

Cooper Tools



DC ELECTRIC ASSEMBLY TOOLS


COOPER Tools

CooperTools Is On The Web!

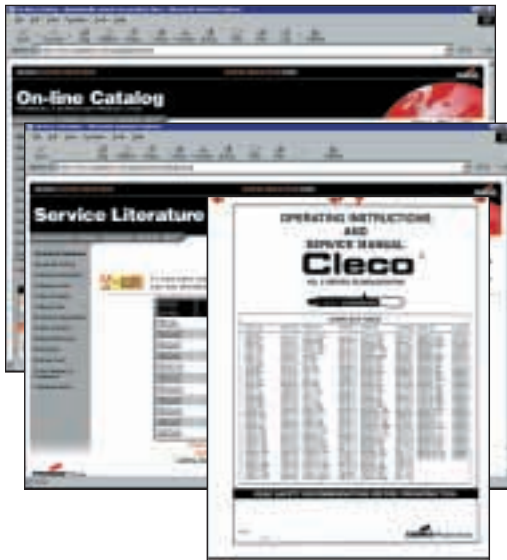
CooperTools is pleased to unveil a complete resource for power tools on-line. www.coopertools.com offers product information, service literature, brand catalogs, press releases and more. A dominant source of information, the CooperTools' web site is your source for application solutions on-line.



Making your job easier is our goal!

You can access service literature anytime. Choose a category such as Assembly Tools or Material Removal Tools from the main menu and then click on the brand you're looking for. You'll be on your way to any current service literature you need, whether it's Cleco, Apex, Master Power, or any of our power tools' brands.

Up-to-date product catalogs are also available online providing you with current information on our broad product line. Even Material Safety Data Sheets (M.S.D.S.) for Safety and Disposal Information are available on our website.



It's simple!

Our *Customer Service* section provides you with information such as answers to frequently asked questions or contact phone numbers and addresses for your area of the country. You can learn more about CooperTools in the *About Us* section or browse through the *What's New* information to learn how CooperTools continues to be your source for solutions.



For even faster searches, you can go direct to a brand site by simply entering the brand name. Entering

www.clecotools.com takes you directly to the brand site.

What is the future of www.coopertools.com? A dynamic site continuing to focus on your need for up-to-date information on the latest CooperTools' offerings that you can access anytime you need...twenty-four hours a day, seven days a week!

ISO-9001	2
Warranty, Lubrication, Safety	3
Model Number Index	4
Electronic Controllers & Software	
Introduction	6
Single-Channel TME Controller	8
2-Channel TME Controller	8
TMEM Controller	10
Controller Software	12
TM-COM Communications Software	14
TM-COM1 Communications Software	16
TM-COM1M Communications Software	17
Controller Specifications	18
Software Specifications	19
Instrumented Tools	
Tool Overview	20
Pistol Grip	22
Right Angle	23
Inline	24
Floating Spindle	26
Right Angle Floating Spindle	28
Flush Socket	30
Crowfoot	32
Tube Nut	34
Hold-n-Drive	36
Accessories	38
General Accessories	42
Service & Training	46
Sales & Service Centers	48
Cooper Tools on the Web	49

Quality System Certified

CooperTools Division has attained ISO 9001 Quality System Certification for seven of our facilities. The driving force behind the implementation of the Quality System is the commitment “to provide our customers with the **best value delivered** by offering only products and services **that meet or exceed their expectations**”.



Lexington, South Carolina



Dayton, Ohio



Hicksville, Ohio



Springfield, Ohio



Braunschweig, Germany



Westhausen, Germany



Ozoir-la-Ferrière, France

Warranty

Cooper warrants products and parts sold by it, insofar as they are of its own manufacture, against defects of material and workmanship, under normal use and service in accordance with its written instructions, recommendations, and ratings for installation, operation, maintenance, and service of products, for a period of **ONE YEAR FROM THE DATE OF INITIAL USE, BUT IN NO EVENT SHALL THE WARRANTY EXCEED 24 MONTHS FROM DATE OF DELIVERY TO DISTRIBUTOR.** Proof of Purchase with shipment date must be furnished by the user to validate the warranty. This warranty applies only to products manufactured by Cooper and specifically excludes products manufactured by others. Products not manufactured by Cooper are warranted only to the extent and in the manner warranted to Cooper by the manufacturer

and then only to the extent Cooper is able to enforce such warranty. Cooper's warranty with respect to products manufactured by it is limited to the repair or replacement, as Cooper may elect, of any defective part regarding which the Distributor has given 5 days written notice from the discovery of such defect. Installation and transportation costs are not included. Cooper shall have the option of requiring the return to it of the defective material, transportation prepaid, for inspection. No allowance will be made for repairs without Cooper's approval. **COOPER MAKES NO OTHER WARRANTY OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED, AND HEREBY DISCLAIMS ALL WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**

Lubrication Products

CooperTools' products are classified as non-hazardous manufactured items, defined in the OSHA 1910.1200 Hazard Communication Standard as "Articles". These products, under conditions of normal use, do not release or cause exposure to a hazardous chemical.

Under normal conditions of use, lubrication products sold separately for or used within these tools should not cause an exposure hazard. Refer to the Material Safety Data Sheet (M.S.D.S.) for Safety and Disposal Information. M.S.D.S. sheets are available upon request from CooperTools.

Cooper is also aware of, and complies with, the

provisions of section 611 amendments to the Clean Air Act of 1990. No ozone depleting chemicals have been used in the manufacture of our products.

If you resell or distribute these products, you have the responsibility for ensuring that the Material Safety Data Sheets are provided to the purchaser.

Proper lubrication is essential to the economical operation of pneumatic and electric tools. CooperTools perform better and their life is extended by using the recommended lubricants. All lubricants that are listed in the accessory section of this catalog have undergone extensive testing and are recommended for use with CooperTools products.

Fastener Selection

The suggested fasteners listed in this catalog are determined by matching a tool's maximum rated load to Society of Automotive Engineers (SAE) Grade 5 and International Organization of Standardization (ISO) Grade 9.8 fasteners. The torque capabilities for SAE Grade 5 fasteners are from SAE Manual, SAE J429 (Mechanical and Material Requirement for Externally Threaded Fasteners). The torque capabilities for ISO Grade 9.8 fasteners are from ISO 898-1 (Mechanical Properties of Fasteners). All values selected are based on lubricated fasteners.

The suggested fasteners listed in this catalog are advisory only, and CooperTools recommends that you further consult other technical references before final tool selection. Reliance on the accuracy of this catalog data for any purpose by anyone is at the sole risk of that person. CooperTools is not responsible for any loss, claim, or damage arising from improper tool selection.

The torque values listed under the headings "TORQUE" are tested on an ISO 5393 soft joint rate test fixture unless otherwise stated by a special note.

Model Number Index

Model	Page	Model	Page	Model	Page	Model	Page
54348	18	48316033	39	47EA135F4ML00	30	47ES281ZA	26
• 200427	41	49097101	39	47EA135H3MOFMD	36	47ES36D3	24
• 200428	41	49097101	39	• 47EA135MH4	23	47ES401ZA	26
• 200429	41	49098103	39	47EA135S461	28	47ES48D3	24
205832	39	57217101	39	47EA15AL3	23	47ES602ZA	26
205834	39	57218103	39	• 47EA175AX5	23	47ES702ZA	26
205838	39	1110496-06	40	• 47EA230AX5	23	47ES802ZA	26
205838	39	1110496-12	40	47EA230F4MO00	30	47ET20T2ED00	34
205838	39	1110496-18	40	47EA230H3MUMMB	36	47ET20T2MD00	34
535832	39	1110496-24	40	47EA230S461	28	47ET20T2MG00	34
536185	39	1110496-30	40	47EA30F2MG00	30	47ET30T3EF00	34
541090	40	• 17EA08AL2	23	47EA30S231	28	47ET30T3MG00	34
541715	39	• 17EA15AM3	23	• 47EA33AM3	23	47ET30T3MM00	34
541715	39	17EA16F1MD00	30	47EA39F2MG00	30	47ET40T4EK00	34
541715	39	17EA16S131	28	47EA39S231	28	47ET40T4EM00	34
541715	39	• 17EA22AM3	23	• 47EA43AM3	23	47ET40T4MR00	34
541757	39	17EA23F1MG00	30	47EA43F3MI00	30	47ET40T4MU00	34
542428	39	17EA23S131	28	47EA43H3MGFM5	36	541715-2	39
542428	39	• 17EA28AM3	23	47EA43S341	28	541715-2	39
542972	38	17EA30F1MD00	30	47EA55F2MI00	30	541715-2	39
542973	38	17EA30S131	28	47EA55S231	28	541715-2	39
542974	38	• 17EP06Q	22	47EA56F3MJ00	30	• 542778-10M	38
542975	38	• 17EP12D3	22	47EA56H3MIFMA	36	542778-15M	38
542979	38	• 17EP12Q	22	47EA56S341	28	542778-1M	38
543070	39	• 17EP17D3	22	• 47EA60AM3	23	• 542778-2M	38
543070	39	• 17EP17Q	22	• 47EA60AM4	23	• 542778-3M	38
543071	39	• 17EP22D3	22	47EA80F3MJ00	30	542778-50M	38
543230	39	• 17EP31D3	22	47EA80H3MJT30	36	• 542778-6M	38
543230	39	• 17ES06Q	24	47EA80S341	28	• 542778-8M	38
543232	39	17ES06ZA	26	• 47EA90AH4	23	• 542779-10M	38
543235	39	• 17ES12D3	24	47EC30D1ME01	32	• 542779-15M	38
543414	39	• 17ES12Q	24	47EC30D3ME01	32	542779-1M	38
543448	19	17ES12ZA	26	47EP12Q(1)	22	• 542779-20M	38
543449	19	• 17ES17D3	24	• 47EP25D3	22	542779-25M	38
543488	19	• 17ES17Q	24	• 47EP36D3	22	• 542779-2M	38
543489	19	17ES17ZA	26	• 47EP48D3	22	• 542779-30M	38
1110493	40	• 17ES22D3	24	47ES1152ZA	26	542779-3M	38
1110495	40	• 17ES31D3	24	47ES12Q	24	• 542779-40M	38
1110501	39	23 47ES12ZA	26	47ES1502ZA	26	542779-50M	38
35007004	39	• 47EA105AH4	23	47ES1653ZA	26	542779-6M	38
43287131	39	47EA110F3MT00	30	47ES221ZA	26	542779-8M	38
45017152	39	47EA110H3MLFMB	36	47ES2503ZA	26	• 542780-10M	38
48316033	39	47EA110S341	28	47ES25D3	24	• 542780-15M	38

Rapid Select means fast delivery

Models indicated with the **Rapid Select** icon represent our most popular tools, and are available for fast delivery on limited quantities.

Model Number Index

Model	Page	Model	Page	Model	Page	Model	Page
542780-1M	38	543445-50	38	67ES4050D12	25	• TME-111-30-D-EN	18
• 542780-2M	38	543445-7	38	67ES475D6	25	• TME-111-30-D-EP	18
• 542780-3M	38	543446-7	38	67ES475Z6	27	• TME-111-30-P	18
542780-50M	38	543451-25	38	67ES610D6	25	• TME-111-30-P-ED	18
• 542780-6M	38	543451-3	38	67ES610Z6	27	• TME-111-30-P-EN	18
• 542780-8M	38	543451-50	38	67ES65D4	25	• TME-111-30-P-EP	18
542916-1	39	543451-9	38	67ES65Z4	27	• TME-111-30-S	18
542916-3	39	543490-10	38	67ES850D8	25	• TME-111-30-S-ED	18
542916-4	39	576058-25	38	67ES850Z8	27	• TME-111-30-S-EN	18
542976-1	38	576058-3	38	BH-100A	41	• TME-111-30-S-EP	18
542976-2	38	576058-50	38	BH-45A	41	• TME-111-30-U	18
542976-3	38	576058-9	38	BH-60B	41	• TME-111-30-U-ED	18
542976-4	38	576060-2	38	BH-70A	41	• TME-111-30-U-EN	18
542976-5	38	576060-3	38	BH-80A	41	• TME-111-30-U-EP	18
542976-6	38	576060-4	38	BH-90A	41	• TME-121-15-D	18
542977-8	38	576060-5	38	• BL-2A	41	• TME-121-15-D-EN	18
542978-4	38	576060-6	38	• BL-4A	41	• TME-121-15-P	18
542978-8	38	67EA1035AH8	23	• BL-6A	41	• TME-121-15-P-EN	18
542979-50	38	67EA1340AH8	23	• BL-8A	41	• TME-121-15-S	18
542985-25	38	67EA150S461	28	BLL-6A	41	• TME-121-15-S-EN	18
542985-3	38	67EA1700AH8	23	• BLL-8A	41	• TME-121-15-U	18
542985-50	38	67EA185S461	28	BM-13A	41	• TME-121-15-U-EN	18
542985-9	38	67EA2010AH8	23	BM-18A	41	• TME-121-30-D	18
542986-25	38	67EA210S461	28	BM-25A	41	• TME-121-30-D-EN	18
542986-3	38	67EA235AL6	23	BM-35A	41	• TME-121-30-P	18
542986-50	38	67EA235S461	28	BM-45A	41	• TME-121-30-P-EN	18
542986-9	38	67EA255AL6	23	BML-13A	41	• TME-121-30-S	18
542987-25	38	67EA255S461	28	PL-12A	41	• TME-121-30-S-EN	18
542987-3	38	67EA340AM6	23	• TM-COM-V2.02	19	• TME-121-30-U	18
542987-50	38	67EA460AM6	23	• TM-COM1-V2.02	19	• TME-121-30-U-EN	18
542987-9	38	67EA570AM	23	• TM-COM1M-V2.02	19	• TMEM-114-15-D	18
542988-25	38	67EA730AM6	23	• TME-111-15-D	18	• TMEM-114-15-D-IO	18
542988-3	38	67EA860AH8	23	• TME-111-15-D-ED	18	• TMEM-114-15-P	18
542988-50	38	67ES1050D8	25	• TME-111-15-D-EN	18	• TMEM-114-15-P-IO	18
542988-9	38	67ES1050Z8	27	• TME-111-15-D-EP	18	• TMEM-114-15-S	18
542989-25	38	67ES105D4	25	• TME-111-15-P	18	• TMEM-114-15-S-IO	18
542989-3	38	67ES105Z4	27	• TME-111-15-P-ED	18	• TMEM-114-15-U	18
542989-50	38	67ES135D4	25	• TME-111-15-P-EN	18	• TMEM-114-15-U-IO	18
542989-9	38	67ES135Z4	27	• TME-111-15-P-EP	18	• TMEM-114-30-D	18
543334-EN	18	67ES1670D8	25	• TME-111-15-S	18	• TMEM-114-30-D-IO	18
543334J-EN	18	67ES1670Z8	27	• TME-111-15-S-ED	18	• TMEM-114-30-P	18
543335-ED	18	67ES190D6	25	• TME-111-15-S-EN	18	• TMEM-114-30-P-IO	18
543335J-ED	18	67ES190Z6	27	• TME-111-15-S-EP	18	• TMEM-114-30-S	18
543444-16	38	67ES2060D8	25	• TME-111-15-U	18	• TMEM-114-30-S-IO	18
543444-24	38	67ES2060Z8	27	• TME-111-15-U-ED	18	• TMEM-114-30-U	18
543444-5	38	67ES285D6	25	• TME-111-15-U-EN	18	• TMEM-114-30-U-IO	18
543444-8	38	67ES285Z6	27	• TME-111-15-U-EP	18		
543445-100	38	67ES385D6	25	• TME-111-30-D	18		
543445-25	38	67ES385Z6	27	• TME-111-30-D-ED	18		

The Total Solution For Critical Fastening Operations

Any number of companies can offer you power hand tools. Only CooperTools can offer you the innovative concept of Tightening Management.

It is an idea born of necessity, because CooperTools' fastening technology is used principally in the assembly of some of the most demanding products in the world – the automobiles and aircraft in which we all entrust our lives.

In demanding manufacturing environments such as automotive and aircraft assembly, "good enough" will never be acceptable. As a result, the Cooper concept of Tightening Management has been forged on a foundation of dedication to technical concepts, creative thinking, diligent scientific inquiry, and the continuous pursuit of perfection. Nothing is left to chance. Nothing is forgotten.

Because of our drive for perfection, you can excel in your job. Indeed, due to our uncommon focus on

total fastening solutions instead of just products, our customers look upon us not merely as vendors, but as strategic allies. And at CooperTools, we welcome the challenge of leadership this imposes.

The System

CooperTools' state of the art Cleco Tightening Manager System delivers unprecedented performance, productivity and accountability in the most critical assembly applications.

The system is comprised of the industry's most comprehensive line of DC electric assembly tools, driven by the remarkable Cleco Tightening Manager Controllers, which are available in a number of different configurations. The system also encompasses our proprietary network communications software – Tightening Manager Communications (TM-COM) – a

host of innovative accessories, and CooperTools' highly acclaimed service and support.

Significantly, the Cleco Tightening Manager System is designed for flexibility and with a common platform:

- One controller will run any Cleco tool from 2 to 4000 Nm. No other manufacturer in the industry offers one controller that does everything.
- One cable connects to any Cleco tool. This reduces the need for technical knowledge of your on-site service, maintenance and support professionals, because they do not have to keep up with a multitude of different cables and other accessories. Their effectiveness increases because of commonality of mechanical components and identical trouble-shooting.
- One user interface drives every Cleco Tightening Manager Controller. Each controller, regardless of its

configuration, uses the same user interface, which means operators have to be trained only once in how to set up or trouble shoot a system.

■ One controller can control a multitude of operations. This modularity allows you to move a Cleco Tightening Manager Controller from one assembly line to another even with completely different Cleco tools, without the need to purchase special cables or adapters.

When considering the cumulative impact of all these components – the tools, the controllers, the software, the flexibility, the accessories and the support – it becomes easy to see why the Cleco Tightening Manager System is the benchmark for all DC electric tool systems.

Cleco®



The Controllers: Single-Channel & 2-Channel TME

The heartbeat of the system is the Cleco Tightening Manager Controllers. These extraordinary controllers improve productivity by providing programmable automation on the assembly line. They use technology that is both user-friendly and technically advanced, delivering speed and repeatability and reducing the possibility of error. And they increase profit potential with their design ingenuity that enables Cleco controllers to trouble shoot simultaneously. They not only do the work; they also look for problems in the process.

Cleco Tightening Manager Controllers are available in three basic configurations – single-channel TME, 2-channel TME, and now introducing CooperTools' newest addition, the "Mini" TME (or TMEM).

With a wide range of hardware and software options, any of the Cleco controllers can be customized to accommodate your specific fastening requirements and assembly line protocols.

All of the Cleco Tightening Manager Controllers are designed to help overcome the most persistent problems inherent in many of today's complex manufacturing environments:

- Built-in versatility ensures that you are not forced



Shown above from left to right are the Cleco TME Single-Channel, TME 2-Channel, and the new TMEM Mini Tightening Manager Controllers.

to buy more tools than needed to achieve fastening strategies. Cleco Tightening Manager Controllers are capable of handling a broad array of tools ranging in torque from 2 to 4000 Nm, including right-angle, inline and pistol-grip tools, as well as specialty nutrunners such as flush socket, floating spindle, crowfoot, tube nut and hold-n-drive.

- One of the inherent drawbacks of other controllers is the user interface – which tends to be unnecessarily complex and difficult to use. So, we have designed ours to be as simple as possible, to improve speed and reduce the potential for error. Ours is highly intuitive – there is no need to consult a manual or use a laminated "cheat sheet," because

everything needed to operate the controller is right on the screen.

- CooperTools helps save both time and money by employing a navigational strategy that makes it easy to find your way around. For example, we have eliminated the sequential nature of other controllers, enabling efficiency and avoiding wasted steps.

- Perfection in critical fastening applications demands an accurate and consistent flow of real-time information. Cleco Tightening Manager Controllers allow for the monitoring and evaluation of any procedure through the use of unique graphic displays, including histograms, diagnostics and statistical process control data. X-Bar and R chart histograms provide the ability to correct programming requirements before little problems become big problems. CooperTools' oscilloscope screen allows a thorough analysis of the torque and the rotation relationship on every application. We provide you with the means to truly manage the tightening process.

- Our controllers offer a wide range of innovative design features that save time,



money and wear-and-tear, including removable mounting brackets, strategically placed connections to minimize possible damage, and fully configurable inputs and outputs to ensure compatibility with in-plant error proofing systems.



Removable mounting bracket permits quick and easy mounting and exchanging of controllers. All critical connects are shielded from inadvertent damage on the factory floor.



The Controllers: TME or "Mini TME"

Control, Flexibility and Affordability

The new Cleco TME Controller delivers the benefit of greatly enhanced performance and productivity in critical assembly applications, at a value that's certain to be a pleasant surprise.

The TME, a streamlined version of the remarkable Cleco Tightening Manager Controller, offers the same sophisticated fastening strategies as its more elaborate cousin – torque control, angle control, the



Front faceplate includes two-line LCD display, red, green, and yellow status lights and serial connector for programming.

Two-line LCD display indicates system status, error messages, and rundown results.

ability to change speeds and the like. But in creating the less expensive TME, we've taken the cost of the internal graphic user interface out of the Tightening Manager and made it programmable with a laptop computer or through an Ethernet network.

