Instruction Manual
P1890E/EN
2017-06

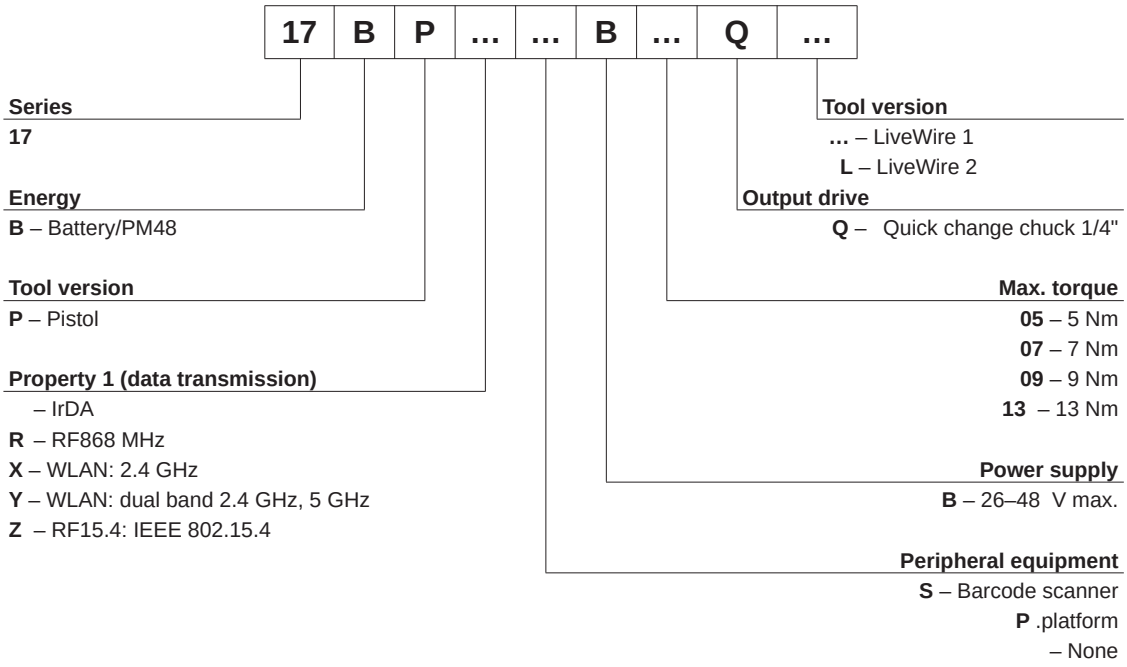
Cleco®

17BP

Cordless EC tool

Disclaimer:

Nomenclature



Contents

General safety instructions for electric tools

WARNING!

Read all directions and safety instructions. Failure to follow the directions and safety instructions could result in electric shocks, burns and/or serious injuries.

Keep all directions and safety instructions for future reference.

The term "electric tool" used in these safety instructions refers to an electrically powered tool (with power cable) and also to battery operated electric tools (without power cables).

1 Safety at work

a) **Keep your work area clean and well illuminated.** Untidiness and poorly illuminated work areas can cause accidents.

b) 

Do not work with electric tools in an explosive environment where there are combustible fluids, gases or dust. Electric tools create sparks which could ignite the dust or the vapors.

c) **Keep children and other persons away when using electric tools.** If you are distracted, you could lose control over the tool.

2 Electrical safety

a) **The plug on the electric tool must fit in the outlet. The plug must not be modified in any way. Do not use an adapter plug together with electric tools with protective ground connection.** Unmodified plugs and matching outlets reduce the risk of an electric shock.

b) **Avoid physical contact with ground-protected surfaces such as pipes, heating, ovens and fridges.** The risk of an electric shock will be greater if your body is connected to ground.

c) **Keep electric tools away from rain and wetness.** Water ingress into an electric tool will increase the risk of an electric shock.

d) **Do not misuse the cable to carry or suspend the electric tool or to pull the plug from the outlet. Keep the cable away from heat, oil, sharp edges or moving parts of the machine.** Damaged or tangled cables will increase the risk of an electric shock.

3 Safety of persons

Be alert, pay attention to what you are doing and act sensibly when working with electric tools. Do not use electric tools if you are tired or under the influence of drugs, alcohol or medication. One moment of carelessness when using an electric tool can lead to serious injuries.

a) 

Use personal protection equipment and always wear protective goggles. Depending on the type electric tool and on how it is being used, using personal protection equipment such as a dust mask, non-slip gloves, a hard hat or ear protectors will reduce the risk of injuries.

b) **Avoid unintentional start-ups. Make sure the electric tool is switched off before you connect it to the power supply or the battery, pick it up or carry it.** Carrying an electric tool with your finger on the switch or connecting the tool to the power supply while it is switched on could cause an accident.

c) **Remove any adjustment tools or wrenches before switching the electric tool on.** A tool or wrench in a turning part of the tool could cause injuries.

d) **Avoid any abnormal posture. Make sure you are standing firmly and keep your balance at all times.** This will enable you to keep better control over the electric tool in unexpected situations.

e) 

Wear suitable clothing. Do not wear loose clothing or jewelery. Keep hair, clothing and gloves away from moving parts. Loose clothing, jewelery or long hair could get caught up in moving parts.

4 Use and handling of a electric tool

a) **Do not overload the tool. Use the electric tool appropriate to the job you are doing.** Your work will be better and safer with the appropriate electric tool in the specified power range.

b) **Do not use an electric tool if the switch is defective.** An electric tool that cannot be switched on and off is dangerous and must be repaired.

c) 

Pull the plug for the nutrunner controller or the tool cable from the outlet and/or remove the battery before making any device settings, replacing accessories, or putting the device away. These precautionary measures will prevent the electric tool from starting unexpectedly.

d) **Keep electric tools out of the reach of children when they are not being used. Do not allow persons to use the tool unless they are familiar with it and have read these instructions.** Electric tools are dangerous if they are used by unexperienced persons.

e) **Take good care of electric tools. Check that moving parts are working properly and not sticking, that no parts are broken or damaged such that the function of the electric tool is impaired. Have any damaged**

parts repaired before using the tool. Many accidents are caused by poorly maintained electric tools.

f) **Use electric tools, accessories, insertion tools, etc. in accordance with these instructions. Take into account the work conditions and the job to be done.** The use of electric tools for applications other that those intended can lead to a dangerous situation.

5 Service

a) [1] **Only have your electric tool repaired by a qualified specialist and only using original replacement parts.** This will ensure that the safety of the electric tool is maintained.

Specific safety instructions for electric hand-held nutrunners

b) *Our insulation is not insulation in the sense of VDE standards:* Hold the device at the insulated handle surfaces when you perform work where the screw can strike hidden power lines or your own power cable. Contact between the screw and a live power line could energize metal parts of the tool and cause an electric shock.

c) 18ET/EC, 48ET/EC: By accidentally pressing the start button, the drive socket can rotate in the right angle nutrunner attachment (e.g., when putting aside the tool). There is a risk that fingers may be crushed or severed in the process. Never reach into the drive socket. To change the drive socket, unplug the tool cable.

d) Hold the tool firmly. Be prepared for alternating counter torques.

e) For applications of the tool in limited spaces and torques over
- 4 Nm, straight tools
- 10 Nm, pistol-type tools
- 60 Nm, angle tools

always use a reaction bar. Never rest your hand on the reaction bar when working.

f) Check that the suspension bail is properly secured to the balancer.

Tools with integrated barcode scanner

Class 2 laser product
Class 2 laser scanners use a laser diode that produces a low-power visible light beam that is comparable to a very bright source of light, such as the sun.
Doing so can cause damage to the eyes.

- Do not look into the laser beam.
- Repair faults on optical parts at once.
- Changes to the barcode scanner are prohibited.
- Take defective tools out of operation immediately.

6 Use and handling of the electric hand-held nutrunner

a) Only use screw bits for machine-controlled tools.

b) Make sure that the screw bits are securely inserted.

c) Do not attach screw bit to the screw head at an angle.

d) Inspect screw bits for visible damage and cracks. Replace damaged screw bits immediately.

e) Disconnect the tool from the power supply before changing the screw bits.

f) Never use a high-pressure cleaner/jet to clean the tool.

g) Do not immerse the tool in cleaning agents.

h) Cordless EC tools: Do not open the battery pack.

1. Due to their vocational training, knowledge, experience and understanding of the circumstances involved in this kind of work, suitably qualified personnel are able to identify potential hazards and to initiate appropriate safety measures. Qualified personnel are obliged to comply with regulations.

1 Introduction

The original language of this Instruction Manual is German. This Instruction Manual is intended for any persons working with this tool that do not carry out any programming.

The Instruction Manual has the following purposes:
- provides important notices for safe and effective operation.
- describes the function and operation of the cordless EC tool.
- serves as a reference for technical data, service intervals, and spare part orders.
- indicates options.

1.1 Further information

Document No.	Document type	Title
P2260JH	Installation Manual	WLAN data transmission Cordless EC tool
P1730E	Procedure description	Bolted joint diagrams
P2280SW	Programming Manual	mPro400GC Standard SW
P2171MA	Assembly instructions	TAG D4 Ubisense 943546PT
P2172MA	Assembly instructions	Scanner 937240PT, 961621PT
P2242MA	Assembly instructions	Gyroskop 942039PT
P2262MA	Assembly instructions	TAG D4 Ubisense & Scanner 942169PT
P3248C	EC Declaration of Conformity	Cordless EC tool

Symbols in the text:

17BP(…)	stands for all versions of the cordless EC tool/LiveWire 1 described here.
17BP(...)L	stands for all versions of the cordless EC tool/LiveWire 2 described here.
ES	stands for all versions of the power supply described here: Battery pack or Power module.
LMC	stands for the LiveWire Memory Chip memory module
•	identifies lists.
→	identifies instructions to be followed.
In the software descriptions	
Italic	identifies menu items such as *Diagnostics*
<…>	identifies elements that have to be selected or deselected, such as buttons or check boxes, e.g., <F5>
`Courier`	Denotes input fields, check boxes, radio buttons or dropdown menus. Denotes filenames and paths, e.g., **`setup.exe`**
\	A backslash between two names indicates the selection of an item from the menu, e.g. file \ print

Symbols in graphics:

⟵	identifies movement in one direction.
⇩	identifies function and force.

2 Warnings and notices

Warning notices are identified by a signal word and a pictogram:

- The signal word describes the severity and the probability of the impending danger.
- The pictogram describes the type of danger.

WARNING!

A symbol combined with the word **WARNING** indicates a hazard with a **medium level** of risk which, if not avoided, could result in death or serious injury.

CAUTION!

A symbol combined with the word **CAUTION** indicates a hazard with a **low level** of risk which, if not avoided, could result in minor or moderate injury or environmental damage.

General notices
include application tips and useful information but no hazard warnings.

2.1 Symbols on the product

Be sure that you understand their meaning before operation

Class 2 laser product
Class 2 laser scanners use a laser diode that produces a low-power visible light beam that is comparable to a very bright source of light, such as the sun.
Do not look into the laser beam when the laser is on.
Doing so can cause damage to the eyes.

CE compliant
The product corresponds to the prescribed technical requirements in Europe.

Read all instructions.

Observe generally valid disposal guidelines such as, in Germany, the Electrical and Electronic Equipment Act (ElektroG) and the Battery Act (BattG).

→ Wasted rechargeable batteries must be disposed of. Return the tool and defective/power supplies to your company collection facility or to *Sales & Service Centers*.

Eurasia compliant
The product corresponds to the prescribed technical requirements in Russia, Belarus and Kazakhstan.

2.2 Operator training

All operators must be trained and experienced before operating the tool. The tool may only be repaired by authorized personnel.

2.3 Intended use

The tool is a part of the APEX tightening system and is exclusively intended for fastening and releasing threaded fasteners.

→ Use only in connection with a nutrunner controller of the mPro400GC series and the accessories and cables approved by APEX.
→ Only operate with a power supply from APEX.
→ Do not use as a hammer or for re-bending.
→ Do not open it or modify it structurally.
→ Do not use it in areas where there is a risk of explosion.
→ Only in EMC Limit Class A (electromagnetic immunity for industrial areas).

2.4 Standards

It is mandatory that national, state, and local codes and standards be followed.
12 Technische Daten, Page 58.

2.4.1 FCC conformity

This device complies with Part 15 of the FCC Rules. Operation satisfies the following two prerequisites: (1) the device does not cause any impermissible failure, and (2) the device accepts failure, including failures which cause unwanted operation of the device.
Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

2.4.2 Canada conformity

Operation satisfies the following two prerequisites: (1) the device does not cause any impermissible failure, and (2) the device accepts failure, including failures which cause unwanted operation of the device.

2.4.3 EMC, noise, vibration

For the currently observed EMC standards, emission sound pressure levels and vibration values, see the EC Declaration of Conformity.

