

## User Manual

# Battery Torque Wrench MAD



## 1. Introduction

Thank you for purchasing this fine M-PT product! M-PT are built in Germany with passion and years of experience in design and manufacturing. We highly recommend reading this user manual thoroughly in order to understand all aspects of these tools. All tool features, our safety instructions and tool maintenance are explained in detail.

Familiarizing yourself with all the ins and outs of this tool will ensure a long lifetime of the tool and a and happy operator.

In case of any supplementary questions, do not hesitate and consult our factory service. Patent right and copyright must be respected. Distribution, reproduction and transmission to third parties are not admissible.

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### 3. Safety Notes

#### 3.1. General Remarks

- Safety of personnel and trouble-free operation can only be warranted with original M-PT components installed. This relates to all elements of the device, accessories and spare parts. M-PT does not assume any responsibility and rejects all corresponding claims in the case of unauthorized installation of foreign parts.

#### 3.2. Surroundings

- The working zone must be clean and sufficiently illuminated.
- The equipment is not appropriate for environment requiring ATEX instrumentation, i.e. the presence of corresponding liquid, gas or dust in proximity of the working zone is strictly forbidden. Sparks could give rise to fire hazard.
- Local legislation and regulations for prevention of accidents must be observed.

#### 3.3. Electrical Safety

- The connector of the tool must match the socket in place. Manipulations are not admissible.
- The tool has not been designed for applications in wet environment (rain, extreme moisture etc.).
- With respect to the cable, generally known rules must be followed (prevention of excessive stress, heat, abrasion or damage caused by sharp edges or moving machine components).
- For outdoor applications, also extension cables -whenever used- must meet the same requirements.
- If operation in humid environment cannot be avoided, a fault current circuit breaker is imperative.

#### 3.4. Safety of Personnel

- Persons not participating in the procedure in question should be kept away, in order not interfere in the work.
- Tools should be stored protected from unauthorized access.
- The tool should not be left to persons, unconscious of possible danger, or not knowing this manual.
- Protective equipment is required.



#### 3.5. Absence of Damages

- Before starting to work, the entire equipment must be inspected.
- In case of any damages, first repair must be performed – by qualified specialists and by means of original spare parts.
- This is particularly valid in the case of defective switches.
- At the end of the work or before exchanging components, the device must be disconnected from mains.

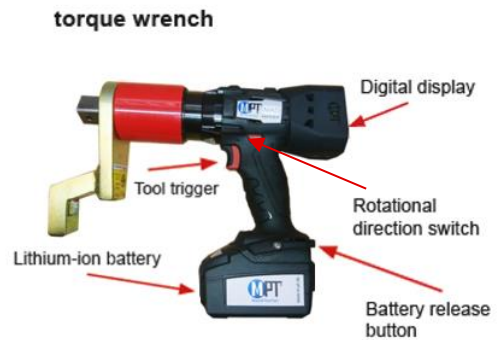
## 4. Assembly

1. Make sure the battery is fully charged.
2. Slide in the battery pack until it engages.
3. Fasten and secure the reaction arm on the jagged side of the gearbox with the retaining ring.

Figure 1



Figure 2



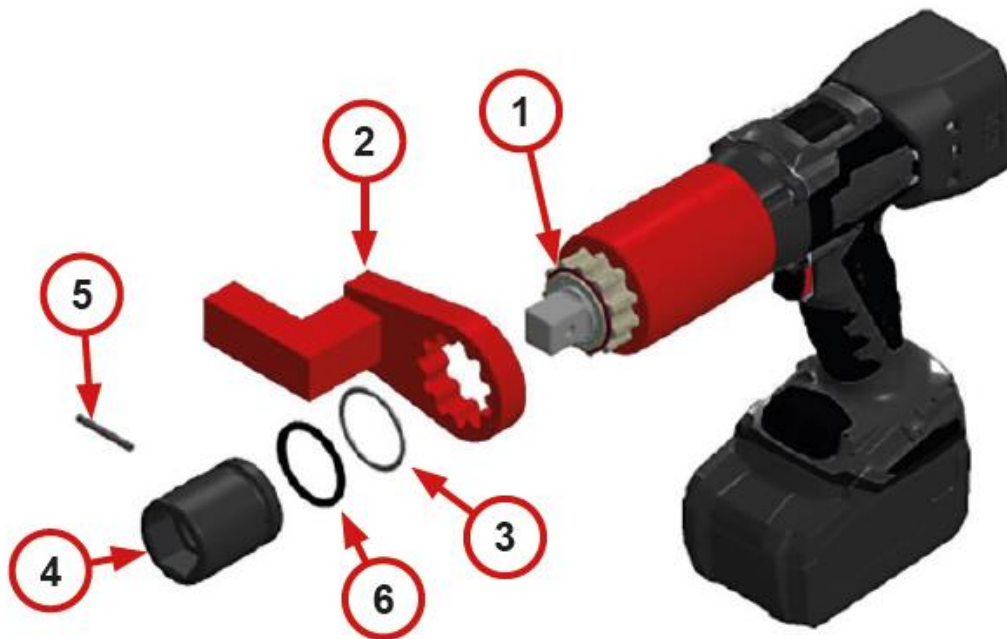
## 5. Description of functions

### 5.1. Commissioning

- The torque wrench is supplied ready to operate.
- Only components and accessories that do not impair the function and safety of the torque wrench may be used.

