

Cleco®

Recoules
Quackenbush®

DOTCO®

APEX®

Quality Tools for the Aerospace Industry



TABLE OF CONTENTS

| | |
|---|-----|
| Advanced Drilling Portable Machines | 1 |
| Advanced Drilling Cutting Tools | 25 |
| Hand Drilling Tools | 31 |
| Microstop Cages for Hand Drilling Tools | 49 |
| Hand Drilling Cutting Tools | 73 |
| Riveting Equipment | 99 |
| Assembly Tools | 123 |
| Apex Fastening Tools | 147 |
| Index | 156 |

The Aerospace Industry requires strength under pressure and durability at high speeds. Therefore, you need to use strong, powerful tools that are up to the challenge.

Apex Power Tools, part of the Apex Tool Group, represents one of the most diverse families of products in the manufacturing industry, comprising global brands such as Cleco, Dotco, Recoules Quackenbush, and Apex.

Our products serve Aerospace, from fastening and material removal tools to sophisticated drilling equipment, our products are used in quality- and safety-critical applications around the world.

AEROSTRUCTURES

Tail
Wing
Fuselage
Wing Box
Wing Skin & Repair
Wing Skin & Stringer Nose
Leading Edge & Trailing Edge



FINAL ASSEMBLY

Cockpit
Wing Box
Fuselage Join
Fuselage Interior
Wing to Body Join
Pylon / Engine Mount



Advanced Drilling Portable Equipment
Advanced Drilling Cutting Tools
Microstop Cages for Hand Drilling Tools
Hand Drilling Cutting Tools
Riveting Equipment
Assembly Tools
Apex Fastening Tools

MAINTENANCE REPAIR & OVERHAUL

Wing Repair
Engine Repair
Interior Repair
Fuselage Repair



FLYAWAY HARDWARE

Cabins
Landing Gear
Seat Assembly
Wheel Assembly



Microstop Cages for Hand Drilling Tools
Hand Drilling Cutting Tools
Assembly Tools
Apex Fastening Tools

| | |
|---|----|
| Positive Feed - Automatic A2 Series ----- | 2 |
| Positive Feed - Automatic A1 Series ----- | 4 |
| Positive Feed - Automatic 20932, 20942, 20952, 20962 Series ----- | 6 |
| Positive Feed - Automatic 230 Series ----- | 8 |
| Positive Feed - Manual 158Q, 15Q Series ----- | 10 |
| Positive Feed - Manual Mini C-Clamp ----- | 12 |
| Hydraulic Air Feed Drills - Pistol 21500, CD Series ----- | 14 |
| Hydraulic Air Feed Drills - Angle PA, PB Series ----- | 15 |
| Hydraulic Air Feed Drills - Peck Feed HT3, HT4 Series ----- | 16 |
| Hydraulic Air Feed Drills - Self-Colleting 136, 120, 180 Series ----- | 17 |
| Hydraulic Air Feed Drills - Nut Plate 10QNPD Series ----- | 18 |
| Floor Pump Lubricators ----- | 19 |
| Accu-Lube Micro-Lubrication ----- | 20 |
| Accu-Lube Lubricants ----- | 21 |
| Positive Feed Drilling Options MITIS™ Chip Fragmentation ----- | 22 |
| Positive Feed Drilling Options ----- | 23 |
| Hydraulic Controlled Air Feed Options ----- | 24 |



DESCRIPTION

- Drill and 100% countersink with chip fragmentation using proven Mitis™ technology.
- Nominal capacity 1/2 in / 12.7 mm in aluminum and CFRP, 3/8 in / 10 mm in titanium.
- Easy-change access to change both feed and MITIS™ in less than 15 minutes.
- External shear pin for gear head protection and easy change.
- Tested and proven on thousands of drilled holes.
- Grease ports, self-contained bearings, and captive O-rings reduce service costs.
- Up to 500 hours / 100000 cycle PM interval.
- Configurable error-proofing with electronic counter for cutter change and service interval.
- Available in both turbine and vane-governed power unit options to minimize speed drop.
- Many customizable options, see page 23.

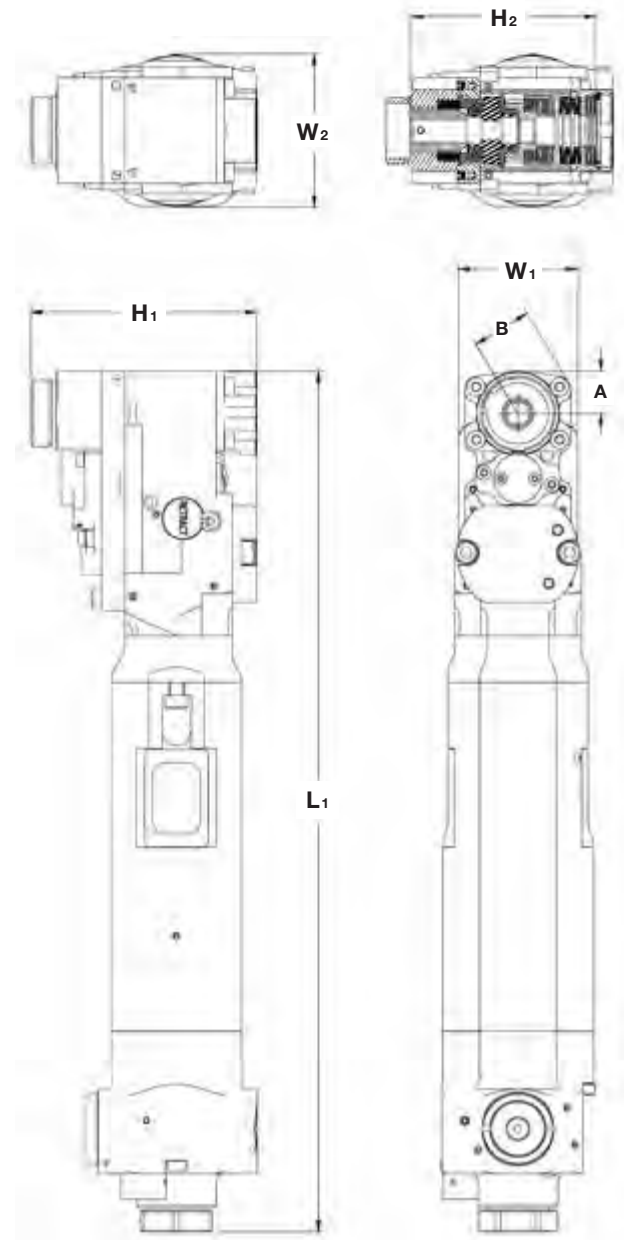
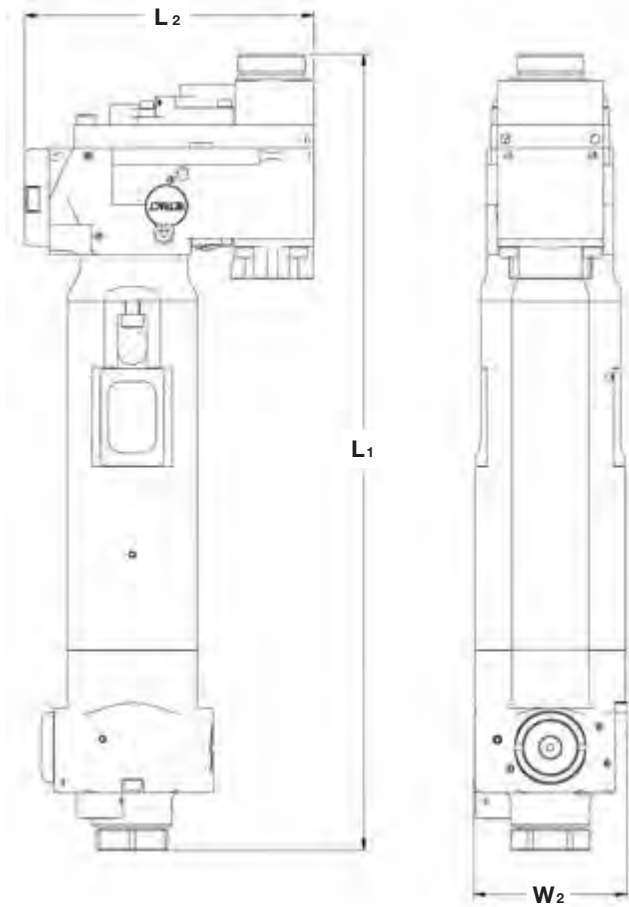


| MODEL | MOTOR CONFIGURATION | STROKE | RATED SPEED -0 / +10% | FEEDS | | ACCESSORIES | STD CUTTER / SPINDLE ATTACHMENT |
|-------|------------------------|-----------------|--|-------|---------|-------------|---|
| | | | | IPR | mm / TR | | |
| A24V | Right Angle Vane Motor | Per Application | 220, 275, 325, 350, 400, 430, 500, 550, 600, 650, 700, 800, 1000, 1150, 1500, 1700, 2300, 2600, 2900, 3300, 3700, 3900, 4200, 4500, 5200 | 0.001 | 0.03 | See Options | 1/4 in - 28F 5/16 in - 24F 3/8 in - 24F 7/16 in - 20F 9/16 in - 18F |
| A24T | Right Angle Turbine | | 450, 550, 650, 700, 850, 1000, 1200, 1800, 2700, 3400, 4000, 4400, 5400 | 0.002 | 0.05 | | |
| A26V | In Line Vane Motor | | 220, 275, 325, 350, 400, 430, 500, 550, 600, 650, 700, 800, 1000, 1150, 1500, 1700, 2300, 2600, 2900, 3300, 3700, 3900, 4200, 4500, 5200 | 0.003 | 0.08 | | |
| A26T | In Line - Turbine | | 450, 550, 650, 700, 850, 1000, 1200, 1800, 2700, 3400, 4000, 4400, 5400 | 0.004 | 0.10 | | |
| | | | | 0.006 | 0.15 | | |
| | | | | 0.007 | 0.18 | | |
| | | | | 0.008 | 0.20 | | |
| | | | | 0.010 | 0.25 | | |

| TYPE | SPEED | | A | B | W ₁ | W ₂ | H ₁ | H ₂ | L ₁ | L ₂ |
|-------------|-----------|----|------|------|----------------|----------------|----------------|----------------|----------------|----------------|
| Right Angle | 2300-5400 | mm | 16 | 22.6 | 45 | 58 | 85 | 70 | 326 | NA |
| | 250-5400 | | 16 | 22.6 | 45 | 58 | 85 | 70 | 339 | NA |
| | 2300-5400 | in | 0.63 | 0.89 | 1.77 | 2.28 | 3.35 | 2.76 | 12.83 | NA |
| | 250-5400 | | 0.63 | 0.89 | 1.77 | 2.28 | 3.35 | 2.76 | 13.35 | NA |
| Inline | 2300-5400 | mm | 16 | 22.6 | 45 | 58 | 85 | 70 | 302 | 110 |
| | 250-5400 | | 16 | 22.6 | 45 | 58 | 85 | 70 | 315 | 110 |
| | 2300-5400 | in | 0.63 | 0.89 | 1.77 | 2.28 | 3.35 | 2.76 | 11.89 | 4.33 |
| | 250-5400 | | 0.63 | 0.89 | 1.77 | 2.28 | 3.35 | 2.76 | 12.40 | 4.33 |

A2 Series Inline - Turbine Motor Shown

A2 Series Right Angle - Turbine Motor Shown



TECHNICAL DATA

Base Weight: 5 lbs / 2.3 kg

Noise Level: <=85 dBA

Air Inlet Pressure: 90 psi / 6.3 bar

Countersink Accuracy: ± 0.001 in / ± 0.02 mm

Power: Turbine - 2.2 hp / 1.6 kW, Vane - 1.4 hp / 1 kW

Thrust: 400 lbs / 1800 N



DESCRIPTION

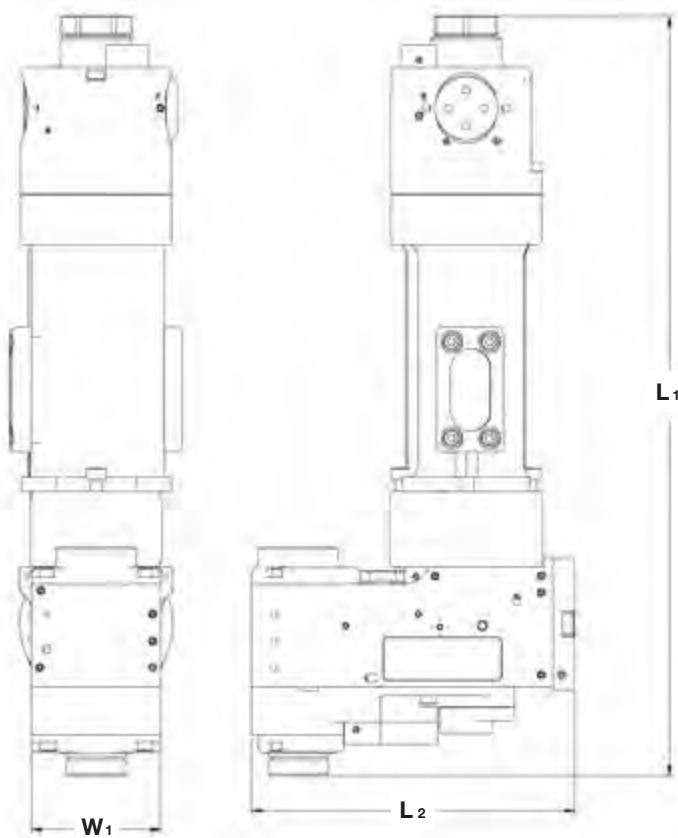
- Drill and 100% countersink with chip fragmentation using proven Mitis™ technology.
- Nominal capacity 1 in / 25.4 mm in aluminum and CFRP, 5/8 in / 16 mm in titanium.
- Configurable error-proofing with electronic counter for cutter change and service interval.
- Up to 500 hours /100000 cycle PM interval.
- Easy-change access to change both feed and MITIS™ in less than 15 minutes.
- Turbine 2.4 hp / 1.8 kW, Vane 1.7 hp / 1.3 kW.
- Integrated MITIS™ available for optimum chip evacuation/reduced clean-up time.
- External shear pin for gear head protection and easy change.
- Many customizable options, see page 23.



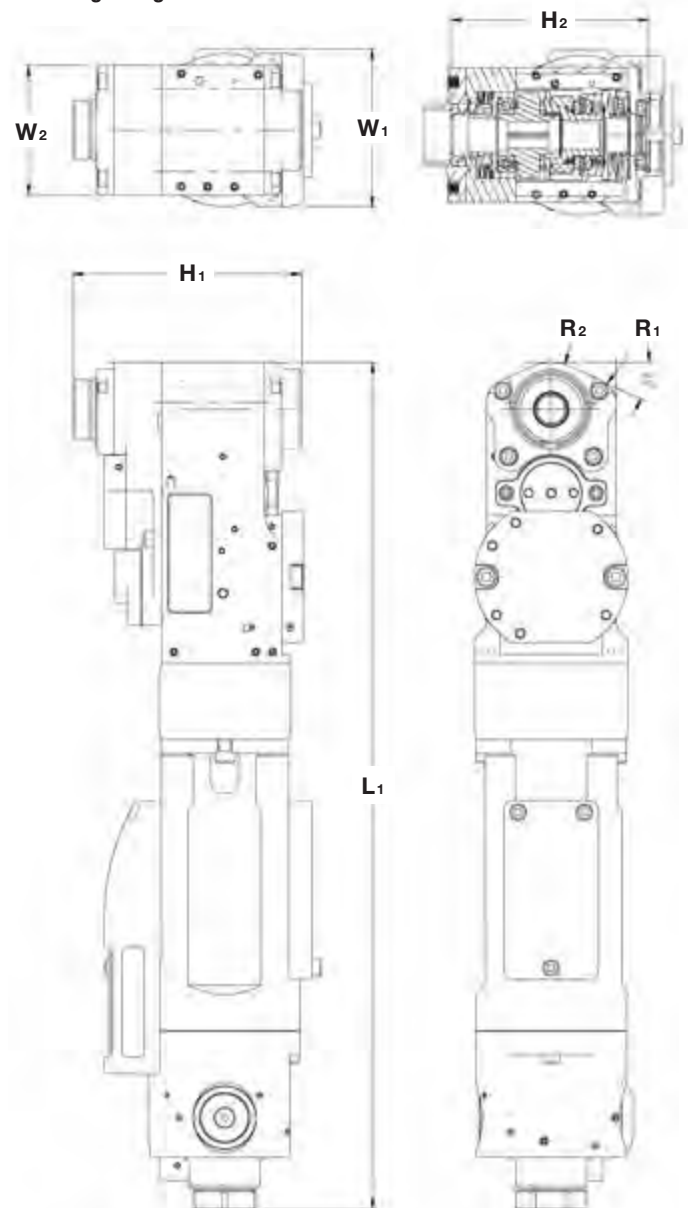
| MODEL | MOTOR CONFIGURATION | PER APPLICATION | RATED SPEED -0 / +10% | FEEDS | | ACCESSORIES | STD CUTTER / SPINDLE ATTACHMENT |
|-------|------------------------|-----------------|---|-------|-------|-------------|---------------------------------|
| | | | | IPR | MM/TR | | |
| A14V | Right Angle Vane Motor | 40 | 250, 320, 350, 410, 460, 510, 600, 670, 760, 850, 1100, 950, 1450, 1700, 1900, 2100, 2500, 2800, 3100 | 0.001 | 0.025 | See Options | 1/4 in - 28F |
| A14T | Right Angle Turbine | 60 | 400, 600, 750, 950, 1700, 2500, 3200 | 0.002 | 0.05 | | 5/16 in - 24F |
| A16V | In Line Vane Motor | 80 | 250, 320, 350, 410, 460, 510, 600, 670, 760, 850, 950, 1450, 1700, 1900, 2100, 2500, 2800, 3100 | 0.003 | 0.08 | | 3/8 in - 24F |
| A16T | In Line - Turbine | 100 | 400, 600, 750, 950, 1700, 2500, 3200 | 0.004 | 0.10 | | 7/16 in - 20F |
| | | 120 | | 0.006 | 0.15 | | 9/16 in - 18F |
| | | 140 | | 0.007 | 0.18 | | |
| | | | | 0.008 | 0.20 | | |
| | | | | | | | |

| TYPE | | SPEED | | R ₁ | R ₂ | W ₁ | W ₂ | H ₁ | H ₂ | L ₁ | L ₂ |
|---------|-------------|-------------|----|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Vane | Right Angle | 1500 - 4100 | mm | 10 | 20 | 55 | 67 | 97 | 81 | 360 | NA |
| | | 250 - 1100 | | 10 | 20 | 55 | 67 | 97 | 81 | 392 | NA |
| | | 1500 - 4100 | in | 0.39 | 0.79 | 2.17 | 2.64 | 3.82 | 3.19 | 14.17 | NA |
| | | 250 - 1100 | | 0.39 | 0.79 | 2.17 | 2.64 | 3.82 | 3.19 | 15.43 | NA |
| | Inline | 1500 - 4100 | mm | 10 | 20 | 55 | 67 | 97 | 81 | 320 | 137 |
| | | 250 - 1100 | | 10 | 20 | 55 | 67 | 97 | 81 | 352 | 137 |
| | | 1500 - 4100 | in | 0.39 | 0.79 | 2.17 | 2.64 | 3.82 | 3.19 | 12.60 | 5.39 |
| | | 250 - 1100 | | 0.39 | 0.79 | 2.17 | 2.64 | 3.82 | 3.19 | 13.86 | 5.39 |
| Turbine | Right Angle | 1500 - 4100 | mm | 10 | 20 | 55 | 67 | 97 | 81 | 362 | NA |
| | | 250 - 1100 | | 10 | 20 | 55 | 67 | 97 | 81 | 394 | NA |
| | | 1500 - 4100 | in | 0.39 | 0.79 | 2.17 | 2.64 | 3.82 | 3.19 | 14.25 | NA |
| | | 250 - 1100 | | 0.39 | 0.79 | 2.17 | 2.64 | 3.82 | 3.19 | 15.51 | NA |
| | Inline | 1500 - 4100 | mm | 10 | 20 | 55 | 67 | 97 | 81 | 322 | 137 |
| | | 250 - 1100 | | 10 | 20 | 55 | 67 | 97 | 81 | 354 | 137 |
| | | 1500 - 4100 | in | 0.39 | 0.79 | 2.17 | 2.64 | 3.82 | 3.19 | 12.68 | 5.39 |
| | | 250 - 1100 | | 0.39 | 0.79 | 2.17 | 2.64 | 3.82 | 3.19 | 13.94 | 5.39 |

A1 Series Inline - Turbine Motor Shown



A1 Series Right Angle - Vane Motor Shown



TECHNICAL DATA

Base Weight: 7 lbs / 3.2 kg

Noise Level: <=85 dBA

Air Inlet Pressure: 90 psi / 6.3 bar

Countersink Accuracy: ± 0.001 in / ± 0.02 mm

Power: Turbine - 2.4 hp / 1.8 kW, Vane - 1.7 hp / 1.3 kW

Thrust: 500 lbs / 2200 N



DESCRIPTION

- Nominal capacity 1/2 in /12.7 mm in aluminum and CFRP, 3/8 in / 10 mm in titanium.
- 20942 and 20962 able to drill and 100% countersink with chip fragmentation using proven MITIS™ technology.
- 20932 and 20952 are drill/ream only with no countersink capability.
- Many customizable options, see page 23.

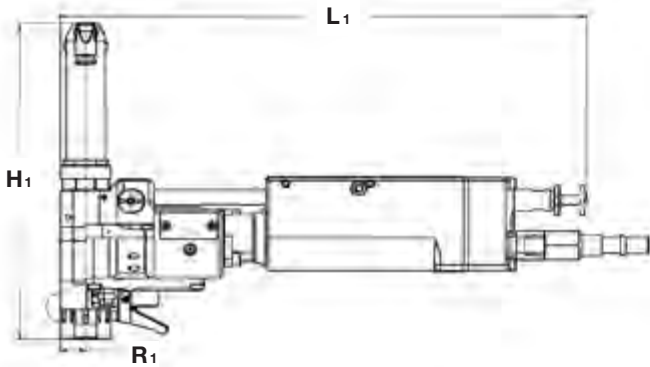


| MODEL | MOTOR CONFIGURATION | STROKE | SPEEDS | FEED RATE | SPINDLE ATTACHMENT | ACCESSORIES |
|-------------------------------|---------------------|-----------------|--|---|---|-------------|
| 20932/932QR - Standard | Right Angle | Per Application | 400, 750, 1100, 1400, 1700, 2700, 4500 | 0.0005, 0.001, 0.002, 0.003, 0.004 ipr | 1/4 in - 28, 5/16 in - 24, 3/8 in - 24, 9/16 in - 18, 200DA Collet, *Specials on Request* | See Options |
| 20942/942QR - Standard | Right Angle | Per Application | 401, 750, 1100, 1400, 1700, 2700, 4500 | 0.0005, 0.001, 0.002, 0.003, 0.004, ipr | 1/4 in - 28, 5/16 in - 24, 3/8 in - 24, 9/16 in - 18, 200DA Collet, *Specials on Request* | See Options |
| 20952/952QB - Standard | Inline | Per Application | 402, 750, 1100, 1400, 1700, 2700, 4500 | 0.0005, 0.001, 0.002, 0.003, 0.004 ipr | 1/4 in - 28, 5/16 in - 24, 3/8 in - 24, 9/16 in - 18, 200DA Collet, *Specials on Request* | See Options |
| 20962/962QB - Standard | Inline | Per Application | 403, 750, 1100, 1400, 1700, 2700, 4500 | 0.0005, 0.001, 0.002, 0.003, 0.004 ipr | 1/4 in - 28, 5/16 in - 24, 3/8 in - 24, 9/16 in - 18, 200DA Collet, *Specials on Request* | See Options |
| 20932/932QR - Boosted | Right Angle | Per Application | 450, 800, 1300, 1600, 2000, 3200 | 0.0005, 0.001, 0.002, 0.003, 0.004 ipr | 1/4 in - 28, 5/16 in - 24, 3/8 in - 24, 9/16 in - 18, 200DA Collet, *Specials on Request* | See Options |
| 20942/942QR - Boosted | Right Angle | Per Application | 451, 800, 1300, 1600, 2000, 3200 | 0.0005, 0.001, 0.002, 0.003, 0.004 ipr | 1/4 in - 28, 5/16 in - 24, 3/8 in - 24, 9/16 in - 18, 200DA Collet, *Specials on Request* | See Options |
| 20952/952QB - Boosted | Inline | Per Application | 452, 800, 1300, 1600, 2000, 3200 | 0.0005, 0.001, 0.002, 0.003, 0.004 ipr | 1/4 in - 28, 5/16 in - 24, 3/8 in - 24, 9/16 in - 18, 200DA Collet, *Specials on Request* | See Options |
| 20962/962QB - Boosted | Inline | Per Application | 453, 800, 1300, 1600, 2000, 3200 | 0.0005, 0.001, 0.002, 0.003, 0.004 ipr | 1/4 in - 28, 5/16 in - 24, 3/8 in - 24, 9/16 in - 18, 200DA Collet, *Specials on Request* | See Options |

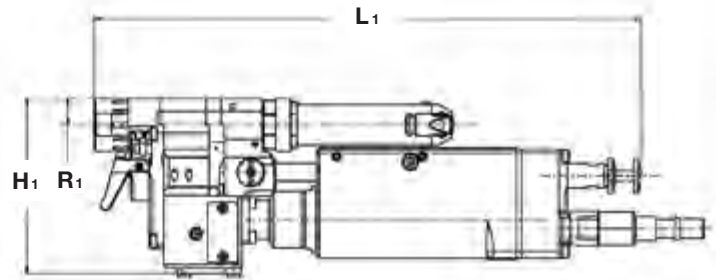
Positive Feed Drilling Machine - Automatic

20932 | 20942 | 20952 | 20962 Series

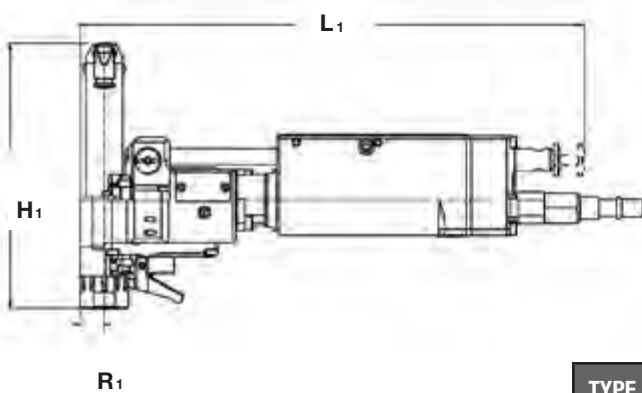
20942



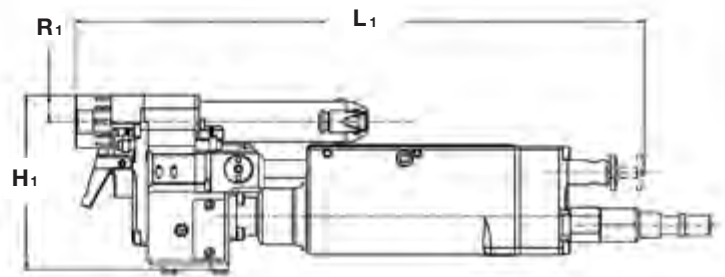
20962



20932



20952



TECHNICAL DATA

Power: 1.0 hp / 0.75 kW, Boosted - 1.3 hp / 1.0 kW

Motor power: Standard

Base Weight: 4.6 lbs / 2.1 kg

Noise level: <=85 dBA

Air Inlet pressure: 90 Psi / 6.3 bar

Countersink precision: ± 0.001 in - 20942 & 20962 only

Thrust: 360 lbs / 1600 N

| TYPE | SPEED | UNITS | L1 | H1 | R1 | |
|--------------------------------------|-------------|-------|------|---------------------|------|-----|
| 20932 - Standard 20942 - Standard | 1700 - 4500 | mm | 313 | Varies by Stroke | 15 | |
| | | in | 12.4 | | 0.6 | |
| | 1400 | mm | 329 | | 15 | |
| | | in | 13 | | 0.6 | |
| 400 - 110 | mm | 345 | 15 | | | |
| | in | 13.6 | 0.6 | | | |
| 20952 - Standard 20962 - Standard | 1700 - 4500 | mm | 321 | | 99.5 | 15 |
| | | in | 12.7 | | 3.92 | 0.6 |
| | 1400 | mm | 337 | 99.5 | 15 | |
| | | in | 13.3 | 3.92 | 0.6 | |
| 400 - 110 | mm | 354 | 99.5 | 15 | | |
| | in | 14 | 3.92 | 0.6 | | |
| 20932 - Boosted 20942 - Boosted | 2000 - 3250 | mm | 338 | Varies by Stroke | 15 | |
| | | in | 13.4 | | 0.6 | |
| | 1600 | mm | 354 | | 15 | |
| | | in | 14 | | 0.6 | |
| 450 - 1300 | mm | 370 | 15 | | | |
| | in | 14.6 | 0.6 | | | |
| 20952 - Boosted 20962 - Boosted | 2000 - 3250 | mm | 346 | | 99.5 | 15 |
| | | in | 13.7 | | 3.92 | 0.6 |
| | 1600 | mm | 362 | 99.5 | 15 | |
| | | in | 14.3 | 3.92 | 0.6 | |
| 450 - 1300 | mm | 379 | 99.5 | 15 | | |
| | in | 15 | 3.92 | 0.6 | | |

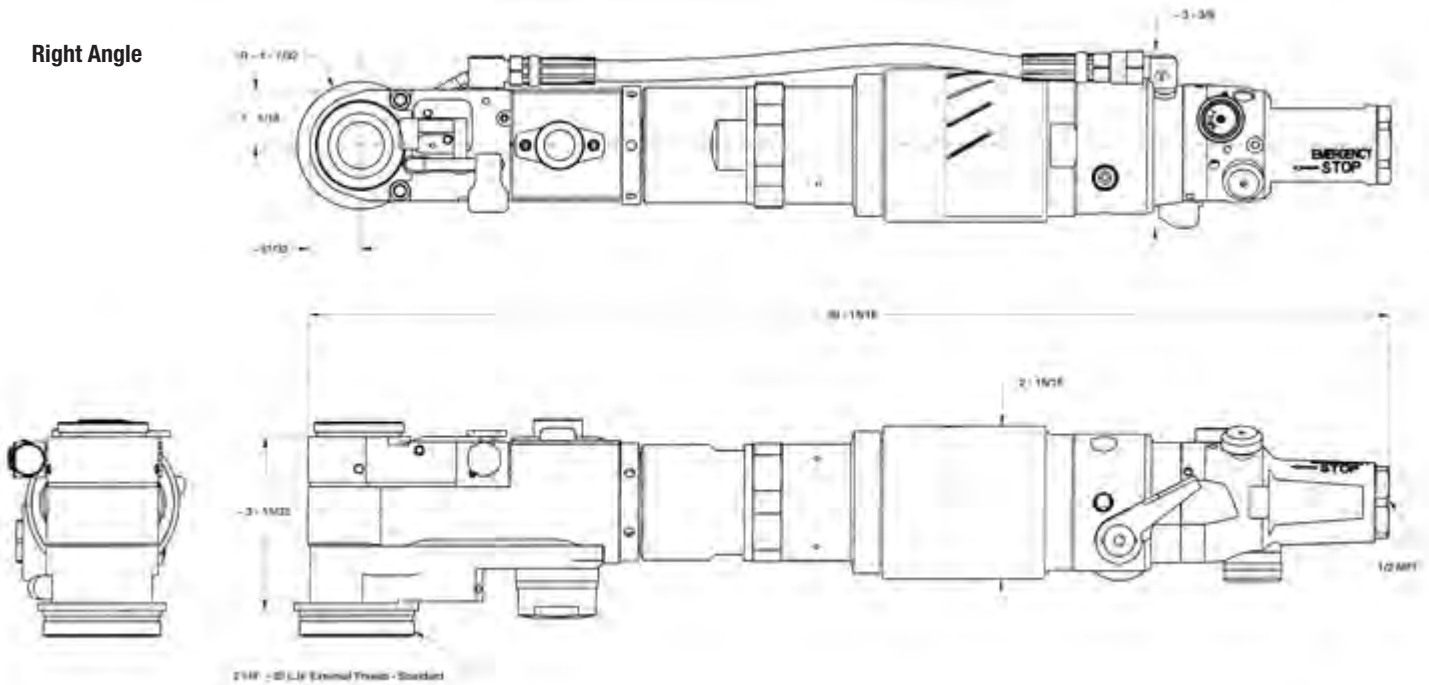
DESCRIPTION

- Fully automatic drill cycle start, feed, retract, stop.
- Wide range of fixturing options and accessories.
- Use spindles of varying lengths to provide range of stroke* required for the application.
- Spindle can be manually retracted at any point during the cycle.
- Many customizable options, see page 23.

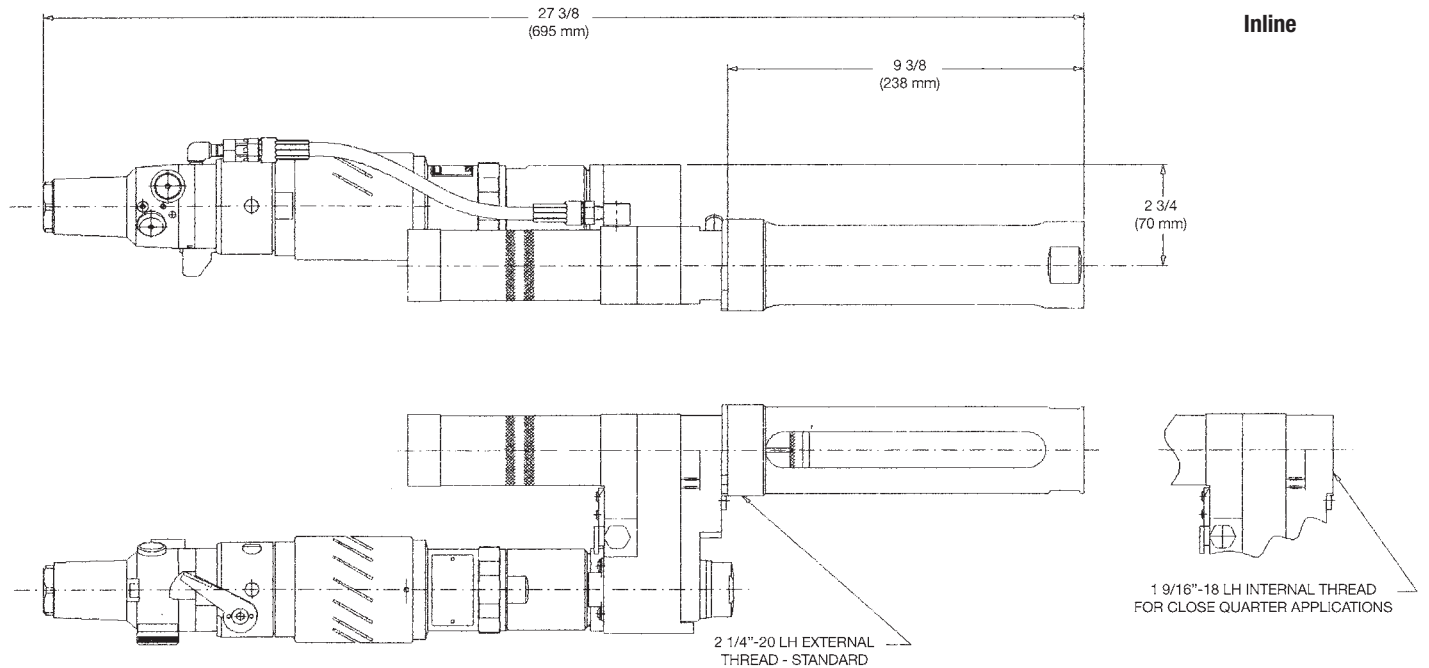


| MODEL | MOTOR CONFIGURATION | SPEEDS | FEED RATE | SPINDLE ATTACHMENT | STROKE | ACCESSORIES |
|----------------------------------|---------------------|--|--|---|-----------------|-------------|
| 230QB | Inline | 75, 97, 120, 150, 188, 240, 307, 310, 390, 480, 585, 680, 825, 960, 1155, 1500 | 0.0005, 0.001, 0.002, 0.003, 0.0045, 0.006, 0.008, 0.012 ipr | 1/4 in - 28, 5/16 in - 24, 3/8 in - 24, 9/16 in - 18, 200DA Collet, *Specials on Request* | Per Application | See Options |
| 230QR-GD Gun Drill | Right Angle | 1500 1850 2100 | 0.0005, 0.001 ipr | 1/4 in - 28, 5/16 in - 24, 3/8 in - 24, 9/16 in - 18, 200DA Collet, *Specials on Request* | Per Application | See Options |
| 230QR | Right Angle | 50, 65, 80, 100, 125, 160, 205, 260, 320, 390, 440, 550, 640, 770, 1000 | 0.0005, 0.001, 0.002, 0.003, 0.0045, 0.006, 0.008, 0.012 ipr | 1/4 in - 28, 5/16 in - 24, 3/8 in - 24, 9/16 in - 18, 200DA Collet, *Specials on Request* | Per Application | See Options |
| 230QRV Variable Speed | Right Angle | 50 - 125 100 - 250 210 - 520 420 - 1000 | 0.0005, 0.001, 0.002, 0.003, 0.0045, 0.006, 0.008, 0.012 ipr | 1/4 in - 28, 5/16 in - 24, 3/8 in - 24, 9/16 in - 18, 200DA Collet, *Specials on Request* | Per Application | See Options |
| 230QBV Variable Speed | Inline | 75 - 187 150 - 375 330 - 780 600 - 1500 | 0.0005, 0.001, 0.002, 0.003, 0.0045, 0.006, 0.008, 0.012 ipr | 1/4 in - 28, 5/16 in - 24, 3/8 in - 24, 9/16 in - 18, 200DA Collet, Specials on Request | Per Application | See Options |

Right Angle



Inline



TECHNICAL DATA

- Motor power: Standard
- Base Weight: 15.8 - 17 lbs / 7.1 - 7.7 kg
- Noise: <=80 dBA
- Nominal Power: 2.1 hp
- Recommended Hose Size: 1/2 in / 12 mm
- Air Consumption: 69
- Thrust: 1800 lbs



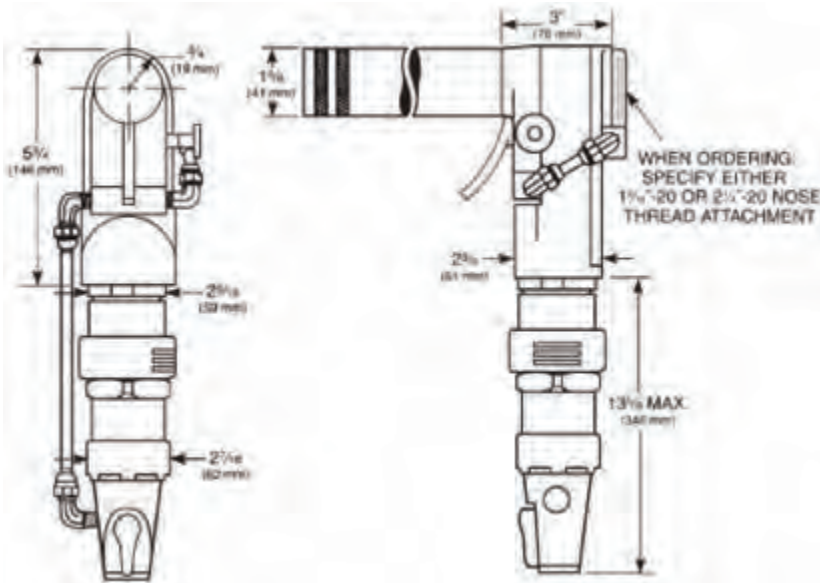
DESCRIPTION

- Nominal capacity: 158Q - 1 in / 25 mm in aluminum and CFRP, 5/8 in / 16 mm in titanium.
15QR - 5/8 in / 16 mm in aluminum and CFRP, 1/2 in / 12.7 mm in titanium.
- Separate manual control for air motor and feed - less affect from air supply variation.
- Feed is engaged by pressing down on feed engagement lever/button.
- Automatic retract stop with protective rolling impulse clutch prevents jamming of spindle at end of retract.
- Air motor is manually started at beginning and shut off at completion of drill cycle.
- Use spindles of varying lengths to provide range of stroke* required for the application.
- 15QRHD new heavy duty gives greater hole capacity/durability (up to 5/8 in - titanium) in a compact size.
- 15QRHD Externally replaceable shear pin provides gear protection if chips pack or cutter binds.
- Many customizable options, see page 23.

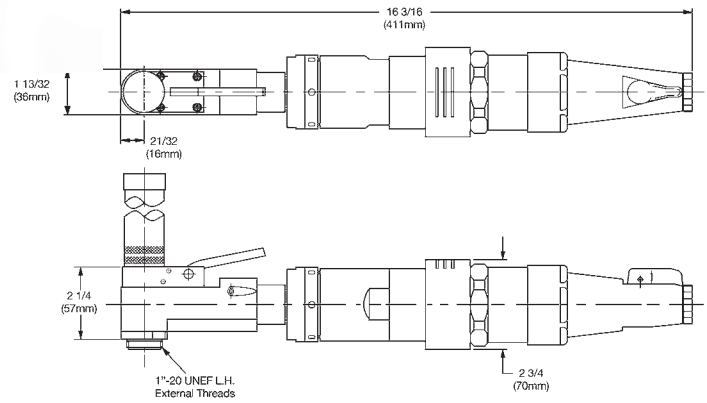


| MODEL | MOTOR CONFIGURATION | SPEEDS | FEED RATE | SPINDLE ATTACHMENT | STROKE | ACCESSORIES |
|------------------------------|---------------------|---|--|---|-----------------|-------------|
| 158QR | Right Angle | 47, 56, 70, 94, 110, 120,140, 185, 194, 230, 288, 380, 388, 460, 485, 570, 760, 950 | 0.0005, 0.001, 0.002, 0.0035, 0.0055, 0.0075 ipr | 1/4 in - 28, 5/16 in - 24, 3/8 in - 24, 9/16 in - 18, 200DA Collet, *Specials on Request* | Per Application | See Options |
| 158QRV - Variable Speed | Right Angle | 47-120, 92-230, 194-485, 380-950 | 0.0005, 0.001, 0.002, 0.0035, 0.0055, 0.0075 ipr | 1/4 in - 28, 5/16 in - 24, 3/8 in - 24, 9/16 in - 18, 200DA Collet, *Specials on Request* | Per Application | See Options |
| 158-15QRHDV - Variable Speed | Right Angle | 70 - 150, 140 - 290, 250 - 600, 490 - 1200, 2000 - 3000 | 0.0005, 0.001, 0.002, 0.003, 0.006 ipr | 1/4 in - 28, 5/16 in - 24, 3/8 in - 24, 9/16 in - 18, 200DA Collet, *Specials on Request* | Per Application | See Options |
| 158-15QRHD | Right Angle | 110, 140, 230,290, 490, 600,1000, 1200,2000, 3000 | 0.0005, 0.001, 0.002, 0.003, 0.006 ipr | 1/4 in - 28, 5/16 in - 24, 3/8 in - 24, 9/16 in - 18, 200DA Collet, *Specials on Request* | Per Application | See Options |
| 15QRHD | Right Angle | 165, 265, 335, 465, 660, 1000, 1650 | 0.0005, 0.001, 0.002, 0.003, 0.006 ipr | 1/4 in - 28, 5/16 in - 24, 3/8 in - 24, 9/16 in - 18, 200DA Collet, *Specials on Request* | Per Application | See Options |

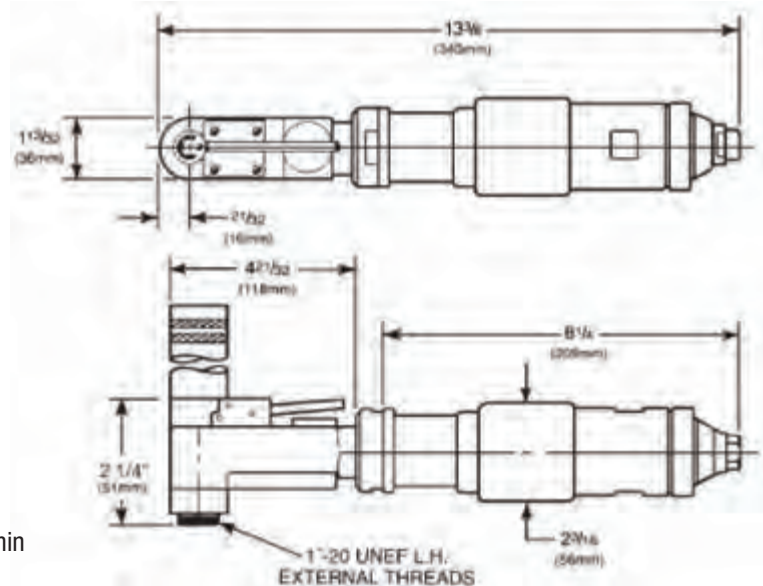
158QR(V)



158-15QR-(V)HD



15QRHD



TECHNICAL DATA

Motor power: 15 - 1 hp / 0.75 kW, 158 - 1.6 hp / 1.2 kW

Base Weight: 15 - 5 lbs / 2.3 kg, 158 - 9.8 lbs / 4.5 kg

Noise: ≤ 80 dBA

Air Inlet Pressure: 90 psi / 6.3 bar

Recommended Hose Size: 1/2 in / 12 mm

Air Consumption: 15 - 42 cfm / 1190 l/min, 158 - 63 cfm / 1780 l/min

Thrust: 158Q Series - 1000 lbs, 158 & 15QR Series - 500 lbs

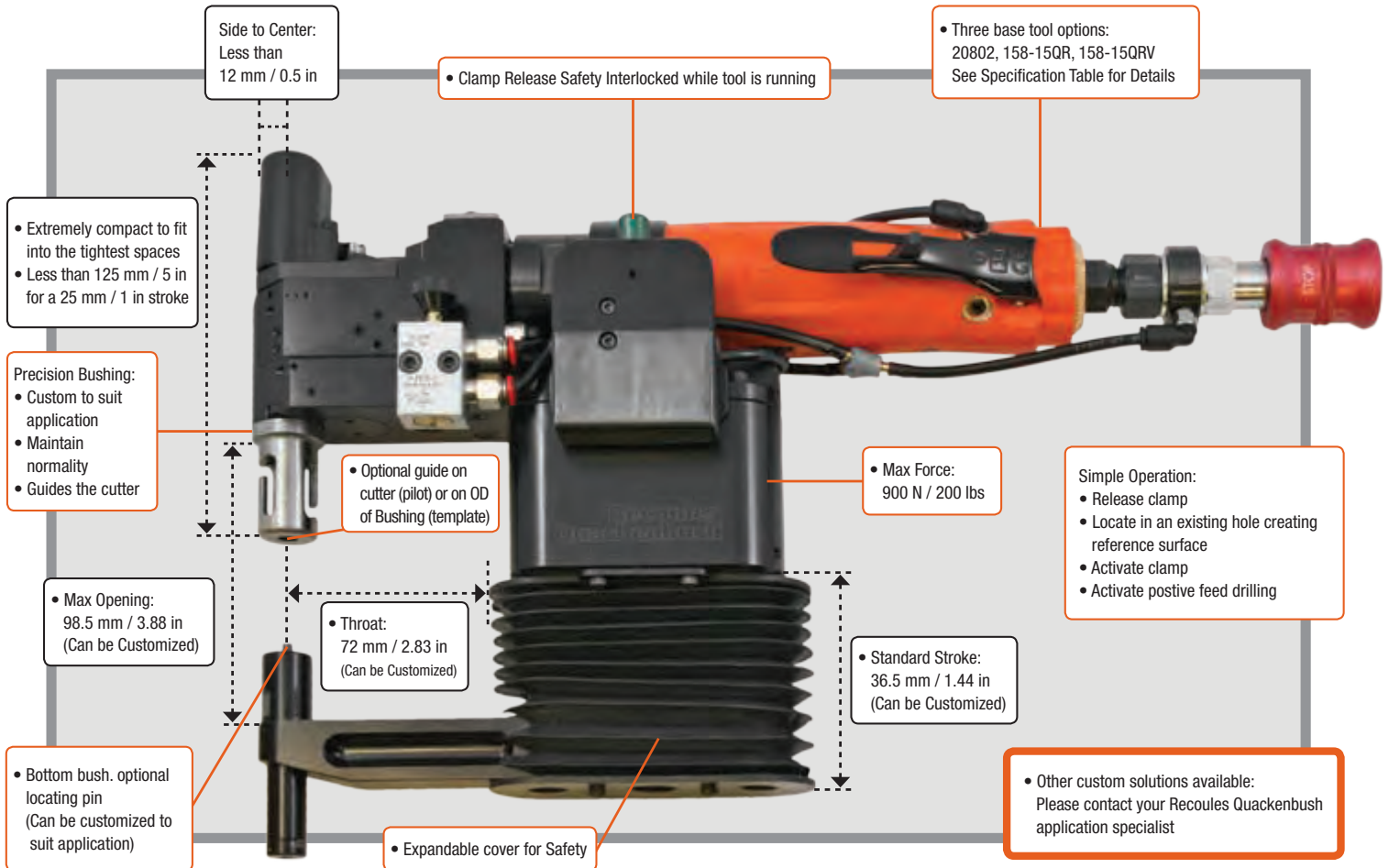


DESCRIPTION

- Simple and easy to fixture and operate -fixturing can be eliminated.
- Extremely compact for difficult access applications such as ribs and spars.
- Expandable cover for safety.
- Modular design.
- Precision bushing to maintain normality and guide the cutter.
- Safety interlock to maintain clamp while running.
- Many customizable options, see page 23.



| MODEL | SPEED RPM | FEED in / rev (ipr) | FEED mm / rev | SPINDLE ATTACHMENT OPTIONS | STROKE in / mm | NOMINAL POWER hp / kW | FIXTURING OPTIONS | ACCESSORIES |
|-----------------|---|--|--|--|--|-----------------------|---|---|
| 20802-MCC | 380 560 950 1500 1800 2200 3800 6100 | 0.001 0.003 0.004 | 0.028 0.07 0.10 | 1/4 in - 28 5/16 in - 24 M4 M6 Specials on Request | Std 1 / 25.4 Other strokes on Request | 0.9 / 0.70 | Locate on Prehole in Component: Pilot on Cutter. Locating Pin on Clamp Locate on Outside Diameter of Bushing | M Mitis™ Chip Fragmentation. Vacuum. Onboard Lubricator. Floor Pump Lubricator. Electronic Cycle Counter - (Service, Maintenance and Cutter Life). Cutters |
| | 158-15QRHD-MCC | 110 230 490 600 1200 2000 3000 | 0.0005 0.001 0.002 0.003 0.006 | 0.013 0.025 0.051 0.076 0.152 | | | | 1/4 in - 28 5/16 in - 24 3/8 in - 24 9/16 in - 18 200DA Collet Specials on Request |
| 158-15QRVHD-MCC | 140 - 290 490 - 1200 2000 - 3000 | | | | | | | |



TECHNICAL DATA

Motor power: 158 - 1.6 hp / 1.2 kW, 20802 - 0.9 hp / 0.7 kW

Base Weight: 158 - 4 kg / 8.8 lbs, 20802 - 3 kg / 6.6 lbs

Noise: <=80 dBA

Air Inlet Pressure: 90 psi / 6.3 bar

Recommended Hose Size: 1/2 in / 12 mm

Air Consumption: 158 - 63 scfm / 1780 l/min, 20802 - 36 scfm / 1000 l/min



DESCRIPTION

- Compact portable air-feed drill with hydraulic feed control.
- Reduced operator effort for drilling / countersinking.
- Lightweight and comfortable grip.
- Range of speeds, stroke, and power.
- Range of location / fixture options.
- Vacuum option to reduce clean up.
- Many customizable options, see page 24.



| MODEL | SPEEDS | STROKE in / mm | ACCESSORIES |
|-------------------------|--|-------------------|-------------|
| 21500 21502 120QP | 15000 | 1 / 25 | See Options |
| CD14 | 500, 800, 1300, 1900, 3200, 5200, 6200, 20000 | 1 / 25 | See Options |
| CD1V | Variable, 150-550, 400-1200, 700-2400 | 1 / 25 | See Options |
| CD15 | 1000, 1700, 4500, 18000 | 1 / 25 | See Options |
| CD25 | 1000, 1700, 4500, 18000 | 2 / 51 | See Options |
| CD2V | Variable, 150-550, 400-1200, 700-2400 | 2 / 51 | See Options |
| CD24 | 500, 800, 1300, 1900, 3200, 5200, 6200, 20000 | 2 / 51 | See Options |

TECHNICAL DATA

Motor Power: CD-V & CD-4 - 0.9 hp / 0.67 kW, CD-5 - 1.3 hp / 1.0 kW, 21500 - 1.2 hp / 0.95 kW

Base Weight: 40 lbs / 1.8 kg

Thrust: CD1 - 90 lbs / 400 N, CD2 - 120 lbs / 535 N, 21500 - 55 lbs / 245 N

Noise Level: <=85 dBA

Countersink Accuracy: ± .002 in / ±.05 mm

Air Consumption: CD-V - 32 scfm / 900 l/min, CD-4 - 30 scfm / 850 l/min, CD-5 - 46 scfm / 1300 l/min, 21500 - 30 scfm / 850 l/min

Recommended Hose Size: 1/2 in / 12 mm



DESCRIPTION

- PA for Drilling small holes in aluminum, PB for larger holes in aluminum, titanium, and steel.
- Compact air feed with hydraulic feed control.
- Access very confined spaces.
- Modular design.
- Variety of angle head, speeds, and yoke sizes.
- Thrust actuated by button / toggle or combine with drill lever (tape lock only).
- Drill point lubricator can improve hole quality and extend cutter life.
- Many customizable options, see page 24.



| MODEL | NOMINAL POWER hp / kW | MOTOR CONFIGURATION | SPEEDS | SPINDLE ATTACHMENT | STROKE in / mm | THRUST lbs / N | RECOMMENDED HOSE SIZE ID | AIR CONSUMPTION SCFM / l/min |
|----------------|--------------------------|--|--|---|-------------------|-------------------|--------------------------|---------------------------------|
| PAX-5XX | 0.9 / 0.67 | PA2 - Squeeze Yoke PA3 - Push Away PA5 - Taper lok | 300, 500, 750, 1000, 1300, 2100, 3500, 4500 | 1/4 in - 28 Heavy Duty Angle Head. 5/16 in - 24 Heavy Duty Angle Head 3/8 in - 24 Heavy Duty Angle Head | 1.25 / 31.8 | 120 / 540 | 1/2 in / 12 mm | 32 / 900 |
| PAX-6XX | 0.9 / 0.67 | PA2 - Squeeze Yoke PA3 - Push Away PA5 - Taper lok | 450, 750, 1100, 1400, 1850, 3000, 5000, 6000 | 1/4 in - 28 MiniAngle Head 5/16 in - 24 Mini Angle Head | 1.25 / 31.8 | 120 / 540 | 1/2 in / 12 mm | 32 / 900 |
| PAX-8XX | 0.9 / 0.67 | PA2 - Squeeze Yoke PA3 - Push Away PA5 - Taper lok | 300, 500, 750, 1000, 1300, 2100, 3500, 4550 | 300DA Collet Spindle | 1.25 / 31.8 | 120 / 540 | 1/2 in / 12 mm | 32 / 900 |
| PBX-5XX | 0.9 / 0.67 | PA2 - Squeeze Yoke PA3 - Push Away PA5 - Taper lok | 300, 500, 750, 1000, 1300, 2100, 3500, 4500 | 1/4 in - 28 Heavy Duty Angle Head. 5/16 in - 24 Heavy Duty Angle Head 3/8 in - 24 Heavy Duty Angle Head | 1.25 / 31.8 | 160 / 710 | 1/2 in / 12 mm | 32 / 900 |
| PBX-6XX | 0.9 / 0.67 | PA2 - Squeeze Yoke PA3 - Push Away PA5 - Taper lok | 450, 750, 1100, 1400, 1850, 3000, 5000, 6000 | 1/4 in - 28 MiniAngle Head 5/16 in - 24 Mini Angle Head | 1.25 / 31.8 | 160 / 710 | 1/2 in / 12 mm | 32 / 900 |
| PBX-8XX | 0.9 / 0.67 | PA2 - Squeeze Yoke PA3 - Push Away PA5 - Taper lok | 300, 500, 750, 1000, 1300, 2100, 3500, 4550 | 300DA Collet Spindle | 1.25 / 31.8 | 160 / 710 | 1/2 in / 12 mm | 32 / 900 |

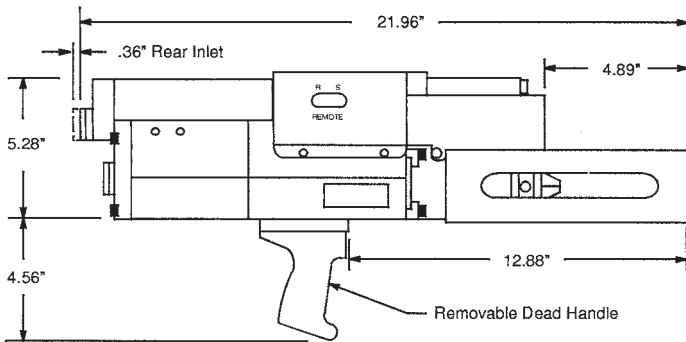


DESCRIPTION

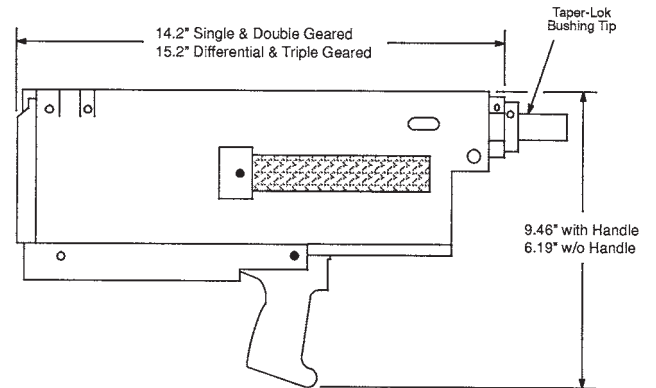
- Can eliminate reaming operations, Drills materials dry while maintaining acceptable hole quality and long cutter life.
- Peck feed drills drill a short distance, then retract from the hole to clear the chips and dissipate heat.
- Adjustable, controlled feed rate, adjustable peck rate, depth control, and rapid advance.
- HT3 Series Capacity: Aluminum – 1.25 in / 32 mm, Titanium – 1 in / 25 mm, Steel – 1 in / 25 mm.
- HT3 Series Push button peck disable for non-peck advance at any time during the drilling cycle.
- HT4 Series Capacity: Aluminum – 0.5 in / 13 mm, Titanium – 0.375 in / 10 mm, Steel – 0.375 in / 10 mm.
- One button start, fully automatic cycle.
- Reduces cost per hole.
- Equal drill time.
- Many customizable options, see page 24.



HT3



HT4



| MODEL | NOMINAL POWER hp / kW | MOTOR CONFIGURATION | SPEEDS | STROKE in / mm | THRUST lbs / N | FIXTURING OPTIONS | RECOMMENDED HOSE SIZE ID in / mm |
|------------|--------------------------|---------------------|--|-------------------|-------------------|---|-------------------------------------|
| HT3 | 1.1 / 0.8 | Pistol Grip | 3000, 2400, 2100, 1600, 650, 475, 300, 150, 80 | 3 / 76.2 | 630 / 2800 | Nose Concentric Collet | 1/2 / 12 |
| HT4 | 0.75 / 0.6 | Pistol Grip | 22000, 11000, 5700, 2900, 1500, 780, 500, 270, 150 | 4 / 102 | 500 / 2225 | 21k series 22k series 23k series 24k series Concentric Collet | 3/8 / 10 |



DESCRIPTION

- Range of Self-Colleting air fed tools with hydraulic feed control for hole making operations.
- Variety of spindle speeds and terminations to satisfy a wide range of applications.
- Micro Depth Adjustment - countersink depths within ± 0.001 in.
- 136TF Hole Spacing Range: 0.5 in / 12.5 mm to 2.75 in / 70 mm.
- 120TF Hole Spacing Range: 1.00 in to 3.50 in.
- Many customizable options, see page 24.

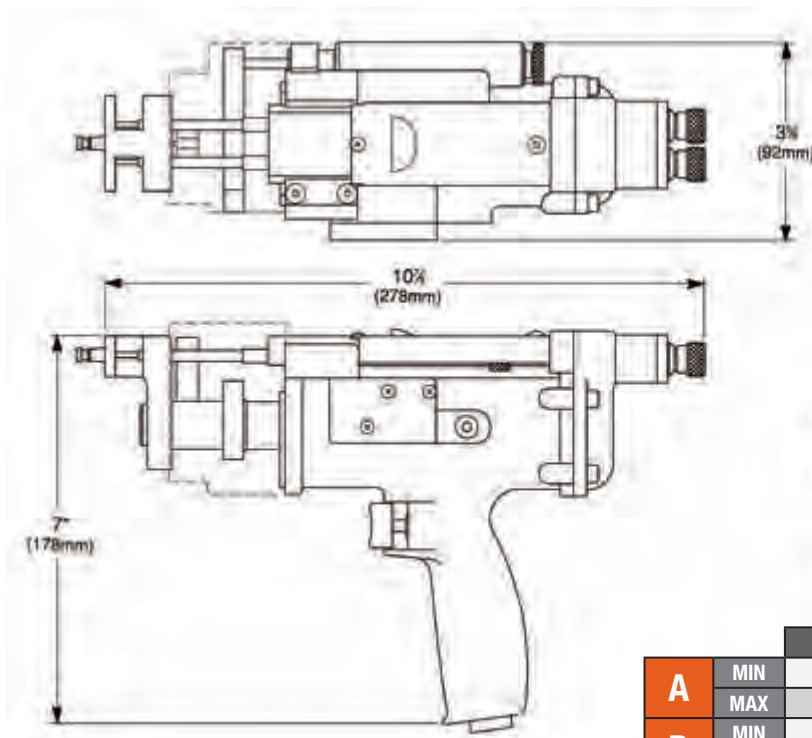


| MODEL | NOMINAL POWER hp / kW | MOTOR CONFIGURATION | SPEEDS | STROKE in / mm | THRUST lbs / N | FIXTURING OPTIONS | ACCESSORIES | RECOMMENDED HOSE SIZE ID in / mm | AIR CONSUMPTION SCFM / l/min |
|---------|--------------------------|---------------------|---|-------------------|-------------------|---|-------------|-------------------------------------|---------------------------------|
| 136-150 | 0.85 / 0.63 | Pistol Grip | 400, 900, 2100, 3100, 6000, 7800, 11500, 22500 | 1.5 / 38.1 | 195 / 38.1 | Template Foot - Left Hand, Template Foot - Right Hand, 21k Bushing, 22k Bushing, Jig Collet Foot - Standard, Jig Collet Foot - Depth sensing for countersink, C/D Yoke | See Options | 1/2 / 12 | 30 / 850 |
| 120-112 | 1.2 / 0.9 | Pistol Grip | 270, 470, 700, 900, 1150, 2200, 3500, 5500, 7000, 14000, 23500 | 1.125 / 28.6 | 300 / 1330 | Template Foot - Left Hand, Template Foot - Right Hand, 21k Bushing, 22k Bushing, Jig Collet Foot - Standard, Jig Collet Foot - Depth sensing for countersink, C/D Yoke | See Options | 1/2 / 12 | 42 / 1200 |
| 120-225 | 1.2 / 0.9 | Pistol Grip | 270, 470, 700, 900, 1150, 2200, 3500, 5500, 7000, 14000, 23500 | 2.25 / 57.2 | 300 / 1330 | Template Foot - Left Hand, Template Foot - Right Hand, 21k Bushing, 22k Bushing, Jig Collet Foot - Standard, Jig Collet Foot - Depth sensing for countersink, C/D Yoke | See Options | 1/2 / 12 | 42 / 1200 |
| 180-225 | 1.8 / 1.3 | Pistol Grip | 240, 420, 650, 850, 1050, 2000, 3100, 4900, 6300, 12500, 21000 | 2.25 / 57.2 | 300 / 1330 | Template Foot - Left Hand, Template Foot - Right Hand, 21k Bushing, 22k Bushing, Jig Collet Foot - Standard, Jig Collet Foot - Depth sensing for countersink | See Options | 1/2 / 12 | 63 / 1780 |



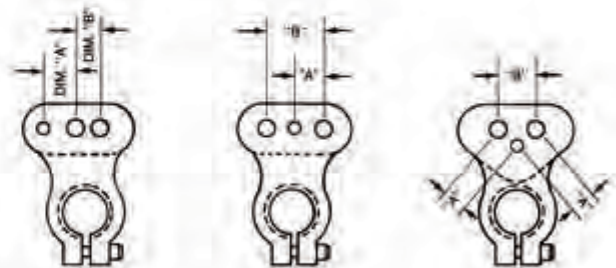
DESCRIPTION

- Twin spindle drill for nut plate fasteners.
- Large range of pressure feet to suit nut plate designs.
- Capacity: Drill - 0.1285 in / 3 mm, Countersink* - 0.250 in / 6 mm.
- Minimum Countersink Depth Accuracy of ± 0.001 in / ± 0.03 mm.
- Countersink Depth adjustable in 0.001 in / 0.03 mm increments.
- Variable spacing available from 0.3 in / 7.6 mm to 1.0 in / 25.4 mm.
- M Mini Spindle Option for closer centers (0.219 in / 5.6 mm) min.
- Single tool can be used to drill and countersink holes for Single Wing, Double Wing, and Mickey Mouse fasteners by simply changing the spindle support block, lift finger, and pressure foot.
- Pressure foot options to suit nut plate centers.
- Many customizable options, see page 24.



INFORMATION NECESSARY TO ORDER NUT PLATE DRILL

1. Tool rpm _____
2. Type of foot _____
3. Collet to spindle spacing (A) _____
4. Spindle to spindle spacing (B) _____
5. Drill Shank Diameter (C) _____
6. Pilot Hole Diameter: _____
Min. _____
Max. _____
7. Thickness of material to be drilled _____

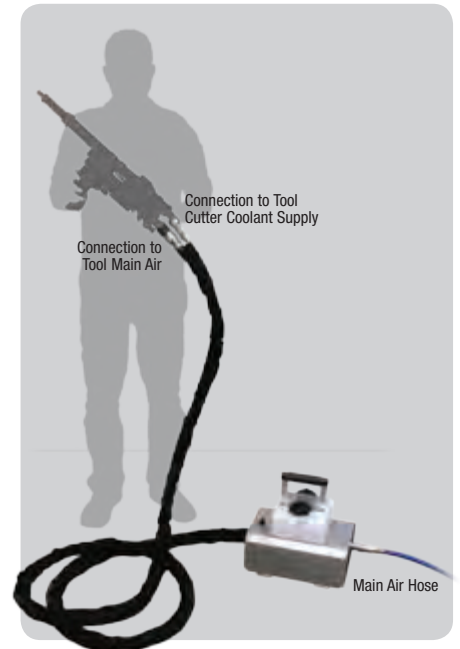
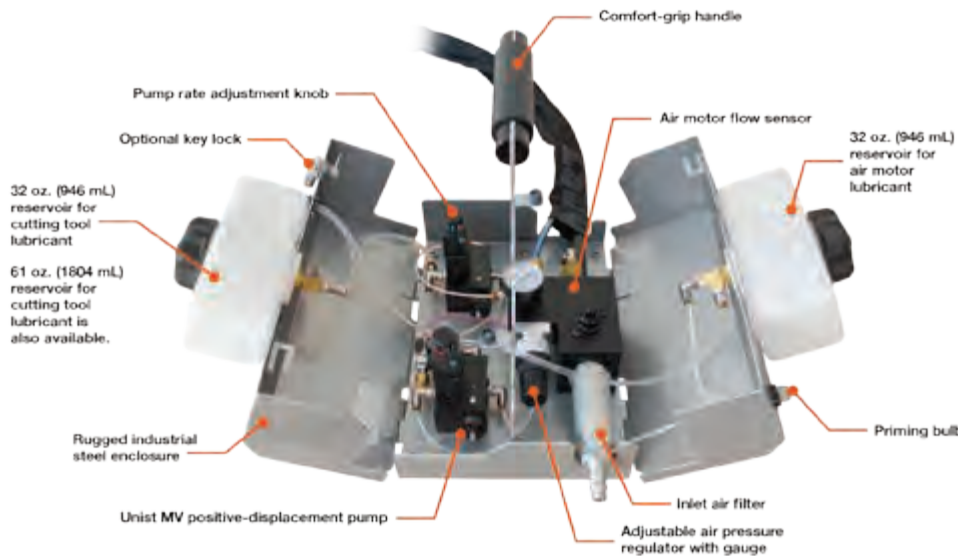


| | | SINGLE WING | DOUBLE WING | MICKEY MOUSE |
|----------|-----|-------------|-------------|--------------|
| A | MIN | 0.344 | - | 0.212 |
| | MAX | 0.679 | - | 0.500 |
| B | MIN | 0.312 | 0.343 | 0.300 |
| | MAX | 1.000 | 1.125 | 1.000 |

| MODEL | NOMINAL POWER hp / kW | MOTOR CONFIGURATION | SPEEDS | STROKE in / mm | THRUST lbs / N | FIXTURING OPTIONS | ACCESSORIES | RECOMMENDED HOSE SIZE ID in / mm |
|---------------|--------------------------|------------------------|-----------|-------------------|-------------------|--|-------------|--|
| 10QNPD | 0.75 / 0.56 | Pistol Grip | 6000 | 0.6 / 15.2 | 180 / 800 | Double Wing Single Wing Mickey Mouse | See Options | 3/8 / 10 |
| 10QNPD | 0.75 / 0.56 | Pistol Grip | 600. 6000 | 0.6 / 15.2 | 180 / 800 | Double Wing Single Wing Mickey Mouse | See Options | 3/8 / 10 |

DESCRIPTION

- Portable design and comfort-grip handle.
- Tough, durable construction.
- Low pressure drop.
- Works well with both oil- and water-based cutting tool lubricants.
- Reliable, consistent lubricant application to both the cutting tool and air motor (optional).
- Independent adjustment of fluid and air.



| MODEL | COOLANT RESERVOIR | AIR TOOL OIL RESERVOIR |
|----------|----------------------------|------------------------|
| 635107PT | 0.95 liters / 0.25 gallons | No |
| 635108PT | 0.95 liters / 0.25 gallons | Yes |

FEATURES VS. ON-BOARD LUBRICATORS

Larger reservoir capacity: 946 mL vs. 55 mL > 17x means less fill-ups and more holes between fill-ups.

More flexible: With the on-board system, one pump can be used with multiple drill units vs. a pump unit for every unit.

Better ergonomics: Keeps tool weight lower with no on-board lubricator.

More durable and reliable lubrication flow: Less opportunity to drill without lubrication.

High-visibility reservoir: Know exactly when to refill.

Higher air pressure: For more reliable lubrication flow.

DESCRIPTION

- The production costs can be significantly reduced by the use of micro lubrication.
- The reduction of friction and the resulting increase of productivity will allow a more economical processing of workpieces.
- Shorter machine down time by increase of tool life.
- Reduction of disposal costs due to almost dry chips.
- No extra installation for the operation of coolants required - additional energy cost savings.

OUTSIDE LUBRICATION APPLICATOR EQUIPPED WITH BRASS PUMPS



- 1 Switch: ON / OFF. Optional: solenoid valve, toggle switch, roller valve, drawer distributor.
- 2 Air control valve: Regulates the air outlet at the nozzle. Each aluminum pump has its own air control valve which can be used independently.
- 3 Graduation scale of the amount of Lubricant - The adjustment screw regulates the amount of Lubricant necessary.
- 4 Frequency Generator: Checks the pump cycle frequency. Pneumatic pulse generator: 5-180 strokes / minute. Generator electrical frequency: 1-128 strokes / minute. Solenoid: freely programmable.
- 5 Metal Housing
- 6 Mounting System: Pre-drilled holes for fixed installation of the applicator on the machine tool or to schedule are magnets on the metal housing.
- 7 Air supply: Input pressure: min. 4 bar, max. 10 bar.
- 8 Air Filter
- 9 Tank. Capacity: 0.3 L; 1 L, 2 L, 3 L also available with level indicator.
- 10 Nozzles: Circular saw tape, copper nozzles, steel and Loc-line, flexible metal nozzles, rotating nozzles, and special nozzles.
- 11 Lubricant

Copper / steel nozzles with adjusting block



Rotative nozzles



Nozzle tips



Special nozzles



ACCU-LUBE MINI BOOSTER MB 2010 MINI SR

- For tools with oil hole diameter of 1 - ≤ 12 mm or maximum 2 x 6 mm.

TECHNICAL DATA

Operating current: 24 V CC 2W (optional: 110 V, 230 V)

Operating pressure: 5.5 - 9 bars

Reservoir: 500 - 750 ml (optional 950 / 1.400 ml)

ACCU-LUBE LUBRICANTS - NO HARM TO OPERATORS OR ENVIRONMENT

- Accu-Lube Lubricants which do not leave any stains on the material after post heat treatment.
- The following Accu-Lube lubricants are especially appropriate for processing of ferrous material. Should these Accu-Lube lubricants be used on non-ferrous material, it must be degreased prior to post heat treatment in order to avoid stains on the material.

| PROCESSING AREAS | LUBRICANT | | | | | | | |
|-----------------------------|------------|----------|---------|----------|---------|---------|-----------|----------|
| | LB 2000 | LB 5000 | LB 6000 | LB 5500 | LB 4500 | LB 4000 | LB 8000 | LB 10000 |
| All Metallic Materials | ● | ● | ● | ● | ● | ● | ● | ● |
| Pin+V-Block lubricity test | 1.750 | 1.000 | 1.250 | 900 | 1.250 | | | 1.750 |
| Flash point | >300°C | >160°C | 214°C | >160°C | 191°C | 214°C | 310°C | >250°C |
| Pour point | -8° - -5°C | 2° - 7°C | -20°C | 0° - 3°C | 4°C | -20°C | ca. -20°C | <0°C |
| Viscosity at 40°C | 35 | 18.0 | 12 | 20 | 5 | 12 | 36 | 35 |
| Suitable for Booster system | — | ● | ● | ● | — | ● | ● | — |

| QUANTITY | ITEM N° | | | | | | | |
|------------|----------|----------|----------|----------|----------|----------|----------|----------|
| | LB 2000 | LB 5000 | LB 6000 | LB 5500 | LB 4500 | LB 4000 | LB 8000 | LB 10000 |
| 1 liter | 70501005 | 70501205 | 70501405 | 70501705 | 70501905 | 70501305 | 70501805 | 70501505 |
| 5 liters | 70501010 | 70501210 | 70501410 | 70501710 | 70501910 | 70501310 | 70501810 | 70501510 |
| 20 liters | 70501035 | 70501235 | 70501435 | 70501735 | 70501935 | 70501335 | 70501835 | 70501535 |
| 205 liters | 70501040 | 70501240 | 70501440 | 70501740 | 70501940 | 70501340 | 70501840 | 70501540 |

| CHARACTERISTICS OF THESE LUBRICANTS | |
|-------------------------------------|--|
| LB 2000 | For light to heavy cutting operations. Accu-Lube LB 2000 - is manufactured out of natural, highly refined triglycerides. |
| LB 5000 | For medium to heavy cutting operations. |
| LB 6000 | For light to medium-heavy cutting operations. Accu-Lube LB 6000. |
| LB 5500 | For light to medium-heavy cutting operations. |
| LB 4500 | For light cutting operations. Accu-Lube LB 4500 consists of natural ingredients. It is especially appropriate for working in aluminium. Accu-Lube LB 4500 is conditionally suitable for post heat treatment. |
| LB 4000 | For light to medium-heavy cutting operations. Accu-Lube LB 4000 is based on natural fatty acids. |
| LB 8000 | For light to medium-heavy cutting operations. Accu-Lube LB 8000 – is a mixture of natural ingredients. |
| LB 10000 | For light to medium-heavy cutting operations. Accu-Lube LB 8000 is manufactured out of natural, refined triglycerides. |

The following Accu-Lube lubricants in solid and paste-like form are especially appropriate for manual application:

| ITEM NO. | DESCRIPTION |
|----------|---------------------------------------|
| 70501016 | Accu-Lube LB 5000 Gel Paste (255 g) |
| 70501015 | Accu-Lube LB 5000 Solid Paste (255 g) |
| 70501025 | Accu-Lube LB 5000 Solid Block (71 g) |
| 70501030 | Accu-Lube LB 5000 Solid Stick (62 g) |
| 70501032 | Accu-Lube LB 5000 Solid Stick (368 g) |
| 70501060 | Accu-Lube LB 2000 Spray (222 g) |
| 70501360 | Accu-Lube LB 4000 Spray (222 g) |
| 70501260 | Accu-Lube LB 5000 Spray (222 g) |
| 70501760 | Accu-Lube LB 5500 Spray (222 g) |
| 70501560 | Accu-Lube LB 10000 Spray (222 g) |

TOOL LIFE (ACCORDING TO CONDITIONS SPECIFIED IN USER MANUAL)



HOW THE VIBRATORY SYSTEM WORKS

- A small coaxial vibration combined with constant Advanced Drilling feed generates the chip fragmentation allowing a better chip extraction. This vibration is created by a simple mechanical device. The frequency and amplitude of the vibration is defined in function of the application.

BENEFITS

- Small chips generation whatever drilling condition.
- Excellent chips extraction.
- No risk of spoiled surface due to long chip extraction.
- No overload for torque and thrust during drilling operation.
- Predictive tool life cycle thanks to constant sollicitations.
- Potential tool life extension.
- Good lubrication and cooling thanks to cut discontinuity.