Built-in versatility ensures against the unnecessary



purchase of more tools than are needed to achieve desired fastening strategies. The TME, like all Tightening Manager Controllers from CooperTools, is capable of handling a broad array of tools ranging in torque from 2 to 4000 Nm, including right-angle, inline and pistol-grip tools, as well as specialty nutrunners such as flush socket, floating spindle, crowfoot, tube nut and hold-n-drive.

This wide range of tools is the same wide range of tools used on the original Cleco Tightening Manager Controller, the TME. The cables are also the same, regardless of controller or tool. CooperTools offers easy interchangeability.

The new Cleco TME controller is available in two basic forms: Standard and I/O. The standard TME is the most cost effective controller available that delivers precision control to the most critical tightening applications. The green lights on the tool, as well as on the front of the controller, are your indication that the fastening was completed to the stringent requirements you've come to expect from the Cleco Tightening Manager family of controllers.

The I/O version of the TME includes additional hardware to allow interface to line control devices:

- Fully configurable 24 volt input and output connectors are

compatible with existing TME accessories such as socket trays and start/stop boxes.



The TME hardware architecture tracks the time-proven TME hardware.

- An additional RS232 serial connector allows connection to serial devices such as barcode scanners.



24 volt inputs and output connectors on the I/O version controller are compatible with existing TME accessories.



The standard TME is very simple – only 3 connectors – power, tool, and serial for programming.

This can be used to select the correct application, as well as associate the resultant data to the ID number scanned.

- An RJ-45 Ethernet connector allows connection to CooperTools' TM-COM1 software for single point programming and analysis or CooperTools' TM-COM software for a complete networking communications solution. The Ethernet connector can also be used to communicate to customer networks.



TME with I/O including configurable 24 volt, ethernet, and additional serial connectors.

Standard TME

The Controllers: User Friendly Interface

Intuitive On-Screen Setup

The System In a Nutshell: The new line of Cleco DC electric assembly tools from CooperTools, driven by the remarkable Cleco Tightening Manager Controllers, gives you enhanced productivity and accountability in critical fastening applications using advanced and user-friendly technology.

The intuitive graphic user interface, as shown in the following, is designed for ease of use.

1 The Navigational Strategy

- time is money, and we help you save both by making it easy to find your way around.
- we've eliminated the sequential nature of other controllers, so you can go where you need to be with no wasted steps.
- no need for manuals or "cheat sheets," because everything's on the screen including help windows on demand.



Basic Application Builder screen offers one screen programming for simple two-step rundown applications.

2 Basic Application Builder

- simple one screen programming for two-step rundown operations.
- ability to monitor or control degrees of rotation.
- programming is independent of the tool, therefore reprogramming current parameters or programming the next function can be done without having to shut down the line.

3 Standard Application Builder

- allows programming of multi-step applications for more complex torque strategies.
- helps avoid expensive, time-consuming manual operations and tool changes since all functions are handled within the system.



Standard Application Builder screen can be used for more complex applications requiring up to six steps.

- enhances productivity in applications with torque traceability or safety issues.

4 Advanced Application Builder

- allows for fine-tuning strategies for the most complex of fastening strategies.
- maximizes efficiency and product quality.
- enhances productivity by allowing direct access to "Advanced" without having to step through time-consuming sequential steps.



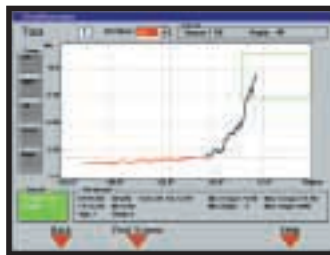
Advanced Applications Builder screen permits fine-tuning of complex applications, maximizing efficiency and product quality.

5 Run Screen

- large full-color LCD screen with enhanced indicator features removing any doubt as to the outcome of the rundown.
- easy-to-read data and graphics.
- screen can be configured to display counters and rundown details.
- oscilloscope imaging provides a rare "inside-the-process" picture of the joint and angle dynamics.
- helps not only in running the application, but also anticipates and helps in solving problems.



Run screen



Diagnostics screen displays an oscilloscope style torque trace of the joint to help identify potential problems.

6 Communications

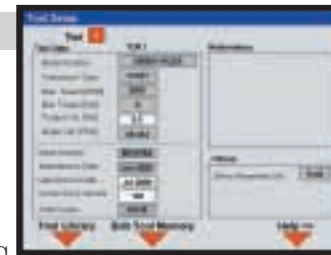
- on-board PC enhances flexibility in data collection and network interface.
- industry standard computer ports accommodate a variety of peripherals, including bar code readers and networked computer monitoring and reporting.
- wide variety of protocols for data stream.



Communications screen enhances flexibility in data collection and network interface

7 Tool Setup

- auto recognition feature simplifies access to all critical tool values stored on each tool.
- enhances functionality and flexibility by minimizing need for multiple backup tools.



Tool Setup screen simplifies access to all critical tool values.

8 Statistics

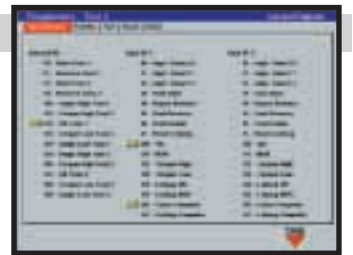
- statistical process control data provides early identification of any problems before they become a real threat.
- provides real-time dynamic collection of rundowns used in charting, record-keeping and SPC analysis.



Statistics screen displays valuable SPC data to aid in process evaluation promoting early identification of unforeseen problems.

9 Diagnostics

- helps troubleshoot any system problem.
- allows access to input/output status, tool functions, and fieldbus functions.



10 Utilities

- system software updates can be made with simple on-screen interface.



11 Administration

- allows easy selection of the system language.
- load/save screen allows one-button upload or download of setup data from 3.5" floppy.
- allows system security enhancements by programming password protection.



Administration screen allows one-button upload or download of controller set-up data. All data points can be downloaded to a single file.



The Network Software: TM-COM

Cleco Tightening Manager Controllers are supported by familiar Windows CE based software, making application programming easy and intuitive.

But the real genius built into the Cleco Tightening Manager Controllers is the network communications software. Cooper Tools' proprietary TM-COM Software delivers the ultimate in control, because it empowers users to control the controllers.

Every Cleco Tightening Manager controller on the plant floor can be controlled from a central location, such as an office, through a desktop PC.

That means, that each of CooperTools'

controllers can be monitored – or even changed by re-programming from any central or remote location. Even if your plant has different controllers in different departments or assembly stations, they can all be under the control of a tool or process engineer or anyone who is charged with making sure that the plant's fastening activities are performing to required standards. Efficient and centralized management of the tightening process assures quality products.

The Cleco Tightening Manager system has always provided the user ease of walking up to the controller and reviewing on-site the real-time fastening results on its screens. But now, anything that can be seen on the controller, can also be seen at a remote location, because the exact same screens

will be on the PC's desktop. For example, when watching a fastening histogram on the screen and noticing that the torques are beginning to overshoot, the controller can be re-programmed to adjust the speeds that will give a better run-down – all from the computer's desktop at a remote location.

There is a strong benefit in being able to keep historical records of all fastening operations, which is totally impractical on a controller-by-controller basis. And, since CooperTools continually improves its software, we are able to provide new features and benefits, such as with our TM-COM, which allows the downloading of software enhancements to a desktop and the upgrading of each controller from one central location.

TM-COM Software increases your efficiency and productivity. It improves production line speeds. It makes trouble-shooting quicker and easier. And, since time translates into money, it significantly enhances the bottom line.



You can review the chronological history, review statistical graphs, and even export the data to your PC for further analysis or future reference.



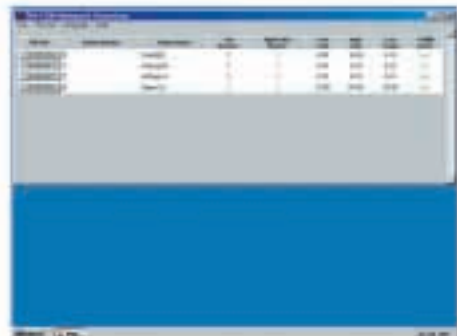
From the Navigator Screen, you can access all the programming screens available on the TME or TMEM I/O. For example, you can view and change the torque parameters.



You can launch sessions with multiple TME/TMEMs connected to your network. For example, you can monitor the Run Screens on four TME/TMEMs.



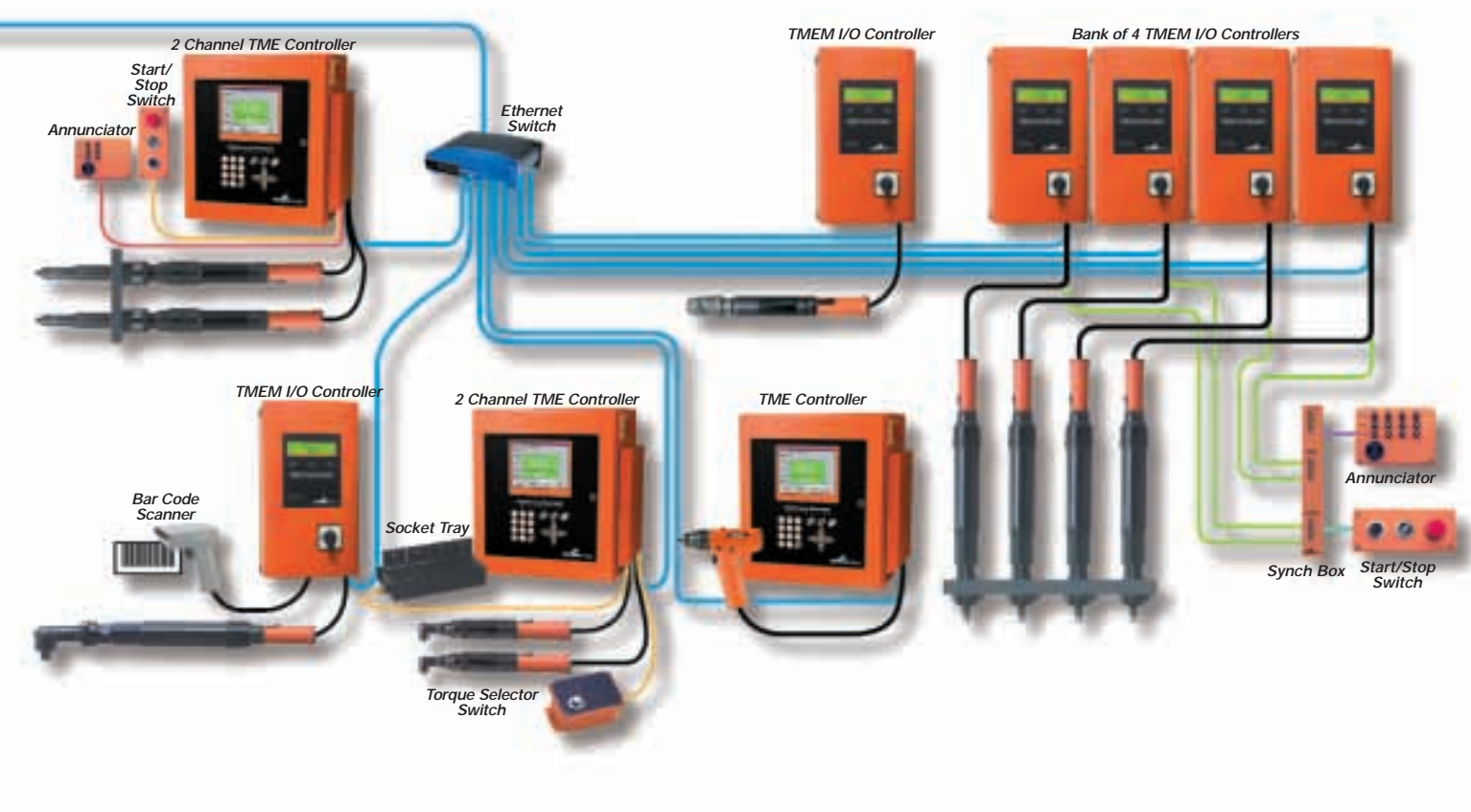
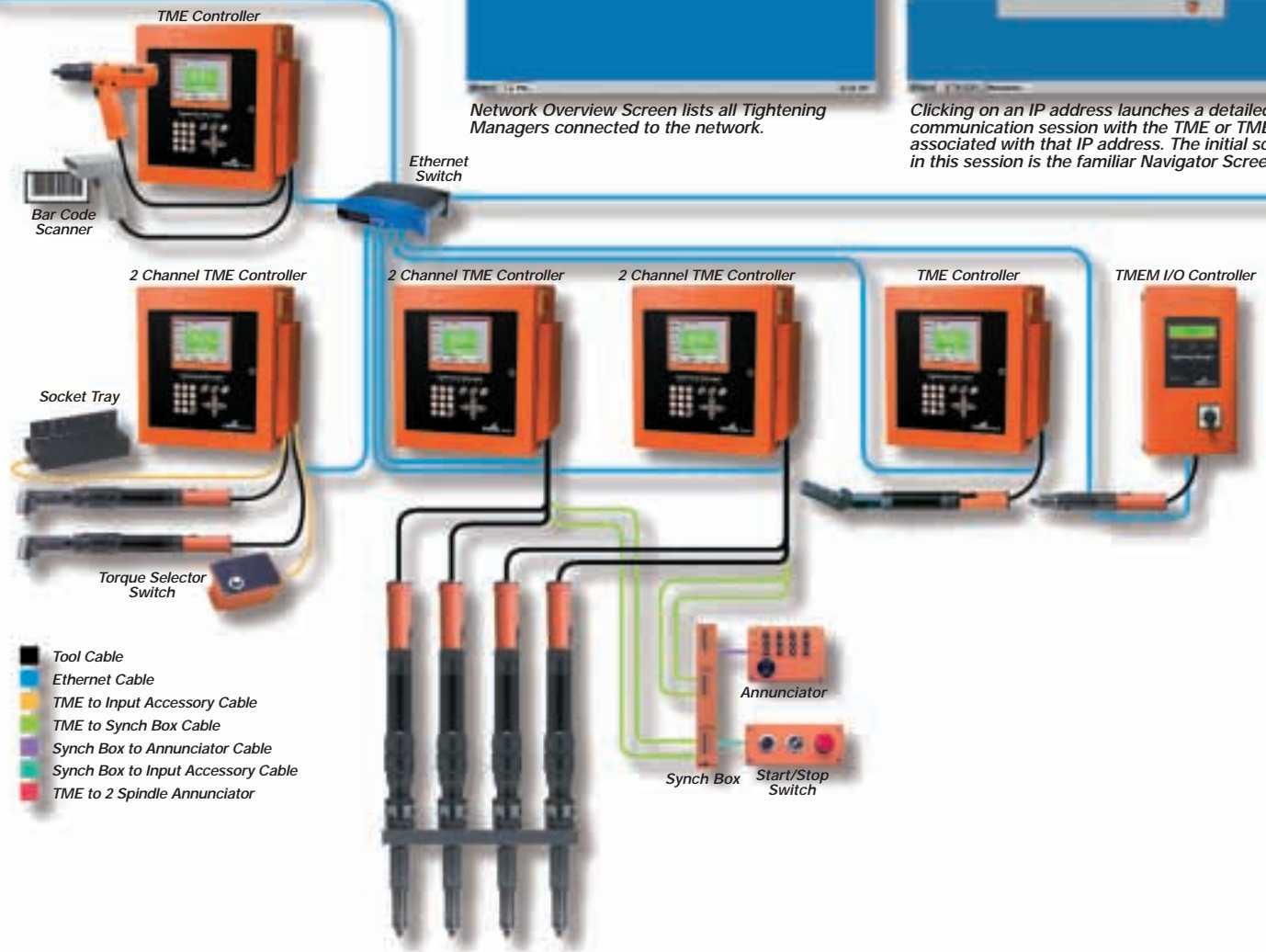
You can also launch multiple sessions to the same TME or TMEM I/O so you can monitor the Run Screen and the Oscilloscope at the same time.



Network Overview Screen lists all Tightening Managers connected to the network.



Clicking on an IP address launches a detailed communication session with the TME or TMEM I/O associated with that IP address. The initial screen in this session is the familiar Navigator Screen.



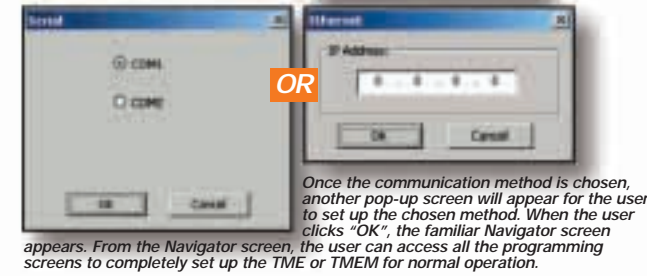
The Set-Up Software: TM-COM1

Same software with more options!

CooperTools' network software is now also available for non-networked environments. TM-COM1 works just like TM-COM except it communicates to only one TME or TMEM at a time. This software was developed specifically for the TMEM because this new controller requires programming set up from a PC. However, because all our software is based on the same platform, TM-COM1 can also communicate to TMEs.

TM-COM1 can communicate to any TMEM via the

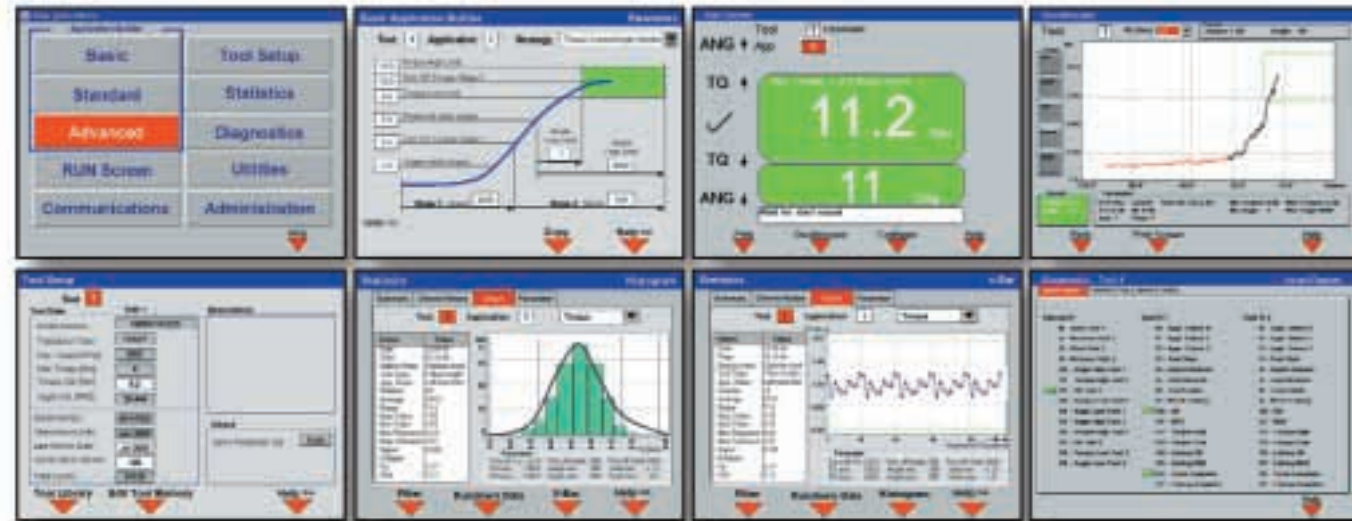
RS232 serial port. TM-COM1 can also communicate via Ethernet to a TME or TMEM equipped with Ethernet.



When TM-COM1 is first launched, a pop-up menu will be displayed. From this menu, the user will choose the communication method to the TME or TMEM – either RS232 serial or Ethernet. The user can also change the language from this menu.

Once the communication method is chosen, another pop-up screen will appear for the user to set up the chosen method. When the user clicks "OK", the familiar Navigator screen appears. From the Navigator screen, the user can access all the programming screens to completely set up the TME or TMEM for normal operation.

All screens available on TME and TM-COM are also available in TM-COM1.



TM-COM1 connected to standard TMEM via RS232 serial.

TM-COM1 connected to TMEM I/O via RS232 serial.

TM-COM1 connected to TME via Ethernet crossover cable.

TM-COM1 connected to TME 2-channel via Ethernet crossover cable.

The "Mini" Software: TM-COM1M

Same software simplified!

Just want to see the tool lights? Our software is also available in a "Mini" version – TM-COM1M. This software is a simplified version of TM-COM1. Like TM-COM1, TM-COM1M connects to one TME or TMEM at a time. However, for better value under certain conditions, not all screens are available. We left just enough to program the required critical fastening strategy – and thus avoiding unnecessary features.

TM-COM1M still allows the setup of multiple stage rundowns, changing speeds, and achieving the same fastening control that professionals expect from Cleco. But if torque data is not being sent to the server, using bar code scanners to automatically choose the torque, or interfacing with other plant floor automation, there is no reason to have the customer pay for such capability. By combining the TM-COM1M software with the standard TMEM

controller and CooperTools' family of Tightening Manager tools and cables, the most economical solution to critical tightening is achieved.



TMEs that are out of reach can be re-programmed or analyzed through an Ethernet crossover cable with TM-COM, TM-COM1, or TM-COM1M.

A limited number of screens are available in TM-COM1M.



TM-COM1M connected to standard TMEM via RS232 serial.

TM-COM1M connected to TMEM I/O via RS232 serial.

TM-COM1M connected to TME via Ethernet crossover cable.

TM-COM1M connected to TME 2-channel via Ethernet crossover cable.

