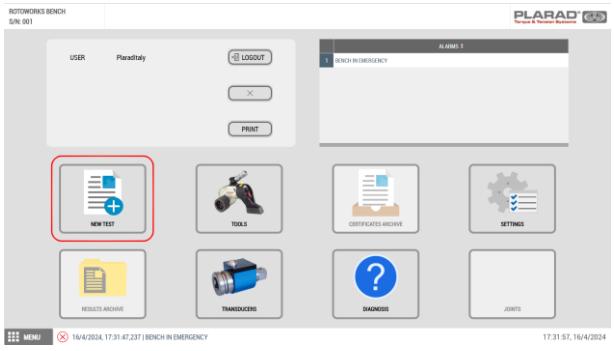


Fig.5.4.3

Access the hydraulic wrench test screen from the main page of the Software with the NEW TEST key  .

Fig.5.4.4

Select the SHOW ALL button  to display the complete legend of the products entered or NUTRUNNER  to display only the nutrunners.

Scroll through the list and choose the model to be tested. If it is not listed, enter it as described in paragraph 3.9 PRELIMINARY ELECTRONIC ADJUSTMENTS FOR ENTERING NEW EQUIPMENT.

After selecting the product to be tested, the relevant test screen is displayed on the panel.

On this page, the nutrunner rotation direction is checked, which must correspond to that set electronically on the nutrunner and the test sequence required for the test.

Electronically set the value corresponding to the first test sequence on the nutrunner and start the test with the START TEST button START TEST.

Activate the nutrunner using the supplied control. The increase in torque and the achievement of the maximum torque set are displayed by the graph.

The screen displays the status of the torque measurement and signals the possible failure of the test.

To proceed with the next test measurement, loosen the tightening nut by reversing the movement of the nutrunner then tighten the nut again with the nutrunner for the next test required by the software. The test identifies the number of measurements to be made and on completion indicates the need for the electronic variation of the nutrunner for the next measurement sequence.

The PAUSE TEST key PAUSE TEST stops the measurement without deleting the test and the RESET TEST key RESET TEST deletes the test carried out.

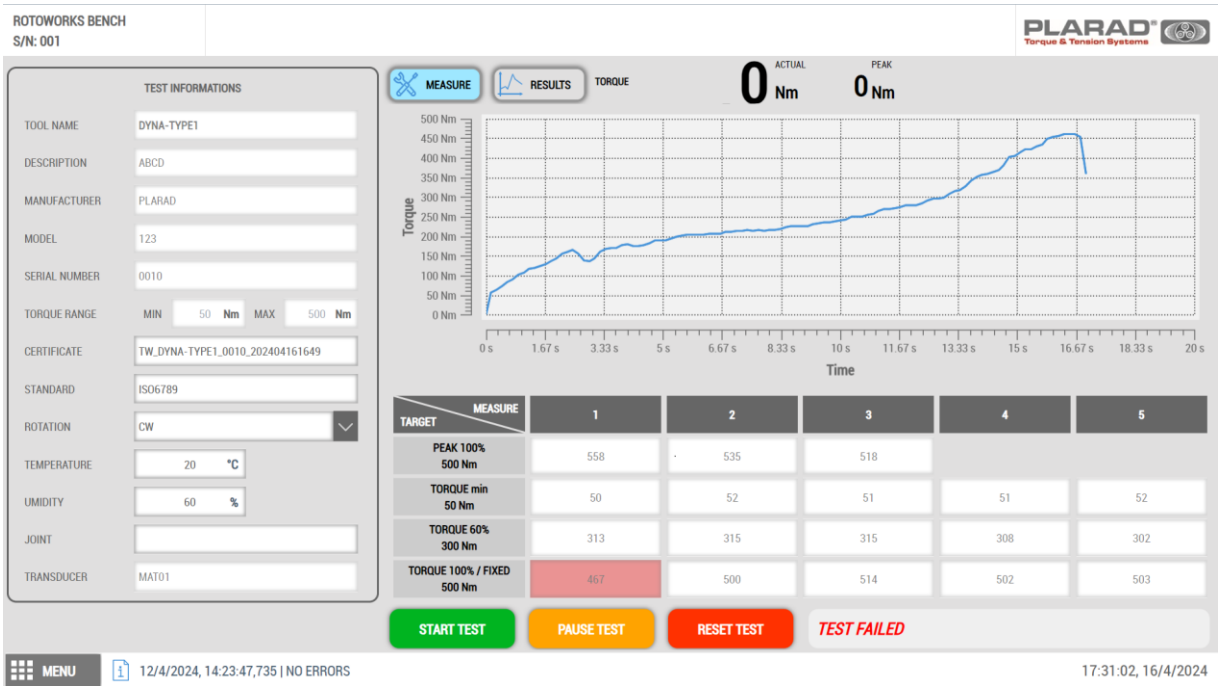


Fig.5.4.5

Pressing the RESULT key 

displays the data of the test carried out.

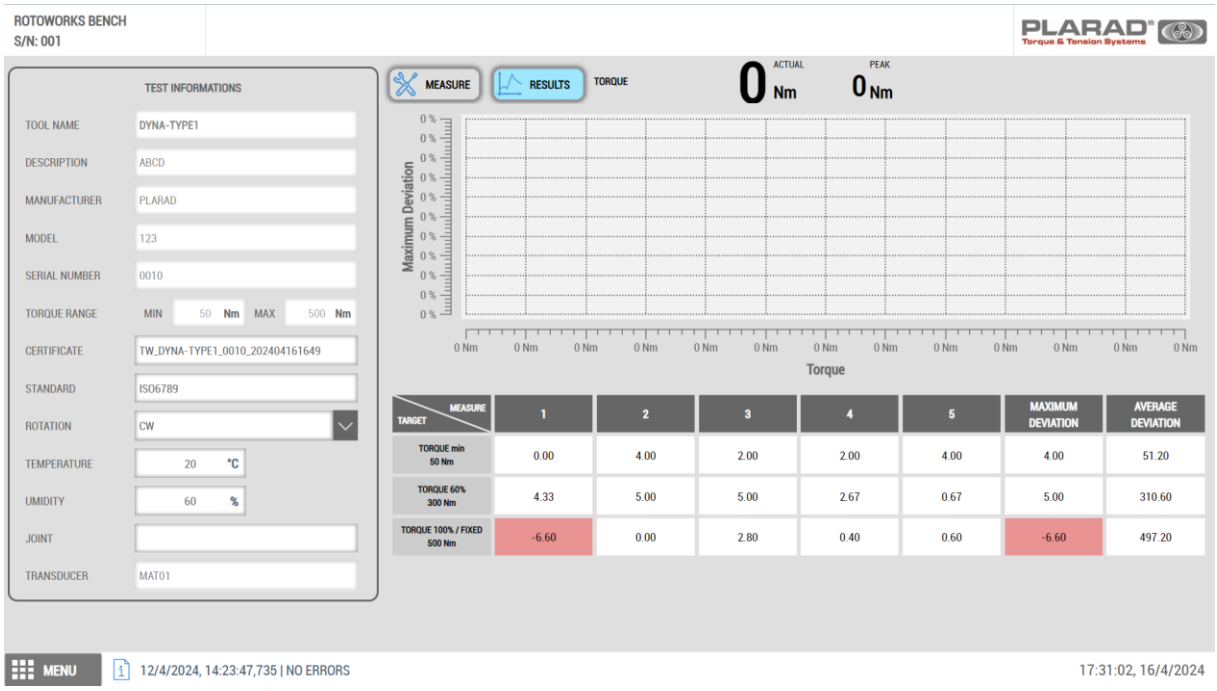


Fig.5.4.6

Pressing the RESULT ARCHIVE key 
displays the results of the tests carried out.

Pressing the CERTIFICATES ARCHIVE key 
displays the certificate of the test carried out and it can be downloaded for the user of the wrench.

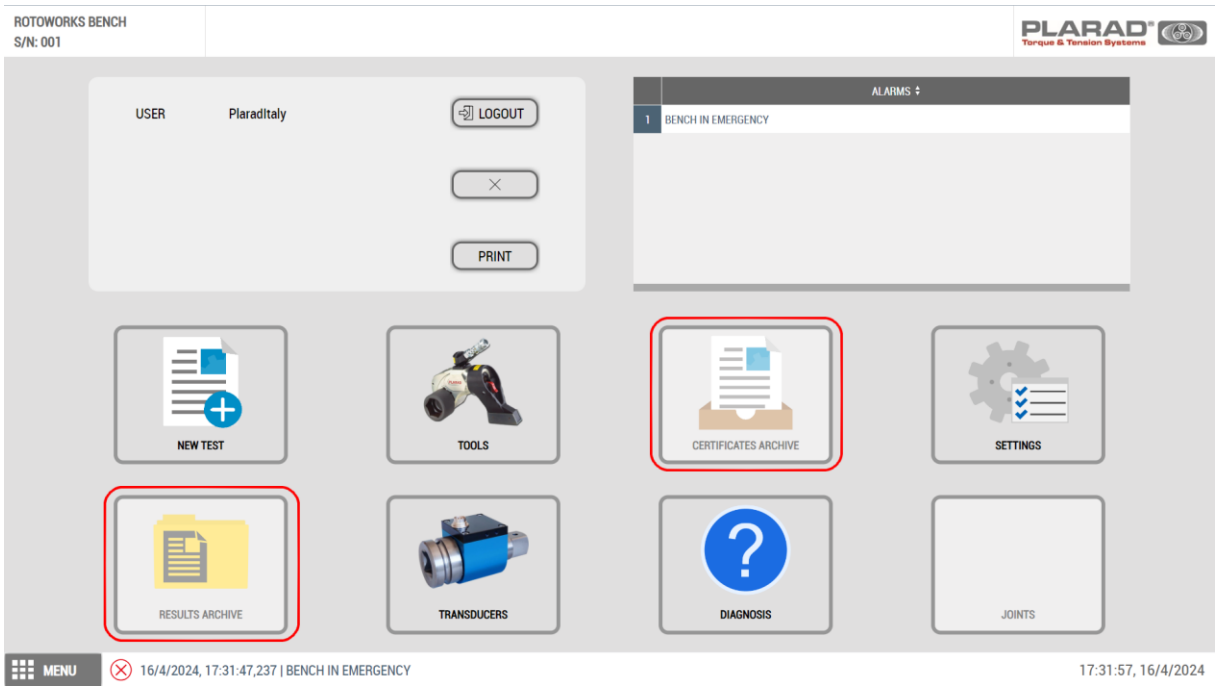


Fig.5.4.7

5.6 EXTERNAL HYDRAULIC CONTROL UNIT TEST

Fig.5.6.1

External hydraulic control units are tested in the tightening wrench testing station.

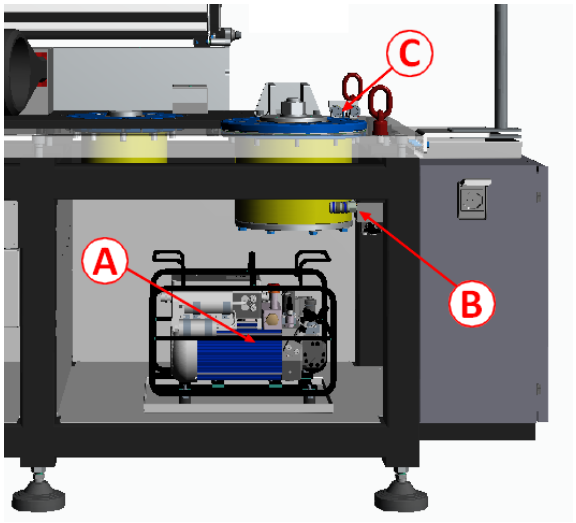


Fig.5.6.2

Proceed with the positioning of the control unit to be tested near the bench control unit.

Disconnect the bench control unit (A) by releasing the quick couplings (B).

Connect the hoses of the control unit to be tested on the couplings (B), checking that the output couplings (C) are disconnected from the utilities.

WARNING: before connecting the external control unit, check that the couplings are compatible with those installed on the test bench.

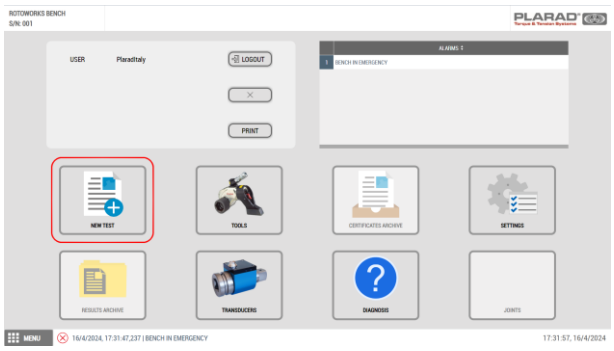


Fig.5.6.3

Access the hydraulic wrench test screen from the main page of the Software with the NEW TEST key 

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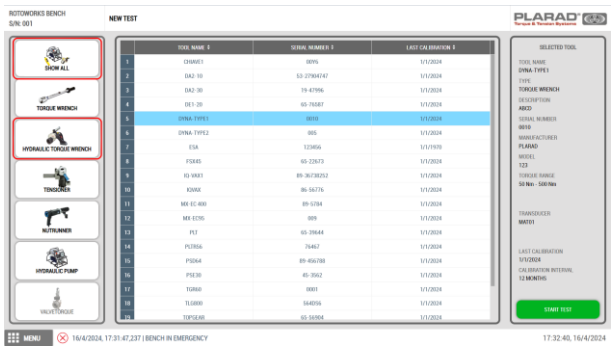


Fig.5.6.4

Select the SHOW ALL button 

to display the complete legend of the products entered or HYDRAULIC PUMP 

to display only the hydraulic control units.

Scroll through the list and choose the model to be tested. If it is not listed, enter it as described in paragraph 3.9 PRELIMINARY ELECTRONIC ADJUSTMENTS FOR ENTERING NEW EQUIPMENT.

After selecting the product to be tested, the relevant test screen is displayed on the panel.

The test pressure of the control unit required by the test can be checked on the page.

Start the test with the START TEST button START TEST.

Activate the hydraulic control unit with the wired remote control  of the control unit to be tested and increase the force with the pressure regulator placed on the control unit itself.

The pressure is increased by keeping the remote control button pressed and slowly screwing the regulator clockwise.

The screen displays the status of the pressure measurement and signals the possible failure of the test.

To proceed with the next test measurement, use the remote control to de-pressurise the control unit and unscrew the regulator anticlockwise to decrease the pressure and repeat the test for the next measurement.

The test identifies the number of measurements to be taken. The PAUSE TEST key PAUSE TEST stops the measurement without deleting the test and the RESET TEST key RESET TEST deletes the test carried out.

Fig.5.6.5

Pressing the RESULT key  displays the data of the test carried out.

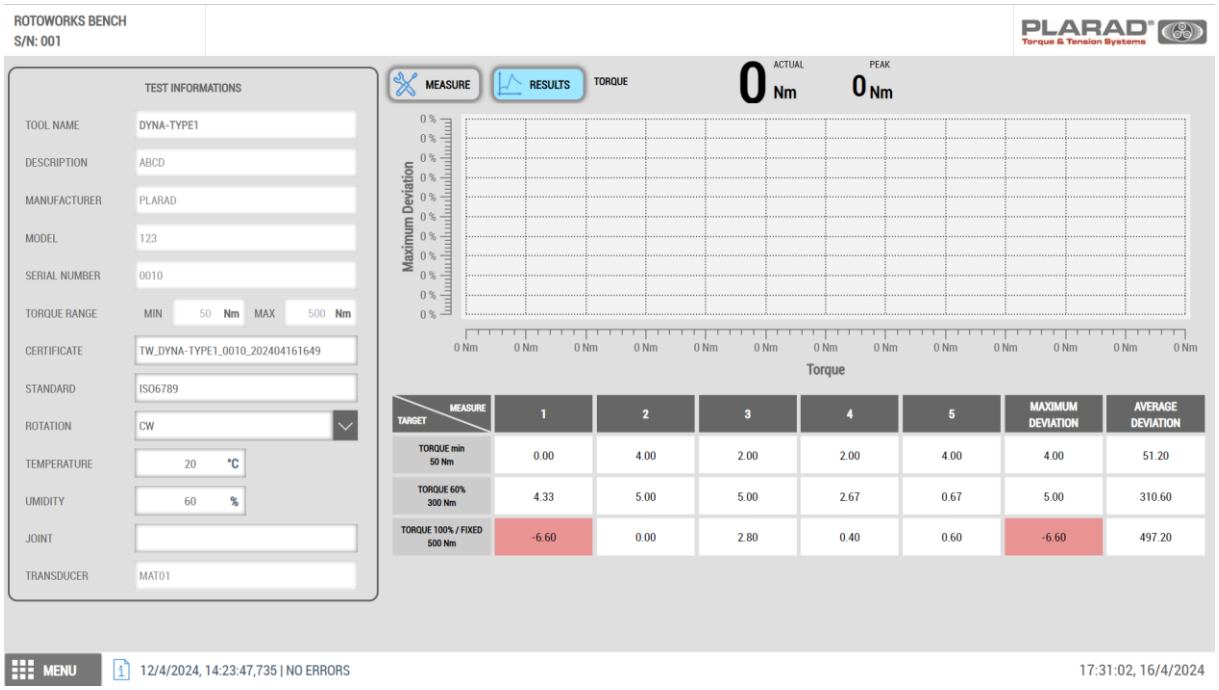


Fig.5.6.6

Pressing the RESULT ARCHIVE key  displays the results of the tests carried out.

