Translation of original

Electric Power Pack

IQ-VAX 2- DR-DW
IQ-VAX 3,5-DR-DW

Operating manual

Store for future reference.

CONTENTS

IMPORTANT INFORMATION

1. NOTES

1.1. CE MARKING

The products bear the CE conformity mark. The Declaration of Conformity guarantees that the products comply with the safety directives of the European Union.

1.2. GENERAL NOTES

Before you use the bolting system …

…make sure you read and understand the instructions in this manual. The legislator requires us to point out important safety notes and advise you how to avoid damage to the unit.

If you do not observe this manual, Maschinenfabrik Wagner is not liable for any damage caused by negligent or intentional disregard of the instructions contained in it.

- The operating manual is a component part of the equipment. It has to be stored near the unit at all times. Exact observance of the instructions in this manual is the pre-requisite for proper use and correct operation of the equipment.
- The safety of the operator and problem-free unit operation can only be guaranteed if original unit parts are used. If other components are used, Maschinenfabrik Wagner cannot accept any liability for safe operation and safe function. No claims will be accepted for damages caused by these reasons.

- Maschinenfabrik Wagner only considers itself responsible for the units in terms of safety, reliability and functional ability provided assembly, re-setting, modifications, extensions and repairs have been carried out by Maschinenfabrik Wagner or its authorised representative and if the equipment has been used in line with the operating manual.

1.3. GENERAL SAFETY INSTRUCTIONS

- When the equipment is in operation, the laws and regulations valid at the site of application must be heeded. In the interest of safe working procedure, operator and user are responsible for the observance of the regulations.

- Before every application, the user must ensure that the unit is functioning safely and is in a proper working condition.

- The user must be familiar with equipment operation.

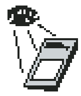
- Before initial operation the unit and lead must be checked for damage. Damaged leads and plug fixtures must be replaced immediately.

- The mains plug must always be removed from the socket during repair and servicing work.

1.4. SYMBOLS AND WARNING SIGNS

- Warning of dangerous electrical voltage.

- CE marking



- Observe mounting and operating instructions!

- Special note

1.5. METHOD DESCRIPTION

The hydraulic unit is used to carry out bolt attachments using the torque method or the torque/angle of rotation method. Bolt connections can be tightened in one working cycle using a combination of jointing torque and subsequent angle of rotation. With this method, the control unit switches from torque mode to angle of rotation mode during the bolting process and monitors the torque.
The hydraulic unit measures the current pressure and determines the current volume flow. Pressure is used to calculate the current torque, and volume flow is used to calculate the current angle of rotation. These calculated and current parameters are then used to control the bolting process.

2. PRODUCT INFORMATION

2.1. PROPER USE

The hydraulic unit has been designed for the operation of Plarad hydraulic tools for tightening bolt attachments.
The operating unit has been designed for data input and documentation of bolting parameters in connection with Plarad hydraulic units for tightening bolt connections according to the torque or torque/angle of rotation method.

2.2. IMPROPER USE

The operating unit has been designed for use inside and outside, at ambient temperatures of -10 to +50 °C. The manufacturer must be consulted in the case of deviations.

The operating unit is suitable for operation with Plarad hydraulic units and with a PC in connection with the cable provided, in as far as the conditions described are met.

The units are suitable for operation both connected to the mains supply and to mobile generators, as long as the conditions described in Chapter 4 "Technical Data" are met.

The units have been assigned to protective class IP54 according to
VDE 0530-5, Annex A (national)
IEC 34-5 (international)
EN60034-5 (harmonised European)
for foreign bodies and accidental contact/water contact.

Any other or further use shall be considered improper. The manufacturer is not liable for any damage resulting from this. The risk is borne by the operator / user alone.

3. SCOPE OF SUPPLY / ACCESSORIES

Hydraulic unit, filled with oil and ready to use.

The parts listed below are included in the scope of supply.
Please order if required!

Filter insert 10 µm	K20-058-4-27901
Hydraulic oil 1l	K20-001-4-46701
Hydraulic oil 5 l	K20-001-4-46701

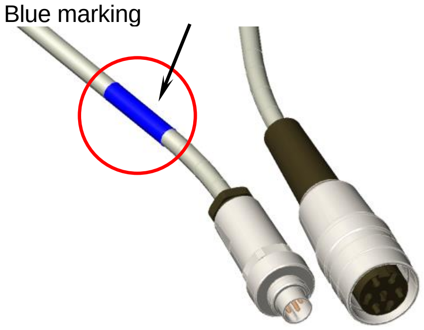
Please indicate the amount of oil on your order!!!

BE	G23-000-4-00101
Adapter cable BE-X2	K10-000-4-01001
Adapter cable BE-PC	K10-000-4-00901
Mains adaptor for BE	B10-001-1-00301

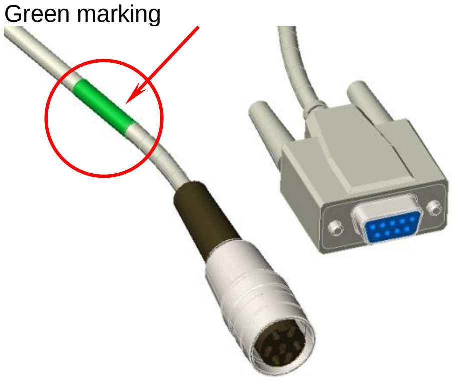
Software BE_X2	K10-000-4-00201
Adapter cable BE-X2	K10-000-4-01001

Illustration similar

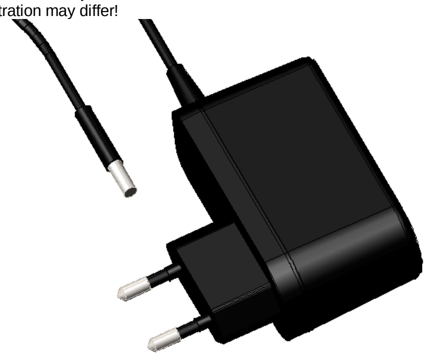
Blue marking



Adapter cable BE-PC K10-000-4-00901
Green marking



Mains adapter for BE
Illustration may differ!



4. TECHNICAL DATA

Maximum operating pressure 11,500psi

Minimum connected load for mobile current generator 4kVA

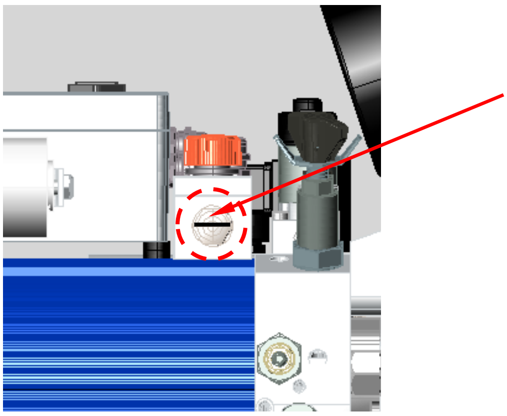
Note: Observe specifications on the type plate

5. FUNCTIONAL DESCRIPTION

5.1. PUTTING THE POWER PACK INTO OPERATION

- Check oil level

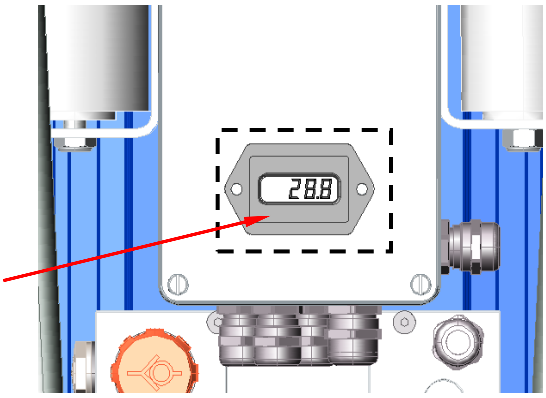
Note: When checking the oil level make sure the unit is in a horizontal position



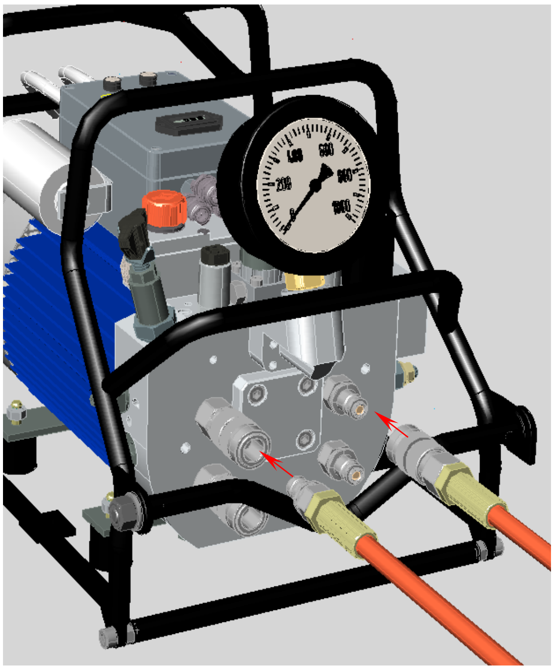
- Connect operating unit (BE) and hydraulic unit using the "unit adapter cable".
- Connect the unit to the mains

Note: Observe the mains voltage given on the type plate

- After the mains connection has been set up, a short test is carried out, during which all 4 signal lamps on the bolting system light up for approx. 5 seconds (can be interrupted by button).
- Once the mains supply has been set up, the operating hours are displayed on the unit.

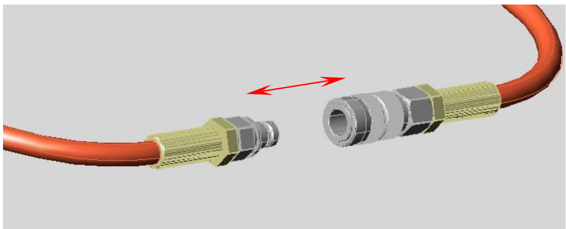


- Connect the hydraulic hoses to the unit.

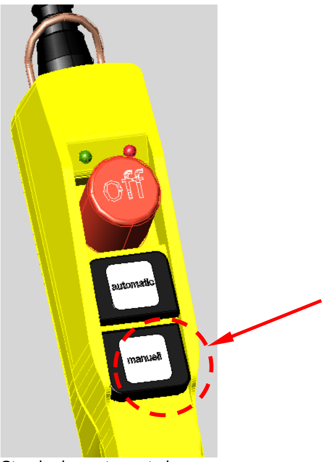


Note: Do not yet connect the hydraulic tool

- Connect the hydraulic hoses at the other end. For tandem applications connect both pairs of hoses.

