

User Guide

MWR-TA and CHARGING CRADLE MWR

Atlas Copco Industrial Technique AB

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Atlas Copco

Revision history

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1.1	13 January 2017	C. Pacente	Battery Information updated, Specifications updated (<i>par. 1.3</i>), EC Declaration of Conformity updated (<i>par. 1.4</i>), FCC Rules added (<i>par. 1.5</i>), System Overview updated (<i>chapter 2</i>), Battery/Charging Cradle MWR updated (<i>par. 2.3</i>), End Fitting Tools updated (<i>par. 2.5</i>), Handling added (<i>par. 3.2</i>), Correct handling added (<i>par. 3.2.1</i>), Wrong handling added (<i>par. 3.2.2</i>), Troubleshooting Guide updated (<i>chapter 5</i>)

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NOTE: In case of conflicts between translations of this User Guide, always refer to the official English version.


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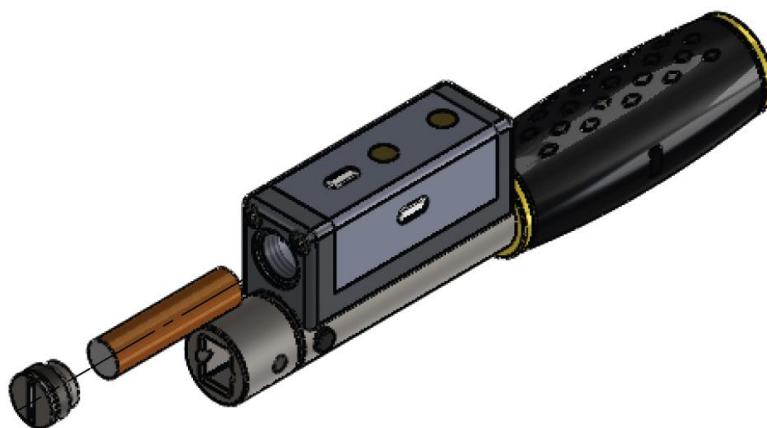
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BATTERY INFORMATION according to European Regulation 2006/66/CE

BATTERY SPECIFICATION

	
TYPE	Rechargeable battery, NiMH, type AAA, 1.2 V 1000mAh



NOTE: Dismiss the wasted batteries according to the local regulations.

SAFETY INFORMATION



WARNING: PLEASE READ CAREFULLY THE MWR-TA SAFETY INFORMATION (No. 9834 4136 00) AND CHARGING CRADLE MWR SAFETY INFORMATION (No. 9834 4138 00) PRIOR TO USE THE PRODUCT AND PAY ATTENTION TO THE SAFETY INSTRUCTIONS PROVIDED.

1 INTRODUCTION

1.1 About this Document

This document is a User Guide for the *MWR-TA* and *Charging Cradle MWR*: it consists of the following main parts:

Part	Name	Description
Chapter 1	Introduction	This chapter introduces this User Guide and provides the technical specifications for the MWR-TA and the Charging Cradle MWR.
Chapter 2	System Overview	This chapter introduces the MWR wrenches system (MWR-TA + Charging Cradle MWR) with its accessories.
Chapter 3	MWR wrenches Operations	This chapter explains how to adjust the click-point of the MWR-TA and how to perform a tightening operation.
Chapter 4	Maintenance	This chapter describes the required maintenance procedures for the MWR wrenches system (MWR-TA + Charging Cradle MWR).
Chapter 5	Troubleshooting Guide	This chapter explains how to solve the most common problems while working with the MWR wrenches system (MWR-TA + Charging Cradle MWR).

1.2 Reference Documents

Below is a list of important documents, useful for a complete view of the product in all its applications:

- MWR-TA Safety Information (No. 9834 4136 00): Multilanguage Safety Information and Declaration of Conformity
- Charging Cradle MWR Safety Information (No. 9834 4138 00): Multilanguage Safety Information and Declaration of Conformity
- Focus 60 / Focus 61 User Guide (No. 9839 0211 01)
- Focus 60 / Focus 61 Safety Information (No. 9834 4137 00): Multilanguage Safety Information and Declaration of Conformity

1.3 Specifications

TECHNICAL (MWR-TA)

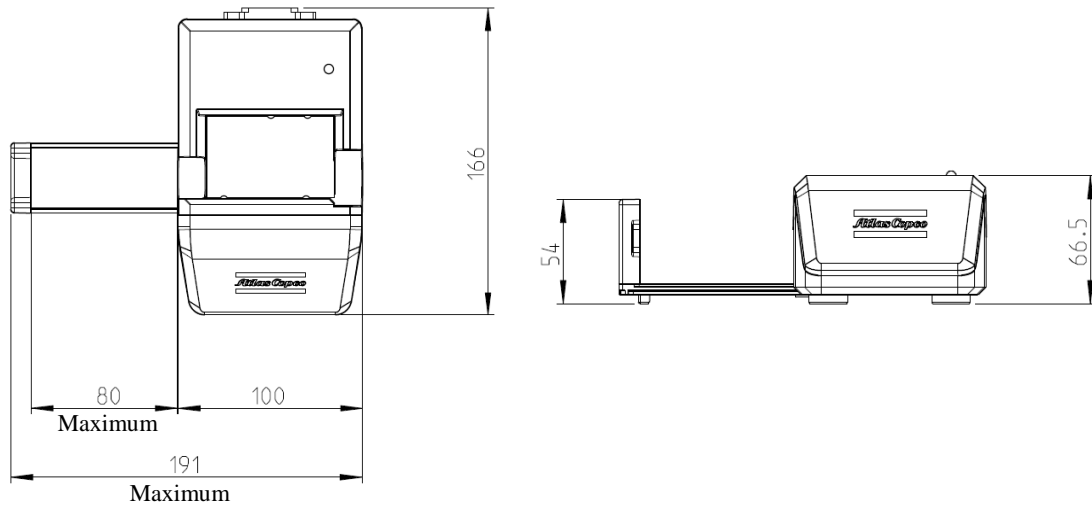
- Operating torque measuring range:

<u>TYPE</u>	<u>TORQUE RANGE</u>	
	<u>Nm</u>	<u>ft lb</u>
MWR-25 TA	<u>2 - 25</u>	<u>1.5 - 18.4</u>
MWR-50 TA	<u>5 - 50</u>	<u>3.7 - 36.9</u>
MWR-85 TA	<u>15 - 85</u>	<u>11.1 - 62.7</u>
MWR-200 TA	<u>50 - 200</u>	<u>36.9 - 147.5</u>

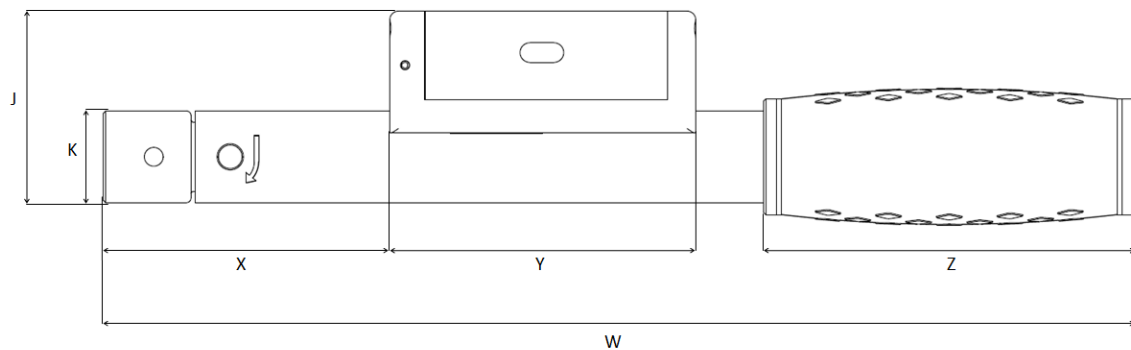
- Overload capacity: **120% of MWR-TA nominal capacity**
- Temperature stability of torque measurement: **+10 °C to +40 °C (10 °F to 104 °F)**
- Maximum angular speed (for wrench with angle measurement): **250 °/s**
- Angle measurement accuracy (for wrench with angle measurement): **± 3.6° / 360° (at 6° per second)**
- Tightening results memory capacity: **8100 Data sets (maximum)**
- Torque measurement: **± 1%**
- Mechanical repeatability click: **± 4%**
- MWR-TA Reference Firmware version: **2.2.5**

CHARGING CRADLE MWR

- Input power: **100-240 VAC with 50/60 Hz**
- AC power consumption: **0.18 A (maximum input current)**
- Output: **2V / 750mA (maximum)**
- Overvoltage category: **Category / Class II**
- Weight: **1021g (2.3 lbs)**

DIMENSIONS (CHARGING CRADLE MWR)

The unit of the dimensions is in mm.

DIMENSIONS AND WEIGHT (MWR-TA)

MODEL	LENGTH						WEIGHT (without end fitting tool and battery)	
	X (mm)	Y (mm)	Z (mm)	W (mm)	J (mm)	K (mm)	kg	lb
	MWR-25 TA	20.5	70	85	176	44	21	0.386
MWR-50 TA	65.7	70	85	236	44	21	0.503	1.109
MWR-85 TA	119.6	70	85	309	44	21	0.620	1.367
MWR-200 TA	177.5	70	85	419	44	21	0.981	2.162

INTERFACES

- ISM band radio interface :
 - Frequency bands: **868 MHz / 915 MHz**
 - RF output power: **3 mW**
 - Receive input level (max): **-107 dBm**

ENVIRONMENTAL CONDITIONS

Comply with the following environmental conditions during the operations:

- Indoor Use ONLY
- Environmental class: II
- IP Index according to EN IEC 60529 for **MWR-TA wrenches: IP40**
- IP Index according to EN IEC 60529 for **Charging Cradle MWR: IP40**
- Room temperature: 5 °C to 40 °C (41 °F to 104 °F)
- Maximum relative humidity 80% for temperature up to 31 °C (88 °F) decreasing linearly to 50% relative humidity at 40 °C (104 °F)
- Altitude: Up to 2000 m

1.4 EC Declaration of Conformity

The **MWR system (MWR-TA + Charging Cradle MWR)** is in conformity with the requirements of the council Directives on 06/22/1998 on the approximation of the laws of the Member States relating:

- 2014/30/EU EMC Directive – Electromagnetic Compatibility
- 2011/65/EC ROHS Directive – Risk of Hazardous Substances
- 1999/05/EC R&TTE Directive – Radio and Telecommunications Terminal Equipment

The **MWR system (MWR-TA + Charging Cradle MWR)** complies with the following harmonized standards:

Emission

- ETSI EN 301 489-3 v1.6.1 Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 3: Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 246 GHz

- EN 61000-3-2:2006 + A1:2009 + A2:2009 Harmonic current emissions
- EN 61000-3-3:2008 Voltage changes, voltage fluctuations and flicker

Immunity

- ETSI EN 301 489-3 v1.6.1 Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 3: Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 246 GHz
- EN 61000-4-2:2009 Electrostatic discharge immunity test (ESD)
- EN 61000-4-3:2006 + A1:2008 + A2:2010 Radiated, radio-frequency, electromagnetic field immunity test
- EN 61000-4-4:2004 + A1:2010 Electrical fast transient / burst immunity test (BURST)
- EN 61000-4-5:2006 Surge immunity test (Surge)
- EN 61000-4-6:2009 Immunity to conducted disturbances, induced by radio-frequencies fields
- EN 61000-4-11:2004 Voltage dips, short interruptions and voltage variations immunity test