TME Single Channel

Model Number		Language	Features	Weight		Width		Height		Depth	
115VAC	230VAC			lbs.	kg	in.	mm	in.	mm	in.	mm
TME-111-15-U	TME-111-30-U	English	Standard*	87	39.5	16.5	419.1	17.5	444.5	12.3	312.4
TME-111-15-U-EN	TME-111-30-U-EN	English	Ethernet	87	39.5	16.5	419.1	17.5	444.5	12.3	312.4
TME-111-15-U-ED	TME-111-30-U-ED	English	Ethernet & DeviceNet	87	39.5	16.5	419.1	17.5	444.5	12.3	312.4
TME-111-15-U-EP	TME-111-30-U-EP	English	Ethernet & Profibus	87	39.5	16.5	419.1	17.5	444.5	12.3	312.4
TME-111-15-D	TME-111-30-D	German	Standard*	87	39.5	16.5	419.1	17.5	444.5	12.3	312.4
TME-111-15-D-EN	TME-111-30-D-EN	German	Ethernet	87	39.5	16.5	419.1	17.5	444.5	12.3	312.4
TME-111-15-D-ED	TME-111-30-D-ED	German	Ethernet & DeviceNet	87	39.5	16.5	419.1	17.5	444.5	12.3	312.4
TME-111-15-D-EP	TME-111-30-D-EP	German	Ethernet & Profibus	87	39.5	16.5	419.1	17.5	444.5	12.3	312.4
TME-111-15-S	TME-111-30-S	Spanish	Standard*	87	39.5	16.5	419.1	17.5	444.5	12.3	312.4
TME-111-15-S-EN	TME-111-30-S-EN	Spanish	Ethernet	87	39.5	16.5	419.1	17.5	444.5	12.3	312.4
TME-111-15-S-ED	TME-111-30-S-ED	Spanish	Ethernet & DeviceNet	87	39.5	16.5	419.1	17.5	444.5	12.3	312.4
TME-111-15-S-EP	TME-111-30-S-EP	Spanish	Ethernet & Profibus	87	39.5	16.5	419.1	17.5	444.5	12.3	312.4
TME-111-15-P	TME-111-30-P	Portuguese	Standard*	87	39.5	16.5	419.1	17.5	444.5	12.3	312.4
TME-111-15-P-EN	TME-111-30-P-EN	Portuguese	Ethernet	87	39.5	16.5	419.1	17.5	444.5	12.3	312.4
TME-111-15-P-ED	TME-111-30-P-ED	Portuguese	Ethernet & DeviceNet	87	39.5	16.5	419.1	17.5	444.5	12.3	312.4
TME-111-15-P-EP	TME-111-30-P-EP	Portuguese	Ethernet & Profibus	87	39.5	16.5	419.1	17.5	444.5	12.3	312.4

*3.5" floppy drive, 24 volt I/O, 2 serial connectors, printer connector, keyboard connector.

TME 2-Channel

Model Number		Language	Features	Weight		Width		Height		Depth	
115VAC	230VAC			lbs.	kg	in.	mm	in.	mm	in.	mm
TME-121-15-U	TME-121-30-U	English	Standard*	103	46.8	16.5	419.1	17.5	444.5	14.1	358.1
TME-121-15-U-EN	TME-121-30-U-EN	English	Ethernet	103	46.8	16.5	419.1	17.5	444.5	14.1	358.1
TME-121-15-D	TME-121-30-D	German	Standard*	103	46.8	16.5	419.1	17.5	444.5	14.1	358.1
TME-121-15-D-EN	TME-121-30-D-EN	German	Ethernet	103	46.8	16.5	419.1	17.5	444.5	14.1	358.1
TME-121-15-S	TME-121-30-S	Spanish	Standard*	103	46.8	16.5	419.1	17.5	444.5	14.1	358.1
TME-121-15-S-EN	TME-121-30-S-EN	Spanish	Ethernet	103	46.8	16.5	419.1	17.5	444.5	14.1	358.1
TME-121-15-P	TME-121-30-P	Portuguese	Standard*	103	46.8	16.5	419.1	17.5	444.5	14.1	358.1
TME-121-15-P-EN	TME-121-30-P-EN	Portuguese	Ethernet	103	46.8	16.5	419.1	17.5	444.5	14.1	358.1

*3.5" floppy drive, 24 volt I/O, 2 serial connectors, printer connector, keyboard connector.

TMEM

Model Number		Language	Features	Weight		Width		Height		Depth	
115VAC	230VAC			lbs.	kg	in.	mm	in.	mm	in.	mm
TMEM-114-15-U	TMEM-114-30-U	English	Serial connector	46	20.9	7.9	200.7	16.2	411.5	12.7	322.6
TMEM-114-15-U-IO	TMEM-114-30-U-IO	English	I/O*	46	20.9	7.9	200.7	16.2	411.5	12.7	322.6
TMEM-114-15-D	TMEM-114-30-D	German	Serial connector	46	20.9	7.9	200.7	16.2	411.5	12.7	322.6
TMEM-114-15-D-IO	TMEM-114-30-D-IO	German	I/O*	46	20.9	7.9	200.7	16.2	411.5	12.7	322.6
TMEM-114-15-S	TMEM-114-30-S	Spanish	Serial connector	46	20.9	7.9	200.7	16.2	411.5	12.7	322.6
TMEM-114-15-S-IO	TMEM-114-30-S-IO	Spanish	I/O*	46	20.9	7.9	200.7	16.2	411.5	12.7	322.6
TMEM-114-15-P	TMEM-114-30-P	Portuguese	Serial connector	46	20.9	7.9	200.7	16.2	411.5	12.7	322.6
TMEM-114-15-P-IO	TMEM-114-30-P-IO	Portuguese	I/O*	46	20.9	7.9	200.7	16.2	411.5	12.7	322.6

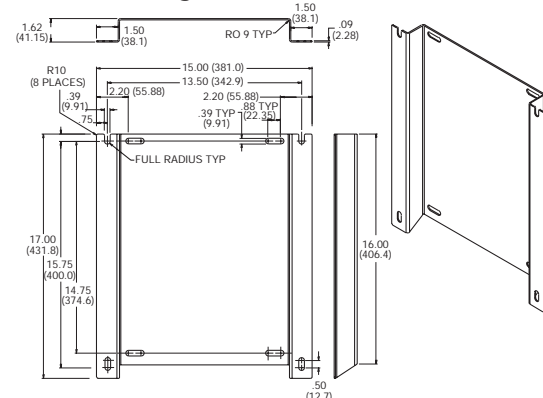
*24 volt I/O, Ethernet, and 2 serial connectors.

Refer to page 4 for description of Rapid Select.

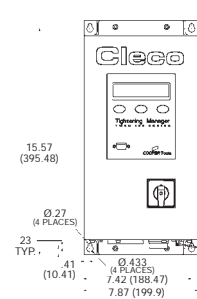
Tightening Manager Upgrade Kits

Part Number	Description
543481	Upgrades a Standard TMEM to a TMEM I/O
543334-EN	Upgrades a Standard TME with a 6 character serial number to an Ethernet TME
543334J-EN	Upgrades a Standard TME with a serial number having a J as the seventh character to an Ethernet TME
543335-ED	Upgrades a Standard TME with a 6 character serial number to a DeviceNet TME
543335J-ED	Upgrades a Standard TME with a serial number having a J as the seventh character to a DeviceNet TME

TME Mounting Dimensions



TMEM Mounting Dimensions



Software

Part Number	Description
TM-COM-V2.02	Network software (Serial cable included)
TM-COM1-V2.02	Setup software (Serial cable included)
TM-COM1M-V2.02	Mini setup software (Serial cable included)
543448	Notebook computer loaded with TM-COM (Carrying case included)
543449	Desktop computer loaded with TM-COM (Monitor, keyboard and mouse included)
543488	Notebook computer loaded with TM-COM1 (Carrying case included)
543489	Notebook computer loaded with TM-COM1M (Carrying case included)

Refer to page 4 for description of Rapid Select.



TM-COM Minimum System Requirements

Operating System: Windows 2000, NT or XP
 Processor: Pentium
 Memory: 256MB
 Free Disk Space: 10MB per controller
 Other: Ethernet connection, MS Office 2000



TM-COM1 & TM-COM1M Minimum System Requirements

Operating System: Windows 2000, NT or XP
 Processor: Pentium
 Memory: 256MB
 Other: MS Office 2000
 If connected to: TMEM Standard- RS232 serial connection
 TMEM I/O - RS232 serial or Ethernet connection
 TME - Ethernet connection

Software Functionality

	TM-COM	TM-COM1	TM-COM1M
Network Software	*		
Overview Screen	*		
Single point serial connection	.	.	.
Single point Ethernet connection	.	.	.
Navigator	.	.	.
Basic Application Builder	.	.	.
Torque Control/Angle Monitor	.	.	.
Angle Control/Torque Monitor	.	.	.
Standard Application Builder (Seq 11,30,50,41)	.	.	.
High Speed Rundown	.	.	.
Torque Control/Angle Monitor	.	.	.
Angle Control/Torque Monitor	.	.	.
Angle Controlled Backoff	.	.	.
TubeNut	.	.	.
Advanced Application Builder	.	.	.
Setup Matrix	.	.	.
+24V Inputs/Outputs	.	.	.
I/O Mapping	.	.	.
FieldBus DeviceNet	.	.	.
Profibus	.	.	.
Linking	.	.	.
System Settings	.	.	.
Run Screen	.	.	.
Oscilloscope graphs	.	.	.
Communications	.	.	.
Data Transmission	.	.	.
Part ID (Barcode)	.	.	.
Printer	.	.	.
Tool Setup	.	.	.
Read Tool Memory	.	.	.
Tool Library	.	.	.
Statistics	.	.	.
Chrono History	.	.	.
X-bar, Range, Histogram charts	.	.	.
Export Data	.	.	.
Data Filter	.	.	.
Diagnostics (I/O, Fieldbus, Arcnet, Tool)	.	.	.
Inputs/Outputs	.	.	.
FieldBus	.	.	.
Tool	.	.	.
Arcnet	.	.	.
Serial	.	.	.
Utilities	.	.	.
Software Upgrade	.	.	.
Administration	.	.	.
Load/Save system setup	.	.	.
Print reports + system setup	.	.	.
Password	.	.	.
Time/Date	.	.	.
Language Selection	.	.	.
Counter	.	.	.

The Tools

Simply the most serviceable DC electric tools in the world!

In a perfect world, every nut and bolt would be just alike. Only one DC electric tool would be required.

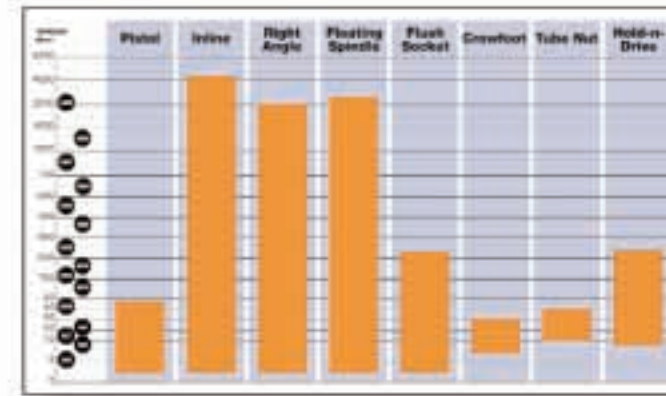
In the real world, industrial and production engineers translate the designs of the automotive or aeronautical engineers into fastening strategies that turn those designs into reality. Invariably, that means a broad variety of fastening applications requiring a wide range of tool types.

At CooperTools, our focus is to make tools to match production dynamics, instead of requiring the production line to fit our tools. So, the Cleco Tightening Manager System offers the most robust line of electric tools to meet all fastening applications. They are available in right-angle, inline and pistol-grip configurations, in addition to specialty nutrunners such as flush socket, floating spindle, crowfoot, tube nut and hold-n-drive tools. They deliver torque ranges

from 2 to 4000 Nm and accommodate bolt sizes from #10 to 1-3/4".

All of our tools are extremely robust, yet complex, highly sophisticated and technically advanced machines. They are engineered with precision gearing. They are designed with electric motors controlling the speed. They have resolvers that monitor the rotation of the motor and send those signals back, so that when the operator engages the shaft of the bolt and runs it down, the controller determines how much the bolt is stretching, how tight the clamp is, what the rotation and speed and stress/strain curve are. Our tools meet and exceed the most stringent global tool standards for accuracy, durability, vibration and noise.

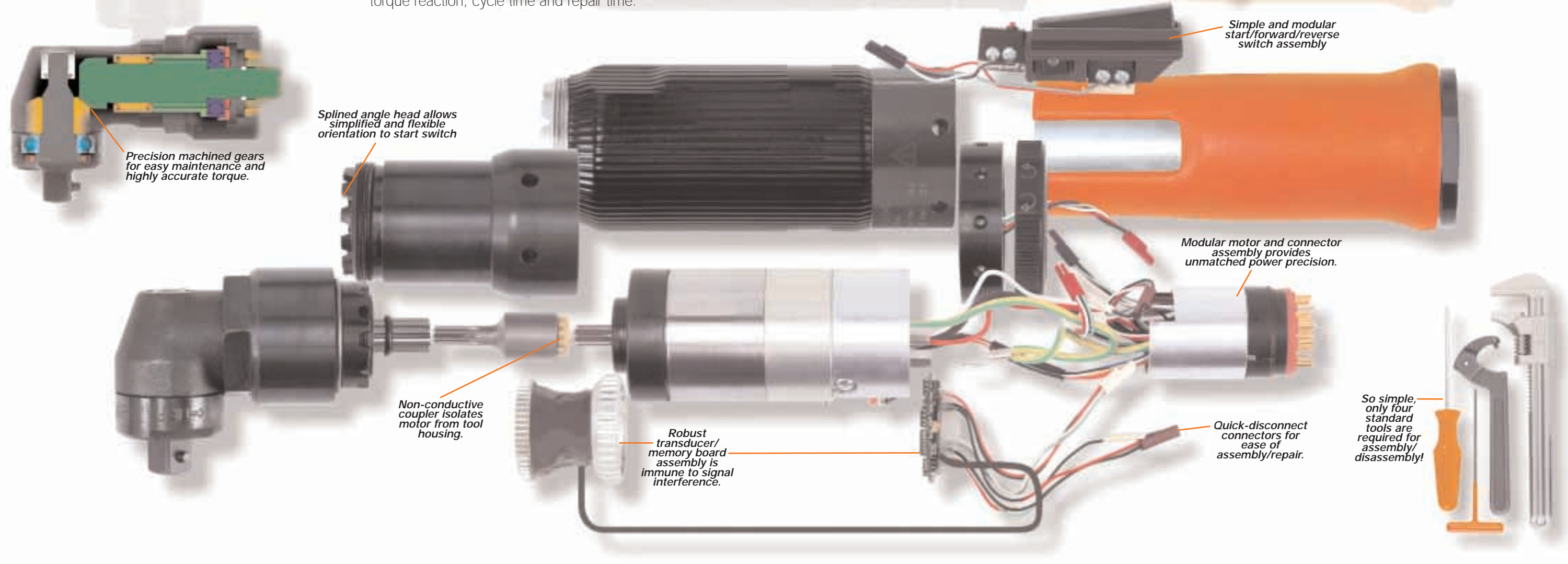
All Cleco DC electric tools are engineered to provide greater torque repeatability, minimal torque loss, increased speed control and ease of maintenance. They are designed to provide wider torque ranges for unprecedented flexibility and to enhance profit potential with engineering innovations that decrease torque reaction, cycle time and repair time.



performed, you know when it is time for preventive maintenance before it is too late and becomes a repair job.

They are also designed with advanced software that is operator-friendly. Their ergonomic engineering features make them lighter and faster enabling them to deliver enhanced performance, increased safety and reduced operator fatigue.

And a remarkable onboard memory chip records set-up values and performance history, making accurate analysis a reality, time after time. Because the tool records the number of cycles it has



Instrumented Electric Nutrunners

Pistol Grip Tools

Cleco®

17EP, 47EP, Series

Torque Range
2 - 48 Nm
1.5 - 35.4 Ft. Lbs.

Bolt Size
M5 - M10
#10 - 7/16"

Fastening Strategies
Torque Control with Angle Monitoring
Angle Control with Torque Monitoring
Torque Control with Time Monitoring

- Smart Tool Technology
- DC Brushless Motor
- Light ring
- Trigger start
- Reversible



Model Number		Bolt Size		Free Speed RPM	Torque Range		Length		Weight**		Side to Center		
1/4" Quick Change*	3/8" Sq. Dr.*	Gr. 5	Gr. 9.8		ft. lbs	Nm	in.	mm	lbs.	kg	in.	mm	
Pistol Grip													
	17EP06Q ⁽¹⁾		#10	M5	2600	4.4-1.5	6-2	7.0	178	2.2	1.0	0.84	21
	17EP12Q	17EP12D3	1/4	M6	1200	8.9-2.2	12-3	7.7	196	2.4	1.1	0.84	21
	17EP17Q	17EP17D3	5/16	M7	860	12.5-3.0	17-4	7.7	196	2.4	1.1	0.84	21
		17EP22D3	5/16	M8	650	16.2-3.7	22-5	7.2	183	2.4	1.1	0.84	21
		17EP31D3	3/8	M8	460	22.9-5.2	31-7	7.2	183	2.4	1.1	0.84	21
	47EP12Q ⁽¹⁾		1/4	M6	2600	8.9-2.2	12-3	8.2	208	2.7	1.2	0.84	21
		47EP25D3	5/16	M8	1200	18.4-3.7	25-5	8.4	213	2.9	1.3	0.84	21
		47EP36D3	3/8	M8	860	26.6-5.9	36-8	8.4	213	2.9	1.3	0.84	21
		47EP48D3	7/16	M10	650	35.4-7.4	48-10	8.6	218	3.0	1.4	0.84	21

*⁽¹⁾ Replace "Q" with "D2" for 1/4" sq. dr.

** Weights are without tool cable, suspension bail, reaction bar or dead handle if so equipped.

GENERAL:
All tools must be used with Tightening Manager Electronic Controller.

STANDARD EQUIPMENT:
Suspension Bail; Dead Handle is included with pistol & inline tools with output torques of 12 NM. Reaction bar is included with pistol tools with output torques of 17 NM and higher.

EXTRA EQUIPMENT:
Std. Tool Cable 542778-XX, Swivel Cable 542780-XX, Extension Cable 542779-XX.

Additional Accessories (Pages 38-45)
Refer to page 4 for description of Rapid Select.

Cables			Length Ft. M
Tool	Extension	Swivel	
542778-1M*	542779-1M	542780-1M*	3 1
542778-2M*	542779-2M	542780-2M*	6 2
542778-3M	542779-3M	542780-3M	9 3
542778-6M	542779-6M	542780-6M	19.5 6
542778-8M	542779-8M	542780-8M	26 8
542778-10M	542779-10M	542780-10M	33 10
542778-15M	542779-15M	542780-15M	49 15
	542779-20M		66 20
	542779-25M		82 25
	542779-30M		98 30
	542779-40M		131 40
542778-50M	542779-50M	542780-50M	164 50

*Must be used with 542779 extension cable.

Instrumented Electric Nutrunners

Right Angle Electric Tools

Cleco®

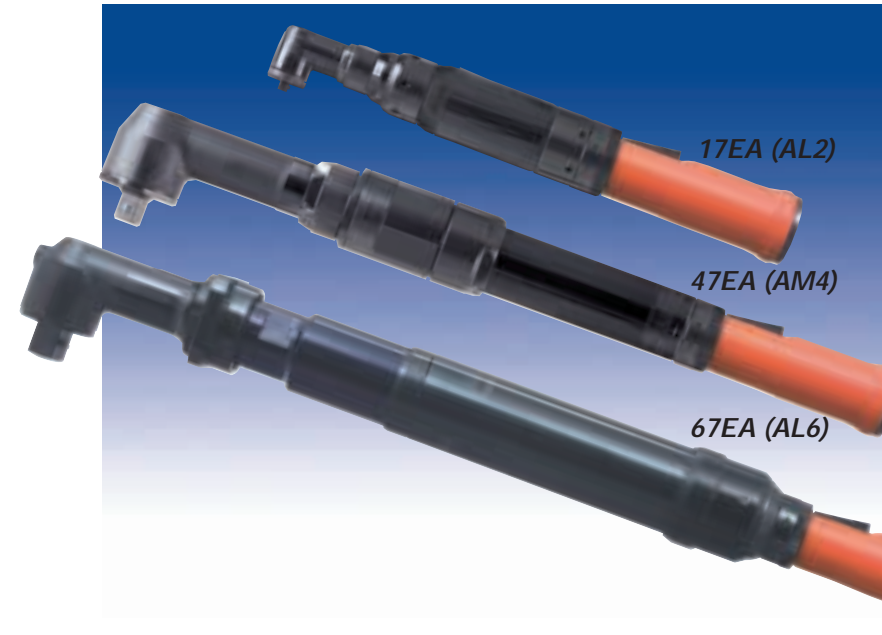
17EA, 47EA, 67EA Series

Torque Range
2 - 2000 Nm
1.5 - 1475.0 Ft. Lbs.

