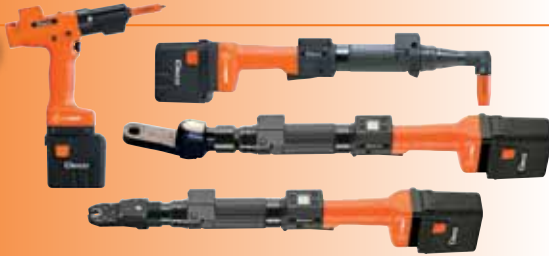


Cleco®

DC Electric Assembly Tools



Safety Critical



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Quality Critical



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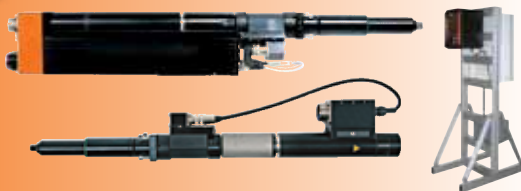
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Fixtured Safety Critical



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The Total Solution For Quality & Critical Fastening Operations

Cleco's fastening technology is used globally and across all industries. This technology is used in Aerospace, Motor Vehicle, Offroad, Wind Energy, Agriculture, and a great multitude of applications within general industry where "quality critical" requirements are the rule. In motor vehicle environments across the globe, Cleco and DGD's complete line of transducerized electric tools are used in "safety critical" applications where spot-on precision and traceability are required. And finally, in one of the most demanding environments, our line of DC electric tools are used in aircraft assembly where "good enough" will never be acceptable.

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 Apex, we welcome the challenge of leadership this imposes.

The Systems

Cleco's state of the art Tightening System delivers unprecedented performance, productivity and accountability in both "quality critical" and "safety critical" assembly applications.

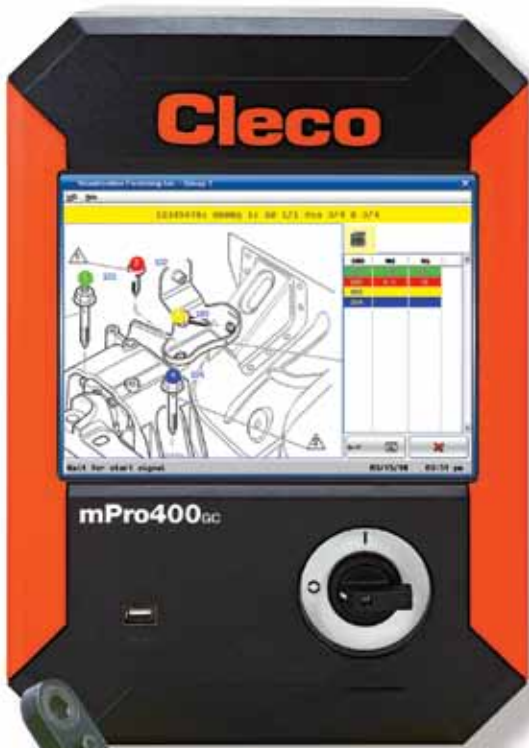
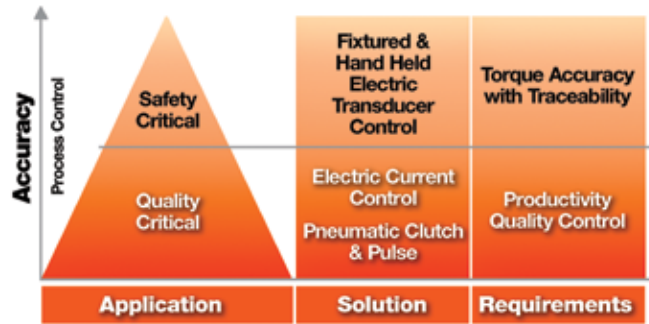
Durability, speed, and ergonomics are achieved using the corded Cleco DC electric tools with a complete line of tool configurations and an assortment of controller options to choose from.



The Cleco LiveWire™ system provides the most cost-effective safety critical fastening solution available in the world today. By marrying cordless tools and WiFi communications, the operators gain the mobility and flexibility they need to increase productivity and reduce in-system damage costs. One line controller managing up to 10 cordless tools while utilizing the most up-to-date wireless encryption technology provides a cost savings unparalleled in industry today.

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

Application Segment



Cleco®



How To Build A DC Global Controller System

mPro400GC-M, mPro400GC-P & mPro400GC-S

Building a DC Global Controller System is as simple as 1, 2, 3!

1. Choose a common system to the right.
2. Select the correct components below.
3. Order your System!

(Refer to Pages 38-39 to build a mPro400GC-E/GC-I system.)

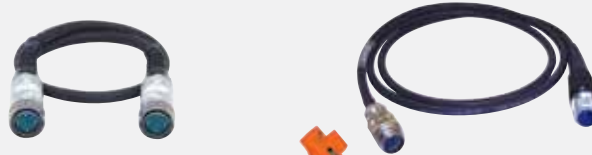
Controller (Page 40)



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Access Point (Page 58)



IRDA Device (Infrared Cable) (Page 58)



System Bus Cable (Page 59)



System Bus Terminator Plug (Page 59)



System Bus Accessories (Page 59)



Isolation Transformer (Page 56)



→
Add or delete components as required.

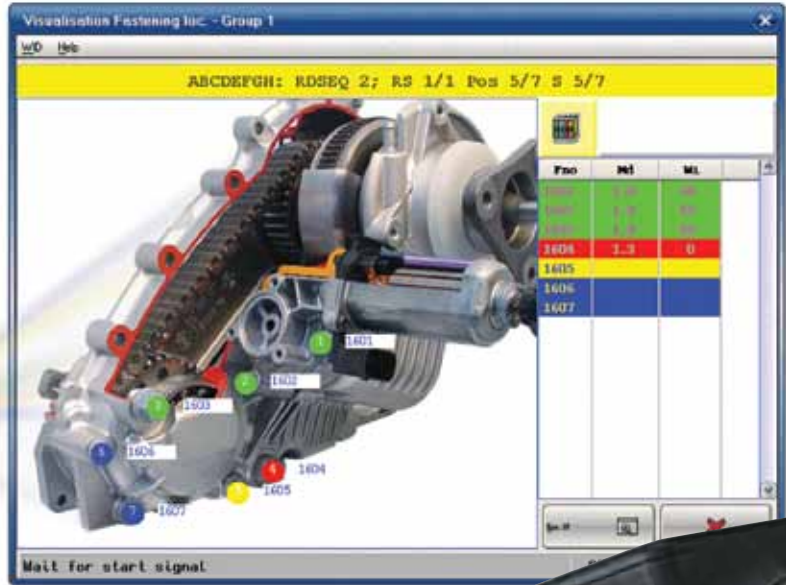
Model/Part Number	One Corded Tool (18/48E-E)	One Corded Tool (18/48E-E) with a Control Box	Two Corded Tools (18/48E-E)	One Corded 18/48E-E Tool w/4-Position Socket Tray	Three Corded Tools (18/48E-E) w/LiveWire™	Three LiveWire™ Tools Only w/3 Stack Lights	One LiveWire™ Tool only	Three Corded Tools (18/48E-E)	One LiveWire™ Tool only
mPro400GC-M (Master)							1	1	
mPro400GC-P (Primary)	1	1	1	1	1	1			
mPro400GC-S (Secondary)				1		2			
18/48E_EXXX	1		1	2	1	3			
67E_XXX		1							
Tool Cable - 301866-XM (Air-Lb)	1		1	2	1	3			
Tool Cable - 542778-XM (Matrix)		1							
Extension Cable - 301877-XM (If Required) (Air-Lb)									
Extension Cable - 542779-XM (If Required) (Matrix)									
17/47B__BXX			1				1	3	
543995 (US) 961323 (EU)			1				1	1	
935170 IRDA Only 935144 Pistol Holder w/IRDA 935290 Right Angle Holder w/IRDA 935999 70Nm, 90Nm, Crowfoot/Tubenut Holder w/IRDA			1				1	1	
544196-005 (0.5M) 544196-020 (2M) 544196-050 (5M) 544196-200 (20M) 544196-500 (50M)		1		1	1	2		3	
544197PT		1		1	1	1		1	
S133420 Stack Light								3	
S133410 4-Position Socket Tray					1				
S133411 8-Position Socket Tray				1					
S133406 Control Box		1							
544185PT		1							

All The Brains. All The Power.

LiveWire™ offers precision torque, angle and speed control features for safety critical fastening in an ergonomic, wireless design.

With up to 1,700 rundowns per battery charge or continuous power, your safety critical applications are assured to never run out of power.

LiveWire™ has been designed and tested to provide wireless connectivity across the harshest of machine-to-machine environments.



Digital Process Control

- Auto bolt sequencing
- Auto image selection
- Configurable reject management



Electronic Intelligence

- On-board controller with power management
- Integrated servo with I/O signal handling
- Auto sensing power intelligence
- 512 cycle memory buffer



Power. And It's Wireless.

Integrated Bar Code Scanner (optional)

- Enables real-time bar code data collection
- Programmable bit for Auto Parameter Select
- Tool enable and disable configurability



Configurable LED Illumination



Modular Tightening System



Operator Display

- Real-time interface
- Redundant feedback
 - Green LCD = OK
 - Yellow LCD = Running
 - Red LCD = NOK / Errors
 - Green LED = OK
 - Red LED = NOK
- Configurable application buttons



One controller manages up to 32 tools simultaneously in varying combinations.

The Most Cost-Effective Safe

Up To 50% Savings Over Traditional Systems!

Mobility is a major advantage with wireless communications. Cleco LiveWire™ marries the freedom and flexibility of cordless tools with real-time wireless error proofing. Utilizing an industry standard 2.4/5GHz WLAN (Wireless Local Area Network) interface in conjunction with the highest security encryption and authentication levels, plus a 512-cycle tool memory buffer, LiveWire™ ensures you will never compromise safety critical data transmissions.

**2.4 or
5GHz
WLAN**

**10
LiveWire
Tools.
1 Line
Controller.**



Security Critical Solution Available.

Up To 83% More Productivity!

Cleco LiveWire™ tools are now available with Vmax™, a solution that drives tool power and speed increases up to 83% without losing accuracy or durability. This leading innovation utilizes the same 10 tools to one line controller hardware solution with up to 50% cost savings over traditional systems. New Vmax™ technology auto-senses the applied power source and adjusts the maximum tool speed capability on the fly. LiveWire™ with Vmax™ combines the power you need with the most versatile wireless system available today.



Wireless Security

- WEP (Wired Equivalent Privacy)
 - 64/128 Bit Encryption HEX (RC4)
- WPA (Wireless Protected Access)/WPA2/802.11
 - 128 Bit TKIP/CCMP Encryption
 - 802.1x EAP Authentication
 - LEAP, PEAP, TTLS
 - GTC, MD5, OTP, PAP, CHAP, MSCHAP, MSCHAPv2, TTLS MSCHAPv2



Electric Nutrunners – Cordless Transducer Control

Right Angle Tools

Cleco®

Right Angle Series

Torque Range
5.5 - 90 Nm
4.1 - 77.4 Ft. Lbs.

Bolt Size
M5 - M12
#10 - 9/16"

- Brushless precision
- Resolver control
- Transducer accuracy
- On-board controller with power management
- Integrated servo with I/O signal handling

47BAYSB28AM3

(Apex u-Guard socket shown above not included)



Cordless Tools Nomenclature

47	B	A	X	X	B	XX	XXX	X
Motor 47	Power B-Battery				Battery B - 26-48V		Output Drive AM3 - 3/8" Sq.Dr. AH4 - 1/2" Sq.Dr.	Retainer - Pin Retainer B Ball Retainer
Tool Style A - Angle			Peripherals S - Barcode Scanner - - None			Max Torque (Nm) Under 60Nm, rounded up to the nearest 1Nm. Over 60Nm, rounded to the nearest 5Nm.		
Data Transmission X - WLAN: WEP, WPA, WPA2, 802.1x Y - Dual Band - 2.4/5 GHz Z - Xbee (4 tools/access point) R - RF868MHz (4 tools/box station) EU only								

Right Angle Model Number	Torque Range		Free Speed (RPM)			Weight Less Battery		Output Drive Size	Length With 26V Battery	
	Ft.Lbs.	Nm	26V*	44V*	Tethered	lbs.	kg		in.	mm
47BAYSB15AM3	4.1-11.1	5.5-15	538	983	983	4.77	2.17	3/8" SQ	21.79	553.5
47BAYSB21AM3	5.9-15.5	8-21	411	751	751	4.77	2.17	3/8" SQ	21.79	553.5
47BAYSB28AM3	7.4-20.7	10-28	291	532	532	4.77	2.17	3/8" SQ	22.32	567.5
47BAYSB35AM3	9.6-25.8	12-35	244	447	447	5.35	2.43	3/8" SQ	23.06	600.0
47BAYSB50AM3	13.3-36.9	18-50	168	293	293	5.39	2.45	3/8" SQ	23.94	608.0
47BAYSB70AH4	17.7-51.6	24-70	123	216	216	8.54	3.88	1/2" SQ	26.7	678.0
47BAYSB90AH4	29.5-77.4	40-90	82	144	144	8.73	3.96	1/2" SQ	26.7	678.0

*Speed with fully charged battery.

General: All tools must be used with a Cleco approved line controller.

Standard Equipment: Integrated infrared communications.

Extra Equipment: See pages 14-15 & 58-60 for optional accessories.



17BPYSB13Q

(Apex u-Guard socket shown above not included)

Cleco®

Pistol Grip Series

Torque Range	Bolt Size
3.0 - 13 Nm	M5 - M6
2.2 - 9.6 Ft. Lbs.	#10 - 1/4"

- Brushless precision
- Resolver control
- Transducer accuracy
- On-board controller with power management
- Integrated servo with I/O signal handling



Cordless Tools Nomenclature

17	B	P	X	X	B	XX	Q
Motor 17	Power B-Battery				Battery B – 26-48V		Output Drive Q – Quick change
Tool Style P – Pistol		Peripherals S – Barcode Scanner - - None				Max Torque (Nm) Under 60Nm, rounded up to the nearest 1Nm.	
Data Transmission X – WLAN: WEP, WPA, WPA2, 802.1x Y – Dual Band – 2.4/5 GHz Z – Xbee (4 tools/access point) R – RF868MHz (4 tools/box station) EU only							

Pistol Model Number	Torque Range		Free Speed (RPM)			Weight Less Battery		Output Drive Size	Length With 26V Battery	
	Ft.Lbs.	Nm	26V*	44V*	Tethered	lbs.	kg		in.	mm
17BPYSB05Q	2.2-3.7	3-5	1639	2428	2428	3.34	1.52	1/4" Hex	8.44	214.5
17BPYSB07Q	2.2-5.2	3-7	1161	1721	1721	3.34	1.52	1/4" Hex	8.44	214.5
17BPYSB09Q	2.2-6.6	3-9	887	1314	1314	3.34	1.52	1/4" Hex	8.44	214.5
17BPYSB13Q	2.2-9.6	3-13	629	931	931	3.34	1.52	1/4" Hex	8.44	214.5

*Speed with fully charged battery.

General: All tools must be used with a approved Cleco line controller.

Standard Equipment: Integrated infrared communications.

Extra Equipment: See pages 14-15 & 58-60 for optional accessories.

Electric Nutrunners – Cordless Transducer Control

Tube Nut Tools

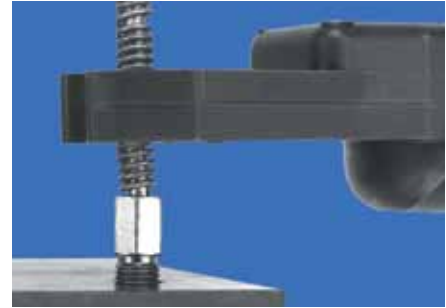
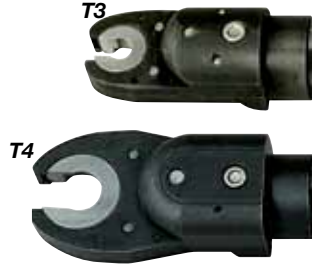
Cleco®

Tube Nut Series

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

Bolt Size
M6 - M8
1/4" - 7/16"

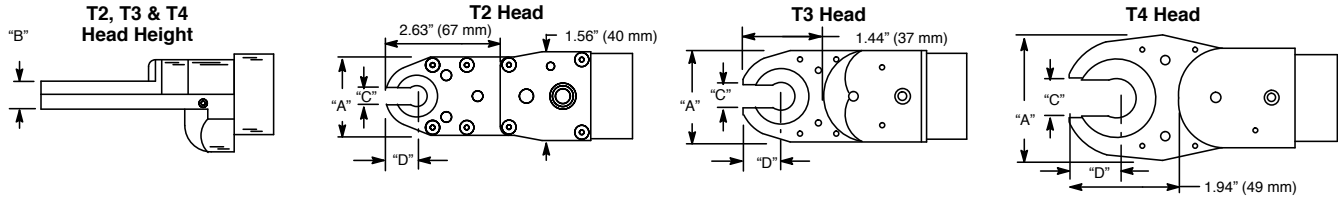
- Brushless precision
- Resolver control
- Transducer accuracy
- On-board controller with power management
- Integrated servo with I/O signal handling



The 47BT 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.



47BTYSB20T2



Tube Nut Tool Nomenclature

47 B T X X X XX XX KSX XX XX X

Series
47

Power
B-Battery

Tool Style
T - Tube Nut

Data Transmission

- X - WLAN: WEP, WPA, WPA2, 802.1x
- Y - Dual Band - 2.4/5 GHz
- Z - Xbee (4 tools/access point)
- R - RF868MHz (4 tools/box station) EU only

Peripherals

- S - Barcode Scanner
- - None

Battery
B-26V-48V

Head Type

- KS2 - T2
- KS3 - T3
- KS4 - T4

Max Torque (Nm)

Under 60Nm, rounded up to the nearest 1Nm. Over 60Nm, rounded to the nearest 5Nm.

Output Type

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

Extension Length

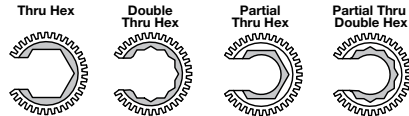
- 0 - Flush
- 2 - 1/4"
- 4 - 1/2"
- 6 - 3/4"

Maximum Hex Socket Size

- MG, EE T2 Head Type
- MM T3 Head Type
- MU T4 Head Type
- 00, ## (Specials) All Head Types

Socket Sizes

EA - 1/4"	M5 - 5mm	MH - 14mm	MP - 22mm
EC - 3/8	M6 - 6mm	MI - 15mm	MQ - 23mm
EE - 1/2	MA - 7mm	MJ - 16mm (5/8")	MR - 24mm (15/16")
EF - 9/16	MB - 8mm (5/16)	MK - 17mm	MS - 25mm
EH - 11/16	MD - 10mm	ML - 18mm	MT - 26mm
EJ - 13/16	ME - 11mm (7/16)	MM - 19mm (3/4")	MU - 27mm (1 1/16")
EK - 7/8	MF - 12mm	MN - 20mm	
EM - 1	MG - 13mm	MO - 21mm	



Tube Nut	Torque Range		Free Speed (RPM)			Weight Less Battery		Max. Drive Size	Length w/ 26V Battery	Head								
	Ft.Lbs.	Nm	26V*	44V*	48V	lbs.	kg			A Width	B Blade Ht.	C Opening	D End/Cntr.					
47BTYSB20T2	7.4-14.8	10-20	260	455	455	5.6	2.54	1/2"	23.6	598	1.42	36	0.55	14	0.28	7	0.53	13
47BTYSB30T3	11.1-22.1	15-30	188	329	329	5.6	2.53	3/4"	23.3	588	1.65	42	0.59	15	0.475	12	0.73	19
47BTYSB40T4	14.8-29.5	20-40	141	247	247	6.4	2.90	1 1/16"	29.9	612	2.36	60	0.59	15	0.675	17	0.93	24

*Speed with fully charged battery.

General: All tools must be used with a Cleco approved line controller.

Standard Equipment: Integrated infrared communications.

Extra Equipment: See pages 14-15 & 58-60 for optional accessories.

To order individual sockets, use a "KS" prefix. (i.e. KS2EA01 for a T2, 1/4", flush, thru hex socket.)

Cleco®

Crowfoot Series

Torque Range
 10.5 - 30 Nm
 7.7 - 22.1 Ft. Lbs.

Bolt Size
 M6 - M8
 1/4" - 7/16"

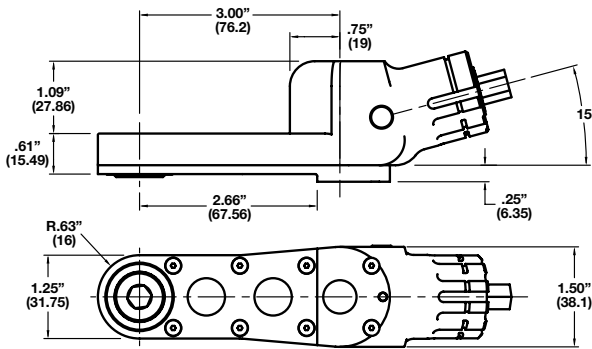
- Brushless precision
- Resolver control
- Transducer accuracy
- On-board controller with power management
- Integrated servo with I/O signal handling



47BCYSB30C1

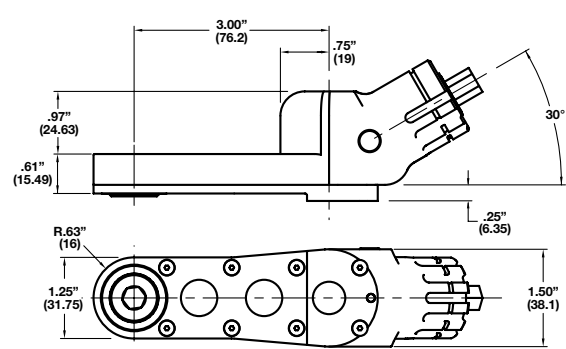
C1 – 15° Head (Part No. 301959)

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



C3 – 30° Head (Part No. 301960)

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



Crowfoot Tool Nomenclature

47 | **B** | **C** | **X** | **X** | **B** | **XX** | **XX** | **CS** | **XX** | **X** | **X**

Series 47	Battery	Peripherals -- None S - Barcode scanner	Battery B - 26V-48V	Head Type C1 - 15° C3 - 30°	Socket Type CS - Crowfoot	Output Type 1 - Thru Hex
Tool Style C - Crowfoot						Extension Length 0 - Flush 4 - 1/2" 6 - 3/4"
Data Transmission X - WLAN: WEP, WPA, WPA2, 802.1x Y - Dual Band - 2.4/5 GHz Z - Xbee (4 tools/access point) R - RF868MHz (4 tools/box station) EU only				Max Torque (Nm) Under 60Nm, rounded up to the nearest 1Nm. Over 60Nm, rounded to the nearest 5Nm.	Socket Size	
					EA - 1/4" MA - 7mm MF - 12mm EC - 3/8" MB - 8mm (5/16) MG - 13mm EE - 1/2" MC - 9mm MH - 14mm EF - 9/16" MD - 10mm MI - 15mm* ME - 11mm (7/16) *Fragile. Light duty apps.	

Socket Nomenclature

Crowfoot	Torque Range		Free Speed (RPM)			Weight Less Battery		Max. Drive Size	Length w/26V Battery	
	ft. lbs.	Nm	26V*	44V*	48V	lbs.	kg		in.	mm
47BCYSB30C1	7.7-22.1	10.5-30	186	326	326	6.12	2.78	1/2"	26.26	667
47BCYSB30C3	7.7-22.1	10.5-30	186	326	326	6.12	2.78	3/4"	25.98	660

*Speed with fully charged battery.

General: All tools must be used with a Cleco approved line controller.

Standard Equipment: Integrated infrared communications.

Extra Equipment: See pages 14-15 & 58-60 for optional accessories.

To order individual sockets, use a "CS" prefix before the required socket. (i.e. CSEE01 for a 1/2", flush, thru hex socket.)

Cordless Tool Accessories

Batteries & Chargers

Cordless Freedom

or

Tethered Speed...



The Choice Is Yours.

44V Li-Ion Battery Technology

- Up to 83% faster vs. 26V battery
- Up to 1,700 rundowns/charge (hard joint)
- Life > 800 charging cycles
- On-board intelligence
 - Charge level/cycles LCD
 - Diagnostics to a PC
- Single tab, one-hand removal



The cells and electronic balancing circuit are fixed to an internal cell holder to provide maximum durability.



Single tab removal



5 bar on-battery display for advanced feedback

Charge Cycles – Unplugged display

Display	Charge Cycles
■ ■ ■ ■ ■	0 – 199
■ ■ ■ ■ □	200 – 399
■ ■ ■ □ □	400 – 599
■ ■ □ □ □	600 – 799
■ □ □ □ □	> 800

Charge Level – Operational display

Display	Charge Level
□ □ □ □ □	Deep Sleep Mode or Defective
■ □ □ □ □	< 20%
■ ■ □ □ □	20 – 40%
■ ■ ■ □ □	40 – 60%
■ ■ ■ ■ □	60 – 80%
■ ■ ■ ■ ■	80 – 100%

26V/44V Charger Technology

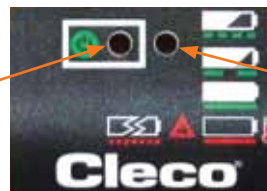
- Auto-sensing 26/44V
- One hour charge cycle
- Auto-sensing input (85-270) VAC
- Power/Status LEDs



Charger Display For Advanced Feedback

Power Supply

LED Display	Status
●	No Main Supply
●	Main Supply OK



Red/Green LED For Charge & Error

LED Display	Status
●	No Battery
● Flash @ .5 Hz	Charging, Level > 80%
● Flash @ 1 Hz	Charging, Level < 80%
●	Battery 100% Charge
●	Cell Over Temperature
● Flash @ 2 Hz	Battery Error (Short circuit, defective cell, etc.)





LiveWire Power Module

- Up to 83% faster!
- Auto sensing input – (85-275 VAC)
- Power & status LEDs
- Electronic circuit protection



Speed Improvement Comparison

Series	Model Number	Free Speed (RPM)		% Increase
		26V Battery	Tethered	
Pistol	17BPYSB05Q	1639	2428	48%
	17BPYSB07Q	1161	1721	48%
	17BPYSB09Q	887	1314	48%
	17BPYSB13Q	629	931	48%
Right Angle	47BAYSB15AM3	538	983	83%
	47BAYSB21AM3	411	751	83%
	47BAYSB28AM3	291	532	83%
	47BAYSB35AM3	244	447	83%
	47BAYSB50AM3	168	293	75%
	47BAYSB70AH4	123	216	75%
	47BAYSB90AH4	82	144	75%

mPro400GC Controller

- Up to 16 tools per controller (LiveWire + Corded + Fixtured)
- 10.4" display with wide viewing angle
- Touchscreen with alpha numeric entry
- Corded and cordless functionality
- Redundant Ethernet and Fieldbus ports
- Serial and USB connectivity
- Configurable 24V I/O
- System bus standard
- Fieldbus optional



mPro400GC Nomenclature

M PRO	4 00GC	X
Controller Style	Series	Type
		M – Master P – Primary



Global Controllers

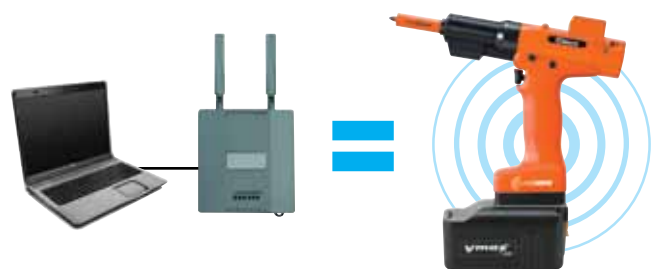
Model Number*	Description	Weight		Width		Height		Depth*	
		lbs.	kg	in.	mm	in.	mm	in.	mm
MPRO400GC-M	Master controller, display, no servo, Fieldbus optional	23.3	10.57	10.5	266.7	15	381.0	13.24	336.29
MPRO400GC-P	Primary controller, display, STMH servo, Fieldbus optional	30.8	13.97	10.5	266.7	15	381.0	13.24	336.29

*Includes mounting bracket.
See additional information on pages 32-40.

Low-Cost Software Solution



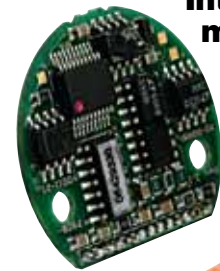
- No error proofing
- No software licensing
- Up to 10 tools to PC
- Local data storage



Durability. Speed.

Cleco 18-48 series tools are driven by a maintenance-free brushless motor with up to 50% more speed and productivity. This motor technology coupled with our high-resolution resolver offers full range control for safety critical joints. The 18-48 series tools with industry proven gear trains create outstanding durable production performance.

The Cleco 18-48 series electric tools provide a unique modular assembly design for ease of repair. The on-board intelligent memory chip records tool set-up values and counts cycles for maintenance scheduling to prevent costly production downtime.



Intelligent memory chip

Highly visible operator feedback LEDs

Error free connector

(in tool handle)



Air-LB

(Tools with Matrix connector available upon request.)

Low compression switch



Ergonomic handle for operator comfort



Resolver technology for full range speed control

Ergonomics.

Optimal tool weight and balance

Durable industry proven gear train

Reaction transducer for consistent torque repeatability

Adjustable angle head allows flexible orientation

Low inertia brushless motor for superior fastening control

Standard tools required for service



Cleco®

Electric Nutrunners – Coded Transducer Control

Right Angle Tools

Cleco®

Right Angle Series

Torque Range
2 - 230 Nm
1.5 - 169.6 Ft. Lbs.

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

- Brushless precision
- Resolver control
- Transducer control
- Memory intelligence



XX	E	A	E	XXX	XXX	X
Motor 18, 48	Power E-Electric	Connector Air-LB				Retainer - Pin retainer B Ball retainer
Tool Style A – Right Angle				Output Drive		
Max Output Torque (Nm) Under 60 Nm, rounded up to the nearest 1 Nm. Over 60 Nm, rounded to the nearest 5 Nm.				AL2 – 1/4" Sq.Dr. AM4 – 1/2" Sq.Dr. AL3 – 3/8" Sq.Dr. AH4 – 1/2" Sq.Dr. AM3 – 3/8" Sq.Dr. MH4 – 1/2" Sq.Dr. AX6 – 3/4" Sq.Dr.		

Right Angle Model Number	Torque Range		Max. Speed RPM	Weight*		Output Drive Size	Length		Anglehead			
	ft. lbs.	Nm		lbs.	kg		in.	mm	Side to Center		Height	
									in.	mm	in.	mm
18EAE08AL2	1.5-5.9	2-8	3000	2.9	1.3	1/4"	13.6	345	0.51	13	1.4	36
18EAE15AM3	3.0-11.1	4-15	1300	3.3	1.5	3/8"	14.8	376	0.59	15	1.6	41
18EAE22AM3	3.7-16.2	5-22	920	3.3	1.5	3/8"	14.8	376	0.59	15	1.6	41
18EAE28AM3	4.4-20.7	6-28	700	3.3	1.5	3/8"	14.8	376	0.59	15	1.6	41
48EAE15AL3	2.2-11.1	3-15	2855	3.8	1.7	3/8"	15.7	398	0.59	15	1.6	41
48EAE28AL3	4.4-20.7	6-28	1300	4.1	1.9	3/8"	16.2	410	0.59	15	1.6	41
48EAE41AM3	6.6-30.2	9-41	1090	4.3	2.0	3/8"	17.3	440	0.75	19	1.9	48
48EAE58AM3	8.9-42.8	12-58	770	4.3	2.0	3/8"	17.3	440	0.75	19	1.9	48
48EAE58AM4	8.9-42.8	12-58	770	4.3	2.0	1/2"	17.3	440	0.75	19	1.9	48
48EAE90AH4	13.3-64.2	18-87	515	6.6	3.0	1/2"	18.5	470	0.81	21	2.3	58
48EAE105AH4	15.5-76.7	21-104	340	6.6	3.0	1/2"	18.5	470	0.81	21	2.3	58
48EAE135MH4	19.9-98.1	27-133	265	7.3	3.3	1/2"	19.1	485	0.94	24	2.4	61
48EAE175AX6	26.6-129.8	36-176	190	10.2	4.6	3/4"	21.6	549	1.06	27	2.7	69
48EAE230AX6	33.9-169.6	46-230	145	10.2	4.6	3/4"	21.6	549	1.06	27	2.7	69

*Weights are without tool cable and reaction bar.

General: All tools must be used with an approved ATG cable and controller.

Standard Equipment: Air-LB Connector. Ball retainer optional.

Tools with Matrix connector available upon request

Extra Equipment: Std. tool cable 301866-XX, RA swivel cable 301903-XX,

Inline swivel cable 301904-XX, Extension cable 301877-XX.

Additional Accessories: See pages 58-61 for additional accessories.



67EA235AL6

Cleco®

Right Angle Series

Torque Range
 46 - 2000 Nm
 34 - 1475 Ft. Lbs.

Bolt Size
 M18 - M36
 3/4" - 1 1/2"

- Brushless precision
- Resolver control
- Transducer control
- Memory intelligence

All 67 Series Tools require an isolation transformer (544185PT) for use with Cleco Global Controller.



XX	E	A	XXXX	XXX	X
Motor 67	Power E-Electric				Retainer - Pin retainer B Ball retainer
Tool Style A - Right Angle			Output Drive AL6 - 3/4" Sq.Dr. AM6 - 3/4" Sq.Dr. ML6 - 3/4" Sq.Dr. AH8 - 1" Sq.Dr.		
Max Output Torque (Nm) Under 60 Nm, rounded up to the nearest 1 Nm. Over 60 Nm, rounded to the nearest 5 Nm.					

Right Angle Model Number	Torque Range		Max. Speed RPM	Weight*		Output Drive Size	Length		Anglehead			
	ft. lbs.	Nm		lbs.	kg		in.	mm	Side to Center		Height	
									in.	mm	in.	mm
67EA235AL6	33.9-169.6	46-230	135	12.9	5.9	3/4"	25.8	655	1.03	26	2.3	58
67EA255AL6	40.6-188.1	55-255	115	12.9	5.9	3/4"	25.8	655	1.03	26	2.3	58
67EA310ML6	44-229	60-310	100	20.2	9.2	3/4"	29.1	739	1.06	27	2.55	65
67EA340AM6	51.6-247.1	70-335	90	21.0	9.5	3/4"	31.6	803	1.38	35	3.1	79
67EA460AM6	70.1-339.3	95-460	66	21.0	9.5	3/4"	31.6	803	1.38	35	3.1	79
67EA570AM6†	84.8-420.4	115-570	53	21.0	9.5	3/4"	31.6	803	1.38	35	3.1	79
67EA860AH8	129.1-634.3	175-860	33	22.7	10.3	1"	25.3	643	1.50	38	9.32	237
67EA1035AH8	154.9-763.3	210-1035	25	23.0	10.5	1"	26.3	668	1.50	38	9.32	237
67EA1340AH8	199.1-988.3	270-1340	20	23.0	10.5	1"	26.3	668	1.50	38	9.32	237
67EA1700AH8	250.8-1253.8	340-1700	16	23.0	10.5	1"	26.3	668	1.50	38	9.32	237
67EA2010AH8	295.0-1475.0	400-2000	13	23.0	10.5	1"	26.3	668	1.50	38	9.32	237

*Weights are without tool cable and reaction bar.