Compatible Advanced Drilling Equipment with integrated MITIS™ option

A2V / A2T

A1V / A1T

20932 / 42

20952 / 62

Non Fragmented chips



Fragmented chips



| FIXTURING OPTIONS AND ACCESSORIES | DESCRIPTION | AD MODEL | | | | | | |
|--|---|----------|-----|-----|------|-------|-----|--------|
| | | 209X2 | A1X | A2X | 15QR | 158QR | 230 | MINI C |
| Twist Lock |  Bayonet clamping with Optional Vacuum Extraction | ● | ● | ● | ● | ● | ● | — |
| Concentric Collet |  Clamping system in a straight bore hole Lower cost fixture and faster clamping | ● | ● | ● | ● | — | — | — |
| Template Foot |  Clamping in the component on an adjacent hole with a template strip for location | ● | ● | ● | — | — | — | — |
| C Clamping |  For holes near a component edge with limited access | ● | — | ● | ● | — | — | ● |
| DASA |  DASA attachment for big diameters and long thickness | — | ● | — | — | — | ● | — |
| Crowfoot |  Offset heads for difficult access Only for right angle | ● | ● | — | — | — | — | — |
| Telescopic Spindle |  Telescopic spindle for difficult access | — | ● | — | ● | — | — | ● |
| MITIS™ Internal | | ● | ● | ● | — | — | ● | ● |
| MITIS™ External | | ● | ● | ● | ● | ● | ● | — |
| Electronic Counter for Cutter. Maintenance and Overall Life |  Helps maintain hole quality and Implement Preventative Maintenance | ● | ● | ● | ● | ● | ● | ● |
| Pneumatic Counter for Cutter Life |  Helps maintain hole quality | ● | ● | ● | ● | ● | ● | ● |
| On Board Cutter Lubricator | | ● | ● | ● | ● | ● | ● | ● |
| Floor Pump Cutter Lubricator | | ● | ● | ● | ● | ● | ● | ● |
| Pistol Handle |  Options for Single and Double trigger to improve ergonomic use | ● | — | ● | — | — | — | ● |
| Other Handles |  On Request to improve ergonomic use | ● | ● | ● | ● | ● | ● | — |
| Adaptive Control |  Improve cycle time and process control in multi layer stacks | ● | — | — | ● | ● | ● | — |
| Cutting Tools |  Get a complete drilling solution for optimum hole quality | ● | ● | ● | ● | ● | ● | ● |

| FIXTURING OPTIONS AND ACCESSORIES | DESCRIPTION | AD MODEL | | | | | | | |
|--|---|----------|-----|-----|----|----|-------------|-------|-----|
| | | 136 | 120 | 180 | HT | CD | 21500/120QP | PA/PB | 10Q |
| Twist Lock | Bayonet clamping with Optional Vacuum Extraction | ● | ● | ● | ● | ● | ● | ● | — |
| Concentric Collet | Clamping system in a straight bore hole. Lower cost fixture and faster clamping | ● | ● | ● | ● | — | ● | — | — |
| Template Boss | Location in template Fixture | — | — | — | — | ● | ● | — | — |
| C-Clamp | For holes near a component edge with limited access | — | — | — | — | — | — | ● | — |
| Push Away | For limited Access | — | — | — | — | — | — | ● | — |
| Twin Hole Drilling for Nut Plates | Single Wing. Double wing with Vacuum Options. Mickey Mouse Wing | — | — | — | — | — | — | — | ● |
| Thrust Booster | Increase thrust by 2.5 times for greater capacity | ● | ● | ● | — | — | — | — | ● |
| Electronic Counter for Cutter. Maintenance and Overall Life | Helps maintain hole quality and Implement Preventative Maintenance | ● | ● | ● | ● | ● | ● | ● | ● |
| Pneumatic Counter for Cutter Life | Helps maintain hole quality | ● | ● | ● | ● | ● | ● | ● | ● |
| On Board Cutter Lubricator | Helps maintain hole quality | ● | ● | ● | ● | ● | ● | ● | ● |
| Floor Pump Cutter Lubricator | Helps maintain hole quality | ● | ● | ● | ● | ● | ● | ● | ● |
| Cutting Tools | Get a complete drilling solution for optimum hole quality | ● | ● | ● | ● | ● | ● | ● | ● |

General Drilling Recommendations ----- 26

Cutter Mounting Type ----- 27

Cutting Tool Geometry ----- 28

Attachments ----- 28

Cutter Configuration Example ----- 29

Custom-Designed Cutter Application Form ----- 30

GENERAL DRILLING RECOMMENDATIONS

BEST HOLE QUALITY

- Thru-the-cutter lubrication; High quality cutter lubricant at manufacturer's recommended rate.
- Drill geometry with split point. 2/4 drill / reamer flute design.
- Review benefits of peck and positive feed.
- For aluminum, use high speed with low feed rate.
- For titanium, steel, etc.- use machining handbook rates for initial trials.
- Verify adequate flow path for chips thru flutes, tool, and fixture.
- Recondition cutters before cutting edge breaks or excessive wear occurs.
- Maintain tool in very good condition.
- Test drill in coupon (sample material) before using in production.
- Personnel must be well-trained and competent.
- "One Shot" operation is usually attainable, but requires very close attention to details.
- Verify cutter quality, proper lubrication rate, replace cutter before becoming dull, replace bushings and service tool regularly.
- "Two Shot" operation - drill followed by ream requires less detailed attention.
- Two operations will produce virtually any hole specification.

COMPOSITE MATERIALS

These materials vary widely in fiber type, resin type, and manufacturing method. Cutter lubrication is always beneficial but may not be permitted. Experimentation is required to optimize drill geometry, speeds, and cutter material.

STACKS OF DIFFERENT MATERIALS

Speeds and feed rates must be lowest and slowest of materials in the stack. Peck Drilling is usually advantageous.

CUTTER MATERIAL


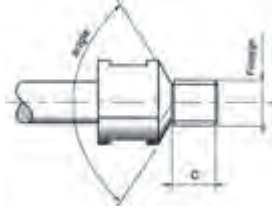
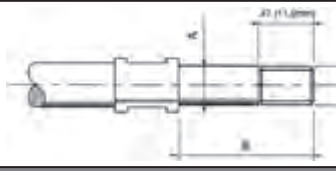
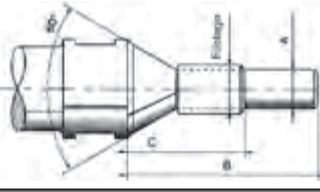
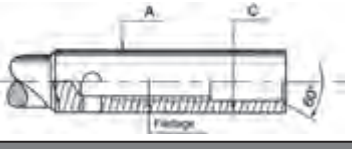
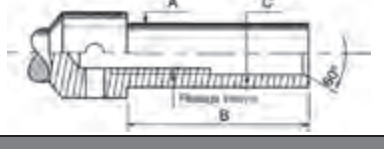
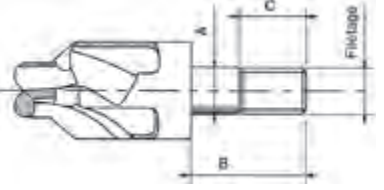
Micrograin Carbide is best for drilling / reaming titanium and carbon fiber. Can also be used for aluminum. More holes per sharpening. M42 High Speed Steel is recommended for drilling precision holes / countersinks in aluminum.

CUTTER COSTS

Some cutter types cost much more than others. It is best to compare cutter costs by the number of holes generated per sharpening, production time, number of operations required, and quality of holes.





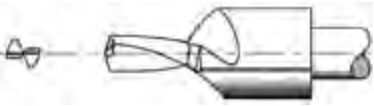


RECONDITIONING CUTTERS

Reconditioning is very difficult and tedious. Close attention to detail is mandatory.






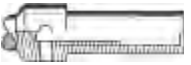

| | | MOUNTING STYLE | PART N° | THREAD | A | | B | | C | |
|--|---|----------------|---------|-----------|-------|------|-------|------|------|------|
| | | | | | in | mm | in | mm | in | mm |
| | | A | - | - | - | - | - | - | - | - |
| Straight shank |  | | | | | | | | | |
| External thread with 120° taper |  | B | B1 | 1/4 - 28 | - | - | - | - | 0.32 | 8.1 |
| | | B | B2 | 5/16 - 24 | - | - | - | - | 0.39 | 9.9 |
| | | B | B3 | 3/8 - 24 | - | - | - | - | 0.47 | 11.9 |
| | | B | B4 | 7/16 - 20 | - | - | - | - | 0.47 | 11.9 |
| | | B | B5 | 9/16 - 18 | - | - | - | - | 0.63 | 16 |
| | | B | B5 | 5/8 - 18 | - | - | - | - | 0.63 | 16 |
| | | B | B7 | M6 x 100 | - | - | - | - | 0.32 | 8.1 |
| | | B | B8 | M8 x 100 | - | - | - | - | 0.32 | 8.1 |
| | | B | B9 | M10 x 100 | - | - | - | - | 0.39 | 9.9 |
| External thread with pilot Diameter and square face |  | C | C1 | M6 x 100 | 0.244 | 6.2 | 0.98 | 24.9 | - | - |
| | | C | C2 | M8 x 100 | 0.323 | 8.2 | 1.38 | 35.1 | - | - |
| | | C | C3 | M10 x 100 | 0.402 | 10.2 | 1.38 | 35.1 | - | - |
| | | C | C4 | M12 x 100 | 0.48 | 12.2 | 1.58 | 40.1 | - | - |
| | | C | C5 | M16 x 100 | 0.638 | 16.2 | 1.58 | 40.1 | - | - |
| Pilot diameter with external thread and 60° taper (PET) |  | D | D1 | 5/16 - 24 | 0.25 | 6.4 | 1.06 | 29.9 | 0.44 | 11.2 |
| | | D | D2 | 3/8 - 24 | 0.3 | 7.6 | 1.145 | 29.1 | 0.52 | 13.2 |
| Internal thread (Spacematic style) |  | E | E1 | 1/4 - 28 | 0.375 | 9.25 | - | - | - | - |
| | | E | E2 | 1/4 - 28 | 0.500 | 12.7 | - | - | - | - |
| | | E | E3 | 1/4 - 28 | 0.625 | 15.9 | - | - | - | - |
| | | E | E4 | 3/8 - 16 | 0.625 | 15.9 | - | - | - | - |
| Same as style E but with cutter diameter greater than 0.19 in (4.8 mm) |  | F | F1 | 1/4 - 28 | 0.375 | 9.52 | 1.22 | 31 | - | - |
| | | F | F2 | 1/4 - 28 | 0.500 | 12.7 | 1.22 | 31 | - | - |
| | | F | F3 | 1/4 - 28 | 0.625 | 15.9 | 1.22 | 31 | - | - |
| | | F | F4 | 3/8 - 16 | 0.625 | 15.9 | 1.22 | 31 | - | - |
| External thread with pilot diameter & square face location slots for telescopic wrench |  | H | H1 | M8 x 100 | 10 | | 16 | | 8.1 | |
| | | H | H3 | M10 x 100 | 12.5 | | 19.8 | | 9.9 | |
| | | H | H4 | M12 x 100 | 14 | | 23.9 | | 11.9 | |
| | | H | H6 | M14 x 100 | 16 | | 27.9 | | 14 | |
| | | H | H7 | M18 x 100 | 20 | | 27.9 | | 14 | |

- The mounting style Morse taper is also available codified under CM1 - CM2 - CM3.
- All cutters are available with oil hole for Thru-coolant lubrication.



| DESCRIPTION | HSS-E | CARBIDE | PCD | ATTACHMENT | CUTTER STYLE | COMMENTS |
|--|-------|---------|----------------|------------|--------------|--|
| Drill Only  | ● | ● | ● PCD point | All | M | Split Point is standard. |
| Ream Only Pre-hole required  | ● | ● | | All | N | Left hand helix. Swarf directed away from cutter ensuring quality of surface finish and hole size. |
| Drill + Reamer  | ● | ● | | All | P | Drill / Reamer produces high quality, accurate hole in one operation. Split Point is standard. Countersink is available. |
| Square Drill  | ● | ● | ● | All | Q | Square Drill is strong, permits good lubrication, and swarf flow. Especially good for deep hole precision and good surface finish. Use in positive feed ADE only. Countersink is available. |
| Drill + Countersink  | ● | ● | ● PCD point | All | R | Drill plus Countersink produces standard hole and countersink in one operation. Split point is standard. |
| Ream + Countersink Pre-hole required  | ● | ● | ● PCD point | All | U | Ream-Countersink cutter with pilot for accurate alignment in pre-drilled hole. |
| Taper-Lock Ream + Countersink Pre-hole required  | ● | | | B-C-D et H | V | Taper-Lock specifications are based on Briles Aerospace standards. However, many variations exist and complete specifications are required. |

ATTACHMENT

| A | B | C | D | E | F | H |
|--|---|---|---|--|---|---|
|  |  |  |  |  |  |  |

| B7 | 1 | T | 1 | 2 |
|---|---|--|--|---|
| CUTTER MOUNTING STYLE | OIL HOLE | TYPE OF CUTTER | CUTTER MATERIAL | SPECIFICATION SOURCE |
| <p>Cutter Mounting Style (See preceding pages for details)</p> | <p>Solid or Oil-hole 1 - Solid 2 - Oil Hole (for thru-coolant lubrication)</p> | <p>Type of Cutter (See preceding pages for details)</p> | <p>Cutter Material 1 - HSS-E High Speed Steel 2 - Carbide 3 - PCD</p> | <p>Specification Source 1- Customer Drawing with complete specifications 2- Cutter design by Recoules Quackenbush Application information provided by customer</p> |

- Cutters manufactured to customer specification are not guaranteed for hole diameter unless so stated.
- For optimum results, cutter must be used on specified tool, with recommended cutter lubrication, properly installed, and managed.
- Cutters will be quoted upon request. Please specify quantity. Higher quantities will yield lower unit cost.

CUTTERS DESIGNED BY RECOULES QUACKENBUSH FOR A SPECIFIC APPLICATION REQUIRE THE FOLLOWING INFORMATION:

Identification - Name or Number:

Customer Identification name or number

First Workpiece Material and Thickness:

Identify first material drilled

- Aircraft alloy aluminum - advise alloy number
- Aircraft alloy titanium - advise alloy number
- Stainless Steel - advise alloy number
- Mild Steel - hardness less than 28 Rc
- Alloy Steel - advise alloy number & hardness
- Composite - advise fiber, resin, and properties
- Other - advise material properties

Alloy Number: _____

Thickness = _____ maximum (inch or mm)

Second Workpiece Material:

Identify second material drilled

Use same code as above

Alloy Number: _____

Thickness = _____ maximum (inch or mm)

Additional Materials or Voids:

Advise if additional materials or open spaces are included.

Hole Diameter:

Advise the exact minimum and maximum acceptable hole diameter - inch or metric

Min.: _____ Max.: _____

Countersink - if applicable:

Advise Countersink maximum diameter and angle:

Diameter: Min.: _____ Max.: _____

Angle: Min.: _____ Max.: _____

Pre-Hole:

Yes: ____ Hole diameter: _____

No: ____

Quantity Required:

Specify quantity or quantities to quote.

Used on ADE Tool:

- Peck Drill
- Positive Feed
- Self Clamping - Variable Spacing
- Self Clamping - Concentric Collet
- Portable Self Feed (CD or 21500)
- Flexirec
- Other: _____
- Model Number: _____

Type of Lubrication:

- Water Soluble Coolant
- Water only
- Acculube/Boelube type Lubricant
- None
- Other - Specify: _____
- Brand & Type: _____

Additional information required:

Other hole quality parameters such as finish, roundness, straightness.

Special conditions or specifications.

Taperlock Group and specifications.

Recommendation for requesting Quotation: Photo copy this catalog page. Fill in the blanks for each block. Add any supplemental information needed to completely define the application requirement.

| | |
|--|----|
| Pistol Grip Drills 14 Series | 32 |
| Pistol Grip Drills 15, 135 Series | 34 |
| Angle Drills 15 Series | 35 |
| Angle Drills Other Angle Head Options | 38 |
| Angle Drills Indexable Quick Change Angle Drills | 39 |
| Inline Drills 15 Series | 40 |
| Back Spotfacer | 42 |
| Drill Accessories For M6, M8, M10 Cutters | 43 |
| Drill Accessories Flat Offset Angle Drill | 44 |
| Cleco® TULMan™ Electronic Counter | 45 |
| Drill Accessories Jacobs® Chucks, Collet Chucks | 46 |
| Drill Accessories Drilling Guides - Manual | 47 |

14CF SERIES - NON-REVERSIBLE



- 160 - 29000 rpm
- 0.4 hp / 0.30 kW
- Supplied with Jacobs[®] Keyed Chuck or Threaded Termination for Keyless Chuck/Collet - options on Page 46.
- Non-reversible.
- Comfort grip with ergonomic finger and thumb guides to aid control.
- Excellent for aerospace, metal fabrication, and woodworking applications.

| TERMINATION CAT. NO. | | | FREE SPEED (rpm) | WEIGHT | LENGTH | AIR INLET SIZE |
|----------------------|--------------|--------------------------------|------------------|------------------|-----------------|----------------|
| 1/4 in Chuck | 3/8 in Chuck | External Thread 3/8 in - 24 | | | | |
| 14CFS97-38 | 14CFS97-51 | 14CFS97-40 | 600 | 1.8 lb / 0.82 kg | 6.9 in / 175 mm | 1/4 in |
| 14CFS96-38 | 14CFS96-51 | 14CFS96-40 | 700 | 1.8 lb / 0.82 kg | 6.9 in / 175 mm | 1/4 in |
| 14CFS95-38 | 14CFS95-51 | 14CFS95-40 | 1000 | 1.8 lb / 0.82 kg | 6.9 in / 175 mm | 1/4 in |
| 14CFS94-38 | 14CFS94-51 | 14CFS94-40 | 2400 | 1.6 lb / 0.73 kg | 5.7 in / 145 mm | 1/4 in |
| 14CFS93-38 | 14CFS93-51 | 14CFS93-40 | 3200 | 1.5 lb / 0.68 kg | 5.7 in / 145 mm | 1/4 in |
| 14CFS92-38 | 14CFS92-51 | 14CFS92-40 | 3800 | 1.5 lb / 0.68 kg | 5.7 in / 145 mm | 1/4 in |
| 14CFS91-38 | 14CFS91-51 | 14CFS91-40 | 5200 | 1.5 lb / 0.68 kg | 5.7 in / 145 mm | 1/4 in |
| 14CFS90-38 | 14CFS90-51 | 14CFS90-40 | 29000 | 1.5 lb / 0.68 kg | 5.7 in / 145 mm | 1/4 in |

All tools performance rated @ 90 psi / 620 kPa air pressure.
Minimum Hose I.D.: 5/16 in / 7.9 mm
Drill Diameter Capacity Matches Chuck Size

14CS SERIES - NON-REVERSIBLE



- 500 - 20000 rpm
- 0.6 hp / 0.45 kW
- Supplied with Jacobs[®] Keyed Chuck or Threaded Termination for Keyless Chuck/Collet - options on Page 46.
- Comfort grip with ergonomic finger and thumb guides to aid control.
- Excellent for aerospace, metal fabrication, and woodworking applications.
- 1/2 in models equipped with dead handle.

| TERMINATION CAT. NO. | | | FREE SPEED (rpm) | WEIGHT | LENGTH | AIR INLET SIZE |
|----------------------|--------------|--------------------------------|------------------|------------------|-----------------|----------------|
| 1/4 in Chuck | 3/8 in Chuck | External Thread 3/8 in - 24 | | | | |
| — | 14CSL97-51 | 14CSL97-40 | 500 | 2.9 lb / 1.32 kg | 8.1 in / 206 mm | 1/4 in |
| — | 14CSL95-51 | 14CSL95-40 | 1300 | 2.9 lb / 1.32 kg | 8.1 in / 206 mm | 1/4 in |
| 14CSL92-38 | — | 14CSL92-40 | 3200 | 2.1 lb / 0.95 kg | 6.3 in / 160 mm | 1/4 in |
| 14CSL91-38 | — | 14CSL91-40 | 5200 | 2.1 lb / 0.95 kg | 6.3 in / 160 mm | 1/4 in |
| 14CSL98-38 | — | 14CSL98-40 | 6000 | 2.1 lb / 0.95 kg | 6.3 in / 160 mm | 1/4 in |
| 14CSL90-38 | — | 14CSL90-40 | 20000 | 2.1 lb / 0.95 kg | 6.3 in / 160 mm | 1/4 in |

All tools performance rated @ 90 psi / 620 kPa air pressure.
Minimum Hose I.D.: 5/16 in / 7.9 mm
Standard equipment: Jacobs geared chuck, chuck key
Drill Diameter Capacity Matches Chuck Size

14CNL SERIES - NON-REVERSIBLE

- 500 - 20000 rpm
- 0.9 hp / 0.67 kW
- Supplied with Jacobs[®] Keyed Chuck or Threaded Termination for Keyless Chuck/Collet - options on Page 46.
- Comfort grip with ergonomic finger and thumb guides to aid control.
- Excellent for aerospace, metal fabrication, and woodworking applications.
- 1/2 in models equipped with dead handle.



| TERMINATION CAT. NO. | | | | FREE SPEED (rpm) | WEIGHT | LENGTH | AIR INLET SIZE |
|----------------------|-------------------|--------------------------------|-------------------|------------------|------------------|-----------------|----------------|
| 1/4 in Chuck | 3/8 in Chuck | External Thread 3/8 in - 24 | 1/2 in Chuck | | | | |
| — | 14CNL97-51 | 14CNL97-40 | 14CNL97-53 | 500 | 3.5 lb / 1.59 kg | 9.1 in / 231 mm | 1/4 in |
| — | 14CNL95-51 | 14CNL95-40 | — | 1300 | 2.8 lb / 1.27 kg | 8.6 in / 218 mm | 1/4 in |
| 14CNL92-38 | 14CNL92-51 | 14CNL92-40 | 14CNL92-53 | 3200 | 2.4 lb / 1.09 kg | 7.2 in / 183 mm | 1/4 in |
| — | 14CNL91-51 | 14CNL91-40 | — | 5200 | 2.4 lb / 1.09 kg | 7.2 in / 183 mm | 1/4 in |
| 14CNL98-38 | 14CNL98-51 | 14CNL98-40 | 14CNL98-53 | 6000 | 2.2 lb / 1.00 kg | 6.8 in / 173 mm | 1/4 in |
| 14CNL90-38 | — | 14CNL90-40 | — | 20000 | 2.2 lb / 1.00 kg | 6.8 in / 173 mm | 1/4 in |

All tools performance rated @ 90 psi / 620 kPa air pressure.
Minimum Hose I.D.: 5/16 in / 7.9 mm
Standard equipment: Jacobs geared chuck, chuck key
Drill diameter capacity matches chuck size.

14CHL SERIES - NON-REVERSIBLE

- 3200 - 6000 rpm
- 1.4 hp / 1.04 kW
- Supplied with Jacobs[®] Keyed Chuck or Threaded Termination for Keyless Chuck/Collet - options on Page 46.
- Powerful motor.
- Rear exhaust.



| CAT. NO. | TERMINATION | FREE SPEED (RPM) | WEIGHT | LENGTH | AIR INLET SIZE |
|-------------------|-------------------------|------------------|------------------|-----------------|----------------|
| 14CHL92-38 | Chuck 1/4 in | 3200 | 2.6 lb / 1.18 kg | 6.5 in / 165 mm | 1/4 in |
| 14CHL92-40 | Ext. Thread 3/8 in - 24 | 3200 | 2.4 lb / 1.09 kg | 5.5 in / 140 mm | 1/4 in |
| 14CHL92-51 | Chuck 3/8 in | 3200 | 2.8 lb / 1.27 kg | 7.1 in / 180 mm | 1/4 in |
| 14CHL92-53 | Chuck 1/2 in | 3200 | 3.8 lb / 1.72 kg | 7.4 in / 188 mm | 1/4 in |
| 14CHL98-38 | Chuck 1/4 in | 6000 | 2.6 lb / 1.18 kg | 6.5 in / 165 mm | 1/4 in |
| 14CHL98-40 | Ext. Thread 3/8 in - 24 | 6000 | 2.4 lb / 1.09 kg | 5.5 in / 140 mm | 1/4 in |
| 14CHL98-51 | Chuck 3/8 in | 6000 | 2.8 lb / 1.27 kg | 7.1 in / 180 mm | 1/4 in |
| 14CHL98-53 | Chuck 1/2 in | 6000 | 3.8 lb / 1.72 kg | 7.4 in / 188 mm | 1/4 in |

All tools performance rated @ 90 psi / 620 kPa air pressure.
Drill Diameter Capacity Matches Chuck Size
Minimum hose ID: 5/16 in / 7.9 mm

15DP SERIES - NON-REVERSIBLE

- 160 - 1400 rpm
- 1.0 hp / 0.75 kW
- Excellent for slow speed applications.
- Powerful motor.



| CAT. NO. | TERMINATION | FREE SPEED (rpm) | WEIGHT | LENGTH | AIR INLET SIZE |
|---------------------|--------------|------------------|------------------|-----------------|----------------|
| 15DP-1.6B-53 | Chuck 1/2 in | 160 | 6.0 lb / 2.72 kg | 9.8 in / 249 mm | 3/8 in |
| 15DP-4B-53 | Chuck 1/2 in | 400 | 5.5 lb / 2.49 kg | 8.5 in / 216 mm | 3/8 in |
| 15DP-8B-53 | Chuck 1/2 in | 800 | 5.5 lb / 2.49 kg | 8.5 in / 216 mm | 3/8 in |
| 15DP-14B-49 | Chuck 3/8 in | 1400 | 4.5 lb / 2.04 kg | 8.3 in / 211 mm | 3/8 in |

All tools performance rated @ 90 psi / 620 kPa air pressure.

Standard Equipment: Operating instructions and service manual, Dead handles on all models except 15DP-14B, 3-Jaw Chuck, and Key.

General: Air Inlet: 3/8 in NPTF, Minimum Hose Size: 3/8 in, Spindle Thread: 1/2 in - 20, Spindle Offset: Pistol Grip: 31/32 in

Drill Diameter Capacity Matches Chuck Size

Minimum hose ID: 5/16 in / 7.9 mm

135DPV SERIES - VARIABLE SPEED

- 600 - 2600 rpm
- 0.7 hp / 0.5 kW
- Variable speed.
- Calibrated governed speed control.



| CAT. NO. | TERMINATION | FREE SPEED (RPM) | GOVERNED RPM RANGE | WEIGHT | LENGTH | AIR INLET SIZE |
|----------------------|--------------|------------------|--------------------|------------------|-----------------|----------------|
| 135DPV-7B-43 | Chuck 1/2 in | 600 | 150 - 550 | 3.6 lb / 1.63 kg | 9.6 in / 244 mm | 1/4 in |
| 135DPV-7B-50 | Chuck 1/2 in | 600 | 150 - 550 | 3.6 lb / 1.63 kg | 9.6 in / 244 mm | 1/4 in |
| 135DPV-14B-50 | Chuck 1/2 in | 1250 | 400 - 1200 | 3.4 lb / 1.54 kg | 9.3 in / 236 mm | 1/4 in |
| 135DPV-14B-51 | Chuck 3/8 in | 1250 | 400 - 1200 | 3.4 lb / 1.54 kg | 9.3 in / 236 mm | 1/4 in |
| 135DPV-28B-51 | Chuck 3/8 in | 2600 | 700 - 2400 | 3.2 lb / 1.45 kg | 8.5 in / 216 mm | 1/4 in |

All tools performance rated @ 90 psi / 620 kPa air pressure.

Standard Equipment: Operating instructions, service manual, 3-Jaw Chuck, and Key-Jaw Chuck and Key.

General: Air Inlet: 1/4 in NPT, Minimum Hose Size: 1/4 in / 6 mm, Spindle Offset: 25/32 in / 20 mm.

Drill Diameter Capacity Matches Chuck Size.

15L14 SERIES - ANGLE DRILL

- 2400 - 3600 rpm
- 0.3 hp / 0.22 kW
- Optional Jacobs[®] geared chuck.
- Rear exhaust.
- Safety lever.



| CAT. NO. | TERMINATION | FREE SPEED (RPM) | TYPE HOUSING | WEIGHT | LENGTH | HEAD HEIGHT | AIR INLET SIZE |
|------------|-------------------------|------------------|--------------|------------------|-----------------|-------------|----------------|
| 15L1487-32 | Int. Thread 1/4 in - 28 | 1500 | Composite | 1.2 lb / 0.54 kg | 8.0 in / 203 mm | 3.0 in | 1/4 in |
| 15L1487-36 | Collet 1/4 in | 1500 | Composite | 1.2 lb / 0.54 kg | 8.0 in / 203 mm | 3.0 in | 1/4 in |
| 15L1487-38 | Chuck 1/4 in | 1500 | Composite | 1.5 lb / 0.68 kg | 8.0 in / 203 mm | 3.0 in | 1/4 in |
| 15L1488-36 | Collet 1/4 in | 2400 | Composite | 1.6 lb / 0.73 kg | 8.7 in / 221 mm | 3.0 in | 1/4 in |
| 15L1488-38 | Chuck 1/4 in | 2400 | Composite | 1.5 lb / 0.68 kg | 8.0 in / 203 mm | 3.0 in | 1/4 in |
| 15L1489-32 | Int. Thread 1/4 in - 28 | 3600 | Composite | 1.6 lb / 0.73 kg | 8.7 in / 221 mm | 3.0 in | 1/4 in |
| 15L1489-36 | Collet 1/4 in | 3600 | Composite | 1.6 lb / 0.73 kg | 8.7 in / 221 mm | 3.0 in | 1/4 in |
| 15L1489-38 | Chuck 1/4 in | 3600 | Composite | 1.5 lb / 0.68 kg | 8.0 in / 203 mm | 3.0 in | 1/4 in |
| 15L1489-51 | Chuck 3/8 in | 3600 | Composite | 1.5 lb / 0.68 kg | 8.0 in / 203 mm | 3.0 in | 1/4 in |
| 15L1470-37 | Chuck 5/32 in | 12000 | Composite | 1.2 lb / 0.54 kg | 6.9 in / 175 mm | 2.5 in | 1/4 in |
| 15L1401-37 | Chuck 5/32 in | 20000 | Composite | 1.0 lb / 0.45 kg | 6.2 in / 157 mm | 2.5 in | 1/4 in |
| 15L1471-37 | Chuck 5/32 in | 20000 | Composite | 1.2 lb / 0.54 kg | 6.9 in / 175 mm | 2.5 in | 1/4 in |

All tools performance rated @ 90 psi / 620 kPa air pressure.
 Minimum Hose I.D.: 1/4 in / 6.4 mm
 Standard Equipment: Jacobs geared chuck, chuck key
 Drill Diameter Capacity Matches Chuck Size

15LF SERIES - LIGHT DUTY HEAD

- 600 - 5300 rpm
- 0.4 hp / 0.30 kW
- Wide array of speeds, head designs, and spindle threads for all applications.
- High-efficiency motor and gear train.
- Comfortable and ergonomic handle.
- Other terminations available (see page 38): -61 10-32 internal thread, -63 threaded collet, -64 5/16 in - 24 thread



| CAT. NO. | TERMINATION | FREE SPEED (RPM) | TYPE HOUSING | WEIGHT | LENGTH | AIR INLET SIZE |
|------------|-------------------------|------------------|--------------|------------------|------------------|----------------|
| 15LF287-62 | Int. Thread 1/4 in - 28 | 600 | Composite | 1.9 lb / 0.86 kg | 11.8 in / 300 mm | 1/4 in |
| 15LF286-62 | Int. Thread 1/4 in - 28 | 750 | Composite | 1.9 lb / 0.86 kg | 11.8 in / 300 mm | 1/4 in |
| 15LF285-62 | Int. Thread 1/4 in - 28 | 1000 | Composite | 1.9 lb / 0.86 kg | 11.8 in / 300 mm | 1/4 in |
| 15LF284-62 | Int. Thread 1/4 in - 28 | 2400 | Composite | 1.8 lb / 0.82 kg | 11.1 in / 282 mm | 1/4 in |
| 15LF283-62 | Int. Thread 1/4 in - 28 | 3300 | Composite | 1.6 lb / 0.73 kg | 10.7 in / 272 mm | 1/4 in |
| 15LF282-62 | Int. Thread 1/4 in - 28 | 4000 | Composite | 1.6 lb / 0.73 kg | 10.7 in / 272 mm | 1/4 in |
| 15LF281-62 | Int. Thread 1/4 in - 28 | 5300 | Composite | 1.6 lb / 0.73 kg | 10.7 in / 272 mm | 1/4 in |

All tools performance rated @ 90 psi / 620 kPa air pressure.
 Standard Equipment: 600 Series Mini Angle Head with 1/4 in - 28 internal thread

15LS SERIES - LIGHT DUTY HEAD

- 500 - 5430 rpm
- 0.6 hp / 0.45 kW
- Wide array of speeds, head designs, and spindle threads for all applications.
- High-efficiency motor and gear train.
- Comfortable and ergonomic handle.



| CAT. NO. | TERMINATION | FREE SPEED (RPM) | TYPE HOUSING | WEIGHT | LENGTH | AIR INLET SIZE |
|------------|-------------------------|------------------|--------------|------------------|------------------|----------------|
| 15LS287-62 | Int. Thread 1/4 in - 28 | 500 | Composite | 1.9 lb / 0.86 kg | 12.7 in / 323 mm | 1/4 in |
| 15LS286-62 | Int. Thread 1/4 in - 28 | 840 | Composite | 1.9 lb / 0.86 kg | 12.7 in / 323 mm | 1/4 in |
| 15LS285-62 | Int. Thread 1/4 in - 28 | 1360 | Composite | 1.9 lb / 0.86 kg | 12.7 in / 323 mm | 1/4 in |
| 15LS284-62 | Int. Thread 1/4 in - 28 | 1660 | Composite | 1.9 lb / 0.86 kg | 12.7 in / 323 mm | 1/4 in |
| 15LS283-62 | Int. Thread 1/4 in - 28 | 2010 | Composite | 2.3 lb / 1.04 kg | 11.5 in / 292 mm | 1/4 in |
| 15LS282-62 | Int. Thread 1/4 in - 28 | 3370 | Composite | 2.3 lb / 1.04 kg | 11.5 in / 292 mm | 1/4 in |
| 15LS281-62 | Int. Thread 1/4 in - 28 | 5430 | Composite | 2.3 lb / 1.04 kg | 11.5 in / 292 mm | 1/4 in |

All tools performance rated @ 90 psi / 620 kPa air pressure.
Standard Equipment: 600 Series Mini Angle Head with 1/4 in - 28 internal thread

15LN SERIES - SERIES LIGHT DUTY HEAD

- 540 - 3700 rpm
- 0.4 hp / 0.30 kW



| CAT. NO. | TERMINATION | FREE SPEED (RPM) | TYPE HOUSING | WEIGHT | LENGTH | HEAD HEIGHT | AIR INLET SIZE |
|------------|-------------------------|------------------|--------------|------------------|------------------|-------------|----------------|
| 15LN287-62 | Int. Thread 1/4 in - 28 | 320 | Composite | 2.5 lb / 1.13 kg | 12.0 in / 305 mm | 1.0 in | 1/4 in |
| 15LN286-62 | Int. Thread 1/4 in - 28 | 540 | Composite | 2.5 lb / 1.13 kg | 13.5 in / 343 mm | 1.0 in | 1/4 in |
| 15LN285-62 | Int. Thread 1/4 in - 28 | 1000 | Composite | 2.5 lb / 1.13 kg | 12.0 in / 305 mm | 1.0 in | 1/4 in |
| 15LN284-62 | Int. Thread 1/4 in - 28 | 1530 | Composite | 2.5 lb / 1.13 kg | 12.0 in / 305 mm | 1.0 in | 1/4 in |
| 15LN283-62 | Int. Thread 1/4 in - 28 | 1850 | Composite | 2.5 lb / 1.13 kg | 12.0 in / 305 mm | 1.0 in | 1/4 in |
| 15LN282-62 | Int. Thread 1/4 in - 28 | 3100 | Composite | 2.5 lb / 1.13 kg | 12.0 in / 305 mm | 1.0 in | 1/4 in |
| 15LN281-62 | Int. Thread 1/4 in - 28 | 5000 | Composite | 2.5 lb / 1.13 kg | 12.0 in / 305 mm | 1.0 in | 1/4 in |
| 15LN288-62 | Int. Thread 1/4 in - 28 | 5600 | Composite | 2.5 lb / 1.13 kg | 12.0 in / 305 mm | 1.0 in | 1/4 in |

All tools performance rated @ 90 psi / 620 kPa air pressure.
Standard Equipment: 600 Series Mini Angle Head with 1/4 in - 28 internal thread

15LF SERIES - HEAVY DUTY HEAD

- 420 - 3700 rpm
- 0.4 hp / 0.30 kW
- Wide array of speeds, head designs, and spindle threads for all applications.
- High-efficiency motor and gear train.
- Comfortable and ergonomic handle.



| CAT. NO. | TERMINATION | FREE SPEED (RPM) | TYPE HOUSING | WEIGHT | LENGTH | AIR INLET SIZE |
|------------|-------------------------|------------------|--------------|------------------|------------------|----------------|
| 15LF287-52 | Int. Thread 1/4 in - 28 | 420 | Composite | 2.0 lb / 0.91 kg | 12.0 in / 305 mm | 1/4 in |
| 15LF286-52 | Int. Thread 1/4 in - 28 | 525 | Composite | 2.0 lb / 0.91 kg | 12.0 in / 305 mm | 1/4 in |
| 15LF285-52 | Int. Thread 1/4 in - 28 | 700 | Composite | 2.0 lb / 0.91 kg | 12.0 in / 305 mm | 1/4 in |
| 15LF284-52 | Int. Thread 1/4 in - 28 | 1700 | Composite | 1.8 lb / 0.82 kg | 10.6 in / 269 mm | 1/4 in |
| 15LF283-52 | Int. Thread 1/4 in - 28 | 2300 | Composite | 1.7 lb / 0.77 kg | 11.0 in / 279 mm | 1/4 in |
| 15LF282-52 | Int. Thread 1/4 in - 28 | 2800 | Composite | 1.7 lb / 0.77 kg | 11.0 in / 279 mm | 1/4 in |
| 15LF281-52 | Int. Thread 1/4 in - 28 | 3700 | Composite | 1.7 lb / 0.77 kg | 11.0 in / 279 mm | 1/4 in |

All tools performance rated @ 90 psi / 620 kPa air pressure.
Standard Equipment: 500 Series Heavy Duty Angle Head with 1/4 in - 28

15LS SERIES - HEAVY DUTY HEAD



- 350 - 3800 rpm
- 0.6 hp / 0.45 kW
- Wide array of speeds, head designs, and spindle threads for all applications.
- High-efficiency motor and gear train.
- Comfortable and ergonomic handle.

| CAT. NO. | TERMINATION | FREE SPEED (RPM) | TYPE HOUSING | WEIGHT | LENGTH | AIR INLET SIZE |
|------------|-------------------------|------------------|--------------|------------------|------------------|----------------|
| 15LS287-52 | Int. Thread 1/4 in - 28 | 350 | Composite | 2.8 lb / 1.27 kg | 12.3 in / 312 mm | 1/4 in |
| 15LS286-52 | Int. Thread 1/4 in - 28 | 590 | Composite | 2.8 lb / 1.27 kg | 12.3 in / 312 mm | 1/4 in |
| 15LS285-52 | Int. Thread 1/4 in - 28 | 950 | Composite | 2.8 lb / 1.27 kg | 12.3 in / 312 mm | 1/4 in |
| 15LS283-52 | Int. Thread 1/4 in - 28 | 1410 | Composite | 2.4 lb / 1.09 kg | 11.0 in / 279 mm | 1/4 in |
| 15LS282-52 | Int. Thread 1/4 in - 28 | 2360 | Composite | 2.4 lb / 1.09 kg | 11.0 in / 279 mm | 1/4 in |
| 15LS281-52 | Int. Thread 1/4 in - 28 | 3800 | Composite | 2.4 lb / 1.09 kg | 11.0 in / 279 mm | 1/4 in |

All tools performance rated @ 90 psi / 620 kPa air pressure.
Standard Equipment: 500 Series Heavy Duty Angle Head with 1/4 in - 28

15LN SERIES - HEAVY DUTY HEAD



- 320 - 3900 rpm
- 0.9 hp / 0.67 kW
- Wide array of speeds, head designs, and spindle threads for all applications.
- High-efficiency motor and gear train.
- Comfortable and ergonomic handle.

| CAT. NO. | TERMINATION | FREE SPEED (RPM) | TYPE HOUSING | WEIGHT | LENGTH | AIR INLET SIZE |
|------------|-------------------------|------------------|--------------|------------------|------------------|----------------|
| 15LN286-52 | Int. Thread 1/4 in - 28 | 540 | Composite | 3.0 lb / 1.36 kg | 12.8 in / 325 mm | 1/4 in |
| 15LN285-52 | Int. Thread 1/4 in - 28 | 870 | Composite | 3.0 lb / 1.36 kg | 12.8 in / 325 mm | 1/4 in |
| 15LN284-52 | Int. Thread 1/4 in - 28 | 1070 | Composite | 3.0 lb / 1.36 kg | 12.8 in / 325 mm | 1/4 in |
| 15LN283-52 | Int. Thread 1/4 in - 28 | 1300 | Composite | 2.6 lb / 1.18 kg | 11.5 in / 292 mm | 1/4 in |
| 15LN281-52 | Int. Thread 1/4 in - 28 | 3500 | Composite | 2.6 lb / 1.18 kg | 11.5 in / 292 mm | 1/4 in |
| 15LN288-52 | Int. Thread 1/4 in - 28 | 3900 | Composite | 2.6 lb / 1.18 kg | 11.5 in / 292 mm | 1/4 in |

All tools performance rated @ 90 psi / 620 kPa air pressure.
Standard Equipment: 500 Series Heavy Duty Angle Head with 1/4 in - 28

OPTIONAL DRILL ATTACHMENTS

- For use on Dotco 15LF, 15LS, and 15LN series.
- Capacity: 1/4 in Diameter Drill
- These drill attachments can be ordered as a separate accessory item or as part of a complete model. To order as a complete model, use the basic model number from the appropriate 15LF, 15LS, or 15LN catalog page and INDEXlace the termination number (-32 for example) with the termination number of the desired optional attachment (-71 for example) from this page.

| PART NO. | TERMINATION | SPINDLE INTERNAL THREAD |
|---|-------------|-------------------------|
| COMPACT ANGLE HEAD – 700 SERIES | | |
| 1025477 | -72 | 1/4 in - 28 |
| 1025476 | -73 | 9/32 in - 40 Collet* |
| 1025668 | -74 | 5/16 in - 24 |
| LIGHT DUTY HEAD – 600 SERIES | | |
| 1025314 | -61 | #10 - 32 |
| 1025409 | -62 | 1/4 in - 28 |
| 1025313 | -63 | 9/32 in - 40 Collet* |
| 1025528 | -64 | 5/16 in - 24 |
| HEAVY DUTY ANGLE HEAD – 500 SERIES | | |
| 1021289 | -52 | 1/4 in - 28 |
| 1021292 | -53 | 9/32 in - 40 Collet* |
| 1021291 | -54 | 5/16 in - 24 |
| 1025780 | -55 | 3/8 in - 24 |
| 45° LIGHT DUTY ANGLE HEAD | | |
| 1025730 | -42 | 1/4 in - 28 |
| 1025731 | -43 | 9/32 in - 40 Collet* |
| 1025733 | -44 | 5/16 in - 24 |
| 360° LIGHT DUTY ANGLE HEAD | | |
| 1025696 | -91 | #10 - 32 |
| 1025694 | -92 | 1/4 in - 28 |

* See page XX for collets



1025447



1025409



1021289



1025730



1025694



1021620

| PART NO. | DRILL CHUCK | |
|------------------------------|-------------|---|
| HEAVY DUTY ANGLE HEAD | | |
| 1021620 | -59 | 500 Series Angle Head with drill chuck, 1/4 in capacity |
| 1021620 | -59 NC | 500 Series Angle Head, no chuck 3/8 in - 24 ext. thread |

BASE MODULAR QUICK-CHANGE TOOLS

- 320 - 5300 tr/min
- 15LF: 0.4 hp / 0.3 kW, 15LN: 0.9 hp - 0.7 kW
- Quick-release for range of angle head attachments.
- Can be used for quick-change of: cutter size, drilling speed, head style.
- Pull-back sleeve to change angle head.
- Common drive system retained on power unit.



| CAT. NO. | TERMINATION | SPEED | | WEIGHT | LENGTH | AIR INLET SIZE |
|----------|----------------------|-------------|----------------------------|-----------------|--------------------|----------------|
| | | w/ Q5X HEAD | w/ Q4X, Q6X, Q7X, Q9X HEAD | | | |
| 15LF281Q | Quick Change Adapter | 3700 | 5300 | 0.4 hp / 0.3 kW | 0.65 kg / 1.43 lbs | 1/4 in |
| 15LF282Q | Quick Change Adapter | 2800 | 4000 | 0.4 hp / 0.3 kW | 0.65 kg / 1.43 lbs | 1/4 in |
| 15LF283Q | Quick Change Adapter | 2300 | 3300 | 0.4 hp / 0.3 kW | 0.65 kg / 1.43 lbs | 1/4 in |
| 15LF284Q | Quick Change Adapter | 1700 | 2400 | 0.4 hp / 0.3 kW | 0.65 kg / 1.43 lbs | 1/4 in |
| 15LF285Q | Quick Change Adapter | 700 | 1000 | 0.4 hp / 0.3 kW | 0.65 kg / 1.43 lbs | 1/4 in |
| 15LF286Q | Quick Change Adapter | 525 | 750 | 0.4 hp / 0.3 kW | 0.65 kg / 1.43 lbs | 1/4 in |
| 15LF287Q | Quick Change Adapter | 420 | 600 | 0.4 hp / 0.3 kW | 0.65 kg / 1.43 lbs | 1/4 in |
| 15LN281Q | Quick Change Adapter | 3500 | 5000 | 0.9 hp / 0.7 kW | 1.05 kg / 2.31 lbs | 1/4 in |
| 15LN282Q | Quick Change Adapter | 2170 | 3100 | 0.9 hp / 0.7 kW | 1.05 kg / 2.31 lbs | 1/4 in |
| 15LN283Q | Quick Change Adapter | 1300 | 1850 | 0.9 hp / 0.7 kW | 1.05 kg / 2.31 lbs | 1/4 in |
| 15LN284Q | Quick Change Adapter | 1070 | 1530 | 0.9 hp / 0.7 kW | 1.05 kg / 2.31 lbs | 1/4 in |
| 15LN285Q | Quick Change Adapter | 870 | 1240 | 0.9 hp / 0.7 kW | 1.05 kg / 2.31 lbs | 1/4 in |
| 15LN286Q | Quick Change Adapter | 540 | 770 | 0.9 hp / 0.7 kW | 1.05 kg / 2.31 lbs | 1/4 in |
| 15LN287Q | Quick Change Adapter | 320 | 460 | 0.9 hp / 0.7 kW | 1.05 kg / 2.31 lbs | 1/4 in |

QUICK-CHANGE ANGLE HEADS

- 45° Light duty angle head.
- Light duty head: 600 Series.
- Heavy duty angle head: 500 Series.
- Compact angle head: 700 Series.
- Heavy duty angle head: 500 Series, drill chuck.
- 360° light duty angle head.



| ORDERING CODE | TERMINATION | TYPE | NOTES |
|---------------|-----------------------|------------------------------------|---------------------------------------|
| 302206PT-Q42 | 1/4 in - 28 | 45° Light Duty Angle Head | |
| 302206PT-Q43 | Collet (9/32 in - 40) | 45° Light Duty Angle Head | *Order Collets Separately: See pg. 46 |
| 302206PT-Q52 | 1/4 in - 28 | Heavy Duty Angle Head - 500 Series | |
| 302206PT-Q53 | Collet (9/32 in - 40) | Heavy Duty Angle Head - 500 Series | *Order Collets Separately: See pg. 46 |
| 302206PT-Q59 | 3/8 in - 24 | Heavy Duty Angle Head - 500 Series | |
| 302206PT-Q62 | 1/4 in - 28 | Light Duty Head - 600 Series | |
| 302206PT-Q63 | Collet (9/32 in - 40) | Light Duty Head - 600 Series | *Order Collets Separately: See pg. 46 |
| 302206PT-Q72 | 1/4 in - 28 | Compact Angle Head - 700 Series | |
| 302206PT-Q73 | Collet (9/32 in - 40) | Compact Angle Head - 700 Series | *Order Collets Separately: See pg. 46 |
| 302206PT-Q92 | 1/4 in - 28 | 360° Light Duty Angle Head | |
| 302206PT-Q93 | Collet (9/32 in - 40) | 360° Light Duty Angle Head | *Order Collets Separately: See pg. 46 |

15LF SERIES - INLINE

- 600 - 5300 rpm
- 0.4 hp / 0.30 kW
- Optional Jacobs[®] geared chuck.
- Rear exhaust.
- Safety lever.



| EXHAUST CAT. NO. | | TERMINATION | FREE SPEED (RPM) | TYPE HOUSING | WEIGHT | LENGTH | AIR INLET SIZE |
|------------------|------------|-------------------------|------------------|--------------|------------------|-----------------|----------------|
| REAR | FRONT | | | | | | |
| 15LF087-38 | | Chuck 1/4 in | 600 | Composite | 1.9 lb / 0.86 kg | 8.6 in / 218 mm | 1/4 in |
| 15LF087-40 | | Ext. Thread 3/8 in - 24 | 600 | Composite | 1.9 lb / 0.86 kg | 8.6 in / 218 mm | 1/4 in |
| 15LF086-38 | | Chuck 1/4 in | 750 | Composite | 1.4 lb / 0.64 kg | 8.0 in / 203 mm | 1/4 in |
| — | 15LF055-38 | Chuck 1/4 in | 1000 | Composite | 1.9 lb / 0.86 kg | 8.6 in / 218 mm | 1/4 in |
| 15LF085-38 | | Chuck 1/4 in | 1000 | Composite | 1.4 lb / 0.64 kg | 8.0 in / 203 mm | 1/4 in |
| 15LF085-40 | | Ext. Thread 3/8 in - 24 | 1000 | Composite | 1.4 lb / 0.64 kg | 8.0 in / 203 mm | 1/4 in |
| — | 15LF054-38 | Chuck 1/4 in | 2400 | Composite | 1.3 lb / 0.59 kg | 7.3 in / 185 mm | 1/4 in |
| 15LF084-38 | | Chuck 1/4 in | 2400 | Composite | 1.4 lb / 0.64 kg | 8.0 in / 203 mm | 1/4 in |
| — | 15LF053-38 | Chuck 1/4 in | 3300 | Composite | 1.3 lb / 0.59 kg | 7.3 in / 185 mm | 1/4 in |
| 15LF083-38 | | Chuck 1/4 in | 3300 | Composite | 1.4 lb / 0.64 kg | 8.0 in / 203 mm | 1/4 in |
| 15LF083-40 | | Ext. Thread 3/8 in - 24 | 3300 | Composite | 1.4 lb / 0.64 kg | 8.0 in / 203 mm | 1/4 in |
| — | 15LF052-38 | Chuck 1/4 in | 4000 | Composite | 1.3 lb / 0.59 kg | 7.3 in / 185 mm | 1/4 in |
| 15LF082-38 | | Chuck 1/4 in | 4000 | Composite | 1.4 lb / 0.64 kg | 8.0 in / 203 mm | 1/4 in |
| 15LF082-40 | | Ext. Thread 3/8 in - 24 | 4000 | Composite | 1.4 lb / 0.64 kg | 7.3 in / 185 mm | 1/4 in |
| — | 15LF051-38 | Chuck 1/4 in | 5300 | Composite | 1.3 lb / 0.59 kg | 7.3 in / 185 mm | 1/4 in |
| 15LF081-38 | | Chuck 1/4 in | 5300 | Composite | 1.4 lb / 0.64 kg | 8.0 in / 203 mm | 1/4 in |
| 15LF081-40 | | Ext. Thread 3/8 in - 24 | 5300 | Composite | 1.4 lb / 0.64 kg | 8.0 in / 203 mm | 1/4 in |
| 15LF080-38 | | Chuck 1/4 in | 28500 | Composite | 0.9 lb / 0.41 kg | 6.3 in / 160 mm | 1/4 in |

All tools performance rated @ 90 psi / 620 kPa air pressure.

Minimum Hose I.D.: 1/4 in / 6.4 mm

Standard Equipment: Jacobs geared chuck, chuck key

Drill diameter capacity matches chuck size.

DESCRIPTION

- Specially designed for all back-spotfacing operations with an accuracy of 0.001 in, with micrometric adjustment.
- Fixed speed (RB 1130 | 60QBSF) or adjustable speed (RB 1130-2 | 70QBSF) for use in light alloys or steel.
- Machine design provides smooth and easy feed without strain on the operator.
- All Recoules Quackenbush standard pilots and back-spotfacing cutters can be used on this machine (see page 84).
- Wide range of interchangeable collets.
- Quick mounting nose-piece provides easy access to collet.
- Feed lever with 360° orientation.



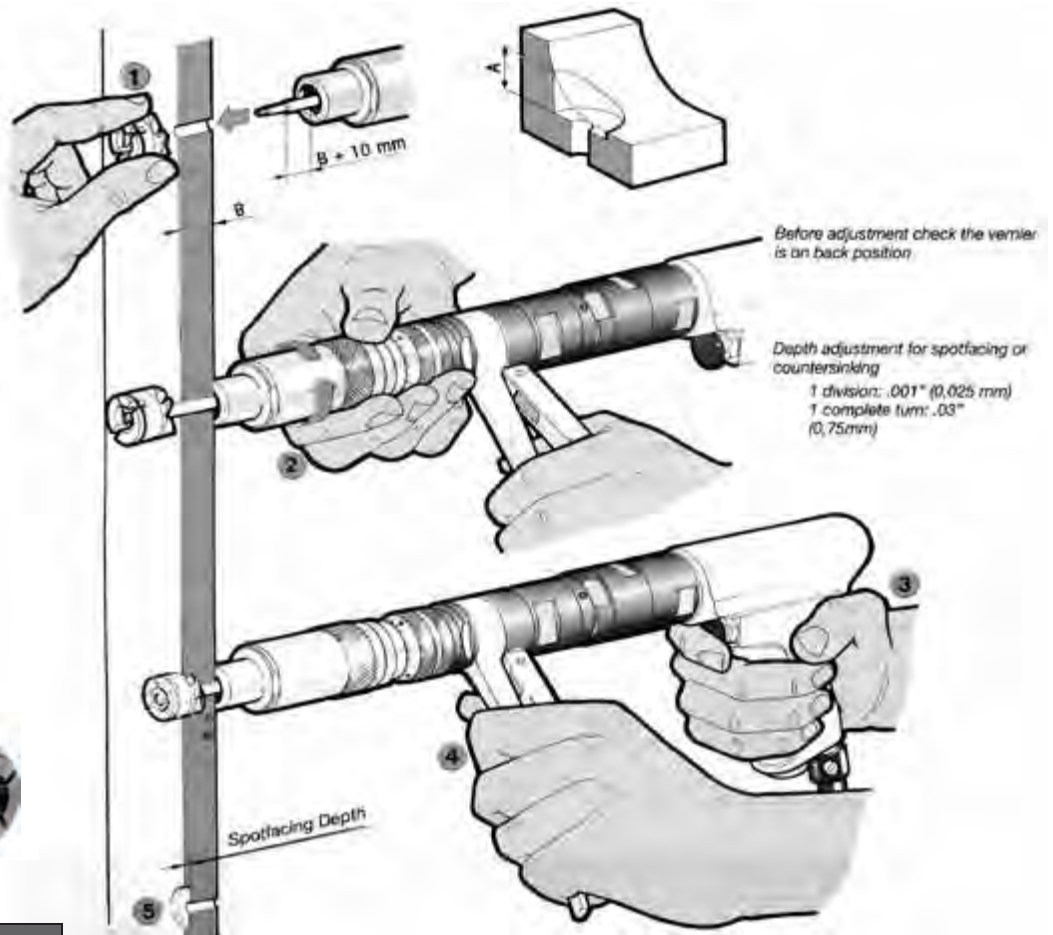
| MODEL | MOTOR CONFIGURATION | STD STROKE | | STD SPINDLE SPEED RPM | SPOTFACING CAPACITY | | ACCESSORIES | CUTTERS |
|--------------------|---------------------|------------|---------|-----------------------|---------------------|--------------------|--------------------|-------------|
| | | mm | in | | LIGHT ALLOYS | STEEL AND TITANIUM | | |
| RB 1130 / 60QBSF | Pistol Grip | 10 mm | 3/8 in | 460 | Ø 30 mm - 1.181 in | Ø 20 mm - 0.787 in | See Collets charts | See page XX |
| RB 1130-2 / 70QBSF | Pistol Grip | 15 mm | 0.06 in | 150 - 550 | Ø 30 mm - 1.181 in | Ø 20 mm - 0.787 in | See Collets charts | See page XX |

TECHNICAL DATA

Motor Power: RB1130 / 60QBSF - 0.6 hp / 0.4 kW, RB1130-2 / 70QBSF - 0.7 hp / 0.5 kW

Air Pressure: 90 psi / 6.3 bar

Recommended Hose Size: 3/8 in / 10 mm



| STANDARD COLLETS | | |
|-------------------|--------|-------------|
| STANDARD DIAMETER | | CODE COLLET |
| mm | in | |
| 2 | 0.0787 | 70110200 |
| 2.5 | 0.098 | 70110250 |
| 3 | 0.1181 | 70110300 |
| 3.5 | | 70110350 |
| 4 | 5/32 | 70110400 |
| 4.8 | 3/16 | 70110480 |
| 5 | 0.1968 | 70110500 |
| 5.5 | | 70110550 |
| 6 | 0.2362 | 70110600 |
| 6.35 | 1/4 | 70110635 |
| 7.94 | 5/16 | 70110794 |
| 9.52 | 3/8 | 70110952 |

How to order a collet dia 3.17 mm

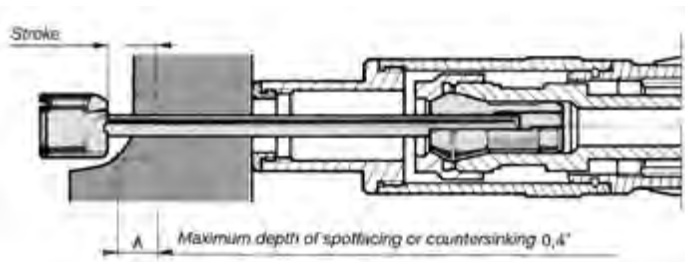
Basic Code Collet dia in 100th of mm

70.110 + **317**

70.110.317

Code to indicate

Alternative collets diameters available on request.

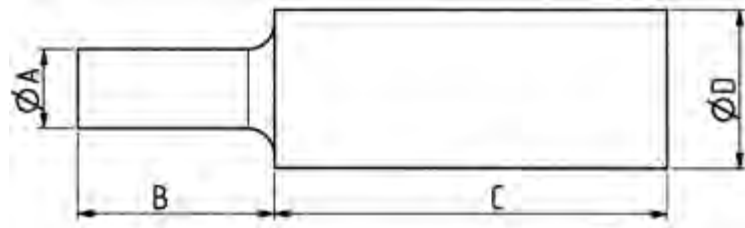


EXPERT ADVICE

- Precise backspotfacing and countersinking operation with the micrometric adjustment similar to the Recoules cages.
- Cutters and Pilots, see page 84.

PRECISE MANUFACTURE

In some cases, microstop cages are impractical or too bulky to be used.
We recommended fitting our cutters to the drilling equipment by means of the following adapters:



| FOR CUTTER THREAD | Ø A | | B mm | C mm | Ø D mm | CODE | |
|-------------------|-----|-------|------|------|--------|----------|--|
| | mm | in | | | | | |
| M6 x 1 | 4 | 0.157 | 15 | 15 | 10 | 10090000 | |
| M6 x 1 | 6 | 0.236 | 20 | 30 | 10 | 10090050 | |
| M8 x 1 | 6 | 0.236 | 20 | 30 | 12 | 10090055 | |
| M8 x 1 | 8 | 0.315 | 20 | 30 | 14 | 10090100 | |
| M10 x 1 | 10 | 0.394 | 20 | 30 | 14 | 10090150 | |

EXPERT ADVICE

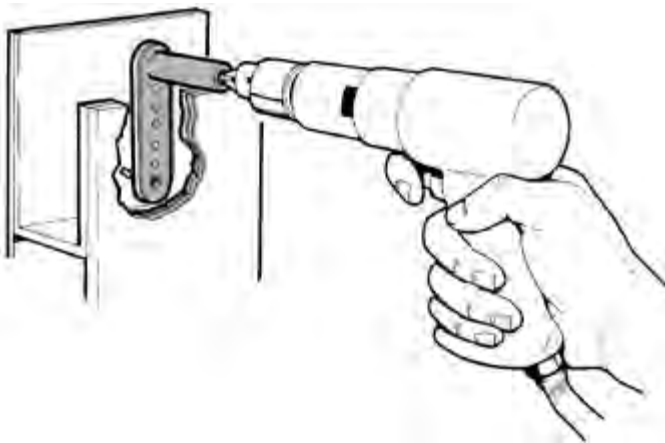


- For use with pistol tools, see pages 32-34.
- Cutters, see pages 74-82.

On request, we can supply all special adapters with a morse taper #1, #2, or #3.

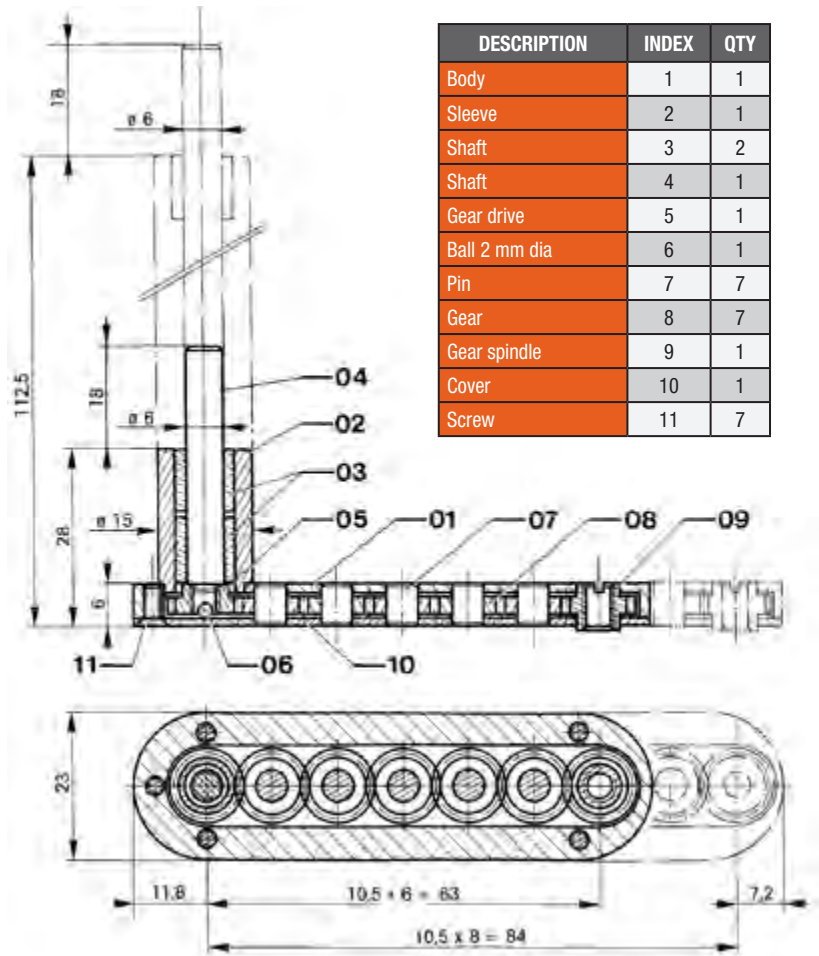


| TOOL ATTACHMENT | A | B | CODE |
|-----------------|----|-------|----------|
| UNF 10-32 F | 84 | 28 | 10080005 |
| | 84 | 112.5 | 10080010 |
| | 63 | 28 | 10080015 |
| | 63 | 112.5 | 10080020 |



TECHNICAL DATA

Shank diameter: 0.236 in / 6 mm
 Maximum drilling capacity: 0.197 in / 5 mm
 Maximum countersinking capacity: 0.594 in / 15 mm
 Weight: 105 - 220 g



| DESCRIPTION | INDEX | QTY |
|---------------|-------|-----|
| Body | 1 | 1 |
| Sleeve | 2 | 1 |
| Shaft | 3 | 2 |
| Shaft | 4 | 1 |
| Gear drive | 5 | 1 |
| Ball 2 mm dia | 6 | 1 |
| Pin | 7 | 7 |
| Gear | 8 | 7 |
| Gear spindle | 9 | 1 |
| Cover | 10 | 1 |
| Screw | 11 | 7 |

EXPERT ADVICE

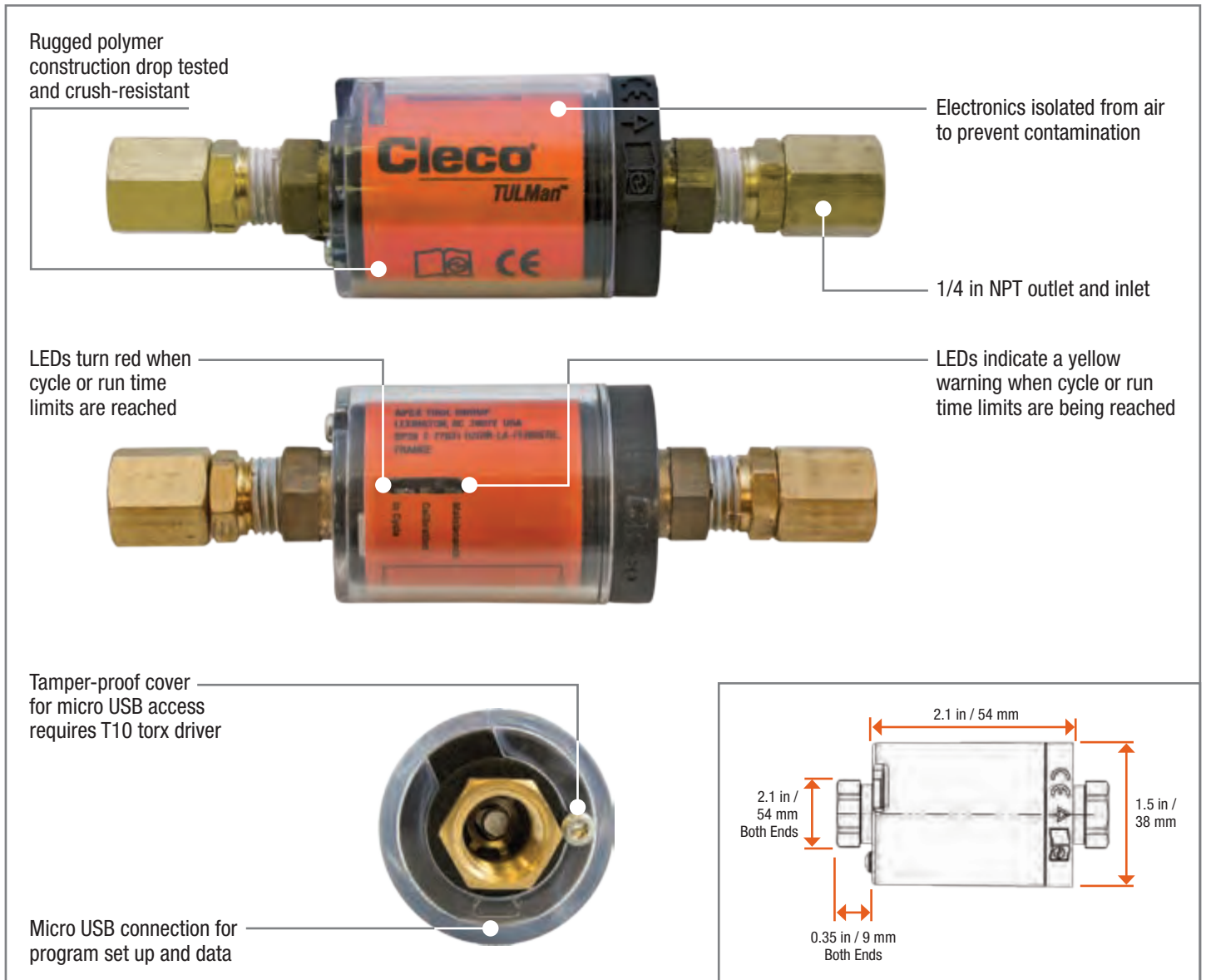
- For use with pistol grip tools, see pages 32-34.
- Cutters, see page 96.



On request, we can supply special offset angle drill to customer specifications. Please contact your normal customer service representative and indicate dimensions A and B when ordering.

SIMPLE AND EASY INSTALL

Simple and easy to install on any small pneumatic tool, the Cleco TULMan allows you to know **when and how often** your tools are used for calibration, service, and overall life. This device can also be used to **monitor** consumables and productivity.



| PART NUMBER | MAX PRESSURE | MIN FLOW | MAX FLOW | WEIGHT | CONNECTION |
|-------------|-------------------|-----------------|------------------|---------------|------------|
| 240461PT | 100 psi / 6.9 bar | 5 cfm / 145 lpm | 20 cfm / 570 lpm | 2.8 oz / 80 g | 1/4 in NPT |

COLLET CHUCK - MINI

- To adapt female thread termination to a collet.

| SHANK SIZE | ASSEMBLY | COLLET |
|------------|----------|------------|
| 1/8 in | 14-1102* | 14-0158** |
| 1/4 in | 14-1104* | 14-0168*** |
| 6 mm | 14-1094* | 14-0170*** |



* For 1/4 in - 28 Internal Thread
 ** For 5/16 in - 24 Internal Thread – 1/8 in Collet
 *** For 3/8 in - 24 Internal Thread – 1/4 in Collet

COLLET CHUCK - STANDARD

| PART NO. | DRILL SIZE |
|----------|------------|
| 863810 | 3/16 in |
| 863806 | 1/4 in |



CONE JAW CHUCK

- To adapt female thread termination to a chuck.

| PART NO. | DESCRIPTION |
|----------|--|
| 1020699 | 1/4 in capacity with a 1/4 in - 28 male thread |



300 SERIES COLLET CHUCK

- Use with standard collet: 1/4 in (#308).
- Termination number: -36
- To adapt male thread termination to a collet.

| PART NO. | DESCRIPTION |
|----------|---|
| 14-1148 | 1/64 in - 1/4 in capacity with a 5/16 in - 24 female thread |



QUICK-CHANGE CHUCK

- To adapt male thread termination to a 1/4 in hex.

| PART NO. | THREAD SIZE | CAPACITY |
|----------|-------------|------------|
| QRA-08 | 3/8 in - 24 | 1/4 in Hex |



CLECO TULMan™

- www.ClecoTools.com/TULMan



| PART NUMBER | MAX PRESSURE | MIN FLOW | MAX FLOW | WEIGHT | CONNECTION |
|-------------|-------------------|-----------------|------------------|---------------|------------|
| 240461PT | 100 psi / 6.9 bar | 5 cfm / 145 lpm | 20 cfm / 570 lpm | 2.8 oz / 80 g | 1/4 in NPT |

JACOBS® CHUCKS



| MODEL NUMBER | TYPE | | CAPACITY | TERMINATION |
|--------------|----------|-----------|----------|-------------|
| 1005078 | With Key | 1/4 in | 6.3 mm | 3/8 in - 24 |
| 1001505 | With Key | 1/4 in HD | 6.3 mm | 3/8 in - 24 |
| 1001252 | With Key | 3/8 in | 9.5 mm | 3/8 in - 24 |
| 1009726 | With Key | 1/2 in | 12.7 mm | 3/8 in - 24 |
| 33633 | Keyless | 5/16 in | 8.0 mm | 3/8 in - 24 |
| 33663D | Keyless | 25/64 in | 10.0 mm | 3/8 in - 24 |

COLLETS FOR ANGLE DRILLS

- For use on Dotco 15LF, 15LS & 15LN right angle drills with 9/32 in - 40 spindles.



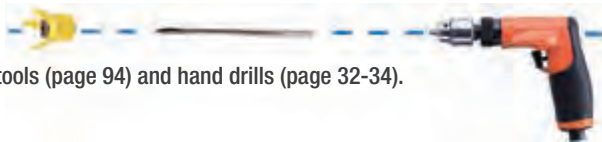
| COLLETS | DRILL | | |
|---------|-------|-------|------|
| CAT NO | SIZE | DEC. | mm |
| 1006408 | 53 | 0.060 | 1.51 |
| 1005180 | 1/16 | 0.063 | 1.59 |
| 1006412 | 51 | 0.067 | 1.70 |
| 1005875 | 46 | 0.081 | 2.06 |
| 1005182 | 3/32 | 0.094 | 2.38 |
| 1005684 | 40 | 0.098 | 2.49 |
| 1006395 | 39 | 0.100 | 2.53 |
| 1005183 | 7/64 | 0.109 | 2.78 |
| 1005873 | 31 | 0.12 | 3.05 |
| 1005184 | 1/8 | 0.125 | 3.18 |
| 1013904 | 30 | 0.129 | 3.26 |
| 1005185 | 9/64 | 0.141 | 3.57 |
| 1005872 | 27 | 0.144 | 3.66 |
| 1005186 | 5/32 | 0.156 | 3.97 |
| 1005926 | 22 | 0.157 | 3.99 |
| 1005682 | 21 | 0.159 | 4.04 |
| 1005876 | 20 | 0.161 | 4.09 |
| 1006035 | 19 | 0.166 | 4.22 |
| 1005187 | 11/64 | 0.172 | 4.37 |
| 1005977 | 17 | 0.173 | 4.39 |
| 1005927 | 13 | 0.185 | 4.70 |
| 1005188 | 3/16 | 0.188 | 4.76 |
| 1005871 | 12 | 0.189 | 4.80 |
| 1006001 | 11 | 0.191 | 4.85 |
| 1005681 | 10 | 0.194 | 4.91 |

DESCRIPTION AND ADVANTAGES

- The RB 240 is an injection molded polyamide nylon tripod with a knurled steel sleeve, especially designed to use on any surface.
- The RB 245 is an injection molded polyamide nylon quadripod with a knurled steel sleeve and interchangeable aluminum mounting base (code number 90820085) with 4 nylons studs (code number 93045030). Especially designed to use on curved components. The operator has direct control over perpendicularity as three legs only out of four are in contact with the surface when the tool position is not correct.
- These drill guides, simple and sturdy, can be fitted with a removable drill bush of tempered high speed steel.
- The drill bush is slide fit to H7g6 with a m6 fit on the last 3 mm.



EXPERT ADVICE



- For use with our cutting tools (page 94) and hand drills (page 32-34).

| DRILLING GUIDES | CODE NUMBER |
|------------------|-------------|
| Tripod RB 240 | 70300005 |
| Quadripod RB 245 | 70300010 |

DESCRIPTION AND ADVANTAGES

- We can supply all drilling bushes from 0.039 in up to 0.47 in dia.
- All our bushes are manufactured with a tolerance of +0.0006 in / +0 on the nominal diameter.