Bolt Size
M5 - M36
#10 - 1 1/2"

Fastening Strategies
Torque Control with Angle Monitoring
Angle Control with Torque Monitoring
Torque Control with Time Monitoring

- Smart Tool Technology
- DC Brushless Motor
- Light ring
- Reversible



Model Number		Bolt Size		Free Speed RPM	Torque Range		Length		Weight**		Head Height		Side to Center	
3/8" Sq. Dr.*	1/2" Sq. Dr.*	Gr. 5	Gr. 9.8		ft. lbs	Nm	in.	mm	lbs	kg	in.	mm	in.	mm

Right Angle

17EA08AL2 ⁽¹⁾		#10	M5	2000	5.8-1.5	7.8-2	13.6	345	2.9	1.3	1.4	36	0.5	13
17EA15AM3		1/4	M7	860	11.1-3.3	15-5	14.8	376	3.6	1.6	1.6	41	0.59	15
47EA15AL3		1/4	M7	1900	11.1-3.7	15-5	15.6	396	4.1	1.9	1.6	41	0.59	15
17EA22AM3		5/16	M8	610	16.2-4.6	22-6	14.8	376	3.6	1.6	1.6	41	0.59	15
17EA28AM3		5/16	M8	465	20.7-6.6	28-9	14.8	376	3.6	1.6	1.6	41	0.59	15
47EA33AM3		3/8	M8	895	24.3-5.2	33-7	17.7	450	5.0	2.3	1.9	48	0.75	19
47EA43AM3		3/8	M10	685	31.7-6.6	43-9	17.7	450	5.0	2.3	1.9	48	0.75	19
47EA60AM3	47EA60AM4	7/16	M10	485	45.0-9.6	61-13	17.7	450	5.0	2.3	1.9	48	0.75	19
	47EA90AH4	1/2	M12	340	64.2-13.3	87-18	18.4	467	6.7	3.0	2.3	58	0.81	21
	47EA105AH4	9/16	M12	230	76.7-15.5	104-21	18.4	467	6.7	3.0	2.3	58	0.81	21
	47EA135MH4	9/16	M14	180	98.1-19.9	133-27	19.0	483	7.3	3.3	2.4	61	0.94	24
	47EA175AX5 ⁽²⁾	5/8	M14	130	129.8-26.6	176-36	21.5	546	10.2	4.6	2.7	69	1.06	27
	47EA230AX5 ⁽²⁾	5/8	M16	100	169.6-33.9	230-46	21.5	546	10.2	4.6	2.7	69	1.06	27
	67EA235AL6 ⁽³⁾	3/4	M18	145	169.6-33.9	230-46	25.8	655	12.9	5.9	2.3	58	1.03	26
	67EA255AL6 ⁽³⁾	3/4	M18	125	188.1-40.6	255-55	25.8	655	12.9	5.9	2.3	58	1.03	26
	67EA340AM6 ⁽³⁾	3/4	M18	100	247.1-51.6	335-70	31.6	803	21.0	9.5	3.1	79	1.38	35
	67EA460AM6 ⁽³⁾	7/8	M20	73	339.3-70.1	460-95	31.6	803	21.0	9.5	3.1	79	1.38	35
	67EA570AM6 ^{(3)†}	1	M22	60	420.4-84.8	570-115	31.6	803	21.0	9.5	3.1	79	1.38	35
	67EA730AM6 ^{(3)†}	1	M22	46	538.4-110.6	730-150	31.6	803	21.0	9.5	3.1	79	1.38	35
	67EA860AH8 ⁽⁴⁾	1 1/8	M24	36	634.3-129.1	860-175	25.3	643	22.7	10.3	9.32	237	1.50	38
	67EA1035AH8 ⁽⁴⁾	1 1/4	M27	28	763.3-154.9	1035-210	26.3	668	23.0	10.5	9.32	237	1.50	38
	67EA1340AH8 ⁽⁴⁾	1 1/4	M27	22	988.3-199.1	1340-270	26.3	668	23.0	10.5	9.32	237	1.50	38
	67EA1700AH8 ⁽⁴⁾	1 3/8	M30	17	1253.8-250.8	1700-340	26.3	668	23.0	10.5	9.32	237	1.50	38
	67EA2010AH8 ⁽⁴⁾	1 1/2	M36	15	1475.0-295.0	2000-400	26.3	668	23.0	10.5	9.32	237	1.50	38

*⁽¹⁾ 1/4" sq. dr.; ⁽²⁾ 5/8" sq. dr.; ⁽³⁾ 3/4" sq. dr.; ⁽⁴⁾ 1" sq. dr.

** Weights are without reaction bar and tool cable.

† NOTE: Limited anglehead durability at rated torque.

GENERAL:
All tools must be used with Tightening Manager Electronic Controller.

STANDARD EQUIPMENT:
Suspension Bail;
Mounting Plate (67...AL6, 67...AM6)
Reaction Bar (67...AH8)

EXTRA EQUIPMENT:
Std. Tool Cable 542778-XX, Swivel Cable 542780-XX, Extension Cable 542779-XX.
17 & 47 series: For ball retainer (in place of pin retainer) add "B" to end of model number.

ADDITIONAL ACCESSORIES (Page 38-45)
Refer to page 4 for description of Rapid Select.

Cables			Length Ft. M
Tool	Extension	Swivel	
542778-1M*	542779-1M	542780-1M*	3 1
542778-2M*	542779-2M	542780-2M*	6 2
542778-3M	542779-3M	542780-3M	9 3
542778-6M	542779-6M	542780-6M	19.5 6
542778-8M	542779-8M	542780-8M	26 8
542778-10M	542779-10M	542780-10M	33 10
542778-15M	542779-15M	542780-15M	49 15
	542779-20M		66 20
	542779-25M		82 25
	542779-30M		98 30
	542779-40M		131 40
542778-50M	542779-50M	542780-50M	164 50

*Must be used with 542779 extension cable.

Instrumented Electric Nutrunners

Inline Electric Tools

Cleco® 17ES & 47ES Series

Torque Range
2 - 48 Nm
1.5 - 35.4 Ft. Lbs.

Bolt Size
M5 - M10
#10 - 7/16"

Fastening Strategies
Torque Control with Angle Monitoring
Angle Control with Torque Monitoring
Torque Control with Time Monitoring

- Smart Tool Technology
- DC Brushless Motor
- Light ring
- Reversible



Instrumented Electric Nutrunners

Inline Electric Tools

Cleco® 67ES Series

Torque Range
13 - 4050 Nm
10 - 2985 Ft. Lbs.

Bolt Size
M10 - M42
7/16" - 1 3/4"

Fastening Strategies
Torque Control with Angle Monitoring
Angle Control with Torque Monitoring
Torque Control with Time Monitoring

- Smart Tool Technology
- DC Brushless Motor
- Light ring
- Reversible



Model Number	Bolt Size		Free Speed	Torque Range		Length		Weight**		Side to Center	
	Gr. 5	Gr. 9.8		ft. lbs	Nm	in.	mm	lbs.	kg	in.	mm
1/4" Slip Chuck*											
3/8" Sq. Dr.*											
Inline											
17ES06Q ⁽¹⁾	#10	M5	2600	4.4-1.5	6-2	12.3	312	2.5	1.1	0.91	23
17ES12Q	1/4	M6	1200	8.9-2.2	12-3	13.0	330	2.7	1.2	0.91	23
17ES17Q	5/16	M7	860	12.5-3.0	17-4	13.0	330	2.7	1.2	0.91	23
	5/16	M8	650	16.2-3.7	22-5	12.4	315	2.7	1.2	0.91	23
	3/8	M8	460	22.9-5.2	31-7	12.4	315	2.7	1.2	0.91	23
47ES12Q ⁽¹⁾	1/4	M6	2600	8.9-2.2	12-3	13.5	343	3.0	1.4	0.91	23
	5/16	M8	1200	18.4-3.7	25-5	13.6	345	3.2	1.5	0.91	23
	3/8	M8	860	26.6-5.9	36-8	13.6	345	3.2	1.5	0.91	23
	7/16	M10	650	35.4-7.4	48-10	13.8	351	3.3	1.5	0.91	23

* ⁽¹⁾ Replace "Q" with "D2" for 1/4" sq. dr.

** Weights are without tool cable or suspension bail.

GENERAL:
All tools must be used with Tightening Manager Electronic Controller.

STANDARD EQUIPMENT:
Suspension Bail; Dead Handle is included with pistol & inline tools with output torques of 12 NM. Reaction bar is included with pistol & inline tools with output torques of 17 NM and higher.

EXTRA EQUIPMENT:
Std. Tool Cable 542778-XX, Swivel Cable 542780-XX, Extension Cable 542779-XX.
Mounting Plate: 543231

ADDITIONAL ACCESSORIES (Pages 38-45)

Refer to page 4 for description of Rapid Select.

Tool	Extension	Swivel	Length	
			Ft.	M
542778-1M*	542779-1M	542780-1M*	3	1
542778-2M*	542779-2M	542780-2M*	6	2
542778-3M	542779-3M	542780-3M	9	3
542778-6M	542779-6M	542780-6M	19.5	6
542778-8M	542779-8M	542780-8M	26	8
542778-10M	542779-10M	542780-10M	33	10
542778-15M	542779-15M	542780-15M	49	15
	542779-20M		66	20
	542779-25M		82	25
	542779-30M		98	30
	542779-40M		131	40
542778-50M	542779-50M	542780-50M	164	50

*Must be used with 542779 extension cable.

Model Number	Drive	Bolt Size		Free Speed	Torque Range		Length		Weight*		Side to Center	
		Gr. 5	Gr. 9.8		ft. lbs	Nm	in.	mm	lbs	kg	in.	mm
		in.	mm	RPM								
Fixed Spindle												
67ES65D4	1/2	7/16	M10	595	47-10	64-13	21.0	533	10.3	4.7	1.31	33
67ES105D4	1/2	9/16	M12	365	77-15	104-21	21.0	533	10.3	4.7	1.31	33
67ES135D4	1/2	9/16	M14	270	100-20	135-27	21.0	533	10.3	4.7	1.31	33
67ES190D6	3/4	5/8	M16	180	140-28	190-38	20.5	521	11.6	5.3	1.31	33
67ES285D6	3/4	3/4	M16	125	210-42	285-57	20.5	521	11.6	5.3	1.31	33
67ES385D6	3/4	3/4	M18	93	285-57	386-77	20.5	521	11.6	5.3	1.31	33
67ES475D6	3/4	7/8	M20	75	350-70	475-95	20.9	531	12.0	5.4	1.31	33
67ES610D6	3/4	1	M22	55	450-90	610-122	20.9	531	12.0	5.4	1.31	33
67ES850D8	1	1 1/8	M24	37	625-125	848-170	23.8	605	17.0	7.7	1.50	38
67ES1050D8	1	1 1/4	M27	30	775-155	1050-210	23.8	605	17.0	7.7	1.50	38
67ES1670D8	1	1 3/8	M30	19	1230-246	1668-334	23.8	605	17.0	7.7	1.50	38
67ES2060D8	1	1 1/2	M36	15	1520-304	2060-412	23.8	605	17.0	7.7	1.50	38
67ES4050D12	1 1/2	1 3/4	M42	7	2985-597	4050-810	24.5	622	45.2	20.5	2.35	60

* Weights are without tool cable or reaction bar if so equipped.

GENERAL:
All tools must be used with Tightening Manager Electronic Controller.

STANDARD EQUIPMENT:
Reaction bar; Slave drive reaction bar on 67ES4050D12.

EXTRA EQUIPMENT:
Std. Tool Cable 542778-XX, Swivel Cable 542780-XX, Extension Cable 542779-XX.
Mounting Plates: 67ES...D4 - 49087108; 67ES...D6 - 44597101; 67ES...D8 - 49487101.

ADDITIONAL ACCESSORIES (Pages 38-45)
Refer to page 4 for description of Rapid Select.

Tool	Extension	Swivel	Length	
			Ft.	M
542778-1M*	542779-1M	542780-1M*	3	1
542778-2M*	542779-2M	542780-2M*	6	2
542778-3M	542779-3M	542780-3M	9	3
542778-6M	542779-6M	542780-6M	19.5	6
542778-8M	542779-8M	542780-8M	26	8
542778-10M	542779-10M	542780-10M	33	10
542778-15M	542779-15M	542780-15M	49	15
	542779-20M		66	20
	542779-25M		82	25
	542779-30M		98	30
	542779-40M		131	40
542778-50M	542779-50M	542780-50M	164	50

*Must be used with 542779 extension cable.

Instrumented Electric Nutrunners

Floating Spindle Electric Tools

Cleco®

17ES, 47ES Series

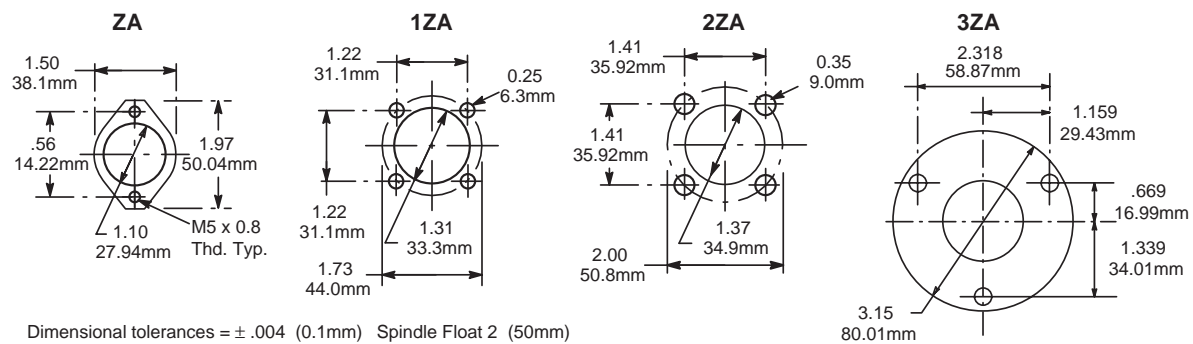
Torque Range
2 - 247 Nm
1.5 - 182.2 Ft. Lbs.

Bolt Size
M5 - M16
#10 - 5/8"

Fastening Strategies
Torque Control with Angle Monitoring
Angle Control with Torque Monitoring
Torque Control with Time Monitoring

- Smart Tool Technology
- DC Brushless Motor
- Light ring
- Reversible

Base Plate Mounting Dimensions



Model Number		Bolt Size		Free Speed RPM	Torque Range		Length		Weight**		Head Height		Side to Center	
1/4" Sq. Dr.*	1/2" Sq. Dr.*	Gr. 5 in.	Gr. 9.8 mm		ft. lbs	Nm	in.	mm	lbs	kg	in.	mm	in.	mm
Floating Spindle														
17ES06ZA		#10	M5	2600	4.4-1.5	6-2	15.5	394	3.0	1.4	-	-	0.91	23
17ES12ZA		1/4	M6	1200	8.9-2.2	12-3	16.0	406	3.2	1.5	-	-	0.91	23
17ES17ZA		5/16	M7	860	12.5-3.0	17-4	16.0	406	3.2	1.5	-	-	0.91	23
47ES12ZA		1/4	M6	2600	8.9-2.2	12-3	16.7	425	3.4	1.5	-	-	0.91	23
47ES221ZA ⁽¹⁾		5/16	M7	1490	16.2-3.7	22-5	22.0	559	5.8	2.6	-	-	0.92	23
47ES281ZA ⁽¹⁾		3/8	M10	1145	20.7-4.4	28-6	22.0	559	5.8	2.6	-	-	0.92	23
47ES401ZA ⁽¹⁾		3/8	M10	810	29.5-5.9	40-8	22.0	559	5.8	2.6	-	-	0.92	23
	47ES602ZA	7/16	M10	570	42.0-8.9	57-12	24.4	620	8.4	3.8	-	-	1.10	28
	47ES702ZA	7/16	M10	380	50.2-10.3	68-14	24.4	620	8.4	3.8	-	-	1.10	28
	47ES802ZA	1/2	M12	300	60.5-12.5	82-17	26.7	678	9.6	4.4	-	-	1.22	31
	47ES1152ZA	9/16	M12	215	84.8-18.4	115-25	26.7	678	9.6	4.4	-	-	1.22	31
	47ES1502ZA	5/8	M14	165	110.6-22.1	150-30	26.7	678	9.6	4.4	-	-	1.22	31
	47ES1653ZA ⁽²⁾	5/8	M14	150	121.7-24.3	165-33	28.6	726	14.6	6.6	-	-	1.57	40
	47ES2503ZA ⁽²⁾	5/8	M16	100	182.2-36.1	247-49	28.6	726	14.6	6.6	-	-	1.57	40

⁽¹⁾ 3/8" sq. dr.; ⁽²⁾ 3/4" sq. dr.;

** Weights are without tool cable, suspension bail, reaction bar or dead handle if so equipped.

GENERAL:
All tools must be used with Tightening Manager Electronic Controller.

STANDARD EQUIPMENT:
Suspension Bail.

EXTRA EQUIPMENT:
Std. Tool Cable 542778-XX, Swivel Cable 542780-XX, Extension Cable 542779-XX.

ADDITIONAL ACCESSORIES (Pages 38-45)

Refer to page 4 for description of Rapid Select.

Tool	Extension	Swivel	Length Ft.	M
542778-1M*	542779-1M	542780-1M*	3	1
542778-2M*	542779-2M	542780-2M*	6	2
542778-3M	542779-3M	542780-3M	9	3
542778-6M	542779-6M	542780-6M	19.5	6
542778-8M	542779-8M	542780-8M	26	8
542778-10M	542779-10M	542780-10M	33	10
542778-15M	542779-15M	542780-15M	49	15
	542779-20M		66	20
	542779-25M		82	25
	542779-30M		98	30
	542779-40M		131	40
542778-50M	542779-50M	542780-50M	164	50

*Must be used with 542779 extension cable.

Instrumented Electric Nutrunners

Floating Spindle Electric Tools

Cleco®

67ES Series

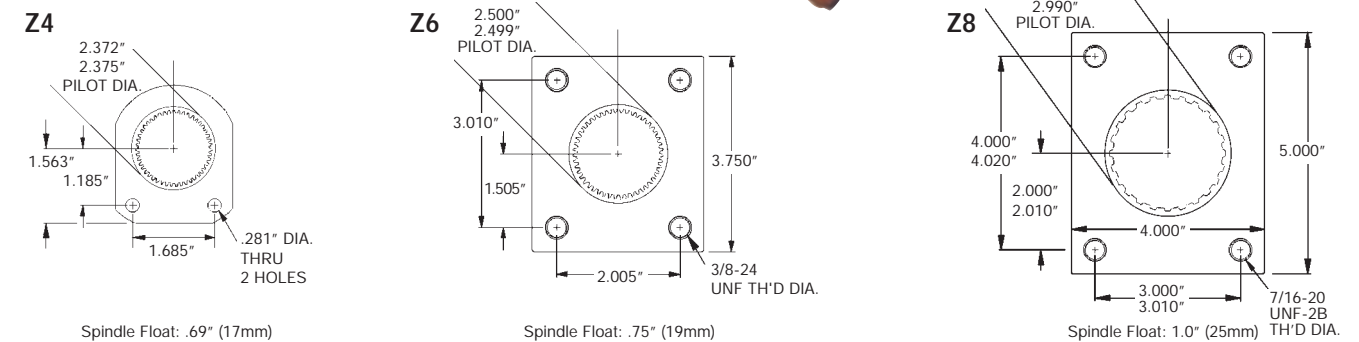
Torque Range
13 - 2060 Nm
10 - 1520 Ft. Lbs.

Bolt Size
M10 - M36
7/16" - 1 1/2"

Fastening Strategies
Torque Control with Angle Monitoring
Angle Control with Torque Monitoring
Torque Control with Time Monitoring

- Smart Tool Technology
- DC Brushless Motor
- Light ring
- Reversible

Base Plate Mounting Dimensions



Model Number	Drive	Bolt Size		Free Speed RPM	Torque Range		Length		Weight*		Side to Center	
		Gr. 5 in.	Gr. 9.8 mm		ft. lbs	Nm	in.	mm	lbs	kg	in.	mm
Floating Spindle												
67ES65Z4	1/2	7/16	M10	595	47-10	64-13	21.0	533	10.8	4.9	1.31	33
67ES105Z4	1/2	9/16	M12	365	77-15	104-21	21.0	533	10.8	4.9	1.31	33
67ES135Z4	1/2	9/16	M14	270	100-20	135-27	21.0	533	10.8	4.9	1.31	33
67ES190Z6	3/4	5/8	M16	180	140-28	190-38	22.0	559	15.6	7.1	1.31	33
67ES285Z6	3/4	3/4	M16	125	210-42	285-57	22.0	559	15.6	7.1	1.31	33
67ES385Z6	3/4	3/4	M18	93	285-57	386-77	22.0	559	15.6	7.1	1.31	33
67ES475Z6	3/4	7/8	M20	75	350-70	475-95	22.4	569	16.0	7.3	1.31	33
67ES610Z6	3/4	1	M22	55	450-90	610-122	22.4	569	16.0	7.3	1.31	33
67ES850Z8	1	1 1/8	M24	37	625-125	848-170	23.8	605	20.0	9.1	1.50	38
67ES1050Z8	1	1 1/4	M27	30	775-155	1050-210	23.8	605	20.0	9.1	1.50	38
67ES1670Z8	1	1 3/8	M30	19	1230-246	1668-334	23.8	605	20.0	9.1	1.50	38
67ES2060Z8	1	1 1/2	M36	15	1520-304	2060-412	23.8	605	20.0	9.1	1.50	38

* Weights are without tool cable or mounting plate.

GENERAL:
All tools must be used with Tightening Manager Electronic Controller.