†Note: All 67 series tools require an isolation transformer (544185PT) for use with Cleco Global Controller.

‡Note: Limited anglehead durability at rated torque.

General: All tools must be used with an approved ATG cable and controller.

Standard Equipment: Matrix Connector.

Extra Equipment: Std. tool cable 542778-XX, RA swivel cable 544055-XX, Inline swivel cable 544056-XX, Extension cable 542779-XX.

Additional Accessories: See pages 58-61 for additional accessories.

Electric Nutrunners – Coded Transducer Control

Inline Non-Floating Spindle Tools

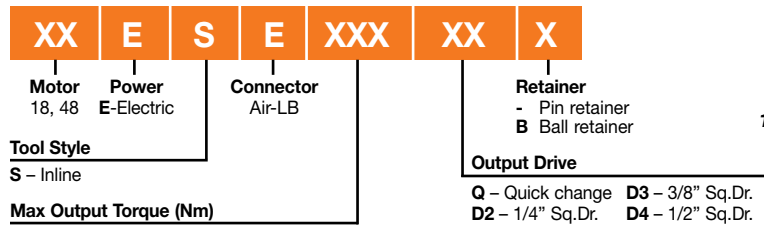
Cleco®

Inline Non-Floating Series

Torque Range
2 - 150 Nm
1.5 - 110 Ft. Lbs.

Bolt Size
M5 - M14
#10 - 5/8"

- Brushless precision
- Resolver control
- Transducer control
- Memory intelligence



Inline Non-Floating Model Number	Torque Range		Max. Speed RPM	Weight*		Output Drive Size	Length		Side to Center	
	ft. lbs.	Nm		lbs.	kg		in.	mm	in.	mm
18ESE06Q	1.5-4.4	2-6	4000	2.5	1.1	1/4" Hex	12.3	312	0.91	23
18ESE06D2	1.5-4.4	2-6	4000	2.5	1.1	1/4"	11.8	300	0.91	23
18ESE12Q	2.2-8.9	3-12	1820	2.7	1.2	1/4" Hex	13.0	330	0.91	23
18ESE12D3	2.2-8.9	3-12	1820	2.7	1.2	3/8"	12.4	315	0.91	23
18ESE17Q	3.0-12.5	4-17	1290	2.7	1.2	1/4" Hex	13.0	330	0.91	23
18ESE17D3	3.0-12.5	4-17	1290	2.7	1.2	3/8"	12.4	315	0.91	23
18ESE22D3	3.7-16.2	5-22	985	2.7	1.2	3/8"	12.4	315	0.91	23
18ESE31D3	5.2-22.9	7-31	695	2.7	1.2	3/8"	12.4	315	0.91	23
48ESE12Q	2.2-8.9	3-12	4000	3.0	1.4	1/4" Hex	13.5	343	0.91	23
48ESE12D2	2.2-8.9	3-12	4000	3.0	1.4	1/4"	13.0	330	0.91	23
48ESE25D3	4.4-18.4	6-25	1820	3.2	1.5	3/8"	13.6	345	0.91	23
48ESE36D3	5.9-26.6	8-36	1290	3.2	1.5	3/8"	13.6	345	0.91	23
48ESE48D3	7.4-35.4	10-48	985	3.3	1.5	3/8"	13.8	351	0.91	23
48ESE65D4	9.6-47.9	13-65	750	5.3	2.4	1/2"	16.6	420	1.13	29
48ESE90D4	14.0-66.4	19-90	510	5.6	2.5	1/2"	17.1	435	1.13	29
48ESE125D4	19.2-92.2	26-125	360	5.6	2.5	1/2"	17.1	435	1.13	29
48ESE150D4	22.9-110.6	31-150	240	5.6	2.5	1/2"	17.1	435	1.13	29

*Weights are without tool cable.

General: All tools must be used with an approved ATG cable and controller.

Standard Equipment: Air-LB Connector; Dead Handle is included with 18ES12Q and 18ES12D3. Ball retainer optional.

Tools with Matrix connector available upon request.

Reaction bar is included with inline tools with output torques of 17-150 NM.

Extra Equipment: Std. tool cable 301866-XX, RA swivel cable 301903-XX, Inline swivel cable 301904-XX, Extension cable 301877-XX.

Mounting Plates: 543231 - (all with exception of listed below)

543235 - 18ESE06Q/D2, 48ESE12Q/D2

49087108 - 48ESE65D4, 48ESE90D4, 48ESE125D4, & 48ESE150D4.

See page 43 for mounting plate dimensions.

Additional Accessories: See pages 58-61 for additional accessories.



Inline Non-Floating Series

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

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

- Brushless precision
- Resolver control
- Transducer control
- Memory intelligence

All 67 Series Tools require an isolation transformer (544185PT) for use with Cleco Global Controller.



XX	E	S	XXXX	XXX	X
Motor 67	Power E-Electric				Retainer - Pin retainer B Ball retainer
Tool Style S - Inline			Output Drive D4 - 1/2" Sq.Dr. D8 - 1" Sq.Dr. D6 - 3/4" Sq.Dr. D12 - 1 1/2" Sq.Dr.		
Max Output Torque (Nm) Under 60 Nm, rounded up to the nearest 1 Nm. Over 60 Nm, rounded to the nearest 5 Nm.					

67ES135D4

Inline Non-Floating Model Number	Torque Range		Max. Speed RPM	Weight*		Output Drive Size	Length		Side to Center	
	ft. lbs.	Nm		lbs.	kg		in.	mm	in.	mm
67ES65D4	10-47	13-64	535	10.3	4.7	1/2"	21.0	533	1.31	33
67ES105D4	15-77	21-104	330	10.3	4.7	1/2"	21.0	533	1.31	33
67ES135D4	20-100	27-135	245	10.3	4.7	1/2"	21.0	533	1.31	33
67ES190D6	28-140	38-190	165	11.6	5.3	3/4"	20.5	521	1.31	33
67ES285D6	42-210	57-285	115	11.6	5.3	3/4"	20.5	521	1.31	33
67ES385D6	57-285	77-386	83	11.6	5.3	3/4"	20.5	521	1.31	33
67ES475D6	70-350	95-475	67	12.0	5.4	3/4"	20.9	531	1.31	33
67ES610D6	90-450	122-610	50	12.0	5.4	3/4"	20.9	531	1.31	33
67ES850D8	125-625	170-848	33	17.0	7.7	1"	23.8	605	1.50	38
67ES1050D8	155-775	210-1050	27	17.0	7.7	1"	23.8	605	1.50	38
67ES1670D8	246-1230	334-1668	17	17.0	7.7	1"	23.8	605	1.50	38
67ES2060D8	304-1520	412-2060	14	17.0	7.7	1"	23.8	605	1.50	38
67ES4050D12	597-2985	810-4050	6	45.2	20.5	1 1/2"	24.5	622	2.35	60

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

Note: All 67 series tools require an isolation transformer (544185PT) for use with Cleco Global Controller.

General: All tools must be used with an approved ATG cable and controller.

Standard Equipment: Matrix Connector; Reaction bar; Slave drive reaction bar on 67ES4050D2.

Extra Equipment: Std. tool cable 542778-XX, RA swivel cable 544055-XX, Inline swivel cable 544056-XX, Extension cable 542779-XX.

Additional Accessories: See pages 58-61 for additional accessories.

Electric Nutrunners – Coded Transducer Control

Pistol Grip Tools

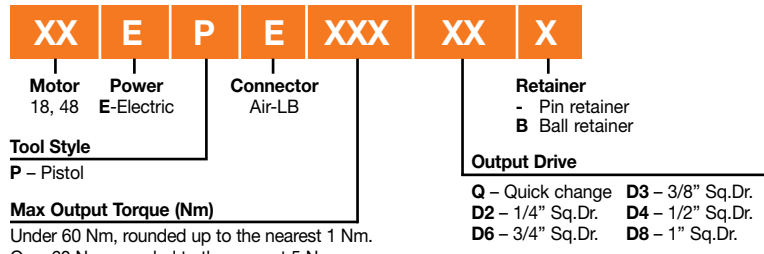
Cleco®

Pistol Grip Series

Torque Range
2 - 1000 Nm
1.5 - 740 Ft. Lbs.

Bolt Size
M5 - M22
#10 - 1"

- Brushless precision
- Resolver control
- Transducer control
- Memory intelligence



Max Output Torque (Nm)
Under 60 Nm, rounded up to the nearest 1 Nm.
Over 60 Nm, rounded to the nearest 5 Nm.

Pistol Grip Model Number	Torque Range		Max. Speed RPM	Weight*		Output Drive Size	Length		Side to Center	
	ft. lbs.	Nm		lbs.	kg		in.	mm	in.	mm
18EPE06Q	1.5-4.4	2-6	4000	2.2	1.0	1/4" Hex	7.0	178	0.84	21
18EPE06D2	1.5-4.4	2-6	4000	2.2	1.0	1/4"	6.5	165	0.84	21
18EPE12Q	2.2-8.9	3-12	1820	2.4	1.1	1/4" Hex	7.7	196	0.84	21
18EPE12D3	2.2-8.9	3-12	1820	2.4	1.1	3/8"	7.2	183	0.84	21
18EPE17Q	3.0-12.5	4-17	1290	2.4	1.1	1/4" Hex	7.7	196	0.84	21
18EPE17D3	3.0-12.5	4-17	1290	2.4	1.1	3/8"	7.2	183	0.84	21
18EPE22D3	3.7-16.2	5-22	985	2.4	1.1	3/8"	7.2	183	0.84	21
18EPE31D3	5.2-22.9	7-31	695	2.4	1.1	3/8"	7.2	183	0.84	21
48EPE12Q	2.2-8.9	3-12	4000	2.7	1.2	1/4" Hex	8.2	208	0.84	21
48EPE12D2	2.2-8.9	3-12	4000	2.7	1.2	1/4"	7.7	196	0.84	21
48EPE25D3	3.7-18.4	5-25	1820	2.9	1.3	3/8"	8.4	213	0.84	21
48EPE36D3	5.9-26.6	8-36	1290	2.9	1.3	3/8"	8.4	213	0.84	21
48EPE48D3	7.4-35.4	10-48	985	3.0	1.4	3/8"	8.6	218	0.84	21
48EPE65D4	9.6-47.9	13-65	750	5.0	2.3	1/2"	11.4	290	1.1	28
48EPE90D4	14.0-66.4	19-90	510	5.3	2.4	1/2"	12.0	305	1.1	28
48EPE125D4	19.2-92.2	26-125	360	5.3	2.4	1/2"	12.0	305	1.1	28
48EPE150D4	22.9-110.6	31-150	240	5.3	2.4	1/2"	12.0	305	0.9	23
48EPE200D6	92-144	125-195	180	9.5	4.3	3/4"	16.2	410	1.13	29
48EPE500D6	225-368	300-500	53	9.8	4.5	3/4"	16.2	410	1.13	29
48EPE1000D8	370-740	500-1000	33	16.2	7.3	1"	19.16	486	1.5	38

*Weights are without tool cable or suspension bail.
General: All tools must be used with an approved ATG cable and controller.
Standard Equipment: Air-LB Connector; Suspension Bail; Dead Handle is included with 18EPE12Q & 18EPE12D3. Reaction bar is included with pistol tools with output torques of 17-1000 Nm. Ball retainer optional.
 Tools with Matrix connector available upon request.

Extra Equipment: Std. tool cable 301866-XX, RA swivel cable 301903-XX, Inline swivel cable 301904-XX, Extension cable 301877-XX.
Additional Accessories: See pages 58-61 for additional accessories.



18EPE06QP



18ESE06QP

Cleco®

Push-to-Start Series

Torque Range
2 - 12 Nm
1.5 - 8.9 Ft. Lbs.

Bolt Size
M5 - M6
#10 - 1/4"

- Brushless precision
- Resolver control
- Transducer control
- Memory intelligence

XX	E	P	E	XX	XX	P
Motor 18, 48	Power E-Electric	Connector Air-LB		Push-to-Start		
Tool Style				Output Drive		
P - Pistol S - Inline				Q - Quick change D3 - 3/8" Sq.Dr.		
Max Output Torque (Nm)						
Under 60 Nm, rounded up to the nearest 1 Nm.						

Push-to-Start Model Number	Torque Range		Max. Speed RPM	Weight*		Output Drive Size	Length		Side to Center	
	ft. lbs.	Nm		lbs.	kg		in.	mm	in.	mm
18EPE06QP	1.5-4.4	2-6	4000	2.66	1.19	1/4" Hex	9.35	238	0.84	21
18EPE06D3P	2.2-8.9	3-12	4000	2.66	1.19	3/8"	8.8	224	0.84	21
18EPE12QP	2.2-8.9	3-12	1820	2.83	1.27	1/4" Hex	9.35	196	0.84	21
18EPE12D3P	2.2-8.9	3-12	1820	2.83	1.27	3/8"	8.8	224	0.84	21
18ESE06QP	1.5-4.4	2-6	4000	2.93	1.31	1/4" Hex	14.75	375	0.91	23
18ESE06D3P	2.2-8.9	3-12	4000	2.93	1.31	3/8"	14.20	360	0.91	23
18ESE12QP	2.2-8.9	3-12	1820	3.10	1.40	1/4" Hex	14.75	375	0.91	23
18ESE12D3P	2.2-8.9	3-12	1820	3.10	1.40	3/8"	14.20	360	0.91	23

*Weights are without tool cable or suspension bail.

General: All tools must be used with an approved ATG cable and controller.

Standard Equipment: Air-LB Connector; Suspension Bail (pistol only); Dead Handle (301857) is included with 18CPE12Q & 18CPE12D3.

Tools with Matrix connector available upon request.

Extra Equipment: Std. tool cable 301866-XX, RA swivel cable 301903-XX,

Inline swivel cable 301904-XX, Extension cable 301877-XX.

Additional Accessories: See pages 58-61 for additional accessories.

Electric Nutrunners – Coded Transducer Control

Inline Floating Spindle Tools



Inline Floating Spindle Series

Torque Range
 2 - 248 Nm
 1.5 - 182.9 Ft. Lbs.

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

- Brushless precision
- Resolver control
- Transducer control
- Memory intelligence

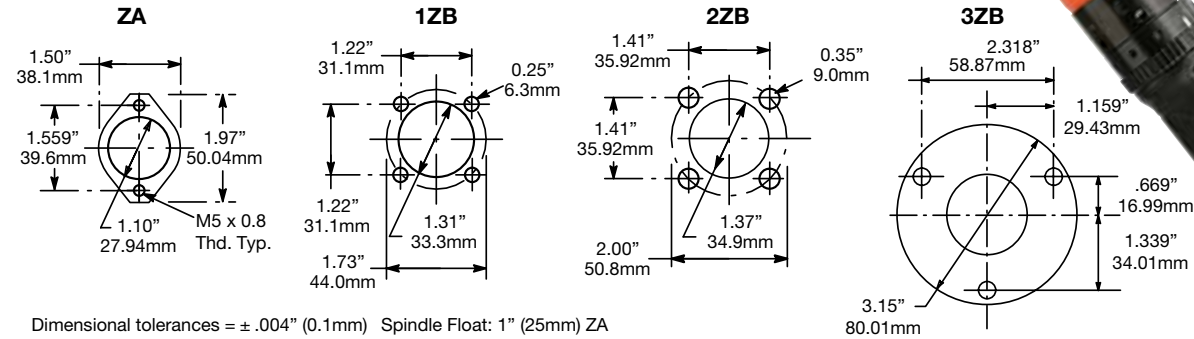


48ESE12ZA

XX	E	S	E	XXX	XXX
Motor 18, 48	Power E-Electric	Connector Air-LB		Output Drive	
Tool Style S - Inline				ZA - 1/4" Sq.Dr. 1ZB - 3/8" Sq.Dr. 2ZB - 1/2" Sq.Dr. 3ZB - 3/4" Sq.Dr.	

Max Output Torque (Nm)
 Under 60 Nm, rounded up to the nearest 1 Nm.
 Over 60 Nm, rounded to the nearest 5 Nm.

Base Plate Mounting Dimensions



Inline Floating Spindle Model Number	Torque Range		Max. Speed RPM	Weight*		Output Drive Size	Length		Side to Center	
	ft. lbs.	Nm		lbs.	kg		in.	mm	in.	mm
18ESE06ZA	1.5-4.4	2-6	4000	3.0	1.4	1/4	15.5	394	0.91	23
18ESE12ZA	2.2-8.9	3-12	1820	3.2	1.5	1/4	16.0	406	0.91	23
18ESE17ZA	3.0-12.5	4-17	1290	3.2	1.5	1/4	16.0	406	0.91	23
48ESE12ZA	2.2-8.9	3-12	4000	3.4	1.5	1/4	16.7	425	0.91	23
48ESE271ZB	5.9-19.9	8-27	1820	5.8	2.6	3/8	22.0	559	0.92	23
48ESE361ZB	5.2-26.6	7-36	1290	5.8	2.6	3/8	22.0	559	0.92	23
48ESE602ZB	8.1-42.0	11-57	855	8.4	3.8	1/2	24.4	620	1.10	28
48ESE702ZB	10.3-50.2	14-68	570	8.4	3.8	1/2	24.4	620	1.10	28
48ESE802ZB	12.5-60.5	17-82	450	9.6	4.4	1/2	26.7	678	1.10	31
48ESE1152ZB	18.4-84.8	25-115	320	9.6	4.4	1/2	26.7	678	1.10	31
48ESE1502ZB	22.9-110.6	31-150	245	9.6	4.4	1/2	26.7	678	1.10	31
48ESE1653ZB	24.3-121.7	33-165	220	14.6	6.6	3/4	28.6	726	1.57	40
48ESE2503ZB	36.8-182.9	50-248	145	14.6	6.6	3/4	28.6	726	1.57	40

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

General: All tools must be used with an approved ATG cable and controller.

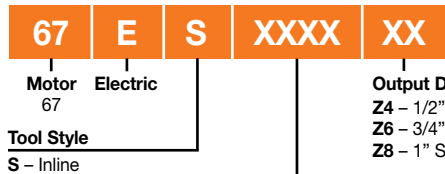
Standard Equipment: Air-LB Connector. Tool square drives have thru hole output. Tools with Matrix connector available upon request.

Extra Equipment: Std. tool cable 301866-XX, RA swivel cable 301903-XX, Inline swivel cable 301904-XX, Extension cable 301877-XX.

Additional Accessories: See pages 58-61 for additional accessories.



67ES2060Z8



Max Output Torque (Nm)

Under 60 Nm, rounded up to the nearest 1 Nm.
Over 60 Nm, rounded to the nearest 5 Nm.

Inline Floating Spindle Series

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

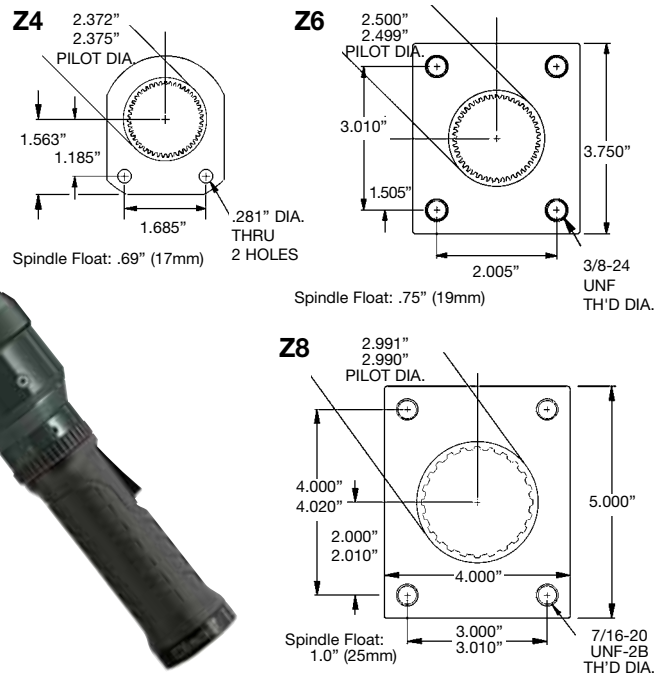
Bolt Size
M6 - M36
1/4" - 1 1/2"

- Brushless precision
- Resolver control
- Transducer control
- Memory intelligence

All 67 Series Tools require an isolation transformer (544185PT) for use with Cleco Global Controller.



67ES Base Plate Mounting Dimensions



Inline Floating Spindle Model Number	Torque Range		Max. Speed RPM	Weight*		Output Drive Size	Length		Side to Center	
	ft. lbs.	Nm		lbs.	kg		in.	mm	in.	mm
67ES65BZ4	10-47	13-64	535	10.8	4.9	1/2	21.0	533	1.31	33
67ES105BZ4	15-77	21-104	330	10.8	4.9	1/2	21.0	533	1.31	33
67ES135BZ4	20-100	27-135	245	10.8	4.9	1/2	21.0	533	1.31	33
67ES190Z6	28-140	38-190	165	15.6	7.1	3/4	22.0	559	1.31	33
67ES285Z6	42-210	57-285	115	15.6	7.1	3/4	22.0	559	1.31	33
67ES385Z6	57-285	77-386	83	15.6	7.1	3/4	22.0	559	1.31	33
67ES475Z6	70-350	95-475	67	16.0	7.3	3/4	22.4	569	1.31	33
67ES610Z6	90-450	122-610	50	16.0	7.3	3/4	22.4	569	1.31	33
67ES850Z8	125-625	170-848	33	20.0	9.1	1	23.8	605	1.50	38
67ES1050Z8	155-775	210-1050	27	20.0	9.1	1	23.8	605	1.50	38
67ES1670Z8	246-1230	334-1668	17	20.0	9.1	1	23.8	605	1.50	38
67ES2060Z8	304-1520	412-2060	14	20.0	9.1	1	23.8	605	1.50	38

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

Note: All 67 series tools require an isolation transformer (544185PT) for use with Cleco Global Controller.

General: All tools must be used with an approved ATG cable and controller.

Standard Equipment: Matrix Connector; 67ES series – Mounting plate.

Extra Equipment: Std. tool cable 542778-XX, RA swivel cable 544055-XX, Inline swivel cable 544056-XX, Extension cable 542779-XX.

Additional Accessories: See pages 58-61 for additional accessories.

Electric Nutrunners – Corded Transducer Control

Hold & Drive Tools

Cleco®

Hold & Drive Series

Torque Range
 11 - 227 Nm
 8.1 - 167.4 Ft. Lbs.

- Brushless precision
- Resolver control
- Transducer control
- Memory intelligence



48EAE115H

“Hold & 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.



Hold & Drive Tool Nomenclature

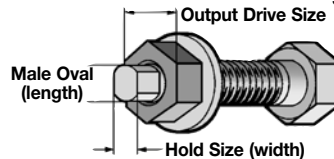
48	E	A	E	XXX	H
Motor 48	Electric	Tool Style A - Angle	Connector Air-LB		Head Type H-Hold & Drive
Max Output Torque					Retainer Shaft
<60 Nm, rounded up to the nearest 1 Nm.					3 - 3 1/2"
>60 Nm, rounded to the nearest 5 Nm.					4 - 4"
					5 - 5 3/8"
					6 - 5 7/8"
					9 - 9 1/2"

Socket Nomenclature

H	X	XX	X	XX	X
Hold & Drive	Socket Style				Oval Dim. (length) If socket style =0 (female oval)
	F - Female Hex				Hold Socket (width across flats)
	M - Male Hex				EA - 1/4
	T - Torx				ME - 11mm (7/16")
	O - Female Oval				EC - 3/8
					MF - 12mm
					M5 - 5mm
					15 - T15
					M6 - 6mm
					20 - T20
					MA - 7mm
					25 - T25
					MB - 8mm (5/16")
					30 - T30
					MC - 9mm
					40 - T40
					MD - 10mm
					45 - T45
					50 - T50

Drive Socket Sizes (surface drive)

EH - 11/16	MG - 13mm	MM - 19mm (3/4")	MS - 25mm
EJ - 13/16	MH - 14mm	MN - 20mm	MT - 26mm
EK - 7/8	MI - 15mm	MO - 21mm	MU - 27mm (1 1/16")
EM - 1	MJ - 16mm (5/8")	MP - 22mm	MX - 30mm (1 3/16")
EO - 1 1/8	MK - 17mm	MQ - 23mm	MZ - 32mm (1 1/4")
	ML - 18mm	MR - 24mm (15/16")	



Hold & Drive Model Number	Torque Range		Free Speed RPM	Length		Weight*		Head Height		Side to Center	
	Ft.Lbs.	Nm		in.	mm	lbs.	kg	in.	mm	in.	mm
48EAE53H	8.1 - 39.1	11 - 53	850	20.2	512	7.9	3.60	2.40	61	1.06	27
48EAE75H	11.1 - 54.6	15 - 74	600	20.2	512	7.9	4.03	2.40	61	1.06	27
48EAE110H	17.0 - 82.6	23 - 112	400	20.2	512	8.9	4.03	2.40	61	1.06	27
48EAE135H	20.7 - 98.8	28 - 134	270	20.6	522	8.9	4.03	2.40	61	1.06	27
48EAE230H	34.7 - 167.4	47 - 227	150	22.2	563	10.6	4.79	2.40	61	1.06	27

*Weights are without tool cable and reaction bar.

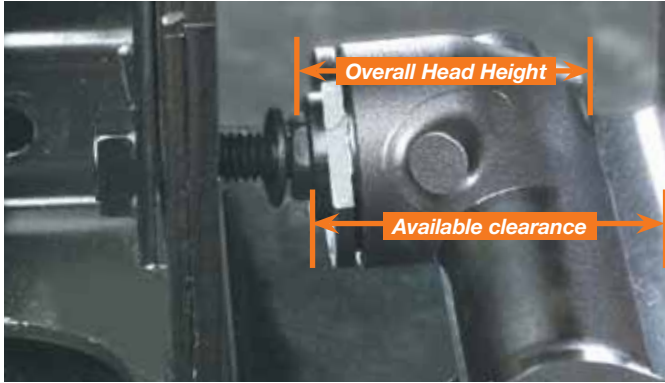
General: All tools must be used with an approved ATG cable and controller.

Standard Equipment: Air-LB Connector. Retraction 1" standard for hold bit.

Tools with Matrix connector available upon request.

Extra Equipment: Std. tool cable 301866-XX, RA swivel cable 301903-XX, Inline swivel cable 301904-XX, Extension cable 301877-XX.

Additional Accessories: See pages 58-61 for additional accessories.



Flush socket tools have plenty of clearance to fit low clearance applications. Electric flush socket tools tighten with much higher accuracy than tools with crowfoot attachment.

Cleco®

Flush Socket Series

Torque Range
4.9 - 230 Nm
3.6 - 169.6 Ft. Lbs.

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

- Brushless precision
- Resolver control
- Transducer control
- Memory intelligence



Flush Socket Tool Nomenclature



Motor
18
48

Electric

Connector
Air-LB

Tool Style
A - Right Angle

Max Output Torque

F1 16,23, 30 Nm **F3** 53, 75, 110 Nm
F2 37, 52 Nm **F4** 135, 230 Nm

<60 Nm, rounded up to the nearest 1 Nm. >60 Nm, rounded to the nearest 5 Nm.

Head Type

F1 Head 8-15mm socket capacity
F2 Head 10-15mm socket capacity
F3 Head 13-21mm socket capacity
F4 Head 13-21mm socket capacity

Socket Nomenclature



Flush Socket

1 F1
2 F2
3 F3
4 F4

Output Type

0-Standard 1-Fast Lead 2-Magnetic

Extension Length

0 - Flush 4 - 1/2" 8 - 1"
2 - 1/4" 6 - 3/4"

Socket Size

EC - 3/8 **MB** - 8mm (5/16) **MJ** - 16mm (5/8")
EE - 1/2 **MD** - 10mm **MK** - 17mm
EF - 9/16 **ME** - 11mm (7/16) **ML** - 18mm
EH - 11/16 **MF** - 12mm **MM** - 19mm (3/4")
EJ - 13/16 **MG** - 13mm **MN** - 20mm
MH - 14mm **MO** - 21mm
MI - 15mm

X Dimension For Flush Socket

Head	in.	mm	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

Flush Socket Model Number	Head Type	Torque Range		Free Speed RPM	Weight*		Length		Anglehead				
		ft. lbs.	Nm		lbs.	kg	in.	mm	Side to Center		Height		
										in.	mm	in.	mm
18EAE16F	F1	3.6-11.8	4.9-16	1225	4.4	2.00	16.0	406	0.55	14	1.54	39	
18EAE23F	F1	3.4-17.0	4.6-23	860	4.4	2.00	16.0	406	0.55	14	1.54	39	
18EAE30F	F1	4.4-22.1	6.0-30	655	4.4	2.00	16.0	406	0.55	14	1.54	39	
48EAE37F	F2	5.9-27.3	8.0-37	1225	5.4	2.43	18.7	474	0.67	17	1.69	43	
48EAE52F	F2	8.1-38.3	11-52	860	5.4	2.43	18.7	474	0.67	17	1.69	43	
48EAE53F	F3	8.1-39.0	11-53	850	6.0	2.74	20.0	509	0.87	22	2.32	59	
48EAE75F	F3	11.1-55.3	15-75	600	6.0	2.74	20.0	509	0.87	22	2.32	59	
48EAE110F	F3	17.0-81.1	23-110	400	7.4	3.38	20.5	521	0.87	22	2.32	59	
48EAE135F	F4	19.9-99.5	27-135	270	8.9	4.03	20.6	522	1.06	27	2.40	61	
48EAE230F	F4	34.7-169.6	47-230	150	10.6	4.79	22.2	563	1.06	27	2.40	61	

*Weights are without tool cable or reaction bar if so equipped.
General: All tools must be used with an approved ATG cable and controller.
Standard Equipment: Air-LB Connector.
 Tools with Matrix connector available upon request.

Extra Equipment: Std. tool cable 301866-XX, RA swivel cable 301903-XX, Inline swivel cable 301904-XX, Extension cable 301877-XX.
Additional Accessories: See pages 58-61 for additional accessories.

Electric Nutrunners – Coded Transducer Control

Tube Nut Tools



Tube Nut Series

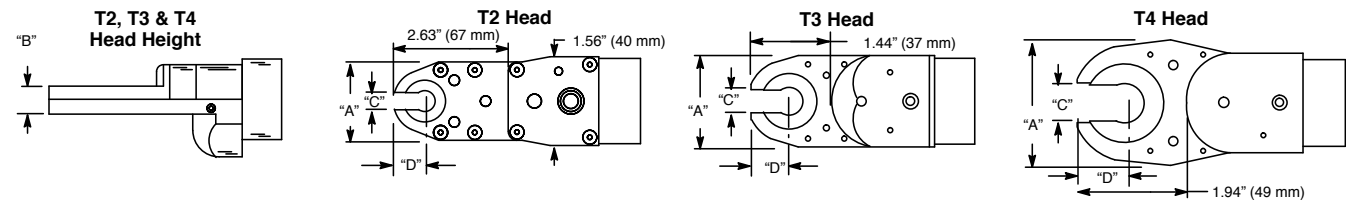
Torque Range
10 - 40 Nm
7.4 - 29.5 Ft. Lbs.

Bolt Size
M6 - M10
1/4" - 3/8"

- Brushless precision
- Resolver control
- Transducer control
- Memory intelligence



The 48ET 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.



Tube Nut Tool Nomenclature

XX E T E XX XX

Motor: 48
Electric
Connector: Air-LB

Tool Style
T - Tube Nut

Max Output Torque
<60 Nm, rounded up to the nearest 1 Nm.

Head Type
T2 - 20 Nm
T3 - 30 Nm
T4 - 40 Nm

Socket Nomenclature

KSX XX XX X

Head Type:
KS2 - T2
KS3 - T3
KS4 - T4

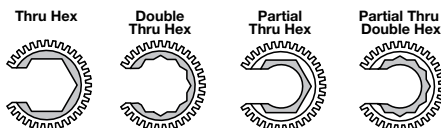
Output Type:
0 - Partial Thru Hex
1 - Thru Hex
2 - Double Thru Hex
3 - Partial Thru Double Hex

Extension Length:
0 - Flush
4 - 1/2"
2 - 1/4"
6 - 3/4"
8 - 1"

Maximum Hex Socket Size:
MG, EE T2 Head Type
MM, 3/4" T3 Head Type
MU, 1 1/16" T4 Head Type
00, ## (Specials) All Head Types

Socket Sizes

EA - 1/4"	M5 - 5mm	MH - 14mm	MP - 22mm
EC - 3/8"	M6 - 6mm	MI - 15mm	MQ - 23mm
EE - 1/2"	MA - 7mm	MJ - 16mm (5/8)	MR - 24mm (15/16)
EF - 9/16"	MB - 8mm (5/16)	MK - 17mm	MS - 25mm
EH - 11/16"	MD - 10mm	ML - 18mm	MT - 26mm
EJ - 13/16"	ME - 11mm (7/16)	MM - 19mm (3/4)	MU - 27mm (1 1/16)
EK - 7/8"	MF - 12mm	MN - 20mm	
EM - 1"	MG - 13mm	MO - 21mm	



Note: To order individual sockets, use a "KS" prefix (i.e. KS2EA01 for a T2 1/4", Flush, Thru Hex socket.)

Tube Nut	Max. Drive Size	Torque Range		Free Speed	Weight*		Length		Head							
		Ft.Lbs.	Nm		RPM	lbs.	kg	in.	mm	in.	mm	in.	mm	in.	mm	in.
48ETE20T2	1/2"	7.4-14.8	10-20	1425	4.4	2.0	16.9	430	1.42	36	0.55	14	0.28	7	0.53	13
48ETE30T3	3/4"	11.1-22.1	15-30	1030	4.5	2.0	16.6	422	1.65	42	0.59	15	0.475	13	0.73	19
48ETE40T4	1 1/16"	14.8-29.5	20-40	770	5.3	2.3	17.9	454	2.36	60	0.59	15	0.675	18	0.93	24

*Weights are without tool cable and reaction bar.

