

Operating instructions

Torque Control Tower



PLARAD[®] 
Torque & Tension Systems

**Read the manual carefully before use!
Keep for future use.**

Maschinenfabrik Wagner GmbH & Co. KG

Birrenbachshöhe 17

53804 Much

GERMANY

Telephone: +49 2245 62-0

Fax: +49 2245 62-22

Email: info@plarad.de

Internet: www.plarad.de

Translation of the original operating instructions

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Information about this manual



This manual enables safe and efficient handling of the Torque Control Tower.

The manual is a component of the Torque Control Tower and must be kept in its immediate vicinity so that the user can access it at any time.

The user must have read and understood this manual prior to commencing any tasks. A basic prerequisite for ensuring that work is performed safely is compliance with all safety instructions and guidelines in this manual. In addition, the local accident prevention regulations and general safety provisions for the Torque Control Tower's area of application apply.

Illustrations in this manual serve to provide a basic understanding and may differ from the actual design.

Hydraulic power pack

The Torque Control Tower is designed for use with PLARAD[®]-IQVAX hydraulic power packs. The contents of this manual, which describe the hydraulic power pack, relate to PLARAD[®] IQVAX hydraulic power packs and provide examples to illustrate their use.



The IQVAX hydraulic power pack is not included in the standard scope of delivery. The hydraulic power pack must be explicitly ordered if you wish it to be included in the delivery.

The hydraulic power pack can be provided by the operator.

If you have questions about integration of other hydraulic power packs, contact PLARAD[®] service.

Other applicable documents

The following documents must be observed in addition to this manual:

- Rating plate
- Information about components of the Torque Control Tower (Printer, barcode scanner, control unit, industrial PC)
- Operating instructions for the hydraulic tool connected
- Documentation for the hydraulic power pack provided by the operator
- Technical data sheet

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Further development of the manual

This manual was compiled with great care. If you notice any errors, have any questions or identify any inconsistencies, please notify us in writing. Your suggestions for improvement will help us design a user-friendly manual.

Follow-up order

Further copies of this manual can be ordered subject to an additional fee.

Contact ☎ *'Manufacturer'* on page 4.

Manufacturer

Maschinenfabrik Wagner GmbH & Co. KG

Birrenbachshöhe 17

53804 Much

GERMANY

Telephone: +49 2245 62-0

Telefax: +49 2245 62-22

Email: info@plarad.de

Internet: www.plarad.de

PLARAD[®] service

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1 Illustration

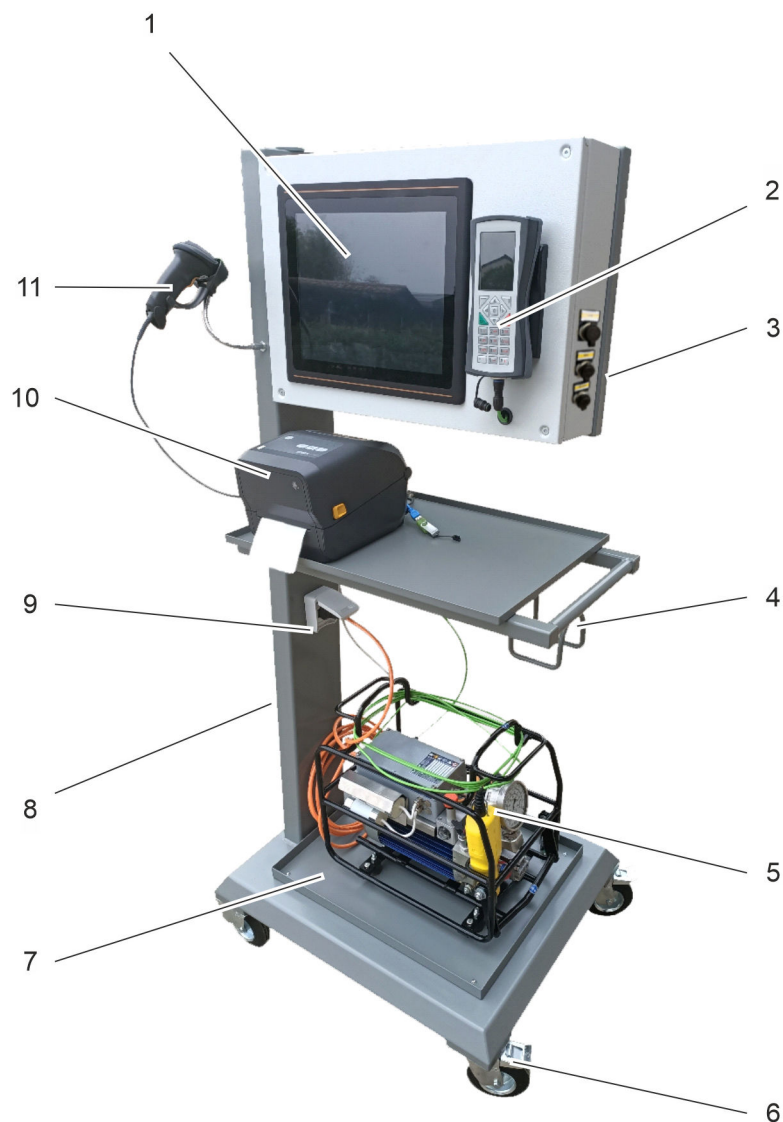


Fig. 1: Illustration

- | | |
|---|---|
| 1 Industrial PC with touch-sensitive 15" screen | 7 Oil drip tray |
| 2 Control unit (BE) with holder | 8 Main switch and mains socket |
| 3 Data interface | 9 Mains connection for hydraulic power pack |
| USB (save data) | 10 Printer |
| ETH (remote access) | 11 Barcode scanner |
| BE ETH (control unit) | |
| 4 Mount for hydraulic hoses | |
| 5 Electric hydraulic power pack | |
| 6 Wheels | |

Further details

Number	Description
1	Industrial PC with touch-sensitive 15" screen The PLARAD[®] software runs on the industrial PC with Windows[®] operating system. Entries can be made via the touch-sensitive 15" screen.
2	Control unit (BE) with holder The control unit (BE) can be used to define bolting applications and save bolting operations.  Chapter 12 'Control unit (BE)' on page 65
3	Data interface ■ USB: Data can be transferred to a USB storage device. ■ ETH: Remote access is possible via a network. ■ BE ETH: Access to the control unit BE is possible.
4	Mount for hydraulic hoses
5	Electric hydraulic power pack The hydraulic power pack is placed in an oil drip tray, as this enables easy removal of escaping oil. The Torque Control Tower has been optimised for operation with PLARAD[®] hydraulic power packs. It can also be operated with other hydraulic power packs.
6	Four wheels which allow the Torque Control Tower to be moved easily to the operating site Parking brakes prevent rolling away.
7	Oil drip tray
8	Main switch and mains socket The power cable provided by the operator is connected here. Switch on the main switch to supply the Torque Control Tower with electrical energy. Switch positions of the main switch: ■ 0 – Off ■ I – On
9	Mains connection for hydraulic power pack The power cable of the hydraulic power pack is connected to the Torque Control Tower here.



Number	Description
10	Printer Reports and barcodes created by the PLARAD[®] software can be printed.
11	Barcode scanner Barcodes can be read. The following information is processed by the PLARAD[®] software: ■ User ID ■ Bolting application ■ Job ■ Bolting application result ■ Date and time ■ Result ■ Tool used ■ Job name ■ Torque setpoint ■ Torque min/max setpoint ■ Actual torque value ■ Actual pressure value ■ Logged-in user ■ Job number

2 Unpacking and transporting

Delivery



Fig. 2: Delivery

The Torque Control Tower and remaining items of delivery are packed for transport in packaging that has been specially chosen according to the transport route and delivery location.

Checking the delivery



Check the delivery for transport damage and ensure it is complete immediately upon receipt. If it is incomplete or if there are defects, note the extent of the damage on the transport documents and lodge a complaint immediately.

Scope of delivery

The scope of delivery includes:

- Frame
- PC with touch-sensitive screen
- Barcode scanner
- Printer
- Control unit (BE)
- Data interface
- Document folder
 - Operating instructions
 - EU declaration of conformity

Options:

- Any accessory ordered
- Test reports
- Hydraulic power pack filled with hydraulic oil



Transport by a forwarding agent

Observe the following points when the Torque Control Tower and the hydraulic power pack (optional) are transported in a vehicle by a forwarding agent or parcel service:

1. ➤



WARNING!

Danger of crushing from unsecured load!

Ensure that the load is properly secured in the vehicle. Secure packages in such a way that nothing can slide out of position during transport.

2. ➤



ENVIRONMENT!

Danger to the environment due to hydraulic oil leakage!

Ensure that the hydraulic power pack (option) is horizontal and protected from shocks and impacts for the entire duration of transport.

Never put the hydraulic power pack on its side or position it upside down.

3. ➤

Put the hydraulic power pack in a foil bag to prevent oil spillage in the event of an accident.

4. ➤

Ensure that electrical equipment is not exposed to any moisture.

Transport by forklift

Prerequisites:

- The forklift truck is designed for the weight of the transport items.
- The forklift operator is authorised to operate industrial trucks with an operator's seat or operator's platform in accordance with locally applicable regulations.

1. ➤

Drive the forks of the forklift into the forklift pockets.

2. ➤

Drive in the forks until they protrude on the opposing side.

3. ➤

Ensure that the assembly cannot tip over.

4. ➤

Lift the transport item and commence transport.

Unpacking

- Protective equipment:
- Protective work clothing
 - Safety gloves
 - Safety shoes

1. ➤ Remove the protective film.

2. ➤



CAUTION!

Cuts due to tensioned plastic straps!

Carefully cut through and remove plastic straps.

3. ➤ Remove the wood slab from the vehicle base.

4. ➤ Drive between the wood base and vehicle floor with a forklift. In doing so, ensure that the fork width is correct. Do not damage the wheels.

5. ➤ Carefully lift the Torque Control Tower and place it on the ground.

6. ➤ Apply the brakes on the wheels to secure the Torque Control Tower against rolling away.

Handling packaging material

The individual packages are packed according to the expected transport conditions. Only environmentally friendly materials are used for the packaging.

The packaging should provide protection against transport damage, corrosion and other damage. For this reason, do not destroy the packaging and do not remove it until shortly before use.

Dispose of packaging material in accordance with the applicable statutory provisions and local regulations.



ENVIRONMENT!

Danger to the environment due to incorrect disposal!

Packaging materials are valuable raw materials and, in many cases, can be further utilised or appropriately reconditioned and recycled. Incorrect disposal of packaging materials can be hazardous to the environment.

- Reuse pallets.
- Dispose of packaging materials in an environmentally sound manner.
- Observe the locally applicable disposal regulations. If necessary, engage the services of a specialist company with regard to disposal.



Transporting the hydraulic power pack by crane

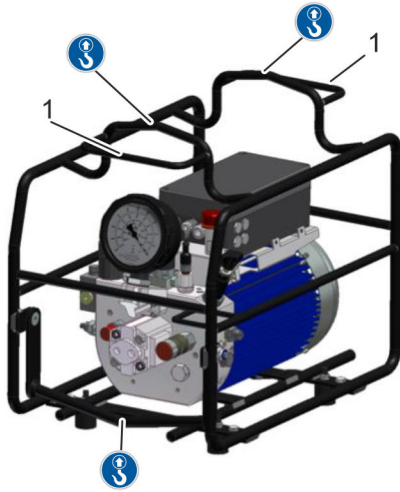


Fig. 3: Transporting the hydraulic power pack

Protective equipment: ■ Industrial safety helmet

If unpacked, the hydraulic power pack (option) can be transported by crane.

The attachment points are marked with .

The cables can be rolled up on the holders (Fig. 3/1).

1. ➤ Ensure that the crane and hoists are designed for the weight of the hydraulic power pack. See the rating plate of the hydraulic power pack for weight specification.
2. ➤ Attach the ropes, slings or multi-point suspension gear in the proper manner.

3. ➤



WARNING!

Danger of crushing due to the hydraulic power pack falling!

Ensure that the hydraulic power pack hangs straight. Observe the eccentric centre of gravity as necessary.

4. ➤ Commence transport.

Do not loiter under suspended loads.

Transport by hand

1. ➤ Remove any hoses that are connected.

2. ➤



WARNING!

Danger of tripping!

Neatly roll up the power cable, the remote control cable of the hydraulic power pack, and the cables of the other components and secure them on the frame.

3. ➤ Seal the couplings and nipples of the hydraulic power pack with the caps prior to transport.
4. ➤ Ensure that all openings of the hydraulic power pack (e.g. cover of the surge tank) are sealed.

5. ➤



WARNING!

Danger of injury from high weight!

Carry the hydraulic power pack with the aid of a second person and put it on the frame of the Torque Control Tower. In doing so, keep the transport item horizontal at all times. Never turn it upside down.

6. ➔



WARNING!

Risk of tipping over due to being top-heavy!

Carefully push the frame onto the wheels.

Transport after operation



WARNING!

Danger of burns due to hot surfaces or hydraulic oil!

In the event of a high ambient temperature and prolonged operation, the hydraulic power pack can reach surface temperatures of up to 80 °C. The hydraulic oil gets hot when pressurised. Contact with hot surfaces and hot hydraulic oil could result in severe burns.

- Let the hydraulic power pack cool down prior to transport.
- Seal all openings.
- Wear personal protective equipment.

Storage

- Ensure disconnection from the power supply grid during storage.
- Put it in a horizontal position.
- Comply with ambient conditions ↗ *Chapter 18 'Technical data' on page 106.*
- Seal all openings (couplings, nipples, surge tank).
- Roll up the power cable and the remote control cable of the hydraulic power pack. Do not twist, kink or subject to any other mechanical loads.



3 Getting to know the Torque Control Tower

3.1 Illustration

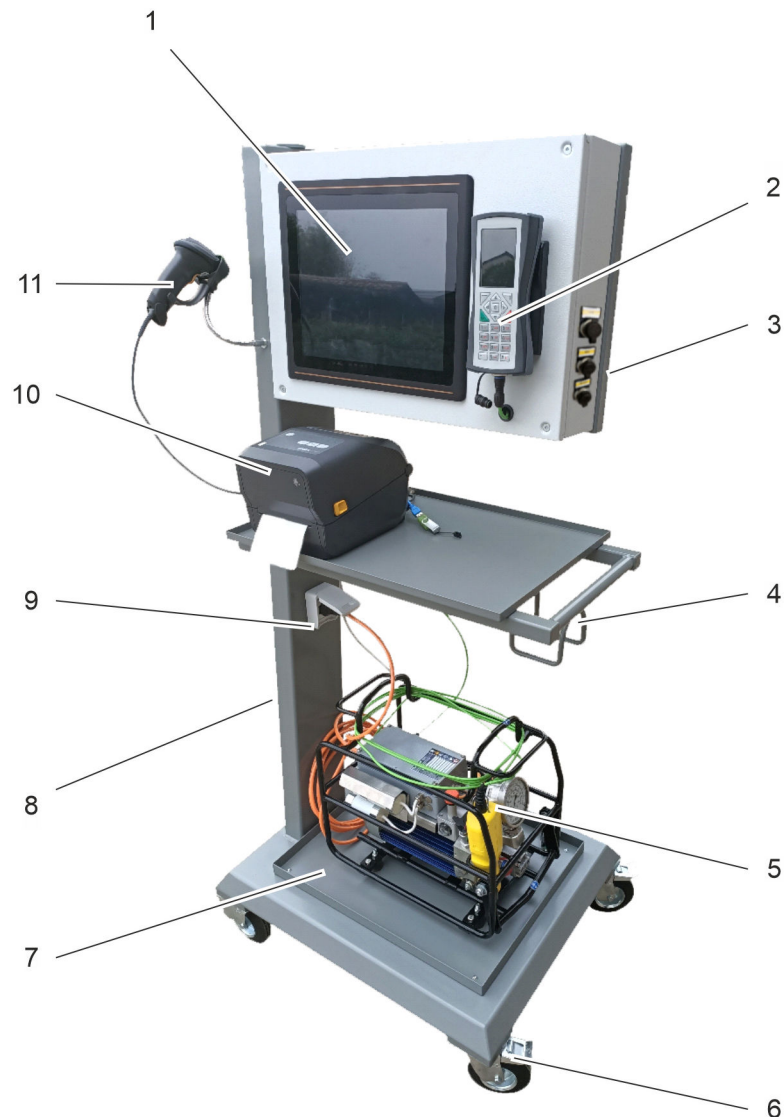


Fig. 4: Illustration

- | | |
|---|---|
| 1 Industrial PC with touch-sensitive 15" screen | 7 Oil drip tray |
| 2 Control unit (BE) with holder | 8 Main switch and mains socket |
| 3 Data interface | 9 Mains connection for hydraulic power pack |
| USB (save data) | 10 Printer |
| ETH (remote access) | 11 Barcode scanner |
| BE ETH (control unit) | |
| 4 Mount for hydraulic hoses | |
| 5 Electric hydraulic power pack | |
| 6 Wheels | |

3.2 Brief description

The Torque Control Tower is used to plan, test, and document bolting applications.

The control unit (BE) can be used to define and document bolting applications. The data is exchanged with the hydraulic power pack.

The holder (docking station) of the control unit (BE) is also connected to the industrial PC via an Ethernet cable.