3 Items delivered and storage

3.1 Items delivered

Check delivery for transit damage and ensure that all items have been supplied:
1 17BP
1 This instruction manual
1 Declaration of Conformity
1 Factory test certificate for transducers
1 Machine Capability Analysis (MCA)

3.2 Storage

For short-term storage and for protection against damage
→ Place the tool in the tool holder.
For storage longer than 100 hours

→ Disconnect the battery pack from the tool.
The battery pack is discharged by the electronics integrated in the tool.

For the storage temperature, see 12.7 Umgebungsbedingungen, Page 67 .

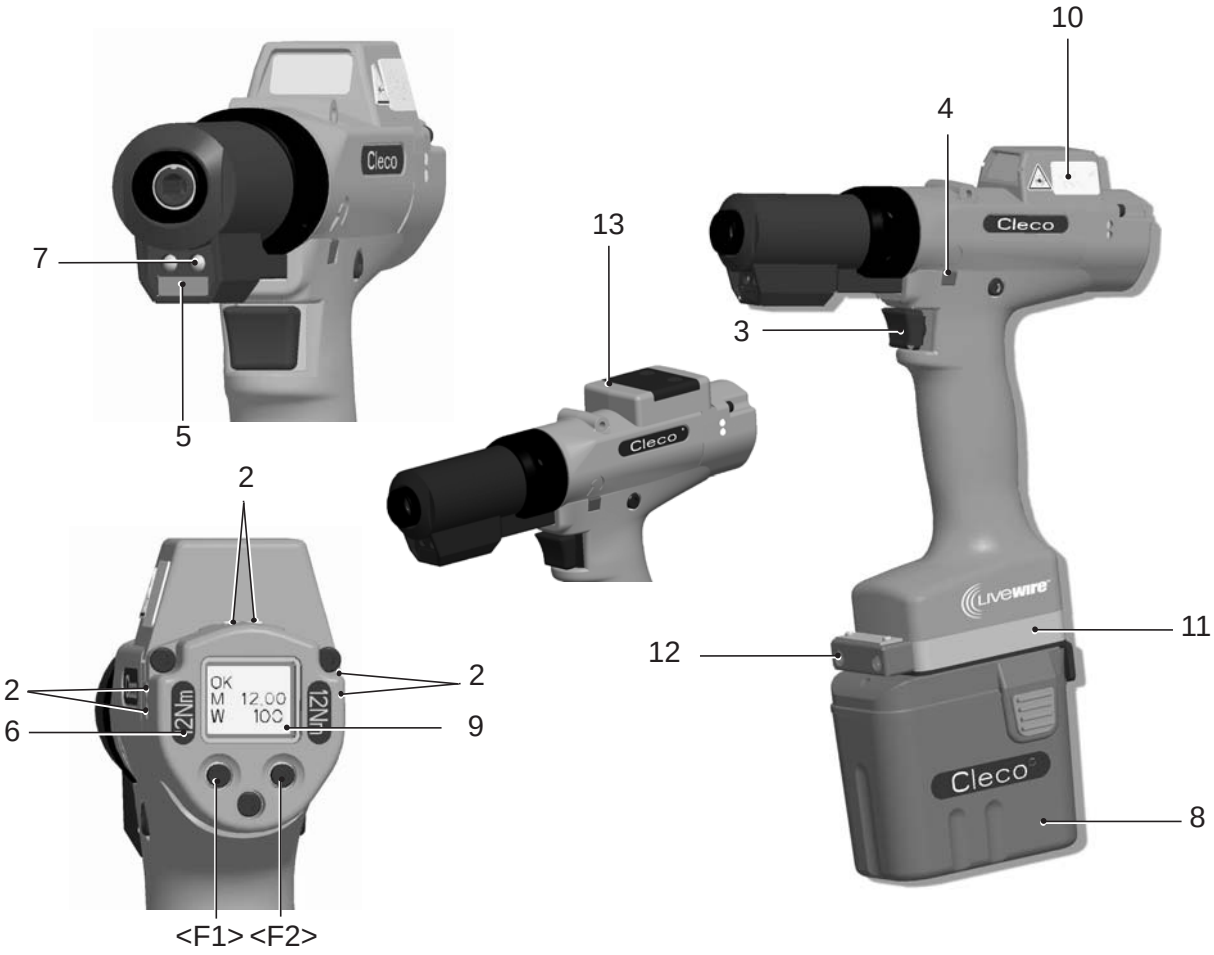
4 Product description

4.1 General description

- Sturdy, brushless motor with resolver. Shutoff is torque/angle-controlled.
- LCD display with information on status, torque, and angle.
- Green OK and red NOK LED display provides information about current fastening result.
- LED lighting makes it possible to find the screw point quickly.
- Clockwise/counterclockwise rotation
- Low vibration level
- Servo and fastening electronics are integrated in the tool.
- Fastening parameters are set with the controller or a PC.
- An exchangeable memory module (LiveWire Memory Chip) allows the quick exchange of identical tools, without changing the parameters.
- Depending on the type, data is transmitted between the control and the tool via
  - Infrared (IrDA)
    Parameters and fastening results are transmitted to the control system or to a PC by simply placing the tool in the tool holder.
  - 868 MHz
  - WLAN
  - RF15.4 (IEEE 802.15.4)
- Power can be supplied by way of
  - Battery pack 26 V/44 V
  - Battery pack 18 V (special type)
  - Power module 48 V
- Optionally, the tools are equipped with a 1D Linear barcode scanner.
- Built-in acoustic signal. The signal is activated after barcodes are scanned. It can also be activated after NOK rundowns for a programmable time.

4.2 Operation and functional elements

This chapter describes operational and functional elements and their tasks in the order of their respective item nos.



Item	Designation
<F1>, <F2>	Function keys
2	LED display
3	Start button
4	Reverse switch
5	IrDA (infrared interface port)
6	Set torque – stick-on marking foil
7	LED lights for fast location of the fastening position
8	Power supply; battery pack 26 V illustrated
9	LCD display with information on torque, angle, and status
10	Barcode scanner
11	Wireless module
12	LiveWire Memory Chip (LMC); 17BPX(…) illustrated
13	Platform; 17BPYP(…) illustrated

4.2.1 Function keys

Left function key <F1>

- Confirm error message

→ Press once.

Programmable: Depending on how the key is programmed, actions can be carried out by pressing it briefly.

- Exit menu

→ Press for two seconds

Right function key <F1>

- Activate menu

→ Press until the display shows the *Main menu* (for additional information, refer to 8.3.4 Administration submenu, Page 28).

- Select functions, if menu is activated

→ Press for two seconds. Alternatively, the start button can be pressed.

4.2.2 LED display

The LED display shows the respective operating status and the result of the last fastening sequence (see 7.2 Operating status, Page 19):

LEDs	Operating status	Result after fastening cycle
Continuous green light	Active	OK
Continuous red light	Active	NOK
Flashing light Green – low frequency	Energy saver mode	
Off	Sleep	
If linking is selected on the controller:		
Green flashing light – high frequency	Active/Setting: Linking	Linking OK
Flashing red light	Active/Setting: Linking	Linking NOK

Software update

During the *software update*, the actual programming process is indicated by rapid flashing alternating at irregular intervals between red and green.

Do not interrupt programming by disconnecting the power supply during this phase.

4.2.3 Start button

Depending on the setting, the start button has three functions:

- It activates the LED lighting.

→ Press the start button halfway down and hold it.

- It starts the motor, the LED light goes out.

→ Press the start button all the way down.

- It activates the barcode scanner—only for types of the 17BP(...)S series.

→ Press the start button all the way down.

4.2.4 Reverse switch

The reverse switch changes the rotation direction of the tool:

Clockwise rotation – for screwing in screws
Press reverse switch as far as it will go.
When the start button is pressed *Active* appears on the LCD display.

Counterclockwise rotation – for loosening or screwing out screws
Press reverse switch as far as it will go.
When the start button is pressed *Left* appears on the LCD display.

4.2.5 IrDA interface port

The tool communicates with the controller over the tool holder via the IrDA interface port (infrared). For secure data transmission and for programming, place the tool in the tool holder with IrDA interface port, Order No. 935999. Data transmission is possible in the Active, Energy-saver mode and *Standby* operating modes, but not possible in *Sleep* mode (see 7.2 Operating status, Page 19).

If the data transmission has been interrupted, the LCD display reports a synch error.

→ Replace the tool in the tool holder.

The complete data transmission is acknowledged on the display with *Rest 512*.

4.2.6 Identification – set torque (accessories, optional)

To identify the tool with the set torque, glue the corresponding marking foil to the right and the left of the LCD display.

4.2.7 LED lighting

LED lighting make it possible to quickly find the screw point.
3 different activation methods are possible. Which is used depends on the programming in the control:

- Activation by pressing the start button halfway down (4.2.3 Start button, Page 12).
- Time-controlled beginning at start
- You also have the option of disabling it.

The range of the LED illumination is 500 mm.

4.2.8 Power supply

See instruction manual for battery pack/instruction manual for power module PM48

4.2.9 LCD display

See 8 LCD display, Page 21

4.2.10 Barcode scanner

For tools of the (...)S series, the built-in barcode scanner is a class 2 laser scanner with a wavelength of 650 nm.

CAUTION!

Eye injury from class 2 laser beam

- → Do not look into the laser beam window when the laser is on.
- → Repair any damage immediately.
  Damage of the optical components can cause laser radiation.
- → Modifications to the barcode scanner and procedures not outlined in this instruction manual are strictly prohibited.
- → Take defective devices out of operation immediately.

Keep window clean.
A dirty window affects the detection rate of the scanner.

The barcode scanner reads one-dimensional linear barcodes:

Scanning operation	Acoustic signal
• Successful	50 ms long
• Faulty • Not within 3 seconds • *Cancel* by releasing the Start button	3 times in rapid succession

Depending on how the control is programmed, there are two different operating modes:

Barcode as release for further rundowns

→ Press the start button on the tool; this activates the barcode scanner.
The successful scan is acknowledged by an acoustic signal.

→ Press the start button on the tool again; this starts the rundown.

If is necessary to read another barcode, proceed as follows.

Barcode not necessary as release for further rundowns

→ From the *Scanner* tool menu, select *Read barcode*.

→ Press the start button on the tool; this activates the barcode scanner.
The successful scan is acknowledged by an acoustic signal.

→ Press the start button on the tool again; this starts the rundown.

Alternatively: assign the *Read barcode* function to the left function key <F1> on the tool.

→ Press the left function key <F1> on the tool once.

→ Press the start button on the tool again; this activates the barcode scanner.

Programming the barcode scanner is described in the programming manual of the control.

4.2.11 Wireless interface

Depending on the exact type, the tools are also equipped with a wireless interface in addition to the IrDA interfaceThe tool uses this wireless interface port for continuous communication with the controller. This

Type	Communications	Required linking terminal
17BPR(…)	RF868 MHz	Basis station Order No. 961300
17BPX(…)	WLAN standard IEEE 802.11b	Access point to standard IEEE 802.11b
17BPY(…)	WLAN standard IEEE 802.11a/b/g	Access point acc. to standard IEEE 802.11a/b/g
17BPZ(…)	WPAN standard IEEE 802.15.4	Basis station Order No. 961390/961410

interface port is used to transmit both the parameters and the rundown results. Data transmission is possible in the *Active*, *Energy saver mode* and *Standby* operating modes, but not possible in *Sleep* (see 7.2 Operating status, Page 19). Programming and setting up the wireless interface port are described in the programming manual of the controller.

After the tool is switched on, it can take up to 35 seconds until the communication is active.

4.2.12 LiveWire Memory Chip (LMC), only for types of the 17BPYP(…)

To permit simple replacement of tools in production, a replaceable LMC memory module is installed. When the tool is switched on, the network settings are read from the LMC chip and used to establish the WLAN connection. When the tools are changed, the LMC has to be installed in the new tool being used. Please refer to 6.3 Changing LMC, Page 17.
The following data are stored on the LMC:

- MAC address
- Network name (SSID)
- Encryption
- Network key
- Use of the DHCP server
- IP address
- Subnet mask
- Gateway
- Country-specific settings

The MAC address is defined by *Cleco* and cannot be changed. The other data can be changed via infrared connection of the tool to the controller.

4.2.13 Platform, only for models of the 17BPYP(…)

Tools with a platform are basic tools which can be fitted with different add-on parts. Scanners and tags can be ordered individually.