### 5.2. Preparing the torque wrench

1. Attach the reaction arm (2) to the gearbox of the torque wrench (1).
2. Secure the reaction arm with the retaining ring (3) onto the torque wrench.
3. Attach the socket (4) onto the square of the torque wrench. Use only sockets with a standardized square in accordance with DIN 3121.
4. Secure the socket with a pin (5).
5. Secure the pin with a snap ring (6) to prevent it from falling out.

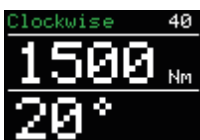
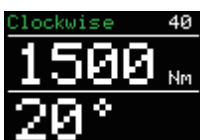


### 5.3. Switching the torque wrench on



When the torque wrench is started, the current time and currently opened file are displayed. Confirm the screen by pressing the M button. This screen is displayed only when data logging is active.

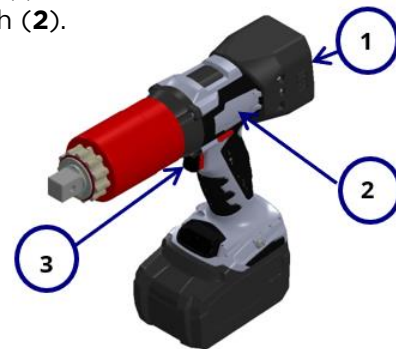
### 5.4. Indicators on the main screen



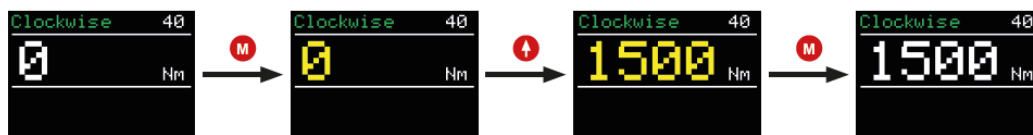
- Top left: shows the current direction of rotation
- Top right: torque wrench type ('40' means MAD 40)
- When the transducer is activated, a blue S is displayed next to the torque wrench type (B-RAD S series only).
- Centre row: set current torque
- Bottom row: set current angle
- The last result is displayed for 10 seconds
- If an error occurs, the torque on the display turns red. The error can be acknowledged with any button.
- If the main screen of the torque wrench is active and no buttons are pressed for 60 seconds, the display switches off

### 5.5. Operating the torque wrench

- Adjust the settings with the buttons **M**, **↑** and **↓** (1).
- The direction of rotation is set with the toggle switch (2).
- Start rotation with the trigger (3).



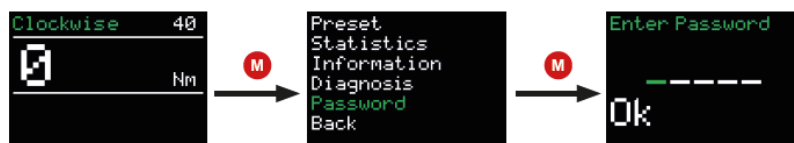
### 5.6. Setting the torque



- After being switched on, the torque wrench displays the last set torque.
- The default setting from the factory is 0 Nm.
- The current direction of rotation is displayed at the top left.
- The torque wrench type is displayed at the top right. '40' means MAD 40.
- Torque setting is activated by pressing the **M** button briefly.
- The torque indicator now turns yellow.
- The torque is adjusted by pressing **↑** and **↓**.
- Pressing and holding **↑** and **↓** adjusts the torque in larger increments.
- Pressing **M** again confirms the torque.
- The set torque is shown in white.

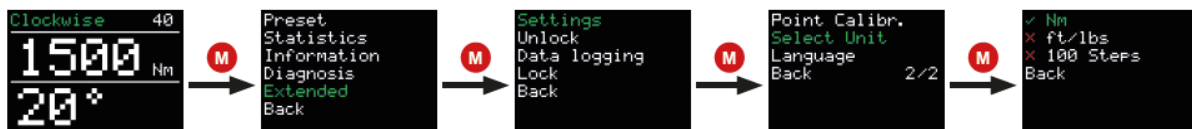
### 5.7. Extended menu

- The extended menu can be opened by using the password **17580**.
- The password should be entered under 'Password' in the main menu.



- The following settings can be implemented in the extended menu:
  - Advanced settings
    - Activate the angle
    - Activate the torque limits
    - Activate bolt counter
    - Point calibration
    - Units
    - Language
  - Unlock (only after consultation your M-PT distributor)
  - Data logging
  - Locking the extended menu

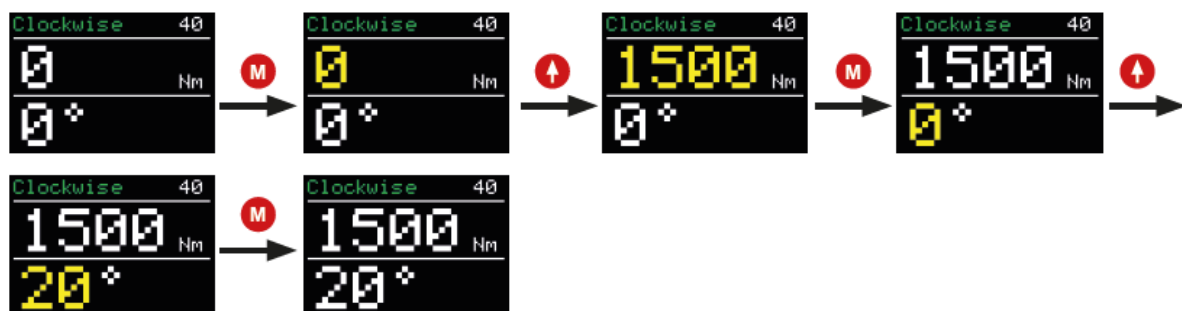
### 5.8. Units



- The torque units can be set in the extended menu.
- The following torque units are possible:
  - Newton metres - Nm
  - Foot-pound - ft/lbs
  - 100 setting levels (finer graduations are possible on request)
- Recalibration does not need to be carried out after switching the units.
- A torque chart is required if working in step mode. A torque chart can be obtained from your M-PT distributor.