How to order

For ≤ 0.3933 in

Example :

Bush 0.1275 in dia
Mini dia 0.1275 in dia
Maxi dia 0.1281 in dia

Basic Code

Collet dia in 100th of mm

70.310

+

324

70310324

Code to indicate

How to order

For dia 0.3937 in to 0.4724 in

Example :

Bush 0.4468 in dia
Mini dia 0.4468 in dia
Maxi dia 0.4474 in dia

Basic Code

Collet dia in 100th of mm

70.311

+

135

70311135

Code to indicate

| | |
|---|----|
| Microstop Cages RB 156 | 51 |
| Microstop Cages RB 206, RBI 206 | 52 |
| Microstop Cages RB 256, RBI 256 | 54 |
| Ball-Type Microstop Cages RB 257 | 56 |
| Ball-Type Microstop Cages RB 258, RBI 258 | 58 |
| Microstop Cages RB 306 - Large Window | 60 |
| Microstop Cages RB 306 - Small Window | 61 |
| Ball-Type Microstop Cages RB 307, RBI 307 - Large Window | 62 |
| Ball-Type Microstop Cages RB 307, RBI 307 - Small Window | 63 |
| Microstop Cages RB 356 HP 21, RBI 356 HPI 21 - Large Window | 64 |
| Microstop Cages RB 356 HP 21, RBI 356 HPI 21 - Small Window | 65 |
| Microstop Cages RB 356 HP38, RBI 356 HPI 38 - Large Window | 66 |
| Microstop Cages RB 356 HP38, RBI 356 HPI 38 - Small Window | 67 |
| Microstop Cages RB 356 HP58, RBI 356 HPI 58 | 68 |
| Microstop Cages RB 406 | 70 |
| Drill Holder For Use with Microstop Cages | 72 |

RB 156



RB 256



RB 406



RB 356 HP 38



| MICROSTOP CAGE | SHANK DIA. | CUTTER THREAD | STROKE | Ø EXT. MAXI | TOTAL LENGTH | |
|----------------|----------------------------|----------------|------------------|------------------------|------------------|------------------|
| | | | | | MINI | MAXI |
| RB 156 | Ø 4.8 mm - 0.19 in dia | M6 x 1 | 3.5 mm - 0.14 in | Ø 25 mm - 1 in dia | 51 mm - 2 in | 55 mm - 2.16 in |
| RB 206 | Ø 6 mm - 0.24 in dia | M6 x 1 | 6 mm - 0.24 in | Ø 21 mm - 0.826 in dia | 95 mm - 3.74 in | 101 mm - 3.97 in |
| RBI 206 | Ø 6 mm - 0.24 in dia | 1/4 in - 28 F | 6 mm - 0.24 in | Ø 21 mm - 0.826 in dia | 95 mm - 3.74 in | 101 mm - 3.97 in |
| RB 256 | Ø 6 mm - 0.24 in dia | M6 x 1 | 7.5 mm - 0.3 in | Ø 28 mm - 1.1 in dia | 91 mm - 3.58 in | 98 mm - 3.85 in |
| RBI 256 | Ø 6 mm - 0.24 in dia | 1/4 in - 28 F | 7.5 mm - 0.3 in | Ø 28 mm - 1.1 in dia | 91 mm - 3.58 in | 98 mm - 3.85 in |
| RB 257 | Ø 6 mm - 0.24 in dia | M6 x 1 | 6 mm - 0.24 in | Ø 29 mm - 1.14 in dia | 88 mm - 3.46 in | 92 mm - 3.62 in |
| RB 258 | Ø 6.35 mm - 1/4 in dia | M6 x 1 | 27 mm - 1.06 in | Ø 29 mm - 1.14 in dia | 141 mm - 5.55 in | 156 mm - 6.14 in |
| RBI 258 | Ø 6.35 mm - 1/4 in dia | 1/4 in - 28 F | 27 mm - 1.06 in | Ø 29 mm - 1.14 in dia | 141 mm - 5.55 in | 156 mm - 6.14 in |
| RB 306 | Ø 6 mm - 0.24 in dia | M8 x 1 | 7.5 mm - 0.3 in | Ø 28 mm - 1.1 in dia | 91 mm - 3.58 in | 98 mm - 3.85 in |
| RB 307 | Ø 6 mm - 0.24 in dia | M8 x 1 | 7 mm - 0.28 in | Ø 29 mm - 1.14 in dia | 88 mm - 3.46 in | 98 mm - 3.62 in |
| RBI 307 | Ø 6 mm - 0.24 in dia | 1/4 in - 28 F | 7 mm - 0.28 in | Ø 29 mm - 1.14 in dia | 88 mm - 3.46 in | 98 mm - 3.62 in |
| RB 406 | Ø 6 mm - 0.24 in dia / JTI | M10 x 1 | 14 mm - 0.55 in | Ø 36 mm - 1.42 in dia | 136 mm - 5.35 in | 163 mm - 6.42 in |
| RB 356 HP 21 | Ø 6 mm - 0.24 in dia / JTI | M6 x 1 | 21 mm - 0.83 in | Ø 27 mm - 1.06 in dia | 116 mm - 4.57 in | 136 mm - 5.35 in |
| RB 356 HPI 21 | Ø 6 mm - 0.24 in dia / JTI | 1/4 in - 28 F | 21 mm - 0.83 in | Ø 27 mm - 1.06 in dia | 116 mm - 4.57 in | 136 mm - 5.35 in |
| RB 356 HP 38 | Ø 6 mm - 0.24 in dia / JTI | M6 x 1 | 38 mm - 1.5 in | Ø 27 mm - 1.06 in dia | 183 mm - 7.2 in | 168 mm - 6.61 in |
| RB 356 HPI 38 | Ø 6 mm - 0.24 in dia / JTI | 1/4 in - 28 F | 38 mm - 1.5 in | Ø 27 mm - 1.06 in dia | 183 mm - 7.2 in | 168 mm - 6.61 in |
| RB 356 HP 58 | Ø 6 mm - 0.24 in dia / JTI | M10 x 1 | 58 mm - 2.28 in | Ø 38 mm - 1.5 in dia | 264 mm - 10.4 in | 292 mm - 11.5 in |
| RB 356 HPI 58 | Ø 6 mm - 0.24 in dia / JTI | 7/16 in - 20 F | 58 mm - 2.28 in | Ø 38 mm - 1.5 in dia | 264 mm - 10.4 in | 292 mm - 11.5 in |

ADVANTAGES

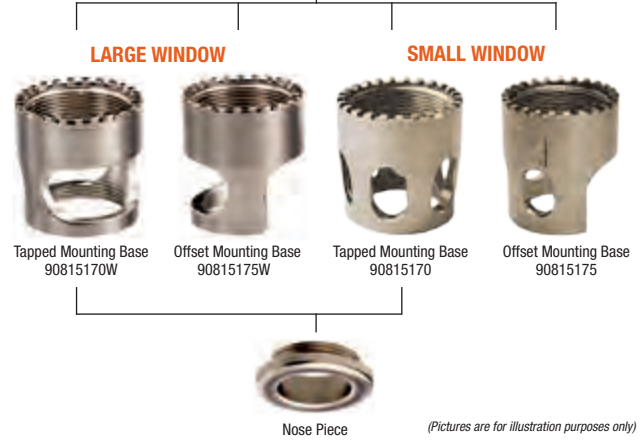
- Different mounting bases available.
- Reduced dimensions for tight access areas.
- For special composites → mounting base with vacuum.

PRECISION MANUFACTURING

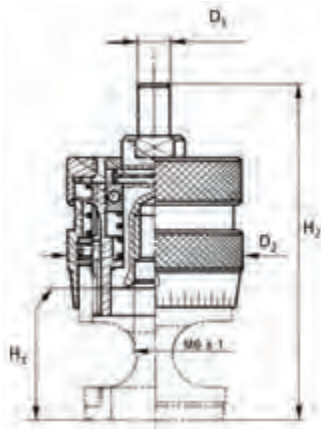
- Cemented, hardened, and ground chrome-nickel steel spindle mounted on a self-lubricating bronze body and a thrust bearing.
- Centering cone of the cutter (120°) for perfect concentricity.
- Microstop depth adjustment (1 scale division = 0.001 in).
- Microstop depth setting is held securely in place by locknut with seal. This patented feature allows an easy loosening of the locknut without damage to the drill cage.



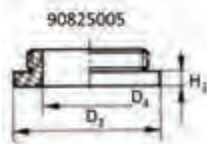
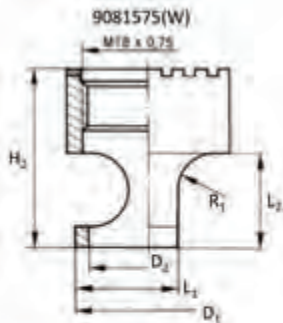
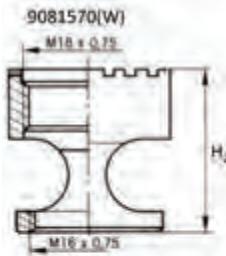
Basic Drill Cage



(Pictures are for illustration purposes only)



Dimensions for large and small window



| MICROSTOP CAGE | | | | | | | | | |
|----------------|---|--------|------|------|------|------|------|------|--------|
| RB 156 | T | M6 x 1 | D1 | D2 | H1 | | H2 | | Stroke |
| | | | | | Min | Max | Min | Max | |
| | | | | | mm | in | mm | in | |
| | | | 4.8 | 25 | 20 | 24 | 51 | 55 | 3.5 |
| | | | 0.19 | 0.98 | 0.79 | 0.94 | 2.01 | 2.17 | 0.14 |

| MOUNTING BASE | | | | | | | | |
|---------------|----|------|------|------|------|------|------|----|
| | | D1 | D2 | L1 | L2 | H2 | R1 | D6 |
| 9081570(W) | mm | NA | NA | NA | NA | 22 | NA | NA |
| | in | NA | NA | NA | NA | 0.87 | NA | NA |
| 9081575(W) | mm | 20 | 16 | 14 | 13 | 24 | 13 | NA |
| | in | 0.79 | 0.63 | 0.55 | 0.51 | 0.94 | 0.51 | NA |

| NOSE PIECE | | | | |
|------------|----|------|------|------|
| | | D3 | D4 | H3 |
| 90825005 | mm | 20 | 12.5 | 2 |
| | in | 0.79 | 0.49 | 0.08 |

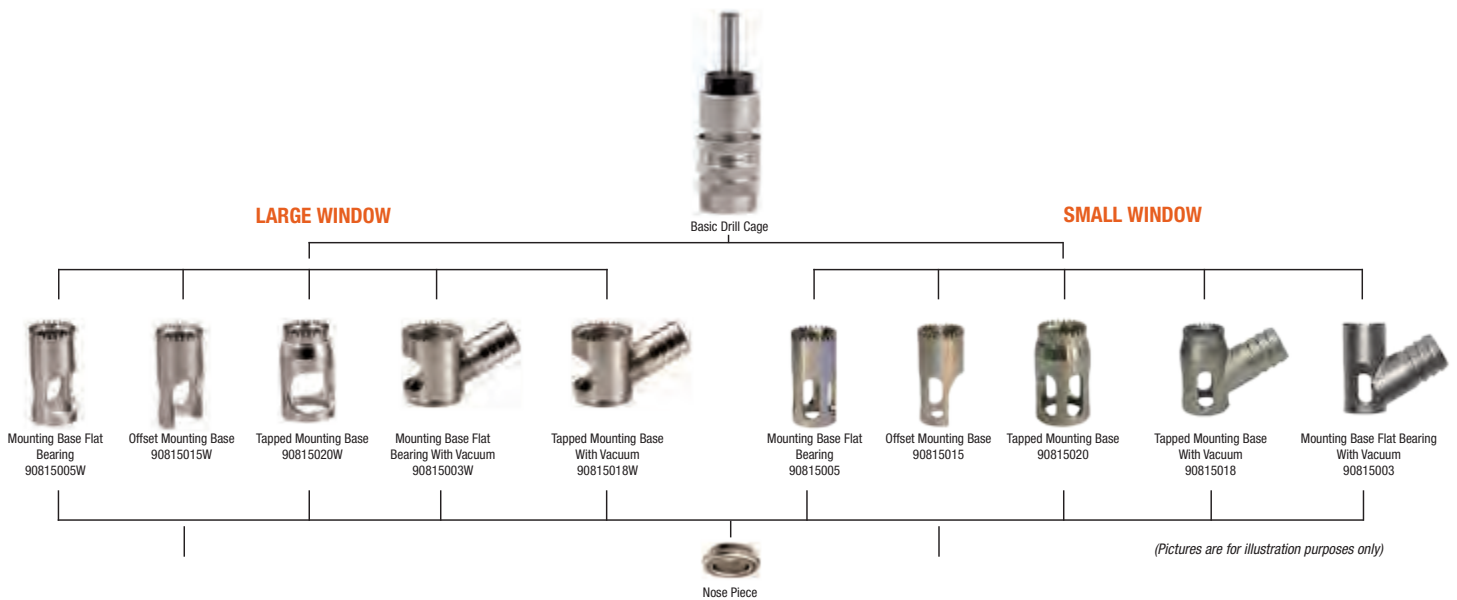
| RB 156 | | MICROSTOP CAGE ASSEMBLY CODE | | | |
|-----------------------------------|-----------|------------------------------|-----------|----------|-----------|
| | | 10000010 | 10000010W | 10000100 | 10000100W |
| Basic Drill Cage | | ● | ● | ● | ● |
| Tapped Mounting Base | 90815170 | ● | | | |
| Tapped Mounting Base Large Window | 90815170W | | ● | | |
| Offset Mounting Base | 90815175 | | | ● | |
| Offset Mounting Base Large Window | 90815175W | | | | ● |
| Nylon Nose Piece | 90825005 | ● | ● | | |

ADVANTAGES

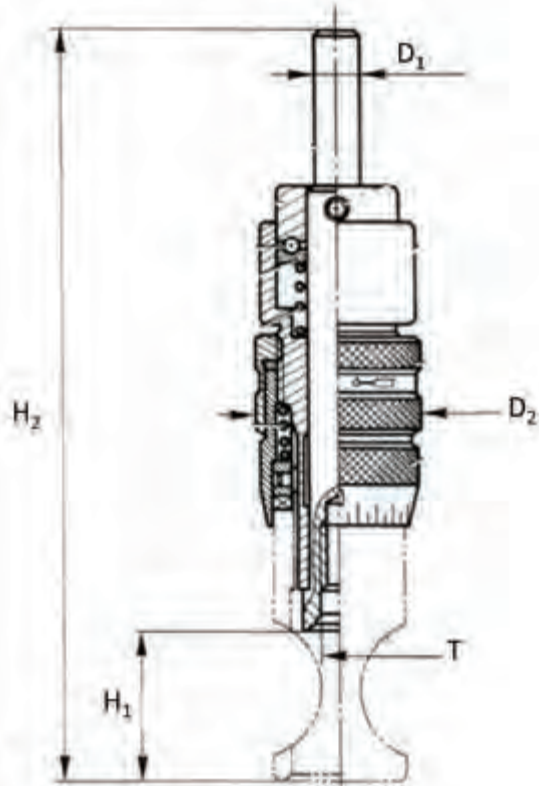
- Different mounting bases available.
- Reduced dimensions for tight access areas.
- For special composites → mounting base with vacuum.

PRECISION MANUFACTURING

- Cemented, hardened, and ground chrome-nickel steel spindle mounted on a self-lubricating bronze body and thrust bearing.
- Centering cone of the cutter (120°) for perfect concentricity.
- Microstop depth adjustment (1 scale division = 0.001 in).
- Microstop depth setting is held securely in place by locknut with seal. This patented feature allows an easy loosening of the locknut without damage to the drill cage.

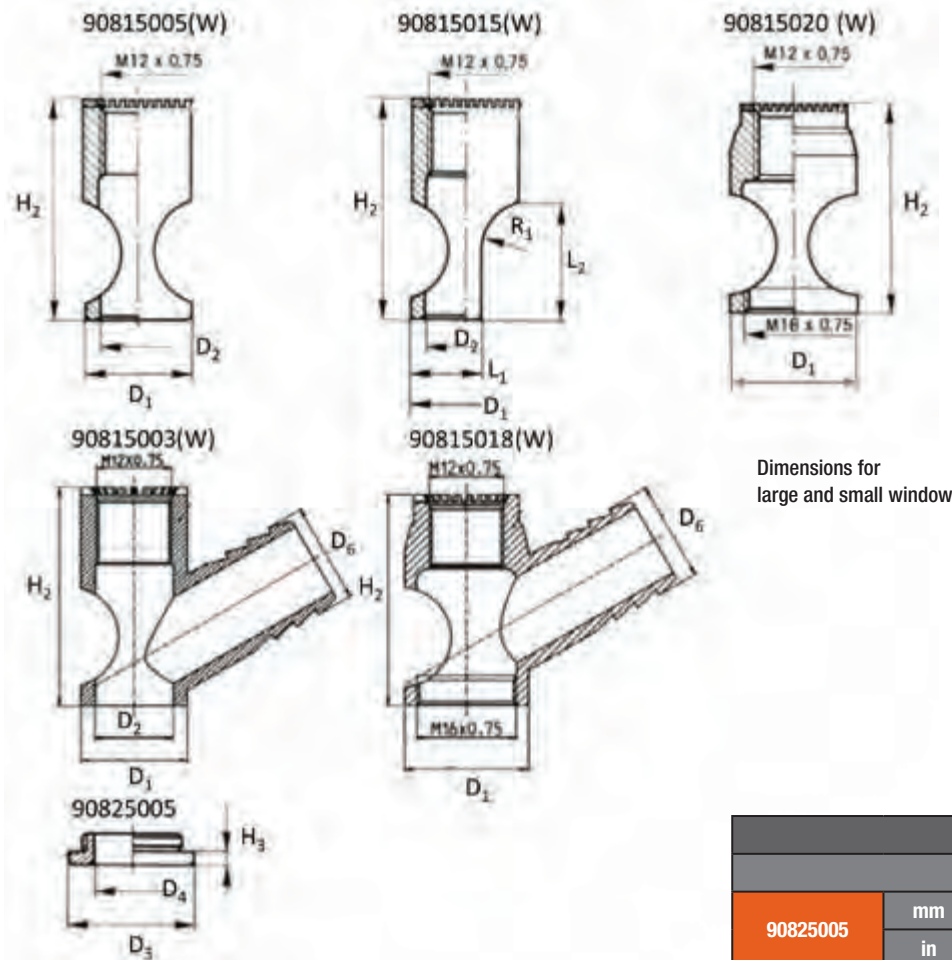


| RB 206 | | MICROSTOP CAGE ASSEMBLY CODE | | | | | | | | | |
|---|-----------|------------------------------|----------|-----------|----------|-----------|----------|-----------|----------|-----------|----------|
| | | 10005000W | 10005000 | 10005200W | 10005200 | 10005305W | 10005305 | 10005001W | 10005001 | 10005306W | 10005306 |
| RBI 206 | | 10005050W | 10005050 | 10005250W | 10005250 | 10005355W | 10005355 | 10005051W | 10005051 | 10005356W | 10005356 |
| Basic Drill Cage | | • | • | • | • | • | • | • | • | • | • |
| Mounting Base Flat Bearing Large Window | 90815005W | • | | | | | | | | | |
| Mounting Base Flat Bearing | 90815005 | | • | | | | | | | | |
| Offset Mounting Base Large Window | 90815015W | | | • | | | | | | | |
| Offset Mounting Base | 90815015 | | | | • | | | | | | |
| Tapped Mounting Base Large Window | 90815020W | | | | | • | | | | | |
| Tapped Mounting Base | 90815020 | | | | | | • | | | | |
| Mounting Base Flat Bearing Large Window w/ Vacuum | 90815003W | | | | | | | • | | | |
| Mounting Base Flat Bearing With Vacuum | 90815003 | | | | | | | | • | | |
| Tapped Mounting Base Large Window w/ Vacuum | 90815018W | | | | | | | | | • | |
| Tapped Mounting Base w/ Vacuum | 90815018 | | | | | | | | | | • |
| Nylon Nose Piece | 90825005 | | | | | • | • | | | • | • |



| MICROSTOP CAGE | | | | | | | | | |
|----------------|-------------|----|------|------|------|------|------|--------|------|
| | | | | H1 | | H2 | | Stroke | |
| | T | | D1 | D2 | Min | Max | Min | | Max |
| RB 206 | M6 x 1 | mm | 6 | 21 | 19 | 25 | 95 | 101 | 6 |
| RBI 206 | 1/4 in - 28 | in | 0.24 | 0.83 | 0.75 | 0.98 | 3.74 | 3.98 | 0.24 |

| MOUNTING BASE | | | | | | | | |
|---------------|----|------|------|------|------|------|------|------|
| | | D1 | D2 | L1 | L2 | H2 | R1 | D6 |
| 90815005(W) | mm | 17 | 12.5 | NA | NA | 35 | NA | NA |
| | in | 0.67 | 0.49 | NA | NA | 1.38 | NA | NA |
| 90815015(W) | mm | 17 | 12.5 | 11 | 19 | 35 | 8 | NA |
| | in | 0.67 | 0.49 | 0.43 | 0.75 | 1.38 | 0.31 | NA |
| 90815020(W) | mm | 20 | NA | NA | NA | 33 | NA | NA |
| | in | 0.79 | NA | NA | NA | 1.30 | NA | NA |
| 90815003(W) | mm | 17 | 12.5 | NA | NA | 35 | NA | 16 |
| | in | 0.67 | 0.49 | NA | NA | 1.38 | NA | 0.63 |
| 90815018(W) | mm | 20 | NA | NA | NA | 34 | NA | 16 |
| | in | 0.79 | NA | NA | NA | 1.34 | NA | 0.63 |



Dimensions for large and small window

| NOSE PIECE | | | | |
|------------|----|------|------|------|
| | | D3 | D4 | H3 |
| 90825005 | mm | 20 | 12.5 | 2 |
| | in | 0.79 | 0.49 | 0.08 |

ADVANTAGES

- Different mounting bases available
- Reduced dimensions for tight access areas
- For special composites → mounting base with vacuum.

PRECISION MANUFACTURING

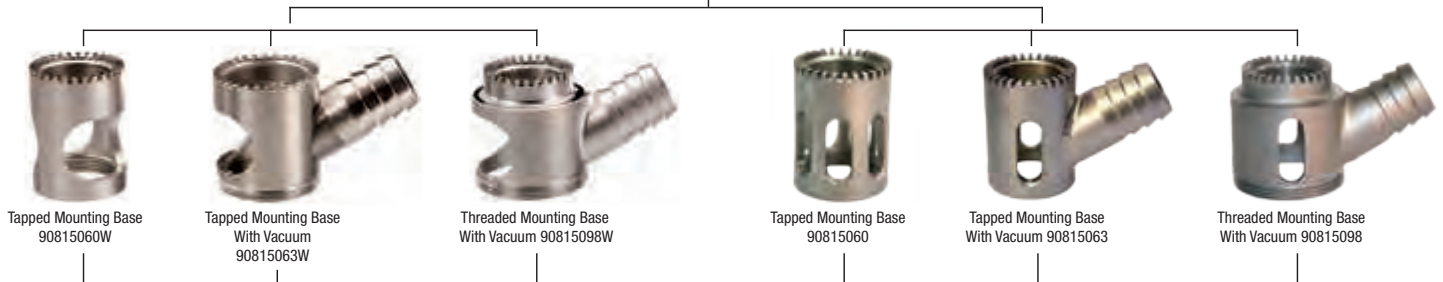
- Cemented, hardened, and ground chrome-nickel steel spindle mounted on a self-lubricating bronze body and a thrust bearing.
 - Centering cone of the cutter (120°) for perfect concentricity.
 - Microstop depth adjustment (1 scale division = 0.001 in).
 - Microstop depth setting is held securely in place by locknut with seal.
- This patented feature allows an easy loosening of the locknut without damage to the drill cage.



Basic Drill Cage

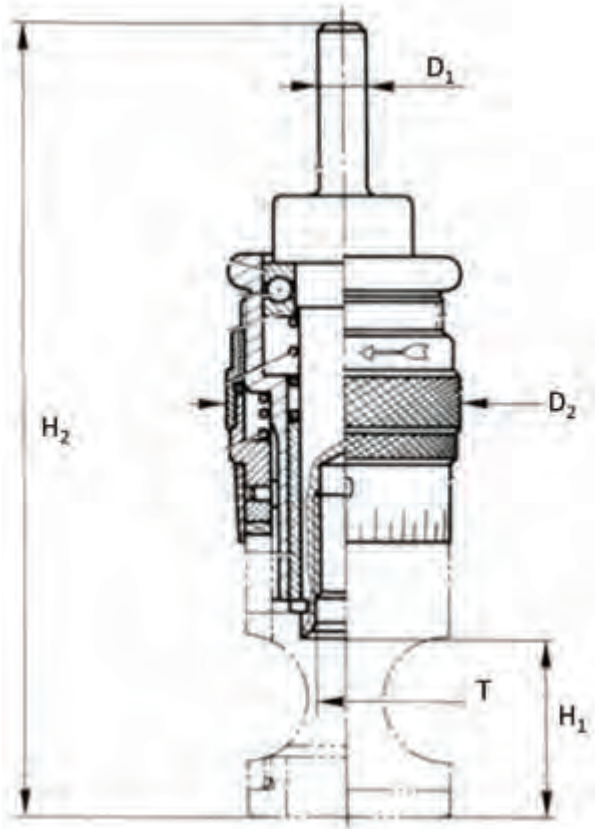
LARGE WINDOW

SMALL WINDOW



(Pictures are for illustration purposes only)

| RB 256 | | MICROSTOP CAGE ASSEMBLY CODE | | | | | | | | | |
|---|-----------|------------------------------|----------|-----------|----------|-----------|----------|-----------|----------|-----------|----------|
| | | 10010010W | 10010010 | 10010015W | 10010015 | 10010001W | 10010001 | 10010016W | 10010016 | 10010205W | 10010205 |
| RBI 256 | | 10010110W | 10010110 | 10010115W | 10010115 | 10010111W | 10010111 | 10010116W | 10010116 | | |
| Basic Drill Cage | | • | • | • | • | • | • | • | • | • | • |
| Tapped Mounting Base Large Window | 90815060W | • | | • | | | | | | | |
| Tapped Mounting Base | 90815060 | | • | | • | | | | | | |
| Tapped Mounting Base Large Window w/ Vacuum | 90815063W | | | | | • | | • | | | |
| Tapped Mounting Base w/ Vacuum | 90815063 | | | | | | • | | • | | |
| Threaded Mounting Base Large Window w/ Vacuum | 90815098W | | | | | | | | | • | |
| Threaded Mounting Base w/ Vacuum | 90815098 | | | | | | | | | | • |
| Hard Chrome Steel Nose | 90825015 | • | • | | | • | • | | | | |
| Nylon Nose Piece | 90825020 | | | • | • | | | • | • | | |
| Nylon Nose Piece | 90825085 | | | | | | | | | • | • |

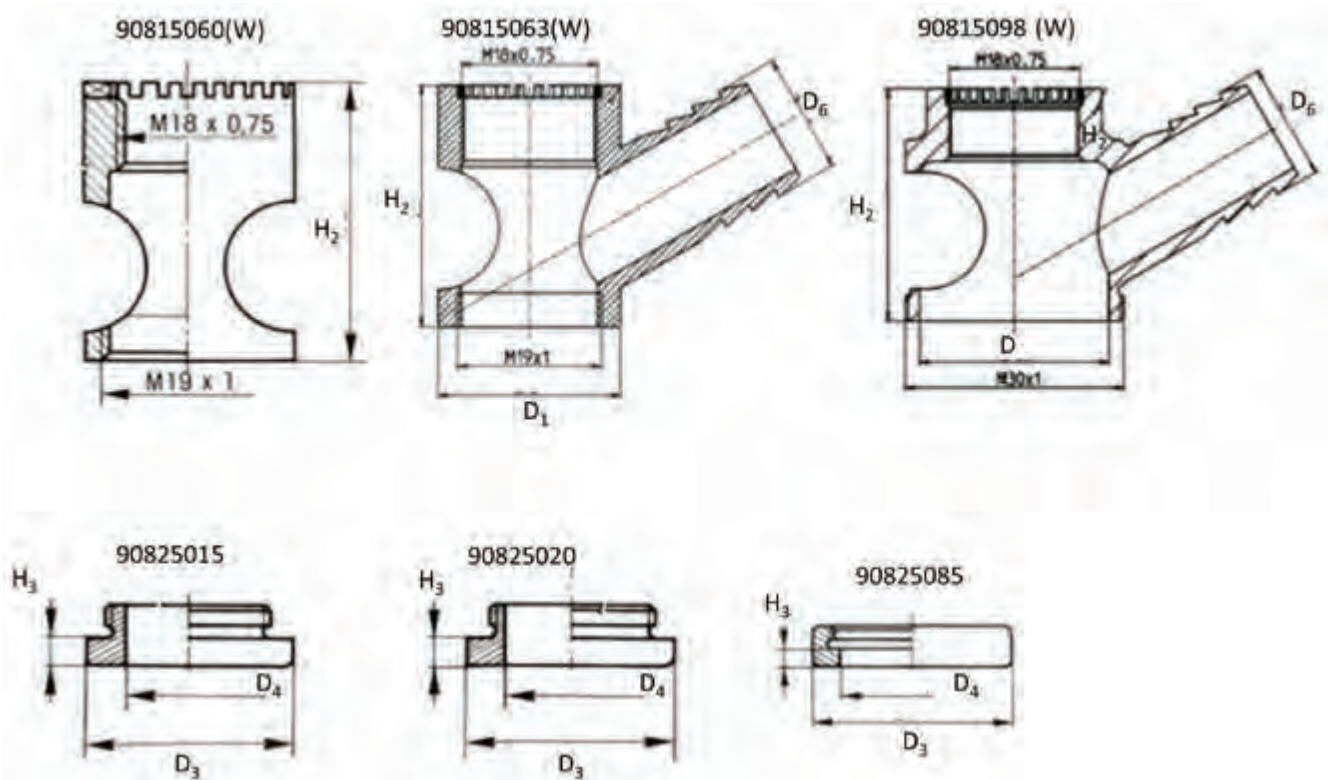


| MICROSTOP CAGE | | | | | | | | | |
|----------------|-------------|----|------|------|------|------|------|------|--------|
| | T | | D1 | D2 | H1 | | H2 | | Stroke |
| | | | | | Min | Max | Min | Max | |
| RB 256 | M6 x 1 | mm | 6 | 28 | 19 | 26 | 91 | 98 | 7.5 |
| RBI 256 | 1/4 in - 28 | in | 0.24 | 1.10 | 0.75 | 1.02 | 3.58 | 3.86 | 0.30 |

| MOUNTING BASE | | | | | | | | |
|---------------|----|-------------|------|----|----|------|----|------|
| | | D1 | D2 | L1 | L2 | H2 | R1 | D6 |
| | | 90815060(W) | mm | NA | NA | NA | NA | 32 |
| | in | NA | NA | NA | NA | 1.26 | NA | NA |
| 90815063(W) | mm | 24 | NA | NA | NA | 32 | NA | 16 |
| | in | 0.94 | NA | NA | NA | 1.26 | NA | 0.63 |
| 90815098(W) | mm | NA | 26 | NA | NA | 32 | NA | 16 |
| | in | NA | 1.02 | NA | NA | 1.26 | NA | 0.63 |

| NOSE PIECE | | | | |
|------------|----|----------|------|------|
| | | D3 | D4 | H3 |
| | | 90825015 | mm | 24 |
| | in | 0.94 | 0.59 | 0.12 |
| 90825020 | mm | 24 | 15 | 3 |
| | in | 0.94 | 0.59 | 0.12 |
| 90825085 | mm | 36 | 26 | 3 |
| | in | 1.42 | 1.02 | 0.12 |

Dimensions for large and small window



ADVANTAGES

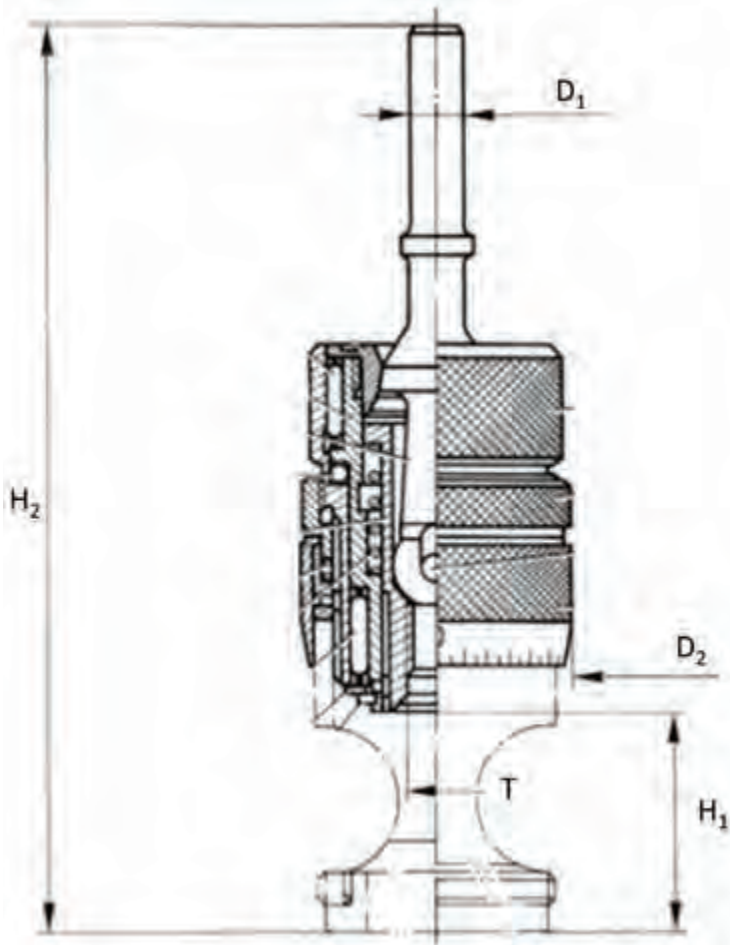
- Different mounting bases available.
- Reduced dimensions for tight access areas.
- For special composites → mounting base with vacuum.

PRECISION MANUFACTURING

- High precision microstop cage, body in heat-treated chrome steel, fully ground throughout. This ball-mounted microstop cage includes two needle bearings for best utilization.
- When using the RB 257, any misalignment of the microstop cage is corrected by the unique ball-pivoting spindle. This assembly ensures perpendicularity throughout the operation at all time.
- Centering cone of the cutter (120°) for perfect concentricity.
- Microstop depth adjustment (1 scale division = 0.001 in).
- Microstop depth setting is held securely in place by locknut with seal. This patented feature allows an easy loosening of the locknut without damage to the drill cage.



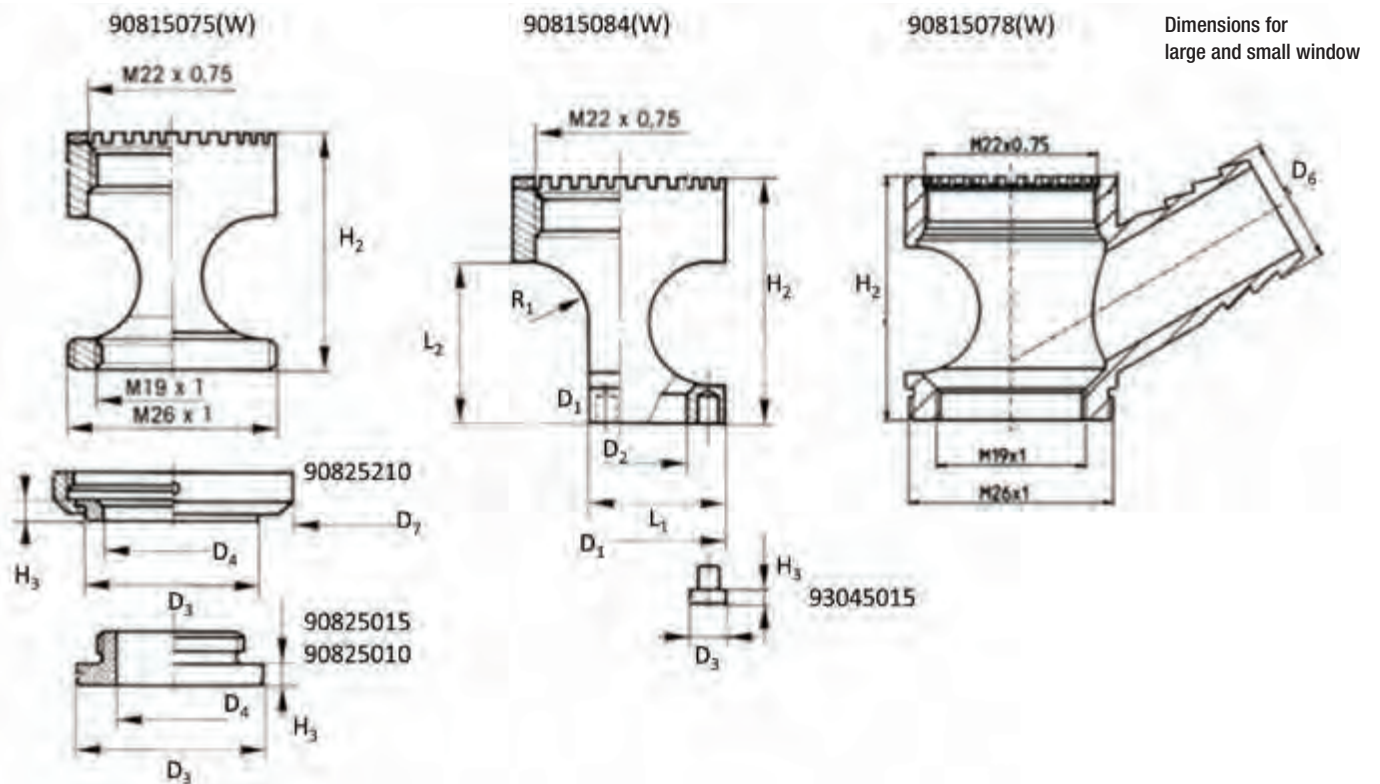
| RB 257 | | MICROSTOP CAGE ASSEMBLY CODE | | | | | | | | | | | | | |
|--|-----------|------------------------------|----------|-----------|----------|--------------|-------------|-----------|----------|-----------|----------|-----------|----------|-----------|----------|
| | | 10015010W | 10015010 | 10015015W | 10015015 | RC-10015020W | RC-10015020 | 10015200W | 10015200 | 10015001W | 10015001 | 10015016W | 10015016 | 10015021W | 10015021 |
| Basic Drill Cage | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Threaded + tapped base Large Window | 90815075W | ● | | ● | | ● | | | | | | | | | |
| Threaded + tapped base | 90815075 | | ● | | ● | | ● | | | | | | | | |
| Threaded Mounting Base Large Window w/ Vacuum | 90815078W | | | | | | | | | ● | | ● | | ● | |
| Threaded Mounting Base Large Window w/ Vacuum | 90815078 | | | | | | | | | | ● | | ● | | ● |
| Offset Mounting Base Large Window + 3 nylon pins | 90815084W | | | | | | | ● | | | | | | | |
| Offset Mounting Base + 3 nylon pins | 90815084 | | | | | | | | ● | | | | | | |
| Hard Chrome Steel Nose | 90825015 | | | ● | ● | | | | | | | ● | ● | | |
| Nylon Nose Piece | 90825020 | | | | | ● | ● | | | | | | | ● | ● |
| Celeron Rotary Nose | 90825210 | ● | ● | | | | | | | ● | ● | | | | |



| MICROSTOP CAGE | | | | | | | | | |
|----------------|--------|----|------|------|------|------|------|------|--------|
| | T | | D1 | D2 | H1 | | H2 | | Stroke |
| | | | | | Min | Max | Min | Max | |
| RB 257 | M6 x 1 | mm | 6 | 29 | 19 | 24 | 88 | 92 | 6 |
| | | in | 0.24 | 1.14 | 0.75 | 0.94 | 3.46 | 3.62 | 0.24 |

| MOUNTING BASE | | | | | | | | |
|---------------|----|-------------|------|------|------|------|------|------|
| | | D1 | D2 | L1 | L2 | H2 | R1 | D6 |
| | | 90815075(W) | mm | NA | NA | NA | NA | 31 |
| in | NA | | NA | NA | NA | 1.22 | NA | NA |
| 90815084(W) | mm | 27 | 18 | 17.5 | 21 | 32 | 8 | NA |
| | in | 1.06 | 0.71 | 0.69 | 0.83 | 1.26 | 0.31 | NA |
| 90815078(W) | mm | NA | NA | NA | NA | 31 | NA | 16 |
| | in | NA | NA | NA | NA | 1.22 | NA | 0.63 |

| NOSE PIECE | | | | | |
|------------|------|----------|------|------|------|
| | | D3 | D4 | H3 | D7 |
| | | 90825210 | mm | 29 | 17 |
| in | 1.14 | | 0.67 | 0.12 | 0.85 |
| 90825015 | mm | 24 | 15 | 3 | NA |
| 90825010 | in | 0.94 | 0.59 | 0.12 | NA |
| 93045015 | mm | 5 | NA | 2 | NA |
| | in | 0.20 | NA | 0.08 | NA |



Dimensions for large and small window

ADVANTAGES

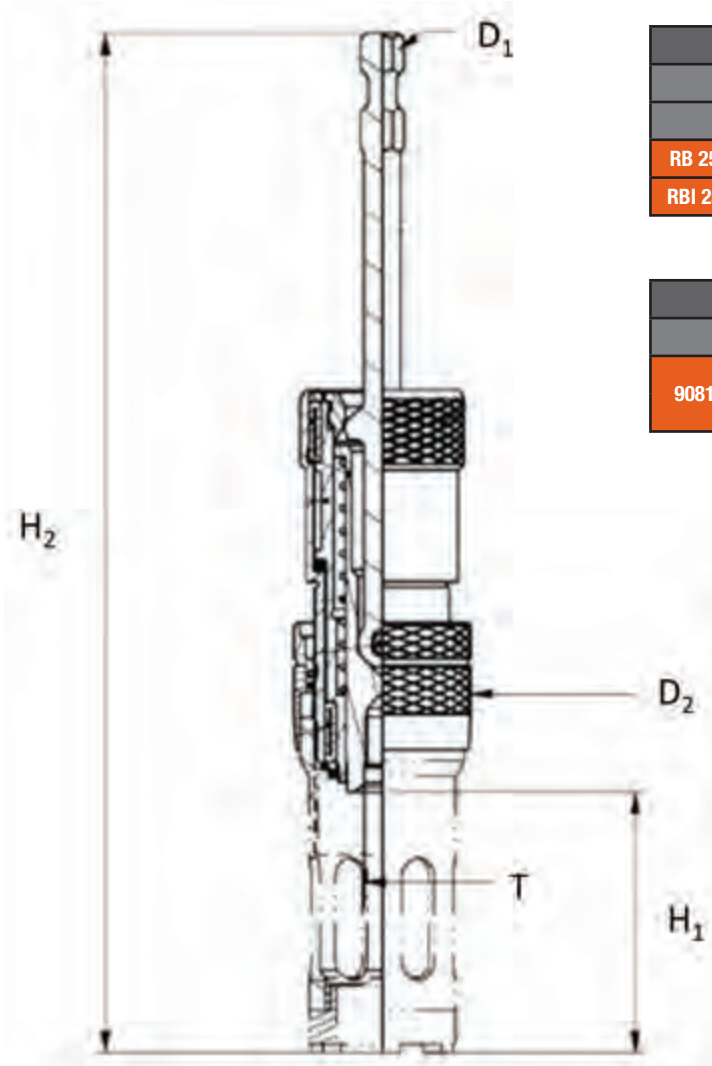
- Different mounting bases available.
- Reduced dimensions for tight access areas.
- High precision microstop cage, body in heat-treated chrome steel, fully ground throughout. This ball-mounted microstop cage includes two needle bearings for best utilization.

PRECISION MANUFACTURING

- When using the RB 258, any misalignment of the microstop cage is corrected by the unique ball-pivoting spindle. This assembly ensures perpendicularity throughout the operation at all time.
- Centering cone of the cutter (120°) for perfect concentricity.
- Microstop depth adjustment (1 scale division = 0.001 in).
- Microstop depth setting is held securely in place by locknut with seal. This patented feature allows an easy loosening of the locknut without damage to the drill cage.

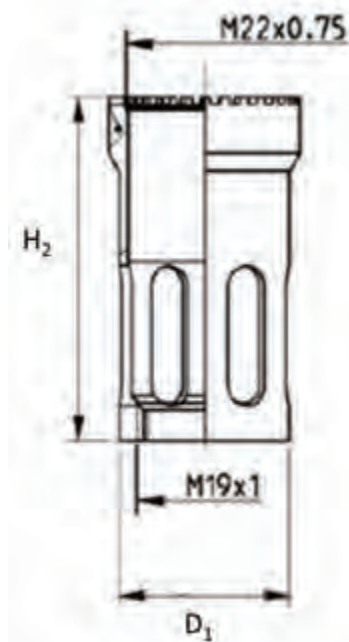


| RB 258 | | MICROSTOP CAGE ASSEMBLY CODE | |
|----------------------------|------------|------------------------------|-----------|
| | | 10015500PT | 10015500W |
| RBI 258 | | 10015550 | 10015550W |
| Basic Drill Cage | | ● | ● |
| Mounting Base Large Window | 90815077 W | | ● |
| Mounting Base | 90815077 | ● | |
| Nose Piece | 90825035 | ● | ● |

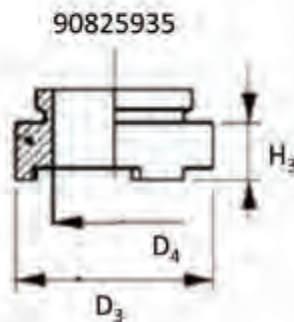


| MICROSTOP CAGE | | | | | | | | | |
|----------------|-------------|----|------|------|------|------|------|------|--------|
| | | | | | H1 | | H2 | | Stroke |
| | T | | D1 | D2 | Min | Max | Min | Max | |
| RB 258 | M6 x 1 | mm | 6.35 | 29 | 41 | 56 | 141 | 156 | 27 |
| RBI 258 | 1/4 in - 28 | in | 0.25 | 1.14 | 1.61 | 2.20 | 5.55 | 6.14 | 1.06 |

| MOUNTING BASE | | | | | | | | |
|---------------|----|------|----|----|----|------|----|----|
| | | D1 | D2 | L1 | L2 | H2 | R1 | D6 |
| 90815077(W) | mm | 24 | NA | NA | NA | 49 | NA | NA |
| | in | 0.94 | NA | NA | NA | 1.93 | NA | NA |



| NOSE PIECE | | | | | |
|------------|----|------|------|------|----|
| | | D3 | D4 | H3 | D7 |
| 90825935 | mm | 24 | 15 | 7 | NA |
| | in | 0.94 | 0.59 | 0.28 | NA |



ADVANTAGES

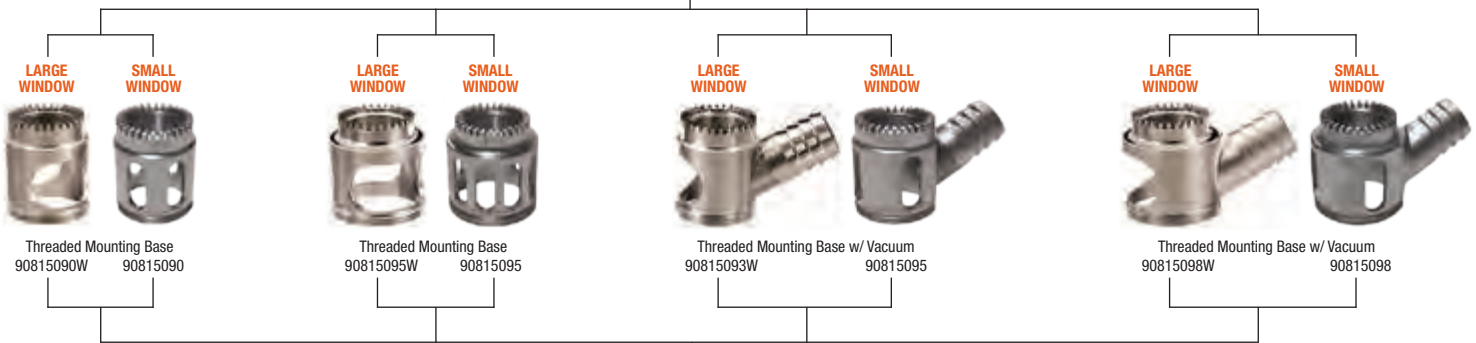
- Different mounting bases available.
- This cage has been designed for use with cutters greater than 0.394 in dia.
- For special composites → mounting base with vacuum.

PRECISION MANUFACTURING

- Cemented, hardened, and ground chrome-nickel steel spindle mounted on a self-lubricating bronze body and a thrust bearing.
- Centering cone of the cutter (120°) for perfect concentricity.
- Microstop depth adjustment (1 scale division = 0.001 in).
- Microstop depth setting is held securely in place by locknut with seal. This patented feature allows an easy loosening of the locknut without damage to the drill cage.



Basic Drill Cage



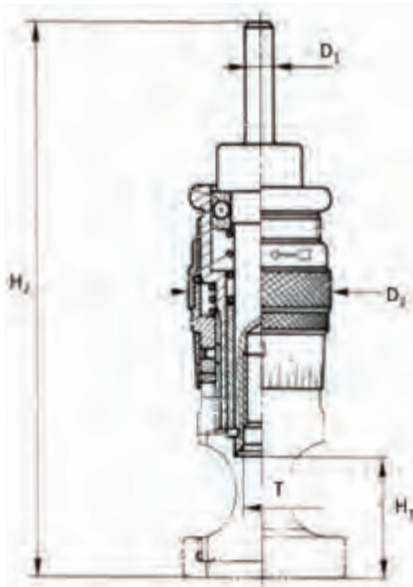
Nose Piece

(Pictures are for illustration purposes only)

| RB 306 - LARGE | | MICROSTOP CAGE ASSEMBLY CODE: LARGE WINDOW | | | | | | | | |
|---|-----------|--|--------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | | RC-10025010W | RC-10025015W | 10025105W | 10025110W | 10025001W | 10025016W | 10025111W | 10025116W | 10025117W |
| Basic Drill Cage | | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Threaded Mounting Base Large Window | 90815090W | ● | ● | | | | | | | |
| Threaded Mounting Base Large Window w/ Vacuum | 90815093W | | | | | ● | ● | | | |
| Threaded Mounting Base Large Window | 90815095W | | | ● | ● | | | | | |
| Threaded Mounting Base Large Window w/ Vacuum | 90815098W | | | | | | | ● | ● | ● |
| Hard Chrome Steel Nose | 90825050 | ● | | | | ● | | | | |
| Nylon Nose Piece | 90825055 | | ● | | | | ● | | | |
| Hard Chrome Steel Nose | 90825080 | | | ● | | | | | | ● |
| Nylon Nose Piece | 90825085 | | | | ● | | | ● | | |
| Rotary Nose Piece | 90825090 | | | | | | | | ● | |

Microstop Cages for Hand Drilling Tools

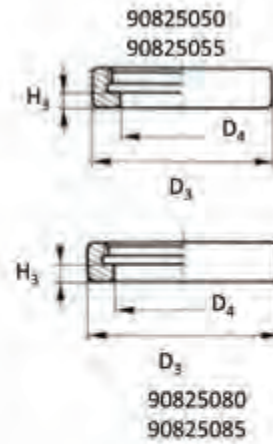
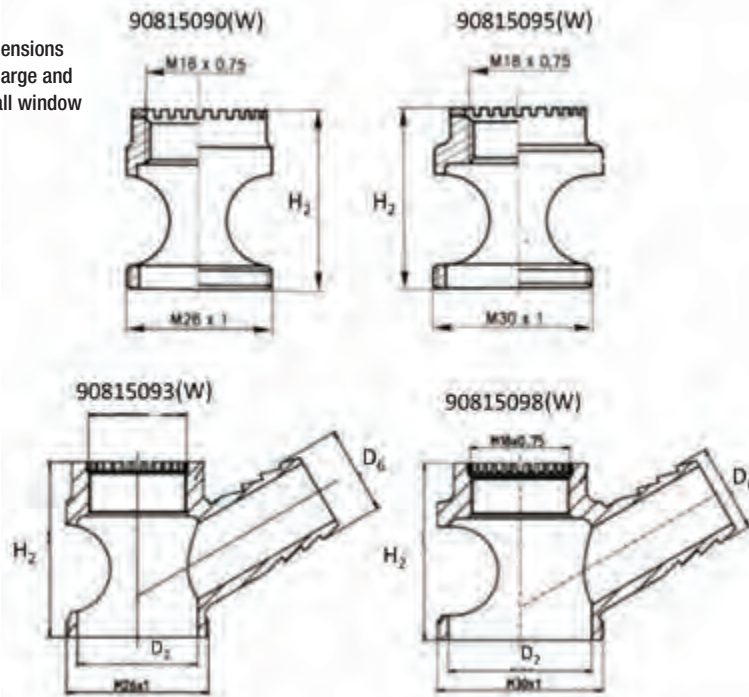
RB 306 - Small Window



| MICROSTOP CAGE | | | | | | | | | |
|----------------|--------|----|------|------|------|------|------|------|--------|
| | T | | D1 | D2 | H1 | | H2 | | Stroke |
| | | | | | Min | Max | Min | Max | |
| RB 306 | M6 x 1 | mm | 6 | 28 | 19 | 26 | 91 | 98 | 7.5 |
| | | in | 0.24 | 1.10 | 0.75 | 1.02 | 3.58 | 3.86 | 0.30 |

| MOUNTING BASE | | | | | | | | |
|---------------|----|----|------|----|----|------|----|------|
| | | D1 | D2 | L1 | L2 | H2 | R1 | D6 |
| 90815090(W) | mm | NA | NA | NA | NA | 32 | NA | NA |
| | in | NA | NA | NA | NA | 1.26 | NA | NA |
| 90815095(W) | mm | NA | NA | NA | NA | 32 | NA | NA |
| | in | NA | NA | NA | NA | 1.26 | NA | NA |
| 90815093(W) | mm | NA | 22 | NA | NA | 32 | NA | 16 |
| | in | NA | 0.87 | NA | NA | 1.26 | NA | 0.63 |
| 90815098(W) | mm | NA | 26 | NA | NA | 32 | NA | 16 |
| | in | NA | 1.02 | NA | NA | 1.26 | NA | 0.63 |

Dimensions for large and small window



| NOSE PIECE | | | | | |
|------------|----|------|------|------|----|
| | | D3 | D4 | H3 | D7 |
| 90825050 | mm | 32 | 22 | 3 | NA |
| 90825055 | in | 1.26 | 0.87 | 0.12 | NA |
| 90825080 | mm | 36 | 26 | 3 | NA |
| 90825085 | in | 1.42 | 1.02 | 0.12 | NA |

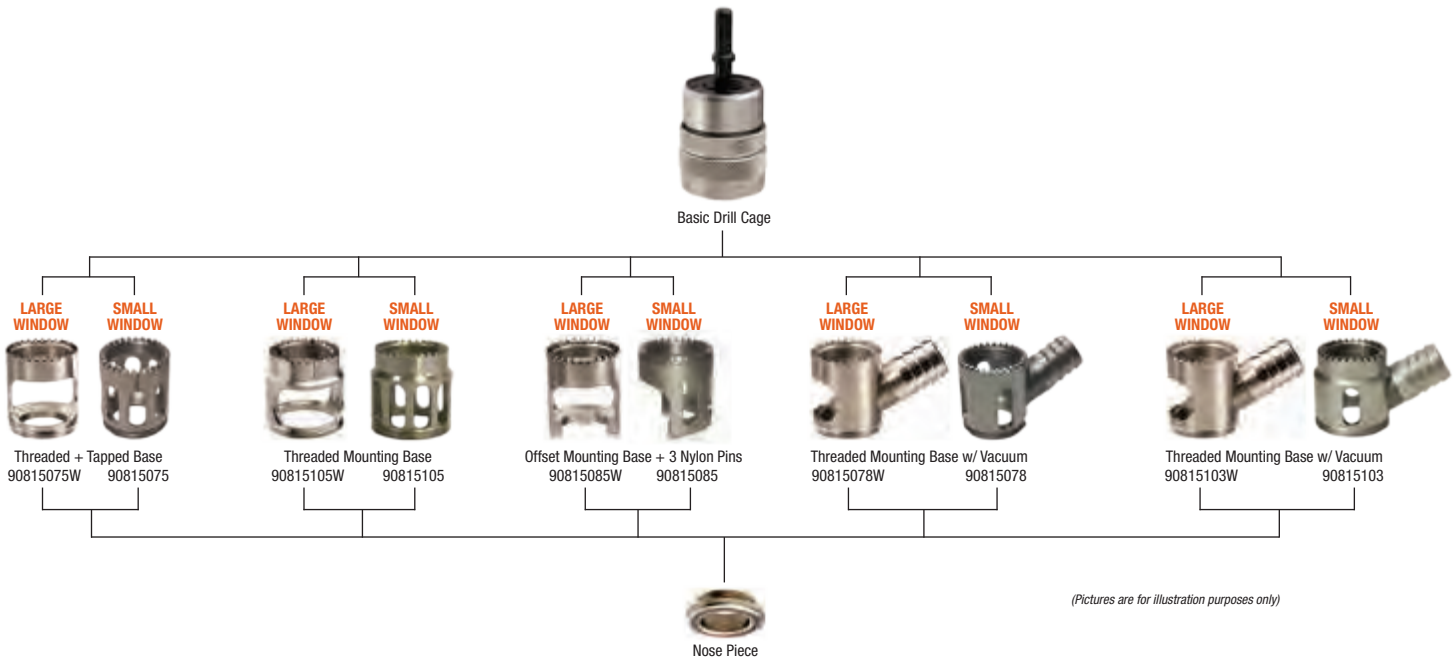
| RB 306 - SMALL | | MICROSTOP CAGE ASSEMBLY CODE: SMALL WINDOW | | | | | | | | |
|----------------------------------|----------|--|-------------|----------|----------|----------|----------|----------|----------|----------|
| | | RC-10025010 | RC-10025015 | 10025105 | 10025110 | 10025001 | 10025016 | 10025111 | 10025116 | 10025117 |
| Basic Drill Cage | | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Threaded Mounting Base | 90815090 | ● | ● | | | | | | | |
| Threaded Mounting Base w/ Vacuum | 90815093 | | | | | ● | ● | | | |
| Threaded Mounting Base | 90815095 | | | ● | ● | | | | | |
| Threaded Mounting Base w/ Vacuum | 90815098 | | | | | | | ● | ● | ● |
| Hard Chrome Steel Nose | 90825050 | ● | | | | ● | | | | |
| Nylon Nose Piece | 90825055 | | ● | | | | ● | | | |
| Hard Chrome Steel Nose | 90825080 | | | ● | | | | | | ● |
| Nylon Nose Piece | 90825085 | | | | ● | | | ● | | |
| Rotary Nose Piece | 90825090 | | | | | | | | ● | |

ADVANTAGES

- Different mounting bases available.
- Reduced dimensions for tight access areas.
- For special composites → mounting base with vacuum.

PRECISION MANUFACTURING

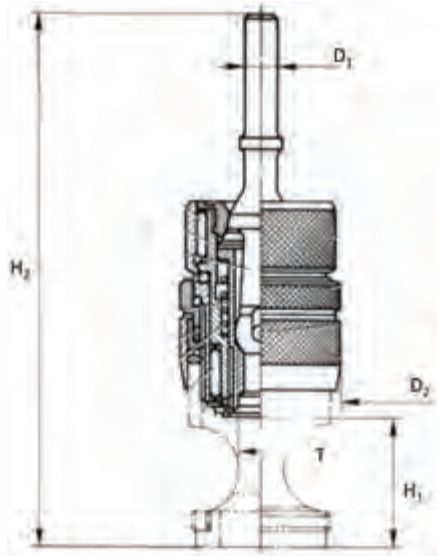
- High precision microstop cage, body in heat-treated chrome steel, fully ground throughout. This ball-mounted microstop cage includes two needle bearings for best utilization.
- When using the RB 307, any misalignment of the microstop cage is corrected by the unique ball-pivoting spindle. This assembly ensures perpendicularity throughout the operation at all time.
- Centering cone of the cutter (120°) for perfect concentricity.
- Microstop depth adjustment (1 scale division = 0.001 in).
- Microstop depth setting is held securely in place by locknut with seal. This patented feature allows an easy loosening of the locknut without damage to the drill cage.



| RB 307 - LARGE | | MICROSTOP CAGE ASSEMBLY CODE: LARGE WINDOW | | | | | | | | | | | | |
|--|-----------|--|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | | 10020010W | 10020015W | 10020020W | 10020105W | 10020110W | 10020115W | 10020200W | 10020016W | 10020001W | 10020021W | 10020106W | 10020111W | 10020116W |
| RBI 307 - LARGE | | 10020060W | 10020065W | 10020070W | 10020155W | 10020160W | 10020165W | 10020250W | | | | | | 10020166W |
| Basic Drill Cage | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Threaded + tapped base Large Window | 90815075W | ● | ● | ● | | | | | | | | | | |
| Threaded Mounting Base Large Window w/ Vacuum | 90815078W | | | | | | | | ● | ● | ● | | | |
| Offset Mounting Base Large Window + 3 nylon pins | 90815085W | | | | | | | ● | | | | | | |
| Threaded Mounting Base Large Window w/ Vacuum | 90815103W | | | | | | | | | | | ● | ● | ● |
| Threaded Mounting Base Large Window | 90815105W | | | | ● | ● | ● | | | | | | | |
| Nose Piece - Rotary Assembly | 90825210 | ● | | | | | | | | ● | | | | |
| Hard Chrome Steel Nose | 90825015 | | ● | | | | | | ● | | | | | |
| Nylon Nose Piece | 90825020 | | | ● | | | | | | | ● | | | |
| Celeron Rotary Nose | 90825205 | | | | ● | | | | | | | ● | | |
| Hard Chrome Steel Nose | 90825080 | | | | | ● | | | | | | | ● | |
| Nylon Nose Piece | 90825085 | | | | | | ● | | | | | | | ● |

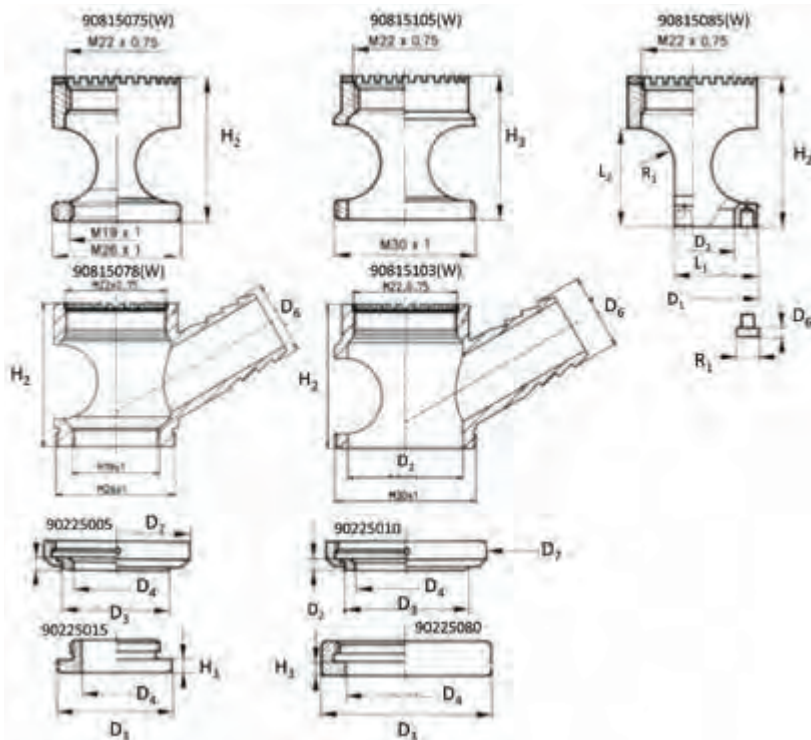
Ball-Type Microstop Cages for Hand Drilling Tools

RB 307 | RBI 307 - Small Window



| MICROSTOP CAGE | | | | | | | | | |
|----------------|-------------|----|------|------|------|------|------|------|--------|
| | T | | D1 | D2 | H1 | | H2 | | Stroke |
| | | | | | Min | Max | Min | Max | |
| RB 307 | M8 x 1 | mm | 6 | 29 | 19 | 24 | 88 | 92 | 7.5 |
| RBI 307 | 1/4 in - 28 | in | 0.24 | 1.14 | 0.75 | 0.94 | 3.46 | 3.62 | 0.30 |

| MOUNTING BASE | | | | | | | | |
|--------------------|----|------|------|------|------|------|------|------|
| | | D1 | D2 | L1 | L2 | H2 | R1 | D6 |
| 90815075(W) | mm | NA | NA | NA | NA | 31 | NA | NA |
| | in | NA | NA | NA | NA | 1.22 | NA | NA |
| 90815105(W) | mm | NA | NA | NA | NA | 31 | NA | NA |
| | in | NA | NA | NA | NA | 1.22 | NA | NA |
| 90815085(W) | mm | 27 | 18 | 17.5 | 21 | 32 | 5 | 3 |
| | in | 1.06 | 0.71 | 0.69 | 0.83 | 1.26 | 0.20 | 0.12 |
| 90815078(W) | mm | NA | NA | NA | NA | 31 | NA | 16 |
| | in | NA | NA | NA | NA | 1.22 | NA | 0.63 |
| 90815103(W) | mm | NA | 24.5 | NA | NA | 30.5 | NA | 16 |
| | in | NA | 0.96 | NA | NA | 1.20 | NA | 0.63 |



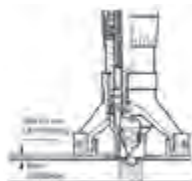
Dimensions for large and small window

| NOSE PIECE | | | | | |
|-----------------|----|------|------|------|------|
| | | D3 | D4 | H3 | D7 |
| 90225005 | mm | 21.5 | 17 | 3 | 29 |
| | in | 0.85 | 0.67 | 0.12 | 1.14 |
| 90225010 | mm | 26 | 23 | 3 | 34 |
| | in | 1.02 | 0.91 | 0.12 | 1.34 |
| 90225015 | mm | 24 | 15 | 3 | NA |
| | in | 0.94 | 0.59 | 0.12 | NA |
| 90225080 | mm | 36 | 26 | 3 | NA |
| | in | 1.42 | 1.02 | 0.12 | NA |

| RB 307 - SMALL | | MICROSTOP CAGE ASSEMBLY CODE: SMALL WINDOW | | | | | | | | | | | | |
|-------------------------------------|----------|--|----------|------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| | | 10020010 | 10020015 | 10020020PT | 10020105 | 10020110 | 10020115 | 10020200 | 10020016 | 10020001 | 10020021 | 10020106 | 10020111 | 10020116 |
| RBI 307 - SMALL | | 10020060 | 10020065 | 10020070 | 10020155 | 10020160 | 10020165 | 10020250 | | | | | | 10020166 |
| Basic Drill Cage | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Threaded + tapped base | 90815075 | ● | ● | ● | | | | | | | | | | |
| Threaded Mounting Base w/ Vacuum | 90815078 | | | | | | | | ● | ● | ● | | | |
| Offset Mounting Base + 3 nylon pins | 90815085 | | | | | | | ● | | | | | | |
| Threaded Mounting Base w/ Vacuum | 90815103 | | | | | | | | | | ● | ● | ● | |
| Threaded Mounting Base | 90815105 | | | | ● | ● | ● | | | | | | | |
| Celeron Rotary Nose | 90825210 | ● | | | | | | | | ● | | | | |
| Hard Chrome Steel Nose | 90825015 | | ● | | | | | | | ● | | | | |
| Nylon Nose Piece | 90825020 | | | ● | | | | | | | ● | | | |
| Celeron Rotary Nose | 90825205 | | | | ● | | | | | | | | | |
| Hard Chrome Steel Nose | 90825080 | | | | | ● | | | | | | ● | | |
| Nylon Nose Piece | 90825085 | | | | | | ● | | | | | | | ● |

PRECISION MANUFACTURING

- Detachable spindle adapter provides alternative methods for use:
 - In combination with 3 jaw chuck.
 - Mounting direct onto machine spindle. This method provides increased level of concentricity, while reducing the length and weight of the drill/tool assembly. This results in better performance, improved machining and less fatigue on the operator.
- Cemented, hardened, and ground chrome-nickel steel spindle mounted on 3-needle-bearings and a thrust bearing.
- Microstop depth adjustment (1 scale division = 0.001 in).
- Microstop depth setting is held securely in place by locknut with seal. This patented feature allows an easy loosening of the locknut without damage to the drill cage.



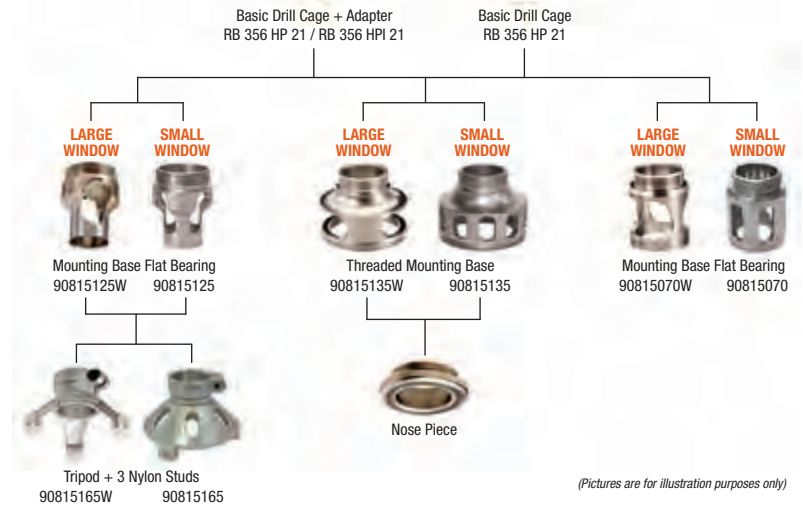
DRILLING + COUNTERSINKING APPLICATION

- The mounting base is commonly used with strip templates. The tripod ensures maximum stability. Can be used with Cutter type RB 018 - see page 88.



REAMING + COUNTERSINKING APPLICATION

- In this example, the tripod is used with cutter RB 022 - see page 91. (Positioning of the cutter with pilot into the pilot hole).



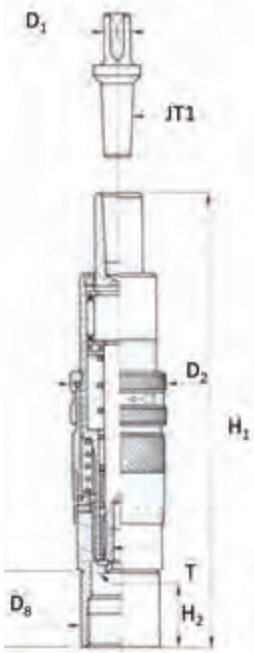
(Pictures are for illustration purposes only)

| RB 356 HP 21 - LARGE | | MICROSTOP CAGE ASSEMBLY CODE: LARGE WINDOW* | | | | | |
|---|-------------------------------|---|-----------|-----------|-----------|-----------|-----------|
| | | 10040000PT | 10040200W | 10040210W | 10040405W | 10040505W | 10040600W |
| RB 356 HPI 21 - LARGE | | 10040050 | 10040250W | 10040260W | 10040455W | 10040555W | 10040650W |
| RB 356 HPI 21 (Thread 3/8 - 24F) | | 10040700PT | 10040720W | 10040730W | 10040740W | 10040750W | 10040760W |
| Basic Drill Cage + Adapter | RB 356 HP 21 RB 356 HPI 21 | ● | ● | ● | ● | ● | ● |
| Mounting Base Flat Bearing Large Window | 90815125W | | ● | ● | | | |
| Threaded Mounting Base Large Window | 90815135W | | | | ● | | |
| Tripod + 3 nylon studs | 90815165W | | | ● | | ● | |
| Mounting Base Flat Bearing Large Window | 90815070W | | | | | | ● |
| Nylon Nose Piece | 90825175 | | | | ● | | |

*Add CJ or CJW to the reference for Jacobs cone adapter.

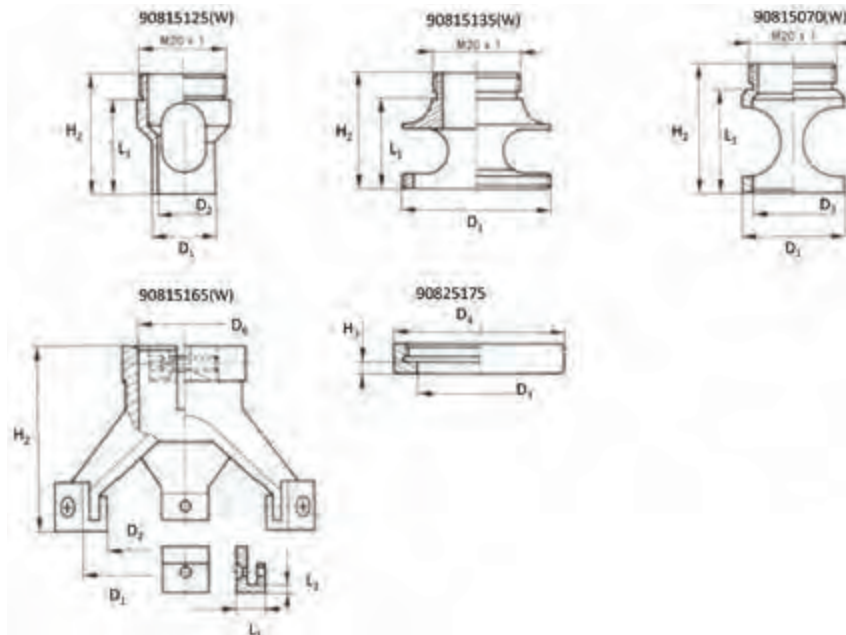
Microstop Cages for Hand Drilling Tools

RB 356 HP 21 | RBI 356 HPI 21 - Small Window



| MICROSTOP CAGE | | | | | | | | | | |
|----------------------|-------------|----|------|------|------|------|------|------|--------|------|
| | T | | D1 | D2 | H1 | | H2 | | Stroke | D8 |
| | | | | | Min | Max | Min | Max | | |
| RB 356 HP 21 | M6 x 1 | mm | 7 | 27 | 4 | 24 | 116 | 136 | 21 | 22 |
| RB 356 HPI 21 | 1/4 in - 28 | in | 0.28 | 1.06 | 0.16 | 0.94 | 4.57 | 5.35 | 0.83 | 0.87 |

| MOUNTING BASE | | | | | | | | |
|--------------------|----|------|------|------|----|------|----|------|
| | | D1 | D2 | L1 | L2 | H2 | R1 | D6 |
| 90815125(W) | mm | 14.5 | 12.5 | 22 | NA | 26 | NA | NA |
| | in | 0.57 | 0.49 | 0.87 | NA | 1.02 | NA | NA |
| 90815135(W) | mm | NA | NA | 21 | NA | 27 | NA | NA |
| | in | NA | NA | 0.83 | NA | 1.06 | NA | NA |
| 90815070(W) | mm | 24 | 19 | 24 | NA | 30 | NA | NA |
| | in | 0.94 | 0.75 | 0.94 | NA | 1.18 | NA | NA |
| 90815165(W) | mm | 64 | 51 | 6.5 | 2 | 42 | NA | 22 |
| | in | 2.52 | 2.01 | 0.26 | NA | 1.65 | NA | 0.87 |



Dimensions for large and small window

| NOSE PIECE | | | | | |
|-----------------|----|------|------|------|----|
| | | D3 | D4 | H3 | D7 |
| 90825175 | mm | 29 | 40 | 3 | NA |
| | in | 1.14 | 1.57 | 0.12 | NA |

| RB 356 HP 21 - SMALL | | MICROSTOP CAGE ASSEMBLY CODE: SMALL WINDOW* | | | | | |
|---|-------------------------------|---|------------|----------|----------|----------|------------|
| | | 1004000PT | 10040200PT | 10040210 | 10040405 | 10040505 | 10040600PT |
| RB 356 HPI 21 - SMALL | | 10040050 | 10040250 | 10040260 | 10040455 | 10040555 | 10040650 |
| RB 356 HPI 21 (Thread 3/8 - 24F) | | 10040700PT | 10040720 | 10040730 | 10040740 | 10040750 | 10040760 |
| Basic Drill Cage + Adapter | RB 356 HP 21 RB 356 HPI 21 | ● | ● | ● | ● | ● | ● |
| Mounting Base Flat Bearing | 90815125 | | ● | ● | | | |
| Threaded Mounting Base | 90815135 | | | | ● | | |
| Tripod + 3 Nylon studs | 90815165 | | | ● | | ● | |
| Mounting Base Flat Bearing | 90815070 | | | | | | ● |
| Nylon Nose Piece | 90825175 | | | | ● | | |

*Add CJ or CJW to the reference for Jacobs cone adapter.

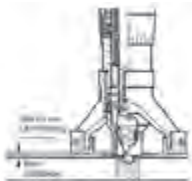
PRECISION MANUFACTURING

- Detachable spindle adapter provides alternative methods for use:
 - In combination with 3 jaw chuck.
 - Mounting direct onto machine spindle. This method provides increased level of concentricity, while reducing the length and weight of the drill/tool assembly. This results in better performance, improved machining and less fatigue on the operator.
- Cemented, hardened, and ground chrome-nickel steel spindle mounted on 3-needle-bearings and a thrust bearing.
- Microstop depth adjustment (1 scale division = 0.001 in).
- Microstop depth setting is held securely in place by locknut with seal. This patented feature allows an easy loosening of the locknut without damage to the drill cage.



Basic Drill Cage + Adapter
RB 356 HP 38 / RB 356 HPI 38

Basic Drill Cage
RB 356 HP 38



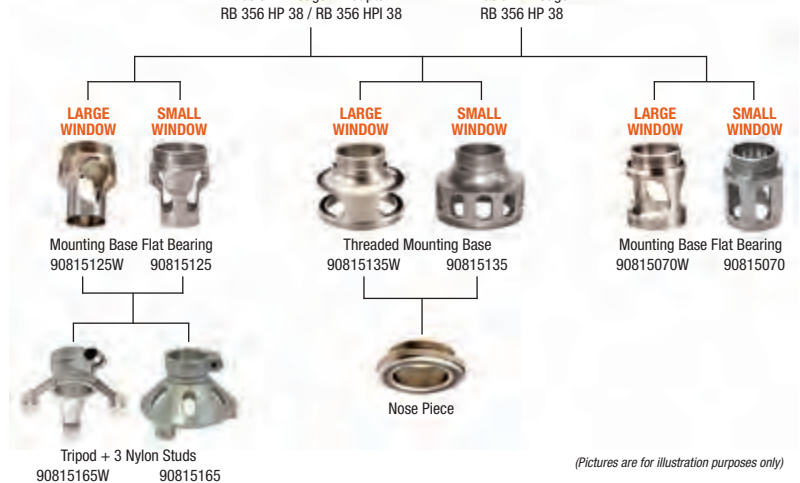
DRILLING + COUNTERSINKING APPLICATION

- The mounting base is commonly used with strip templates. The tripod ensures maximum stability. Can be used with Cutter type RB 018 - see page 88.



REAMING + COUNTERSINKING APPLICATION

- In this example, the tripod is used with cutter RB 022 - see page 91. (Positioning of the cutter with pilot into the pilot hole).



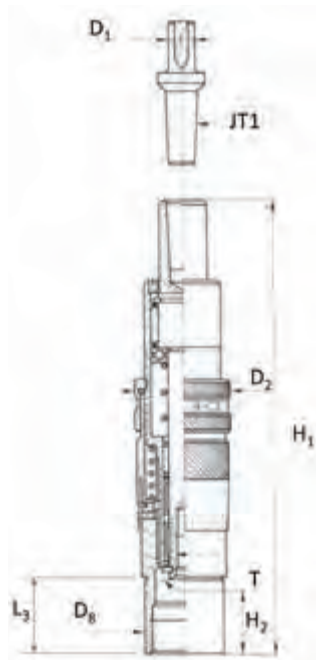
(Pictures are for illustration purposes only)

| RB 356 HP 38 - LARGE | | MICROSTOP CAGE ASSEMBLY CODE: LARGE WINDOW* | | | | | |
|---|-------------------------------|---|-----------|-----------|-----------|-----------|-----------|
| | | 10045000PT | 10045200W | 10045210W | 10045405W | 10045505W | 10045600W |
| RB 356 HPI 38 - LARGE | | 10045050 | 10045250W | 10045260W | 10045455W | 10045555W | 10045650W |
| RB 356 HPI 38 (Thread 3/8 - 24F) | | 10045700PT | 10045720W | 10045730W | 10045740W | 10045750W | 10045760W |
| Basic Drill Cage + Adapter | RB 356 HP 38 RB 356 HPI 38 | ● | ● | ● | ● | ● | ● |
| Mounting Base Flat Bearing Large Window | 90815125W | | ● | ● | | | |
| Threaded Mounting Base Large Window | 90815135W | | | | ● | | |
| Tripod + 3 nylon studs | 90815165W | | | ● | | ● | |
| Mounting Base Flat Bearing Large Window | 90815070W | | | | | | ● |
| Nylon Nose Piece | 90825175 | | | | ● | | |

*Add CJ or CJW to the reference for Jacobs cone adapter.