5 Accessories

LiveWire 1/2			
	Battery pack, li-ion, 26 V Order No. 935377		Battery pack, li-ion, 44 V Order No. 936400PT

LiveWire 1/2			
	Battery charger, li-ion 26 V (110 – 230 VAC) Order No. 935391 – 1-piece Order No. 935302 – 4-piece		Battery charger, li-ion 44 V (85 – 270 VAC) Order No. 936491 PT – 1-piece
	Adapter cable PM48 Order No. 961341-030 – 3 m Order No. 961341-060 – 6 m Order No. 961341-080 – 8 m Order No. 961341-100 – 10 m		Extension cable: Adapter cable PM48 Order No. 961342-030 – 3 m Order No. 961342-060 – 6 m Order No. 961342-080 – 8 m Order No. 961342-100 – 10 m
	Tool holder with IrDA interface Order No. 935144 …without IrDA interface, Order No. 935396		RS232 extension cable (IrDA) Order No. 935154 – 3 m (9.84") Order No. 935155 – 6 m (19.7") Order No. 935157 – 10 m (32.8")
	Power Module PM48 Order No. 961350PT		IrDA adapter Order No. 935170
	laminate Order No. 935078		
	LMC Order No. 961461PT		
	Platform: Scanner Order No. 961621PT – Laser Class 1 Order No. 937240PT – Laser Class 2		Platform: Top plate Order No. 937255PT
	Platform: Gyroscope Order No. 942039PT		Platform: TAG/Scanner Order No. 942169PT
	Platform: TAG D4 Ubisense Order No. 943546PT		Platform: 2D scanner Order No. 943045PT

Only for LiveWire 1			
	Scratch protection scanner (not for 17BPYP(…) with platform) Black: Order no. 936489PT Green: Order No. 942182PT		Platform: Scratch protection TAG scanner Black: Order no. 942336PT Brown: Order No. 942337PT Green: Order No. 942338PT Pink: Order No. 942339PT

6 Prior to initial operation

The tool was preset by Apex Tool Group. A setting for your specific fastening sequence must only be made with the controller or a PC by a qualified person. For more information, refer to the programming manual.

6.1 Setting up tool holder

→ Mount the tool holder on a stable base.

For tool holder with IrDA interface port:

→ Select the location in such a way that no outside light shines onto the tool holder. This can inhibit data transmission.

→ Lay the connection cable in such a way that there is no danger that persons can trip.

6.2 Charge battery pack

Battery pack is only partly charged upon delivery.

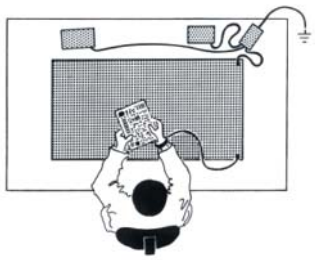
→ It must be fully charged before initial use. See battery pack instruction manual.

6.3 Changing LMC

NOTE

Electrostatically sensitive component. Note handling instructions.

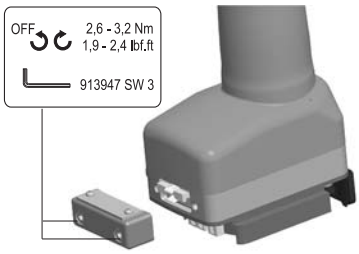
The electronic assemblies of the cordless EC tool can be destroyed or damaged by electrostatic discharge (ESD). This can lead to immediate failure, or to malfunctions at a later date. To avoid damage when changing the LMC, make sure that there is a potential equalization between the person and the tool.



Graphic: CANESPA

Possibly set up equipment in an ESD-protected environment. Recommendation for an ESD workplace: Electrically conductive work surfaces, anti-static straps, appropriate furniture, clothing and footwear, as well as grounding of all components.

LMC must only be changed with the battery is disconnected.

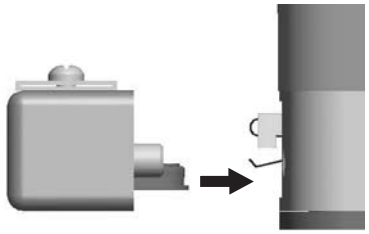


Removing LMC

→ Remove the battery.

→ Slacken the screws (M4, DIN 912).

→ Carefully pull the LMC out of the handle and replace it.



Inserting LMC

- → Carefully insert the LMC as shown in the illustration.
- → Tighten the screws (M4, DIN 912).
- → Insert the battery.

Fig. 6-1: Changing LMC

6.4 Activating scanner/TAG

See the corresponding installation instructions:1.1 Further information, Page 7

→ Activate the LCD display with the start button.

→ Select ***Administration*** > ***Platf***. To do this, select menu items with <F1>/<F2> and confirm with the start button.

<Main
Admini
strati

Platf
None

→ Enter ***Pin 254***. To do this, count up with <F1> and confirm with the start button..

Pin
000

→ Select ***Barcod*** or ***TAG***(firmware-dependent) and confirm with the start button

Platf
937›
Barcod

Platf
937›
TAG

…

6.5 Changing the screw inserts

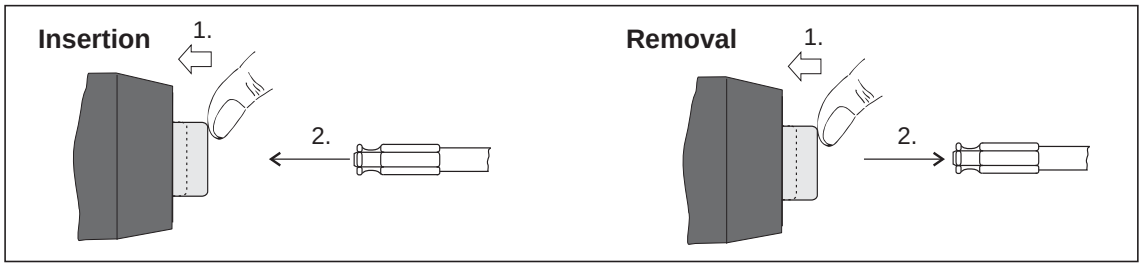


Fig. 6-2: Screw bits (GETA/APEX recommendation): Connection in accordance with DIN 3126, form E 6.3 (¼" shank).

7 Initial operation

WARNING!

Risk of glove being pulled in due to rotating machine parts.
Risk of fingers being crushed or lost.

→ Do not wear gloves when working with this tool.

7.1 Carrying out the rundown

Ensure secure position of the power supply before starting the tool. The tool is now ready for operation.

→ Press and release the start button: Rundown is executed, the LCD display shows *Ready.*

Types with wireless transmission continuously communicate with the controller. The tool automatically receives the parameters and, when the rundown is complete, automatically sends the rundown results to the control system. Programming and setting up the wireless interface port are described in the programming manual of the controller.

Types without wireless transmission must be placed in the tool holder when the rundown is complete. The rundown results are transmitted and shown under the *Run screen* menu item.

7.2 Operating status

The operating modes change in the following order. The following functions are available depending on the display:

Operating status	LED display	LCD display	Function
Active	Continuous light: Red – Fastening NOK Green – Fastening OK	On	screws Data transmission
[1)] After 1 minute idle time automatic switch to:			
Energy saver mode	Green flashing light	Off	Data transmission
Automatic switch to the following after a further 10 minutes:			
Sleep	Off	Off	Data transmission not possible
Manual change from *Sleep* to *Active*: Press the start button fully down and hold it for about 1 second. For manual deactivation of the tool, disconnect the power supply.			

1) Times are default values and can be programmed in the controller.

8 LCD display

The LCD display on the tool is divided into the result display, status display, operating menu and system error messages.

8.1 Result display

The LCD display consists of a three lines, each with 6 characters,
to display the status, torque and angle. The result display is updated after the rundown ends.

First line – result:

OK	Result is OK
NOK	Result is not OK
OFF	Torque encoder offset error
CAL	Torque encoder calibration error
ENC	Angle encoder error
IP	Current overload in output section
IIT	Requested motor output is too high
TMAX	Maximum fastening time exceeded
RC	Rundown terminated by disabled start signal
TS	Depth sensor signal was enabled at start or was subsequently disabled during the rundown (only for 17BP series)
Tq<	Torque too low
Tq>	Torque too high
WI<	Angle too small
WI>	Angle too large
Error	Error occurred
AW<	Too few graphic values recorded for an evaluation (SEQ 31/51)
BLOC	Fastened to block / tightened screw fastened (SEQ 31/51)
IRED	Current redundancy error
JMP	Bit jump detected
MBO>	Torque has exceeded top evaluation torque (SEQ 31/51)
MBU<	Torque has fallen below bottom evaluation torque (SEQ 31/51)
MDSI	Safety torque exceeded (SEQ 31/51)
SS>	Time for stick-slip too large
SST	Too many stick-slip edges
TTT<	Time since TT too small
TTT>	Time since TT too large

The status is displayed in alternation with the Application being used.

Second line – Shut-off torque in Nm:

T	Shutoff torque

Third line – Shut-off angle in degrees:

A	Shutoff angle

The ⚿ symbol at the top right shows an interrupted data connection to the control.

8.2 Status display

The status display is divided into the "Standard" and "Linking" modes. "Standard" is selected if "Linking" is not enabled at the control system

→ See **`Process Programming Advanced\Linking`**). The application is selected at the <Run Screen> or via the App. selection inputs.

No other status messages take priority.
The tool is ready.

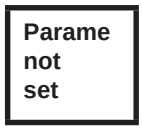
Number of remaining rundowns that can still be carried out until the rundown data memory is full and the rundown data have to be transmitted to the control.

All fastening sequences have been completed.

→ Synchronize the tool with the control once again.

No fastening sequences have been initialized.

→ Synchronize the tool with the control once again.



No fastening sequence parameters have been set.

→ Check the Application and Tightening group selected on the control to determine whether the tool settings and process programming have been carried out.

Application locked.

→ Synchronize the tool with the control once again.

Reject Release active.
The Reject Release was programmed in the control.

→ See **`Process programming\Advanced\Tool Settings\Reject Release`**.

→ Depending on the programming, unlock the tool via the external input *NOK release* or Release on Backoff. For unlocking via the external input *NOK release*, set the external input and synchronize it with the control.

Sync Error	Error in last data synchronization with the control. → Synchronize the tool with the control once again.
Tool not set	Tool has not yet been synchronized with a control. → Synchronize the tool with the control for the first time.
Input Enable Missin	The *Tool Enable* input is missing. → Activate **`External Tool enable`** in **`Process programming\Advanced\Tool Settings`**. → Synchronize the tool with the control once again.
Need Part ID	No barcode was detected within the timeout or an invalid barcode was read. The display switches to *Expect barcod*. → Scan the barcode in again.
Wait barcod enable	Tool waits for job from the control. If no job within 5 seconds: → Scan the barcode in again.
Expect barcod	Tool waits for a barcode to be scanned.
Barcod accept	Barcode was read successfully and confirmed by the control.
WLAN init..	Initialization of WLAN chip and WLAN module.
Service in XXXXXX	Optional - XXXXXX rundowns remaining until next service.
Serv. Interv	Optional - Service interval—the tool is blocked. No rundowns possible. → Return tool to *Sales & Service Centers* for service.

Additional messages in "Linking" mode

P 1/16 0ZZ899 99	Linking display, if this is programmed in the job, here link position 1 of 16 for WK-ID 0ZZ89999.
N.Pos1 of 3 Rpl 0	First line: The next position to be fastened. Second line: Number of positions. Third line: Number of repetitions at this position in case of an NOK rundown.
Linkin No Result	Linking has been canceled without a batch result. Not all of the positions in the tightening group have been programmed. → Check the Application and Tightening group selected on the control to determine whether the tool settings and process programming have been carried out.
Linking OK	Linking result OK.
Linking NOK	Linking result NOK.
Linkin locked Synch	Linking disabled. → Synchronize the tool with the control once again.
Linkin No Job	Wait for end of transmission. → Synchronize the tool with the control once again.