Pressing the CERTIFICATES ARCHIVE key  displays the certificate of the test carried out and it can be downloaded for the user of the wrench.

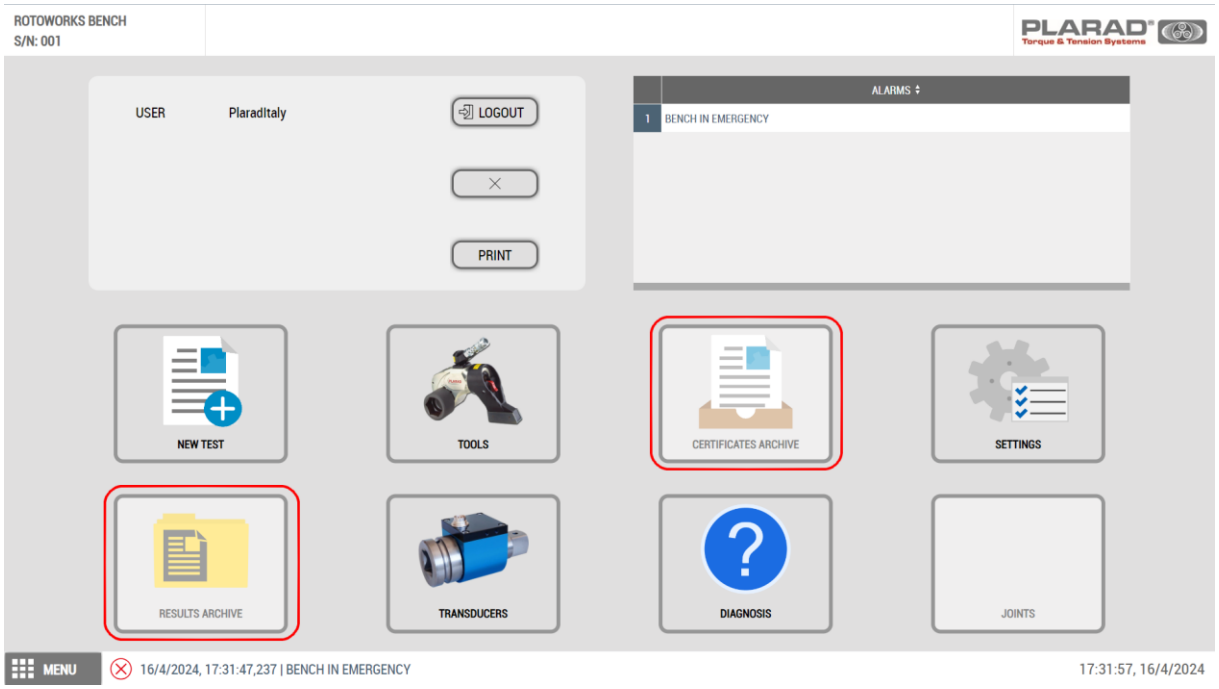
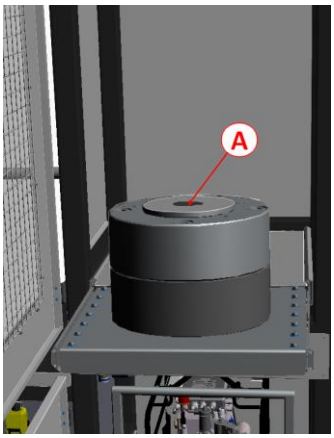


Fig.5.6.7

5.7 TESTING TENSIONERS

Tensioners are tested in the tightening wrench testing station.

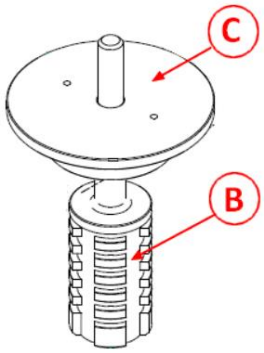
Fig.5.7.1



Open the fixed guard and remove the carriage with the tensioner test block installed.

Check the test rod installation hole (A) and remove any impurities.

Fig.5.7.2



Remove the tie rod (B) from the side rack, with the thread provided for the tensioner to be tested, and its locking ring (C).

Grease the hooking teeth before proceeding with insertion.

Fig.5.7.3

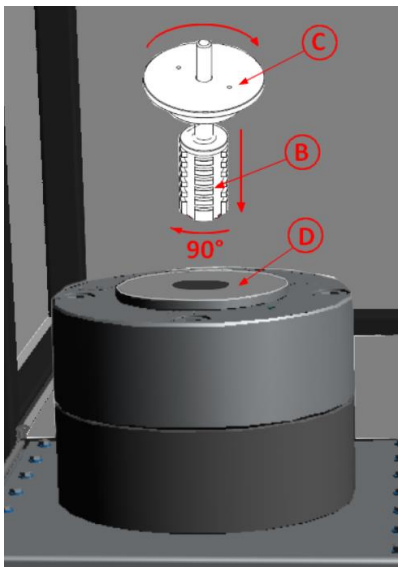


Fig.5.7.4

Remove the ring nut (D) from the base, insert the tie rod (B) and rotate it through 90° to hook the tie rod onto the internal sensor.

Insert the fixing ring nut (C) corresponding to the tie rod and screw it to the base.

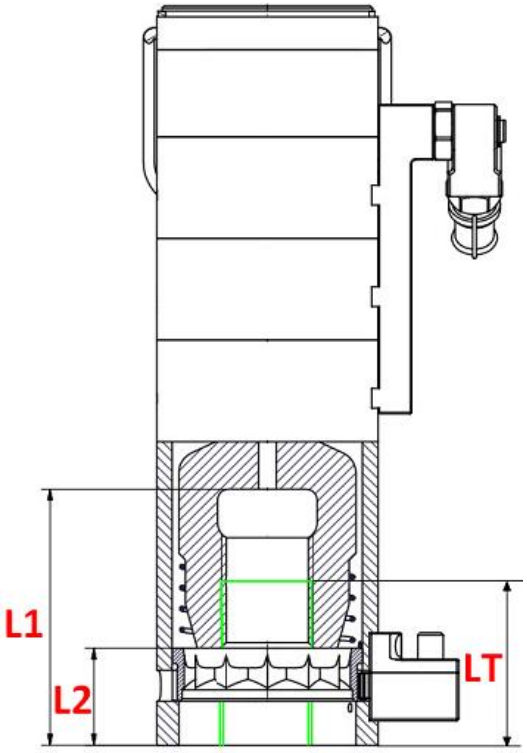


Fig.5.7.5

Carry out a dimensional check on the tensioner to be installed.

Measure the dimensions L2, height from the base of the tensioner to the beginning of the thread, and L1 maximum insertion depth of the tensioner.

Measure the protrusion of the tie rod and check that the tie rod thread reaches a minimum protrusion height equal to LT min=L2+D (diameter of the tie rod thread) and height

LT max=L1-3mm.

Incorrect cases and solutions:

height LT < a L2+D; the tie rod does not screw sufficiently. Stop the test and ask the manufacturer for a tie rod model with an increased LT size.

height LT > L1-3mm; the tie rod is too long and the tensioner does not rest correctly on the base. Stop the test and ask the manufacturer for the thickness on the drawing.

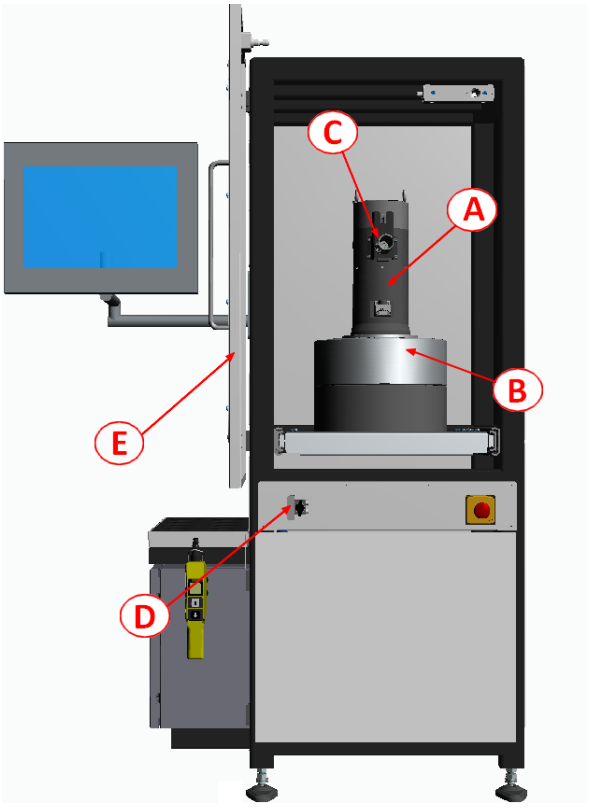


Fig.5.7.6

Proceed to position the tensioner (A) by screwing it onto the tie rod, lubricating the thread before starting the coupling, until it adheres to the base (B) and check there is no gap between the tensioner and the base with a thickness gauge.

In case of excessive resistance during coupling, stop the process and check the condition of the threads.

The positioning of the tensioner weighing more than 15 Kg must be carried out with the winch present in the workstation.

With the tensioner positioned, make the hydraulic connection, with the supplied hoses, on the quick couplings (C) and completely loosen the pressure regulation valve (D).

NOTE: To decrease the pressure, the knob must be unscrewed by turning it anticlockwise.

insert the carriage and close the front guard (E).

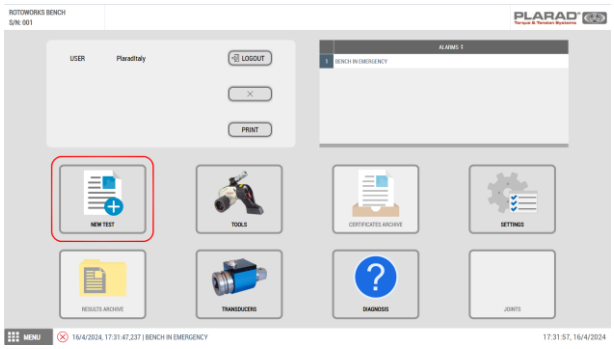


Fig.5.7.7

Access the hydraulic wrench test screen from the main page of the Software with the NEW TEST key  .

Fig.5.7.8

Select the SHOW ALL button  to display the complete legend of the products entered or TENSIONER  to display only the tensioners.

Scroll through the list and choose the model to be tested. If it is not listed, enter it as described in paragraph 3.9 PRELIMINARY ELECTRONIC ADJUSTMENTS FOR ENTERING NEW EQUIPMENT.

After selecting the product to be tested, the relevant test screen is displayed on the panel.

Start the test with the START TEST button 

.

Activate the closing of the hydraulic wrench with the wired remote control  located near the test area and increase the force with the pressure regulator (D) described above.

The pressure is increased by keeping the remote control button pressed and slowly screwing the regulator clockwise.

The screen displays the status of the torque measurement and signals the possible failure of the test.

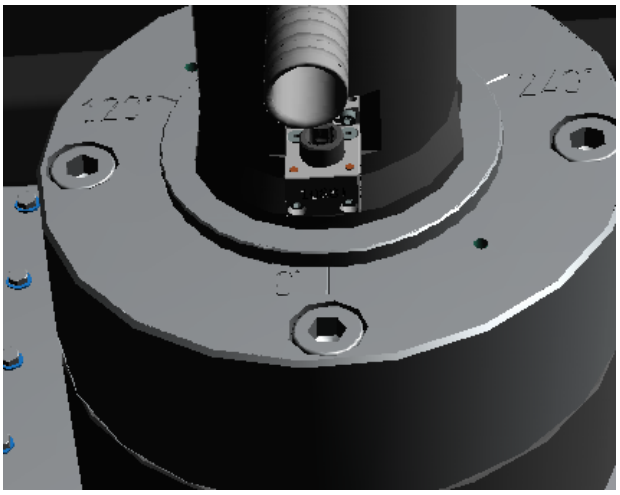
To proceed with the next test measurement, use the remote control to loosen the tensioner and unscrew the regulator anticlockwise to decrease the pressure and repeat the test for the next measurement.

The test identifies the number of measurements to be taken. The PAUSE TEST key 

stops the measurement without deleting the test and the RESET TEST key 

deletes the test carried out.

Fig.5.7.9



The tensioner test involves changing the angular position of the tensioner during the test.

On indication of the Software, open the movable guard and make the angular rotation in the new defined position.

The test positions are 0°, 120° and 270°.

Fig.5.7.10

Pressing the RESULT key 

displays the data of the test carried out.

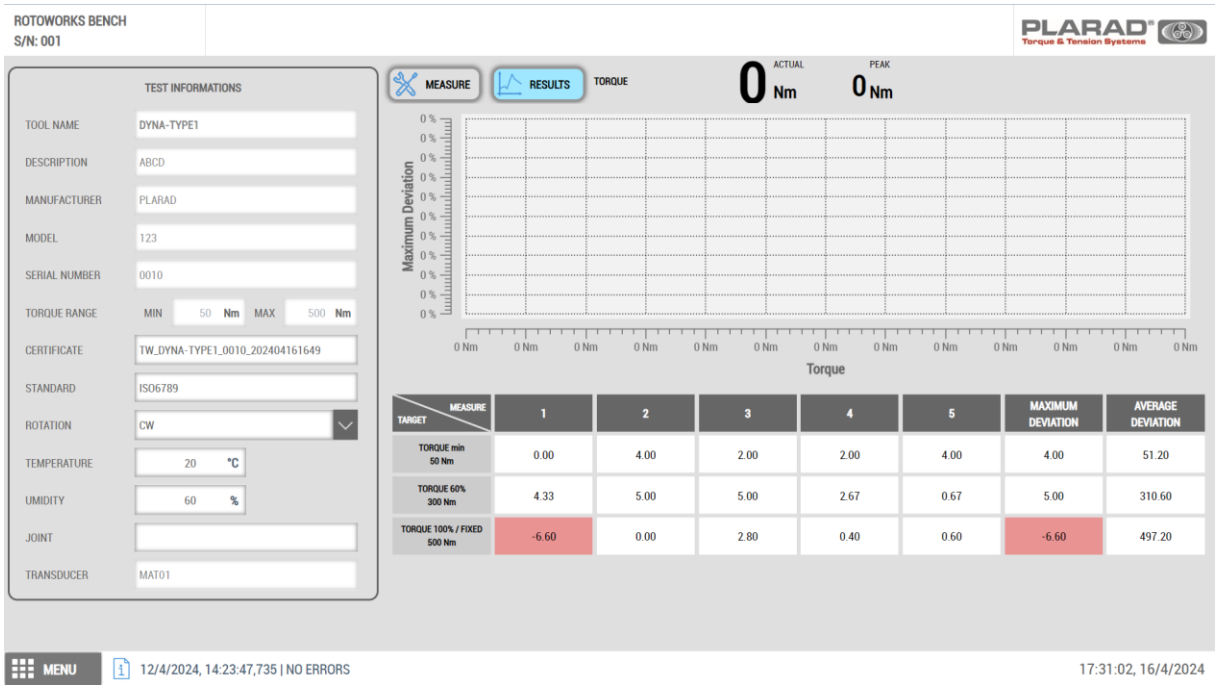


Fig.5.3.6

Pressing the RESULT ARCHIVE key  displays the results of the tests carried out.