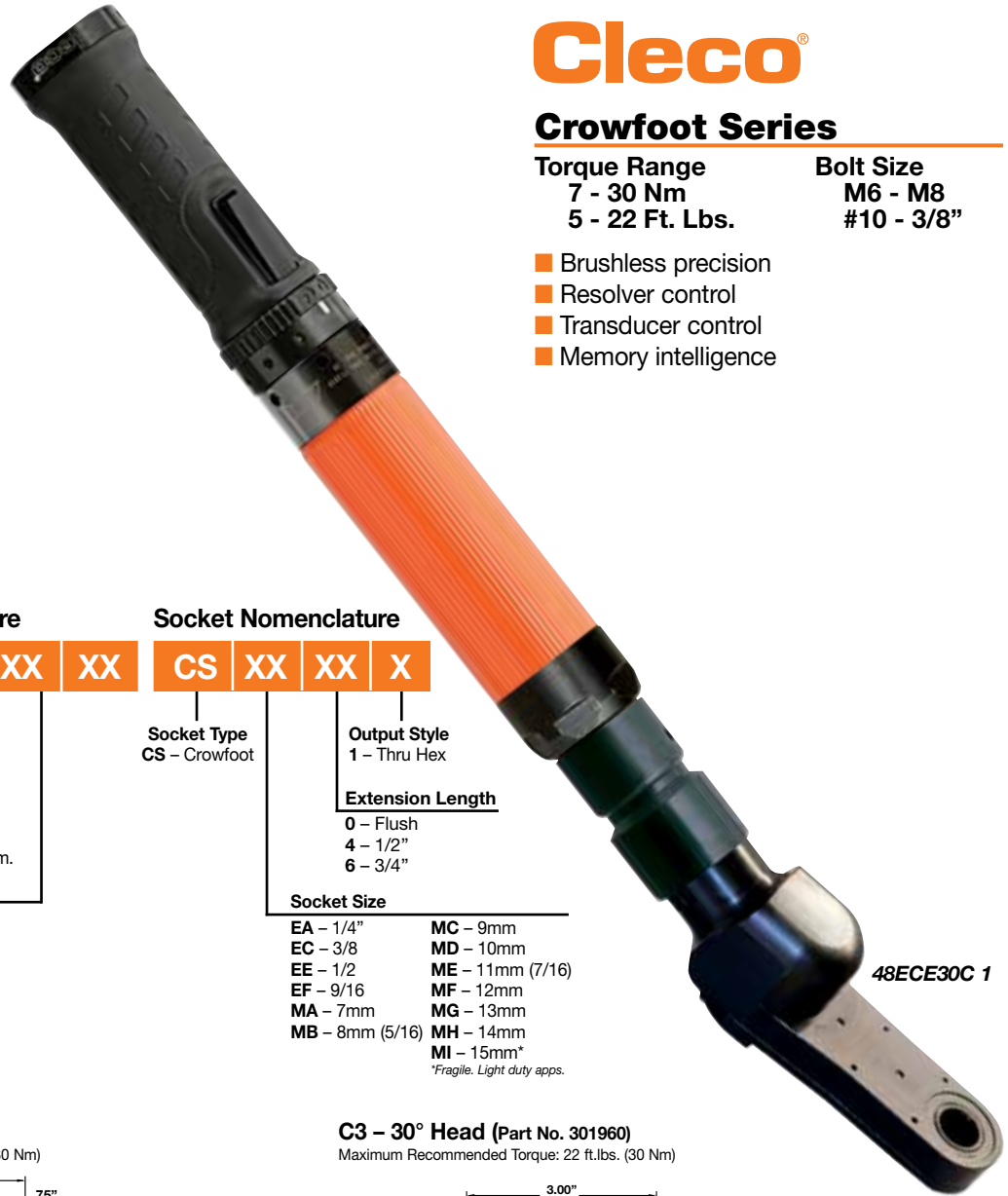
General: All tools must be used with an approved ATG cable and controller.

Standard Equipment: Air-LB Connector.

Tools with Matrix connector available upon request.

Extra Equipment: Std. tool cable 301866-XX, RA swivel cable 301903-XX, Inline swivel cable 301904-XX, Extension cable 301877-XX.

Additional Accessories: See pages 58-61 for additional accessories.



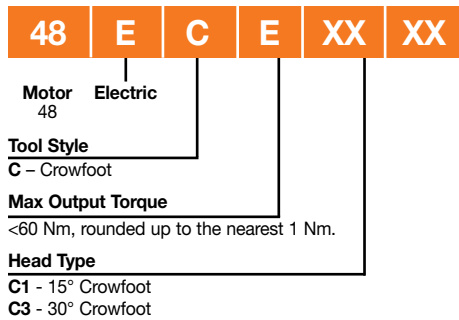
Cleco®

Crowfoot Series

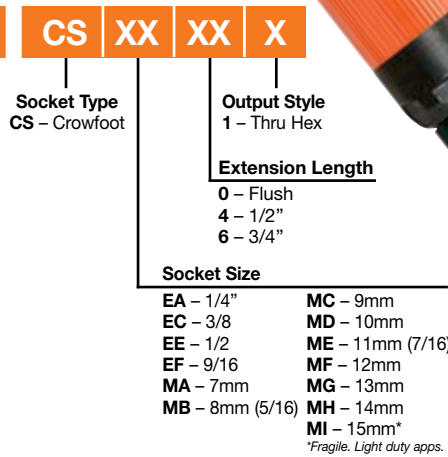
Torque Range	Bolt Size
7 - 30 Nm	M6 - M8
5 - 22 Ft. Lbs.	#10 - 3/8"

- Brushless precision
- Resolver control
- Transducer control
- Memory intelligence

Crowfoot Tool Nomenclature



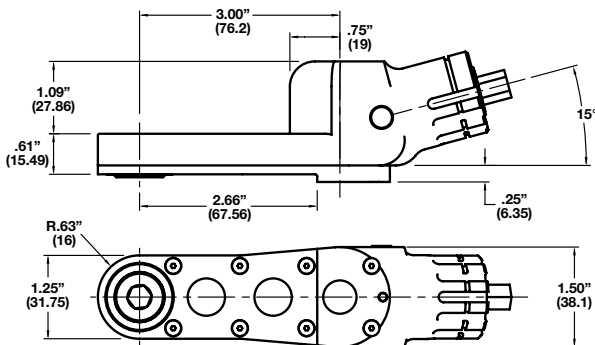
Socket Nomenclature



48ECE30C 1

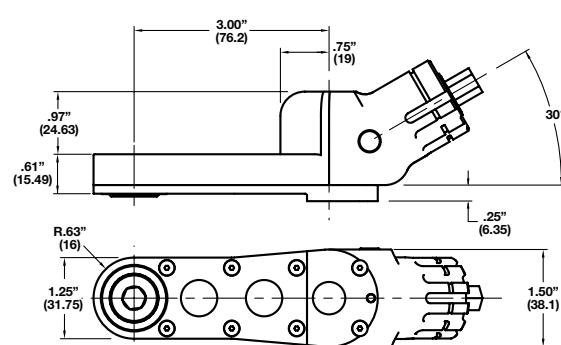
C1 – 15° Head (Part No. 301959)

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



C3 – 30° Head (Part No. 301960)

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



Crowfoot		Torque Range		Free Speed	Weight*		Length	
Model Number		ft. lbs.	Nm	RPM	lbs.	kg	in.	mm
15° Head	30° Head							
48ECE30C1	48ECE30C3	5.2-22.1	10.5-30	860	5.5	2.3	20.5	521

*Weights are without tool cable and reaction bar.

General: All tools must be used with an approved ATG cable and controller.

Standard Equipment: Air-LB Connector.

Tools with Matrix connector available upon request.

Extra Equipment: Std. tool cable 301866-XX, RA swivel cable 301903-XX, Inline swivel cable 301904-XX, Extension cable 301877-XX.

Additional Accessories: See pages 58-61 for additional accessories.

To order individual sockets, use "CS" prefix before the required socket. (i.e. CSEA01 for a 1/4", flush, thru hex socket.)

Electric Nutrunners – Coded Transducer Control

Right Angle Floating Spindle Tools



Right Angle Floating Spindle Series

Torque Range
5.1 - 255 Nm
3.7 - 188.1 Ft. Lbs.

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

- Brushless precision
- Resolver control
- Transducer control
- Memory intelligence



Right Angle Floating Spindle Tool Nomenclature

XX	E	A	X	XXX	XX	X	X
Motor 18 48 67	Electric	Connector E - Air-LB		Square Drive 3 - 3/8" (S1, S2) 4 - 1/2" (S3, S4) 6 - 3/4" (S4)	Extension Length 1 - 1.13" (S1), 1.00" (S2 & S3), 1.25" (S4) 2 - 2.13" (S1), 3.00" (S2), 2.5" (S4 1/2" Dr.) 5 - 5.13" (S2), 4.25" (S4) 6 - 6.0" (S4 1/2" Dr.), 7.0" (S4 3/4" Dr.) 11 - 11.0" (S4 3/4" Dr.)		
Tool Style A - Right Angle				Tool Termination S1 Sliding (Floating) Spindle S3 Sliding (Floating) Spindle S2 Sliding (Floating) Spindle S4 Sliding (Floating) Spindle			
Max Output Torque S1 Head - 16, 23, or 30 Nm S2 Head - 37 or 52 Nm S3 Head - 53, 75, 95, or 110 Nm S4 Head - 135 or 230 Nm (48 series) S4 Head - 150, 185, 210, 235 or 255 Nm (67 series)							



All 67 Series Tools require an isolation transformer (544185PT) for use with Cleco Global Controller.

Right Angle Floating Spindle Model Number	Torque Range		Max. Speed	Weight*		Output Drive Size	Length		Side to Center	
	ft. lbs.	Nm	RPM	lbs.	kg		in.	mm	in.	mm
18EAE16S131	3.7-11.8	5.1-16	1225	4.4	2.00	3/8"	16.0	406	0.55	14
18EAE23S131	5.3-16.9	7.2-23	860	4.4	2.00	3/8"	16.0	406	0.55	14
18EAE30S131	4.4-22.1	6.0-30	655	4.4	2.00	3/8"	16.0	406	0.55	14
48EAE37S231	5.9-27.2	8.0-37	1225	5.4	2.43	3/8"	18.7	474	0.67	17
48EAE52S231	8.1-38.3	11-52	860	5.4	2.43	3/8"	18.7	474	0.67	17
48EAE53S341	8.1-39.1	11-53	850	6.0	2.74	1/2"	20.0	509	0.87	22
48EAE75S341	11.0-55.3	15-75	600	6.0	2.74	1/2"	20.0	509	0.87	22
48EAE95S341	14.7-70.0	20-95	460	7.4	3.38	1/2"	20.5	521	0.87	22
48EAE110S341	16.9-81.1	23-110	400	7.4	3.38	1/2"	20.5	521	0.87	22
48EAE135S461	20.6-99.5	28-135	270	8.9	4.03	3/4"	20.6	522	1.06	27
48EAE230S461	34.6-169.6	47-230	150	10.6	4.79	3/4"	22.2	563	1.06	27
67EA150S461	22.1-110.6	30-150	210	12.9	5.90	3/4"	25.8	655	1.03	26
67EA185S461	27.3-136.3	37-185	170	12.9	5.90	3/4"	25.8	655	1.03	26
67EA210S461	31.0-154.8	42-210	155	12.9	5.90	3/4"	25.8	655	1.03	26
67EA235S461	33.9-169.6	46-230	135	12.9	5.90	3/4"	25.8	655	1.03	26
67EA255S461	40.6-188.1	55-255	115	12.9	5.90	3/4"	25.8	655	1.03	26

*Weights are without tool cable and mounting plate.

Note: All 67 series tools require an isolation transformer (544185PT) for use with Cleco Global Controller.

General: All tools must be used with an approved ATG cable and controller.

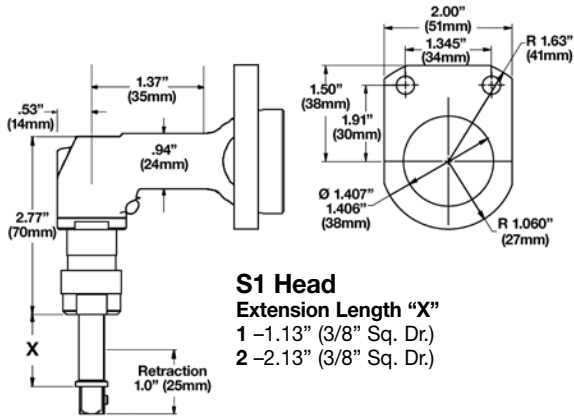
Standard Equipment: 18/48 tools; Air-LB Connector; Mounting plate.

Tools with Matrix connector available upon request.
67 tools; Matrix Connector; Mounting plate

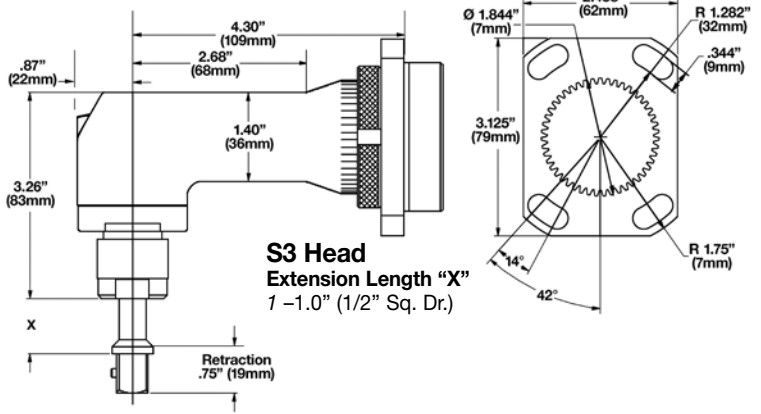
Extra Equipment: 18/48 tools; Std. tool cable 301866-XX, RA swivel cable 301903-XX, Inline swivel cable 301904-XX, Extension cable 301877-XX.
67 tools; Std. tool cable 542778-XX, RA swivel cable 544055-XX, Inline swivel cable 544056-XX, Extension cable 542779-XX.

Additional Accessories: See pages 58-61 for additional accessories.

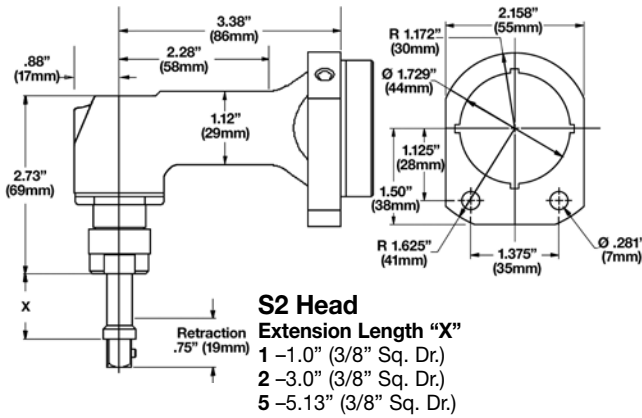
18EA, 48EA & 67EA Floating Spindle Angle Heads



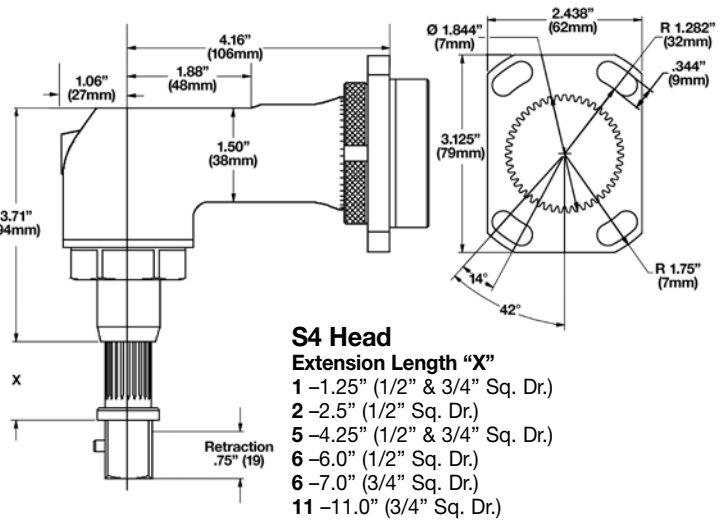
S1 Head
 Extension Length "X"
 1 -1.13" (3/8" Sq. Dr.)
 2 -2.13" (3/8" Sq. Dr.)



S3 Head
 Extension Length "X"
 1 -1.0" (1/2" Sq. Dr.)



S2 Head
 Extension Length "X"
 1 -1.0" (3/8" Sq. Dr.)
 2 -3.0" (3/8" Sq. Dr.)
 5 -5.13" (3/8" Sq. Dr.)



S4 Head
 Extension Length "X"
 1 -1.25" (1/2" & 3/4" Sq. Dr.)
 2 -2.5" (1/2" Sq. Dr.)
 5 -4.25" (1/2" & 3/4" Sq. Dr.)
 6 -6.0" (1/2" Sq. Dr.)
 6 -7.0" (3/4" Sq. Dr.)
 11 -11.0" (3/4" Sq. Dr.)

The Most Flexible, Cost-Effect

Introducing the Cleco **mPro400GC** Global Controller, the first controller for safety-critical applications that offers unsurpassed levels of flexibility, connectivity, and serviceability while providing superb torque accuracy and process control. This new controller incorporates the advanced technical features of the proven DGD mPro system with the user-friendly software of the trusted Cleco TME controller, resulting in a powerful control solution that offers impressive cost savings through unequalled flexibility.

Corded, Cordless, Or Fixtured ... All From One Controller

The Cleco **mPro400GC** Global Controller is compatible with all Cleco 18-48 Series DC electric corded tools, LiveWire cordless tools, and all DGD and EMT fixtured spindles. That means fewer controllers and cables are needed for your line. And that means savings...up to 50% over traditional systems.

Reduce System Costs Up To 50%

- Configure up to 32 DC spindles in varying configurations. Consult your Apex representative for details.
- **Facility Cost Savings**
 - Installation Expenses: Save on Ethernet and power drops, controller stands, cable management, labor to install and support
 - Production Expenses: One controller means fewer backups, fewer repairs, fewer headaches and one-time training



Intelligent Systems Controller... Ever

Control System



Data Server
TorqueNet



mPro Remote
Programming



Access
Point



Power/
CPM



DGD Intelligent Spindles
Unique Technology, Smallest Hardware Foot Print, Best TCO.



Customer
Control
System



DGD
Conventional
Spindles

Corded Hand Tool



Up to 10 LiveWire Tools
To 1 Controller

Universal Connectivity

Universal connectivity begins with global auto-sensing input voltage, 16 configurable inputs and outputs, plus DeviceNet, Ethernet-IP, Profibus and Profinet fieldbus standards. User-friendly software mapping of discrete and fieldbus selections provides ultimate error-proofing control. Dual fieldbus ports allow redundant I/O mapping or expansion. Utilize two different fieldbus standards simultaneously for maximum flexibility.

The Cleco **mPro400GC** Global Controller comes standard with a system bus to manage internal data flow and avoid burdening outside networks. It can be utilized for rapid “grab and go” connectivity to accessories, such as adding error-proofing

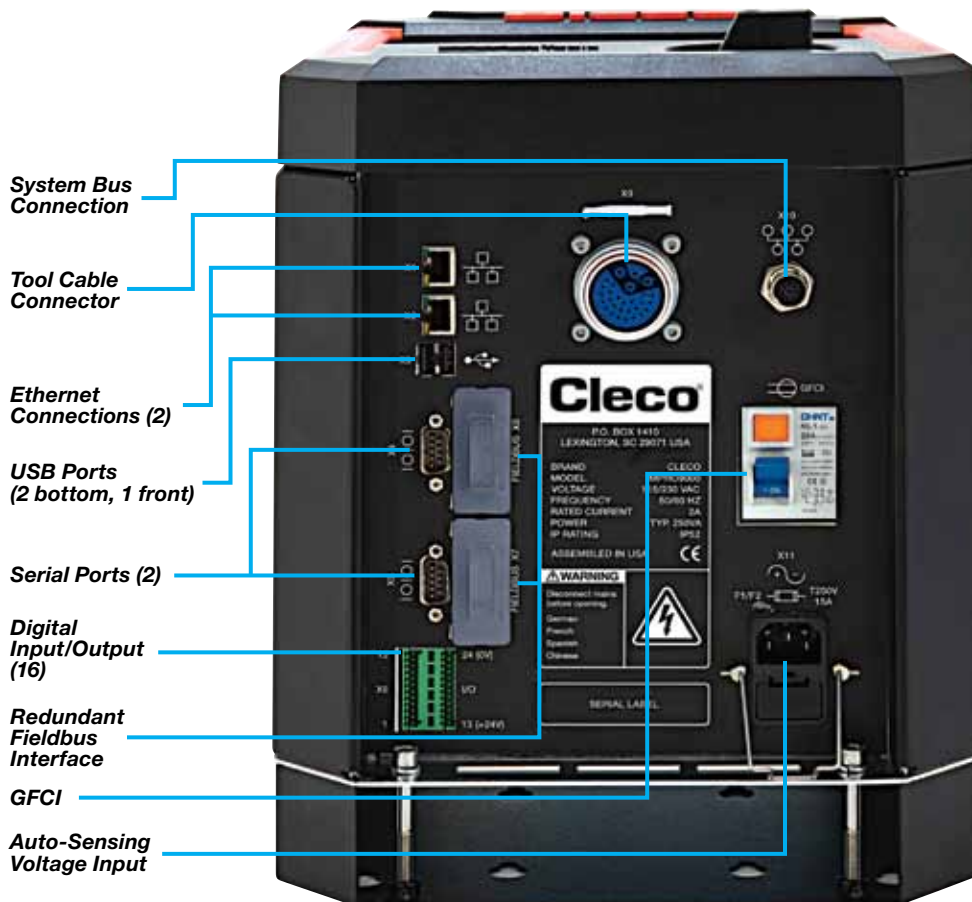
from socket trays, stack lights, or operator boxes. Configurable software menus allow quick integration into any process. With up to 32 configurable nodes on the system bus, endless error-proofing combinations are possible.

The system bus can manage multiple secondary controllers in combination with single and multi-spindle stations. Spindle sequencing, data management, and diagnostics are just a few of the many functions performed. In addition, DGD® Fixtured Intelligent Spindles can

utilize the system bus to drive up to 30% of cost out of a traditional system through cable reduction, maximizing acquisition and facility cost savings.

Universal Connectivity

- Auto-Sensing Voltage
- 16 Configurable I/O's
- Redundant Fieldbus
- Redundant Serial and Ethernet Ports
- Isolated System Bus



Superior Serviceability For



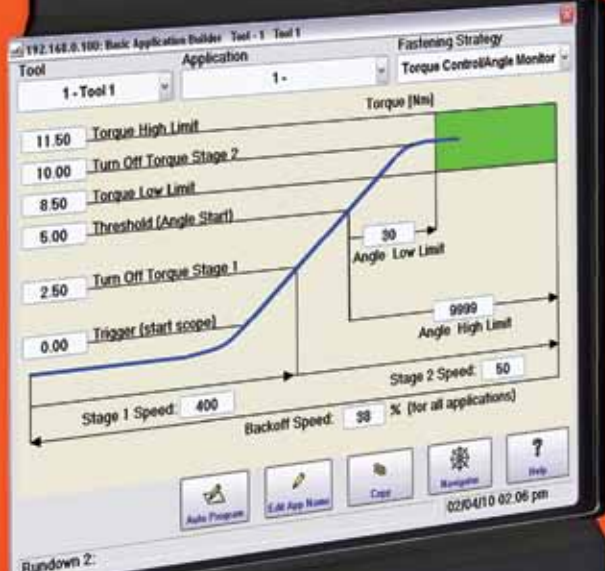
Installation Flexibility

At only 10" w X 15" h X 15" d (254mm X 381mm X 381mm) and weighing just 30 lbs. (13.6 kg.), the Cleco **mPro400GC** is smaller and lighter than most traditional controllers. It can be lifted easily by a single person and will mount just about anywhere.



10"x15"x15"
(254mm X 381mm X 381mm)
And Just
30 lbs.
(13.6 kg.)

Cleco



mPro400GC

Master/Primary Unit

Exceptional Ease-Of-Use

Quick Mount Bracket

No more templates and measuring mounting hole patterns...installation of the **mPro400GC** is simple with a separate receiver bracket that makes locating mounting holes easy. The unit then attaches directly to the bracket so the installation is fast and foolproof.



Integrated Cable Management

The **mPro400GC** mounting bracket incorporates an integral cable management channel, so installations stay orderly and easily accessible. Clearly labeled connectors and top-down cable routing means a clean installation with no guesswork. Mounting was designed to be simple and effective to get you up and running fast.

CompactFlash® Memory For Production Uptime

A standard CompactFlash card reliably stores:

- Operating system
- Drivers
- Network settings
- Application parameters
- Torque data

**50
Second
Boot!**



Positioned on the back of the unit for added security and tamper resistance, the card is still easily accessible.

- Rapid controller swap with 50-second boot
- No licensing or proprietary hardware
- Card stores a minimum of 10,000 rundowns per tool

Secondary Controller Functionality

A secondary controller is controlled from a master or primary unit. It has I/O for local error proofing and peripherals, plus a LCD for operator feedback and troubleshooting.



Building a DC Global Controller System is as simple as 1, 2, 3!

1. Choose a common system to the right.
2. Select the correct components below.
3. Order your System!

(Refer to Pages 4-5 to build a mPro400GC-M/GC-P/GC-S system.)

Controller (Page 10)



Corded Tool, Transducer Control (Page 15)



Corded Tool, Current Control (Page 15)



Cable (Page 23)



Input Accessories (Page 41)



Output Accessories (Page 41)



Input Accessory Cables (Page 42)



Output Accessory Cables (Page 42)



Input to Input Accessory Cables (Page 14)



Isolation Transformer (Page 11)



→
Add or delete components as required.

Model/Part Number	One Corded CC Tool (18/48C_E) & 8 Pos. Socket Tray One Corded CC Tool (18/48E_E) & Annunciator One Corded Tool (18/48E_E) & Torque Selector One Corded Tool (67E_XXX) One Corded Tool (18/48E_E)							
	1	1	1	1	1	1	1	1
mPro400GC-E (Transducer Control)	1	1	1	1				1
mPro400GC-I (Current Control)					1	1		
18/48E_EXXX	1		1	1				1
67E_XXX		1						
18/48C_EXXX					1	1		
Tool Cable - 301866-XM (Air-Lb)	1		1	1	1	1	1	1
Tool Cable - 542778-XM (Matrix)		1						
Extension Cable - 301877-XM (If Required) (Air-Lb)								
Extension Cable - 542779-XM (If Required) (Matrix)								
542977-X Torque Selector Switch			1					1
542978-X Socket Tray								
960645 - 4-pos Bit & Socket Tray								
960645 - 8-pos Bit & Socket Tray							1	
54297X - Start/Stop Switches								1
542976-1 Annunciator				1				
544237-1M Input Accessory Cable			1				1	1
544237-5M Input Accessory Cable								
544237-10M Input Accessory Cable								
544237-15M Input Accessory Cable								
544238-1M Output Accessory Cable				1				
544238-5M Output Accessory Cable								
544238-10M Output Accessory Cable								
544238-15M Output Accessory Cable								
542986-X - Input to Input Accessory Cable								1
544185PT		1						

Cleco mPro400GC Global Controller

Master, Primary & Secondary

Cleco®

mPro400GC Global Controller

- Graphics interface
- Fully programmable
- Local storage of 10,000 cycles
- LAN capable
- Fieldbus options available

Master/Primary Unit

Secondary Unit



MPRO400GC-M



MPRO400GC-P



MPRO400GC-P-1-2



MPRO400GC-S



MPRO400GC-S-1-2

Model	Description	Tool Compatibility	Weight		Width		Height		Depth	
			lbs.	kg	in.	mm	in.	mm	in.	mm
MPRO400GC-P	Primary	Cleco 18-48 Series, LiveWire, Intelligent Spindle*	30.7	13.9	10.3	261.62	14.9	378.46	12.9	327.66
MPRO400GC-P-12	Primary 1-2	LiveWire, Intelligent Spindle*, DGD/EMT Fixtured Spindles - Size 1-2	30.7	13.9	10.3	261.62	14.9	378.46	12.9	327.66
MPRO400GC-P-34	Primary 3-4	LiveWire, Intelligent Spindle*, DGD/EMT Fixtured Spindles - Size 3-4	30.7	13.9	10.3	261.62	14.9	378.46	12.9	327.66
MPRO400GC-S	Secondary	Cleco 18-48 Series	28.1	12.7	10.3	261.62	14.9	378.46	12.9	327.66
MPRO400GC-S-12	Secondary 1-2	DGD/EMT Fixtured Spindles - Size 1-2	28.1	12.7	10.3	261.62	14.9	378.46	12.9	327.66
MPRO400GC-S-34	Secondary 3-4	DGD/EMT Fixtured Spindles - Size 3-4	28.1	12.7	10.3	261.62	14.9	378.46	12.9	327.66
MPRO400GC-M	Master	LiveWire, Intelligent Spindle*	23.3	10.6	10.3	261.62	14.9	378.46	12.9	327.66

* Requires quote to accommodate hardware configurations.

Note: 17/47/67 and Matrix versions of the 18/48 series tools require Isolation Transformer 544185PT for use with Primary/Secondary controllers.



Cleco®

Torque Control mPro400GC-E Global Controller

- Single channel
- Economical
- Remote programming
- Local storage of 5,000 cycles
- LAN capable
- Input Voltage: 115/230VAC
- Connections: (1) Serial, (1) TM-COM, (1) Ethernet
- Inputs/Outputs: (8) 24V Inputs, (8) 24V Outputs

All 67 Series Tools require an isolation transformer (544185PT) for use with Cleco Global Controller.



MPRO400GC-E

Model	Description	Tool Compatibility	Weight		Width		Height		Depth	
			lbs.	kg	in.	mm	in.	mm	in.	mm
MPRO400GC-E	Torque Control	Cleco 18-48 EXE Series Series*	32.8	72.3	10.3	261.62	14.9	378.46	12.9	327.66

*Note: 17/47/67 and Matrix versions of the 18/48 series tools require Isolation Transformer 544185PT for use with GC-E model.
Standard Equipment: TM-COM Remote Programming Software and a Null Modem Serial Cable.

Durability. Speed

Cost Effective Solution for Quality Critical Applications.

Cleco **CurrentControl** electric assembly tools provide an up-sell solution to quality critical applications presently specifying a pneumatic clutch tool and verifier combination. Cleco proprietary **CurrentControl** systems up-sell on superior productivity, error proofing and process flexibility.

Our Cleco controller systems are recognized globally for “best in class” software interface. This is accomplished through simple navigation, basic programming screens, visual programming graphics and real-time process feedback. Our latest innovation “Auto Program” takes the guesswork out of programming. Simply enter the application torque target and the software automatically compiles the program for production use.



Unrestricted Speed Control



Adjustable angle head allows flexible orientation



Cleco®

ed. Ergonomics.

Why CurrentControl vs. Pneumatic Clutch?

Superior Productivity

- Up to 2–3X faster
- Unrestricted speed control
- Up to 25% less noise
- Cleaner operating environment
- Auto torque sequencing
- Proven production durability

Superior Error Proofing

- 96 position fastener count
- 9 tool LED operator feedback
- 8 configurable I/O
- Fieldbus ready
- 5,000 tightening cycle storage
- Advanced system diagnostics
- Barcode application select

Superior Process Flexibility

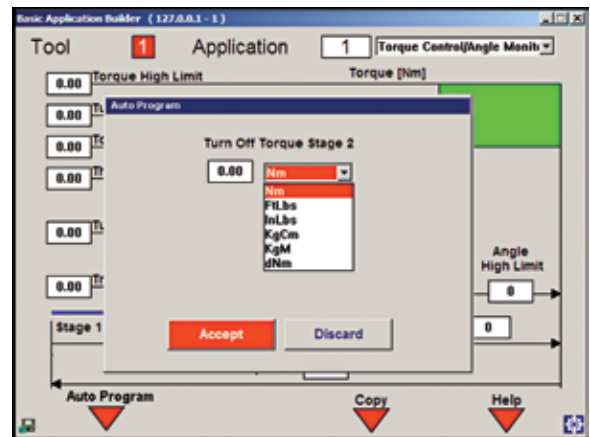
- 255 programmable tightening strategies
- 6 configurable stages per strategy
- Angle process control/monitoring
- Counter-clockwise process control/monitoring
- Less parts to maintain – no clutch
- 100M field cable lengths

Easy Setup 1-2-3-Go!

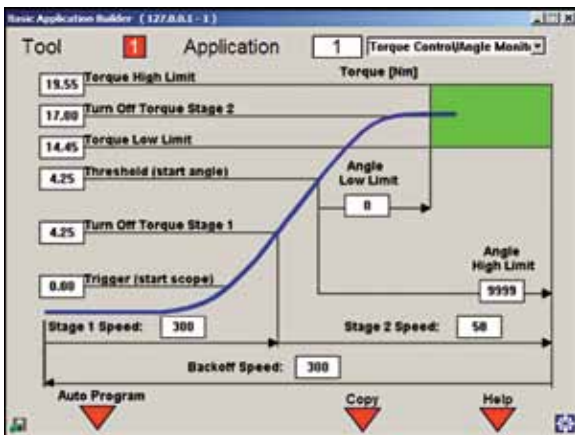
1. Select "Basic" from menu.



2. Enter final torque value.



3. Tool automatically programmed.



Go! Production ready.



Electric Nutrunners – Corded Current Control

Right Angle Tools

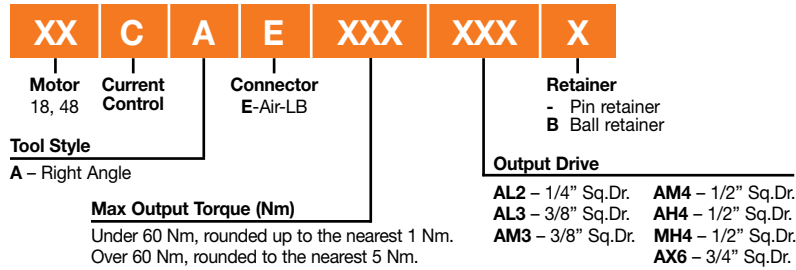
Cleco®

Right Angle Series

Torque Range
2 - 230 Nm
1.5 - 170 Ft. Lbs.

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

- Brushless precision
- Resolver control
- Memory intelligence



Right Angle Model Number	Torque Range		Max. Speed RPM	Weight*		Output Drive Size	Length		Anglehead					
	ft. lbs.	Nm		lbs.	kg		in.	mm	Side to Center		Height			
									in.	mm	in.	mm	in.	mm
18CAE08AL2	1.5-5.9	2-8	3000	2.9	1.3	1/4"	13.6	345	0.51	13	1.4	36		
18CAE15AM3	3.0-11.1	4-15	1300	3.3	1.5	3/8"	14.8	376	0.59	15	1.6	41		
18CAE22AM3	3.7-16.2	5-22	920	3.3	1.5	3/8"	14.8	376	0.59	15	1.6	41		
18CAE28AM3	4.4-20.7	6-28	700	3.3	1.5	3/8"	14.8	376	0.59	15	1.6	41		
48CAE15AL3	2.2-11.1	3-15	2855	3.8	1.7	3/8"	15.7	398	0.59	15	1.6	41		
48CAE28AL3	4.4-20.7	6-28	1300	4.1	1.9	3/8"	16.2	410	0.59	15	1.6	41		
48CAE41AM3	6.6-30.2	9-41	1090	4.3	2.0	3/8"	17.3	440	0.75	19	1.9	48		
48CAE58AM3	8.9-42.8	12-58	770	4.3	2.0	3/8"	17.3	440	0.75	19	1.9	48		
48CAE58AM4	8.9-42.8	12-58	770	4.3	2.0	1/2"	17.3	440	0.75	19	1.9	48		
48CAE90AH4	13.3-64.2	18-87	515	6.6	3.0	1/2"	18.5	470	0.81	21	2.3	58		
48CAE105AH4	15.5-76.7	21-104	340	6.6	3.0	1/2"	18.5	470	0.81	21	2.3	58		
48CAE135MH4	19.9-98.1	27-133	265	7.3	3.3	1/2"	19.1	485	0.94	24	2.4	61		
48CAE175AX6	26.6-129.8	36-176	190	10.2	4.6	3/4"	21.6	549	1.06	27	2.7	69		
48CAE230AX6	33.9-169.6	46-230	145	10.2	4.6	3/4"	21.6	549	1.06	27	2.7	69		

*Weights are without tool cable and reaction bar.