8.3 Operating menu

8.3.1 General

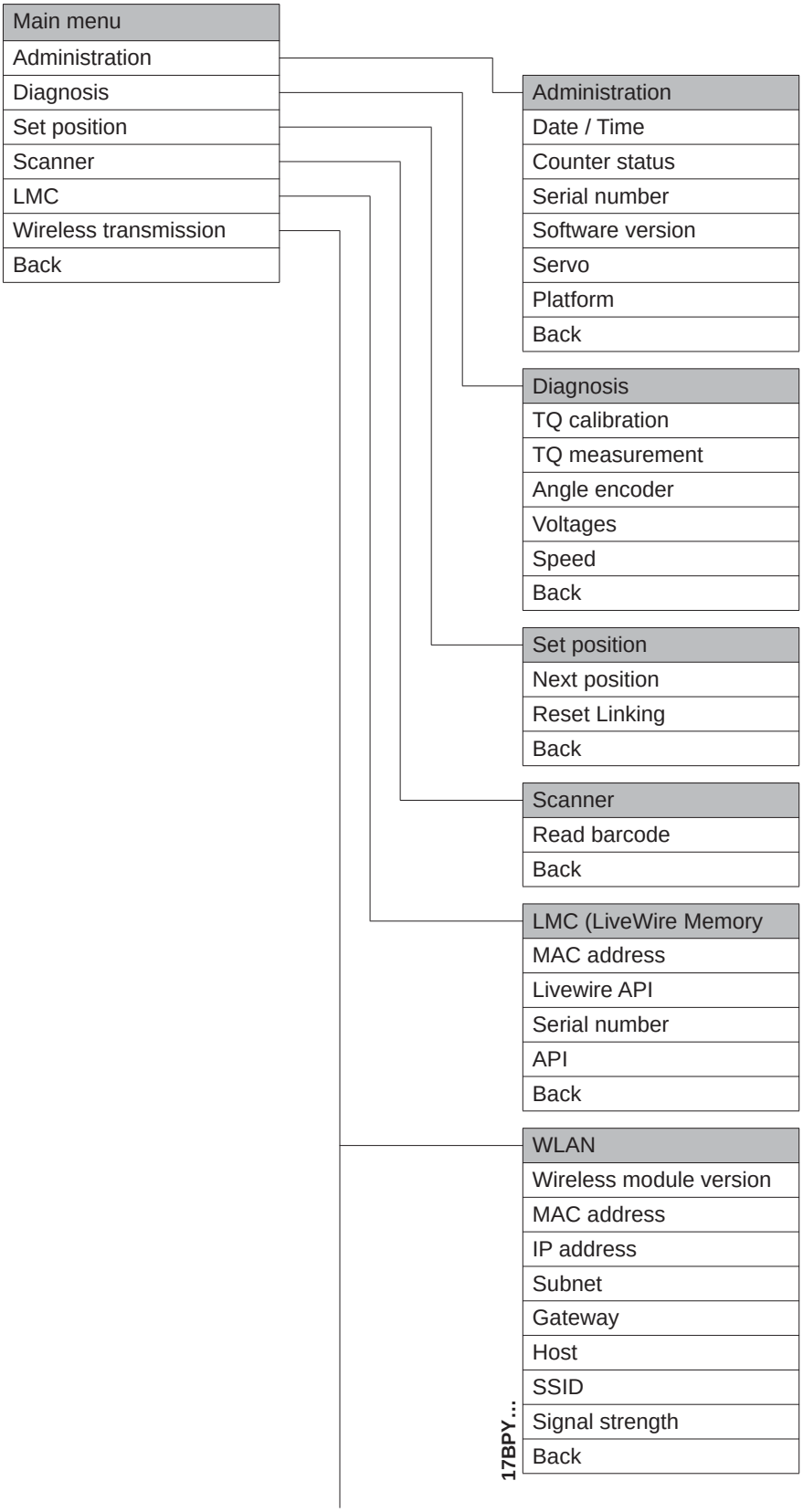
The operating menu on the tool is divided into a main menu and submenus. You can navigate through the menus using the two function keys below the LCD display. In the following description, <F1> is used for the left function key and <F2> is used for the right function key. The menu is activated by pressing the right function key, <F2>. The menus can be disabled by configuring appropriate parameter in the controller.

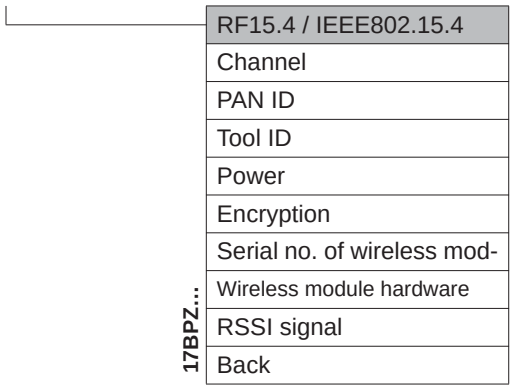
Basic functions:

- → <F2>: Activate main menu.
- → <F1>: Go to previous menu item.
- → <F2>: Go to next menu item.
- → Press <F1> longer than 2 seconds
  to go to the next higher menu level. If the main menu is activated, the system goes into production mode.
- → Press the start button or <F2> longer than 2 seconds
  to activated the highlighted item or execute the highlighted action. Actions that start the tool can be carried out only by pressing the start button.
- → If the menu is enabled, no rundowns are possible.
- → At the end of each submenu there is an entry for *Back*.

Enables the main menu.

8.3.2 Structure





8.3.3 Main menu

>Main Administrati	Shows general items such as Date/Time, Counter display, etc.
>Main Diag-nostic	Diagnostic functions for the tool.
>Main Posi-tion	*Position* – Selects the position to be used next.
>Main Scan-ner	Deletes a previously read barcode and activates a new read cycle.
>Main LMC	Shows Settings *LiveWire Memory Chip*.
>Main RF WLAN	Shows settings of wireless transmission.

8.3.4 Administration submenu

Time 07:47 30.09

Date / Time
Displays the tool system time.
The system time can be displayed in US or European format.

→ Refer to "Setting the system time on the control" under **`Administration\Date\Time`**.

Counte 99 XXXXXX

Counter status
The tool counter display is incremented after each rundown throughout the service life of the tool.
Refer to control under **`Diagnostics\Tool\Tool Memory`**.

Counte load XXXXXX

Optional -
Active when service counter was activated by Apex Tool Group.
Number of rundowns under load.

Counte serv XXXXXX

Optional -
Active when service counter was activated by Apex Tool Group.
Number of rundowns until next service.

S/N 000000 245

Serial number
Serial no. display.

→ Refer to Serial number on the Control under **`Tool Setup`**.

Vers. V1.00. 00

Control software version
Displays the installed software version.

Servo V:T10C N00015

Servo software version
Displays the installed software version.

Platf None

Only for models of the 17YP(…)47BAYP(…) series
Activating add-on parts fitted on platform (scanner, TAG…).

8.3.5 Diagnostics submenu

Cal OK
K 1.11
O 0.00

TQ calibration
This test function cyclically recalibrates the system with the values used immediately before the start of a rundown. For this, the tool must not be tensioned!
First line: Calibration test and status.
Second line: TQ calibration voltage.
Third line: Offset voltage. If a value lies outside the tolerance range, the corresponding error is displayed.

Value	Rated value	Tolerance
TQ calibration voltage:	1.10 V	± 45 mV
Calibration offset	0 V	± 58 mV

Torque
T 5.57
T 8.23

TQ measurement
In this test function, after the start button is pressed, the same calibration is carried out as immediately before the start of a rundown. For this, the tool must not be tensioned!
Then, the tool starts with speed "0". The torque is continuously measured and displayed until the start button is released.
Second line: Current torque.
Third line: Peak value, highest value since the start button was pressed.

Angle
A 360
OK

Angle encoder
The start button starts the tool at 30% of the maximum speed. After one revolution of the output shaft (nominal angle 360°), measured with the resolver, the tool is stopped. During a fixed dwell time of 200 ms, any further angle pulses occurring are traced. The total result is shown as Actual Angle. If the test run is not terminated by a monitoring criterion and the batch result is greater than or equal to 360 degrees, it is evaluated and displayed as OK. Monitoring criteria are the torque and a monitoring time.

If the torque exceeds 15 % of the calibration value (even during the dwell time), or if the monitoring time of 4 seconds expires, the test run is terminated with a *TQ>* or *TMAX* result. However, you specifically need to check whether the output shaft has actually turned by the value indicated (e. g. by placing a mark on the spindle). If the angle reached by the output shaft does not agree with the value displayed, either the angle factor has been entered incorrectly or the resolver is defective.

Voltage
V26.40
U19.00

Voltages
Second line: Current battery voltage. To ensure high utilization potential, this voltage is monitored continuously during fastening operation. If the voltage drops below limit, a warning output on the tool.
Third line: Programmed value.
This can be changed using the control (in menu *Tool*) .

Speed
RPM466
T 0.02

Speed
The start button starts the tool at the maximum speed.
Second line: Current output shaft speed.
Third line: Current torque.
Rotational speed measurement is based on the angle information of the resolver. If you release the start button, the tool stops. As a safety function the torque is monitored by the tool transducer. If it exceeds 15 % of its calibrated value, the speed measurement is terminated.

8.3.6 Set position submenu – only with Linking enabled

>Posit Change Positi	Selects the position to be used next.
Select Positi 2/6	You can skip the position. You can select the position to be used next using the function keys: → <F1>: Activate the previous position. → <F2>: Activate the next position. → Press the start button or <F2> longer than 2 seconds to accept the select and display the next menu item. → Press <F1> longer than 2 seconds to delete the selection and exit the menu.
>Posit Reset Positi	Reset linking to position 1. The machine operator can cancel Linking.

8.3.7 17BP(…)SWLAN wireless transmission submenu – only for models of the Y(…)series and W(…) series

The WLAN wireless transmission submenu shows the settings being used.
If no actions are carried out, the menu is automatically exited after 60 seconds.
Programming the RF settings for WLAN data transmission is described in the programming manual of the control.

Versio #27173 Dec 1	Displays the installed software version of the wireless module.
MAC 00302e e162f8	MAC address display
IP 010 122.0 77.110	IP address display
Sub255 .255.2 40.0	Subnet display

Gat010 **122.0** **61.001**	Gateway display
Host **122.0** **61.001**	Display of tool designation in a network.
SSID **APEX**	Display SSID. Only a maximum of the first 12 characters are displayed.
WLAN **Signal**	Change to graphic view of current quality of wireless signal via function key <F1>.
WLAN 	When the start button is pressed, the current strength of the wireless signal is displayed as an RSSI value.
S: 60	S = Signal strength (dBm) When the start button is pressed, [dBm +128][1)] is displayed as an RSSI value. S = Signal quality. Range 28 to 138 The lower the RSSI value, the poorer the signal strength. Signal strength become unreliable if the RSSI value falls below 55.
Roamin 	Sensitivity display Tool reaction to Access Point change
Comm. **TCP**	Selection of communication tool – control: TCP / UDP

1) RSSI (Received Signal Strength Indication) Indication of the reception strength of wireless communication systems.

8.3.8 Wireless transmission submenu RF15.4 only for models of the 17BPZ(…)

The RF15.4 wireless transmission submenu shows the settings being used. If no actions are carried out, the menu is automatically exited after 60 seconds.

Programming the wireless settings is described in the controller programming manual.

RF15.4 Channel

Displays the wireless channel being used and allows you to configure settings.
Channel 11 – 26 as per IEEE802.15.4 are available for selection (2.4 GHz range).

Channel

21

Displays the wireless channel being used and allows you to configure settings.

- → Start button>: show channel (default: 21).
- → <F1>: Activate a lower channel.
- → <F2>: Activate a higher channel.
- → Press the start button or <F2> longer than 2 seconds to accept the selection and display the next menu item.
- → Press <F1> longer than 2 seconds to delete the selection and exit the menu.

The channel must match the set channel of the base station.

RF15.4 PAN

Defines the network identification. You can operate no more than 4 tools per PAN ID.

- → Start button>: show PAN ID (default: C007).

PAN

1234

The PAN ID consists of 4 hexadecimal numbers.
A maximum of 65 534 different PAN IDs are therefore available.
Cursor flashes under the number to be modified:

- → <F1>: lower number
- → <F2>: higher number.
- → Press the start button: the selected number is adopted and the cursor moves to the next number.
- → Press <F1> longer than 2 seconds to delete the selection and exit the menu.
- → Press <F2> longer than 2 seconds to confirm the selection and exit the editing field.

Once all 4 numbers are confirmed, the editing field closes.

The PAN ID must match the preset PAN ID of the base station.

RF15.4 Tool ID

Displays the tool ID and allows you to configure settings.
You can select a channel from 1 – 4.

- → Start button>: show tool ID (default: 1).
- → <F1>: Activate a lower network ID.
- → <F2>: Activate a higher network ID.
- → Press the start button or <F2> longer than 2 seconds to accept the selection and display the next menu item.
- → Press <F1> longer than 2 seconds to delete the selection and exit the menu.

Each tool can be used only once for each base station.

RF15.4 Power

Displays the transmission power and allows you to configure settings.
5 transmission power settings are available.

Power

Displays the transmission power and allows you to configure settings.

- → <Start button>: show power settings on display (default: maximum).
- → <F1>: Activate a lower transmission power.
- → <F2>: Activate a higher transmission power.
- → Press the start button or <F2> longer than 2 seconds to accept the selection and display the next menu item.
- → Press <F1> longer than 2 seconds to delete the selection and exit the menu.

Display	Transmission power dBm	Transmission power mW
	0	1
	-2	0.63
	-4	0.40
	-6	0.25
	-10	0.10

RF15.4 AES

Displays the data transmission encryption.
AES = Advanced Encryption Standard, code length = 128 bit.

AES **On**

On and *Off* are available for selection.

→ Start button>: show encryption (default: off).

→ <F1>: Activate *On*.

→ Press the start button or <F2> longer than 2 seconds to accept the selection and display the next menu item.

→ Press <F1> longer than 2 seconds to delete the selection and exit the menu.

On / *Off* must match the preset PAN ID of the base station.

S:0013 **A20×××** **××××××**

Displays the wireless module serial number.

Vers. **10A5** **1707**

Displays the firmware and hardware version of the RF15.4 module.

RF15.4 **Signal**

Displays the current RSSI value.
RSSI = Received Signal Strength Indication, indication of the reception strength of wireless communication systems.
The lower the RSSI value, the poorer the signal strength.
Value range: 0 (very good) to -100 (no reception).
If the tool is positioned in the direct vicinity of the base station and the transmission power is preset to maximum, the RSSI value should be between -30 and -55. Data transmission become unreliable if the RSSI value falls below -85.