### 5.9. Setting the angle

- To set an angle, the angle option must be activated in advanced settings.
- Setting the angle opens the main screen.

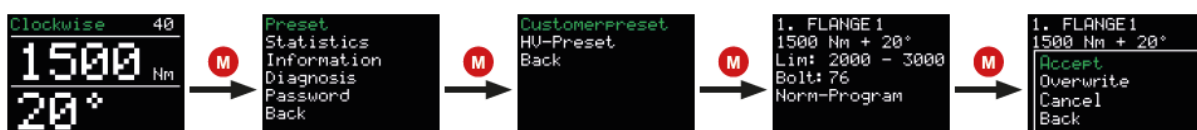


- Torque setting is activated by pressing the **M** button.
- Set the torque.
- Angle can be set after confirming the torque with **M**.
- Angle is set by pressing **↑** and **↓**.
- Pressing **M** (M) again confirms the angle.
- Angle value can only be set between 10° and 360°.

Please note!

Set torque + angle should not exceed the maximum torque capacity of the tool. If this threatens to occur, the tool will automatically stop to prevent damage.

### 5.10. Presets



- The device can store up to 10 user-defined presets.
- In addition, presets are also stored for standardized HV connections.
- Pressing and holding the **M** button opens the main menu.



- Pressing the **M** button again opens the presets menu.
- Here, you can switch between user-defined customer presets and the HV presets.
- The following is displayed in the preset:
  - Reference number of the preset
  - Name of the preset
  - Torque
  - Set angle
  - Set limits for the final torque
  - Set bolt counter
  - Selected program (normal or torque check program)
- The presets can be selected with the arrow buttons ( **↑** and **↓** ).
- Pressing the **M** button opens a menu with the following functions:



- 'Accept' applies the displayed preset as the current setting.



- 'Overwrite' will store the preset settings in the current preset.
- To save a preset, first enter the desired torque (+ angle) in the main screen.



- 'Cancel' returns you to the displayed preset.



- 'Back' returns you to the presets menu.



- 'Back' returns to the presets menu of the main menu.

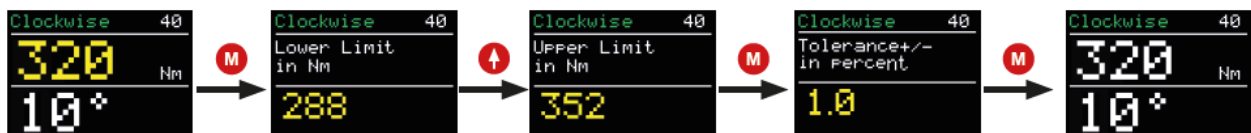
- HV preset can only be selected and cannot be overwritten.
- HV preset are displayed only in accordance with the torque range of the torque wrench.
- The preset tightening torques for HV bolts refer to the modified torque procedure in accordance with DIN EN 19963-1-8 for k-class K1.

### 5.11. Limit settings

- Limits are activated and deactivated in advanced settings:



- Limits can be defined for every final torque.
- Angle limits can be defined for purely torque-controlled tightening. The angle is counted when the torque wrench's minimum torque is reached and will only be measured after the tool has reached its minimum torque.
- Limits can be defined for the final tightening torque for torque/angle tightening.
- The limits are entered on the main screen after the torque and angle have been set:



- The limits are confirmed with the **M** button.
- The limits are also stored when storing as a preset.
- In the event that the limits are not met or are exceeded when operating, an indicator appears on the screen.
- The torque wrench can be operated again after pressing any button.

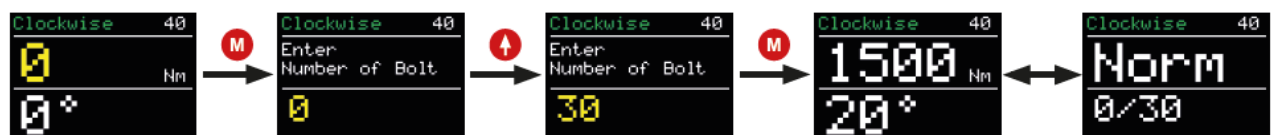


### 5.12. Bolt counter

- The bolt counter is activated and deactivated in advanced settings:



- The bolt counter is set on the main screen:



- Once activated, the bolt counter must be set to a minimum of 1 and can be set to a maximum of 999.
- The bolt counter counts all completed bolting operations in a clockwise direction. Counter clockwise will be ignored.
- Once all bolts have been tightened, the device is locked. The device can be released in two ways:
  - Resetting the number of individual bolts.
  - Deactivating the bolt counter.
- If the battery is removed from the torque wrench before the bolt counter is complete, the counter will resume from the same point the next time the torque wrench is used.
- To prevent the individual bolts from being torqued twice, e.g. by tightening a bolt that has already been tightened (“rehit”), the counter should be used in combination with the limit setting. For instance a minimum Angle must be achieved to count as a correct tightening.