The bolted connection data can be managed on the screen of the industrial PC using the PLARAD[®] software for the Torque Control Tower.

With the software, a printer can print out generated barcodes for various purposes:

- Document results information and parameters for bolting operations
- Load jobs and bolting applications
- Log in users

These barcodes can be read with the barcode scanner.

3.3 Rating plate

The Torque Control Tower does not have its own rating plate. Only the components are marked with their own rating plates.

3.4 Display elements and controls

Main switch

The main switch establishes the electric energy supply:

[0] - Power supply off

[I] - Power supply on

Touch-sensitive screen of the industrial PC

The industrial PC and the software are operated with a touch-sensitive screen.

Trigger of the barcode scanner

A trigger is attached to the handle of the barcode scanner.

A barcode can be read and transferred to the industrial PC by pulling the trigger.

Printer buttons

For details of printer controls, see  *Printer operating instructions*.



Control unit (BE)



- 1 Display
- 2 Membrane keyboard

The control unit (BE) can be used to define bolting applications and save bolting operations. After being transferred to the industrial PC, the data can serve as verifiable proof of bolting work.

Further details ↗ Chapter 12 'Control unit (BE)' on page 65.

Fig. 5: Control unit (BE)

Hydraulic power pack



The PLARAD® IQVAX hydraulic power pack is used here as an example.

The hydraulic power pack can be equipped with the following display elements and controls:

Hydraulic power pack: Remote control



Fig. 6: Remote control with display

- 1 Remote control cable of the hydraulic power pack
- 2 Red button
- 3 Green button
- 4 White button
- 5 Black button
- 6 Display
- 7 LED display

Hydraulic power pack: Pressure displays



Fig. 7: Example, pressure gauge

There could be different pressure displays depending on the area of application:

The working pressure is also displayed on the remote control
 ↪ 'Hydraulic power pack: Remote control' on page 17.

Hydraulic power pack: Pressure adjustment valve with adjustment lock

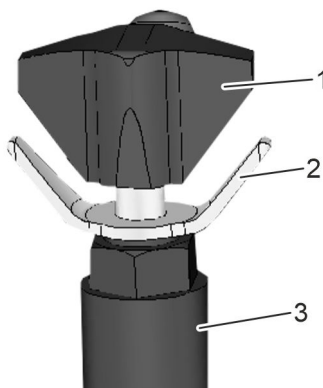


Fig. 8: Pressure adjustment valve

- 1 Knob
- 2 Adjustment lock
- 3 Pressure adjustment valve

The hydraulic pressure used to supply the connected tool is adjusted with the aid of the pressure adjustment valve.

An adjustment lock prevents the pressure being changed unintentionally. Prior to any pressure adjustment, the adjustment lock needs to be loosened and secured again after the adjustment has been made.

↺ Reduce pressure – turn the knob anti-clockwise

↻ Increase pressure – turn the knob clockwise

Hydraulic power pack: Pressure valves

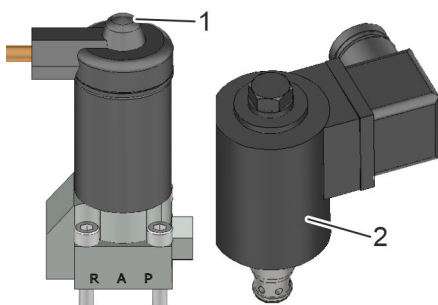


Fig. 9: Pressure valves

Main valve

The main valve is equipped with a button that can be used to release the pressure in the respective system.

The main valve (Fig. 9/1) switches between forward and return stroke.

Pressure relief valve

If the return stroke of the tool has been completed, the pressure relief valve switches to relief mode (release).

Pressure release valve

The pressure release valve (Fig. 9/2) is installed parallel to the lever of the safety valve for releasing the pressure.



Hydraulic power pack: Safety valve for pressure release

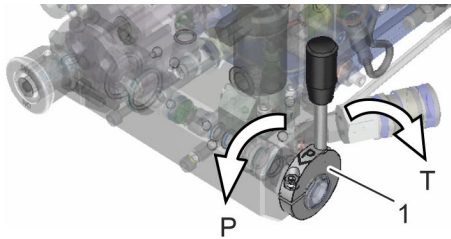


Fig. 10: Lever

Lever (Fig. 10/1) between pressure connection and pressure release.

P - Pull the lever forward – Build up pressure at the hydraulic tensioner pressure connection

T - Push the lever back – Relieve pressure

Hydraulic power pack: Pressure amplifier switching valve

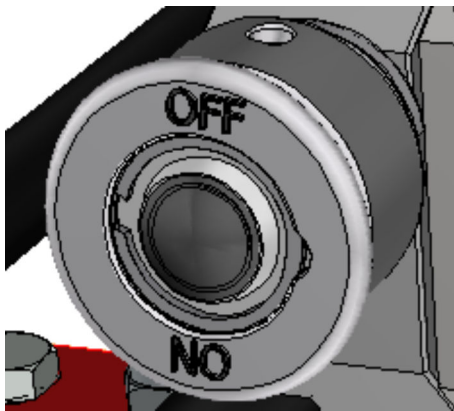


Fig. 11: Switching valve

The switching valve can be used to switch between the front pressure connections for hydraulic wrenches and the side pressure connection for hydraulic tensioners.

Markings:

ON - Maximum 1,500 bar (2,400 bar) at the side pressure connection

OFF - Maximum 800 bar at the front pressure connections

3.5 Connections

Power plug



Fig. 12: Example, CEE-7/7 power plug

The electrical connection of the Torque Control Tower is dependent on the hydraulic power pack used and its electrical specifications.

Possible power plugs:

- CEE-compliant power plugs
 - 230 V
 - 400 V, three-phase
- Others on request

Process connections of the hydraulic power pack



Fig. 13: Example, CEJN SE 115

Various coupling/nipple versions are available for connecting the hose lines to the hydraulic power pack.

The hydraulic power pack is equipped with pressure-dependent hydraulic quick-release couplings (process connections) from Cejn, Lukas, Pioneer or Parker for 350, 700, 800, 1,500 or 2,400 bar applications as standard.

Service and documentation interface on the hydraulic power pack

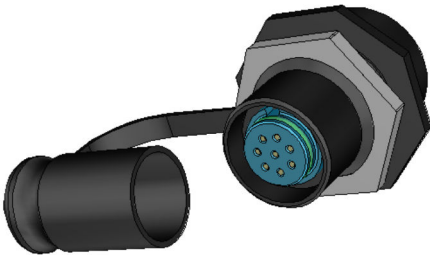


Fig. 14: Service and documentation interface

The service and documentation interface of the hydraulic power pack control system can be used as the communication interface for service and as the connection for the control unit (BE).

Data interfaces



Fig. 15: Data interfaces

The following data interfaces are present on the industrial PC:

- USB (save data)
- ETH (remote access)
- BE ETH (control unit)



3.6 Assemblies

Industrial PC with touch-sensitive screen

The user interface of the control unit (BE) is extended via the industrial PC with its 15" touch-sensitive screen.

The PLARAD[®] software runs on the industrial PC with a Windows[®] operating system.

Control unit (BE)

The control unit (BE) is used to plan and evaluate bolting applications. Individual bolting applications or sequences of bolting applications can be defined and transferred to the connected hydraulic power pack. After performing a bolting operation, measuring data can be read out from the connected hydraulic power pack and archived.

The control unit (BE) is equipped with a hardware interface on the back. A docking station (holder) can be connected via this interface. The interface enables data transfer to connected PCs and can also be used for remote access.



For further information, see ↗ *Control unit (BE)*.

PLARAD[®] IQVAX hydraulic power pack

Hydraulic power packs of the IQ series are capable of generating defined pressures and are thus capable of supplying connected hydraulic tools.

Setpoints for individual bolting applications can be received and measurement values for actual implementation can be sent via an optional data interface.

A wired remote control issues the start signal for building up pressure. Pressure is built up, until the specified setpoint is reached, and is kept constant as per the specification.



For further information, see ↗ *IQVAX operating instructions*.

Ethernet switch

The integrated Ethernet switch connects the control unit (BE) to the industrial PC. Remote access via the Internet is also possible via an input on the Ethernet switch.

Printer

The printer can be used to print data and barcodes.



For further information, see ↗ *Printer operating instructions*.

Printer type: ZEBRA ZD420

3.7 Software

The PLARAD[®] software runs on the industrial PC. It simplifies the performance and management of bolting jobs involving hydraulic tools and hydraulic power packs.



4 Before you begin – safety

This section provides an overview of all important safety aspects for protecting personnel and for ensuring safe and fault-free operation. Further task-specific safety instructions can be found in the sections of the individual chapters.

4.1 Symbols in this manual

Safety instructions

Safety instructions are indicated by symbols in this manual. The safety instructions are initiated by signal words that indicate the degree of the danger.



DANGER!

This combination of symbol and signal word indicates an imminently dangerous situation which, if not avoided, will result in death or serious injury.



WARNING!

This combination of symbol and signal word indicates a potentially dangerous situation which, if not avoided, could result in death or serious injury.



CAUTION!

This combination of symbol and signal word indicates a potentially dangerous situation which, if not avoided, could result in slight or minor injuries.



NOTICE!

This combination of symbol and signal word indicates a potentially dangerous situation which, if not avoided, could result in damage to property.



ENVIRONMENT!

This combination of symbol and signal word indicates potential dangers to the environment.

Safety instructions in specific instructions

Safety instructions may refer to specific, individual instructions. Such safety instructions are integrated into the instruction so that they do not interrupt the flow of reading when carrying out the task. The signal words described above are used.

Example:

1. ➤ Loosen the screw.

2. ➤



CAUTION!
Risk of pinching by cover!

Close the cover carefully.

3. ➤ Tighten the screw.

Tips and recommendations



This symbol highlights useful tips and recommendations as well as information designed to ensure efficient and smooth operation.

Other markings

The following markings are used in this manual in order to highlight instructions, outcomes, lists, references and other elements:

Marking	Explanation
➤	Step by step instructions
⇒	Outcomes of steps
↗	References to sections of this manual and to other applicable documents
■	Lists without a fixed order
[Button]	Controls (e.g. buttons, switches), indicators (e.g. signal lamps)
'Display'	Display elements (e.g. on-screen buttons, assignment of function keys)
'Menu' → 'Submenu' → 'Setting'	Shortened description of navigation: Call up menu, call up submenu, change settings



4.2 Symbols

Illegible signage



WARNING!

Danger in the event of illegible signage!

Over time, signs and stickers can become dirty or be rendered unrecognisable by other means, such that hazards cannot be recognised and necessary operating instructions cannot be followed. This creates a danger of injury.

- Keep all safety notices, warnings and operating instructions in a clearly legible state at all times.
- Replace damaged signs and stickers immediately.

The following symbols and information notices are located on the hydraulic power pack:

Voltage



The equipment marked in this way is supplied with electrical energy.

Do not open the hydraulic power pack.

Hot surface



Hot surfaces, such as the housing of the drive motor, cannot always be identified as such. Do not touch surfaces marked in this way without protective gloves.

Follow the manual



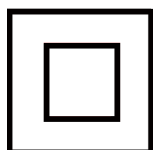
Read the operating instructions prior to using the hydraulic power pack.

Hearing protection



Hearing protection is used to protect against hearing damage caused by noise.

Protection class II



This symbol indicates protection class II. Equipment of protection class II has reinforced insulation between active and touchable parts.

Separate collection



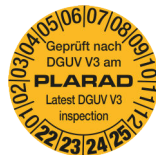
Do not dispose of waste electronic and electrical equipment marked with this symbol in household waste.

Test badges



The test badges state the dates of the respective tests.

Date of the next PLARAD[®] service



Date of the last DGUV-V3 test

High-pressure cleaners prohibited



Do not use any high-pressure cleaners when cleaning. The pressure of the cleaning jet can result in property damage.

Attachment point



Attach the hoist only at the marked points for lifting.

Maximum oil level



The marking indicates the maximum permissible oil level at 20 °C. Never fill oil above this marking.



4.3 Intended use

The Torque Control Tower is a transportable system for managing and organising bolting data.

The Torque Control Tower can be used to create bolting applications, print and read jobs as a barcode, and print correct bolting results as a barcode.

The Torque Control Tower may only be used for commercial purposes and only in conjunction with PLARAD[®] hydraulic power packs and tools to establish bolted connections within the defined specifications (🔗 *Chapter 18 'Technical data' on page 106*).

Use with other hydraulic power packs must be agreed with PLARAD[®].

The Torque Control Tower must never be used in a potentially explosive atmosphere.

The Torque Control Tower may only be used in a dry environment.

Intended use includes compliance with all of the stipulations in this manual.

4.4 Misuse

Any use beyond the intended use as well as any other use is considered misuse.



WARNING!

Danger in the event of misuse!

Misuse of the Torque Control Tower can lead to dangerous situations.

- Never operate with unsuitable hydraulic power packs.
- Never disregard protection classes.
- Never operate outside the permissible environmental conditions.
- Never operate with a mains voltage and mains frequency other than those specified on the rating plate.
- Do not switch on in a damp environment.
- Never operate in a potentially explosive atmosphere.
- Do not operate the hydraulic power pack outside the defined specifications.
- Do not operate the hydraulic power pack in continuous operation.

4.5 Residual risks

The following section outlines the residual risks potentially posed by the Torque Control Tower even when it is used as intended.

To reduce the risks of personal injury and property damage and to avoid dangerous situations, observe the safety instructions listed here and the safety instructions in the other sections of this manual.



Observe the warnings in the operating instructions for the individual components as well.



4.5.1 Electrical dangers

Electrical current



DANGER!

Danger of death due to electric shock!

Touching live parts poses an immediate danger of death due to electric shock. Damage to the insulation or individual components can be life-threatening.

- Do not open the housing of electrical components.
- In the event of damage, disconnect the hydraulic power pack from the power supply immediately and arrange for repair.
- Keep moisture away from live parts. Moisture can cause short circuits.
- Never operate with a mains voltage and mains frequency other than those specified on the rating plate.
- Ensure that the power supply complies with local regulations.
- Never make modifications to the hydraulic power pack.
- Never modify the power plug or power cable.
- Only operate at suitable power sockets.
- Never operate after the inspection period has elapsed. See the test seal for the date of the next test.
- Never operate in a potentially explosive atmosphere.
- Keep away from moisture, liquids, steam, dust and coarse contamination.
Do not switch on in a damp environment or in the rain.
- If possible, operate with a residual current-operated circuit breaker installed.
- Avoid making physical contact with earthed components.

Faulty power cable



DANGER!

Danger of death due to faulty power cable!

Faulty power cables can lead to a direct danger of death from electric shock.

Rolled-up power cables can result in thermal overload and could catch fire.

- Never modify the power plug or power cable.
- Only operate at suitable power sockets.
- Prior to every use, check the power cable for visible damage to the insulation.
Never replace the power cable yourself.
- Do not crush, shear or overload the power cable (pressure, strain).
- Do not pull on the power cable in order to disconnect the power plug from the power socket.
- Prior to switching it on, always unwind the power cable fully.
- Do not route the power cable over sharp edges, pinch points, through water, oil or other chemicals.
- Do not kink the power cable and do not twist it.
- Do not route the power cable close to moving parts or hot surfaces, such as motors or exhaust lines of mobile power generators.
- Wherever possible, do not expose the power cable to constant sunlight or other forms of UV radiation.
- Do not wrap the power cable around the hydraulic power pack.
- Ensure that extension cables routed outdoors or through humid environments are approved for the ambient conditions.
- Ensure that supply lines have the minimum permissible cross-section.



4.5.2 Dangers due to the hydraulic power pack



WARNING!

Danger of injury from operation of a hydraulic power pack!

When operating hydraulic power packs, there is a significant danger of injury due to hydraulics, hot surfaces and media, noise, moving parts, pressure, hydraulic oil, weight, and non compliance with oil specifications.

- Never put the hydraulic power pack into operation without having read and understood the operating instructions for the hydraulic power pack.
- Observe all warnings in the operating instructions for the hydraulic power pack.

4.5.3 Mechanical dangers

Crushing



WARNING!

Danger of crushing due to high weight!

The Torque Control Tower is top-heavy and can tip over easily.

The high weight can cause crushing if it falls down.

- Only move the Torque Control Tower on the castors on flat surfaces.
- Handle the hydraulic power pack with care and as intended.
- Give due consideration to the weight during transport and during all work.
- Carry the hydraulic power pack with the aid of a second person or use suitable hoists.
- Wear safety shoes.
- Carefully wheel the Torque Control Tower and always park it with the brakes applied.

Dirt and scattered objects



CAUTION!

Danger of injury from falling over dirt and scattered objects!

People may slip on or stumble over dirt and scattered objects. Falling may cause injuries.

- Always keep the work area clean.
- If objects are no longer needed, remove them from the work area and especially if such objects are at ground level.
- Mark unavoidable stumbling points with hazard tape.

4.5.4 Work environment

Inattention



WARNING!

Danger of injury due to distraction, inattention or irresponsible use!

Distraction, inattention or irresponsible use can result in erroneous parameter entries in the Torque Control Tower, losing control of the hydraulic power pack, and thus cause serious injuries.