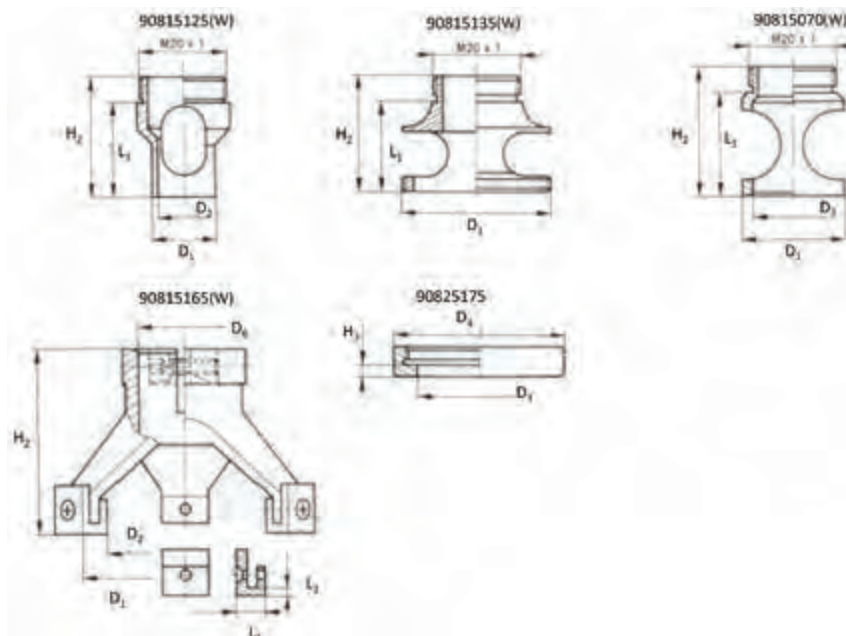
Microstop Cages for Hand Drilling Tools

RB 356 HP 38 | RBI 356 HPI 38 - Small Window



| MICROSTOP CAGE | | | | | | | | | | | |
|----------------------|-------------|----|------|------|------|------|------|------|--------|------|------|
| | T | | D1 | D2 | H1 | | H2 | | Stroke | D8 | L3 |
| | | | | | Min | Max | Min | Max | | | |
| RB 356 HP 38 | M6 x 1 | mm | 7 | 27 | 22 | 37 | 165 | 183 | 38 | 22 | 22 |
| RB 356 HPI 28 | 1/4 in - 28 | in | 0.28 | 1.06 | 0.87 | 1.46 | 6.50 | 7.20 | 1.50 | 0.87 | 0.87 |

| MOUNTING BASE | | | | | | | | |
|--------------------|----|--------------------|------|------|------|------|----|------|
| | | D1 | D2 | L1 | L2 | H2 | R1 | D6 |
| | | 90815125(W) | mm | 14.5 | 12.5 | 22 | NA | 26 |
| | in | 0.57 | 0.49 | 0.87 | NA | 1.02 | NA | NA |
| 90815135(W) | mm | NA | NA | 21 | NA | 27 | NA | NA |
| | in | NA | NA | 0.83 | NA | 1.06 | NA | NA |
| 90815070(W) | mm | 24 | 19 | 24 | NA | 30 | NA | NA |
| | in | 0.94 | 0.75 | 0.94 | NA | 1.18 | NA | NA |
| 90815165(W) | mm | 64 | 51 | 6.5 | 2 | 42 | NA | 22 |
| | in | 2.52 | 2.01 | 0.26 | NA | 1.65 | NA | 0.87 |



Dimensions for large and small window

| NOSE PIECE | | | | | |
|------------|----|-----------------|------|------|----|
| | | D3 | D4 | H3 | D7 |
| | | 90825175 | mm | 29 | 40 |
| | in | 1.14 | 1.57 | 0.12 | NA |

| RB 356 HP 38 - SMALL | | MICROSTOP CAGE ASSEMBLY CODE: SMALL WINDOW* | | | | | |
|---|-------------------------------|---|------------|----------|----------|----------|------------|
| | | 10045000PT | 10045200PT | 10045210 | 10045405 | 10045505 | 10045600PT |
| RB 356 HPI 38 - SMALL | | 10045050 | 10045250 | 10045260 | 10045455 | 10045555 | 10045650 |
| RB 356 HPI 38 (Thread 3/8 - 24F) | | 10045700PT | 10045720 | 10045730 | 10045740 | 10045750 | 10045760 |
| Basic Drill Cage + Adapter | RB 356 HP 38 RB 356 HPI 38 | ● | ● | ● | ● | ● | ● |
| Mounting Base Flat Bearing | 90815125 | | ● | ● | | | |
| Threaded Mounting Base | 90815135 | | | | ● | | |
| Tripod + 3 Nylon studs | 90815165 | | | ● | | ● | |
| Mounting Base Flat Bearing | 90815070 | | | | | | ● |
| Nylon Nose Piece | 90825175 | | | | ● | | |

*Add CJ or CJW to the reference for Jacobs cone adapter.

ADVANTAGES

- Special for drill countersinking reamers and taper-lok cutters:
 - RB 356 HPI 58 for use with taper-lok cutters
 - RB 356 HP 58 for use with cutters RB 022

PRECISION MANUFACTURING

- Detachable spindle adapter provides alternative methods for use:
 - In combination with 3 jaw chuck.
 - Mounting direct onto machine spindle. This method provides increased level of concentricity, while reducing the length and weight of the drill / tool assembly. This results in better performance, improved machining, and less fatigue on the operator.
- Cemented, hardened, and ground chrome-nickel steel spindle mounted on 3 needle-bearings and a thrust bearing.
- Microstop depth adjustment (1 scale division = 0.001 in).
- Microstop depth setting is held securely in place by locknut with seal. This patented feature allows an easy loosening of the locknut without damage to the drill cage.



Basic Drill Cage + Adapter
RB 356 HP 58 / RB 356 HPI 58



Mounting Base Flat Bearing
90815140W



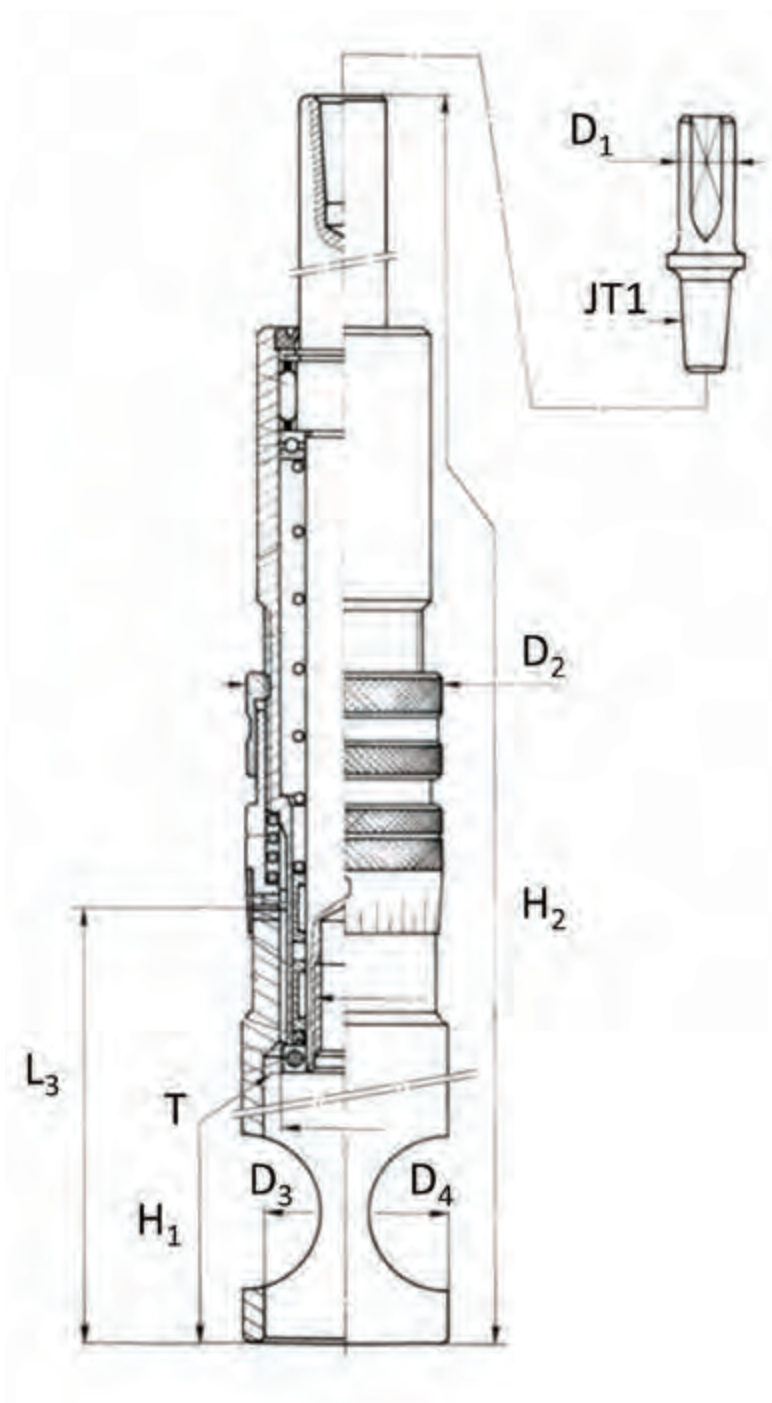
Mounting Base Flat Bearing
90815140

(Pictures are for illustration purposes only)

| RB 356 HP 58 | | MICROSTOP CAGE ASSEMBLY CODE* | |
|----------------------------|-----------|-------------------------------|----------|
| | | 1005000W | 10050000 |
| RB 356 HPI 58 | | 10050050W | 10050050 |
| Basic Drill Cage + Adapter | | ● | ● |
| Mounting Base Large Window | 90815140W | ● | |
| Mounting Base Flat Bearing | 90815140 | | ● |

*Add CJ or CJW to the reference for Jacobs cone adapter.

| MICROSTOP CAGE | | | | | | | | | | | | |
|----------------------|--------------|----|------|------|------|------|-------|-------|--------|------|------|------|
| | T | | D1 | D2 | H1 | | H2 | | Stroke | D3 | L3 | D4 |
| RB 356 HP 58 | M10 x 1 | mm | 10 | 36 | Min | Max | Min | Max | 58 | 30 | 103 | 38 |
| RB 356 HPI 58 | 7/16 in - 20 | in | 0.39 | 1.42 | 2.52 | 3.62 | 10.39 | 11.50 | 2.28 | 1.18 | 4.06 | 1.50 |



ADVANTAGES

- This drill cage has been designed for use with cutter of 7/8 in to 1 1/2 in diameter.
- Different mounting bases available.
- Reduced dimensions for tight access areas.

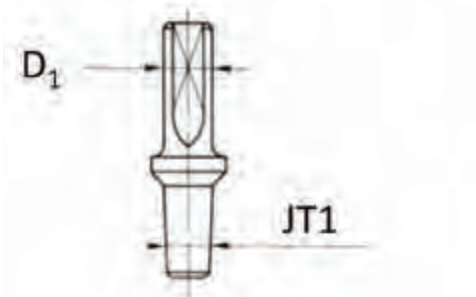
PRECISION MANUFACTURING

- Detachable spindle adapter provides alternative methods for use:
 - In combination with 3 jaw chuck.
 - Mounting direct onto machine spindle. This method provides increased level of concentricity, while reducing the length and weight of the drill/tool assembly. This results in better performance, improved machining, and less fatigue on the operator.
- Cemented, hardened, and ground chrome-nickel steel spindle mounted on 3-needle bearings and a thrust bearing.
- Microstop depth adjustment (1 scale division = 0.001 in).
- Microstop depth setting is held securely in place by locknut with seal. This patented feature allows an easy loosening of the locknut without damage to the drill cage.



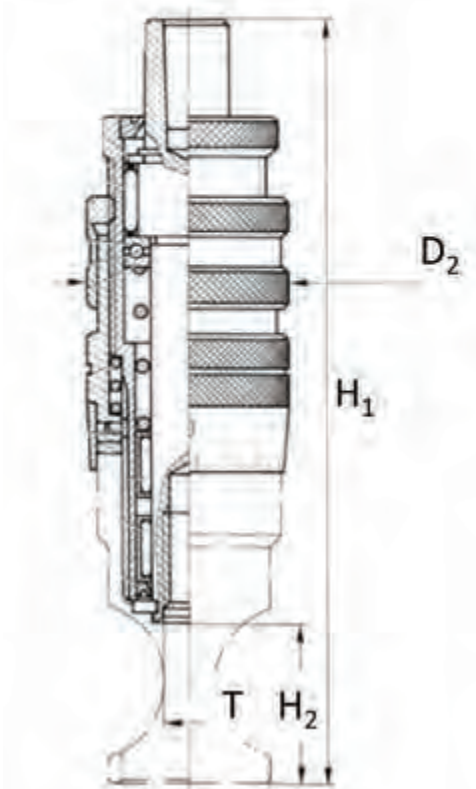
| RB 406 | | MICROSTOP CAGE ASSEMBLY CODE* | | | |
|---|-----------|-------------------------------|------------|------------|-----------|
| | | 10030010W | 10030010PT | 100300105W | 100300105 |
| Basic Drill Cage + Adapter | | ● | ● | ● | ● |
| Mounting Base Flat Bearing Large Window | 90815150W | ● | | | |
| Mounting Base Flat Bearing | 90815150 | | ● | | |
| Mounting Base Flat Bearing Large Window | 90815155W | | | ● | |
| Mounting Base Flat Bearing | 90815155 | | | | ● |

*Add CJ or CJW to the reference for Jacobs cone adapter.

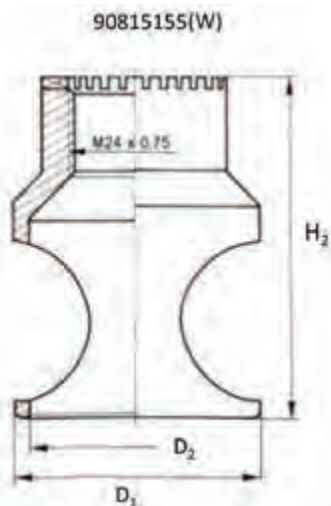
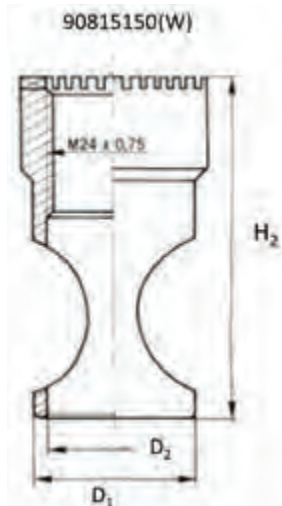


| MICROSTOP CAGE | | | | | | | | | |
|----------------|---------|----|------|------|------|------|------|------|--------|
| | T | | D1 | D2 | H1 | | H2 | | Stroke |
| | | | | | Min | Max | Min | Max | |
| RB406 | M10 x 1 | mm | 10 | 36 | 26 | 53 | 136 | 163 | 14 |
| | | in | 0.39 | 1.42 | 1.02 | 2.09 | 5.35 | 6.42 | 0.55 |

| MOUNTING BASE | | | | | | | | |
|---------------|----|------|------|----|----|------|----|----|
| | | D1 | D2 | L1 | L2 | H2 | R1 | D6 |
| 90815150(W) | mm | 30 | 25 | NA | NA | 63 | NA | NA |
| | in | 1.18 | 0.98 | NA | NA | 2.48 | NA | NA |
| 90815155(W) | mm | 45 | 40 | NA | NA | 63 | NA | NA |
| | in | 1.77 | 1.57 | NA | NA | 2.48 | NA | NA |

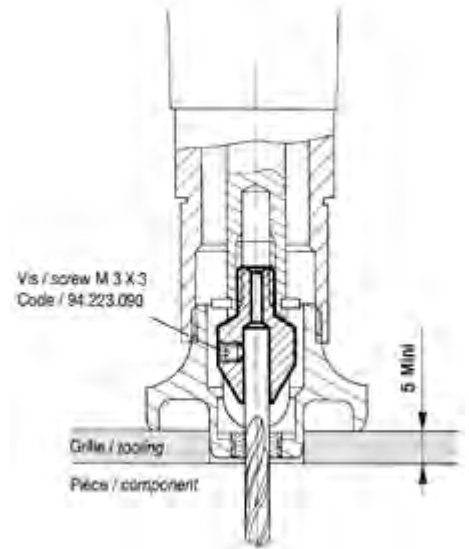


Dimensions for
large and small window



DESCRIPTION

- The drill-holder should be used in combination with our mounting base 90815120.
- Expands the capability of the strip template, while reducing manufacturing cost.
- Precise concentricity ensures cutter wear is kept to a minimum.



| MICROSTOP CAGE | DRILL HOLDER ATTACHMENT | MAXIMUM DRILLING - DIAMETER | BASE CODE NUMBER |
|----------------|-------------------------|-----------------------------|------------------|
| RB 356 HP 21 | M6 x 1 | 6.35 - 1/4 in | 10120 + 0 |
| RB 356 HP 38 | M6 x 1 | 6.35 - 1/4 in | 10120 + 0 |
| RB 356 HPI 21 | 1/4 - 28 F | 6.35 - 1/4 in | 10130 + 0 |
| RB 356 HPI 38 | 1/4 - 28 F | 6.35 - 1/4 in | 10130 + 0 |

EXAMPLE: FOR USE WITH A DRILL OF 3.17 mm DIAMETER

For Drill Holder M6 x 1

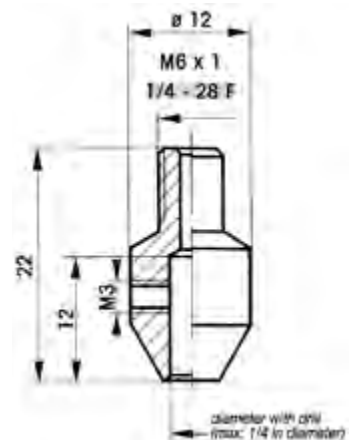
Basic Code + Drill Size Expressed in 1/100 mm: Code to Indicate

10120 + 317 : 10120317

For Drill Holder 1/4 - 28F

Basic Code + Drill Size Expressed in 1/100 mm: Code to Indicate

10130 + 317 : 10130317



All special drills for use on these drill holders may be supplied on request.

| | |
|--|-----------|
| Cutters w/ Inserted Pilot Carbide, HSS-E, PCD | 74, 77-81 |
| Cutters w/ Inserted Pilot HSS-PCD | 75 |
| Cutters w/ Solid Pilot Carbide PCD | 76 |
| Spotfacing Cutters w/ Pilot Insert Carbide, HSS-E, PCD | 82 |
| Standard Sizes for Pilots | 83 |
| Back Spotfacing and Countersink Cutters HSS-E | 84 |
| Standard Sizes for Pilots Threaded | 85 |
| Back Spotfacing and Countersink Cutters - Bayonet Locking Pilot | 86 |
| Standard Sizes for Pilots Bayonet Locking | 87 |
| Drill and Countersink Cutters Carbide, HSS-E, PCD | 88 |
| Drill and Countersink Cutters - Semi/Auto Carbide, HSS-E, PCD | 89 |
| Drill, Ream, and Countersink Cutters Carbide, HSS-E, PCD | 90 |
| Drill and Countersink Cutters - Nutplate Drill Motors Carbide, HSS-E | 92 |
| Router Cutters Carbide, HSS-E, PCD | 93 |
| Tapered Drill Reamers Carbide | 94 |
| Fluted Hand Reamers Carbide, HSS-E | 95 |
| Drills for Flat Offset Angle Drills HSS | 96 |
| Wire Brush for Rivet Holes | 97 |

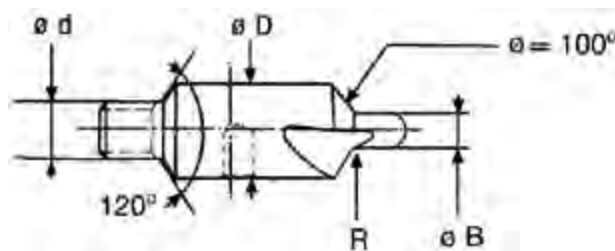
Cutters with Inserted Pilot for Rivets and Screws

Carbide | HSS-E | PCD



| FOR USE WITH | ALUMINIUM | STEEL | TITANIUM | COMPOSITE |
|--------------|-----------|-------|----------|-----------|
| Carbide | ● | ● | ● | ● |
| HSS-E | ● | ● | ● | |
| PCD* | | | | ● |

Centering cone



| MICROSTOP CAGE REF CHAPTER A | CUTTER Ø D ± 0.1 mm | PILOT Ø B | | RADIUS R mm | NUMBERS OF FLUTES | THREAD Ø d | CUTTER REF. HSS-E | CUTTER REF. CARBIDE |
|---|---------------------------|----------------------|--------------------------|-------------------|----------------------|---------------|----------------------|------------------------|
| | | -0.02 mm -0.05 mm | -0.0007 in -0.0020 in | | | | | |
| RB156 RB206 RB256 RB257 RB258 | 10 | 2.38 | 0.0937 | 0.2 - 0.4 | 3 | M6x1 | 31206000 | - |
| | 10 | 2.50 | 0.0984 | 0 - 0.25 | 3 | M6x1 | - | 02504028PT |
| | 10 | 3.00 | 0.1181 | 0.45 - 0.65 | 3 | M6x1 | - | 02504029PT |
| | 10 | 3.162 | 0.1245 | 0 - 0.25 | 3 | M6x1 | - | 02504067PT |
| | 10 | 3.17 | 0.1248 | 0.2 - 0.4 | 3 | M6x1 | 31206005 | - |
| | 10 | 3.50 | 0.1378 | 0.2 - 0.4 | 3 | M6x1 | 31206010 | - |
| | 10 | 3.60 | 0.1417 | 0.2 - 0.4 | 3 | M6x1 | 31206015 | - |
| | 10 | 3.97 | 0.1563 | 0.2 - 0.4 | 3 | M6x1 | 31206020 | - |
| | 10 | 4.00 | 0.1575 | 0.2 - 0.4 | 3 | M6x1 | 31206025 | - |
| | 10 | 4.00 | 0.1575 | 0.45 - 0.65 | 3 | M6x1 | - | 02504030PT |
| | 10 | 4.10 | 0.1614 | 0.55 - 0.75 | 3 | M6x1 | - | 02504061PT |
| | 10 | 4.15 | 0.1634 | 0.2 - 0.4 | 3 | M6x1 | 31206030 | - |
| | 10 | 4.76 | 0.1874 | 0.4 - 0.75 | 3 | M6x1 | 31206035 | - |
| | 10 | 4.80 | 0.1890 | 0.4 - 0.75 | 3 | M6x1 | 31206040 | - |
| | 10 | 4.80 | 0.1890 | 0.55 - 0.75 | 3 | M6x1 | - | 02504064PT |
| 10 | 4.95 | 0.1949 | 0.55 - 0.75 | 3 | M6x1 | - | 02504062PT | |
| 10 | 5.60 | 0.2205 | 0.4 - 0.75 | 3 | M6x1 | 31206045 | - | |
| 10 | 6.22 | 0.2449 | 0.4 - 0.75 | 3 | M6x1 | - | 02504069PT | |
| RB306 RB307 | 14 | 4.76 | 0.1874 | 0.4 - 0.75 | 3 | M8x1 | 31206100 | - |
| | 14 | 5.00 | 0.1969 | 0.4 - 0.75 | 3 | M8x1 | 31206105 | - |
| | 14 | 5.00 | 0.1969 | 0.55 - 0.75 | 3 | M8x1 | - | 02504031PT |
| | 14 | 5.50 | 0.2165 | 0.55 - 0.75 | 3 | M8x1 | - | 02504032PT |
| | 14 | 5.60 | 0.2205 | 0.4 - 0.75 | 3 | M8x1 | 31206110 | - |
| | 14 | 6.00 | 0.2362 | 0.4 - 0.75 | 3 | M8x1 | 31206120 | - |
| | 14 | 6.00 | 0.2362 | 0.55 - 0.75 | 3 | M8x1 | - | 02504033PT |
| | 14 | 6.35 | 0.2500 | 0.4 - 0.75 | 3 | M8x1 | 31206125 | - |
| | 14 | 6.50 | 0.2559 | 0.55 - 0.75 | 3 | M8x1 | - | 02504034PT |
| | 17 | 8.00 | 0.3150 | 0.75 - 1.25 | 3 | M8x1 | 31206200 | - |
| | 21 | 8.00 | 0.3150 | 0.8 - 1.00 | 3 | M8x1 | - | 02504035PT |
| | 21 | 8.50 | 0.3346 | 0.8 - 1.00 | 3 | M8x1 | - | 02504036PT |
| | 21 | 9.52 | 0.3748 | 0.75 - 1.25 | 3 | M8x1 | 31206300 | - |
| 21 | 10.00 | 0.3937 | 0.75 - 1.25 | 3 | M8x1 | 31206305 | - | |
| RB406 RB356HP58 | 25.4 | 10.00 | 0.3937 | 0.8 - 1.00 | 3 | M10x1 | - | 02504037PT |
| | 25.4 | 12.00 | 0.4724 | 1 - 1.25 | 3 | M10x1 | - | 02504038PT |

EXPERT ADVICE

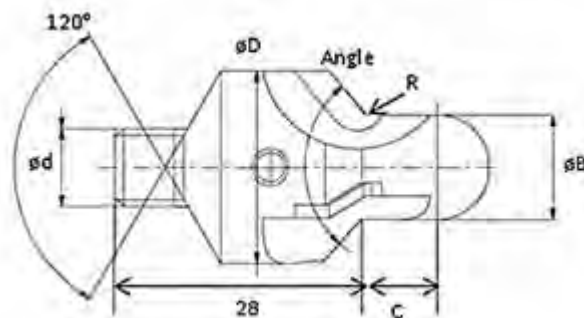


- In some cases, microstop cages are impractical or too bulky to be used. We then recommend to use drilling adapters, pg. 43.

Alternative cutters can be made on request with special diameters, special thread (ex: 1/4-28F, M10x1...), special angles (ex: 90°, 120°...), carbide, HSS-E or PCD*
* Only to use only with pilots having a head dia ≥ shank dia + 0.5 mm (0.0196 in).



| FOR USE WITH | ALUMINIUM | STEEL | TITANIUM | COMPOSITE |
|--------------|-----------|-------|----------|-----------|
| HSS-PCD | | | | ● |



| MICROSTOP CAGE REF CHAPTER A | CUTTER Ø D ± 0.1 mm | PILOT Ø B | | RADIUS R mm | NUMBERS OF FLUTES | ANGLE | THREAD Ø D | PILOT Ø C | CUTTER REF. HSS-PCD |
|------------------------------------|---------------------------|----------------------|--------------------------|-------------------|-------------------------|-------|---------------|-----------|------------------------|
| | | -0.02 mm -0.05 mm | -0.0007 in -0.0020 in | | | | | | |
| RB156 | 10 | 2.5 | 0.0984 | 0.2 / 0.4 | 2 | 100° | M6x100 | 2.4 | 02084019PT |
| | 10 | 3 | 0.1181 | 0.2 / 0.4 | 2 | 100° | M6x100 | 3.1 | 02084021PT |
| | 10 | 3.2 | 0.1260 | 0.2 / 0.4 | 2 | 100° | M6x100 | 3.1 | 02084020PT |
| | 10 | 3.5 | 0.1378 | 0.2 / 0.4 | 2 | 100° | M6x100 | 3.7 | 02084022PT |
| | 10 | 4 | 0.1575 | 0.2 / 0.4 | 2 | 100° | M6x100 | 4 | 02084023PT |
| | 10 | 4.8 | 0.1890 | 0.4 / 0.75 | 2 | 100° | M6x100 | 4.7 | 02084032PT |
| RB306 | 10 | 5 | 0.1969 | 0.4 / 0.75 | 2 | 100° | M6x100 | 4.7 | 02084026PT |
| | 14 | 3.89 | 0.1531 | 0.64 / 0.84 | 2 | 100° | M8x100 | 5.06 | 02084035PT |
| | 14 | 4.15 | 0.1634 | 0.64 / 0.84 | 2 | 100° | M8x100 | 4.93 | 02084030PT |
| | 14 | 4.81 | 0.1894 | 0.75 / 0.95 | 2 | 100° | M8x100 | 4.6 | 02084031PT |
| | 14 | 5.04 | 0.1984 | 0.75 / 0.95 | 2 | 100° | M8x100 | 4.48 | 02084029PT |
| | 14 | 6 | 0.2362 | 0.4 / 0.75 | 2 | 120° | M8x100 | 5 | 02084208PT |
| RB307 | 14 | 6.6 | 0.2598 | 0.75 / 1.25 | 2 | 100° | M8x100 | 5 | 02084027PT |

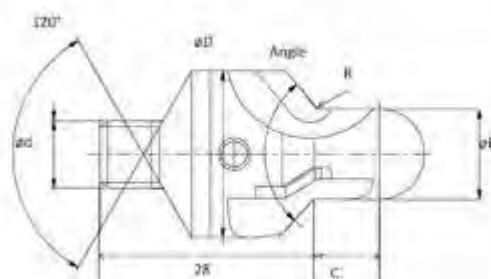
EXPERT ADVICE

- In some cases, microstop cages are impractical or too bulky to be used. We then recommend to use drilling adapters, pg. 43

Alternative cutters can be made on request with special diameters, special thread (ex: 1/4-28F, M10x1...), special angles (ex: 90°, 120°...), carbide, HSS-E or PCD*
* Only to use only with pilots having a head dia ≥ shank dia + 0.5 mm (0.0196 in).



| FOR USE WITH | ALUMINIUM | STEEL | TITANIUM | COMPOSITE |
|--------------|-----------|-------|----------|-----------|
| Carbide PCD | | | | ● |



| MICROSTOP CAGE REF CHAPTER A | CUTTER Ø D ±0.1 mm | PILOT ØB | | RADIUS R mm | NUMBERS OF FLUTES | ANGLE | THREAD Ø D | PILOT Ø C | REF. CUTTER CARBIDE PCD |
|---|--------------------------|----------------------|--------------------------|----------------|----------------------|-------|---------------|--------------|----------------------------|
| | | -0.02 mm -0.05 mm | -0.0007 in -0.0020 in | | | | | | |
| RB156 RB206 RB256 RB257 RB258 | 12 | 4.82 | 0.190 | 0.5 / 0.7 | 2 | 100° | M6x100 | 6.6 | 02084001PT |
| RB306 RB307 | 12 | 4.82 | 0.1898 | 0.5 / 0.7 | 2 | 130° | M8x100 | 6.6 | 02084008PT |
| | 14 | 5.54 | 0.2181 | 0.5 / 0.7 | 2 | 130° | M8x100 | 7.2 | 02084009PT |
| | 14 | 6.34 | 0.2496 | 0.5 / 0.7 | 2 | 100° | M8x100 | 6.8 | 02084003PT |
| | 17 | 7.93 | 0.3122 | 0.8 / 1 | 2 | 100° | M8x100 | 7 | 02084004PT |
| | 17 | 9.51 | 0.3744 | 0.8 / 1 | 2 | 100° | M8x100 | 7.25 | 02084005PT |
| | 21 | 7.93 | 0.3122 | 0.8 / 1 | 2 | 130° | M8x100 | 11 | 02084014PT |
| | 21 | 9.52 | 0.3748 | 0.8 / 1 | 2 | 130° | M8x100 | 13.24 | 02084016PT |
| RB406 RB356HP58 | 21 | 11.11 | 0.4374 | 1.1 / 1.3 | 3 | 100° | M10x100 | 7.5 | 02084006PT |
| | 22.2 | 12.67 | 0.4988 | 1.1 / 1.3 | 3 | 100° | M10x100 | 7.7 | 02084007PT |
| | 25 | 14.27 | 0.5618 | 1.1 / 1.3 | 3 | 100° | M10x100 | 7.9 | 02084010PT |

EXPERT ADVICE

- In some cases, microstop cages are impractical or too bulky to be used. We then recommend to use drilling adapters, pg. 44.

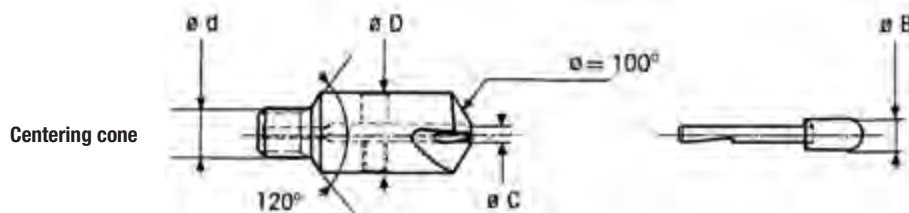
Alternative cutters can be made on request with special diameters, special thread (ex: 1/4-28F, M10x1...), special angles (ex: 90°, 120°...), carbide, HSS-E or PCD*
* Only to use only with pilots having a head dia ≥ shank dia + 0.5 mm (0.0196 in).

Cutters with Inserted Pilot for Rivets and Screws

Carbide | HSS-E | PCD

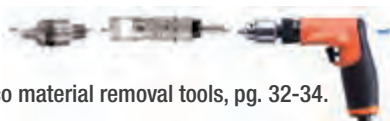


| FOR USE WITH | ALUMINIUM | STEEL | TITANIUM | COMPOSITE | KEVLAR |
|--------------|-----------|-------|----------|-----------|--------|
| Carbide | ● | ● | ● | ● | |
| HSS-E | ● | ● | ● | | |
| PCD* | | | | ● | |
| HSS-E | | | | | ● |
| Carbide | | | | | ● |



| MICROSTOP CAGE REF CHAPTER A | CUTTER Ø D ± 0.1 mm | PILOT | | | NUMBERS OF FLUTES | THREAD Ø D | CUTTER + PILOT REF. HSS-E | CUTTER ONLY REF. HSS-E |
|--|---------------------------|----------------------|--------------------------|-----------------|----------------------|---------------|---------------------------------|---------------------------|
| | | HEAD Ø B | | SHANK Ø C mm | | | | |
| | | -0.02 mm -0.05 mm | -0.0007 in -0.0020 in | | | | | |
| RB 156 RB 206 RB 256 RB 257 RB 258 | 10 | 2.00 | 0.0787 | 2 | 2 | M6 x 1 | 30220005 | 30220001 |
| | 10 | 2.38 | 0.0937 | 2 | 2 | M6 x 1 | 30220010 | 30220001 |
| | 10 | 2.50 | 0.0984 | 2 | 2 | M6 x 1 | 30220015 | 30220001 |
| | 10 | 2.80 | 0.1102 | 2.5 | 2 | M6 x 1 | 30220110 | 30220101 |
| | 10 | 3.00 | 0.1181 | 2.5 | 2 | M6 x 1 | 30220115 | 30220101 |
| | 10 | 3.17 | 0.1248 | 2.5 | 2 | M6 x 1 | 30220120 | 30220101 |
| | 10 | 3.50 | 0.1377 | 2.5 | 2 | M6 x 1 | 30220215 | 30220101 |
| | 10 | 4.00 | 0.1574 | 3.5 | 2 | M6 x 1 | 30220310 | 30220301 |
| RB 306 RB 307 | 10 | 4.15 | 0.1634 | 3.5 | 2 | M6 x 1 | 30220315 | 30220301 |
| | 14 | 4.76 | 0.1874 | 4 | 2 | M8 x 1 | 30222015 | 30222001 |
| | 14 | 4.80 | 0.1890 | 4 | 2 | M8 x 1 | 30222025 | 30222001 |
| | 14 | 5.00 | 0.1968 | 4 | 2 | M8 x 1 | 30222030 | 30222001 |
| | 14 | 5.60 | 0.2204 | 4 | 2 | M8 x 1 | 30222040 | 30222001 |
| | 14 | 6.00 | 0.2362 | 4 | 2 | M8 x 1 | 30222050 | 30222001 |
| | 14 | 6.35 | 0.2500 | 4 | 2 | M8 x 1 | 30222055 | 30222001 |
| | 17 | 7.94 | 0.3126 | 5 | 3 | M8 x 1 | 30223035 | 30223001 |
| | 17 | 8.00 | 0.3149 | 5 | 3 | M8 x 1 | 30223040 | 30223001 |
| | 21 | 9.52 | 0.3748 | 5 | 3 | M8 x 1 | 30224045 | 30224001 |
| 21 | 10.00 | 0.3937 | 5 | 3 | M8 x 1 | 30224050 | 30224001 | |

EXPERT ADVICE



- We recommend using Dotco material removal tools, pg. 32-34.
- For microstop cage selection, refer to pg. 49-72.

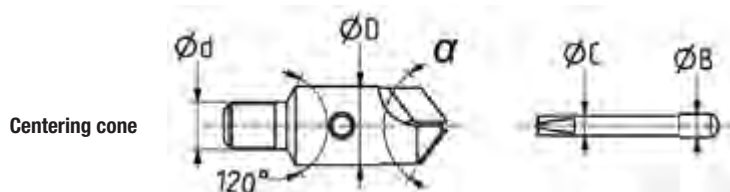
Alternative cutters can be made on request with special diameters, special thread (ex: 1/4-28F, M10x1...), special angles (ex: 90°, 120°...), carbide, HSS-E or PCD*
* Only to use only with pilots having a head dia ≥ shank dia + 0.5 mm (0.0196 in).

ADVANTAGES

- High quality PCD inserts provide superior surface finish to composite materials requiring minimal effort from the operator.
- Superior characteristics of PCD ensure cutters with extended life.



| FOR USE WITH | ALUMINIUM | STEEL | TITANIUM | COMPOSITE | KEVLAR |
|--------------|-----------|-------|----------|-----------|--------|
| Carbide | ● | ● | ● | ● | |
| HSS-E | ● | ● | ● | | |
| PCD* | | | | ● | |
| HSS-E | | | | | ● |
| Carbide | | | | | ● |



| MICROSTOP CAGE REF CHAPTER A | CUTTER Ø D ± 0.1 mm | PILOT | | | NUMBERS OF FLUTES | THREAD Ø D | COUNTERSINKING ANGLE | CUTTER + PILOT REF. PCD* | CUTTER ONLY REF. PCD* |
|--|---------------------------|----------------------|-------------------------|-----------------|----------------------|---------------|-------------------------|--------------------------------|-----------------------------|
| | | HEAD Ø B | | SHANK Ø C mm | | | | | |
| | | -0.02 mm -0.05 mm | 0.0007 in -0.0020 in | | | | | | |
| RB 156 RB 206 RB 256 RB 257 RB 258 | 10 | 2.40 | 0.0945 | 2 | 2 | M6 x 1 | 100° | 30500311 | 30500300 |
| | 10 | 3.00 | 0.1181 | 2.5 | 2 | M6 x 1 | 100° | 30500055 | 30500000 |
| | 10 | 3.17 | 0.1248 | 2.5 | 2 | M6 x 1 | 100° | 30500060 | 30500000 |
| | 10 | 3.50 | 0.1377 | 2.5 | 2 | M6 x 1 | 100° | 30500065 | 30500000 |
| | 10 | 4.00 | 0.1574 | 2.5 | 2 | M6 x 1 | 100° | 30500070 | 30500000 |
| | 10 | 4.00 | 0.1574 | 2.5 | 2 | M6 x 1 | 130° | 30503060 | 30503060 |
| | 10 | 4.15 | 0.1634 | 2.5 | 2 | M6 x 1 | 100° | 30500075 | 30500000 |
| | 14 | - | - | 2.5 | 2 | M6 x 1 | 130° | - | 02500591PT |
| 14 | - | - | 3.5 | 2 | M6 x 1 | 130° | - | 02500592PT | |
| RB 306 RB 307 | 14 | - | - | 2.5 | 2 | M8 x 1 | 130° | - | 02500593PT |
| | 14 | - | - | 3.5 | 2 | M8 x 1 | 130° | - | 02500586PT |
| | 14 | 4.10 | 0.0614 | 4 | 2 | M8 x 1 | 130° | 30503166 | 30503160 |
| | 14 | 4.76 | 0.1874 | 4 | 2 | M8 x 1 | 100° | 30500105 | 30500100 |
| | 14 | 4.80 | 0.1890 | 4 | 2 | M8 x 1 | 100° | 30500110 | 30500100 |
| | 14 | 4.80 | 0.1890 | 4 | 2 | M8 x 1 | 130° | 30502160 | 30503160 |
| | 14 | 5.00 | 0.1968 | 4 | 2 | M8 x 1 | 100° | 30500115 | 30500100 |
| | 14 | 5.10 | 0.2007 | 4 | 2 | M8 x 1 | 130° | 30503165 | 30503160 |
| | 14 | 5.60 | 0.2204 | 4 | 2 | M8 x 1 | 100° | 30500120 | 30500100 |
| | 14 | 6.00 | 0.2362 | 4 | 2 | M8 x 1 | 100° | 30500125 | 30500100 |
| | 14 | 6.35 | 0.2500 | 4 | 2 | M8 x 1 | 100° | 30500130 | 30500100 |
| | 21 | 7.00 | 0.2756 | 5 | 3 | M8 x 1 | 100° | 30500203 | 30500200 |
| | 21 | 7.94 | 0.3126 | 5 | 3 | M8 x 1 | 100° | 30500205 | 30500200 |
| | 21 | 8.00 | 0.3149 | 5 | 3 | M8 x 1 | 100° | 30500210 | 30500200 |
| | 21 | 9.52 | 0.3748 | 5 | 3 | M8 x 1 | 100° | 30500215 | 30500200 |
| | 21 | 10.00 | 0.3937 | 5 | 3 | M8 x 1 | 100° | 30500220 | 30500200 |
| | 21 | - | - | 5 | 3 | M8 x 1 | 130° | - | 30503260 |

EXPERT ADVICE

- Our PDC cutters can be resharpened 3 to 4 times.

Alternative cutters can be made on request with special diameters, special thread (ex: 1/4-28F, M10x1...), special angles (ex: 90°, 120°...), carbide, HSS-E or PCD*
* Only to use only with pilots having a head dia ≥ shank dia + 0.5 mm (0.0196 in).

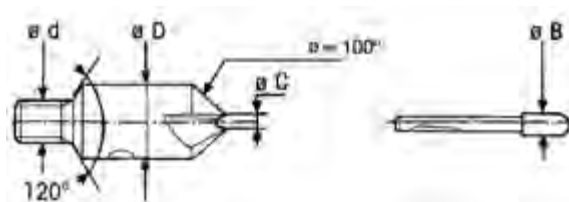
Cutters with Inserted Pilot for Rivets and Screws

Carbide | HSS-E | PCD



| FOR USE WITH | ALUMINIUM | STEEL | TITANIUM | COMPOSITE | KEVLAR |
|--------------|-----------|-------|----------|-----------|--------|
| Carbide | ● | ● | ● | ● | |
| HSS-E | ● | ● | ● | | |
| PCD* | | | | ● | |
| HSS-E | | | | | ● |
| Carbide | | | | | ● |

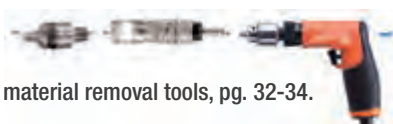
Centering cone



| MICROSTOP CAGE REF CHAPTER A | CUTTER Ø D ± 0.1 mm | PILOT | | SHANK Ø C mm | NUMBERS OF FLUTES | THREAD THREAD Ø D | CUTTER + PILOT REF. CARBIDE | CUTTER ONLY REF. CARBIDE |
|--|---------------------------|----------------------|--------------------------|-----------------|----------------------|-------------------------|-----------------------------------|-----------------------------|
| | | HEAD Ø B | | | | | | |
| | | -0.02 mm -0.05 mm | -0.0007 in -0.0020 in | | | | | |
| RB 156 RB 206 RB 256 RB 257 RB 258 | 10 | 2.00 | 0.0787 | 2 | 3 | M6 x 1 | 30320005 | 30320000 |
| | 10 | 2.38 | 0.0937 | 2 | 3 | M6 x 1 | 30320010 | 30320000 |
| | 10 | 2.50 | 0.0984 | 2 | 3 | M6 x 1 | 30320015 | 30320000 |
| | 10 | 2.80 | 0.1102 | 2.5 | 3 | M6 x 1 | 30320110 | 30320100 |
| | 10 | 3.00 | 0.1181 | 2.5 | 3 | M6 x 1 | 30320115 | 30320100 |
| | 10 | 3.17 | 0.1248 | 2.5 | 3 | M6 x 1 | 30320120 | 30320100 |
| | 10 | 3.50 | 0.1377 | 2.5 | 3 | M6 x 1 | 30320215 | 30320100 |
| | 10 | 4.00 | 0.1574 | 3.5 | 3 | M6 x 1 | 30320310 | 30320300 |
| | 10 | 4.15 | 0.1634 | 3.5 | 3 | M6 x 1 | 30320315 | 30320300 |
| RB 306 RB 307 | 14 | 4.76 | 0.1874 | 4 | 3 | M8 x 1 | 30322015 | 30322000 |
| | 14 | 4.80 | 0.1890 | 4 | 3 | M8 x 1 | 30322025 | 30322000 |
| | 14 | 5.00 | 0.1968 | 4 | 3 | M8 x 1 | 30322030 | 30322000 |
| | 14 | 5.60 | 0.2204 | 4 | 3 | M8 x 1 | 30322040 | 30322000 |
| | 14 | 6.00 | 0.2362 | 4 | 3 | M8 x 1 | 30322050 | 30322000 |
| | 14 | 6.35 | 0.2500 | 4 | 3 | M8 x 1 | 30322055 | 30322000 |
| | 17 | 7.94 | 0.3126 | 5 | 3 | M8 x 1 | 30323035 | 30323000 |
| | 17 | 8.00 | 0.3149 | 5 | 3 | M8 x 1 | 30323040 | 30323000 |
| | 21 | 9.52 | 0.3748 | 5 | 2 | M8 x 1 | 30324045 | 30324000 |
| | 21 | 10.00 | 0.3937 | 5 | 2 | M8 x 1 | 30324050 | 30324000 |

EXPERT ADVICE

- We recommend using Dotco material removal tools, pg. 32-34.
- For microstop cage selection, refer to pg. 49-72.



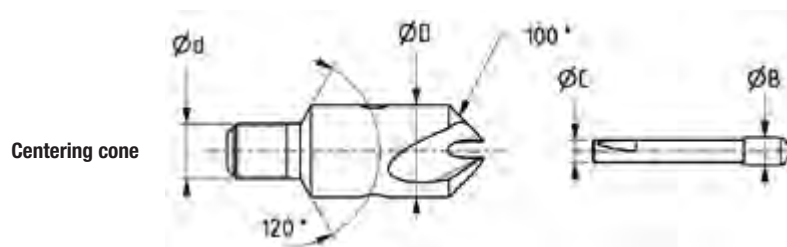
Alternative cutters can be made on request with special diameters, special thread (ex: 1/4-28F, M10x1...), special angles (ex: 90°, 120°...), carbide, HSS-E or PCD*
* Only to use only with pilots having a head dia ≥ shank dia + 0.5 mm (0.0196 in).

ADVANTAGES

- Unique cutter geometry provides excellent surface finish and prevents tearing of fibers.



| FOR USE WITH | ALUMINIUM | STEEL | TITANIUM | COMPOSITE | KEVLAR |
|--------------|-----------|-------|----------|-----------|--------|
| Carbide | ● | ● | ● | ● | |
| HSS-E | ● | ● | ● | | |
| PCD* | | | | ● | |
| HSS-E | | | | | ● |
| Carbide | | | | | ● |



| MICROSTOP CAGE REF CHAPTER A | CUTTER Ø D ± 0.1 mm | PILOT | | | NUMBERS OF FLUTES | THREAD Ø D | CUTTER + PILOT REF. HSS-E | CUTTER ONLY REF. HSS-E |
|--|---------------------------|----------------------|--------------------------|-----------------|----------------------|---------------|---------------------------------|---------------------------|
| | | HEAD Ø B | | SHANK Ø C mm | | | | |
| | | -0.02 mm -0.05 mm | -0.0007 in -0.0020 in | | | | | |
| RB 156 RB 206 RB 256 RB 257 RB 258 | 10 | 3.00 | 0.1181 | 2.5 | 2 | M6 x 1 | 30600010 | 30600001 |
| | 10 | 3.17 | 0.1248 | 2.5 | 2 | M6 x 1 | 30600015 | 30600001 |
| | 10 | 3.50 | 0.1377 | 2.5 | 2 | M6 x 1 | 30600020 | 30600001 |
| | 10 | 4.00 | 0.1574 | 2.5 | 2 | M6 x 1 | 30600025 | 30600001 |
| | 10 | 4.15 | 0.1634 | 2.5 | 2 | M6 x 1 | 30600030 | 30600001 |
| RB 306 RB 307 | 14 | 4.80 | 0.1890 | 4 | 2 | M8 x 1 | 30600110 | 30600101 |
| | 14 | 5.00 | 0.1968 | 4 | 2 | M8 x 1 | 30600115 | 30600101 |
| | 14 | 6.00 | 0.2362 | 4 | 2 | M8 x 1 | 30600120 | 30600101 |
| | 14 | 6.35 | 0.2500 | 4 | 2 | M8 x 1 | 30600125 | 30600101 |

EXPERT ADVICE

- Alternate pilots may be manufactured on request.
e.g.: special diameters and lengths.

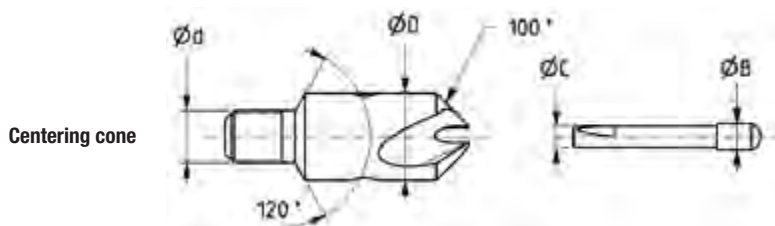
Alternative cutters can be made on request with special diameters, special thread (ex: 1/4-28F, M10x1...), special angles (ex: 90°, 120°...), carbide, HSS-E or PCD*
* Only to use only with pilots having a head dia ≥ shank dia + 0.5 mm (0.0196 in).

ADVANTAGES

- Unique cutter geometry provides excellent surface finish and prevents tearing of fibers.

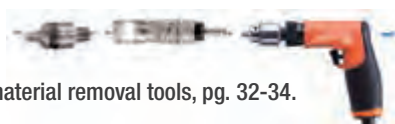


| FOR USE WITH | ALUMINIUM | STEEL | TITANIUM | COMPOSITE | KEVLAR |
|--------------|-----------|-------|----------|-----------|--------|
| Carbide | ● | ● | ● | ● | |
| HSS-E | ● | ● | ● | | |
| PCD* | | | | ● | |
| HSS-E | | | | | ● |
| Carbide | | | | | ● |



| MICROSTOP CAGE REF CHAPTER A | CUTTER $\varnothing D$ ± 0.1 mm | PILOT | | | NUMBERS OF FLUTES | THREAD $\varnothing D$ | CUTTER + PILOT REF. CARBIDE | CUTTER ONLY REF. CARBIDE |
|--|---|----------------------|--------------------------|-----------------------------|----------------------|---------------------------|-----------------------------------|-----------------------------|
| | | HEAD $\varnothing B$ | | SHANK $\varnothing C$ mm | | | | |
| | | -0.02 mm -0.05 mm | -0.0007 in -0.0020 in | | | | | |
| RB 156 RB 206 RB 256 RB 257 RB 258 | 10 | 3.00 | 0.1181 | 2.5 | 2 | M6 x 1 | 30601010 | 30601001 |
| | 10 | 3.17 | 0.1248 | 2.5 | 2 | M6 x 1 | 30601015 | 30601001 |
| | 10 | 3.50 | 0.1377 | 2.5 | 2 | M6 x 1 | 30601020 | 30601001 |
| | 10 | 4.00 | 0.1574 | 2.5 | 2 | M6 x 1 | 30601025 | 30601001 |
| | 10 | 4.15 | 0.1634 | 2.5 | 2 | M6 x 1 | 30601030 | 30601001 |
| RB 306 RB 307 | 14 | 4.80 | 0.1890 | 4 | 2 | M8 x 1 | 30601110 | 30601101 |
| | 14 | 5.00 | 0.1968 | 4 | 2 | M8 x 1 | 30601115 | 30601101 |
| | 14 | 6.00 | 0.2362 | 4 | 2 | M8 x 1 | 30601120 | 30601101 |
| | 14 | 6.35 | 0.2500 | 4 | 2 | M8 x 1 | 30601125 | 30601101 |

EXPERT ADVICE



- We recommend using Dotco material removal tools, pg. 32-34.
- For microstop cage selection, refer to pg. 49-72.

Alternative cutters can be made on request with special diameters, special thread (ex: 1/4-28F, M10x1...), special angles (ex: 90°, 120°...), carbide, HSS-E or PCD*
* Only to use only with pilots having a head dia \geq shank dia + 0.5 mm (0.0196 in).

Spotfacing Cutters with Pilot Insert

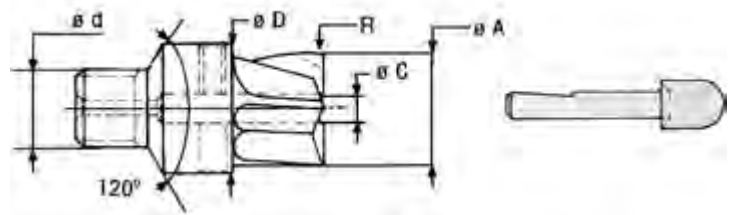
Carbide | HSS-E | PCD

Recoules Quackenbush
Precision Drilling - Every Time



| FOR USE WITH | ALUMINIUM | STEEL | TITANIUM | COMPOSITE |
|--------------|-----------|-------|----------|-----------|
| Carbide | ● | ● | ● | |
| HSS-E | ● | ● | ● | |
| PCD* | | | | ● |

Centering cone



| MICROSTOP CAGE REF CHAPTER A | Ø SPOTFACING DIA | | CUTTERS BODY Ø D mm | SHANK DU PILOT Ø C mm | NUMBER OF FLUTES | THREAD Ø D | CUTTER REF. HSS-E R = 0 mm | CUTTER REF. HSS-E R = 1 mm | CUTTER REF. HSS-E R = 2 mm | CUTTER REF. CARBIDE R = 0 mm |
|--|------------------|--------|---------------------------|-----------------------------|---------------------|---------------|----------------------------------|----------------------------------|----------------------------------|------------------------------------|
| | mm | in | | | | | | | | |
| RB 156 RB 206 RB 256 RB 257 RB 258 | 5 | 0.1968 | 10 | 2 | 4 | M6 x 1 | 31000000 | 31001002 | - | - |
| | 6 | 0.2362 | 10 | 2 | 4 | M6 x 1 | 31000005 | 31001007 | - | - |
| | 7 | 0.2755 | 10 | 2 | 4 | M6 x 1 | 31000010 | 31001012 | - | - |
| | 8 | 0.3149 | 10 | 2 | 4 | M6 x 1 | 31000015PT | 31001017 | - | - |
| | 9 | 0.3543 | 10 | 2 | 4 | M6 x 1 | 31000020 | 31001022 | - | - |
| RB 306 RB 307 | 10 | 0.3937 | 10 | 2 | 4 | M6 x 1 | 31000025 | 31001030 | - | 02506010PT |
| | 11 | 0.4330 | 11 | 3 | 4 | M8 x 1 | 31000100PT | 31001101 | 31001103 | - |
| | 12 | 0.4724 | 12 | 3 | 4 | M8 x 1 | 31000105 | 31001106 | 31001108 | 02506012PT |
| | 13 | 0.5118 | 13 | 3 | 4 | M8 x 1 | 31000110 | 31001111 | 31001113 | 02506013PT |
| | 14 | 0.5511 | 14 | 3 | 4 | M8 x 1 | 31000115 | 31001120 | 31001130 | 02506014PT |
| | 15 | 0.5905 | 15 | 4 | 4 | M8 x 1 | 31000200PT | 31001201 | 31001203 | 02506015PT |
| | 16 | 0.6299 | 16 | 4 | 4 | M8 x 1 | 31000205 | 31001206 | 31001208 | 02506016PT |
| | 17 | 0.6692 | 17 | 4 | 4 | M8 x 1 | 31000210 | 31001215 | 31001225 | 02506017PT |
| | 18 | 0.7086 | 18 | 4 | 4 | M8 x 1 | 31000300PT | 31001301 | 31001303 | 02506018PT |
| | 19 | 0.7480 | 19 | 4 | 4 | M8 x 1 | 31000305 | 31001306 | 31001308 | 02506019PT |
| | 20 | 0.7874 | 20 | 4 | 4 | M8 x 1 | 31000310 | 31001311 | 31001313 | 02506020PT |
| 21 | 0.8267 | 21 | 4 | 4 | M8 x 1 | 31000315 | 31001320 | 31001330 | 02506021PT | |
| RB 406 | 22 | 0.8661 | 22 | 5 | 4 | M10 x 1 | 31000400PT | 31001401 | 31001404 | - |
| | 24 | 0.9448 | 24 | 5 | 4 | M10 x 1 | 31000410 | 31001413 | 31001420 | - |
| | 25.4 | 1.000 | 25.4 | 5 | 4 | M10 x 1 | 31000500PT | 31001501 | 31001503 | - |
| | 26 | 1.0236 | 26 | 5 | 4 | M10 x 1 | 31000505 | 31001506 | 31001508 | - |
| | 28 | 1.1023 | 28 | 5 | 4 | M10 x 1 | 31000510 | 31001511 | 31001513 | - |
| | 30 | 1.1811 | 30 | 5 | 4 | M10 x 1 | 31000520 | 31001521 | 31001523 | - |
| 38.1 | 1.5000 | 38.1 | 5 | 4 | M10 x 1 | 31000600PT | 31001610 | 31001620 | - | |

EXPERT ADVICE

- Alternate cutter example: combined carbide cutter chamfer + counterbore.



Alternative cutters can be made on request with special diameters, special thread (ex: 1/4-28F, M10x1...), special angles (ex: 90°, 120°...), carbide, HSS-E or PCD*
* Only to use only with pilots having a head dia ≥ shank dia + 0.5 mm (0.0196 in).

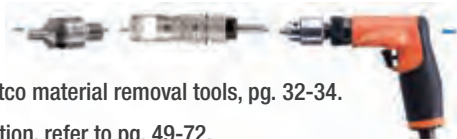


| HEAD Ø B | | SHANK Ø C mm | PILOT REF. |
|----------------------|--------------------------|--------------|------------|
| -0.02 mm -0.05 mm | -0.0007 in -0.0020 in | | |
| 3.80 | 0.1496 | 3.5 | 31100300 |
| 4.00 | 0.1574 | 3.5 | 31100305 |
| 4.15 | 0.1634 | 3.5 | 31100310 |
| 4.80 | 0.1890 | 3.5 | 31100315 |
| 5.00 | 0.1968 | 3.5 | 31100320 |
| 4.00 | 0.1574 | 4 | 31100400 |
| 4.50 | 0.1771 | 4 | 31100405 |
| 4.76 | 0.1874 | 4 | 31100410 |
| 4.80 | 0.1890 | 4 | 31100415 |
| 5.00 | 0.1968 | 4 | 31100420 |
| 5.50 | 0.2165 | 4 | 31100425 |
| 5.60 | 0.2204 | 4 | 31100430 |
| 6.00 | 0.2362 | 4 | 31100440 |
| 6.20 | 0.2441 | 4 | 31100444 |
| 6.30 | 0.2480 | 4 | 31100446 |
| 6.35 | 0.2500 | 4 | 31100445 |
| 7.00 | 0.2756 | 4 | 31100460 |
| 7.90 | 0.3110 | 4 | 31100478 |
| 8.00 | 0.3149 | 4 | 31100455 |
| 6.35 | 0.2500 | 5 | 31100515 |
| 7.00 | 0.2755 | 5 | 31100520 |
| 9.30 | 0.3661 | 5 | 31100586 |

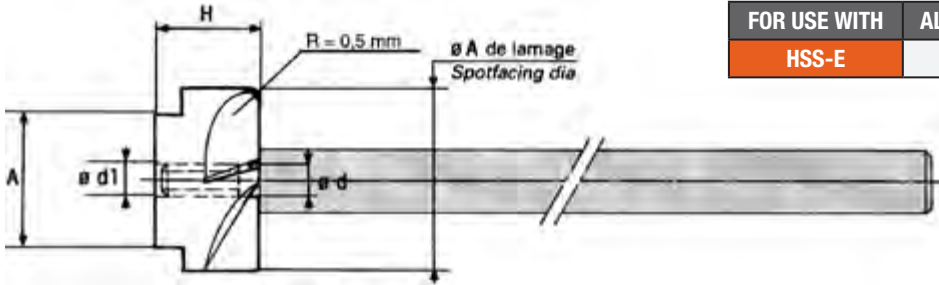
| HEAD Ø B | | SHANK Ø C mm | PILOT REF. |
|----------------------|--------------------------|--------------|------------|
| -0.02 mm -0.05 mm | -0.0007 in -0.0020 in | | |
| 2.00 | 0.0787 | 2 | 31100000 |
| 2.38 | 0.0937 | 2 | 31100005 |
| 2.40 | 0.0944 | 2 | 31100006 |
| 2.45 | 0.0964 | 2 | 31100009 |
| 2.50 | 0.0984 | 2 | 31100010 |
| 3.00 | 0.1181 | 2 | 31100020 |
| 3.17 | 0.1248 | 2 | 31100025 |
| 3.20 | 0.1259 | 2 | 31100024 |
| 3.50 | 0.1377 | 2 | 31100030 |
| 4.00 | 0.1574 | 2 | 31100035 |
| 4.80 | 0.1890 | 2 | 31100056 |
| 2.50 | 0.0984 | 2.5 | 31100100 |
| 2.80 | 0.1102 | 2.5 | 31100105 |
| 3.00 | 0.1181 | 2.5 | 31100110 |
| 3.17 | 0.1248 | 2.5 | 31100115 |
| 3.20 | 0.1259 | 2.5 | 31100114 |
| 3.50 | 0.1377 | 2.5 | 31100120 |
| 3.60 | 0.1417 | 2.5 | 31100122 |
| 4.00 | 0.1574 | 2.5 | 31100130 |
| 4.15 | 0.1634 | 2.5 | 31100131 |
| 4.40 | 0.1732 | 2.5 | 31100138 |
| 4.46 | 0.1755 | 2.5 | 03590513PT |
| 4.60 | 0.1811 | 2.5 | 31100142 |
| 4.76 | 0.1874 | 2.5 | 31100145 |
| 4.80 | 0.1890 | 2.5 | 31100133 |
| 5.00 | 0.1968 | 2.5 | 31100135 |
| 5.50 | 0.2165 | 2.5 | 03590436PT |
| 6.35 | 0.2500 | 2.5 | 31100177 |
| 3.00 | 0.1181 | 3 | 31100200 |
| 3.17 | 0.1248 | 3 | 31100205 |
| 3.20 | 0.1259 | 3 | 31100206 |
| 3.50 | 0.1377 | 3 | 31100210 |
| 4.00 | 0.1574 | 3 | 31100220 |
| 4.80 | 0.1890 | 3 | 31100236 |
| 5.00 | 0.1968 | 3 | 31100225 |
| 5.50 | 0.2165 | 3 | 31100250 |
| 6.00 | 0.2362 | 3 | 31100230 |

EXPERT ADVICE


- We recommend using Dotco material removal tools, pg. 32-34.
- For microstop cage selection, refer to pg. 49-72.

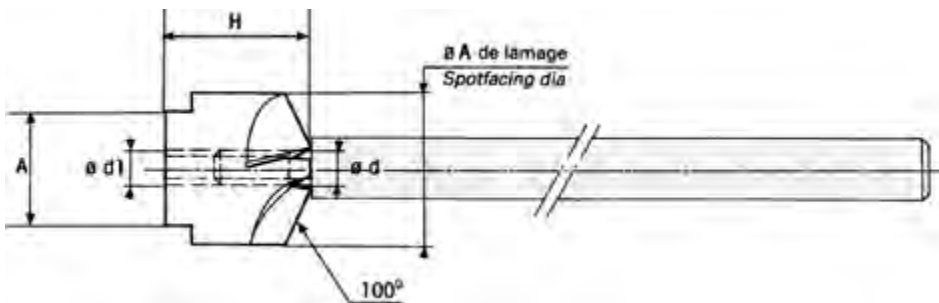



Alternative pilots may be manufactured on request. e.g.: special diameters and lengths.



| FOR USE WITH | ALUMINIUM | STEEL | TITANIUM | COMPOSITE |
|--------------|-----------|-------|----------|-----------|
| HSS-E | ● | ● | ● | |

| BACK SPOTFACING CUTTERS | Ø SPOTFACING DIA | | Ø D1 | Ø D H9 mm | H ± 0.5 mm | A ACROSS FLATS -0.00 mm -0.10 mm | CUTTER REF. |
|---|------------------|--------|----------|--------------|---------------|---|-------------|
| | mm | in | | | | | |
|  | 10 | 0.3937 | M4 x 0.7 | 4 | 10 | 6 | 31500035 |
| | 12 | 0.4724 | M4 x 0.7 | 4 | 10 | 6 | 31500065 |
| | 14 | 0.5511 | M4 x 0.7 | 4 | 10 | 10 | 31500095 |



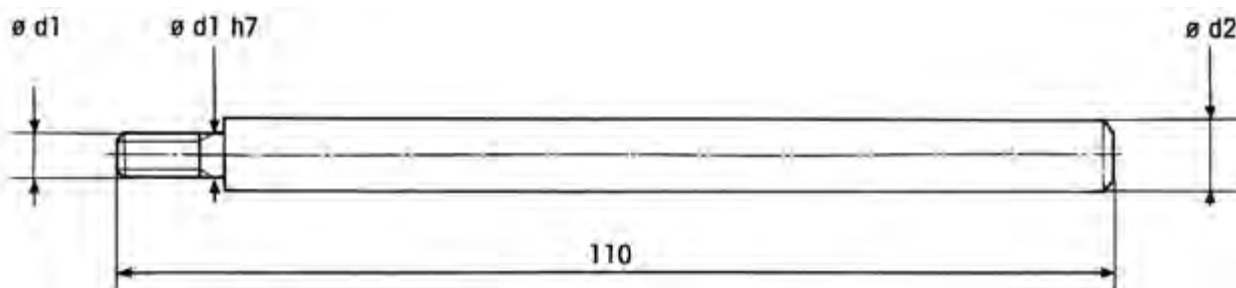
| BACK COUNTERSINK CUTTERS | Ø SPOTFACING DIA | | Ø D1 | Ø D H9 mm | H ± 0.5 mm | A ACROSS FLATS -0.00 mm -0.10 mm | CUTTER REF. |
|---|------------------|--------|----------|--------------|---------------|---|-------------|
| | mm | in | | | | | |
|  | 6 | 0.2362 | M2 x 0.4 | 2 | 7 | 5 | 31601000 |
| | 8 | 0.3149 | M3 x 0.5 | 3 | 10 | 6 | 31601025 |



EXPERT ADVICE

- To use with our back spotfacing guns, pg. 41-42.

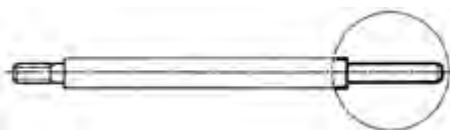
Alternative cutters can be made on request with special diameters and/or radius;
See next page for pilot selection.



| Ø d1 | PILOT | | PILOT REF. |
|----------|----------------------|--------------------------|------------|
| | -0.02 mm -0.05 mm | -0.0007 in -0.0020 in | |
| M2 x 0.4 | 2.35 | 0.0925 | 31700000 |
| M2 x 0.4 | 2.50 | 0.0984 | 31700005 |
| M3 x 0.5 | 3.00 | 0.1181 | 31700200 |
| M3 x 0.5 | 4.00 | 0.1574 | 31700210 |
| M4 x 0.7 | 4.00 | 0.1574 | 31700300 |
| M4 x 0.7 | 4.75 | 0.1870 | 31700310 |
| M4 x 0.7 | 5.00 | 0.1986 | 31700315 |
| M4 x 0.7 | 6.00 | 0.2362 | 31700325 |

EXPERT ADVICE

- Special attachment diameter can be made to collet size.
- To be used with backspotfacing and countersink cutters.



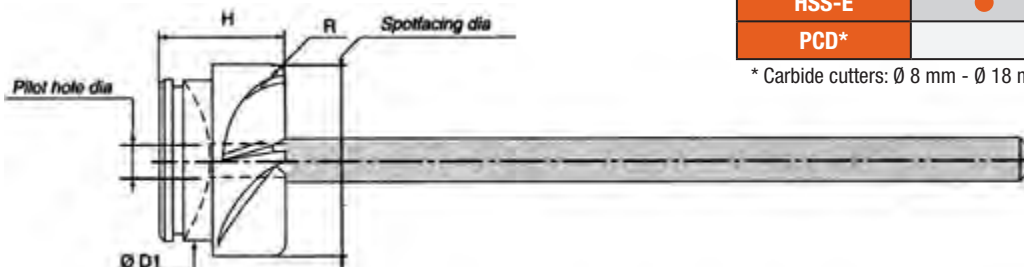
Alternative pilots can be manufactured on request with special diameters and lengths.

Back Spotfacing and Countersink Cutters - Bayonet Locking Pilot

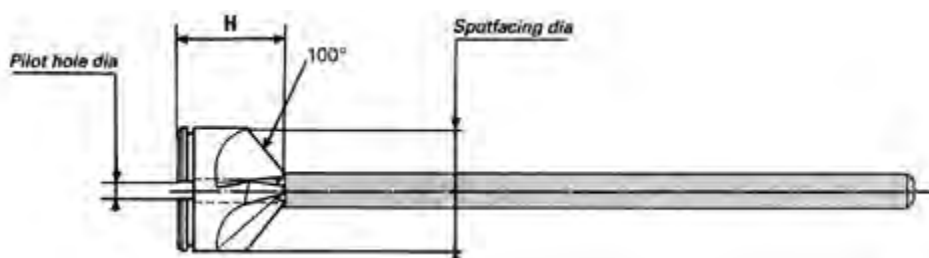
Carbide | HSS-E | PCD

| FOR USE WITH | ALUMINIUM | STEEL | TITANIUM | COMPOSITE |
|--------------|-----------|-------|----------|-----------|
| Carbide | ● | ● | ● | |
| HSS-E | ● | ● | ● | |
| PCD* | | | | ● |

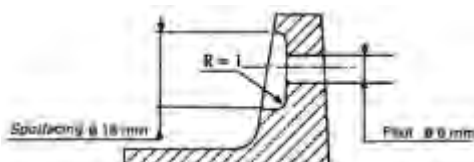
* Carbide cutters: Ø 8 mm - Ø 18 mm Ü H = 16 mm



| BACK SPOTFACING CUTTERS | Ø SPOTFACING DIA | | RADIUS R mm | H mm | Ø PILOT HOLE DIA mm | Ø D1 | CUTTER REF. HSS-E | RING REF. |
|-------------------------|------------------|--------|----------------|---------|---------------------------|------|----------------------|-----------|
| | mm | in | | | | | | |
| <p>Retaining ring</p> | 8 | 0.3149 | 0.5 | 10 | 3 | 8 | 31300000 | 91825010 |
| | 10 | 0.3937 | 0.5 | 10 | 3 | 8 | 31300025 | 91825010 |
| | 10 | 0.3937 | 2 | 10 | 3 | 8 | 31302035 | 91825010 |
| | 12 | 0.4724 | 0.5 | 10 | 3 | 10 | 31300050 | 91825015 |
| | 12 | 0.4724 | 2 | 10 | 3 | 10 | 31302060 | 91825015 |
| | 14 | 0.5511 | 1 | 10 | 3 | 10 | 31300125 | 91825015 |
| | 14 | 0.5511 | 2 | 10 | 3 | 10 | 31302135 | 91825015 |
| | 14 | 0.5511 | 1 | 16 | 4 | 10 | 31300150 | 91825015 |
| | 14 | 0.5511 | 2 | 16 | 4 | 10 | 31302160 | 91825015 |
| | 16 | 0.6299 | 1 | 16 | 4 | 14 | 31300200 | 91825025 |
| | 16 | 0.6299 | 2 | 16 | 4 | 14 | 31302210 | 91825025 |
| | 18 | 0.7086 | 1 | 16 | 4 | 14 | 31300250 | 91825025 |
| | 20 | 0.7874 | 1 | 16 | 4 | 14 | 31300300 | 91825025 |



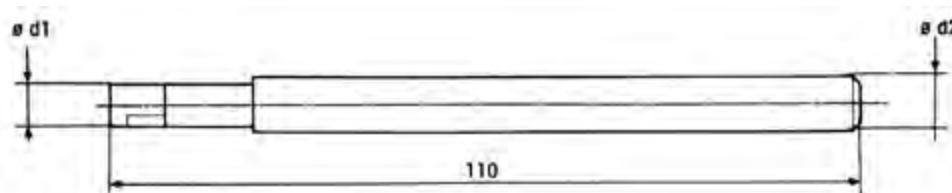
| BACK COUNTERSINK CUTTERS | Ø SPOTFACING DIA | | H mm | Ø PILOT HOLE DIA mm | Ø D1 | CUTTER REF. HSS-E | RING REF. |
|--------------------------|------------------|--------|---------|------------------------|------|----------------------|-----------|
| | mm | in | | | | | |
| <p>Retaining ring</p> | 8 | 0.3149 | 10 | 3 | 8 | 31306000 | 91825010 |
| | 10 | 0.3937 | 10 | 3 | 8 | 31306025 | 91825015 |
| | 12 | 0.4724 | 10 | 3 | 8 | 31306050 | 91825020 |
| | 14 | 0.5511 | 10 | 3 | 10 | 31306150 | 91825025 |
| | 17 | 0.7083 | 10 | 3 | 10 | 31306225 | 91825030 |



EXPERT ADVICE

- Necessary tools: cutter - 31300250, pilot - 31400125.

Alternative cutters can be made on request with special diameters and/or radius, special angles (ex : 90°, 120°...), carbide*, HSS-E or PCD. See next page for pilot selection.



| $\varnothing d1$ | PILOT $\varnothing d2$ | | PILOT REF. |
|------------------|------------------------|--------------------------|------------|
| | -0.00 mm -0.02 mm | -0.000 in. -0.0007 in | |
| 2.5 | 2.50 | 0.0820 | 03596083PT |
| 3 | 3.00 | 0.1181 | 31400000 |
| 3 | 3.20 | 0.1260 | 31400004 |
| 3 | 3.50 | 0.1377 | 31400005 |
| 3 | 4.00 | 0.1574 | 31400015 |
| 3 | 5.00 | 0.1968 | 31400020 |
| 4 | 4.00 | 0.1574 | 31400100 |
| 4 | 4.50 | 0.1771 | 31400105 |
| 4 | 4.80 | 0.1889 | 31400110 |
| 4 | 5.00 | 0.1968 | 31400115 |
| 4 | 6.00 | 0.2362 | 31400125 |
| 5 | 5.00 | 0.1968 | 31400200 |
| 5 | 6.00 | 0.2362 | 31400210 |
| 6 | 6.00 | 0.2362 | 31400300 |



EXPERT ADVICE

- To use with our back spotfacing guns, pg. 41-42.

Alternative pilots can be manufactured on request with special diameters and lengths.
To use with backspotfacing and countersink cutters.
Special attachment diameter can be made to collet size.

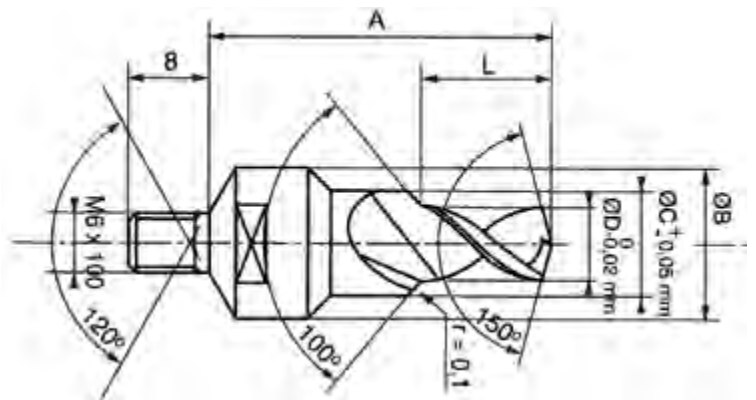
ADVANTAGES

- Drilling and countersinking of all rivet holes can be achieved in one operation.
- Cutter diameters have been designed to meet requirements of various riveting specifications.



| FOR USE WITH | ALUMINIUM | STEEL | TITANIUM | COMPOSITE |
|--------------|-----------|-------|----------|-----------|
| Carbide | ● | ● | ● | |
| HSS-E | ● | ● | ● | |
| PCD* | | | | ● |

* PCD cutters countersinking section.



EXPERT ADVICE

- The RB 018 drill and countersink cutter is suitable for use with any of the above microstop cages.



Alternative diameters, lengths, angles, radius, material (PCD, Carbide, HSS-E) are available on request. When ordering, please indicate material to drill, material thickness, holes diameter, tolerance required.