### 5.13. Adjustment lock

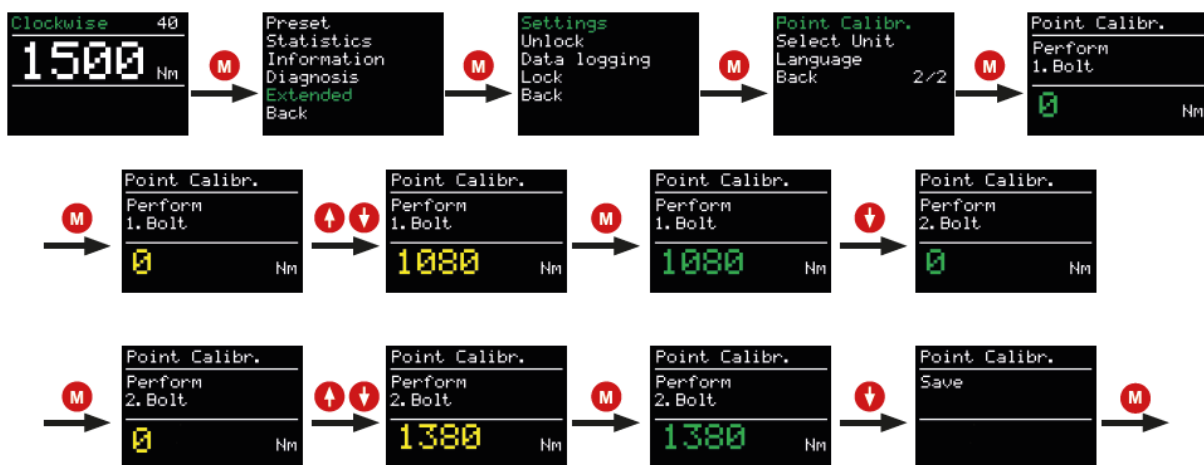
- The adjustment lock is activated and deactivated in advanced settings:



- If the adjustment lock is active, the torque can no longer be adjusted in the basic access level.
- Only torques stored in the presets can be selected.

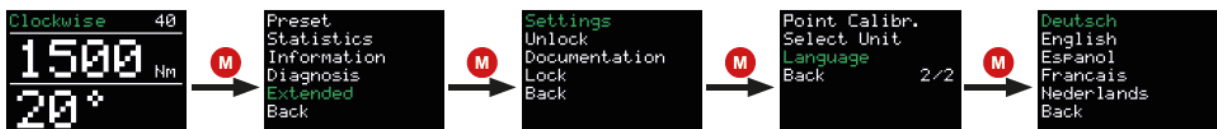
### 5.14. Point calibration

Point calibration allows the accuracy of the torque wrench to be increased to a specific type of bolted joint. Since the B-RAD S has a built-in transducer, Point calibration is not needed for the B-RAD S.



- To verify the actual torque, a measuring instrument such as a Smart Socket™ is required.
- The desired torque is set on the main screen.
- The point calibration can be stored in the presets.
- Point calibration is activated under ‘Point Calibr.’ in the extended menu.
- ‘Perform 1. bolt’ appears on the display.
- The first bolting operation is then carried out.
- The result obtained from a measurement is showed on the display.
- The second bolt is selected with .
- The second bolting operation is then carried out.
- The result is entered on the display.
- Point calibration is completed with followed by .

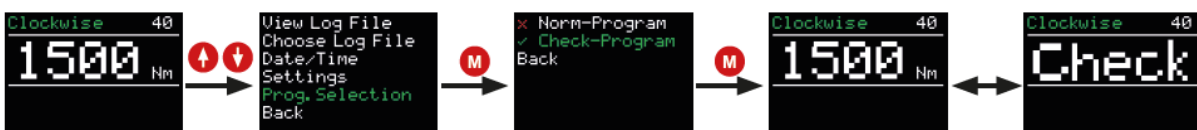
### 5.15. Language



- Five different languages can be selected in advanced settings:
  - German
  - English
  - Spanish
  - French
  - Dutch
- The torque wrench restarts after confirming the language.

### 5.16. Check program / Bolt verification

- The ‘Check’ program is NOT an standard feature on the MAD, but can optionally be equipped or retrofitted with it.
- It has been designed for checking already tightened bolts.
- The Check program can be set via the program selection option:



- With the check program set, the display alternates between the word Check and the set torque.
- The Check program establishes the selected torque slowly.
- If the actual torque on the bolt is lower than the check torque, the torque wrench tightens the bolt to the set torque.
- After completing the operation, the Angle of this movement is displayed. If limits have been activated in advanced settings, the torque wrench evaluates the “controlled Angle”.
- If the controlled angle is outside of the set limits, the display turns red. The abbreviation ‘Upp. Lim.’ or ‘Low. Lim.’ appears.
- The error can be acknowledged by pressing any button.
- If the controlled angle is within the set limits, the display



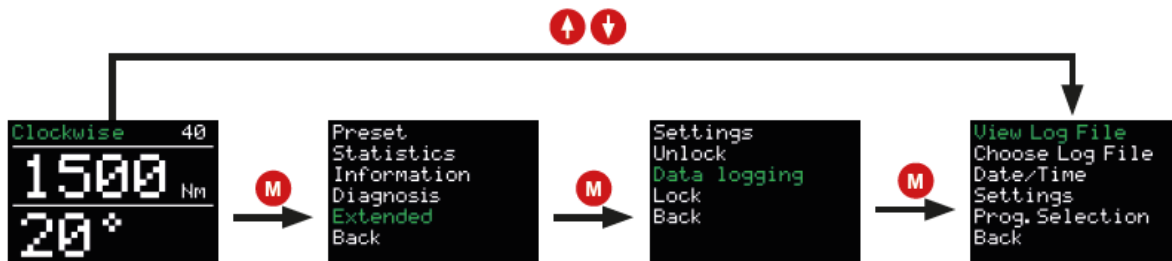
turns green and the controlled angle is displayed.