1.5 FCC Rules

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules and with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:

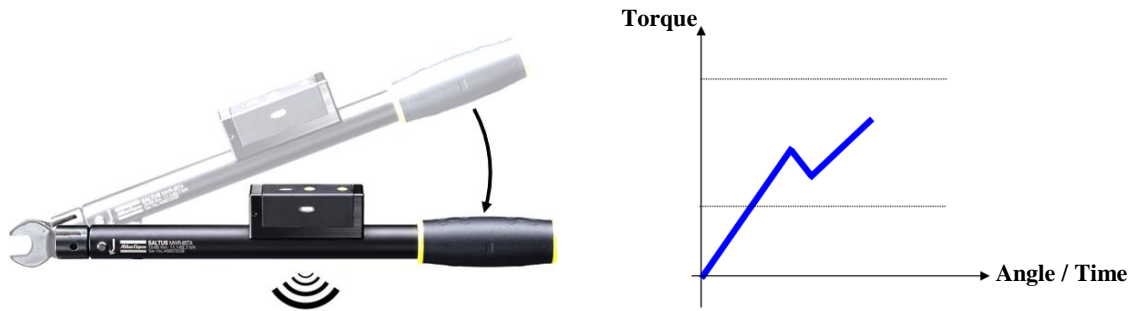
(1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

(1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

2 SYSTEM OVERVIEW

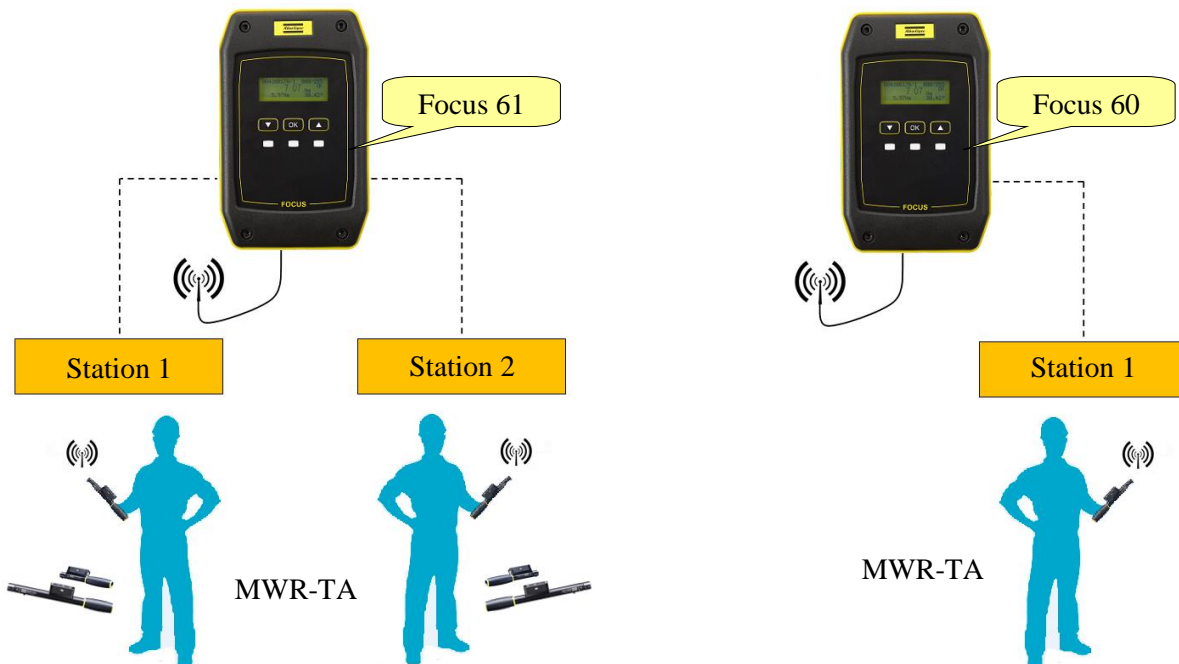
The MWR (mechatronic wrench) is based on a mechanical click-wrench combined with an electronic torque transducer.



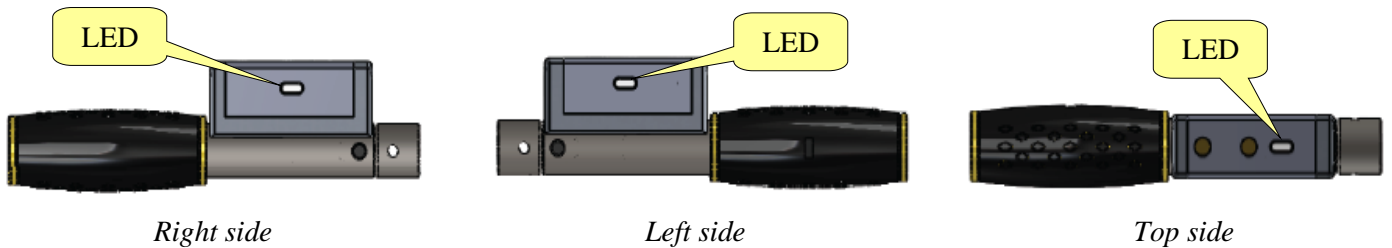
The MWR-TA are equipped with the *ISM band radio interface* (characterized by a frequency equal to 868 MHz / 915 MHz) for wireless connection with Focus 60 / Focus 61.

2.1 Applications

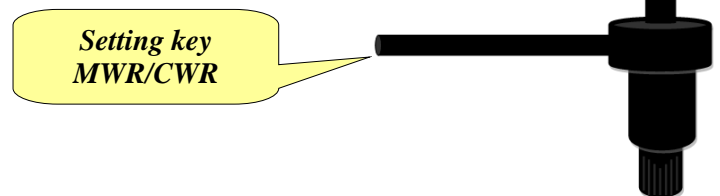
The MWR-TA works with the Focus 60 / Focus 61, which defines the tightening programs for the MWR.