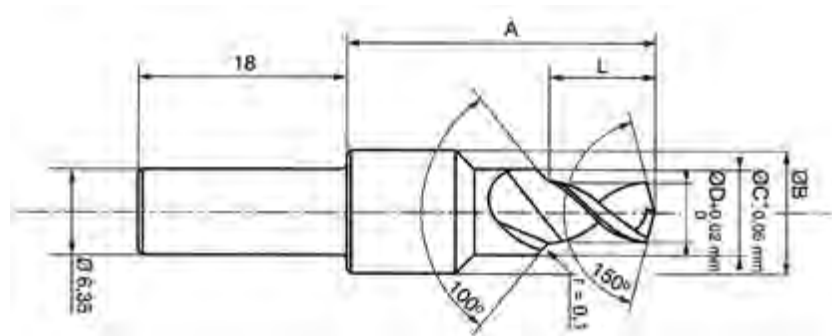
ADVANTAGES

- Drilling and countersinking of all rivet holes can be achieved in one operation with tolerance of 0.003 in (0.07 mm) according to nominal diameter, which meets the requirements of most riveting specifications.



| FOR USE WITH | ALUMINIUM | STEEL | TITANIUM | COMPOSITE |
|--------------|-----------|-------|----------|-----------|
| Carbide | ● | ● | ● | |
| HSS-E | ● | ● | ● | |
| PCD* | | | | ● |

* PCD cutters countersinking section.



| NOMINAL RIVET | | DIA C | | L | | DIA C | | A | | DIA B | | DRILL CAPACITY | | PART N° HSS-E | PART N° CARBIDE |
|---------------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------------|-------|---------------|-----------------|
| mm | in | mm | in | mm | in | mm | in | mm | in | mm | in | mm | in | | |
| 3.20 | 1/8 | 3.20 | 0.126 | 7.00 | 0.276 | 7.00 | 0.276 | 26.00 | 1.023 | 10.00 | 0.394 | 6.00 | 0.236 | 32800100 | 32802100 |
| 4.00 | 5/32 | 4.00 | 0.157 | 7.00 | 0.276 | 10.00 | 0.394 | 26.00 | 1.023 | 10.00 | 0.394 | 5.50 | 0.216 | 32800200 | 32802200 |
| 4.00 | 5/32 | 4.00 | 0.157 | 12.00 | 0.472 | 10.00 | 0.394 | 26.00 | 1.023 | 10.00 | 0.394 | 10.00 | 0.394 | 32800205 | 32802205 |
| 4.80 | 3/16 | 4.80 | 0.189 | 12.00 | 0.472 | 10.00 | 0.394 | 26.00 | 1.023 | 10.00 | 0.394 | 10.50 | 0.413 | 32800260 | 32802260 |

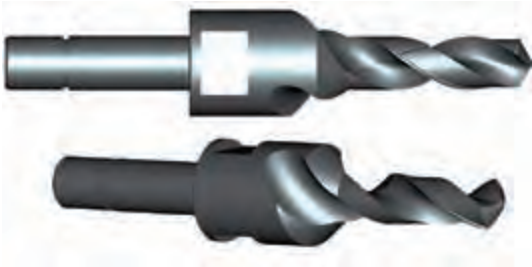
RB 019 HP: HIGH-PRECISION CUTTERS

- On request only. we can supply the RB 019 HP in HSS-E, carbide, or PCD to use on aluminum alloy or titanium, which will guarantee a hole accuracy of 0.0012 in (0.03 mm). These cutters with special grinding, polished flutes, and a drill point concentric to less than 0.0005 in (0.01 mm) are commonly used for HI-LITE or HUCK LGP fasteners installation.
- When ordering, please indicate: material to drill, material thickness, hole diameter, and tolerance required.

Alternative RB019 may be made on request with special diameters and dimensions carbide, HSS-E, or PCD.

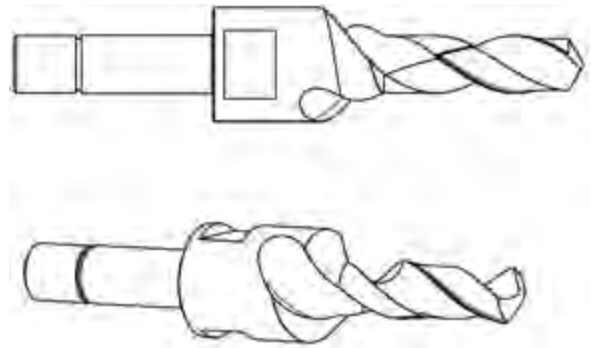
PRECISION MANUFACTURING

- On request only, we can supply the RB 020 HP in HSS-E, carbide, or PCD to use on aluminum alloy or titanium, which will guarantee a hole accuracy of 0.0012 in (0.03 mm). These cutters are manufactured with special grinding, polished flutes, and a drill point concentric to less than 0.0005 in (0.01 mm).
- When ordering, please indicate: material to drill, material thickness, hole diameter and tolerance required.



| FOR USE WITH | ALUMINIUM | STEEL | TITANIUM | COMPOSITE |
|--------------|-----------|-------|----------|-----------|
| Carbide | ● | ● | ● | |
| HSS-E | ● | ● | ● | |
| PCD* | | | | ● |

* Carbide cutters: Ø 8 mm - Ø 18 mm Ü H = 16 mm



EXPERT ADVICE

- We recommend the use of Recoules Quackenbush ADE machines.

| THREAD | M6 | M8-M10-M12 |
|-------------|---|--|
| | 21500 | 20962 |
| ADE Machine |  |  |

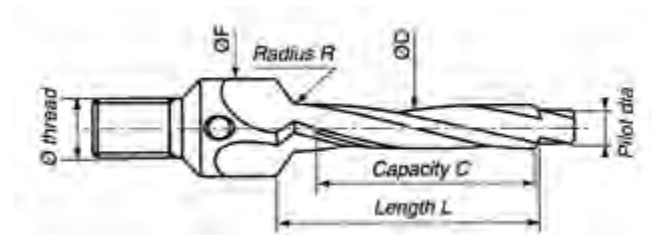
ADVANTAGES

- This particular type of drill featuring a solid pilot and three flutes has been developed especially to produce finished holes in a single operation: reaming, countersinking, and producing the blend radius for all holes up to grade 8, locating in pre-drilled holes as reference.
- The non-cutting rear guide ensures perfect concentricity of the countersink, with no elongation of reamed holes.



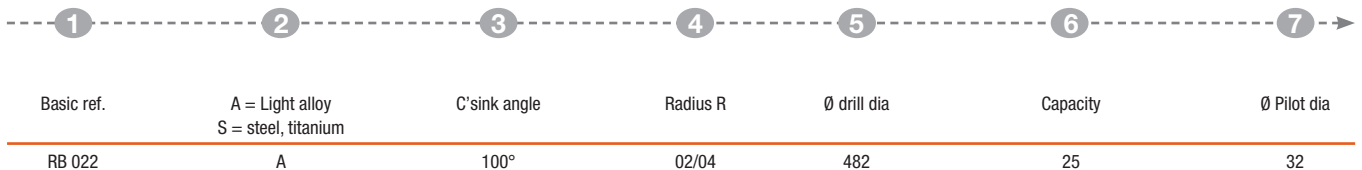
| FOR USE WITH | ALUMINIUM | STEEL | TITANIUM | COMPOSITE |
|--------------|-----------|-------|----------|-----------|
| Carbide | ● | ● | ● | |
| HSS-E | ● | ● | ● | |
| PCD* | | | | ● |

* Carbide cutters: Ø 8 mm - Ø 18 mm Ü H = 16 mm



| MICROSTOP CAGE REF CHAPTER A | THREAD Ø D | REAMER DIA Ø D | | L MAXI | | MAXI BODY DIA F | | DRILL CAPACITY C MAXI | |
|---------------------------------|---------------|-------------------|---------------|--------|-------|--------------------|-------|--------------------------|-------|
| | | mm | in | mm | in | mm | in | mm | in |
| RB 356 HP 21 | M6 x 1 | 3.20 - 4.20 | 0.125 - 0.165 | 20 | 0.787 | 10 | 0.393 | 12 | 1/2 |
| RB 356 HP 38 | M6 x 1 | 3.20 - 4.21 | 0.125 - 0.165 | 36 | 1.417 | 10 | 0.393 | 25 | 1 |
| RB 356 HP 21 | M6 x 1 | 4.30 - 6.35 | 0.169 - 1/4 | 20 | 0.787 | 14 | 0.551 | 12 | 1/2 |
| RB 356 HP 38 | M6 x 1 | 4.30 - 6.35 | 0.169 - 1/4 | 36 | 1.417 | 14 | 0.551 | 25 | 1 |
| RB 356 HP 58 | M10 x 1 | 6.35 - 8.00 | 1/4 - 0.315 | 40 | 1.574 | 17 | 0.669 | 30 | 1.181 |
| RB 356 HP 58 | M10 x 1 | 8.00 - 10.00 | 0.315 - 0.393 | 40 | 1.574 | 21 | 0.826 | 30 | 1.181 |

Example ordering information RB 022:



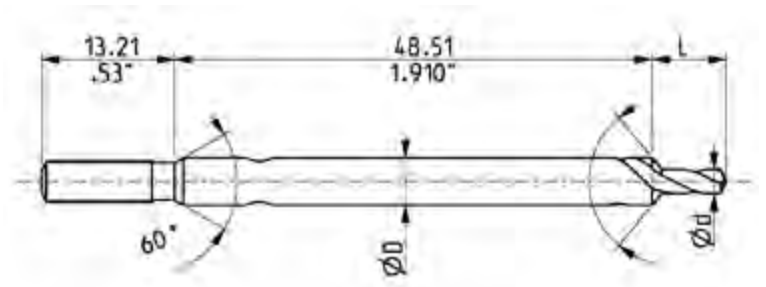
EXPERT ADVICE

- The RB 022 drill- ream and countersink cutter is suitable for use with any of the above microstop cages.

Alternative diameters, lengths, radius, materials (PCD, Carbide, HSS-E) are available on request. On request 1/4-28 cutter thread.



| FOR USE WITH | ALUMINIUM | STEEL | TITANIUM | COMPOSITE |
|--------------|-----------|-------|----------|-----------|
| Carbide | ● | ● | ● | |
| HSS-E | ● | ● | ● | |



| TYPE | SHANK DIA D | | DRILL DIA D | | DRILL LENGTH L | | COUNTERSINK ANGLE | EXTERNAL THREAD | PART N° HSS-E | PART N° CARBIDE |
|----------------|-------------|--------|-------------|--------|----------------|--------|-------------------|-----------------|---------------|-----------------|
| | mm | in | mm | in | mm | in | | | | |
| WD40 100 25 | 4.76 | 0.1875 | 2.49 | 0.0980 | 7.49 | 0.2950 | 100° | 8-32 | 32820010 | - |
| WD40 100 35 | 4.76 | 0.1875 | 2.49 | 0.0980 | 10.67 | 0.4200 | 100° | 8-32 | 32820110 | - |
| WD40 M3 100 25 | 4.76 | 0.1875 | 2.49 | 0.0980 | 7.49 | 0.2950 | 100° | 8-32 | - | 02110004PT |



EXPERT ADVICE

- To use with our nutplate drill 10 QNDP, pg. 18.

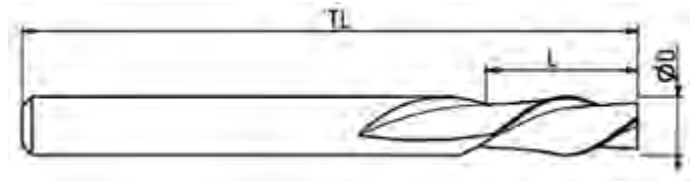
Alternative WD and WDS series drill-countersink cutters are available on request. When ordering, please state code and series number.



ADVANTAGES

- These cutters are manufactured with a left hand helix. This ensures swarf dispersion towards the tip of the cutter, improving the working conditions for the operator.
- Can be used on thicknesses up to 6 mm in light alloys.
- For certain jobs where the routing operation is in the middle of the plate (such as routing windows or inspection doors), ground point cutters are recommended.



| FOR USE WITH | ALUMINIUM | STEEL | TITANIUM | COMPOSITE |
|--------------|-----------|-------|----------|-----------|
| Carbide | ● | | | |
| HSS-E | ● | | | |
| PCD* | | | | ● |



| NOMINAL DIA. D | | CUTTING LENGTH L | | TOTAL LENGTH | | REF. WITHOUT GROUND POINT | REF. WITH GROUND POINT |
|-------------------|--------|---------------------|--------|--------------|------|--|---|
| mm | in | mm | in | mm | in |  |  |
| 6.00 | 0.2362 | 15.00 | 0.5905 | 64.00 | 2.52 | 32600000 | 32600005 |
| 6.35 | 1/4 | 15.00 | 0.5905 | 64.00 | 2.52 | 32600050 | 32600055 |
| 7.94 | 5/16 | 15.00 | 0.5905 | 64.00 | 2.52 | 32600100 | 32600105 |



EXPERT ADVICE

- These router cutters are designed for use on all Dotco routers.

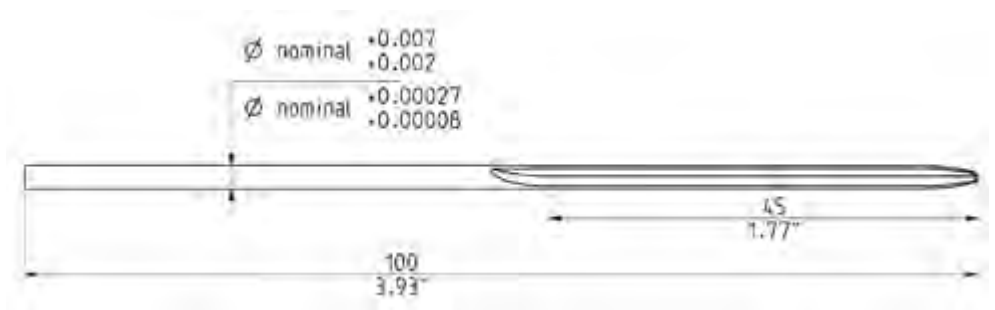
Alternative diameters, lengths, materials (PCD, Carbide, HSS-E) are available on request.

ADVANTAGES

- Special drill reamers producing accurate holes without delamination.
- For small thickness material, we recommend the 4 fluted cutter.
- Diameter 0.094 in up to 0.393 in.



| FOR USE WITH | ALUMINIUM | STEEL | TITANIUM | COMPOSITE |
|--------------|-----------|-------|----------|-----------|
| Carbide | | | | ● |



Example - for use with a drill of 3.17 mm dia:



3 FLUTED OGIVAL SHAPE

Basic Code

32757

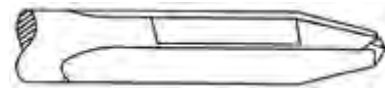
+

Drill size in 1/100 mm

317

32757317

Code to indicate



4 FLUTED TAPERED SHAPE

Basic Code

32755

+

Drill size in 1/100 mm

317

32755317

Code to indicate

EXPERT ADVICE

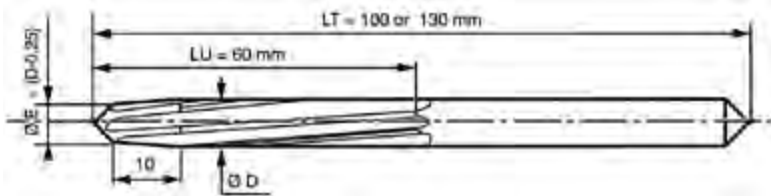
- To use with our drill guides RB 240 - RB 245, pg. 47 and Dotco Pistol Drills, pg. 32-34.



For best results, Recoules Quackenbush recommends cutting speed of 125.150 sfpm. Workpiece must be clamped secure to reduce risk of vibration.

SPECIFICATIONS

- HSS-E Cobalt
- 15° left hand spiral flutes
- Overall length: 100 mm / 4 in or 130 mm / 5.1 in
- Flute length: 60 mm / 2.36 in
- 90° ground points
- Taper lead length: 10 mm / 0.4 in
- Diameter from 3/32 in to 0.5 in
- All tolerances
- N° of flutes: up to dia 4.9 mm
up to dia 13 mm

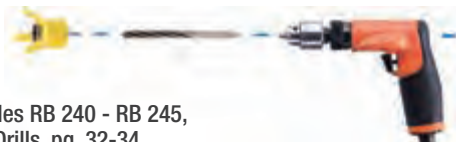


| FOR USE WITH | ALUMINIUM | STEEL | TITANIUM | COMPOSITE |
|--------------|-----------|-------|----------|-----------|
| Carbide | ● | ● | ● | ● |
| HSS-E | ● | ● | ● | |

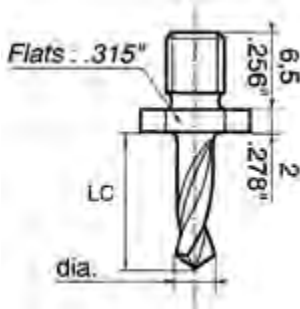
| DIA REQUIRED | CODE NUMBER | |
|--------------|------------------------|--------------------------|
| | LENGTH = 100 mm (4 in) | LENGTH = 130 mm (5.1 in) |
| 4 U 9 | 33503108 | - |
| 4 X 7 | 33504104 | 33504105 |
| 4 Z 7 | 33506100 | - |
| 4.8 H 7 | 33500104 | - |
| 4.8 H 8 | - | 33500187 |
| 5 H 8 | 33500206 | 33500207 |
| 5 X 7 | 33504204 | 33504205 |
| 5.2 U 9 | 33503228 | - |
| 5.2 X 7 | 33504224 | - |
| 6 H 8 | 33500306 | - |
| 6 X 7 | 33504304 | - |
| 6.33 H 7 | 33500301 | - |
| 6.35 H 7 | 33500305 | - |
| 7.9 H 8 | 33500404 | - |
| 8 H 7 | 33500504 | - |
| 8.3 H 8 | 33500536 | 33500537 |
| 9.2 H 8 | - | 33500627 |
| 9.5 H 8 | - | 33500657 |
| 10 M 8 | - | 33501707 |
| 12 H 7 | 33500904PT | - |

EXPERT ADVICE

- To use with our drill guides RB 240 - RB 245, pg. 47 and Dotco Pistol Drills, pg. 32-34.



On request, we can supply special reamers - diameters, length, tolerance, flutes, coating, shank according to your specifications.



Alternative drills may be manufactured on request:
E.g. special diameters and lengths.

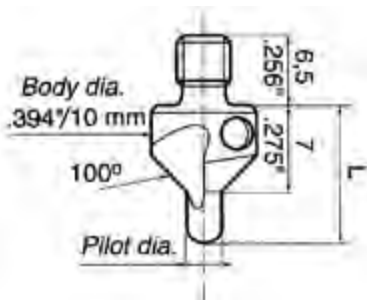
| FOR USE WITH | ALUMINIUM | STEEL | TITANIUM | COMPOSITE |
|--------------|-----------|-------|----------|-----------|
| HSS | ● | | | |

| LC | | DRILL DIAMETER | | PART NUMBER |
|----|-------|----------------|--------|-------------|
| mm | in | mm | in | |
| 8 | 0.315 | 3.20 | 0.1260 | 33000132 |
| 12 | 0.472 | 2.50 | 0.0984 | 33000020 |
| 12 | 0.472 | 3.00 | 0.1181 | 33000025 |
| 12 | 0.472 | 3.20 | 0.1260 | 33000030 |
| 12 | 0.472 | 4.00 | 0.1575 | 33000040 |
| 15 | 0.591 | 4.00 | 0.1575 | 33000240 |
| 15 | 0.591 | 4.80 | 0.1890 | 33000248 |
| 20 | 0.787 | 2.50 | 0.0984 | 33000625 |
| 20 | 0.787 | 3.20 | 0.1260 | 33000632 |

COUNTERSINK CUTTERS FOR FLAT OFFSET ANGLE DRILL

- HSS UNF 10-32F

| FOR USE WITH | ALUMINIUM | STEEL | TITANIUM | COMPOSITE |
|--------------|-----------|-------|----------|-----------|
| HSS | ● | | | |



| L | | PILOT DIAMETER | | PART NUMBER |
|-------|-------|----------------|--------|-------------|
| mm | in | mm | in | |
| 9.40 | 0.370 | 1.60 | 0.0630 | 33001005 |
| 10.60 | 0.417 | 2.40 | 0.0945 | 33001010 |
| 10.75 | 0.423 | 2.50 | 0.0984 | 33001015 |
| 11.60 | 0.456 | 3.20 | 0.1260 | 33001020 |

EXPERT ADVICE

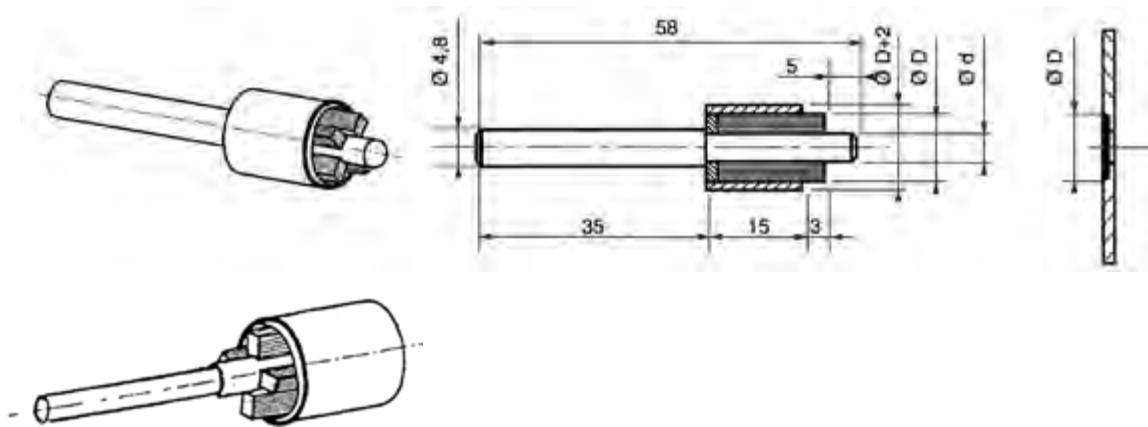
- These cutters are designed for use with the flat offset angle drill RB 106 with UNF 10-32 F spindle thread, pg. 44.
- We recommend the use of Dotco pistol drills, pg. 32-34.



Alternative drills may be manufactured on request:
E.g. special diameters and lengths.

PRECISION MANUFACTURING

- Used for cleaning paint, dirt, rust from around rivet or bolt holes. By placing the pilot in the rivet hole, the cleaning process is secure. Assures a positive electrical contact to eliminate static electricity buildup.
- Wire diameter 0.008 in.
- Solid item with a steel shank + pilot, nylon body in a copper sleeve, 4 steel brushes set at 90°.



| DIA D mm | DIA D mm | PART NUMBER |
|----------|----------|-------------|
| 8 | 3.20 | 32110067 |
| 10 | 2.40 | 32110102 |
| 10 | 2.50 | 32110069 |
| 10 | 3.10 | 32110070 |
| 10 | 3.50 | 32110071 |
| 10 | 4.00 | 32110065 |
| 10 | 5.00 | 32110078 |
| 12 | 2.40 | 32110103 |
| 12 | 3.00 | 32110097 |
| 12 | 3.10 | 32110072 |
| 12 | 3.50 | 32110073 |
| 12 | 4.00 | 32110055 |

| DIA D mm | DIA D mm | PART NUMBER |
|----------|----------|-------------|
| 12 | 4.80 | 32110074 |
| 12 | 5.00 | 32110079 |
| 13 | 3.00 | 32110060 |
| 13 | 4.80 | 32110057 |
| 13 | 5.00 | 32110056 |
| 14 | 4.00 | 32110063 |
| 14 | 4.80 | 32110064 |
| 14 | 5.00 | 32110082 |
| 14 | 5.20 | 32110081 |
| 14 | 6.00 | 32110080 |
| 14 | 6.30 | 32110068 |

| DIA D mm | DIA D mm | PART NUMBER |
|----------|----------|-------------|
| 14 | 7.50 | 32110059 |
| 16 | 4.10 | 32110075 |
| 16 | 4.80 | 32110076 |
| 16 | 5.00 | 32110119 |
| 16 | 6.00 | 32110098 |
| 16 | 6.30 | 32110058 |
| 18 | 4.80 | 32110062 |
| 20 | 5.00 | 32110077 |
| 20 | 7.80 | 32110066 |
| 21 | 9.30 | 32110083 |
| 23 | 7.50 | 32110061 |

| | | |
|---|-------|-----|
| Compression Riveter - Alligator Jaw RB43, RB40-85, RB40-60, RB44-60 | --- | 100 |
| Compression Riveter - C-Yoke RB41, RB42 | ----- | 102 |
| Special C-Yokes For RB41, RB42 Squeezers | ----- | 104 |
| Pressure Riveting Unit RB46 | ----- | 106 |
| Special C-Yokes For RB46 | ----- | 108 |
| Special Alligator Jaw For RB46 | ----- | 109 |
| Hydropneumatic Generator - Hose For RB46 | ----- | 110 |
| Riveting Cylinder For RB46 | ----- | 111 |
| Rivet Squeezer Sets RB400, RB401, RB402 | ----- | 113 |
| Flush Rivet Set - Swivel Type | ----- | 114 |
| Flush Rivet Set - Mushroom Type | ----- | 115 |
| Thickness Gauge - Hand-Riveting Pliers RB41-17-70 | ----- | 116 |
| Hand-Riveting Pliers | ----- | 117 |
| Rivet Cutting Pliers RB2015, RBI2015 | ----- | 118 |
| Ring Cutters | ----- | 119 |
| Rivet Hammers - Riveter For F2-F4, F4-PT-RT-B | ----- | 120 |
| Rivet Sets RB6081, RB6082, RB6083, RB6084, RB6085 | ----- | 121 |
| Rivet Shaver 14CF Series | ----- | 122 |

DESCRIPTION

- Rivet set holder adjustment - stroke 0.2 in / 5 mm in allows the operator to use this compression riveter with different thicknesses without changing the rivet set.
- This light, sturdy, compact and fast compression riveter, has a maximum rivet capacity of 3/16 in dia for aluminum rivets (depending on the rivet joint thickness).
- Equipped with a safety throttle lever.
- Smooth controlled throttle movement for fast and slow approach.
- Alternative air inlet on request (example 1/4 BSP or 1/4 NPT)
- To develop maximum power the riveter must squeeze the rivet near to the end of the riveting stroke. Therefore, the combined length of the two rivets sets must be correct.



| COMPRESSION RIVETER - ALLIGATOR JAWS | | | | | | | | |
|--------------------------------------|-------------|------------------------------|---|-----------------------------------|---------------|-------------|--------------------|-----------------|
| Model | Part Number | Rivet Squeezer Set Shank Dia | Capacity Aluminum Rivets Diameter - in / mm | Maximum force at 6.3 bar / 90 PSI | Reach mm / in | Gap mm / in | Max Travel mm / in | Weight kg / lbs |
| RB43 | 60104010 | 5 mm | 9/64 in / 3.6 mm | 1.4 t / 3090 lbs | 60 / 2.36 | 55 / 2.16 | 49 / 1.93 | 2.080 / 0.94 |
| RB43 | 60104110 | 3/16 in | 9/64 in / 3.6 mm | 1.4 t / 3090 lbs | 60 / 2.36 | 55 / 2.16 | 49 / 1.93 | 2.080 / 0.94 |
| RB40-85 | 60101020 | 5 mm | 9/64 in / 3.6 mm | 1.8 t / 3970 lbs | 85 / 3.35 | 55 / 2.16 | 49 / 1.93 | 3.100 / 1.41 |
| RB40-85 | 60101120 | 3/16 in | 9/64 in / 3.6 mm | 1.8 t / 3970 lbs | 85 / 3.35 | 55 / 2.16 | 49 / 1.93 | 3.100 / 1.41 |
| RB40-60 | 60101010 | 5 mm | 3/16 in / 4.8 mm | 2.6 t / 5730 lbs | 60 / 2.36 | 55 / 2.16 | 49 / 1.93 | 3.020 / 1.37 |
| RB40-60 | 60101110 | 3/16 in | 3/16 in / 4.8 mm | 2.6 t / 5730 lbs | 60 / 2.36 | 55 / 2.16 | 49 / 1.93 | 3.020 / 1.37 |
| RB44-60 | 60110010 | 5 mm | 7/32 in / 5.6mm | 3.0 t / 6610 lbs | 58 / 2.28 | 35 / 1.38 | 45 / 1.77 | 5.100 / 2.32 |
| RB44-60 | 60110011 | 3/16 in | 7/32 in / 5.6mm | 3.0 t / 6610 lbs | 58 / 2.28 | 35 / 1.38 | 45 / 1.77 | 5.100 / 2.32 |

TECH DATA

Part Number for Standard Alligator Jaws as shown on outline drawing - Special versions are available

RB44-60 Capacity Titanium Rivets 5/32 in / 4.0 mm

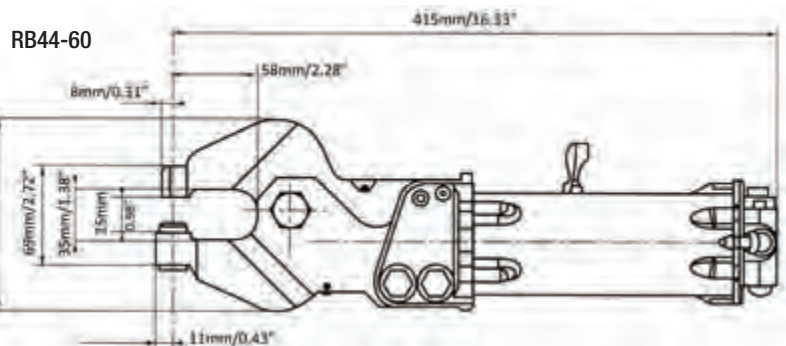
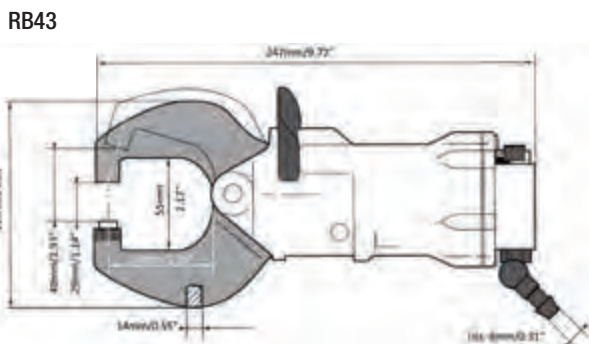
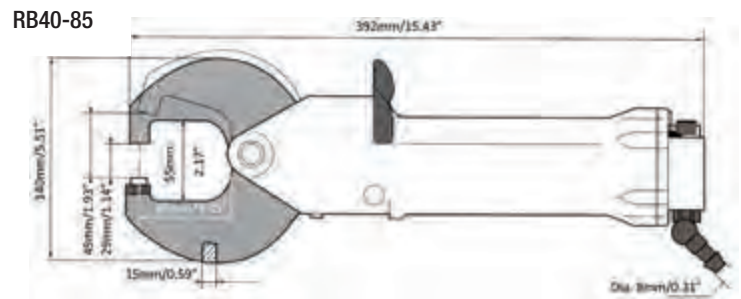
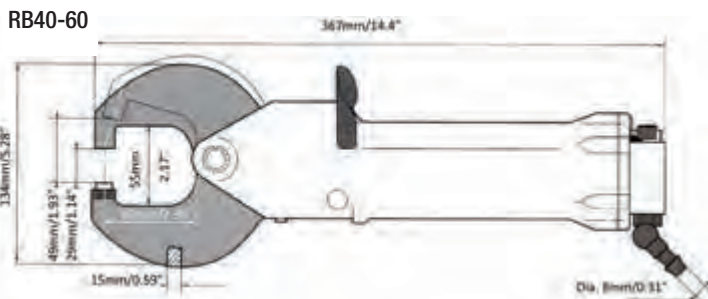
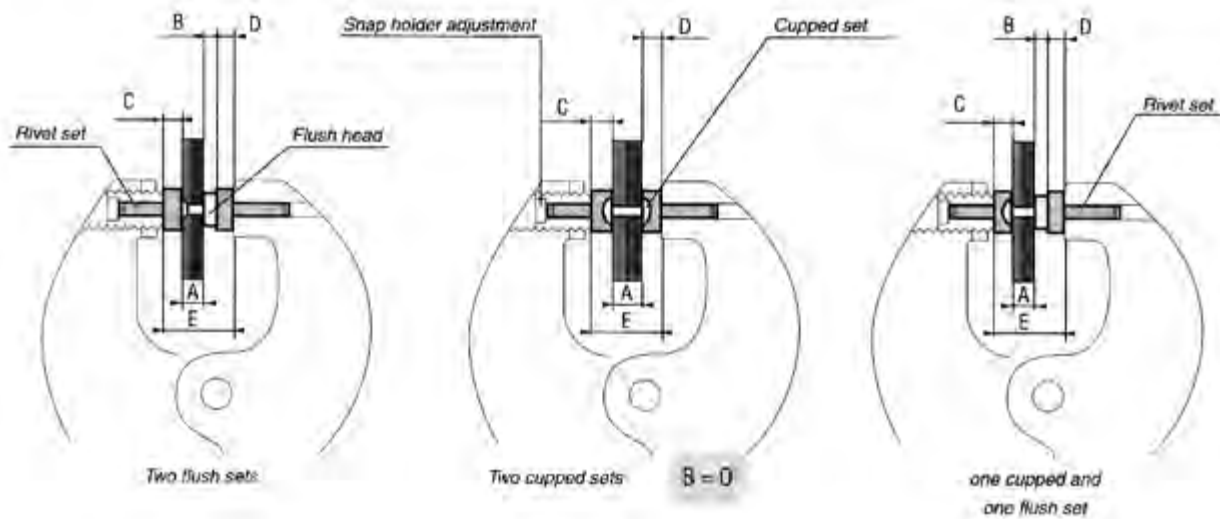
Select Rivet Set from: RB 400 for countersink rivets, RB 401 for universal head type rivets, RB 402 for special reduced universal head rivets, pg. 113.

Data at 6.3 bar / 90 psi

DETERMINE THE CORRECT LENGTH OF RIVET SETS AS FOLLOWS:

E - A - B = C + D

- A** - component thickness
- B** - height of finished rivet head (flush)
- C** - rivet set height (fixed)
- D** - rivet set height (mobile)
- E** - closed height dimension of the jaws (adjust by moving the snap holder)



DESCRIPTION

- Rivet set holder adjustment - stroke 0.12 in / 3 mm allows the operator to use this compression riveter with different thicknesses without changing the rivet set.
- This light, sturdy, compact and fast compression riveter has a maximum rivet capacity of 9/64 in dia (3.6 mm) for aluminum rivets (depending on the rivet joint thickness).
- Equipped with a safety throttle lever.
- Smooth controlled throttle movement for fast and slow approach.
- To develop maximum power the riveter must squeeze the rivet near to the end of the riveting stroke. Therefore, the combined length of the two rivets sets must be correct.



RB41



RB42

| COMPRESSION RIVETER - C YOKE | | | | | | | | | |
|------------------------------|-------------|-----------------------------------|---|-----------------------------------|---------------|-------------|-----------------------|--------------------|-----------------|
| Model | Part Number | Rivet Squeezer Set Shank Diameter | Capacity Aluminum Rivets Diameter - in / mm | Maximum force at 6.3 bar / 90 PSI | Reach mm / in | Gap mm / in | Piston Stroke mm / in | Max Travel mm / in | Weight kg / lbs |
| RB 42 | 60103110 | 3/16 in | 9/64 / 3.6 | 1.4 t / 3090 lbs | 50 / 2.00 | 36 / 1.41 | 16 / 0.62 | 35 / 1.38 | 2.165 / 0.98 |
| RB 42 | 60103010 | 5 mm | 9/64 / 3.6 | 1.4 t / 3090 lbs | 50 / 2.00 | 36 / 1.41 | 16 / 0.62 | 35 / 1.38 | 2.165 / 0.98 |
| RB 41 | 60102110 | 3/16 in | 3/16 / 4.8 | 2.2 t / 4850 lbs | 50 / 2.00 | 35 / 1.38 | 12 / 0.47 | 34 / 1.34 | 3.040 / 1.38 |
| RB 41 | 60102010 | 5 mm | 3/16 / 4.8 | 2.2 t / 4850 lbs | 50 / 2.00 | 35 / 1.38 | 12 / 0.47 | 34 / 1.34 | 3.040 / 1.38 |

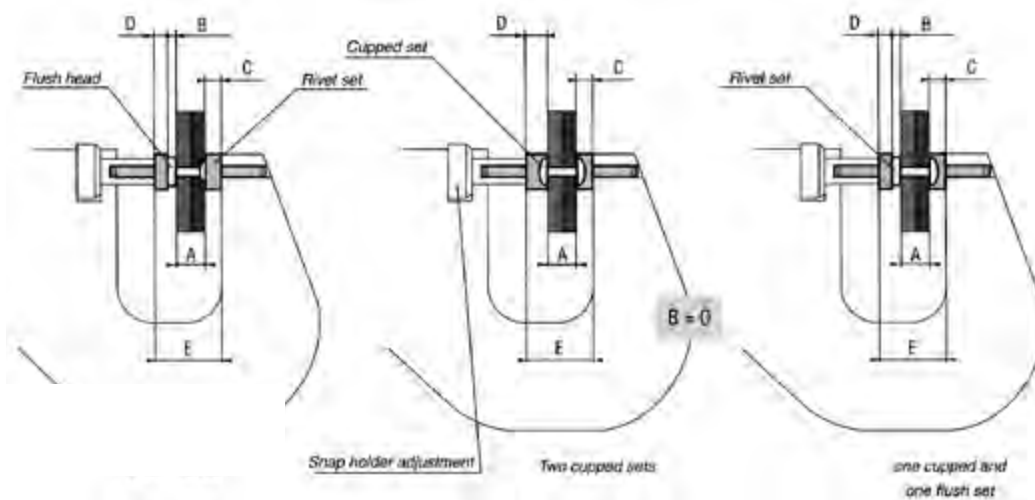
TECH DATA

Part Number for Standard C Yoke Jaws as shown on outline drawing - Special versions are available
 Select Rivet Set from: RB 400 for countersink rivets. RB 401 for universal head type rivets. RB 402 for special reduced universal head rivets, pg. 113.
 Data at 6.3 bar / 90 psi

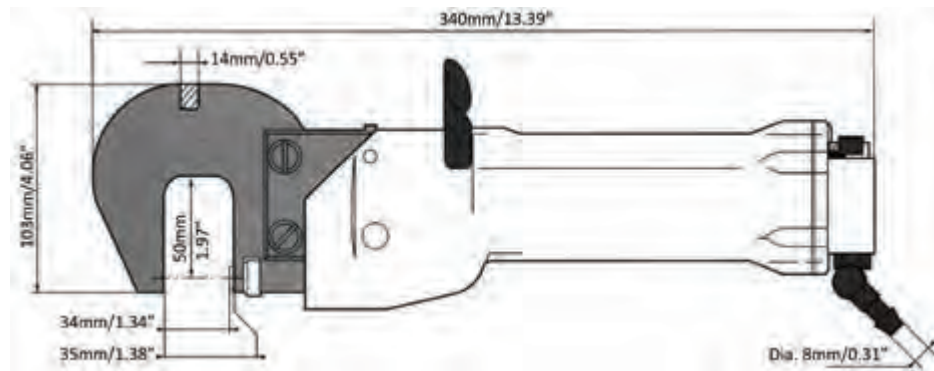
DETERMINE THE CORRECT LENGTH OF RIVET SETS AS FOLLOWS:

E - A - B = C + D

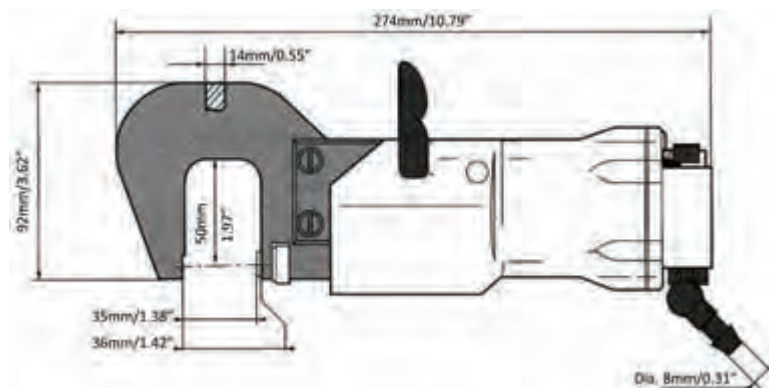
- A** - component thickness
- B** - height of finished rivet head (flush)
- C** - rivet set height (fixed)
- D** - rivet set height (mobile)
- E** - closed height dimension of the jaws (adjust by moving the snap holder)



RB41



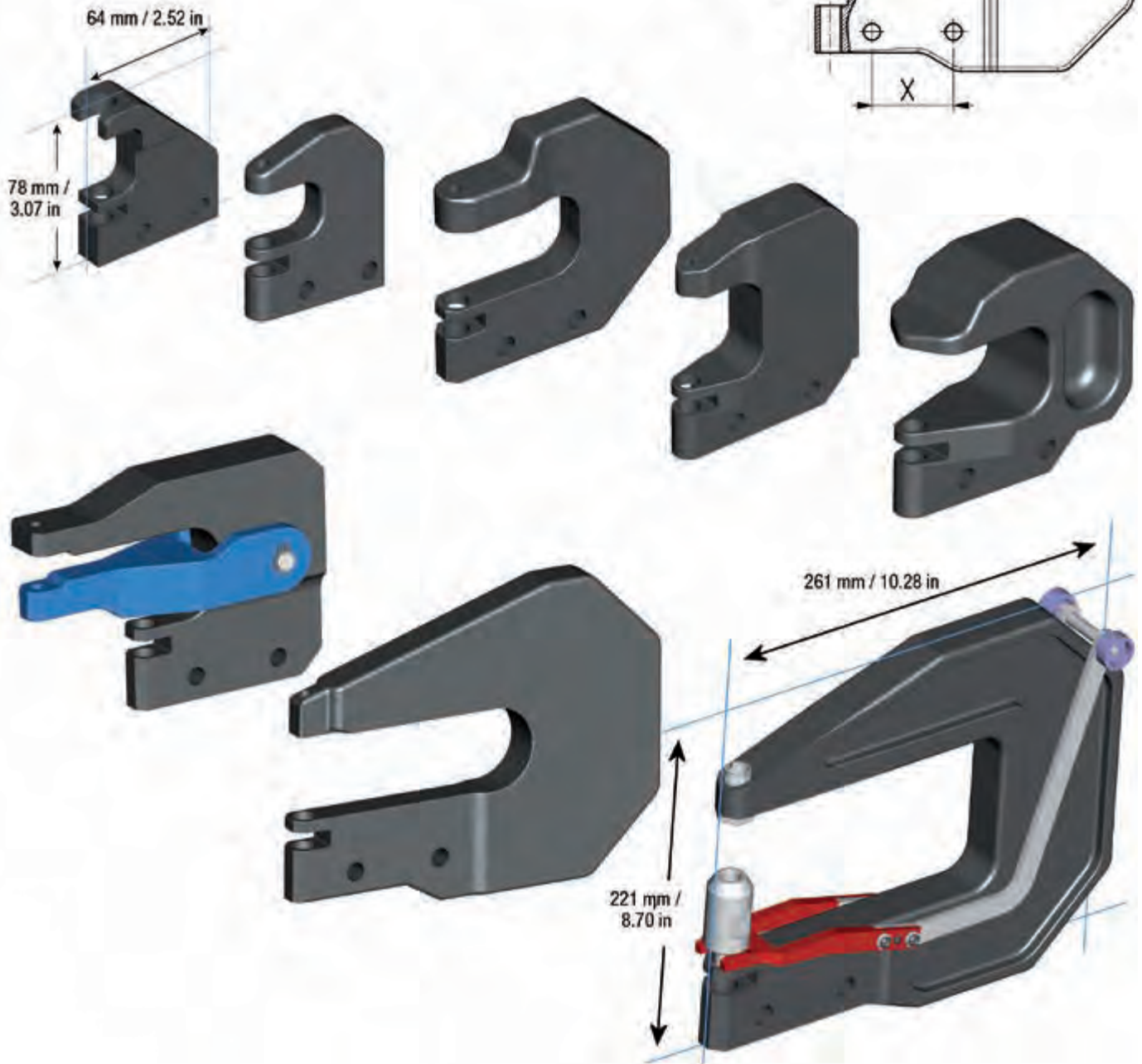
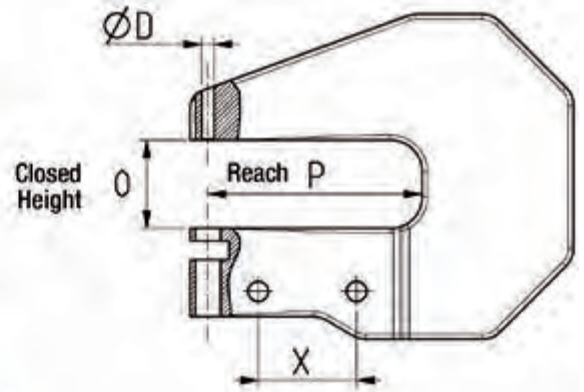
RB42



DESCRIPTION

- For each special application, the C-yoke's shape is optimized for weight, flexibility, and strength with a fine element analysis software.

| YOKE RB 41 | YOKE RB 42 |
|---------------------|---------------------|
| X = 39 mm / 1.54 in | X = 31 mm / 1.22 in |

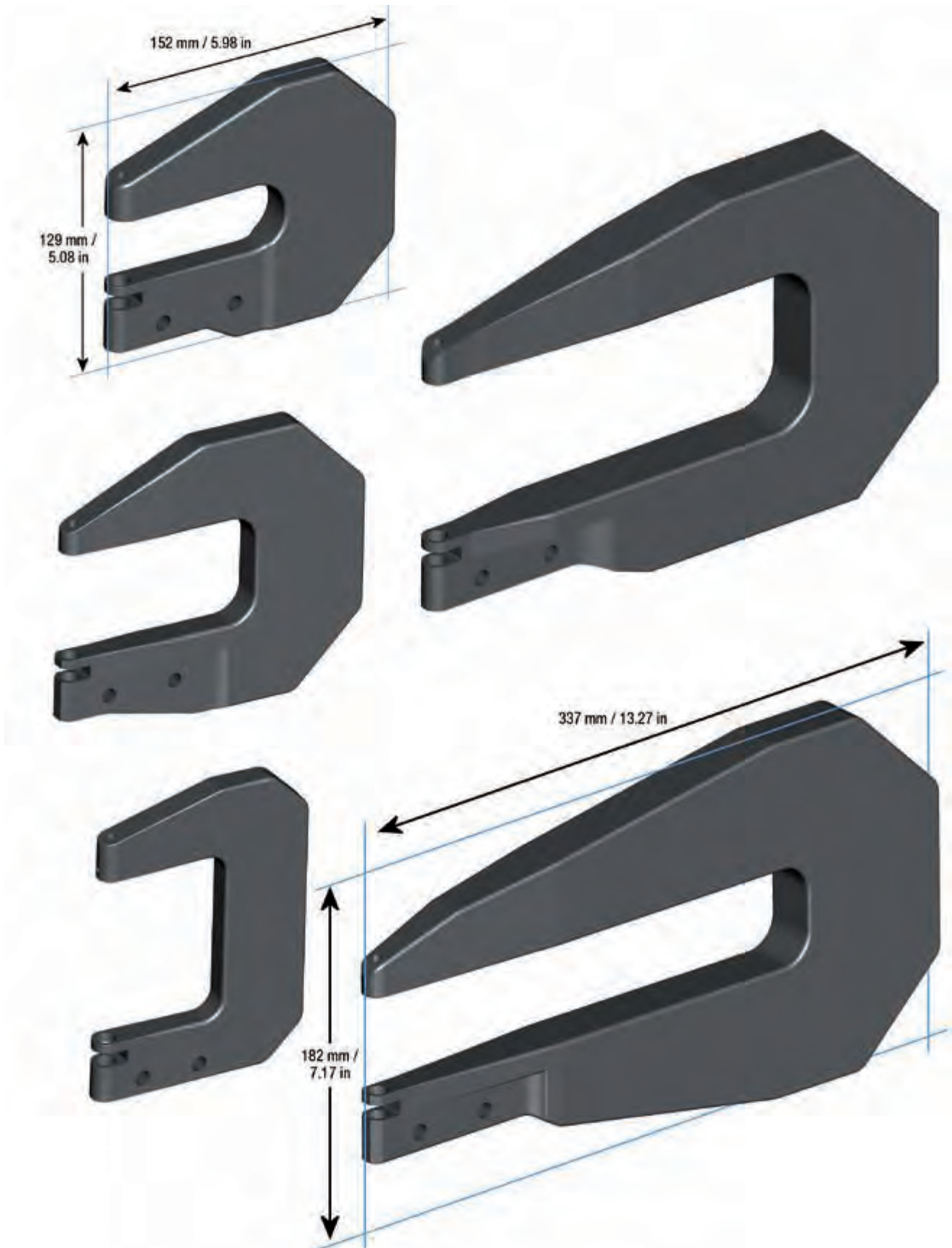



Alternative C-yokes may be made on request with special dimensions.


When ordering, please indicate: rivet diameter and material, rivet squeezer set shank diameter, reach "P", closed height "O" and X = 31 (RB 42) or X = 39 (RB 41). Hundreds of models available on demand.

Special C-Yokes

For RB41 | RB42 Squeezers



| RB 46-01 | STANDARD EQUIPMENT | RIVETING ASSEMBLY CODE NUMBER |
|---|---|-------------------------------|
| Manual cycle start-up and force adjustment on cylinder | | |
|  | Hydropneumatic generator with 1.8 m / 5.9 ft hose 60300106 | 60203006 |
| | Riveting cylinder with manual control on cylinder 60202005 | |
| | Hydropneumatic generator with 3 m / 9.8 ft hose 60300206 | 60203106 |
| | Riveting cylinder with manual control on cylinder 60202005 | |

| RB 46-03 | STANDARD EQUIPMENT | RIVETING ASSEMBLY CODE NUMBER |
|---|---|-------------------------------|
| Pedal cycle start-up and force adjustment on generator | | |
|  | Hydropneumatic generator with 1.8 m / 5.9 ft hose 60300111 | 60203016 |
| | Riveting cylinder with connection block 60202010 Remote pedal control 60404005 | |
| | Hydropneumatic generator with 3 m / 9.8 ft hose 60300211 | 60203116 |
| | Riveting cylinder with connection block 60202010 | |
| | Remote pedal control 60404005 | |

TECHNICAL DATA

Max. riveting dia. (depending on the rivet joint thickness):

Light alloy: 5/16 in - Ø 8 mm

Mone!® metal: 1/4 in - Ø 6.35 mm

Titanium: 7/32 in - Ø 5.6 mm

Adjusting nut for return stroke

Min. force: 0.4 t

Max. force: 7 t

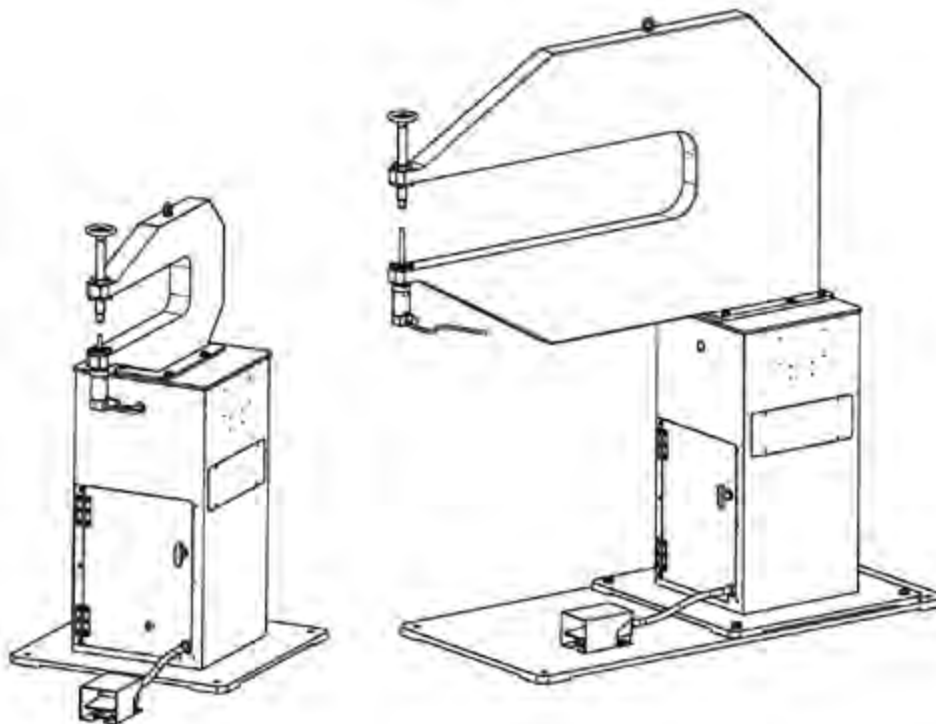
Max. cylinder stroke: 2.00 in - 50 mm

DESCRIPTION

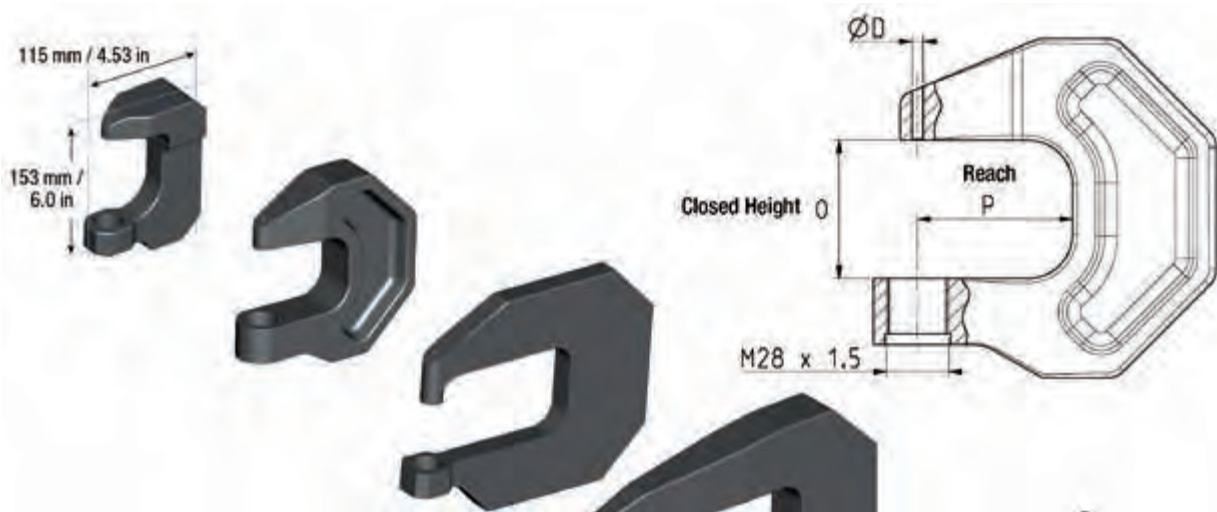
- The RB 46 pressure riveting assembly comprises a hydropneumatic generator, a hydraulic cylinder and a regulator for setting the force (max. 7 tonnes). It uses various standard and special yokes to form solid rivets made from various materials.
- It is easy to use and adjust, making it suitable for all riveting operations on assembly rigs and for maintenance repairs.
- The work cycle is performed automatically after initiation by the operator.
 - quick feed at low pressure until rivet contact
 - high pressure squeezing at preset forces
 - automatic return.
- The principle of this riveting assembly is based on automatic control of the squeezing force; no additional adjustment is required to squeeze rivets of the same type, diameter, and material on assemblies of varying thicknesses.
- An adjusting nut can be used to reduce the return stroke to shorten the riveting time.



Assembly for riveting fastened to fixed frames examples

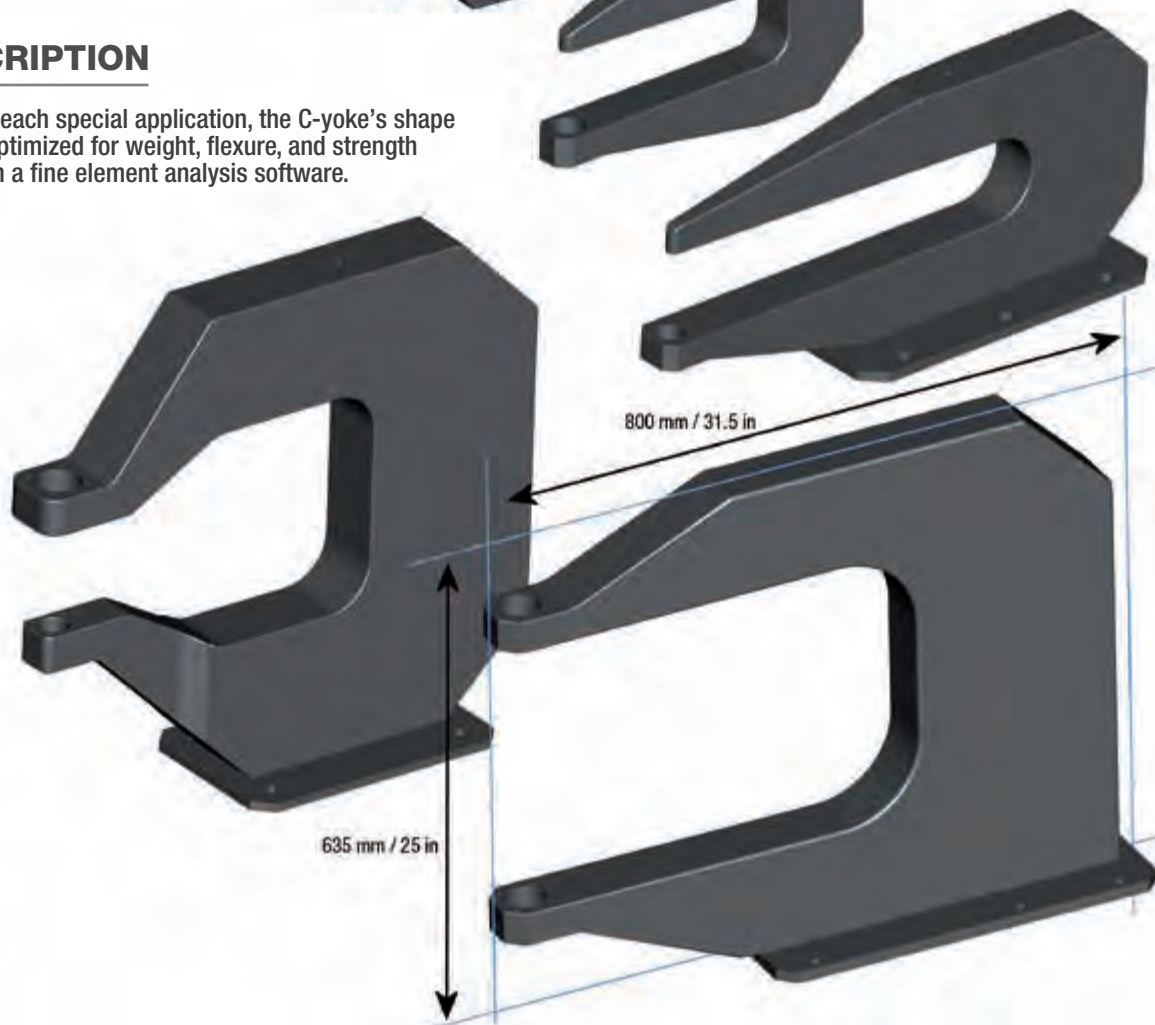


*When ordering, indicate riveting assembly code number only.
Options on request: Special yokes,
Assembly for riveting, dimpling, and punching operations (fastened to fixed frames).*



DESCRIPTION

- For each special application, the C-yoke's shape is optimized for weight, flexure, and strength with a fine element analysis software.

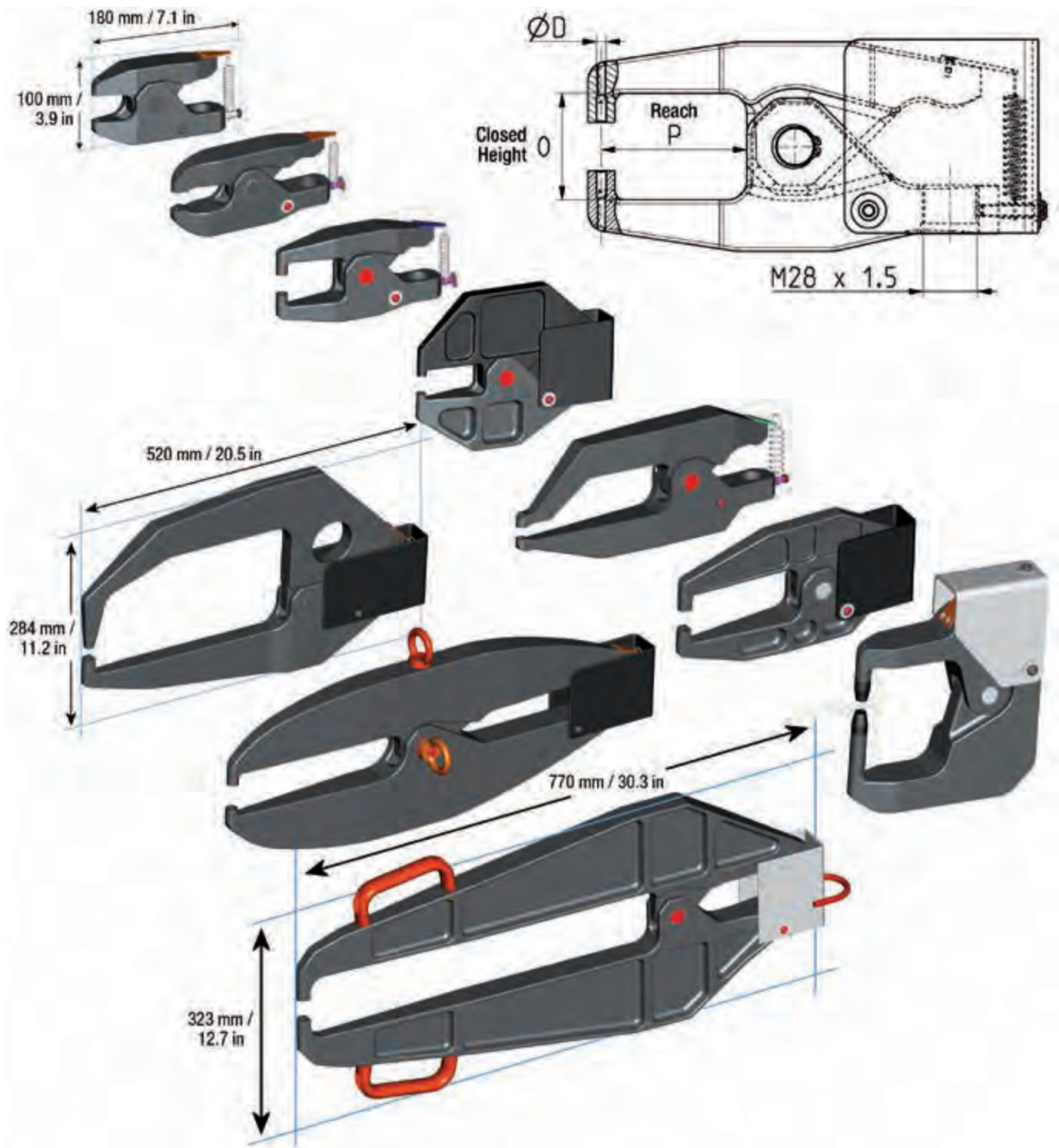


Alternative C-yokes may be made on request with special dimensions.
When ordering, please indicate: rivet diameter and material, rivet squeezer set shank diameter, reach "P", closed height "O".
Hundreds of models available on demand.

Special Alligator Jaws

For RB46

**Recoules
Quackenbush**
Precision Drilling - Every Time



EXPERT ADVICE

- Refer to pg. 113 for rivet squeezer set selection (RB400, RB401, RB402).



Alternative alligator jaws may be made on request with special dimensions. When ordering, please indicate rivet diameter and material, rivet squeezer set shank diameter, reach "P", closed height "0". Hundreds of models available on demand.

DESCRIPTION

- This hydropneumatic generator comprises:
 - compressed air conditioning assembly with lubricating regulating cylinder.
 - wheeled trolley with a 4.5 l / 1.2 g oil tank with a working capacity of 2.8 l / 0.74 g.
 - two-stage low and high pressure pump.
- Hydraulic pressure can be adjusted (max. 10 KSI).
- The high pressure stage generates the preset force, either directly onto the cylinder (RB 46-01) or on the adjustment block (RB 46-03).
- The end of the automatic cycle takes place when the preset force is reached.



| HYDROPNEUMATIC GENERATOR | CODE NUMBER |
|--------------------------|-------------|
| For RB 46-01 | 60300006 |
| For RB 46-03 | 60300011 |

TECHNICAL DATA

Connection to compressed air network: 6 to 7 bars (87 - 101 psi)
 Flow rate: 750 L/mn / 26 cfm
 Pipe I.D.: Min 10 mm / 0.39 in

EXPERT ADVICE

- We recommend the use of MOBIL DTE.13 oil (5 liter can) #91450007.

| HOSE | LENGTH | RIVETING ASSEMBLY CODE NUMBER |
|--------------|-----------------|-------------------------------|
| For RB 46-01 | | |
| | 1.80 m / 5.9 ft | 40150520 |
| | 3 m / 9.8 ft | 40150530 |

6 m / 19.6 ft hose on request only.

| HOSE | LENGTH | RIVETING ASSEMBLY CODE NUMBER |
|--------------|-----------------|-------------------------------|
| For RB 46-03 | | |
| | 1.80 m / 5.9 ft | 60300520 |
| | 3 m / 9.8 ft | 60300530 |

6 m / 19.6 ft hose on request only.

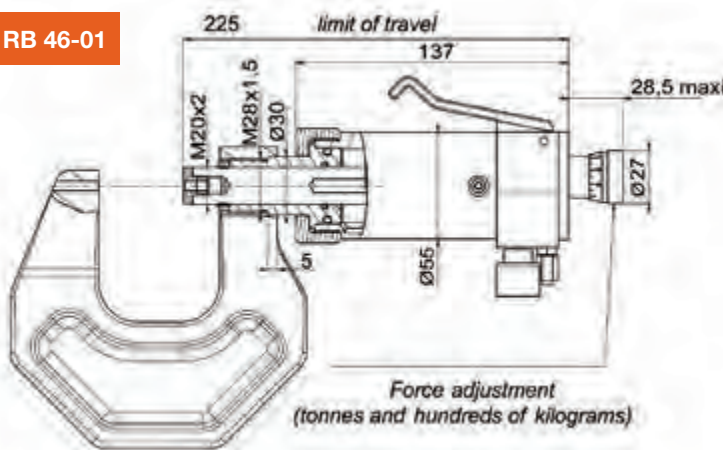
DESCRIPTION

- This cylinder performs an automatic work cycle. A hydraulic pressure controller permits automatic force control, whatever the pressure variation in the hydropneumatic generator power system.
- The automatic force control operates along the entire stroke. It enables rivets of the same type, diameter, and material to be squeezed on assemblies of varying thicknesses without additional adjustment.
- Safety device preventing accidental startup with the manual control cylinder version.

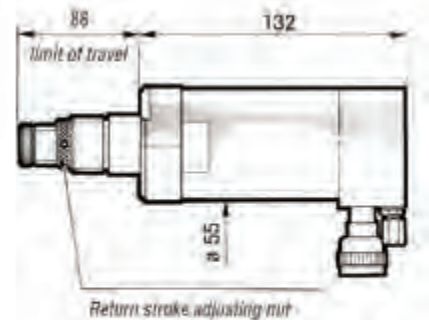
| RIVETING CYLINDER | CODE NUMBER |
|---|-------------|
| Riveting cylinder with manual control on cylinder For RB 46-01 | 60202005 |
| Riveting cylinder with connection block For RB 46-03 | 60202010 |



For RB 46-01



For RB 46-03



TECHNICAL DATA

Max. riveting dia. (depending on the rivet joint thickness):

Light alloy: 5/16 in - Ø 8 mm

Max. force: 7 t

Monel® metal: 1/4 in - Ø 6.35 mm

Max. cylinder stroke: 2.00 in - 50 mm

Titanium: 7/32 in - Ø 5.6 mm

Weight without Yoke: 2 kg / 4.4 lbs

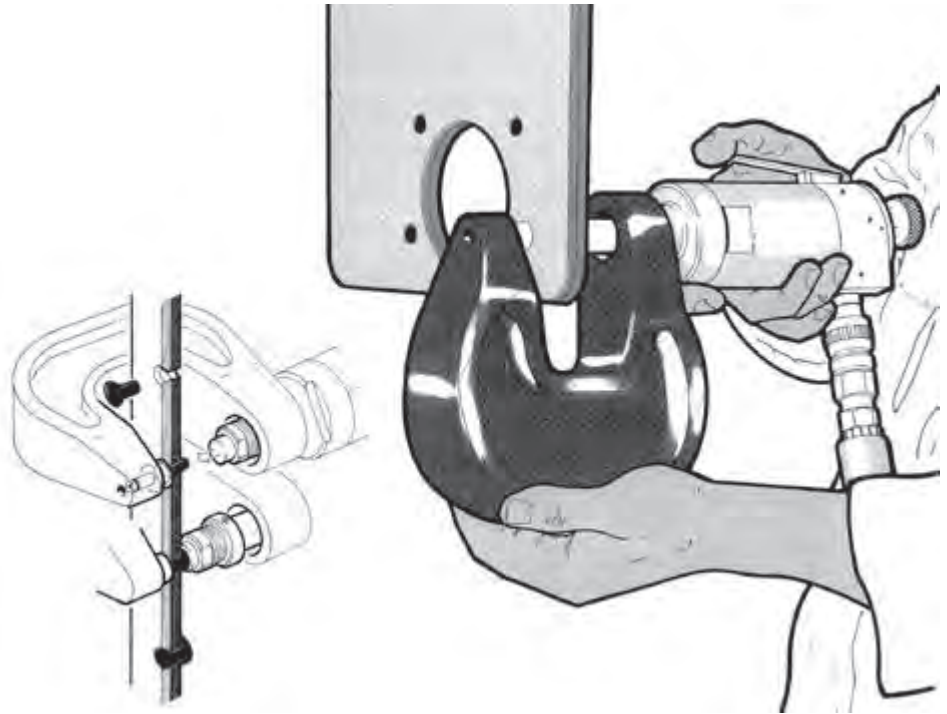
Min. force: 0.4 t

Cycle time: 2.5 s*

*To set a light alloy rivet with a diameter of 4.8 mm with a no-load stroke of 10 mm / 0.39 in and a 1.80 m / 5.9 ft hydraulic hose.

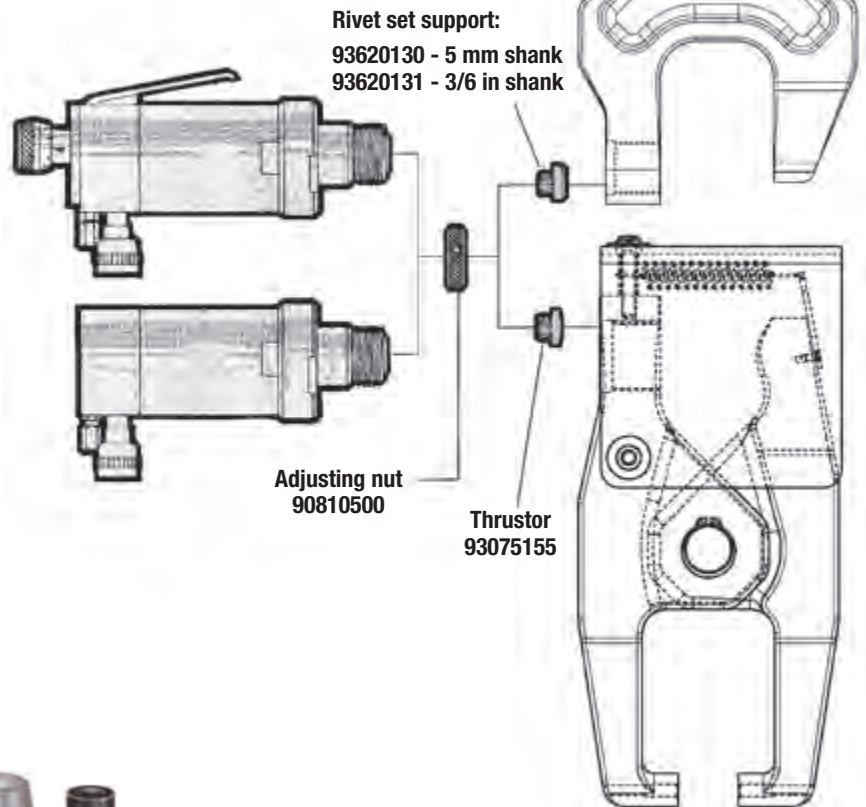
RIVETING CYLINDER

- For RB46-01, RB46-03



For RB 46-01

For RB 46-03



EXPERT ADVICE

- Refer to pg. 113 for rivet squeezer set selection (RB400, RB401, RB402).



Special c-yokes / alligator jaws on request.

PRECISION MANUFACTURING

- RB 400 for countersink rivets
- RB 401 for universal head type rivets
- RB 402 for special reduced universal head rivets

ON REQUEST SQUEEZER SETS WITH 3/16 IN SHANK:

RB 400 Code number 60702...

RB 401 Code number 60712...

RB 402 Code number 60722...

RB 400

SHANK Ø 4
D RING Ø 2.7 x 1
Code: 91 820 321

SHANK Ø 4.8 - 5
D RING Ø 3 x 1
Code: 91 820 301

Standard

| RIVET DIA | 1.6 & 2.4 | | 3.2 & 3.6 | | 4 | | 4.8 | | 5.6 & 6.4 | | |
|-----------|-------------------|----------|------------------|---|----------|----------|---------|--|------------------|--|--|
| | 1/16 in & 3/32 in | | 1/8 in & 9/64 in | | 5/32 in | | 3/16 in | | 7/32 in & 1/4 in | | |
| Ø | d | 7 | 9 | 10 | 12 | 16 | | | | | |
| | D | 9 | 9 | 14 | 14 | 16 | | | | | |
| L | 4 | 60703005 | 60703205 | 60703405 | 60703505 | 60703605 | | | | | |
| | 7 | 60703020 | 60703220 | 60703420 | 60703520 | 60703620 | | | | | |
| | 10 | 60703040 | 60703240 | 60703440 | 60703540 | 60703640 | | | | | |
| | 12.5 | 60703055 | 60703255 | 60703455 | 60703555 | 60703655 | | | | | |
| | 16 | 60703075 | 60703275 | 60703475 | 60703575 | 60703675 | | | | | |
| | 20 | 60703095 | 60703295 | 60703495 | 60703595 | 60703695 | | | | | |
| L | 4 | 60701005 | 60701205 | RB 40-13-30 Shank 4 dia only 0.1575 in | | | | | | | |
| | 7 | 60701020 | 60701220 | | | | | | | | |

RB 401

NFL 21215
AN 470
LN 9198
NSA 5413

r = 0.2

SHANK Ø 4
D RING Ø 2.7 x 1
Code: 91 820 321

SHANK Ø 4.8 - 5
D RING Ø 3 x 1
Code: 91 820 301

Standard

| RIVET DIA | 2.4 | | 3.2 | | 4 | | 4.8 | | 5.6 | | 6.4 | |
|-----------|---------|----------|----------|---|----------|----------|----------|----|---------|----|--------|----|
| | 3/32 in | | 1/8 in | | 5/32 in | | 3/16 in | | 7/32 in | | 1/4 in | |
| Ø | d | 7 | 9 | 10 | 12 | 14 | 14 | 14 | 14 | 16 | 16 | 16 |
| | D | 9 | 9 | 14 | 14 | 14 | 14 | 14 | 14 | 16 | 16 | 16 |
| L | 4 | 60713105 | 60713205 | 60713405 | 60713505 | 60713605 | 60713705 | | | | | |
| | 7 | 60713120 | 60713220 | 60713420 | 60713520 | 60713620 | 60713720 | | | | | |
| | 10 | 60713140 | 60713240 | 60713440 | 60713540 | 60713640 | 60713740 | | | | | |
| | 12.5 | 60713155 | 60713255 | 60713455 | 60713555 | 60713655 | 60713755 | | | | | |
| | 16 | 60713175 | 60713275 | 60713475 | 60713575 | 60713675 | 60713775 | | | | | |
| | 20 | 60713195 | 60713295 | 60713495 | 60713595 | 60713695 | 60713795 | | | | | |
| L | 4 | 60711105 | 60711205 | RB 40-13-30 Shank 4 dia only 0.1575 in | | | | | | | | |
| | 7 | 60711120 | 60711220 | | | | | | | | | |

RB 402

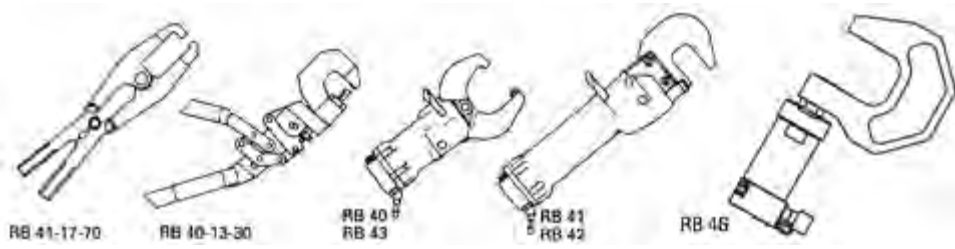
NSA 5411 - Titanium:
NSA 5415 - Monel® metal:
ASNA 2020

r = 0.2

SHANK Ø 4.8 - 5
D RING Ø 3 x 1
Code: 91 820 301

Standard

| RIVET DIA | 2.4 | | 3.2 | | 3.6 | | 4 | | 4.8 | | 5.6 | |
|-----------|---------|----------|----------|----------|----------|----------|----------|----|---------|----|---------|----|
| | 3/32 in | | 1/8 in | | 9/64 in | | 5/32 in | | 3/16 in | | 7/32 in | |
| Ø | d | 7 | 9 | 9 | 9 | 10 | 12 | 14 | 14 | 14 | 14 | 14 |
| | D | 9 | 9 | 9 | 9 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| L | 4 | 60723105 | 60723205 | 60723305 | 60723405 | 60723505 | 60723605 | | | | | |
| | 7 | 60723120 | 60723220 | 60723320 | 60723420 | 60723520 | 60723620 | | | | | |
| | 10 | 60723140 | 60723240 | 60723340 | 60723440 | 60723540 | 60723640 | | | | | |
| | 12.5 | 60723155 | 60723255 | 60723355 | 60723455 | 60723555 | 60723655 | | | | | |
| | 16 | 60723175 | 60723275 | 60723375 | 60723475 | 60723575 | 60723675 | | | | | |
| | 20 | 60723195 | 60723295 | 60723395 | 60723495 | 60723595 | 60723695 | | | | | |



EXPERT ADVICE

- All of our rivet squeezer sets have been specially designed to use with our pneumatic or hydraulic tools.