- The torque wrench rotates slower in the Check program than in the normal program.
- Due to the elasticity of the reaction arm, a controlled angle of approx. 1 - 3° is displayed even for non-moving bolted joints. This must be determined at the beginning of the test and taken into account in the evaluation.

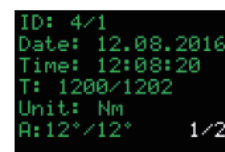


### 5.17. Data logging

- Data logging is a standard feature on the MAD & B-RAD S.
- When the data logging is active, the sub-item 'data logging' appears in the extended menu.
- Pressing the two arrow buttons simultaneously is a shortcut to enter the data logging menu.



- The data logging menu contains the following sub-items:
  - View log file: view the data for all completed bolts.
  - Select log file: create a new log file.
  - Date/time: set the current time.
  - Settings: activate and deactivate the operator ID and data transfer to a PC.
  - Program selection: switch between the normal program and the check program.
- The following data are saved to the log files:
  - Sequential number: a sequential number is assigned to each tightening where a torque is applied that exceeds the minimum torque of the tool.
  - Operation number: an operation number is assigned to every bolt successfully tightened in a clockwise direction.
  - Date and time of the bolting operation
  - Set and final torque
  - Set torque unit
  - Set and final angle
  - Final torque with angle tightening
  - Set limits
  - Total angle and bolting time
  - Battery voltage
  - Program use (normal/prove)
  - Operator
- A new log file can be created under 'Select log file'.
- This is activated with 'Save'.
- Pressing and holding the M button deletes the entry.
- When a blank entry is saved, the device automatically continues to use the last file.

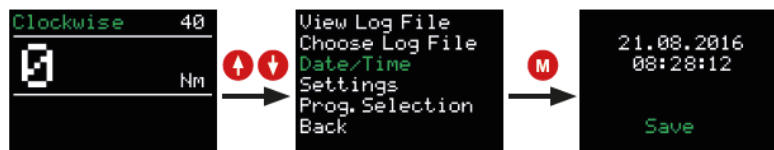


### 5.18. Setting the data and time

- The data and time are only displayed and used if data logging is active.



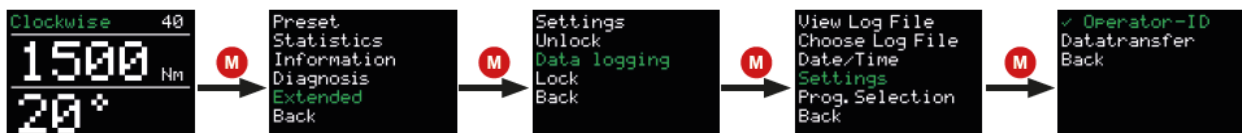
- The date and time can only be set if the extended menu has been unlocked with the password.



- The time can be synchronized with the supplied software.

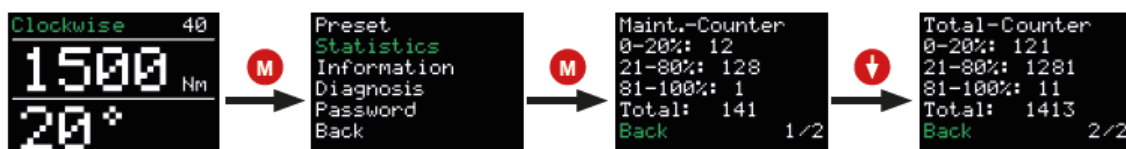
### 5.19. Operator ID

- The operator ID is activated and deactivated in the data logging settings.
- If the option has been activated, the torque wrench asks for an 8-digit operator designation when the toolkit is switched on. This is recorded in the data logging.



### 5.20. Total counter and maintenance counter

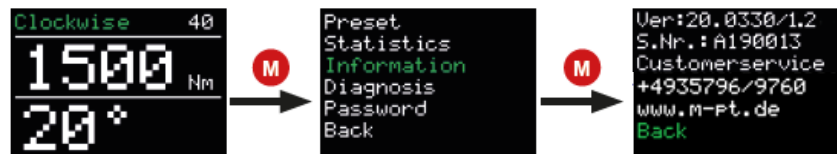
- The total counter and maintenance counters can be found under 'Statistics' in the menu.
- The maintenance counter indicates the number of bolts tightened since the last maintenance was carried out.



- The total counter indicates the number of bolts tightened overall.
- The counters are divided into:
  - 0 - 20% of the maximum torque
  - 21 - 80% of the maximum torque
  - 81 - 100% of the maximum torque
  - 0 - 100% of the maximum torque ('Total')
- When more than 20.000 bolts have been tightened, 'Schedule maintenance' appears on the display when the device is switched on.

### 5.21. Toolkit information

- The following information is displayed under „Information“ in the menu:
  - The software version number
  - The torque wrench serial number
  - The customer service telephone number
  - The manufacturer’s website



### 5.22. Diagnosis function

- Torque wrench data can be found under ‘Diagnosis’ in the menu.
- The ‘Status’ entry indicates the progress through the cycle until the next maintenance is due. The torque wrench should undergo maintenance when this reaches 100%.
- This menu is intended solely for remote maintenance by telephone.