There are four LEDs on three sides of the MWR-TA, which provide a visual feedback about the tightening (refer to the paragraph “LEDs” for further details).



NOTE: The *Setting key MWR/CWR* (Ordering No. 4027 5013 96) allows the torque adjustment.



2.2 Models

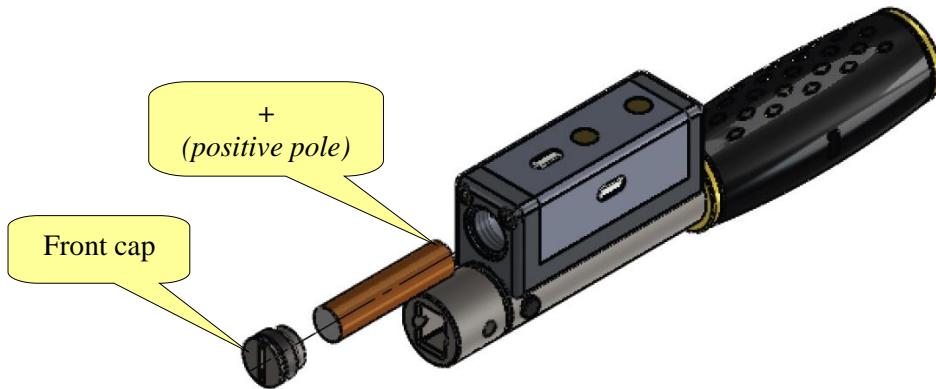
The *MWR-TA* measures *torque* and *angle* values. It also includes error-proofing functions (like a *re-hit* and loosening detection) and thus assures that all screws, organized in a defined sequence, are correctly tightened.

Below is the list of the different *MWR-TA* models:

<i>TYPE</i>	<i>TORQUE RANGE</i>		<i>ORDERING NUMBER</i>
	<i>Nm</i>	<i>ft lb</i>	
MWR-25 TA	2-25	1.5-18.4	8439 0044 20
MWR-50 TA	5-50	3.7-36.9	8439 0044 21
MWR-85 TA	15-85	11.1-62.7	8439 0044 22
MWR-200 TA	50-200	36.9-147.5	8439 0044 23

2.3 Battery / Charging Cradle MWR

A rechargeable NiMH AAA battery 1.2 V 1000mAh provides power to the *MWR-TA*.



To install/remove the rechargeable AAA battery, remove the front cap (shown in the figure above) by using a flat screwdriver.

To power on the MWR-TA, insert the battery (with the correct polarity) into the related case.



WARNING: Never try to recharge non-rechargeable batteries. Such batteries cannot only leak out during charging attempts, but can also explode, which can lead to destruction, fire risk and to injuries.

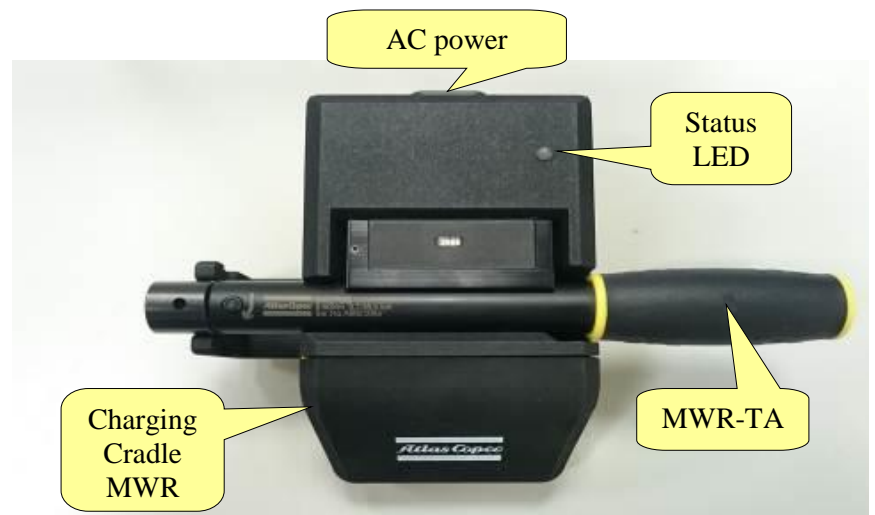
Connect the Charging Cradle MWR to the AC power in order to recharge the battery. Then insert the MWR-TA into the Charging Cradle MWR, as shown in the picture on the right.



WARNING: Install the Charging Cradle MWR close to the AC Power (220 V).

Red, yellow and green LEDs (placed on three sides of the MWR-TA) flash alternately.

This indicates that the wrench sets the internal offset (zero point) for the torque transducer and runs a quick self-test.



If the MWR-TA is in charging mode, the yellow LED of the MWR-TA is on and the *Status LED* of the Charging Cradle MWR is flashing (green colored). When the charging process of the MWR-TA is complete, the *Status LED* of the Charging Cradle MWR is constantly on (green colored).

If there is no wrench in the cradle then the cradle will be in standby mode, which is visualized by a blue lightened status LED.

