



ALLIED MACHINE & ENGINEERING

Holemaking Solutions for Today's Manufacturing



Boring



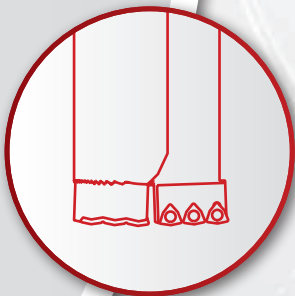
Reaming



Burnishing



Threading



Specials



Revolution Drill[®]

► *DRILLING*

Indexable Insert Drilling System

SECTION

A60

Revolution Drill®

Revolution Drill®

Large Diameter Replaceable IC Insert Drilling System

► **Diameter Range:** 1.875" - 4.000" (47.63 mm - 101.60 mm)



Large Scale Innovation

The Revolution Drill has an innovative design that allows for adjustability of 0.200" (5.10 mm) on diameter. This eliminates the need for special tooling and/or subsequent boring operations. With the ability to drill from solid, the Revolution Drill does not require a previously drilled pilot hole. The replaceable cartridges reduce setup time, and the indexable inserts protect your investment. The insert design provides excellent chip control and aggressive penetration rates.

| | | |
|-------------------|--------------------------|------------------------|
| Drills from solid | Drill depths up to 4.5xD | Excellent chip control |
|-------------------|--------------------------|------------------------|

Applicable Industries



Aerospace



Agriculture



Automotive



Firearms



General Machining



Oil & Gas



Renewable Energy

Your safety and the safety of others is very important. This catalog contains important safety messages. Always read and follow all safety precautions.



This triangle is a safety hazard symbol. It alerts you to potential safety hazards that can cause tool failure and serious injury.

When you see this symbol in the catalog, look for a related safety message that may be near this triangle or referred to in the nearby text.

There are safety signal words also used in the catalog. Safety messages follow these words.

WARNING

WARNING (shown above) means that failure to follow the precautions in this message could result in tool failure and serious injury.

NOTICE means that failure to follow the precautions in this message could result in damage to the tool or machine but not result in personal injury.

NOTE and **IMPORTANT** are also used. These are important that you read and follow but are not safety-related.

Visit www.alliedmachine.com for the most up-to-date information and procedures.

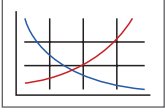
Reference Icons

The following icons will appear throughout the catalog to help you navigate between products.



Setup / Assembly Information

Detailed instructions and information regarding the corresponding part(s)



Recommended Cutting Data

Speed and feed recommendations for optimum and safe drilling



Coolant-Through Option

Indicates that the product is coolant through

| Series | Diameter Range | |
|--------|-----------------|----------------|
| | Imperial (inch) | Metric (mm) |
| 34 | 1.875 - 2.000 | 47.63 - 50.80 |
| 36 | 2.000 - 2.200 | 50.80 - 55.88 |
| 38 | 2.200 - 2.400 | 55.88 - 60.96 |
| 42 | 2.400 - 2.600 | 60.96 - 66.04 |
| 44 | 2.600 - 2.800 | 66.04 - 71.12 |
| 46 | 2.800 - 3.000 | 71.12 - 76.20 |
| 48 | 3.000 - 3.200 | 76.20 - 81.28 |
| 52 | 3.200 - 3.400 | 81.28 - 86.36 |
| 54 | 3.400 - 3.600 | 86.36 - 91.44 |
| 56 | 3.600 - 3.800 | 91.44 - 96.52 |
| 58 | 3.800 - 4.000 | 96.52 - 101.60 |

Introduction Information

Product Overview 2 - 3
 Setup Instructions 4
 Product Nomenclature 5

Drill Series

34 Series 6 - 7
 36 Series 8 - 9
 38 Series 10 - 11
 42 Series 12 - 13
 44 Series 14 - 15
 46 Series 16 - 17
 48 Series 18 - 19
 52 Series 20 - 21
 54 Series 22 - 23
 56 Series 24 - 25
 58 Series 26 - 27