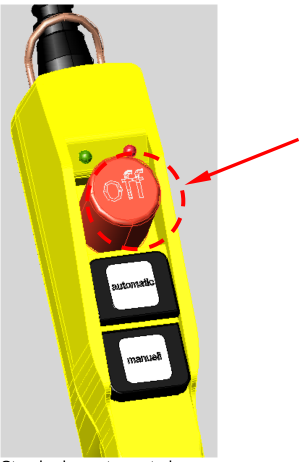


- The unit is started up by pressing the "manual" button.



Standard remote control

- Keep the "manual" button pressed for approx. 30 seconds
- Switch the unit off by pressing the "stop" button



Standard remote control

- Connect the hydraulic tool

5.2. BOLTING

5.2.1. MANUAL OPERATION

Note: Teach mode is not carried out during manual operation. When bolting work begins, the pressure for the required torque must be taken from the torque table of the hydraulic tool.

"Manual" button pressed   Tool moves forward

"Manual" button not pressed   Tool moves backwards

- Press the "manual" button and keep it pressed until the tool stops turning, the green signal lamp will flash quickly
- Release the "manual" button and wait until the green signal lamp flashes slowly
- Release the "manual" button and wait until the green signal lamp flashes slowly. This process is repeated until the tool no longer turns on repeated pressing and the pre-set pressure has been reached

5.2.2. AUTOMATIC OPERATION

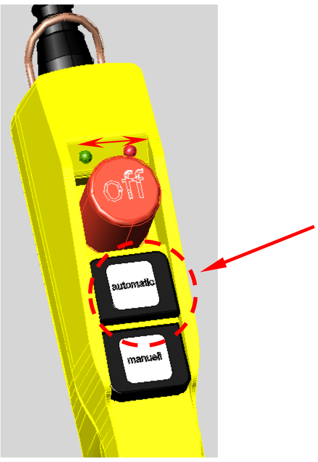
Note: During automatic operation of the bolting system, teach mode must be carried out before bolting

5.2.2.1. LEARNING MODE

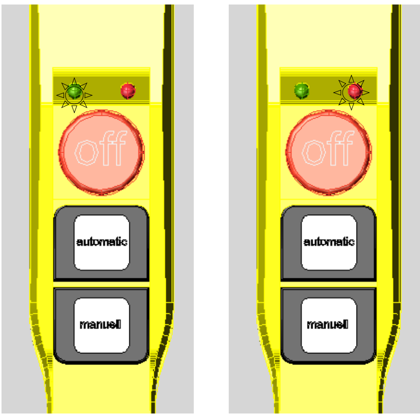
Measurements are carried out in teach mode. The measured values recorded are required for the automatic control of the bolting process.

Note: Do not place the tool onto the bolt

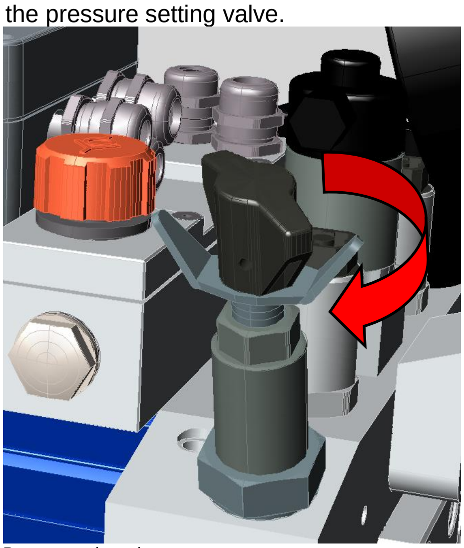
- The green signal lamp flashes on the remote control
- If the signal lamps flash slowly, the teach process has not yet been carried out.
  The signal lamps on the remote control have the following meaning:
  green signal lamp   **tighten**
  red signal lamp   **loosen**
- The "automatic" button on the remote control can be used to switch between tightening and loosening.



- Then switch the unit on using the "manual" button.
- The signal lamp will flash more quickly during the switch-on process. This signalises that a process is in progress. The start process is only completed once the signal lamp flashes slowly again.



- Keep the "manual" button on the remote control pressed and set the required hydraulic pressure at the pressure setting valve.


Pressure setting valve

- The pressure to be set can be found in the torque table of the hydraulic tool.
- The pressure is read off at the unit manometer or, in the case of digital remote control, in the remote control display.

- Teaching can be carried out in the tightening or loosening mode.
- Keep the "automatic" button pressed for teaching. The teach mode will automatically be carried out. The hydraulic tool carries out several working cycles during the measurement.
- Measured values are determined which are necessary for the automatic control of the power wrench. The measured values are always only determined for the connected components.
- When the teaching process has been successfully completed, the signal lamp on the remote control stops flashing and is on permanently. (If the signal lamps still flash when the teaching process has been concluded, see the faults list for the remote control)

The bolting system is now ready for the bolting process.

- The learnt measured values are retained until the unit is disconnected from the power supply or the measured values are deleted. To delete the learnt measured values, press the "automatic" and the "off" buttons simultaneously until the respective signal lamp flashes. Then teaching can begin again.

5.2.2.2. BOLTING AUTOMATIC OPERATION

- Place the power wrench onto the bolt.
- The bolting process is started by pressing the "automatic" button and keeping it pressed. Automatic operation is signalised by fast flashing of the signal lamp.
- The bolting process is carried out automatically.
- When the bolting process has been completed, the green signal lamp switches from flashing to permanently on. (If the signal lamps still flash when the bolting process has been concluded, see the faults messages for the remote control)
- If there is a fault message, the pressure of the power wrench must be checked and the teach mode carried out again.

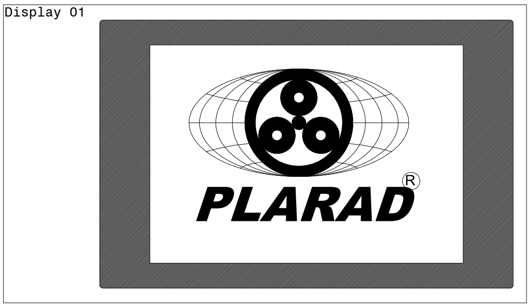
5.3. BOLTING WITH THE OPERATING UNIT (BE)

Put the unit into operation as described above.

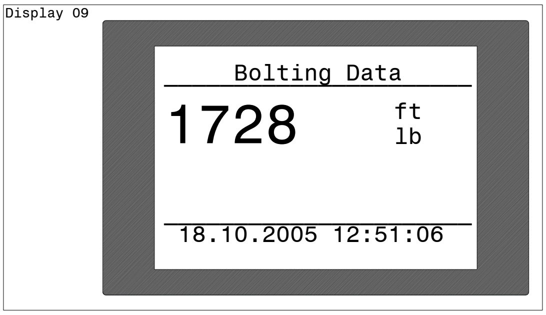
Connect BE and hydraulic unit using the unit adapter cable.

5.3.1. MENU GUIDE BE

- The opening window appears in the display of the operating unit

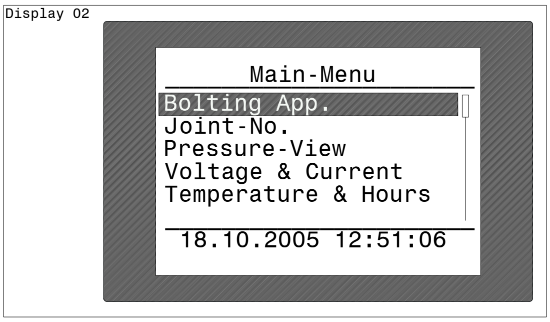


- Press the enter button to move to the bolt data window.



5.3.2. MAIN MENU

- Press the menu button again to move to the **main menu** window.

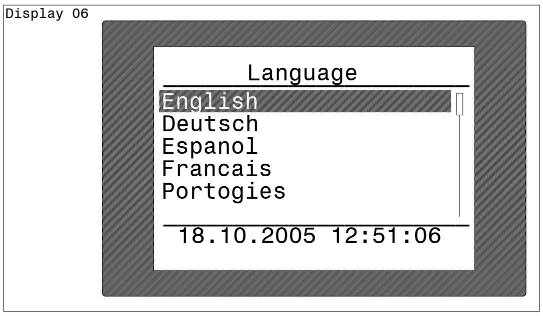


The cursor keys are used to select the menu lines. The line selected is reverse typed. Only 5 menu lines are shown on the display. When the menu is opened, the first or the current menu item is selected. The cursor keys are used to select further menu lines. When the last menu line has been reached and the cursor button pressed again, the selection returns to the first menu line.

- Press the enter button to reach the respective submenu

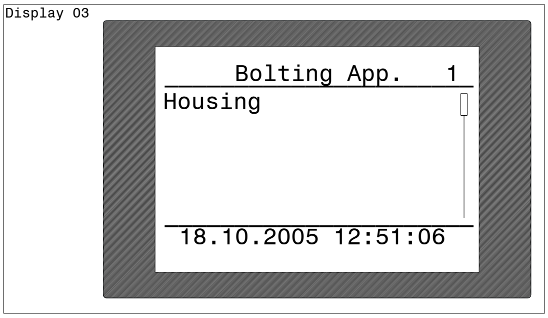
5.3.3. SUBMENU LANGUAGE

The menu language can be selected in the language submenu.



5.3.4. SUBMENU BOLTING APPLICATION

The names of the programmed bolting applications are displayed for selection in the bolting application submenu. The counter number of the bolting application is displayed in the top right-hand corner. The bolting applications previously loaded into the BE are available for selection. (See section 6.11 Loading the bolting application list into the BE). These are defined at the PC using the PC software "BE_X2" and stored in a bolting application list. (See section 6.7 Preparing a bolting application list). The bolting application list can contain a maximum of 18 bolting applications. If more than 18 bolting applications are required, several bolting application lists have to be prepared.



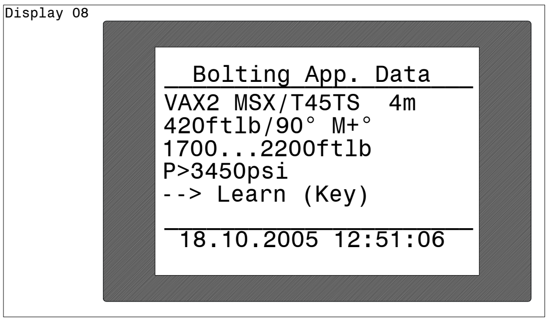
The cursor keys are used to select the respective bolting application.