STANDARD EQUIPMENT:
Mounting plate.

EXTRA EQUIPMENT:
Std. Tool Cable 542778-XX; Swivel Cable 542780-XX, Extension Cable 542779-XX;
Reaction Bar: 67ES...Z4 - 48047128; 67ES...Z8 - 46036202.

ADDITIONAL ACCESSORIES (Pages 38-45)

Refer to page 4 for description of Rapid Select.

Tool	Extension	Swivel	Length Ft.	M
542778-1M*	542779-1M	542780-1M*	3	1
542778-2M*	542779-2M	542780-2M*	6	2
542778-3M	542779-3M	542780-3M	9	3
542778-6M	542779-6M	542780-6M	19.5	6
542778-8M	542779-8M	542780-8M	26	8
542778-10M	542779-10M	542780-10M	33	10
542778-15M	542779-15M	542780-15M	49	15
	542779-20M		66	20
	542779-25M		82	25
	542779-30M		98	30
	542779-40M		131	40
542778-50M	542779-50M	542780-50M	164	50

*Must be used with 542779 extension cable.

Instrumented Electric Nutrunners

Right Angle Floating Spindle

Cleco®

17EA, 47EA, 67EA Series

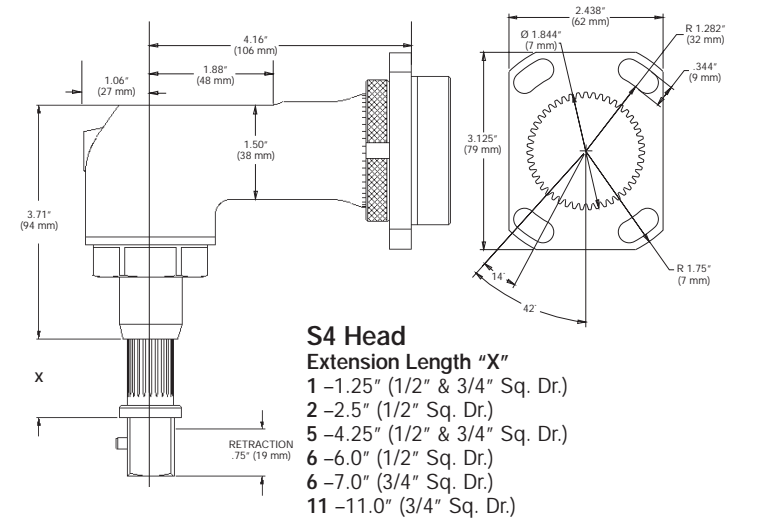
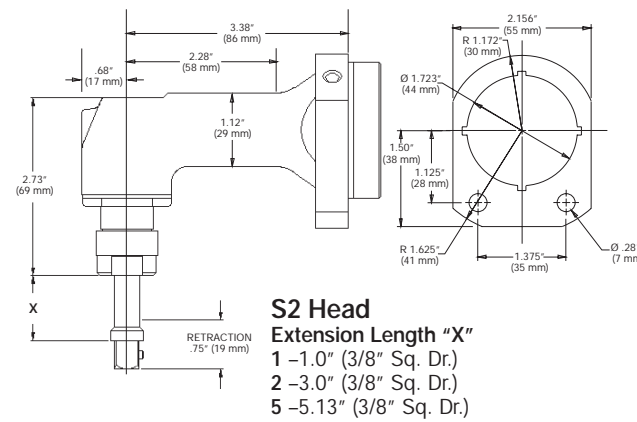
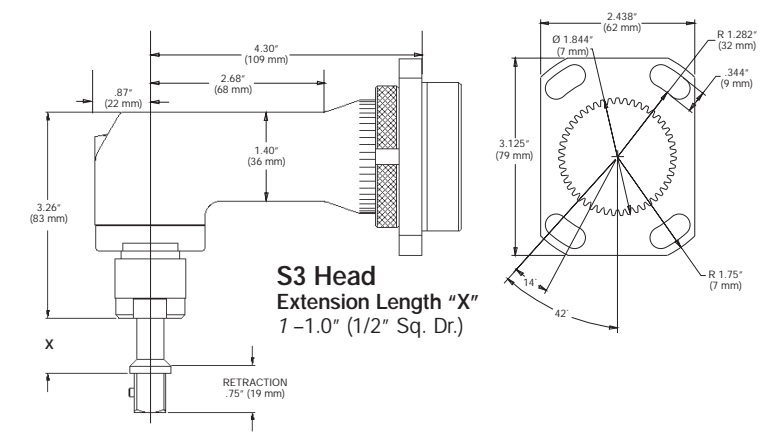
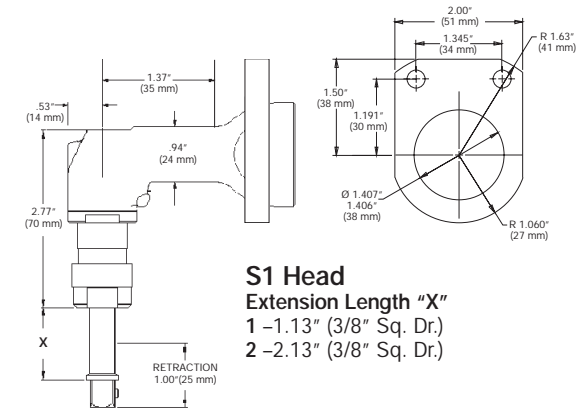
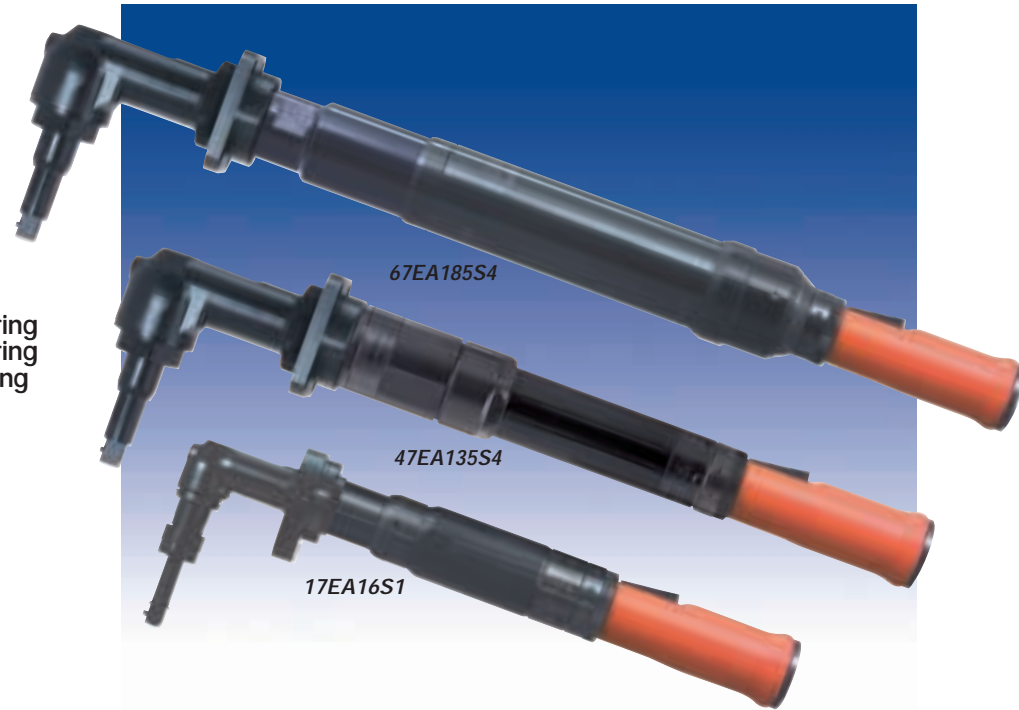
Torque Range
3 - 255 Nm 2.4 - 188.1 Ft. Lbs.

Bolt Size
M7 - M18 1/4" - 3/4"

Fastening Strategies

- Torque Control with Angle Monitoring
- Angle Control with Torque Monitoring
- Torque Control with Time Monitoring

- Smart Tool Technology
- DC Brushless Motor
- Light ring
- Reversible



Model Number	Square Drive Size	Bolt Size		Free Speed RPM	Torque Range		Length		Weight*		Side to Center	
		Gr. 5	Gr. 9.8		ft. lbs.	Nm	in.	mm	lbs	kg	in.	mm
17EA16S131	3/8"	5/16	M6	810	11.8-2.4	16-3.2	16.0	406	4.4	2.00	0.55	14
17EA23S131	3/8"	5/16	M8	570	17.0-3.4	23-4.6	16.0	406	4.4	2.00	0.55	14
17EA30S131	3/8"	5/16	M8	440	22.1-4.4	30-6.0	16.0	406	4.4	2.00	0.55	14
47EA30S231	3/8"	5/16	M8	995	22.1-4.4	30-6.0	18.7	474	5.4	2.43	0.67	17
47EA39S231	3/8"	3/8	M8	760	28.8-5.8	39-7.8	18.7	474	5.4	2.43	0.67	17
47EA55S231	3/8"	7/16	M10	540	40.6-8.1	55-11	18.7	474	5.4	2.43	0.67	17
47EA43S341	1/2"	3/8	M10	695	31.7-6.3	43-8.6	20.0	509	6.0	2.74	0.87	22
47EA56S341	1/2"	7/16	M10	535	41.3-8.3	56-11	20.0	509	6.0	2.74	0.87	22
47EA80S341	1/2"	1/2	M12	380	59.0-11.8	80-16	20.0	509	6.0	2.74	0.87	22
47EA110S341	1/2"	9/16	M12	265	81.1-16.2	110-22	20.5	521	7.4	3.38	0.87	22
47EA135S461	3/4"	9/16	M14	180	99.6-19.9	135-27	20.6	522	8.9	4.03	1.06	27
47EA230S461	3/4"	5/8	M16	100	169.6-33.9	230-46	22.2	563	10.6	4.79	1.06	27
67EA150S461	3/4"	5/8	M14	235	110.6-22.1	150-30	25.8	655	12.9	5.90	1.03	26
67EA185S461	3/4"	5/8	M16	190	136.3-27.3	185-37	25.8	655	12.9	5.90	1.03	26
67EA210S461	3/4"	5/8	M16	170	154.8-31.0	210-42	25.8	655	12.9	5.90	1.03	26
67EA235S461	3/4"	3/4	M18	145	169.6-33.9	230-46	25.8	655	12.9	5.90	1.03	26
67EA255S461	3/4"	3/4	M18	125	188.1-40.6	255-55	25.8	655	12.9	5.90	1.03	26

* Weights are without mounting plate and tool cable.

GENERAL:
All tools must be used with Tightening Manager Electronic Controller.

STANDARD EQUIPMENT:
Suspension Bail.
Mounting plate.

EXTRA EQUIPMENT:
Std. Tool Cable 542778-XX, Swivel Cable 542780-XX, Extension Cable 542779-XX.

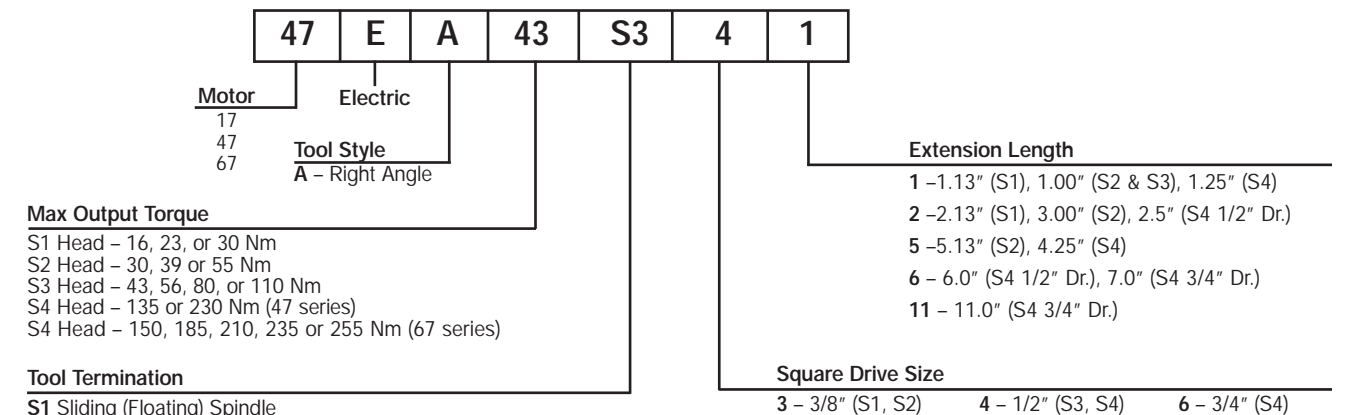
ADDITIONAL ACCESSORIES (Page 38-45)
Refer to page 4 for description of Rapid Select.

Tool	Extension	Swivel	Length Ft.	M
542778-1M*	542779-1M	542780-1M*	3	1
542778-2M*	542779-2M	542780-2M*	6	2
542778-3M	542779-3M	542780-3M	9	3
542778-6M	542779-6M	542780-6M	19.5	6
542778-8M	542779-8M	542780-8M	26	8
542778-10M	542779-10M	542780-10M	33	10
542778-15M	542779-15M	542780-15M	49	15
	542779-20M		66	20
	542779-25M		82	25
	542779-30M		98	30
	542779-40M		131	40
542778-50M	542779-50M	542780-50M	164	50

*Must be used with 542779 extension cable.

Instrumented Electric Nutrunners

Right Angle Floating Spindle



Max Output Torque

S1 Head - 16, 23, or 30 Nm
S2 Head - 30, 39 or 55 Nm
S3 Head - 43, 56, 80, or 110 Nm
S4 Head - 135 or 230 Nm (47 series)
S4 Head - 150, 185, 210, 235 or 255 Nm (67 series)

Tool Termination

- S1 Sliding (Floating) Spindle
- S2 Sliding (Floating) Spindle
- S3 Sliding (Floating) Spindle
- S4 Sliding (Floating) Spindle

Instrumented Electric Nutrunners

Flush Socket Electric Tools

Cleco®

17EA, 47EA Series

Torque Range

3 - 230 Nm 2.4 - 169.6 Ft. Lbs.

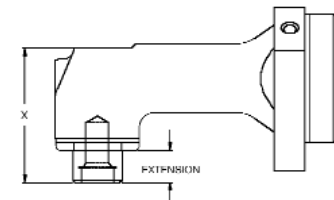
Bolt Size

M8 - M21 1/2" - 1 3/16"

Fastening Strategies

- Torque Control with Angle Monitoring
- Angle Control with Torque Monitoring
- Torque Control with Time Monitoring

- Smart Tool Technology
- DC Brushless Motor
- Light ring
- Reversible



X Dimension For Flush Socket

Head	Inches	Milimeters	Socket Size Range
F1	1.54	39	8-15mm
F2	1.69	43	10-15mm
F3	2.32	59	13-21mm
F4	2.4	61	17-21mm

Model Number	Output Drive Size	Free Speed RPM	Torque Range		Length		Weight*		Head Height		Side to Center	
			ft. lbs	Nm	in.	mm	lbs	kg	in.	mm	in.	mm
17EA16F1MD00	10mm	810	11.8-2.4	16-3.2	16.0	406	4.4	2.00	1.54	39	0.55	14
17EA23F1MG00	13mm	570	17.0-3.4	23-4.6	16.0	406	4.4	2.00	1.54	39	0.55	14
17EA30F1MD00	10mm	440	22.1-4.4	30-6.0	16.0	406	4.4	2.00	1.54	39	0.55	14
47EA30F2MG00	13mm	995	22.1-4.4	30-6.0	18.7	474	5.4	2.43	1.69	43	0.67	17
47EA39F2MG00	13mm	760	28.8-5.8	39-7.8	18.7	474	5.4	2.43	1.69	43	0.67	17
47EA55F2MI00	15mm	540	40.6-8.1	55-11	18.7	474	5.4	2.43	1.69	43	0.67	17
47EA43F3MI00	15mm	695	31.7-6.3	43-8.6	20.0	509	6.0	2.74	2.32	59	0.87	22
47EA56F3MJ00	16mm	535	41.3-8.3	56-11	20.0	509	6.0	2.74	2.32	59	0.87	22
47EA80F3MJ00	18mm	380	59.0-11.8	80-16	20.0	509	6.0	2.74	2.32	59	0.87	22
47EA110F3MT00	16mm	265	81.1-16.2	110-22	20.5	521	7.4	3.38	2.32	59	0.87	22
47EA135F4ML00	18mm	180	99.6-19.9	135-27	20.6	522	8.9	4.03	2.40	61	1.06	27
47EA230F4MO00	21mm	100	169.6-33.9	230-46	22.2	563	10.6	4.79	2.40	61	1.06	27

* Weights are without reaction bar and tool cable.

GENERAL:
All tools must be used with Tightening Manager Electronic Controller.

STANDARD EQUIPMENT:
Suspension Bail.

EXTRA EQUIPMENT:
Std. Tool Cable 542778-XX, Swivel Cable 542780-XX, Extension Cable 542779-XX.

ADDITIONAL ACCESSORIES (Page 38-45)
Refer to page 4 for description of Rapid Select.

Tool	Extension	Swivel	Length Ft.	M
542778-1M*	542779-1M	542780-1M*	3	1
542778-2M*	542779-2M	542780-2M*	6	2
542778-3M	542779-3M	542780-3M	9	3
542778-6M	542779-6M	542780-6M	19.5	6
542778-8M	542779-8M	542780-8M	26	8
542778-10M*	542779-10M	542780-10M*	33	10
542778-15M	542779-15M	542780-15M	49	15
	542779-20M		66	20
	542779-25M		82	25
	542779-30M		98	30
	542779-40M		131	40
542778-50M	542779-50M	542780-50M	164	50

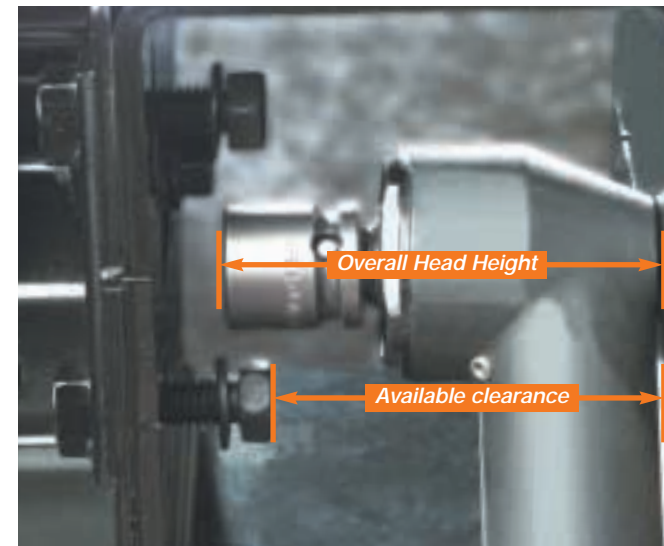
*Must be used with 542779 extension cable.

Instrumented Electric Nutrunners

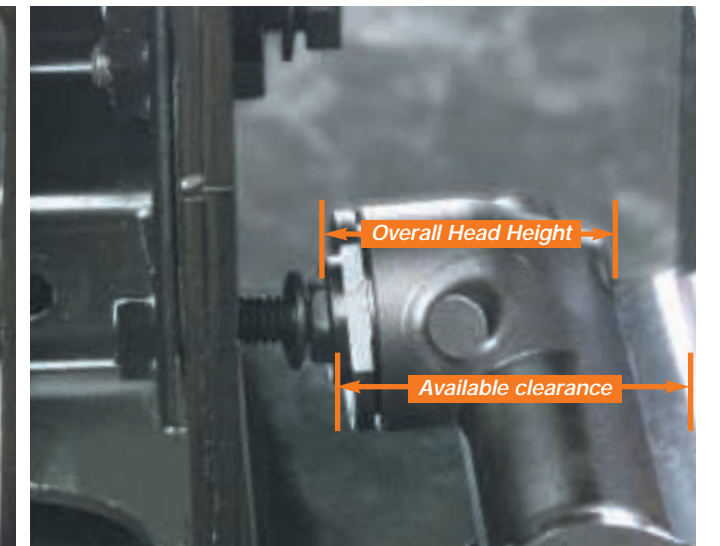
Flush Socket Electric Tools



Tight clearance applications, once only accessible by the use of hand tools or crowfoot attachments, can now be tightened by the new family of Cleco Flush Socket Electric Tools at a speed that maximizes productivity. When combined with the Cleco Tightening Manager controller, torque repeatability is assured and documentation of the tightening cycle is provided.



Standard right angle head with square drive and separate socket will not fit on tight clearance applications. The overall head height is greater than the available clearance.



Flush socket tools have plenty of clearance to fit on the same application. Electric flush socket tools tighten with much higher accuracy than tools with crowfoot attachment. The overall head height is less than the available clearance.