### 5.23. Button lock

- Press the **M** and **↑** buttons together for 3 seconds to activate the button lock.
- To deactivate the button lock, press the **M** and **↑** buttons together for 3 seconds.
- When the button lock is active, the display can no longer be operated.
- The torque wrench continues to operate as set when the button lock is active.

### 5.24. Temperature monitoring

Temperature monitoring prevents the torque wrench from heating up excessively. A warning is displayed beyond a motor temperature of 120°C.

## 6. Datalogger PC software

### 6.1. Adding the torque wrench with Bluetooth in Windows

- Install the Bluetooth stick (supplied).
- Activate the data connection on your torque wrench. To do this, go to → Extended → Data logging → Settings → Data transfer in the torque wrench’s menu.
- Select ‘Devices and printers’ in the PC’s configuration menu.
- Select ‘Add device’.
- Select the torque wrench’s serial number (e.g. A123456).
- Click on ‘Next’.
- When the torque wrench has been successfully added, click on ‘Close’.
- In the ‘Devices and printers’ window, click on the torque wrench’s serial number with the right-hand button.
- Select ‘Properties’.
- Select the ‘Hardware’ tab.
- Select standard serial connection from Bluetooth.
- Select properties and you will find the corresponding COM port in the name designation of the Bluetooth connection (e.g. ‘COM11’).
- Close all windows.

## 6.2. Installing the software in Windows

- Install the software by starting the file 'setup.exe'.
- Confirm the terms of the licence by click on 'I agree'.
- Click on 'Next'.
- Select an installation location and click on 'Next'.
- Click on 'Next'.
- When the installation is complete, click on 'Close'.
- End data connection on your torque wrench by clicking on 'Back'.

## 6.3. Configuring the software

- Open the 'Datalogger' software by clicking on the link on your desktop.
- Under 'Select port', select the COM port that you identified in 4.1.10 (e.g 'COM11').

## 6.4. Download data from torque wrench

- Activate the data connection on your torque wrench. To do this, go to → Extended → Data logging → Settings → Data transfer in the torque wrench's menu.
- Click on 'Load data'.
- If selecting the torque wrench for the first time, name the torque wrench with the serial number of the torque wrench.
- Confirm with 'Save'.
- If loading a new file, enter a name (optional).
- Confirm with 'Save'.
- The progress of the download is shown at the bottom left of the screen. Around 3 data sets are downloaded per second.
- Once the download is complete, the torque wrench and the file can be selected at the top left.
- The name of the torque wrench and the file, as well as a data table, appear on the screen.

## 6.5. Saving and printing the data

- To print to a printer, select 'Print' on the 'Menu' tab.
- To save as a PDF, select a PDF printer in the print menu.
- To save as a .csv or .xlsx file, select 'Export' on the 'Menu' tab, followed by the corresponding file ending.

## 6.6. Synchronizing the time

- Activate the data connection on your torque wrench.  
To do this, go to → Extended → Data logging → Settings → Data transfer in the torque wrench's menu.
- Select 'Set RTC' on the 'File' tab.



## 7. Battery

- Warning!** Before initial use, check that the voltage and frequency stated on the charger's rating plate match the figures for your own electrical supply.
- Warning!** Unplug charger immediately if the cable or charger is damaged. Unplug immediately if any sign of smoke or flames.
- Warning!** To reduce risk of injury, charge only rechargeable M-PT batteries, other types of batteries may burst causing personal injury and damage.
- Warning!** Do not submit the casing to impact or drill into the casing. Do not throw battery packs or charger in fire or immerse in water. Keep battery packs dry. Do not use any damaged or deformed battery packs.
- Warning!** M-PT chargers should only be operated between 0-49 degrees Celsius. Keep away from moisture.
- Warning!** Slightly acidic, flammable fluid may leak from defective Li-ion battery packs. If battery fluid leaks out and comes into contact with your skin, rinse immediately with plenty of water. If battery fluid leaks and comes into contact with your eyes, wash them with clean water and seek medical treatment immediately.

Lithium-ion battery chargers are to be used exclusively for charging M-PT 18V Lithium-ion battery packs with the maximum capacity of 5.2 Ah or 8.0 Ah.



**Note:**

To prevent the battery from draining, always remove battery from tool before storage.

### 7.1. Battery pack faults

#### Warning indicator stays on

The battery pack is not being charged. The temperature is too high or too low. If the temperature of the battery pack is between 0 - 49 degrees Celsius, the charging process begins automatically.

#### Warning indicator flashes on

The battery pack is defective, remove from charger immediately.

The battery fails to charge, contacts may be dirty. Remove the battery pack, clean the contacts and replace the charger.



**Note:** In the case of prolonged activity of electromagnetic disturbances, the battery charger ends the charging process prematurely for safety reasons. Remove the plug and plug in again after 2 seconds.

#### Warning beep

In the case of overheating, the battery will give a loud beep tone. The Lithium-ion battery should be disconnected immediately to cool down. The Lithium-ion battery can be used again once it is cooled down.

## 8. Battery charger

Before initial use, check that the voltage and frequency stated on the rating plate match your own electrical supply and check that the ventilation slits are clear. Minimum clearance from other objects is 5 centimeters.

1. Connect to electrical supply, the red and green indicator lights up for approximately 1 second.
2. Once the self test is completed, the indicator lights are off.
3. Insert the battery pack into the charging shaft socket; push it to the back until it engages.
4. Charge the battery pack before use. Only once it has been charged and discharged five charging cycles does the battery pack reach its full charging capacity. You may store charged Lithium-ion battery packs and recharge them after an interval of no more than six months.