- Always enter parameters correctly.
- Always keep the work area well-lit when working on the hydraulic power pack.
- Keep children and unauthorised persons away.
- Work purposefully and in a responsible manner. Do not allow yourself to be distracted.
- Do not work if you are tired or under the influence of drugs, alcohol or medicine.
- Do not be lulled into a false sense of security. Do not disregard the safety information and instructions in this manual, even if the procedure seems familiar to you after frequent use.
- When the Torque Control Tower is not in use, always store it safely out of reach of unauthorised persons.
- Wear the prescribed personal protective equipment when working on the hydraulic power pack.



Faulty safety devices



WARNING!

Danger of death due to inoperative safety devices!

If safety devices or safety functions are inoperative or disabled, there is a danger of serious injuries.

- Prior to commencing work, check that all safety devices are operative and correctly installed.
- Never disable or bypass safety devices or safety functions.

The Torque Control Tower is not equipped with its own safety devices or safety functions.

A residual current-operated circuit breaker must be installed by the operator.



Note the safety devices of the individual components.

4.6 Operator's obligations

The torque wrench is used in the commercial sector. The operator of the Torque Control Tower is therefore subject to the statutory obligations pertaining to occupational safety.

In addition to the safety instructions in this manual, the applicable safety, occupational safety and environmental protection regulations for the Torque Control Tower's area of application must be adhered to.

The following specifically applies in this regard:

- Operators must familiarise themselves with the applicable occupational safety regulations and, as part of a risk assessment, determine additional dangers that arise as a result of the specific operating conditions at the Torque Control Tower's operating site. This risk assessment must be implemented in the form of safety instructions for operation of the torque wrench.
- During the entire time the Torque Control Tower is in use, the operator must check whether the safety instructions they have compiled reflect current regulations and, if necessary, the operator must change the instructions accordingly.
- The operator must clearly define and regulate responsibilities for all work on and with the Torque Control Tower. The authority and responsibilities of personnel regarding operation, set-up, maintenance and repair must be clearly defined.
- The operator must reliably check the use of the Torque Control Tower and ensure that only commissioned and instructed personnel work with the torque wrench. Personnel being trained or instructed and personnel undertaking vocational training must always be supervised by an experienced person when working on the Torque Control Tower.
- The operator must ensure that the Torque Control Tower is not opened and that no work is performed on the electrical equipment by unauthorised persons.
Work on electrical equipment may only be performed by an electrician or by trained persons under the guidance and supervision of an electrician. Adhere to electrotechnical regulations for safety reasons.

The operator is further responsible for ensuring that the Torque Control Tower is in technically flawless condition at all times. The following applies for this reason:

- The operator must ensure adherence to the maintenance intervals described in this manual.
- The operator must have the functionality and integrity of all safety devices checked on a regular basis.



4.7 Who may use the Torque Control Tower?



WARNING!

Danger of injury if personnel are insufficiently qualified!

If unqualified personnel perform work on or with the hydraulic power pack or if such persons are present in the danger zone while work is being performed, dangers arise that could cause serious injuries and considerable property damage.

- Have all tasks performed by suitable qualified personnel without exception.
- Keep unqualified personnel away from the danger zones and work areas.

User

Users of the hydraulic power pack have the requisite knowledge and the requisite training for handling electric power generators. Furthermore, as part of training provided by the operator, users have been trained in relation to the tasks assigned to them and the potential dangers associated with improper conduct.

Users are trained in how to use the personal protective equipment, are familiar with the most important specifications, situations and information relating to working with electric and hydraulic systems and are capable of using the hydraulic power pack safely. This includes connecting and flushing hydraulic hoses.

Users must satisfy the legal minimum age requirements.

Users may only perform tasks that exceed operation under normal operating conditions if this is specified in this manual and the operator has expressly entrusted the users with the performance of such tasks.

Users know who their supervisor is, can contact their supervisor if they have questions or in an emergency, and are able to communicate with their supervisor.

The user is familiar with all residual risks and is trained in the practical handling of the hydraulic power pack.

Qualified hydraulic power pack personnel

Qualified hydraulic power pack personnel are trained for the specific task area in which they work and are familiar with the relevant standards and regulations.

Due to their professional training and experience, qualified hydraulic power pack personnel are able to perform work with the hydraulic power pack, recognise and avoid potential dangers independently and convey this to users.

Specific capabilities of qualified hydraulic power pack personnel include:

- Use all functions of the hydraulic power pack.
- Create passwords for users.
- Uphold safety, occupational safety and health protection when using the hydraulic power pack and convey this to users.

- Identify damage on the hydraulic power pack and arrange for repairs or get in touch with the manufacturer.
- Instruct users in the proper manner.

Operator

Operators are persons who operate the hydraulic power pack for commercial or economic purposes themselves, or make it available for a third party to use, and who bear legal responsibility for the product vis-à-vis protection of personnel and third parties during operation.

🔗 *Chapter 4.6 'Operator's obligations' on page 34*

PLARAD® service

Certain work may only be performed by PLARAD® service or by personnel authorised by Maschinenfabrik Wagner GmbH & Co. KG. Other personnel are not authorised to perform this work. Contact PLARAD® service or authorised PLARAD® partners regarding performance of the work that is due.

Contact: www.plarad.de

Unauthorised persons



WARNING!

Danger of death for unauthorised persons due to dangers in the danger zone and work area!

Unauthorised persons, who do not meet the requirements described in this manual, are not aware of the dangers in the danger zone. There is therefore a danger of serious injuries or even death for unauthorised persons.

- Keep unauthorised persons away from the danger zone and work area.
- If in doubt, address the respective persons and instruct them to leave the danger zone and work area.
- Suspend work while there are unauthorised persons loitering in the work and danger zone.

4.8 Personal protective equipment

Safety gloves



Safety gloves are used to protect the hands from friction, abrasions, punctures or deeper injuries and from contact with hot surfaces.

**Safety shoes**

Safety shoes protect the feet from crushing, falling parts and from slipping on slippery ground.

Hearing protection

Hearing protection is used to protect against hearing damage caused by noise.

Safety goggles

Safety goggles are used to protect the eyes from airborne parts and liquid jets.

Protective work clothing

Protective work clothing is tight fitting work clothing with a low tearing resistance, with tight sleeves and without any protruding parts.

Industrial safety helmet

Industrial safety helmets are used to protect the head from falling objects, suspended and swinging objects and from bumping into stationary objects.

An industrial safety helmet must be worn for overhead work involving the nutrunner.

4.9 Environmental protection



ENVIRONMENT!

Danger of pollution from incorrect handling of environmentally hazardous substances!

If environmentally hazardous substances are handled incorrectly, especially if such substances are disposed of incorrectly, this could cause significant damage to the environment.

- Always adhere to the instructions given below in relation to the handling of environmentally hazardous substances and the disposal thereof.
- If environmentally hazardous substances accidentally enter the environment, adopt suitable measures immediately. If in doubt, notify the competent local authority of the damage and inquire about suitable measures to be taken.

The following environmentally hazardous substances are used:

Batteries and rechargeable batteries

Batteries and rechargeable batteries contain toxic heavy metals. They are subject to special waste treatment and must be deposited at municipal collection points or be disposed of by a specialist company.

Lubricants

Lubricants, such as greases and oils, contain toxic substances. Such substances must not enter the environment. Arrange for such substances to be disposed of by a specialist disposal company.

Electrical and electronic components

Electrical and electronic components contain toxic materials. These components must be collected separately and deposited at municipal collection points or be disposed of by a specialist company.

Hydraulic oil

Hydraulic oil can contain harmful and environmentally hazardous substances. It must not enter the environment (soil, water), sewage system or household waste. Dispose of hydraulic oil and waste containing hydraulic oil separately via an approved disposal company.

Observe the manufacturer's safety data sheet.



5 Choosing the installation site

Incorrect installation site



WARNING!

Danger of injury due to careless choice of installation site!

Risks could arise from the choice of installation site. If the Torque Control Tower rolls away, tips over or falls, this could result in serious crushing. The noise emissions could cause hearing damage.

- Adhere to the following principles when choosing the installation site.

Installation site

- | | |
|-----------------------|----------------------------|
| Personnel: | ■ User |
| Protective equipment: | ■ Protective work clothing |
| | ■ Safety gloves |
| | ■ Safety shoes |

1. ➤ Ensure that the ambient conditions are adhered to:

- Chapter 18 'Technical data' on page 106
- Flat surface
- Not a potentially explosive atmosphere
- Dry

2. ➤



ENVIRONMENT!

Environmental damage due to oil leakage!

Ensure that the hydraulic power pack is horizontal.

3. ➤



WARNING!

Danger of crushing due to falling, tipping or moving Torque Control Tower!

Ensure that the Torque Control Tower cannot roll away, fall or tip over.

Apply the brakes.

4. ➤ Note the maximum power cable length.

5. ➤



WARNING!
Hearing damage due to noise!

As far as possible, install the Torque Control Tower in such a way that the noise emissions from the hydraulic power pack do not affect the workplace. Note the maximum remote control cable length for the hydraulic power pack.

6. ➤

Check the stability.



6 Preparing the hydraulic power pack



For information about the hydraulic power pack, see [Hydraulic power pack operating instructions](#).

The section below describes the procedure with the PLARAD® hydraulic power pack.

- | | |
|-----------------------|----------------------------|
| Personnel: | ■ User |
| Protective equipment: | ■ Protective work clothing |
| | ■ Safety goggles |
| | ■ Safety gloves |
| | ■ Safety shoes |

Installing the hydraulic power pack

1. ➤ Install the hydraulic power pack securely [Chapter 5 'Choosing the installation site' on page 39](#).
2. ➤ Check for leaks. If the hydraulic power pack is damaged, do not put it into service.

Oil level



Fig. 16: "max Oil" sticker

3. ➤



WARNING!

Danger of burns and environmental damage due to hydraulic oil!

Hydraulic oil expands when it heats up during operation. If filled above the marking, hydraulic oil could escape from the sealing plug. Contact with hot oil could result in burns. If hydraulic oil escapes, this could result in environmental damage.

Check the oil level in the sight glass to ensure it matches the "max Oil" sticker. In doing so, ensure that the hydraulic power pack is horizontal so that the correct value can be read.

The "max Oil" sticker indicates the intended maximum oil level in the surge tank when the hydraulic power pack has cooled down (20 °C).

4. ➤ Top up the oil if the display and oil level in the sight glass do not match.
To do so, open the cover of the oil filling neck.
5. ➤ Fill hydraulic oil (['Oil specifications' on page 106](#)) through an oil filter and into the surge tank until the oil level in the sight glass matches the marking on the "max Oil" sticker.
6. ➤ Mop up any spilled hydraulic oil in the proper manner and clean the work environment.

7 Supplying with energy

Electrical current



DANGER!

Danger of death due to electric shock!

Touching live parts poses an immediate danger of death due to electric shock. Damage to the insulation or individual components can be life-threatening.

- If the housing is damaged, disconnect it from the power supply immediately and arrange for repair.
- Keep moisture away from live parts. Moisture can cause short circuits.
- Never operate with a mains voltage and mains frequency other than those specified on the rating plate.
- Ensure that the power supply complies with local regulations.
- Never modify the power plug or power cable.
- Only operate at suitable power sockets.
- Never operate after the inspection period has elapsed. See the test seal for the date of the next test.
- Keep away from moisture, liquids, steam, dust and coarse contamination.
Do not switch on in a damp environment or in the rain.
- Avoid making physical contact with earthed components.
- During operation with mobile power generators, ensure continuous and constant compliance with the specified values for voltage, frequency, sufficient power and earthing.



Faulty power cable



DANGER!

Danger of death due to faulty power cable!

Faulty power cables can lead to a direct danger of death from electric shock.

Rolled-up power cables can result in thermal overload and could catch fire.

- Never modify the power plug or power cable.
- Only operate at suitable power sockets.
- Prior to every use, check the power cable for visible damage to the insulation.
Never replace the power cable yourself.
- Do not crush, shear or overload the power cable (pressure, strain).
- Do not pull on the power cable in order to disconnect the power plug from the power socket.
- Prior to switching it on, always unwind the power cable fully.
- Do not route the power cable over sharp edges, pinch points, through water, oil or other chemicals.
- Do not kink the power cable and do not twist it.
- Do not route the power cable close to moving parts or hot surfaces, such as motors or exhaust lines of mobile power generators.
- Wherever possible, do not expose the power cable to constant sunlight or other forms of UV radiation.
- Do not wrap the power cable around the hydraulic power pack.
- Ensure that extension cables routed outdoors or through humid environments are approved for the ambient conditions.
- Ensure that supply lines have the minimum permissible cross-section.

- | | |
|-----------------------|----------------------------|
| Personnel: | ■ User |
| Protective equipment: | ■ Protective work clothing |
| | ■ Safety gloves |
| | ■ Safety shoes |

The Torque Control Tower needs to be supplied with electrical power prior to use.

The following connections are possible depending on the hydraulic power pack used:

Power supply

- 230 V, 16 A, single-phase
- 400 V, 16 A, three-phase

1. ➤ Ensure that the available electrical power supply complies with the device's electrical connected loads ↗ *Chapter 18 'Technical data' on page 106.*



Consult an electrician if you have any questions. Never make changes or perform repair work on the electrical system yourself.

Connecting cable

2. ➤ Have a suitable connecting cable ready for the operating site.
3. ➤ Ensure that there is no damage on the Torque Control Tower, on the power cable, on the connecting cable, on the power plug or on the power socket.
4. ➤ Lay connecting cables in such a way that no tripping hazards arise, no mechanical load occurs, no sharp corners or edges can damage the insulation and that the ambient conditions correspond to the operating conditions for the connecting cables. Completely unwind the connecting cables if they are on a reel.

Securing the brakes

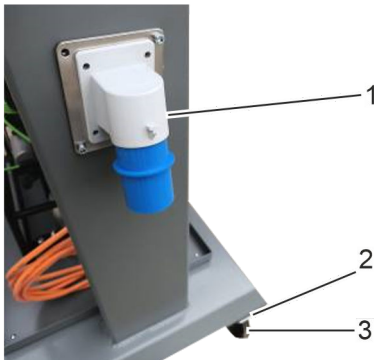


Fig. 17: Mains socket

- 1 Mains socket
- 2 Brake
- 3 Wheel

Connection

6. ➤ Plug the connecting cable's plug into the power socket and connect the connecting cable to the mains socket (Fig. 17/1) of the Torque Control Tower.
 - ⇒ The Torque Control Tower is electrically connected.

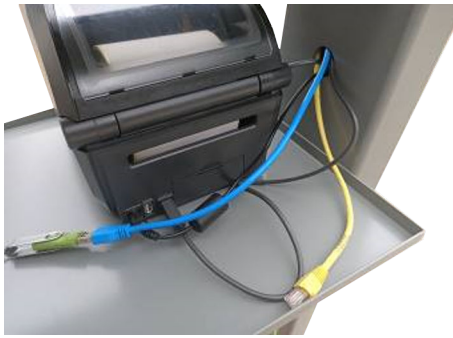


Fig. 18: Example of connecting the printer

- 7.** ➤ Ensure all Torque Control Tower components (barcode scanner, printer, control unit (BE)) have been connected properly ➤ *Operating instructions for the components.*

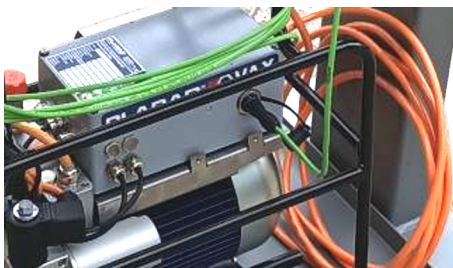


Fig. 19: Connecting the data cable

- 8.** ➤ Connect the green data cable to the service and documentation interface on the hydraulic power pack.



Fig. 20: Example of internal power socket

- 9.** ➤ Connect the orange power cable to the internal power socket of the Torque Control Tower.
⇒ The hydraulic power pack is connected.

8 Switching on the Torque Control Tower

Prerequisites:

- The Torque Control Tower has been set up securely and the brakes have been applied.
- The Torque Control Tower is supplied with power.
- The hydraulic power pack is connected.
- All components have been connected.

➔ Switch the main switch on the Torque Control Tower to position *[I]*.

⇒ The Torque Control Tower starts.

The industrial PC operating system starts.

All connected components are supplied with electrical energy. For information about special start components for the components, see  *Operating instructions for the components*.

The PLARAD[®] software starts automatically.



9 Preparing for operation

9.1 Starting the hydraulic power pack

- Personnel: ■ User
- Protective equipment: ■ Protective work clothing
■ Safety goggles
■ Safety gloves
■ Safety shoes

Power supply



DANGER!

Danger of death due to improperly secured mains connection!

Safeguard the power supply ↗ Chapter 7 'Supplying with energy' on page 42.

⇒ The hydraulic power pack starts with a self-test.

9.2 Connecting the hose

- Personnel: ■ User
- Protective equipment: ■ Protective work clothing
■ Safety goggles
■ Safety gloves
■ Safety shoes

Period of use

- 1.** → Ensure that the hydraulic hoses have not exceeded the maximum period of use.