Recommended Cutting Data

Imperial (inch) 28
 Metric (mm) 29

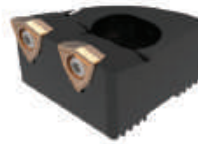
Product Overview

| Series | Diameter Range | | Length-to-Diameter Ratio | Shank Options | | | Inserts per Cartridge | Page |
|--------|----------------|----------------|--------------------------|---------------|-------|-------|-----------------------|---------|
| | Imperial (in) | Metric (mm) | | Straight | CAT40 | CAT50 | | |
| 34 | 1.875 - 2.000 | 47.63 - 50.80 | 2.2, 3.5, 4.5 | ✓ | ✓ | ✓ | 2 | 6 - 7 |
| 36 | 2.000 - 2.200 | 50.80 - 55.88 | 2.2, 3.5, 4.5 | ✓ | ✓ | ✓ | 2 | 8 - 9 |
| 38 | 2.200 - 2.400 | 55.88 - 60.96 | 2.2, 3.5, 4.5 | ✓ | ✓ | ✓ | 2 | 10 - 11 |
| 42 | 2.400 - 2.600 | 60.96 - 66.00 | 2.2, 3.5, 4.5 | ✓ | ✓ | ✓ | 2 | 12 - 13 |
| 44 | 2.600 - 2.800 | 66.00 - 71.12 | 2.2, 3.5 | ✓ | | ✓ | 3 | 14 |
| 46 | 2.800 - 3.000 | 71.12 - 76.20 | 2.2, 3.5 | ✓ | | ✓ | 3 | 15 |
| 48 | 3.000 - 3.200 | 76.20 - 81.28 | 1.0, 2.5 | ✓ | | ✓ | 3 | 16 |
| 52 | 3.200 - 3.400 | 81.28 - 86.36 | 1.0, 2.5 | ✓ | | ✓ | 3 | 17 |
| 54 | 3.400 - 3.600 | 86.36 - 91.44 | 1.0, 2.5 | ✓ | | ✓ | 3 | 18 |
| 56 | 3.600 - 3.800 | 91.44 - 96.52 | 1.0, 2.5 | ✓ | | ✓ | 4 | 19 |
| 58 | 3.800 - 4.000 | 96.52 - 101.60 | 1.0, 2.5 | ✓ | | ✓ | 4 | 20 |

NOTE: Stacked plate styles are also available

Features & Benefits

- Adjustability of 0.200" (5.10 mm) on diameter
- Drill depths up to 4.5xD (standard)
- The replaceable cartridges protect your investment
- Adjustable diameter reduces inventory and cost
- The insert design allows for excellent chip control and aggressive penetration rates
- No pilot hole needed



2 Inserts
(34 - 42 series)



3 Inserts
(44 - 54 series)



4 Inserts
(56 - 58 series)



Shank Options



Straight Shank
(all series)



CAT40 Shank
(34, 36, 38, 42 series)