Pressing the CERTIFICATES ARCHIVE key  displays the certificate of the test carried out and it can be downloaded for the user of the tensioner.

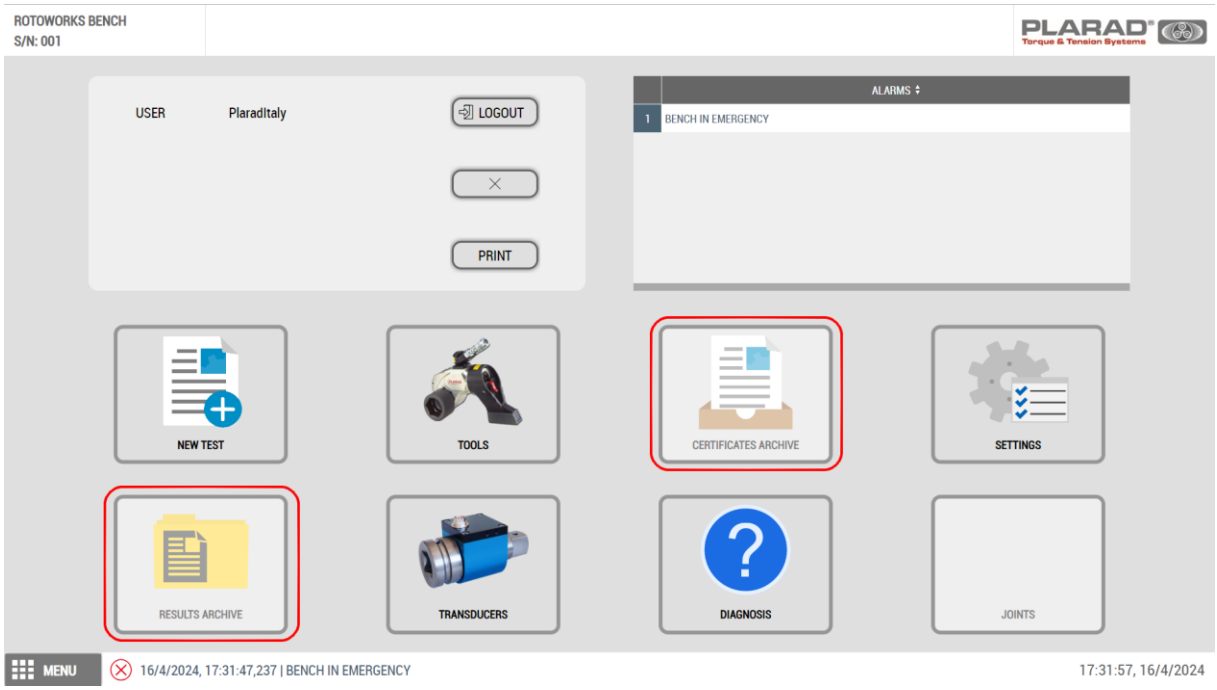


Fig.5.3.7

5.8 HYDRAULIC WRENCH TESTING OPTION ON ELECTRIC NUTRUNNER STATIONS

Fig.5.3.1

Optionally, hydraulic wrenches can be tested in the electric nutrunner testing station.

NOTE: the force exerted by the wrenches to be tested must not exceed 2 kNm.

Check the compatibility of the wrench coupling panel, the optional coupling flange with the torque measurement transducers.

Disassemble the test flange of the nutrunners (A) and screw in the test ring with the hydraulic wrench panel (B).

Replace the nutrunner reaction arm support (C) with the bracket provided by the manufacturer.

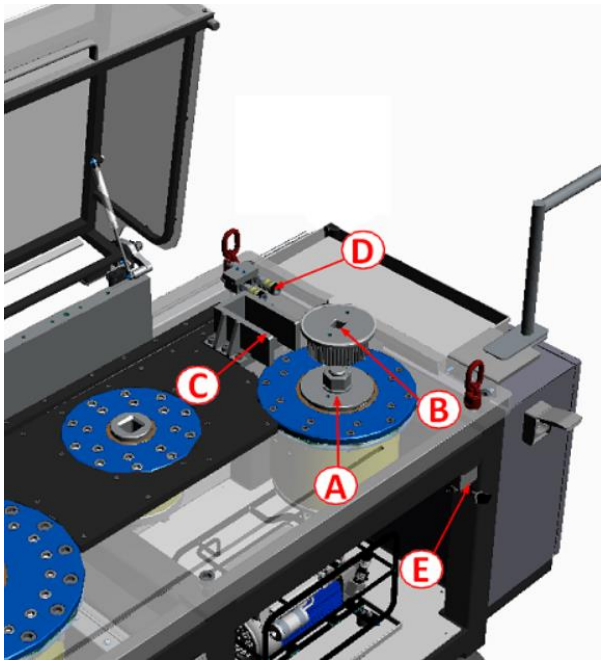


Fig.5.3.2

Proceed to position the wrench in the station (A) and place the reaction foot of the wrench on the support bracket (C). The positioning of the wrench must be perpendicular to the axis of the testing station.

The positioning of wrenches weighing more than 15 Kg must be carried out with the winch present in the workstation.

If the positioning does not comply with the indicated perpendicularity, the support must be replaced.

With the wrench in place, make the hydraulic connection, with the hoses supplied, between the quick couplings (D) and completely loosen the pressure regulation valve (E).

NOTE: To decrease the pressure, the knob must be unscrewed by turning it anticlockwise.

NOTE: the hydraulic wrench test must be carried out with the remaining testing stations free of products and with the protection guard of the hydraulic testing stations closed.

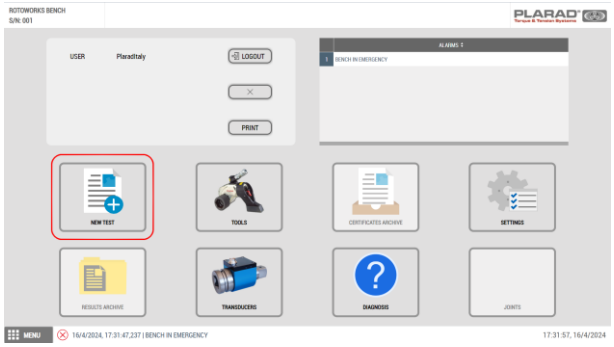


Fig.5.3.3

Access the hydraulic wrench test screen from the main page of the Software with the NEW TEST key  .

Select the SHOW ALL button  to display the complete legend of the products entered or TORQUE WRENCH  to display only the torque wrenches.

Scroll through the list and choose the model to be tested. If it is not listed, enter it as described in paragraph 3.9 PRELIMINARY ELECTRONIC ADJUSTMENTS FOR ENTERING NEW EQUIPMENT.

Fig.5.3.4

After selecting the product to be tested, the relevant test screen is displayed on the panel.

On this page, the wrench rotation direction is checked, which must correspond to that set on the wrench and the test sequence required for the test.

Start the test with the START TEST button  .

Activate the closing of the hydraulic wrench with the wired remote control  located near the test area and increase the force with the pressure regulator (E) described above.

The pressure is increased by keeping the remote control button pressed and slowly screwing the regulator clockwise.

The screen displays the status of the torque measurement and signals the possible failure of the test.

To proceed with the next test measurement, use the remote control to loosen the wrench and unscrew the regulator anticlockwise to decrease the pressure and repeat the test for the next measurement.

The test identifies the number of measurements to be taken. The PAUSE TEST key  stops the measurement without deleting the test and the RESET TEST key  deletes the test carried out.

Fig.5.3.5

Pressing the RESULT key  displays the data of the test carried out.

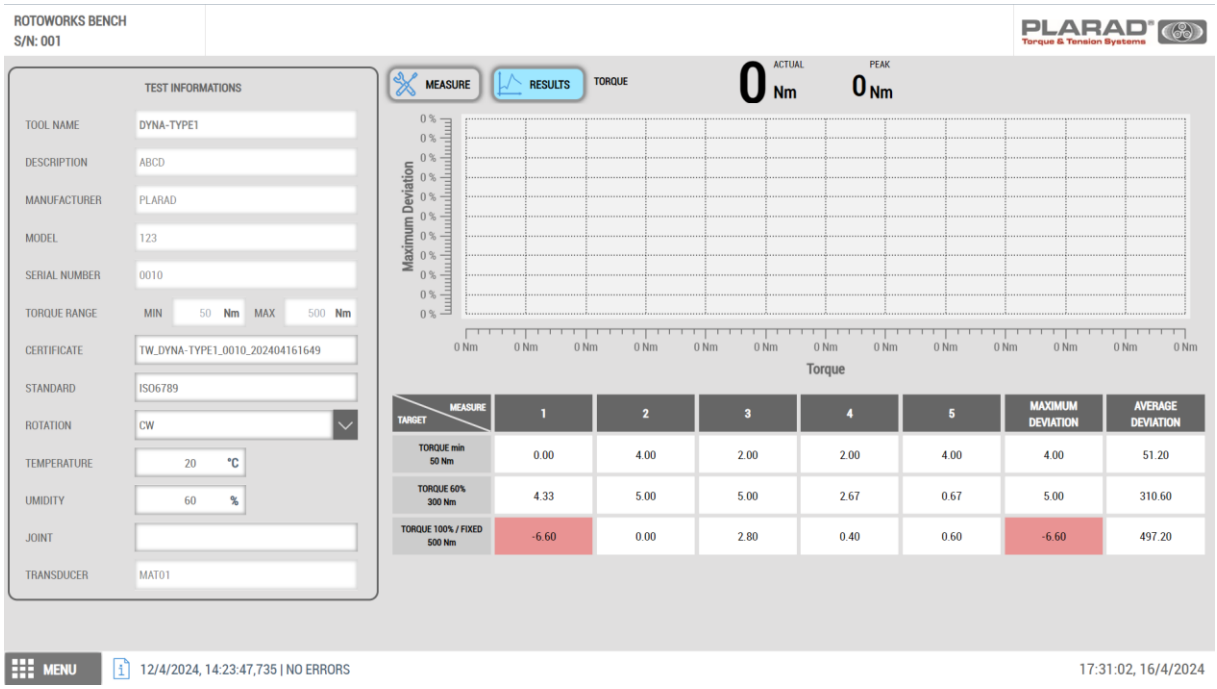


Fig.5.3.6

Pressing the RESULT ARCHIVE key  displays the results of the tests carried out.

Pressing the CERTIFICATES ARCHIVE key  displays the certificate of the test carried out and it can be downloaded for the user of the wrench.

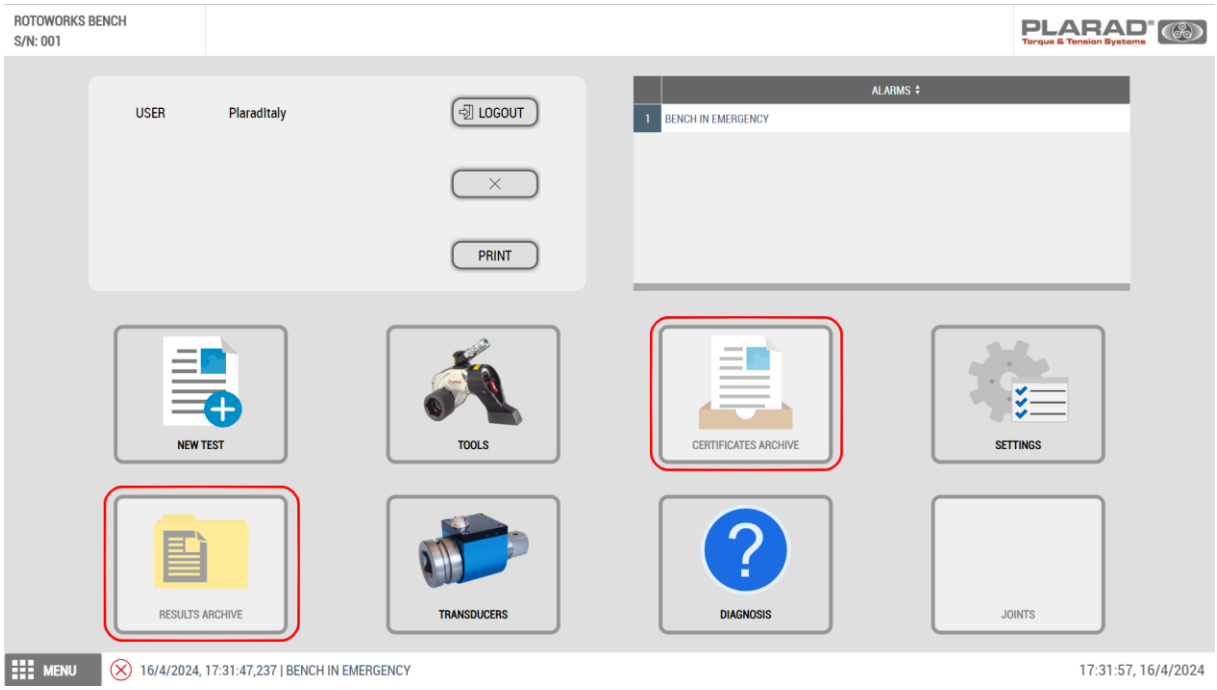


Fig.5.3.7

5.9 NORMAL STOP

The activity of the machine is stopped, in relation to the pressurisation of the control units, by the release of the remote control buttons  .

To stop the bench completely, turn the main switch  of the electrical panel to 0.

5.10 EMERGENCY STOP

The Emergency Stop manoeuvre of the machine is carried out by pressing the corresponding Red mushroom button; this action causes the immediate stop of all the parts that have been started and are moving.

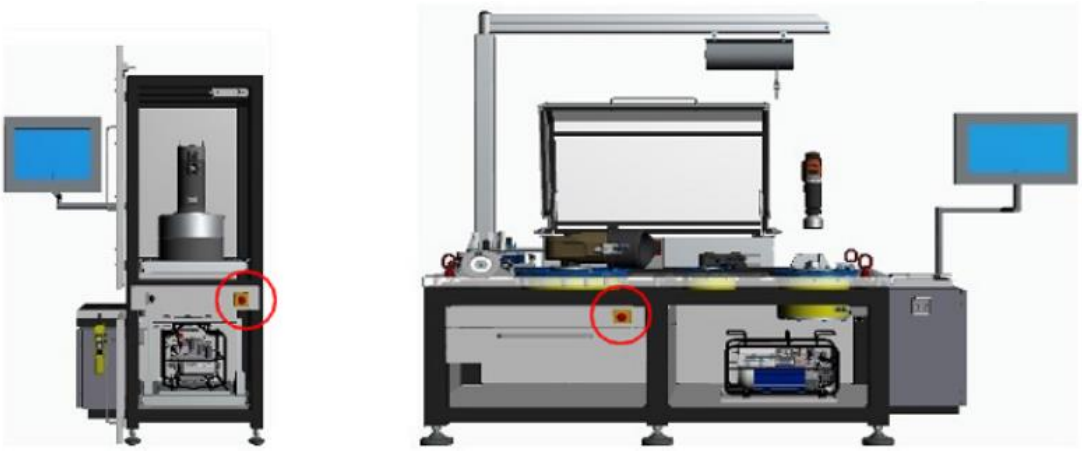


Fig.5.4.1

5.11 DISASTER RECOVERY

After manually resetting the mushroom Emergency Button by rotating it clockwise by about 30 degrees, the machine can normally be restarted after performing the reset action.

The reset procedure involves resetting the alarms from the operator panel  and activating the reset button  .

5.12 DECOMMISSIONING

During long periods of inactivity, it is necessary to disconnect the power supply from the general electrical panel.

Disconnect the machine from the electrical system.

Disconnect the hydraulic systems and empty the hydraulic oil tanks.

6 MAINTENANCE

Routine maintenance - Type of maintenance interventions during the life cycle, intended to:

- maintain the original integrity of the asset;
- maintain or restore the efficiency of the assets;
- contain the normal degradation of use;
- ensure the useful life of the asset;
- deal with accidental events.

Generally, interventions are required as a result of:

- detection of faults or failures (fault-related or corrective maintenance),
- implementation of maintenance policies (preventive, cyclical, predictive maintenance according to condition),
- need to optimise the availability of the asset and improve its efficiency (improvement or small modifications that do not entail an increase in the asset's value).