The enter button is used to reach the bolting application data window

5.3.5. SUBMENU BOLTING APPLICATION DATA

All the parameters programmed for the respective bolting application are listed in the bolting application submenu. The bolting application data are the ones prepared at the PC and loaded into the BE.

Note: The submenu bolting application is only used to check the bolt data. Changes can only be made at the PC!!!



The bolting application data menu provides the following information

Line 1
left = Description of bolting application
in the example Housing
right = minimum pressure to be set
in the example P>3450psi

Line 2
left = Unit description
in the example VAX 2
centre = tool description
in the example MSX/T45TS
right = length of hose
in the example 4m

Line 3 Bolting parameters
left = Joint torque and angle of rotation
in the example 420Nm / 90°
centre = bolting method
in the example M+°
M = Torque
° = Angle of rotation

Line 4
Window area target torque

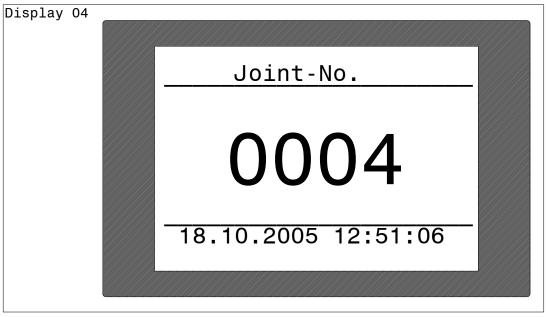
Line 5
Reference to the next step

Line 6
The current date and time always appear in the lower area of the windows

5.3.6. SUBMENU JOINT NO.

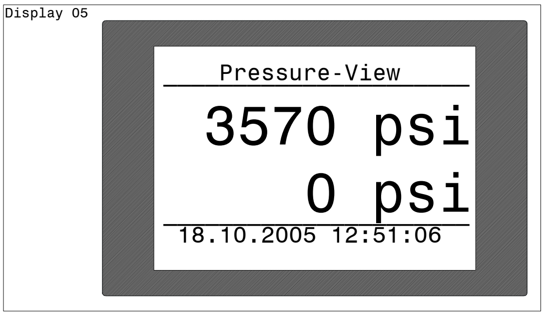
The bolt connections are automatically numbered by the BE for purposes of documentation.
The current counter number of the bolt connection is shown in the bolting application no. submenu.
If no start number is given, numbering automatically begins with the last bolt number. The bolt number at which the BE is to begin numbering the bolting applications can be set, however.

- The backwards/forwards keys are used to select the individual parts of the bolt number. The spot selected is reverse typed. This can be changed using the numeric keys.



5.3.7. SUBMENU PRESSURE VIEW

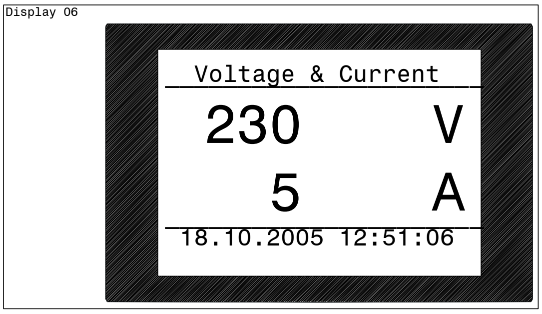
The current pressure display for the feed and return pressure is shown in the pressure display submenu.



top line: feed pressure (3570 psi in the example)
bottom line: return pressure (0 psi in the example)

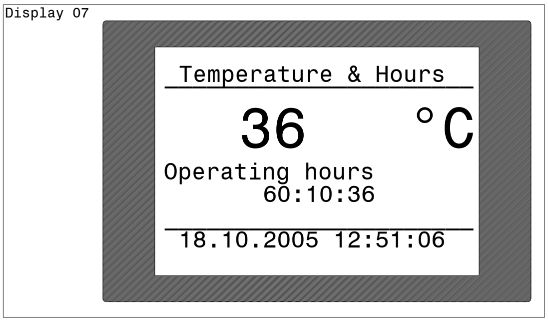
5.3.8. SUBMENU VOLTAGE & CURRENT

The current mains voltage and current consumption of the unit are shown in the voltage & current submenu.



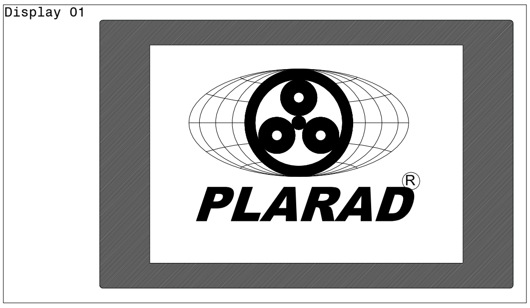
5.3.9. SUBMENU TEMPERATURE & HOURS

The submenu temperature & hours displays the unit temperature and the operating hours so far.

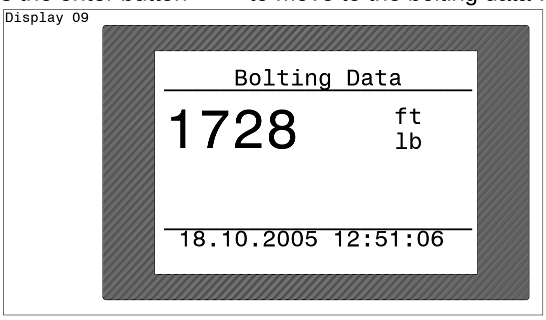


5.4. AUTOMATIC OPERATION TORQUE ANGLE OF ROTATION WITH BE

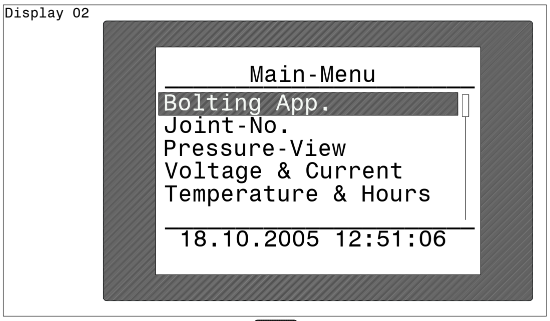
- Connect operating unit and hydraulic unit using the "unit adapter cable".
- Connect the power wrench and the hydraulic unit using the hoses
- Connect the unit to the mains
- **Note: Observe the mains voltage given on the type plate**
- After the mains connection has been set up, a short test is carried out, during which all 4 signal lamps on the bolting system light up for approx. 5 seconds (can be interrupted by key)
- The welcome window appears in the display of the operating unit



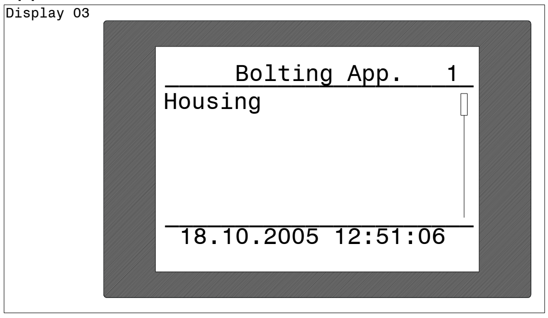
Press the enter button to move to the bolting data window.



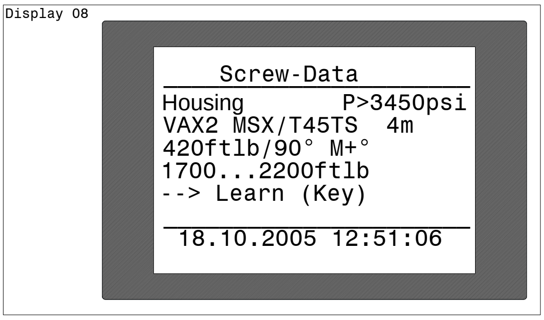
- Press the menu button again to reach the **main menu**.



- Press the enter button to move to the bolting application submenu.



- The required bolting application is selected using the cursor keys.
- Press the enter button to move to the bolting application data submenu.



All the necessary information can be found in the bolting application data window. The pressure of the hydraulic unit must be set at least **3450 psi**. A hydraulic tool **MSX/T45TS** with a **4m** hydraulic hose is connected to the **VAX2** unit. The bolting process is carried out using a joint torque of **420 ftlbs** and a subsequent angle of rotation of **90°**. The bolting process is OK if the torque is within a range of **1700 ftlbs** and **2200 ftlbs** after the bolting process has been completed.

- The **Teach** line refers to the next step

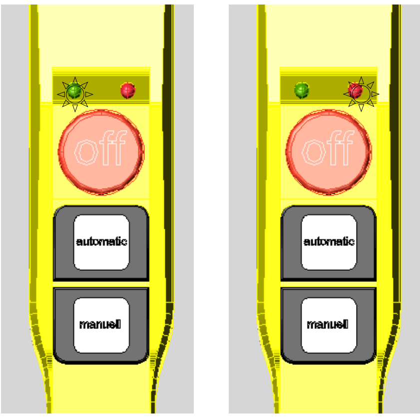
Press the enter button to confirm the bolting application

5.4.1. LEARNING MODE

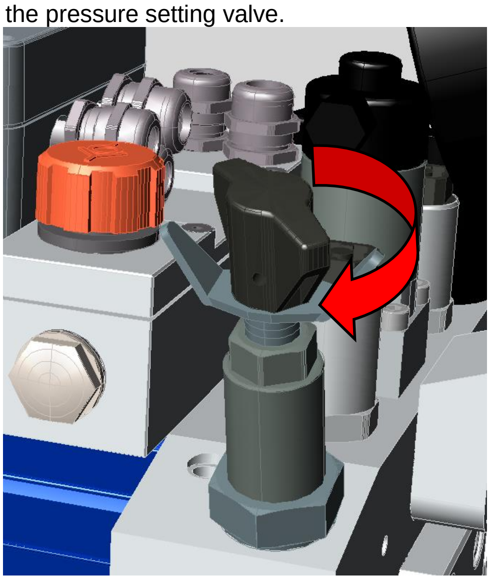
Measurements are carried out in teach mode. The measured values recorded are required for the automatic control of the bolting process and determination of the angle of rotation.