General: All tools must be used with an approved ATG cable and controller.

Standard Equipment: Air-LB Connector. Ball retainer optional.

Extra Equipment: Std. tool cable 301866-XX, RA swivel cable 301903-XX, Inline swivel cable 301904-XX, Extension cable 301877-XX.

Additional Accessories: See pages 58-61 for additional accessories.

Electric Nutrunners – Corded Current Control

Inline Non-Floating Spindle Tools

Cleco®



Cleco®

Inline Non-Floating Series

Torque Range
2 - 150 Nm
1.5 - 113 Ft. Lbs.

Bolt Size
M5 - M14
#10 - 5/8"

- Brushless precision
- Resolver control
- Memory intelligence

XX	C	S	E	XXX	XX	X
Motor 18, 48	Current Control	Connector E – Air-LB				Retainer - Pin retainer B Ball retainer
Tool Style				Output Drive		
S – Inline				Q – Quick change D3 – 3/8" Sq.Dr. D2 – 1/4" Sq.Dr. D4 – 1/2" Sq.Dr.		
Max Output Torque (Nm)						
Under 60 Nm, rounded up to the nearest 1 Nm. Over 60 Nm, rounded to the nearest 5 Nm.						

Inline Non-Floating Model Number	Torque Range		Max. Speed RPM	Weight*		Output Drive Size	Length		Side to Center	
	ft. lbs.	Nm		lbs.	kg		in.	mm	in.	mm
18CSE06Q	1.5-4.4	2-6	4000	2.5	1.1	1/4" Hex	12.3	312	0.91	23
18CSE06D2	1.5-4.4	2-6	4000	2.5	1.1	1/4"	11.8	300	0.91	23
18CSE12Q	2.2-8.9	3-12	1820	2.7	1.2	1/4" Hex	13.0	330	0.91	23
18CSE12D3	2.2-8.9	3-12	1820	2.7	1.2	3/8"	12.4	315	0.91	23
18CSE17Q	3.0-12.5	4-17	1290	2.7	1.2	1/4" Hex	13.0	330	0.91	23
18CSE17D3	3.0-12.5	4-17	1290	2.7	1.2	3/8"	12.4	315	0.91	23
18CSE22D3	3.7-16.2	5-22	985	2.7	1.2	3/8"	12.4	315	0.91	23
18CSE31D3	5.2-22.9	7-31	695	2.7	1.2	3/8"	12.4	315	0.91	23
48CSE12Q	2.2-8.9	3-12	4000	3.0	1.4	1/4" Hex	13.5	343	0.91	23
48CSE12D2	2.2-8.9	3-12	4000	3.0	1.4	1/4"	13.0	330	0.91	23
48CSE25D3	4.4-18.4	6-25	1820	3.2	1.5	3/8"	13.6	345	0.91	23
48CSE36D3	5.9-26.6	8-36	1290	3.2	1.5	3/8"	13.6	345	0.91	23
48CSE48D3	7.4-35.4	10-48	985	3.3	1.5	3/8"	13.8	351	0.91	23
48CSE65D4	9.6-47.9	13-65	750	5.3	2.4	1/2"	16.6	420	1.13	29
48CSE90D4	14.0-66.4	19-90	510	5.6	2.5	1/2"	17.1	435	1.13	29
48CSE125D4	19.2-92.2	26-125	360	5.6	2.5	1/2"	17.1	435	1.13	29
48CSE150D4	22.9-110.6	31-150	240	5.6	2.5	1/2"	17.1	435	1.13	29

*Weights are without tool cable and reaction bar.

General: All tools must be used with an approved ATG cable and controller.

Standard Equipment: Air-LB Connector; Dead Handle is included with 18CSE12Q and 18CSE12D3. Reaction bar is included with inline tools with output torques of 17-150 Nm. Ball retainer optional.

Extra Equipment: Std. tool cable 301866-XX, RA swivel cable 301903-XX, Inline swivel cable 301904-XX, Extension cable 301877-XX.

Mounting Plates: 543231 - (all with exception of listed below)

543235 - 18ES06Q/D2, 48ES12Q/D2

49087108 - 48ES65D4, 48ES90D4, 48ES125D4, & 48ES150D4.

Additional Accessories: See pages 58-61 for additional accessories.

Electric Nutrunners – Corded Current Control

Pistol Grip Tools

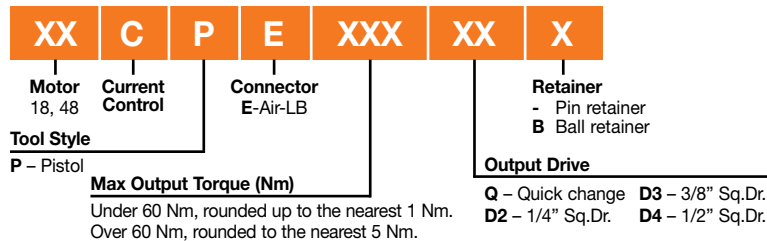
Cleco®

Pistol Grip Series

Torque Range
2 - 150 Nm
1.5 - 110 Ft. Lbs.

Bolt Size
M5 - M14
#10 - 5/8"

- Brushless precision
- Resolver control
- Memory intelligence



Pistol Grip Model Number	Torque Range		Max. Speed RPM	Weight*		Output Drive Size	Length		Side to Center	
	ft. lbs.	Nm		lbs.	kg		in.	mm	in.	mm
18CPE06Q	1.5-4.4	2-6	4000	2.2	1.0	1/4" Hex	7.0	178	0.84	21
18CPE06D2	1.5-4.4	2-6	4000	2.2	1.0	1/4"	6.5	165	0.84	21
18CPE12Q	2.2-8.9	3-12	1820	2.4	1.1	1/4" Hex	7.7	196	0.84	21
18CPE12D3	2.2-8.9	3-12	1820	2.4	1.1	3/8"	7.2	183	0.84	21
18CPE17Q	3.0-12.5	4-17	1290	2.4	1.1	1/4" Hex	7.7	196	0.84	21
18CPE17D3	3.0-12.5	4-17	1290	2.4	1.1	3/8"	7.2	183	0.84	21
18CPE22D3	3.7-16.2	5-22	985	2.4	1.1	3/8"	7.2	183	0.84	21
18CPE31D3	5.2-22.9	7-31	695	2.4	1.1	3/8"	7.2	183	0.84	21
48CPE12Q	2.2-8.9	3-12	4000	2.7	1.2	1/4" Hex	8.3	211	0.84	21
48CPE12D2	2.2-8.9	3-12	4000	2.7	1.2	1/4"	7.7	196	0.84	21
48CPE25D3	4.4-18.4	6-25	1820	2.9	1.3	3/8"	8.4	213	0.84	21
48CPE36D3	5.9-26.6	8-36	1290	2.9	1.3	3/8"	8.4	213	0.84	21
48CPE48D3	7.4-35.4	10-48	985	3.0	1.4	3/8"	8.6	218	0.84	21
48CPE65D4	9.6-47.9	13-65	750	5.0	2.3	1/2"	10.8	274	1.1	28
48CPE90D4	14.0-66.4	19-90	510	5.3	2.4	1/2"	11.3	287	1.1	28
48CPE125D4	19.2-92.2	26-125	360	5.3	2.4	1/2"	11.3	287	1.1	28
48CPE150D4	22.9-110.6	31-150	240	5.3	2.4	1/2"	11.3	287	0.9	23

*Weights are without tool cable and reaction bar.

General: All tools must be used with an approved ATG cable and controller.

Standard Equipment: Air-LB Connector; Suspension Bail; Dead Handle is included with 18CPE12Q & 18CPE12D3. Reaction bar is included with pistol tools with output torques of 17-150 Nm. Ball retainer optional.

Extra Equipment: Std. tool cable 301866-XX, RA swivel cable 301903-XX, Inline swivel cable 301904-XX, Extension cable 301877-XX.

Additional Accessories: See pages 58-61 for additional accessories.



18CPE06QP



18CSE06QP

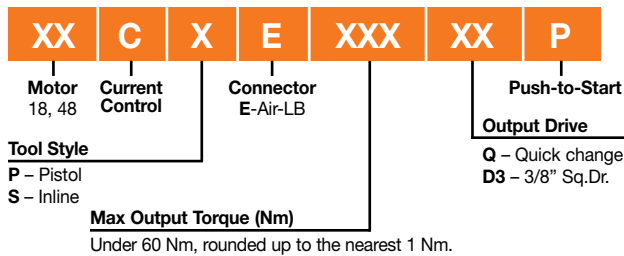
Cleco®

Push-to-Start Series

Torque Range
2 - 12 Nm
1.5 - 8.9 Ft. Lbs.

Bolt Size
M5 - M6
#10 - 1/4"

- Brushless precision
- Resolver control
- Memory intelligence



Push-to-Start Model Number	Torque Range		Max. Speed RPM	Weight*		Output Drive Size	Length		Side to Center	
	ft. lbs.	Nm		lbs.	kg		in.	mm	in.	mm
18CPE06QP	1.5-4.4	2-6	4000	2.66	1.19	1/4" Hex	9.35	238	0.84	21
18CPE06D3P	2.2-8.9	3-12	4000	2.66	1.19	3/8"	8.8	224	0.84	21
18CPE12QP	2.2-8.9	3-12	1820	2.83	1.27	1/4" Hex	9.35	196	0.84	21
18CPE12D3P	2.2-8.9	3-12	1820	2.83	1.27	3/8"	8.8	224	0.84	21
18CSE06QP	1.5-4.4	2-6	4000	2.93	1.31	1/4" Hex	14.75	375	0.91	23
18CSE06D3P	2.2-8.9	3-12	4000	2.93	1.31	3/8"	14.20	360	0.91	23
18CSE12QP	2.2-8.9	3-12	1820	3.10	1.40	1/4" Hex	14.75	375	0.91	23
18CSE12D3P	2.2-8.9	3-12	1820	3.10	1.40	3/8"	14.20	360	0.91	23

*Weights are without tool cable and reaction bar.

General: All tools must be used with an approved ATG cable and controller.

Standard Equipment: Air-LB Connector; Suspension Bail on pistol models; Dead Handle (301857) is included with 18CPE12Q & 18CPE12D3.

Extra Equipment: Std. tool cable 301866-XX, RA swivel cable 301903-XX, Inline swivel cable 301904-XX, Extension cable 301877-XX.

Additional Accessories: See pages 58-61 for additional accessories.

Electric Nutrunners – Corded Current Control

Inline Floating Spindle Tools

Cleco®

Inline Floating Spindle Series

Torque Range
2 - 248 Nm
1.5 - 182.9 Ft. Lbs.

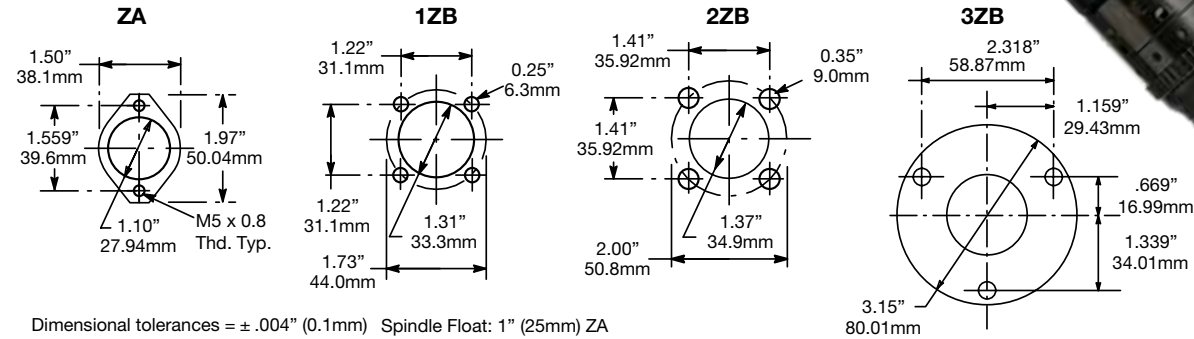
Bolt Size
M5 - M16
#10 - 5/8"

- Brushless precision
- Resolver control
- Memory intelligence

18CSE12ZA

XX	C	S	E	XXX	XXX
Motor 18, 48	Current Control		Connector E-Air-LB		Output Drive ZA – 1/4" Sq.Dr. 1ZB – 3/8" Sq.Dr. 2ZB – 1/2" Sq.Dr. 3ZB – 3/4" Sq.Dr.
Tool Style S – Inline			Max Output Torque (Nm) Under 60 Nm, rounded up to the nearest 1 Nm. Over 60 Nm, rounded to the nearest 5 Nm.		

Base Plate Mounting Dimensions



Inline Floating Spindle Model Number	Torque Range		Max. Speed RPM	Weight*		Output Drive Size	Length		Side to Center	
	ft. lbs.	Nm		lbs.	kg		in.	mm	in.	mm
18CSE06ZA	1.5-4.4	2-6	4000	3.0	1.4	1/4	15.5	394	0.91	23
18CSE12ZA	2.2-8.9	3-12	1820	3.2	1.5	1/4	16.0	406	0.91	23
18CSE17ZA	3.0-12.5	4-17	1290	3.2	1.5	1/4	16.0	406	0.91	23
48CSE12ZA	2.2-8.9	3-12	4000	3.4	1.5	1/4	16.7	425	0.91	23
48CSE271ZB	5.9-19.9	8-27	1820	5.8	2.6	3/8	22.0	559	0.92	23
48CSE361ZB	5.2-26.6	7-36	1290	5.8	2.6	3/8	22.0	559	0.92	23
48CSE602ZB	8.1-42.0	11-57	855	8.4	3.8	1/2	24.4	620	1.10	28
48CSE702ZB	10.3-50.2	14-68	570	8.4	3.8	1/2	24.4	620	1.10	28
48CSE802ZB	12.5-60.5	17-82	450	9.6	4.4	1/2	26.7	678	1.10	31
48CSE1152ZB	18.4-84.8	25-115	320	9.6	4.4	1/2	26.7	678	1.10	31
48CSE1502ZB	22.9-110.6	31-150	245	9.6	4.4	1/2	26.7	678	1.10	31
48CSE1653ZB	24.3-121.7	33-165	220	14.6	6.6	3/4	28.6	726	1.57	40
48CSE2503ZB	36.8-182.9	50-248	145	14.6	6.6	3/4	28.6	726	1.57	40

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

General: All tools must be used with an approved ATG cable and controller.

Standard Equipment: Air-LB Connector.

Tool square drives have thru hole output.

Extra Equipment: Std. tool cable 301866-XX, RA swivel cable 301903-XX, Inline swivel cable 301904-XX, Extension cable 301877-XX.

Additional Accessories: See pages 58-61 for additional accessories.

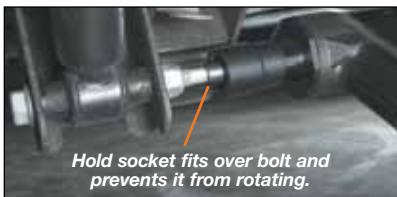


Cleco®

Hold & Drive Series

Torque Range
 11 - 227 Nm
 8.1 - 167.4 Ft. Lbs.

- Brushless precision
- Resolver control
- Memory intelligence



“Hold & 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.



Hold & Drive Tool Nomenclature

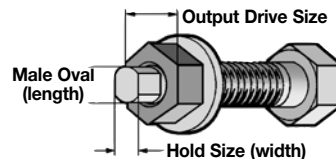
48	C	A	E	XXX	H
Motor 48	Current Control	Connector E – Air-LB	Head Type H-Hold & Drive	Head & Drive	Head & Drive
Tool Style					
A – Right Angle					
Max Output Torque					
<60 Nm, rounded up to the nearest 1 Nm.					
>60 Nm, rounded to the nearest 5 Nm.					

Head Assembly Nomenclature

H	X	XX	X	XX	X
Retainer Shaft	Socket Style	Oval Dim. (length)	Hold Socket (width across flats)		
3 - 3 1/2"	F – Female Hex	If socket style =0 (female oval)	EA - 1/4	15 - T15	
4 - 4"	M – Male Hex		EC - 3/8	20 - T20	
5 - 5 3/8"	T – Torx		M5 - 5mm	25 - T25	
6 - 5 7/8"	O – Female Oval		M6 - 6mm	30 - T30	
9 - 9 1/2"			MA - 7mm	40 - T40	
			MB - 8mm (5/16")	50 - T50	
			MC - 9mm		
			MD - 10mm		
			ME - 11mm (7/16")		
			MF - 12mm		

Drive Socket Sizes (surface drive)

EH - 11/16	MH - 14mm	MN - 20mm	MS - 25mm
EJ - 13/16	MJ - 15mm	MO - 21mm	MT - 26mm
EK - 7/8	MJ - 16mm (5/8")	MP - 22mm	MU - 27mm (1 1/16")
EM - 1	MK - 17mm	MQ - 23mm	MX - 30mm (1 3/16")
EO - 1 1/8	ML - 18mm	MR - 24mm (15/16")	MZ - 32mm (1 1/4")
MG - 13mm	MM - 19mm (3/4")		



Hold & Drive Model Number	Torque Range		Free Speed RPM	Length		Weight*		Head Height		Side to Center	
	Ft.Lbs.	Nm		in.	mm	lbs.	kg	in.	mm	in.	mm
48CAE53H	8.1 – 39.8	11 – 54	850	20.2	512	7.9	3.60	2.40	61	1.06	27
48CAE75H	11.1 – 56.8	15 – 77	600	20.2	512	7.9	4.03	2.40	61	1.06	27
48CAE110H	17.0 – 85.6	23 – 115	400	20.2	512	8.9	4.03	2.40	61	1.06	27
48CAE135H	20.7 – 101.8	28 – 135	270	20.6	522	8.9	4.03	2.40	61	1.06	27
48CAE230H	34.7 – 169.6	47 – 230	150	22.2	563	10.6	4.79	2.40	61	1.06	27

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

General: All tools must be used with an approved ATG cable and controller.

Standard Equipment: Air-LB Connector. Retraction 1" standard for hold bit.

Extra Equipment: Std. tool cable 301866-XX, RA swivel cable 301903-XX, Inline swivel cable 301904-XX, Extension cable 301877-XX.

Additional Accessories: See pages 58-61 for additional accessories.

Electric Nutrunners – Coded Current Control

Flush Socket Tools

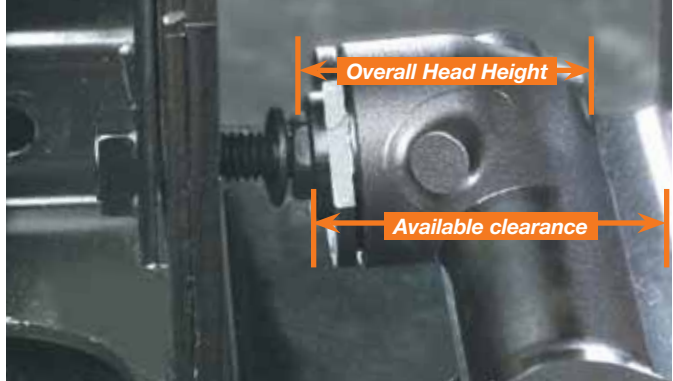


Flush Socket Series

Torque Range
4.9 - 234 Nm
3.6 - 172.6 Ft. Lbs.

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

- Brushless precision
- Resolver control
- Memory intelligence



Flush socket tools have plenty of clearance to fit low clearance applications. Electric flush socket tools tighten with much higher accuracy than tools with crowfoot attachment.

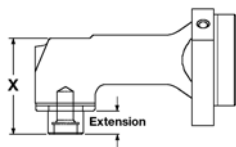


Flush Socket Tool Nomenclature

XX	C	A	E	XXX	F
Motor 18, 48	Current Control	Connector E - Air-LB			Flush Socket
Tool Style A - Right Angle					
Max Output Torque					
F1 16,23, 30 Nm		F3 53, 75, 110 Nm			
F2 37, 52 Nm		F4 135, 230 Nm			
<60 Nm, rounded up to the nearest 1 Nm. >60 Nm, rounded to the nearest 5 Nm.					
Head Type					
F1 Head 8-15mm socket capacity		F2 Head 10-15mm socket capacity		F3 Head 13-21mm socket capacity	
F4 Head 13-21mm socket capacity					

Head Assembly Nomenclature

FX	XX	X	X
			Output Type 0-Standard 1-Fast Lead 2-Magnetic
Extension Length			
0 - Flush		4 - 1/2" 8 - 1"	
2 - 1/4"		6 - 3/4"	
Socket Size			
EC - 3/8	MB - 8mm (5/16")	MJ - 16mm (5/8")	
ED - 7/16	MD - 10mm	MK - 17mm	
EE - 1/2	ME - 11mm (7/16")	ML - 18mm	
EF - 9/16	MF - 12mm	MM - 19mm (3/4")	
EH - 11/16	MG - 13mm	MN - 20mm	
EJ - 13/16	MH - 14mm	MO - 21mm	
	MI - 15mm		



X Dimension For Flush Socket

Head	in.	mm	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

Flush Socket Model Number	Head Type	Torque Range		Free Speed RPM	Weight*		Length		Anglehead				
		ft. lbs.	Nm		lbs.	kg	in.	mm	Side to Center		Height		
										in.	mm	in.	mm
18CAE16F	F1	3.6-11.8	4.9-16	1225	4.4	2.00	16.0	406	0.55	14	1.54	39	
18CAE23F	F1	3.4-17.0	4.6-23	860	4.4	2.00	16.0	406	0.55	14	1.54	39	
18CAE30F	F1	4.4-22.1	6.0-30	655	4.4	2.00	16.0	406	0.55	14	1.54	39	
48CAE37F	F2	5.9-27.3	8.0-37	1225	5.4	2.43	18.7	474	0.67	17	1.69	43	
48CAE52F	F2	8.1-38.3	11-52	860	5.4	2.43	18.7	474	0.67	17	1.69	43	
48CAE53F	F3	8.1-39.0	11-53	850	6.0	2.74	20.0	509	0.87	22	2.32	59	
48CAE75F	F3	11.1-55.3	15-75	600	6.0	2.74	20.0	509	0.87	22	2.32	59	
48CAE110F	F3	17.0-81.1	23-110	400	7.4	3.38	20.5	521	0.87	22	2.32	59	
48CAE135F	F4	19.9-99.5	27-135	270	8.9	4.03	20.6	522	1.06	27	2.40	61	
48CAE230F	F4	34.7-172.6	47-230	150	10.6	4.79	22.2	563	1.06	27	2.40	61	

*Weights are without tool cable or reaction bar if so equipped.
General: All tools must be used with an approved ATG cable and controller.
Standard Equipment: Air-LB Connector.

Extra Equipment: Std. tool cable 301866-XX, RA swivel cable 301903-XX, Inline swivel cable 301904-XX, Extension cable 301877-XX.
Additional Accessories: See pages 58-61 for additional accessories.



Cleco®

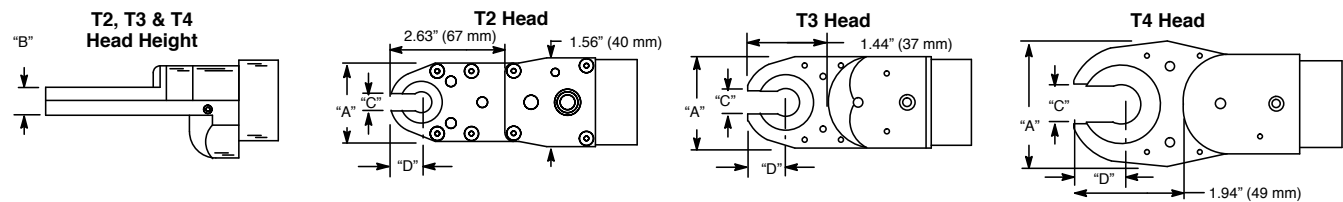
Tube Nut Series

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

Bolt Size
 M6 - M10
 1/4" - 3/8"

- Brushless precision
- Resolver control
- Memory intelligence

The 48ET 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.

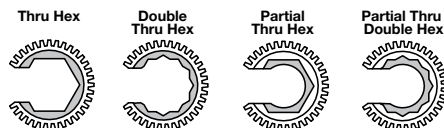


Tube Nut Tool Nomenclature

XX	C	T	E	XX	XX
Motor 48	Current Control	Connector E - Air-LB			
Tool Style T - Tube Nut					
Max Output Torque <60 Nm, rounded up to the nearest 1 Nm.					
Head Type T2 - 20 Nm T3 - 30 Nm T4 - 40 Nm					

Socket Nomenclature

KSX	XX	XX	X
Head Type KS2 - T2 KS3 - T3 KS4 - T4	Output Type 0 - Partial Thru Hex 2 - Double Thru Hex 1 - Thru Hex 3 - Partial Thru Double Hex		
Extension Length 0 - Flush 4 - 1/2" 8 - 1" 2 - 1/4" 6 - 3/4"			
Maximum Hex Socket Size			
MG, EE	T2 Head Type		
MM, 3/4"	T3 Head Type		
MU, 1 1/16"	T4 Head Type		
00, ## (Specials)	All Head Types		
Socket Sizes			
EA - 1/4"	M5 - 5mm	MH - 14mm	MP - 22mm
EC - 3/8	M6 - 6mm	MI - 15mm	MQ - 23mm
EE - 1/2	MA - 7mm	MJ - 16mm (5/8)	MR - 24mm (15/16)
EF - 9/16	MB - 8mm (5/16)	MK - 17mm	MS - 25mm
EH - 11/16	MD - 10mm	ML - 18mm	MT - 26mm
EJ - 13/16	ME - 11mm (7/16)	MM - 19mm (3/4)	MU - 27mm (1 1/16)
EK - 7/8	MF - 12mm	MN - 20mm	
EM - 1	MG - 13mm	MO - 21mm	



Note: To order individual sockets, use a "KS" prefix (i.e. KS2EA01 for a T2 1/4", Flush, Thru Hex socket.)

Tube Nut	Max. Drive Size	Torque Range		Free Speed	Weight*	Length		Head									
		Ft.Lbs.	Nm			RPM	lbs.	kg	in.	mm	A Width		B Blade Ht.		C Opening		D End/Cntr.
Model Number								in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
48CTE20T2	1/2"	7.4-14.8	10-20	1425	4.4	2.0	16.9	430	1.42	36	0.55	14	0.28	7	0.53	13	
48CTE30T3	3/4"	11.1-22.1	15-30	1030	4.5	2.0	16.6	422	1.65	42	0.59	15	0.475	13	0.73	19	
48CTE40T4	1 1/16"	14.8-29.5	20-40	770	5.3	2.3	17.9	454	2.36	60	0.59	15	0.675	18	0.93	24	

*Weights are without tool cable and reaction bar.

General: All tools must be used with an approved ATG cable and controller.

Standard Equipment: Air-LB Connector.

Extra Equipment: Std. tool cable 301866-XX, RA swivel cable 301903-XX, Inline swivel cable 301904-XX, Extension cable 301877-XX.

Additional Accessories: See pages 58-61 for additional accessories.

Electric Nutrunners – Corded Current Control

Right Angle Floating Spindle Tools



Right Angle Floating Spindle Series

Torque Range
5.1 - 230 Nm
3.7 - 169.6 Ft. Lbs.

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

- Brushless precision
- Resolver control
- Memory intelligence



48CAE135S461

Right Angle Floating Spindle Tool Nomenclature

XX	C	A	E	XXX	XX	X	X
Motor 18 48	Current Control	Tool Style A – Right Angle	Connector E – Air-LB	Square Drive 3 - 3/8" (S1,S2) 4 - 1/2" (S3,S4) 6 - 3/4" (S4)	Extension Length 1 -1.13" (S1), 1.00" (S2 & S3), 1.25" (S4) 2 -2.13" (S1), 3.00" (S2), 2.5" (S4 1/2" Dr.) 5 -5.13" (S2), 4.25" (S4) 6 -6.0" (S4 1/2" Dr.), 7.0" (S4 3/4" Dr.) 11 -11.0" (S4 3/4" Dr.)	Tool Termination S1 Sliding (Floating) Spindle S2 Sliding (Floating) Spindle	S3 Sliding (Floating) Spindle S4 Sliding (Floating) Spindle
Max Output Torque							
S1 Head – 16, 23, or 30 Nm S2 Head – 37 or 52 Nm S3 Head – 53, 75, 95, or 110 Nm S4 Head – 135 or 230 Nm (48 series)							

Right Angle Floating Spindle Model Number	Torque Range		Max. Speed	Weight*		Output Drive Size	Length		Side to Center	
	ft. lbs.	Nm	RPM	lbs.	kg		in.	mm	in.	mm
18CAE16S131	3.7-11.8	5.1-16	1225	4.4	2.00	3/8"	16.0	406	0.55	14
18CAE23S131	5.3-16.9	7.2-23	860	4.4	2.00	3/8"	16.0	406	0.55	14
18CAE30S131	4.4-22.1	6.0-30	655	4.4	2.00	3/8"	16.0	406	0.55	14
48CAE37S231	5.9-27.2	8.0-37	1225	5.4	2.43	3/8"	18.7	474	0.67	17
48CAE52S231	8.1-38.3	11-52	860	5.4	2.43	3/8"	18.7	474	0.67	17
48CAE53S341	8.1-39.1	11-53	850	6.0	2.74	1/2"	20.0	509	0.87	22
48CAE75S341	11.0-55.3	15-75	600	6.0	2.74	1/2"	20.0	509	0.87	22
48CAE95S341	14.7-70.0	20-95	460	7.4	3.38	1/2"	20.5	521	0.87	22
48CAE110S341	16.9-81.1	23-110	400	7.4	3.38	1/2"	20.5	521	0.87	22
48CAE135S461	20.6-99.5	28-135	270	8.9	4.03	3/4"	20.6	522	1.06	27
48CAE230S461	34.6-169.6	47-230	150	10.6	4.79	3/4"	22.2	563	1.06	27

*Weights are without tool cable and mounting plate.

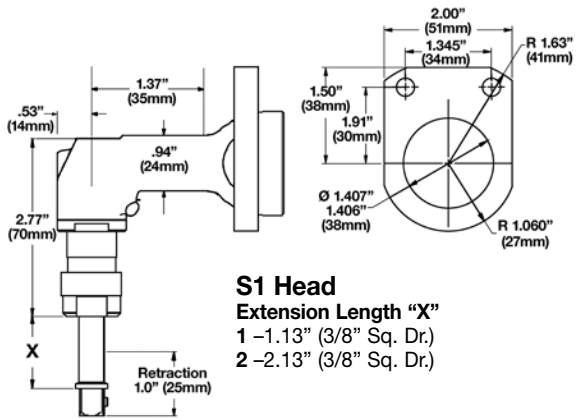
General: All tools must be used with an approved ATG cable and controller.

Standard Equipment: Air-LB Connector; Mounting plate.

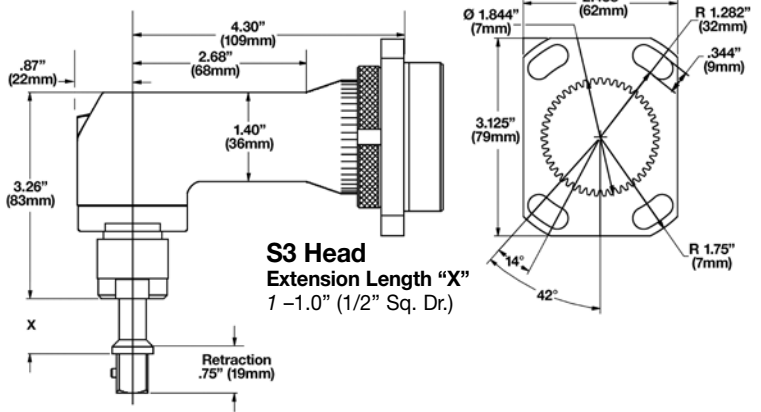
Extra Equipment: Std. tool cable 301866-XX, RA swivel cable 301903-XX, Inline swivel cable 301904-XX, Extension cable 301877-XX.

Additional Accessories: See pages 58-61 for additional accessories.

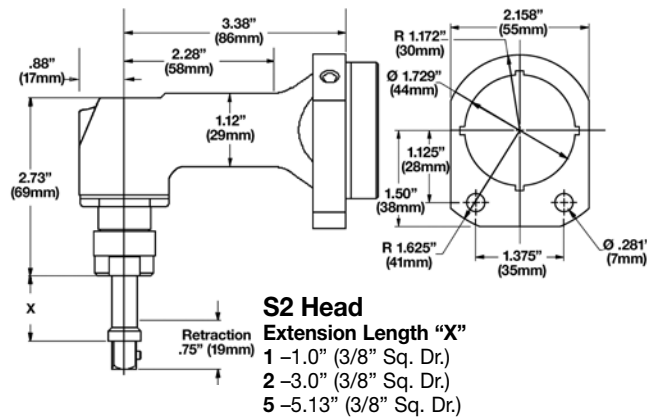
18CAE & 48CAE Floating Spindle Angle Heads



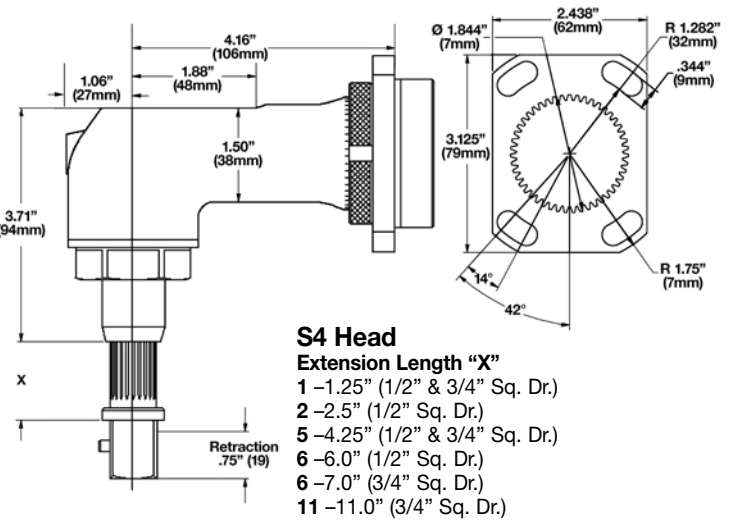
S1 Head
 Extension Length "X"
 1 -1.13" (3/8" Sq. Dr.)
 2 -2.13" (3/8" Sq. Dr.)