The aforementioned interventions do not change the original characteristics (plate data, sizing, construction values, etc.) of the asset itself and do not change its essential structure or its intended use. The relative costs must be foreseen (also on a statistical basis) in the maintenance budget and attributed to the financial year in which the activities were carried out (see UNI 10992). Routine maintenance costs are always incurred.

Extraordinary maintenance - Type of non-recurring and high-cost interventions, compared to the replacement value of the asset and the annual costs of routine maintenance thereof. Interventions also:

- can prolong the useful life and/or, alternatively, improve its efficiency, reliability, productivity, maintainability and inspectability;
- do not change the original characteristics (plate data, sizing, construction values, etc.) or the essential structure;
- do not involve changes in the intended use of the asset.

The relative costs are foreseen in the maintenance budget (see UNI 10992).

The intervention must be shown in the accounts; the cost incurred for its implementation can be:

- attributed to the financial year in which the interventions were carried out;
- capitalised, provided that it determines an increase in the asset's value (interventions such as replacements of important structural components, the substantial remaking of parts of the asset) which in general determines a significant increase in the useful life of the asset itself and/or in the performance of its function.

All mechanical setting operations must only be performed with the system switched off and must only be performed by trained, qualified and authorised personnel!

6.1 MAINTENANCE STATUS

Maintenance operations must be carried out with the machine in the conditions described in the item "MACHINE STATUS" in Tab. 6-6.1 of Scheduled Maintenance.

6.2 ON-BOARD MACHINE ELECTRICAL SYSTEM FUNCTIONAL CHECKS

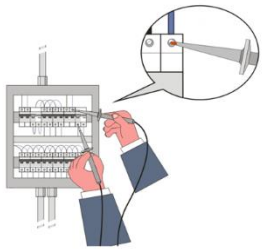
Only suitably trained personnel can carry out maintenance operations on electrical panels or on the electrical equipment on the machine.

MEASUREMENT TYPE

The open panel has a degree of protection towards the active parts ≥ IPXXB.

There is no risk of accidental contact, nor of accidental short circuit, taking into account the type of tips used (shape and size of the bare contact tip) and the distances of the active parts from each other towards ground.

There is no need for expert supervision, insulating gloves or short-circuit protection visors.



There is no risk of accidental contact, nor of accidental short circuit, taking into account the type of tips used (shape and size of the bare contact tip) and the distances of the active parts from each other towards ground.

Fig.6.2.1

The manufacturer is not responsible for non-compliance with the aforementioned recommendations or for any other use that differs from or is not mentioned in these instructions.

6.3 MACHINE INSULATION

Before carrying out any type of maintenance and/or repair, it is necessary to isolate the machine from the power supply and other energy sources.

All disconnecting devices must be able to be locked in the “isolated circuit” position, for example by means of padlocks, so that the operators working on the machine can ensure that no element of it can be started while the intervention is in progress, by means of a procedure of this type:

before working on the machine, each operator locks all the disconnectors of the external power sources with personal locking means - for example padlocks - and carries the opening wrenches with them. Each operator removes the personal locking means of the disconnectors only once the intervention on the machine is finished, this means the locking of the disconnectors can be removed only after all the operators have removed the personal locking means, or only after all the operators have finished working on the machine.

If the disconnectors do not have enough space for all the padlocks, simple locking means of the type shown in the photo can be used:

Fig.6.3.1

This procedure prevents an operator from starting the machine without noticing the presence of other operators inside the dangerous areas of the machine; for it to be effective, it is essential that all operators who work on the machine lock the disconnectors with personal padlocks.

A procedure for the isolation of energy sources widely used in the industrial field is known as Lockout/Tagout (LOTO); this procedure is of US origin and has been defined by the Occupational Safety and Health Administration (OSHA) [www.osha.gov].

Insulation	Mode
	Electricity: turn the main switch to O and apply the padlock

Fig.6.3.1

6.4 SPECIAL PRECAUTIONS

When carrying out maintenance and/or repair work, scrupulously follow the following instructions:

a) before starting work, display a sign that says “MACHINE IN MAINTENANCE” in a clearly visible position;

b) do not use solvents or flammable materials;

c) take care not to disperse cooling lubricants in the environment;

d) to access the highest parts of the machine, use suitable equipment for the operations to be carried out;

e) do not climb on any parts of the machine, as they have not been designed to support people;

f) at the end of the work, restore and properly secure all protections and guards removed, opened and deactivated.

The manufacturer is not responsible for non-compliance with the aforementioned recommendations or for any other use that differs from or is not mentioned in these instructions.

6.5 CLEANING

Before carrying out any type of cleaning, it is necessary to isolate the machine from the power supply.

The measures necessary for carrying out these operations in safe conditions are indicated in the following procedure.

Clean the machine before each restart, eliminating the waste produced by processing.

Check that connections and fittings are free of grease and oil.

Use non-corrosive products and cloths that do not release fabric residues.

Do not use flammable liquids for cleaning the machine.

Before cleaning:

Close or cover all cracks to prevent liquids from entering, thus avoiding any safety and/or operating problems.

The most sensitive parts are: electrical components, control cabinets, electrical connections and air filters.

After cleaning:

– close or reassemble the various guards.

– check the tightness of the various hoses, the tightness of the fittings, and the absence of damage.

- Remedy all defects/damage discovered immediately.

Do not clean with steam jet equipment or similar!

6.6 SCHEDULED ROUTINE MAINTENANCE

General requirements

Scheduled routine maintenance includes inspections, checks and interventions that, to prevent interruptions and failures, systematically monitor the lubrication status of the machine and the condition of the parts subject to wear.

These operations, although simple, must be carried out by Qualified Personnel.

The machine has been designed to minimise routine maintenance; it is up to the operator to assess the condition and its suitability for use.

It is recommended, however, to stop and carry out maintenance whenever there is less than optimal operation; this will always allow maximum efficiency.

a) Always use the appropriate PPE - Personal Protective Equipment:

b) gloves;

c) non-slip shoes;

d) goggles;

e) suitable clothing.

Visually check the condition of the individual parts that make up the machine, verifying that there are no alterations due to yielding or deformation.

For all maintenance that does not require voltage to the power components, it is necessary to stop the system, disconnecting the power supply from the main panel disconnector, locking it, with a special padlock, into the “O” (OFF) position.

Check and test the correct operation and intervention of the Emergency Stops once a month, running the machine idle.

In case of malfunction, appoint only specialised personnel to look for the fault or call the electrical panel manufacturer technical support service.

Check the continuity of the ground circuit by carrying out the continuity measurement in accordance with IEC EN 60207-1 p. 18.2.2.

All mechanical setting operations must only be performed with the system switched off and must only be performed by trained, qualified and authorised personnel!

Failure to comply with the requirements exempts the manufacturer from any type of liability.

Checks to be carried out by the manufacturer	Timing
For the correct operation of the machine, a check by the supplier is necessary, the purpose of which is to verify the functional parameters, the state of wear of the components and equipment, the safety components and the integrity of the fixed and movable guards.	SIX-MONTHLY
Checks to be carried out by the user	
Visually check the condition of the individual parts that make up the machine, verifying that there are no alterations due to yielding or deformation. For all maintenance that does not require voltage to the power components, it is necessary to stop the system, disconnecting the power supply from the main panel disconnector, locking it, with a special padlock, into the "O" (OFF) position.	DAILY
Check and test the correct operation and intervention of the Emergency Stops, running the machine idle. In case of malfunction, appoint only specialised personnel to look for the fault or call the electrical panel manufacturer technical support service.	MONTHLY
Lubricate the sliding parts such as guides and couplings with transducers.	TWICE A MONTH
Replace the hydraulic oil in the control unit tanks. Place a container of sufficient volume below the hydraulic unit. Open the oil drain plug. When the oil has completely drained, close the oil drain plug. Open the oil filler cap. Carefully pour fresh, clean hydraulic oil into the surge tank through a funnel, until the correct oil level is reached. When the oil level in the level pipe coincides with the illustration of the "Oil Level" sticker, do not add any more oil. Close the oil filler cap.	YEARLY
Check the continuity of the ground circuit by carrying out the continuity measurement in accordance with IEC EN 60207-1 p. 18.2.2.	TWO-YEARLY
Replace the tensioner test punches.	EVERY 5000 TEST CYCLES
	TAB.6.6.1

6.7 DISASSEMBLY OF SENSORS FOR CALIBRATION

The machine provides for a procedure for disassembling the torque measurement cells and the pressure transducers of the hydraulic circuits.

The procedure must be carried out with the frequency provided by the manufacturer.

Checks to be carried out by the user	Timing
Disassembly of the cell for calibration by the manufacturer	26 months

Warning: the instructions for disassembly and assembly of the cells must be carried out by experienced personnel appointed by the user.

Equipment subject to periodic disassembly is located in the tightening wrench testing station and in the tensioner testing station.

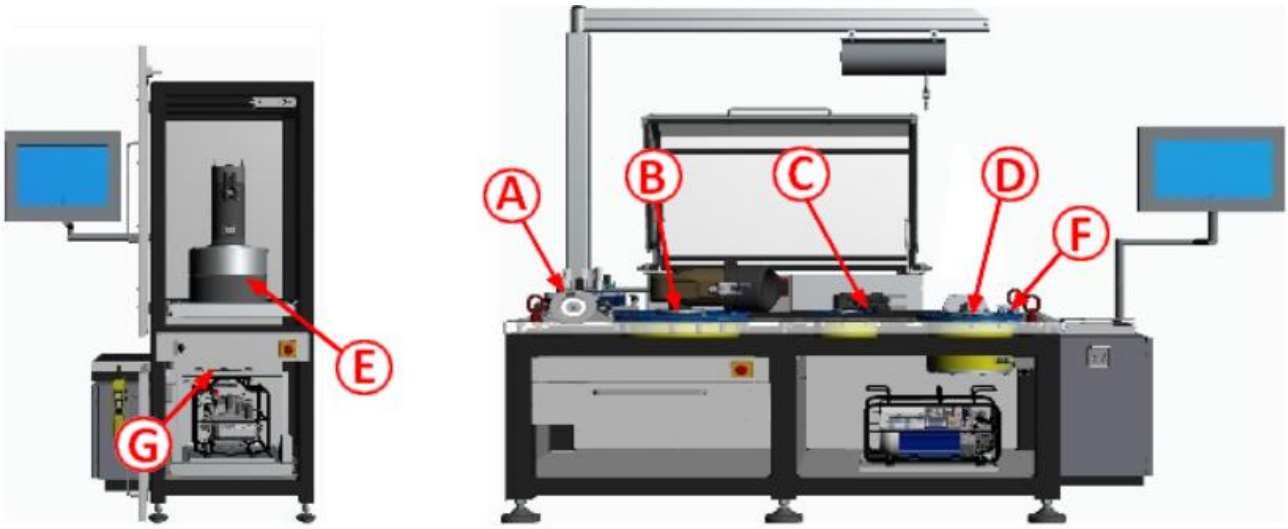


Fig.6.7.1

A. Torque wrench torque measurement cells;
B. Hydraulic wrench torque measurement cell with 50kNm force;
C. Hydraulic wrench torque measurement cell with 5kNm force;
D. Electric nutrunner torque measurement cell with 2kNm force;
E. Tensioner torque measurement cell;
F. Hydraulic system pressure transducer for tightening wrench testing station;
G. Hydraulic system pressure transducer for tensioner testing station.

All mechanical setting operations must only be performed with the system switched off and must only be performed by trained, qualified and authorised personnel!

6.8 DISASSEMBLY OF THE TORQUE WRENCH TORQUE MEASUREMENT CELLS

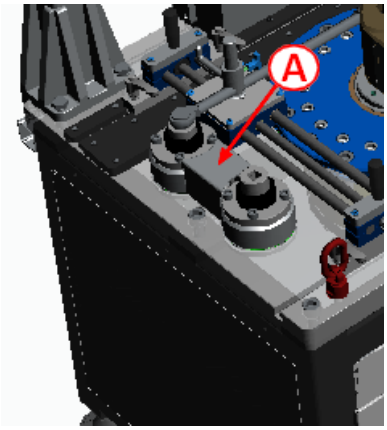


Fig.6.8.1

Remove the cover (A) of the sensors located between the torque measurement cells.

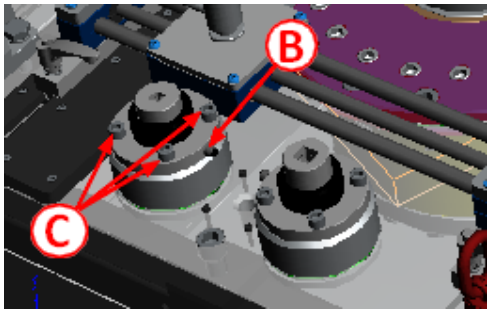


Fig.6.8.2

Disconnect the connector of the cells (B) and completely unscrew the set screws (C).

Note: the screws must be stored in such a way that they do not undergo oxidation.

Remove the measurement cells from the housings.

Fig.6.8.3

Ship to the calibration laboratory identified by the manufacturer.

⚠ **WARNING: The cells must be shipped by inserting the instruments with suitable packaging that protects against impact and vibrations during transport.**

Also indicate the following data: types of test screws/tie rods necessary for which tools, dimensions, type of maintenance, durability, lubrication, etc. as well as all the information aimed at describing the system.

6.9 ASSEMBLY OF THE TORQUE WRENCH TORQUE MEASUREMENT CELLS

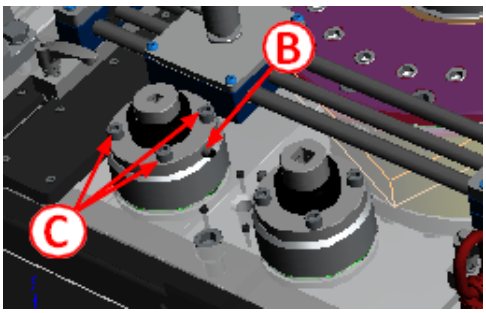


Fig.6.9.1

Insert the cells into the seats taking care with the orientation of the cell connections.

The connections of the cells must be perpendicular to the testing station and facing each other.

Fully tighten the set screws (C) to the torque indicated by the manufacturer.

⚠ **CAUTION: in case of excessive resistance of the screws during tightening, stop the procedure and check the status of the screws and seats.**

Connect the cell connectors (B).

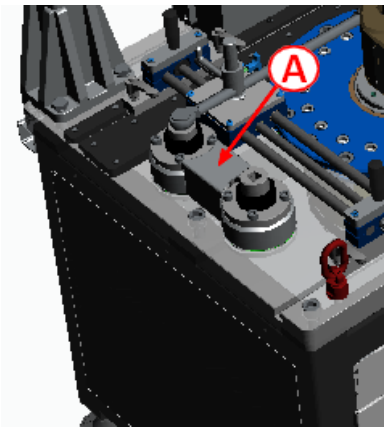


Fig.6.9.2

reposition the cover (A) of the sensors located between the torque measurement cells.

6.10 DISASSEMBLY OF THE HYDRAULIC WRENCH TORQUE MEASUREMENT CELLS 50 kNm

Warning: the handling of the described components must be carried out with a suitable certified lifting device that has a capacity of at least 200 kg

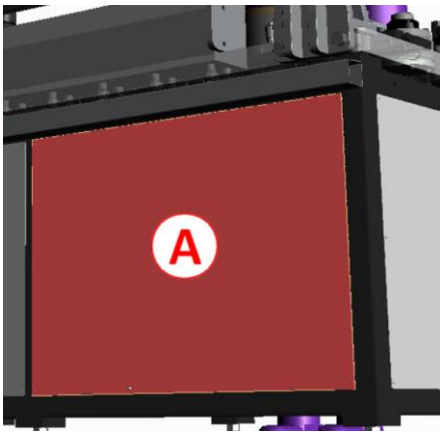


Fig.6.10.1

Disassemble the rear panel (A) to access the internal parts of the testing station, open the cable containment channel and remove the cell connection cable and the LED connection cable.

Inside the channel there is a reserve of cable, for both connections, of one meter to facilitate the extraction manoeuvres.

Disconnect the LED cable connector.