Do not place the wrench onto the bolt

- The green signal lamp flashes on the remote control
- If the signal lamps flash slowly, the teach process has not yet been carried out.
  The signal lamps on the remote control have the following meaning:
  green signal lamp **tighten**
  red signal lamp **loosen**
- The "automatic" button on the remote control can be used to switch between tightening and loosening.
- Then switch the unit on using the "manual" button.
- The signal lamp will flash more quickly during the switch-on process. This signalises that a process is in progress. The start process is only completed once the signal lamp flashes slowly again.

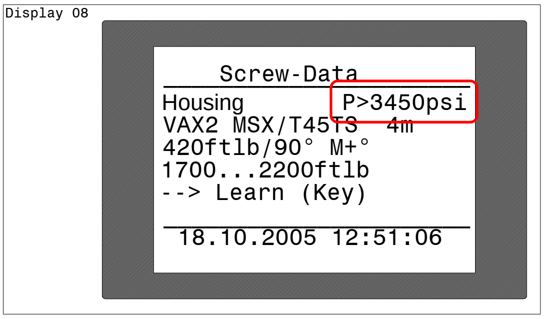


- Keep the “manual” button on the remote control pressed and set the required hydraulic pressure at the pressure setting valve.



Pressure setting valve

The minimum pressure to be set will be displayed in the bolting application data window on the BE. In the example P> (greater than) 3450 psi.



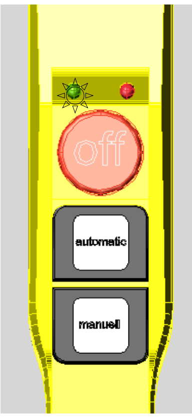
- Teaching can be carried out in the tightening or loosening mode.
- Keep the "automatic" button pressed for teaching. The teach mode will automatically be carried out. The hydraulic tool carries out several working cycles during the measurement.
- Measured values are determined that are necessary for the automatic control of the bolting system. The measured values are determined always for the connected components only.
- When the teaching process has been successfully completed, the signal lamp stops flashing and remains permanently on. (If the signal lamps still flash when the teaching process has been concluded, see the faults list for the remote control)

The bolt unit is now ready for the bolting process.

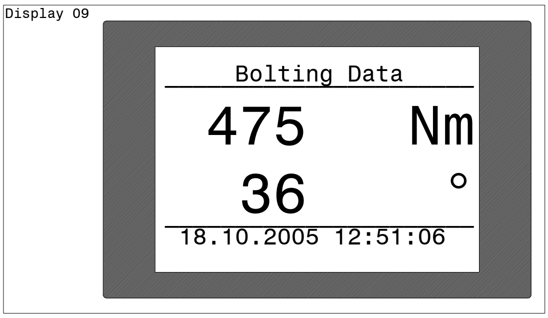
- The measured values acquired are retained until the unit is disconnected from the power supply or the measured values are deleted. To delete the measured values acquired, press the "automatic" and the "off" buttons simultaneously until the respective signal lamp flashes. Then teaching can begin again.
- If a new bolting application is selected in the BE and a new teaching process is required, the signal lamp starts flashing automatically.

5.4.2. BOLTING

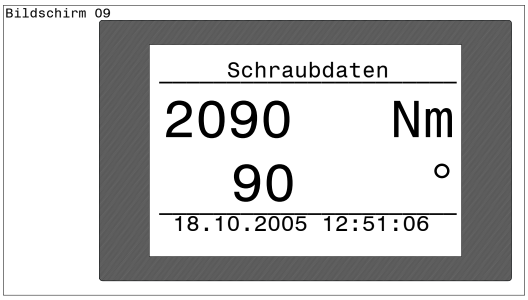
- Place the power wrench onto the bolt.
- The bolting process is started by pressing the "automatic" button and keeping it pressed. Automatic operation is signalised by fast flashing of the signal lamp.



- The bolting process is carried out automatically. The bolting system is controlled according to torque up until the programmed joint torque is reached. The bolting system then automatically switches to angle of rotation control, and the programmed angles of rotation run.
- As soon as the joint torque has been reached, the red signal lamp comes on.
- During the bolting process, the bolt connection progress can be observed in the BE display. The current torques and/or angles of rotation are displayed here. Counting of the angle of rotation begins only after the joint torque has been reached.



- When the bolting process has been completed, the green signal lamp switches from flashing to permanently on. (If the signal lamps still flash when the teaching process has been concluded, see the faults list for the remote control)
- The bolting parameters reached are displayed in the "bolt data" window after the bolting process has been completed.



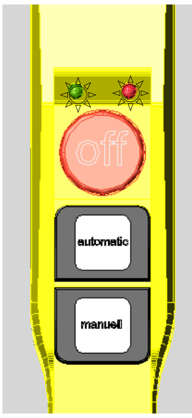
- The values are stored with the current time, date, bolting application and bolt number.
- These are used to document the bolt connection and can be read out using the "BE_X2" software.

5.5. AUTOMATIC OPERATION TORQUE WITH BE

During automatic operation with BE the procedure is as described under "Automatic operation torque angle of rotation with BE" in section 5.4. The only difference is that the bolting application is determined using the torque method. Accordingly, the documentation is restricted to the data required for this.

5.6. SAFETY FUNCTIONS

- If the parameters reached during the bolting process deviate from those programmed, this is indicated by alternating flashing of the red and green signal lamps.



- The fault is displayed in text form in the BE. The fault message must be confirmed at the BE by pressing the enter button. Until this confirmation has been given, all the functions on the remote control except for "off" are blocked. The fault messages are stored and are available when the bolting process data are read out.

6. PC and BE

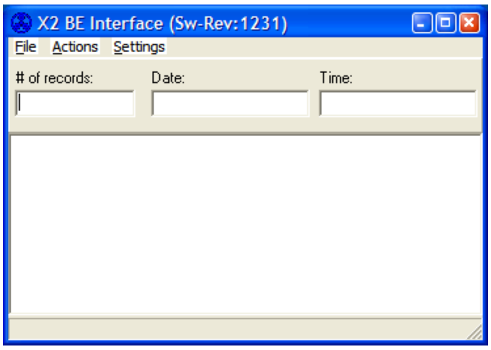
6.1. TRANSMITTING SOFTWARE TO THE PC

All files on the CD provided must be copied into a sub-directory on the local PC fixed disc.

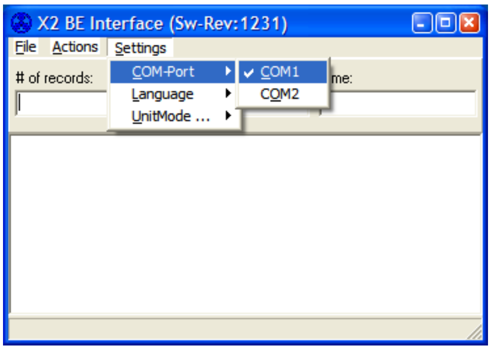
6.2. CONNECT PC and BE

- Connect the operating unit and a PC using the "PC adapter cable"
- Insert mains adapter for BE
- Start the PC software "BE_X2" by double-clicking BE-X2.exe.

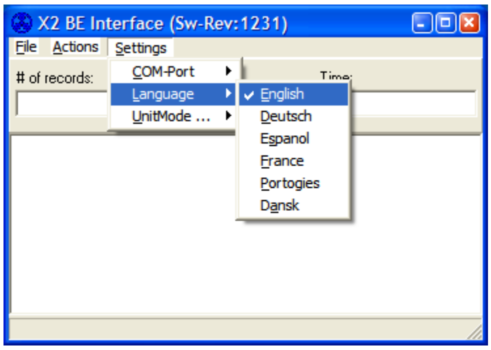
- The program window is opened



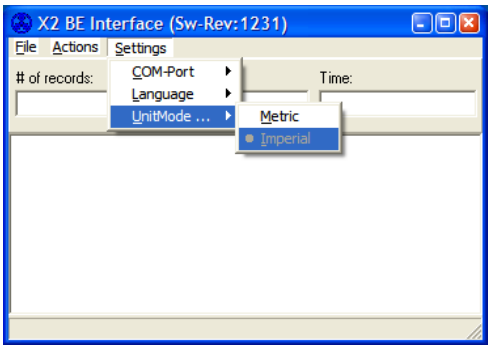
- The menu "Settings" “COM-Port" is used to select the interface used. COM1 is the default setting.



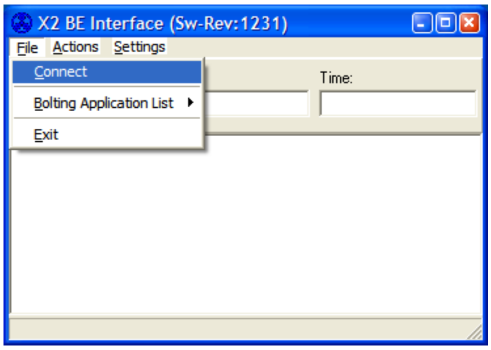
- The menu "Settings" “Language" is used to select the menu language. German is the default setting.



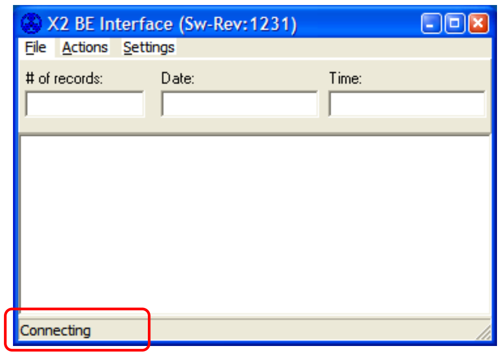
- The menu “Settings” “UnitMode” is used to select the system of units (imperial <=> metric).



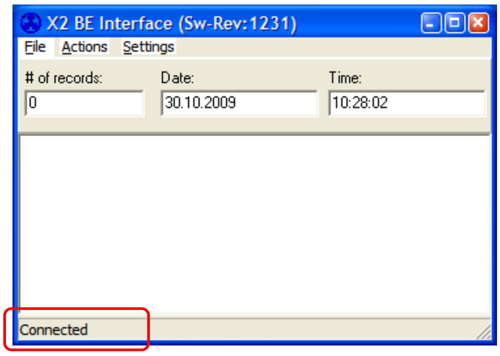
- Set up communication between the BE and the PC using the menu "File" and "Connect".