Hose check:

- *The maximum period of use must not be exceeded.*
Comply with the exchange interval. Use for a maximum of 5 years.
- *The maximum pressure must not be reached.*
- *Use filled hydraulic hoses only.*
- *Oil specifications must match.*
- *Couplings and nipples must be compatible and be undamaged.*
- *There is no visible damage.*

Coupling

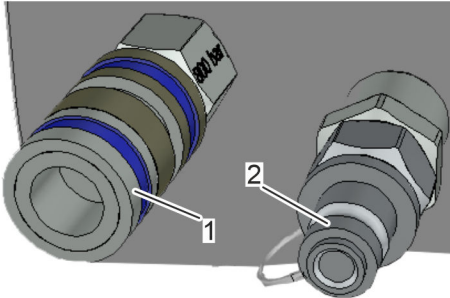


Fig. 21: Example, coupling (1) – nipple (2)

2. ➔



The hydraulic power pack can be equipped with various coupling systems.

The pressure connection is the connection on the hydraulic power pack that is fitted with a coupling.

Ensure that the coupling/nipple combination is suitable and free of damage.

3. ➔

Ensure that the maximum permissible pressures of all components are sufficient.

4. ➔

Ensure that the hydraulic hose is fully filled with suitable hydraulic oil ↗ 'Oil specifications' on page 106.

5. ➔

Connect the hydraulic hoses to the hydraulic power pack.

6. ➔

Check the lock.



Older couplings have counter-threads. Tighten to lock.

Newer couplings have a bayonet closure. Let it fully engage.

7. ➔

Do not connect the tool yet.

8. ➔

Flush ↗ Chapter 9.4 'Flushing' on page 49.

9. ➔

Connect the tool. Observe the following sequence to this end.

Flushing

Tool

Sequence



Connect hydraulic hoses only in a depressurised state!

The motor may run.

Adhere to the following sequence when connecting the tools:

1. - Hydraulic power pack pressure port
2. - Tool pressure connection
3. - Hydraulic power pack return
4. - Tool return



9.3 Setting the operating pressure

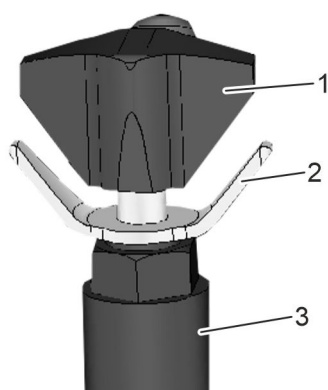


Fig. 22: Pressure adjustment valve

- 1 Knob
- 2 Adjustment lock
- 3 Pressure adjustment valve

- Personnel: ■ User
- Protective equipment: ■ Protective work clothing
■ Safety goggles
■ Safety gloves
■ Safety shoes

1. ➤ Read the pressure to be set from the torque chart/tensile force chart for the tool.
2. ➤ Release the adjustment lock (Fig. 22/2). Turn the knob anti-clockwise to do so.
3. ➤ Turn the knob (Fig. 22/1) anti-clockwise and open it completely.
4. ➤ Start the hydraulic power pack with the remote control. Press the white button to start the motor.

5. ➤



WARNING!

Danger of injury from exceeding the maximum permissible tool pressure!

Set the pressure during the forward stroke. To do so, slowly turn the knob clockwise. Note the pressure display.

⇒ The pressure is increased.

6. ➤ Activate the forward stroke again if the maximum forward stroke time is exceeded. To do so, release the button and press it again.
7. ➤ Save the setting when the desired pressure is reached. To do so, turn the adjustment lock clockwise until the knob is secured.

9.4 Flushing

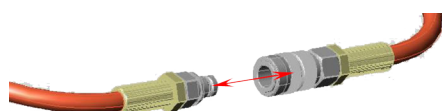


Fig. 23: Flushing

- Personnel: ■ User
- Protective equipment: ■ Protective work clothing
■ Safety goggles
■ Safety gloves
■ Safety shoes

To prevent air pockets, the hoses need to be flushed prior to use.

1. ➤ Ensure that the hydraulic hoses are properly connected
↳ Chapter 9.2 'Connecting the hose' on page 47.
2. ➤ Connect the hydraulic hoses together at the ends. For tandem use, connect both pairs of hoses together.



- 3.** ➤ Press the black button to switch on the hydraulic power pack.

⇒ The hydraulic power pack starts.

As the hydraulic power pack performs a return stroke after every start and no pressure can build up via the connected hydraulic hoses, this return stroke is never completed.

The ongoing return stroke ensures that the hydraulic hoses are flushed. Any air pockets present are cleared from the hoses.



Depending on the set function, either the red LED or the green LED flashes rapidly when the hydraulic power pack is switched on.

The LED continues to flash until the hydraulic power pack is switched off by pressing the red button.

- 4.** ➤ Let the hydraulic power pack run for at least 30 seconds (for a standard hose length of 4 m).
- 5.** ➤ Check for leaks. Replace the hydraulic hoses if there are any leaks.
- 6.** ➤ Switch off the hydraulic power pack.
Press the red button to switch off the motor.
- 7.** ➤ Disconnect the ends of the hydraulic hoses.
⇒ The hydraulic power pack is operational.

10 Using the PLARAD® software

10.1 Starting the program

After switching on the Torque Control Tower, the operating system of the industrial PC starts and the PLARAD® software is executed automatically.



→ If the PLARAD® software was not started automatically, launch the icon on the screen manually. Press the program icon  to do so.

⇒ The login screen is displayed.

10.2 Logging in

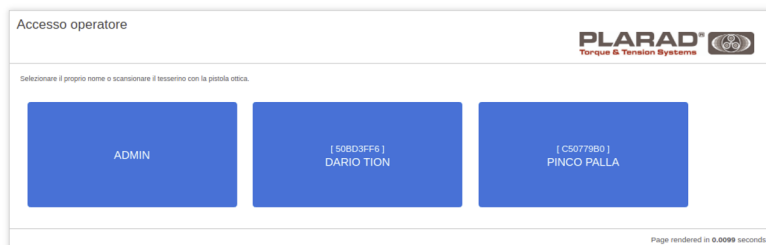


Fig. 24: Login

There are various login options available:

- Scan the user's barcode.
- Press the user's tile (Fig. 24).

You can specify in the configuration (↗ Chapter 10.6 'Configuration' on page 53) whether a password needs to be entered.



If no users have been created, it is only possible to log in as admin.

To create new users as admin, see ↗ Chapter 10.6 'Configuration' on page 53.

→ Log into the software.

- Log in as admin.
Starter password: plarad

⇒ The home screen is displayed.

10.3 Illustration of home screen



For users without admin rights, this is the only page that can be displayed (operator view).

Users who are logged in as admin can make further settings.

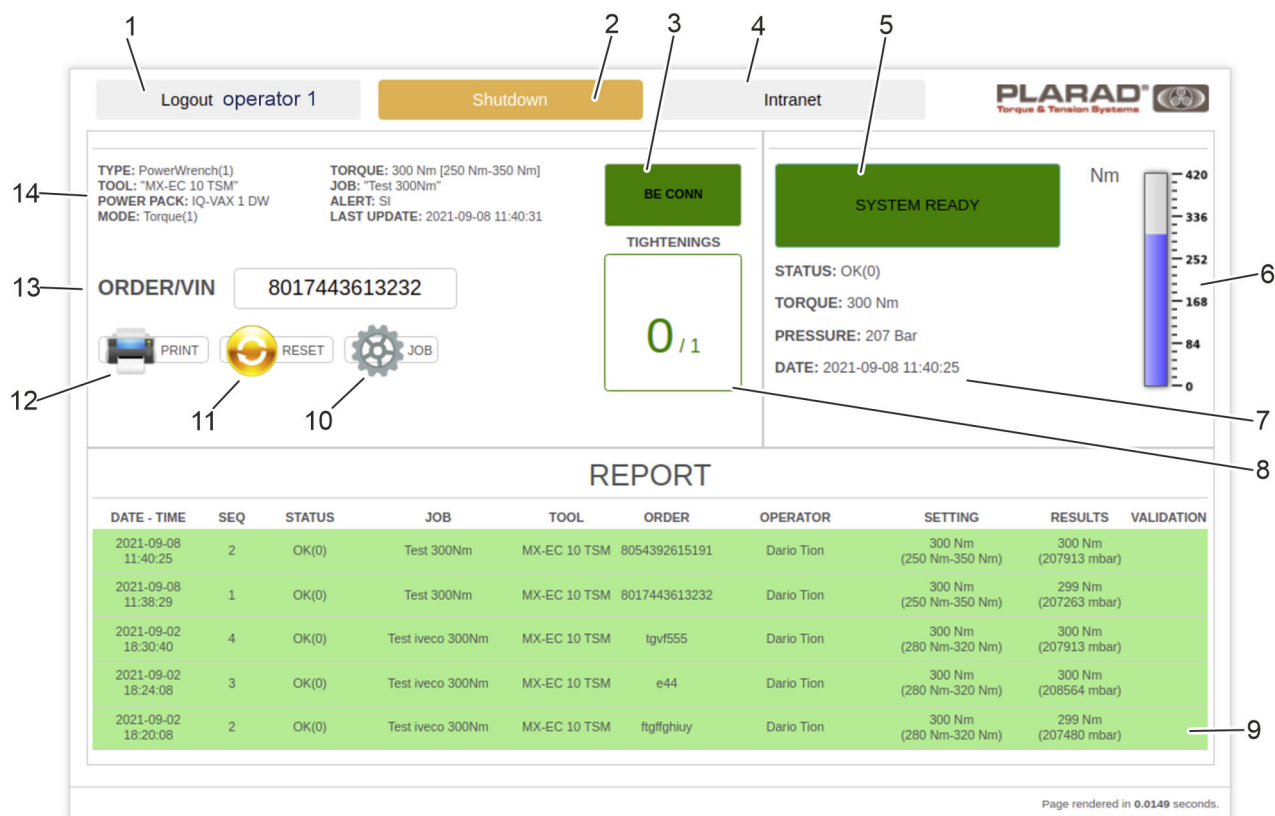
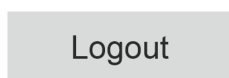


Fig. 25: Illustration of home screen

- | | | | |
|---|---|----|---|
| 1 | User access ↗ Chapter 10.4 on page 52 | 8 | ↗ 'Bolting operation counter' on page 61 |
| 2 | Shutdown ↗ Chapter 10.5 on page 52 | 9 | ↗ 'Documentation for the bolting operations' on page 61 |
| 3 | ↗ 'Status of the control unit (BE)' on page 60 | 10 | Bolting application selection ↗ Chapter 10.8 on page 62 |
| 4 | Intranet/configuration (admin only) ↗ Chapter 10.6 on page 53 | 11 | Reset counter ↗ Chapter 10.9 on page 63 |
| 5 | ↗ 'Messages' on page 60 | 12 | Print ↗ Chapter 10.10 on page 63 |
| 6 | ↗ 'Torque for the current bolting operation' on page 61 | 13 | ↗ 'Job number/VIN' on page 61 |
| 7 | ↗ 'Data for the current bolting operation' on page 61 | 14 | ↗ 'Data for the hydraulic power pack and tool' on page 62 |

10.4 User access

Button (Fig. 25/1)



➔ To log the current user out and log in a new user, press 'Logout' (Fig. 25/1).

⇒ The home screen is closed and the login screen (Fig. 24) is displayed.

10.5 Shutdown

Button (Fig. 25/2)

Shutdown

1. To switch off the Torque Control Tower, press 'Shutdown' (Fig. 25/2).
⇒ The PLARAD® software closes after 5 seconds and the operating system of the industrial PC shuts down.
2. To switch off the Torque Control Tower and de-energise all components, switch the main switch to position [0].

10.6 Configuration

Button (Fig. 25/4)



The configuration page (Intranet) can only be selected with the admin password.

Intranet

1. To make settings in the PLARAD® software or view all historical bolting data, press 'Intranet' (Fig. 25/4).
2. Enter the admin password.
⇒ The configuration window opens if the correct password is entered.



Fig. 26: Configuration page

- | | |
|--|----------------------------------|
| 1 Bolting/tensioning processes | 10 Exit configuration |
| 2 VIN results | 11 Display |
| 3 Job management | 12 Export |
| 4 List of messages | 13 Print |
| 5 User Manager | 14 Delete display filter |
| 6 Settings | 15 View, edit, delete list entry |
| 7 Logo | 16 Display filter |
| 8 Service – activate remote connection (support) | 17 Navigation |
| 9 Switch-off | |

Pressing buttons 1 to 17 performs the following actions:

1 – Bolting operations

Data is stored for each bolting operation:

- Date and time
- Result

- Tool used
- Job name
- Torque setpoint
- Torque min/max setpoint
- Actual torque value
- Actual pressure value
- Logged-in user
- Job number

The following actions (Fig. 26/15) can be performed for each list entry:



- Display details
- Edit
- Delete

2 – VIN results

ProductOrder	Operator	OrderDate	Actions
48296	Operatore 0	29/07/2020	 OK  FULL REPORT

Fig. 27: VIN results

All jobs performed are listed.

Several bolting operations are generally conflated in the same VIN/job number for one job. The overall results for the respective job are listed on this page. The following is displayed:

- VIN/job number
- User
- Job date

1. ➤ A report can be printed for each list entry. Press 'Full report' to do so.
2. ➤ A sticker with the OK report can be printed for correctly performed jobs. Press 'OK' to do so.

3 – Job management

JobName	Tightenings	JobAlias	MaskedJobAlias	JobAliasBarcode	Actions
Test 300Nm	1	8054392615191	805		  

Fig. 28: Job management

The software automatically retrieves the job list of the control unit (BE).

The following is displayed:

- Unique job ID (only in detail display)
- Freely assignable job name
- 'JobAlias'
String that needs to be recognised when scanning the barcode



- Number of bolting operations
- Barcode



1. ➤ View job in detail, edit, or delete.
2. ➤ Press  to edit the job.
3. ➤ Enter job name and number of bolting operations.
4. ➤ Enter '*JobAlias*', e.g. in the following form:
XXXXX055XXXXX

⇒ The barcode has 13 characters.

Characters marked with an "X" are not considered for recognition by the barcode scanner.

"055" must be recognised.

The barcode is generated automatically.

This barcode allows the job to be called up via the barcode scanner.



The number and position of the characters that are recognised when the barcode is scanned can be specified in  '6 – Settings' on page 56.

4 – List of logins

All software logins are logged and listed.

5 – User Manager

All registered users are listed:

- Code
- Name
- Status
- Barcode



1. ➤ Press  to edit a user entry.

⇒ The user entry opens.

The code, name, and status (active/inactive) can be changed.

2. ➤ Press '*Update changes*' to accept changes.
3. ➤ Press '*Update and go back to list*' to accept changes and close the user entry.
4. ➤ Press '*Cancel*' to discard changes.
5. ➤ Press '*Add record*' to create a new user.
⇒ A new, empty user entry is displayed.
6. ➤ Enter the code, name, and status of the new user.

7. ➤ Press 'Save' to create a further user entry.
 - ⇒ A notification confirms that entry in the database was successful.
 - A new, empty user entry is displayed.
8. ➤ Press 'Save and go back to list' to accept changes to the newly created user and to close the user entry.
 - ⇒ The new user is shown in the list along with a barcode.
9. ➤ Press 'Cancel' to discard the newly created user entry.

Code	Name	Status	Barcode	Actions
235235235	Operatore 0	active		

Fig. 29: User

6 – Settings



Only allow changes to be made by the administrator.

Incorrect settings can cause software malfunctions.

If you have questions, contact PLARAD® service.

Configuration key	Meaning
ADMIN_LOGIN	0 – Every user has access 1 – Access only with admin password
ADMIN_PWD	Admin password
AUTO_PRINT	1 – Sticker is printed automatically if the specified number of bolting operations is reached
BACKUP_PATH	File path for backups
BACKUP_RETENTION	
BE_PASSWORD	Password for the control unit (BE)
COMPANY	Company name
COUNTER_KO	
COUNTER_OK	
CURRENT_OPERATOR	Maximum number of users
CURRENT_PRODUCT_ORDER	Current job number
JOB_CODE_START_POS	First character in the barcode for job recognition
JOB_CODE_LENGTH	Number of characters in the barcode for job recognition
USER_LOGIN_BUTTON	1 – User has access without a barcode
LANGUAGE	



Configuration key	Meaning
PID_FILE	
REPORT_AUTOCLOSE	
REPORT_TYPE	
SIGNAL_MANAGEMENT	
TOTAL_JOBS	

Configuration key and associated value are listed and can be edited.



1. ➤ Press  to edit the entry.
⇒ The entry opens.
‘Config key’ and ‘Config value’ can be changed.
2. ➤ Press ‘Update changes’ to accept changes.
3. ➤ Press ‘Update and go back to list’ to accept changes and close the entry.
4. ➤ Press ‘Cancel’ to discard changes.
5. ➤ Press ‘Add record’ to create a new entry.
⇒ A new, empty entry is displayed.
6. ➤ Enter ‘Config key’ and ‘Config value’.
7. ➤ Press ‘Save’ to create a further entry.
⇒ A notification confirms that entry in the database was successful.
A new, empty entry is displayed.
8. ➤ Press ‘Save and go back to list’ to accept changes to the newly created entry and close the entry.
⇒ The list is displayed.
9. ➤ Press ‘Cancel’ to discard the newly created entry.

7 – Logo



A company logo can be printed on the printouts.

All stored companies are displayed in the list.

The company entries and logos can be viewed in detail, edited, and deleted.