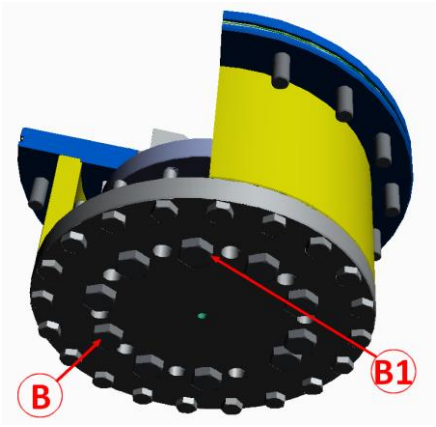


Fig.6.10.2

Accessing the lower compartment, unscrew the set screws (B) of the torque measurement cell with the exception of the set screw (B1).

The set screw (B1), oriented towards the front work station, must only be loosened to keep the cell in place during the following steps.

Note: the screws must be stored in such a way that they do not undergo oxidation.

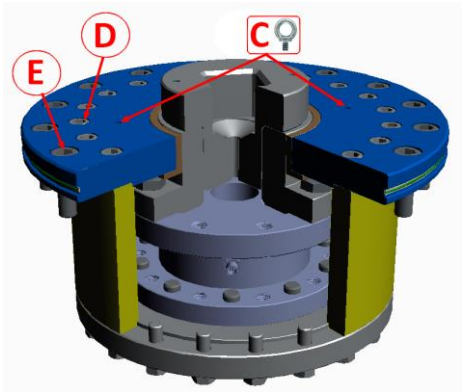


Fig.6.10.3

Insert the eyebolts (C), supplied by the manufacturer, into the flange seats to carry out the subsequent lifting.

Loosen the set screws (D) of the flange to the structure, to contain the cell, without removing them to prevent the body from falling.

Unscrew the set screws (E) of the block on the floor of the testing station.

Note: the screws must be stored in such a way that they do not undergo oxidation.

Connect the lifting means, with certified lifting chains, to the eyebolts (C).

Lift the entire block.

⚠ WARNING: Total weight of the block 200 kg

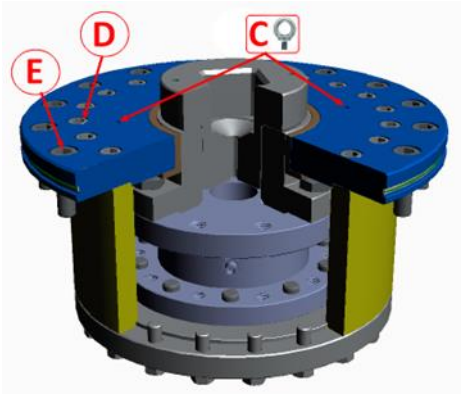
removal from the seat must take place slowly and avoiding oscillations.

During removal, check that the cables do not get caught by accompanying the cable into the grooves in the internal slits.

With the block removed, insert wooden panels to create a support and lower the load without unhooking the lifting system.

The wooden panels must be suitable to support the removed block in a stable manner.

Fig.6.10.4

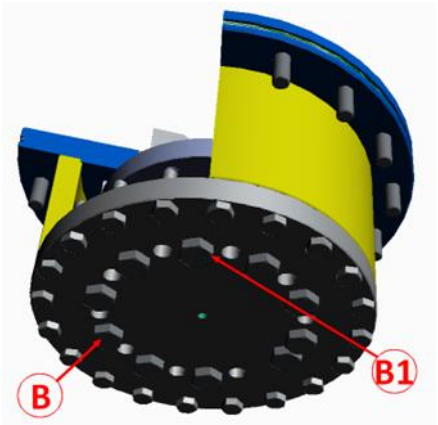


Unscrew the set screws (D) of the flange to the structure and insert in two seats, placed at 180°, the guide pins provided by the manufacturer to facilitate removal.

Note: the screws must be stored in such a way that they do not undergo oxidation.

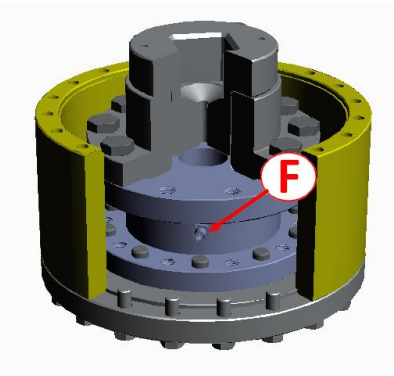
Lift the flange, weighing 40 kg, and place it stably on a Europallet and store it in a dry environment protected from the elements.

Fig.6.10.5



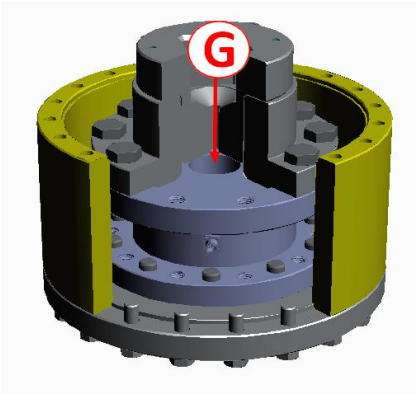
Remove the set screw (B1) to free the measurement cell.

Fig.6.10.6



Disconnect the cell connector (F)

Fig.6.10.7



Insert the removal bar, provided by the manufacturer, of the cell into the housing reachable from the hole (G).

Make sure the lifting bar is fully screwed in before proceeding.

Remove the measurement cell, weighing 50 kg, with the lifting equipment

Fig.6.10.8

Ship to the calibration laboratory identified by the manufacturer.

⚠ WARNING: The cells must be shipped by inserting the instruments with suitable packaging that protects against impact and vibrations during transport.

Fig.6.10.9

6.11 ASSEMBLY OF THE HYDRAULIC WRENCH TORQUE MEASUREMENT CELLS 50 kNm

Warning: the handling of the described components must be carried out with a suitable certified lifting device that has a capacity of at least 200 kg

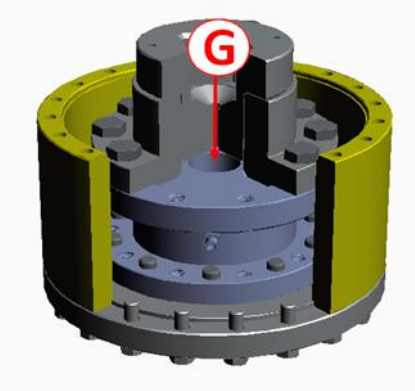


Fig.6.11.1

Insert the removal bar, provided by the manufacturer, of the cell into the housing reachable from the hole (G).

Make sure the lifting bar is fully screwed in before proceeding.

Lift the measurement cell, weighing 50 kg, with the lifting equipment and place it in the cell containment structure.

The structure must, like the disassembly procedure, be positioned on the walls, near the housing present in the testing station, verifying that it is stable.

In the insertion step, check that the cell is correctly housed in the centre of the structure itself.

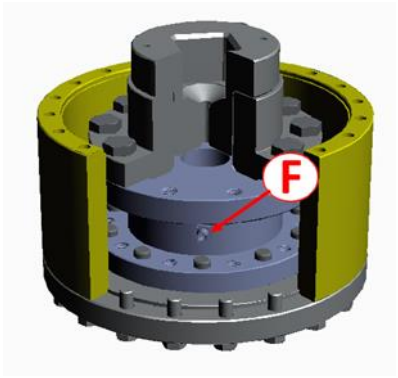


Fig.6.11.2

Orient the cell so that the connection is facing the connection connector.

Connect the cell connector (F)

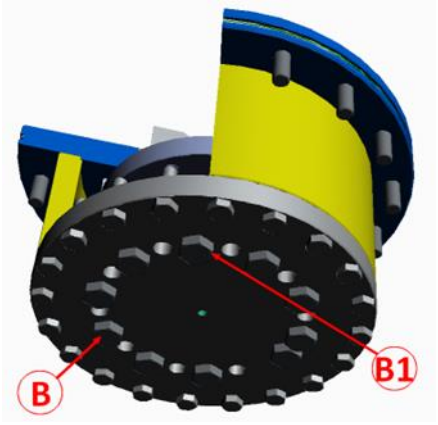


Fig.6.11.3

Tighten the set screw (B1), until it comes into contact with the plate, to fix the measurement cell without tightening completely.

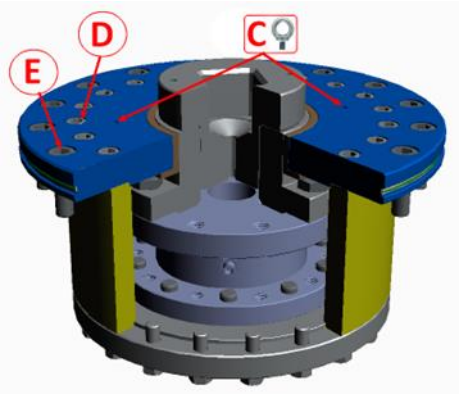


Fig.6.11.4

Lift the flange, weighing 40 kg, and insert the flange, without tilting it, to insert the bushing.

To facilitate the action, insert the guide pins provided by the manufacturer in two seats, placed at 180°, to facilitate the operation.

NOTE: If the flange tends to lock during the insertion step, stop the procedure and check that the bushing is not damaged.

Stick the flange to the housing structure and tighten the screws (D) to secure the flange without tightening completely.

Fig.6.11.5

Lift the entire block.

⚠ WARNING: Total weight of the block 200 kg

Remove the wooden panels and proceed with the insertion; insertion into the seat must take place slowly and avoiding oscillations.

During insertion, check that the cables do not get caught by accompanying the cable into the grooves in the internal slits.

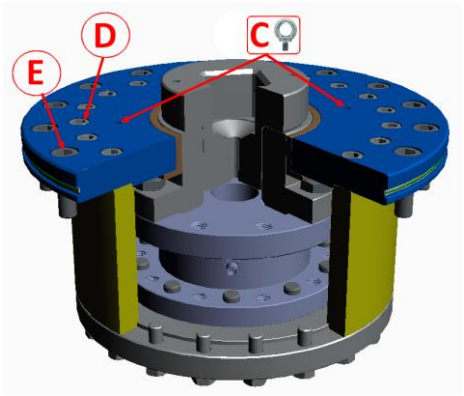


Fig.6.11.6

Screw the set screws (E) to secure the flange to the plane of the testing station without tightening completely.

Remove the eyebolts (C).

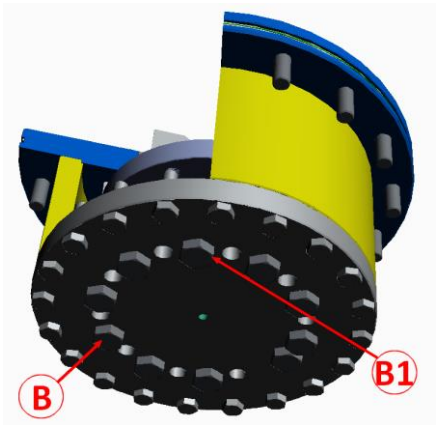


Fig.6.11.7

Accessing the lower compartment, screw the set screws (B) of the torque measurement cell without fully tightening them.

Tighten the screws according to the following sequence:

1. tightening screws E;
2. tightening screws D;
3. tightening screws B.

the tightening of the screws must be carried out as indicated in table Tab.6.11.1.

Set screws B	: torque 560 Nm
Set screws D	: torque 280 Nm
Set screws E	: torque 560 Nm

Tab.6.11.1

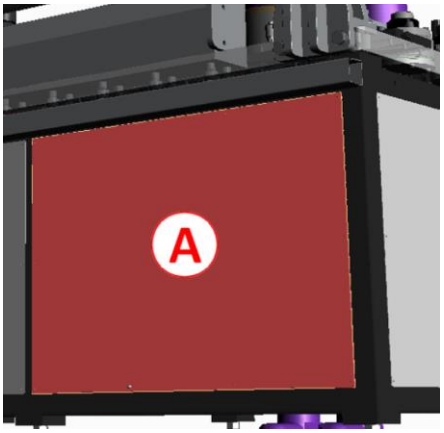


Fig.6.11.8

Connect the LED power cable and reposition the cables inside the cable containment duct.

Close the duct and reassemble the rear panel (B).

6.12 DISASSEMBLY OF THE HYDRAULIC WRENCH TORQUE MEASUREMENT CELLS 5 kNm

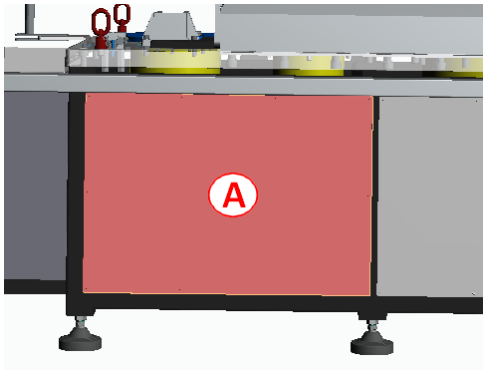


Fig.6.12.1

Disassemble the rear panel (A) to access the internal parts of the testing station, open the cable containment channel and remove the cell connection cable and the LED connection cable.

Inside the channel there is a reserve of cable, for both connections, of one meter to facilitate the extraction manoeuvres.

Disconnect the LED cable connector.

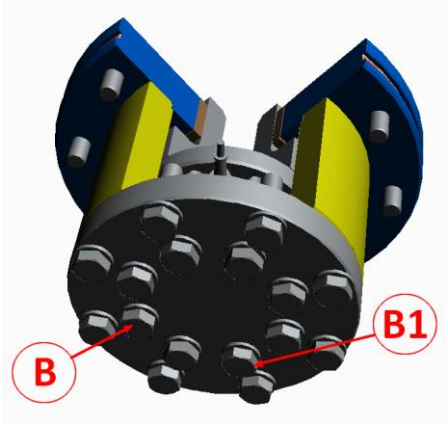


Fig.6.12.2

Accessing the lower compartment, unscrew the set screws (B) of the torque measurement cell with the exception of the set screw (B1).

The set screw (B1), oriented towards the front work station, must only be loosened to keep the cell in place during the following steps.

Note: the screws must be stored in such a way that they do not undergo oxidation.

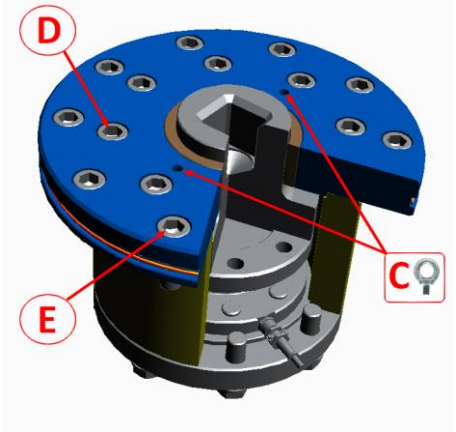


Fig.6.12.3

Insert the eyebolts (C), supplied by the manufacturer, into the flange seats to carry out the subsequent lifting.

Loosen the set screws (D) of the flange to the structure, to contain the cell, without removing them to prevent the body from falling.

Unscrew the set screws (E) of the block on the floor of the testing station.

Note: the screws must be stored in such a way that they do not undergo oxidation.

Connect the lifting means, with certified lifting chains, to the eyebolts (C).

Lift the entire block.

⚠ WARNING: Total weight of the block 50 kg

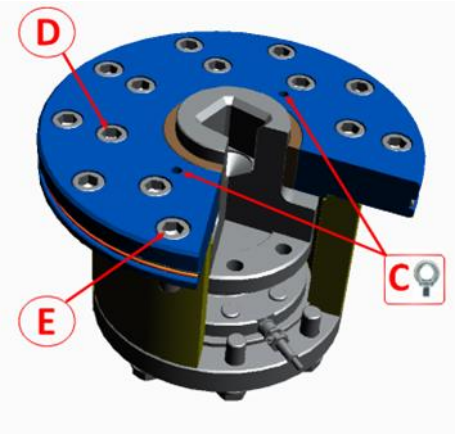
removal from the seat must take place slowly and avoiding oscillations.

During removal, check that the cables do not get caught by accompanying the cable into the grooves in the internal slits.

With the block removed, insert wooden panels to create a support and lower the load and unhook the lifting system.

The wooden panels must be suitable to support the removed block in a stable manner.