Below is a table that summarizes the LEDs behavior of the Charging Cradle MWR:

<i>MWR-TA</i>	<i>Status Description</i>	<i>LED Blue</i>	<i>LED Green</i>	<i>LED Red</i>
Outside of the Charging Cradle MWR	Standby	Permanent		
Inside of the Charging Cradle MWR	Charging		1 s Interval	
Inside of the Charging Cradle MWR	Standby-Charging		Permanent	
Inside of the Charging Cradle MWR	Error			Permanent
Inside of the Charging Cradle MWR	Error	Alternating		Alternating

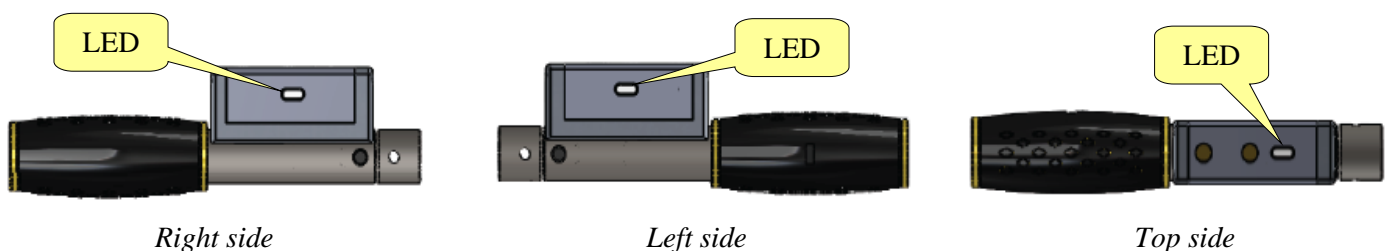
The support of the Charging Cradle MWR is intended for the MWR-85 TA and MWR-200 TA. There are three holes in the support of the Charging Cradle MWR. As there are only two holes in the housing of the Charging Cradle MWR, you will have two possible positions to mount the support on the housing. The positions on the support arm are marked with an indicator for MWR-85 TA and MWR-200 TA to find the right position.

If MWR-85 TA and MWR-200 TA are charged in the Charging Cradle MWR without the support, there is a risk that the wrench/cradle can “flip” to the left side because of the length and weight. If this happens, the wrench cannot be charged correctly.

In addition, if e.g. an MWR-200 TA has an end fitting which is inserted into the wrench, it will flip to the left side almost every time. The charging process of the wrench is then affected in a negative way.

2.4 MWR-TA LEDs

The MWR-TA has three sets of LEDs (refer to the following figure):



Each set consists of the following LEDs: *RED, GREEN, YELLOW, BLUE*.

Hereunder is a table that describes the LEDs behaviour of the MWR-TA:

Outside of the Charging Cradle MWR

	<i>Battery</i>	<i>Status Job</i>	<i>Status</i>	<i>MWR Condition</i>	<i>LED Red</i>	<i>LED Green</i>	<i>LED Yellow</i>	<i>LED Blue</i>
	OK	Active	Ready to Use	Free of load			3 s Interval	1 s Interval
	OK	Active	OK	After Click, free of load		3 s		1 s Interval
	OK	Active	NOK	After Click, free of load	3 s			1 s Interval
	OK	Active	Measuring	tqstart reached			< 1 s Interval	
Deadtime	OK	Active	OK = TOK	After Click, free of load		3 s	During Deadtime	After Deadtime
Deadtime	OK	Active	NOK = TNOK	After Click, free of load	3 s		During Deadtime	After Deadtime
Rehit	OK	Active	Rehit/NOK	After Click, free of load	3 s		During Deadtime	1 s Interval
	NOK	Active	Ready to Use		3 s Interval			1 s Interval
	NOK	Active	OK	After Click, free of load		3 s		1 s Interval
	NOK	Active	NOK	After Click, free of load	3 s			1 s Interval
	NOK	Active	Measuring	tqstart reached	1 s Interval			
Deadtime	NOK	Active	OK = TOK	After Click, free of load		3 s	During Deadtime	After Deadtime
Deadtime	NOK	Active	NOK = TNOK	After Click, free of load	3 s		During Deadtime	After Deadtime
Rehit	NOK	Active	Rehit/NOK	After Click, free of load	3 s		During Deadtime	1 s Interval

Outside of the Charging Cradle MWR

	<i>Battery</i>	<i>Status Job</i>	<i>Status</i>	<i>MWR Condition</i>	<i>LED Red</i>	<i>LED Green</i>	<i>LED Yellow</i>	<i>LED Blue</i>
	OK	No Job	Ready to Use	Free of load			3 s Interval	
	OK	No Job	OK = LCK	After Click, free of load	3 s			
	OK	No Job	NOK = LCK	After Click, free of load	3 s			
	OK	No Job	Measuring	tqstart reached			< 1 s Interval	
	NOK	No Job	Ready to Use	Free of load	3 s Interval			
	NOK	No Job	OK = LCK	After Click, free of load	3 s			
	NOK	No Job	NOK = LCK	After Click, free of load	3 s			
	NOK	No Job	Measuring	tqstart reached	1 s Interval			

Inside of the Charging Cradle MWR

	<i>Battery</i>	<i>Status Job</i>	<i>Status</i>	<i>MWR Condition</i>	<i>LED Red</i>	<i>LED Green</i>	<i>LED Yellow</i>	<i>LED Blue</i>
	OK	Active	Ready to Use				Permanently	1 s Interval
	OK	No Job	Ready to Use				Permanently	
	NOK	Active	Ready to Use				Permanently	1 s Interval
	NOK	No Job	Ready to Use				Permanently	

ERROR

	<i>Battery</i>	<i>Status Job</i>	<i>Status</i>	<i>MWR Condition</i>	<i>LED Red</i>	<i>LED Green</i>	<i>LED Yellow</i>	<i>LED Blue</i>
Error	Outside of Charging Cradle MWR				300 ms Interval			
Out of radio range	Outside of Charging Cradle MWR				3 s Interval	3 s Interval	3 s Interval	
Error	Inside of the Charging Cradle MWR				300 ms Interval		Permanently	
Out of radio range	Inside of the Charging Cradle MWR						Permanently	



2.5 End Fitting Tools

At the front part of the MWR-TA the wrench has a standard drive (9x12 or 14x18) which allows to attach different types of end-fittings.

Order the *End Fitting Tools* for the MWR-TA separately, according to the related price list.