### 8.1. Removing and inserting the battery pack

Removal: Press and hold the release button and remove the battery pack.  
Inserting: Slide in the battery pack until it engages.

## 9. Movement of the reaction arm

This user manual was created with the greatest care. However, if you notice any omissions or inaccuracies, please let us know at the address provided.

M-PT assumes no liability for technical and typographical errors and reserves the right to make changes to the product and the operating instructions at any time without prior notice.

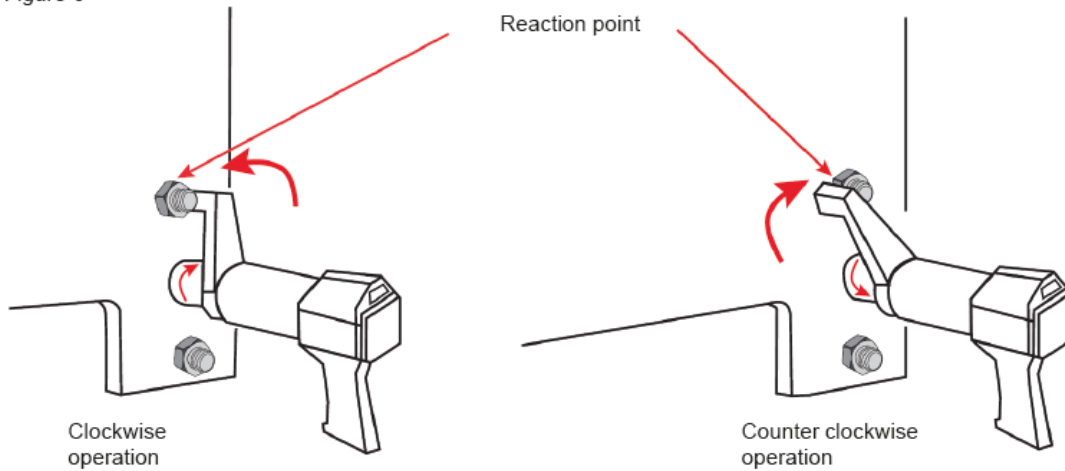
M-PT is not liable or responsible for direct and indirect consequential damages arising in connection with the features, performance and use of this product. No guarantee is given for the contents of this document.

Any damage caused by non-observance of these operating instructions will void the warranty claim. M-PT assumes no liability for consequential damage!

### 9.1. Installing the reaction arm

Ensure the reaction arm and retaining ring are installed securely to hold the reaction arm in place. Make sure the reaction arm is in contact with a solid reaction point before you operate the tool. When the tool is in operation the reaction arm rotates in the opposite direction to the output square drive and must be allowed to rest squarely against a solid object or surface adjacent to the bolt to be tightened, see Figure 6.

Figure 6



**WARNING:** While in use, this tool must be supported at all times in order to prevent unexpected release in the event of a fastener or component failure!

## 9.2. Reaction arm height

Ensure the height of the socket is even with the height of the reaction arm as seen below in Figure 6A. The height of the socket cannot be shorter or higher than the height of the reaction arm as seen below in Figure 6B and Figure 6C.

Figure 6A



Figure 6B

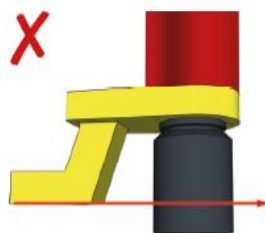


Figure 6C



**NOTE:** Improper reaction will void warranty and can cause premature tool failure.

### 9.3. Reaction arm foot

Ensure the foot of the reaction arm aligns with the length of the nut as seen in Figure 7A. The length of the foot cannot be shorter or longer than the nut as seen in Figure 7B and Figure 7C.

Figure 7A

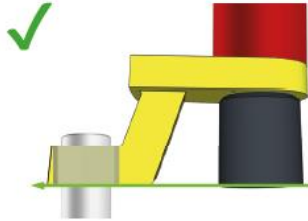


Figure 7B

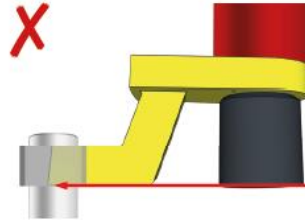
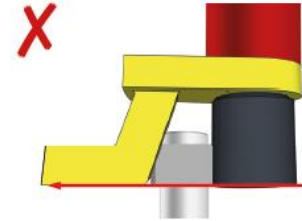


Figure 7C



### 9.4. Reaction point

Ensure the reaction arm reacts off the middle of the foot as seen in Figure 8A. Do not react off the heel of the reaction foot as seen in Figure 8B.

Please contact RAD Torque Systems B.V. or your local RAD authorized distributor for custom reaction arms.



**WARNING:** Always keep your hand and body parts clear of the reaction arm and barrel when the tool is in operation, see Figure 8C.

Figure 8A



Figure 8B

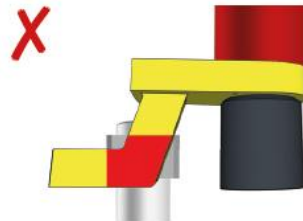


Figure 8C



## 10. Trouble-Shooting

If a particular problem cannot be solved on the basis of the instructions listed below, consult factory service immediately. Improvised repair is not recommended.

### 10.1. Message "Voltage Fault"

Cause: The motor, battery or control electronics are too hot. Allow the device to cool down.

### 10.2. Message "Insert SD Card"

The SD card has not been recognized.

### 10.3. Error Message: Instead of letters, the display shows merely lines

The SD card has not been recognized.