47 E A 43 F3 MI 0 0

Motor: 17, 47
Electric
Tool Style: A - Right Angle
Output Type: 0-Standard, 1-Fast Lead, 2-Magnetic
Extension Length: 0-Flush, 4-1/2", 6-3/4", 1-1/8", 2-1/4", 8-1"

Max Output Torque
F1 Head - 16, 23, or 30 Nm
F2 Head - 30, 39 or 55 Nm
F3 Head - 43, 56, 80, or 110 Nm
F4 Head - 135 or 230 Nm

Tool Termination
F1 Flush Socket (17 - Drive capacity 8-15mm)
F2 Flush Socket (47 - Drive capacity 10-15mm)
F3 Flush Socket (47 - Drive capacity 13-21mm)
F4 Flush Socket (47 - Drive capacity 17-21mm)

Drive Socket
EA - 1/4" EI - 3/4" MF - 12mm MK - 17mm
EB - 5/16" EJ - 13/16" MG - 13mm ML - 18mm
EE - 1/2" MB - 8mm MH - 14mm MM - 19mm
EF - 9/16" MD - 10mm MI - 15mm MN - 20mm
EG - 5/8" ME - 11mm MJ - 16mm MO - 21mm
EH - 11/16"

Instrumented Electric Nutrunners

Crowfoot Electric Tools

Cleco®

47EC Series

Torque Range
7 - 30 Nm
5 - 22 Ft. Lbs.

Fastening Strategies

- Torque Control with Angle Monitoring
- Angle Control with Torque Monitoring
- Torque Control with Time Monitoring

- Smart Tool Technology
- DC Brushless Motor
- Light ring
- Reversible

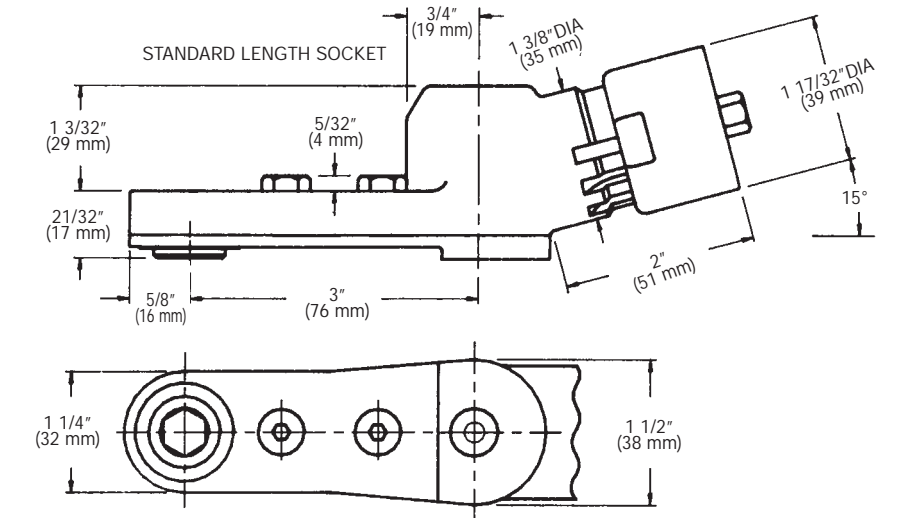


Instrumented Electric Nutrunners

Crowfoot Electric Tools

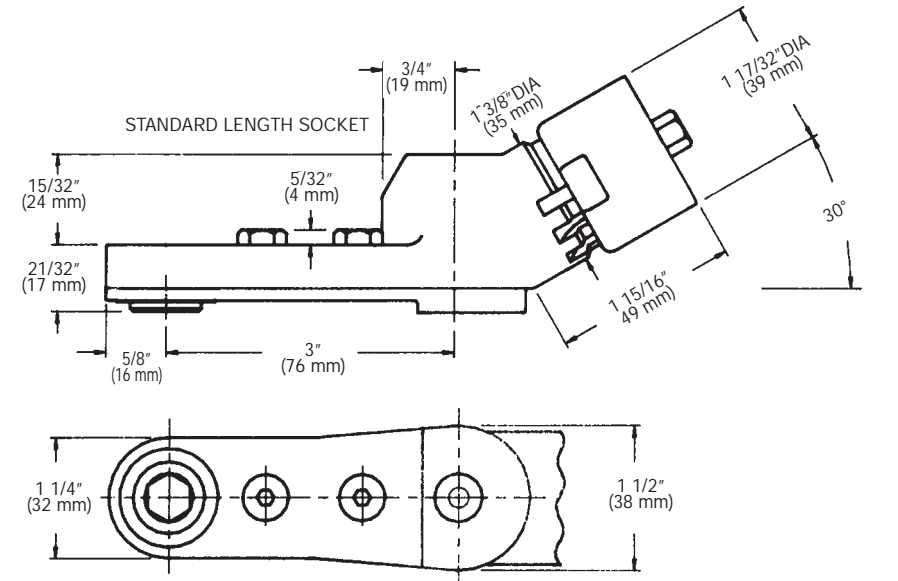
15° HEAD

Maximum Recommended Torque: 22 ft. lb. (30 Nm)



30° HEAD

Maximum Recommended Torque: 22 ft. lb. (30 Nm)



NOTE: Models listed are examples. Use chart on bottom of facing page for specific model required but not listed.

Model Number		Socket Size		Free Speed	Torque Range		Length		Weight**	
15° Head	30° Head	in.	mm	RPM	ft. lbs	Nm	in.	mm	lbs	kg
47EC30D1ME01	47EC30D3ME01	-	11	760	22-5	30-7	20.5	521	5.5	2.3

** Weights are without reaction bar and tool cable.

GENERAL:
All tools must be used with Tightening Manager Electronic Controller.

STANDARD EQUIPMENT:
Suspension Ball.

EXTRA EQUIPMENT:
Std. Tool Cable 542778-XX, Swivel Cable 542780-XX, Extension Cable 542779-XX.

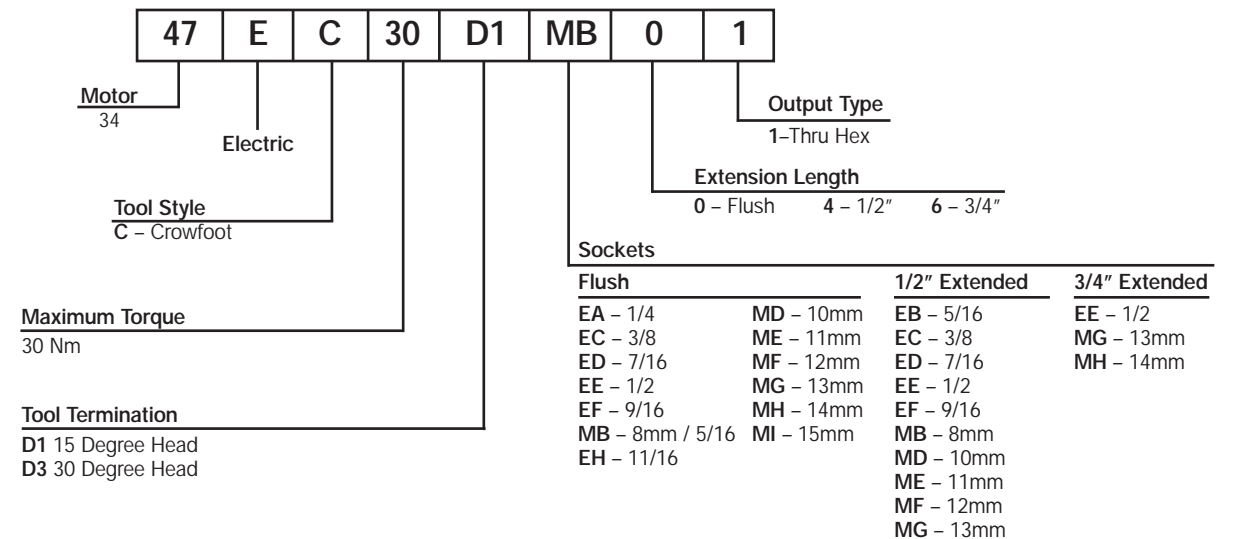
ADDITIONAL ACCESSORIES (Page 38-45)

Refer to page 4 for description of Rapid Select.

Cables			Length
Tool	Extension	Swivel	Ft. M
542778-1M*	542779-1M	542780-1M*	3 1
542778-2M*	542779-2M	542780-2M*	6 2
542778-3M	542779-3M	542780-3M	9 3
542778-6M	542779-6M	542780-6M	19.5 6
542778-8M	542779-8M	542780-8M	26 8
542778-10M	542779-10M	542780-10M	33 10
542778-15M	542779-15M	542780-15M	49 15
	542779-20M		66 20
	542779-25M		82 25
	542779-30M		98 30
	542779-40M		131 40
542778-50M	542779-50M	542780-50M	164 50

*Must be used with 542779 extension cable.

Model Number Example



Instrumented Electric Nutrunners

Tube Nut Electric Tools

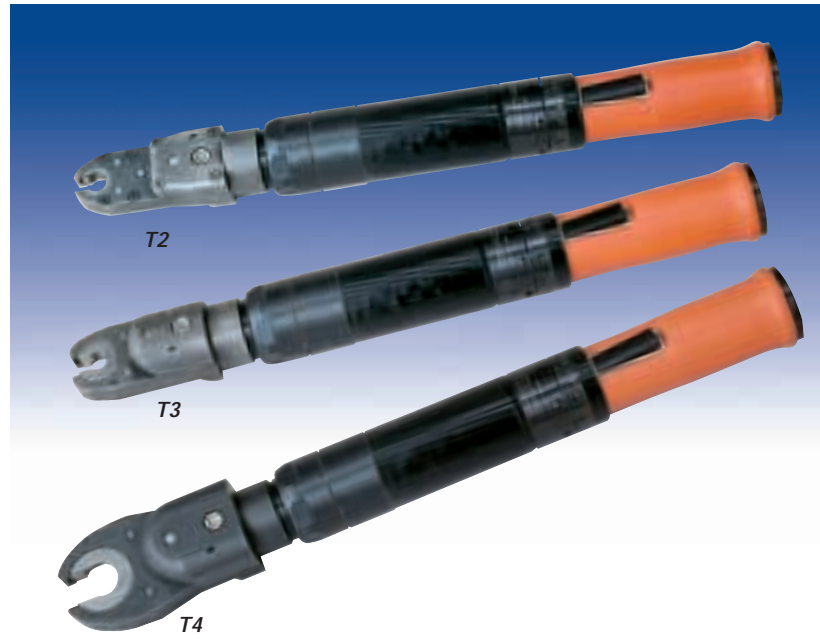
Cleco®

47ET Series

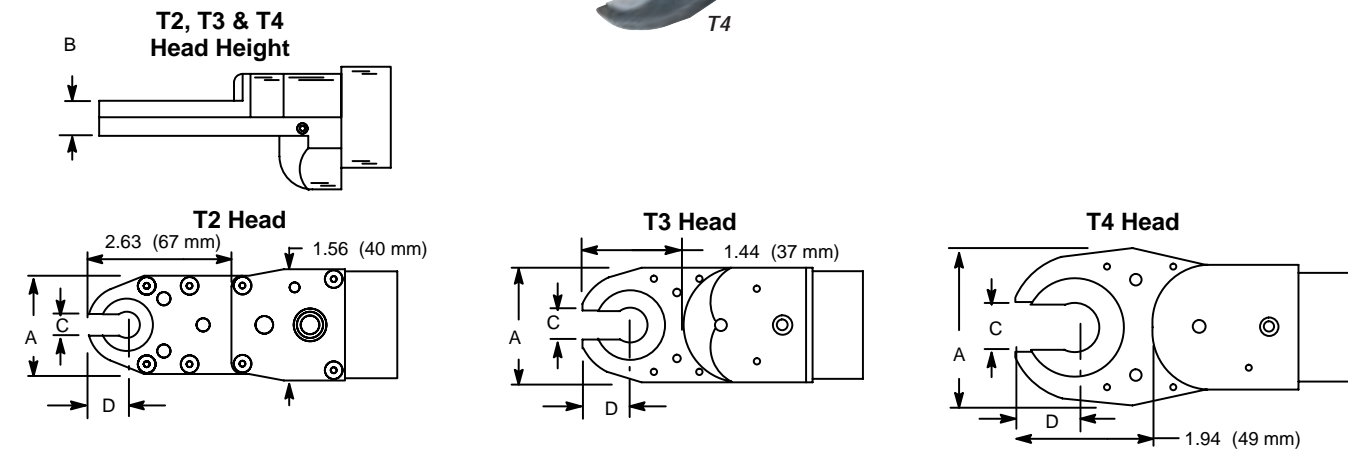
Torque Range
10 - 40 Nm
7.4 - 29.5 Ft. Lbs.

Fastening Strategies
Torque Control with Angle Monitoring
Angle Control with Torque Monitoring
Torque Control with Time Monitoring

■ DC Brushless Motor



TERMINATION



Model Number	Socket Size		Free Speed rpm	Torque Range		Length		Weight*		"A" Width		"B" Blade Ht.		"C" Opening Width		"D" End/Center	
	In.	mm		Ft. Lbs.	Nm	In.	mm	lbs.	kg	In.	mm	In.	mm	In.	mm	In.	mm
Tube Nut																	
47ET20T2ED00	7/16	-	950	14.8-7.4	20-10	16.93	430	4.3	2.0	1.42	36	0.55	14	0.28	7	0.53	13
47ET20T2MD00	-	10	950	14.8-7.4	20-10	16.93	430	4.3	2.0	1.42	36	0.55	14	0.28	7	0.53	13
47ET20T2MG00	-	13	950	14.8-7.4	20-10	16.93	430	4.3	2.0	1.42	36	0.55	14	0.28	7	0.53	13
47ET30T3EF00	9/16	-	680	22.1-11.1	30-15	16.63	422	4.4	2.0	1.65	42	0.59	15	0.51	13	0.73	19
47ET30T3MG00	-	13	680	22.1-11.1	30-15	16.63	422	4.4	2.0	1.65	42	0.59	15	0.51	13	0.73	19
47ET30T3MM00	-	19	680	22.1-11.1	30-15	16.63	422	4.4	2.0	1.65	42	0.59	15	0.51	13	0.73	19
47ET40T4EK00	7/8	-	515	29.5-14.8	40-20	17.86	454	5.1	2.3	2.36	60	0.59	15	0.71	18	0.93	24
47ET40T4EM00	1	-	515	29.5-14.8	40-20	17.86	454	5.1	2.3	2.36	60	0.59	15	0.71	18	0.93	24
47ET40T4MR00	-	24	515	29.5-14.8	40-20	17.86	454	5.1	2.3	2.36	60	0.59	15	0.71	18	0.93	24
47ET40T4MU00	-	27	515	29.5-14.8	40-20	17.86	454	5.1	2.3	2.36	60	0.59	15	0.71	18	0.93	24

GENERAL:
All tools must be used with Tightening Manager TM-111 Series Electronic Controller.

STANDARD EQUIPMENT:
Suspension Bail.

EXTRA EQUIPMENT:
Swivel Bail 541715-2
Std. Tool Cable 542778-XX, Swivel Cable 542780-XX, Extension Cable 542779-XX.

ADDITIONAL ACCESSORIES (Pages 38-45)

*NOTE: Weights are without tool cable, suspension bail, reaction bar or dead handle if so equipped.

Refer to page 4 for description of Rapid Select.

Tool	Extension	Swivel	Length Ft.	M
542778-1M*	542779-1M	542780-1M*	3	1
542778-2M*	542779-2M	542780-2M*	6	2
542778-3M	542779-3M	542780-3M	9	3
542778-6M	542779-6M	542780-6M	19.5	6
542778-8M	542779-8M	542780-8M	26	8
542778-10M	542779-10M	542780-10M	33	10
542778-15M	542779-15M	542780-15M	49	15
	542779-20M		66	20
	542779-25M		82	25
	542779-30M		98	30
	542779-40M		131	40
542778-50M	542779-50M	542780-50M	164	50

*Must be used with 542779 extension cable.

Instrumented Electric Nutrunners

Tube Nut Electric Tools Features & Sockets



Tube and hose applications, once only accessible by the use of hand tools, can now be tightened by the new family of Cleco Tube Nut Wrenches at a speed that maximizes productivity. When combined with the Cleco Tightening Manager controller, torque repeatability is assured and documentation of the fastening cycle is provided.

The productivity of most assembly line operations is greatly increased with the use of our dual operation lever and auto indexing socket. The tool alternates the direction of rotation each time the lever is actuated. When rotating in reverse, the socket will stop at the open position. Slide the tool onto the fastener and press the lever to run the fastener down. To free the tool from the work, slide the tool off the tightened fastener and press the lever to release the socket back to the open position.



The 47ET tube nut wrench alternates the direction of rotation each time the lever is actuated. When rotating in reverse, the socket will stop at the open position.

Slide the tool onto the fastener and press the lever to run the fastener down.

To free the tool from the work, slide the tool off the tightened fastener and press the lever to release the socket back to the open position.

(MODEL NUMBER EXAMPLE) **47ET20** **T2** **ED** **0** **0**

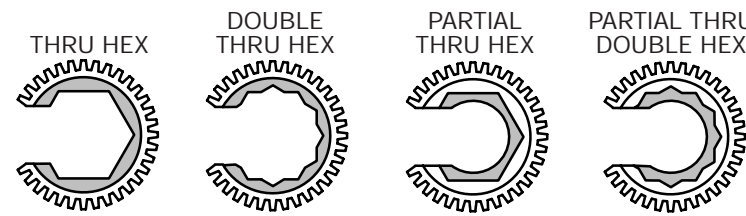
Termination
0 - Partial Thru Hex
1 - Thru Hex
2 - Double Thru Hex
3 - Partial Thru Double Hex

Output Type
0 - Flush
1 - 1/8
2 - 1/4
3 - 3/8
4 - 1/2
5 - 5/8
6 - 3/4

Extension Length

T2 Sockets	T3 Sockets	T4 Sockets
EA - 1/4	EC - 3/8	EE - 1/2
EB - 5/16	ED - 7/16	EF - 9/16
EC - 3/8	EE - 1/2	EG - 5/8
ED - 7/16	EF - 9/16	EH - 11/16
EE - 1/2	EG - 5/8	EI - 3/4
EA - 7mm	EH - 11/16	EJ - 13/16
EB - 8mm	EI - 3/4	EK - 7/8
EC - 9mm	EL - 15/16	EM - 1
ED - 10mm		
EE - 11mm		
EF - 12mm		
EG - 13mm		
EH - 14mm		
EI - 15mm		
EJ - 16mm		
EK - 17mm		
EL - 18mm		
EM - 19mm		
		MG - 13mm
		MH - 14mm
		MI - 15mm
		MJ - 16mm
		MK - 17mm
		ML - 18mm
		MM - 19mm
		MO - 21mm
		MP - 22mm
		MQ - 23mm
		MR - 24mm
		MS - 25mm
		MT - 26mm
		MU - 27mm

Head Size
T2 - 15 Ft. Lbs. (20 Nm) Max Output
T3 - 22 Ft. Lbs. (30 Nm) Max Output
T4 - 30 Ft. Lbs. (40 Nm) Max Output



To order individual sockets, replace the "T" with "KS" before the socket required. (i.e. KS2EA01 for a T2, 1/4", flush, thru hex socket.)

Instrumented Electric Nutrunners

Hold-n-Drive Electric Tools

Cleco®

47EA Series

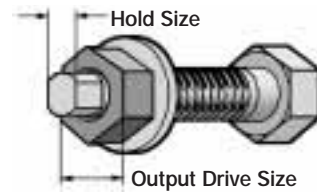
Torque Range
10 - 40 Nm
7.4 - 29.5 Ft. Lbs.

Fastening Strategies
Torque Control with Angle Monitoring
Angle Control with Torque Monitoring
Torque Control with Time Monitoring

- Smart Tool Technology
- DC Brushless Motor
- Light ring
- Reversible



47EA



Model Number	Output Drive Size*	Hold Size	Free Speed RPM	Torque Range		Length		Weight*		Head Height		Side to Center	
				ft. lbs	Nm	in.	mm	lbs	kg	in.	mm	in.	mm
47EA43H3MGFM5	13MM	5mm Female Hex	695	6.3 - 31.7	8.6 - 43	20.2	512	7.9	3.60	2.40	61	1.06	27
47EA56H3MIFMA	15MM	7mm Female Hex	535	8.3 - 41.3	11.2 - 56	20.2	512	7.9	3.60	2.40	61	1.06	27
47EA80H3MJT30	16MM	T30 Torx	380	11.8 - 9.0	16 - 80	20.2	512	7.9	3.60	2.40	61	1.06	27
47EA110H3MLFMB	18MM	8mm Female Hex	265	16.2 - 81.1	22 - 110	20.6	522	8.9	4.03	2.40	61	1.06	27
47EA135H3MOMFD	21MM	10mm Female Hex	180	19.9 - 99.6	27 - 135	20.6	522	8.9	4.03	2.40	61	1.06	27
47EA230H3MUMMB	27MM	8mm Male Hex	100	33.9 - 169.6	46 - 230	22.2	563	10.6	4.79	2.40	61	1.06	27

* Weights are without reaction bar and tool cable.

GENERAL:
All tools must be used with Tightening Manager Electronic Controller.

STANDARD EQUIPMENT:
Suspension Bail.

EXTRA EQUIPMENT:
Std. Tool Cable 542778-XX, Swivel Cable 542780-XX, Extension Cable 542779-XX.

ADDITIONAL ACCESSORIES (Page 38-45)
Refer to page 4 for description of Rapid Select.