FUNCTION	DESCRIPTION
<p>Tool size (mm)</p>	<p>Specific length (in millimeters) that characterizes the end fitting tool installed on the MWR-TA (see the examples on the right):</p> <div data-bbox="954 719 1378 987" style="text-align: center;"> </div> <p>NOTE: It is mandatory to enter the proper value into the Pset. This value is used to calculate the proper torque applied to the joint.</p>
<p>Tool Bend (° / Nm)</p>	<p>Bending of the end fitting tool installed on the MWR-TA.</p> <p>NOTE: It is mandatory to enter the proper value. This value is used to compensate the bending of the end fitting tool in the angle measurement. The default parameter value is 0.</p>

A wide selection of *End-Fitting Tools* is available:

END FITTING TOOLS	DESCRIPTION
	<p>Open End</p>
	<p>Box End</p>

END FITTING TOOLS	DESCRIPTION
	Bit Holder
	Flared End
	Hexagon Ratchet
	Open Hexagon Ratchet
	Open End with Ratchet function
	Connector for Dovetail Insert
	Blank End

END FITTING TOOLS	DESCRIPTION
	Fixed Square
	Non-reversible Ratchet End
	Reversible Ratchet End
	Reversible Ratchet End
	Ratchet Reversible with Hexagonal Output
	Belknap adapter



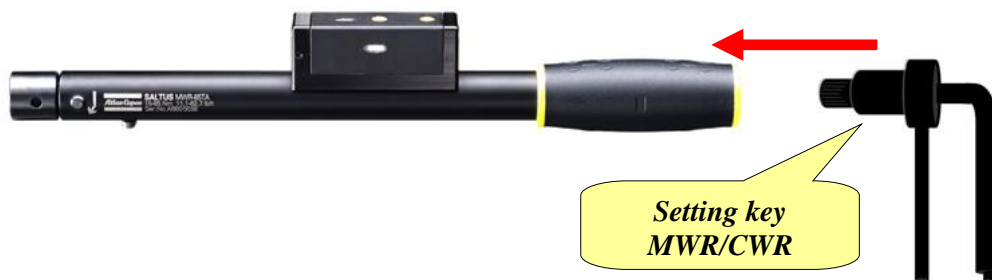
NOTE: Each *End Fitting Tool* of the above list characterizes more than one model. Refer to the price list for further details.

3 MWR-TA OPERATIONS

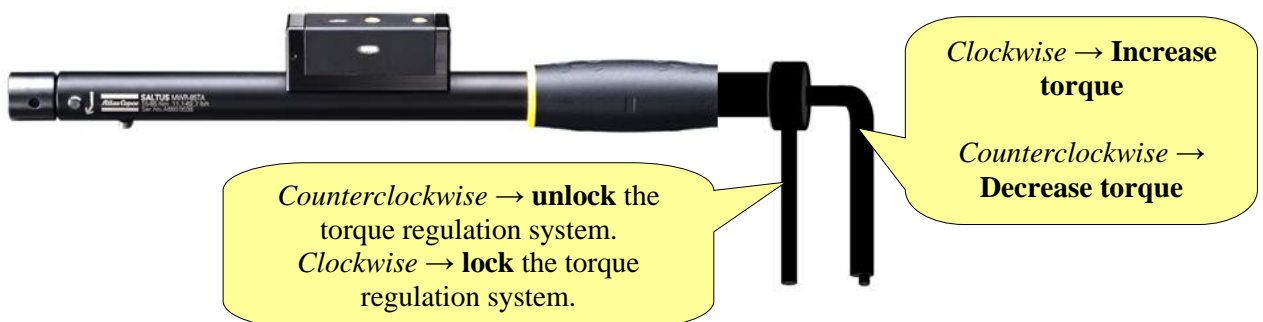
3.1 Click-Torque Adjustment

Do the following procedure in order to adjust the mechanical click-torque of the MWR-TA:

1. Insert the *Setting key MWR/CWR* in the MWR-TA and handle it as shown in the following figure:



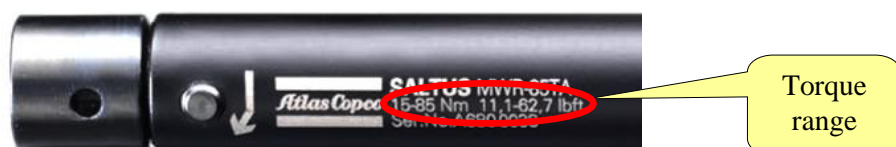
2. Unlock the MWR-TA torque regulation system; then adjust the torque. Finally, lock the torque regulation system.



NOTE: Please ensure that the torque regulation system is locked properly after adjusting the mechanical click-torque. After locking the torque regulation system, it is highly recommended to perform at least 10 clicks to verify the mechanical click setup.



NOTE: The label printed on each MWR-TA (see the following figure) indicates the torque range of the MWR-TA:



3.2 Handling

3.2.1 Correct handling

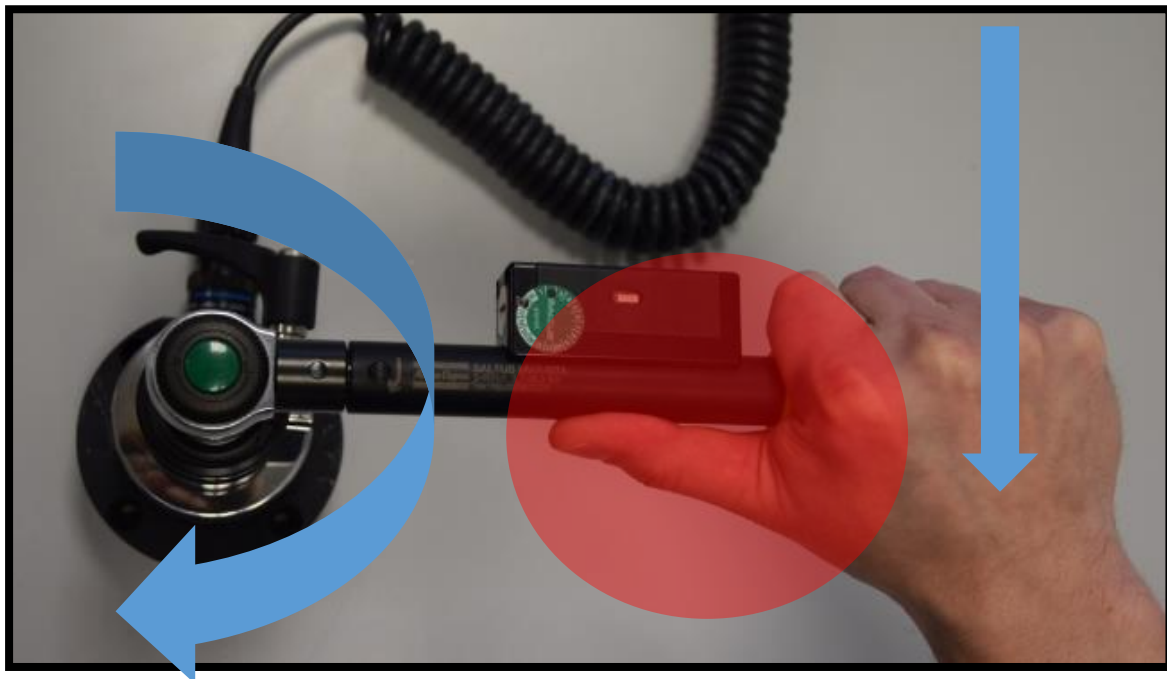
- The screw should be tightened in even strokes.
- The closing speed should be chosen so that when the click occurs an immediate interruption of the tightening process is possible.
- The operation of the torque wrench must be carried out by the middle of the handle.
- The force should be one-handed, uniform, parallel and applied in the last phase without interruption until the tool clicks.
- The achievement of the set value (Click) is clearly heard and felt.



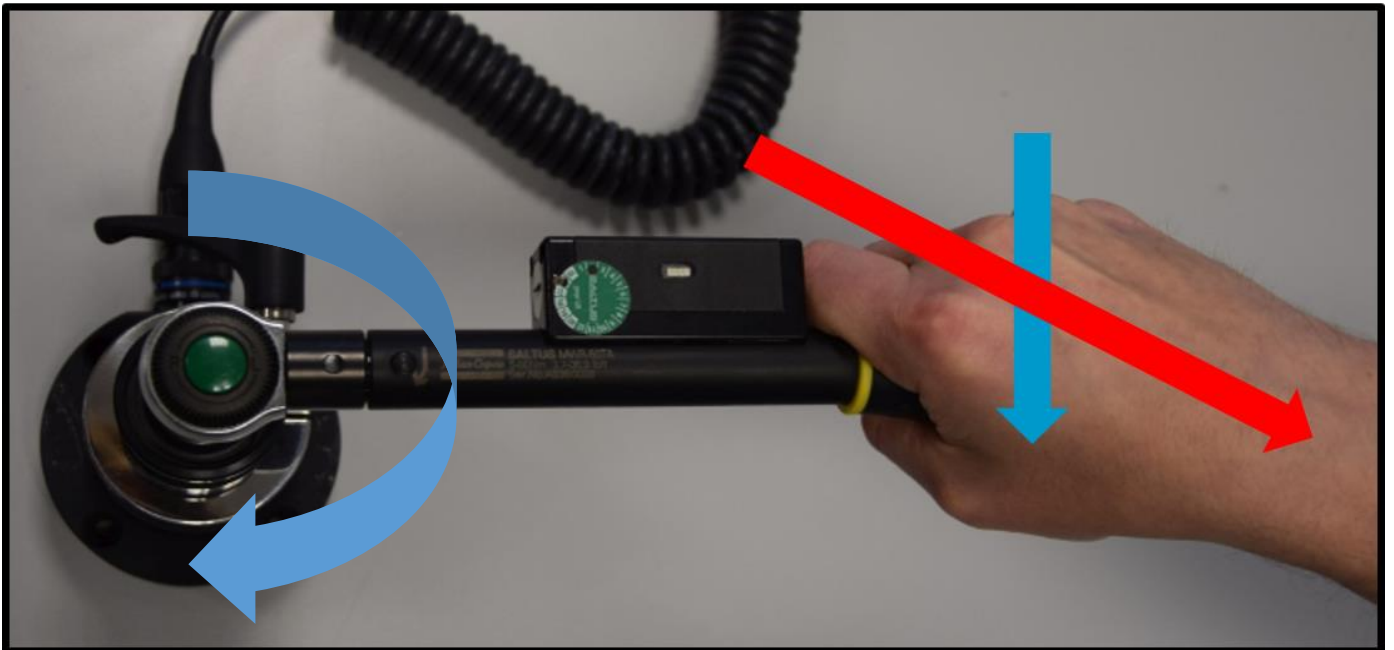
NOTE: After the automatic release (click), the wrench must not be moved further.