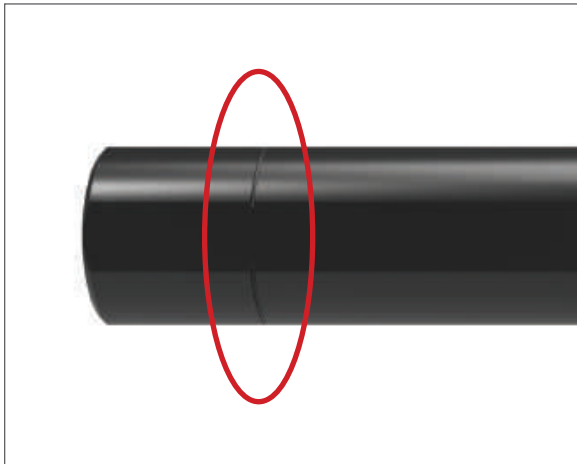
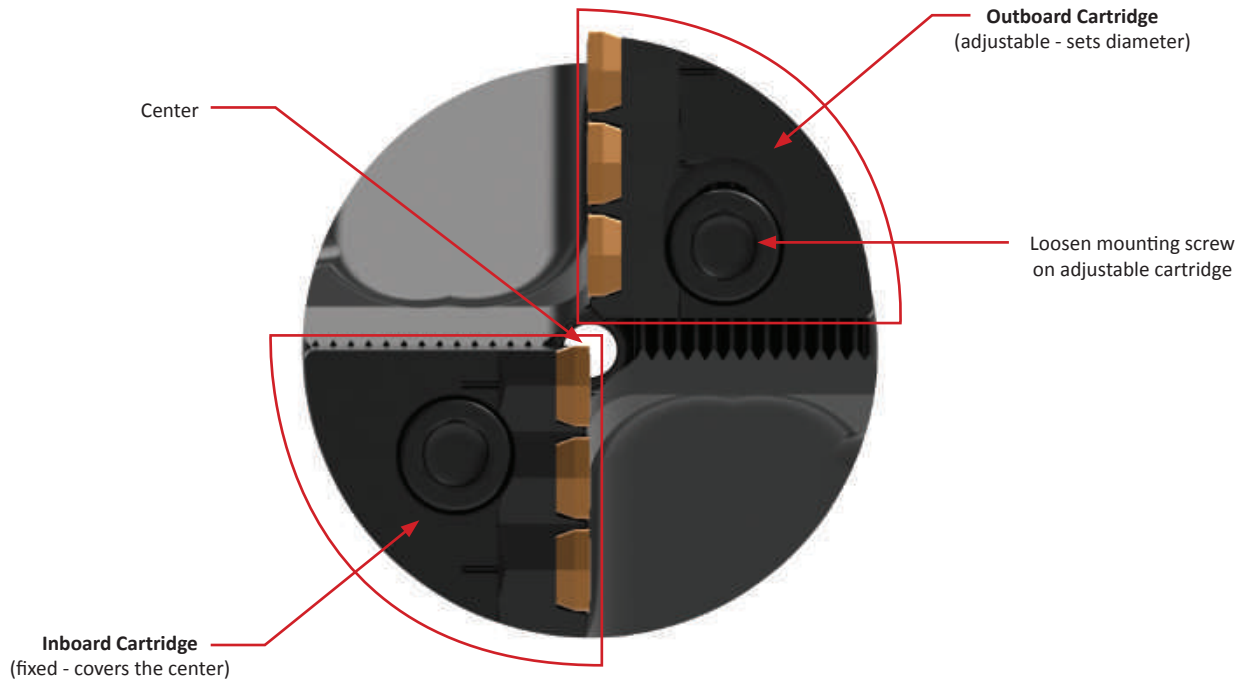
CAT50 Shank
(all series)

Body Lengths

- 1.0xD (48, 52, 54, 56, 58 series)
- 2.2xD (34, 36, 38, 42, 44, 46 series)
- 2.5xD (48, 52, 54, 56, 58 series)
- 3.5xD (34, 36, 38, 42, 44, 46 series)
- 4.5xD (34, 36, 38, 42, 44, 46 series)

A
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THREADING
X
SPECIALS

Product Overview



Straight Shanks

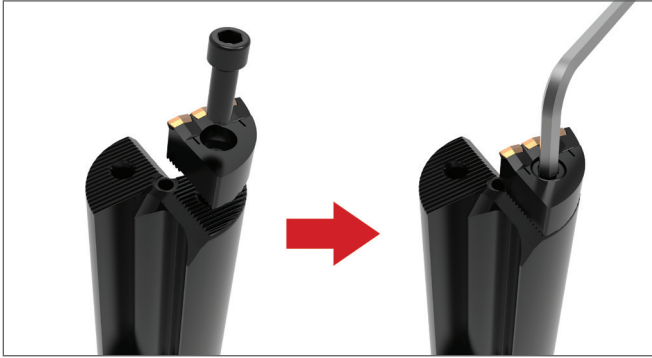
- Designed for lathe applications
- Can be cut off for use in end mill holders
- The score mark (circled above) is provided for recommended cut length
- Cut and deburr at the score mark
- This improves rigidity when the body sits against the face of an end mill holder