1. ➤ Press ‘Add record’ to create a new company.
⇒ A new, empty entry is displayed.
2. ➤ Enter the company name.
3. ➤ Upload the JPG image file of the logo.

4. ➤ Press 'Save' to create a further entry.
 - ⇒ A notification confirms that entry in the database was successful.
 - A new, empty entry is displayed.
5. ➤ Press 'Save and go back to list' to accept changes to the newly created entry and close the entry.
 - ⇒ The list is displayed.
 - A new company with logo is created and can be used for printing.
6. ➤ Press 'Cancel' to discard the newly created entry.

8 – Service – Activating remote connection (support)

9 – VPN



Fig. 30: Internet connection

Remote access is possible via VPN or via the local network.

A remote VPN connection can be established for service incidents or software updates. Agree service options with PLARAD® service.

1. ➤ Ensure that you are connected to the Internet. To do so, connect the Ethernet cable with Internet access (DHCP) to port "ETH" (Fig. 30/1).
2. ➤ Press 'Service'.
 - ⇒ A VPN connection is established.
 - Remote access is possible for PLARAD® service.

Local network

The "ETH" port can be used for remote access to the control system of a PC in the same network with DHCP.

1. ➤ To do so, connect the Ethernet cable and call up the address of the web server via a browser.
2. ➤ To make it possible for an external PC to establish a connection to the control system, DNS settings need to be made:

For WINDOWS® PC, insert under

C:\windows\System32\drivers\etc\hosts

X.X.X.X. bemanager.plarad

X.X.X.X. is the IP address of the control system

Check that the IP address is correct, as the control system receives the IP address from the DHCP.



9 – Switch-off

↗ Chapter 10.5 'Shutdown' on page 52

10 – Exit configuration

Exit configuration and return to home screen.

12 – Export

1. ➤ Press 'Export' to save the displayed data.
2. ➤ Enter the file path and file name and press 'Save'.
⇒ The data listed in the display is saved as an xls file.

13 – Print

1. ➤ Press 'Print' to print the displayed data.
2. ➤ Make the necessary settings in the printer menu and press 'Print'.
⇒ The data listed in the display is saved as an xls file.

15 – List entries



The following actions can be performed for list entries:

(Fig. 26/15)

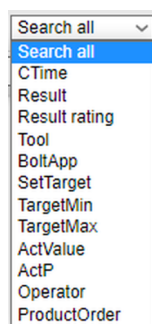
- Display details
- Edit
- Delete

16 – Display filter

It is possible to filter and search the display.

Fig. 31: Display filter and navigation

1. ➤ Enter the search term and press 'Search' (Fig. 26/16).
⇒ The database entries are searched and the display is filtered according to the search term.
2. ➤ To limit the search to specific parameters, select parameters in the selection menu, and press 'Search'.
3. ➤ To cancel the filtering, press 'Clear filtering' (Fig. 26/14).



17 – Navigation

There are navigation aids to help provide a clear display (Fig. 26/17):

- Number of entries per page
- Navigate to first page
- Navigate one page back
- Specification of a page to be displayed
- Navigate one page forward
- Navigate to last page
- Update display
- Numbers for the displayed entries and total number of entries

10.7 Understanding the displayed information

Status of the control unit (BE)

BE CONN

Button (Fig. 25/3)

The connection status of the control unit (BE) is displayed:

Green - *'BE CONN'*

The control unit (BE) is connected correctly.

Red - *'Switch on BE'*

The control unit (BE) is not ready for use.

Ensure that the internal connection is established.

Switch on the control unit (BE). To do so, press the green button.

Messages

SYSTEM READY

Button (Fig. 25/5)

Display and button with three background colours:

Green - OK

Red - Errors

Orange - Warning

System status and result of the current bolting operation are displayed on the button as text:

Bolting OK - The bolting operation was performed correctly.

Bolting error - Bolting NOK.

Reasons can include: incomplete, incorrect pressure, cancellation by user etc.

Press the red button to proceed.

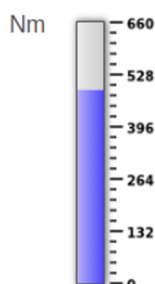
Bolting repeated - An already tightened bolt was tightened again.

Press the orange button to proceed.

System ready - Torque Control Tower is ready for use.



Torque for the current bolting operation



Display (Fig. 25/6)

The torque for the current bolting operation is displayed after the tightening operation.

Data for the current bolting operation

Display (Fig. 25/7)

The following data for the last bolting operation is displayed:

- Status
- Number of bolting operations
- Torque
- Pressure
- Date and time

Bolting operation counter



Display (Fig. 25/8)

The number of bolting operations performed to date and the total number of bolting operations in the job are displayed. The total number can be set in the configuration (Intranet).

Documentation for the bolting operations

Display (Fig. 25/9)

The report displays the last five bolting operations.

All bolting operations can be retrieved in the intranet, see [Chapter 10.6 'Configuration' on page 53](#).

The following data is displayed for each bolting operation:

- Date, time
- Sequence
- Status
- Job name
- Tool
- Job number/VIN
- User
- Torque setting
- Result: Torque, pressure
- Details of errors

Job number/VIN

Display (Fig. 25/13)

Specification of the unique job number or vehicle identification number (VIN)

Data for the hydraulic power pack and tool

Display (Fig. 25/14)

The following is displayed:

- Tool type
- Tool designation
- Hydraulic power pack type
- Set function of the hydraulic power pack
- Torque setting
- Job name
- Errors
- Last data update

10.8 Selecting the bolting application



1. ➤ Press  to select a new bolting application (Fig. 25/10).

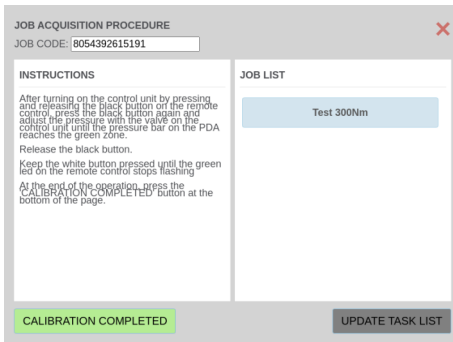


Alternatively, a new bolting application can also be scanned via a barcode.

- ⇒ The bolting applications stored in the control unit (BE) are loaded and displayed in a window.



For information about creating and adding new bolting applications, see the operating instructions for the control unit (BE).



2. ➤ Press 'Update Task List' if no new bolting applications are displayed.
3. ➤ Select the bolting application.
 - ⇒ The requisite parameters are loaded by the Torque Control Tower.
4. ➤ Calibrate the hydraulic power pack (learning process). To do so, follow the procedure in the operating instructions for the hydraulic power pack and tool.
5. ➤ If a PLARAD® hydraulic power pack is in use, proceed as follows:
 - To start, briefly press and release the black button on the remote control of the hydraulic power pack.
 - Press and hold the button again and set the desired pressure with the pressure adjustment valve.
 - ⇒ The pressure indication on the control unit (BE) must lie within the target range marked green.
6. ➤ Release the black button.



7. ➤ Press and hold the white button until the learning process is complete.
 - ⇒ The green LED on the remote control lights up continuously.
8. ➤ Press 'Calibration Completed'.
 - ⇒ The bolting application can be used.



*Further setting options for bolting applications, see
Chapter 10.6 'Configuration' on page 53.*

10.9 Resetting the counter



➤ To reset the bolting operation counter (Fig. 25/8), press  (Fig. 25/11).

10.10 Printing



➤ To print the currently displayed screen content, press  (Fig. 25/12).

11 Creating and managing fastening operations

Control unit (BE)

Bolting applications in the control unit (BE) can be created in the Torque Control Tower and on an external PC.

To do so, use the PC program "BE32.exe".

For further information, see ↗ "BE32.exe" PC program operating instructions ↗ *Chapter 12 'Control unit (BE)' on page 65.*

These instructions describe the following tasks:

- Creating user fields
- Creating and editing bolting applications
- Creating bolting definition lists
- Managing documentation data

Torque Control Tower



Fig. 32: Port "BE-ETH"

1. ➤ Connect the external PC to port "BE-ETH" (Fig. 32/1) via a patch cable.
2. ➤ Set the PC subnet to 192.168.6.xxx. The address must differ from the BE address (192.168.6.71). The IP address of the control unit (BE) can be read in the control unit's settings.
3. ➤ Create bolting applications using the program "BE32.exe".
For further information, see ↗ "BE32.exe" PC program operating instructions.

External PC

1. ➤ Disconnect the green data cable from the control unit (BE).
2. ➤ Take the control unit (BE) out of the BE holder on the Torque Control Tower.
3. ➤ Insert the control unit (BE) in the correctly installed BE holder of the external PC.
4. ➤ Use the PC program "BE32.exe" to create bolting applications on the external PC and transfer them to the control unit (BE). For further information, see ↗ "BE32.exe" PC program operating instructions.
5. ➤ Take the control unit (BE) out of the BE holder on the external PC and insert it in the holder on the Torque Control Tower. Connect the control unit (BE) to the green data cable.
 - ⇒ The bolting applications stored in the control unit (BE) can be used with the Torque Control Tower.



12 Control unit (BE)

Brief description

Bolting operations (all implemented tightening torques and further rotation angles) or tensioning operations can be stored using the optional control unit (BE). After being transferred to a computer, the data can serve as verifiable proof of work.

pA# 82954

Scope of delivery

The scope of delivery for the control unit (BE) comprises the following:

- Control unit (BE)
- Docking station
- Adapter cable
- CD
- Holder (option)

12.1 Illustration

Illustration of the control unit (BE)



- 1 Housing with port for the docking station
- 2 Display
- 3 Docking station
- 4 Menus and navigation buttons
- 5 Input buttons
- 6 Port for the adapter cable

Fig. 33: Illustration

Display

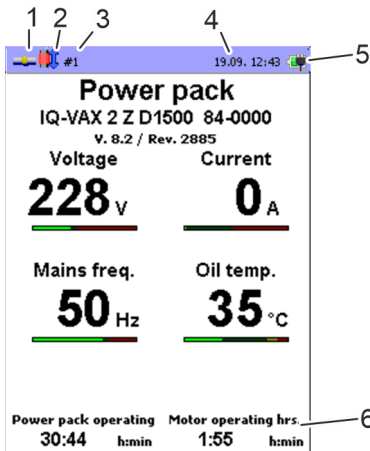


Fig. 34: Display elements

1	Connection status	
		Control unit (BE) not connected to the hydraulic power pack
		Control unit (BE) connected to the hydraulic power pack
		Control unit (BE) has a data connection to the PC
2	Hydraulic power pack status	
		Hydraulic tensioner mode
		No bolting application transmitted
		Torque function
		Loosening function
		Torque rotation angle function
		Pressure adjustment mode active 1,500 bar – hydraulic tensioner function 800 bar – bolts function – learning required
3	Number of the current bolting operation	
4	Date, time	
5	Battery charge status or mains supply	
6	Footer	



Menus and navigation buttons

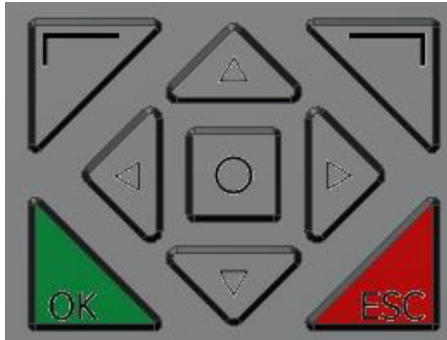


Fig. 35: Menus and navigation buttons

	Triangular button
	Navigation buttons
	Menu button
	Confirmation button [OK]
	Cancel button [ESC]

Input buttons

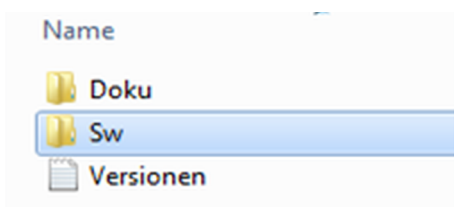


Fig. 36: Input buttons

Inputs of letters and numbers

Switch between upper case, lower case, and numerical input

Software



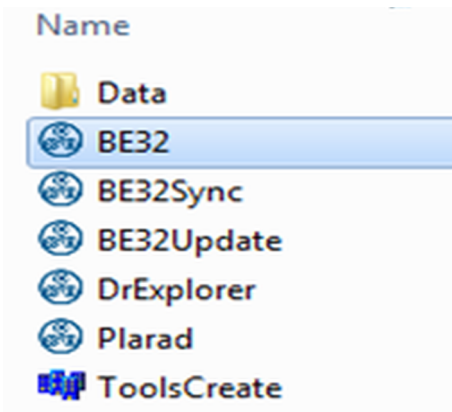
The “BE32.exe” PC software is part of the scope of delivery for the control unit (BE). This allows you to create bolting applications on the PC, which can then be transferred to the connected hydraulic power pack via the control unit.

A CD containing the following is enclosed with the control unit:

Doku - Operating instructions in several languages

Sw - Folder containing saved functions

Versionen - Information about the current software version



The 'Sw' folder contains the following:

- Data - Data folder
- BE32 - Program for entering documentation specifications
- BE32Sync - Program for synchronising the specifications from the computer with the control unit (BE) and transferring the bolting application data
- BE32Update - Online update for new functions and parameters
- DrExplorer - Online update for new functions and parameters
- ToolsCreate - Tool database

Adapter cable



An adapter cable is part of the scope of delivery for the control unit (BE). This cable connects the control unit (BE) to the data interface of the hydraulic power pack.

- Red bushing - Connect the red bushing to the control unit (BE).
- Blue plug - Insert the blue plug in the documentation and service interface of the hydraulic power pack.

Fig. 37: Adapter cable

Docking station



A docking station is part of the scope of delivery for the control unit (BE). The docking station allows you to charge the battery of the control unit (BE).

Fig. 38: Docking station

12.2 Safety

If using the control unit (BE), also observe the following safety instructions regarding residual risks posed by the hydraulic power pack and the hydraulic tool:

Battery

The control unit (BE) is equipped with a battery.



WARNING!

Danger of injury from incorrect handling of batteries!

Incorrect handling of rechargeable batteries can result in fire, explosions and electric shock. Escaping gases or smoke can lead to poisoning and suffocation.

- Only use the docking station included in the delivery to charge the battery.
- Never open the control unit (BE) and remove the battery. Always dispose of the battery together with the control unit.
- If the battery is faulty, contact PLARAD® service.

Data protection

Data is recorded while the control unit (BE) is in use.

The operator must ensure that saving and processing of personal data complies with the locally applicable data protection laws.

12.3 Charging the control unit (BE)

If the control unit (BE) is connected to the hydraulic power pack, the hydraulic power pack supplies the control unit (BE) with electrical energy.

The control unit (BE) is also equipped with a battery. If the control unit (BE) is connected to the hydraulic power pack, the battery is not charged.

Connecting the PSU

1. ➔



DANGER!

Danger of death due to electrical energy!

Only use the original PSU.

To charge the battery, connect the docking station to the PSU and plug the power plug into the power socket.

Docking station

2. ➔

Connect the control unit (BE) to the docking station.

⇒ The battery of the control unit is charged.

The control unit can be operated for roughly 2 hours without an external power supply if the battery is fully charged.

12.4 Connecting the control unit (BE)

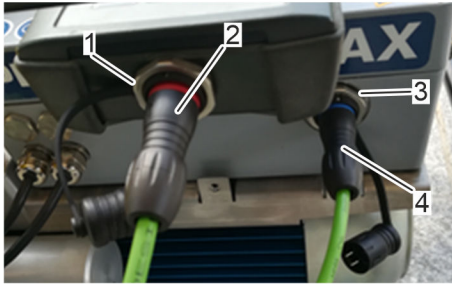


Fig. 39: Connecting the adapter cable

1. ➤ Connect the red bushing of the adapter cable (Fig. 39/2) to the control unit (BE) (Fig. 39/1).
2. ➤ Plug the blue plug of the adapter cable (Fig. 39/3) into the documentation and service interface of the hydraulic power pack (Fig. 39/4).
3. ➤ Supply the hydraulic power pack with power.
 - ⇒ The control unit (BE) is supplied with electrical energy.

12.5 Putting the control unit (BE) into operation

To put the control unit (BE) into operation, proceed as follows:

Starting



1. ➤ Press  to switch on the control unit (BE).

⇒ The control unit (BE) is initialised.
 The start screen is displayed.