Fig.6.12.4

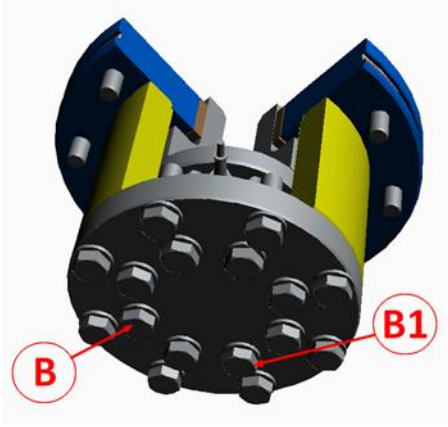


Unscrew the set screws (D) of the flange to the structure and insert in two seats, placed at 180°, the guide pins provided by the manufacturer to facilitate removal.

Note: the screws must be stored in such a way that they do not undergo oxidation.

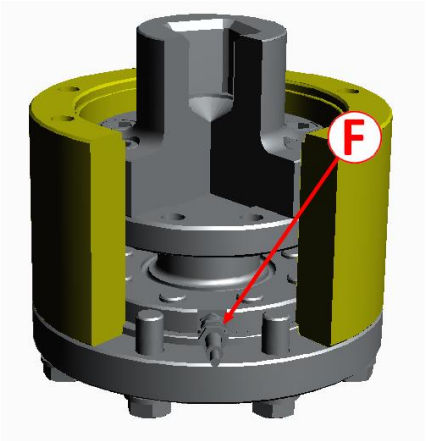
Lift the flange, weighing 10 kg, and place it stably on a Europallet and store it in a dry environment protected from the elements.

Fig.6.12.5



Remove the set screw (B1) to free the measurement cell.

Fig.6.12.6



Disconnect the cell connector (F) and remove the measurement cell, weighing 30 kg, manually.

Fig.6.12.7

Ship to the calibration laboratory identified by the manufacturer.

⚠ WARNING: The cells must be shipped by inserting the instruments with suitable packaging that protects against impact and vibrations during transport.

Fig.6.12.8

6.13 ASSEMBLY OF THE HYDRAULIC WRENCH TORQUE MEASUREMENT CELLS 5 kNm

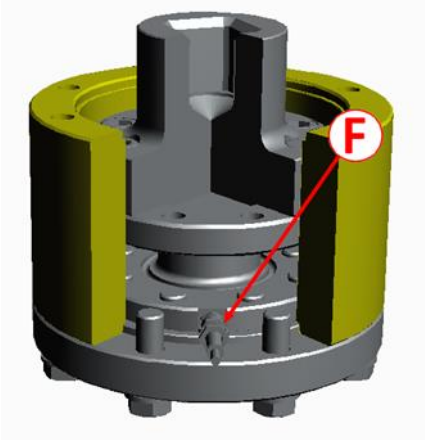


Fig.6.13.1

Insert the measurement cell, weighing 3 kg, manually and place it in the cell containment structure.

The structure must, like the disassembly procedure, be positioned on the walls, near the housing present in the testing station, verifying that it is stable.

In the insertion step, check that the cell is correctly housed in the centre of the structure itself.

Orient the cell so that the connection is facing the connection connector.

Connect the transducer (F)

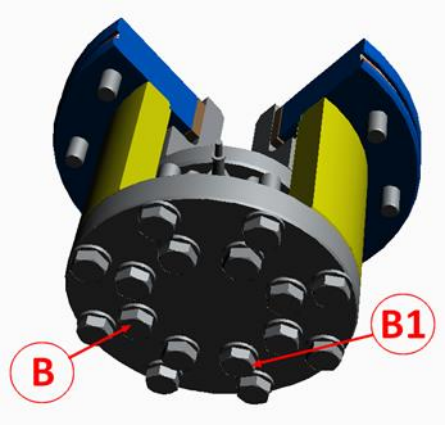


Fig.6.13.2

Tighten the set screw (B1), until it comes into contact with the plate, to fix the measurement cell without tightening completely.

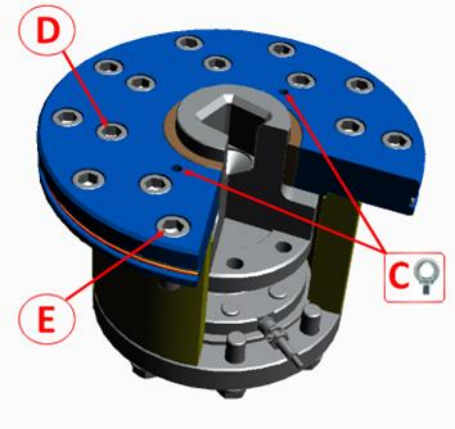


Fig.6.13.4

Connect the lifting means, with certified lifting chains, to the eyebolts (C).

Lift the flange, weighing 10 kg, and insert the flange, without tilting it, to insert the bushing.

To facilitate the action, insert the guide pins provided by the manufacturer in two seats, placed at 180°, to facilitate the operation.

NOTE: If the flange tends to lock during the insertion step, stop the procedure and check that the bushing is not damaged.

Stick the flange to the housing structure and tighten the screws (D) to secure the flange without tightening completely.

Fig.6.13.5

Lift the entire block.

⚠ WARNING: Total weight of the block 50 kg

Remove the wooden panels and proceed with the insertion; insertion into the seat must take place slowly and avoiding oscillations.

During insertion, check that the cables do not get caught by accompanying the cable into the grooves in the internal slits.

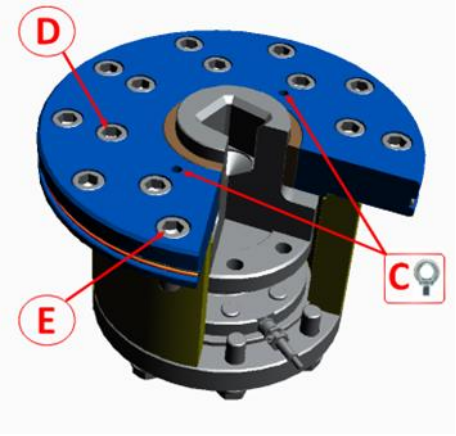


Fig.6.13.6

Screw the set screws (E) to secure the flange to the plane of the testing station without tightening completely.

Remove the eyebolts (C).

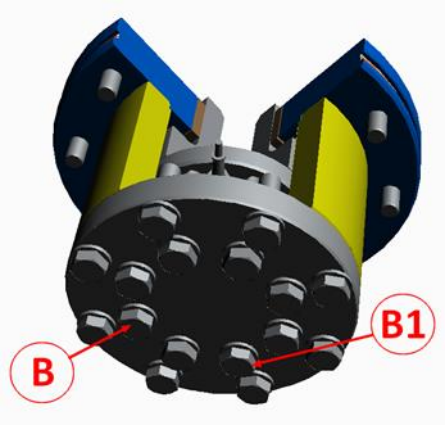


Fig.6.13.7

Accessing the lower compartment, screw the set screws (B) of the torque measurement cell without fully tightening them.

Tighten the screws according to the following sequence:

1. tightening screws E;
2. tightening screws D;
3. tightening screws B.

the tightening of the screws must be carried out as indicated in table Tab.6.13.1.

Set screws B	: torque 280 Nm
Set screws D	: torque 280 Nm
Set screws E	: torque 280 Nm

Tab.6.13.1

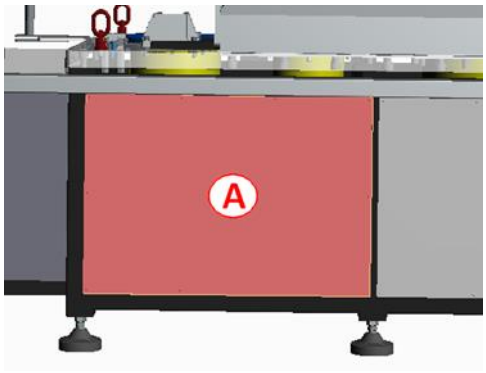


Fig.6.13.8

Connect the LED power cable and reposition the cables inside the cable containment duct.

Close the duct and reassemble the rear panel (B).

6.14 DISASSEMBLY OF THE ELECTRIC NUTRUNNER TORQUE MEASUREMENT CELLS WITH 2KNM FORCE

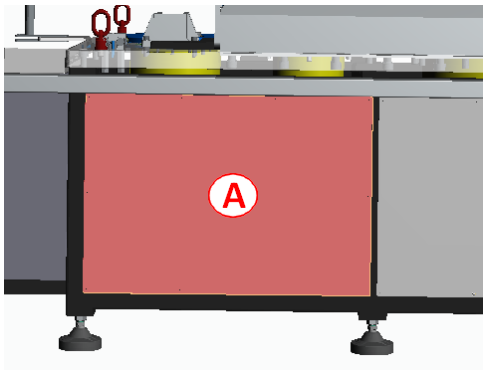


Fig.6.14.1

Disassemble the rear panel (A) to access the internal parts of the testing station, open the cable containment channel and remove the cell connection cable and the LED connection cable.

Inside the channel there is a reserve of cable, for both connections, of one meter to facilitate the extraction manoeuvres.

Disconnect the LED cable connector.

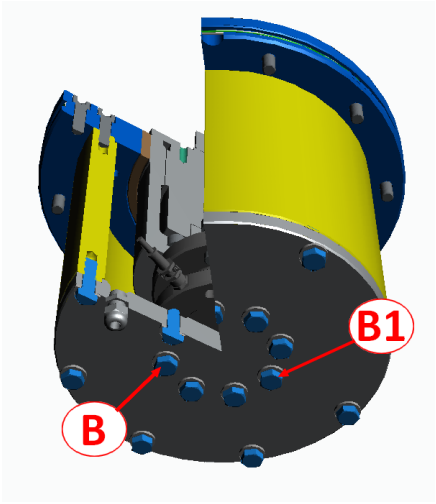


Fig.6.14.2

Accessing the lower compartment, unscrew the set screws (B) of the torque measurement cell with the exception of the set screw (B1).

The set screw (B1), oriented towards the front work station, must only be loosened to keep the cell in place during the following steps.

Note: the screws must be stored in such a way that they do not undergo oxidation.

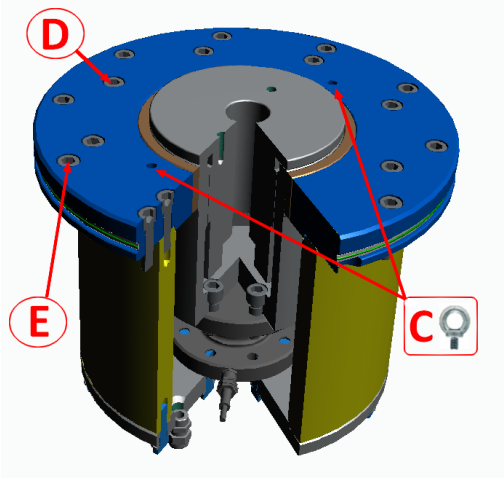


Fig.6.14.3

Insert the eyebolts (C), supplied by the manufacturer, into the flange seats to carry out the subsequent lifting.

Loosen the set screws (D) of the flange to the structure, to contain the cell, without removing them to prevent the body from falling.

Unscrew the set screws (E) of the block on the floor of the testing station.

Note: the screws must be stored in such a way that they do not undergo oxidation.

Connect the lifting means, with certified lifting chains, to the eyebolts (C).

Fig.6.14.4

Lift the entire block.

⚠ WARNING: Total weight of the block 30 kg

removal from the seat must take place slowly and avoiding oscillations.

During removal, check that the cables do not get caught by accompanying the cable into the grooves in the internal slits.

With the block removed, insert wooden panels to create a support and lower the load and unhook the lifting system.

The wooden panels must be suitable to support the removed block in a stable manner.

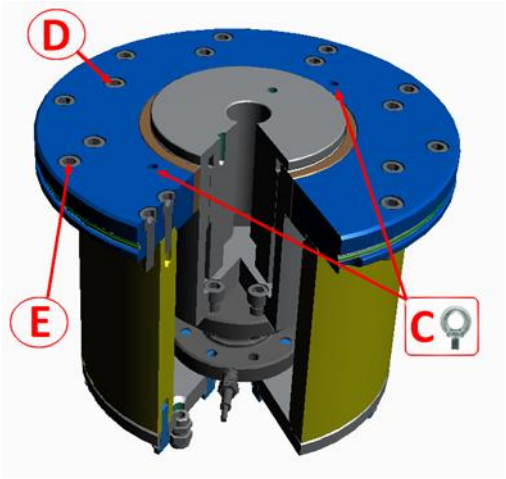


Fig.6.14.5

Unscrew the set screws (D) of the flange to the structure and insert in two seats, placed at 180°, the guide pins provided by the manufacturer to facilitate removal.

Note: the screws must be stored in such a way that they do not undergo oxidation.

Lift the flange, weighing 10 kg, and place it stably on a Europallet and store it in a dry environment protected from the elements.

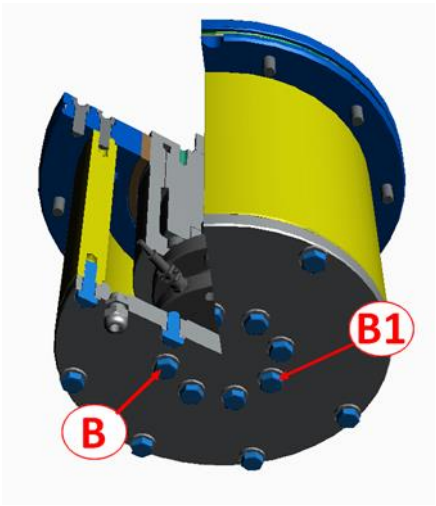


Fig.6.14.6

Remove the set screw (B1) to free the measurement cell.

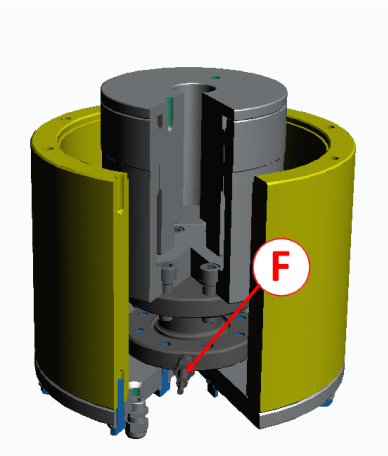


Fig.6.14.7

Disconnect the cell connector (F) and remove the measurement cell, weighing 30 kg, manually.

Fig.6.14.8

Ship to the calibration laboratory identified by the manufacturer.

⚠ WARNING: The cells must be shipped by inserting the instruments with suitable packaging that protects against impact and vibrations during transport.

6.15 ASSEMBLY OF THE ELECTRIC NUTRUNNER TORQUE MEASUREMENT CELLS WITH 2KNM FORCE

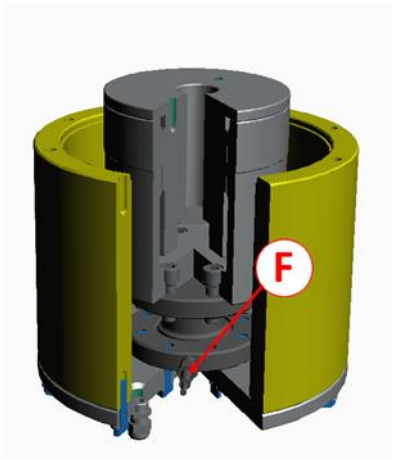


Fig.6.15.1

Insert the measurement cell, weighing 3 kg, manually and place it in the cell containment structure.

The structure must, like the disassembly procedure, be positioned on the walls, near the housing present in the testing station, verifying that it is stable.

In the insertion step, check that the cell is correctly housed in the centre of the structure itself.

Orient the cell so that the connection is facing the connection connector.

Connect the cell connector (F)

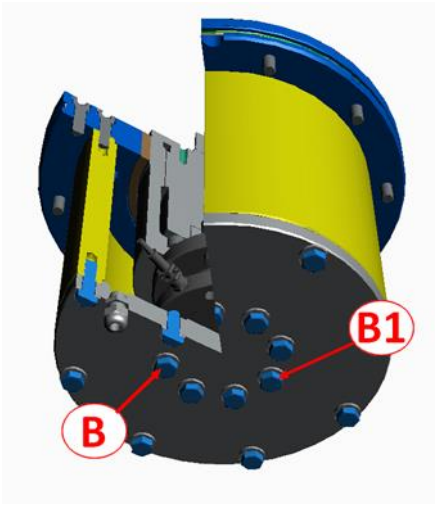


Fig.6.15.2

Tighten the set screw (B1), until it comes into contact with the plate, to fix the measurement cell without tightening completely.