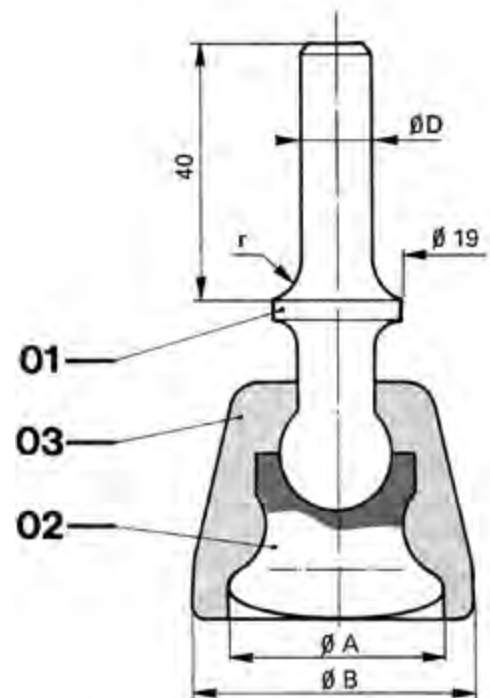
PRECISION MANUFACTURING

- Use of this type of rivet set with a rubber guard prevents slipping and damage to skin surface.



| DIA D | | DIA A | | DIA B | R | CODE NUMBER |
|-------|-------|-------|-------|-------|------|-------------|
| mm | in | mm | in | mm | | |
| 10.2 | 0.401 | 18 | 0.700 | 24 | 12.7 | 60751100 |
| 10.2 | 0.401 | 31 | 1.22 | 40 | 12.7 | 60751150 |
| 10.2 | 0.401 | 25 | 0.984 | 33 | 12.7 | 03910638PT |

| REP | DIA D | DIA A | CODE NUMBER |
|-----|-------|-------|-------------|
| 01 | 9.9 | 18 | 93201000 |
| 01 | 9.9 | 31 | 93201050 |
| 01 | 10.2 | 18 | 93201100 |
| 01 | 10.2 | 31 | 93201150 |
| 01 | 12.7 | 18 | 93201200 |
| 01 | 12.7 | 31 | 93201250 |
| 02 | - | 18 | 90830001 |
| 02 | - | 31 | 90830002 |
| 03 | - | 18 | 93080001 |
| 03 | - | 31 | 93080002 |

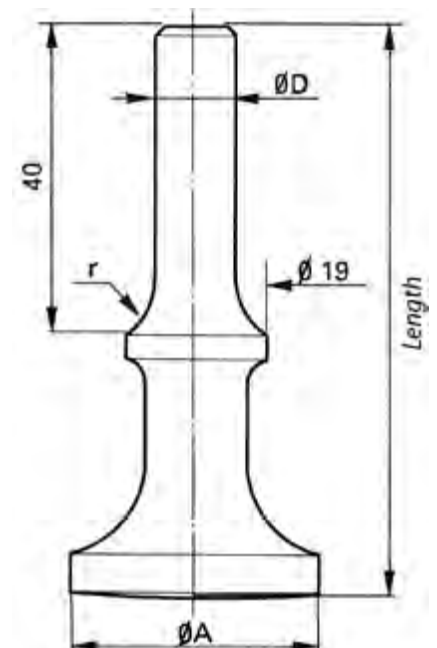


PRECISION MANUFACTURING

- This type of rivet set is particularly adapted for all riveting operations on thin sections.
- Quality of the working surface prevents damage to the skin.



| DIA D | | DIA A | | DIA L | | R | CODE NUMBER | |
|-------|-------|-------|-------|-------|------|-------|-------------|----------------------|
| mm | in | mm | in | mm | in | | | |
| 9.5 | 0.374 | 22 | 0.866 | 102 | 4.02 | - | 03911800PT | |
| 10.2 | 0.401 | 21 | 0.827 | 48 | 1.89 | - | 03911374PT | Special shank length |
| 10.2 | 0.401 | 22 | 0.866 | 65 | 2.56 | - | 03910900PT | |
| 10.2 | 0.401 | 22 | 0.866 | 66 | 2.58 | - | 03911809PT | |
| 10.2 | 0.401 | 22 | 0.866 | 109 | 4.27 | - | 03911810PT | |
| 10.2 | 0.401 | 31 | 1.22 | 90 | 3.54 | 12.70 | 60771150 | |
| 10.2 | 0.401 | 31 | 1.22 | 150 | 5.90 | 12.70 | 60771155 | |
| 10.2 | 0.401 | 31 | 1.22 | 190 | 7.48 | 12.70 | 60771160 | |
| 12.7 | 0.498 | 21 | 0.827 | 48 | 1.89 | - | 03911360PT | Special shank length |
| 12.7 | 0.498 | 35 | 1.38 | 55 | 2.17 | - | 03911361PT | Special shank length |



Different shank diameters are available.

PRECISION MANUFACTURING

- Simple and handy, equipped with a flexible, highly-efficient safety locking device, this inspection tool is designed for checking all thicknesses from 0 to 1 1/4 in (30 mm).
- The accurate scale allows reading to 0.004 in (0.1 mm).



CODE NUMBER

60901000

EXPERT ADVICE

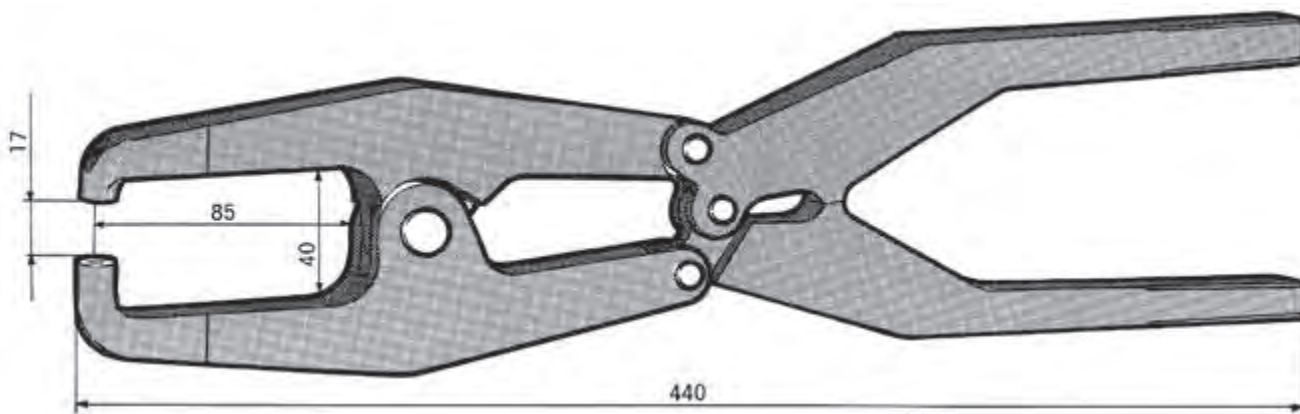
- Alternative thicknesses are available on request (example: 1.5 in / 40 mm, 4 1/2 in / 115 mm, 6 1/4 in / 160 mm, etc).
- On request, this tool is available in imperial measurement in graduation of 1/16 in.

HAND-RIVETING PLIERS

CODE NUMBER

60003000

RB 41-17-70



TECHNICAL DATA

Riveting aluminum rivets: 3/32 in dia - maxi Ø 2.4 mm

Weight: 1.750 kg

Depth: 3.35 in - 85 mm

To use with rivet squeezer set: 0.197 in dia shank - Ø 5 mm

Maxi opening: 1.57 in - 40 mm

Overall length: 17.32 in - 440 mm

This tool is supplied exclusive of the squeezer set

EXPERT ADVICE

- Refer to pg. 113 for rivet squeezer set selection (RB400, RB401, RB402).



ADVANTAGES

- Simple and sturdy, equipped with an interchangeable swivel yoke. These pliers have been designed to squeeze aluminum rivets up to capacity 1/8 in dia (Ø 3.2 mm).
- Compact with a 0.63 in (16 mm) opening and a depth of 1.18 in (30 mm), the standard yoke is toughened steel. The pliers setting is achieved by simple adjustment of the snap-holder.
- All special yokes are supplied on request. Simply specify the yoke opening and depth when ordering.
- On request only, this hand riveting plier can be made with bended handles (60002305).

CODE NUMBER (STD C-YOKE 1 1/4 in x 1 1/4 in)

60002005



TECHNICAL DATA

Riveting aluminum rivets: 1/8 in dia - maxi Ø 3.2 mm

Weight: 1.350 kg

Depth: 1.18 in - 30 mm

To use with rivet squeezer set: 5/32 in dia shank - Ø 4 mm

Yoke opening: 0.63 in - 16 mm

Overall length: 16.53 in - 420 mm

This tool is supplied exclusive of the squeezer set

EXPERT ADVICE

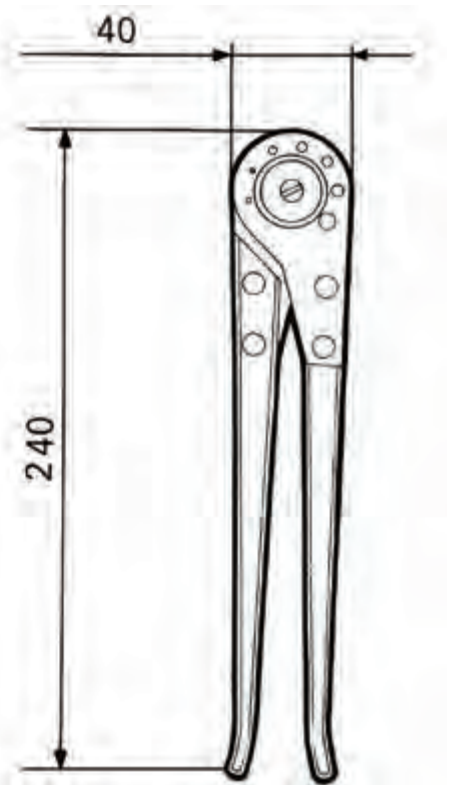
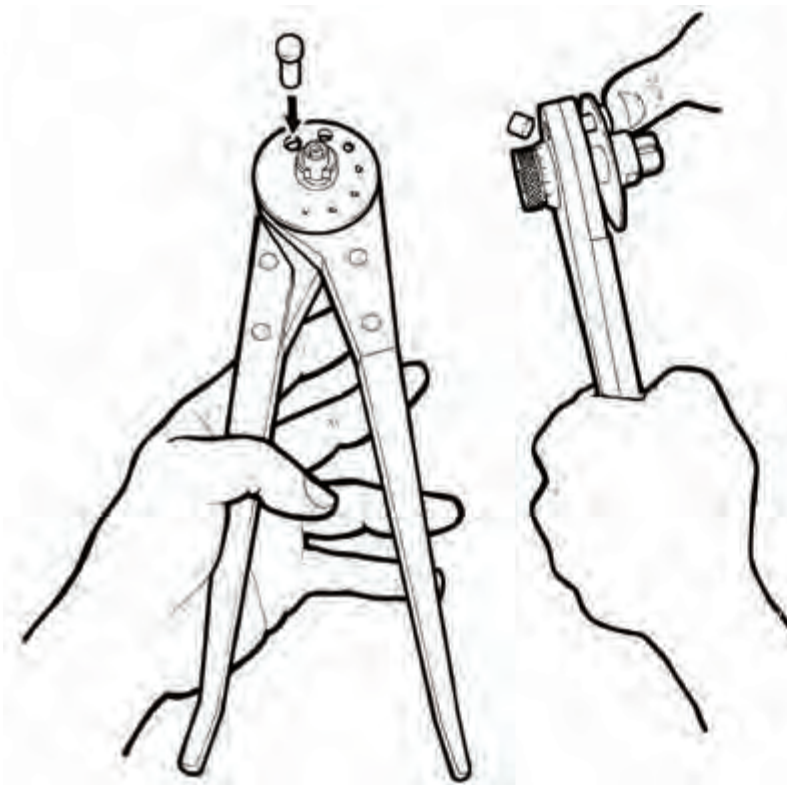
- Refer to pg. 113 for rivet squeezer set selection (RB400, RB401, RB402).



PRECISION MANUFACTURING

- This very simple hand cutting tool includes a microstop adjustment for a clean, precise cut of all aluminum rivets from: 1/16 in to 7/32 in dia.

| REFERENCE | RIVET DIA. | CODE NUMBER |
|-----------------|--|-------------|
| RB 2015 | 2, 2.5, 3, 3.5, 4, 5, 6 | 60001000 |
| RBI 2015 | 1/16 in, 3/32 in 1/8 in, 9/64 in 5/32 in, 3/16 in, 7/32 in | RC-60001005 |



TECHNICAL DATA

Minimum underhead cutting length: 0.197 in dia - 5 mm

Tolerance over length: 0.002 in dia - 0.5 mm

EXPERT ADVICE

- This tool is also very useful for aircraft maintenance technicians.

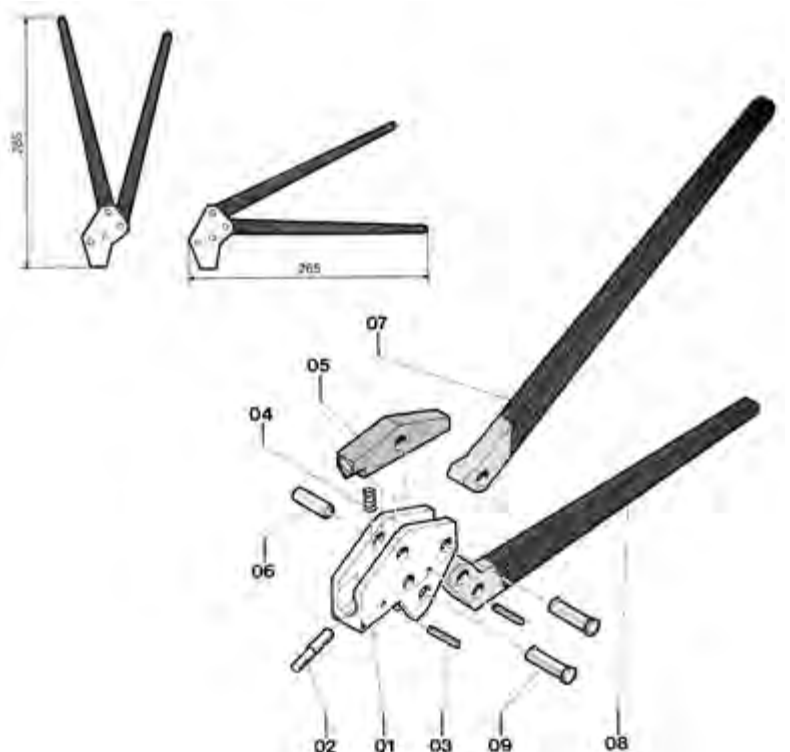
ADVANTAGES

- Simple, rugged, and handy, this tool has been designed to afford the easy removal of rivet rings (Huck, LGP type or others) without risk of damage to the hole or skin.
- Strong mechanical leverage enables clean removal of rings into two half shells.
- Quick change levers enable the ring cutter to be used in either inline or right angle position.
- Reduced dimension of the working part.
- No adjustment or setting required for use which is a considerable time-saver for rivet ring removal.
- Removable, quick-change anvils.
- Each tool is supplied with 1 set of anvils for one rivet ring diameter.

| FASTENERS DIAMETER | | CODE NUMBER |
|--------------------|--------|-------------|
| mm | in | |
| 4.00 | 0.1579 | 60004000 |
| 4.16 | 0.1638 | 60004017 |
| 4.80 | 3/16 | 60004001 |
| 5.00 | 0.1969 | 60004005 |
| 5.60 | 7/32 | 60004008 |
| 6.00 | 0.2362 | 60004010 |
| 6.35 | 1/4 | 60004016 |
| 7.94 | 5/16 | 60004015 |



| REFERENCE SPARE PARTS (METRIC) | INDEX | QTY | DESCRIPTION |
|--------------------------------|-------|-----|-------------------|
| 90510005 | 1 | 1 | Body for dia 4 mm |
| 90510010 | 1 | 1 | Body for dia 5 mm |
| 90510015 | 1 | 1 | Body for dia 6 mm |
| 90520010 | 2 | 1 | Fixed anvils |
| 91217225 | 3 | 2 | Pins |
| 93430075 | 4 | 1 | Spring |
| 90520005 | 5 | 1 | Pivoting anvil |
| 90030005 | 6 | 1 | Axis |
| 93060010 | 7 | 1 | Mobile lever |
| 93060005 | 8 | 1 | Fixed lever |
| 60004501 | 9 | 3 | Axis |



Ordering information: please indicate code number.
Spare parts for alternative diameters on request only.

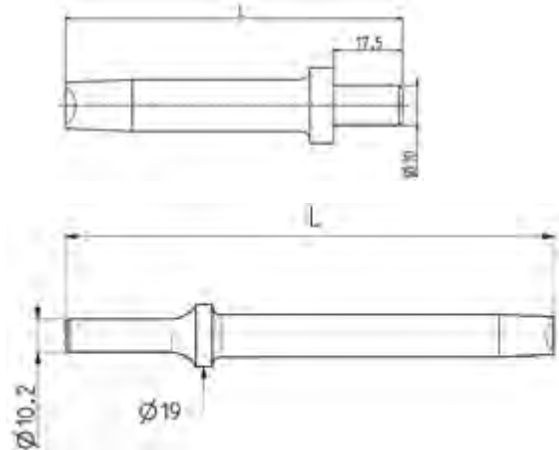
F-SERIES - ROUND TAPER NOSE RIVETER

- For driving 1/8 in - 1/4 in (3 - 6 mm) rivets.
- Standard beehive retainer.
- Built-in air regulator controls power output.
- Spool valve for precise speed control.



| CAT. NO. | BORE | ABRASIVE CAPACITY | STROKE | TYPE HOUSING | BLOWS PER MINUTE | WEIGHT | LENGTH | AIR INLET SIZE |
|-------------------|---------|--------------------------------|--------|--------------|------------------|------------------|-----------------|----------------|
| F4-PT-RT-B | 0.56 in | 0.401 Rivet Set Shank Diameter | 4.0 in | Aluminum | 1.700 | 3.3 lb / 1.50 kg | 8.7 in / 221 mm | 1/4 in |

All tools performance rated @ 90psi / 620 kPa air pressure.
Minimum Hose I.D.: 1/4in / 6.4mm
Standard Equipment: Operating instructions & service manual



| RIVET DIAMETER | 2.4 mm | 3.2 mm | 4 mm | 4.8 mm | 2.4 mm - 5.6 mm | 6.35 mm - 9.52 mm |
|--|---------|------------|------------|------------|-------------------|-------------------|
| | 3/32 in | 1/8 in | 5/32 in | 3/16 in | 3/32 in - 7/32 in | 1/4 in - 3/8 in |
| FOR UNIVERSAL HEAD RIVET TYPE L21215B | | | | | | |
| L | 33 | 03910226PT | 03910227PT | 03910228PT | - | - |
| | 60 | - | 03912760PT | 03912769PT | - | - |
| | 90 | - | 03912761PT | - | - | - |
| | 120 | - | 03912762PT | - | - | - |
| FOR UNIVERSAL HEAD RIVET TYPE AN470 | | | | | | |
| L | 60 | - | - | 60802143 | 60802144 | - |
| | 90 | 60802241 | 60802242 | 60802243 | 60802244 | - |
| | 150 | - | - | 60802343 | 60802344 | - |
| FOR FLUSH HEAD RIVET TYPE | | | | | | |
| L | 150 | - | - | - | - | 60802311 60802316 |

EXPERT ADVICE

- We manufacture all type of rivets applicable to all current norms.
We can manufacture a rivet squeezer set from your rivet.

Alternative short shank rivet set may be manufactured by request with special lengths.



Made from alloy steel forged blanks limiting the risk of bursting, our standard snaps are available in different types, lengths and diameters of attachments.

* Other prints on request.

* On request only.

| SPECIFICATION | Ø ATTACHEMENT | | | TOTAL LENGTH | | | RIVET-SQUEEZER TYPE | | Ø RIVET-SQUEEZER | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------|---------------|-----------|-----------|--------------|-------|-----|---------------------|--------|------------------|------------|--------|----------------|-----------|-----|---|------|------|---|------|-----|---|------|-----|---|-------|------|-------|-------|-------|------|-------|------|---|---|---|---|---|---|
| | r 3 | r 10,2 | r 12,7 | 60 | 90 | 150 | 190 | 340 | 250 | FLUSH HEAD | | UNIVERSAL HEAD | | | | | | | | | | | | | | | | | | | | | | | | | | |
| mm | .390 | .401 | .498 | 2 1/2 | 3 1/2 | 6" | 7 1/2 | 13 1/2 | 9 5/16 | AN 430 | AN 455 | AN 470 | ASMA 2020 | 2,4 | ↓ | 5,60 | 9,52 | ↓ | 6,35 | 2,4 | ↓ | 3,32 | 1/4 | ↓ | 3,32" | 1/8" | 5/32" | 3/16" | 7/32" | 1/4" | 5/16" | 3/8" | | | | | | |
| inch | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BASIC PART NUMBER | 1 | 2 | 3 | 1 | 2 | 3 | 4 | 5 | 6 | 1 | 2 | 3 | 4 | 5 | 1 | 6 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 6 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| 6080 | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | | | |
| 6081 | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | | |
| 6082 | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | |
| *6083 | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | |
| *6084 | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o |
| *6085 | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o |
| 608--- | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | o | |

● Standard
○ On request

| NORMS | | |
|------------------------|---------|---|
| USA | GERMANY | FRANCE |
| Universal Head | AN 470 | LN 9198 |
| Brazier Head | AN 455 | L 21211 |
| Reduced Universal Head | | NSA 5411 Rivet Titanium Squeezer NSA 5415 Monel Rivet |
| Round Head | AN 430 | |

60 802 316 EXAMPLE : 6080 Straight type - Shank 0.401 in dia - Length 6 in
- For flush head rivets 1/4 in dia.

60 823 247 EXAMPLE : 6082 Straight type - Shank 0.498 in dia - Length 3 1/2 in
- For universal head AN 470 rivet 5/16 in dia.

14CF SERIES - RIVET SHAVER WITH STABILIZER

- Non-reversible
- Optional stabilizer attachment



| CAT. NO. | FREE SPEED (RPM) | ABRASIVE CAPACITY | WEIGHT | LENGTH |
|------------|------------------|---------------------------|------------------|-----------------|
| 14CFS60-95 | 29.000 | 0.0005 Cutter Adjustment | 2.3 lb / 1.04 kg | 8.2 in / 208 mm |
| 14CFS60-98 | 29.000 | 0.00025 Cutter Adjustment | 2.3 lb / 1.04 kg | 8.2 in / 208 mm |
| 14CNL60-95 | 20.000 | 0.0005 Cutter Adjustment | 4.5 lb / 2.04 kg | 8.9 in / 226 mm |

All tools performance rated @ 90psi / 620 kPa air pressure.
Minimum Hose I.D.: 5/16in / 7.9mm
Standard Equipment: Stabilizer and choice of skirt

| CUTTER DIAMETER in | CARBIDE CUTTER | PART NUMBER | | | | | | | | | | |
|-----------------------|----------------|-------------|---------|---------------------|---------|----------|---------------------|---------|----------|---------------------|---------|----------|
| | | SKIRTS | | 1 in EXTENDED SKIRT | | | 4 in EXTENDED SKIRT | | | 6 in EXTENDED SKIRT | | |
| | | Std. | Wide | Adapter | Skirt | Assembly | Adapter | Skirt | Assembly | Adapter | Skirt | Assembly |
| 5/16 | – | 14-4391 | 14-4401 | – | – | – | – | – | – | – | – | – |
| 3/8 | 14-4382 | 14-4392 | 14-4402 | – | – | 14-4532 | 14-4302 | 14-4312 | 14-4512 | – | 14-4372 | 14-4572 |
| 7/16 | 14-4383 | 14-4393 | 14-4403 | 14-4323 | – | 14-4533 | 14-4303 | – | 14-4513 | 14-4363 | 14-4373 | 14-4573 |
| 1/2 | 14-4384 | 14-4394 | 14-4404 | 14-4324 | 14-4334 | 14-4534 | – | – | 14-4514 | 14-4364 | 14-4374 | 14-4574 |
| 9/16 | 14-4385 | 14-4395 | 14-4405 | – | – | – | – | – | – | – | – | – |
| 5/8 | 14-4386 | 14-4396 | 14-4406 | – | – | – | 14-4306 | 14-4316 | 14-4516 | – | – | – |
| 3/4 | 14-4387 | 14-4397 | – | – | – | – | – | – | – | – | – | – |
| 1 | 14-4422 | 14-4410 | – | – | – | – | – | – | – | – | – | – |
| 1-1/4 | – | 14-4412 | – | – | – | – | – | – | – | – | – | – |

| | |
|--|------------|
| Pneumatic Assembly Tools - Inline 19, 8, 88 Series ----- | 124 |
| Pneumatic Assembly Tools - Right Angle 19, 24, 34, 55, 75 Series ----- | 125 |
| Pneumatic Assembly Tools - Right Angle 19, 24, 34 Series ----- | 126 |
| Pneumatic Assembly Tools - Right Angle 55, 75 Series ----- | 127 |
| Pneumatic Assembly Tools - Pistol Grip 19, 19 Stall, 88 Series ----- | 128 |
| Pneumatic Assembly Tools Pulse Nutrunners ----- | 130 |
| DC Electric Global Controllers mPro400GC, mPro400GC-SG ----- | 132 |
| Cleco LiveWire™ DC Electric Cordless Tools Right Angle ----- | 133 |
| Cleco LiveWire™ DC Electric Cordless Tools Pistol Grip ----- | 135 |
| Cleco LiveWire™ DC Electric Cordless Tools Tube Nut Series ----- | 136 |
| Cleco LiveWire™ DC Electric Cordless Tools Crowfoot Series ----- | 137 |
| DC Electric Corded Transducer Control Tools - Right Angle 18, 48 Series --- | 138 |
| DC Electric Corded Transducer Control Tools - Pistol Grip 18, 48 Series ---- | 139 |
| DC Electric Corded Transducer Control Tools Inline Non-Floating Spindle --- | 140 |
| Intelligent Spindles Straight, Offset, Angle Drives ----- | 141 |
| Pneumatic Assembly Tools - Attachments Type 1, 2, 3, 4 ----- | 142 |
| Pneumatic Assembly Tools Frangible Collar Pistol Attachment ----- | 143 |
| Pneumatic Assembly Tools - Attachments Angle Offset, Standard ----- | 144 |
| Pneumatic Assembly Tools Torque Control Pistol Offset Attachment ----- | 145 |
| Pneumatic Assembly Tools Frangible Collar Angle Attachment ----- | 146 |

19 SERIES

- Torque Range: 0.6 - 14.7 Nm / 5.0 - 130 in-lbs
- Push-to-start, push-and-lever start
- External torque adjustment
- Bit & finder, 1/4 in quick-change chuck



8 SERIES

- Torque Range: 1.7 - 8.5 Nm / 15.0 - 75 in-lbs
- Push button reverse, non-reversible
- Push-to-start, push-and-lever start
- Bit & finder, quick-change chuck



88 SERIES

- Torque Range: 1.7 - 19 Nm / 15.0 - 190 in-lbs
- Push button reverse, non-reversible
- Push-to-start, push-and-lever start
- Quick-change chuck, 3/8 in square drive



| MODEL NUMBER | | TORQUE RANGE | | | | FREE SPEED | LENGTH* | | WEIGHT | | AIR CONSUMPTION | | |
|---------------|---------------------|--------------|----|------------------|----|------------|---------|----|--------|----|-----------------|----------------|------|
| Bit & Finder* | 1/4 in Quick Change | Tool Range | | With Std. Spring | | | in | mm | lbs | kg | Air Inlet NPT | Min. Hose I.D. | SCFM |
| | | in-lbs | Nm | in-lbs | Nm | RPM | | | | | | | |

PUSH-TO-START - PUSH BUTTON REVERSE

| | | | | | | | | | | | | |
|----------|---------|-----------|---------|-----------|------|-----|-----|-----|------|--------|---------|----|
| 19BPA02Q | 5 - 19 | 0.6 - 2.1 | 5 - 19 | 0.6 - 2.1 | 2300 | 9.1 | 230 | 1.4 | 0.63 | 1/8 in | 3/16 in | 11 |
| 19BPA03Q | 5 - 26 | 0.6 - 2.9 | 5 - 19 | 0.6 - 2.1 | 1600 | 9.3 | 235 | 1.4 | 0.64 | 1/8 in | 3/16 in | 11 |
| 19BPA04Q | 10 - 40 | 1.1 - 4.5 | 10 - 38 | 1.1 - 4.3 | 920 | 9.1 | 230 | 1.3 | 0.61 | 1/8 in | 3/16 in | 11 |
| 19BPA05Q | 10 - 45 | 1.1 - 5.1 | 10 - 38 | 1.1 - 4.3 | 560 | 9.5 | 240 | 1.5 | 0.67 | 1/8 in | 3/16 in | 11 |
| 19BPA06Q | 10 - 45 | 1.1 - 5.1 | 10 - 38 | 1.1 - 4.3 | 220 | 9.5 | 240 | 1.5 | 0.68 | 1/8 in | 3/16 in | 11 |

PUSH-TO-START - COLLAR REVERSE

| | | | | | | | | | | | | | |
|----------|----------|---------|-----------|---------|-----------|------|-----|-----|-----|------|--------|---------|----|
| 19SPA02B | 19SPA02Q | 5 - 19 | 0.6 - 2.1 | 5 - 19 | 0.6 - 2.1 | 2800 | 9.1 | 230 | 1.4 | 0.63 | 1/8 in | 3/16 in | 11 |
| 19SPA03B | 19SPA03Q | 5 - 26 | 0.6 - 2.9 | 5 - 19 | 0.6 - 2.1 | 1900 | 9.3 | 235 | 1.4 | 0.64 | 1/8 in | 3/16 in | 11 |
| 19SPA04B | 19SPA04Q | 10 - 40 | 1.1 - 4.5 | 10 - 38 | 1.1 - 4.3 | 1100 | 9.1 | 230 | 1.3 | 0.61 | 1/8 in | 3/16 in | 11 |
| 19SPA05B | 19SPA05Q | 10 - 45 | 1.1 - 5.1 | 10 - 38 | 1.1 - 4.3 | 660 | 9.5 | 240 | 1.5 | 0.67 | 1/8 in | 3/16 in | 11 |
| 19SPA06B | 19SPA06Q | 10 - 45 | 1.1 - 5.1 | 10 - 38 | 1.1 - 4.3 | 260 | 9.5 | 240 | 1.5 | 0.68 | 1/8 in | 3/16 in | 11 |

LEVER PUSH-TO-START - COLLAR REVERSE

| | | | | | | | | | | | | | |
|----------|----------|---------|-----------|---------|-----------|------|------|-----|-----|------|--------|---------|----|
| 19SCA02B | 19SCA02Q | 5 - 19 | 0.6 - 2.1 | 5 - 19 | 0.6 - 2.1 | 2800 | 9.8 | 249 | 1.5 | 0.69 | 1/8 in | 3/16 in | 11 |
| 19SCA03B | 19SCA03Q | 5 - 26 | 0.6 - 2.9 | 5 - 19 | 0.6 - 2.1 | 1900 | 10.0 | 254 | 1.5 | 0.70 | 1/8 in | 3/16 in | 11 |
| 19SCA04B | 19SCA04Q | 10 - 40 | 1.1 - 4.5 | 10 - 38 | 1.1 - 4.3 | 1100 | 9.8 | 249 | 1.5 | 0.66 | 1/8 in | 3/16 in | 11 |
| 19SCA05B | 19SCA05Q | 10 - 45 | 1.1 - 5.1 | 10 - 38 | 1.1 - 4.3 | 660 | 10.2 | 259 | 1.6 | 0.73 | 1/8 in | 3/16 in | 11 |
| 19SCA06B | 19SCA06Q | 10 - 45 | 1.1 - 5.1 | 10 - 38 | 1.1 - 4.3 | 260 | 10.2 | 259 | 1.6 | 0.74 | 1/8 in | 3/16 in | 11 |

*Add 0.63 in (16 mm) for bit & finder models
 ** Short housing
 General:
 90 psi (620 kPa) required for maximum rated torque.

Standard Equipment:
 Operating instructions & service manual.
 Suspension ball.
 All torque springs required to meet indicated torque.
 Lever Push-to-Start models include kit to convert to lever only. (301409)

Additional accessories: bits & finders,
 Non-Reverse Kit: 207030
 Torque Signal Kit: 301106 (lever only)
 Overhose: 207019

| MODEL NUMBER | | | TORQUE RANGE | | FREE SPEED | LENGTH* | | WEIGHT | | AIR CONSUMPTION | | |
|--------------|-------------------------|---------------------|--------------|----|------------|---------|----|--------|----|-----------------|----------------|------|
| Bit & Finder | 1/4 in Hex Quick Change | 3/8 in Square Drive | in-lbs | Nm | | in | mm | lbs | kg | Air Inlet NPT | Min. Hose I.D. | SCFM |

PUSH-TO-START - PUSH BUTTON REVERSE

| | | | | | | | | | | | | |
|---------|-----------|------------|----------|-----------|-----|-----|-----|-----|-----|--------|--------|----|
| 8RSA-10 | 8RSA-10BQ | | 15 - 65 | 1.7 - 7.3 | 800 | 9.6 | 260 | 2.4 | 1.1 | 1/4 in | 1/4 in | 19 |
| | 8RSA-7BQ | | 15 - 75 | 1.7 - 8.5 | 550 | 9.6 | 260 | 2.4 | 1.1 | 1/4 in | 1/4 in | 19 |
| | 8RSA-5BQ | | 15 - 75 | 1.7 - 8.5 | 400 | 9.6 | 260 | 2.4 | 1.1 | 1/4 in | 1/4 in | 19 |
| | 88RSA-7CQ | 88RSA-7C-3 | 15 - 95 | 1.7 - 10 | 550 | 9.5 | 241 | 2.6 | 1.2 | 1/4 in | 1/4 in | 19 |
| | 88RSA-5CQ | 88RSA-5C-3 | 15 - 160 | 1.7 - 18 | 400 | 9.5 | 241 | 2.6 | 1.2 | 1/4 in | 1/4 in | 19 |

PUSH AND LEVER START - PUSH BUTTON REVERSE

| | | | | | | | | | | | | |
|--|------------|-------------|----------|-----------|-----|------|-----|-----|-----|--------|--------|----|
| | 8RSAL-10BQ | | 15 - 60 | 1.7 - 6.8 | 800 | 11.3 | 302 | 2.9 | 1.3 | 1/4 in | 1/4 in | 19 |
| | 88RSAL-5CQ | 88RSAL-5C-3 | 15 - 160 | 1.7 - 18 | 400 | 11.1 | 282 | 3.1 | 1.4 | 1/4 in | 1/4 in | 19 |

*Add 0.63 in (16 mm) for bit & finder models
 General:
 90 psi (620 kPa) required for maximum rated torque.
 Length and weight of finder type tools includes standard length bit & finder. Weight does not include dead handle.

Standard Equipment:
 Operating instructions & service manual
 Suspension ball
 Dead handle on models above 100 in-lbs torque cap.
 All torque springs required to meet indicated torque

Standard Equipment if Specified:
 One bit, finder, and finder spring (bit & finder models)
 Grip Sleeve (202346; Push-to-Start models only)
 Dead handle (861006)

Pneumatic Assembly Tools - Right Angle

19 Series | 24 Series | 34 Series | 55 Series | 75 Series

19 SERIES

- Torque Range: 0.5 - 11 Nm / 4.0 - 100 in-lbs
- Class-leading accuracy and repeatability
- External torque adjustment
- Sliding knob reverse
- 1/4 in and 3/8 in square drive



24 SERIES

- Torque Range: 4.0 - 23 Nm / 3.0 - 17 ft-lbs
- External torque adjustment
- 3/8 in square drive
- Indexable angle-head
- One torque spring to meet specified torque
- Oil-less blades



34 SERIES

- Torque Range: 8.0 - 75 Nm / 4.0 - 55 ft-lbs
- External torque adjustment
- 3/8 in and 1/2 in square drive
- Indexable angle-head
- One torque spring to meet specified torque
- Oil-less blades



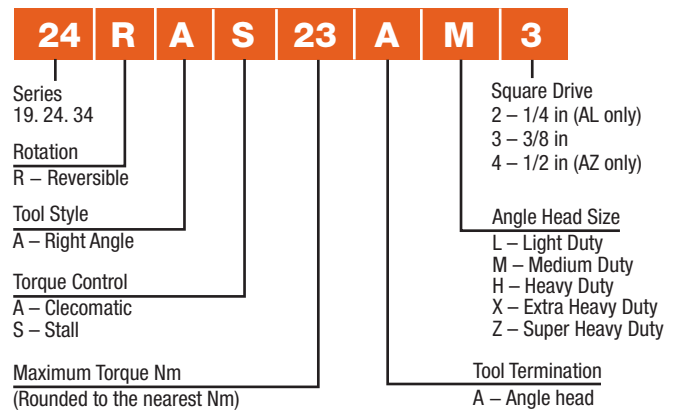
55 SERIES

- Torque Range: 32 - 176 Nm / 24 - 130 ft-lbs
- External torque adjustment
- 1/2 in square drive
- Reversible and non-reversible
- Lever start
- Rotating exhaust deflector

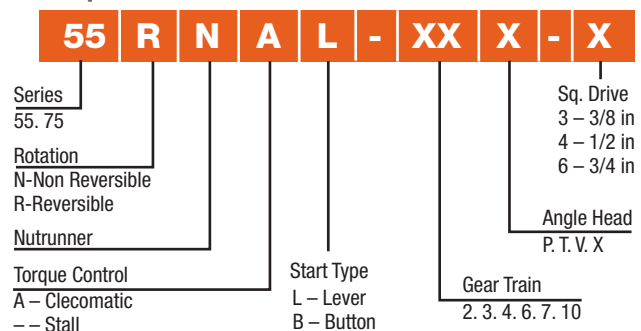
75 SERIES

- Torque Range: 95 - 430 Nm / 70 - 320 ft-lbs
- External torque adjustment
- 1/2 in and 3/4 in square drive
- Reversible and non-reversible
- External torque adjustment
- Lever start

19 | 24 | 34 MODEL NUMBER EXAMPLE



55 | 75 MODEL NUMBER EXAMPLE



| MODEL NUMBER | | TORQUE RANGE* | | | | FREE SPEED | LENGTH | | WEIGHT | | HEAD HEIGHT | | SIDE TO CENTER | | AIR CONSUMPTION | | |
|----------------|----------------|---------------|----|------------------|----|------------|--------|----|--------|----|-------------|----|----------------|----|-----------------|----------------|------|
| | | Tool Range | | With Std. Spring | | | | | | | | | | | Air Inlet NPT | Min. Hose I.D. | SCFM |
| 1/4 in Sq. Dr. | 3/8 in Sq. Dr. | in-lbs | Nm | in-lbs | Nm | RPM | in | mm | lbs | kg | in | mm | in | mm | | | |

19 SERIES - REVERSIBLE – CLECOMATIC CLUTCH

| | | | | | | | | | | | | | | | | | |
|-------------|------------|----------|------------|----------|------------|------|------|-----|-----|-----|------|----|------|----|--------|---------|----|
| 19RAA02AM2 | | 5 - 19 | 0.6 - 2.1 | 5 - 19 | 0.6 - 2.1 | 2400 | 11.9 | 303 | 1.7 | 0.8 | 1.06 | 27 | 0.36 | 9 | 1/8 in | 3/16 in | 11 |
| 19RAA02AH2 | 19RAA02AH3 | 6 - 21 | 0.7 - 2.4 | 6 - 21 | 0.7 - 2.4 | 2100 | 12.5 | 316 | 1.8 | 0.8 | 1.19 | 30 | 0.50 | 13 | 1/8 in | 3/16 in | 11 |
| 19RAA03AM2 | | 5 - 27 | 0.6 - 3.1 | 5 - 21 | 0.6 - 2.4 | 1650 | 12.2 | 310 | 1.8 | 0.8 | 1.06 | 27 | 0.36 | 9 | 1/8 in | 3/16 in | 11 |
| 19RAA03AH2 | 19RAA03AH3 | 6 - 30 | 0.7 - 3.4 | 6 - 24 | 0.7 - 2.7 | 1450 | 12.7 | 321 | 1.8 | 0.8 | 1.19 | 30 | 0.50 | 13 | 1/8 in | 3/16 in | 11 |
| 19RAA04AM2 | | 12 - 42 | 1.4 - 4.7 | 12 - 42 | 1.4 - 4.7 | 950 | 12.0 | 305 | 1.7 | 0.8 | 1.06 | 27 | 0.36 | 9 | 1/8 in | 3/16 in | 11 |
| 19RAA05AM2 | | 12 - 50 | 1.4 - 5.7 | 12 - 42 | 1.4 - 4.7 | 570 | 12.4 | 316 | 1.8 | 0.8 | 1.06 | 27 | 0.36 | 9 | 1/8 in | 3/16 in | 11 |
| 19RAA06AH2* | 19RAA06AH3 | 13 - 53 | 1.5 - 6.0 | 13 - 48 | 1.5 - 5.4 | 850 | 12.5 | 316 | 1.8 | 0.8 | 1.19 | 30 | 0.50 | 13 | 1/8 in | 3/16 in | 11 |
| 19RAA07AH2* | 19RAA07AH3 | 13 - 60 | 1.5 - 6.8 | 13 - 48 | 1.5 - 5.4 | 500 | 12.9 | 326 | 1.9 | 0.9 | 1.19 | 30 | 0.50 | 13 | 1/8 in | 3/16 in | 11 |
| 19RAA09AH2* | 19RAA09AH3 | 18 - 75 | 2.0 - 8.5 | 30 - 75 | 3.4 - 8.5 | 500 | 12.9 | 326 | 1.9 | 0.9 | 1.19 | 30 | 0.50 | 13 | 1/8 in | 3/16 in | 11 |
| 19RAA11AH2* | 19RAA11AH3 | 18 - 100 | 2.0 - 11.3 | 30 - 100 | 3.4 - 11.3 | 340 | 12.3 | 312 | 2.1 | 1.0 | 1.19 | 30 | 0.50 | 13 | 1/8 in | 3/16 in | 11 |
| 19RAA12AH2* | 19RAA12AH3 | 18 - 100 | 2.0 - 11.3 | 30 - 100 | 3.4 - 11.3 | 200 | 12.9 | 326 | 1.9 | 0.9 | 1.19 | 30 | 0.50 | 13 | 1/8 in | 3/16 in | 11 |

*Applications greater than 50 in-lbs may affect spindle/drive durability

General:
Tool performance rated at 90 psi (620 kPa) air pressure

Standard Equipment:
Operating instructions & service manual
Suspension bail
All torque springs required to meet indicated torque specification

Optional Equipment:
Non-Reverse Kit: 207030
Torque Signal Kit: 301106 (Clecomatic clutch only)
Overhose: 207019
Quick Change and 1/4 in magnetic hex outputs available on AH3 models only
Quick Change: Change AH3 to AHQ
1/4 in Magnetic Hex: Change AH3 to AHM

| MODEL NUMBER | | TORQUE RANGE | | FREE SPEED | LENGTH | | WEIGHT | | HEAD HEIGHT | | SIDE TO CENTER | | AIR CONSUMPTION | | | | |
|----------------|----------------|--------------|----|------------|--------|--|--------|--|-------------|--|----------------|--|-----------------|----|----|----|----|
| | | ft-lbs | Nm | | | | | | | | | | RPM | in | mm | in | mm |
| 3/8 in Sq. Dr. | 1/2 in Sq. Dr. | | | | | | | | | | | | | | | | |

24 SERIES – REVERSIBLE – CLECOMATIC CLUTCH

| | | | | | | | | | | | | | | | |
|------------|--|------|-------|------|------|-----|-----|-----|------|------|------|------|--------|---------|----|
| 24RAA06AL3 | | 3-4 | 4-5.5 | 2200 | 14.1 | 358 | 2.6 | 1.2 | 1.08 | 27.5 | 0.47 | 12.0 | 3/8 in | 5/16 in | 24 |
| 24RAA07AL3 | | 3-5 | 5-7 | 1770 | 14.1 | 358 | 2.6 | 1.2 | 1.08 | 27.5 | 0.47 | 12.0 | 3/8 in | 5/16 in | 24 |
| 24RAA11AL3 | | 5-8 | 7-11 | 1260 | 14.1 | 358 | 2.6 | 1.2 | 1.08 | 27.5 | 0.47 | 12.0 | 3/8 in | 5/16 in | 24 |
| 24RAA12AM3 | | 5-9 | 6-12 | 1200 | 14.2 | 360 | 2.8 | 1.3 | 1.16 | 29.5 | 0.52 | 13.2 | 3/8 in | 5/16 in | 24 |
| 24RAA19AM3 | | 7-14 | 10-19 | 700 | 15.0 | 380 | 3.2 | 1.4 | 1.16 | 29.5 | 0.52 | 13.2 | 3/8 in | 5/16 in | 24 |
| 24RAA23AM3 | | 9-17 | 12-23 | 600 | 15.0 | 380 | 3.2 | 1.4 | 1.16 | 29.5 | 0.52 | 13.2 | 3/8 in | 5/16 in | 24 |

34 SERIES – REVERSIBLE – CLECOMATIC CLUTCH

| | | | | | | | | | | | | | | | |
|------------|------------|-------|-------|------|------|-----|-----|-----|------|------|------|------|--------|---------|----|
| 34RAA08AL3 | | 4-6 | 8-5 | 2060 | 14.5 | 368 | 2.7 | 1.2 | 1.08 | 27.5 | 0.47 | 12.0 | 3/8 in | 5/16 in | 34 |
| 34RAA11AL3 | | 5-8 | 7-11 | 1675 | 14.5 | 368 | 2.7 | 1.2 | 1.08 | 27.5 | 0.47 | 12.0 | 3/8 in | 5/16 in | 34 |
| 34RAA15AM3 | | 7-11 | 9-15 | 1185 | 14.6 | 370 | 2.9 | 1.3 | 1.16 | 29.5 | 0.52 | 13.2 | 3/8 in | 5/16 in | 34 |
| 34RAA26AH3 | | 10-19 | 13-26 | 710 | 15.4 | 390 | 3.2 | 1.5 | 1.22 | 31.0 | 0.57 | 14.4 | 3/8 in | 5/16 in | 34 |
| 34RAA28AH3 | | 10-20 | 14-28 | 580 | 15.4 | 390 | 3.3 | 1.5 | 1.22 | 31.0 | 0.57 | 14.4 | 3/8 in | 5/16 in | 34 |
| 34RAA33AX3 | | 12-24 | 17-33 | 545 | 15.5 | 393 | 3.5 | 1.6 | 1.36 | 34.5 | 0.67 | 17.1 | 3/8 in | 5/16 in | 34 |
| 34RAA37AX3 | | 14-27 | 18-37 | 480 | 15.6 | 397 | 3.4 | 1.5 | 1.36 | 34.5 | 0.67 | 17.1 | 3/8 in | 5/16 in | 34 |
| 34RAA47AX3 | | 17-35 | 24-47 | 385 | 15.6 | 397 | 3.4 | 1.5 | 1.36 | 34.5 | 0.67 | 17.1 | 3/8 in | 5/16 in | 34 |
| 34RAA68AZ3 | 34RAA68AZ4 | 25-50 | 34-68 | 255 | 16.2 | 411 | 3.7 | 1.7 | 1.60 | 41.0 | 0.70 | 18.0 | 3/8 in | 5/16 in | 34 |
| 34RAA75AZ3 | 34RAA75AZ4 | 28-55 | 38-75 | 155 | 17.0 | 431 | 3.9 | 1.8 | 1.60 | 41.0 | 0.70 | 18.0 | 3/8 in | 5/16 in | 34 |

General:
Tool performance rated at 90 psi (620 kPa) air pressure.

Standard Equipment:
Operating instructions & service manual
Suspension bail
Clutch adjustment tool

Optional Equipment:
Assembly wrench: 201898
Torque signal kit: 301937PT
Non-reversible kit: 204999
Exhaust Overhose: 204978

Pneumatic Assembly Tools - Right Angle

55 Series | 75 Series



| Model Number | Max. Torque | | Square Drive | Free Speed | Length | | Weight | | Head Height | | Side to Center | | Air Consumption | | |
|--------------|-------------|----|--------------|------------|--------|----|--------|----|-------------|----|----------------|----|-----------------|----------------|------|
| | ft-lbs | Nm | | | in | mm | lbs | kg | in | mm | in | mm | Air Inlet NPT | Min. Hose I.D. | SCFM |

19 SERIES – REVERSIBLE – STALL

| | | | | | | | | | | | | | | | |
|------------|------|------|-----|------|------|-----|-----|-----|------|----|------|----|--------|---------|----|
| 19RAS03AM2 | 2.3 | 3.2 | 1/4 | 1700 | 11.4 | 290 | 1.3 | 0.6 | 1.06 | 27 | 0.36 | 9 | 1/8 in | 3/16 in | 11 |
| 19RAS04AH2 | 2.6* | 3.6* | 1/4 | 1500 | 11.2 | 284 | 1.4 | 0.6 | 1.19 | 30 | 0.5 | 13 | 1/8 in | 3/16 in | 11 |
| 19RAS05AM2 | 3.8 | 5.2 | 1/4 | 850 | 10.6 | 269 | 1.2 | 0.5 | 1.06 | 27 | 0.36 | 9 | 1/8 in | 3/16 in | 11 |
| 19RAS06AH3 | 4.6 | 6.2 | 3/8 | 880 | 11.0 | 279 | 1.3 | 0.6 | 1.19 | 30 | 0.5 | 13 | 1/8 in | 3/16 in | 11 |

24, 34 SERIES – REVERSIBLE – STALL

| | | | | | | | | | | | | | | | |
|------------|-----|----|-----|------|------|-----|-----|-----|-----|----|-----|----|--------|---------|----|
| 34RAS11AL3 | 8.1 | 11 | 3/8 | 1675 | 12.0 | 305 | 2.1 | 1.0 | 1.1 | 28 | 0.5 | 12 | 3/8 in | 5/16 in | 34 |
| 24RAS13AM3 | 9.6 | 13 | 3/8 | 1200 | 11.7 | 297 | 2.2 | 1.0 | 1.2 | 30 | 0.5 | 13 | 3/8 in | 5/16 in | 24 |
| 34RAS28AH3 | 20 | 28 | 3/8 | 710 | 12.9 | 328 | 2.6 | 1.2 | 1.2 | 31 | 0.6 | 14 | 3/8 in | 5/16 in | 34 |
| 34RAS36AX3 | 26 | 36 | 3/8 | 545 | 13.0 | 330 | 2.8 | 1.3 | 1.4 | 35 | 0.7 | 17 | 3/8 in | 5/16 in | 34 |

* Maximum torque of tool exceeds the maximum torque rating for the head. increased maintenance should be expected when operated at the upper torque capacity range.

Standard Equipment:
Operating instructions & service manual
Suspension bail (19 series)
Torque reaction mounting plate (75 series)

Optional Equipment:
19 Series: Non-Reverse Kit: 207030
Overhose: 207019

Quick Change and 1/4 in magnetic hex outputs available on AH3 models only.
Quick Change: Change AH3 to AHQ
1/4 in Magnetic Hex: Change AH3 to AHM
24/34 Series: Assembly wrench: 201898
Non-reverse kit: 204999

General:
Tool performance rated at 90 psi (620 kPa) air pressure.

| Model Number | | Torque Range | | Free Speed | Length | | Weight | | Head Height | | Side to Center | | Angle Head | Air Consumption | | |
|----------------|----------------|--------------|----|------------|--------|----|--------|-----|-------------|----|----------------|----|------------|-----------------|---------------|----------------|
| 1/2 in Sq. Dr. | 3/4 in Sq. Dr. | ft-lbs | Nm | | RPM | in | mm | lbs | kg | in | mm | in | | mm | Air Inlet NPT | Min. Hose I.D. |

55 & 75 SERIES – LEVER START – REVERSIBLE

| | | | | | | | | | | | | | | | | |
|-------------|-------------|-----------|------------|-----|------|-----|------|-----|-----|----|-----|----|---|--------|--------|----|
| 55RNAL-6T-4 | | 24 - 48 | 32 - 65 | 370 | 19.3 | 489 | 7.8 | 3.5 | 2.0 | 50 | 0.9 | 22 | T | 1/2 in | 1/2 in | 55 |
| 55RNAL-4P-4 | | 26 - 54 | 35 - 73 | 330 | 19.1 | 486 | 7.4 | 3.3 | 1.6 | 41 | 0.7 | 18 | P | 1/2 in | 1/2 in | 55 |
| 55RNAL-4T-4 | | 29 - 64 | 39 - 87 | 280 | 19.3 | 489 | 7.8 | 3.5 | 2.0 | 50 | 0.9 | 22 | T | 1/2 in | 1/2 in | 55 |
| 55RNAL-3P-4 | | 36 - 80* | 49 - 109* | 220 | 19.1 | 486 | 7.4 | 3.3 | 1.6 | 41 | 0.7 | 18 | P | 1/2 in | 1/2 in | 55 |
| 55RNAL-3T-4 | | 43 - 95 | 58 - 129 | 190 | 19.3 | 489 | 7.8 | 3.5 | 2.0 | 50 | 0.9 | 22 | T | 1/2 in | 1/2 in | 55 |
| 55RNAL-2T-4 | | 50 - 125* | 81 - 170* | 140 | 19.3 | 489 | 7.8 | 3.5 | 2.0 | 50 | 0.9 | 22 | T | 1/2 in | 1/2 in | 55 |
| 75RNAL-3V-4 | | 70 - 140 | 95 - 190 | 175 | 21.9 | 556 | 13.3 | 6.0 | 2.5 | 64 | 1.1 | 28 | V | 1/2 in | 1/2 in | 70 |
| 75RNAL-2V-4 | | 90 - 190* | 122 - 255* | 130 | 21.9 | 556 | 13.3 | 6.0 | 2.5 | 64 | 1.1 | 28 | V | 1/2 in | 1/2 in | 70 |
| | 75RNAL-3X-6 | 110 - 225 | 150 - 305 | 110 | 22.6 | 575 | 15.0 | 6.8 | 2.8 | 70 | 1.4 | 37 | X | 1/2 in | 1/2 in | 70 |
| | 75RNAL-2X-6 | 150 - 305 | 203 - 410 | 80 | 22.6 | 575 | 15.0 | 6.8 | 2.8 | 70 | 1.4 | 37 | X | 1/2 in | 1/2 in | 70 |

* Maximum torque of tool exceeds the maximum torque rating for the head, high maintenance should be expected when operated at the upper torque capacity range.

General:
Tool performance rated at 90 psi (620 kPa) air pressure.

Standard Equipment:
Operating instructions & service manual
Torque Reaction Mounting Plate (75 series)
All torque springs required to meet indicated torque

19 SERIES

- Torque Range: 0.6 - 14.7 Nm / 5.0 - 130 in-lbs
- Class-leading accuracy and repeatability
- Adjustable reverse lever for true one-handed operation
- 1/4 in hex quick change drive
- "P" and "T" style handles
- 2 interchangeable soft-touch grip sizes
- Streamlined torque signal ports
- Trigger-and-push, trigger-start



19 SERIES STALL

- Torque Range: 2.1 - 7.9 Nm / 19 - 70 in-lbs
- 1/4 in hex quick change drive
- Trigger start
- "P" and "T" style handles
- 2 interchangeable soft-touch grip sizes
- Adjustable reverse lever for true one-handed operation
- Sliding knob or push-button reverse



88 SERIES

- Torque Range: 1.7 - 20 Nm / 15 - 180 in-lbs
- Quick change and square drive
- Reversible
- Trigger-and-push, trigger-start



Pneumatic Assembly Tools - Pistol Grip

19 Series | 19 Series Stall | 88 Series



| MODEL NUMBER | | TOOL TORQUE RANGE | | MAXIMUM FREE SPEED | 19P SERIES | | | | 19T SERIES | | | |
|-----------------|-------------------------------------|-------------------|----|--------------------|------------|----|--------|----|------------|----|--------|----|
| P-Handle Pistol | T-Handle Pistol with Top Air Option | in-lb | Nm | rpm | LENGTH | | WEIGHT | | LENGTH | | WEIGHT | |
| | | | | | in | mm | lbs | kg | in | mm | lbs | kg |

PUSH & TRIGGER START

| | | | | | | | | | | | | |
|----------|----------|---------|-----------|------|-----|-----|-----|-----|-----|-----|-----|-----|
| 19PCA02Q | 19TCA02Q | 3 - 19 | 0.3 - 2.1 | 2800 | 8.1 | 206 | 1.4 | 0.6 | 8.2 | 208 | 1.4 | 0.6 |
| 19PCA03Q | 19TCA03Q | 3 - 26 | 0.3 - 2.9 | 1900 | 8.3 | 211 | 1.5 | 0.7 | 8.4 | 212 | 1.5 | 0.7 |
| 19PCA04Q | 19TCA04Q | 3 - 40 | 0.3 - 4.5 | 1100 | 8.1 | 206 | 1.4 | 0.6 | 8.2 | 208 | 1.5 | 0.7 |
| 19PCA05Q | 19TCA05Q | 3 - 45 | 0.3 - 5.1 | 660 | 8.5 | 216 | 1.5 | 0.7 | 8.6 | 218 | 1.5 | 0.7 |
| 19PCA06Q | 19TCA06Q | 3 - 45 | 0.3 - 5.1 | 260 | 8.5 | 216 | 1.5 | 0.7 | 8.6 | 218 | 1.5 | 0.7 |
| 19PCA07Q | 19TCA07Q | 18 - 60 | 2.0 - 6.8 | 660 | 8.5 | 216 | 1.5 | 0.7 | 8.6 | 218 | 1.5 | 0.7 |
| 19PCA09Q | 19TCA09Q | 18 - 79 | 2.0 - 8.9 | 470 | 9.8 | 248 | 1.7 | 0.7 | 9.8 | 249 | 1.7 | 0.8 |

TRIGGER START

| | | | | | | | | | | | | |
|----------|----------|----------|------------|------|-----|-----|-----|-----|-----|-----|-----|-----|
| 19PTA02Q | 19TTA02Q | 3 - 19 | 0.3 - 2.1 | 2800 | 8.1 | 206 | 1.4 | 0.6 | 8.2 | 208 | 1.4 | 0.6 |
| 19PTA03Q | 19TTA03Q | 3 - 26 | 0.3 - 2.9 | 1900 | 8.3 | 211 | 1.5 | 0.7 | 8.4 | 212 | 1.5 | 0.7 |
| 19PTA04Q | 19TTA04Q | 3 - 40 | 0.3 - 4.5 | 1100 | 8.1 | 206 | 1.4 | 0.6 | 8.2 | 208 | 1.5 | 0.7 |
| 19PTA05Q | 19TTA05Q | 3 - 45 | 0.3 - 5.1 | 660 | 8.5 | 216 | 1.5 | 0.7 | 8.6 | 218 | 1.5 | 0.7 |
| 19PTA06Q | 19TTA06Q | 3 - 45 | 0.3 - 5.1 | 260 | 8.5 | 216 | 1.5 | 0.7 | 8.6 | 218 | 1.5 | 0.7 |
| 19PTA07Q | 19TTA07Q | 18 - 60 | 2.0 - 6.8 | 660 | 8.5 | 216 | 1.5 | 0.7 | 8.6 | 218 | 1.5 | 0.7 |
| 19PTA09Q | 19TTA09Q | 18 - 79 | 2.0 - 8.9 | 470 | 9.8 | 248 | 1.7 | 0.7 | 9.8 | 249 | 1.7 | 0.8 |
| 19PTA15Q | 19TTA15Q | 40 - 140 | 4.5 - 15.8 | 260 | 9.7 | 246 | 1.9 | 0.9 | 9.8 | 248 | 1.9 | 0.9 |

STALL

| | | | | | in | mm | lbs | kg | in | mm | lbs | kg |
|----------|----------|----|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|
| 19PTS02Q | 19TTS02Q | 19 | 2.1 | 2800 | 5.9 | 150 | 1.2 | 0.5 | 5.8 | 146 | 1.2 | 0.5 |
| 19PTS03Q | 19TTS03Q | 26 | 2.9 | 1900 | 6.1 | 155 | 1.2 | 0.5 | 6.1 | 154 | 1.2 | 0.5 |
| 19PTS04Q | 19TTS04Q | 40 | 4.5 | 1100 | 5.9 | 150 | 1.2 | 0.5 | 5.8 | 146 | 1.2 | 0.5 |
| 19PTS05Q | 19TTS05Q | 45 | 5.1 | 660 | 6.1 | 155 | 1.2 | 0.5 | 6.1 | 154 | 1.2 | 0.5 |

All pistol tools have 1/4 in NPT inlet with minimum hose ID recommended at 3/8 in (10 mm).
Air consumption of pistol tools rated at 11 SCFM.

All performance specifications measured at 90 PSI (6.2 Bar).
Includes all springs needed for coverage of advertised torque range. Includes suspension bail.

| MODEL NUMBER | | TORQUE RANGE | | FREE SPEED | LENGTH | | WEIGHT | | AIR CONSUMPTION | | |
|-------------------------|---------------------|--------------|----|------------|--------|----|--------|----|-----------------|----------------|------|
| 1/4 in Hex Quick Change | 3/8 in Square Drive | in-lbs | Nm | RPM | in | mm | lbs | kg | Air Inlet NPT | Min. Hose I.D. | SCFM |
| | | | | | | | | | 1/4 in | 1/4 in | 19 |

PUSH AND TRIGGER START - SLIDING KNOB REVERSE

| | | | | | | | | | | | |
|-------------|--------------|----------|----------|-----|-----|-----|-----|-----|--------|--------|----|
| 88RSAPT-7CQ | | 15 - 95 | 1.7 - 10 | 550 | 9.0 | 229 | 3.1 | 1.4 | 1/4 in | 1/4 in | 19 |
| 88RSAPT-5CQ | 88RSAPT-5C-3 | 15 - 160 | 1.7 - 18 | 400 | 9.0 | 229 | 3.1 | 1.4 | 1/4 in | 1/4 in | 19 |
| 88RSAPT-2CQ | | 15 - 180 | 1.7 - 20 | 200 | 9.8 | 248 | 3.4 | 1.5 | 1/4 in | 1/4 in | 19 |

TRIGGER START - SLIDING KNOB REVERSE

| | | | | | | | | | | | |
|-------------|--------------|----------|----------|-----|-----|-----|-----|-----|--------|--------|----|
| 88RSATP-7CQ | 88RSATP-7C-3 | 15 - 95 | 1.7 - 10 | 550 | 8.9 | 225 | 3.1 | 1.4 | 1/4 in | 1/4 in | 19 |
| 88RSATP-5CQ | 88RSATP-5C-3 | 15 - 160 | 1.7 - 18 | 400 | 8.9 | 225 | 3.1 | 1.4 | 1/4 in | 1/4 in | 19 |
| 88RSATP-2CQ | 88RSATP-2C-3 | 15 - 180 | 1.7 - 20 | 200 | 9.6 | 245 | 3.4 | 1.5 | 1/4 in | 1/4 in | 19 |

General:
Tool performance rated at 90 psi (620 kPa).
Weight does not include dead handle

Standard Equipment:
Operating instructions & service manual
Dead handle on all models above 100 in-lbs torque
All torque springs required to meet indicated torque

Standard Equipment if Specified:
Dead handle (861006)

H-SERIES PTH

- Torque Range: 4 - 120 Nm / 3.0 - 88.8 ft-lbs
- Bolt Size: M5 - M12 / #10 - 1/2 in
- Inertia shut-off
- Motor governor equipped
- External torque adjustment
- External speed control
- Torque signal port
- Adjustable pulse unit volume simplifies maintenance
- Market-leading repeatability
- Reversible
- Oil-less blades



35PTH403

C-SERIES PTHC & PTHFC

- Torque Range: 100 - 400 Nm / 74 - 295 ft-lbs
- Bolt Size: M12 - M20 / 1/2 in - 3/4 in
- Hydraulic pulse shut-off
- Motor governor equipped
- External torque adjustment
- External speed control
- Reversible
- Oil-less blades
- Torque signal port



140PTHC25Q

C-SERIES STHFC & STHF

- Torque Range: 2.6 - 35 Nm / 1.9 - 26 ft-lbs
- Bolt Size: M5 - M8 / #10 - 3/8 in
- Hydraulic pulse shut-off
- Motor governor equipped
- External torque adjustment
- External speed control
- Reversible
- Oil-less blades
- Torque signal port



15STH

H-SERIES PH NON-SHUT-OFF

- Torque Range: 4 - 120 Nm / 2.9 - 88.5 ft-lbs
- Bolt Size: M5 - M12 / #10 - 1/2 in
- External speed control
- Reversible
- Oil-less blades



55PHHA403



55PHH403

| MODEL NUMBER | DRIVE TYPE | TORQUE RANGE | | FREE SPEED | WEIGHT | | AIR CONSUMPTION | | |
|---|---------------|--------------|----------|------------|--------|------|-----------------|-----------|------|
| | | ft-lbs | Nm | rpm | lbs | kg | NPT | Hose I.D. | SCFM |
| H-SERIES – PISTOL GRIP – SHUT-OFF MODELS | | | | | | | | | |
| 7PTHH352 | 1/4 in Sq.Dr. | 3.0 - 5.1 | 4 - 7 | 3500 | 1.74 | 0.79 | 1/4 in | 3/8 in | 7.06 |
| 7PTHH35Q | 1/4 in QC | 3.0 - 5.1 | 4 - 7 | 3500 | 1.74 | 0.79 | 1/4 in | 3/8 in | 7.06 |
| 11PTHH352 | 1/4 in Sq.Dr. | 4.4 - 8.1 | 6 - 11 | 3500 | 1.81 | 0.82 | 1/4 in | 3/8 in | 7.06 |
| 11PTHH35Q | 1/4 in QC | 4.4 - 8.1 | 6 - 11 | 3500 | 1.87 | 0.85 | 1/4 in | 3/8 in | 7.06 |
| 11PTHH353* | 3/8 in Sq.Dr. | 4.4 - 8.1 | 6 - 11 | 3500 | 1.83 | 0.83 | 1/4 in | 3/8 in | 7.06 |
| 20PTHH40Q | 1/4 in QC | 7.4 - 14.7 | 10 - 20 | 4000 | 1.92 | 0.87 | 1/4 in | 1/2 in | 8.7 |
| 20PTHH403* | 3/8 in Sq.Dr. | 7.4 - 14.7 | 10 - 20 | 4000 | 1.90 | 0.86 | 1/4 in | 1/2 in | 8.7 |
| 35PTHH40Q | 1/4 in QC | 14.8 - 25.8 | 20 - 35 | 4000 | 2.31 | 1.05 | 1/4 in | 1/2 in | 15.9 |
| 35PTHH403* | 3/8 in Sq.Dr. | 14.8 - 25.8 | 20 - 35 | 4000 | 2.31 | 1.05 | 1/4 in | 3/8 in | 15.9 |
| 55PTHH403* | 3/8 in Sq.Dr. | 22.1 - 40.5 | 30 - 55 | 4000 | 2.54 | 1.15 | 1/4 in | 3/8 in | 15.9 |
| 80PTHH35Q | 7/16 in QC | 36.9 - 59.0 | 50 - 80 | 3500 | 3.20 | 1.45 | 1/4 in | 3/8 in | 19.4 |
| 80PTHH354 | 1/2 in Sq.Dr. | 36.9 - 59.0 | 50 - 80 | 3500 | 3.10 | 1.40 | 1/4 in | 3/8 in | 19.4 |
| 110PTHH30Q | 7/16 in QC | 55.3 - 81.1 | 75 - 110 | 3000 | 3.75 | 1.70 | 3/8 in | 1/2 in | 19.4 |
| 120PTHH304 | 1/2 in Sq.Dr. | 55.3 - 88.8 | 75 - 120 | 3000 | 3.75 | 1.70 | 3/8 in | 1/2 in | 19.4 |

| | | | | | | | | | |
|---|---------------|----------|-----------|------|-----|-----|--------|--------|------|
| C-SERIES – PISTOL GRIP – SHUT-OFF MODELS | | | | | | | | | |
| 140PTH25Q | 7/16 in QC | 74 - 103 | 100 - 140 | 2500 | 5.7 | 2.6 | 3/8 in | 1/2 in | 25.4 |
| 160PTH256 | 3/4 in Sq.Dr. | 74 - 118 | 100 - 160 | 2500 | 5.7 | 2.6 | 3/8 in | 1/2 in | 25.4 |

| | | | | | | | | | |
|--|---------------|-----------|-----------|------|------|-----|--------|--------|------|
| C-SERIES – PISTOL GRIP – SHUT-OFF MODELS – TRIGGER THROTTLE | | | | | | | | | |
| 250PTH226 | 3/4 in Sq.Dr. | 118 - 184 | 160 - 250 | 2200 | 8.8 | 4.0 | 3/8 in | 1/2 in | 33.5 |
| 400PTH206 | 3/4 in Sq.Dr. | 185 - 295 | 250 - 400 | 2000 | 11.7 | 5.3 | 3/8 in | 1/2 in | 33.5 |

| | | | | | | | | | |
|--------------------------------|---------------|-----------|-----------|------|-----|------|--------|--------|------|
| IN-LINE – PUSH-TO-START | | | | | | | | | |
| 7STHFA55Q | 1/4 in QC | 1.9 - 4.9 | 2.6 - 6.6 | 5500 | 1.8 | 0.83 | 1/8 in | | 7.0 |
| 35STHFA40Q | 7/16 in QC | 12 - 26 | 15 - 35 | 4000 | 3.1 | 1.4 | 1/4 in | 3/8 in | 15.9 |
| 35STHFA404 | 1/2 in Sq.Dr. | 12 - 26 | 15 - 35 | 4000 | 2.9 | 1.3 | 1/4 in | 3/8 in | 15.9 |

| | | | | | | | | | |
|-----------------------------------|---------------|-----------|-----------|------|-----|------|--------|--------|------|
| C-SERIES – IN-LINE – LEVER | | | | | | | | | |
| 7STHFC55Q | 1/4 in QC | 1.9 - 4.9 | 2.6 - 6.6 | 5500 | 2.1 | 0.93 | 1/8 in | | 7.0 |
| 15STHFC40Q | 1/4 in QC | 3.6 - 11 | 5.0 - 15 | 4000 | 2.4 | 1.1 | 1/4 in | 3/8 in | 16.5 |
| 35STHFC40Q | 7/16 in QC | 12 - 26 | 15 - 35 | 4000 | 3.3 | 1.5 | 1/4 in | 3/8 in | 15.9 |
| 35STHFC404 | 1/2 in Sq.Dr. | 12 - 26 | 15 - 35 | 4000 | 3.3 | 1.5 | 1/4 in | 3/8 in | 15.9 |
| 15STHFC40Q | 1/4 in QC | 3.6 - 11 | 5.0 - 15 | 3000 | 2.4 | 1.1 | 1/4 in | 3/8 in | 16.5 |

PTHHA=Top Air Inlet
(*) 7/16 in Quick Change Chuck available separately as an accessory
General:
Tool performance rated @ 87 psi (6 bar) air pressure.

Standard Equipment:
Suspension bail and torque adjusting wrench.
Torque signal port (pistol grip models only)

| MODEL NUMBER | DRIVE TYPE | TORQUE RANGE | | FREE SPEED | WEIGHT | | AIR CONSUMPTION | | |
|---|---------------|--------------|----------|------------|--------|------|-----------------|-----------|------|
| | | ft-lbs | Nm | rpm | lbs | kg | NPT | Hose I.D. | SCFM |
| H-SERIES – PISTOL GRIP – NON SHUT - OFF MODELS | | | | | | | | | |
| 7PHH602 | 1/4 in Sq.Dr. | 2.9 - 5.2 | 4 - 7 | 6000 | 1.70 | 0.77 | 1/4 in | 3/8 in | 8.7 |
| 7PHH60Q | 1/4 in QC | 2.9 - 5.2 | 4 - 7 | 6000 | 1.74 | 0.79 | 1/4 in | 3/8 in | 8.7 |
| 11PHH653* | 3/8 in Sq.Dr. | 4.4 - 8.1 | 6 - 11 | 6500 | 1.74 | 0.79 | 1/4 in | 3/8 in | 10.5 |
| 11PHH652 | 1/4 in Sq.Dr. | 4.4 - 8.1 | 6 - 11 | 6500 | 1.72 | 0.78 | 1/4 in | 3/8 in | 10.5 |
| 11PHH65Q | 1/4 in QC | 4.4 - 8.1 | 6 - 11 | 6500 | 1.76 | 0.80 | 1/4 in | 3/8 in | 10.5 |
| 20PHH753* | 3/8 in Sq.Dr. | 7.4 - 14.7 | 10 - 20 | 7500 | 1.85 | 0.84 | 1/4 in | 3/8 in | 17.3 |
| 20PHH75Q | 1/4 in QC | 7.4 - 14.7 | 10 - 20 | 7500 | 1.90 | 0.86 | 1/4 in | 3/8 in | 17.3 |
| 35PHH653* | 3/8 in Sq.Dr. | 14.7 - 25.8 | 20 - 35 | 6500 | 2.25 | 1.02 | 1/4 in | 3/8 in | 19.4 |
| 35PHH65Q | 1/4 in QC | 14.7 - 25.8 | 20 - 35 | 6500 | 2.29 | 1.03 | 1/4 in | 3/8 in | 15.9 |
| 55PHH603* | 3/8 in Sq.Dr. | 22.1 - 40.5 | 30 - 55 | 6000 | 2.47 | 1.12 | 1/4 in | 3/8 in | 22.9 |
| 80PHH604 | 1/2 in Sq.Dr. | 36.9 - 59.0 | 50 - 80 | 6000 | 3.09 | 1.40 | 1/4 in | 3/8 in | 26.5 |
| 80PHH60Q | 7/16 in QC | 36.9 - 59.0 | 50 - 80 | 6000 | 3.13 | 1.41 | 1/4 in | 3/8 in | 26.5 |
| 110PHH55Q | 7/16 in QC | 55.3 - 81.1 | 75 - 110 | 5500 | 3.68 | 1.66 | 3/8 in | 1/2 in | 30.0 |
| 120PHH554 | 1/2 in Sq.Dr. | 55.3 - 88.5 | 75 - 120 | 5500 | 3.64 | 1.65 | 3/8 in | 1/2 in | 30.0 |

| | | | | | | | | | |
|--|---------------|-----------|-----------|------|------|-----|--------|--------|------|
| HIGH TORQUE PISTOL GRIP – NON - SHUT - OFF MODELS | | | | | | | | | |
| 140PH45Q | 7/16 in QC | 74 - 103 | 100 - 140 | 4500 | 5.7 | 2.6 | 3/8 in | 1/2 in | 31.7 |
| 160PH456 | 3/4 in Sq.Dr. | 74 - 118 | 100 - 160 | 4500 | 5.7 | 2.6 | 3/8 in | 1/2 in | 31.7 |
| 250PHF406 | 3/4 in Sq.Dr. | 118 - 184 | 160 - 250 | 4000 | 8.6 | 3.9 | 3/8 in | 1/2 in | 40.6 |
| 400PHF356 | 3/4 in Sq.Dr. | 184 - 295 | 250 - 400 | 3500 | 11.5 | 5.2 | 3/8 in | 1/2 in | 42.3 |

PTHHA=Top Air Inlet
*7/16 in Quick Change Chuck available separately as an accessory.
For 7 - 75 Series Models, small handle can be ordered by substituting "S" for "L" in model number.

General:
Tool performance rated @ 87 psi (6 bar) air pressure.

Standard Equipment:
Suspension bail and torque adjusting wrench.

mPRO400GC GLOBAL CONTROLLER

- Graphics interface
- Fully programmable
- Local storage of 10000 cycles
- LAN capable
- Fieldbus options available

mPRO400GC-SG GLOBAL CONTROLLER

- Controller provides the same capabilities and functions as the mPro400GC-M controller with the added convenience of panel mount installation.



Master/Primary Unit



Secondary Unit



MPRO400GC-M



MPRO400GC-P



MPRO400GC-S

| 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-S | Secondary | Cleco 18-48 Series | 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 |
| MPRO400GC-SG | Panel Mount | LiveWire, Intelligent Spindle, 1.2.3.4 | | | | | | | | |

*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.
Panel Mount can be used in different cabinet solutions.