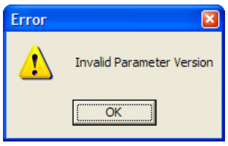
- During the connection process, the word "connecting" is shown in the status line



- Once the connection has been set up correctly, the word "connected" is shown in the status line



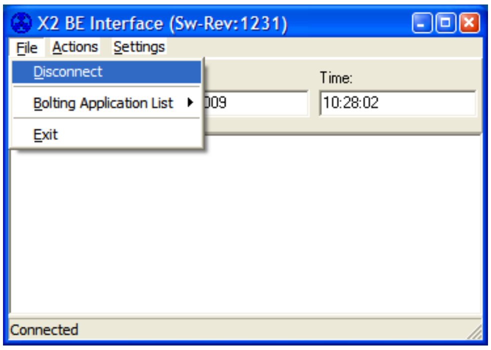
Fault message **"Invalid parameter version"**



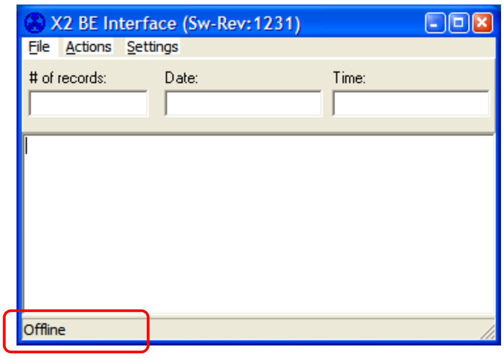
- The PC software "BE_X2" and the BE software are not compatible. The software provided with the BE must be used.

6.3. DISCONNECTING PC AND BE

- Communication between the BE and the PC is interrupted using the menu "File" and "Disconnect".

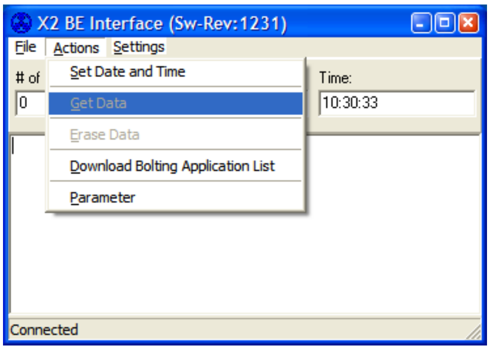


- Once the connection has been terminated, the word "offline" is shown in the status line

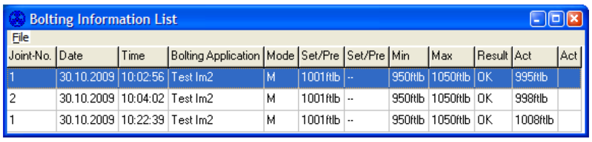


6.4. READING OUT THE STORED DATA

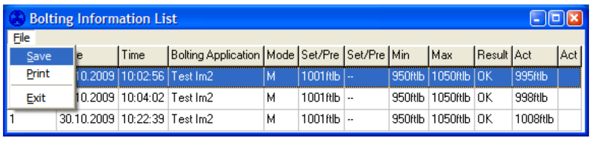
- The stored bolting process data are read out from the BE into the PC using the menu “Actions“ “Get data“.



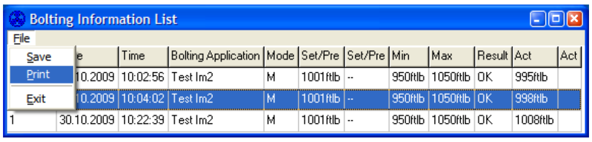
- The next window shows the bolting process data list



- The menu "File" "Save" is used to store the bolting process data in *.csv format.
- The bolting process data can then be further processed in EXCEL, for example.

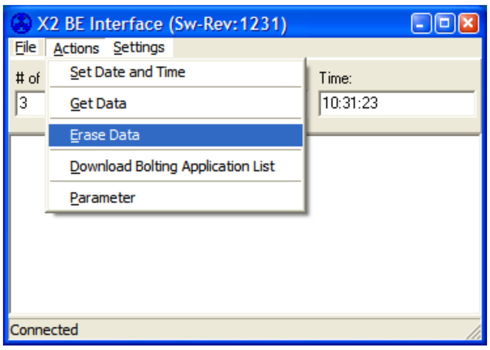


- The menu "File" "Print" is used to print the bolting process data.



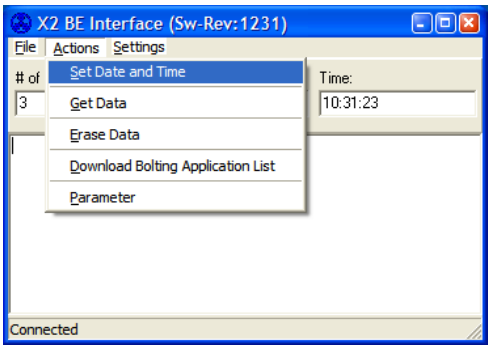
6.5. DELETING DATA IN THE BE

- The bolting process data are deleted in the BE using the menu "Actions" "Erase data".



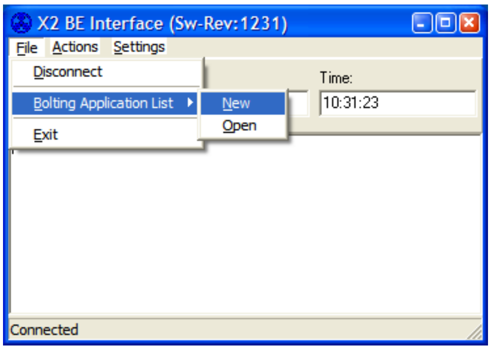
6.6. SETTING DATE AND TIME

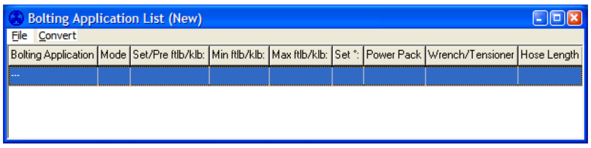
- The menu "Actions" "Set date and time" are used to import the current time and date of the connected PC into the BE.



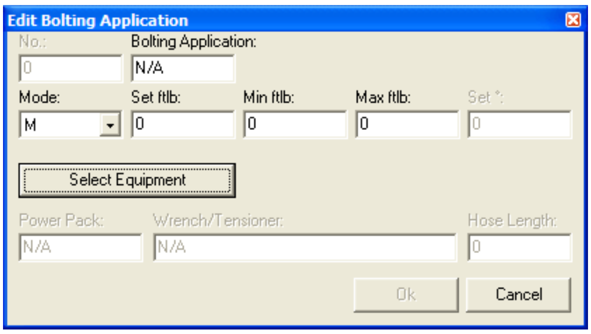
6.7. PREPARE BOLTING APPLICATION LIST

- The menu "File" "Bolting application list" "New" is used to open an empty bolting application list.

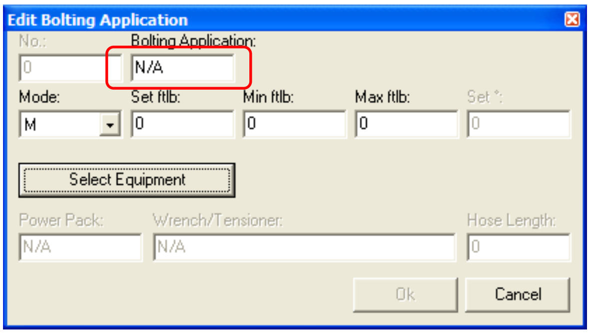




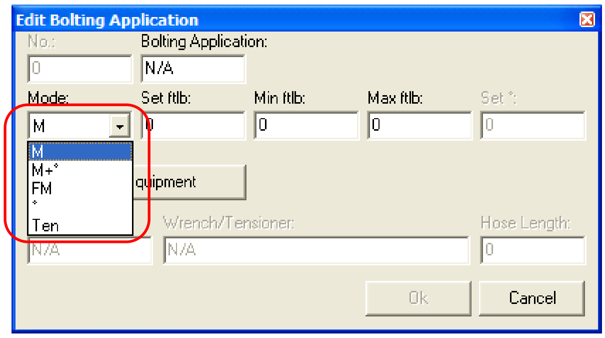
The input window is opened by double-clicking the marked line.



- In the **bolting application** box, the bolting application description is entered with a maximum of 11 characters.



- The bolting mode is defined in the mode box

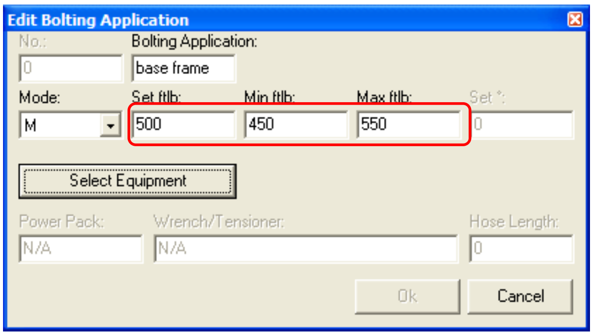


The abbreviations have the following meaning

M	Bolting according to the torque method
M+°	Bolting according to the torque/angle of rotation method
FM	Joint torque for separate torque-angle of rotation method
°	Angle of rotation for separate torque-angle of rotation method
Ten	Bolting with bolt tensioners

6.8. PREPARE BOLTING ACCORDING TO THE TORQUE METHOD

The input boxes
Ref. Nm **Min. Nm** **Max. Nm**
are activated for the torque method.

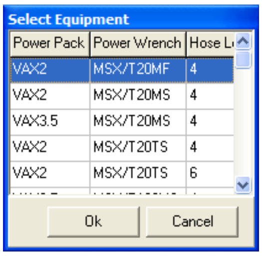


Ref. Nm The required torque is entered here

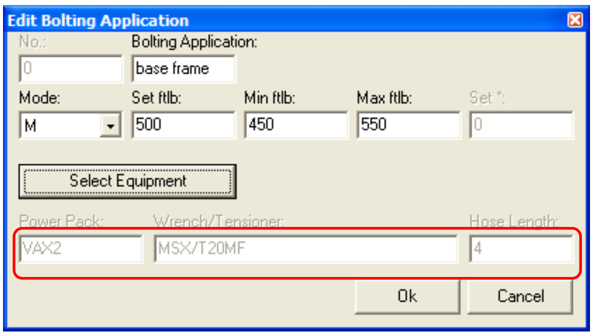
Min. Nm Lower torque limit at which the bolt connection is still OK

Max. Nm Upper torque limit at which the bolt connection is still OK

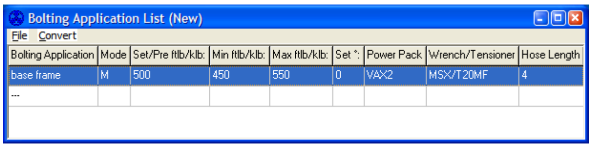
Additionally to defining bolting data for a bolting application, the user selects a combination of devices for that bolting application.
Press the “Select Equipment” button to display the list of available device combinations. The respective equipment combination is selected by clicking the appropriate line.