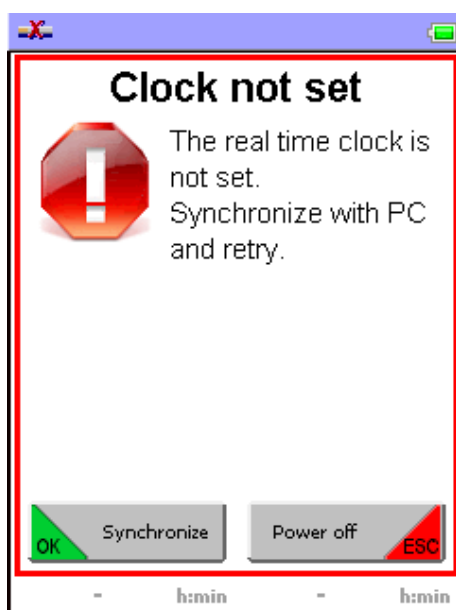


Fig. 40: Message

Initialisation

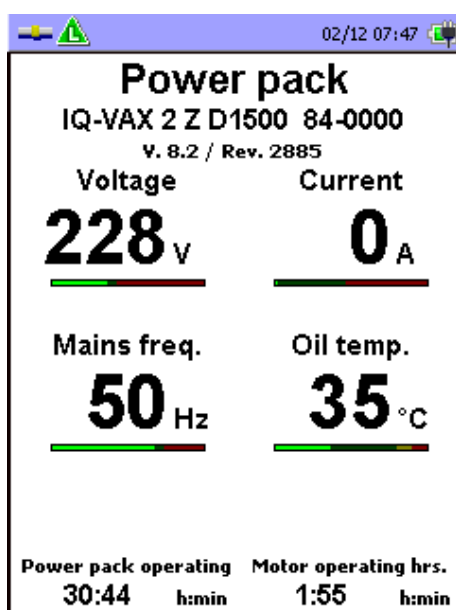


Fig. 41: Power pack data



2. If the control unit (BE) has never been synchronised with a PC, the message Fig. 40 is displayed. Synchronise the control unit with a PC (↪ Chapter 12.11 'Data exchange between PC and control unit' on page 85) and restart the control unit (BE) (↪ 'Starting' on page 70).
3. If the message Fig. 40 is displayed in relation to an already synchronised control unit, the internal clock battery is faulty. Have the battery exchanged by PLARAD[®] service.

4. Wait until initialisation is complete.
 - ⇒ A proper connection between the hydraulic power pack and control unit (BE) is indicated in the connection status (Fig. 34/1) by .
 - ⇒ If the data connection has been established between the control unit (BE) and the hydraulic power pack, the 'Power pack' menu is displayed.

5. If there is a faulty connection between the control unit (BE) and the hydraulic power pack (connection status ) , ensure that the adapter cable has been connected correctly.

12.6 Tensioning with the control unit (BE) (dual hydraulic power packs only)

Preparing the control unit (BE) and hydraulic power pack

Prerequisites:

- The hydraulic power pack and the control unit (BE) are connected ↪ *Chapter 12.4 'Connecting the control unit (BE)' on page 70.*
- The hydraulic power pack and the control unit (BE) are ready for use ↪ *Chapter 12.5 'Putting the control unit (BE) into operation' on page 70.*
- Bolting applications (hydraulic tensioner mode) have been created and were transferred to the control unit (BE) ↪ *Chapter 12.12 'Managing bolting applications' on page 87.*



1. Press  to call up the main menu of the control unit (BE).



2. Use  or  to select the 'Bolting App. Defs.' submenu and confirm with .

⇒ The list of available bolting applications is displayed.

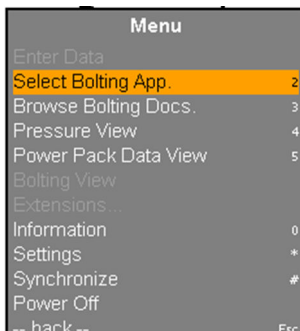


Fig. 42: Bolting application definitions



Fig. 43: Bolting application definitions

3. Use  or  to select the list of bolting applications and confirm with .



Fig. 44: List of bolting applications

4. Use  or  to select the bolting application and confirm with .



Fig. 45: Bolting application

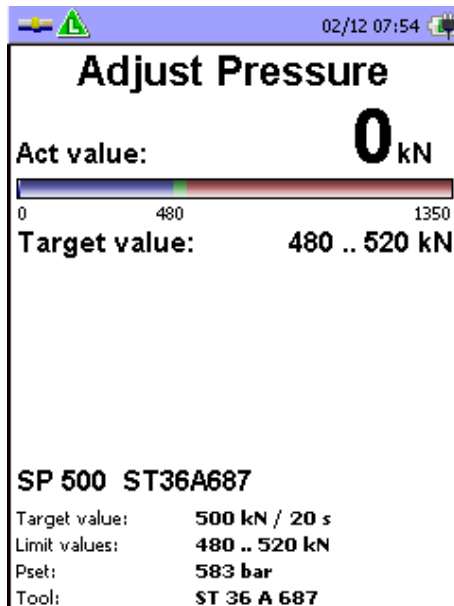


Fig. 46: Pressure adjustment

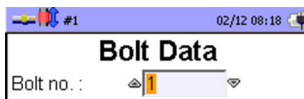


Fig. 47: Bolt data

5. Ensure that a bolting application created in hydraulic tensioner mode (marked with ) is selected.

⇒ The bolting application parameters are transferred to the hydraulic power pack.

- 6.



The pressure adjustment only works in pressure adjustment mode if using the control unit (BE).

To switch to pressure adjustment mode, press the white button to activate adjustment mode or learning mode while keeping the red button pressed down.

Use the pressure reducing valve to set the value of the pre-tensioning force in kN displayed on the control unit (BE).

⇒ Chapter 9.3 'Setting the operating pressure' on page 49

Press the white button and red button on the remote control simultaneously to deactivate pressure adjustment mode.

⇒ The window for data entry appears.



In the 'Bolt Data' submenu, data for the bolted connection (e.g. operator's name, operator's number, workpiece designation) can be entered in six assignable user-defined text fields.

The number and name of the fields is defined in the PC software "BE32.exe" included in the delivery. The control unit (BE) cannot be used to make any changes in this regard. It is only possible to enter data in the fields if a bolting application was selected beforehand.

Entering bolt data

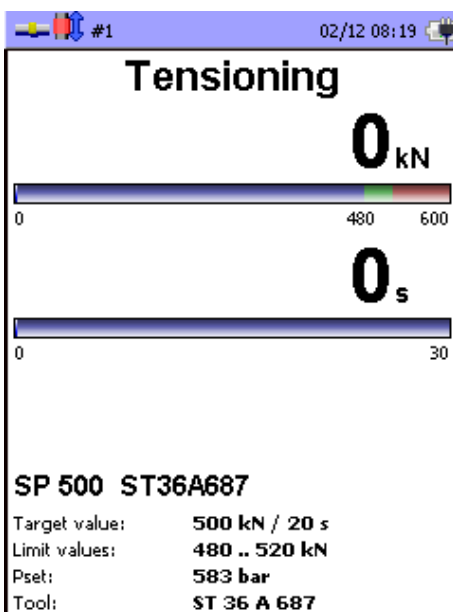
7. Select the data field.



8. ➤ Use the input buttons to enter free text.

Press **#1** to switch between upper case, lower case, and numerical input.

9. ➤ Confirm the entry with  or cancel with .



⇒ If the entry is confirmed, the data is transferred and the selected bolting application is shown on the control panel. The header displays the number of the next bolted connection.

10. ➤ Connect the hydraulic tensioner to the hydraulic hose.

⇒ Documented operation of the hydraulic tensioner has been prepared.

Fig. 48: Bolt data

Tensioning

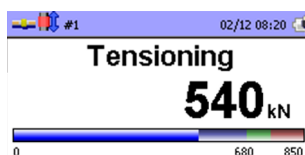


Fig. 49: Pressure build-up

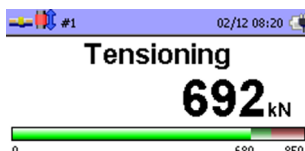


Fig. 50: Control unit display

1. ➤ Press and hold the white button on the remote control.

⇒ The pressure build-up is shown on the control unit (BE).

2. ➤ Press and hold the white button on the remote control until the green and red LEDs light up continuously and simultaneously on the remote control.

⇒ The tensile force achieved is within the tolerance window and the control unit (BE) indicates Fig. 50.



Fig. 51: Remote control display

⇒ The remote control display indicates Fig. 51.

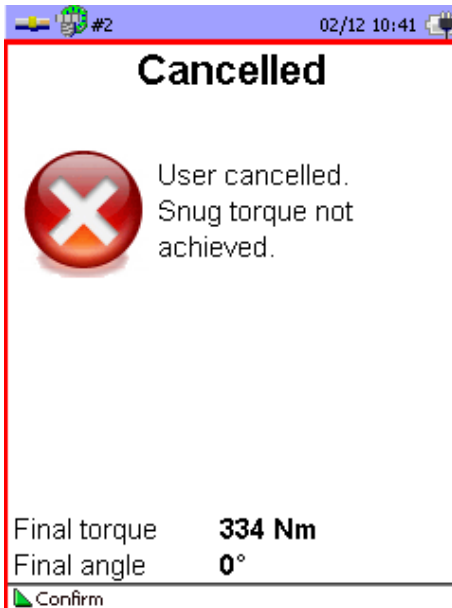
3. ➤ Tighten the fastening element.
 - ⇒ If using the control unit (BE), the hydraulic power pack always re-pumps if, for example, the pressure reached drops due to settling losses.
4. ➤ Relieve pressure from the hydraulic tensioner after tightening the fastening element. Press the green button on the remote control to do so.
 - ⇒ The control system documents the pressure measured immediately before pressure relief as the bolting result.

Documentation for the tensioning process



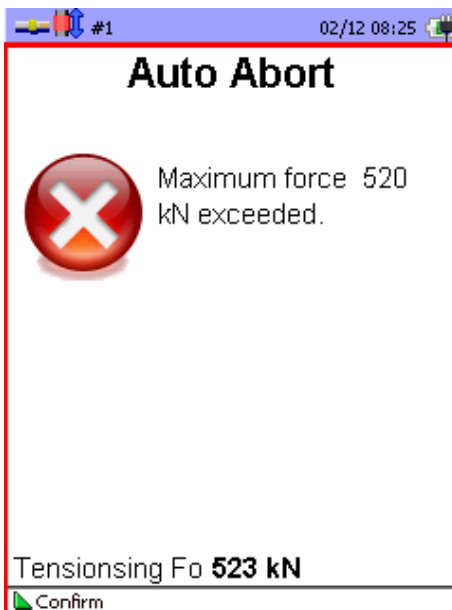
If the tensioning process has been completed successfully, the 'Bolting OK' message appears on the control unit (BE).

Cancellation by the user



If the tensioning process was cancelled by pressing the red button on the remote control, the 'User Cancelled' error message appears on the control unit (BE).

Faulty tensioning process



Other error messages, such as exceeding the maximum permissible tensile force by inadvertently shifting the pressure adjustment valve, are shown as a plain text message.

If there is a pending error message, the number of the bolted connection does not increase automatically.

12.7 Bolting with the control unit (BE)

Preparing the control unit (BE) and hydraulic power pack

Prerequisites:

- The hydraulic power pack is suitable for torque-angle bolting applications.
- The hydraulic power pack and the control unit (BE) are connected ↗ *Chapter 12.4 'Connecting the control unit (BE)' on page 70.*



- The hydraulic power pack and the control unit (BE) are ready for use ↪ *Chapter 12.5 'Putting the control unit (BE) into operation' on page 70.*
- Bolting applications (torque mode or torque-angle mode) have been created and were transferred to the control unit ↪ *Chapter 12.12 'Managing bolting applications' on page 87.*



1. ➔ Press  to call up the main menu of the control unit (BE).



2. ➔ Use  or  to select the 'Bolting App. Defs.' submenu and confirm with .

⇒ The list of available bolting applications is displayed.

3. ➔ Use  or  to select the list of bolting applications and confirm with .

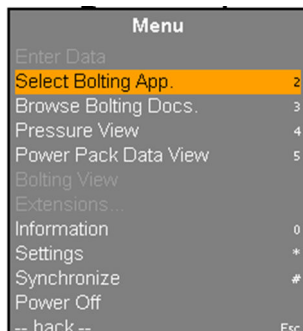


Fig. 52: Bolting application definitions



Fig. 53: Bolting application

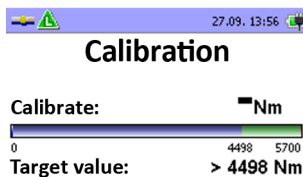


Fig. 54: 'Calibration' display

Setting the pressure

4. Use ▼ or ▲ to select the bolting application and confirm with



Torque-angle bolting applications can only be performed with suitable hydraulic power packs.

The control unit detects whether the connected hydraulic power pack can perform torque-angle bolting applications. If the hydraulic power pack is not suitable, stored torque-angle bolting applications will be greyed out on the control unit.

- ⇒ The bolting application parameters are transferred to the hydraulic power pack.
 - ⇒ The 'Calibration' display appears.
- If the power pack requires calibration, this is indicated by in the status bar.
- ⇒ If the calibration pressure corresponds to a previously learned bolting pressure and the same hydraulic wrench is used, the 'Calibration' display appears. Calibration is not performed again. Bolting can commence.

5. Connect the hydraulic wrench to the hydraulic hose.

6. Set the pressure.

■ Torque bolting applications:

On the pressure reducing valve of the hydraulic power pack, set the pressure ("target value") as precisely as possible so that it corresponds to the indicated torque.

■ Torque-angle bolting applications:

The torque indicated on the control unit is a minimum value. Set the hydraulic power pack to any given pressure corresponding to a torque in excess of this minimum value.

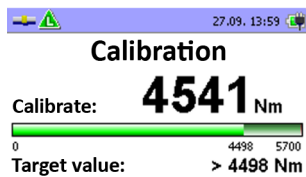


Fig. 55: Torque

Calibration

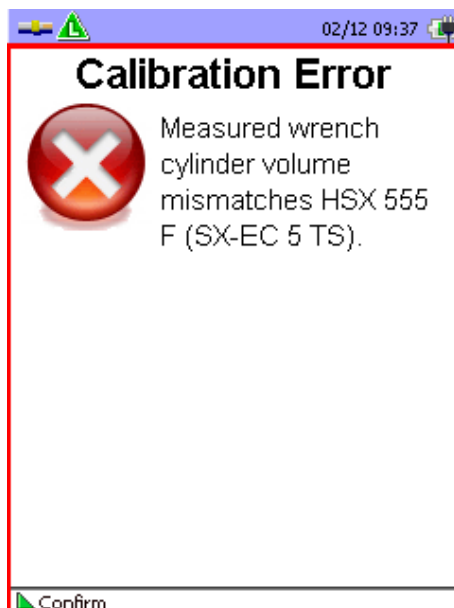


Fig. 56: Calibration error

7. ➔



WARNING!

Danger of injury from high pressure!

Excessive pressure can cause components to burst, and result in injuries and property damage.

- Never exceed the maximum permissible operating pressure for the connected hydraulic wrench.

While adjusting the pressure, observe the increase in the resulting torque on the control unit.

Example: torque-angle bolting process

The value for the set pressure corresponds to a torque of 4,541 Nm and is thus greater than the target value of 4,498 Nm. The result is OK.

- ⇒ If the necessary pressure has been set properly, the bar display indicating the torque is green.

8. ➔

Perform the 'Calibration' function of the hydraulic power pack.

- ⇒ An error during calibration is indicated as follows:

- The LEDs on the remote control flash in alternation.
- A clear text message is displayed on the control unit (BE).

9. ➤ Rectify the calibration error by pressing the green button and repeat calibration.

⇒ If calibration was performed correctly, this is indicated as follows:

- The green LED on the remote control switches from blinking to permanent light.

⇒ After successfully undergoing calibration, the power pack is prepared for automatic bolting processes and their documentation on the control unit (BE).

The control unit displays the bolting screen associated with the bolting application:

- Torque bolting process
- Torque-angle bolting process

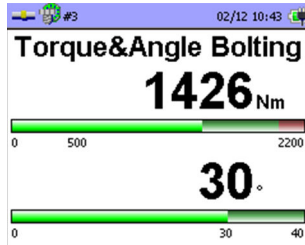


Fig. 57: Example: torque-angle bolting process

Bolting

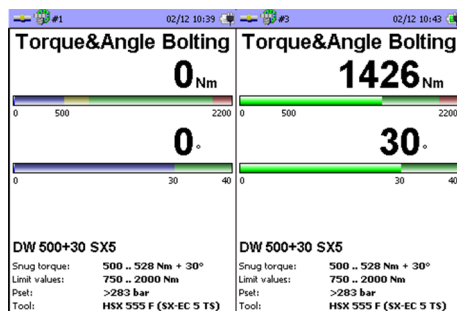


Fig. 58: Example: torque-angle bolting process

Left During bolting

Right After completion of the bolting operation

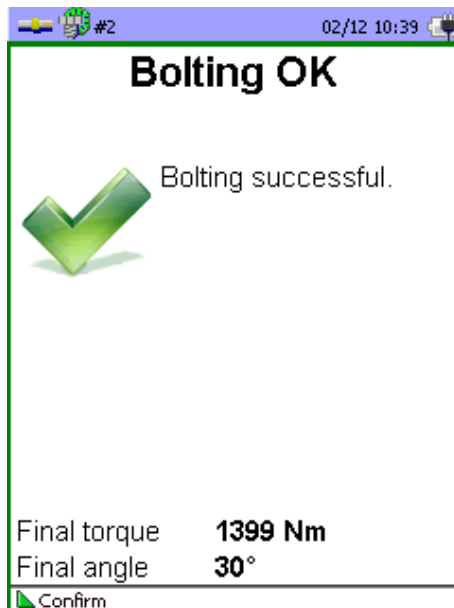
10. ➤ Bolt.

⇒ During bolting, the control unit (BE) indicates the progress of the bolting process.