S3 Head
 Extension Length "X"
 1 -1.0" (1/2" Sq. Dr.)



S2 Head
 Extension Length "X"
 1 -1.0" (3/8" Sq. Dr.)
 2 -3.0" (3/8" Sq. Dr.)
 5 -5.13" (3/8" Sq. Dr.)



S4 Head
 Extension Length "X"
 1 -1.25" (1/2" & 3/4" Sq. Dr.)
 2 -2.5" (1/2" Sq. Dr.)
 5 -4.25" (1/2" & 3/4" Sq. Dr.)
 6 -6.0" (1/2" Sq. Dr.)
 6 -7.0" (3/4" Sq. Dr.)
 11 -11.0" (3/4" Sq. Dr.)

Electric Nutrunners – Corded Current Control

Crowfoot Tools

Cleco®

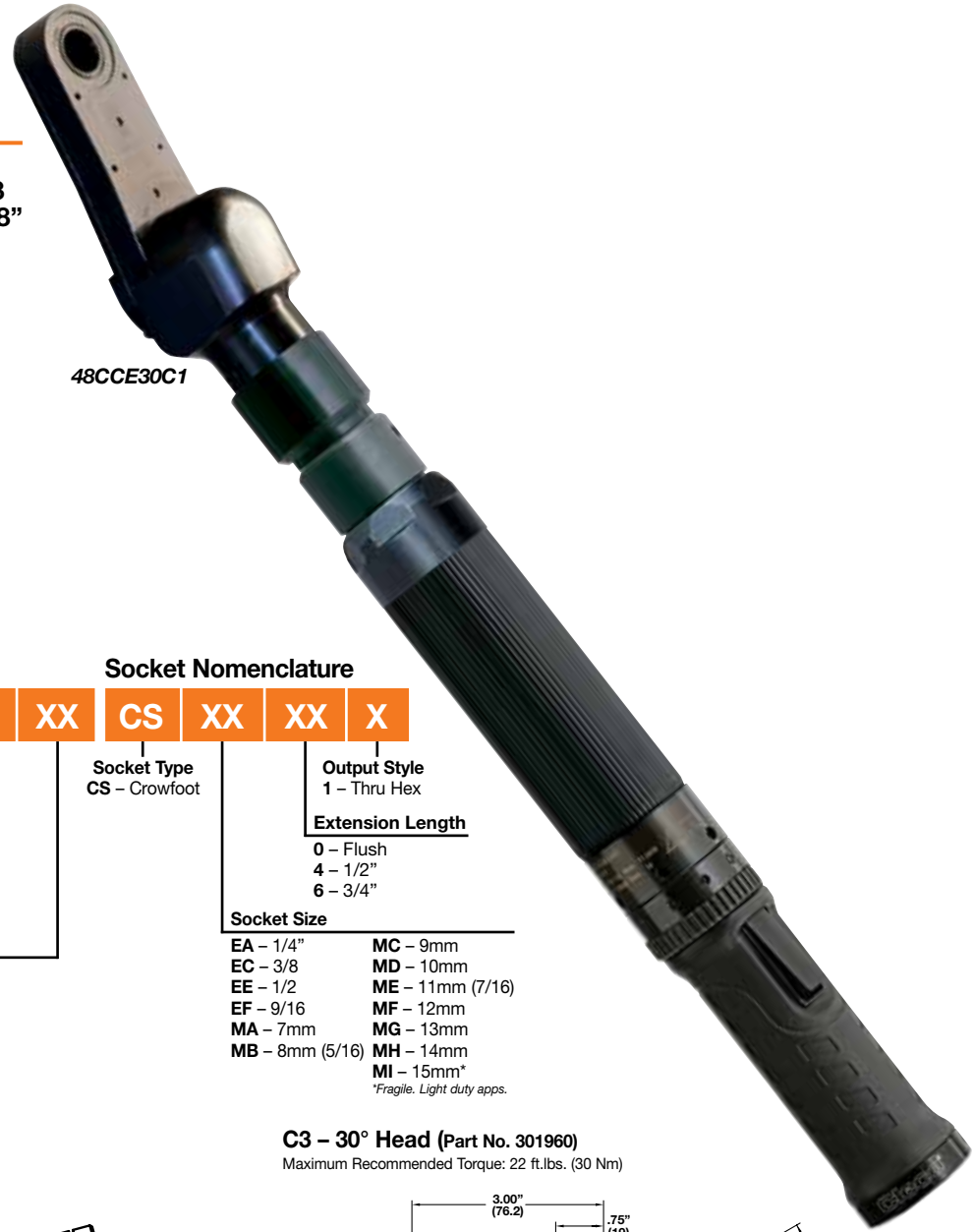
Crowfoot Series

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

Bolt Size
M6 - M8
#10 - 3/8"

- Brushless precision
- Resolver control
- Memory intelligence

48CCE30C1



Crowfoot Tool Nomenclature

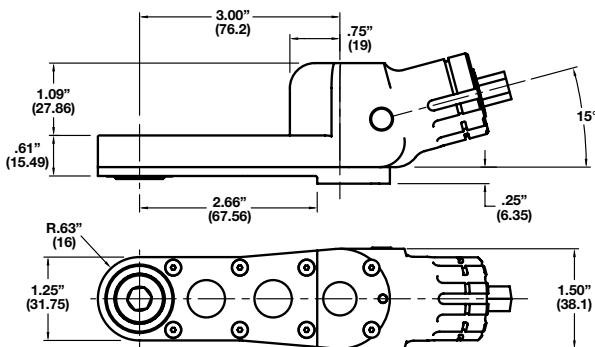
48	C	C	E	XX	XX
Motor 48	Current Control	Connector E – Air-LB			
Tool Style C – Crowfoot					
Max Output Torque <60 Nm, rounded up to the nearest 1 Nm.					
Head Type C1 - 15° Crowfoot C3 - 30° Crowfoot					

Socket Nomenclature

CS	XX	XX	X
Socket Type CS – Crowfoot	Output Style 1 – Thru Hex		
Extension Length 0 – Flush 4 – 1/2" 6 – 3/4"			
Socket Size			
EA – 1/4"	MC – 9mm		
EC – 3/8	MD – 10mm		
EE – 1/2	ME – 11mm (7/16)		
EF – 9/16	MF – 12mm		
MA – 7mm	MG – 13mm		
MB – 8mm (5/16)	MH – 14mm		
	MI – 15mm*		
<small>*Fragile. Light duty apps.</small>			

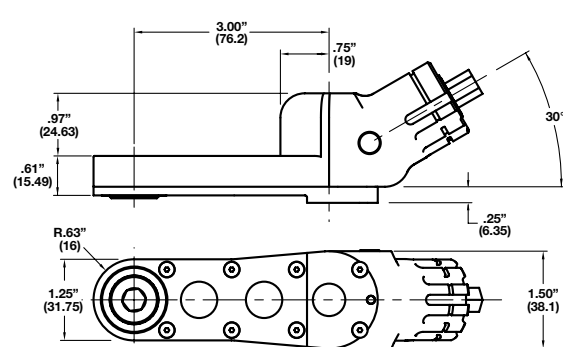
C1 – 15° Head (Part No. 301959)

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



C3 – 30° Head (Part No. 301960)

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



Crowfoot		Torque Range		Free Speed	Weight*		Length	
Model Number		ft. lbs.	Nm	RPM	lbs.	kg	in.	mm
15° Head	30° Head							
48CCE30C1	48CCE30C3	7.7-22.1	10.5-30	860	5.5	2.3	20.5	521

*Weights are without tool cable and reaction bar.

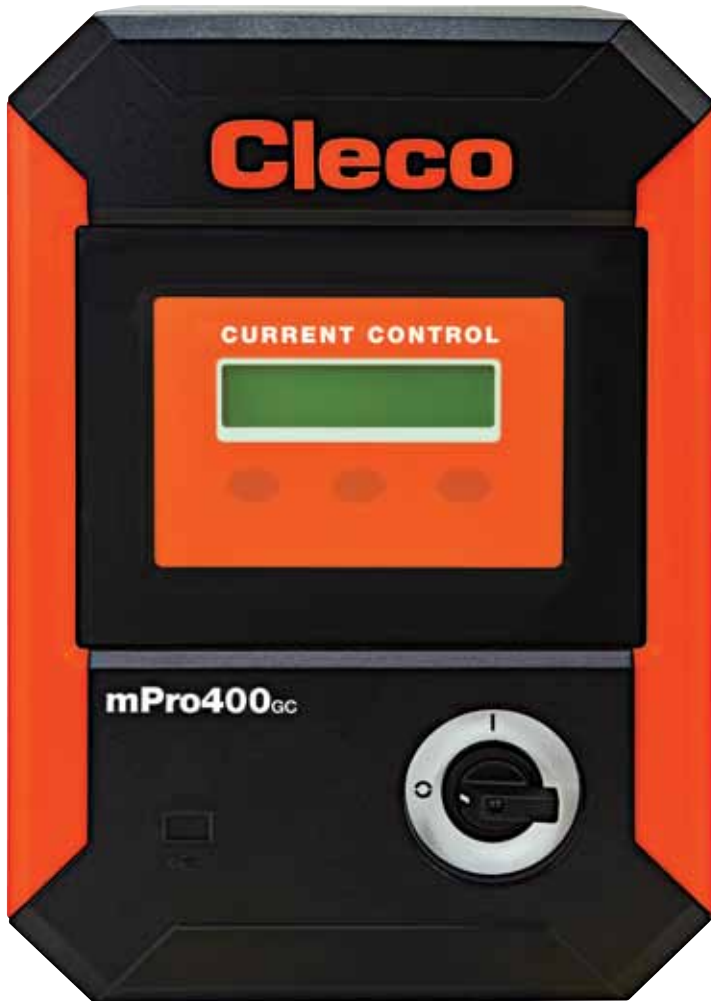
General: All tools must be used with an approved ATG cable and controller.

Standard Equipment: Air-LB Connector.

Extra Equipment: Std. tool cable 301866-XX, RA swivel cable 301903-XX, Inline swivel cable 301904-XX, Extension cable 301877-XX.

Additional Accessories: See pages 58-61 for additional accessories.

To order individual sockets, use a "CS" prefix before the required socket. (i.e. CSEA01 for a, 1/4", flush, thru hex socket.)



Cleco®
Current Control
mPro400GC-I
Global Controller

- Single channel
- Economical
- Remote programming
- Local storage of 5,000 cycles
- LAN capable
- Input Voltage: 115/230VAC
- Connections: (1) Serial, (1) TM-COM, (1) Ethernet
- Inputs/Outputs: (8) 24V Inputs, (8) 24V Outputs



MPRO400GC-I

Model	Description	Tool Compatibility	Weight		Width		Height		Depth	
			lbs.	kg	in.	mm	in.	mm	in.	mm
MPRO400GC-I	Current Control	Cleco 18-48 CXE Series*	32.8	72.3	10.3	261.62	14.9	378.46	12.9	327.66

*Note: 48 series tools require 230 VAC.

Isolation Transformer

mPro400GC-IT Isolation Transformer

The purpose of the Isolation Transformer is to allow use of legacy Matrix connector tools (17/47, 18/48, and 67 Series) with the Global Controller and maintain safety and CE standards.



Air-Lb Connector



Matrix Connector

- 115/230 VAC Operation Selectable (Not auto sensing, switch selectable). Factory default setting is 230 VAC.
- All connection cables included except Tool Cables. See below.



544185PT Isolation Transformer Applications

Controller	Tool Used					
	17/47E_XX (Matrix)	18/48E_XX (Matrix)	18/48E_EXX (Air-Lb)	67E_XX (Matrix)	17/18C_EXX (Air-Lb)	Fixtured Spindles (DGD/EMT)
TME/TMEM	No	No	Adapter Cable Required	No	NA	NA
mPro400GC-P	Yes	Yes	No	Yes	NA	NA
mPro400GC-S	Yes	Yes	No	Yes	NA	NA
mPro400GC-M	NA	NA	NA	NA	NA	NA
mPro400GC-E	Yes	Yes	No	Yes	NA	NA
mPro400GC-I	NA	NA	NA	NA	No	NA

Tool Cables

Model Number		Swivel		Length	
Tool	Extension	Right Angle	Inline	Feet	Meters
542778-1M*	542779-1M	544055-1M*	544056-1M*	3	1
542778-2M*	542779-2M	544055-2M*	544056-2M*	6	2
542778-3M	542779-3M	544055-3M	544056-3M	9	3
542778-6M	542779-6M	544055-6M	544056-6M	19.5	6
542778-8M	542779-8M	544055-8M	544056-8M	26	8
542778-10M	542779-10M	544055-10M	544056-10M	33	10
542778-15M	542779-15M	544055-15M	544056-15M	49	15
	542779-20M			66	20
	542779-25M			82	25
	542779-30M			96	30
	542779-40M			131	40
542778-50M	542779-50M	544055-50M	544056-50M	164	50

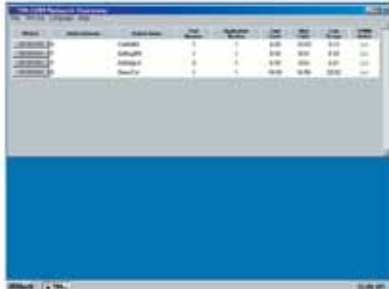
Maximum cable length 100M 115VAC/20M 230VAC.

Overall minimum cable length 3M.

*Must be used with 542779 extension cable.



Swivel Cable



TM-COM Network overview screen lists all mPro400GC-E and mPro400GC-I controllers connected to the network.



mProRemote for mPro400GC-M and mPro400GC-P controllers.



All menus in all controllers are accessible from the Navigator screen.

Cleco®

Remote Programming Software

Cleco's remote programming software delivers ultimate control to the user, empowering them to control the production process remotely through programming that is easy to use and intuitive. Anything that can be programmed locally on the controller can also be performed from a remote location using the exact same screens.

Using this software to monitor, modify, and/or manage the production line will increase your efficiency and productivity. Centralized management of the tightening process assures quality products.

TM-COM (for GC-E/GC-I controllers) can communicate using either a RS232 or TCP/IP connection. mProRemote (for GC-M/GC-P controllers) utilizes a TCP/IP connection only.



Software

Part Number	Description
mProRemote	Provided with each mPro400GC-M & mPro400GC-P
TM-COM	Provided with each mPro400GC-E & mPro400GC-I

mProRemote & TM-COM Minimum System Requirements

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



Accessories

Batteries

Part No.	Description	Weight	
		lbs.	kg
935377	26V Li-Ion	1.1	0.50
936400PT	44V Li-Ion	1.9	0.85



Battery Charger

Part No.	Description
936491PT	26V/44V charger



Vmax Power Module

Model No.	Weight		Width		Length		Depth	
	lbs.	kg	in.	mm	in.	mm	in.	mm
961350PT	6.8	3.1	9.4	240	4.7	120	5.9	150

2M power cable included.

Vmax Tethers

Part Number	
Tool	Extension
961341-***	961342-***

***Length: 030=3m, 060=6m, 080=8m, 100=10m
Note: Maximum 20M length



2.4GHz to 5.0GHz Upgrade Kit

Upgrades are available at your local ATG Application Center to upgrade the W and X series 2.4GHz tools to a 5.0GHz Y series tool.

WLAN Access Point – 2.4GHz/5.0GHz

Part No.	Description
543995	Access Point 2.4GHz WLAN (US)
961323	Access Point 2.4GHz WLAN (EU)
961253PT	Access Point Dual Band 2.4/5GHz

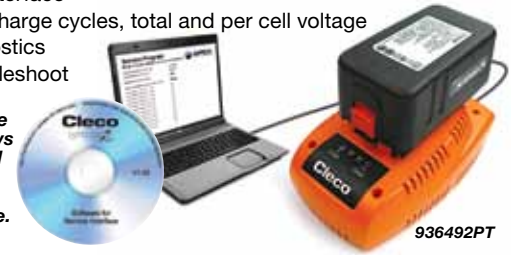
Radio Range: 30-50 meters
IEEE 802.11a/b/g (depending on tool)
Max. Tools: 10



Preventative Maintenance Diagnostics

- USB to PC interface
- Displays discharge cycles, total and per cell voltage
- Better diagnostics
- Easy to troubleshoot

Battery service interface allows cycles and cell voltages to be read via serial interface cable.



mPro400GC Program & OS Software

Part No.	Description
544163PT	CompactFlash Module Programmed

Software

Part No.	Description
TMEB-COM-V2.03	Remote Programming Software Included with mPro400GC-E.

Tool Holders

Part No.	Description
935144	Pistol tool holder w/infrared interface
935396	Pistol tool holder
935290	Angle tool holder w/infrared interface
935395	Angle tool holder
935170	Infrared interface cable
935998	70Nm RA, Crowfoot/Tubenut holder
935999	70Nm RA, Crowfoot/Tubenut holder w/infrared interface



Tool Holder Extension Cables

Part No.	Description
935154	9' (3m) extension cable
935155	19.5' (6m) extension cable
935157	33' (10m) extension cable

Pistol Dead Handle

Part No.	Description
301837	Reversible handle mount



Tool Suspension Bail

Part No.	Description
541715-2	Angle tool swivel bail



System Bus Accessories

Part No.	Description
544197PT	System Bus Terminator
544196-005	System Bus Cable - 0.5M
544196-020	System Bus Cable - 2M
544196-050	System Bus Cable - 5M
544196-200	System Bus Cable - 20M
544196-500	System Bus Cable - 50M
S133437	System Bus 16 I/O Expander
S133436	System Bus 32 I/O Expander
S133410	System Bus 4-Position Socket Tray
S133411	System Bus 8-Position Socket Tray
S133406	System Bus Control Box with Buzzer
S133405	System Bus Stack Light without Buzzer
S133420	System Bus Stack Light with Buzzer



S133420
Stack Light
with Buzzer



S133410
Socket Tray



S133406
Control Box
with Buzzer

Network Accessories

Part No.	Description
543446-7	Ethernet Crossover Cable - 7ft.
543445-7	Ethernet Patch Cable - 7ft.
543445-50	Ethernet Patch Cable - 50ft.
543445-100	Ethernet Patch Cable - 100ft.
543490-10	Serial Null Modem Cable - 3M
543444-8	Ethernet Switch - 8 Port
543444-16	Ethernet Switch - 16 Port
543444-24	Ethernet Switch - 24 Port

Fieldbus Accessories

Part No.	Description
544171PT	Fieldbus Devicenet
544172PT	Fieldbus Ethernet-IP
544173PT	Fieldbus Profibus
544174PT	Fieldbus Profinet
544211PT	Fieldbus Modbus/TCP

544172PT
Fieldbus
Ethernet-IP



544171PT
Fieldbus
Devicenet

544174PT
Fieldbus Profinet



544173PT
Fieldbus Profibus



Discrete Output Accessories

Annunciators

Part No.	Description
542976-1	Annunciator - 1 Spindle
542976-2	Annunciator - 2 Spindle
542976-3	Annunciator - 3 Spindle
542976-4	Annunciator - 4 Spindle
542976-5	Annunciator - 5 Spindle
542976-6	Annunciator - 6 Spindle



542976-1

Discrete Input Accessories

Torque Selector Switches

Part No.	Description
542977-8	Torque Selector - 8 Position
542977-16	Torque Selector - 16 Position
542977-32	Torque Selector - 32 Position
542977-64	Torque Selector - 64 Position



542977-8

Start/Stop Switches

Part No.	Description
542972	Start Box
542973	Stop Box
542974	Start/Stop Box
542975	Start/Stop/Reverse



542975

Bits & Socket Trays (Global Controller Only)

Part No.	Description
544241PT	Tray - 4 Position with 10m cable
544242PT	Tray - 8 Position with 10m cable
5970716	Replacement Inserts

Maximum socket diameter 1.125".



960645



5970716

Socket Only Trays

Part No.	Description
542978-4	Socket Tray - 4 Position
542978-8	Socket Tray - 8 Position

Notes: Up to 16 linked 4 position trays maximum.
Minimum socket O.D. 1". Maximum O.D. 2.25".
See below for Socket Posts and Lockout Washers



542978-4

Socket Posts

For use with 542978-4 & 542978-8 socket trays.

Part No.	Socket Post Size	Part No.	Socket Post Size
99249181	.550/.540	99249158	.687/.677
99249169	1.062/1.052	99249157	.875/.865
99249165	.590/.580	99249156	1.000/.990
99249164	.945/.935	99249148	1.125/1.115
99249163	.827/.817	99249147	.938/.928
99249162	.709/.699	99249104	.750/.740
99249161	.625/.615	99249103	.669/.659
99249160	.437/.432	99249102	.562/.552
99249159	.812/.802	99249101	.500/.490

Note: Select socket post size within tolerance of socket used.

Choose largest socket post size (diameter) that will accept the hex size of the intended socket.

Lockout Washer

For use with 542978-4 & 542978-8 socket trays.

Part Number	Note
99248150	Vacant position lockout washer

Required for unused positions on the 542978-4 & 542978-8 socket tray.

Accessory Cables

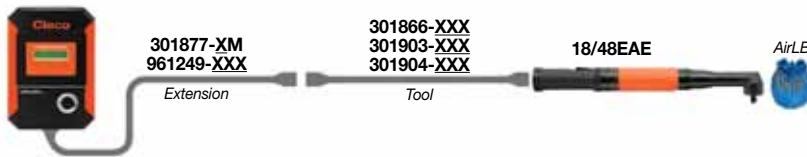
Part No.	Description
544237-1M	Accessory Input Cable - 1M
544237-5M	Accessory Input Cable - 5M
544237-10M	Accessory Input Cable - 10M
544237-15M	Accessory Input Cable - 15M
542986-1M	Accessory to Accessory Cable - 1M
542986-5M	Accessory to Accessory Cable - 5M
542986-10M	Accessory to Accessory Cable - 10M
542986-15M	Accessory to Accessory Cable - 15M
544238-1M	Accessory Output Cable - 1M
544238-5M	Accessory Output Cable - 5M
544238-10M	Accessory Output Cable - 10M
544238-15M	Accessory Output Cable - 15M

Accessories

Tool Cables

Model Number		Swivel		Length	
Tool	Extension	Right Angle	Inline	Feet	Meters
301866-1M*	301877-1M	301903-1M*	301904-1M*	3	1
301866-2M*	301877-2M	301903-2M*	301904-2M*	6	2
301866-3M	301877-3M	301903-3M	301904-3M	9	3
301866-6M	301877-6M	301903-6M	301904-6M	19.5	6
301866-8M	301877-8M	301903-8M	301904-8M	26	8
301866-10M	301877-10M	301903-10M	301904-10M	33	10
301866-15M	301877-15M	301903-15M	301904-15M	49	15
	301877-20M			66	20

Maximum tool to controller cable length 20M.
Overall minimum cable length 3M.
*Must be used with 301877 extension cable.



Swivel Cable

Tool & Cable Tester

Part No.	Description
961024	Tool & cable tester tool memory programming
542991	Tool & cable tester

Note: Adapter cable required for Air-Lb tools. Contact Tech Service.



Lever Extension Kits

Description	Part No.
Lever Extension Kit (non-swivel)	541757
Lever Extension Kit (swivel)	543414

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



Suspension Bail

Description	Part No.
Tool suspension bail	1110909



Test Fixture

Part Number
536185

Medium to Hard Torque
Belleville Washer Test Fixture is clamped in a vise and used to test tools (10 In. Lbs. – 100 Ft. Lbs., 1.13Nm – 135.6Nm). Washers can be rearranged to simulate “hard” or “soft” joints.



Joint Simulator

Joint simulators are most frequently used to certify the repeatability of nutrunners before being installed on a production line and are also an excellent means of testing nutrunners following repair.

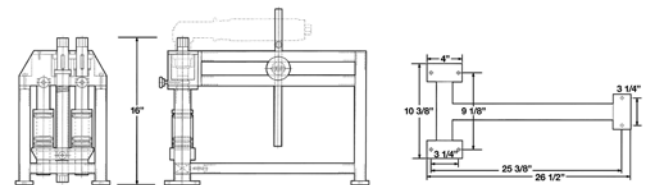
The Joint Simulator can simulate and test the torque output of nutrunners on both hard and soft joints. Each Joint Simulator is supplied with a quantity of spring washers which are used to test tool accuracy. Torque per revolution is varied by stacking the spring washers in different combinations.

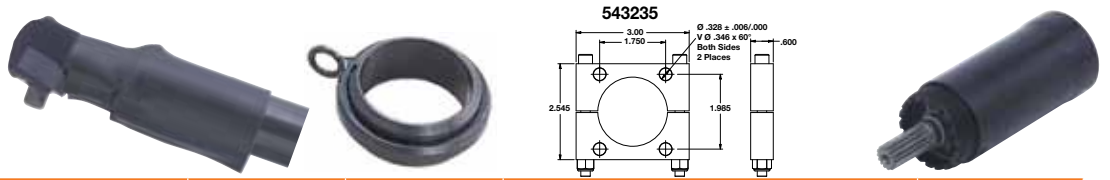
Electronic torque testing is accomplished by attaching an external rotary transducer between the tool's square drive and the socket.

- Easy access, load, set-up and maintenance.
- Heavy-duty and economical.
- Adjustable torque reaction bracket can accommodate virtually any tool.
- For use with reversible/non-reversible tools.

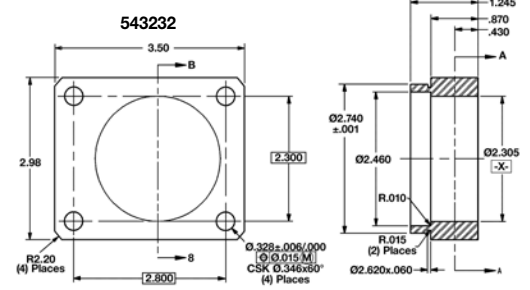
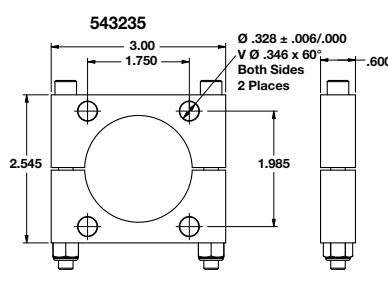
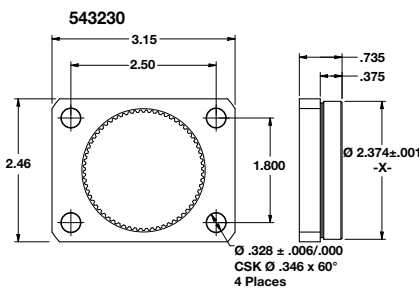


Part No.	Torque Range		Width		Height		Length	
	Ft. Lbs.	Nm	in.	mm	in.	mm	in.	mm
550006	12-220	15-300	10.4	264	16	406	26.5	667

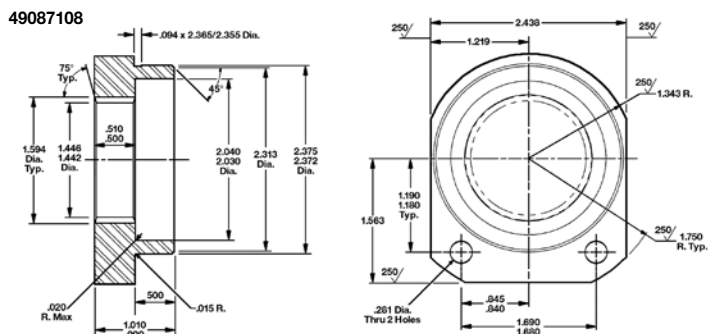
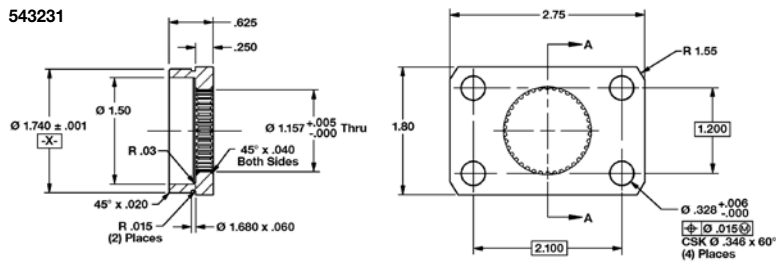




Tool Type	Model Number	Cover	Swivel Bail	Mounting Plate	Extension
Right Angle	17/18EA...AL2	205832	541715-2	-----	-----
	17/18EA...AM3	205834	541715-2	-----	-----
	47EA...AM3/4	543070	541715-2	543235	542428
	47/48EA...AH4	543070	541715	543230	535833
	47/48EA135MH4	543071	541715	543230	535833
	47/48EA...AX6	205838	541715	543232	-----
	67EA...AL6	205838	35007004	49097101 (included with tool)	48316033
67EA...AM6	-----	-----	48A17006	45017152 (included with tool)	-----
Flush Socket	17/18EA...F1...	-----	541715-2	57217101 (requires 57218103 screw)	-----
	47/48EA...F2...	-----	541715-2	43287131	-----
	47/48EA...F3...	-----	541715-2	49097101 (requires 49098103 locknut)	-----
	47/48EA...F4...	205838	541715	49097101 (requires 49098103 locknut)	48316033
Hold-N-Drive	47/48EA ...H...over 100NM	205838	541715	49097101 (requires 49098103 locknut)	48316033
	47/48EA ...H...under 100NM	205838	541715-2	49097101 (requires 49098103 locknut)	48316033



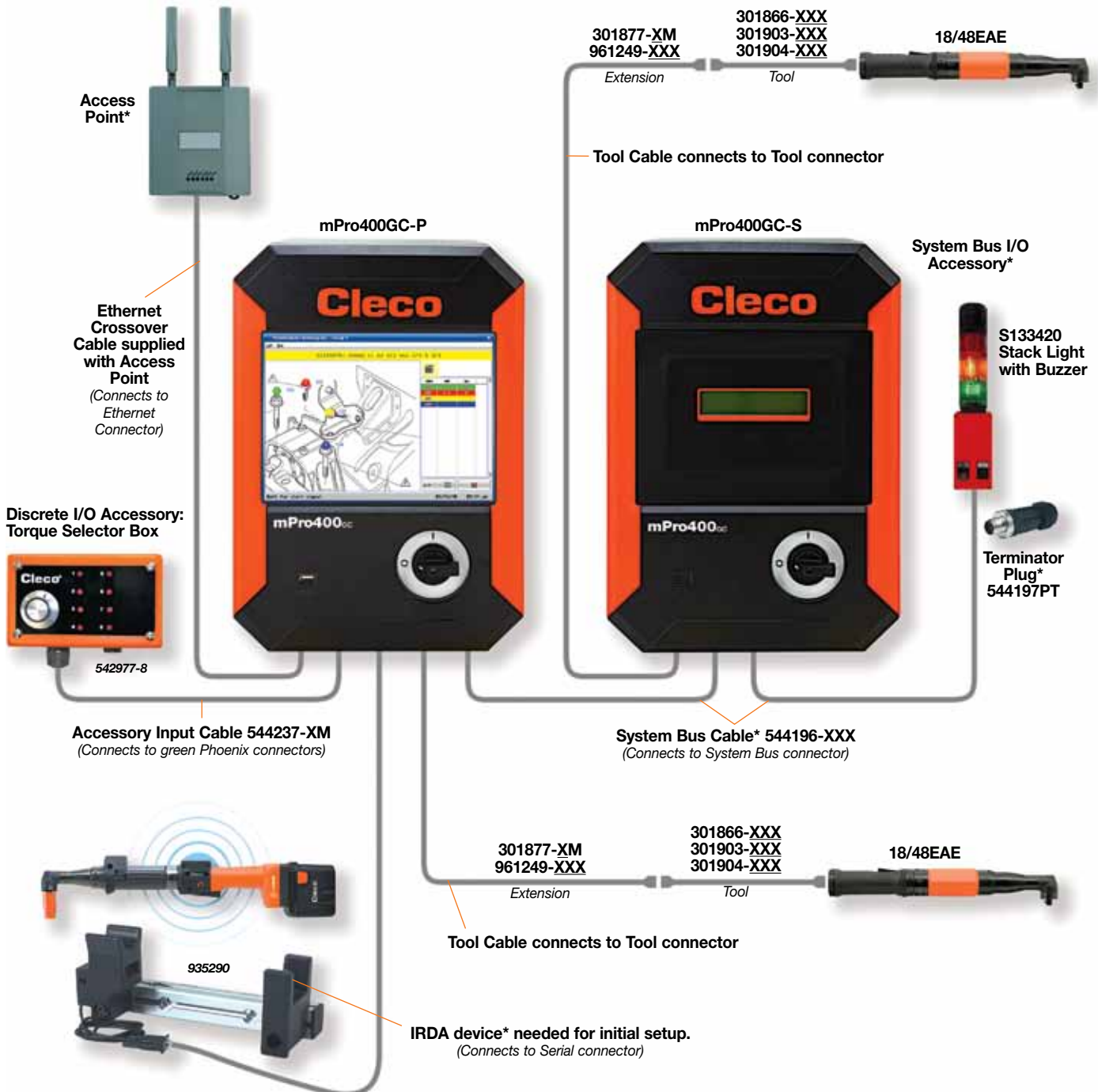
Inline Tools Mounting Plates



System Component Connectivity

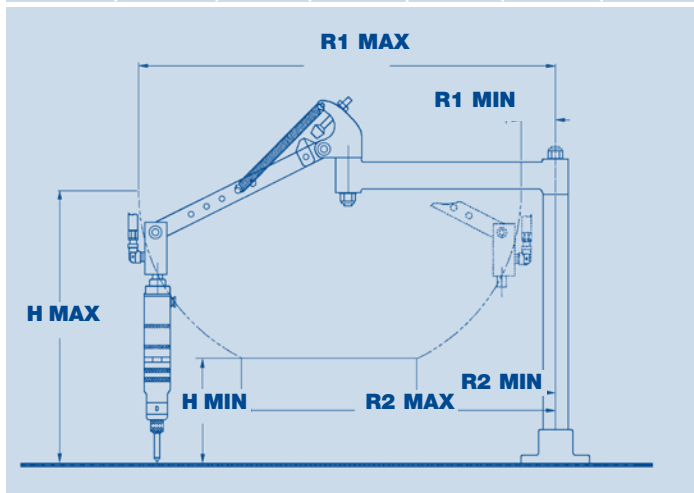
This diagram is intended to show how various components connect in a system, not necessarily the exact components required to create a particular system.