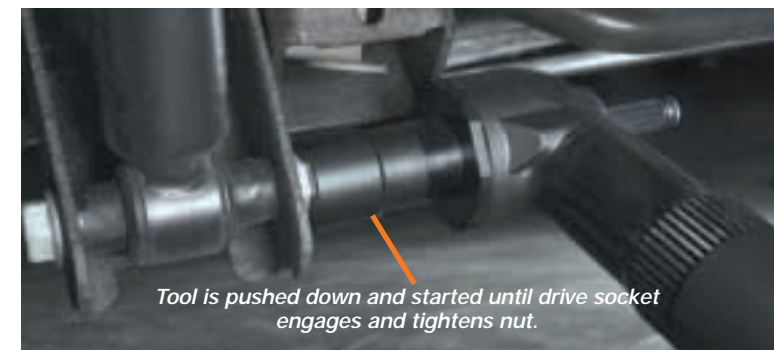
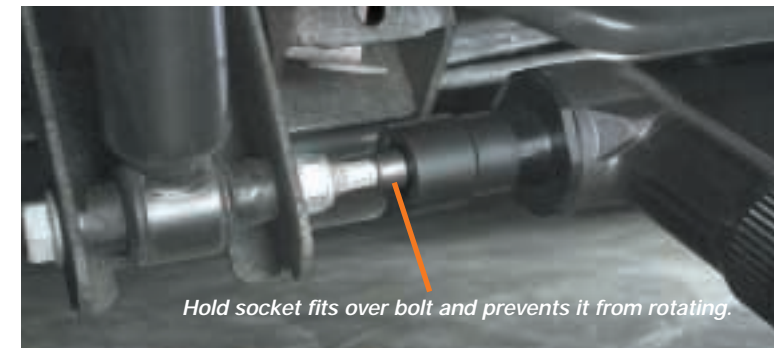
Cables			Length Ft.	M
Tool	Extension	Swivel		
542778-1M*	542779-1M	542780-1M*	3	1
542778-2M*	542779-2M	542780-2M*	6	2
542778-3M	542779-3M	542780-3M	9	3
542778-6M	542779-6M	542780-6M	19.5	6
542778-8M	542779-8M	542780-8M	26	8
542778-10M	542779-10M	542780-10M	33	10
542778-15M	542779-15M	542780-15M	49	15
	542779-20M		66	20
	542779-25M		82	25
	542779-30M		98	30
	542779-40M		131	40
542778-50M	542779-50M	542780-50M	164	50

*Must be used with 542779 extension cable.

Instrumented Electric Nutrunners

Hold-n-Drive Electric Tools

Sometimes called shock absorber tools, "Hold-n-Drive" bolts are used with these tools in automotive and truck frame applications. They reduce assembly handling to one person working from one side of the workpiece. The bolt is held stationary by the tool while the nut is tightened from the same side. This also eliminates reaction bars since the bolt absorbs the torque.



47 E A 43 H X XX X XX X

Motor 47
Electric
Tool Style A - Right Angle
Max Output Torque Torque ratings are: 4, 56, 80, 110, 15, or 230
Tool Termination H Hold-n-Drive
Retainer Shaft 3 3 1/2" 5 5 3/8" 4 4" 6 5 7/8"

Drive Sockets
EE - 1/2" EF - 9/16" EG - 5/8" EH - 11/16" EI - 3/4" EJ - 13/16" EK - 7/8" EL - 15/16"
EM - 1" EN - 1 1/16" EO - 1 1/8" EP - 1 3/16" EQ - 1 1/4" MG - 13mm MH - 14mm MI - 15mm
MJ - 16mm MK - 17mm ML - 18mm MM - 19mm MN - 20mm MO - 21mm MP - 22mm MQ - 23mm
MR - 24mm MS - 25mm MT - 26mm MU - 27mm XX - Special

Hold Sockets
EA - 1/4" EB - 5/16" EC - 3/8" ED - 7/16" EF - 9/16" EG - 5/8" M5 - 5mm M6 - 6mm MA - 7mm MB - 8mm MC - 9mm MD - 10mm
ME - 11mm MF - 12mm MG - 13mm MH - 14mm 15 - T15 20 - T20 25 - T25 30 - T30 40 - T40 45 - T45

Socket Style
F - Female Hex
M - Male Hex
T - Torx
O - Female oval

Second Oval Dimension
Utilize the unit of measure from length to identify oval width

Accessories

Tool Cables

Tool	Extension	Swivel	Length	
			Ft.	M
542778-1M*	542779-1M	542780-1M*	3	1
542778-2M*	542779-2M	542780-2M*	6	2
542778-3M	542779-3M	542780-3M	9	3
542778-6M	542779-6M	542780-6M	19.5	6
542778-8M	542779-8M	542780-8M	26	8
542778-10M	542779-10M	542780-10M	33	10
542778-15M	542779-15M	542780-15M	49	15
	542779-20M		66	20
	542779-25M		82	25
	542779-30M		98	30
	542779-40M		131	40
542778-50M	542779-50M	542780-50M	164	50

*Must be used with 542779 extension cable.

Swivel cable rotates 330° to absorb constant twisting and turning.



SWIVEL CABLE

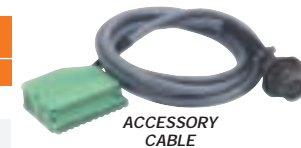
8 Position Remote Parameter Switch

Description	Part Number
Remote Parameter Switch (with 25' integrated cable)	542979
Remote Parameter Switch (with 50' integrated cable)	542979-50



Accessory Cables

TME to Input Accessories	Input Acc. to Input Acc.	TME to Synch Box	TME to 1 Spindle Annunciator	TME to 2 Spindle Annunciator	Synch Box to Input Accessories	Synch Box to Annunciators (2/more spindles)	Length	
							Feet	Meters
542985-3	542986-3	576058-3	542989-3	543451-3	542987-3	542988-3	3	1
542985-9	542986-9	576058-9	542989-9	543451-9	542987-9	542988-9	9	3
542985-25	542986-25	576058-25	542989-25	543451-25	542987-25	542988-25	25	7.5
542985-50	542986-50	576058-50	542989-50	543451-50	542987-50	542988-50	50	15



Ethernet Switches

Part Number	Ports			Approx. Dimensions		Approx. Weight	
	Total	In	Out	Inches	mm	Lbs.	Kg
543444-5	5	1	4	4.5x3.5x1.5	110x90x30	0.4	0.2
543444-8	8	1	7	6.5x4.5x1.5	160x110x35	0.6	0.3
543444-16	16	1	15	7x6x2.5	185x150x65	1.1	0.5
543444-24	24	1	23	10.5x7x2	270x170x50	3.0	1.3



Patch Cables

Connects Ethernet Switches to TME or PC

Part Number	Length	
	Feet	Meters
543445-7	7	2
543445-25	25	7.5
543445-50	50	15
543445-100	100	30



543445-25

Direct Connect Cables

Connects TME or TME direct to PC

Part Number	Description	Length	
		Feet	Meters
543446-7	Ethernet crossover cable	7	2
543490-10	Serial cable	10	3



543446-7

Annunciators

Spindles	Part Number
1	542976-1
2	542976-2
3	542976-3
4	542976-4
5	542976-5
6	542976-6



Synch Boxes

Spindles	Part No.
2	576060-2
3	576060-3
4	576060-4
5	576060-5
6	576060-6

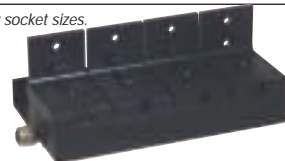


Input Accessories

Socket Trays

Description	Part Number
Four position	542978-4
Eight position	542978-8

Note: Specify socket sizes.



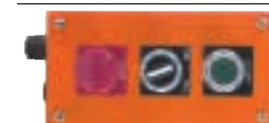
Torque Selector Switch

Torque Selector	Part Number
8 Select	542977-8

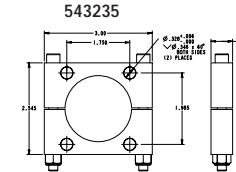


Start/Stop Switches

Description	Part Number
Start Box	542972
Stop Box	542973
Start/Stop Box	542974
Start/Stop/Reverse	542975



Accessories



Tool Type	Model Number	Cover	Swivel Bail	Mounting Plate	Extension Kit
Right Angle	17EA08AL2	205832	541715-2	-----	-----
	17EA...AM3	205834	541715-2	-----	535832
	47EA...AM3/4	543070	541715-2	543235	-----
	47EA...AH4	543070	541715	543230	542428
	47EA135MH4	543071	541715	543230	542428
	47EA...AX5	205838	541715	543232	-----
	67EA...AL6	205838	35007004	49097101 (included with tool)	48316033
Flush Socket	67EA...AM6	-----	48A17006	45017152 (included with tool)	-----
	17EA...F1...	-----	541715-2	57217101 (requires 57218103 screw)	-----
	47EA...F2...	-----	541715-2	43287131	-----
	47EA...F3...	-----	541715-2	49097101 (requires 49098103 locknut)	-----
Hold-N-Drive	47EA...F4...	205838	541715	49097101 (requires 49098103 locknut)	48316033
	47EA...H...over 100NM	205838	541715	49097101 (requires 49098103 locknut)	48316033
	47EA...H...under 100NM	205838	541715-2	49097101 (requires 49098103 locknut)	48316033

Lever Extension Kits

Description	Part Number
Lever Extension Kit (non-swivel)	541757
Lever Extension Kit (swivel)	543414

Note: Models for standard tool cable (non-swivel) and swivel cable.



Special Adapter Cables

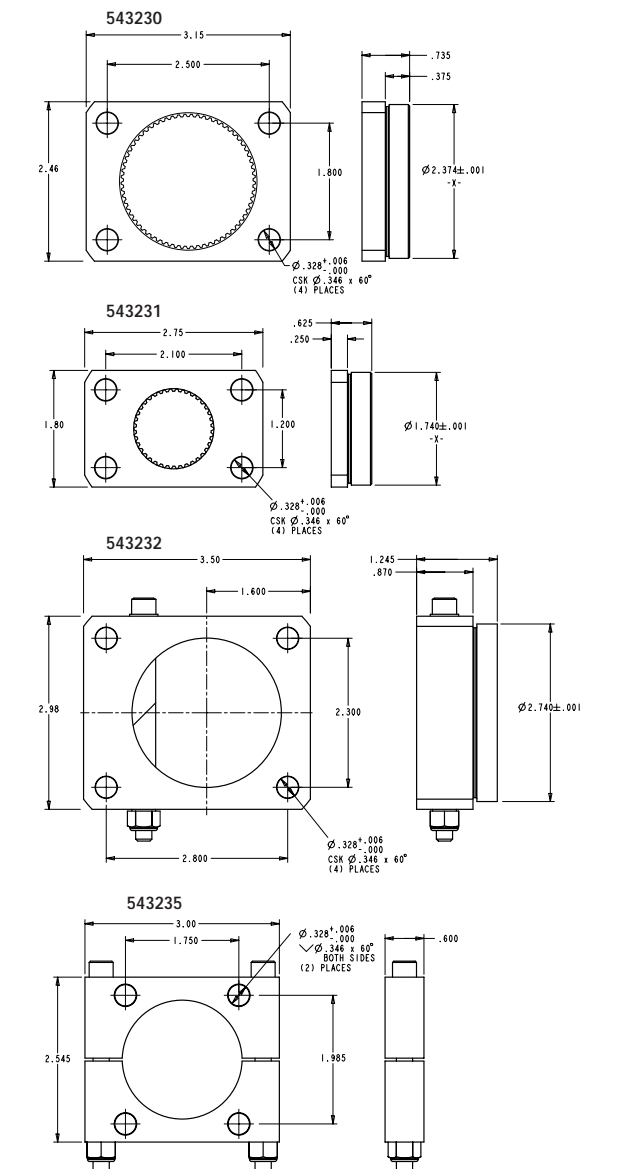
Description	Part Number
Rotor Adapter Cable	542916-1
CCW Torque Adapter Cable	542916-3
Rotor CCW Torque Adapter Cable	542916-4



Test Fixture

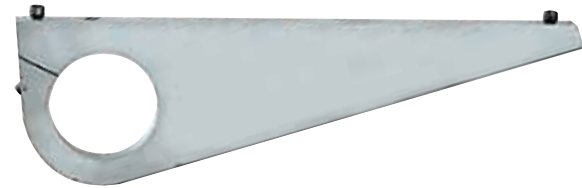
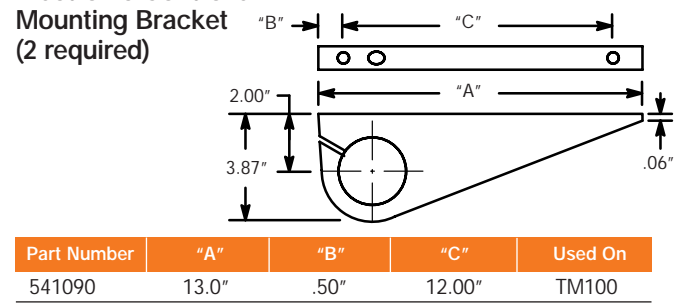
Part Number
536185

Medium to Hard Torque
Belleville Washer Test Fixture may be clamped in a vise and used to test tools (10 in. LBS. - 100 Ft. Lbs., 1.13Nm - 135.6Nm)
Washers may be arranged stacked in pairs for "soft" make-up or arranged all cupped the same way for "hard" make-up.

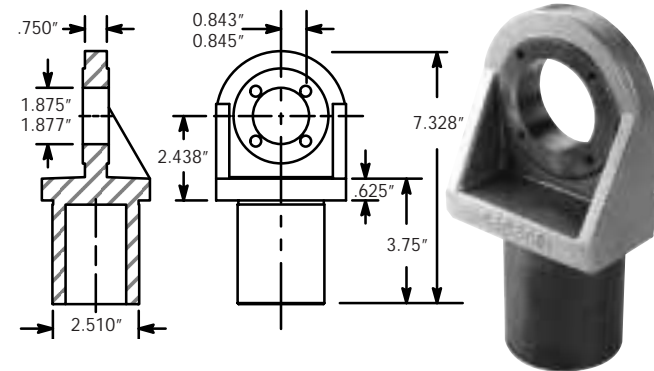




Electronic Controller Mounting Bracket (2 required)

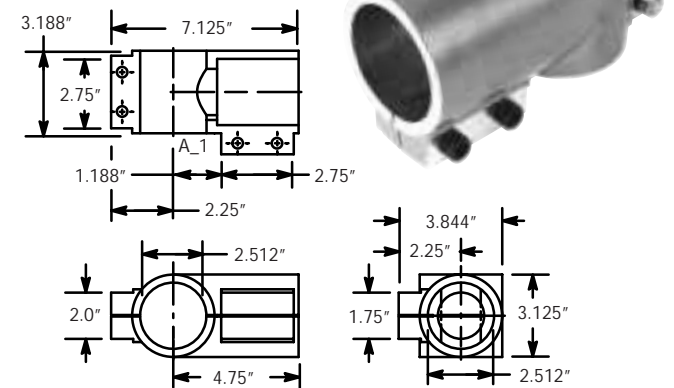


Tool Mount Assembly Part Number: 111050

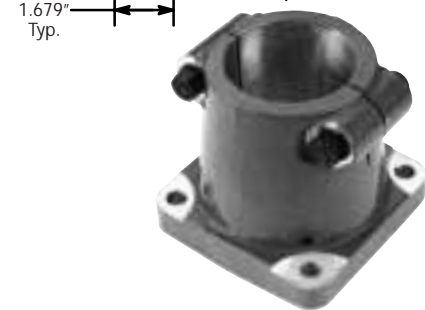
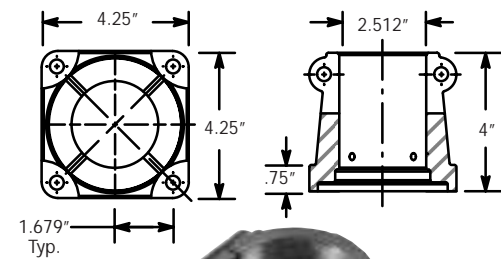


Tee Mount Part Number: 1110495

Forms a right angle from mounting tube to allow for proper positioning of the tool to the workpiece.



Base Mount Assembly Part Number: 1110493



1110496-(xx) Mounting Tube

Tube Part Number	Length "L"	
	in.	mm
1110496-06	6	152
1110496-12	12	305
1110496-18	18	457
1110496-24	24	610
1110496-30	30	762

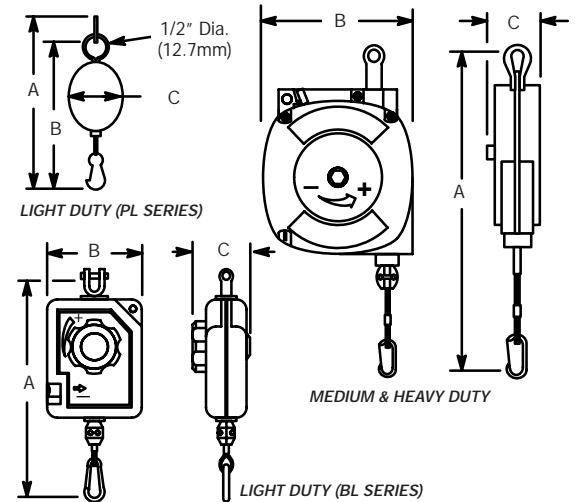
Longer tubes available upon request.



Ergonomic Tool Balancers

Capacity:
0.5 – 45.5 kg
1.0 – 100 Lbs

- External tension Adjustment
- 360° Swivel
- Retracting In-Line Cable



Model Number	Lock Feature	Capacity		"A"		"B"		"C"		Weight	
		lbs.	kg	in	mm	in	mm	in.	mm	lbs.	kg
Light Duty – 4.6 ft. (1.4m) Cable Travel											
PL-12A	-	12.0-1.0	5.5-0.5	6.8	171	5.1	130	2.3	58	-	-
Light Duty – 5.0 ft. (1.5m) Cable Travel											
200427	-	2.0-0	.9-0	10.9	277	4.4	112	1.6	41	1.3	0.6
200428	-	4.0-2.0	1.8-.9	10.9	277	4.4	112	1.6	41	1.3	0.6
200429	-	5.0-3.0	2.3-1.4	10.9	277	4.4	112	1.6	41	1.3	0.6
Light Duty – 5.2 ft. (1.6m) Cable Travel											
BL-2A	-	2.0-1.0	0.9-0.5	10.4	263	4.0	102	2.2	56	1.1	0.5
BL-4A	-	4.0-2.0	1.8-0.9	10.4	263	4.0	102	2.2	56	1.1	0.5
Light Duty – 6.7 ft. (2.0m) Cable Travel											
BL-6A	-	6.0-4.0	2.7-1.8	12.9	327	5.5	140	3.1	79	3.3	1.5
BLL-6A	Ratchet	6.0-4.0	2.7-1.8	12.9	327	5.5	140	3.1	79	3.3	1.5
BL-8A	-	8.0-6.0	3.6-2.7	12.9	327	5.5	140	3.1	79	3.3	1.5
BLL-8A	Ratchet	8.0-6.0	3.6-2.7	12.9	327	5.5	140	3.1	79	3.3	1.5
Medium Duty – 6.6ft. (2.0m) Cable Travel											
BM-13A	Automatic	13-9.0	5.9-4.1	13.8	350	6.9	175	4.5	114	9.0	4.1
BML-13A	Automatic/Ratchet	13-9.0	5.9-4.1	13.8	350	6.9	175	4.5	114	9.0	4.1
BM-18A	Automatic	18-13	8.2-5.9	13.8	350	6.9	175	4.5	114	9.0	4.1
Medium Duty – 6.0ft. (1.8m) Cable Travel											
BM-25A	Automatic	25-18	11.4-8.2	20.7	527	7.8	197	6.6	169	19	8.6
BM-35A	Automatic	35-25	15.9-11.4	20.7	527	7.8	197	6.6	169	19	8.6
BM-45A	Automatic	45-35	20.5-15.9	20.7	527	7.8	197	6.6	169	19	8.6
Heavy Duty – 7.0ft. (2.1m) Cable Travel											
BH-45A	Automatic	45-30	20.5-13.6	25.2	640	9.3	235	7.9	200	40	18
BH-60B*	Automatic	60-45	27.3-20.5	25.2	640	9.3	235	7.9	200	40	18
BH-70A	Automatic	70-60	31.8-27.3	25.2	640	9.3	235	7.9	200	40	18
BH-80A	Automatic	80-70	36.4-31.8	25.2	640	9.3	235	7.9	200	40	18
BH-90A	Automatic	90-80	40.9-36.4	25.2	640	9.3	235	7.9	200	40	18
BH-100A	Automatic	100-90	45.4-40.9	25.2	640	9.3	235	7.9	200	40	18

*4.9 ft. cable travel

Refer to page 4 for description of Rapid Select.



Quality Fastener Tools

For more than half a century Apex has maintained the position of world leader in industrial fastening tools. Many power and insert bits, socket combinations and other drivers/adapters pioneered by Apex have today become industry standards, while Apex quality, service and selection give you unsurpassed value.

More Quality For Your Money

Apex quality starts with the selection of raw materials. Only carefully chosen, high grade tool steel is used to make Apex industrial fastener tools. Next, each tool is precision machined from solid bar stock to exacting standards of accuracy. You always get a snug, secure fit – a fit that is not possible from stamped tools.

Finally, each Apex fastener tool is tempered with our exclusive heat treating process. During this step the degree of hardness is determined based upon the application.

Fast Delivery

All Apex standard catalog items are available off-the-shelf for immediate delivery. If you need special assistance with your order, your Apex manufacturer's representative can handle any questions you may have.

Special Orders

Apex offers the broadest selection of screw driver and nut runner tools available, from bits, sockets and universal wrenches to extensions, adapters and nut setters. If you have a special application, contact your Apex representative. We may have what you need in stock, or can design and produce special fastener tools for almost any application.