8.3.9 LMC submenu

MAC 00302e e162f8	→ MAC address display.
S: 5800 00008D 54C823	→ Display LMC serial number.
LW API Active No	→ Display whether LiveWire API (Application Programming Interface) is active.

8.4 System error messages

If an error is displayed, fastening is disabled until the error is acknowledged with the left-hand button on the tool. In the event of serious hardware errors, the tool is not enabled again even after the error is acknowledged, and must be returned to the manufacturer for repair.

Servo Error Init	Initialization error in tool servo. → Remove the battery and then re-insert it. If this does not help: → Return tool to *Sales & Service Centers* for repair.
Servo Error PWM	Speed specification from the measuring board to the servo is faulty. → Remove the battery and then re-insert it. If this does not help: → Return tool to *Sales & Service Centers* for repair.
Servo Error IIT	Too much power is being demanded from the tool. → Switch the tool off for a time so that it can cool down. → Increase the cycle time, reduce the fastening time or the torque.
Servo Error IOFF	The servo's current sensor is detecting a current offset error. → Return tool to *Sales & Service Centers* for repair.
Servo Error Other	Collective servo error caused by hardware. → Return tool to *Sales & Service Centers* for repair.

Servo Error IP	The current setpoint has been exceeded. There may be a short circuit. → Return tool to *Sales & Service Centers* for repair.
Servo Error Temp >	The servo has overheated. → Switch the tool off for a time so that it can cool down. → Increase the cycle time, reduce the fastening time or the torque.
Servo Error TempM>	The tool motor has overheated. → Switch the tool off for a time so that the motor can cool down. → Increase the cycle time, reduce the fastening time or the torque.
Servo Error Voltag	Operating voltage is outside the admissible range. → Change the battery. If this does not help: → Return tool to *Sales & Service Centers* for repair.
Servo Error Curr>	Current at servo output stage is too high. There may be a short circuit. → Return tool to *Sales & Service Centers* for repair.
Servo Error Angle	Tool angle encoder is sending incorrect signals to the servo amplifier. → Return tool to *Sales & Service Centers* for repair.
Low voltag warnin	Warns that battery is running low. → Recharge battery or replace it with one that is already charged.
Servo Error Othe80	Servo firmware is not compatible with measuring board software. → Update servo firmware.
Tool Error Counte	The rundown counter could not be read or written to. → Return tool to *Sales & Service Centers* for repair.
Tool Error Ident	Tool memory could not be read. → Return tool to *Sales & Service Centers* for repair.

Tool Error Start	Two-stage start button defective. → Return tool to *Sales & Service Centers* for repair.
Transd Ref.V. Error	Transducer reference voltage error → Return tool to *Sales & Service Centers* for repair.
Trans CAL Error	Transducer calibration voltage error Tool was not discharged at time of calibration. → Allow tool to discharge and try again. If this does not help: → Return tool to *Sales & Service Centers* for repair.
Trans Off Error	Transducer offset voltage error Tool was not discharged at time of calibration. → Allow tool to discharge and try again. If this does not help: → Return tool to *Sales & Service Centers* for repair.
Unknow Error	General collective error Return tool to *Sales & Service Centers* for repair.
Batter empty -> off	The battery is empty. → Replace the battery.
No result	The min. torque for evaluation was not reached. → Repeat the current rundown.
LMC Error	Initialization error *LiveWire Memory Chip* . → Switch the tool on and off again. → Check the parameters in the software controller. → Insert the WLAN chip again. Replace if necessary. → Return tool to manufacturer for repair.
WLAN error	WLAN module programming initialization fault. → Switch the tool on and off again. → Check the parameters in the software controller. → Return tool to manufacturer for repair.

9 Servicing

9.1 Cleaning instructions

For tools with a built-in barcode scanner, the window must be free of dirt. The barcode is not read if the window is dirty.

→ Clean it regularly—or immediately, if it becomes dirty—using a damp cloth and a conventional window cleaner. Do not use acetone for cleaning.

→ Remove contamination on the plastic housing (47BA(…)L) with a commercially available cleaning agent. Do not use acidic cleaners or acetone. These could dissolve the plastic.

9.2 Service schedule

A repair is only permitted by Apex Tool Group authorized personnel. Regular service reduces operating faults, repair costs, and downtime. In addition to the following service schedule, implement a safety-related service program that takes the local regulations for repair and service for all operating phases of the tool into account.

CAUTION!

Risk of injury through unintentional activation
– prior to servicing 47BA disconnect power supply.

After … fastening cycles[1)2)]	Measures
100,000	→ Check to ensure the battery adapter, scanner and wireless adapter are seated securely. → Check the tool and power supply for damage. → Check to ensure scanner window is transparent. → Check to ensure the power supply is clean. → Check to ensure battery charger is clean. → Check the gearing and angle head for leaks.
500,000	→ Check power supply guide, locking mechanism and contacts for wear and replace if necessary. → Clean the gearing parts with a grease-dissolving agent and re-lubricate. → Check the gearing parts for wear, renew as necessary.
1 million	→ Recommendation: Recalibration of tool, see 13.1 Rekalibrierung, Page 67.
2.5 million	→ General refurbishment of tool. Send it to *Sales & Service Centers*.

1) For the number of fastening cycles, refer to the counter display in 8.3.4 Administration submenu, Page 28

2) Use of 80% of maximum torque

9.3 Lubricants

→ For proper operation and a long service life, use the correct type of grease.

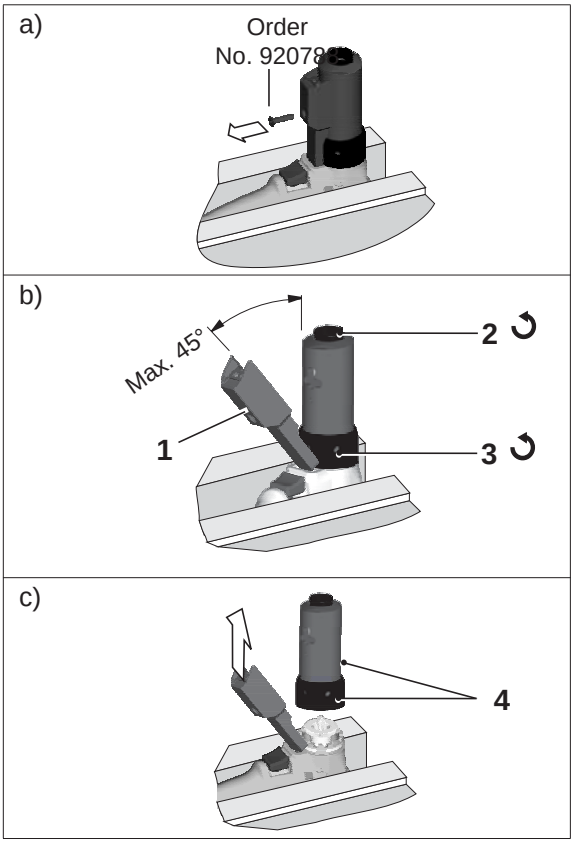
Grease lubricants according to DIN51502/ISO3498

Order No.	Packing unit [kg]	DIN 51502	KLÜBER LUBRICATION
933027	1	KP1K	Microlube[1)] GL 261

1) Primary lubrication Apex Tool Group

9.4 Disassembling gear

If the tool is opened, the warranty is voided. Only specialized technicians should be allowed to open the gear for servicing.



→ Carefully clamp the 17BP on the pistol grip in a vice with plastic jaws.

→ Remove the countersunk screw, order no. 920788. Size 2.5 (internal hexagon).

→ After the maintenance of the drive, tighten the countersunk screw by 1.6 – 1.9 Nm.

→ Fold back **1** as shown.

Do not open it beyond the prescribed angle, as otherwise the internal, flexible board will be damaged.

→Unscrew **2** counterclockwise, size 28.

→ **3** Unscrew counterclockwise. ø 42.5; Order No. 933336

→ Completely remove **4**.

9.4.1

10 Troubleshooting

Problem	Possible cause	Measure for mPro400GC (SW S816813)	Measure for mPro400S… (example SW 816841)[1)]
General tool			
Tool doesn't start with counterclockwise rotation activated.	With counterclockwise rotation, parameter for speed is set to 0 1/min.	→ Parameterize *Speed left rotation*	
		On the control screen *Standard* > *Standard Application Builder* > *Tool Groups*	On the control screen *Main Menu* > *Application Builder* > *Tool Groups*
Tool light disabled.	Disabled by parameter setting.	→ Parameterize the **`tool light`**	
		On the control screen *Advanced* > *Tool Settings* > *LiveWire Settings*	→ Press <> on the control. → Select the required tool under *TM Unit #* > **`Tool Assignment`**. → Press < > >. → Make selection under *Nutrunner* **`Lighting Function`**.
Control menu on tool not enabled or only partially enabled.	Disabled by parameter setting.	→ On the control screen *Advanced* > *Tool Settings* > *LiveWire Settings*, mark the check box **`Enable Tool Menu`** or use the drop down list **`F1 Button on Tool`** to assign the left function key <F1>.	→ Press <> on the control. → Select the required tool under *TM Unit #* > **`Tool Assignment`**. → Press < > >. → Select function under **`Control Button Settings`**. **`Default = Control menu disabled.`**
Idle speed not reached.	Battery voltage is too low.	→ Use fully charged battery.	
Expected number of test rundowns is not achieved with one charge of the battery.	Battery is not fully charged.	→ Use fully charged battery.	
	The warning threshold for undervoltage is not set to minimum value.	→ On the control screen *Tool Setup* > *Tool Settings*, reduce the **`Undervoltage (V)`**.	→ Press <> on the control. → Select the required tool *TM Unit #* > under **`Tool Assignment`** → Press < > >. → Under **`Energy Management`** reduce the **`Undervoltage Threshold`**.
	High torque is needed during a fastening sequence, e.g. for coated fasteners.	If a high torque is needed for a longer period of time, e.g. for several turns, the number of rundowns that can be achieved with one battery charge will be significantly reduced.	
	Battery has too many charging cycles.	After 800 charging cycles the capacity is reduced to approx. 60%.	

1) Software-dependent measure. Discrepancy possible when using Custom Tool Software.

Problem	Possible cause	Measure for mPro400GC (SW S816813)	Measure for mPro400S… (example SW 816841)[1)]
Infrared data communication between controller and tool			
No infrared data communication between the controller and tool.	Incorrect interface selected for the connection to the controller.	→ On the control screen *Tool Setup* > *Wireless Settings*, check the correct **IRDA Connection**.	→ On the control screen *Main Menu* > *System Programming* > *Service* > *TMA Configuration* > *Communication with Tool*, check the correct **IRDA Connection**.
		→ Check whether the tool holder is connected at the selected interface.	
	Selected interface is used for serial data transmission.	Do not use the same interface for serial data transmission and infrared data transmission.	
		Check on the control screen *Communication* > *Data Transmission* → Is serial data transmission activated (selection **RF Mode** is not **None**)? → Is the same interface selected? → If so, select a different interface or deactivate serial data transmission. All tools must be checked.	Check on the control screen *Main menu* > *System Programming* > *Service* > *TMA Configuration* > *Communication with Tool* → Is serial data transmission activated (selection **RF Mode** is not **None**)? → Is the same interface selected? → If yes, select another interface under *Main Menu* > *System Programming* < *System Programming* > *Serial Ports* → Disable serial data transmission. All tools must be checked.

1) Software-dependent measure. Discrepancy possible when using Custom Tool Software.

Problem	Possible cause	Measure for mPro400GC (SW S816813)	Measure for mPro400S… (example SW 816841)[1)]
WLAN data communication between controller and tool			
No WLAN data communication between the controller and tool.	The IP address of the tool is not correctly entered in the control.	→ On the control screen *Tool Setup*, check whether the IP address of the tool has been entered in the field **Type**. → Otherwise, mark the line and <Edit>. IP address of tool – see Tool in submenu *Wireless Settings*.	→ Press  > on the control. → Select the required tool under *TM Unit #* > **Tool Assignment**. → Press <  >. → Enter the IP address under **Tool Address**. IP address of tool – see Tool in submenu *Wireless Settings*.
	Tool not yet parameterized with the correct WLAN settings.	→ On the control screen *Tool Setup* > *RF Settings*, parameterize the tool with the infrared interface with the correct WLAN settings.	→ On the control screen *Main Menu* > *System Programming* > *Service* > *TMA Configuration* > *Communication with Tool*, select > **RF Mode** WLAN. → Parameterize the tool with the correct settings via the infrared interface.
	WLAN settings are different for control and access point.	→ On the control screen *Tool Setup* > *RF Settings*, check whether the WLAN settings for the tool agree with the settings for the access points (network name, encryption, network key).	→ On the control screen *Main Menu* > *System Programming* > *Service* > *TMA Configuration* > *Communication with Tool*, check whether the WLAN settings for the tool agree with the settings for the access point (network name, encryption, network key).
	A filter for MAC addresses is activated at the Access Point.	→ Add the MAC address for the tool to the list of approved addresses at the Access Point. MAC adress of tool – see • Label above the battery • On the tool in the *Wireless Settings* submenu.	
	Port 4001 is disabled by a firewall.	→ Configure the firewall such that the required IP/MAC addresses can use port 4001.	
	The wireless channel at the access point is outside the range supported by the tool.	→ To change the wireless channel setting at the access point to the right wireless channel with respect to country code: EU 1–13; World 1–11 (see Installation Manual P1894E).	
	Tool is already assigned to another control.	→ Check whether another control already has a connection to this tool. In other words, another tool is using the same IP address.	
IP address cannot be pinged.	IP Address already exists in network. In this case, the tool will not build up a connection.	→ Check the physical connection (RSSI values). → Check the assigned IP address.	