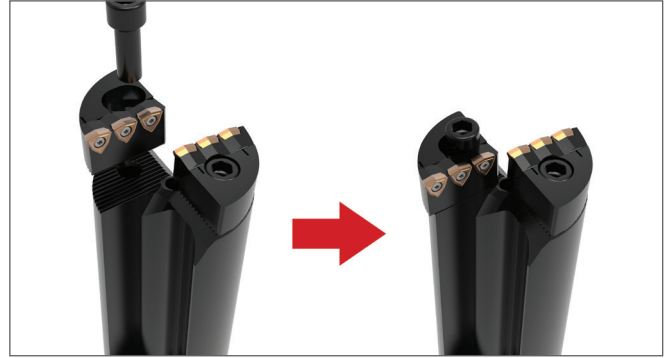
A
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THREADING
X
SPECIALS

Setup Instructions

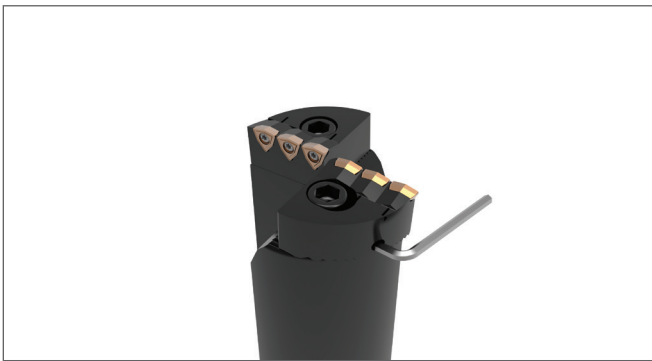
A
DRILLING
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BORING
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BURNISHING
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THREADING
X
SPECIALS



Step 1:
Mount the fixed cartridge and tighten the mounting screw to 11-14 ft-lbf (15-19 N-m).



Step 2:
Finger-tighten the mounting screw on the adjustable cartridge.



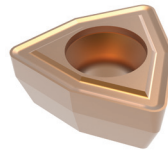
Step 3:
Set the diameter using the adjustment screw against the mounting screw. Place the drill in a presetter to ensure the correct diameter setting.



Step 4:
Tighten the mounting screw to 11-14 ft-lbf (15-19 N-m).

IC Inserts

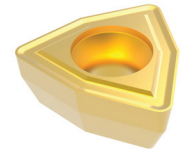
- The design allows for excellent chip control and aggressive penetration rates
- The proprietary AM200® and AM300® coatings increase tool life above competitors' premium coatings
- The same inserts are used for both Revolution Drill® and Opening Drill® products



AM300®



AM200®



TIN

Insert Application Recommendations

Carbide Grade Options

| | |
|----------|--|
| C5 (P35) | General purpose carbide grade suitable for most applications. ▶ <i>Common application in steels and stainless steels.</i> |
| C1 (K35) | Toughest carbide grade. Provides the best combination of edge strength and tool life. ▶ <i>Recommended for less rigid applications.</i> |
| C2 (K25) | Higher wear-resistant carbide suitable for abrasive material applications. ▶ <i>Recommended for grey, ductile, and nodular irons.</i> |

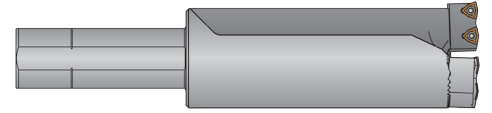
Additional Geometry Option

| | |
|----------------|--|
| High Rake (HR) | Provides superior chip control and tool life in long chipping carbon and alloy steels below 200 Bhn. |
|----------------|--|

Product Nomenclature

Revolution Drill Holders

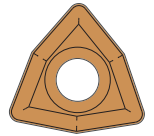
| | | | | | |
|----------|-----------|----------|-----------|----------|-------------|
| R | 34 | X | 22 | - | 150L |
| 1 | 2 | | 3 | | 4 |



| 1. Drill Style | 2. Series | 3. Length-to-Diameter Ratio | 4. Shank Information |
|------------------------------------|--|---|--|
| R = Standard SP = Stacked Plate | 34 = 34 series 44 = 44 series 54 = 54 series 36 = 36 series 46 = 46 series 56 = 56 series 38 = 38 series 48 = 48 series 58 = 58 series 42 = 42 series 52 = 52 series | 10 = 1.0xD 22 = 2.2xD 25 = 2.5xD 35 = 3.5xD 45 = 4.5xD | 150L = 1-1/2 ϕ straight 200L = 2 ϕ straight 40M = 40mm ISO 9766 50M = 50mm ISO 9766 CV40 = CAT40 CV50 = CAT50 |