DESCRIPTION

- LiveWire Right Angle Series
- Torque Range: 5.5 - 90 Nm / 4.1 - 66.4 ft-lbs
- Bolt Size: M5 - M10 / #10 - 9/16 in
- Brushless precision motor
- High-resolution resolver
- Exact torque measurement by transducer
- Integrated electronic intelligence with power management and I/O signal processing
- Integrated servo



RIGHT ANGLE NUTRUNNER NOMENCLATURE

| | | | | | | | | |
|---|------------------------------|----------|--|----------|------------------------------|-----------|--|---|
| 47 | B | A | X | X | B | XX | XXX | X |
| Motor 47 | Supply B - Batt./ PM48 | | | | Input Voltage B - 26-48 V | | Output Drive Size P3 - 3/8 in Sq. dr. spiral geared P4 - 1/2 in Sq. dr. spiral geared | Output Drive Locking - Pin locking B - Ball locking |
| Tool Version A - Right angle | | | Peripherals S - Barcode scanner - None P - Expansion platform | | | | Max. Torque (Nm) 15 - 15 Nm 48 - 48 Nm 21 - 21 Nm 70 - 70 Nm 28 - 28 Nm 90 - 90 Nm 35 - 35 Nm | |
| Data Transfer Y - WLAN: Dual band 2.4 GHz, 5 GHz Z - XBee: IEEE 802.15.4 (4 tools per access point) | | | | | | | | |

The Apex μ-Guard bit shown above is not included with the tool - order separately, see page 153.

| RIGHT ANGLE Model Number | TORQUE RANGE | | FREE SPEED (RPM) | | | WEIGHT-LESS BATTERY | | OUTPUT DRIVE SIZE | LENGTH WITH 26 V BATTERY | |
|-----------------------------|--------------|----------|------------------|------|------|---------------------|------|-------------------|--------------------------|-----|
| | ft-lb | Nm | 26 V | 44 V | Vmax | lbs | kg | | in | mm |
| 47BAYPB15P3 | 4.1 - 11.1 | 5.5 - 15 | 485 | 890 | 890 | 4.9 | 2.20 | 3/8 in SQ | 23.0 | 585 |
| 47BAYPB21P3 | 5.9 - 15.5 | 8 - 21 | 370 | 680 | 680 | 4.9 | 2.20 | 3/8 in SQ | 23.0 | 585 |
| 47BAYPB28P3 | 7.4 - 20.7 | 10 - 28 | 260 | 480 | 480 | 4.9 | 2.20 | 3/8 in SQ | 23.0 | 585 |
| 47BAYPB35P3 | 8.9 - 25.8 | 12 - 35 | 255 | 445 | 445 | 5.0 | 2.25 | 3/8 in SQ | 23.1 | 588 |
| 47BAYPB48P3 | 13.3 - 35.4 | 18 - 48 | 180 | 315 | 315 | 5.2 | 2.34 | 3/8 in SQ | 23.6 | 600 |
| 47BAYPB70P4 | 17.7 - 51.7 | 24 - 70 | 123 | 216 | 216 | 9.2 | 4.18 | 1/2 in SQ | 27.2 | 691 |
| 47BAYPB90P4 | 29.5 - 66.4 | 40 - 90 | 80 | 140 | 140 | 9.2 | 4.18 | 1/2 in SQ | 27.2 | 691 |

General: All tools must be used with a suitable Cleco/DGD nutrunner controller or PC software solution.
Weight of the batteries 26 V Li-ion battery 0.50 kg, 44 V Li-ion battery 0.85 kg, The 44 V battery is 19 mm / 0.750 in shorter than the 26 V battery.

Optional accessories: Batteries, battery chargers, scanner, sockets, and bits are not included in the standard equipment.

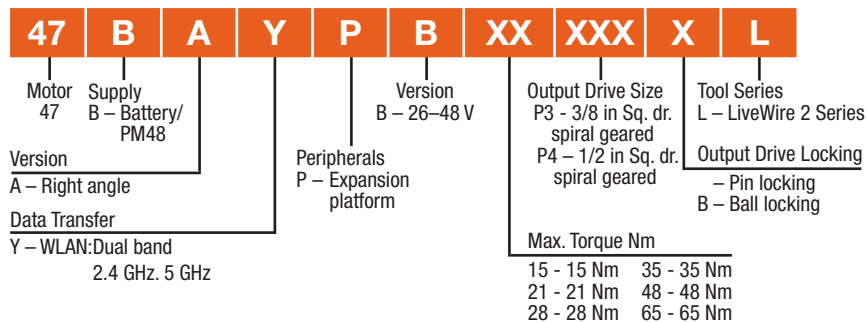
Extra Equipment: Sockets, batteries, and chargers must be ordered separately.

DESCRIPTION

- LiveWire 2 Right Angle Nutrunners
- Torque Range: 5.5 - 65 Nm / 4.1 - 47.9 ft-lbs
- Bolt Size: M5 - M10 / #10 - 9/16 in
- About 360 g lighter than LiveWire
- Expansion platform for attachments and accessories
- Brushless precision motor
- Exact torque measurement by transducer
- Integrated electronic intelligence with power management and I/O signal processing
- Integrated servo



NOMENCLATURE FOR WEIGHT-REDUCED LIVEWIRE 2 RIGHT ANGLE NUTRUNNERS



| RIGHT ANGLE Model Number | TORQUE RANGE | | FREE SPEED (RPM) | | | WEIGHT-LESS BATTERY | | OUTPUT DRIVE SIZE | LENGTH WITH 26 V BATTERY | |
|-----------------------------|--------------|----------|------------------|------|------|---------------------|------|----------------------|-----------------------------|-----|
| | ft-lb | Nm | 26 V | 44 V | Vmax | lbs | kg | | in | mm |
| 47BAYPB15P3L | 4.1 - 11.1 | 5.5 - 15 | 487 | 891 | 891 | 4.03 | 1.83 | 3/8 in SQ | 22.87 | 581 |
| 47BAYPB21P3L | 5.9 - 15.5 | 8 - 21 | 370 | 680 | 680 | 4.03 | 1.83 | 3/8 in SQ | 22.87 | 581 |
| 47BAYPB28P3L | 7.4 - 20.7 | 10 - 28 | 264 | 482 | 482 | 4.03 | 1.83 | 3/8 in SQ | 22.87 | 581 |
| 47BAYPB35P3L | 8.9 - 25.8 | 12 - 35 | 255 | 446 | 446 | 4.14 | 1.88 | 3/8 in SQ | 22.95 | 583 |
| 47BAYPB48P3L | 13.3 - 35.4 | 18 - 48 | 181 | 316 | 316 | 4.34 | 1.97 | 3/8 in SQ | 23.46 | 596 |
| 47BAYPB65P4L* | 11.1 - 47.9 | 15 - 65 | 135 | 236 | 236 | 4.56 | 2.07 | 1/2 in SQ | 23.54 | 598 |

General: All tools must be used with an approved Cleco/DGD tightening controller or suitable PC software.
Battery weights: 26 V Li-Ion 1.1 lbs. (0.50 kg).
44 V Li-Ion 1.9 lbs. (0.85 kg).
The 44 V battery is 19 mm / 0.750 in shorter than the 26 V battery.

Extra Equipment: Scanner, sockets, batteries, and chargers must be ordered separately.

*Refer to service literature for maintenance schedule

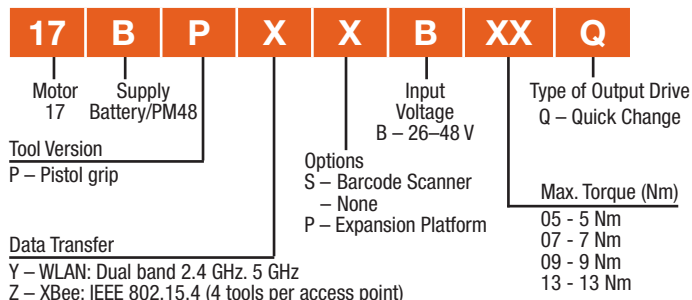
DESCRIPTION

- Pistol Grip Series
- Torque Range: 3.05 - 13 Nm / 2.2 - 9.6 ft-lbs
- Bolt Size: M5 - M6 / #10 - 1/4 in
- Brushless precision motor
- High-resolution resolver
- Exact torque measurement by transducer
- Integrated electronic intelligence with power management and I/O signal processing
- Integrated servo



17BPYSB13Q

PISTOL GRIP NUTRUNNER NOMENCLATURE



The Apex μ-Guard bit shown above is not included with the tool - order separately, see page 153.

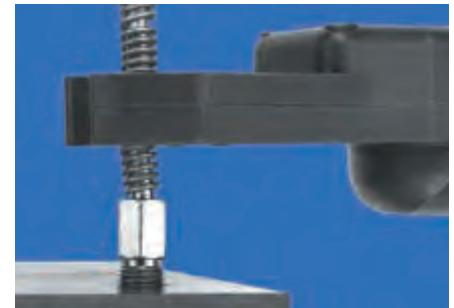
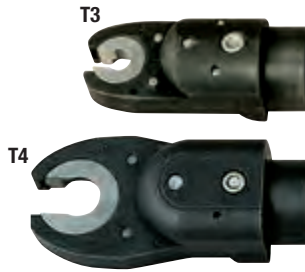
| PISTOL | TORQUE RANGE | | FREE SPEED (RPM) | | | WEIGHT-LESS BATTERY | | OUTPUT DRIVE SIZE | HEIGHT WITH 26 V BATTERY | |
|------------|--------------|--------|------------------|------|------|---------------------|------|-------------------|--------------------------|-----|
| | Model Number | ft-lb | Nm | 26 V | 44 V | Vmax | lbs | | kg | in |
| 17BPYPB05Q | 2.2 - 3.7 | 3 - 5 | 1639 | 2428 | 2428 | 3.28 | 1.49 | 1/4 in Hex | 8.44 | 215 |
| 17BPYPB07Q | 2.2 - 5.2 | 3 - 7 | 1161 | 1721 | 1721 | 3.28 | 1.49 | 1/4 in Hex | 8.44 | 215 |
| 17BPYPB09Q | 2.2 - 6.6 | 3 - 9 | 887 | 1314 | 1314 | 3.28 | 1.49 | 1/4 in Hex | 8.44 | 215 |
| 17BPYPB13Q | 2.2 - 9.6 | 3 - 13 | 629 | 931 | 931 | 3.28 | 1.49 | 1/4 in Hex | 8.44 | 215 |

General: All tools must be used with an approved Cleco/DGD tightening controller or suitable PC software.
Battery weights: 26 V Li-Ion 1.1 lbs. (0.50 kg), 44 V Li-Ion 1.9 lbs. (0.85 kg).
The 44 V battery is 19 mm / 0.750 in shorter than the 26 V battery.

Extra Equipment: Sockets, batteries, and chargers must be ordered separately.

DESCRIPTION

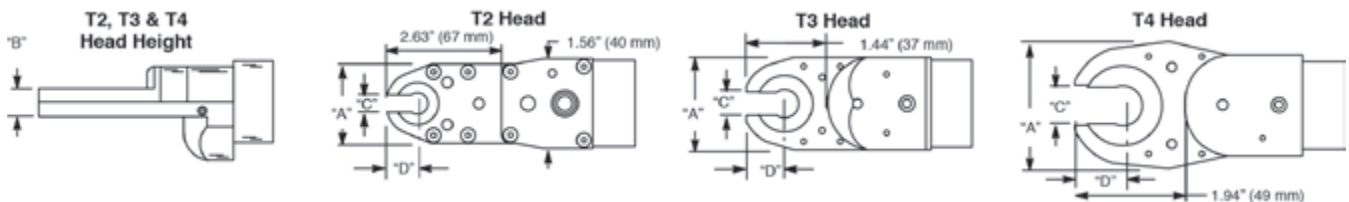
- Tube Nut Series
- Torque Range: 10 - 40 Nm / 7.4 - 29.5 ft-lbs
- Bolt Size: M6 - M8 / 1/4 in - 7/16 in
- Brushless precision motor
- High-resolution resolver
- Exact torque measurement by transducer
- Integrated electronic intelligence with power management and I/O signal processing
- Integrated servo



On the 47BT tube nutrunner a single lever controls the tightening of the fastener and the return of the hex socket to the open position. This flexibility paired with proven performance significantly increases productivity during assembly.



47BTYSB20T2



TUBE NUTRUNNER NOMENCLATURE

SOCKET IDENTIFIER

| | | | | | | | | | | |
|----|---|---|---|---|---|----|-----|----|---|---|
| 47 | B | T | X | X | X | XX | KSX | XX | X | X |
|----|---|---|---|---|---|----|-----|----|---|---|

| | | | | |
|-------------------------------------|---|---|--|--|
| Motor 17 | Supply B - Batt./PM48 | Input Voltage B-26-48 V | Options S - Barcode scanner - None | Head Size T2 - 20 Nm T3 - 30 Nm T4 - 40 Nm |
| Tool Version T - Tube nut wrench | Data Transfer Y - WLAN: Dual band 2.4 GHz. 5 GHz Z - XBee: IEEE 802.15.4 (4 tools per access point) | Socket Sizes | | |
| | | EA - 1/4 in EC - 3/8 in EE - 1/2 in EF - 9/16 in EH - 11/16 in EJ - 13/16 in EK - 7/8 in EM - 1 in | M5 - 5 mm M6 - 6 mm MA - 7 mm MB - 8 mm (5/16 in) MD - 10 mm ME - 11 mm (7/16 in) MF - 12 mm MG - 13 mm | MH - 14 mm MI - 15 mm MJ - 16 mm (5/8 in) MK - 17 mm ML - 18 mm MM - 19 mm (3/4 in) MN - 20 mm MO - 21 mm |

| | | | |
|---|--|---|--|
| Head Size KS2 - T2 KS3 - T3 KS4 - T4 | Type of Output Drive 0 - Partial thru hex 1 - Thru hex | Extensions 0 - Flush 2 - 1/4 in 4 - 1/2 in 6 - 3/4 in | Max. Hex Socket Sizes MG, EE T2 head version MM, 3/4 in T3 head version MU, 1 1/16 in T4 head version OO, ## (special) All head versions |
|---|--|---|--|



| TUBE NUT | TORQUE RANGE | | FREE SPEED (rpm) | | | WEIGHT-LESS BATTERY | | MAX. DRIVE SIZE | LENGTH WITH 26 V BATTERY | | HEAD | | | | | | | | |
|-------------|--------------|-------------|------------------|------|------|---------------------|-----|-----------------|--------------------------|------|------|---------|----|-------------|----|-----------|----|-------------|----|
| | Model Number | ft-lb | Nm | 26 V | 44 V | Vmax | lbs | | kg | in | mm | 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 in | 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 in | 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 in | 29.9 | 612 | 2.36 | 60 | 0.59 | 15 | 0.675 | 17 | 0.93 | 24 |

General: All tools must be used with an approved Cleco/DGD tightening controller or suitable PC software.
Battery weights: 26 V Li-Ion 1.1 lbs. (0.50 kg), 44 V Li-Ion 1.9 lbs (0.85 kg)
The 44 V battery is 19 mm / 0.750 in shorter than the 26 V battery.

Extra Equipment: Batteries and chargers must be ordered separately.
To order individual sockets, use a "KS" prefix.
(i.e. KS2EA01 for a T2, 1/4 in. flush thru hex socket.)

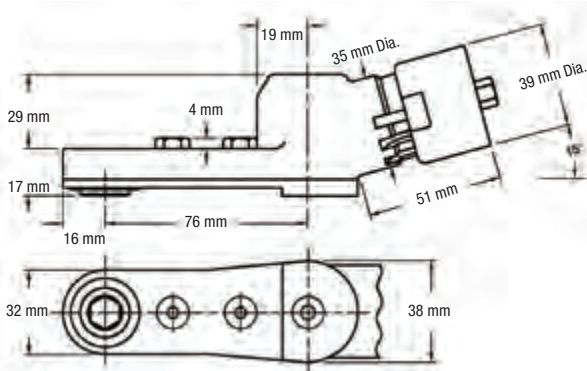
DESCRIPTION

- Crowfoot Series
- Torque Range: 10.5 - 30 Nm / 7.7 - 22.1 ft-lbs
- Bolt Size: M6 - M8 / 1/4 in - 7/16 in
- Brushless precision motor
- High-resolution resolver
- Exact torque measurement by transducer
- Integrated electronic intelligence with power management and I/O signal processing
- Integrated servo

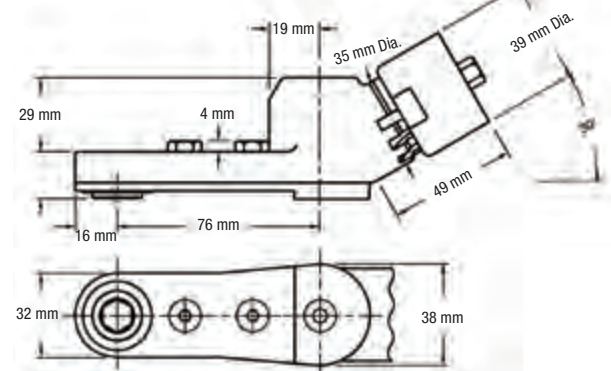


47BCYSB30C1

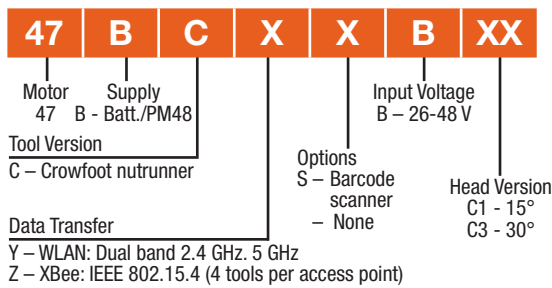
C1 – 15° head (order no. 301071)
Maximum recommended torque: 30 Nm



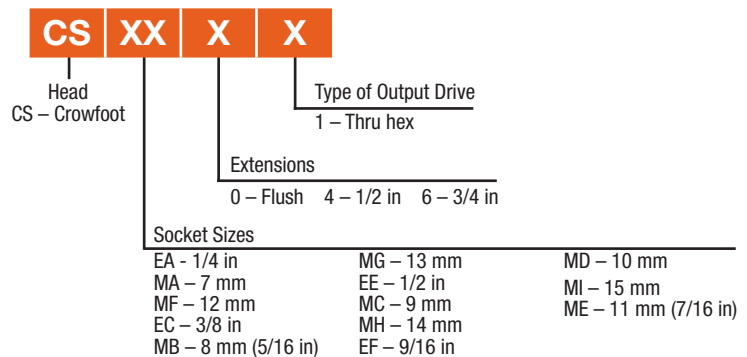
C3 – 30° head (order no. 301072)
Maximum recommended torque: 30 Nm



CROWFOOT NUTRUNNER NOMENCLATURE



SOCKET IDENTIFIER



| CROWFOOT Model Number | TORQUE RANGE | | FREE SPEED (rpm) | | | WEIGHT-LESS BATTERY | | MAX. DRIVE SIZE | LENGTH WITH 26 V BATTERY | |
|--------------------------|--------------|-----------|------------------|------|------|---------------------|------|-----------------|--------------------------|-----|
| | ft-lb | Nm | 26 V | 44 V | Vmax | lbs | kg | | in | mm |
| 47BCYSB30C1 | 7.7 - 22.1 | 10.5 - 30 | 186 | 326 | 326 | 6.12 | 2.78 | 15 mm | 26.3 | 667 |
| 47BCYSB30C3 | 7.7 - 22.1 | 10.5 - 30 | 186 | 326 | 326 | 6.12 | 2.78 | 15 mm | 26 | 660 |

General: All tools must be used with an approved Cleco/DGD tightening controller or suitable PC software.
Battery weights: 26 V Li-Ion 1.1 lbs (0.50 kg), 44 V Li-Ion 1.9 lbs (0.85 kg).
The 44 V battery is 19 mm / 0.750 in shorter than the 26 V battery.

Extra Equipment: Batteries and chargers must be ordered separately.
To order individual sockets, use a "CS" prefix before the required socket.
(i.e. CSE01 for a 1/2 in. flush thru hex socket.)

DESCRIPTION

- Right Angle Series
- Torque Range: 2 - 230 Nm / 1.5 - 169.6 ft-lbs
- Bolt Size: M5 - M16 / #10 - 5/8 in
- 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 AL2 - 1/4 in Sq.Dr. AM4 - 1/2 in Sq.Dr. AL3 - 3/8 in Sq.Dr. AH4 - 1/2 in Sq.Dr. AM3 - 3/8 in Sq.Dr. MH4 - 1/2 in Sq.Dr. AX6 - 3/4 in 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. | | | | | | |

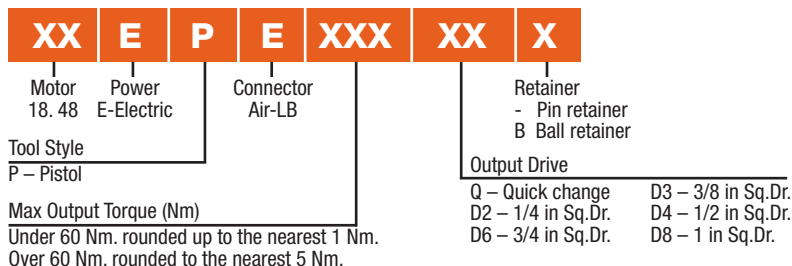
| RIGHT ANGLE | TORQUE RANGE | | MAX. SPEED | WEIGHT* | | OUTPUT DRIVE SIZE | LENGTH | | ANGLE HEAD | | | |
|--------------|--------------|----------|------------|---------|-----|-------------------|--------|-----|----------------|----|--------|----|
| | ft-lbs | Nm | | lbs | kg | | in | mm | Side to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

DESCRIPTION

- Pistol Grip Series
- Torque Range: 2 - 1000 Nm / 1.5 - 740 ft-lbs
- Bolt Size: M5 - M22 / #10 - 1 in
- Brushless precision
- Resolver control
- Transducer 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 |
| 18EPE06Q | 1.5 - 4.4 | 2 - 6 | 4000 | 2.2 | 1.0 | 1/4 in Hex | 7.0 | 178 | 0.84 | 21 |
| 18EPE06D2 | 1.5 - 4.4 | 2 - 6 | 4000 | 2.2 | 1.0 | 1/4 in | 6.5 | 165 | 0.84 | 21 |
| 18EPE12Q | 2.2 - 8.9 | 3 - 12 | 1820 | 2.4 | 1.1 | 1/4 in Hex | 7.7 | 196 | 0.84 | 21 |
| 18EPE12D3 | 2.2 - 8.9 | 3 - 12 | 1820 | 2.4 | 1.1 | 3/8 in | 7.2 | 183 | 0.84 | 21 |
| 18EPE17Q | 3.0 - 12.5 | 4 - 17 | 1290 | 2.4 | 1.1 | 1/4 in Hex | 7.7 | 196 | 0.84 | 21 |
| 18EPE17D3 | 3.0 - 12.5 | 4 - 17 | 1290 | 2.4 | 1.1 | 3/8 in | 7.2 | 183 | 0.84 | 21 |
| 18EPE22D3 | 3.7 - 16.2 | 5 - 22 | 985 | 2.4 | 1.1 | 3/8 in | 7.2 | 183 | 0.84 | 21 |
| 18EPE31D3 | 5.2 - 22.9 | 7 - 31 | 695 | 2.4 | 1.1 | 3/8 in | 7.2 | 183 | 0.84 | 21 |
| 48EPE12Q | 2.2 - 8.9 | 3 - 12 | 4000 | 2.7 | 1.2 | 1/4 in Hex | 8.2 | 208 | 0.84 | 21 |
| 48EPE12D2 | 2.2 - 8.9 | 3 - 12 | 4000 | 2.7 | 1.2 | 1/4 in | 7.7 | 196 | 0.84 | 21 |
| 48EPE25D3 | 3.7 - 18.4 | 5 - 25 | 1820 | 2.9 | 1.3 | 3/8 in | 8.4 | 213 | 0.84 | 21 |
| 48EPE36D3 | 5.9 - 26.6 | 8 - 36 | 1290 | 2.9 | 1.3 | 3/8 in | 8.4 | 213 | 0.84 | 21 |
| 48EPE48D3 | 7.4 - 35.4 | 10 - 48 | 985 | 3.0 | 1.4 | 3/8 in | 8.6 | 218 | 0.84 | 21 |
| 48EPE65D4 | 9.6 - 47.9 | 13 - 65 | 750 | 5.0 | 2.3 | 1/2 in | 11.4 | 290 | 1.1 | 28 |
| 48EPE90D4 | 14.0 - 66.4 | 19 - 90 | 510 | 5.3 | 2.4 | 1/2 in | 12.0 | 305 | 1.1 | 28 |
| 48EPE125D4 | 19.2 - 92.2 | 26 - 125 | 360 | 5.3 | 2.4 | 1/2 in | 12.0 | 305 | 1.1 | 28 |
| 48EPE150D4 | 22.9 - 110.6 | 31 - 150 | 240 | 5.3 | 2.4 | 1/2 in | 12.0 | 305 | 0.9 | 23 |
| 48EPE200D6 (swing bar) | 92 - 144 | 125 - 195 | 180 | 9.5 | 4.3 | 3/4 in | 16.2 | 410 | 1.13 | 29 |
| 48EPE500D6 (swing bar) | 225 - 368 | 300 - 500 | 53 | 9.8 | 4.5 | 3/4 in | 16.2 | 410 | 1.13 | 29 |
| 48EPE1000D8 (swing bar) | 370 - 740 | 500 - 1000 | 33 | 16.2 | 7.3 | 1 in | 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.

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

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.

DESCRIPTION

- Inline Non-Floating Series
- Torque Range: 2 - 150 Nm / 1.5 - 110 ft-lbs
- Bolt Size: M5 - M14 / #10 - 5/8 in
- Brushless precision
- Resolver control
- Transducer control
- Memory intelligence

| | | | | | | |
|--|---------------------|---------------------|----------|--|-----------|---|
| XX | E | S | E | XXX | XX | X |
| Motor 18.48 | Power E-Electric | Connector Air-LB | | | | Retainer - Pin retainer B Ball retainer |
| Tool Style S - Inline | | | | Output Drive Q - Quick change D3 - 3/8 in Sq.Dr. D2 - 1/4 in Sq.Dr. D4 - 1/2 in 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 |
| 18ESE06Q | 1.5 - 4.4 | 2 - 6 | 4000 | 2.5 | 1.1 | 1/4 in Hex | 12.3 | 312 | 0.91 | 23 |
| 18ESE06D2 | 1.5 - 4.4 | 2 - 6 | 4000 | 2.5 | 1.1 | 1/4 in | 11.8 | 300 | 0.91 | 23 |
| 18ESE12Q | 2.2 - 8.9 | 3 - 12 | 1820 | 2.7 | 1.2 | 1/4 in Hex | 13.0 | 330 | 0.91 | 23 |
| 18ESE12D3 | 2.2 - 8.9 | 3 - 12 | 1820 | 2.7 | 1.2 | 3/8 in | 12.4 | 315 | 0.91 | 23 |
| 18ESE17Q | 3.0 - 12.5 | 4 - 17 | 1290 | 2.7 | 1.2 | 1/4 in Hex | 13.0 | 330 | 0.91 | 23 |
| 18ESE17D3 | 3.0 - 12.5 | 4 - 17 | 1290 | 2.7 | 1.2 | 3/8 in | 12.4 | 315 | 0.91 | 23 |
| 18ESE22D3 | 3.7 - 16.2 | 5 - 22 | 985 | 2.7 | 1.2 | 3/8 in | 12.4 | 315 | 0.91 | 23 |
| 18ESE31D3 | 5.2 - 22.9 | 7 - 31 | 695 | 2.7 | 1.2 | 3/8 in | 12.4 | 315 | 0.91 | 23 |
| 48ESE12Q | 2.2 - 8.9 | 3 - 12 | 4000 | 3.0 | 1.4 | 1/4 in Hex | 13.5 | 343 | 0.91 | 23 |
| 48ESE12D2 | 2.2 - 8.9 | 3 - 12 | 4000 | 3.0 | 1.4 | 1/4 in | 13.0 | 330 | 0.91 | 23 |
| 48ESE25D3 | 4.4 - 18.4 | 6 - 25 | 1820 | 3.2 | 1.5 | 3/8 in | 13.6 | 345 | 0.91 | 23 |
| 48ESE36D3 | 5.9 - 26.6 | 8 - 36 | 1290 | 3.2 | 1.5 | 3/8 in | 13.6 | 345 | 0.91 | 23 |
| 48ESE48D3 | 7.4 - 35.4 | 10 - 48 | 985 | 3.3 | 1.5 | 3/8 in | 13.8 | 351 | 0.91 | 23 |
| 48ESE65D4 | 9.6 - 47.9 | 13 - 65 | 750 | 5.3 | 2.4 | 1/2 in | 16.6 | 420 | 1.13 | 29 |
| 48ESE90D4 | 14.0 - 66.4 | 19 - 90 | 510 | 5.6 | 2.5 | 1/2 in | 17.1 | 435 | 1.13 | 29 |
| 48ESE125D4 | 19.2 - 92.2 | 26 - 125 | 360 | 5.6 | 2.5 | 1/2 in | 17.1 | 435 | 1.13 | 29 |
| 48ESE150D4 | 22.9 - 110.6 | 31 - 150 | 240 | 5.6 | 2.5 | 1/2 in | 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.

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 Cleco | 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.

INTELLIGENT SPINDLE CONFIGURATIONS

Straight Drive



Straight Drive with reversible gears



Offset Drive



Offset Drive with reversible gears



Angle Drive



Angle Drive with reversible gears



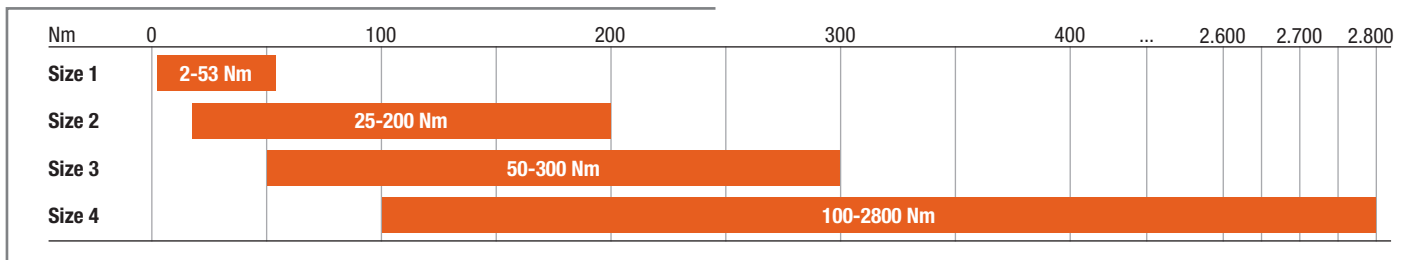
1 **BTSE** — **1B035A** — **2/** **1M1B** — **1ZB**
X **XXXX** — **XXXXXX** — **X** **XXXX** — **XXXXX**

Size: 1, 2, 3, 4
 Gear: 1 - Size, B - Brushless motor gear, XXX - Max. torque, A - Generation
 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
 2nd Transducer for cross check: 2 - 2x only for Z attachment

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

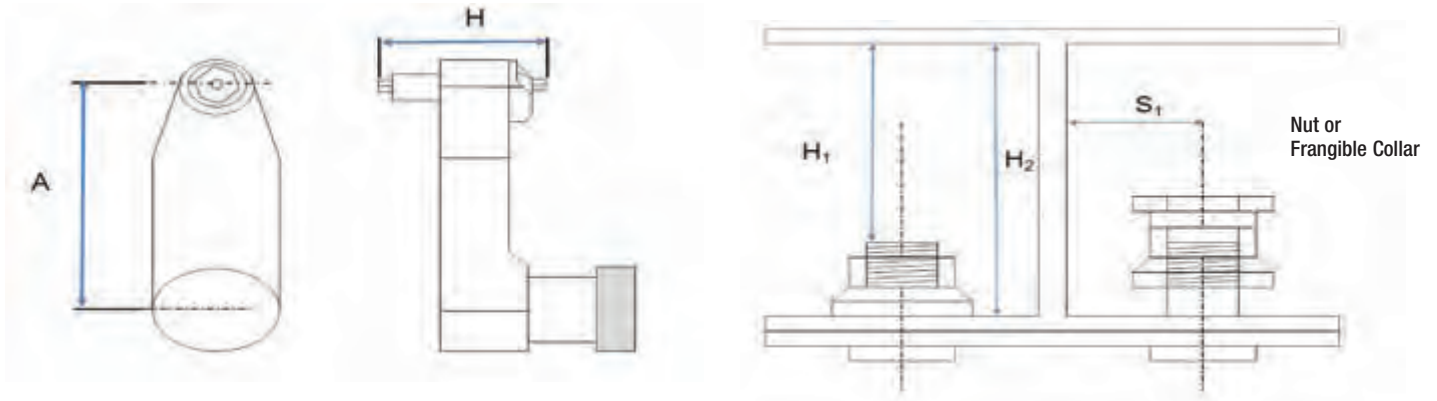
Note: Floating spindle adapter must be ordered separately.

INTELLIGENT SPINDLE SIZES AND TORQUE RANGES



DESCRIPTION

- Cleco offers a range of attachments for special fastener and difficult access applications.
- Some standard solutions are cataloged on the following pages.
- Not all solutions are cataloged, so if you don't find what you need, please submit the following so that we may fulfill your application.



| | | |
|---|-----------------------------------|--|
| 1. Part number of nut or frangible collar | | |
| 2. Hex size of nut or frangible collar | in / mm | |
| 3. Final torque requirement of fastener | in-lbs / Nm | |
| 4. "S1" edge distance between centerline of fastener to nearest structure | in / mm | |
| 5. "H2" total working space | in / mm | |
| 6. "H1" minimum clearance over pin | in / mm | |
| 7. Hex key required? | in / mm / N/A | |
| 8. "A" offset required - min/max | in / mm | |
| 9. Extended socket required? | in / mm / N/A | |
| 10. "H" maximum height of gear head. including socket | in / mm | |
| 11. Determine type of tool | Type 1 Type 2 Type 3 Type 4 | |



TYPE 1
Pistol - Offset



TYPE 2
Pistol - In-line



TYPE 3
Angle - 17 Degree



TYPE 4
Angle - Standard

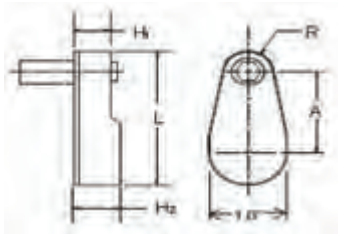
Note: Attachments also available for DC Electric Cordless Tools, pg. 133-135, and DC Corded Tools, pg. 138-139.

| PISTOL OFFSET | | | | | | | | | | | | | | |
|-----------------|------------|----|-----|-------|-------|--------|------|--------|------|-------|-------|-------|------|-----------|
| Base Model | Max Torque | | RPM | Dim A | | Dim H1 | | Dim H2 | | Dim L | | Dim R | | Options |
| | in-lbs | Nm | | in | mm | in | mm | in | mm | in | mm | in | mm | |
| FCB 14CS88-ADBH | 90 | 10 | 310 | 1.25 | 31.8 | 0.47 | 11.9 | 0.61 | 15.5 | 2.07 | 52.6 | 0.32 | 8.1 | See Below |
| FCB 14CN88-ADBH | 90 | 10 | 280 | 1.25 | 31.8 | 0.47 | 11.9 | 0.61 | 15.5 | 2.07 | 52.6 | 0.32 | 8.1 | See Below |
| FCB 14CS88-AAKF | 90 | 10 | 350 | 4.08 | 103.6 | 0.47 | 11.9 | 1.61 | 40.9 | 4.91 | 124.7 | 0.32 | 8.1 | See Below |
| FCB 14CN88-AAKF | 90 | 10 | 320 | 4.08 | 103.6 | 0.47 | 11.9 | 1.61 | 40.9 | 4.91 | 124.7 | 0.32 | 8.1 | See Below |
| FCB 14CS88-ADBJ | 120 | 13 | 310 | 2.68 | 68.1 | 0.47 | 11.9 | 0.78 | 19.8 | 3.53 | 89.7 | 0.35 | 8.9 | See Below |
| FCB 14CN88-ADBJ | 120 | 13 | 280 | 2.68 | 68.1 | 0.47 | 11.9 | 0.78 | 19.8 | 3.53 | 89.7 | 0.35 | 8.9 | See Below |
| FCB 14CN88-AKBK | 190 | 20 | 230 | 3.38 | 85.9 | 0.68 | 17.3 | 1.28 | 32.5 | 4.44 | 112.8 | 0.50 | 12.7 | See Below |
| FCB 14CN87-AKBK | 190 | 20 | 350 | 3.38 | 85.9 | 0.68 | 17.3 | 1.28 | 32.5 | 4.44 | 112.8 | 0.50 | 12.7 | See Below |



| SYSTEM OPTION | |
|---------------|---|
| Q | Indexable Quick Change between Base Tool and Head |

| HEAD OPTIONS | | | | |
|-----------------|-------------------------|---|--|------------------------|
| 1 | 2 | 3 | 4 | 5 |
| Indexer on Head | Extended Length (in/mm) | Drive Hex Size (in) | Extended Drive Socket Length (in/mm) | Hold Hex Key Size (in) |
| Yes or No | 2.0 / 50 6.0 / 152.4 | 7/32 1/4 9/32 5/16 11/32 3/8 7/16 | Flush 0.375 / 9.5 0.5 / 12.7 0.625 / 16 1.0 / 25.4 2.0 / 51 | 1/16 5/64 3/32 |



| HOW TO SPECIFY | | | | | | |
|----------------|---------------|---------------------------|-----------------|----------------|------------------------------|-------------------|
| Base Model | System Option | Head Options (From Above) | | | | |
| | Q or Blank | 1 | 2 | 3 | 4 | 5 |
| | | Indexer on Head | Extended Length | Drive Hex Size | Extended Drive Socket Length | Hold Hex Key Size |

| EXAMPLE | | | | | | |
|------------------------|---|----|--------------|---------|------------------|---------|
| FCB 14CS88-AAKF | Q | No | 2 in / 50 mm | 5/16 in | 0.5 in / 12.7 mm | 1/16 in |

| PISTOL INLINE | | | | | | | | |
|-------------------|------------|----|-----|--------|-------|--------|-----|-----------|
| Base Model | Max Torque | | RPM | Length | | Weight | | Options |
| | in-lbs | Nm | | in | mm | lbs | kg | |
| FCB 14CFS288-BKBH | 90 | 10 | 350 | 7.2 | 182.9 | 2.3 | 1.0 | See Below |
| FCB 14CFS288-BKKE | 110 | 12 | 350 | 9.8 | 248.9 | 2.5 | 1.1 | See Below |

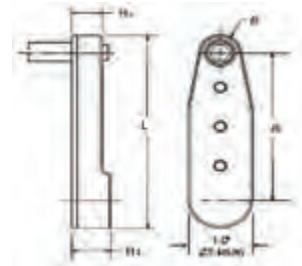
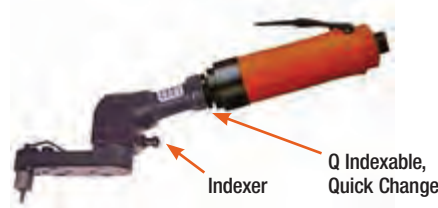


| OPTIONS | | |
|---|--|------------------------|
| 1 | 2 | 3 |
| Drive Hex Size (in) | Extended Drive Socket Length (in / mm) | Hold Hex Key Size (in) |
| 7/32 1/4 9/32 5/16 11/32 3/8 7/16 | 2.0 / 51 3.0 / 76 | 1/16 5/64 3/32 |

| HOW TO SPECIFY | | | |
|----------------|---------------------------|---|---|
| Base Model | Head Options (From Above) | | |
| | 1 | 2 | 3 |

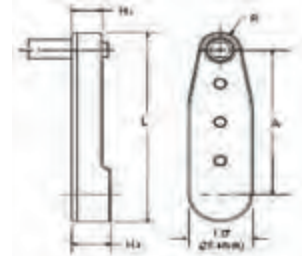
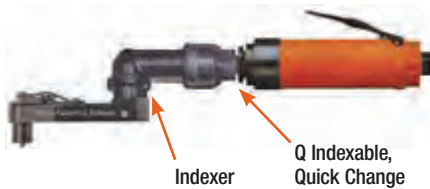
| EXAMPLE | | | |
|--------------------------|------|-------------|------|
| FCB 14CFS288-BKBH | 5/16 | 2 in / 51mm | 5/64 |

ANGLE 17 DEGREE OFFSET



| BASE MODEL | MAX TORQUE | | RPM | DIM A | | DIM H1 | | DIM H2 | | DIM L | | DIM R | | OPTIONS |
|------------------|------------|----|-----|-------|------|--------|------|--------|------|-------|-------|-------|------|-----------|
| | in-lbs | Nm | | in | mm | in | mm | in | mm | in | mm | in | mm | |
| FCB 15LN287-CDBJ | 110 | 12 | 260 | 2.69 | 68.3 | 0.47 | 11.9 | 0.78 | 19.8 | 3.54 | 89.9 | 0.35 | 8.9 | See Below |
| FCB 15LS286-CAAK | 120 | 13 | 380 | 1.33 | 33.8 | 0.47 | 11.9 | 0.61 | 15.5 | 2.26 | 57.4 | 0.43 | 10.9 | See Below |
| FCB 15LN286-CAAK | 120 | 13 | 360 | 1.33 | 33.8 | 0.47 | 11.9 | 0.61 | 15.5 | 2.26 | 57.4 | 0.43 | 10.9 | See Below |
| FCB 15LS286-CDFA | 120 | 13 | 360 | 2.75 | 69.9 | 0.47 | 11.9 | 0.61 | 15.5 | 3.68 | 93.5 | 0.43 | 10.9 | See Below |
| FCB 15LN286-CDFA | 120 | 13 | 340 | 2.75 | 69.9 | 0.47 | 11.9 | 0.61 | 15.5 | 3.68 | 93.5 | 0.43 | 10.9 | See Below |
| FCB 15LN287-CDJH | 240 | 26 | 220 | 3.27 | 83.1 | 0.50 | 12.7 | 0.65 | 16.5 | 4.30 | 109.2 | 0.44 | 11.1 | See Below |
| FCB 15LN286-CDJH | 240 | 26 | 360 | 3.27 | 83.1 | 0.50 | 12.7 | 0.65 | 16.5 | 4.30 | 109.2 | 0.44 | 11.1 | See Below |
| FCB 15LN287-CDGB | 390 | 43 | 160 | 3.00 | 76.2 | 0.69 | 17.5 | 0.94 | 23.9 | 4.19 | 106.4 | 0.56 | 14.2 | See Below |
| FCB 15LN286-CDGB | 390 | 43 | 270 | 3.00 | 76.2 | 0.69 | 17.5 | 0.94 | 23.9 | 4.19 | 106.4 | 0.56 | 14.2 | See Below |

ANGLE STANDARD

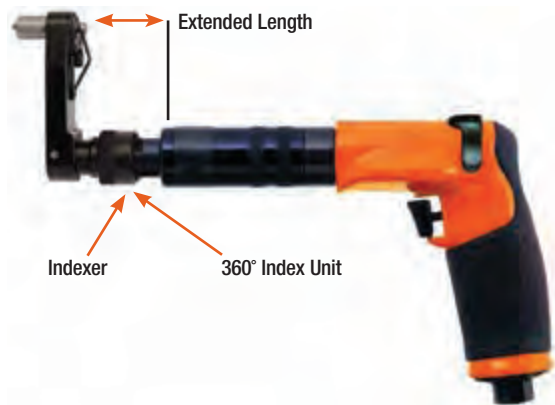


| BASE MODEL | MAX TORQUE | | RPM | DIM A | | DIM H1 | | DIM H2 | | DIM L | | DIM R | | OPTIONS | | | | | |
|-----------------------|----------------|----|------------------------------------|-------|---|--------|------|-----------------------------|------|-------|------|-------|-----|-----------|--|---|--|--|--|
| | in-lbs | Nm | | in | mm | in | mm | in | mm | in | mm | in | mm | | | | | | |
| FCB 15LS288-EDBJ | 80 | 9 | 200 | 2.69 | 68.3 | 0.47 | 11.9 | 0.78 | 19.8 | 3.54 | 89.9 | 0.35 | 8.9 | See Below | | | | | |
| OPTIONS | 1 | | 2 | | 3 | | | 4 | | | | | | | | | | | |
| | INDEXER | | DRIVE HEX SIZE | | EXTENDED DRIVE SOCKET LENGTH | | | HOLD HEX KEY SIZE | | | | | | | | | | | |
| -CDBJ | Yes No | | 7/32 1/4 | | Flush 0.375 in / 9.5mm 0.5 in / 12.7mm | | | 1/16 5/64 3/32 | | | | | | | | | | | |
| -CAAK | | | 9/32 5/16 | | 0.625 in / 16mm 0.75 in / 19.5mm | | | | | | | | | | | | | | |
| -CDFA | | | 11/32 3/8 7/16 | | 1.0 in / 25.4mm 2 in / 51mm | | | | | | | | | | | | | | |
| -CDJH | | | 5/16 3/8 7/16 1/2 9/16 | | Flush 0.5 in / 12.7mm 0.625 in / 16mm 0.75 in / 19.5mm 1.0 in / 25.4mm | | | | | | | | | | | | | | |
| -CDGB | Yes No | | 7/16 1/2 9/16 5/8 3/4 | | Flush 0.5 in / 12.7mm 0.625 in / 16mm 0.75 in / 19.5mm 1.0 in / 25.4mm 2.0 in / 51mm | | | 1/8 5/32 3/16 7/32 | | | | | | | | | | | |
| HOW TO SPECIFY | | | HEAD OPTIONS (FROM ABOVE) | | | | | | | | | | | | | | | | |
| BASE MODEL | | | SYSTEM OPTION: Q or Blank | | 1 | | 2 | | | | | | 3 | | | 4 | | | |

EXAMPLE

| | | | | | |
|-------------------------|---|----|-----|-----------------|------|
| FCB 15LS286-CAAK | Q | No | 1/4 | 0.5 in / 12.7mm | 1/16 |
|-------------------------|---|----|-----|-----------------|------|

PISTOL OFFSET



| BASE MODEL | TORQUE RANGE | | RPM | DIM A | | DIM H1 | | DIM H2 | | DIM L | | DIM R | | OPTIONS |
|---------------------------|--------------|----------|-----|-------|------|--------|-----|--------|------|-------|------|-------|-----|-----------|
| | in-lbs | Nm | | in | mm | in | mm | in | mm | in | mm | in | mm | |
| TCB 19TTA15Q-ADCJ | 38-110 | 4.3-12.4 | 230 | 2.68 | 68.1 | 0.38 | 9.7 | 0.61 | 15.5 | 3.53 | 89.7 | 0.35 | 8.9 | See Below |
| TCB 88RSATP-2-ADCJ | 12-120 | 1.4-13.6 | 170 | 2.68 | 68.1 | 0.38 | 9.7 | 0.61 | 15.5 | 3.53 | 89.7 | 0.35 | 8.9 | See Below |
| TCB 88RSATP-5-ADCJ | 13-120 | 1.4-13.6 | 350 | 2.68 | 68.1 | 0.38 | 9.7 | 0.61 | 15.5 | 3.53 | 89.7 | 0.35 | 8.9 | See Below |

OPTIONS

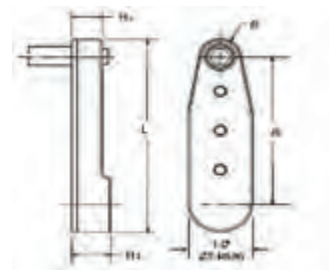
| | 1 | 2 | 3 | 4 | 5 |
|---------|-----------|--|---------------------------------------|---|--|
| INDEXER | Yes No | EXTENDED LENGTH 2 in / 50mm 6 in / 152.4mm | DRIVE HEX SIZE 1/4 9/32 5/16 | EXTENDED DRIVE SOCKET LENGTH Flush 0.375 in / 9.5mm 0.5 in / 12.7mm 0.625 in / 16mm 1.0 in / 25.4mm 2 in / 51mm | HOLD HEX KEY SIZE No Key - Drive Only 5/64 3/32 |

| HOW TO SPECIFY | HEAD OPTIONS (FROM ABOVE) | | | | |
|-------------------|---------------------------|---|---|---|---|
| BASE MODEL | 1 | 2 | 3 | 4 | 5 |

EXAMPLE

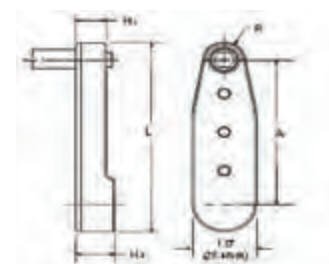
| | | | | | |
|---------------------------|----|-------------|------|-----------------|------|
| TCB 88RSATP-5-ADCJ | No | 2 in / 50mm | 9/32 | 0.5 in / 12.7mm | 3/32 |
|---------------------------|----|-------------|------|-----------------|------|

ANGLE 17 DEGREE OFFSET



| BASE MODEL | MAX TORQUE | | RPM | DIM A | | DIM H1 | | DIM H2 | | DIM L | | DIM R | | OPTIONS |
|--------------------------|------------|-------------|-----|-------|------|--------|------|--------|------|-------|-------|-------|------|-----------|
| | in-lbs | Nm | | in | mm | in | mm | in | mm | in | mm | in | mm | |
| TCB 19SCA06-CDBJ | 4-64 | 0.5 - 7.2 | 130 | 2.68 | 68.1 | 0.47 | 11.9 | 0.61 | 15.5 | 3.53 | 89.7 | 0.35 | 8.9 | See Below |
| TCB 88RSAL-5-CDCJ | 21-110 | 2.4 - 12.4 | 210 | 2.68 | 68.1 | 0.38 | 9.7 | 0.61 | 15.5 | 3.53 | 89.7 | 0.35 | 8.9 | See Below |
| TCB 24RAA23-CDHH | 140-250 | 15.5 - 28.2 | 360 | 3.38 | 85.9 | 0.68 | 17.3 | 1.28 | 32.5 | 4.44 | 112.8 | 0.50 | 12.7 | See Below |

ANGLE STANDARD



| BASE MODEL | MAX TORQUE | | RPM | DIM A | | DIM H1 | | DIM H2 | | DIM L | | DIM R | | OPTIONS |
|-------------------------|----------------------------------|---------|------------------------------------|-------|--|--------|--|--------|------|-------|------|-------|-----|-----------|
| | in-lbs | Nm | | in | mm | in | mm | in | mm | in | mm | in | mm | |
| TCB 19SCA06-EDCJ | 4-59 | 0.5-6.7 | 140 | 2.68 | 68.1 | 0.38 | 9.7 | 0.61 | 15.5 | 3.53 | 89.7 | 0.35 | 8.9 | See Below |
| TCB 8RSA-7-EDCJ | 9-80 | 1.1-9.0 | 310 | 2.68 | 68.1 | 0.38 | 9.7 | 0.61 | 15.5 | 3.53 | 89.7 | 0.35 | 8.9 | See Below |
| OPTIONS | 1 | | 2 | | 3 | | 4 | | | | | | | |
| | INDEXER | | DRIVE HEX SIZE | | EXTENDED DRIVE SOCKET LENGTH | | HOLD HEX KEY SIZE | | | | | | | |
| -CDBJ | Yes No | | 1/4 in 5/16 in | | Flush 0.5 in / 12.7mm 0.625 in / 16mm 1.0 in / 25.4mm | | No Key - Drive Only 5/64 3/32 | | | | | | | |
| -EDCJ | | | | | | | | | | | | | | |
| -CDCJ | Yes No | | 9/32 5/16 11/32 3/8 | | Flush 0.5 in / 12.7mm 0.625 in / 16mm 0.75 in / 19.5mm 1.0 in / 25.4mm | | No Key - Drive Only 3/32 1/8 | | | | | | | |
| -CDHH | Yes No | | 5/16 3/8 7/16 1/2 9/16 | | Flush 0.5 in / 12.7mm 0.625 in / 16mm 1.0 in / 25.4mm 2.0 in / 51mm | | No Key - Drive Only 3/32 1/8 5/32 | | | | | | | |
| HOW TO SPECIFY | HEAD OPTIONS (FROM ABOVE) | | | | | | | | | | | | | |
| BASE MODEL | 1 | | 2 | | 3 | | 4 | | | | | | | |
| EXAMPLE | | | | | | | | | | | | | | |
| TCB 19SCA06-EDCJ | No | | 5/16 in | | 0.5 in / 12.7mm | | 5/64 | | | | | | | |

| | |
|--|-----|
| Apex Fastening Tools Aerospace Intro | 148 |
| Socket Head Insert Bits, Hex Power Drive, Hex Extensions, Triple Square Bits --- | 149 |
| Phillips® Bits, Slotted Bits, Torx® Bits | 150 |
| Torq-Set® Bits, Torx® Bits | 151 |
| Hi-Torque® Bits, Tri-Wing® Bits | 152 |
| Apex U-Guard™ Sockets, Extensions, Bit Holders | 153 |
| Apex Sockets and Universal Wrenches Wrenches, Wrench Adapters, Sockets ---- | 154 |

FOR ALL THESE FASTENING TYPES:

From aircraft manufacturing to critical repair operations, aerospace companies demand fastener drive tools that are high-precision, reliable, and durable. Whether an assembly operation, repair, or MRO application, a plant can realize significant cost savings and productivity enhancements by using screwdriver bits and sockets that last longer, fit better, and offer a superior return on investment.



GLOBAL INDUSTRY LEADER

- Recognized as the global leader in premium, top-of-the-line fastener drive tools.
- Leader in covered products (U-Guard™ line), which enhance operator safety and reduce marring on finished surfaces.
- Unparalleled product offering of 10000+ products.

SUPERIOR PRODUCT QUALITY

- Advanced engineering capabilities, proprietary raw materials, and consistent manufacturing.
- Apex fasteners significantly outlast the competition leading to reduced cost of ownership.
- Precision fit designs for greater torque transfer to the fastener, improving tool life.

ADVANCED TECHNOLOGY

- Latest solid modeling and FEA tools used in product design.
- ISO 9001 / AS9100-certified quality management system at manufacturing plant.
- Latest CNC equipment utilized in manufacturing.

CUSTOM SOLUTIONS CAPABILITY

- The "Go-To" company for customized, hard-to-make products.
- Designed for superior strength and longevity, with quick turnaround times.
- Hundreds of custom solutions developed for aerospace applications.

SUPPORT WHEN YOU NEED IT

- Dedicated application specialists and customer service representatives available.
- 24/7 production with the capability to respond in real-time, and help support you to prevent downtime.

SOCKET HEAD INSERT BITS (1/4 in HEX) - METRIC

- For internal hexagon and adjusting screws.



| PART NUMBER | SIZE mm | OVERALL LENGTH mm |
|-------------|---------|-------------------|
| 185-1.5mm | 1.5 mm | 25 |
| 185-2mm | 2 mm | 25 |
| 185-2.5mm | 2.5 mm | 25 |
| 185-3mm | 3 mm | 25 |
| 185-4mm | 4 mm | 33 |
| 185-5mm | 5 mm | 33 |

HEX EXTENSIONS



| PART NUMBER | HEX in | TYPE OF LOCKING | OVERALL LENGTH mm |
|-------------|--------|-----------------|-------------------|
|-------------|--------|-----------------|-------------------|

HEX DRIVE WITH 1/2 in MALE SQUARE DRIVE

| | | | |
|----------|------|-----|-----|
| EX-501-3 | 7/16 | Pin | 76 |
| EX-501-4 | 7/16 | Pin | 102 |
| EX-501-6 | 7/16 | Pin | 152 |

HEX DRIVE WITH 3/8 in MALE SQUARE DRIVE

| | | | |
|----------|------|-----|-----|
| EX-371-3 | 7/16 | Pin | 76 |
| EX-371-4 | 7/16 | Pin | 102 |
| EX-371-6 | 7/16 | Pin | 152 |

HEX DRIVE WITH 1/4 in MALE SQUARE DRIVE

| | | | |
|----------|-----|-----|-----|
| EX-250-2 | 1/4 | Pin | 51 |
| EX-250-3 | 1/4 | Pin | 76 |
| EX-250-4 | 1/4 | Pin | 102 |
| EX-250-6 | 1/4 | Pin | 152 |
| EX-370 | 3/8 | Pin | 41 |
| EX-370-3 | 3/8 | Pin | 76 |
| EX-500-2 | 1/2 | Pin | 51 |
| EX-500-3 | 1/2 | Pin | 76 |

1/4 in HEX POWER DRIVE NUTSETTERS



| PART NUMBER | PART NUMBER MAGNETIC | SIZE mm | OVERALL LENGTH mm | SOCKET DIAMETER mm |
|-------------|----------------------|---------|-------------------|--------------------|
| 6N-08-8M-3 | M6N-08-8M-3 | 8 | 76 | 12.7 |
| 6N-08-8M-4 | M6N-08-8M-4 | 8 | 102 | 12.7 |
| 6N-08-8M-6 | M6N-08-8M-6 | 8 | 152 | 12.7 |
| 6N-08-10M-3 | M6N-08-10M-3 | 10 | 76 | 14.3 |
| 6N-08-10M-4 | M6N-08-10M-4 | 10 | 102 | 14.3 |
| 6N-08-10M-6 | M6N-08-10M-6 | 10 | 76 | 14.3 |
| 6N-08-12M-3 | M6N-08-12M-3 | 12 | 76 | 19.0 |
| 6N-08-12M-4 | M6N-08-12M-4 | 12 | 102 | 19.0 |
| 6N-08-12M-6 | M6N-08-12M-6 | 12 | 152 | 19.0 |

TRIPLE SQUARE BITS

- 1/4 in Hex Power Drive



| PART NUMBER | SIZE | OVERALL LENGTH | |
|-------------|-------|----------------|----|
| | | in | mm |
| 49-TSQ-4M | 4 mm | 2 | 50 |
| 49-TSQ-5M | 5 mm | 2 | 50 |
| 49-TSQ-6M | 6 mm | 2 | 50 |
| 49-TSQ-8M | 8 mm | 2 | 50 |
| 49-TSQ-10M | 10 mm | 2 | 50 |
| 49-TSQ-12M | 12 mm | 2 | 50 |

PHILLIPS® BITS



- 1/4 in Hex Insert Drive



| PART NUMBER | SIZE | OVERALL LENGTH | | |
|-------------|------|----------------|-----|--------------------|
| | | in | mm | |
| 440-1X | 1 | 1 | 25 | |
| 440-12X | 1 | 2 | 51 | |
| 440-13X | 1 | 3 | 76 | |
| 440-2X | 2 | 1 | 25 | |
| 440-2I | 2 | 1 | 25 | |
| 440-22X | 2 | 2 | 51 | |
| 440-26X | 2 | 6 | 152 | |
| 440-3X | 3 | 1 | 25 | |
| 440-3I | 3 | 1 | 25 | |
| 440-3BNX | 3 | 1 1/4 | 32 | Reinforced version |
| 440-32X | 3 | 2 | 51 | |
| 440-4X | 4 | 1 5/16 | 33 | |

SLOTTED BITS

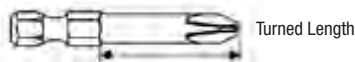


- 1/4 in Hex Insert Bits



| PART NUMBER | SCREW SIZE | TOTAL LENGTH | | BLADE THICKNESS | | BLADE WIDTH | |
|-------------|------------|--------------|----|-----------------|------|-------------|-----|
| | | in | mm | in | mm | in | mm |
| 445-1X | 4F-5R | 1 | 25 | 0.034 | 0.86 | 3/16 | 4.8 |
| 445-2X | 6F-8R | 1 | 25 | 0.040 | 1.02 | 7/32 | 5.6 |
| 445-3X | 8F-10R | 1 | 25 | 0.042 | 1.07 | 1/4 | 6.4 |
| 445-4X | 10F-12R | 1 | 25 | 0.046 | 1.17 | 9/32 | 7.1 |
| 445-1-15X | 4F-5R | 1 1/2 | 38 | 0.034 | 0.86 | 3/16 | 4.8 |
| 445-2-15X | 6F-8R | 1 1/2 | 38 | 0.040 | 1.02 | 7/32 | 5.6 |
| 445-3-15X | 8F-10R | 1 1/2 | 38 | 0.042 | 1.07 | 1/4 | 6.4 |
| 445-4-15X | 10F-12R | 1 1/2 | 38 | 0.046 | 1.17 | 9/32 | 7.1 |
| 445-5X | 12F-14R | 1 1/2 | 38 | 0.050 | 1.27 | 5/16 | 7.9 |
| 445-6X | 14F-16R | 1 1/2 | 38 | 0.055 | 1.40 | 23/64 | 9.1 |

1/4 in HEX POWER BITS



| PART NUMBER | SIZE | TOTAL LENGTH | | SHANK DIAMETER | | TURNED LENGTH | |
|-------------|------|--------------|-----|----------------|-----|---------------|-----|
| | | in | mm | in | mm | in | mm |
| 4910X | 0 | 1 15/16 | 49 | 1/8 | 3.2 | 1 1/4 | 32 |
| 491X | 1 | 1 15/16 | 49 | 3/16 | 4.8 | 1 1/4 | 32 |
| 491-AX | 1 | 2 3/4 | 70 | 3/16 | 4.8 | 2 | 51 |
| 491-BX | 1 | 3 1/2 | 89 | 3/16 | 4.8 | 2 3/4 | 70 |
| 491-CX | 1 | 6 | 152 | 3/16 | 4.8 | 2 | 51 |
| 492X | 2 | 1 15/16 | 49 | 1/4 | 6.4 | 1 1/4 | 32 |
| 492I | 2 | 1 15/16 | 49 | 1/4 | 6.4 | 1 1/4 | 32 |
| 492-AX | 2 | 2 3/4 | 70 | 1/4 | 6.4 | 2 | 51 |
| 492-AI | 2 | 2 3/4 | 70 | 1/4 | 6.4 | 2 | 51 |
| 492-BX | 2 | 3 1/2 | 89 | 1/4 | 6.4 | 2 3/4 | 70 |
| 492-BI | 2 | 3 1/2 | 89 | 1/4 | 6.4 | 2 3/4 | 70 |
| 492-CX | 2 | 6 | 152 | 1/4 | 6.4 | 2 | 51 |
| 492-CI | 2 | 6 | 152 | 1/4 | 6.4 | 2 | 51 |
| 492-200MM | 2 | 7 13/16 | 200 | 1/4 | 6.4 | 7 | 178 |
| 493X | 3 | 1 15/16 | 49 | 5/16 | 7.9 | 1 | 25 |
| 493-AX | 3 | 2 3/4 | 70 | 5/16 | 7.9 | 1 3/4 | 44 |
| 493-BX | 3 | 3 1/2 | 89 | 5/16 | 7.9 | 2 1/2 | 64 |
| 493-CX | 3 | 6 | 152 | 5/16 | 7.9 | 5 | 127 |
| 494X | 4 | 1 15/16 | 49 | 3/8 | 9.5 | 1 | 25 |

TORX® BITS



- 1/4 in Hex Insert Bits



| PART NUMBER | TORXALIGN® PART NUMBER | DRIVER SIZE | | OVERALL LENGTH | |
|---------------|------------------------|-------------|-------|----------------|----|
| | | | | in | mm |
| 440-TX-05X | - | T-5 | 0.055 | 1 | 25 |
| 440-TX-06X | - | T-6 | 0.065 | 1 | 25 |
| 440-TX-07X | - | T-7 | 0.077 | 1 | 25 |
| 440-TX-08X | - | T-8 | 0.090 | 1 | 25 |
| 440-TX-09X | - | T-9 | 0.097 | 1 | 25 |
| 440-TX-10X | 440-TX-10-W | T-10 | 0.107 | 1 | 25 |
| 440-TX-15X | 440-TX-15-W | T-15 | 0.128 | 1 | 25 |
| 440-TX-15-125 | - | T-15 | 0.128 | 1 1/4 | 32 |
| 440-TX-20X | 440-TX-20-W | T-20 | 0.151 | 1 | 25 |
| 440-TX-20-125 | - | T-20 | 0.151 | 1 1/4 | 32 |
| 440-TX-20-2 | - | T-20 | 0.151 | 2 | 51 |
| 440-TX-25X | 440-TX-25-W | T-25 | 0.173 | 1 | 25 |
| 440-TX-27X | 440-TX-27-W | T-27 | 0.195 | 1 | 25 |
| 440-TX-30X | 440-TX-30-W | T-30 | 0.216 | 1 | 25 |
| 440-TX-40X | 440-TX-40-W | T-40 | 0.260 | 1 | 25 |
| 440-TX-40I | 440-TX-40-W | T-40 | 0.260 | 1 | 25 |
| 440-TX-45X* | - | T-45 | 0.306 | 1 1/4 | 32 |
| 440-TX-50X* | - | T-50 | 0.346 | 1 1/4 | 32 |

* Hex will break before rated ultimate torque of the Torx® point is met.

TORQ-SET® BITS



- 1/4 in Hex Insert Bits



| PART NUMBER | DRIVER SIZE | OVERALL LENGTH | |
|-------------|-------------|----------------|----|
| | | in | mm |
| 212-0 | 0 | 1 | 25 |
| 212-1 | 1 | 1 | 25 |
| 212-2 | 2 | 1 | 25 |
| 212-3 | 3 | 1 | 25 |
| 212-4 | 4 | 1 | 25 |
| 212-5 | 5 | 1 | 25 |
| 212-6 | 6 | 1 | 25 |
| 212-8 | 8 | 1 | 25 |
| 212-10 | 10 | 1 | 25 |
| 212-1/4 | 1/4 | 1 | 25 |

TORX® BITS



- 1/4 in Hex Power Drive



| PART NUMBER COMPLETE ASSEMBLY | DRIVER SIZE | | SHANK DIAMETER | | TOTAL LENGTH | |
|-------------------------------|-------------|-------|----------------|-----|--------------|----|
| | | | in | mm | in | mm |
| 49-TX-05 | T-5 | 0.055 | 0.119 | 3.0 | 1 15/16 | 49 |
| 49-TX-06 | T-6 | 0.065 | 0.119 | 3.0 | 1 15/16 | 49 |
| 49-TX-07 | T-7 | 0.077 | 0.119 | 3.0 | 1 15/16 | 49 |
| 49-TX-08 | T-8 | 0.090 | 0.119 | 3.0 | 1 15/16 | 49 |
| 49-TX-09 | T-9 | 0.097 | 0.119 | 3.0 | 1 15/16 | 49 |
| 49-TX-10 | T-10 | 0.107 | 0.150 | 3.8 | 1 15/16 | 49 |
| 49-TX-15 | T-15 | 0.128 | 0.150 | 3.8 | 1 15/16 | 49 |
| 49-TX-20 | T-20 | 0.151 | 0.171 | 4.3 | 1 15/16 | 49 |
| 49-TX-25 | T-25 | 0.173 | 0.193 | 4.9 | 1 15/16 | 49 |
| 49-TX-27 | T-27 | 0.195 | 0.215 | 5.5 | 1 15/16 | 49 |
| 49-TX-30 | T-30 | 0.216 | 0.236 | 6.0 | 1 15/16 | 49 |
| 49-TX-40 | T-40 | 0.260 | 0.309 | 7.8 | 1 15/16 | 49 |

Torx® and Torxalign® are registered trademarks of the Camcar Division of Acument

TORQ-SET® BITS



- 1/4 in Hex Power Drive



| PART NUMBER | DRIVER SIZE | OVERALL LENGTH | |
|-------------|-------------|----------------|-----|
| | | in | mm |
| 170-0 | 0 | 1 1/4 | 32 |
| 273-0 | 0 | 1 15/16 | 49 |
| 273B-0 | 0 | 2 3/4 | 70 |
| 265-0 | 0 | 3 1/2 | 89 |
| 265A-0 | 0 | 6 | 152 |
| 170-1 | 1 | 1 1/4 | 32 |
| 273A-1 | 1 | 1 13/16 | 46 |
| 273-1 | 1 | 1 15/16 | 49 |
| 273B-1 | 1 | 2 3/4 | 70 |
| 265-1 | 1 | 3 1/2 | 89 |
| 265A-1 | 1 | 6 | 152 |
| 170-2 | 2 | 1 1/4 | 32 |
| 273A-2 | 2 | 1 13/16 | 46 |
| 273-2 | 2 | 1 15/16 | 49 |
| 273B-2 | 2 | 2 3/4 | 70 |
| 265-2 | 2 | 3 1/2 | 89 |
| 265A-2 | 2 | 6 | 152 |
| 170-3 | 3 | 1 1/4 | 32 |
| 273A-3 | 3 | 1 13/16 | 46 |
| 273-3 | 3 | 1 15/16 | 49 |
| 273B-3 | 3 | 2 3/4 | 70 |
| 265-3 | 3 | 3 1/2 | 89 |
| 265A-3 | 3 | 6 | 152 |
| 170-4 | 4 | 1 1/4 | 32 |
| 273A-4 | 4 | 1 13/16 | 46 |
| 273-4 | 4 | 1 15/16 | 49 |
| 273B-4 | 4 | 2 3/4 | 70 |
| 265-4 | 4 | 3 1/2 | 89 |
| 265A-4 | 4 | 6 | 152 |
| 170-5 | 5 | 1 1/4 | 32 |
| 273-5 | 5 | 1 15/16 | 49 |
| 273B-5 | 5 | 2 3/4 | 70 |
| 265-5 | 5 | 3 1/2 | 89 |
| 265A-5 | 5 | 6 | 152 |
| 170-6 | 6 | 1 1/4 | 32 |
| 170-6-ACR* | 6 | 1 1/4 | 32 |
| 273A-6 | 6 | 1 13/16 | 46 |
| 273-6 | 6 | 1 15/16 | 49 |
| 273B-6 | 6 | 2 3/4 | 70 |
| 265-6 | 6 | 3 1/2 | 89 |
| 265A-6 | 6 | 6 | 152 |
| 170-8 | 8 | 1 1/4 | 32 |
| 170-8-ACR* | 8 | 1 1/4 | 32 |
| 273A-8 | 8 | 1 13/16 | 46 |
| 273-8 | 8 | 1 15/16 | 49 |
| 273B-8 | 8 | 2 3/4 | 70 |
| 265-8 | 8 | 3 1/2 | 89 |
| 265A-8 | 8 | 6 | 152 |
| 170-10 | 10 | 1 1/4 | 32 |
| 170-10-ACR* | 10 | 1 1/4 | 32 |
| 273A-10 | 10 | 1 13/16 | 46 |
| 273-10 | 10 | 1 15/16 | 49 |
| 273B-10 | 10 | 2 3/4 | 70 |
| 265-10 | 10 | 3 1/2 | 89 |
| 265A-10 | 10 | 6 | 152 |
| 170-1/4B | 1/4 | 1 1/4 | 32 |
| 170-5/16B | 5/16 | 1 1/4 | 32 |
| 170-3/8B | 3/8 | 1 1/4 | 32 |

*Feature ACR® anti-camout ribs.

HI-TORQUE® BITS



- 1/4 in Square Drive Bits



| PART NUMBER | RECESS SIZE | OVERALL LENGTH | BODY DIAMETER | BLADE THICKNESS | BLADE WIDTH |
|-------------|-------------|----------------|---------------|-----------------|-------------|
| | | in | in | in | in |
| HTS-0 | 0 | 1 | 1/2 | 0.029 | 0.167 |
| HTS-1 | 1 | 1 | 1/2 | 0.049 | 0.274 |
| HTS-2 | 2 | 1 | 1/2 | 0.059 | 0.295 |
| HTS-3 | 3 | 1 | 1/2 | 0.059 | 0.377 |
| HTS-4 | 4 | 1 | 1/2 | 0.073 | 0.502 |

3/8 in SQUARE DRIVE BITS



| PART NUMBER | RECESS SIZE | OVERALL LENGTH | BODY DIAMETER | BLADE THICKNESS | BLADE WIDTH |
|-------------|-------------|----------------|---------------|-----------------|-------------|
| | | in | in | in | in |
| HTS-3A | 3 | 1 1/4 | 3/4 | 0.059 | 0.377 |
| HTS-4A | 4 | 1 1/4 | 3/4 | 0.073 | 0.502 |
| HTS-5 | 5 | 1 1/4 | 3/4 | 0.079 | 0.629 |
| HTS-6 | 6 | 1 1/4 | 3/4 | 0.095 | 0.745 |

1/2 in SQUARE DRIVE BITS



| PART NUMBER | RECESS SIZE | OVERALL LENGTH | BODY DIAMETER | BLADE THICKNESS | BLADE WIDTH |
|-------------|-------------|----------------|---------------|-----------------|-------------|
| | | in | in | in | in |
| HTS-7 | 7 | 1 5/8 | 1 | 0.112 | 0.884 |
| HTS-8 | 8 | 1 5/8 | 1 | 0.142 | 0.995 |
| HTS-9 | 9 | 1 5/8 | 1 1/4 | 0.162 | 1.136 |
| HTS-10 | 10 | 1 5/8 | 1 1/4 | 0.182 | 1.250 |
| HTS-12 | 12 | 2 3/8 | 1 1/4 | 0.216 | 1.500 |

1/4 in HEX INSERT BITS



| PART NUMBER | RECESS SIZE | OVERALL LENGTH | BODY DIAMETER | BLADE THICKNESS | BLADE WIDTH |
|-------------|-------------|----------------|---------------|-----------------|-------------|
| | | in | in | in | in |
| HTN-B-1 | 1 | 1 1/4 | 9/32 | 0.049 | 0.274 |
| HTN-B-2 | 2 | 1 1/4 | 5/16 | 0.059 | 0.295 |
| HTN-B-3 | 3 | 1 1/4 | 3/8 | 0.059 | 0.377 |
| HTN-B-4 | 4 | 1 1/4 | 1/2 | 0.073 | 0.502 |

TRI-WING® BITS



- 5/16 in Hex Insert Bits



| PART NUMBER | RECESS SIZE | SCREW SIZE TENSION HEAD | SCREW SIZE SHEAR HEAD | OVERALL LENGTH | |
|-------------|-------------|-------------------------|-----------------------|----------------|----|
| | | | | in | mm |
| TWE-4 | 4 | 8-32 | 10-32 | 1 1/4 | 32 |
| TWE-5 | 5 | 10-32 | 1/4-28 | 1 1/4 | 32 |

1/4 in HEX POWER DRIVE



| PART NUMBER | RECESS SIZE | SCREW SIZE TENSION HEAD | SCREW SIZE SHEAR HEAD | OVERALL LENGTH | |
|-------------|-------------|-------------------------|-----------------------|----------------|----|
| | | | | in | mm |
| TW-0 | 0 | 0-80 | - | 1 1/4 | 32 |
| TW-1 | 1 | 2-56 | 4-40 | 1 1/4 | 32 |
| TW-2 | 2 | 4-40 | 6-32 | 1 1/4 | 32 |
| TW-3 | 3 | 6-32 | 8-32 | 1 1/4 | 32 |
| TW-4 | 4 | 8-32 | 10-32 | 1 1/4 | 32 |
| TW-5 | 5 | 10-32 | 1/4-28 | 1 1/4 | 32 |
| TWB-6 | 6 | 1/4-28 | 5/16-24 | 1 1/2 | 38 |
| TWB-7 | 7 | 5/16-24 | 3/8-24 | 1 1/2 | 38 |
| TWB-8 | 8 | 3/8-24 | 7/16-20 | 1 1/2 | 38 |

5/16 in HEX POWER DRIVE



| PART NUMBER | RECESS SIZE | SCREW SIZE TENSION HEAD | SCREW SIZE SHEAR HEAD | OVERALL LENGTH | |
|-------------|-------------|-------------------------|-----------------------|----------------|----|
| | | | | in | mm |
| TWA-6 | 6 | 1/4-28 | 5/16-24 | 1 1/2 | 38 |
| TWA-7 | 7 | 5/16-24 | 3/8-24 | 1 1/2 | 38 |
| TWA-8 | 8 | 3/8-24 | 7/16-20 | 1 1/2 | 38 |

1/4 in HEX INSERT BITS



| PART NUMBER | SIZE | SIZE TENSION HEAD | SIZE SHEAR HEAD | TOTAL LENGTH | |
|-------------|------|-------------------|-----------------|--------------|----|
| | | | | in | mm |
| TWD-0 | 0 | 0-80 | - | 1 | 25 |
| TWD-1 | 1 | 2-56 | 4-40 | 1 | 25 |
| TWD-2 | 2 | 4-40 | 6-32 | 1 | 25 |
| TWD-3 | 3 | 6-32 | 8-32 | 1 | 25 |
| TWD-4 | 4 | 8-32 | 10-32 | 1 | 25 |
| TWD-5 | 5 | 10-32 | 1/4-28 | 1 | 25 |
| TWD-6 | 6 | 1/4 | 5/16 | 1 | 25 |
| TWD-7 | 7 | 5/16 | 3/8 | 1 | 25 |

U-GUARD SOCKETS

- Includes socket and sleeve



| PART NUMBER | SOCKET | DRIVE END | | | SOCKET LENGTH | FASTENER END | | | FEATURES* |
|--------------|-----------|-----------|--------|-----|---------------|--------------|------|-----|-----------|
| | | Size | Type | Sex | | Size | Type | Sex | |
| UG-10MM21 | 10MM21 | 1/4 | Square | F | Standard | 10 mm | Hex | F | FS |
| UG-M-10MM21 | M-10MM21 | 1/4 | Square | F | Standard | 10 mm | Hex | F | FS, M |
| UG-MB-10MM21 | MB-10MM21 | 1/4 | Square | F | Standard | 10 mm | Hex | F | FS, M, B |
| UG-10MM13 | 10MM13 | 3/8 | Square | F | Standard | 10 mm | Hex | F | FS |
| UG-M-10MM13 | M-10MM13 | 3/8 | Square | F | Standard | 10 mm | Hex | F | FS, M |
| UG-10MM23 | 10MM23 | 3/8 | Square | F | Long | 10 mm | Hex | F | FS |
| UG-M-10MM23 | M-10MM23 | 3/8 | Square | F | Long | 10 mm | Hex | F | FS, M |
| UG-MB-10MM23 | MB-10MM23 | 3/8 | Square | F | Long | 10 mm | Hex | F | FS, M, B |
| UG-13MM23 | 13MM23 | 3/8 | Square | F | Long | 13 mm | Hex | F | FS |
| UG-M-13MM23 | M-13MM23 | 3/8 | Square | F | Long | 13 mm | Hex | F | FS, M |
| UG-MB-13MM23 | MB-13MM23 | 3/8 | Square | F | Long | 13 mm | Hex | F | FS, M, B |
| UG-13MM25 | 13MM25 | 1/2 | Square | F | Long | 13 mm | Hex | F | FS |
| UG-SF-13MM25 | SF-13MM25 | 1/2 | Square | F | Long | 13 mm | Hex | F | FS, SF |
| UG-15MM25 | 15MM25 | 1/2 | Square | F | Long | 15 mm | Hex | F | FS |
| UG-SF-15MM25 | SF-15MM25 | 1/2 | Square | F | Long | 15 mm | Hex | F | FS, SF |
| UG-18MM25 | 18MM25 | 1/2 | Square | F | Long | 18 mm | Hex | F | FS |
| UG-SF-18MM25 | SF-18MM25 | 1/2 | Square | F | Long | 18 mm | Hex | F | FS, SF |



U-GUARD EXTENSIONS

- Includes extension and sleeve



| MODEL NUMBER | EXTENSION | DRIVE END | | | EXTENSION LENGTH | FASTENING END | | | FEATURES* |
|--------------|-----------|-----------|--------|-----|------------------|---------------|--------|-----|-----------|
| | | Size | Type | Sex | | Size | Type | Sex | |
| UG-EX-250-2 | EX-250-2 | 1/4 | Hex | M | 2 | 1/4 | Square | A | FS |
| UG-EX-250-4 | EX-250-4 | 1/4 | Hex | M | 4 | 1/4 | Square | A | FS |
| UG-EX-250-6 | EX-250-6 | 1/4 | Hex | M | 6 | 1/4 | Square | A | FS |
| UG-EX-370-2 | EX-370-2 | 1/4 | Hex | M | 2 | 3/8 | Square | A | FS |
| UG-EX-370-4 | EX-370-4 | 1/4 | Hex | M | 4 | 3/8 | Square | A | FS |
| UG-EX-370-6 | EX-370-6 | 1/4 | Hex | M | 6 | 3/8 | Square | A | FS |
| UG-EX-376-3 | EX-376-3 | 3/8 | Square | F | 3 | 3/8 | Square | A | FS |
| UG-EX-376-6 | EX-376-6 | 3/8 | Square | F | 6 | 3/8 | Square | A | FS |
| UG-EX-376-12 | EX-376-12 | 3/8 | Square | F | 12 | 3/8 | Square | A | FS |
| UG-EX-508-4 | EX-508-4 | 1/2 | Square | F | 4 | 1/2 | Square | A | FS |
| UG-EX-508-8 | EX-508-8 | 1/2 | Square | F | 8 | 1/2 | Square | A | FS |
| UG-EX-508-12 | EX-508-12 | 1/2 | Square | F | 12 | 1/2 | Square | A | FS |



U-GUARD BIT HOLDERS

- Includes bit holder and sleeve



| MODEL NUMBER | BIT HOLDER | DRIVE END | | | BIT HOLDER LENGTH | FASTENING END | | | FEATURES* |
|--------------|------------|-----------|--------|-----|-------------------|---------------|------|-----|-----------|
| | | Size | Type | Sex | | Size | Type | Sex | |
| UG-M-490 | M-490 | 1/4 | Hex | M | 2 31/32 | 1/4 | Hex | F | FS, M, ET |
| UG-M-490-2 | M-490-2 | 1/4 | Hex | M | 2 | 1/4 | Hex | F | FS, M, ET |
| UG-838 | 838 | 3/8 | Square | F | 1 1/2 | 1/4 | Hex | F | FS, ET |
| UG-M-838 | M-838 | 3/8 | Square | F | 2 5/8 | 1/4 | Hex | F | FS, M, ET |
| UG-835 | 835 | 3/8 | Square | F | 1 1/2 | 5/16 | Hex | F | FS, ET |
| UG-M-835 | M-835 | 3/8 | Square | F | 2 3/4 | 5/16 | Hex | F | FS, M, ET |
| UG-855 | 855 | 1/2 | Square | F | 1 1/2 | 5/16 | Hex | F | FS, ET |
| UG-M-855 | M-855 | 1/2 | Square | F | 2 3/4 | 5/16 | Hex | F | FS, M, ET |
| UG-QR-308 | QR-308 | 3/8 | Square | F | 1 3/4 | 1/4 | Hex | F | FS, QR |
| UG-QR-508 | QR-508 | 1/2 | Square | F | 2 1/8 | 1/4 | Hex | F | FS, QR |
| UG-QR-314 | QR-314 | 3/8 | Square | F | 2 | 7/16 | Hex | F | FS, QR |
| UG-QR-514 | QR-514 | 1/2 | Square | F | 2 1/8 | 7/16 | Hex | F | FS, QR |



Features -

- FS Free Spinning:** Tool rotates independent of sleeve.
- M Magnetic:** Tool is equipped with magnet that keeps the fastener in position during tightening.
- B Bolt Clearance:** Tool is sprung so that bolts or nuts can withdraw into the socket.
- SF Surface Drive:** Tool has special hex shape so that bolts and nuts are easier to insert.
- ET Extended Tip:** Sleeve protrudes beyond the end of the bit holder and protects most of the standard insert. ** The tip of the insert bit is free and in this way guarantees a better connection.
- QR Quick Release:** Tool has a clamping device so that bits can be changed quickly and easily. The sleeve does not protrude beyond the end of the bit holder.