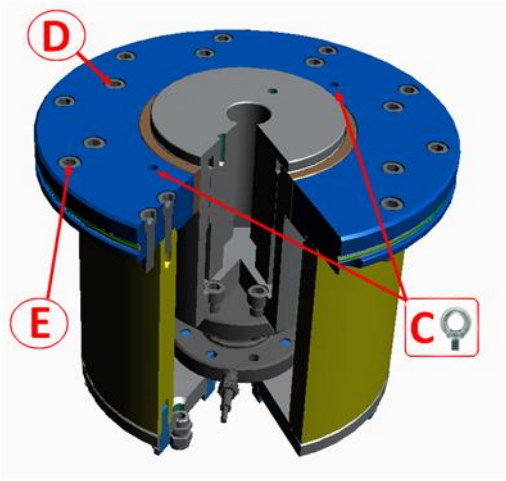


Fig.6.15.4

Connect the lifting means, with certified lifting chains, to the eyebolts (C).

Lift the flange, weighing 10 kg, and insert the flange, without tilting it, to insert the bushing.

To facilitate the action, insert the guide pins provided by the manufacturer in two seats, placed at 180°, to facilitate the operation.

NOTE: If the flange tends to lock during the insertion step, stop the procedure and check that the bushing is not damaged.

Stick the flange to the housing structure and tighten the screws (D) to secure the flange without tightening completely.

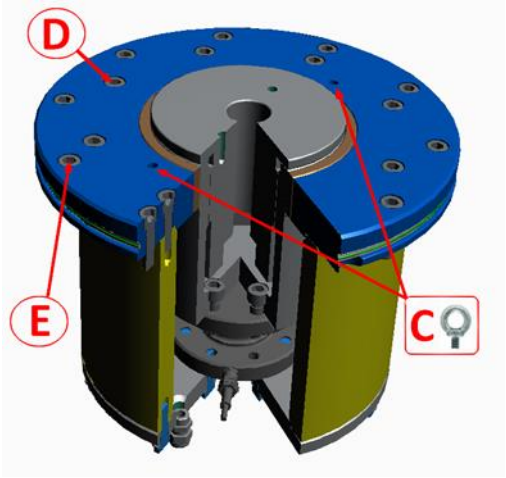
Lift the entire block.

⚠ WARNING: Total weight of the block 50 kg

Remove the wooden panels and proceed with the insertion; insertion into the seat must take place slowly and avoiding oscillations.

During insertion, check that the cables do not get caught by accompanying the cable into the grooves in the internal slits.

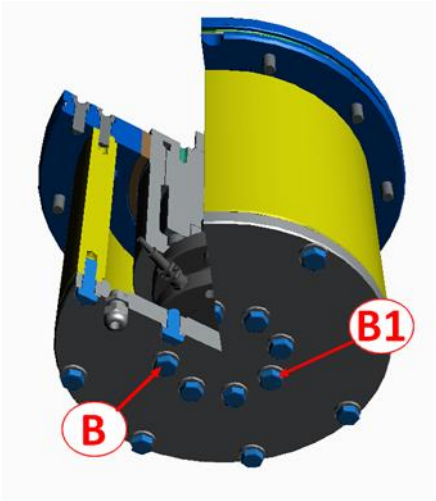
Fig.6.15.5



Screw the set screws (E) to secure the flange to the plane of the testing station without tightening completely.

Remove the eyebolts (C).

Fig.6.15.6



Accessing the lower compartment, screw the set screws (B) of the torque measurement cell without fully tightening them.

Fig.6.15.7

Tighten the screws according to the following sequence:

4. tightening screws E;
5. tightening screws D;
6. tightening screws B.

the tightening of the screws must be carried out as indicated in table Tab.6.13.1.

Set screws B	: torque 90 Nm
Set screws D	: torque 90 Nm
Set screws E	: torque 90 Nm

Tab.6.13.1

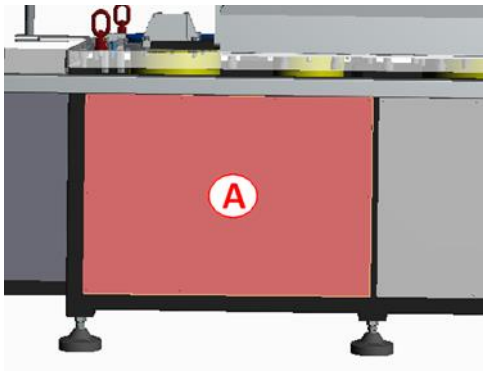


Fig.6.15.8

Connect the LED power cable and reposition the cables inside the cable containment duct.

Close the duct and reassemble the rear panel (B).

6.16 DISASSEMBLY OF THE TENSIONER TORQUE MEASUREMENT CELLS

Warning: the handling of the described components must be carried out with a suitable certified lifting device that has a capacity of at least 200 kg

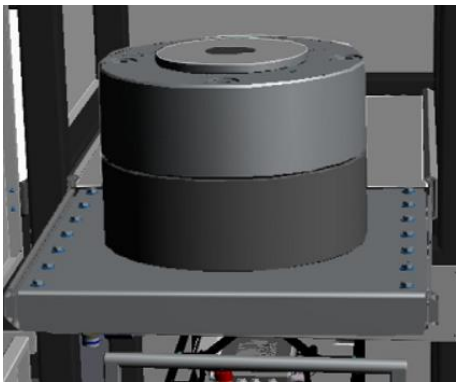


Fig.6.16.1

Remove the carriage with the tensioner test block allocated.

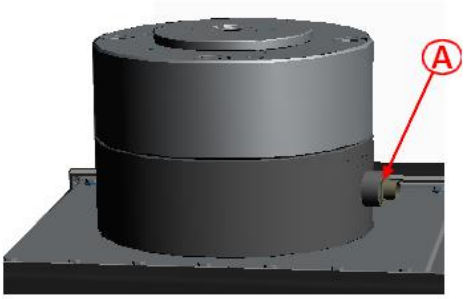


Fig.6.16.2

Disconnect the connector (A) of the measurement cell, located at the rear.

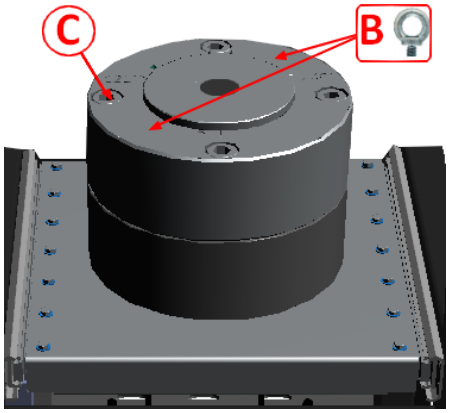


Fig.6.16.3

Insert the eyebolts (B), supplied by the manufacturer, into the flange seats to carry out the subsequent lifting.

Unscrew the set screws (C) of the upper block to protect the cell.

Note: the screws must be stored in such a way that they do not undergo oxidation.

Connect the lifting means, with certified lifting chains, to the eyebolts (B) and remove the upper block weighing 50 kg.

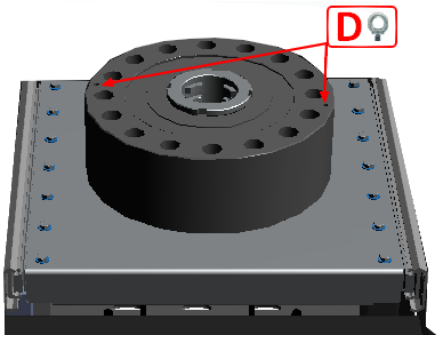


Fig.6.16.4

Insert the eyebolts (D), supplied by the manufacturer, into the flange seats to carry out the subsequent lifting.

Connect the lifting means, with certified lifting chains, to the eyebolts (D) and remove the measurement cell weighing 50 kg.

Fig.6.16.5

Ship to the calibration laboratory identified by the manufacturer.

⚠ WARNING: The cells must be shipped by inserting the instruments with suitable packaging that protects against impact and vibrations during transport.

6.17 ASSEMBLY OF THE TENSIONER TORQUE MEASUREMENT CELLS

Warning: the handling of the described components must be carried out with a suitable certified lifting device that has a capacity of at least 200 kg

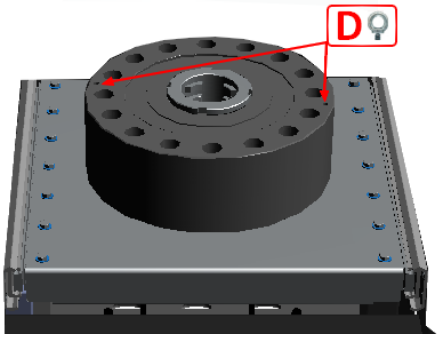


Fig.6.17.1

Insert the eyebolts (D), supplied by the manufacturer, into the flange seats to carry out the subsequent lifting.
Connect the lifting means, with certified lifting chains, to the eyebolts (D) and position the measurement cell weighing 50 kg.
Position the cell using the centring seat and orient the cell connection towards the rear near the connector.

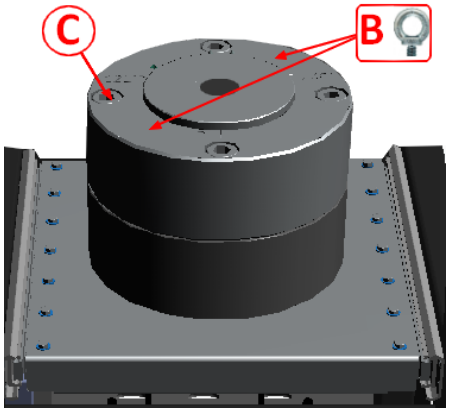


Fig.6.17.2

Connect the lifting means, with certified lifting chains, to the eyebolts (B) and position the upper block weighing 50 kg.
Screw the set screws (C) of the upper block to protect the cell tightening them to the torque of 1,300 Nm.

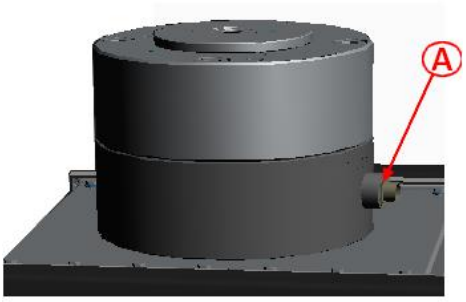
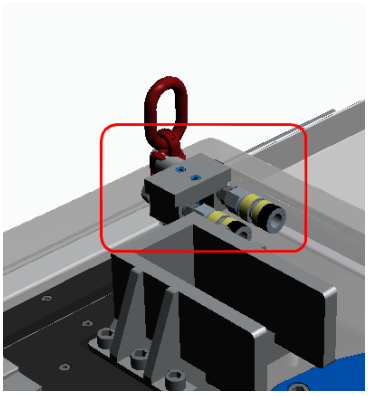


Fig.6.17.3

Disconnect the connector (A) of the measurement cell, located at the rear and insert the carriage.

6.18 DISASSEMBLY OF PRESSURE TRANSDUCERS

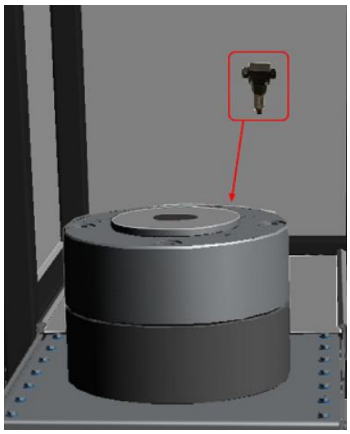
HYDRAULIC WRENCH TEST POSITION PRESSURE TRANSDUCER



Make sure that the hydraulic system is de-pressurised, disconnect the connection connector and disassemble the transducer with the wrench without forcing on the transducer body.

Fig.6.18.1

TENSIONER TEST POSITION PRESSURE TRANSDUCER

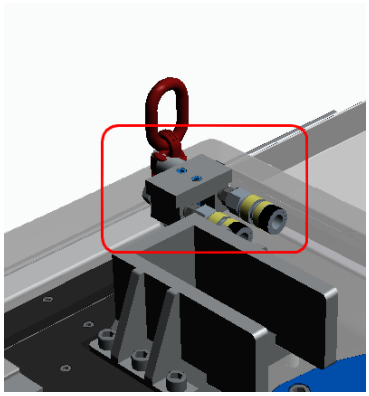


Make sure that the hydraulic system is de-pressurised, remove the carriage, disconnect the connection connector and disassemble the transducer with the wrench without forcing on the transducer body.

Fig.6.18.2

6.19 ASSEMBLY OF PRESSURE TRANSDUCERS

HYDRAULIC WRENCH TEST POSITION PRESSURE TRANSDUCER

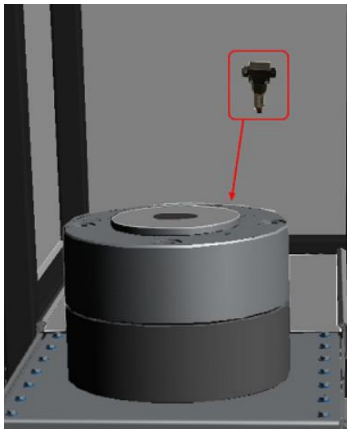


Assemble the pressure transducer by tightening it with the wrench, to the torque of 50 Nm specified by the transducer manufacturer, without straining the body.

Connect the connection connector.

Fig.6.19.1

TENSIONER TEST POSITION PRESSURE TRANSDUCER



Assemble the pressure transducer by tightening it with the wrench, to the torque of 50 Nm specified by the transducer manufacturer, without straining the body.

Connect the connection connector.

Insert the carriage.

Fig.6.19.2

6.20 EXTRAORDINARY MAINTENANCE

General requirements

Warning: it is forbidden for the user to carry out extraordinary maintenance operations, as, having no detailed instructions on how to carry them out, operators could find themselves in dangerous situations. Have the work carried out by experienced personnel appointed by the user.

It is recommended to stop and carry out extraordinary maintenance whenever there is less than optimal operation; this will always allow maximum efficiency.

a) Always use the appropriate PPE - Personal Protective Equipment:
b) gloves;
c) non-slip shoes;
d) goggles;
e) mask;
f) suitable clothing.

All mechanical setting operations must only be performed with the system switched off and must only be performed by trained, qualified and authorised personnel!

Visually check the condition of the individual parts that make up the machine, verifying that there are no alterations due to yielding or deformation.

For all maintenance that does not require voltage to the power components, it is necessary to stop the system, disconnecting the power supply from the main panel disconnector, locking it, with a special padlock, into the “O” (OFF) position.

Failure to comply with the requirements exempts the manufacturer from any type of liability

6.21 TROUBLESHOOTING

If not showing on the alarms page, the main causes are:

FAULTS	CAUSES	RESOLUTIONS
When connected to the electric and hydraulic power supply, the machine does not work	The electrical system is damaged	Contact maintenance
	The machine is not properly connected	Check the electrical connection
		Check the hydraulic connections
The machine performs the work cycle but correct pressurisation does not take place	There is a leak on the pressurisation system	Contact maintenance
	The control PLC is damaged	Contact maintenance

For defects and/or malfunctions of the machine not described in this Manual, please consult the manuals of the individual machines /partly completed machines or contact the Manufacturer.

All mechanical setting operations must only be performed with the system switched off and must only be performed by trained, qualified and authorised personnel!

Failure to comply with the requirements exempts the manufacturer from any type of liability

6.22 DIAGNOSTICS AND ALARMS

The machine has an alarm display system - malfunctions are visible on the main screen and by accessing the sub-page, by pressing the DIAGNOSIS key 

, the machine statuses can be checked.