Problem	Possible cause	Measure for mPro400GC (SW S816813)	Measure for mPro400S… (example SW 816841)[1)]
WLAN data communication between controller and tool			
Occasional interruptions in WLAN data communication.	Distance between the access point and the tool is too great.	→ Check the signal strength at the tool in the *Wireless Setting* submenu. → If necessary, reduce the distance between the access point and the tool.	
	The tool is already assigned to another control.	→ Check whether the tool (IP address) is also assigned to another control. → If yes, delete the assignment in the other control. A tool can only be assigned to one control.	
	Excessive data traffic on WLAN Network.	Reduce data traffic on WLAN Network.	
		→ On the control screen *Basic*, increase the **`Initial Torque`**. → On the control screen *mPro* > *Main Menu* > *System Programming* > *Special Functions* > *MWF*, disable the torque graph data transmission.	→ On the control screen *Main Menu* > *Application Builder* > *Settings* > *Fastening Stages* > *Fastening Stage #* > *Fastening Sequence*, increase the **`Initial Torque`**. → On the control screen *Main Menu* > *System Programming* > *Special Functions* > *MWF*, disable the torque graph data transmission.

1) Software-dependent measure. Discrepancy possible when using Custom Tool Software.

Problem	Possible cause	Measure for mPro400GC (SW S168813)	Measure for mPro400S… (example SW 168841)[1)]
RF15.4 data communication between controller and tool			
No serial communication between the controller and the base station. (error message is displayed after *Accept*<F1> softkey is pressed under *Communication/ Tool*.)	Wrong serial cable is being used.	→ Use zero modem cable (crossed).	
	Incorrect interface selected for the connection to the controller.	→ On the control screen *Tool Setup* > *Wireless Settings*. Check **RF Mode**.	→ On the control screen *Main Menu* > *System Programming* > *Service* > *TMA Configuration* > *Communication with Tool*, check the **RF Mode**.
		→ Check whether the serial connecting cable is connected to the selected interface.	
	Selected interface is used for serial data transmission.	Do not use the same interface for serial data transmission and infrared data transmission.	
		On the control screen *Communication* > *Data Transmission* → Is serial data transmission activated (selection **RF Mode** is not **None**) → Is the same interface selected. → If so, select a different interface or deactivate serial data transmission. All tools must be checked.	Check on the control screen *Main menu* > *System Programming* > *Service* > *TMA Configuration* > *Communication with Tool* → Is serial data transmission activated (selection **RF Mode** is not **None**)? → Is the same interface selected? → If yes, select another interface under *Main Menu* > *System Programming* < *System Programming* > *Serial Ports* → Disable serial data transmission. All tools must be checked.
	Supply voltage not active.	→ Check the socket to which the power supply unit for the base station is connected.	
No data communication between the controller and tool.	Settings were not entered correctly.	→ On the control screen *Communication>Tool* check whether the RF settings for the base station match the tool settings.	→ On the control screen *Main Menu* > *System Programming* > *Service* > *TMA Configuration* > *Communication with Tool* > *RF Mode* **868 MHz**, check whether the RF settings for the base station agree with the settings for the tool. → Parameterize the tool with the correct settings via the infrared interface.
		The tool settings are displayed on the tool in the *Wireless Settings* submenu and can be modified if required. The settings for *Channel*, *Network ID* and *Tool ID* must agree.	
	Distance between the base station and tool is too great.	Distance should not exceed 30 m. → Decrease the distance between the base station and the tool and check whether communication is possible. → If so, increase the power on the base station and tool or → reduce the distance between the base station and the tool.	

Problem	Possible cause	Measure for mPro400GC (SW S168813)	Measure for mPro400S… (example SW 168841)[1)]
RF15.4 data communication between controller and tool			
Occasional interruptions in data communication.	Distance between the base station and tool is too great.	→ Increase the power on the base station and tool or → reduce the distance between the base station and the tool.	
	Transmission power is too low.	→ Increase the power on the base station and tool.	
	Excessive data traffic on WLAN Network.	Reduce data traffic on WLAN Network. → On the control screen *Basic*, increase the **`Initial Torque`**. → On the control screen *mPro* > *Main Menu* > *System Programming* > *Special Functions* > *MWF*, disable the torque graph data transmission.	→ On the control screen *mPro* > *Main Menu* > *Application Builder* > *Settings* > *Fastening Stages* > *Fastening Stage #* > *Fastening Sequence*, increase the **`Initial Torque`**.
	Too many tools on the same wireless channel.	→ Use different channels for different base stations.	
	Other 2.4 GHz machines use the same wireless frequency.	→ Use a different channel. → Cell planning as per Instruction Manual for the base station	
Distance for wireless transmission is less than expected.	Transmission power is too low.	→ Increase the power on the base station and tool.	
	Installation location of the base station is unsuitable.	→ Place the base station in a location where there is a clear line of sight between the base station and the tool.	

1) Software-dependent measure. Discrepancy possible when using Custom Tool Software.

10.1 Reset tool

This key combination activates the *Service* menu. Here, the tool can be shut off or reset to the delivery settings.

ATTENTION!

The following will then be deleted:
- the internal memory (programming)
- the current fastening job
- rundown data not yet transmitted to the control

Once selected, there is no way back to the current fastening job.

1.	2.	3.	4.
 → Press <F1>+<F2> at the same time and hold. → Press start button 1× and release.	 → Release <F2>. → Keep <F1> pressed and continue with step 3.	 → Press <F2> 3× and release. → Keep <F1> pressed and continue with step 4.	 → Press start button 1x. → Release both buttons.

5. Switch off	5. Reset
<Servi Dis Able	→ Change to the Service menu with <F1>, <F2>. **>Servi Reset**
Select within 60 seconds or else the tool with switch off: → Confirm with the start button and switch the tool off. or…	→ Confirm with the start button and reset the tool to the delivery settings.

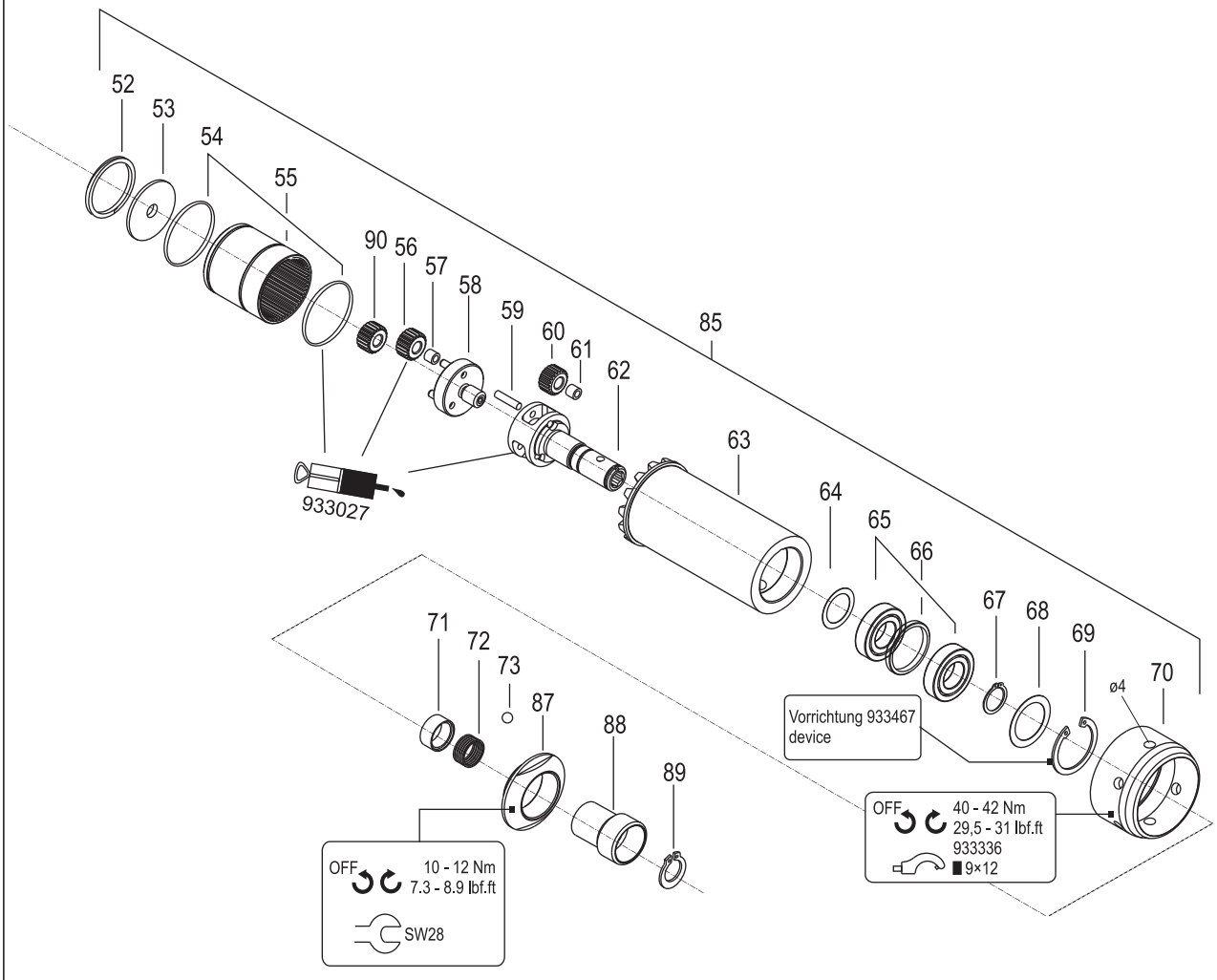
11 Spare parts

Always use only original *Cleco* spare parts. Failure to comply with this instruction can result in decreased performance and an increased need for maintenance. Installing spare parts from other manufacturers will void all manufacturer's warranties. Information, but no warning of hazards.

11.1 Gearing

TAB 10.4

Type	85	56	58	60	62	70	90
17BP(…)B05Q	935101	541894	542230	541894	935599	541904	541899
17BP(…)B07Q	935102		542233	541897	935598		
17BP(…)B09Q	935103	541893	542231	541894	935599		–
17BP(…)B13Q	935104		542232	541897	935598		
17BP(…)B05QL	935105	541894	542230	541894	935599	943441PT	541899
17BP(…)B07QL	935106		542233	541897	935598		
17BP(…)B09QL	935107	541893	542231	541894	935599		–
17BP(…)B13QL	935108		542232	541897	935598		



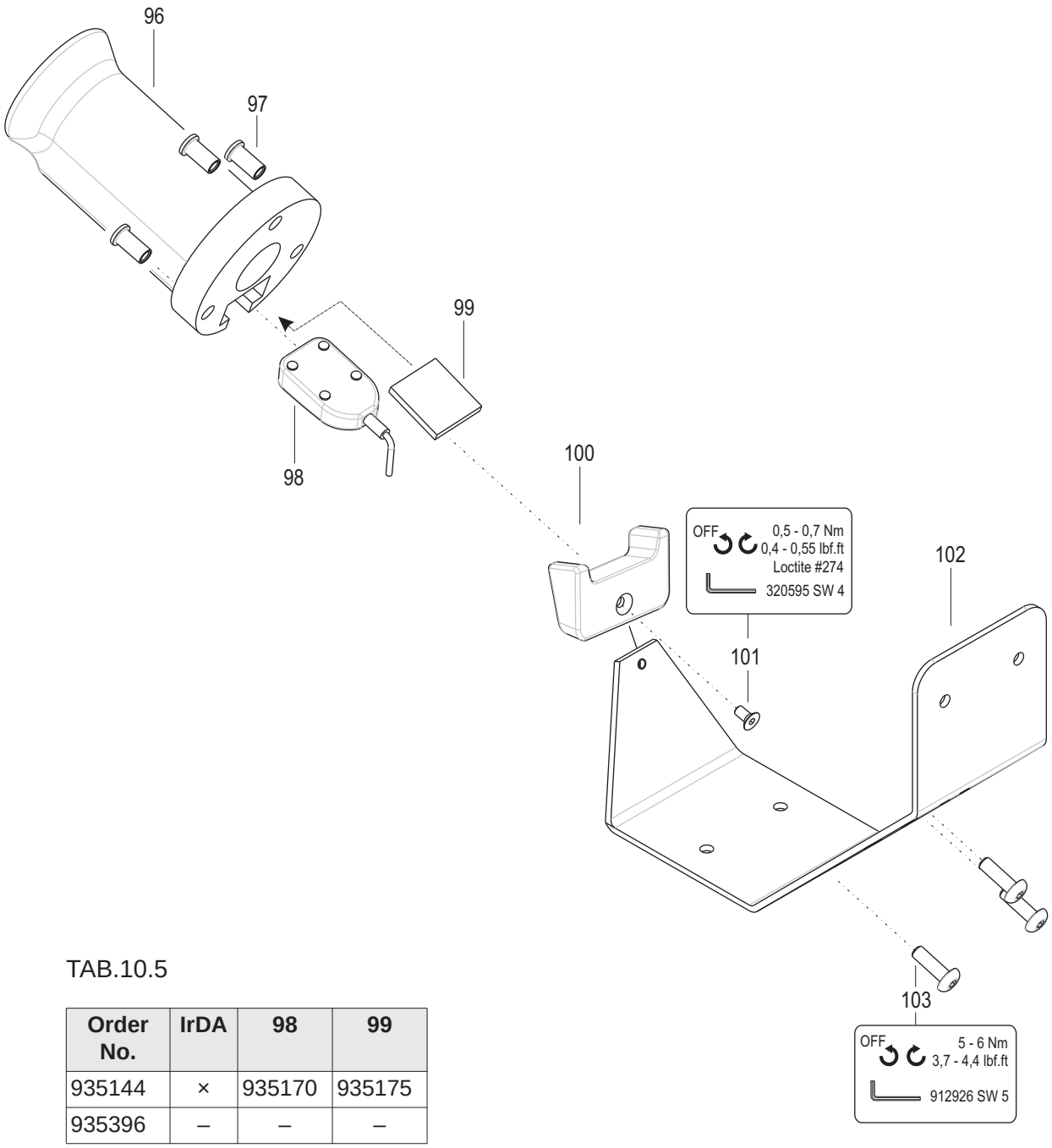
9.3 Lubricants, Page 40
11.3 Equipment order list, Page 53