- Torque
The increase in torque is shown.
- Torque-angle bolting process
First the increase of the torque until the snug torque is reached and then the increase of the angle of further rotation is shown.



Bolting documentation



If the bolting process has been completed successfully, the 'Bolting OK' message appears on the control unit (BE).

- Torque
The torque reached is within the allotted time frame.
- Torque-angle
The angle of further rotation was reached. The torque corresponding to the angle of further rotation is within the tolerance window stored during bolting application definition.

Repositioning the hydraulic wrench

Before repositioning the hydraulic wrench, switch off the power pack by pressing the red button on the side.

The hydraulic wrench can be attached to the next bolted connection and can make this connection without there being any need to acknowledge the data on the control unit that was reported to the control unit (BE) by the power pack. The active bolting counter increases by one. The control unit continues to count automatically.

The system automatically decides whether the bolting operation was performed correctly. The bolting data (operator's name etc.) is automatically transferred for the next bolting operation, unless this data is changed (e.g. during a shift change).

Erroneous bolting process

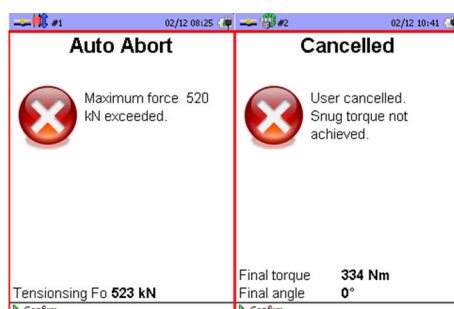


Fig. 59: Example: erroneous bolting process

Left Tightened bolt
Right Cancellation by the user

An error message appears if an error is detected during the bolting process.

Examples:

- An already tightened bolt was tightened again.
- The white button is inadvertently released during the automatic bolting process.

An error message must be acknowledged on the control unit (BE) by pressing

The bolting number does not automatically increase by one. The bolting process can be repeated.

12.8 Loosening with the control unit (BE)

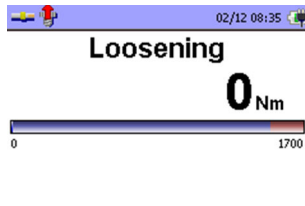


Fig. 60: Loosening

The procedure for loosening bolts is the same with and without the control unit (BE).

The 'Loosening' message appears on the control unit (BE) during the loosening process.

12.9 Getting to know additional features of the control unit (BE)

12.9.1 Calling up the menu

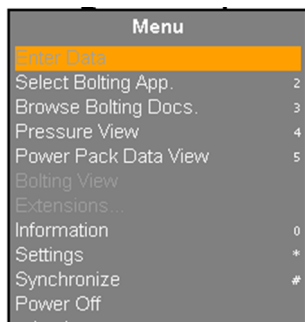


Fig. 61: Menu

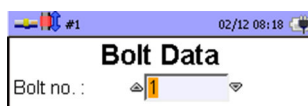
1. Press to call up the main menu of the control unit (BE).
2. Use or to select the desired submenu and confirm with .

12.9.2 User data input

To modify the data that was entered after the pressure adjustment (e.g. operator's name during a shift change), proceed as follows:

1. Select 'Menu' → submenu 'Enter Data' and confirm with .

⇒ The available data fields are displayed.



2. Enter data in the user-defined text fields (maximum six).



The number and name of the fields is defined in the PC software "BE32.exe" included in the delivery. The control unit (BE) cannot be used to make any changes in this regard. It is only possible to enter data in the fields if a bolting application was selected beforehand.



12.9.3 Viewing documentation and data

The completed bolted connections are shown as a list in the 'Documentations' submenu.



Fig. 62: Documentation

1. Select 'Menu' → submenu 'Documentations' and confirm with .
- ⇒ The available records are displayed.
2. To view a set of documentation, use or to select the desired record and confirm with .



Fig. 63: Detailed view

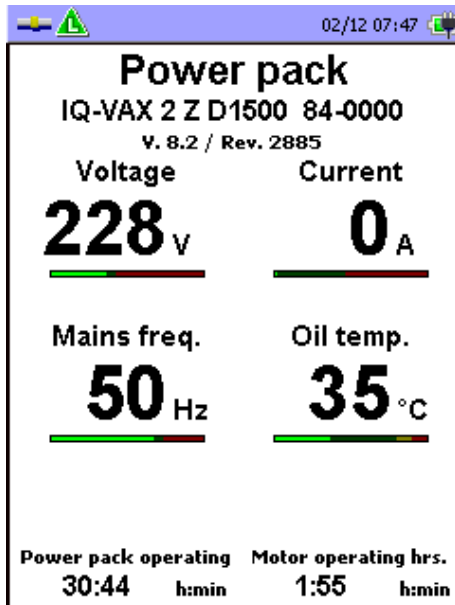
⇒ The complete data for this bolted connection is displayed:

- Date
- Pretensioning force entered
- Torque entered
- Snug torque
- Angle of further rotation
- Tool used
- Bolting designation

3. Use or to navigate to the next or previous record in the detailed view.
- ⇒ If no data is available, the 'No data' message appears.
4. Press to confirm this message.



12.9.4 Viewing hydraulic power pack data

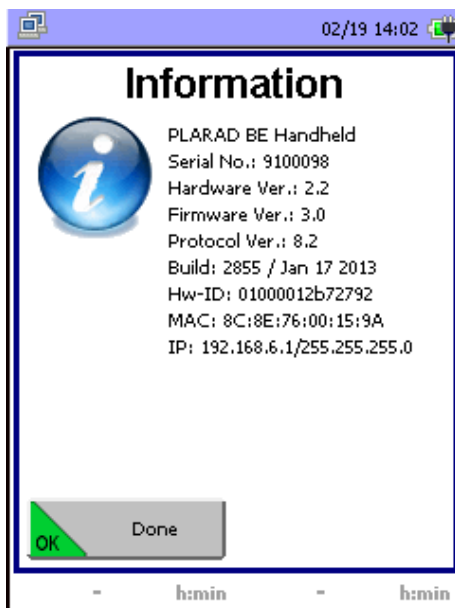


The 'Power Pack Data View' submenu allows you to view the data of the hydraulic power pack connected to the control unit (BE).

- Select 'Menu' → submenu 'Power Pack Data View' and confirm with .
- ⇒ The current data of the hydraulic power pack is displayed.

Fig. 64: Hydraulic power pack data

12.9.5 Viewing data about the control unit (BE)



The 'Information' lets you view all data about the control unit (BE).

1. → Select 'Menu' → submenu 'Information' and confirm with .
- ⇒ The current data of the control unit (BE) is displayed.
2. → Press to exit the information view.

Fig. 65: Data about the control unit (BE)

12.9.6 Modifying settings

You can alter the settings for the control unit (BE) in the "Settings" submenu:

- Language
- Unit for temperature indication (degrees Celsius or Fahrenheit)

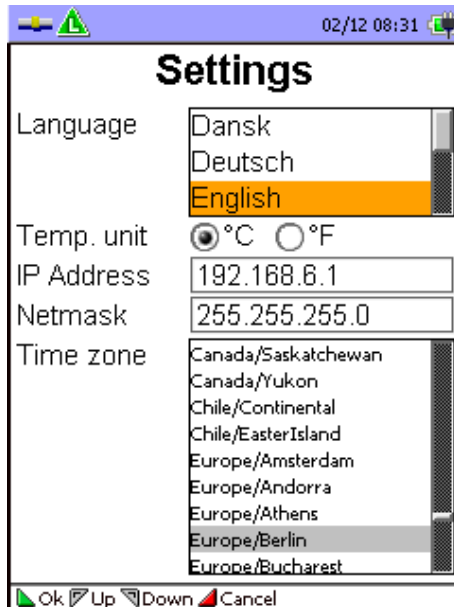


Fig. 66: Settings

- Time zone
- If using the control unit (BE) in a network
 - IP address
 - Netmask

1. ➤ Select 'Menu' → submenu 'Settings' and confirm with .
- ➔ The available settings are displayed.
2. ➤ Use or to select a setting.
- ➔ '123' is displayed in the status bar if IP address or netmask are selected. The input buttons of the control unit can be used to enter digits.
3. ➤ Use , , or to change the language or temperature unit.
4. ➤ The input buttons of the control unit can be used to enter digits. This allows you to enter an IP address or netmask.
5. ➤ Press to confirm the entry.
6. ➤ Press to cancel the entry.

12.10 Switching off the control unit

- ➔ To switch off the control unit (BE), select 'Menu' → submenu 'Power Off' and confirm with .

Alternatively, press and hold the red button on the control unit (BE).

12.11 Data exchange between PC and control unit

PC

The control unit (BE) can only be used with a hydraulic power pack if bolting application data was previously transferred from the PC to the control unit (BE).

Software

Only the PC software included in the delivery can be used to create or modify bolting applications. This ensures that the parameters of the bolting application cannot be tampered with at a subsequent point in time.

Connecting to the network

1. ➤ Use one of the following options to connect the control unit (BE) to the network:
 - Connect the docking station directly to the PC via a network cable.
 - Connect the docking station using the network adapter included in the delivery.

Have the network connection set up by the network administrator. Observe the corresponding documentation on the CD in the 'Doku' folder.
2. ➤ If the network adapter (see enclosed installation CD) included in the delivery is used, connect the control unit (BE) to a USB port of the PC.
3. ➤ If the control unit is addressed via a network, connect the control unit (BE) to the network directly via a network cable.
4. ➤ Assign a valid IP address to the control unit (BE) or to the network interface.

Performing data exchange

1. ➤ Insert the control unit in the docking station.
 - ⇒ If the control unit (BE) is properly connected to the PC via the docking station,  is displayed in the status bar.
2. ➤ Synchronise the control unit with the PC.

To do so, select  'Menu' → submenu 'Synchronize' and confirm with .

 - ⇒ The bolting documentation (data of the completed bolting operations) is transferred to the PC database.

The bolting application definitions selected for the data transfer are transferred from the PC to the control unit (BE).



The 'Initializing...' message is displayed during synchronisation.



Fig. 67: Synchronisation

If the control unit (BE) is not properly connected to the PC or if the synchronisation program is not running on the PC, the 'Synchronizing' message appears.

1. ➤ Press  to cancel the synchronisation process.
2. ➤ Establish the connection or start the synchronisation program "BE32Sync.exe" on the PC.

12.12 Managing bolting applications

12.12.1 Using the PC software "BE32.exe"

Bolting applications are created and managed using the PC software "BE32.exe".

Prerequisite:

- PC software and driver have been installed.
The operating instructions and the software can be found on the enclosed software CD.

Launching the software

1. ➤ Launch the PC software "BE32.exe".

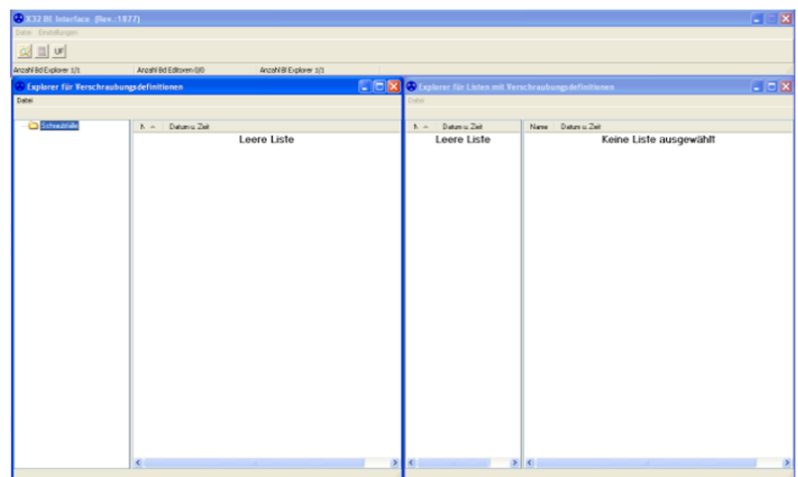


Fig. 68: Main window

- ⇒ The main window 'X32 BE Interface' with the 'Bolting definition browser' and the 'Browser for bolting definition lists' is displayed.



2. ➤ Press    to open additional browsers:
 -  - Bolting definition browser
 -  - Browser for bolting definition lists
 -  - Editor for standard user fields
 ⇒ The status bar indicates the current number of open browsers/editors.
3. ➤ To control the browsers and editors, move the cursor into the work area of the browser or editor.
4. ➤ Right-click to open the context menu.

12.12.2 Creating user fields

The editor for standard user fields can be used to define up to six free text user fields of your choice for the control unit (BE). During the bolting process, additional information can be entered in the fields created with this editor.



1. ➤ Press  to open the editor for standard user fields.

2. ➤ Press 'Edit' to switch to the editor view.



3. Enter headings for the fields.

4. Press 'Preview' to view a preview.

⇒ The preview shows how the text entries will later appear on the control unit (BE).

The template created can be transferred to a bolting application & Chapter 12.12.3 'Creating and editing bolting applications' on page 89.

In the user fields in the example shown here are 'Bolting', 'Operator', 'Flange number' and 'Tower number'. These specifications are stored during bolting along with the bolt data.

12.12.3 Creating and editing bolting applications

The bolting definition browser can be used to create and manage bolting applications. A directory structure can also be created in which to store individual bolting applications (e.g. sorted by machine type).



1. Open the bolting definition browser. Press to do so.



Fig. 69: Editor

2. Right-click to open the context menu.

3. Select 'Create bolting application' and enter a name.

⇒ The bolted application created is shown in the list.

⇒ A bolting application remains invalid until all data fields have been completed correctly and in full.

⇒ If the bolting application has been created correctly and in full, the icon for the respective bolting mode appears in front of the name.



Fig. 70: Bolting definition editor

4. ➤ Open the 'Bolting definition editor' by double-clicking on the bolting application.
5. ➤ Enter the bolting application parameters in the editor window.

Information about the target window

Note regarding definition of the target window and subsequent adjustment of the working pressure on the hydraulic power pack:

Torque bolting operations

The exact pressure is set on the hydraulic power pack for torque bolting operations.

The torque resulting from the torque chart for the hydraulic wrench ensures that the bolt cannot be overtightened.

The hydraulic power pack checks during the calibration process whether the correct pressure expected by the BE32 is set within the appropriate tolerance window.

If the pressure is not set correctly, the hydraulic power pack rejects the calibration process.

Torque-angle bolting operations

With torque-angle bolting operations, a pressure is set on the power pack which is sufficient to apply the snug torque and, subsequently, the further angle of rotation.

The pressure set on the power pack must be greater than the pressure required to reach the maximum torque defined by the operator (which is obtained after applying the further angle of rotation) of the target window.



Two mechanisms prevent the overtightening of a bolt:

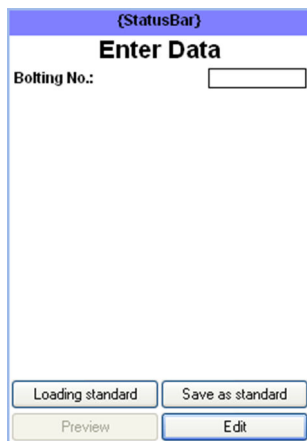
- a - At the start of the bolting operation, the hydraulic power pack detects whether the bolt has already been tightened. Due to external influences (e.g. skipping of a tooth on the ratchet system of the hydraulic wrench in the case of worn wrenches or sudden yielding of the incorrectly applied reaction arm during pressure build-up), it is possible that the hydraulic power pack will not recognise the tightened bolt. This is because, as with a non-tightened bolt, the pressure curve briefly collapses in such cases. This is due to external circumstances and is not a hydraulic power pack malfunction.
- b - The second safety mechanism to prevent overtightening the bolt is ensured by the fact that a torque window (upper and lower target value of the torque after applying snug torque and further angle of rotation) can also be meaningfully defined for torque-angle bolting operations:

Fig. 71: Torque window

If mechanism a does not intervene, the hydraulic power pack constantly checks the current system pressure and compares it with the pressure corresponding to the upper limit of the expected total torque.

If this pressure is not reached, the bolting operation is cancelled with an error message.

If the upper target value of the torque and its corresponding pressure have been meaningfully defined, the bolt cannot be overtightened.

The 'Enter Data' dialog box has a title bar with '(StatusBar)' and 'Enter Data'. It contains a label 'Bolting No.:' followed by a text input field. At the bottom, there are four buttons: 'Loading standard', 'Save as standard', 'Preview', and 'Edit'.

1. ➤ Open the editor for standard user fields if user fields are to be created. Press  to do so ➤ *Chapter 12.12.2 'Creating user fields' on page 88.*
2. ➤ If the user field definition is to be stored as default (as a template for other bolting applications), press 'Save as standard'.
3. ➤ If standard user field definitions have already been created and these are to be loaded, press 'Loading standard'.

12.12.4 Creating bolting definition lists

The browser for bolting definition lists can be used to compile application-specific lists based on the bolting applications you created.



1. ➤ Press  to open the browser for bolting definition lists.
2. ➤ Right-click to open the context menu.
3. ➤ Select 'Create bolting definition list' and enter a name.