For a catalog of the complete line of Apex Quality fastener Tools, please contact your local Apex Distributor.



Registered Trade Marks: HI-TORQUE, Vol-Shan; TORX, Camcar Division of Textron; ACR, POZIDRIV, TORQ-SET and TRI-WING, Phillips International Co.; SUPADRIV, EIS (Fasteners) LTD.; SEL-O-FIT, FLIP-TIP, and Apex, Cooper Industries, CooperTools Division, Apex Operation.

Insert Bits

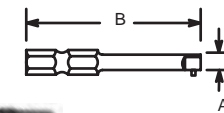
(1/4" hex for socket head cap screws and set screws)



Part Number	Hex Size In.	"A"		Cap Screw	Set Screw
		In.	mm		
185-00	1/16	1.00	25.4	1	5.6
185-0	5/64	1.00	25.4	2.3	8
185-1	3/32	1.00	25.4	4.5	10
185-9	7/64	1.00	25.4	6	—
185-2	1/8	1.00	25.4	8	1/4
185-10	9/64	1.00	25.4	8	—
185-3	5/32	1.31	33.3	10	5/16
185-4	3/16	1.31	33.3	1/4	3/8
185-5	7/32	1.31	33.3	—	7/16
185-6	1/4	1.31	33.3	5/16	1/2
185-7	5/16	1.25	31.8	3/8	5/8
185-8	3/8	1.25	31.8	7/16, 1/2	3/4

Square Drive Adapter

(1/4" hex drive sockets) Use with Quick Change and Bit & Finder Models, except as noted.



Part Number	"A" Sq. Drive	"B"		Bushing No.
		In.	mm	
EX250-2	1/4	2.00	50.8	—
EX250-3	1/4	3.00	76.2	847295*
EX250-4	1/4	4.00	101.6	—
EX250-6	1/4	6.00	152.4	—
EX370	3/8	1.63	41.3	—
EX370-3	3/8	3.00	76.2	847295*
EX500-2	1/2	2.00	50.8	—
EX500-3	1/2	3.00	76.2	—

* Note: Required for bit and finder models.

Hex Extensions

Part Number	Hex Drive (In.)	Type of Lock	Overall Length	
			In.	mm
Male Hex Drive with 1/2" Male Square				
EX-501-3	7/16	Pin	3	76
EX-501-4	7/16	Pin	4	102
EX-501-6	7/16	Pin	6	152
Male Hex Drive with 3/8" Male Square				
EX-371-3	7/16	Pin	3	76
EX-371-4	7/16	Pin	4	102
EX-371-6	7/16	Pin	6	152

Hex Drive Nutsetters

Part Number	Size (In.)	Overall Length (In.)	Socket Nose Diameter (In.)
6N-1416-3	1/2	3	13/16
6N-1416-4	1/2	4	13/16
6N-1418-3	9/16	3	7/8
6N-1418-4	9/16	4	7/8
6N-1420-3	5/8	3	1
6N-1420-6	5/8	6	1

Insert Bits

Used with Bit Holders (all bits are 1.0" (25.4 mm) long)



Point Size	Part Number		Wood		Machine & Self-tapping			
	Phillips	Pozi-Drive	Flat & Oval	Round	Flat, Oval & Pan	Fillister	Truss	Binding
0	446-0	446-1P2D	0.1	0.1	0.1	0.1	0.1	0.1
1	HPL-1	440-1PZD	2-4	2-4	2-4	2-4	2-4	2-4
2	HPI-2	440-2PZD	5-8	5-10	5-10	5-10	6-10	5-10
3	HPI-3	440-3PZD	10-16	12-16	12-16	12-5/16	12-16	12-1/4

6 Point Sockets

Part No.	Hex Opening	Overall Length	Diameter Nose End	Diameter Drive End	Opening Depth
3/8" Square Drive Sockets, SAE					
3112	3/8	1-1/4	19/32	3/4	1/4
3114	7/16	1-1/2	11/16	3/4	9/32
3116	7/16	1/2	1-1/2	13/16	11/32
3118	7/16	9/16	1-1/2	7/8	7/16
1/2" Square Drive Sockets, SAE					
5112	3/8	1-1/2	5/8	15/16	1/4
5114	7/16	1-1/2	11/16	15/16	9/32
5116	1/2	1-1/2	13/16	15/16	11/32
5120	5/8	1-1/2	1	1	7/16
5122	11/16	1-1/2	1-1/8	1-1/8	7/16
5124	3/4	1-1/2	1-1/8	1-1/8	15/32
3/4" Square Drive Sockets, SAE					
7128	7/8	2	1-1/2	1-1/2	9/16
7132	1	2	1-5/8	1-5/8	5/8
7136	1-1/8	2-1/8	1-3/4	1-3/4	3/4
7140	1-1/4	2-1/8	2	1-3/4	13/16
7144	1-3/8	2-1/8	2-1/8	2-1/8	13/16
7148	1-1/2	2-1/4	2-1/4	2-1/8	1
1" Square Drive Sockets, SAE					
8132	1	2-1/8	1-5/8	2	13/16
8140	1-1/4	2-1/8	2-1/8	2-1/8	13/16
8144	1-3/8	2-1/8	2-1/8	2-1/8	13/16
8148	1-1/2	2-1/4	2-1/4	2-1/8	15/16
8156	1-3/4	2-3/8	2-5/8	2-5/8	11/16
8164	2	2-5/8	3	2-5/8	1-3/16



1-1/2" Square Drive Sockets, SAE					
9156	1-3/4	2-7/8	2-7/8	3	1-1/8
9160	1-7/8	3	3-1/8	3	1-1/4
9164	2	3-1/8	3-1/4	3-1/4	1-3/8
9172	2-1/4	3-1/4	3-3/8	3-1/4	1-1/2
3/8" Square Drive Sockets, Metric					
12mm13	12	38.1	19.1	19.1	7.2
14mm13	14	38.1	22.2	22.2	11.1
16mm13	16	38.1	23.8	23.8	11.1
1/2" Square Drive Sockets, Metric					
16mm15	16	38.1	25.4	25.4	11.1
18mm15	18	38.1	28.6	28.6	11.1
20mm15	20	38.1	31.7	31.7	11.9
22mm15	22	38.1	33.3	33.3	14.3
5/8" Square Drive Sockets, Metric					
24mm16	24	51	38.1	38.1	15.9
3/4" Square Drive Sockets, Metric					
28mm17	28	54	44.4	44.4	19.1
30mm17	30	54	47.6	44.4	19.1
32mm17	32	54	50.8	44.4	20.6
34mm17	34	54	54.0	54.0	20.6
36mm17	36	57	57.1	54.0	23.8



Torque verification products for all your critical assembly applications

Utica products, ranging from torque screwdrivers, ratchets and dial wrenches to electronic torque analyzers offer high quality solutions for the many critical torque applications in today's assembly market. Utica products add value to the assembly process by enabling you to assess and control both critical joint values as well as the torque accuracy of production tools. Whether the electronic, automotive, aerospace or general industry, Utica provides a wide range of products for most any assembly application.



Quality

Our goal is to provide high quality torque tools that will maintain accuracy as long as possible. Each Utica tool is calibrated according to ASME B107.14M standards before leaving the plant, using test equipment traceable to NIST. Certification can be provided with each tool for a nominal charge. Cooper Tools manufacturing processes are ISO 9001 certified, which means that the Utica brand is manufactured to the highest standards.

Warranty

Torque products (excluding accessories) are warranted for:
Product – One (1) year from date of purchase to be free of defects in materials and workmanship.
Calibration – Ninety (90) days from date of purchase.
 This warranty does not extend to any product, which has been altered or abused.

Ordering Information

Utica products are distributed world-wide. To locate your nearest Utica and Cooper Tools distributor, visit our website at www.coopertools.com or www.uticatools.com. Or give us a call at (800) 845-5629.

“Click” Type Torque Sensing Wrenches

- Torque accuracy is +/- 4% of setting right hand (clockwise) and +/- 6% of setting left hand (counterclockwise) within upper 80% of scale.
- Audible “click” and/or a few degrees of travel provide accurate torque verification.
- Ergonomic handle and slim, lightweight design reduces fatigue and facilitates use in confined work areas.

Ratchet Head (Nm Graduations)

Model No.	Drive Size	Range (in.)	Graduation Nm	Length		Weight	
				Nm	in.	mm	lb.
TCM-75R	3/8	15-75	.5	14.75	375	2.2	1.0
TCM-75R-1/2	1/2	15-75	.5	14.75	375	2.2	1.0
TCM-150R	1/2	30-150	1.0	18.25	464	2.6	1.2



TCM-75R



Dial Indicating Torque Wrenches

- Torque accuracy of +/- 4% Indicated Value (from 20% to 100% capacity) in either clockwise or counterclockwise direction
- Nickel-plated handle for improved durability
- Memory indicator remains at maximum torque achieved for accurate torque verification
- Slim drive for tight work areas



DA-8

Dial Wrench With Protective Cage

(protects crystal and dial from damage)

Model No.	Drive Size (in.)	Range ft.-lb.	Graduations ft.-lb.	Weight	
				lb.	kg
DA4350FMPC*x	3/4	0-350	10	7.0	3.2

*x includes extension bar. Calibration certification may be provided with each tool for a nominal charge.

Nm/in.-lb. Scale

Model No.	Drive Size (in.)	Range		Graduations		Weight	
		Nm	in.-lb.	Nm	in.-lb.	lb.	kg
DA-3	1/4	0-3.2	0-30	0.1	1.0	1.8	0.8
DA-8	1/4	0-8.2	0-75	0.2	2.5	1.8	0.8
DA-16	3/8	0-16.5	0-150	0.5	2.5	1.9	0.9
DA-35	3/8	0-35.0	0-300	0.5	5.0	1.9	0.9
DA-70	3/8	0-70.0	0-600	1.0	10.0	2.0	0.9

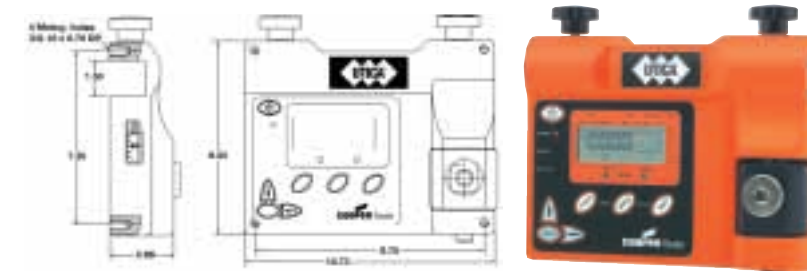
Nm/ft.-lb. Scale

Model No.	Drive Size (in.)	Range		Graduations		Weight	
		Nm	ft.-lb.	Nm	ft.-lb.	lb.	kg
DA-70F	3/8	0-70	0-50	1.0	1.0	2.0	0.9
DA-140F	1/2	0-140	0-100	2.0	2.0	3.3	1.5
DA-240F	1/2	0-240	0-175	5.0	5.0	6.7	3.0
DA-320F*x	1/2	0-320	0-250	10.0	5.0	5.5	2.5
DA-480F*x	3/4	0-480	0-350	10.0	10	12.4	5.6
DA-820F*z	3/4	0-820	0-600	20.0	10	11.0	5.0

*x includes extension bar *z includes extension bar and helper bar

TA4

110V Model	220V Model	Torque Range		Square Dr.	
		English	Metric	In.	mm
TA4-05B-1	TA4-05B-2	5-50 in.-lb.	.56-5.64 Nm	1/4	6.35
TA4-10B-1	TA4-10B-2	10-100 in.-lb.	1.13-11.29 Nm	1/4	6.35
TA4-05F-1	TA4-05F-2	5-50 ft.-lb.	6.78-67.79 Nm	3/8	9.53
TA4-25F-1	TA4-25F-2	25-250 ft.-lb.	33.90-338.95 Nm	1/2	12.7



*Each TA4 unit comes complete with the appropriate rundown adapter, power supply, RS-232 cable, an Excel add-in disc and case.

TA4 Accessories

Run Down Adapters*

Part No.	English	Metric	Sq. Drive
01-9232	5-50 in.-lb	56-564 cNm	1/4"
01-9233	10-100 in.-lb	112-1129 cNm	1/4"
01-9240	5-50 ft.-lb.	6-67 Nm	3/8"
01-9242	25-250 ft.-lb.	33-338 Nm	1/2"

Square drives conform to ASME B107 standards for proper fit with transducer.

Power Supplies*

Part No.	Description
01-9201	110V power supply for all TA4 systems
01-9202	220V power supply for all TA4 systems

Cables

Part No.	Description
01-9205*	RS-232 Cable

P-2 & P-15 Torque Analyzers

Model No.	Graduations	Capacity	Height		Width		Length		Weight		Ordering No.
			In.	mm	In.	mm	In.	mm	Lb.	kg	
P-2B	.5 in.-lbs.	20-2 in.lbs.	5.6	143	7.3	184	12	305	18	8.2	810681
MP-2B (metric)	.5 cm-kg	22-2 cm-kg	5.6	143	7.3	184	12	305	18	8.2	810682
P-15	2 in.-lbs.	150-5 in.lbs.	8	203	5	127	18	457	23	10.4	810002
MP-15 (metric)	5 cm-kg	180-5 cm-kg	8	203	5	127	18	457	23	10.4	810151

GENERAL
 Drive Size: 1/4" male hex (P-2 series)
 5/16" male hex (P-15 series)

OPTIONAL EQUIPMENT
 Calibration Kit (P-2 series) – 810629
 Calibration Kit (P-15 series) – 810080

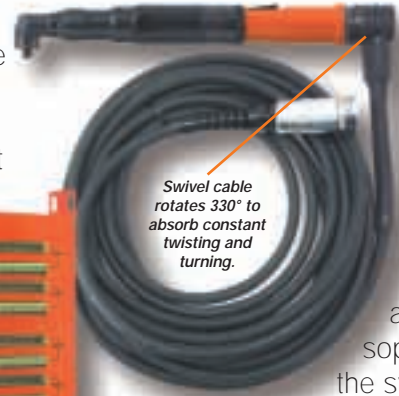


Refer to page 4 for description of Rapid Select.

The Total Solution

The total solution from CooperTools is supported by a broad array of accessories to help customize the Cleco Tightening Manager System to specific individual fastening requirements, as well as professional engineering and product support that are as close as a telephone or e-mail.

The accessory line includes synch boxes that enable the simultaneous use of multiple tools, keeping them synchronized so that the clamp-load is applied uniformly. The synch box also provides input and output connections for other accessories such as annunciators, remote start/stop devices, socket trays, and torque selector switches to help



Swivel cable rotates 330° to absorb constant twisting and turning.

engineer multi-phased fastening lines that meet special technical needs.

We have gone to great lengths to ensure that our cables and other accessories receive the same design and production attention that the more sophisticated components of the system enjoy. Our unique optional swivel cable is a testament to that effort.

The built-in swivel mechanism absorbs the constant twisting and turning that will ultimately break even the most durable standard cables.

Cooper Tools maintains company-owned Service Centers in strategic locations throughout the world, staffed with professional tool repair

technicians who use genuine CooperTools parts and who are outfitted with the very latest in testing, calibration and inspection equipment. Each tool or controller that is returned to a customer from one of our Service Centers carries with it a warranty that is CooperTools' assurance that it will perform just like it did when it was new.

Our support personnel are fully capable of helping diagnose problems and to promptly recommend solutions. Moreover, we also offer custom software for your proprietary assembly applications.

Our complete line of tools are carefully designed and built from the finest materials available in order to provide years of trouble free service. But, as with any piece of equipment, service problems can occur. All tools



are designed to be easy to service ... that is, of course, with properly trained personnel.

To facilitate quick repairs, and limit downtime ... CooperTools conducts training seminars covering all aspects of every tool we make.



Introductory training seminars are designed to fully acquaint students with the entire line of tools and their fundamental operation. Advanced training seminars, which are often tailored to individual needs, are designed to hone the skills of the experienced student. Hands-on experience, with an emphasis on troubleshooting and repairing, are the focus of this training.

Service literature, product information, brand catalogs and FAQs are also available around the clock on the Web. Just access www.coopertools.com for the latest information available about the Cleco Tightening Manager System or any of our other products and services.



Sales & Service Centers

Note: All locations may not service all products. Please contact the nearest Sales & Service Center for the appropriate facility to handle your service requirements.

Dallas

CooperTools
Sales & Service Center
1470 Post & Paddock
Grand Prairie, TX 75050
Tel: (972) 641-9563
Fax: (972) 641-9674

Lexington

CooperTools
670 Industrial Drive
Lexington, SC 29072
Tel: (800) 845-5629
Tel: (803) 359-1200
Fax: (803) 359-0822

Brazil

Cooper Tools Industrial Ltda.
Av. Liberdade, 4055
Zona Industrial - Iporanga
18087-170 Sorocaba, SP Brazil
Tel: (011) 55 15 238 3929
Fax: (011) 55 15 228 3260

Detroit

CooperTools
Sales & Service Center
4121 North Atlantic Blvd.
Auburn Hills, MI 48326
Tel: (248) 391-3700
Fax: (248) 391-6295

Los Angeles

CooperTools
Sales & Service Center
2000 S. Santa Cruz Street
Anaheim, CA 92805-6816
Tel: (714) 712-5800
Fax: (714) 712-5801

Canada

CooperTools
Sales & Service Center
6581 Kitimat Road Unit #10
Mississauga, Ont. L5N 3T5
Canada
Tel: (905) 826-3000
Fax: (905) 826-9443

Houston

CooperTools
Sales & Service Center
6550 West Sam Houston
Parkway North, Suite 200
Houston, TX 77041
Tel: (713) 849-2364
Fax: (713) 849-2047

Springfield

CooperTools
Airetool Operation
(Airetool products only)
302 South Center Street
Springfield, OH 45506
Tel: (937) 323-4981
Tel: (877) 739-7263
Fax: (937) 323-6524

France

CooperTools
Recoules Operation
Zone Industrielle
BP 28
Avenue Maurice Chevalier
77831 Ozoir-la-Ferrière Cedex
France
Tel: 011 33 1 64 43 22 00
Fax: 011 33 1 64 40 17 17

Germany

Cooper Power Tools
GmbH & Co.
Postfach 30
D-73461 Westhausen
Tel: +49 (0) 73 63-8 10
Fax: +49 (0) 73 63-8 12 22

Mexico

Cooper Power Tools
de México S.A. de C.V.
Ave. San Andrés Atoto No. 165A
Col. San Esteban
Naucalpan, Edo. de México C.P.
53550
Tel: (011) 525 576-7955
Fax: (011) 525 576-0096

CooperTools Is On The Web!

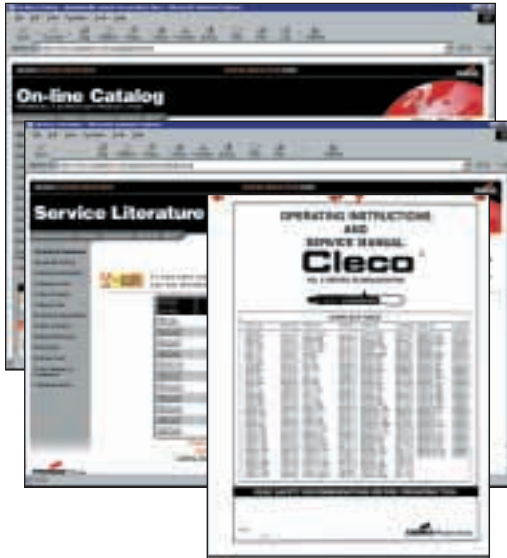
CooperTools is pleased to unveil a complete resource for power tools on-line. www.coopertools.com offers product information, service literature, brand catalogs, press releases and more. A dominant source of information, the CooperTools' web site is your source for application solutions on-line.



Making your job easier is our goal!

You can access service literature anytime. Choose a category such as Assembly Tools or Material Removal Tools from the main menu and then click on the brand you're looking for. You'll be on your way to any current service literature you need, whether it's Cleco, Apex, Master Power, or any of our power tools' brands.

Up-to-date product catalogs are also available online providing you with current information on our broad product line. Even Material Safety Data Sheets (M.S.D.S.) for Safety and Disposal Information are available on our website.



It's simple!

Our *Customer Service* section provides you with information such as answers to frequently asked questions or contact phone numbers and addresses for your area of the country. You can learn more about CooperTools in the *About Us* section or browse through the *What's New* information to learn how CooperTools continues to be your source for solutions.



For even faster searches, you can go direct to a brand site by simply entering the brand name. Entering

www.clecotools.com takes you directly to the brand site.

What is the future of www.coopertools.com? A dynamic site continuing to focus on your need for up-to-date information on the latest CooperTools' offerings that you can access anytime you need...twenty-four hours a day, seven days a week!



AIRETOOL® • APEX®
BUCKEYE® • CLECO®
COOPER AUTOMATION™
DGD® • DOLER® • DOTCO®
GARDNER-DENVER®
GARDOTRANS™ • GETA™
MASTER POWER®
METRONIX™
QUACKENBUSH™
RECOULES™
ROTOR™
UTICA®

Cooper Tools
P.O. Box 1410
Lexington, SC 29071-1410
USA
Phone: 803-359-1200
Fax: 803-808-6735
www.coopertools.com

Cooper Power Tools GmbH & Co.
Postfach 30
D-73461 Westhausen
Germany
Phone: (49)7363-810
Fax: (49)7363-81222