*These items do not apply to mPro400GC-E and mPro400GC-I

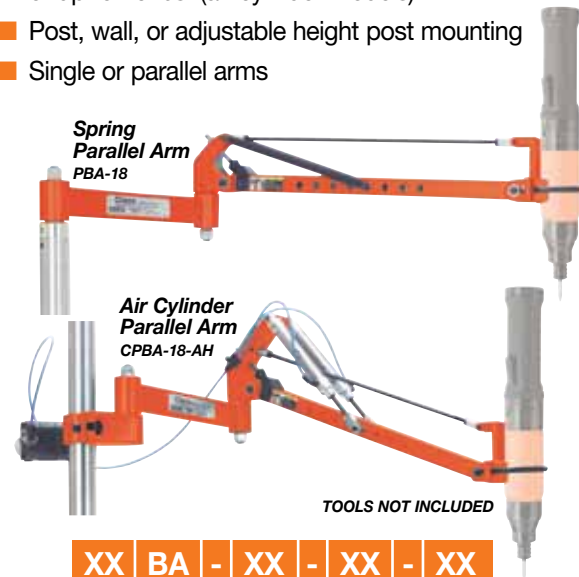


Balance Arm Operating Envelope

MODEL	R1 MAX		R1 MIN		R2 MAX		R2 MIN		H MAX		H MIN	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
SBA-12	24	610	2	51	18	457	8	203	15	381	6	152
SBA-18	30	762	6	152	20	508	7	178	15	381	0	0
PBA-12	26	660	3	76	20	508	7	178	17	432	8	203
PBA-18	32	813	8	203	22	559	6	152	17	432	2	51



- Ball bearing construction
- Supports tools weighing up to 5 lbs. (spring models) or up to 10 lbs. (air cylinder models).
- Post, wall, or adjustable height post mounting
- Single or parallel arms



XX BA - XX - XX - XX

Series
 CS - Air cylinder, single arm
 S - Spring, single arm
 CP - Air cylinder, parallel arm
 P - Spring, parallel arm

Tool Type
 BA - Balance Arm

Arm Extension
 12" 24"
 18" 30"
 (12" unless specified)

Mount
 - Post
 AH - Adjustable Height
 WM - Wall Mount

Adjustable Arm Extension
 12" 24"
 18" 30"

Single Arms		Parallel Arms		Dimensions							
Model No.	Code No.	Model No.	Code No.	A		B		C		D	
				in.	mm	in.	mm	in.	mm	in.	mm

Air Cylinder Models

CSBA18	520160	CPBA-18	520170	12	305	18	457	18	457	-	-
CSBA-24	520200			12	305	24	610	18	457	-	-
CSBA-30	520201	CPBA-30	520203	12	305	30	762	18	457	-	-
CSBA-12-AH	520165	CPBA-12-AH	520178	12	305	12	305	-	-	30	762
CSBA-18-AH	520162	CPBA-18-AH	520172	12	305	18	457	-	-	30	762
CSBA-30-AH	520167	CPBA-30-AH	520215	12	305	30	762	-	-	30	762
		CPBA-30-WM	520207	12	305	30	762	-	-	-	-

Spring Models

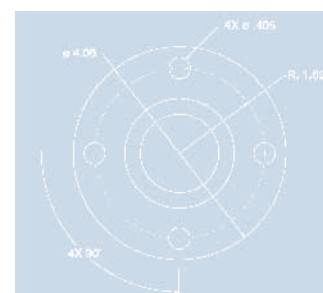
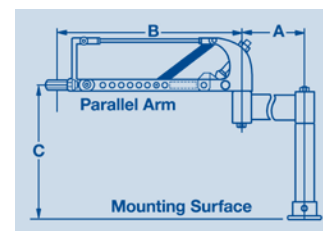
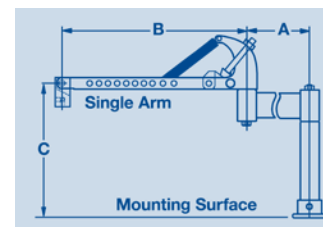
SBA-12	520001	PBA-12	520007	12	305	12	305	18	457	-	-
SBA-18	520004	PBA-18	520010	12	305	18	457	18	457	-	-
		PBA-24	520045	12	305	24	610	18	457	-	-
SBA-12-AH	520003	PBA-12-AH	520009	12	305	12	305	-	-	30	762
SBA-18-AH	520006	PBA-18-AH	520012	12	305	18	457	-	-	30	762
SBA-24-AH	520110	PBA-24-AH	520047	12	305	24	610	-	-	30	762
SBA-30-AH	520044	PBA-30-AH	520050	12	305	30	762	-	-	30	762
		PBA-18-18-AH	520036	18	457	18	305	-	-	30	762
		PBA-12-WM	520008	12	305	12	305	-	-	-	-
SBA-30-WM	520043			12	305	30	762	-	-	-	-

AH = Adjustable Height WM = Wall Mounted
 Tool weight capacity: 10 lbs. (4.6 kg) Air Cylinder models
 5 lbs. (2.3 kg) Spring models
 Torque capacity: 10 ft. lbs. (13.5 Nm)

Standard Equipment: Operating Instructions and Service Manual.
 Regulator for Air Cylinders.

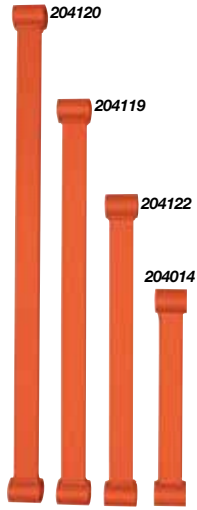
Threaded Nipples for CSBA Models
 1/4 NPT Hex Nipple: 204032 1/4 NPT x 1/8 NPT Hex
 Reducer Nipple: 204137

Optional Equipment: Additional accessories: See page 64.



Accessories

Balance Arms



Articulating Arm Extensions

Part Number	Length (inches)
204014	12
204122	18
204119	24
204120	30

Conversion Kits for Cleco Screwdriver Balance Arms

To Convert Balance Arms		Part No.
From	To	
SBA-12	PBA-12*	521041
SBA-18	PBA-18*	521042
Spring	Cylinder	201606
SBA or PBA Standard Duty	SBA or PBA Heavy Duty**	521060

*Conversion kits for -24 and -30 models are available upon request.
**Has four springs to support heavier tools or longer arms.

Tool Holders

Part Number	Description
301128	18/48 Pistol-Horiz. Tool Holder
301129	18/48 Pistol- Vert. Tool Holder
301130	18/48 Inline-Horiz. Tool Holder
301131	18/48 Inline-Vert. Tool Holder



Ergonomic Tool Balancers

Capacity:

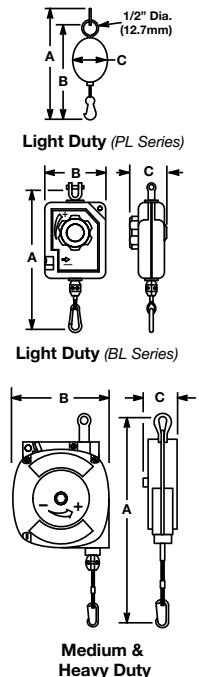
0.5 – 20.5 kg
1.0 – 45 Lbs

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



Model No.	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

*4.9 ft. cable travel



Your Single Source For Custom Automated Systems

Automated Systems provides custom solutions for the automated fastening of threaded joints.

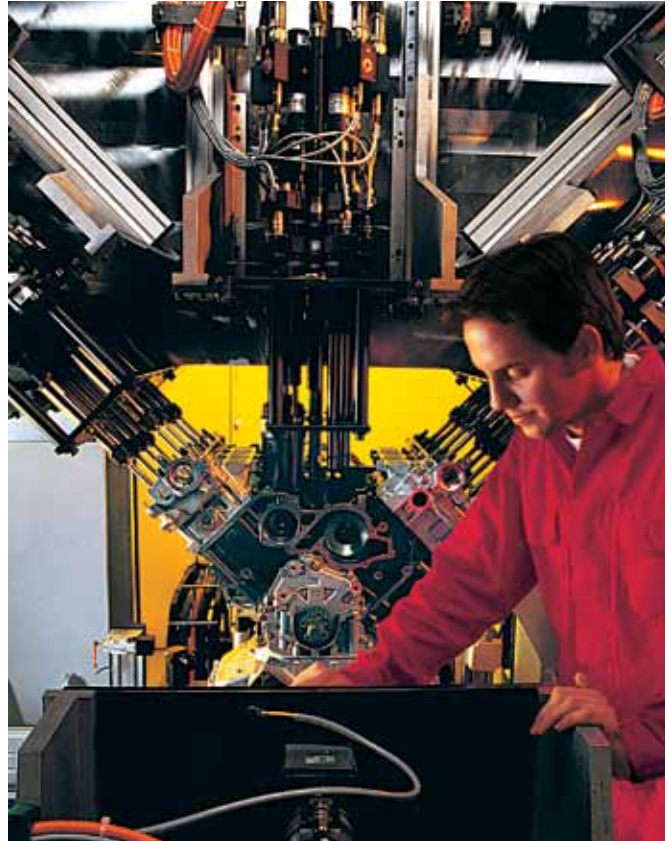
Our global customers span the entire vehicle assembly market, including passenger cars and trucks, power train assembly, off-road vehicles, and agricultural machines. We support machine tool builders in the vehicle and industrial markets with custom fastening system designs based on proven fastening product building modules.

Over many decades, Automated Systems has been providing custom solutions for training, service, and support. From single handheld nutrunners to multiple spindle machines, our custom designed systems are used around the world in an interesting variety of applications.

We have a full support staff of Sales Engineers, Mechanical Engineers, Controls Engineers, Project Managers, Field Service Engineers and In house Service Engineers waiting to serve you.

Custom Automated Solutions

The custom designed equipment Automated Systems creates can be configured in either vertical or horizontal orientations depending on the application and customer requirements



Shown below is a semi-automated water-pump subassembly fastening station. This station design includes a safety light curtain and a 4 spindle fixtured electric tool.



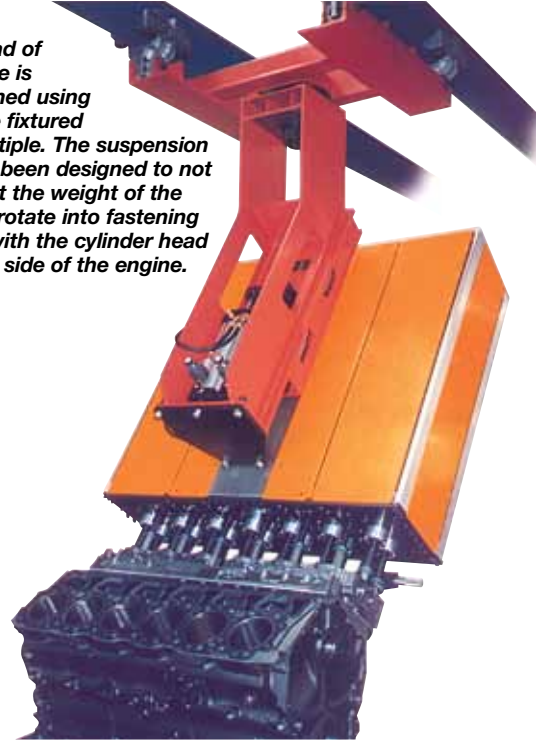
Automated Systems

utilizing standard components. Designs may incorporate operator input or be fully automated dependent on the needs of the customer.

Automated Systems' products use high-efficiency electric motors manufactured specifically for this application. Available motor torques range from 2 Nm to 4,000 Nm. Motor spindles can be mounted and arranged to match any pattern using standard in-line, special offset, and 90° angle electric motors.

In order to apply our powerhead designs, we also design custom suspension systems along with cable management systems to provide support and movement. In addition to custom built stations fitted with fixtured nutrunner powerheads, Automated System designs, builds, installs and provides service and support from the complete fastening lines.

The left cylinder head of a V12 engine is being fastened using a 26 spindle fixtured electric multiple. The suspension system has been designed to not only support the weight of the tool, but to rotate into fastening alignment with the cylinder head on the right side of the engine.

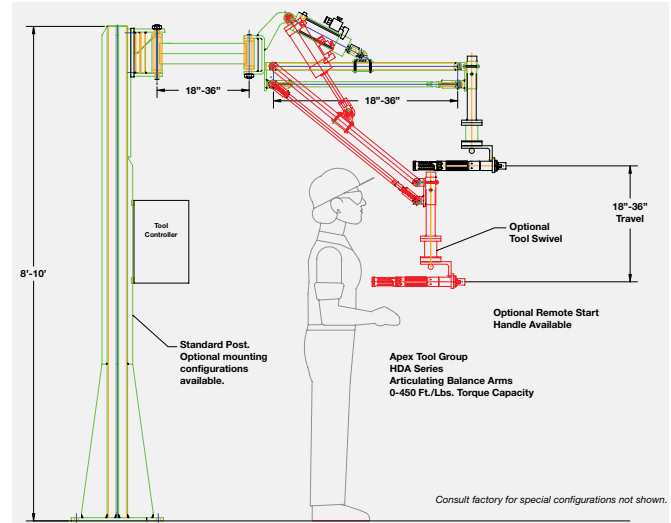


The above manually operated railroad wheel bearing multiple has the capability to tighten three (3) fasteners equally spaced on various centers between 3.50" to 5.85" diameters up to 600 NM torque.

Articulating Support Arms

The basic underlying reason for the use of an articulating arm is to improve productivity through applied ergonomics. A manufacturer cannot ignore the pressure to improve productivity of employees because of the impact productivity has on the bottom line.

Automated Systems offers an articulating arm that can be designed for your suspension application. Articulating arms are also called tool balance arms. Automated Systems' HDA series articulating arms are sized and designed to accommodate different size tools and mounting brackets required for specific applications. The arm can be suspended from an overhead rail,



structural column, ceiling mounted or post. The tool is typically mounted on the end of the arm.

Uses for Articulating Arms

- Stop or AGV stations
- Slow moving conveyor arms
- Work cells
- Side or overhead tool position work

Typical Articulating Arm Features

- Single or parallel arms
- Arm leveling base
- Boom
- Air balancing cylinder
- Mounting end
- Lift arm

Optional Features

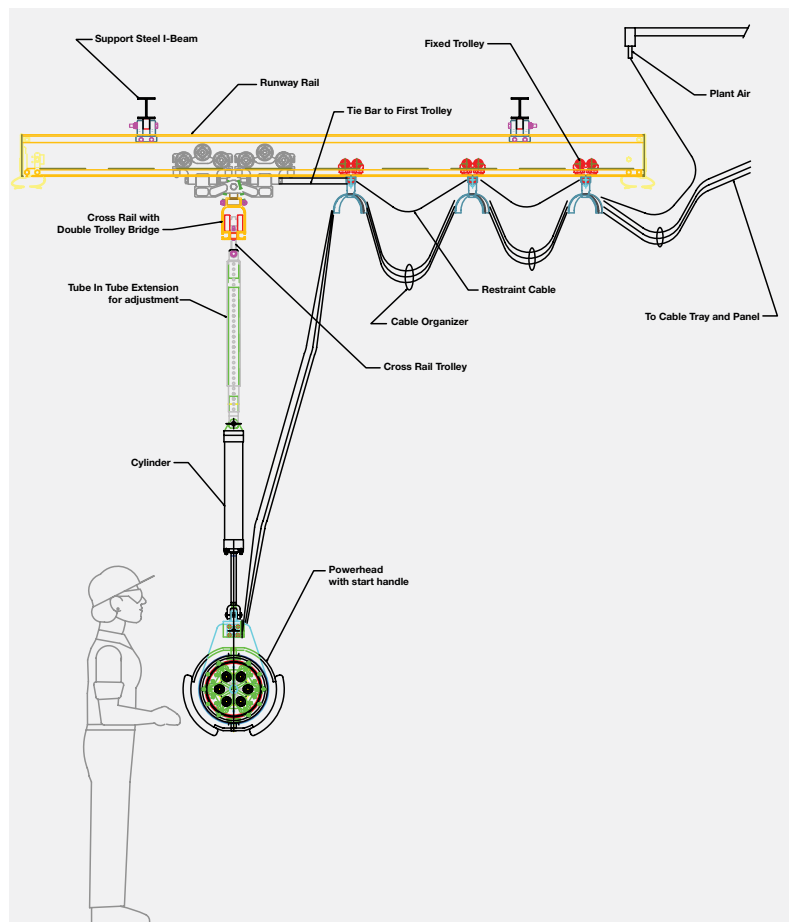
- Pneumatic or electric disc brake

Cable Management

Automated Systems can provide you with assistance ranging from concept to installation of an efficient cable management solution. Automated Systems equipment uses cables in conjunction with hand held tools, fixtured hand tools or when nutrunners are provided for incorporation into automated systems.

Cables need to be protected throughout their routing. We protect the cables from machine movement, equipment, chaffing, sharp objects, vibration, heat and liquid.

We have a full support staff of Sales Engineers, Mechanical Engineers, Controls Engineers, Project Managers, Field Service Engineers and In-house Service Engineers waiting to serve you.



Modular Handling Systems for Handheld Nutrunners & Tightening Spindles

Advantages

- High flexibility/adaptability to your fastening application
- Compact and coordinated system
- Effortless handling
- Can handle DGD and EMT spindles as well as Cleco DC nutrunners
- Modular components means short delivery times



Repair bay operator is using a two spindle fixtured tool to fasten components of a wheel hub assembly.

Standard Features

- Dual start/stop handles
- Lightweight aluminum covers & frame
- E-stop
- Ease of service. Easy spindle removal for maintenance or calibration
- Remote spindle indicator lights

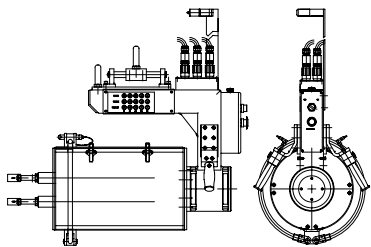
- 2 inch retractable spindle travel
- On-powerhead calibration
- Extended support tubes

Optional Features

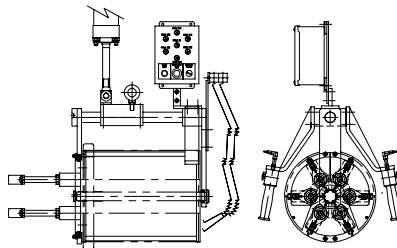
- Powerhead kick-off from wheel
- Remote digital display (MMI)

- Headlights
- Adjustable spindle centers
- Auto spindle retraction for multi-product assembly lines
- Fabricated steel suspension arm
- Part detection

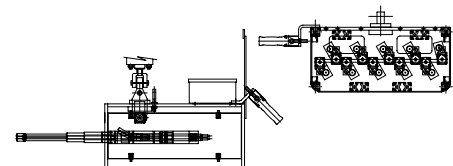
Typical Torque Handling System Configurations



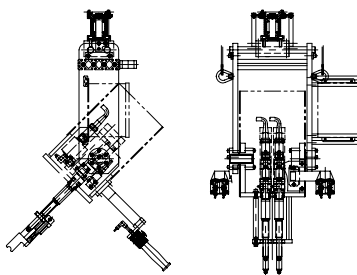
Horizontal Rear Trunion Mount (Wheelnut Application)



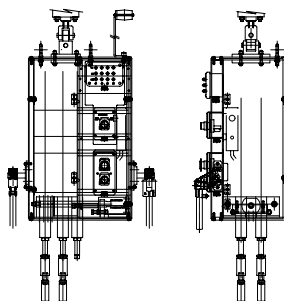
Horizontal Front Trunion Mount (Wheelnut Application)



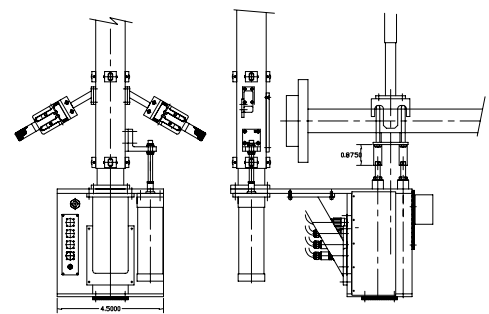
Horizontal Enclosure (Exhaust Manifold Application)



Angled Down Swivel Open Frame (Rocker Application)



Vertical Down Enclosure (U-bolt Application)



Vertical Up Enclosure (U-bolt Application)

Wheelnut Fastening

Automated Systems is the recognized leader in the design and manufacture of multiple spindle wheelnut assembly systems. We are known across the globe for excellence of innovative engineering design, support, and quality award winning service.

Decades of expertise in the design and manufacturing of multiple spindle fixtured and portable assembly systems have identified Automated Systems as an experienced, innovative supplier capable of creating custom solutions matched to unique customer assembly requirements.

Automated Systems makes use of standard system building block components which are used to blend a custom system from a complete line of DC electric spindles, fastening controllers and an extensive listing of twenty-four different fastening strategies which not only include the usual Torque Control, Angle Control and Yield, but also includes the unusual Pulse Torque Recovery makeup torque fastening strategy awarded US Patent number 5,094,301.

Medium Duty Wheelnut Tool For Passenger Vehicles requiring Medium Torque, High Volume

- 100 Nm to 500 Nm

Automated Systems supplies custom Wheelnut multiple designs using standard major components with proven track records for reliability, lifetime performance, millions of cycles capability and ergonomic solutions which support operator safety, comfort and efficiency.

Heavy Duty Wheelnut Tool For Trucks requiring High Torque, Low Volume

- 700 Nm to 1200 Nm

Automated Systems Wheelnut multiples use high-efficiency electric motors manufactured specifically for this application. Available motor torques range from 700 Nm to 1200 Nm. Motor spindles can be mounted and arranged to match any bolt circle pattern, using standard in-line motors with or without offset gearing.



Adjustable Wheel Stud Centers

When several similar wheels need to be assembled and the economics of separate powerheads dictates a single powerhead, Automated Systems has the answer! Adjustable stud centers. The position of the studs can be controlled by an operator manual switch, or auto detection.



Budd Double Wheels

When it comes to fastening inner and outer wheel lug nuts including Budd style stud/nut adapters, a wheelnut powerhead requires long retractable spindles which are designed to prevent side loading. Automated Systems has the know-how, and the products to supply wheelnut multiples for double wheel truck applications. Our wheel equipment is more rugged than the trucks it assembles.

Suspension System

A properly designed suspension system can not only support the tool and return it to a home position, it can also provide a zero gravity lift and hold. The total weight of the tool is controlled by the operator with very little pressure required to move the tool up or down.



Local Operator Display (Operator Interface)

Each powerhead displays a red, green, and yellow LED on a per spindle basis. The LED display indicates the status of the last tightening as NOK, OK and Low Torque or Angle. An optional local operator interface display can be used to display output, and accept touch screen switch inputs.



Some of the uses of a local operator display include:

- Application selection
- Tool home position jog
- Overall fastening status in green or red
- Part graphics
- Fastening values for torque and angle
- Functional push-button inputs & display outputs



Push-off and Return

On moving transfer lines, the overhead suspension system can be mounted to an overhead track, supporting the multiple. At the conclusion of the fastening rundown by all spindles, the suspension pushes the tool away from the wheel and returns the tool to the home position ready for the next wheel. The vehicle on the assembly transfer line continues to move while the lug nuts are being tightened.

Application Detection of Aluminum and Steel Wheels

Wheel lug nut tools are distinguished from standard horizontally aligned systems by their cylindrical shape. Rotation of the tool is required for proper alignment with the wheel lugs, and the ability to provide a clear line of sight for the operator. In addition, a 6 spindle tool can be rotated 30 degrees, rundown a second time and tighten the alternate 6 lug nuts on a 12 lug nut wheel. This alternative design is tightening dual truck wheels, and can automatically determine if the wheel is aluminum or steel and change the fastening parameters automatically.



Productivity That D

Introduced in 2005, DGD Intelligent Spindles were the first fixtured nutrunners that offered onboard servo and modular construction. Today, these third generation nutrunners are based on over 50 years of proven success of our conventional spindles.

DGD Intelligent Spindles combine high speed, exceptional up time availability, and unprecedented accuracy and durability in a compact design that requires substantially less cabling than traditional nutrunners. The result is productivity gains at a lower cost,

with up to 30% savings on initial purchase price. DGD Intelligent Spindles also offer easy integration with Cleco electric tool products, including the new Cleco Global Controller.



Durability & Accuracy

The BTSE nutrunners are certified to the highest standard of accuracy and durability.

- ISO certified to $\pm 2\%$ accuracy
- 1 million duty cycles maintenance free
- 3 million cycle guarantee @ 80% of capability

Compact On-Board Intelligence

The on-board servo module is proven technology that has been tested to:

- Shock & Vibration: 3 dimension at 13G
- Temperature : 45° C
- MTBF of 7 million cycles

Up To 170% Faster

With sealed, long-life, maintenance-free 380 VDC motors, DGD Intelligent Spindles are faster than a conventional spindle at most every torque level.

DGD Speed Comparison

Torque (Nm)	DGD Conventional Spindle	DGD Intelligent Spindle	DGD RPM Advantage
10	1222	1921	57%
50	329	890	170%
100	329	890	170%
150	219	502	137%
200	220	502	48%



Reduced Field Cables

DGD Intelligent Spindles provide a solution for the number-one cause of shut-down ... cable failure ... by substantially reducing the number of cables needed. Where DGD conventional spindles each need a separate cable, up to 16 Intelligent Spindles can be run from a single field cable by cascading cables between spindles.



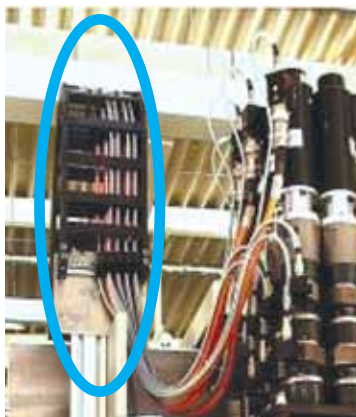
Drives Cost Savings

Acquisition & Installation Costs plus Floor Space Are All Reduced

DGD Conventional Spindle System Solution	DGD 10 Spindle Requirements		DGD Intelligent Spindle System Solution	
	Conventional	Intelligent		
	10	Controllers	1	
	10	Field Cables	1	
	10	Power Interface Points	1	
	5 hrs.	Cable Festooning Time	1 hr.	
	5 hrs.	Controller Installation Time	1 hr.	
	5 hrs.	Startup/Debug Time	3 hrs.	
	6 sq.ft.	Required Floor Space	3.5 sq.ft.	
	No	Ability to add additional tools to existing controller	Yes	

ATG Savings	Time & Material
Tools, Cables & Controller	\$
Installation	\$\$\$
Parts (cables & controllers)	\$
Total System Savings	\$\$

System Simplicity



Older and more expensive DGD Conventional System

Savings with a DGD 10 Spindle Intelligent Spindle System vs. DGD Conventional System In The Following Areas

Festooning Hardware (including installation)	<input checked="" type="checkbox"/>
Installation Labor	<input checked="" type="checkbox"/>
System Field Cables	<input checked="" type="checkbox"/>
Replacement Spare Parts & Cables	<input checked="" type="checkbox"/>
Trouble Shooting Time	<input checked="" type="checkbox"/>
System Availability	<input checked="" type="checkbox"/>

Incredible Savings!



Cost effective DGD Intelligent System

How To Build A Fixtured DC Tool System

Building a Fixtured DC Tool System is as simple as 1, 2, 3!

1. Choose a common system to the right.
2. Select the correct components below.
3. Order your System!



System Control Package -

Controller, Power Transformer, Power Distribution Box, Arcnet Cable, and Stand (Page 80)



Intelligent Fixtured Spindle (Page 79)



Floating Spindle Adapters (Page 78)



Field Cables - Intelligent Spindle (Page 77)



Jumper/Extension Cables - Intelligent Spindle (Page 77)



System Bus Terminator at spindle - Intelligent Spindle (Page 77)



Controller - Conventional Spindle (Page 40)



Conventional Fixtured Spindle (Pages 81-84)



Floating Spindle Adapters (Page 85)



Field Cables - Conventional Spindle (Page 77)



Extension Cables - Conventional Spindle (Page 77)



System Bus Cable - (Page 77)



System Bus Terminator at Controller - Conventional Spindle (Page 77)



Add or delete components as required.

Model/Part Number	Conventional Single Spindle (Size 1, 2)	Conventional Single Spindle (Size 3, 4)	Conventional Two Spindle (Size 1, 2)	Conventional Two Spindle (Size 3, 4)	>2 Convent. Spindles - Consult Application Center	>2 Intelligent Spindles - Consult Application Center	Single Intelligent Spindle	Two Intelligent Spindles	Single Application Center	Two Application Center
mPro400GCM PDBCPSXX - Select model from catalog.							1	1		
Select from catalog.							1	2		
Select from catalog.							1	2		
Select cable with desired connector from catalog.							1	1		
Select cable with desired connector from catalog.							1	1		
961127							1	1		
mPro400GC-P-12 (Primary Size 12)	1			1						
mPro400GC-S-12 (Secondary Size 12)				1						
mPro400GC-P-34 (Primary, Size 34)			1		1					
mPro400GC-S-34 (Secondary, Size 34)					1					
Select from catalog.	1	1	2	2						
Select from catalog.	1	1	2	2						
Select from catalog.	1	1	2	2						
Select from catalog.	1	1	2	2						
Select from catalog. <i>*(Included in the System Control Package)</i>			1		1		*	*		
544197PT			1		1					

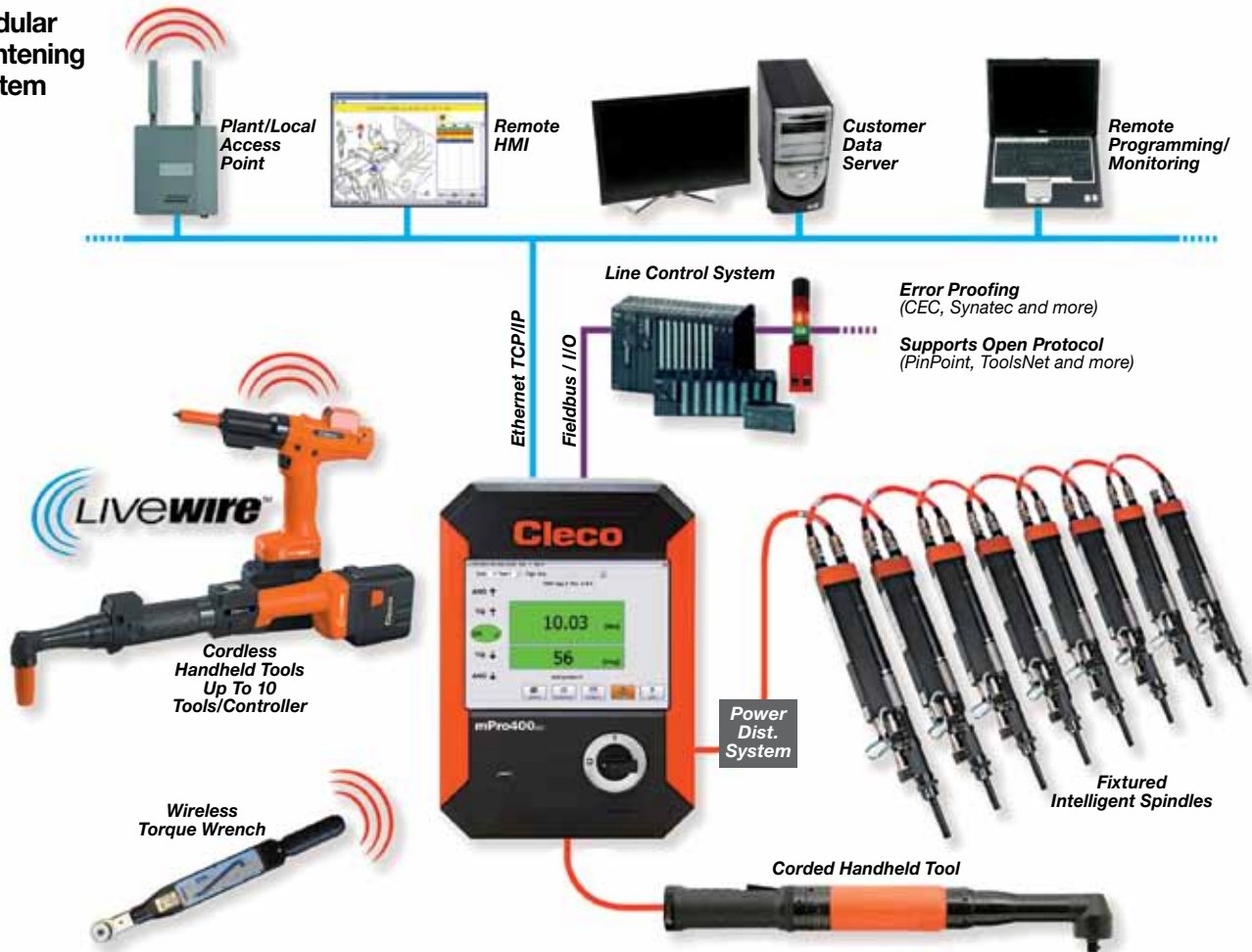
The Most Flexible, Cost-Effect

Versatility To Work With Many Tool Configurations

DGD Intelligent Spindles can be used in conjunction with any Cleco DC electric tool combination – cordless LiveWire or corded handheld – and with

the mPro400GC Global Controller for even greater efficiencies.

Modular Tightening System



One controller manages up to 32 tools simultaneously in varying combinations.

Cleco Global Controllers for Intelligent Spindles

Description	Tool Compatibility	Model
Primary	Cleco 18-48 Series, LiveWire, Intelligent Spindle*	MPRO400GC-P
Master	LiveWire, Intelligent Spindle*	MPRO400GC-M
Panel Mount	LiveWire, Intelligent Spindle	MPRO400GC-MPM

* Requires quote to accommodate hardware configurations.



Intelligent Systems Controller... Ever

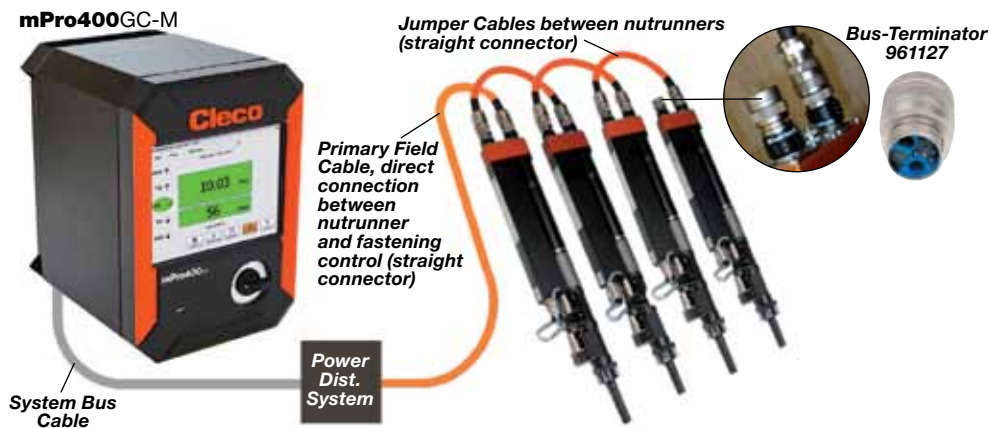
Connection & Extension Cables For Intelligent Spindles Jumper Cables, Straight Connector

HighFlex Quality

- For fixed or flexible routing with heavy-duty requirements in applications with cable drag chain or standard robot applications

SuperHighFlex Quality

- For robot and all high mobility applications (high durability) with complex motion-sequences
- Available on request



System Cables for Intelligent Spindle

System Bus Cables

Description	Length* (m)	Order No.
System Bus Cable	0.5	544196-005
System Bus Cable	2.0	544196-020
System Bus Cable	5.0	544196-050
System Bus Cable	20.0	544196-200
System Bus Cable	50.0	544196-500

*The cable lengths are specified in decimeters at the end of the order number

Jumper Cables

Description	Length* (m)	Order No.
Highflex Type D (Jumper) straight connector on both sides moulded connector housing	0.5	961104-005
	1.0	961104-010
	2.0	961104-020

Highflex Type E (Jumper) 90° connector on both sides rotatable cable glands

Highflex Type E (Jumper) 90° connector on both sides rotatable cable glands	0.5	961299-005
	1.0	961299-010
	2.0	961299-020

*The cable lengths are specified in decimeters at the end of the order number.
Other cable length on request.