Then confirm with OK. The “Select Equipment” window is closed and the device data are transferred into the fields “Power Pack”, “Wrench/Tensioner” and “Hose length” in the “Edit bolting Application” window.

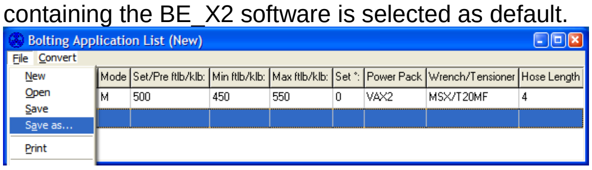


If all the entries are correct, the bolting application is entered in the bolting application list by clicking OK.



Up to 18 bolting applications can be defined in one bolting application list!

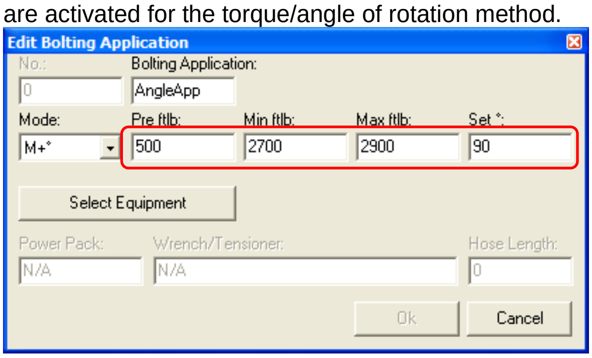
The "File" "Save as" or "File" "Save" menu is used to save the bolting application list. The directory containing the BE_X2 software is selected as default.



6.9. PREPARE BOLTING ACCORDING TO THE TORQUE/ANGLE OF ROTATION METHOD (only possible with Torque/Angle of Rotation mode equipped Power Packs)

Bolting according to torque/angle of rotation method **M+°**

The input boxes
Pre ftlb, Min ftlb, Max ftlb and Set °
are activated for the torque/angle of rotation method.



Pre ftlb The snug torque is entered here

Min ftlb Lower torque limit at which the bolt connection is still OK

Max ftlb Upper torque limit at which the bolt connection is still OK

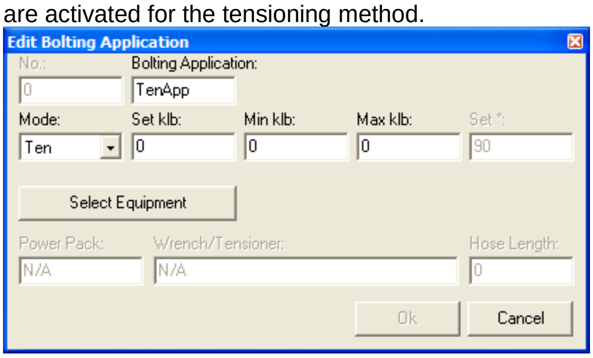
Set ° The angle of rotation is entered here.

The further preparation process is done accordingly to chapter 6.8.

6.10. BOLTING WITH BOLT TENSIONERS

Bolting with bolt tensioners according to tensioning method **Ten.**

The input boxes
Set klb, Min klb and Max klb
are activated for the tensioning method.



Set klb The desired tensioning force is entered here

Min klb Lower tensioning force limit at which the bolt connection is still OK

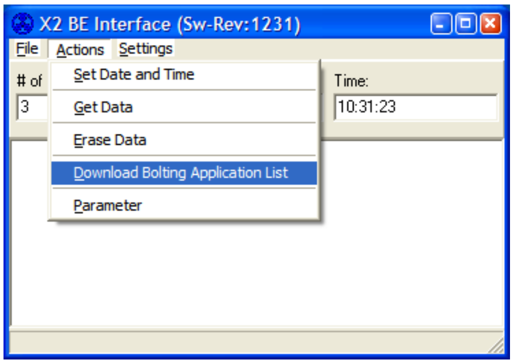
Max klb Upper tension force limit at which the bolt connection is still OK

NOTE: The set value represents the force generated in the bolt tensioner. The force in the bolt can deviate from this value.

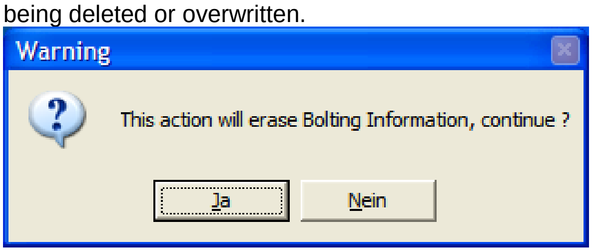
The further preparation process is done accordingly to chapter 6.8.

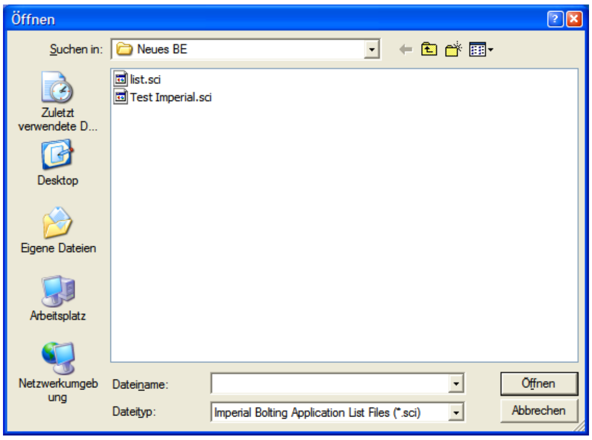
6.11. LOADING THE BOLTING APPLICATION LIST INTO THE BE

- The "Actions" "Download bolting application list" menu is used to open the directory with the existing bolting application lists.

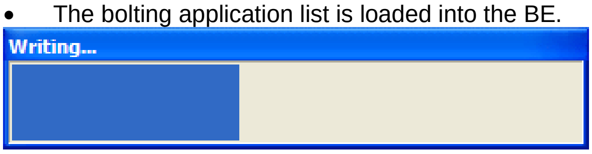


In the following window your attention is drawn to the fact that bolting applications currently in the BE are being deleted or overwritten.





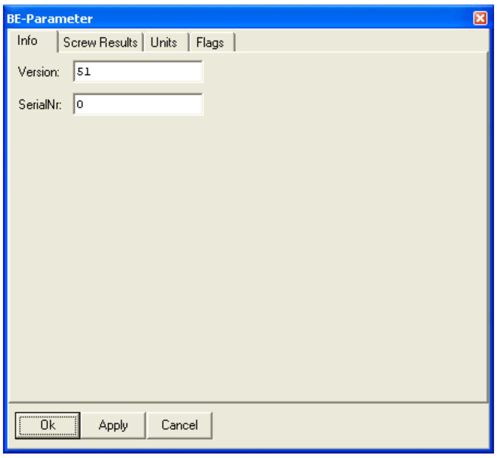
- Select and open the bolting application list – the bolting application lists have the file extension "scs" (Metric Mode lists) respectively "sci" (Imperial Mode lists).
  (Hint: The unit system mode of the list has to be compliant to the unit system mode the BE was set to)
- The bolting application list is loaded into the BE.



6.12. BE PARAMETERS
6.12.1. MENU INFO

- *Version specifies the version number of the BE software*

Serial no. specifies the BE serial no.



6.12.2. BOLTING RESULTS MENU

Settings for the BE are carried out in the Bolting Results menu.
The Save and Lock columns define bolt results as follows:

- ***Save:*** Determines if this result of the bolting process should be saved for documentation.
- ***Lock:*** Determines if this result of the bolting process has to be confirmed by the operator.

Result type (bolting result)

OK Bolting OK

AngleNotReached This result is issued only in torque/angle of rotation mode.
The bolting process was aborted without the set angle being reached. Maybe the Power Pack's pressure adjustment valve was not set to a sufficient level.

MinM The bolting process was accomplished without reaching the defined minimum torque.

MaxM The bolting process was aborted, because the defined maximum torque was exceeded.

ScrewTight The bolt was already tightened. Before applying the torque/angle of rotation method, the bolt was already tightened with a torque higher than the snug torque.

PressHigh The Power Pack's pressure exceeded the level measured during learning process.

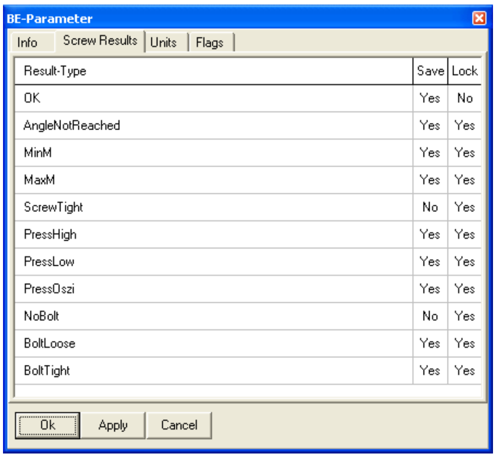
PressLow The Power Pack's pressure under-ran the level measured during learning process.

PressOszi pressure fluctuations out of tolerance

NoBolt bolting aborted by operator before bolt detected

BoltLoose bolting aborted by operator, bolt detected, snug or set torque not attained.

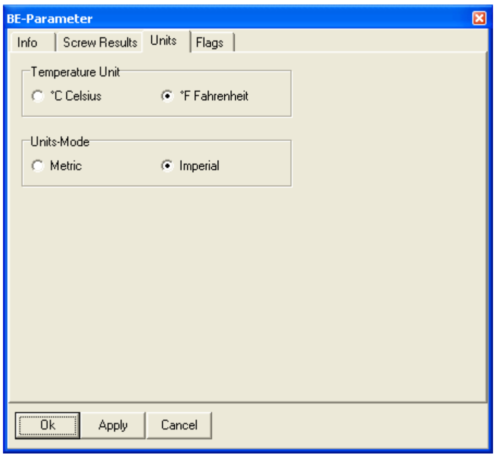
BoltTight This result is issued only in torque/angle of rotation mode.
bolting aborted by operator, snug torque attained or exceeded, set angle not attained.