3.2.2 Wrong handling

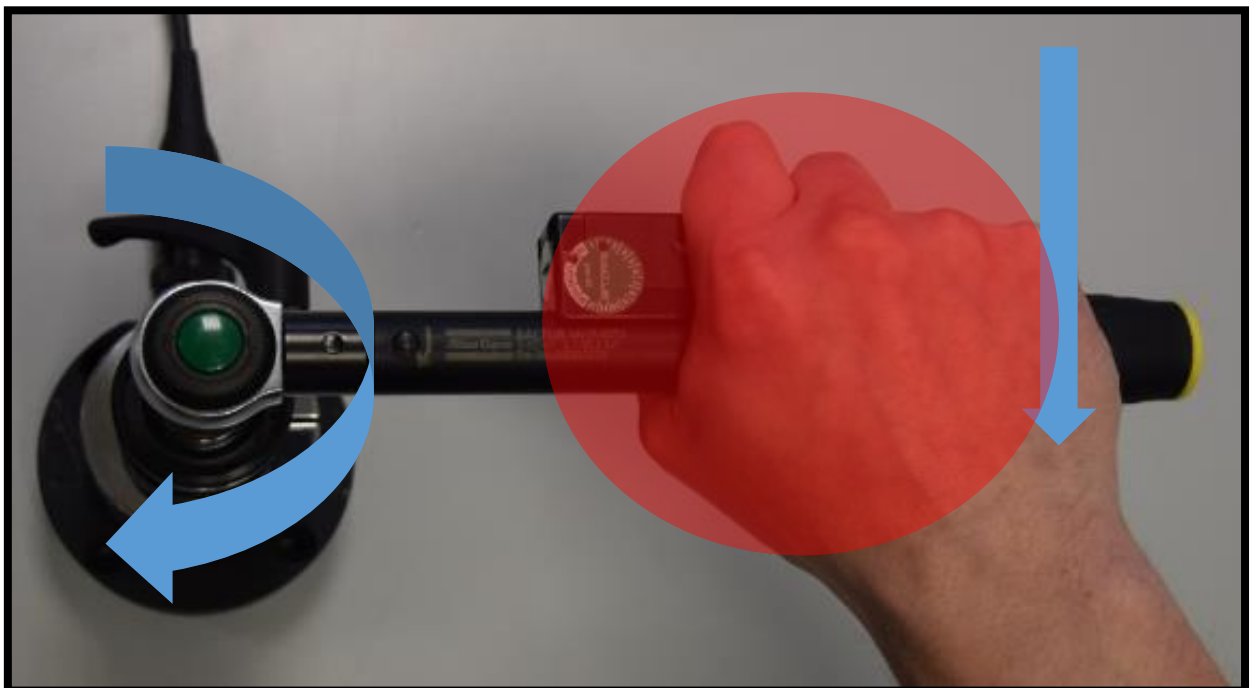
- Having the thumb on the tube will influence the Click value!



- Pull / Push only in tightening direction!
- The operation of the torque wrench must be carried out by the handle (middle).



- The operation of the torque wrench must be carried out by the middle of the handle.

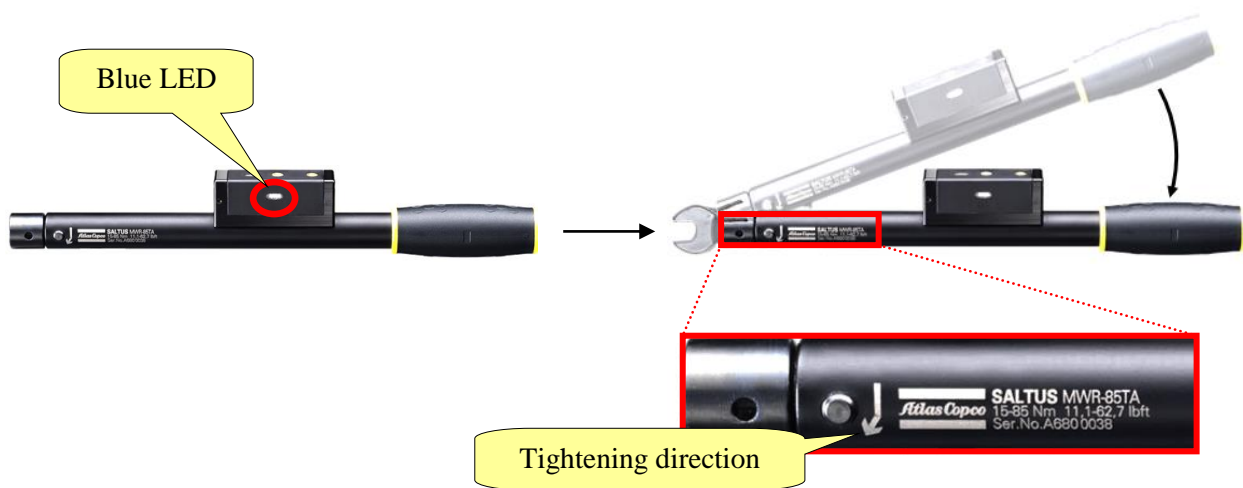


3.3 Tightening Test

The *Focus 60 / Focus 61 Controller* sends the tightening program (*Pset* and *Job*) to the MWR-TA.

When the MWR-TA receives the tightening program and the wrench is ready to use, the blue LED flashes.

Please, load the MWR-TA following the direction of the arrow shown on the related label (see the figure below):



During the measurement (MWR-TA is loaded with torque), the yellow LED flashes.

At the end of each tightening, the LEDs are alight according to the test result:

- **Green LED: Torque OK**
- **Red LED: Torque NOT OK**

4 MAINTENANCE

4.1 Cleaning

Keep the *MWR-TA* and the *Charging Cradle MWR* clean.

After use, remove any traces of oil, grease and dust from the *MWR-TA* and *Charging Cradle MWR*.

Use an anti-static cleaning cloth in order to remove dust from the *MWR-TA* and *Charging Cradle MWR*.

Avoid using harsh detergents to clean *MWR-TA* and *Charging Cradle MWR*.

5 TROUBLESHOOTING GUIDE

Here is a quick troubleshooting guide for the *MWR-TA* and *Charging Cradle MWR*.

If a problem occurs, before taking any action (replacing parts or contacting customer support), be sure to check that the *MWR-TA* and *Charging Cradle MWR* were used correctly.

Improper operations (*for instance Wrong end fitting used, MWR-TA removed from the Charging Cradle MWR while offset is running = LCK*) can cause troubles even though the system is in good working order.



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