Primary Field Cables

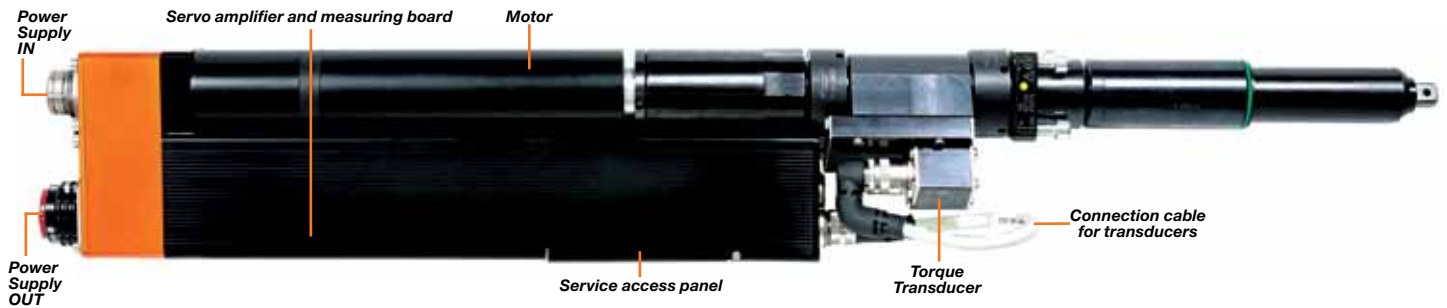
Description	Length* (m)	Order No.
Highflex Type A Straight connector on both sides	0,5	961104-005
	1	961104-010
	2	961104-020
	3	961104-030
	4	961104-040
	5	961104-050
	6	961104-060
	7	961104-070
	8	961104-080
	9	961104-090
	10	961104-100
	15	961104-150
	20	961104-200
30	961104-300	
40	961104-400	
50	961104-500	

*The cable lengths are specified in decimeters at the end of the order number

There's A DGD Intelligent S

With straight drive, offset drive, and angle drive configurations, each available with reversible gears, and four different motor sizes to suit different torque requirements, there's a DGD Intelligent Spindle to fit most any situation. Your Apex Tool Group Technical

Sales Representative will work with you to determine the best solution for you. We can also provide you with application assistance in automation integration, joint analysis testing, complex data connection, and more.



Example 1 BTSE — 1B035A — 2/ 1M1B — 1ZB

X XXXX — XXXXXX — X XXXX — XXXXX

Size
1, 2, 3, 4

Motor with servoamplifier & measurement card
B - Brushless Motor
U - Reverse gearing
TS - Tightening System
E - Standard

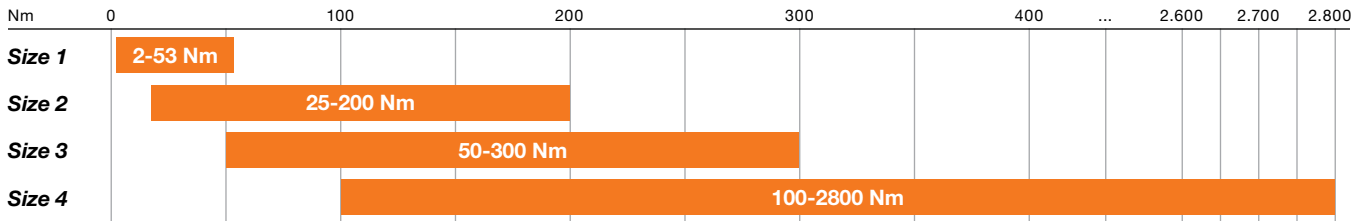
Gear
1 - Size
B - Brushless motor gear
XXX - Max. torque
A - Generation

2nd Transducer for cross check
2 - 2x only for Z attachment

Attachment
1 - Size
Z - Straight attachment
VK - Offset drive with transducer
WK - Angle drive with transducer
1 - Capacity level
B - Version

Transducer
1 - Size
K - Combination torque + angle
1 - Capacity level 1 or 2
B - Version
M - Only moment, no angle encoder

Intelligent Spindle Sizes and Torque Ranges



Floating Adapter



Size	Order No.	Sq. Dr.	Max. Torque Range (Nm)	X (mm)	Drive
1	922325	3/8"	60	180	1ZA 1VK
2	910609	1/2"	160	180	2ZA 2VK
2	935552	3/4"	200	180	2ZA 2VK
3	910613	3/4"	520	185	3ZA 3VK
4	912106	3/4"	520	190	4VK
4	912147	1"	1250	186	4VK
4	S976956	1"	1250	140	4ZA
4	S308441	1 1/2"	1600	140	4ZA
4	916642	3/4"	520	185	4ZA
4	916643	1"	1250	190	4ZA

Floating Adapter including flange housing



Size	Order No.	Sq. Dr.	Max. Torque Range (Nm)	X (mm)	Drive
1	S308434	3/8"	60	168	1 ZA
2	S308435	1/2"	160	172	2 ZA
2	S308450	3/4"	200	172	2 ZA
3	S308436	3/4"	520	176	3 ZA
1	S308437	3/8"	60	168	1 VK
2	S308438	1/2"	110	166,5	2 VK
2	S308475	3/4"	200	166,5	2 VK
3	S308439	3/4"	300	171	3 VK
4	S308440	3/4"	520	175	4 VK
4	S308474	1"	660	171	4 VK

Spindle For Your Application

Straight Drive, Sizes 1-4

Size	Torque Range		Speed RPM	Float		Sq. Dr. inch	Min. Center to center		Length		Weight		Design
	Ft. Lbs.	Nm		In.	mm		In.	mm	In.	mm	Lbs.	kg	
1	1.5-8.8	2-12	1921	1.97	50	3/8"	1.7	43	19.1	486	10.6	4.8	1BTSE-1B012A-1M3B-1ZB
1	3.7-25.8	5-35	727	1.97	50	3/8"	1.7	43	19.1	486	10.6	4.8	1BTSE-1B035A-1M1B-1ZB
1	11-39	15-53	427	1.97	50	3/8"	1.7	43	19.1	486	10.6	4.8	1BTSE-1B060A-1M2B-1ZB
2	18.4-81.1	25-110	890	1.97	50	1/2"	2.2	56	20.8	528	16.7	7.6	2BTSE-2B110A-2M1B-2ZB
2	29.5-147.5	40-200	502	1.97	50	3/4"	2.2	56	20.8	528	16.7	7.6	2BTSE-2B200A-2M3B-2ZB
3	36.8-221.2	50-300	453	1.97	50	3/4"	3.2	81	23.2	589	31.0	14.1	3BTSE-3B300A-3M2B-3ZB
4	73.7-368.7	100-500	254	1.97	50	3/4"	3.6	91	28.3	719	46.3	21	4BTSE-4B500A-4M2B-4ZA
4	95.8-486.7	130-660	174	1.97	50	1"	3.6	91	28.3	719	46.3	21	4BTSE-4B660A-4M3B-4ZA
4	236.0-921.9	320-1250 ¹	86	1.97	50	1"	4.8	121*	30.4	771	63.9	29	4BTSE-4B360A-4M1B-4Z1250A
4	295.0-1180.0	400-1600 ¹	68	1.97	50	1 1/2"	4.8	121*	30.4	771	63.9	29	4BTSE-4B500A-4M2B-4Z1600A
4	723.0-2065.0	980-2800	37	--	--	1 1/2"	6.3	160*	31.1	790	87.6	39.73	4BTSE-4B660A-4M3B-4Z2800G

Offset Drive, Sizes 1-4

1	1.5-8.8	2-12	1825	1.97	50	3/8"	1.4	35	18.7	474	11.7	5.3	1BTSE-1B012A-1VM3B
1	3.7-25.8	5-35	690	1.97	50	3/8"	1.4	35	18.7	474	11.7	5.3	1BTSE-1B035A-1VM1B
1	11-39	15-53	405	1.97	50	3/8"	1.4	35	18.7	474	11.7	5.3	1BTSE-1B060A-1VM2B
2	18.4-81.1	25-110	831	1.97	50	1/2"	1.7	44	21.7	551	20.3	9.2	2BTSE-2B110A-2VM1B
2	29.5-147.5	40-200	468	1.97	50	3/4"	1.7	44	21.7	551	20.3	9.2	2BTSE-2B200A-2VM3B
3	36.8-221.2	50-300	421	1.97	50	3/4"	2.3	59	22.9	584	33.5	15.2	3BTSE-3B300A-3VM2B
4	73.7-368.7	100-500	238	1.97	50	3/4"	2.9	76	26.9	684	49.6	22.5	4BTSE-4B500A-4VM2B
4	95.8-486.7	130-660	163	1.97	50	1"	2.9	76	26.9	684	49.6	22.5	4BTSE-4B660A-4VM3B
4	118.0-553.2	160-750	135	1.97	50	1"	2.9	76	26.9	684	50.7	23	4BTSE-4B660A-4VM4B

Angle Drive, Sizes 1-4

1	1.5-8.8	2-12	1801	.98	25	3/8"	2.0	52	21.3	542	12.5	5.7	1BTSE-1B012A-1WM3B
1	3.7-25.8	5-35	681	.98	25	3/8"	2.0	52	21.3	542	12.5	5.7	1BTSE-1B035A-1WM1B
1	11-39	15-53	400	.98	25	3/8"	2.0	52	21.3	542	12.5	5.7	1BTSE-1B060A-1WM2B
2	18.4-81.1	25-110	838	.98	25	1/2"	2.3	59	22.8	581	19.2	8.7	2BTSE-2B110A-2WM1B
2	29.5-147.5	40-200	472	.98	25	3/4"	2.3	59	22.8	581	19.2	8.7	2BTSE-2B200A-2WM3B
3	36.8-221.2	50-300	437	.98	25	3/4"	3.2	81	26.7	678	39.2	17.8	3BTSE-3B300A-3WM2B
4	73.7-368.7	100-500	245	.98	25	1"	4.4	112	28.7	729	59.7	27.1	4BTSE-4B500A-4WM2B
4	95.8-486.7	130-660	167	.98	25	1"	4.4	112	28.7	729	59.7	27.1	4BTSE-4B660A-4WM3B

Straight Drive with Reversible Gears, Sizes 1-4

1	1.5-8.8	2-12	1921	1.97	50	3/8"	1.7	43	15.5	393	11.7	5.3	1BUTSE-1B012A-1M3B-1ZB
1	3.7-25.8	5-35	727	1.97	50	3/8"	1.7	43	15.5	393	11.7	5.3	1BUTSE-1B035A-1M1B-1ZB
1	11-39	15-53	427	1.97	50	3/8"	1.7	43	15.5	393	11.7	5.3	1BUTSE-1B060A-1M2B-1ZB
2	18.4-81.1	25-110	890	1.97	50	1/2"	2.2	56	22.9	581	19.2	8.7	2BUTSE-2B110A-2M1B-2ZB
2	29.5-147.5	40-200	502	1.97	50	3/4"	2.2	56	22.9	581	19.2	8.7	2BUTSE-2B200A-2M3B-2ZB
3	36.8-221.2	50-300	453	1.97	50	3/4"	3.2	81	16.4	417	35.5	16.1	3BUTSE-3B300A-3M2B-3ZB
4	73.7-368.7	100-500	254	1.97	50	3/4"	3.6	91	21.5	546	49.6	22.5	4BUTSE-4B500A-4M2B-4ZA
4	95.8-486.7	130-660	174	1.97	50	1"	3.6	91	21.5	546	49.6	22.5	4BUTSE-4B660A-4M3B-4ZA
4	236.0-921.9	320-1250 ¹	86	1.97	50	1"	4.8	121*	23.6	599	68.3	31	4BUTSE-4B360A-4M1B-4Z1250A
4	295.0-1180.1	400-1600 ¹	68	1.97	50	1 1/2"	4.8	121*	23.6	599	68.3	31	4BUTSE-4B500A-4M2B-4Z1600A

Offset Drive with Reversible Gears, Sizes 1-4

1	1.5-8.8	2-12	1825	1.97	50	3/8"	1.4	35	15.0	382	12.8	5.8	1BUTSE-1B012A-1VM3B
1	3.7-25.8	5-35	690	1.97	50	3/8"	1.4	35	15.0	382	12.8	5.8	1BUTSE-1B035A-1VM1B
1	11-39	15-53	405	1.97	50	3/8"	1.4	35	15.0	382	12.8	5.8	1BUTSE-1B060A-1VM2B
2	18.4-81.1	25-110	831	1.97	50	1/2"	1.7	44	15.3	390	22.5	10.2	2BUTSE-2B110A-2VM1B
2	29.5-147.5	40-200	468	1.97	50	3/4"	1.7	44	15.3	390	22.5	10.2	2BUTSE-2B200A-2VM3B
3	36.8-221.2	50-300	421	1.97	50	3/4"	2.3	59	16.2	412	37.9	17.2	3BUTSE-3B300A-3VM2B
4	73.7-368.7	100-500	238	1.97	50	3/4"	2.9	76	20.2	512	52.9	24	4BUTSE-4B500A-4VM2B
4	95.8-486.7	130-660	163	1.97	50	1"	2.9	76	20.2	512	52.9	24	4BUTSE-4B660A-4VM3B
4	118-553.2	160-750	135	1.97	50	1"	2.9	76	20.2	512	54.0	24.5	4BUTSE-4B660A-4VM4B

Angle Drive with Reversible Gears, Sizes 1-4

1	1.5-8.8	2-12	1801	.98	25	3/8"	2.0	52	14.5	370	13.6	6.2	1BUTSE-1B012A-1WM3B
1	3.7-25.8	5-35	681	.98	25	3/8"	2.0	52	14.5	370	13.6	6.2	1BUTSE-1B035A-1WM1B
1	11-39	15-53	400	.98	25	3/8"	2.0	52	14.5	370	13.6	6.2	1BUTSE-1B060A-1WM2B
2	18.4-81.1	25-110	838	.98	25	1/2"	2.3	59	16.6	421	21.4	9.7	2BUTSE-2B110A-2WM1B
2	29.5-147.5	40-200	472	.98	25	3/4"	2.3	59	16.6	421	21.4	9.7	2BUTSE-2B200A-2WM3B
3	36.8-221.2	50-300	437	.98	25	3/4"	3.2	81	19.9	506	43.6	19.8	3BUTSE-3B300A-3WM2B
4	73.7-368.7	100-500	245	.98	25	1"	4.4	112	21.9	556	63.0	28.6	4BUTSE-4B500A-4WM2B
4	95.8-486.7	130-660	167	.98	25	1"	4.4	112	21.9	556	63.3	28.7	4BUTSE-4B660A-4WM3B

¹ Special version - technical drawings on request

*Twin transducer (redundant) models are available. The transducer can be rotated for crowded multiple spindle arrangements (DGD 10° radial toothing) = maximum accessibility. Floating adapter not included with spindle.

Intelligent Spindles

Accessories

Power Table

Overview of possible numbers of channels

The maximum number of DGD Intelligent Spindles per mPro400GC Controller depends on load. When calculating the maximum number of spindles, please consider the following conditions:

- Maximum speed at 20% of maximum torque (at 1BTSE, 2BTSE, 3BTSE and 4BTSE)
- Final tightening stage up to 500 Nm Maximal Speed 50 rpm at maximum torque (at 1BTSE, 2BTSE, 3BTSE and 4BTSE-4B500A...)

- Final tightening stage over 500 Nm Maximal Speed 20 rpm at maximum torque (at 4BTSE-4B660A..., 4BTSE-4B660A-4VK4MS, 4BTSE-4B360A-4Z1250A and 4BTSE-4B460A-4Z1600A)

If higher settings are chosen, number of channels should be reduced.

If different spindle types are used at the controller, the number of channels will be individually defined.

Please contact Apex Tool Group.

Control Type	Maximum number of DGD Intelligent Spindles				Number of cables to fastening control	Comments
	1BTSE...	2BTSE...	3BTSE...	4BTSE...		
CPM3	16	6	6	6	1	OC=Outside Controller
CPM3	16	6	6	6	1	H=With Archnet
CPM6	32	12	12	12	2	Archnet Hub Included
CPM9	...	18	18	18	3	Archnet Hub Included
Control Panel	...	32	32	32	...	Archnet Hub Included

Power Distribution System

The Power Distribution System is used in conjunction with the Intelligent Spindles. This system is used for power distribution. Standard hardware such as E stop circuitry, 24VDC power supply, power transformer, line filter, CPM, necessary relays and disconnect.

Power Distribution System	Part No.
CPM3	PDB-CPS3
CPM6	PDB-CPS6
CPM9	PDB-CPS9



Power Control Package

Each Power Control Package consists of the following:

- mPro400 GC-M Global Controller
- PDB-CPS X power distribution box
- Power transformer
- Aluminum stand

Part Number
MPRO400GCMPCPS3A
MPRO400GCMPCPS3T
MPRO400GCMPCPS6A
MPRO400GCMPCPS6T
MPRO400GCMPCPS9A
MPRO400GCMPCPS9T

T=PLC Siemens S7 for additional I/O



Torque Transducer Verification Fixture (TTVF)

Fast, accurate, cost effective way to verify your torque transducer on the assembly line measure. Included is a joint simulator, slip ring torque transducer and spindle adapter. The joint simulator can be mounted to a tooling plate or mounted to the spindle directly. Any data recorder with the proper interface can be used.



Torque Range (Nm)	Part No.
2-23	579900PT-23
6-68	579900PT-68
20-200	579900PT-200
50-500	579900PT-500
100-1000	579900PT-1000



Cleco®

18ESE, 48ESE & 67ES Inline Floating Spindle Series



Torque Range
2 - 2060 Nm
1.5 - 1520 Ft. Lbs.

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

Cleco Inline Floating Spindle Model Number	Torque Range		Max. Speed RPM	Float		Output Drive Size	Minimum Center to Center		Weight*		Length	
	ft. lbs.	Nm		in.	mm		in.	mm	lbs.	kg	in.	mm
18ESE06ZA	1.5-4.4	2-6	4000	.98	25	1/4	1.81	46	3.0	1.4	15.5	394
18ESE12ZA	2.2-8.9	3-12	1820	.98	25	1/4	1.81	46	3.2	1.5	16.0	406
18ESE17ZA	3.0-12.5	4-17	1290	.98	25	1/4	1.81	46	3.2	1.5	16.0	406
48ESE12ZA	2.2-8.9	3-12	4000	.98	25	1/4	1.81	46	3.4	1.5	16.7	425
48ESE271ZB	4.4-19.9	6-27	1820	1.97	50	3/8	1.81	46	5.8	2.6	22.0	559
48ESE361ZB	5.9-28.0	8-38	1290	1.97	50	3/8	1.81	46	5.8	2.6	22.0	559
48ESE602ZB	8.8-42.0	12-57	855	1.97	50	1/2	2.20	56	8.4	3.8	24.4	620
48ESE702ZB	10.3-50.2	14-68	570	1.97	50	1/2	2.20	56	8.4	3.8	24.4	620
48ESE802ZB	12.5-60.5	17-82	450	1.97	50	1/2	2.44	62	9.6	4.4	26.7	678
48ESE1152ZB	18.4-84.8	25-115	320	1.97	50	1/2	2.44	62	9.6	4.4	26.7	678
48ESE1502ZB	22.1-110.6	30-150	245	1.97	50	1/2	2.44	62	9.6	4.4	26.7	678
48ESE1653ZB	24.3-121.7	33-165	220	1.97	50	3/4	3.15	80	14.6	6.6	28.6	726
48ESE2503ZB	36.1-182.1	49-247	145	1.97	50	3/4	3.15	80	14.6	6.6	28.6	726
67ES65BZ4	10-47	13-64	535	.69	17.6	1/2	1.31	33	10.8	4.9	21.0	533
67ES105BZ4	15-77	21-104	330	.69	17.6	1/2	1.31	33	10.8	4.9	21.0	533
67ES135BZ4	20-100	27-135	245	.69	17.6	1/2	1.31	33	10.8	4.9	21.0	533
67ES190Z6	28-140	38-190	165	.75	19	3/4	1.31	33	15.6	7.1	22.0	559
67ES285Z6	42-210	57-285	115	.75	19	3/4	1.31	33	15.6	7.1	22.0	559
67ES385Z6	57-285	77-386	83	.75	19	3/4	1.31	33	15.6	7.1	22.0	559
67ES475Z6	70-350	95-475	67	.75	19	3/4	1.31	33	16.0	7.3	22.4	569
67ES610Z6	90-450	122-610	50	.75	19	3/4	1.31	33	16.0	7.3	22.4	569
67ES850Z8	125-625	170-848	33	1.0	25	1	1.50	38	20.0	9.1	23.8	605
67ES1050Z8	155-775	210-1050	27	1.0	25	1	1.50	38	20.0	9.1	23.8	605
67ES1670Z8	246-1230	334-1668	17	1.0	25	1	1.50	38	20.0	9.1	23.8	605
67ES2060Z8	304-1520	412-2060	14	1.0	25	1	1.50	38	20.0	9.1	23.8	605

*Weights are without tool cable and mounting plate.

General: All tools must be used with an approved ATG cable and controller.

Standard Equipment: 18/48 series tools; Air-LB Connector; Mounting plate.

Tools with Matrix connector available upon request.
67 tools; Matrix Connector; Mounting plate

Extra Equipment: 18/48 tools; Std. tool cable 301866-XX, RA swivel cable 301903-XX, Inline swivel cable 301904-XX, Extension cable 301877-XX.

67 tools; Std. tool cable 542778-XX, RA swivel cable 544055-XX, Inline swivel cable 544056-XX, Extension cable 542779-XX.

Additional Accessories: See pages 58-61 for additional accessories.



DGD

Inline Floating Spindle

Torque Range
2 - 2800 Nm
1.5 - 2065 Ft. Lbs.

Bolt Size
M5 - M40
#10 - 1 3/4"

DGD Inline Floating Spindle			Torque Range		Max. Speed RPM	Float		Output Drive Size	Minimum Center to Center		Weight		Length	
Part No.	Model Number	Motor Size	ft. lbs.	Nm		in.	mm		in.	mm	lbs.	kg	in.	mm
578514	1BB-1B011A-1K3MS-1ZA	1	1.5-8.1	2-11	1222	1.97	50	3/8	1.69	43	3.0	1.4	15.6	396
578500	1BB-1B030A-1K1M-1ZA	1	3.7-23.6	5-32	462	1.97	50	3/8	1.69	43	3.2	1.5	15.6	396
578502	1BB-1B050A-1K2M-1ZA	1	11.0-39.0	15-53	272	1.97	50	3/8	1.69	43	3.2	1.5	15.6	396
578600	2BB-2B100A-2K1M-2ZA	2	18.4-75.2	25-102	329	1.97	50	1/2	2.20	56	3.4	1.5	18.9	481
578602	2BB-2B150A-2K2M-2ZA	2	22.1-112.8	30-153	219	1.97	50	1/2	2.20	56	5.8	2.6	18.9	481
578700	3BB-3B260A-3K2M-3ZA	3	22.1-132.7	30-180	339	1.97	50	3/4	3.18	81	5.8	2.6	21.9	558
578702	3BB-3B180A-3K1M-3ZA	3	36.8-191.7	50-260	220	1.97	50	3/4	3.18	81	8.4	3.8	21.9	558
578800	4BB-4B360A-4K1M-4ZA	4	88.5-265.5	120-360	266	1.97	50	3/4	3.58	91	44	20	27.1	689
578801	4BB-4B460A-4K2M-4ZA	4	118.0-339.2	160-460	209	1.97	50	3/4	3.58	91	44	20	27.1	689
578802	4BB-4B630A-4K2M-4ZA	4	162.2-464.6	220-630	141	1.97	50	1	3.58	91	44	20	27.1	689
578803	4BB-4B360A-4K1M-4Z1250A	4	295.0-921.8	400-1250	78	1.97	50	1	4.76	121	61.7	28	29.2	742
578804	4BB-4B460A-4K2M-4Z1600A	4	398.2-1180.1	540-1600	61	1.97	50	1.5	4.76	121	61.7	28	29.2	742
	4BB-600K-3Z2800G	4	720-2065	980-2800	37	--	--	1.5	6.30	160	82	40	29.8	759

Standard Equipment: Air LB Connector

Fixtured Electric Nutrunners – Transducer Control

Inline & Offset Floating Spindle Tools



EMT Inline Floating Spindles Series

Torque Range
54 - 1485 Nm
40 - 1095 Ft. Lbs.

Bolt Size
M10 - M30
7/16" - 1 3/8"



EMT Inline Floating Spindle			Torque Range		Max Speed	Float		Output drive size	Min center dist		Weight		Length	
Part No.	Motor Size	Model No.	ft. lbs.	Nm	RPM	in.	mm.		in	mm	lbs	kg.	in.	mm
571222	2	EMT200-10R6-1/2"-APM	40	54	614	2	50.8	0.5	2.38	60.3	15.5	7	21.82	554.2
571211	2	EMT200-5R6-1/2"-APM	73	99	334	2	50.8	0.5	2.38	60.3	15.5	7	21.82	554.2
571221	2	EMT200-4R6-1/2"-APM	97	132	250	2	50.8	0.5	2.38	60.3	15.5	7	21.82	554.2
571205	2	EMT200-3R6-1/2"-APM	144	195	169	2	50.8	0.5	2.38	60.3	15.5	7	21.82	554.2
571220	2	EMT200-2R6-1/2"-APM	192	260	127	2	50.8	0.62	2.38	60.3	15.5	7	21.82	554.2
571308	3	EMT400-10R6-3/4"-APM	50.1	67.9	1155	2	50.8	0.75	6.38	162	29	13.2	23.89	606.8
571307	3	EMT400-8R6-3/4"-APM	69.4	94.1	833	2	50.8	0.75	6.38	162	29	13.2	23.89	606.8
571304	3	EMT400-5R6-3/4"-APM	179	243	310	2	50.8	0.75	6.38	162	29	13.2	23.89	606.8
571303	3	EMT400-4R6-3/4"-APM	208	282	266	2	50.8	0.75	6.38	162	29	13.2	23.89	606.8
571302	3	EMT400-3R6-3/4"-APM	288	391	192	2	50.8	0.75	6.38	162	29	13.2	23.89	606.8
571400	3	EMT600-3R6-1"-APM	396	537	149	2	50.8	1"	7.12	181	35	15.9	24.25	616
571404	3	EMT600-2R6-1"-APM	576	781	102	2	50.8	1"	7.12	181	35	15.9	24.25	616
571500	4	EMT800-2R6-1"-APM	792	1073	102	2	50.8	1"	7.5	190.5	50	22.6	28.44	722.4
571002	4	EMT1200-2R8-1"-APM	1095	1485	74	2	50.8	1"	9.38	238.12	60	27.2	32.91	835.9

*EMT200, EMT400 - Optional length spindle drivers available (R8,R10,R12)
 *EMT600, EMT800 - Optional length spindle drivers available (R8,R10,R12,R16)
 *EMT200 - Output drive size (Sq. Drive) available in 1/2", 5/8"
 *EMT400, EMT600 - Output drive size (Sq. Drive) available in 3/4", 1"
 *EMT Fixtured tools may be configured to meet your requirements.
 Contact Apex Tool Group for your configuration.

Standard Equipment: Air LB Connector
Optional Connectors: Contact your nearest ATG Sales & Service Center if a motor is required with a VEAM or PTR connector.



Offset Floating Spindle Series

Torque Range
2 - 1600 Nm
1.5 - 1180.1 Ft. Lbs.

Bolt Size
M5 - M24
#10 - 1 1/8"



DGD Offset Floating Spindle			Torque Range		Max. Speed	Float		Output Drive Size	Minimum Center to Center		Weight		Length	
Part No.	Model Number	Motor Size	ft. lbs.	Nm	RPM	in.	mm		in.	mm	lbs.	kg	in.	mm
578515	1BB-1B011A-1VK3M	1	1.5-8.1	2-11	1161	1.97	50	3/8	1.37	35	8.8	4.0	15.1	384
578506	1BB-1B050A-1VK1M	1	3.7-23.6	5-32	439	1.97	50	3/8	1.37	35	8.8	4.0	15.1	384
578505	1BB-1B030A-1VK2B	1	11.0-39.0	15-53	258	1.97	50	3/8	1.37	35	8.8	4.0	15.1	384
578613	2BB-2B100A-2VK1M	2	18.4-75.2	25-102	307	1.97	50	1/2	1.73	44	17.8	8.1	19.8	504
578614	2BB-2B150A-2VK2M	2	22.1-112.8	30-153	204	1.97	50	1/2	1.73	44	17.8	8.1	19.8	504
578709	3BB-3B180A-3VK1M	3	22.1-132.7	30-180	315	1.97	50	3/4	2.32	59	31.3	14.2	21.7	553
578705	3BB-3B260A-3VK2M	3	36.8-191.7	50-260	204	1.97	50	3/4	2.32	59	31.3	14.2	21.7	553
578805	4BB-4B360A-4VK1M	4	88.5-265.5	120-360	249	1.97	50	3/4	2.99	76	47.3	21.5	25.7	655
578806	4BB-4B460A-4VK2M	4	118.0-339.2	160-460	196	1.97	50	3/4	2.99	76	47.3	21.5	25.7	655
578807	4BB-4B630A-4VK3M	4	162.2-464.6	220-630	133	1.97	50	1	2.99	76	47.3	21.5	25.7	655
578808	4BB-4B630A-4VK4MS	4	184.4-590.0	250-800	110	1.97	50	1	2.99	76	48.5	22.0	25.7	655

Standard Equipment: Air LB Connector



Cleco®

EMT Offset Floating Spindles Series

Torque Range
54 - 1073 Nm
40 - 792 Ft. Lbs.

Bolt Size
M10 - M27
7/16" - 1 1/4"

EMT Offset Floating Spindles			Torque Range		Max Speed	Float		Output drive size	Min center dist		Weight		Length	
Part No.	Motor Size	Model No	ft. lbs	Nm	RPM	in.	mm.		in	mm	lbs	kg.	in.	mm
571223	2	EMT200-10-OS150-1/2"-APM	40	54	614	2	50.8	0.5	1.5	38.1	21	9.5	25.26	641.6
571215	2	EMT200-5-OS150-1/2"-APM	73	99	334	2	50.8	0.5	1.5	38.1	21	9.5	25.26	641.6
571224	2	EMT200-4-OS150-1/2"-APM	97	132	250	2	50.8	0.5	1.5	38.1	21	9.5	25.26	641.6
571225	2	EMT200-3-OS250-1/2"-APM	144	195	169	2	50.8	0.5	1.88	47.6	21	9.5	25.26	641.6
571201	2	EMT200-2-OS250-5/8"-APM	192	260	127	2	50.8	0.62	1.88	47.6	21	9.5	25.26	641.6
571309	3	EMT400-5-OS400-3/4"-APM	179	243	310	2	50.8	0.75	4.75	120.6	39	17.7	30	762
571310	3	EMT400-4-OS400-3/4"-APM	208	282	266	2	50.8	0.75	4.75	120.6	39	17.7	30	762
571311	3	EMT400-3-OS400-3/4"-APM	288	391	192	2	50.8	0.75	4.75	120.6	39	17.7	30	762
571410	3	EMT600-3-OS600-1"-APM	396	537	149	2	50.8	1"	4.75	120.6	45	20.4	30.38	771.6
571413	3	EMT600-2-OS600-1"-APM	576	781	102	2	50.8	1"	4.75	120.6	45	20.4	30.38	771.6
571503	4	EMT800-2-OS800-1"-APM	792	1073	102	2	50.8	1"	5.62	142.7	90	40.8	34.56	877.8

*EMT Fixtured Offset tools may be configured to meet your requirements. Contact Apex Tool Group for your configuration.

Standard Equipment: Air LB Connector.

Optional Connectors: Contact your nearest ATG Sales & Service Center if a motor is required with a VEAM or PTR connector.



Cleco®

Right 18EAE, 48EAE & 67EA Angle Floating Spindle

Torque Range
5.1 - 255 Nm
3.7 - 188.1 Ft. Lbs.

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

Cleco Angle Floating Spindle Model Number	Torque Range		Max. Speed	Float		Output Drive Size	Minimum Center to Center		Weight*		Length	
	ft. lbs.	Nm	RPM	in.	mm		in.	mm	lbs.	kg	in.	mm
18EAE16S131	3.7-12.5	5.1-17	1225	.98	25	3/8	1.10	28	4.4	2.0	16.0	406
18EAE23S131	5.3-17.7	7.2-24	860	.98	25	3/8	1.10	28	4.4	2.0	16.0	406
18EAE30S131	4.4-22.8	6.0-31	655	.98	25	3/8	1.10	28	4.4	2.0	16.0	406
48EAE37S231	5.9-28.0	8.0-38	1225	.74	19	3/8	1.33	34	5.2	2.4	18.6	474
48EAE52S231	8.1-39.8	11-54	860	.74	19	3/8	1.33	34	5.2	2.4	18.6	474
48EAE53S341	8.1-39.8	11-54	850	.74	19	1/2	1.73	44	5.9	2.7	20.0	509
48EAE74S341	11.0-56.8	15-77	600	.74	19	1/2	1.73	44	5.9	2.7	20.0	509
48EAE95S341	14.7-72.2	20-98	460	.74	19	1/2	1.73	44	5.9	2.7	20.0	509
48EAE110S341	16.9-81.1	23-110	400	.74	19	1/2	1.73	44	7.2	3.3	20.5	521
48EAE135S461	20.6-101.7	28-138	270	.74	19	3/4	2.12	54	8.8	4.0	20.5	522
48EAE230S461	34.6-172.5	47-234	150	.74	19	3/4	2.12	54	10.3	4.7	22.1	563
67EA150S461	22.1-110.6	30-150	210	.74	19	3/4	2.04	52	13.0	5.9	25.7	655
67EA185S461	27.3-136.3	37-185	170	.74	19	3/4	2.04	52	13.0	5.9	25.7	655
67EA210S461	31.0-154.8	42-210	155	.74	19	3/4	2.04	52	13.0	5.9	25.7	655
67EA235S461	33.9-169.6	46-230	135	.74	19	3/4	2.04	52	13.0	5.9	25.7	655
67EA255S461	40.6-188.1	55-255	115	.74	19	3/4	2.04	52	13.0	5.9	25.7	655

*Weights are without tool cable and mounting plate.