### 10.4. Error Message: Incorrect Date and Time

The battery is empty (if the problem is not due to transport to another time zone).

### 10.5. Error Message: Adjustment of Minimum or Maximum Torque Impossible

Possible reasons:

- Incorrect calibration
- Internal memory corrupted, consult factory service

### 10.6. Error Message: No Reaction to Key Commands

Possible reasons:

- Internal software error. The device needs to be restarted.
- If the problem cannot be solved by restart, the membrane keyboard is defective.

### 10.7. Error Message: No Reaction to Start Button

Possible reasons:

- Torque set to 0 Nm.
- Bolt Counter activated and set to 0.
- Bolt Counter activated, preselected number reached, all boltings complete.
- Button itself defective.

### 10.8. Error Message: In left-handed rotation, bolts are not detached

Possible reasons:

- Torque required exceeds maximum torque of the tool.
- Selector switch Left/Right is defective.

### 10.9. Error Message: After Completion of Bolting message

Possible reasons:

- Limits have been enabled, but not correctly adjusted.
- Bolt excessively tightened (e.g. a connection already fixed is tightened once more).
- The tool during rotary angle bolting has reached its maximum torque. In corresponding cases, the instrument automatically is switched OFF to protect internal components. Simultaneously an error message appears.
- The start button has been released before the tool is disabled.

## 11. Accessories

### 11.1. Tool Suspension

In order to simplify work and avoid unprofessional constructions, stable suspensions, to be attached to the gearings, are available for all tool models. Consult factory service.



### 11.2. Extension Pieces

Extension pieces in different lengths are available for all models, to grant access also to recessed positions or in narrow places.



### 11.3. Sockets and Securing Pins

Sockets and reaction arms must mutually match. To obtain a convenient configuration, consult factory service.



## 12. Disclaimer

This manual has carefully been prepared. In the case of supplementary questions, do not hesitate and consult factory service. The manufacturer does not assume any responsibility for technical or typographic mistakes; technical specifications and corresponding instructions are subject to change without notice. The manufacturer is not responsible for direct or indirect consequential damages in connection with equipment, services or use of the product. No warranty is given for the content of this document.

The warranty exclusively relates to defects in material and workmanship and becomes null and void in the case of misuse, abuse, neglect and improper use. It is strictly forbidden to manipulate components or to perform repair by means of parts not approved by the manufacturer in writing. Improper use or misapplications shall be construed to include excess of any specification of the equipment.

## 13. Maintenance / Service

### 13.1. General Remarks

- Safety and correct function of the tool can only be ensured by regular maintenance.
- Procedures like mounting, new adjustment, modifications, functional upgrading and repair are reserved to M-PT factory service, if no other authorization is given in writing.
- Installation of original M-PT spare parts is mandatory, foreign parts are not admissible. This includes all internal components and accessories.

### 13.2. Visual Inspection

Visual inspection is required in regular intervals and refers to following criteria:

1. Absence of external damage
2. Function of movable parts
3. Damages of shaft, drive and reaction arm

### 13.3. Service Intervals

1. The convenient service interval depends on frequency of use.
2. For permanent bolting at an intensity of up to 80% of maximum torque, maintenance after 20,000 procedures is recommended.
3. An individual maintenance conception matching the requirements of the application can be discussed with our factory service.

### 13.4. Spare Equipment

1. If during repair or maintenance, a spare tool is required, rental equipment is available any time.

### 13.5. Calibration

1. The period of validity of the factory calibration amounts to 1 year, frequency of use is not taken into consideration.

### 13.6. Manufacturer's Address



M-PT Matjeschk-PowerTools GmbH & Co. KG  
Am Sägewerk 11  
01920 Ralbitz-Rosenthal, Germany  
Telefon: +49 (0) 35796 / 9760  
E-Mail: [mail@m-pt.de](mailto:mail@m-pt.de)

## 14. Product Overview

### 14.1. Battery Torque Wrench

- Torque range 30-15.000 Nm
- Repeatability from  $\pm 2,8$  %
- Torque/angle controlled tightening
- Data Logging
- Torque Check Function for maintenance
- Limit value monitoring



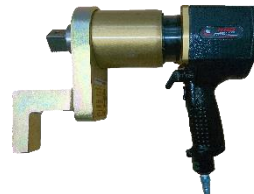
### 14.2. Electric Torque Wrench

- Torque range 65-16.500 Nm
- Repeatability from  $\pm 2,8$  %
- Torque/angle controlled tightening
- Data Logging
- Torque Check Function for maintenance
- Limit value monitoring



### 14.3. Pneumatic Torque Wrench

- Torque range 35-15.000 Nm
- Repeatability of  $\pm 5,0$  %
- Available with ATEX certification



### 14.4. Hydraulic Torque Wrench

- Torque range 110-101.600 Nm
- Repeatability of  $\pm 3,0$  %
- Square drive and cassette type
- 360° x 180° multi-positional swivel couplings



### 14.5. Hydraulic High Performance Pumps

- Pressure range 700-2.000 bar
- For hydraulic torque wrenches and bolt tensioners
- Data Logging



### 14.6. Software for Bolting Systems

- Documentation System for data logging
- Torque Check Function for bolt maintenance
- ProTight™ worker guidance system
- BoltPilot® data monitoring

### 14.7. Transducer Smart Socket™

- Accuracy of transducer  $\pm 1,0$  %
- Graphical display of torque curve
- Data logging software



### 14.8. Rental

- All tools are also available in our rental park.