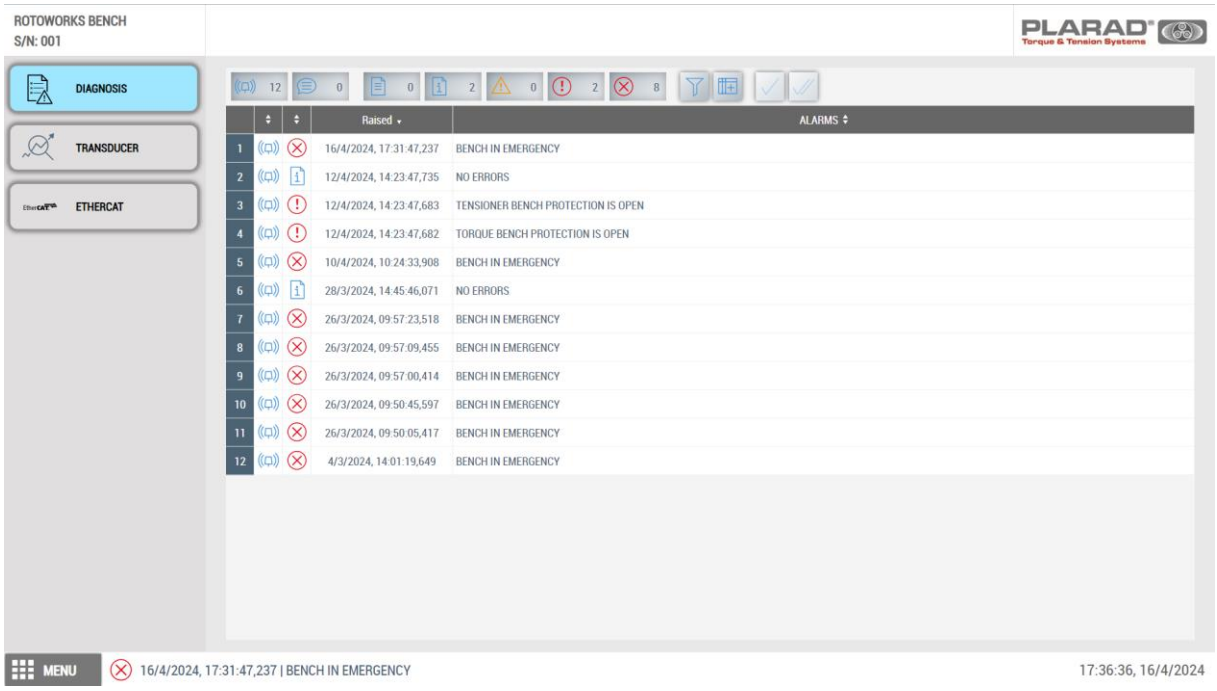


Fig.6.9.1

Allows you to view the errors and the status of the machine

Allows you to view the status of the transducers

Allows you to view the status of the Ethercat network.

7 ACCESSORIES AND SPARE PARTS

7.1 SUPPORT

For any type of information relating to the installation, use and maintenance of the machine, the Manufacturer is always available.

The Customer should ask the questions in clear terms, with references to this Manual and the instructions listed.

7.2 ACCESSORIES

Always use original spare parts.

For any spare parts contact the manufacturer.

For the management of spare parts, the manufacturer recommends using the attached form.

To request spare parts, fill in the form, taking care to enter all the required information, and send it to the Manufacturer.

In order to interact most effectively with our technicians when ordering spare parts, please follow the procedure below:

call the Company's spare parts service and describe the type of fault encountered;

describe the malfunctioning part, use the references indicated on the technical annexes

locate the part of the machine where the non-functioning part is located, using the references indicated on the technical annexes;

order the item using the Order Form on the next page;

The use of non-original spare parts is not recommended: in the event that this occurs, the Warranty conditions (if still in force) and the Manufacturer's Liability in the use of the machine and for any damage to persons and/or property will lapse.

SPARE PARTS REQUEST FORM

APPLICANT DATA	COMPANY NAME	
	NAME SURNAME	
	ADDRESS	
	LOCATION	
	POSTCODE	
	PROVINCE	
	TELEPHONE	
	EMAIL	

MACHINE DATA	MACHINE NAME	
	MODEL	
	SERIAL NO.	
	YEAR OF MANUFACTURE	

	ID	P/N	DESCRIPTION	QUANTITY
LIST OF PARTS TO BE ORDERED				

NOTES	

Spare parts for the tensioner testing station

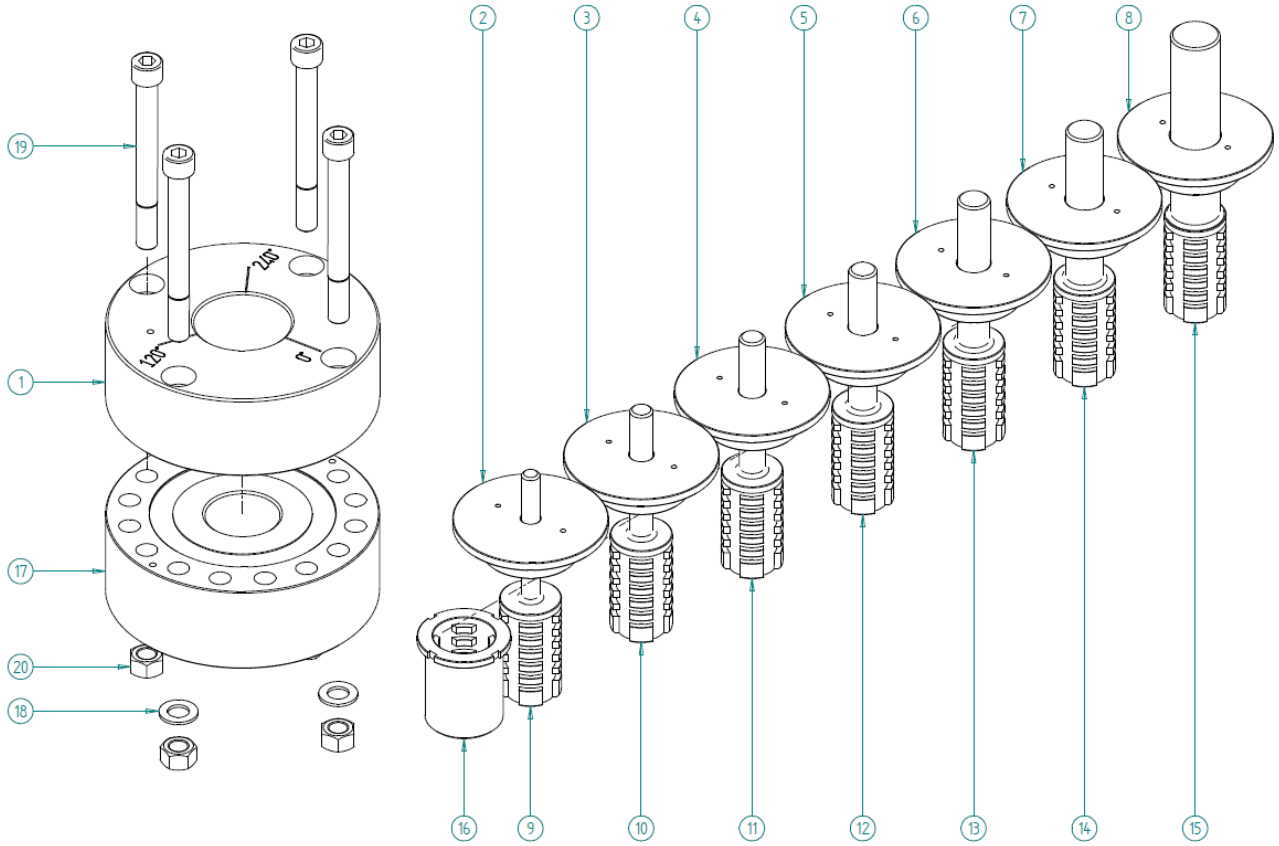


Fig.7.2.1

20	Nut	4	Dado M27
19	Screw	4	T.C.E.I. M27 x 260
18	Washer	4	Rondella da 27
17	Transductor	1	CTC4350300TS_TC4 3MN with base
16	Bushing	1	PBRT-02-03
15	Tie rod M64	1	PBRT-02-04_64
14	Tie rod M48	1	PBRT-02-04_48
13	Tie rod M42	1	PBRT-02-04_42
12	Tie rod M36	1	PBRT-02-04_36
11	Tie rod M33	1	PBRT-02-04_33
10	Tie rod M30	1	PBRT-02-04_30
9	Tie rod M24	1	PBRT-02-04_24
8	Bushing M64	1	PBRT-02-02_64
7	Bushing M48	1	PBRT-02-02_48
6	Bushing M42	1	PBRT-02-02_42
5	Bushing M36	1	PBRT-02-02_36
4	Bushing M33	1	PBRT-02-02_33
3	Bushing M30	1	PBRT-02-02_30
2	Bushing M24	1	PBRT-02-02_24
1	Support disk	1	PBRT-02-01
Pos	Descrizione	Q.	Disegno / codice
Data di revisione	Errore. Nessun riferimento	Tipo di revisione	
N° di revisione	Errore. Nessun riferimento		
OFFICINE CASELLA COSTRUZIONI MECCANICHE - FORATURA PROFONDA		Disegno n° PBRT-02-00	
Scala: 1:4 Data: 20/03/2024 Commessa	Descrizione Banco Rotoworks Gruppo tensionatore	Assieme n° / Data di revisione	
ALL RIGHTS RESERVED, REPRODUCTION PROHIBITED – PROPRIETA' PRIVATA, VIETATA LA RIPRODUZIONE E LA VISIONE A TERZI			

Tab.7.2.2

Hoses and connection components of the hydraulic control units at the tightening wrench testing station

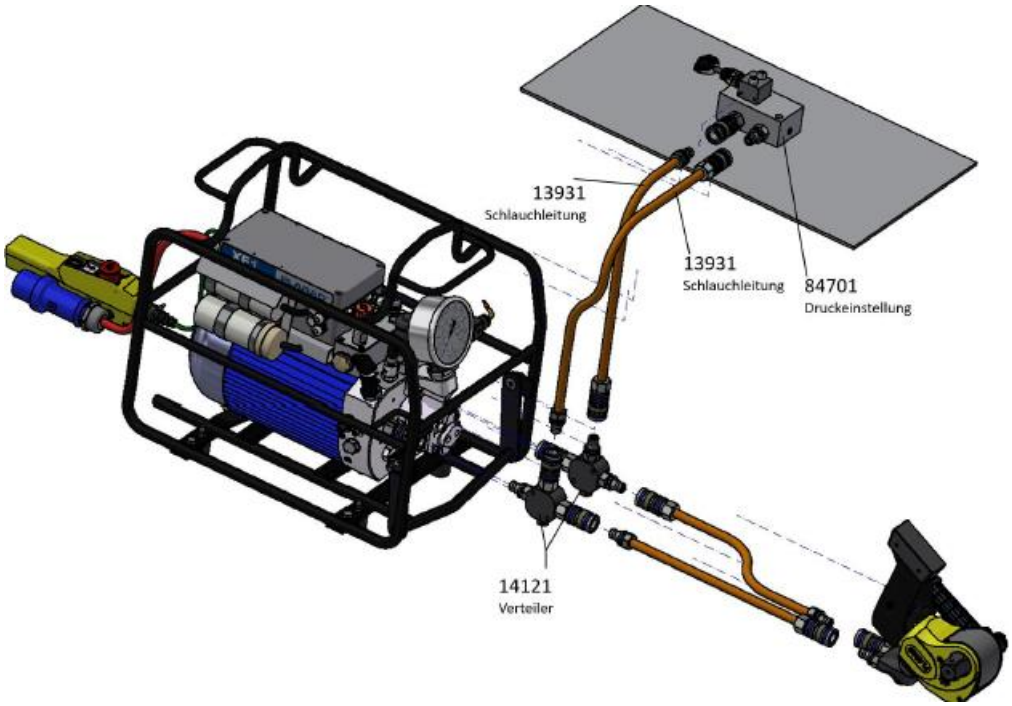


Fig.7.2.3

Hoses and connection components of the hydraulic control units at the tensioner testing station

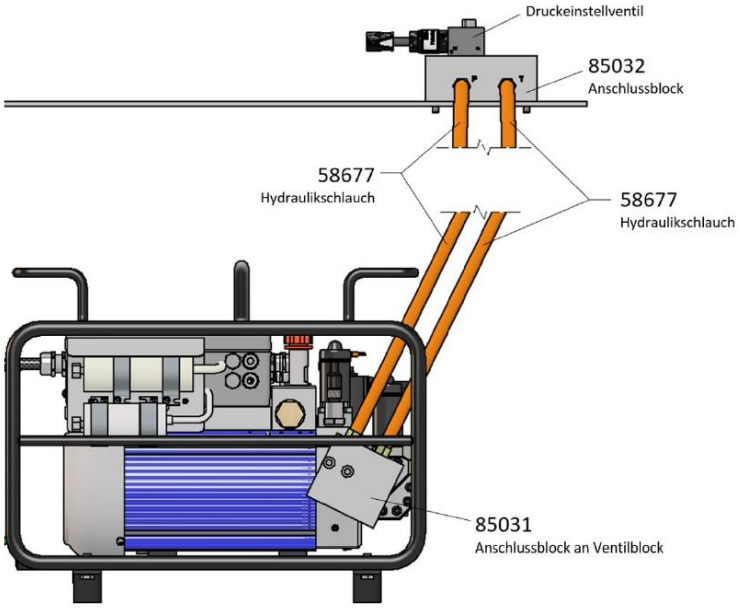


Fig.7.2.4

8 ADDITIONAL INSTRUCTIONS

8.1 WASTE DISPOSAL

It will be the responsibility of the user, according to the laws in force in their country, to verify the correct disposal of the waste that the machine produces during processing.

The disposal of any lubricants and replaced parts must be carried out in compliance with the Regulations in force in the country of use of the machine.

At the time of dismantling, it is necessary to separate the plastic parts, aluminium parts, steel parts and electrical components, which must be sent to separate collections in compliance with the current Standard of the country in which the machine is installed.

The components inside the electrical panel and the electronic control are subject to separate collection and must be disposed of in compliance with the regulations in force in the country of installation regarding electrical and electronic waste (WEEE).

Before delivering the parts of the assembly to the collection centres (public or private) it is mandatory to remove and destroy the labels affixed to the machines.

Improper and abusive disposal of waste entails penalties established by current local regulations on disposal.

MAIN CODES AND SYMBOLS OF THE TYPES OF MATERIALS FOR SEPARATE COLLECTION

PLASTIC		
01 PET	PET or PETE	Polyethylene terephthalate or arnite: Bottles of water, PET bottles of soft drinks, bottles of shampoo
02 PE-HD	HDPE	High Density Polyethylene: Yoghurt containers, detergent bottles
03 PVC	PVC or V	Polyvinyl chloride: Food containers
04 PE-LD	LDPE	Low Density Polyethylene: Frozen food bags, squeezable bottles
05 PP	PP	Polypropylene or Moplen: Ketchup bottles
06 PS	PS	Polystyrene: Disposable cups
07 O	O	All other plastics

METALS		
40 FE	Steel/Iron	
41 ALU	Aluminium	
42-49	Other type of metals	

8.2 DECOMMISSIONING AND DISMANTLING

At the time of dismantling, it is necessary to separate the plastic parts, metal parts and electrical components, which must be sent to separate collections in compliance with current regulations.

As far as the metal mass of the machine is concerned, the division between the ferrous parts and those made of other metals or alloys is sufficient for correct sending to recycling by melting.

WEEE		
	R1	cold and climate (refrigerators, air conditioners and water heater)
	R2	large white goods (washing machines, dishwashers, ovens, hobs, etc.)
	R3	TVs and monitors
	R4	small appliances, consumer electronics, lighting fixtures, and the like
	R5	light sources

WARNING!

Lighting equipment is classified as

- **R5 light sources:** fluorescent tubes, linear and non-linear; non-integrated compact fluorescent lamps; energy-saving integrated compact fluorescent lamps; high-intensity, high- or low-pressure discharge lamps, excluding incandescent and halogen lamps
- **R4 lighting fixtures:** chandeliers, ceiling lights, etc.

8.3 SAFE WORKING PROCEDURES

Properly inform and instruct employees about the specific procedures for:

a) safe use of the machine;

b) emergency situations.

9 ANNEXES

9.1 WIRING DIAGRAMS

Annex; Elettro Service Automazioni srl TEST BENCH V1.0 rev.0 order 061/24

9.2 HYDRAULIC CONNECTION DIAGRAMS

Annex; PLARAD ITALY 000_84702

Annex; PLARAD ITALY 000_85024

9.3 USER MANUALS FOR ACCESSORY EQUIPMENT

Annex; Plarad XE1eco hydraulic unit use and maintenance manual

Company: PLARAD ITALY

Machine: TORQUE WRENCH AND TENSIONER TEST BENCH

Model: PLARAD TEST BENCH

Year of manufacture: 2024

9 ANNEXES