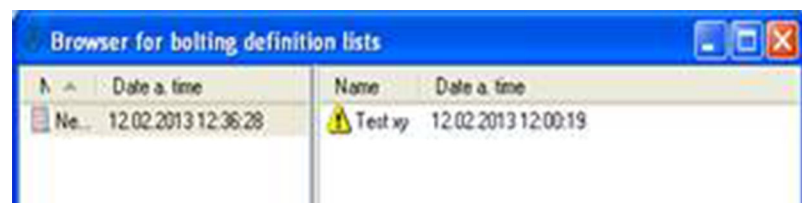


Fig. 72: Bolting definition browser

4. ➤ Drag-and-drop the desired bolting applications from the bolting definition browser to the selected list.

In the default setting, all available bolting definition lists will be transferred to the connected control unit (BE) during every synchronisation.

Invalid bolting applications contained in these bolting definition lists will not be included in the transfer.



12.12.5 Managing documentation data

The sets of bolting documentation stored in the control unit (BE) are transferred to the PC database during every synchronisation.

The sets of bolting documentation stored in the control unit are deleted after each successful transfer.

Program '*DrExplorer.exe*' is used to display and manage the sets of bolting documentation stored on the PC. This program shows the sets of bolting documentation in a table and makes it possible to filter, sort, and export them.

Launching the software

1. ➤ Launch the '*DrExplorer.exe*' software.

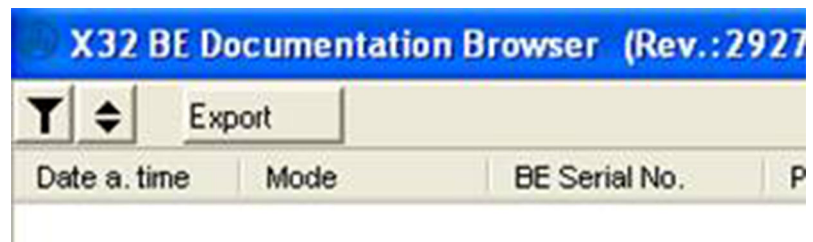


Fig. 73: "*DrExplorer.exe*" software

⇒ The program window is displayed.



2. ➤ To select the '*Filter*' function, press .



3. ➤ To select the '*Sort*' function, press .

4. ➤ Right-click to open the context menu.
 ⇒ The dialog for defining a filter or a sort sequence opens.

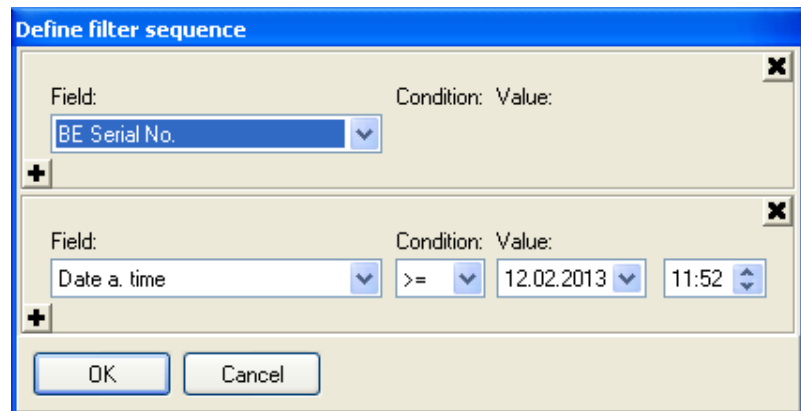


Fig. 74: Example: Filter according to serial number of the control unit and date/time

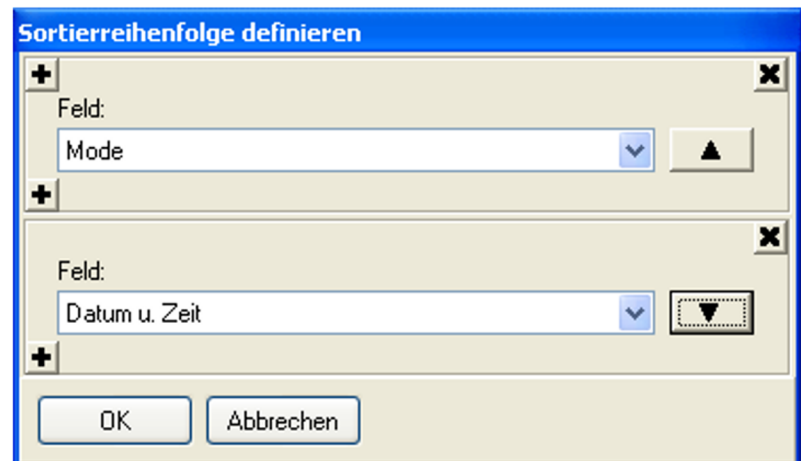
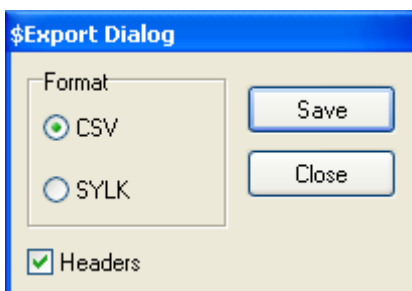


Fig. 75: Example: The results are sorted first by bolting mode (descending) and then by date/time (ascending)

5. ➤ Press 'Export' to export data.



6. ➤ Define the file format.
7. ➤ Press 'Close' to cancel the process.
8. ➤ Press 'Save' to export the data.

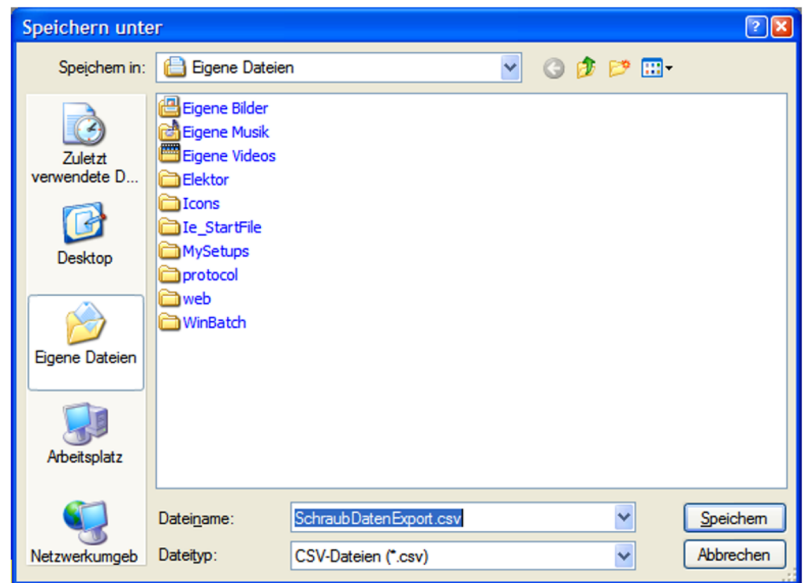


Fig. 76: Save dialog

- 9.** Enter the file name and storage location, and press 'Save'.
 - ⇒ Only data that was previously selected via the filter is exported.

The data is transferred in the sequence that was defined via the sort criteria.

13 Using the USB memory

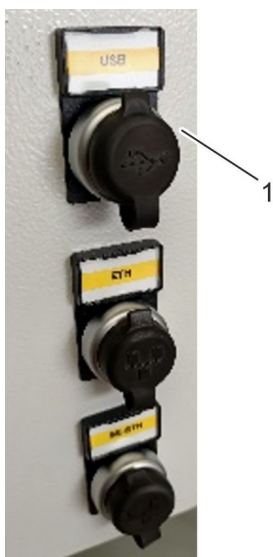


Fig. 77: USB port

Data (e.g. xls files) stored on the desktop of the industrial PC can be transferred via USB.

1. ➤ Insert the USB memory in the USB port (Fig. 77/1).
2. ➤ To access the desktop, swipe with your finger from the top of the touch-sensitive screen towards the centre of the screen and minimise the software window.
3. ➤ Copy the file to the USB memory.
4. ➤ Ensure that copying has concluded.
5. ➤ Remove the USB memory from the USB port and store it in a safe place.
6. ➤ Maximise the software window.



14 Switching off the Torque Control Tower

1. ➔



NOTICE!

Property damage due to disconnecting the power supply while PLARAD[®] software is running!

To switch off the Torque Control Tower, first shut down the PLARAD[®] software ➔ *Chapter 10.5 'Shutdown' on page 52.*

2. ➔

If the PLARAD[®] software and the operating system have been shut down, switch the main switch on the Torque Control Tower to position [0].

⇒ The Torque Control Tower is switched off.

All connected components are no longer supplied with electrical energy.

15 Performing maintenance

Improperly performed maintenance tasks



WARNING!

Danger of injury from improperly performed maintenance tasks!

Improper maintenance can cause serious injuries and significant property damage.

- Ensure sufficient assembly space prior to commencing the tasks.
- Ensure that the assembly site is clean and tidy. Loosely stacked or randomly scattered components and tools may cause accidents.
- With regard to maintenance tasks, only allow “Clean” and “Check for damage” to be performed by the user.
- Have all repairs performed by the manufacturer.
- Never open components.
- Use only PLARAD® original parts.

Faultless operation

The following sections describe the maintenance tasks that are required in order to ensure optimum and faultless operation.

If routine checks reveal increased wear, shorten the requisite maintenance intervals according to the actual signs of wear. If you have questions about maintenance tasks and intervals, contact PLARAD® service.

Accessories, spare parts and wear parts

Spare parts must meet the technical requirements specified by PLARAD®. This is always ensured by original spare parts. A warranty can only be provided for original spare parts supplied by PLARAD®.

The installation or use of other spare parts can, under certain circumstances, adversely alter the specified design properties and, consequently, impair active or passive safety.

Any liability and warranty for damage resulting from the use of parts other than the original spare parts and accessory parts is excluded.

Have at least the following information about the Torque Control Tower to hand to enable quick and easy processing:

- Client
- Serial number
- Desired spare part
- Desired quantity
- Desired mode of shipping

🔗 *‘PLARAD® service’ on page 4*



15.1 Maintenance table



Comply with the maintenance intervals stated in the component documentation.

Interval	Maintenance work
Daily before starting the test	Perform a visual inspection. Remove any soiling. Clean ventilation openings. Rectify any damage. Check that all safety devices provided by the operator are complete and operating correctly. Rectify any damage.
Monthly	Check that signage is complete and legible. Replace any damaged or missing signage.
Every 6 years at the latest	Have hydraulic lines replaced.

15.2 Maintenance by the user

Personnel: ☒ User

Perform the following maintenance steps before and after every use:

Oil level

1. Check the oil level. Top up the oil if the depiction of the "max Oil" sticker and the oil level in the sight glass do not match; see hydraulic power pack operating instructions.

Cleaning

- 2.



NOTICE!
Damage from improper cleaning!

Clean all components with a soft cloth. Never use strong cleaning agents, water, brushes, sharp-edged tools or high-pressure cleaners.



WARNING!
Fire hazard!

When using isopropyl alcohol, do not clean near ignition sources. Do not smoke. Let it evaporate.

Ventilation

3. Remove dust and other soiling from the ventilation openings on the back of the industrial PC.

Surfaces and markings

4. ➤ Check surfaces and markings for damage. Arrange for repairs if there is damage or illegible markings.

Power cable

5. ➤



DANGER!
Electric shock!

Check the power cable and power plug for damage and insufficient fastening. Have them exchanged by PLARAD[®] service if they are damaged.

Never replace them yourself.

Remote control/data cables

6. ➤ Check the remote control and cable for damage and insufficient fastening. Have them exchanged by PLARAD[®] service if they are damaged.

Replace damaged data cables. If you have questions about cable specifications, contact PLARAD[®] service.

Hydraulic hoses

7. ➤ Check the hydraulic hoses and connections for damage and leaks. Check the period of use. Have the hoses replaced if they are damaged or if the maximum permissible service life has been exceeded.

8. ➤



WARNING!
Danger of injury due to faulty hydraulic power pack!

Do not use the hydraulic power pack if it is faulty. Have it repaired immediately or have the faulty parts exchanged. Contact PLARAD[®] service.

Check all other electronic components for correct operation and replace them if damaged. Contact ☎ 'PLARAD[®] service' on page 4 to arrange for repair.



16 Troubleshooting

The section below summarised typical errors and troubleshooting and is intended to provide rapid assistance. For problems that cannot be solved in this way, contact ☎ 'PLARAD® service' on page 4.

16.1 Identifying faults

Fault description	Cause	Remedy	Personnel
Torque Control Tower won't switch on.	No supply voltage for the Torque Control Tower	Ensure that the power supply is properly connected. Check the mains connecting cable and power plug. Have damage repaired. Have damage repaired if the overvoltage protection has tripped. Have the on-site power supply checked for correct operation. Have damage repaired. Switch on the main switch.	User
The PC screen does not light up.	Main switch is not switched on.	Ensure that the power supply is properly connected. Switch on the main switch.	User
	Faulty power supply	Ensure that the power supply is properly connected. Switch on the main switch.	User
	PC screen faulty.	Have the PC screen replaced.	PLARAD® service
Individual components are not working.	Faulty connections.	Check connections and cables.	User
	Faulty components.	Replace components.	User
Hydraulic leakage	Faulty hydraulic connections or faulty hydraulic hoses.	Suspend operation immediately. Check hydraulic connections for tight fit. Replace hydraulic hoses. Contact PLARAD® service if there is a leak on the hydraulic power pack.	User
Software won't start.	Connection failed.	Restart the Torque Control Tower. To do so, switch the Torque Control Tower off and on again. Press the software icon on the touch-sensitive screen.	User
Display for the BE-Conn signal lights up red.	Control unit (BE) is not connected.	Switch on the control unit (BE). Ensure correct seating in the BE holder.	User

Fault description	Cause	Remedy	Personnel
Hydraulic power pack is not displayed in the control unit (BE).	Faulty connection.	Ensure a proper power supply for the hydraulic power pack. Check data cable for damage. Replace data cable if damaged. Ensure that the data cable is properly connected.	User

16.2 Troubleshooting

Improperly performed troubleshooting



WARNING!

Danger of injury from improperly performed troubleshooting!

Improper troubleshooting can cause serious injuries and significant property damage.

- Have all repairs performed by the manufacturer.
- Never open components of the hydraulic power pack.
- Use only PLARAD[®] original parts.

Device damage

1. ➔ Contact  'PLARAD[®] service' on page 4 if there is any damage to the hydraulic power pack.
2. ➔ If there is damage to other components, replace these components. See operating instructions for the components for troubleshooting measures.

Power supply

1. ➔ Check the power cable and connections and arrange for exchange if there is damage.
2. ➔ Check the electrical parameters and correct the power supply.

Returning to service after remedying the error



WARNING!

Danger of injury due to faulty Torque Control Tower!

An improperly repaired Torque Control Tower can cause serious injuries.

- Never put a faulty Torque Control Tower back into operation.



- Prior to first use, have a test performed as per DGUV Regulation 3.

17 Disposal

The Torque Control Tower must be disposed of in an environmentally sound manner at the end of its service life.

Disassembly



WARNING!

Danger of injury due to short circuit and stored residual energy!

If components are damaged, there is a danger of injury due to short circuit or the continued presence of stored residual energy.

1. ➤ Disconnect the Torque Control Tower from the power supply. To do so, unplug the power plug.
2. ➤ Remove the hydraulic hoses.
Reuse these components if necessary.
3. ➤ Disconnect the cables of the individual components.
4. ➤ Dismantle or remove all components from the frame:
 - PC with touch-sensitive 15" screen
 - Control unit (BE)
 - Data interface
 - Electric hydraulic power pack
 - Printer
 - Barcode scanner
5. ➤ Dispose of all components separately, or reuse them.
6. ➤ Do not dismantle the components any further.

Cables

Components

Disposal

If no take-back or disposal agreement has been put in place, dispose of the frame of the Torque Control Tower as metallic waste and dispose of the components as electronic waste in accordance with local regulations. Use authorised collection points for the reprocessing of old electrical and electronic devices.

Dispose of waste oil in an environmentally sound manner as per local regulations.



ENVIRONMENT!

Danger to the environment due to incorrect disposal!

Incorrect disposal can be hazardous to the environment.



Do not allow electronic components to enter bodies of water, the sewage system, the soil or household waste collection.

Have electronic waste, electronic components, lubricants and other auxiliary materials disposed of by approved specialist companies.



If in doubt, obtain information about environmentally sound disposal from the local municipal authority or from specialist disposal companies.

18 Technical data

Dimensions and weights

Data	Value	Unit
Weight*	80	kg
Length	800	mm
Width	800	mm
Height	2,000	mm

* on the hydraulic power pack

Electrical connected loads

Data	Value	Unit
Mains frequency	50 to 60	Hz
Mains voltage	230/400	V
Mains connection	3P+N	
Fuse protection	16	A

Hydraulic connected loads

Data	Value	Unit
Hydraulic pressure, maximum*	1500	bar

* see hydraulic power pack operating instructions

Environment

Data	Value	Unit
Temperature range, operation	0 – 50	°C
Temperature range, storage	-20 – 60	°C
Relative humidity, maximum	Non-condensing	

Emissions

Emission levels as per EN 60745

Data	Value	Unit
Emission sound pressure level	< 70	dB(A)
Measurement uncertainty of emission sound pressure level	3	dB(A)
Vibrations	< 1	m/s ²

Oil specifications

Data	Value
Hydraulic oil*	Shell Tellus S2 VX 15



* see hydraulic power pack operating instructions

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