Index	Order No.	Quantity	1)	Designation	Dimensions
52	800116	1	1	Securing ring	25.98X0.94 internal axis
53	541887	1		Washer	
54	542724	2		O-ring	28.24X 0.78
55	542722	1		Sprocket	
56	2)	3	6	Planetary gear	
57	923095	3	6	Needle roller assembly	3X5X7
58	2)	1		Planetary gear carrier	
59	541888	3	6	Cylindrical pin	
60	2)	3	6	Planetary gear	
61	923095	3	6	Needle roller assembly	
62	2)	1		Planetary gear carrier	
63	934841	1		Drive housing	
64	1019356	1		Spacer	13.49X 18.64X 0.23
65	542089	2	4	Deep-groove ball bearing	
66	541775	1		Spacer ring	
67	902180	1	1	Securing ring	12X1, outer axis
68	922361	1		Spacer	17.3X23.8X0.25
69	901602	1	1	Securing ring	24X1.2 internal axis
70	2)	1		Cap nut	
71	935597	1		Sleeve	
72	540842	1		Compression spring	
73	844265	1		Ball	1/8"
87	935080	1		Threaded ring	
88	935079	1		Sleeve	
89	833688	1	1	Securing ring	
90	2)	1	1	Push-on pinion	

1) Recommended spare part for every 5 tools

2) See table *TAB 10.4* on Page 50

11.2 Tool holder (optional)



TAB.10.5

Order No.	IrDA	98	99
935144	×	935170	935175
935396	–	–	–

Index	Order No.	Quantity	1)	Designation	Dimensions
96	935172	1		Holder, rubber	
97	935174	3		Socket	
98	TAB.10.5	1		IrDA serial adapter	57.6 kbit/s
99	TAB.10.5	1		Holder plate	
100	935173	1		Nutrunner support	
101	918688	1		Countersunk screw	6 x 12
102	935171	1		Bolt-on corner bracket	
103	S902967	3		Button-head screw	M 8X25

1) Recommended spare part for every 5 tools

TAB.10.5 see Table*TAB.10.5* on Page 52

11.3 Equipment order list

Order No.	Designation
933467	<67>
933468	Base
933469	Pin
933470	Sleeve
933336	Hook wrench Tighten retainer nut <70>

12 Technical specifications

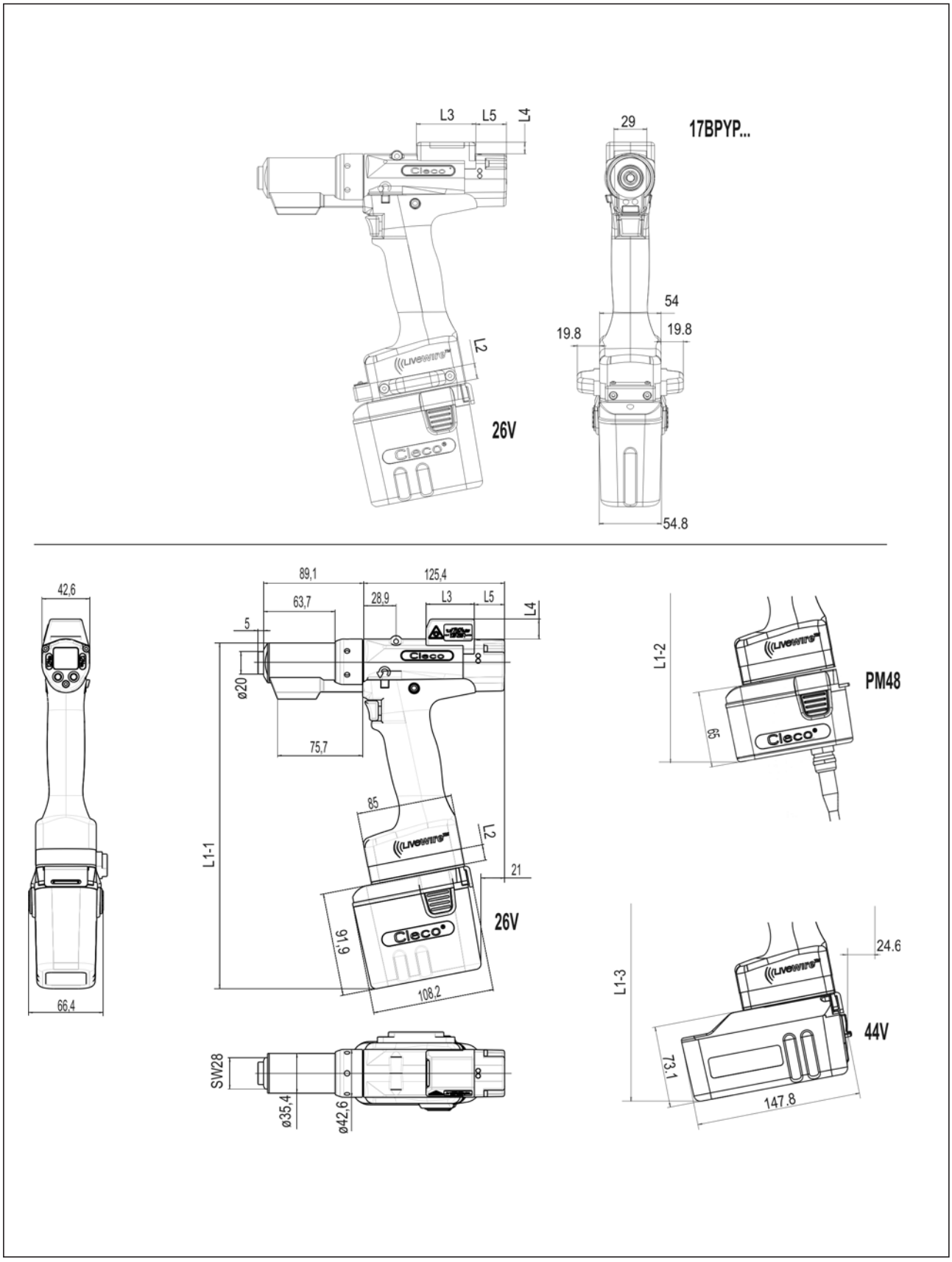
12.1 Measurements: 5 Nm–13 Nm • LiveWire 1 • Standard

Without scanner

Type	L1-1	L1-2	L1-3	L2	L3	L4	L5
17BPB05Q	294	267.1	282.7	–	–	–	26.9
17BPB07Q							
17BPB09Q							
17BPB13Q							
17BPRB05Q	308	281.1	296.7	14.2	–	–	26.9
17BPXB05Q							
17BPYB05Q							
17BPYPB05Q					52.5	10.2	27
17BPZB05Q					–	–	26.9
17BPRB07Q							
17BPXB07Q							
17BPYB07Q							
17BPYPB07Q					52.5	10.2	27
17BPZB07Q					–	–	26.9
17BPRB09Q							
17BPXB09Q							
17BPYB09Q							
17BPYPB09Q					52.5	10.2	27
17BPZB09Q					–	–	26.9
17BPRB13Q							
17BPXB13Q							
17BPYB13Q							
17BPYPB13Q					52.5	10.2	27
17BPZB13Q					–	–	26.9

With scanner

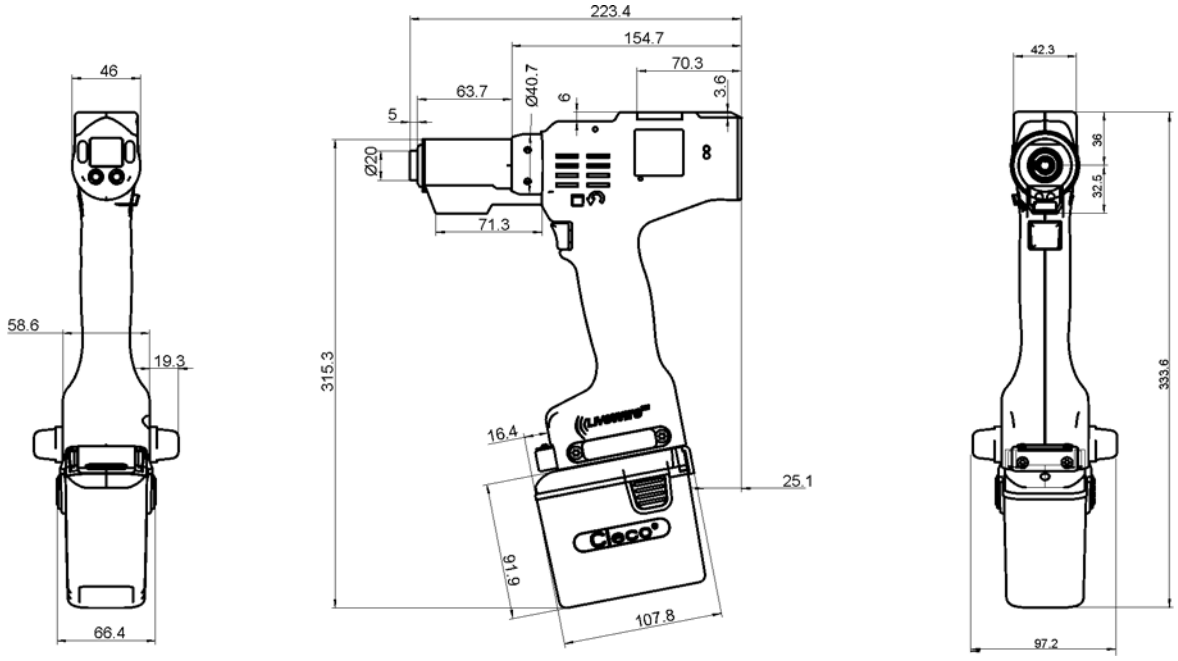
Type	L1-1	L1-2	L1-3	L2	L3	L4	L5
17BPRSB05Q	308	281.1	296.7	14.2	43	17.7	26.9
17BPXSB05Q							
17BPYSB05Q							
17BPZSB05Q							
17BPRSB07Q							
17BPXSB07Q							
17BPYSB07Q							
17BPZSB07Q							
17BPRSB09Q							
17BPXSB09Q							
17BPYSB09Q							
17BPZSB09Q							
17BPRSB13Q							
17BPXSB13Q							
17BPYSB13Q							
17BPZSB13Q							


L3
L5
L4
L2
26V
29
17BPYP...
54
19.8
19.8
54.8
42,6
66,4
89,1
125,4
63,7
28,9
L3
L5
L4
5
ø20
75,7
85
L2
L1-1
21
91,9
26V
108,2
SW28
ø35,4
ø42,6
L1-2
65
PM48
L1-3
24.6
73,1
147.8
44V