Note: All 67 series tools require an isolation transformer (544185PT) for use with Cleco Global Controller.

General: All tools must be used with an approved ATG cable and controller.

Standard Equipment: 18/48 series tools; Air-LB Connector; Mounting plate.

Tools with Matrix connector available upon request.

67 series tools; Matrix Connector; Mounting plate

Extra Equipment: 18/48 tools; Std. tool cable 301866-XX, RA swivel cable 301903-XX, Inline swivel cable 301904-XX, Extension cable 301877-XX.

67 tools; Std. tool cable 542778-XX, RA swivel cable 544055-XX,

Inline swivel cable 544056-XX, Extension cable 542779-XX.

Additional Accessories: See pages 58-61 for additional accessories.

Fixtured Electric Nutrunners – Transducer Control

Right Angle Non-Floating Spindle Tools



Right Angle Non-Floating Spindle Series

Torque Range
2 - 630 Nm
1.5 - 484.6 Ft. Lbs.

Bolt Size
M5 - M22
#10 - 1"



Angle Non-Floating Spindle			Torque Range		Max. Speed	Float		Output Drive Size	Minimum Center to Center		Weight		Length	
Part No.	Model Number	Motor Size	ft. lbs.	Nm	RPM	in.	mm		in.	mm	lbs.	kg	in.	mm
578516	1BB-1B011A-1WK3M	1	1.5-8.1	2-11	1146	.98	25	3/8	2.04	52	9.7	4.4	16.8	427
578513	1BB-1B030A-1WK1M	1	3.7-23.6	5-32	434	.98	25	3/8	2.04	52	9.7	4.4	16.8	427
578511	1BB-1B050A-1WK2M	1	11.0-39.0	15-53	255	.98	25	3/8	2.04	52	9.7	4.4	16.8	427
578608	2BB-2B100A-2WK1M	2	18.4-75.2	25-102	310	.98	25	1/2	2.32	59	16.7	7.6	19.8	505
578606	2BB-2B150A-2WK2M	2	22.1-112.8	30-153	206	.98	25	1/2	2.32	59	16.7	7.6	19.8	505
578710	3BB-3B180A-3WK1M	3	22.1-132.7	30-180	327	.98	25	3/4	3.18	81	37.0	16.8	23.8	607
578706	3BB-3B260A-3WK2M	3	36.8-191.7	50-260	211	.98	25	3/4	3.18	81	37.0	16.8	23.8	607
578809	4BB-4B360A-4WK1M	4	88.5-265.5	120-360	257	.98	25	3/4	4.40	112	57.5	26.1	25.3	645
578810	4BB-4B460A-4WK2M	4	118.0-339.2	160-460	202	.98	25	3/4	4.40	112	57.5	26.1	25.3	645
578811	4BB-4B630A-4WK3M	4	162.2-464.6	220-630	136	.98	25	1	4.40	112	57.5	26.1	25.3	645

Standard Equipment: Air LB Connector



EMT Right Angle Non-Floating Spindles Series

Torque Range
72 - 830 Nm
53.3 - 612 Ft. Lbs.

Bolt Size
M10 - M30
7/16" - 1 3/8"



EMT Angle Non-Floating Spindle			Angle Head Type	Torque Range		Max Speed	Output Drive Size	Min Center Dist		Weight		Length **	
Part No.	Model No.	Motor Size		ft. lbs.	Nm	RPM		In	Mm	Lbs.	kg	in	mm
571127	EMT200-10V-APM	2	V	53.3	72.0	460	.50	2.19	55.6	20	9.0	21.00	533.4
571128	EMT200-5V-APM	2	V	97.3	132.0	250	.625	2.19	55.6	20	9.0	21.00	533.4
571129	EMT200-4V-APM	2	V	129.3	176.0	187	.625	2.19	55.6	20	9.0	21.00	533.4
571230	EMT200-3V-APM	2	V*	192.0	260.0	126	.75	2.19	55.6	20	9.0	21.00	533.4
571231	EMT200-10X-APM	2	X	85.0	114.0	289	.625	2.19	55.6	21	9.5	21.00	533.4
571232	EMT200-5X-APM	2	X	155.0	210.0	157	.75	2.19	55.6	21	9.5	21.00	533.4
571233	EMT200-4X-APM	2	X	206.0	280.0	117	.75	2.19	55.6	21	9.5	21.00	533.4
571234	EMT200-3X-APM	2	X	306.0	414.0	79	.75	2.19	55.6	21	9.5	21.00	533.4
571235	EMT200-2X-APM	2	X*	408.0	552.0	59	.75	2.87	74.0	21	9.5	21.00	533.4
571312	EMT-400-3V-APM	3	V*	384.0	521.0	144	.75	2.19	55.6	36	16.4	25.94	658.8
571313	EMT-400-3X-APM	3	X*	612.0	830.0	90	.75	2.87	74.0	37	16.8	26.32	668.5

*Tool output exceeds angle head capacity – P head: 60 ft- lbs,

T head: 100 ft- lbs, V head: 180 ft- lbs and X head: 350 ft lbs.

**Length is measured from center of the square drive to the end of the motor.

Standard Torque reaction bracket

P and T head - #201012 (Optional bracket # 201039)

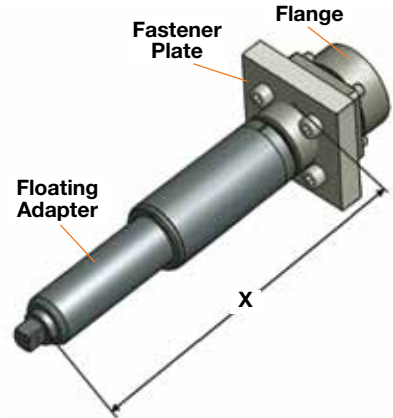
V and X head - # 201034(Optional bracket # 201510)

Standard Equipment: Air LB Connector

Optional Connectors: Contact your nearest ATG Sales & Service Center if a motor is required with a VEAM or PTR connector.

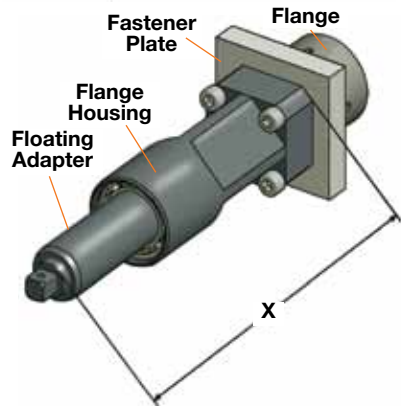
DGD Floating Adapter

Model No.	Motor Size	Maximum Torque		X		Output Drive Size	Drive
		ft. lbs.	Nm	in.	mm		
922325	1	44.25	60	7.08	180	3/8	1ZB 1VK
910609	2	118.00	160	7.08	180	1/2	2ZB 2VK
935552	2	147.51	200	7.08	180	3/4	2ZB 2VK
910613	3	383.63	520	7.28	185	3/4	3ZB 3VK
912106	4	383.63	520	7.48	190	3/4	4VK
912147	4	921.95	1250	7.32	186	1	4VK
S976956	4	921.95	1250	5.31	140	1	4ZA
S308441	4	1180.09	1600	5.31	140	1 1/2	4ZA
916642	4	383.63	520	7.28	185	3/4	4ZA
916643	4	921.95	1250	7.48	190	1	4ZA



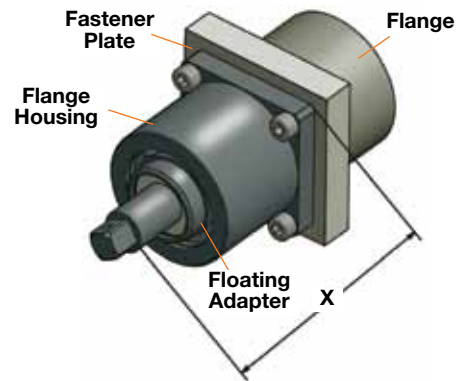
DGD Floating Adapter Including Flange Housing

Model No.	Motor Size	Maximum Torque		X		Output Drive Size	Drive
		ft. lbs.	Nm	in.	mm		
S308434	1	44.25	60	6.61	168	3/8	1ZB
S308435	2	118.00	160	6.77	172	1/2	2ZB
S308450	2	147.51	200	6.77	172	3/4	2ZB
S308436	3	383.63	520	6.92	176	3/4	3ZB
S308437	1	44.25	60	6.61	168	3/4	1VK
S308438	2	81.13	110	6.55	166.5	1	2VK
S308475	2	147.51	200	6.55	166.5	1	2VK
S308439	3	221.26	300	6.73	171	1 1/2	3VK
S308440	4	383.63	520	6.88	175	3/4	4VK
S308474	4	486.79	660	6.73	171	1	4VK



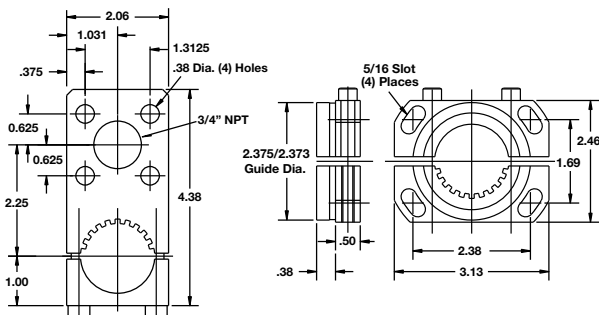
DGD Floating Adapter Including Flange Housing for Right Angle Drive

Model No.	Motor Size	Maximum Torque		X		Output Drive Size
		ft. lbs.	Nm	in.	mm	
929041	1	44.25	60	2.95	75	3/8
929053	2	125.38	170	3.54	90	1/2
929061	2	147.51	200	4.52	115	3/4
929065	3	221.26	300	4.13	105	3/4
929077	4	383.63	520	4.52	115	3/4
929089	4	486.79	660	4.52	115	1



Mounting Brackets for EMT Series Tools

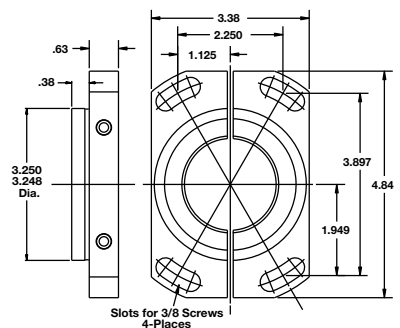
EMT 80 Series



Torque Reaction Bracket
#201012 (Standard)

Torque Reaction Bracket
#201039 (Optional)

EMT 200 & 400 Series



Torque Reaction Bracket
#201034 (Standard)

Torque Reaction Bracket
#201510 (Optional)



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

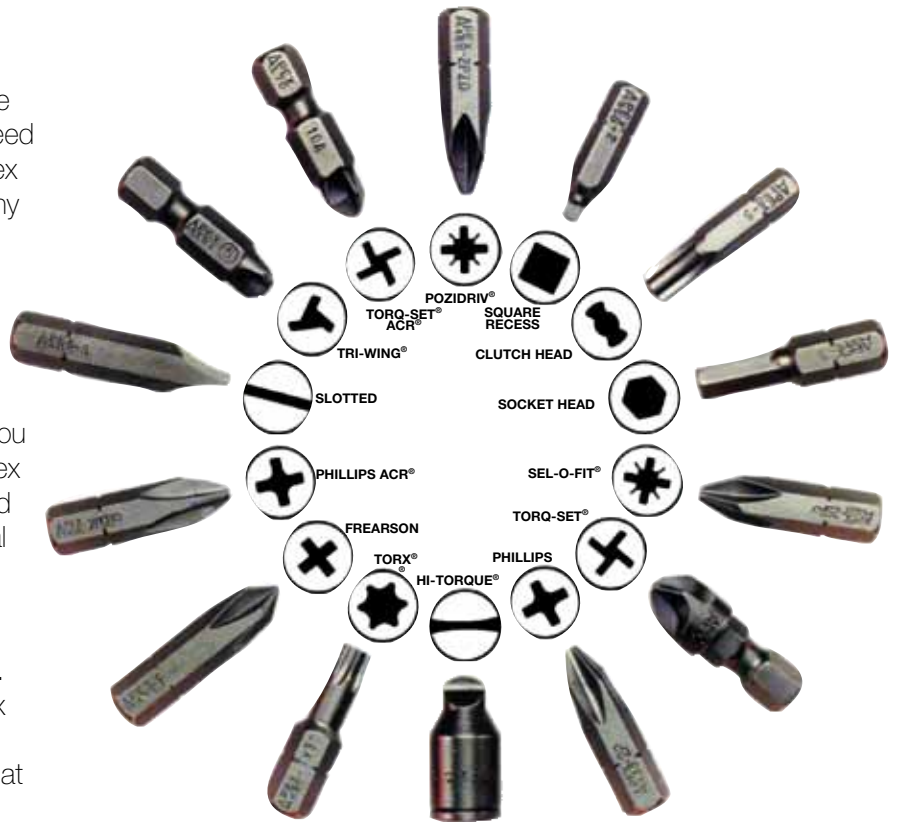
All Apex standard catalog items are available off-the-shelf for immediate delivery. If you need special assistance with your order, your Apex manufacturer's representative can handle any questions you may have.

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.

Ordering Information

Apex products are distributed world-wide. For a catalog of the complete line of Apex quality fastener tools or to locate your nearest Apex distributor, visit our website at www.apex-tools.com.



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 Number
		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.)
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7/16" 6 Point

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	Nose End Diameter	Drive End Diameter	Opening Depth
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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
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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

1" Square Drive Sockets, Metric

32mm18	32	54	54.0	54.0	20.6
34mm18	34	54	54.0	54.0	20.6
36mm18	36	57	57.1	54.0	23.9
38mm18	38	57	57.1	54.0	23.9
42mm18	42	60	63.5	54.0	23.9
46mm18	46	64	69.8	66.7	26.9

APEX® μ -Guard™

Quality Anti-Mar Fastener Tools Begin With Quality Fastener Tools.

Apex μ -Guard™ provides a protective barrier between genuine Apex fastener tools and your finely finished workpiece. The free-spinning patent-pending design provides maximum protection for polished and highly sensitive surfaces.

Apex μ -Guard™ covering is made of a thermo plastic urethane (TPU elastomer) which cushions against costly incidental side impacts. It offers the lowest coefficient of friction for maximum tool efficiency. It is also non-removable for tamper resistance.

With Apex μ -Guard™ you get the proven Apex fastener tool fit and performance plus the best protection available against marring and in-system damage.

μ -Guard™ is your guard against the potential hazards caused by rotational friction.



If it doesn't say Apex on the outside, how can you be sure of what's on the inside?

Prevents Side Impact Damage



Free-Spinning Design



Virtually Damage Free



μ-Guard Sockets

(Includes socket and cover)



Part Number	Socket	Drive End			Socket Length	Fastener End			Assembly Features
		Size	Type	Sex		Size	Type	Sex	
UGS-AB710	10MM21	1/4	Square	F	standard	10 mm	Hex	F	FS
UGS-AB710-01	M-10MM21	1/4	Square	F	standard	10 mm	Hex	F	FS, M
UGS-AB710-02	MB-10MM21	1/4	Square	F	standard	10 mm	Hex	F	FS, M, B
UGS-BA610	10MM13	3/8	Square	F	standard	10 mm	Hex	F	FS
UGS-BA610-01	M-10MM13	3/8	Square	F	standard	10 mm	Hex	F	FS, M
UGS-BB710	10MM23	3/8	Square	F	long	10 mm	Hex	F	FS
UGS-BB710-01	M-10MM23	3/8	Square	F	long	10 mm	Hex	F	FS, M
UGS-BB710-02	MB-10MM23	3/8	Square	F	long	10 mm	Hex	F	FS, M, B
UGS-BB713	13MM23	3/8	Square	F	long	13 mm	Hex	F	FS
UGS-BB713-01	M-13MM23	3/8	Square	F	long	13 mm	Hex	F	FS, M
UGS-BB713-02	MB-13MM23	3/8	Square	F	long	13 mm	Hex	F	FS, M, B
UGS-CB713	13MM25	1/2	Square	F	long	13 mm	Hex	F	FS
UGS-CB713-03	SF-13MM25	1/2	Square	F	long	13 mm	Hex	F	FS, SF
UGS-CB715	15MM25	1/2	Square	F	long	15 mm	Hex	F	FS
UGS-CB715-03	SF-15MM25	1/2	Square	F	long	15 mm	Hex	F	FS, SF
UGS-CB718	18MM25	1/2	Square	F	long	18 mm	Hex	F	FS
UGS-CB718-03	SF-18MM25	1/2	Square	F	long	18 mm	Hex	F	FS, SF

If your tool is not shown in the table of representative products above, please contact your Apex representative.

μ-Guard Extensions

(Includes extension and cover)



Part Number	Extension	Drive End			Extension Length	Socket End			Assembly Features*
		Size	Type	Sex		Size	Type	Sex	
UGE-A2A	EX-250-2	1/4	Hex	M	2	1/4	Square	M	FS
UGE-A4A	EX-250-4	1/4	Hex	M	4	1/4	Square	M	FS
UGE-A6A	EX-250-6	1/4	Hex	M	6	1/4	Square	M	FS
UGE-B2A	EX-370-2	1/4	Hex	M	2	3/8	Square	M	FS
UGE-B4A	EX-370-4	1/4	Hex	M	4	3/8	Square	M	FS
UGE-B6A	EX-370-6	1/4	Hex	M	6	3/8	Square	M	FS
UGE-B3C	EX-376-3	3/8	Square	F	3	3/8	Square	M	FS
UGE-B6C	EX-376-6	3/8	Square	F	6	3/8	Square	M	FS
UGE-B12C	EX-376-12	3/8	Square	F	12	3/8	Square	M	FS
UGE-C4C	EX-508-4	1/2	Square	F	4	1/2	Square	M	FS
UGE-C8C	EX-508-8	1/2	Square	F	8	1/2	Square	M	FS
UGE-C12C	EX-508-12	1/2	Square	F	12	1/2	Square	M	FS

If your tool is not shown in the table of representative products above, please contact your Apex representative.

μ-Guard Bit Holders

(Includes bit holder and cover)



Part Number	Bit Holder	Drive End			Socket Length	Fastener End			Assembly Features
		Size	Type	Sex		Size	Type	Sex	
UGH-1NAA	M-490	1/4	Hex	M	2 31/32	1/4	Hex	F	FS, M, ET
UGH-1AAA	M-490-2	1/4	Hex	M	2	1/4	Hex	F	FS, M, ET
UGH-2NBG	838	3/8	Square	F	1 1/2	1/4	Hex	F	FS, ET
UGH-1NBG	M-838	3/8	Square	F	2 5/8	1/4	Hex	F	FS, M, ET
UGH-2NBC	835	3/8	Square	F	1 1/2	5/16	Hex	F	FS, ET
UGH-1NBC	M-835	3/8	Square	F	2 3/4	5/16	Hex	F	FS, M, ET
UGH-2NBD	855	1/2	Square	F	1 1/2	5/16	Hex	F	FS, ET
UGH-1NBD	M-855	1/2	Square	F	2 3/4	5/16	Hex	F	FS, M, ET
UGH-2NCK	QR-308	3/8	Square	F	1 3/4	1/4	Hex	F	FS, QR
UGH-2NCF	QR-508	1/2	Square	F	2 1/8	1/4	Hex	F	FS, QR
UGH-2NCJ	QR-314	3/8	Square	F	2	7/16	Hex	F	FS, QR
UGH-2NCL	QR-514	1/2	Square	F	2 1/8	7/16	Hex	F	FS, QR

If your tool is not shown in the table of representative products above, please contact your Apex representative.

*Features Abbreviations

- FS** Free Spinning Tool is able to rotate independently of Cover
- M** Magnetic Tool includes magnet to hold the position of the fastener during fastening operation
- B** Bolt Clearance Tool is spring-loaded to allow bolt or nut to retract into the socket body
- SF** Surface Drive Tool has radiused corners to allow easier alignment and engagement of fastener
- ET** Exposed Tip Cover extends beyond end of Bit Holder to shield the majority of a standard 1 inch long Insert Bit.

- QR** Quick Release Tool has tension feature to allow quick & easy change between bits Cover will not extend beyond end of Bit Holder

Notes: Reported lengths are based on uncovered tool length only for reference. Cover may extend beyond end of tool by 2 mm unless otherwise noted.

Conversion Tables

Millimeter – Decimal – Fraction

mm	Dec.	in.	mm	Dec.	in.	mm	Dec.	in.	mm	Dec.	in.	mm	Dec.	in.
0.100	.0039		5.159	.2031	13/64	10.300	.4055		15.400	.6063		20.400	.8031	
0.200	.0079		5.200	.2047		10.319	.4063	13/32	15.478	.6094	39/64	20.500	.8071	
0.300	.0118		5.300	.2087		10.400	.4094		15.500	.6102		20.600	.8110	
0.397	.0156	1/64	5.400	.2126		10.500	.4134		15.600	.6142		20.638	.8125	13/16
0.400	.0157		5.500	.2165		10.600	.4173		15.700	.6181		20.700	.8150	
0.500	.0197		5.556	.2188	7/32	10.700	.4219		15.800	.6220		20.800	.8189	
0.600	.0236		5.600	.2205		10.716	.4219	27/64	15.875	.6250	5/8	20.900	.8228	
0.700	.0276		5.700	.2244		10.800	.4252		15.900	.6250		21.000	.8268	
0.794	.0313	1/32	5.800	.2283		10.900	.4291		16.000	.6299		21.034	.8182	53/64
0.800	.0315		5.900	.2323		11.000	.4331		16.100	.6339		21.100	.8307	
0.900	.0354		5.953	.2344	15/64	11.100	.4370		16.200	.6378		21.200	.8307	
1.000	.0394		6.000	.2362		11.113	.4375	7/16	16.272	.6406	41/64	21.200	.8346	
1.100	.0433		6.100	.2402		11.200	.4409		16.300	.6417		21.300	.8386	
1.191	.0469	3/64	6.200	.2441		11.300	.4449		16.400	.6457		21.400	.8425	
1.200	.0472		6.300	.2480		11.400	.4488		16.500	.6496		21.431	.8438	27/32
1.300	.0512		6.350	.2500	1/4	11.500	.4528		16.600	.6535		21.500	.8465	
1.400	.0551		6.400	.2520		11.509	.4531	29/64	16.669	.6563	21/32	21.600	.8504	
1.500	.0591		6.500	.2559		11.600	.4567		16.700	.6575		21.700	.8543	
1.588	.0625	1/16	6.600	.2598		11.700	.4606		16.800	.6614		21.800	.8583	
1.600	.0630		6.700	.2638		11.800	.4646		16.900	.6654		21.828	.8594	55/94
1.700	.0669		6.747	.2656	17/64	11.900	.4685		17.000	.6693		21.900	.8622	
1.800	.0709		6.800	.2677		11.906	.4688	15/32	17.066	.6719	43/64	22.000	.8661	
1.900	.0748		6.900	.2717		12.000	.4724		17.100	.6732		22.100	.8701	
1.984	.0781	5/64	7.000	.2756		12.100	.4764		17.200	.6772		22.200	.8740	
2.000	.0878		7.100	.2795		12.200	.4803		17.300	.6811		22.225	.8750	7/8
2.100	.0827		7.144	.2813	9/32	12.300	.4843		17.400	.6850		22.300	.8780	
2.200	.0866		7.200	.2835		12.303	.4844	31/64	17.463	.6875	11/16	22.400	.8819	
2.300	.0906		7.300	.2874		12.400	.4882		17.500	.6890		22.500	.8858	
2.381	.0938	3/32	7.400	.2913		12.500	.4921		17.600	.6929		22.600	.8898	
2.400	.0945		7.500	.2953		12.600	.4961		17.700	.6968		22.622	.8906	57/64
2.500	.0984		7.541	.2969	19/64	12.700	.5000	1/2	17.800	.7008		22.700	.8937	
2.600	.1024		7.600	.2992		12.800	.5039		17.859	.7031	45/64	22.800	.8976	
2.700	.1063		7.700	.3031		12.900	.5079		17.900	.7047		22.900	.9016	
2.778	.1094	7/64	7.800	.3071		13.000	.5118		18.000	.7087		23.000	.9055	
2.800	.1102		7.900	.3110		13.097	.5156	33/64	18.100	.7126		23.019	.9063	29/32
2.900	.1142		7.938	.3125	5/16	13.100	.5157		18.200	.7165		23.100	.9094	
3.000	.1181		8.000	.3150		13.200	.5197		18.256	.7188	23/32	23.200	.9134	
3.100	.1220		8.100	.3189		13.300	.5236		18.300	.7205		23.300	.9173	
3.175	.1250	1/8	8.200	.3228		13.400	.5276		18.400	.7244		23.400	.9213	
3.200	.1260		8.300	.3268		13.494	.5313	17/32	18.500	.7283		23.416	.9219	59/64
3.300	.1299		8.334	.3281	21/64	13.500	.5315		18.600	.7323		23.500	.9252	
3.400	.1339		8.400	.3307		13.600	.5354		18.653	.7344	47/64	23.600	.9291	
3.500	.1378		8.500	.3346		13.700	.5394		18.700	.7362		23.700	.9331	
3.572	.1406	9/64	8.600	.3386		13.800	.5433		18.800	.7402		23.800	.9370	
3.600	.1417		8.700	.3425		13.891	.5469	35/64	18.900	.7441		23.900	.9409	
3.700	.1457		8.731	.3438	11/32	13.900	.5472		19.000	.7480		24.000	.9449	
3.800	.1496		8.800	.3465		14.000	.5512		19.050	.7500	3/4	24.100	.9488	
3.900	.1535		8.900	.3504		14.100	.5551		19.100	.7520		24.200	.9528	
3.969	.1563	5/32	9.000	.3543		14.200	.5591		19.200	.7559		24.209	.9531	61/64
4.000	.1575		9.100	.3583		14.288	.5625	9/16	19.300	.7598		24.300	.9567	
4.100	.1624		9.128	.3594	23/64	14.300	.5630		19.400	.7638		24.400	.9606	
4.200	.1654		9.200	.3622		14.400	.5669		19.447	.7656	49/64	24.500	.9646	
4.300	.1693		9.300	.3661		14.500	.5709		19.500	.7677		24.600	.9685	
4.366	.1719	11/64	9.400	.3701		14.600	.5748		19.600	.7717		24.606	.9688	31/32
4.400	.732		9.500	.3740		14.684	.5781	37/64	19.700	.7756		24.700	.9724	
4.500	.1772		9.525	.3750	3/8	14.700	.5787		19.800	.7795		24.800	.9764	
4.600	.1811		9.700	.3819		14.800	.5827		19.844	.7813	25/32	24.900	.9803	
4.700	.1850		9.800	.3858		14.900	.5866		19.900	.7835		25.000	.9843	
4.763	.1875	3/16	9.900	.3898		15.000	.5906		20.000	.7874		25.003	.9844	63/64
4.800	.1890		9.922	.3902	25/64	15.081	.5938	19/32	20.100	.7913		25.100	.9882	
4.900	.1929		10.000	.3937		15.100	.5945		20.200	.7953		25.200	.9921	
5.000	.1969		10.100	.3976		15.200	.5984		20.241	.7969	51/64	25.300	.9961	
5.100	.2008		10.200	.4016		15.300	.6024		20.300	.7992		25.400	1.000	1

Conversion Tables

Torque – Air Pressure – Miscellaneous



Torque Conversion Factors		
To Convert	Into	Multiply By
Inch Pounds	Foot Pounds	0.0835
Inch Pounds	Newton meters	0.1130
Inch Pounds	Kg-meters	0.0115
Inch Pounds	Kg-Cm	1.1519
Foot Pounds	Inch Pounds	12.000
Foot Pounds	Newton meters	1.3560
Foot Pounds	Kg-meters	0.1382
Foot Pounds	Kg-Cm	13.8240
Newton Meters	Inch Pounds	8.8440
Newton Meters	Foot Pounds	0.7370
Newton Meters	Kg-meters	0.1020
Newton Meters	Kg-Cm	10.2000
Kg meters	Inch Pounds	86.8100
Kg meters	Foot Pounds	7.2340
Kg meters	Newton-meters	9.8040
Kg Cm	Inch Pounds	0.8681
Kg Cm	Foot Pounds	0.0723
Kg Cm	Newton-meters	0.0980

Torque Conversion – In. Lbs. (Nm)					
In. Lbs.	Nm	In. Lbs.	Nm	In. Lbs.	Nm
5	0.6	50	5.7	140	15.8
10	1.1	60	6.8	150	17.0
15	1.7	70	7.9	160	18.1
20	2.3	80	9.0	170	19.2
25	2.8	90	10.2	180	20.3
30	3.4	100	11.3	190	21.5
35	4.0	110	12.4	200	22.6
40	4.5	120	13.6		
45	5.1	130	14.7		

Torque Conversion – Ft. Lbs. (Nm)							
Ft. Lbs.	Nm	Ft. Lbs.	Nm	Ft. Lbs.	Nm	Ft. Lbs.	Nm
1	1.36	33	44.8	65	88.1	97	131.5
2	2.7	34	46.1	66	90.0	98	133.0
3	4.1	35	47.5	67	90.9	99	134.2
4	5.4	36	48.8	68	92.2	100	135.6
5	6.8	37	50.2	69	93.6	110	149.2
6	8.1	38	52.0	70	94.9	115	156.0
7	9.5	39	52.9	71	96.3	120	163.0
8	10.9	40	54.2	72	97.6	125	170.0
9	12.2	41	55.6	73	99.0	130	176.3
10	13.6	42	57.0	74	100.3	135	183.1
11	14.9	43	58.3	75	102.0	140	190.0
12	16.3	44	60.0	76	103.1	145	197.0
13	17.6	45	61.0	77	104.4	150	203.4
14	19.0	46	62.4	78	105.8	155	210.2
15	20.3	47	63.7	79	107.1	160	217.0
16	21.7	48	65.1	80	108.5	165	224.0
17	23.1	49	66.4	81	110.0	170	231.0
18	24.4	50	67.8	82	111.2	175	237.3
19	25.8	51	69.2	83	112.6	180	244.1
20	27.1	52	70.5	84	114.0	185	251.0
21	28.5	53	71.9	85	115.3	190	258.0
22	29.8	54	73.2	86	117.0	195	264.4
23	31.2	55	74.6	87	118.0	200	271.2
24	32.5	56	75.9	88	119.3	225	305.1
25	33.9	57	77.3	89	121.0	250	339.0
26	35.3	58	78.7	90	122.0	275	373.0
27	36.6	59	80.0	91	123.4	300	407.0
28	38.0	60	81.4	92	125.0	350	475.0
29	39.3	61	82.7	93	126.1	400	542.4
30	40.7	62	84.1	94	127.5		
31	42.0	63	85.4	95	129.0		
32	43.4	64	86.8	96	130.2		

Inch Bolt Torque Table

SAE J429 and ASME 574

Steel Grade	SAE 5		SAE 8		Socket Head Cap Screws	
	Torque in Pound Foot or (Pound Inch)					
Nom Dia - Pitch	Dry	Lubed	Dry	Lubed	Dry	Lubed
1/4-20	(101)	(76)	(143)	(107)	(168)	(120)
1/4-28	(116)	(87)	(147)	(123)	(192)	(144)
5/16-18	(209)	(157)	(295)	(221)	(348)	(264)
5/16-24	(231)	(174)	(327)	(245)	(384)	(288)
3/8-16	(372)	(276)	44	33	51	38
3/8-24	(420)	(312)	49	37	58	43
7/16-14	49	37	70	52	81	61
7/16-20	55	41	78	58	91	68
1/2-13	75	57	106	80	124	93
1/2-20	85	64	120	90	140	105
5/8-11	150	113	212	159	238	179
5/8-18	170	127	240	180	270	202
3/4-10	267	200	376	282	423	317
3/4-16	297	223	420	315	472	354
7/8-9	429	322	606	455	682	511
7/8-14	474	355	669	502	752	564
1-8	644	483	909	681	1022	767
1-12	722	542	1020	765	1147	860

Metric Bolt Torque Table

ISO 898

Property Class	8.8		10.9		12.9 Socket Head Cap Screw	
	Torque in Newton Meter - Nm					
Nom Size x Pitch	Dry	Lubed	Dry	Lubed	Dry	Lubed
M5 x 0.80	6.1	4.6	8.8	6.7	10.3	7.7
M6 x 1.00	10.4	7.8	15	11.2	17.6	13.1
M7 x 1.00	17.6	13.1	25.1	18.9	29.4	22
M8 x 1.25	25.4	19.1	37.6	27.3	42.6	32.1
M10 x 1.50	50	38	72	54	84	64
M12 x 1.75	88	66	126	94	146	110
M14 x 2.00	141	106	201	150	235	176
M16 x 2.00	218	164	312	233	365	274
M18 x 2.50	301	226	431	323	504	378
M20 x 2.50	426	319	609	457	712	534
M22 x 2.50	580	435	831	624	971	728
M24 x 3.00	736	552	1052	789	1231	923
M27 x 3.00	1079	809	1544	1158	1805	1353
M30 x 3.50	1463	1097	2092	1570	2446	1834
M33 x 3.50	1990	1493	2849	2137	3328	2497
M36 x 4.00	2557	1918	3659	2744	4276	3208

Lubed means cleaned dry bolts lubricated with a standard medium viscosity machine oil. Lubricate all contact areas of the bolts and washers. Lubricating the bolts is the suggested method.

Miscellaneous Conversion Factors			Air Pressure Conversion		
To Convert	Into	Multiply By	PSI	kPa*	Bar**
Inches	Millimeters	25.4000	85	586	5.9
Millimeters	Inches	0.0394	90	620	6.2
Pounds	Kilograms	0.4536	95	655	6.6
Kilograms	Pounds	2.2050	100	690	6.9
psi	bar	0.069	125	860	8.6
bar	psi	14.5			

*Preferred: Approximate to the nearest 5 kPa.
**Approximate to the nearest 0.5 Bar.

Sales & Service Centers

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

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Warranty

Apex Tool Group, LLC 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 Apex Tool Group and specifically excludes products manufactured by others. Products not manufactured by Apex Tool Group are warranted only to the extent and in the manner warranted to Apex Tool Group by the manufacturer

and then only to the extent Apex Tool Group is able to enforce such warranty. Apex Tool Group's warranty with respect to products manufactured by it is limited to the repair or replacement, as Apex Tool Group 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. Apex Tool Group 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 Apex Tool Group approval. **APEX TOOL GROUP 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

Apex Tool Group 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 Apex Tool Group.

Apex Tool Group 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. Apex Tool Group 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 Apex Tool Group 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 Apex Tool Group 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. Apex Tool Group 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.

Power Tools Sales & Service Centers

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

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