Result-Type	Save	Lock
OK	Yes	No
AngleNotReached	Yes	Yes
MinM	Yes	Yes
MaxM	Yes	Yes
ScrewTight	No	Yes
PressHigh	Yes	Yes
PressLow	Yes	Yes
PressOszi	Yes	Yes
NoBolt	No	Yes
BoltLoose	Yes	Yes
BoltTight	Yes	Yes

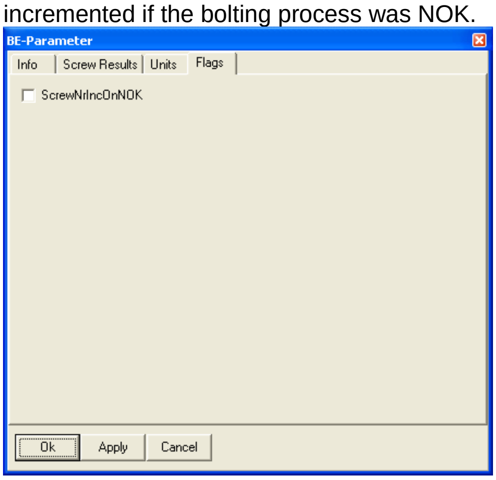
6.12.3. MENU UNIT

The BE temperature display can be changed from °Celsius to °Fahrenheit in the unit menu as well as the unit system used in the BE can be changed from "Metric" to "Imperial".
Changing the unit system is only possible when there is no data stored in the BE.



6.12.4. MENU FLAG

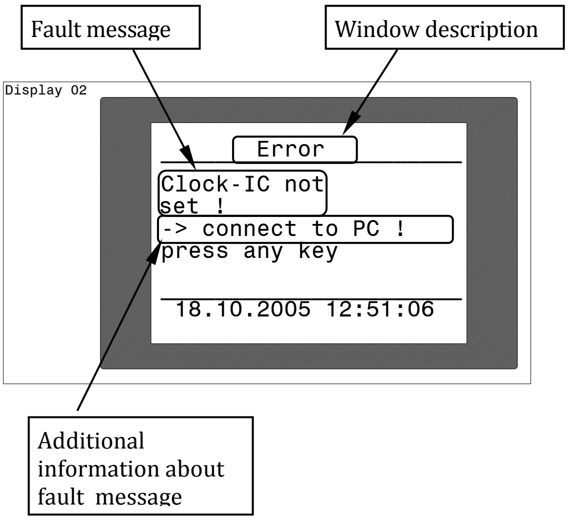
If the box is checked, the Joint-No. is incremented even if the bolting process was stated NOK.
If the box is **not** checked, the Joint-No. is **not** incremented if the bolting process was NOK.



7. FAULT MESSAGES (GENERAL)

If fault messages occur, the unit control options are blocked. Pressing the enter button confirms the fault message and the control options are made available again.

- The respective fault is named in the first line of the fault window. (see fault list)
- Additional information is displayed following the fault message. Not every fault contains additional information.



See BE fault messages

7.1. BE FAULT MESSAGES

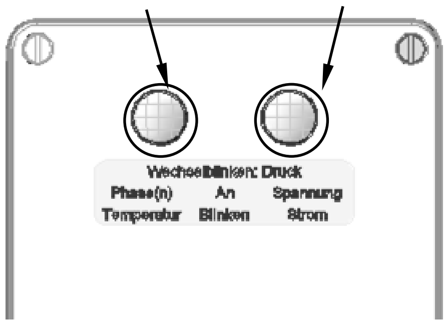
Fault message	Explanation
Clock-IC not found! -> Service necessary!	There is a fault in the clock inside the BE. ***Repair necessary!***
Clock not set! -> Connect to PC!	The BE-internal clock has no current time. *Connect the BE to the PC, this sets the clock.*
EEProm not found! -> Service necessary!	There is a fault in the BE-internal data store. ***Repair necessary!***
Atention: only “xxx” Datasets free !	The memory capacity of the BE is currently restricted to 1024 data records. If there are less than 100 memory spaces free, this message appears when the BE is connected to the unit. If the data records are required for documentation, they should be transferred to a PC using the "BE_X2" software and then deleted in the BE afterwards. **Note!!** After data record 1024 the first data record is automatically overwritten.
Learning NOK (reported by X2)	A fault occurred during the learning process. *Repeat learning*
Teaching not OK (Mode reported by X2)	A fault occurred during the learning process. Fault in communication between BE and Power Pack. *Repeat learning*
Learning NOK (Single Hose detected by X2)	Connected bolting equipment does not correspond to the one defined in the bolting application. *Check and Repeat learning.*
Learning NOK (Twin Hose detected by X2)	Connected bolting equipment does not correspond to the one defined in the bolting application. *Check and Repeat learning.*
Learn: Pres. too low Act: %u Set: %u	Pressure set incorrectly: *Check* *pressure setting*
Learn: Pres. NOK Act: %u Min: %u Max: %u	Pressure set incorrectly: *Check* *pressure setting*
Bolted Joint OK	The bolted joint is OK. This message is not usually shown, but can be added on customer’s request. If added every bolted joint has to be confirmed by pressing a button on the BE. *Press button on the BE*
Bolted Joint NOK, Low °	The bolted joint is faulty. The bolting process was aborted due to maximum torque being exceeded before programmed angle of rotation was reached. *The bolted joint has to be loosened and the bolt thread has to be examined.*
Bolted Joint NOK, Torque below lower Limit	The bolted joint is faulty. The minimum torque of the defined torque window was not reached although the programmed angle of rotation was run. *The bolted joint has to be loosened and the bolt thread has to be examined.*
Bolted Joint NOK, Torque above upper Limit	The bolted joint is faulty. The maximum torque of the defined torque window was exceeded before the programmed angle of rotation was run. *The bolted joint has to be loosened and the bolt thread has to be examined.*
Bolted Joint NOK	The bolted joint is faulty. *The bolted joint has to be loosened and the bolt thread has to be examined.*
Bolting aborted	The bolting process has been interrupted by the user. The button on the remote control has been released.
Invalid Bolting Application	The bolting application list in the BE is invalid. The download of the bolting application list from the PC has to be repeated
No Bolting Applications defined ! -> Load from PC	There are no data records in the BE for bolting applications. Download the bolting application list from the PC

OverPressure	Power Pack not enabled for Angle-Mode !
OverCurrent	The current consumption of the Power Pack is too high. Can be caused by fluctuations in the power supply. If this fault occurs continuously there is a fault in the Power Pack. Service necessary!
Error: Mains Voltage	The mains voltage is outside the specified voltage range. (This test is only carried out when the engine is not running) Check the mains voltage. It has to correspond to that stipulated on the type plate
Phase missing	Three-phase version: one of the three phases is missing. Check the mains connection. General: Fault on the control board. Service necessary!
Rotary-Field inverted	Three-phase version: phases mixed up Change phases (phase changing switch)
OverTemperature	The Power Pack has exceeded the permissible temperature. Power Pack has to cool down until permissible temperature is reached again.

7.2 SIGNAL LAMP FAULT MESSAGES

The Power Pack is equipped with 4 signal lamps. One pair is located on top of the control housing another pair on the remote control.
The various fault functions are indicated on the control housing. Operating states of the Power Pack are indicated on the remote control. Varying flash frequencies indicate the different types of states or faults.

7.1.1. SIGNAL LAMPS ON THE CONTROL HOUSING



Flashing frequency	**Cause**
Signal lamp 1 on permanently	AC current units: Mains voltage was not detected 3-phase units: rotary field inverted
Signal lamp 1 flashing	The maximum permissible temperature of the unit has been exceeded
Signal lamp 2 on permanently	The voltage of the power supply is outside the permissible range
Signal lamp 2 flashing	The maximum permissible current consumption of the unit has been exceeded
Signal lamps 1 and 2 flash alternately	The maximum permissible pressure of the unit has been exceeded