12.2 Measurements: 5 Nm–13 Nm • LiveWire 2 • Platform

Without scanner

Type
17BPYPB05QL
17BPYPB07QL
17BPYPB09QL
17BPYPB13QL



12.3 Dimensions, options

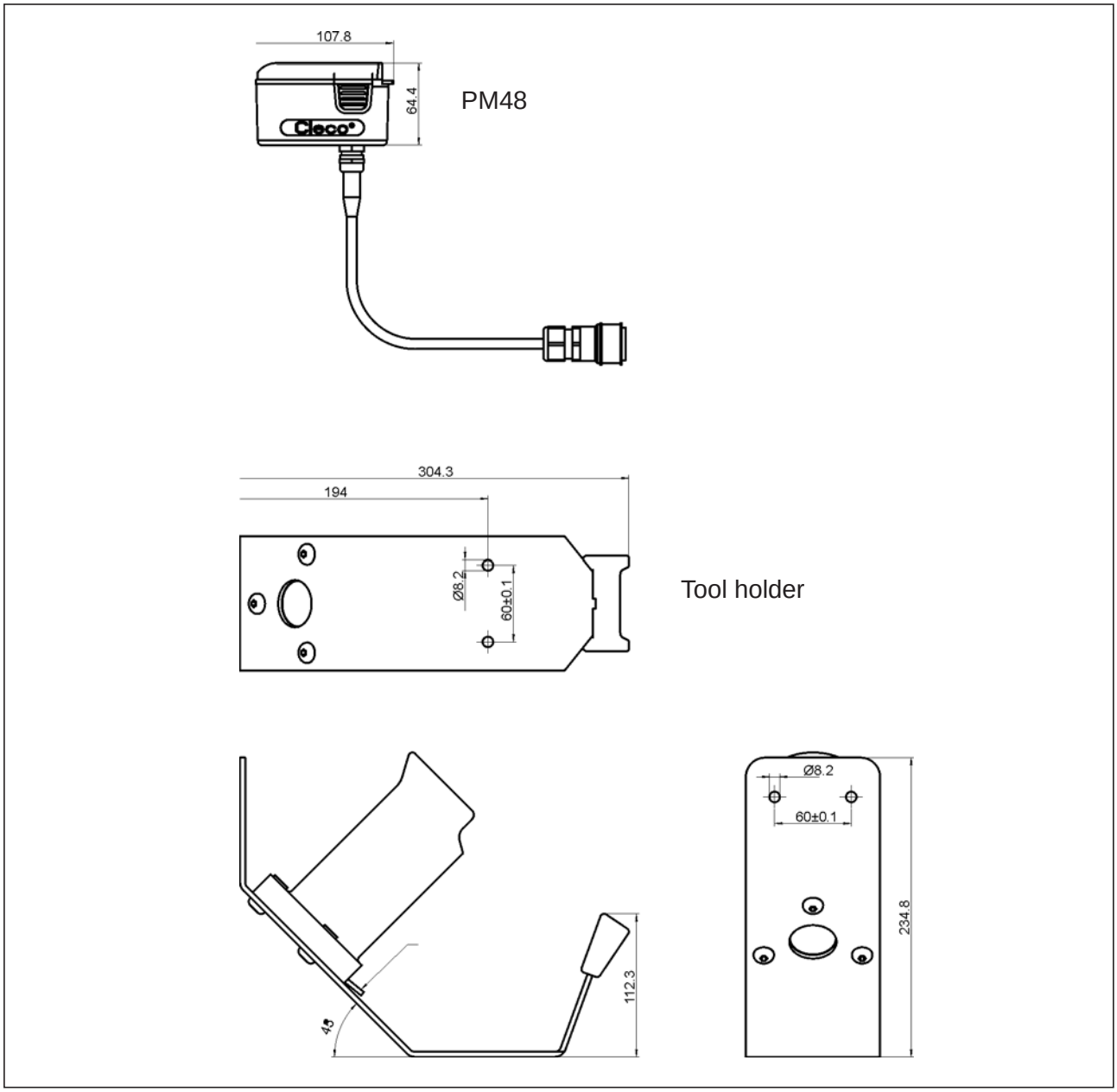


Fig. 12-1: Dimensions, options, (mm)

12.4 Performance data: 5 Nm–13 Nm • LiveWire 1

Type	Recommended torque range		Idling Speed Battery pack 26 V	Idling Speed PM48/Battery pack 44 V	Screw size 8.8	Weight without PS[1)]	Calibration data	
	Nm max.	Nm min.	rpm	rpm	mm	kg	Torque (nominal) Nm	Angle pulses (Resolver) 1 degrees
17BPB05Q	5	3	1639	2428	M4	1.39	6.41	0.7322
17BPRB05Q						1.49		
17BPXB05Q								
17BPYB05Q								
17BPYPB05Q								
17BPZB05Q								
17BPRSB05Q						1.55		
17BPXSB05Q								
17BPYSB05Q								
17BPZSB05Q								
17BPB07Q	7	3	1161	1721	M5	1.39	12.57	1.0332
17BPRB07Q						1.49		
17BPXB07Q								
17BPYB07Q								
17BPYPB07Q								
17BPZB07Q								
17BPRSB07Q						1.55		
17BPXSB07Q								
17BPYSB07Q								
17BPZSB07Q								
17BPB09Q	9	3	887	1314	M5	1.39	12.43	1.3529
17BPRB09Q						1.49		
17BPXB09Q								
17BPYB09Q								
17BPYPB09Q								
17BPZB09Q								
17BPRSB09Q						1.55		
17BPXSB09Q								
17BPYSB09Q								
17BPZSB09Q								

Type	Recommended torque range		Idling Speed Battery pack 26 V	Idling Speed PM48/Battery pack 44 V	Screw size 8.8	Weight without PS[1)]	Calibration data	
	Nm max.	Nm min.	rpm	rpm	mm	kg	Torque (nominal) Nm	Angle pulses (Resolver) 1 degrees
17BPB13Q	13	3	629	931	M6	1.39	17.43	1.9091
17BPRB13Q						1.49		
17BPXB13Q								
17BPYB13Q								
17BPYPB13Q								
17BPZB13Q								
17BPRSB13Q						1.55		
17BPXSB13Q								
17BPYSB13Q								
17BPZSB13Q								

1) Weight of power supply: battery pack 26 V 935377 0.50 kg, battery pack 44 V 936400PT 0.85 kg

12.5 Performance data 5 Nm–13 Nm • LiveWire 2

Type	Recommended torque range		Idling Speed Battery pack 26 V	Idling Speed PM48/Battery pack 44 V	Screw size 8.8	Weight without ES[1)]	Calibration data	
	Nm max.	Nm min.	rpm	rpm	mm	kg	Torque (nominal) Nm	Angle pulses (Resolver) 1 degrees
17BPYPB05QL	5	3	1635	2425	M4	1.26	6.43	0.7322
17BPYPB07QL	7	3	1160	1720	M5	1.26	12.60	1.0331
17BPYPB09QL	9	3	885	1310	M5	1.26	12.45	1.3529
17BPYPB13QL	13	3	625	930	M6	1.26	17.45	1.9091

1) Weight of power supply: battery pack 26 V 935377 0.50 kg, battery pack 44 V 936400PT 0.85 kg

12.6 Electrical data

Tool

Protection class III as per DIN EN 61140 (VDE 0140-1)
Degree of protection IP40 as per DIN EN 60529 (IEC 60529)

Tool holder

Protection class III as per DIN EN 61140 (VDE 0140-1)
Degree of protection IP40 as per DIN EN 60529 (IEC 60529)

12.6.1 Output stage servo electronics

Features	Data
Rated motor phase current	8 A peak value, sine
Rated output	150 VA
Maximum power	500 VA

12.6.2 Control electronics

Features	Data
Rated voltage	26 V
Rated current in *Active* operating mode	105 mA
Rated current in *Standby* operating mode	95 mA
Rated current in *Energy-saver* operating mode	55 mA
Rated current in *Sleep* operating mode	< 1 mA

12.6.3 IrDA interface port

Features	Data
Supply voltage	5.0 V (4.8 to 5.5 V)
Power consumption	0.30 VA
Maximum current	11 mA
Transmission rate	57.6 kbit/s
Parity Bit	None
Data Bit	8 bit
Stop Bit	1 bit
Error check	CRC

12.6.4 Scanner

Features	Data
Scan rate	104 scans/sec. ±12 (bidirectional)
Scan angle	47° ±3 standard/35° ±3 reduced
Crash resistance	2000 G
Ambient light	107,640 lx
Decode zone (typical)	4 mil 2.54 – 13.97 cm 5 mil 3.18 – 20.32 cm 7.5 mil 3.81 – 33.66 cm 10 mil 3.81 – 44.45 cm 100% 3.81 – 59.69 cm 15 mil 3.81 – 74.93 cm 20 mil 4.45 – 90.17 cm 40 mil 1) – 101.60 cm 55 mil 1) – 139.70 cm
Laser safety	Laser class 2, IEC 60825
EMI/RFI	FCC Part 15 Class B EN 55024/CISPR 22 AS 3548 VCCI
Barcode types	UPC-A, UPC-E, UPC-E1, Trioptic Code39, Interleaved 2of5, Discrete 2of5, Chinese 2of5, Codabar, MSI barcode types, EAN8, EAN13, EAN128, ISBT128, Code11, Code39, Code93, Code128, RSS14, RSS Limited, RSS Expanded barcode types.
Standards	21CFR1040.10 and 1040.11 Except for discrepancies as for laser note no. 50, July 26, 2001. EN60825-1:1994+ A1:2002 +A2:2001 IEC60825-1:1993+A1:1997+A2:2001

1) Depending on the width of the barcode

12.6.5 RF15.4 Data Transmission

Features	Data
Frequency	2.4 GHz ISM
Channels	16
Modulation	0-QPSK (DSSS)
Transmission power, max.	1 mW (0 dBm)
Sensitivity (BER < 10-3)	-92 dBm
Wireless transmission rate	57.6 kb/s
Range	up to 30 m
Standards	ETSI EN 300 328 V1.7.1 EN 301489-1 V1.6.1 EN 301489-3 V1.4.1 EN 50392:2004 FCC Part 15.247/RSS-210

12.6.6 WLAN data transmission

Features	Data
Standard	IEEE 802.11a/b/g/h/n
Security	• WEP 64/128-bit encryption • WPA-TKIP/WPA2-AES(CCMP) • 802.1x EAP authentication LEAP, PEAP[1)], EAP-TTLS
Range	Typically up to 50 m
Channels	• 1 – 13 (2.412 – 2.472 GHz) • 36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140, 149, 153, 157, 161, 165 (5.180 – 5.825 GHz)
Transmission power:	20 dBm typ. @ 2.4 GHz 15 dBm typ. @ 5.0 GHz
Sensitivity	-94 dBm (typ. @ 1 Mbit/s, 2.4 GHz) -80 dBm (typ. @ 5 GHz)
Modulation	DSSS/OFDM
Standards	EN 300 328-1 V1.7.1 EN 301489-1, -17 EN 301893 V1.8.1 EN 60950 FCC Part 15 IC (Industry Canada)

1) PEAP (without client certificate)

12.6.7 Torque transducer

Torque is measured by a reaction transducer with expandable measurement strips. The reaction transducer is positioned between the motor and the gears in the handle housing.

Features	Data
Nominal calibration	See 12.4/12.5 Performance data
Sensitivity	2 mV/V
Bridge ohms	1000 Ohm
Precision class	0.5% of final value
Linearity error	+0.25% of final value
Measurement range	-125% to +125% of final value

12.7 Ambient conditions

Working temperature	0 °C (32 °F) to maximum +40 °C (+104 °F)
Permissible relative humidity	0 to 80% (at 40 °C), non-condensing
Working height	up to 3000 m above sea level
Storage temperature, tool without energy supply	-20 °C to +70 °C

13 Service

If repair is required, send the complete tool to *Sales & Service Centers*! Repairs on the gears and angle attachment are only permitted by Apex Tool Group authorized personnel. If the tool is opened, the warranty is voided.

13.1 Recalibration

At delivery, model-specific calibration data is stored in the integrated fastening electronics system of your *Cleco* tool. If service is required to change the torque transducer, the screw electronic system or if a recalibration is required, please send the *Cleco* tool to *Sales & Service Centers*. This will ensure that after the service work, any required calibration data update is carried out properly.

14 Disposal

CAUTION!

Injuries and environmental damage from improper disposal.
Components and auxiliary materials of the tool pose risks to health and the environment.

- → Collect auxiliary materials (oils, greases) when draining and dispose of them properly.
- → Separate the components of the packaging and segregate the different materials before disposing of them.
- → Follow the locally applicable regulations.

Observe generally valid disposal guidelines such as, in Germany, the Electrical and Electronic Equipment Act (ElektroG) and the Battery Act (BattG):

- → Wasted rechargeable batteries must be disposed of. Return the tool and defective/power supplies to your company collection facility or to *Sales & Service Centers*.

POWER TOOLS SALES & SERVICE CENTERS

Please note that all locations may not service all products.
Contact the nearest Apex Tool Group Sales & Service Center for the appropriate facility to handle your service requirements.

Sales Center
Service Center

NORTH AMERICA | SOUTH AMERICA

Detroit, Michigan
Apex Tool Group
2630 Superior Court
Auburn Hills, MI 48236
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Fax: +1 (248) 391-6295

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670 Industrial Drive
Lexington, SC 29072
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Phone: +1 (919) 387-0099
Fax: +1 (803) 358-7681

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