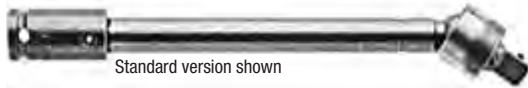
** Bit holder sleeves can be used with 1 in / 25 mm or 1 1/4 in / 32 mm long inserts. Tips of the sleeve can be changed to suit the requirements or as required.

Sleeves can be cut to the required length or heated and adapted to the shape of the bolt head.

NOTES: Lengths stated apply for core length without sleeves. If not otherwise stated, the sleeve can protrude up to 2 mm beyond the end of the tool.

UNIVERSAL WRENCH ADAPTERS

- 3/8 in square drive
- Extension
- Male square to female square



| PART NUMBER STANDARD | PART NUMBER TENSION TYPE | MALE SQUARE in | FEMALE SQUARE in | TYPE OF LOCKING | LARGEST DIAMETER mm |
|----------------------|--------------------------|----------------|------------------|-----------------|---------------------|
| KAM-37-3 | KDM-37-3 | 3/8 | 3/8 | Pin | 19 |
| --- | KDM-37-6 | 3/8 | 3/8 | Pin | 19 |
| --- | KDM-37-B-3 | 3/8 | 3/8 | Ball | 19 |
| KAM-38-6 | KDM-38-6 | 3/8 | 3/8 | Pin | 22 |

Standard lengths are 3 in, 6 in, 9 in and 12 in (76, 152, 229 and 305 mm).

SOCKETS - METRIC

- 3/8 in square drive
- Magnetic
- Thin wall
- Standard length



| PART NUMBER FIXED MAGNET | ACROSS FLATS WIDTH mm | OVERALL LENGTH A | DIAMETER SOCKET END B | DIAMETER DRIVE END C | ACROSS FLATS DEPTH D |
|--------------------------|-----------------------|------------------|-----------------------|----------------------|----------------------|
| M-8mm43 | 8 | 31.7 | 12.7 | 19.1 | 4.8 |
| M-10mm43 | 10 | 31.7 | 15.1 | 19.1 | 6.4 |
| M-11mm43 | 11 | 38.1 | 15.9 | 19.1 | 7.2 |
| M-12mm43 | 12 | 38.1 | 17.5 | 19.1 | 7.2 |
| M-13mm43 | 13 | 38.1 | 19.1 | 19.1 | 8.7 |
| M-14mm43 | 14 | 38.1 | 19.8 | 20.6 | 11.1 |
| M-15mm43 | 15 | 38.1 | 20.5 | 20.6 | 11.1 |

UNIVERSAL WRENCH - METRIC

- 3/8 in square drive
- Extension
- Hex
- Standard and with tension



| PART NUMBER STANDARD | PART NUMBER TENSION TYPE | ACROSS FLATS WIDTH mm | SHANK LENGTH A | SOCKET LENGTH B | DIA. SOCKET C | DIA. SOCKET END D | ACROSS FLATS DEPTH E |
|----------------------|--------------------------|-----------------------|----------------|-----------------|---------------|-------------------|----------------------|
| KA-6-10m-4 | --- | 10 | 102 | 20.6 | 19.1 | 15.1 | 9.5 |
| KA-6-10m-6 | KD-6-10m-6 | 10 | 152 | 20.6 | 19.1 | 15.1 | 9.5 |
| KA-6-10m-9 | KD-6-10m-9 | 10 | 229 | 20.6 | 19.1 | 15.1 | 9.5 |
| --- | KD-7-11m-6 | 11 | 152 | 23.8 | 22.2 | 15.9 | 10.3 |
| KA-7-12m-4 | --- | 12 | 102 | 23.8 | 22.2 | 17.5 | 10.3 |
| KA-7-12m-6 | KD-7-12m-6 | 12 | 152 | 23.8 | 22.2 | 17.5 | 10.3 |
| KA-7-13m-3 | --- | 13 | 76 | 25.4 | 22.2 | 17.5 | 11.9 |
| KA-7-13m-4 | --- | 13 | 102 | 25.4 | 22.2 | 17.5 | 11.9 |
| KA-7-13m-6 | KD-7-13m-6 | 13 | 152 | 25.4 | 22.2 | 17.5 | 11.9 |
| KA-7-14m-6 | KD-7-14m-6 | 14 | 152 | 27.0 | 22.2 | 19.1 | 13.5 |
| --- | KD-7-14m-9 | 14 | 229 | 27.0 | 22.2 | 19.1 | 13.5 |
| KA-8-15m-3 | --- | 15 | 76 | 28.6 | 25.4 | 19.8 | 14.3 |
| --- | KD-8-15m-6 | 15 | 152 | 28.6 | 25.4 | 19.8 | 14.3 |

* Not all parts displayed. Please go to www.Apex-Tools.com for complete listing.

SOCKETS - METRIC

- 1/2 in square drive
- Hex. double hex
- Standard length



| PART NUMBER HEX | PART NUMBER DOUBLE SQUARE | ACROSS FLATS WIDTH mm | OVERALL LENGTH A | DIAMETER SOCKET END B | DIAMETER DRIVE END C | ACROSS FLATS DEPTH D |
|--------------------|------------------------------|-----------------------------|---------------------|-----------------------------|----------------------------|----------------------------|
| 10mm15 | 10mm15-D | 10 | 38.1 | 16.7 | 23.8 | 6.4 |
| 11mm15 | 11mm15-D | 11 | 38.1 | 17.5 | 23.8 | 7.2 |
| 12mm15 | 12mm15-D | 12 | 38.1 | 19.1 | 23.8 | 7.2 |
| 13mm15 | 13mm15-D | 13 | 38.1 | 22.2 | 23.8 | 8.7 |
| 14mm15 | 14mm15-D | 14 | 38.1 | 22.2 | 23.8 | 11.1 |
| 15mm15 | 15mm15-D | 15 | 38.1 | 23.8 | 23.8 | 11.1 |
| 16mm15 | 16mm15-D | 16 | 38.1 | 25.4 | 25.4 | 11.1 |
| 17mm15 | 17mm15-D | 17 | 38.1 | 28.6 | 28.6 | 11.1 |
| 18mm15 | 18mm15-D | 18 | 38.1 | 28.6 | 28.6 | 11.1 |
| 19mm15 | 19mm15-D | 19 | 38.1 | 28.6 | 28.6 | 11.9 |
| 20mm15 | --- | 20 | 38.1 | 31.7 | 31.7 | 11.9 |
| 21mm15 | 21mm15-D | 21 | 38.1 | 31.7 | 31.7 | 13.5 |
| 22mm15 | 22mm15-D | 22 | 38.1 | 33.3 | 33.3 | 14.3 |
| 23mm15 | 23mm15-D | 23 | 38.1 | 34.9 | 34.9 | 15.9 |
| 24mm15 | 24mm15-D | 24 | 38.1 | 34.9 | 34.9 | 15.9 |

SOCKETS - METRIC

- 1/4 in square drive
- Hex. double hex
- Standard length



| PART NUMBER HEX | PART NUMBER DOUBLE HEX | ACROSS FLATS WIDTH mm | OVERALL LENGTH A | DIAMETER SOCKET END B | DIAMETER DRIVE END C | ACROSS FLATS DEPTH D |
|--------------------|---------------------------|--------------------------|---------------------|-----------------------------|----------------------------|-------------------------|
| 3.5mm11 | --- | 3.5 | 22.2 | 6.4 | 12.7 | 2.4 |
| 4mm11 | --- | 4 | 22.2 | 6.4 | 12.7 | 2.4 |
| 4.5mm11 | --- | 4.5 | 22.2 | 7.9 | 12.7 | 2.4 |
| 5mm11 | --- | 5 | 22.2 | 8.7 | 12.7 | 3.9 |
| 5.5mm11 | --- | 5.5 | 22.2 | 9.5 | 12.7 | 3.9 |
| 6mm11 | 6mm11-D | 6 | 22.2 | 9.5 | 12.7 | 3.9 |
| 7mm11 | 7mm11-D | 7 | 22.2 | 11.1 | 12.7 | 4.8 |
| 8mm11 | 8mm11-D | 8 | 25.4 | 12.7 | 12.7 | 4.8 |
| 9mm11 | 9mm11-D | 9 | 25.4 | 14.3 | 14.3 | 4.8 |
| 10mm11 | 10mm11-D | 10 | 25.4 | 15.9 | 15.9 | 6.4 |
| 0S-10mm11 | --- | 10 | 25.4 | 14.3 | 14.3 | 6.4 |
| 11mm11 | 11mm11-D | 11 | 25.4 | 15.9 | 15.9 | 7.2 |
| 12mm11 | 12mm11-D | 12 | 25.4 | 17.5 | 17.5 | 7.2 |
| 13mm11 | 13mm11-D | 13 | 25.4 | 19.1 | 19.1 | 8.7 |
| 14mm11 | 14mm11-D | 14 | 25.4 | 20.6 | 20.6 | 11.1 |
| 15mm11 | --- | 15 | 25.4 | 22.2 | 22.2 | 11.1 |
| 16mm11 | --- | 16 | 25.4 | 22.2 | 22.2 | 11.1 |

| MODEL | PAGE | MODEL | PAGE | MODEL | PAGE | MODEL | PAGE |
|-------------------|------|------------------|------|--------------|------|--------------------|------|
| A14T | 4 | FCB 15LN287-CDGB | 144 | M-13mm43 | 154 | RB 1130 | 41 |
| A14V | 4 | FCB 15LN287-CDJH | 144 | M-14mm43 | 154 | RB 1130-2 | 41 |
| A16T | 4 | FCB 15LS286-CAAK | 144 | M-15mm43 | 154 | RB40-60 | 100 |
| A16V | 4 | FCB 15LS286-CDFA | 144 | M-490 | 153 | RB40-60 | 100 |
| A24T | 2 | FCB 15LS288-EDBJ | 144 | M-490-2 | 153 | RB40-85 | 100 |
| A24V | 2 | HT3 | 16 | M6N-08-10M-3 | 149 | RB40-85 | 100 |
| A26T | 2 | HT4 | 16 | M6N-08-10M-4 | 149 | RB41 | 102 |
| A26V | 2 | HTN-B-1 | 152 | M6N-08-10M-6 | 149 | RB41 | 102 |
| CD14 | 14 | HTN-B-2 | 152 | M6N-08-12M-3 | 149 | RB42 | 102 |
| CD15 | 14 | HTN-B-3 | 152 | M6N-08-12M-4 | 149 | RB42 | 102 |
| CD1V | 14 | HTN-B-4 | 152 | M6N-08-12M-6 | 149 | RB43 | 100 |
| CD24 | 14 | HTS-0 | 152 | M6N-08-8M-3 | 149 | RB43 | 100 |
| CD25 | 14 | HTS-1 | 152 | M6N-08-8M-4 | 149 | RB44-60 | 100 |
| CD2V | 14 | HTS-10 | 152 | M6N-08-8M-6 | 149 | RB44-60 | 100 |
| EX-250-2 | 149 | HTS-12 | 152 | M-835 | 153 | RC-10015020 | 56 |
| EX-250-2 | 153 | HTS-2 | 152 | M-838 | 153 | RC-10015020W | 56 |
| EX-250-3 | 149 | HTS-3 | 152 | M-855 | 153 | RC-10025010 | 61 |
| EX-250-4 | 149 | HTS-3A | 152 | M-8mm43 | 154 | RC-10025010W | 60 |
| EX-250-4 | 153 | HTS-4 | 152 | MB-10MM21 | 153 | RC-10025015 | 61 |
| EX-250-6 | 149 | HTS-4A | 152 | MB-10MM23 | 153 | RC-10025015W | 60 |
| EX-250-6 | 153 | HTS-5 | 152 | MB-13MM23 | 153 | RC-60001005 | 118 |
| EX-370 | 149 | HTS-6 | 152 | Mitis TM | 22 | SF-13MM25 | 153 |
| EX-370-2 | 153 | HTS-7 | 152 | MPRO400GC-M | 132 | SF-15MM25 | 153 |
| EX-370-3 | 149 | HTS-8 | 152 | MPRO400GC-P | 132 | SF-18MM25 | 153 |
| EX-370-4 | 153 | HTS-9 | 152 | MPRO400GC-S | 132 | TCB 19SCA06-CDBJ | 146 |
| EX-370-6 | 153 | KA-6-10m-4 | 154 | MPRO400GC-SG | 132 | TCB 19TTA15Q-ADCJ | 145 |
| EX-371-3 | 149 | KA-6-10m-6 | 154 | OS-10mm11 | 155 | TCB 24RAA23-CDHH | 146 |
| EX-371-4 | 149 | KA-6-10m-9 | 154 | PA2-5XX | 15 | TCB 88RSAL-5-CDCJ | 146 |
| EX-371-6 | 149 | KA-7-12m-4 | 154 | PA2-6XX | 15 | TCB 88RSATP-2-ADCJ | 145 |
| EX-376-12 | 153 | KA-7-12m-6 | 154 | PA2-8XX | 15 | TCB 88RSATP-5-ADCJ | 145 |
| EX-376-3 | 153 | KA-7-13m-3 | 154 | PA3-5XX | 15 | TW-0 | 152 |
| EX-376-6 | 153 | KA-7-13m-4 | 154 | PA3-6XX | 15 | TW-1 | 152 |
| EX-500-2 | 149 | KA-7-13m-6 | 154 | PA3-8XX | 15 | TW-2 | 152 |
| EX-500-3 | 149 | KA-7-14m-6 | 154 | PA5-5XX | 15 | TW-3 | 152 |
| EX-501-3 | 149 | KA-8-15m-3 | 154 | PA5-6XX | 15 | TW-4 | 152 |
| EX-501-4 | 149 | KAM-37-3 | 154 | PA5-8XX | 15 | TW-5 | 152 |
| EX-501-6 | 149 | KAM-38-6 | 154 | PAX-5XX | 15 | TWA-6 | 152 |
| EX-508-12 | 153 | KD-6-10m-6 | 154 | PAX-6XX | 15 | TWA-7 | 152 |
| EX-508-4 | 153 | KD-6-10m-9 | 154 | PAX-8XX | 15 | TWA-8 | 152 |
| EX-508-8 | 153 | KD-7-11m-6 | 154 | PB2-5XX | 15 | TWB-6 | 152 |
| F4-PT-RT-B | 120 | KD-7-12m-6 | 154 | PB2-6XX | 15 | TWB-7 | 152 |
| FCB 14CFS288-BKBH | 143 | KD-7-13m-6 | 154 | PB2-8XX | 15 | TWB-8 | 152 |
| FCB 14CFS288-BKKE | 143 | KD-7-14m-6 | 154 | PB3-5XX | 15 | TWD-0 | 152 |
| FCB 14CN87-AKBK | 143 | KD-7-14m-9 | 154 | PB3-6XX | 15 | TWD-1 | 152 |
| FCB 14CN88-AAKF | 143 | KD-8-15m-6 | 154 | PB3-8XX | 15 | TWD-2 | 152 |
| FCB 14CN88-ADBH | 143 | KDM-37-3 | 154 | PB5-5XX | 15 | TWD-3 | 152 |
| FCB 14CN88-ADBJ | 143 | KDM-37-6 | 154 | PB5-6XX | 15 | TWD-4 | 152 |
| FCB 14CN88-AKBK | 143 | KDM-37-B-3 | 154 | PB5-8XX | 15 | TWD-5 | 152 |
| FCB 14CS88-AAKF | 143 | KDM-38-6 | 154 | PBX-5XX | 15 | TWD-6 | 152 |
| FCB 14CS88-ADBH | 143 | M-10MM13 | 153 | PBX-6XX | 15 | TWD-7 | 152 |
| FCB 14CS88-ADBJ | 143 | M-10MM21 | 153 | PBX-8XX | 15 | TWE-4 | 152 |
| FCB 15LN286-CAAK | 144 | M-10MM23 | 153 | QR-308 | 153 | TWE-5 | 152 |
| FCB 15LN286-CDFA | 144 | M-10mm43 | 154 | QR-314 | 153 | UG-10MM13 | 153 |
| FCB 15LN286-CDGB | 144 | M-11mm43 | 154 | QR-508 | 153 | UG-10MM21 | 153 |
| FCB 15LN286-CDJH | 144 | M-12mm43 | 154 | QR-514 | 153 | UG-10MM23 | 153 |
| FCB 15LN287-CDBJ | 144 | M-13MM23 | 153 | QRA-08 | 46 | UG-13MM23 | 153 |

| MODEL | PAGE |
|--------------|------|
| UG-13MM25 | 153 |
| UG-15MM25 | 153 |
| UG-18MM25 | 153 |
| UG-835 | 153 |
| UG-838 | 153 |
| UG-855 | 153 |
| UG-EX-250-2 | 153 |
| UG-EX-250-4 | 153 |
| UG-EX-250-6 | 153 |
| UG-EX-370-2 | 153 |
| UG-EX-370-4 | 153 |
| UG-EX-370-6 | 153 |
| UG-EX-376-12 | 153 |
| UG-EX-376-3 | 153 |
| UG-EX-376-6 | 153 |
| UG-EX-508-12 | 153 |
| UG-EX-508-4 | 153 |
| UG-EX-508-8 | 153 |
| UG-M-10MM13 | 153 |
| UG-M-10MM21 | 153 |
| UG-M-10MM23 | 153 |
| UG-M-13MM23 | 153 |
| UG-M-490 | 153 |
| UG-M-490-2 | 153 |
| UG-M-835 | 153 |
| UG-M-838 | 153 |
| UG-M-855 | 153 |
| UG-MB-10MM21 | 153 |
| UG-MB-10MM23 | 153 |
| UG-MB-13MM23 | 153 |
| UG-QR-308 | 153 |
| UG-QR-314 | 153 |
| UG-QR-508 | 153 |
| UG-QR-514 | 153 |
| UG-SF-13MM25 | 153 |
| UG-SF-15MM25 | 153 |
| UG-SF-18MM25 | 153 |
| 835 | 153 |
| 838 | 153 |
| 855 | 153 |
| 21502 | 14 |
| 33633 | 46 |
| 863806 | 46 |
| 863810 | 46 |
| 1001252 | 46 |
| 1001505 | 46 |
| 1005078 | 46 |
| 1005180 | 46 |
| 1005182 | 46 |
| 1005183 | 46 |
| 1005184 | 46 |
| 1005185 | 46 |
| 1005186 | 46 |
| 1005187 | 46 |
| 1005188 | 46 |
| 1005681 | 46 |

| MODEL | PAGE |
|----------|------|
| 1005682 | 46 |
| 1005684 | 46 |
| 1005871 | 46 |
| 1005872 | 46 |
| 1005873 | 46 |
| 1005875 | 46 |
| 1005876 | 46 |
| 1005926 | 46 |
| 1005927 | 46 |
| 1005977 | 46 |
| 1006001 | 46 |
| 1006035 | 46 |
| 1006395 | 46 |
| 1006408 | 46 |
| 1006412 | 46 |
| 1009726 | 46 |
| 1013904 | 46 |
| 1020699 | 46 |
| 1021289 | 38 |
| 1021291 | 38 |
| 1021292 | 38 |
| 1021620 | 38 |
| 1021620 | 38 |
| 1025313 | 38 |
| 1025314 | 38 |
| 1025409 | 38 |
| 1025476 | 38 |
| 1025477 | 38 |
| 1025528 | 38 |
| 1025668 | 38 |
| 1025694 | 38 |
| 1025696 | 38 |
| 1025730 | 38 |
| 1025731 | 38 |
| 1025733 | 38 |
| 1025780 | 38 |
| 10000010 | 51 |
| 10000100 | 51 |
| 10005000 | 52 |
| 10005001 | 52 |
| 10005050 | 52 |
| 10005051 | 52 |
| 10005200 | 52 |
| 10005250 | 52 |
| 10005305 | 52 |
| 10005306 | 52 |
| 10005355 | 52 |
| 10005356 | 52 |
| 10010001 | 54 |
| 10010010 | 54 |
| 10010015 | 54 |
| 10010016 | 54 |
| 10010110 | 54 |
| 10010111 | 54 |
| 10010115 | 54 |
| 10010116 | 54 |

| MODEL | PAGE |
|----------|------|
| 10010205 | 54 |
| 10015001 | 56 |
| 10015010 | 56 |
| 10015015 | 56 |
| 10015016 | 56 |
| 10015021 | 56 |
| 10015200 | 56 |
| 10015550 | 58 |
| 10020001 | 63 |
| 10020010 | 63 |
| 10020015 | 63 |
| 10020016 | 63 |
| 10020021 | 63 |
| 10020060 | 63 |
| 10020065 | 63 |
| 10020070 | 63 |
| 10020105 | 63 |
| 10020106 | 63 |
| 10020110 | 63 |
| 10020111 | 63 |
| 10020115 | 63 |
| 10020116 | 63 |
| 10020155 | 63 |
| 10020160 | 63 |
| 10020165 | 63 |
| 10020166 | 63 |
| 10020200 | 63 |
| 10020250 | 63 |
| 10025001 | 61 |
| 10025016 | 61 |
| 10025105 | 61 |
| 10025110 | 61 |
| 10025111 | 61 |
| 10025116 | 61 |
| 10025117 | 61 |
| 10040050 | 64 |
| 10040050 | 65 |
| 10040210 | 65 |
| 10040250 | 65 |
| 10040260 | 65 |
| 10040405 | 65 |
| 10040455 | 65 |
| 10040505 | 65 |
| 10040555 | 65 |
| 10040650 | 65 |
| 10040720 | 65 |
| 10040730 | 65 |
| 10040740 | 65 |
| 10040750 | 65 |
| 10040760 | 65 |
| 10045050 | 66 |
| 10045050 | 67 |
| 10045210 | 67 |
| 10045250 | 67 |
| 10045260 | 67 |
| 10045405 | 67 |

| MODEL | PAGE |
|----------|------|
| 10045455 | 67 |
| 10045505 | 67 |
| 10045555 | 67 |
| 10045650 | 67 |
| 10045720 | 67 |
| 10045730 | 67 |
| 10045740 | 67 |
| 10045750 | 67 |
| 10045760 | 67 |
| 10050000 | 68 |
| 10050050 | 68 |
| 10080005 | 44 |
| 10080010 | 44 |
| 10080015 | 44 |
| 10080020 | 44 |
| 10090000 | 43 |
| 10090050 | 43 |
| 10090055 | 43 |
| 10090100 | 43 |
| 10090150 | 43 |
| 30220001 | 77 |
| 30220001 | 77 |
| 30220001 | 77 |
| 30220005 | 77 |
| 30220010 | 77 |
| 30220015 | 77 |
| 30220101 | 77 |
| 30220101 | 77 |
| 30220101 | 77 |
| 30220101 | 77 |
| 30220110 | 77 |
| 30220115 | 77 |
| 30220120 | 77 |
| 30220215 | 77 |
| 30220301 | 77 |
| 30220301 | 77 |
| 30220310 | 77 |
| 30220315 | 77 |
| 30222001 | 77 |
| 30222001 | 77 |
| 30222001 | 77 |
| 30222001 | 77 |
| 30222001 | 77 |
| 30222001 | 77 |
| 30222001 | 77 |
| 30222015 | 77 |
| 30222025 | 77 |
| 30222030 | 77 |
| 30222040 | 77 |
| 30222050 | 77 |
| 30222055 | 77 |
| 30223001 | 77 |
| 30223001 | 77 |
| 30223035 | 77 |
| 30223040 | 77 |
| 30224001 | 77 |
| 30224001 | 77 |

| MODEL | PAGE | MODEL | PAGE | MODEL | PAGE | MODEL | PAGE |
|----------|------|----------|------|----------|------|----------|------|
| 30224045 | 77 | 30500105 | 78 | 30601101 | 81 | 31001501 | 82 |
| 30224050 | 77 | 30500110 | 78 | 30601101 | 81 | 31001503 | 82 |
| 30320000 | 79 | 30500115 | 78 | 30601101 | 81 | 31001506 | 82 |
| 30320000 | 79 | 30500120 | 78 | 30601110 | 81 | 31001508 | 82 |
| 30320000 | 79 | 30500125 | 78 | 30601115 | 81 | 31001511 | 82 |
| 30320005 | 79 | 30500130 | 78 | 30601120 | 81 | 31001513 | 82 |
| 30320010 | 79 | 30500200 | 78 | 30601125 | 81 | 31001521 | 82 |
| 30320015 | 79 | 30500200 | 78 | 31000000 | 82 | 31001523 | 82 |
| 30320100 | 79 | 30500200 | 78 | 31000005 | 82 | 31001610 | 82 |
| 30320100 | 79 | 30500200 | 78 | 31000010 | 82 | 31001620 | 82 |
| 30320100 | 79 | 30500200 | 78 | 31000020 | 82 | 31100005 | 83 |
| 30320100 | 79 | 30500203 | 78 | 31000025 | 82 | 31100006 | 83 |
| 30320110 | 79 | 30500205 | 78 | 31000105 | 82 | 31100009 | 83 |
| 30320115 | 79 | 30500210 | 78 | 31000110 | 82 | 31100010 | 83 |
| 30320120 | 79 | 30500215 | 78 | 31000115 | 82 | 31100020 | 83 |
| 30320215 | 79 | 30500220 | 78 | 31000205 | 82 | 31100024 | 83 |
| 30320300 | 79 | 30500300 | 78 | 31000210 | 82 | 31100025 | 83 |
| 30320300 | 79 | 30500311 | 78 | 31000305 | 82 | 31100030 | 83 |
| 30320310 | 79 | 30502160 | 78 | 31000310 | 82 | 31100035 | 83 |
| 30320315 | 79 | 30503060 | 78 | 31000315 | 82 | 31100056 | 83 |
| 30322000 | 79 | 30503060 | 78 | 31000410 | 82 | 31100100 | 83 |
| 30322000 | 79 | 30503160 | 78 | 31000505 | 82 | 31100105 | 83 |
| 30322000 | 79 | 30503160 | 78 | 31000510 | 82 | 31100110 | 83 |
| 30322000 | 79 | 30503160 | 78 | 31000520 | 82 | 31100114 | 83 |
| 30322000 | 79 | 30503165 | 78 | 31001002 | 82 | 31100115 | 83 |
| 30322000 | 79 | 30503166 | 78 | 31001007 | 82 | 31100120 | 83 |
| 30322015 | 79 | 30503260 | 78 | 31001012 | 82 | 31100122 | 83 |
| 30322025 | 79 | 30600001 | 80 | 31001017 | 82 | 31100130 | 83 |
| 30322030 | 79 | 30600001 | 80 | 31001022 | 82 | 31100131 | 83 |
| 30322040 | 79 | 30600001 | 80 | 31001030 | 82 | 31100133 | 83 |
| 30322050 | 79 | 30600001 | 80 | 31001101 | 82 | 31100135 | 83 |
| 30322055 | 79 | 30600001 | 80 | 31001103 | 82 | 31100138 | 83 |
| 30323000 | 79 | 30600010 | 80 | 31001106 | 82 | 31100142 | 83 |
| 30323000 | 79 | 30600015 | 80 | 31001108 | 82 | 31100145 | 83 |
| 30323035 | 79 | 30600020 | 80 | 31001111 | 82 | 31100177 | 83 |
| 30323040 | 79 | 30600025 | 80 | 31001113 | 82 | 31100200 | 83 |
| 30324000 | 79 | 30600030 | 80 | 31001120 | 82 | 31100205 | 83 |
| 30324000 | 79 | 30600101 | 80 | 31001130 | 82 | 31100206 | 83 |
| 30324045 | 79 | 30600101 | 80 | 31001201 | 82 | 31100210 | 83 |
| 30324050 | 79 | 30600101 | 80 | 31001203 | 82 | 31100220 | 83 |
| 30500000 | 78 | 30600101 | 80 | 31001206 | 82 | 31100225 | 83 |
| 30500000 | 78 | 30600110 | 80 | 31001208 | 82 | 31100230 | 83 |
| 30500000 | 78 | 30600115 | 80 | 31001215 | 82 | 31100236 | 83 |
| 30500000 | 78 | 30600120 | 80 | 31001225 | 82 | 31100250 | 83 |
| 30500000 | 78 | 30600125 | 80 | 31001301 | 82 | 31100300 | 83 |
| 30500055 | 78 | 30601001 | 81 | 31001303 | 82 | 31100305 | 83 |
| 30500060 | 78 | 30601001 | 81 | 31001306 | 82 | 31100310 | 83 |
| 30500065 | 78 | 30601001 | 81 | 31001308 | 82 | 31100315 | 83 |
| 30500070 | 78 | 30601001 | 81 | 31001311 | 82 | 31100320 | 83 |
| 30500075 | 78 | 30601001 | 81 | 31001313 | 82 | 31100400 | 83 |
| 30500100 | 78 | 30601010 | 81 | 31001320 | 82 | 31100405 | 83 |
| 30500100 | 78 | 30601015 | 81 | 31001330 | 82 | 31100410 | 83 |
| 30500100 | 78 | 30601020 | 81 | 31001401 | 82 | 31100415 | 83 |
| 30500100 | 78 | 30601025 | 81 | 31001404 | 82 | 31100420 | 83 |
| 30500100 | 78 | 30601030 | 81 | 31001413 | 82 | 31100425 | 83 |
| 30500100 | 78 | 30601101 | 81 | 31001420 | 82 | 31100430 | 83 |

| MODEL | PAGE | MODEL | PAGE | MODEL | PAGE | MODEL | PAGE |
|----------|------|----------|------|----------|------|----------|------|
| 31100440 | 83 | 31400200 | 87 | 32800100 | 88 | 60004015 | 119 |
| 31100444 | 83 | 31400210 | 87 | 32800200 | 88 | 60004016 | 119 |
| 31100445 | 83 | 31400300 | 87 | 32800205 | 88 | 60004017 | 119 |
| 31100446 | 83 | 31500035 | 84 | 32800260 | 88 | 60004501 | 119 |
| 31100455 | 83 | 31500065 | 84 | 32802100 | 88 | 60101010 | 100 |
| 31100460 | 83 | 31500095 | 84 | 32802200 | 88 | 60101020 | 100 |
| 31100478 | 83 | 31601000 | 84 | 32802205 | 88 | 60101110 | 100 |
| 31100515 | 83 | 31601025 | 84 | 32802260 | 88 | 60101120 | 100 |
| 31100520 | 83 | 31700000 | 85 | 32820010 | 92 | 60102010 | 102 |
| 31100586 | 83 | 31700005 | 85 | 32820110 | 92 | 60102110 | 102 |
| 31206000 | 74 | 31700200 | 85 | 33000020 | 96 | 60103010 | 102 |
| 31206005 | 74 | 31700210 | 85 | 33000025 | 96 | 60103110 | 102 |
| 31206010 | 74 | 31700300 | 85 | 33000030 | 96 | 60104010 | 100 |
| 31206015 | 74 | 31700310 | 85 | 33000040 | 96 | 60104110 | 100 |
| 31206020 | 74 | 31700315 | 85 | 33000132 | 96 | 60110010 | 100 |
| 31206025 | 74 | 31700325 | 85 | 33000240 | 96 | 60110011 | 100 |
| 31206030 | 74 | 32110055 | 97 | 33000248 | 96 | 60202005 | 106 |
| 31206035 | 74 | 32110056 | 97 | 33000625 | 96 | 60202005 | 106 |
| 31206040 | 74 | 32110057 | 97 | 33000632 | 96 | 60202005 | 111 |
| 31206045 | 74 | 32110058 | 97 | 33001005 | 96 | 60202010 | 106 |
| 31206100 | 74 | 32110059 | 97 | 33001010 | 96 | 60202010 | 106 |
| 31206105 | 74 | 32110060 | 97 | 33001015 | 96 | 60202010 | 111 |
| 31206110 | 74 | 32110061 | 97 | 33001020 | 96 | 60203006 | 106 |
| 31206120 | 74 | 32110062 | 97 | 33500104 | 95 | 60203016 | 106 |
| 31206125 | 74 | 32110063 | 97 | 33500187 | 95 | 60203106 | 106 |
| 31206200 | 74 | 32110064 | 97 | 33500206 | 95 | 60203116 | 106 |
| 31206300 | 74 | 32110065 | 97 | 33500207 | 95 | 60300006 | 110 |
| 31206305 | 74 | 32110066 | 97 | 33500301 | 95 | 60300011 | 110 |
| 31300000 | 86 | 32110067 | 97 | 33500305 | 95 | 60300106 | 106 |
| 31300025 | 86 | 32110068 | 97 | 33500306 | 95 | 60300111 | 106 |
| 31300050 | 86 | 32110069 | 97 | 33500404 | 95 | 60300206 | 106 |
| 31300125 | 86 | 32110070 | 97 | 33500504 | 95 | 60300211 | 106 |
| 31300150 | 86 | 32110071 | 97 | 33500536 | 95 | 60300520 | 110 |
| 31300200 | 86 | 32110072 | 97 | 33500537 | 95 | 60300530 | 110 |
| 31300250 | 86 | 32110073 | 97 | 33500627 | 95 | 60404005 | 106 |
| 31300300 | 86 | 32110074 | 97 | 33500657 | 95 | 60404005 | 106 |
| 31302035 | 86 | 32110075 | 97 | 33501707 | 95 | 60703005 | 113 |
| 31302060 | 86 | 32110076 | 97 | 33503108 | 95 | 60703020 | 113 |
| 31302135 | 86 | 32110077 | 97 | 33503228 | 95 | 60703040 | 113 |
| 31302160 | 86 | 32110078 | 97 | 33504104 | 95 | 60703055 | 113 |
| 31302210 | 86 | 32110079 | 97 | 33504105 | 95 | 60703075 | 113 |
| 31306000 | 86 | 32110080 | 97 | 33504204 | 95 | 60703095 | 113 |
| 31306025 | 86 | 32110081 | 97 | 33504205 | 95 | 60703205 | 113 |
| 31306050 | 86 | 32110082 | 97 | 33504224 | 95 | 60703220 | 113 |
| 31306150 | 86 | 32110083 | 97 | 33504304 | 95 | 60703240 | 113 |
| 31306225 | 86 | 32110097 | 97 | 33506100 | 95 | 60703255 | 113 |
| 31400000 | 87 | 32110098 | 97 | 40150520 | 110 | 60703275 | 113 |
| 31400004 | 87 | 32110102 | 97 | 40150530 | 110 | 60703295 | 113 |
| 31400005 | 87 | 32110103 | 97 | 60001000 | 118 | 60703405 | 113 |
| 31400015 | 87 | 32110119 | 97 | 60002005 | 117 | 60703420 | 113 |
| 31400020 | 87 | 32600000 | 93 | 60003000 | 116 | 60703440 | 113 |
| 31400100 | 87 | 32600005 | 93 | 60004000 | 119 | 60703455 | 113 |
| 31400105 | 87 | 32600050 | 93 | 60004001 | 119 | 60703475 | 113 |
| 31400110 | 87 | 32600055 | 93 | 60004005 | 119 | 60703495 | 113 |
| 31400115 | 87 | 32600100 | 93 | 60004008 | 119 | 60703505 | 113 |
| 31400125 | 87 | 32600105 | 93 | 60004010 | 119 | 60703520 | 113 |

| MODEL | PAGE | MODEL | PAGE | MODEL | PAGE | MODEL | PAGE |
|----------|------|----------|------|------------|------|------------|------|
| 60703540 | 113 | 60723205 | 113 | 70110794 | 42 | 02084021PT | 75 |
| 60703555 | 113 | 60723220 | 113 | 70110952 | 42 | 02084022PT | 75 |
| 60703575 | 113 | 60723240 | 113 | 70300005 | 46 | 02084023PT | 75 |
| 60703595 | 113 | 60723255 | 113 | 70300010 | 46 | 02084026PT | 75 |
| 60703605 | 113 | 60723275 | 113 | 90030005 | 119 | 02084027PT | 75 |
| 60703620 | 113 | 60723295 | 113 | 90510005 | 119 | 02084029PT | 75 |
| 60703640 | 113 | 60723305 | 113 | 90510010 | 119 | 02084030PT | 75 |
| 60703655 | 113 | 60723320 | 113 | 90510015 | 119 | 02084031PT | 75 |
| 60703675 | 113 | 60723340 | 113 | 90520005 | 119 | 02084032PT | 75 |
| 60703695 | 113 | 60723355 | 113 | 90520010 | 119 | 02084035PT | 75 |
| 60711105 | 113 | 60723375 | 113 | 90830001 | 114 | 02084208PT | 75 |
| 60711120 | 113 | 60723395 | 113 | 90830002 | 114 | 02110004PT | 92 |
| 60711205 | 113 | 60723405 | 113 | 91217225 | 119 | 02500586PT | 78 |
| 60711220 | 113 | 60723420 | 113 | 91825010 | 86 | 02500591PT | 78 |
| 60713105 | 113 | 60723440 | 113 | 91825010 | 86 | 02500592PT | 78 |
| 60713120 | 113 | 60723455 | 113 | 91825010 | 86 | 02500593PT | 78 |
| 60713140 | 113 | 60723475 | 113 | 91825010 | 86 | 02504028PT | 74 |
| 60713155 | 113 | 60723495 | 113 | 91825015 | 86 | 02504029PT | 74 |
| 60713175 | 113 | 60723505 | 113 | 91825015 | 86 | 02504030PT | 74 |
| 60713195 | 113 | 60723520 | 113 | 91825015 | 86 | 02504031PT | 74 |
| 60713205 | 113 | 60723540 | 113 | 91825015 | 86 | 02504032PT | 74 |
| 60713220 | 113 | 60723555 | 113 | 91825015 | 86 | 02504033PT | 74 |
| 60713240 | 113 | 60723575 | 113 | 91825015 | 86 | 02504034PT | 74 |
| 60713255 | 113 | 60723595 | 113 | 91825015 | 86 | 02504035PT | 74 |
| 60713275 | 113 | 60723605 | 113 | 91825020 | 86 | 02504036PT | 74 |
| 60713295 | 113 | 60723620 | 113 | 91825025 | 86 | 02504037PT | 74 |
| 60713405 | 113 | 60723640 | 113 | 91825025 | 86 | 02504038PT | 74 |
| 60713420 | 113 | 60723655 | 113 | 91825025 | 86 | 02504061PT | 74 |
| 60713440 | 113 | 60723675 | 113 | 91825025 | 86 | 02504062PT | 74 |
| 60713455 | 113 | 60723695 | 113 | 91825025 | 86 | 02504064PT | 74 |
| 60713475 | 113 | 60751100 | 114 | 91825030 | 86 | 02504067PT | 74 |
| 60713495 | 113 | 60751150 | 114 | 93060005 | 119 | 02504069PT | 74 |
| 60713505 | 113 | 60771150 | 115 | 93060010 | 119 | 02506010PT | 82 |
| 60713520 | 113 | 60771155 | 115 | 93080001 | 114 | 02506012PT | 82 |
| 60713540 | 113 | 60771160 | 115 | 93080002 | 114 | 02506013PT | 82 |
| 60713555 | 113 | 60802143 | 120 | 93201000 | 114 | 02506014PT | 82 |
| 60713575 | 113 | 60802144 | 120 | 93201050 | 114 | 02506015PT | 82 |
| 60713595 | 113 | 60802241 | 120 | 93201100 | 114 | 02506016PT | 82 |
| 60713605 | 113 | 60802242 | 120 | 93201150 | 114 | 02506017PT | 82 |
| 60713620 | 113 | 60802243 | 120 | 93201200 | 114 | 02506018PT | 82 |
| 60713640 | 113 | 60802244 | 120 | 93201250 | 114 | 02506019PT | 82 |
| 60713655 | 113 | 60802311 | 120 | 93430075 | 119 | 02506020PT | 82 |
| 60713675 | 113 | 60802316 | 120 | 100300105 | 70 | 02506021PT | 82 |
| 60713695 | 113 | 60802343 | 120 | 02084001PT | 76 | 03590436PT | 83 |
| 60713705 | 113 | 60802344 | 120 | 02084003PT | 76 | 03590513PT | 83 |
| 60713720 | 113 | 60901000 | 116 | 02084004PT | 76 | 03596083PT | 87 |
| 60713740 | 113 | 70110200 | 42 | 02084005PT | 76 | 03910226PT | 120 |
| 60713755 | 113 | 70110250 | 42 | 02084006PT | 76 | 03910227PT | 120 |
| 60713775 | 113 | 70110300 | 42 | 02084007PT | 76 | 03910228PT | 120 |
| 60713795 | 113 | 70110350 | 42 | 02084008PT | 76 | 03910638PT | 115 |
| 60723105 | 113 | 70110400 | 42 | 02084009PT | 76 | 03910900PT | 115 |
| 60723120 | 113 | 70110480 | 42 | 02084010PT | 76 | 03911360PT | 115 |
| 60723140 | 113 | 70110500 | 42 | 02084014PT | 76 | 03911361PT | 115 |
| 60723155 | 113 | 70110550 | 42 | 02084016PT | 76 | 03911374PT | 115 |
| 60723175 | 113 | 70110600 | 42 | 02084019PT | 75 | 03911800PT | 115 |
| 60723195 | 113 | 70110635 | 42 | 02084020PT | 75 | 03911809PT | 115 |

| MODEL | PAGE | MODEL | PAGE | MODEL | PAGE | MODEL | PAGE |
|------------|------|------------|------|---------------|------|------------|------|
| 03911810PT | 115 | 10020250W | 62 | 10130+Ø | 72 | 14-4316 | 122 |
| 03912760PT | 120 | 10025001W | 60 | 10mm11 | 155 | 14-4323 | 122 |
| 03912761PT | 120 | 10025016W | 60 | 10mm11-D | 155 | 14-4324 | 122 |
| 03912762PT | 120 | 10025105W | 60 | 10MM13 | 153 | 14-4334 | 122 |
| 03912769PT | 120 | 10025110W | 60 | 10mm15 | 155 | 14-4363 | 122 |
| 10000010W | 51 | 10025111W | 60 | 10mm15-D | 155 | 14-4364 | 122 |
| 10000100W | 51 | 10025116W | 60 | 10MM21 | 153 | 14-4372 | 122 |
| 10005000W | 52 | 10025117W | 60 | 10MM23 | 153 | 14-4373 | 122 |
| 10005001W | 52 | 100300105W | 70 | 10QNP | 18 | 14-4374 | 122 |
| 10005050W | 52 | 10030010PT | 70 | 10QNPDM | 18 | 14-4382 | 122 |
| 10005051W | 52 | 10030010W | 70 | 110PHH55Q | 131 | 14-4383 | 122 |
| 10005200W | 52 | 10040000PT | 64 | 110PTHH30Q | 131 | 14-4384 | 122 |
| 10005250W | 52 | 10040000PT | 65 | 11mm11 | 155 | 14-4385 | 122 |
| 10005305W | 52 | 10040200PT | 65 | 11mm11-D | 155 | 14-4386 | 122 |
| 10005306W | 52 | 10040200W | 64 | 11mm15 | 155 | 14-4387 | 122 |
| 10005355W | 52 | 10040210W | 64 | 11mm15-D | 155 | 14-4391 | 122 |
| 10005356W | 52 | 10040250W | 64 | 11PHH652 | 131 | 14-4392 | 122 |
| 10010001W | 54 | 10040260W | 64 | 11PHH653* | 131 | 14-4393 | 122 |
| 10010010W | 54 | 10040405W | 64 | 11PHH65Q | 131 | 14-4394 | 122 |
| 10010015W | 54 | 10040455W | 64 | 11PTHH352 | 131 | 14-4395 | 122 |
| 10010016W | 54 | 10040505W | 64 | 11PTHH353* | 131 | 14-4396 | 122 |
| 10010110W | 54 | 10040555W | 64 | 11PTHH35Q | 131 | 14-4397 | 122 |
| 10010111W | 54 | 10040600PT | 65 | 120-225 | 17 | 14-4401 | 122 |
| 10010115W | 54 | 10040600W | 64 | 120PHH554 | 131 | 14-4402 | 122 |
| 10010116W | 54 | 10040650W | 64 | 120PTHH304 | 131 | 14-4403 | 122 |
| 10010205W | 54 | 10040700PT | 64 | 120QP | 14 | 14-4404 | 122 |
| 10015001W | 56 | 10040700PT | 65 | 12mm11 | 155 | 14-4405 | 122 |
| 10015010W | 56 | 10040720W | 64 | 12mm11-D | 155 | 14-4406 | 122 |
| 10015015W | 56 | 10040730W | 64 | 12mm15 | 155 | 14-4410 | 122 |
| 10015016W | 56 | 10040740W | 64 | 12mm15-D | 155 | 14-4412 | 122 |
| 10015021W | 56 | 10040750W | 64 | 135DPV-14B-50 | 34 | 14-4422 | 122 |
| 10015200W | 56 | 10040760W | 64 | 135DPV-14B-51 | 34 | 14-4512 | 122 |
| 10015500PT | 58 | 10045000PT | 66 | 135DPV-28B-51 | 34 | 14-4513 | 122 |
| 10015500W | 58 | 10045000PT | 67 | 135DPV-7B-43 | 34 | 14-4514 | 122 |
| 10015550W | 58 | 10045200PT | 67 | 135DPV-7B-50 | 34 | 14-4516 | 122 |
| 10020001W | 62 | 10045200W | 66 | 136-112 | 17 | 14-4532 | 122 |
| 10020010W | 62 | 10045210W | 66 | 136-150 | 17 | 14-4533 | 122 |
| 10020015W | 62 | 10045250W | 66 | 13mm11 | 155 | 14-4534 | 122 |
| 10020016W | 62 | 10045260W | 66 | 13mm11-D | 155 | 14-4572 | 122 |
| 10020020PT | 63 | 10045405W | 66 | 13mm15 | 155 | 14-4573 | 122 |
| 10020020W | 62 | 10045455W | 66 | 13mm15-D | 155 | 14-4574 | 122 |
| 10020021W | 62 | 10045505W | 66 | 13MM23 | 153 | 14-4574 | 122 |
| 10020060W | 62 | 10045555W | 66 | 13MM25 | 153 | 14CFS60-95 | 122 |
| 10020065W | 62 | 10045600PT | 67 | 14-0158 | 46 | 14CFS60-98 | 122 |
| 10020070W | 62 | 10045600W | 66 | 14-0168 | 46 | 14CFS90-38 | 32 |
| 10020105W | 62 | 10045650W | 66 | 14-0170 | 46 | 14CFS90-40 | 32 |
| 10020106W | 62 | 10045700PT | 66 | 140PH45Q | 131 | 14CFS90-51 | 32 |
| 10020110W | 62 | 10045700PT | 67 | 140PTH25Q | 131 | 14CFS91-38 | 32 |
| 10020111W | 62 | 10045720W | 66 | 14-1094 | 46 | 14CFS91-40 | 32 |
| 10020115W | 62 | 10045730W | 66 | 14-1102 | 46 | 14CFS91-51 | 32 |
| 10020116W | 62 | 10045740W | 66 | 14-1104 | 46 | 14CFS92-38 | 32 |
| 10020155W | 62 | 10045750W | 66 | 14-1148 | 46 | 14CFS92-40 | 32 |
| 10020160W | 62 | 10045760W | 66 | 14-4302 | 122 | 14CFS92-51 | 32 |
| 10020165W | 62 | 10050000W | 68 | 14-4303 | 122 | 14CFS93-38 | 32 |
| 10020166W | 62 | 10050050W | 68 | 14-4306 | 122 | 14CFS93-40 | 32 |
| 10020200W | 62 | 10120+Ø | 72 | 14-4312 | 122 | 14CFS93-51 | 32 |
| | | | | | | 14CFS94-38 | 32 |

| MODEL | PAGE | MODEL | PAGE | MODEL | PAGE | MODEL | PAGE |
|----------------|------|-----------------|------|-------------|------|------------|------|
| 14CFS94-40 | 32 | 158-15QRVHD-MCC | 12 | 15LF287-62 | 35 | 170-3/8B | 151 |
| 14CFS94-51 | 32 | 158QR | 10 | 15LF287Q | 39 | 170-4 | 151 |
| 14CFS95-38 | 32 | 158QRV - | 10 | 15LN281-52 | 37 | 170-5 | 151 |
| 14CFS95-40 | 32 | 15DP-1.6B-53 | 34 | 15LN281-62 | 36 | 170-5/16B | 151 |
| 14CFS95-51 | 32 | 15DP-14B-49 | 34 | 15LN281Q | 39 | 170-6 | 151 |
| 14CFS96-38 | 32 | 15DP-4B-53 | 34 | 15LN282-52 | 37 | 170-6-ACR* | 151 |
| 14CFS96-40 | 32 | 15DP-8B-53 | 34 | 15LN282-62 | 36 | 170-8 | 151 |
| 14CFS96-51 | 32 | 15L1401-37 | 35 | 15LN282Q | 39 | 170-8-ACR* | 151 |
| 14CFS97-38 | 32 | 15L1470-37 | 35 | 15LN283-52 | 37 | 17BPYPB05Q | 135 |
| 14CFS97-40 | 32 | 15L1471-37 | 35 | 15LN283-62 | 36 | 17BPYPB07Q | 135 |
| 14CFS97-51 | 32 | 15L1487-32 | 35 | 15LN283Q | 39 | 17BPYPB09Q | 135 |
| 14CHL92-38 | 33 | 15L1487-36 | 35 | 15LN284-52 | 37 | 17BPYPB13Q | 135 |
| 14CHL92-40 | 33 | 15L1487-38 | 35 | 15LN284-62 | 36 | 17mm15 | 155 |
| 14CHL92-51 | 33 | 15L1488-36 | 35 | 15LN284Q | 39 | 17mm15-D | 155 |
| 14CHL92-53 | 33 | 15L1488-38 | 35 | 15LN285-52 | 37 | 180-225 | 17 |
| 14CHL98-38 | 33 | 15L1489-32 | 35 | 15LN285-62 | 36 | 185-1.5mm | 149 |
| 14CHL98-40 | 33 | 15L1489-36 | 35 | 15LN285Q | 39 | 185-2.5mm | 149 |
| 14CHL98-51 | 33 | 15L1489-38 | 35 | 15LN286-52 | 37 | 185-2mm | 149 |
| 14CHL98-53 | 33 | 15L1489-51 | 35 | 15LN286-62 | 36 | 185-3mm | 149 |
| 14CNL60-95 | 122 | 15LF051-38 | 40 | 15LN286Q | 39 | 185-4mm | 149 |
| 14CNL90-38 | 33 | 15LF052-38 | 40 | 15LN287Q | 39 | 185-5mm | 149 |
| 14CNL90-40 | 33 | 15LF053-38 | 40 | 15LN288-52 | 37 | 18EAE08AL2 | 138 |
| 14CNL91-40 | 33 | 15LF054-38 | 40 | 15LN288-62 | 36 | 18EAE15AM3 | 138 |
| 14CNL91-51 | 33 | 15LF055-38 | 40 | 15LS281-52 | 37 | 18EAE22AM3 | 138 |
| 14CNL92-38 | 33 | 15LF080-38 | 40 | 15LS281-62 | 36 | 18EAE28AM3 | 138 |
| 14CNL92-40 | 33 | 15LF081-38 | 40 | 15LS282-52 | 37 | 18EPE06D2 | 139 |
| 14CNL92-51 | 33 | 15LF081-40 | 40 | 15LS282-62 | 36 | 18EPE06Q | 139 |
| 14CNL92-53 | 33 | 15LF082-38 | 40 | 15LS283-52 | 37 | 18EPE12D3 | 139 |
| 14CNL95-40 | 33 | 15LF082-40 | 40 | 15LS283-62 | 36 | 18EPE12Q | 139 |
| 14CNL95-51 | 33 | 15LF083-38 | 40 | 15LS284-52 | 37 | 18EPE17D3 | 139 |
| 14CNL97-40 | 33 | 15LF083-40 | 40 | 15LS284-62 | 36 | 18EPE17Q | 139 |
| 14CNL97-51 | 33 | 15LF084-38 | 40 | 15LS285-52 | 37 | 18EPE22D3 | 139 |
| 14CNL97-53 | 33 | 15LF085-38 | 40 | 15LS285-62 | 36 | 18EPE31D3 | 139 |
| 14CNL98-38 | 33 | 15LF085-40 | 40 | 15LS286-52 | 37 | 18ESE06D2 | 140 |
| 14CNL98-40 | 33 | 15LF086-38 | 40 | 15LS286-62 | 36 | 18ESE06Q | 140 |
| 14CNL98-51 | 33 | 15LF087-38 | 40 | 15LS287-52 | 37 | 18ESE12D3 | 140 |
| 14CNL98-53 | 33 | 15LF087-40 | 40 | 15LS287-62 | 36 | 18ESE12Q | 140 |
| 14CSL90-38 | 32 | 15LF281-52 | 36 | 15mm11 | 155 | 18ESE17D3 | 140 |
| 14CSL90-40 | 32 | 15LF281-62 | 35 | 15mm15 | 155 | 18ESE17Q | 140 |
| 14CSL91-38 | 32 | 15LF281Q | 39 | 15mm15-D | 155 | 18ESE22D3 | 140 |
| 14CSL91-40 | 32 | 15LF282-52 | 36 | 15MM25 | 153 | 18ESE31D3 | 140 |
| 14CSL92-38 | 32 | 15LF282-62 | 35 | 15QRHD | 10 | 18mm15 | 155 |
| 14CSL92-40 | 32 | 15LF282Q | 39 | 15STHC40Q | 131 | 18mm15-D | 155 |
| 14CSL95-40 | 32 | 15LF283-52 | 36 | 15STHFC40Q | 131 | 18MM25 | 153 |
| 14CSL95-51 | 32 | 15LF283-62 | 35 | 160PH456 | 131 | 19BPA02Q | 124 |
| 14CSL97-40 | 32 | 15LF283Q | 39 | 160PTH256 | 131 | 19BPA03Q | 124 |
| 14CSL97-51 | 32 | 15LF284-52 | 36 | 16mm11 | 155 | 19BPA04Q | 124 |
| 14CSL98-38 | 32 | 15LF284-62 | 35 | 16mm15 | 155 | 19BPA05Q | 124 |
| 14CSL98-40 | 32 | 15LF284Q | 39 | 16mm15-D | 155 | 19BPA06Q | 124 |
| 14mm11 | 155 | 15LF285-52 | 36 | 170-0 | 151 | 19mm15 | 155 |
| 14mm11-D | 155 | 15LF285-62 | 35 | 170-1 | 151 | 19mm15-D | 155 |
| 14mm15 | 155 | 15LF285Q | 39 | 170-1/4B | 151 | 19PCA02Q | 129 |
| 14mm15-D | 155 | 15LF286-52 | 36 | 170-10 | 151 | 19PCA03Q | 129 |
| 158-15QRHD | 10 | 15LF286-62 | 35 | 170-10-ACR* | 151 | 19PCA04Q | 129 |
| 158-15QRHD-MCC | 12 | 15LF286Q | 39 | 170-2 | 151 | 19PCA05Q | 129 |
| 158-15QRHDV - | 10 | 15LF287-52 | 36 | 170-3 | 151 | 19PCA06Q | 129 |

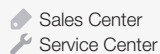
| MODEL | PAGE | MODEL | PAGE | MODEL | PAGE | MODEL | PAGE |
|------------|------|---------------|------|--------------|------|--------------|------|
| 19PCA07Q | 129 | 19TCA02Q | 129 | 24RAA12AM3 | 126 | 302206PT-Q63 | 39 |
| 19PCA09Q | 129 | 19TCA03Q | 129 | 24RAA19AM3 | 126 | 302206PT-Q72 | 39 |
| 19PTA02Q | 129 | 19TCA04Q | 129 | 24RAA23AM3 | 126 | 302206PT-Q73 | 39 |
| 19PTA03Q | 129 | 19TCA05Q | 129 | 24RAS13AM3 | 126 | 302206PT-Q92 | 39 |
| 19PTA04Q | 129 | 19TCA06Q | 129 | 250PHF406 | 131 | 302206PT-Q93 | 39 |
| 19PTA05Q | 129 | 19TCA07Q | 129 | 250PTHFC226 | 131 | 31000015PT | 82 |
| 19PTA06Q | 129 | 19TCA09Q | 129 | 265-0 | 151 | 31000100PT | 82 |
| 19PTA07Q | 129 | 19TTA02Q | 129 | 265-1 | 151 | 31000200PT | 82 |
| 19PTA09Q | 129 | 19TTA03Q | 129 | 265-10 | 151 | 31000300PT | 82 |
| 19PTA15Q | 129 | 19TTA04Q | 129 | 265-2 | 151 | 31000400PT | 82 |
| 19PTS02Q | 129 | 19TTA05Q | 129 | 265-3 | 151 | 31000500PT | 82 |
| 19PTS03Q | 129 | 19TTA06Q | 129 | 265-4 | 151 | 31000600PT | 82 |
| 19PTS04Q | 129 | 19TTA07Q | 129 | 265-5 | 151 | 33500904PT | 95 |
| 19PTS05Q | 129 | 19TTA09Q | 129 | 265-6 | 151 | 33663D | 46 |
| 19RAA02AH2 | 126 | 19TTA15Q | 129 | 265-8 | 151 | 34RAA08AL3 | 126 |
| 19RAA02AH3 | 126 | 19TTS02Q | 129 | 265A-0 | 151 | 34RAA11AL3 | 126 |
| 19RAA02AM2 | 126 | 19TTS03Q | 129 | 265A-1 | 151 | 34RAA15AM3 | 126 |
| 19RAA03AH2 | 126 | 19TTS04Q | 129 | 265A-10 | 151 | 34RAA26AH3 | 126 |
| 19RAA03AH3 | 126 | 19TTS05Q | 129 | 265A-2 | 151 | 34RAA28AH3 | 126 |
| 19RAA03AM2 | 126 | 20802-MCC | 12 | 265A-3 | 151 | 34RAA33AX3 | 126 |
| 19RAA04AM2 | 126 | 20932/932QR - | 6 | 265A-4 | 151 | 34RAA37AX3 | 126 |
| 19RAA05AM2 | 126 | 20942/942QR - | 6 | 265A-5 | 151 | 34RAA47AX3 | 126 |
| 19RAA06AH2 | 126 | 20952/952QB - | 6 | 265A-6 | 151 | 34RAA68AZ3 | 126 |
| 19RAA06AH3 | 126 | 20962/962QB - | 6 | 265A-8 | 151 | 34RAA68AZ4 | 126 |
| 19RAA07AH2 | 126 | 20mm15 | 155 | 273-0 | 151 | 34RAA75AZ3 | 126 |
| 19RAA07AH3 | 126 | 20PHH753* | 131 | 273-1 | 151 | 34RAA75AZ4 | 126 |
| 19RAA09AH2 | 126 | 20PHH75Q | 131 | 273-10 | 151 | 34RAS11AL3 | 126 |
| 19RAA09AH3 | 126 | 20PTH403* | 131 | 273-2 | 151 | 34RAS28AH3 | 126 |
| 19RAA11AH2 | 126 | 20PTH40Q | 131 | 273-3 | 151 | 34RAS36AX3 | 126 |
| 19RAA11AH3 | 126 | 212-0 | 151 | 273-4 | 151 | 35PHH653* | 131 |
| 19RAA12AH2 | 126 | 212-1 | 151 | 273-5 | 151 | 35PHH65Q | 131 |
| 19RAA12AH3 | 126 | 212-1/4 | 151 | 273-6 | 151 | 35PTH403* | 131 |
| 19RAS03AM2 | 126 | 212-10 | 151 | 273-8 | 151 | 35PTH40Q | 131 |
| 19RAS04AH2 | 126 | 212-2 | 151 | 273A-1 | 151 | 35STHFA404 | 131 |
| 19RAS05AM2 | 126 | 212-3 | 151 | 273A-10 | 151 | 35STHFA40Q | 131 |
| 19RAS06AH3 | 126 | 212-4 | 151 | 273A-2 | 151 | 35STHFC404 | 131 |
| 19SCA02B | 124 | 212-5 | 151 | 273A-3 | 151 | 35STHFC40Q | 131 |
| 19SCA02Q | 124 | 212-6 | 151 | 273A-4 | 151 | 4.5mm11 | 155 |
| 19SCA03B | 124 | 212-8 | 151 | 273A-6 | 151 | 400PHF356 | 131 |
| 19SCA03Q | 124 | 21mm15 | 155 | 273A-8 | 151 | 400PTHFC206 | 131 |
| 19SCA04B | 124 | 21mm15-D | 155 | 273B-0 | 151 | 440-12X | 150 |
| 19SCA04Q | 124 | 22mm15 | 155 | 273B-1 | 151 | 440-13X | 150 |
| 19SCA05B | 124 | 22mm15-D | 155 | 273B-10 | 151 | 440-1X | 150 |
| 19SCA05Q | 124 | 230QB | 8 | 273B-2 | 151 | 440-22X | 150 |
| 19SCA06B | 124 | 230QBV | 8 | 273B-3 | 151 | 440-26X | 150 |
| 19SCA06Q | 124 | 230QR | 8 | 273B-4 | 151 | 440-2I | 150 |
| 19SPA02B | 124 | 230QR-GD | 8 | 273B-5 | 151 | 440-2X | 150 |
| 19SPA02Q | 124 | 230QRV | 8 | 273B-6 | 151 | 440-32X | 150 |
| 19SPA03B | 124 | 23mm15 | 155 | 273B-8 | 151 | 440-3BNX | 150 |
| 19SPA03Q | 124 | 23mm15-D | 155 | 3.5mm11 | 155 | 440-3I | 150 |
| 19SPA04B | 124 | 240461PT | 45 | 302206PT-Q42 | 39 | 440-3X | 150 |
| 19SPA04Q | 124 | 24mm15 | 155 | 302206PT-Q43 | 39 | 440-4X | 150 |
| 19SPA05B | 124 | 24mm15-D | 155 | 302206PT-Q52 | 39 | 440-TX-05X | 150 |
| 19SPA05Q | 124 | 24RAA06AL3 | 126 | 302206PT-Q53 | 39 | 440-TX-06X | 150 |
| 19SPA06B | 124 | 24RAA07AL3 | 126 | 302206PT-Q59 | 39 | 440-TX-07X | 150 |
| 19SPA06Q | 124 | 24RAA11AL3 | 126 | 302206PT-Q62 | 39 | 440-TX-08X | 150 |

| MODEL | PAGE | MODEL | PAGE | MODEL | PAGE | MODEL | PAGE |
|---------------|------|-------------|------|-------------|------|--------------|------|
| 440-TX-09X | 150 | 48EAE105AH4 | 138 | 49-TX-05 | 151 | 7STHFC55Q | 131 |
| 440-TX-10-W | 150 | 48EAE135MH4 | 138 | 49-TX-06 | 151 | 80PHH604 | 131 |
| 440-TX-10X | 150 | 48EAE15AL3 | 138 | 49-TX-07 | 151 | 80PHH60Q | 131 |
| 440-TX-15-125 | 150 | 48EAE175AX6 | 138 | 49-TX-08 | 151 | 80PTHH354 | 131 |
| 440-TX-15-W | 150 | 48EAE230AX6 | 138 | 49-TX-09 | 151 | 80PTHH35Q | 131 |
| 440-TX-15X | 150 | 48EAE28AL3 | 138 | 49-TX-10 | 151 | 88RSA-5C-3 | 124 |
| 440-TX-20-125 | 150 | 48EAE41AM3 | 138 | 49-TX-15 | 151 | 88RSA-5CQ | 124 |
| 440-TX-20-2 | 150 | 48EAE58AM3 | 138 | 49-TX-20 | 151 | 88RSA-7C-3 | 124 |
| 440-TX-20-W | 150 | 48EAE58AM4 | 138 | 49-TX-25 | 151 | 88RSA-7CQ | 124 |
| 440-TX-20X | 150 | 48EAE90AH4 | 138 | 49-TX-27 | 151 | 88RSAL-5C-3 | 124 |
| 440-TX-25-W | 150 | 48EPE1000D8 | 139 | 49-TX-30 | 151 | 88RSAL-5CQ | 124 |
| 440-TX-25X | 150 | 48EPE125D4 | 139 | 49-TX-40 | 151 | 88RSAPT-2CQ | 129 |
| 440-TX-27-W | 150 | 48EPE12D2 | 139 | 4mm11 | 155 | 88RSAPT-5C-3 | 129 |
| 440-TX-27X | 150 | 48EPE12Q | 139 | 5.5mm11 | 155 | 88RSAPT-5CQ | 129 |
| 440-TX-30-W | 150 | 48EPE150D4 | 139 | 55NAL-2T-4 | 127 | 88RSAPT-7CQ | 129 |
| 440-TX-30X | 150 | 48EPE200D6 | 139 | 55NAL-3P-4 | 127 | 88RSATP-2C-3 | 129 |
| 440-TX-40I | 150 | 48EPE25D3 | 139 | 55NAL-3T-4 | 127 | 88RSATP-2CQ | 129 |
| 440-TX-40-W | 150 | 48EPE36D3 | 139 | 55NAL-4P-4 | 127 | 88RSATP-5C-3 | 129 |
| 440-TX-40X | 150 | 48EPE48D3 | 139 | 55NAL-4T-4 | 127 | 88RSATP-5CQ | 129 |
| 440-TX-40X | 150 | 48EPE500D6 | 139 | 55PHH603* | 131 | 88RSATP-7C-3 | 129 |
| 440-TX-45X* | 150 | 48EPE65D4 | 139 | 55PTHH403* | 131 | 88RSATP-7CQ | 129 |
| 440-TX-50X* | 150 | 48EPE90D4 | 139 | 55RNAL-2T-4 | 127 | 88SA-5C-3 | 124 |
| 445-1-15X | 150 | 48ESE125D4 | 140 | 55RNAL-3P-4 | 127 | 88SA-5CQ | 124 |
| 445-1X | 150 | 48ESE12D2 | 140 | 55RNAL-3T-4 | 127 | 88SA-7CQ | 124 |
| 445-2-15X | 150 | 48ESE12Q | 140 | 55RNAL-4P-4 | 127 | 8mm11 | 155 |
| 445-2X | 150 | 48ESE150D4 | 140 | 55RNAL-4T-4 | 127 | 8mm11-D | 155 |
| 445-3-15X | 150 | 48ESE25D3 | 140 | 55RNAL-6T-4 | 127 | 8RSA-10 | 124 |
| 445-3X | 150 | 48ESE36D3 | 140 | 5mm11 | 155 | 8RSA-10BQ | 124 |
| 445-4-15X | 150 | 48ESE48D3 | 140 | 60QBSF | 41 | 8RSA-5BQ | 124 |
| 445-4X | 150 | 48ESE65D4 | 140 | 635107PT | 19 | 8RSA-7BQ | 124 |
| 445-5X | 150 | 48ESE90D4 | 140 | 635108PT | 19 | 8RSAL-10BQ | 124 |
| 445-6X | 150 | 4910X | 150 | 6mm11 | 155 | 9mm11 | 155 |
| 45NAB-3P-4 | 127 | 491-AX | 150 | 6mm11-D | 155 | 9mm11-D | 155 |
| 45RNAB-2P-4 | 127 | 491-BX | 150 | 6N-08-10M-3 | 149 | | |
| 45RNAB-2T-4 | 127 | 491-CX | 150 | 6N-08-10M-4 | 149 | | |
| 45RNAB-3P-4 | 127 | 491X | 150 | 6N-08-10M-6 | 149 | | |
| 45RNAB-3T-4 | 127 | 492-200MM | 150 | 6N-08-12M-3 | 149 | | |
| 45RNAB-4T-4 | 127 | 492-AI | 150 | 6N-08-12M-4 | 149 | | |
| 47BAYPB15P3 | 133 | 492-AX | 150 | 6N-08-12M-6 | 149 | | |
| 47BAYPB15P3L | 134 | 492-BI | 150 | 6N-08-8M-3 | 149 | | |
| 47BAYPB21P3 | 133 | 492-BX | 150 | 6N-08-8M-4 | 149 | | |
| 47BAYPB21P3L | 134 | 492-CI | 150 | 6N-08-8M-6 | 149 | | |
| 47BAYPB28P3 | 133 | 492-CX | 150 | 70QBSF | 41 | | |
| 47BAYPB28P3L | 134 | 492I | 150 | 75NAL-2V-4 | 127 | | |
| 47BAYPB35P3 | 133 | 492X | 150 | 75NAL-2X-6 | 127 | | |
| 47BAYPB35P3L | 134 | 493-AX | 150 | 75RNAL-2V-4 | 127 | | |
| 47BAYPB48P3 | 133 | 493-BX | 150 | 75RNAL-2X-6 | 127 | | |
| 47BAYPB48P3L | 134 | 493-CX | 150 | 75RNAL-3V-4 | 127 | | |
| 47BAYPB65P4L* | 134 | 493X | 150 | 75RNAL-3X-6 | 127 | | |
| 47BAYPB70P4 | 133 | 494X | 150 | 7mm11 | 155 | | |
| 47BAYPB90P4 | 133 | 49-TSQ-10M | 149 | 7mm11-D | 155 | | |
| 47BCYSB30C1 | 137 | 49-TSQ-12M | 149 | 7PHH602 | 131 | | |
| 47BCYSB30C3 | 137 | 49-TSQ-4M | 149 | 7PHH60Q | 131 | | |
| 47BTYSB20T2 | 136 | 49-TSQ-5M | 149 | 7PTHH352 | 131 | | |
| 47BTYSB30T3 | 136 | 49-TSQ-6M | 149 | 7PTHH35Q | 131 | | |
| 47BTYSB40T4 | 136 | 49-TSQ-8M | 149 | 7STHFA55Q | 131 | | |

POWER TOOLS SALES & SERVICE CENTERS

Please note that all locations may not service all products.

Contact the nearest Apex Tool Group Sales & Service Center for the appropriate facility to handle your service requirements.



NORTH AMERICA | SOUTH AMERICA

Detroit, Michigan 🏠

Apex Tool Group
2630 Superior Court
Auburn Hills, MI 48236
Phone: +1 (248) 393-5640
Fax: +1 (248) 391-6295

Lexington, South Carolina 🏠

Apex Tool Group
670 Industrial Drive
Lexington, SC 29072
Phone: +1 (800) 845-5629
Phone: +1 (919) 387-0099
Fax: +1 (803) 358-7681

Louisville, Kentucky 🛠️

Apex Tool Group
1000 Glengarry Drive
Suite 150
Fairdale, KY 40118
Phone: +1 (502) 708-3400
apexpowertools.com/service

Canada 🛠️

Apex Tool Canada, Ltd.
7631 Bath Road
Mississauga, Ontario L4T 3T1
Canada
Phone: (866) 691-6212
Fax: (905) 673-4400

Mexico 🛠️

Apex Tool Group
Manufacturing México
S. de R.L. de C.V.
Vialidad El Pueblito #103
Parque Industrial Querétaro
Querétaro, QRO 76220
Mexico
Phone: +52 (442) 211 3800
Fax: +52 (800) 685 5560

Brazil 🛠️

Apex Tool Group
Ind. Com. Ferram, Ltda.
Av. Liberdade, 4055
Zona Industrial Iporanga
Sorocaba, São Paulo
CEP# 18087-170
Brazil
Phone: +55 15 3238 3820
Fax: +55 15 3238 3938

EUROPE | MIDDLE EAST | AFRICA

England 🛠️

Apex Tool Group GmbH
C/O Spline Gauges
Piccadilly, Tamworth
Staffordshire B78 2ER
United Kingdom
Phone: +44 1827 8727 71
Fax: +44 1827 8741 28

France 🛠️

Apex Tool Group S.A.S.
25 rue Maurice Chevalier
B.P. 28
77831 Ozoir-La-Ferrière
Cedex, France
Phone: +33 1 64 43 22 00
Fax: +33 1 64 43 17 17

Germany 🛠️

Apex Tool Group GmbH
Industriestraße 1
73463 Westhausen
Germany
Phone: +49 (0) 73 63 81 0
Fax: +49 (0) 73 63 81 222

Hungary 🛠️

Apex Tool Group
Hungária Kft.
Platánfa u.2
9027 Győr
Hungary
Phone: +36 96 66 1383
Fax: +36 96 66 1135

ASIA PACIFIC

Australia 🏠

Apex Tool Group
519 Nurigong Street, Albury
NSW 2640
Australia
Phone: +61 2 6058 0300

China 🛠️

Apex Power Tool Trading
(Shanghai) Co., Ltd
2nd Floor, Area C
177 Bi Bo Road
Pu Dong New Area, Shanghai
China 201203 P.R.C.
Phone: +86 21 60880320
Fax: +86 21 60880298

India 🛠️

Apex Power Tools India
Private Limited
Gala No. 1, Plot No. 5
S. No. 234, 235 & 245
Indialand Global
Industrial Park
Taluka-Mulsi, Phase I
Hinjawadi, Pune 411057
Maharashtra, India
Phone: +91 020 66761111

Japan 🛠️

Apex Tool Group Japan
Korin-Kaikan 5F,
3-6-23 Shibakoen, Minato-Ku,
Tokyo 105-0011, JAPAN
Phone: +81-3-6450-1840
Fax: +81-3-6450-1841

Korea 🏠

Apex Tool Group Korea
#1503, Hibrand Living Bldg.,
215 Yangjae-dong,
Seocho-gu, Seoul 137-924,
Korea
Phone: +82-2-2155-0250
Fax: +82-2-2155-0252



Apex Tool Group, LLC

Phone: +1 (800) 845-5629
Phone: +1 (919) 387-0099
Fax: +1 (803) 358-7681
www.apexpowertools.com