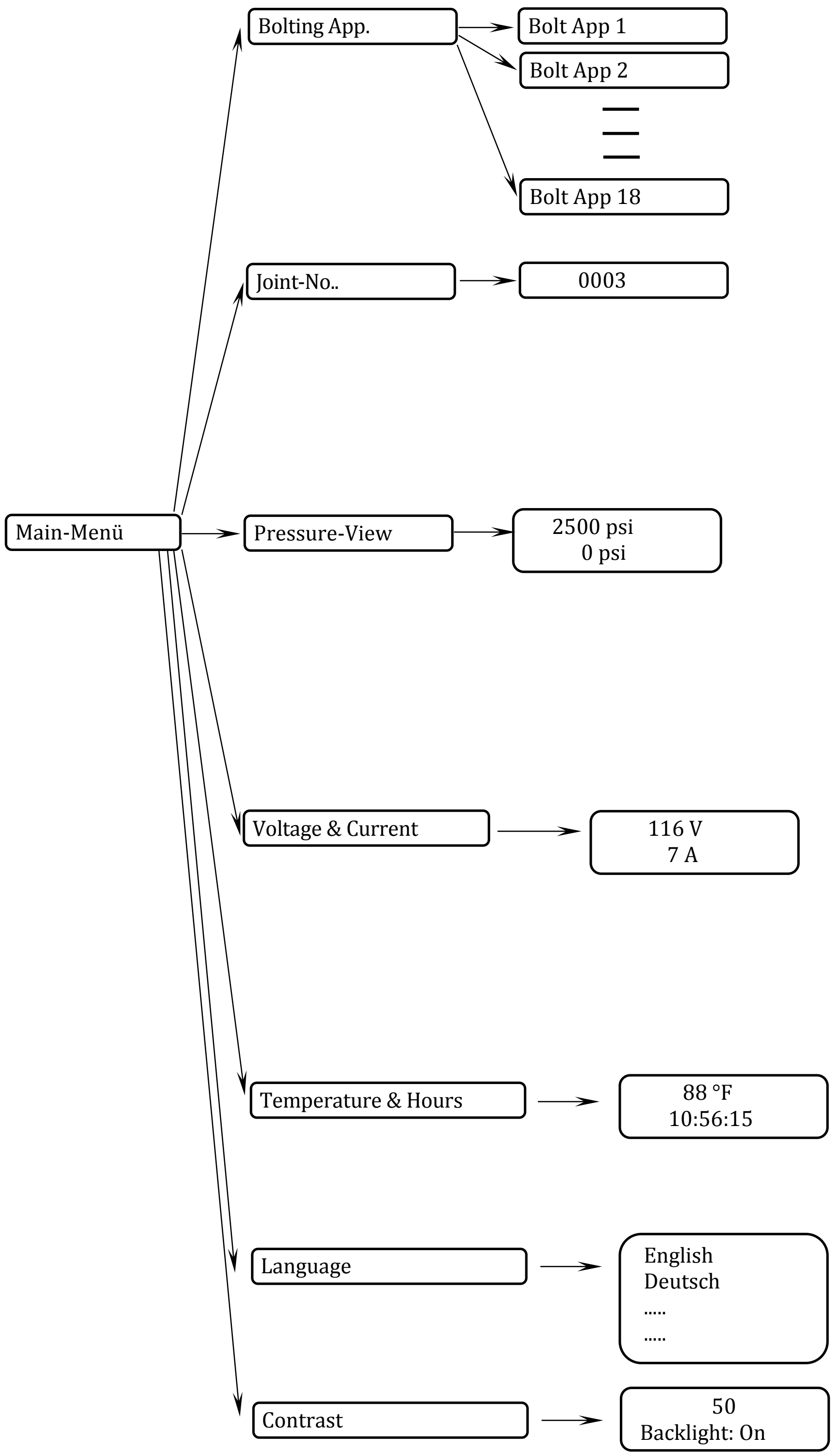
7.1.2. REMOTE CONTROL FAULT MESSAGES

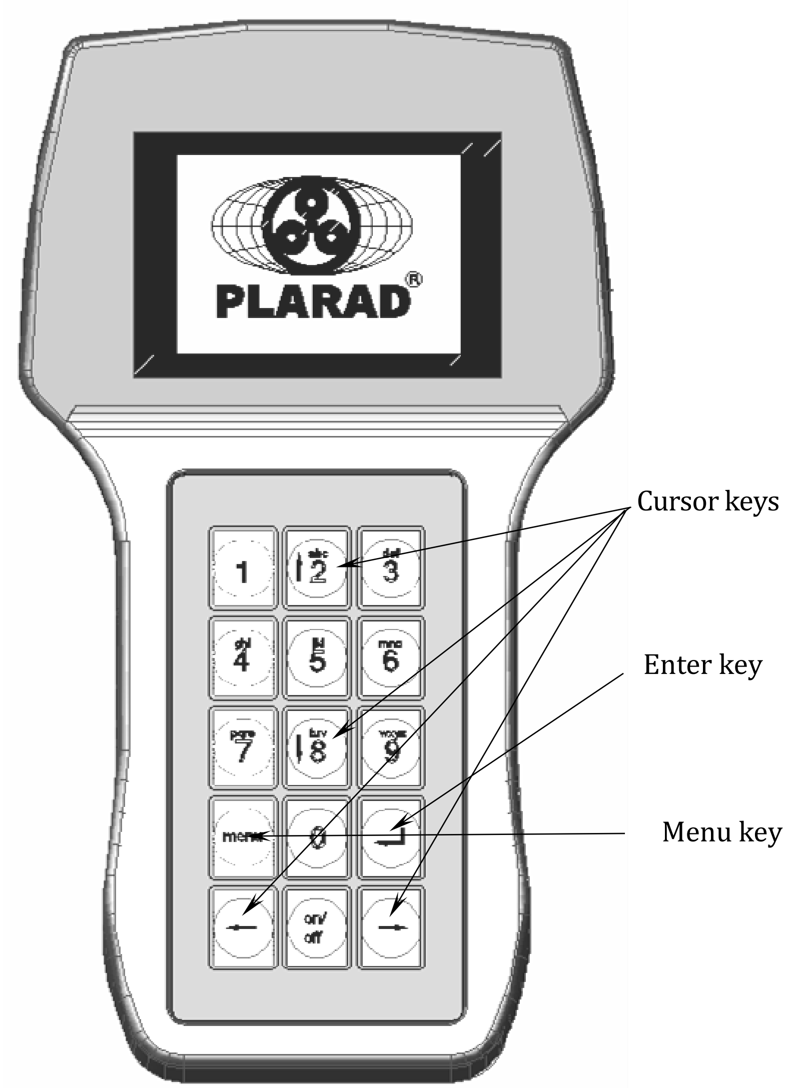
Green signal lamp

The green signal lamp is for the functions "tightening a bolt connection".
The red signal lamp is for the functions "loosening a bolt connection".
The respective operating modes are indicated by different flashing frequencies.

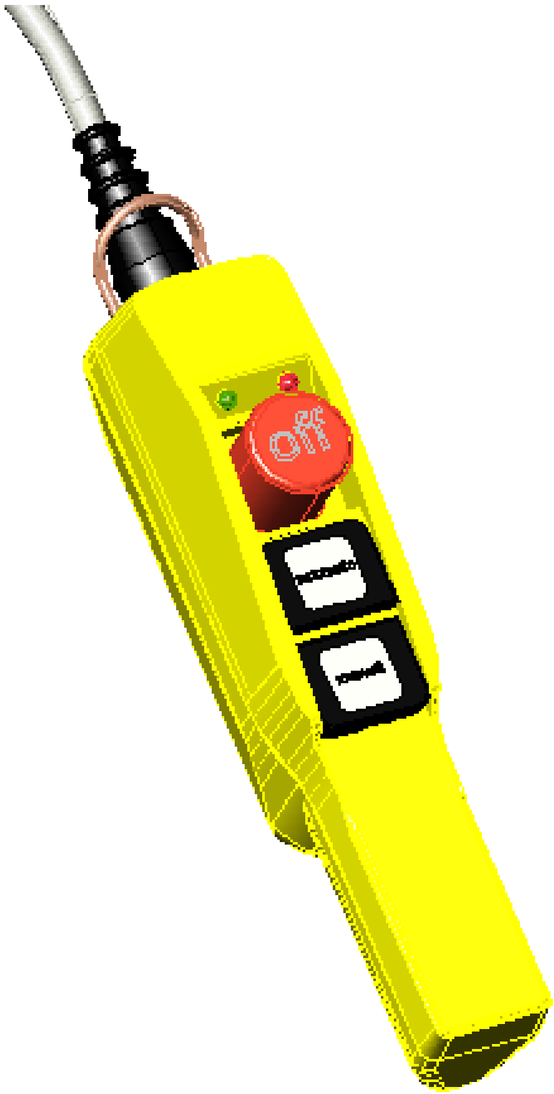
Flashing frequency	Function
Green signal lamp flashing slowly	Bolting system is in tightening mode and learning was not executed Initial mode of the power pack-
Green signal lamp flashing quickly	Bolting system is in tightening mode Quick flashing always indicates that a process of the power pack is currently running, e.g. the engine is starting up or the bolting process is underway
Green signal lamp on permanently	Bolting system is in tightening mode Function 1 after successful learning process Function 2 after correctly executed bolting procedure
Red signal lamp flashing slowly	Bolting system is in loosening mode and learning was not executed
Red signal lamp flashing quickly	Bolting system is in loosening mode Quick flashing always indicates that a process of the power pack is currently running, e.g. the engine is starting up or the loosening process is underway
Red signal lamp on permanently	Bolting system is in loosening mode after successful learning process
Red and green signal lamps flash alternately	Indicates a fault. If a BE is connected, the fault will be given concretely in text form. Without a BE, see 7.2.1.

8. MENU STRUCTURE BE

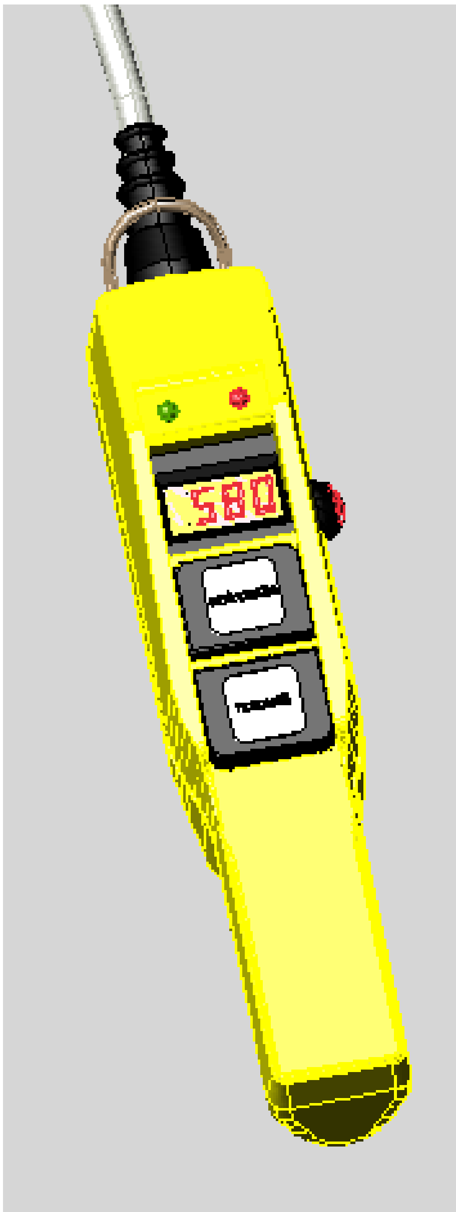



PLARAD®
1
abc 2
def 3
ghi 4
jkl 5
mno 6
pqrs 7
tuv 8
wxyz 9
menu
0
on/
off
Cursor keys
Enter key
Menu key

Standard remote control

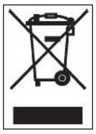


Remote control with digital print display



9. INSTRUCTIONS ON DISPOSAL

Dispose of the power pack as required by local regulations.



Attention!

This symbol points out that the product must not be disposed of with regular household waste as specified in the WEEE directive (Waste Electrical and Electronic Equipment Directive, 2002/96/EC) and national laws.

Dispose of this product at an authorised waste collection facility. Return the product if, for instance, purchasing a similar product or take it to a waste collection facility that is authorised to recycle waste electrical and electronic equipment.

Turn to your local administration office, your public waste disposal authority, a facility that is authorised to dispose of waste electrical and electronic equipment or your waste management company.

PLARAD® Torque & Tension Systems

... a successful connection!

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