Revolution Drill Inserts

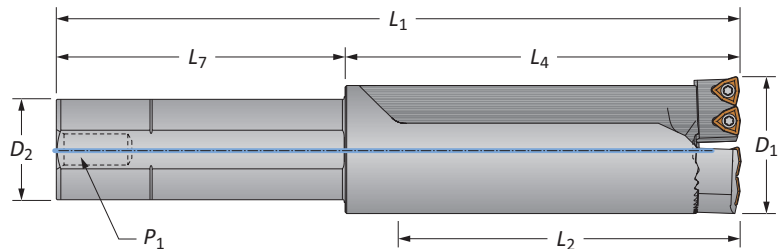
| | | | | | | | | |
|-----------|----------|-----------|-----------|-----------|----------|----------|----------|-----------|
| OP | - | 05 | T3 | 08 | - | 1 | H | HR |
| 1 | | 2 | 3 | 4 | | 5 | 6 | 7 |



| 1. Compatible with: | 2. IC Type | 3. Thickness | 4. Radius | 5. Carbide Grade |
|--|---|-------------------|-------------------|---|
| Opening Drill® Revolution Drill® | 05 = 5/16" | T3 = 5/32" | 08 = 1/32" | Blank = C5 (P35) 1 = C1 (K35) 2 = C2 (K25) |
| 6. Coating | 7. Geometry | | | |
| P = AM300® H = AM200® T = TiN A = TiAlN N = TiCN U = Uncoated | Blank = General Purpose HR = High Rake | | | |

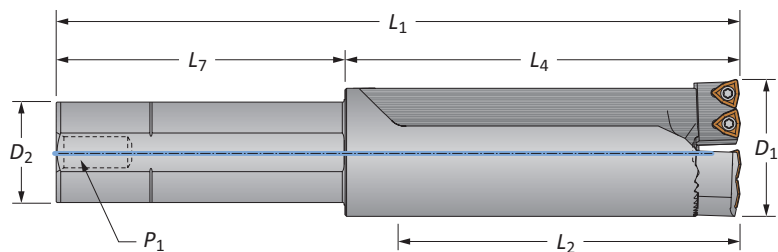
Reference Key

| Symbol | Attribute |
|--------|----------------------|
| D_1 | Drill diameter range |
| D_2 | Shank diameter |
| L_1 | Overall length |
| L_2 | Maximum drill depth |
| L_4 | Holder length |
| L_7 | Shank length |
| P_1 | Rear pipe tap |



Revolution Drill Holders

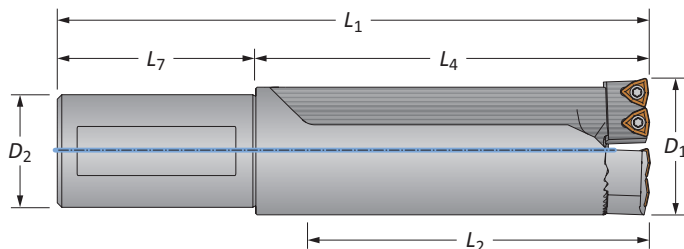
34 Series | Diameter Range: 1.875" - 2.000" (47.63 mm - 50.80 mm)



Straight Shank Imperial

| Style | Length | D_1 Range | Holder | | | Shank | | | Part No.* | Cartridges |
|---------------|--------|---------------|---------|---------|----------|-------|-------|-------|--------------|------------|
| | | | L_2 | L_4 | L_1 | D_2 | L_7 | P_1 | | |
| Standard | 2.2xD | 1.875 - 2.000 | 4-17/32 | 5-13/32 | 9-13/32 | 1-1/2 | 4 | 1/4 | R34X22-150L | C34-... |
| Standard | 3.5xD | 1.875 - 2.000 | 7-1/32 | 7-29/32 | 11-29/32 | 1-1/2 | 4 | 1/4 | R34X35-150L | C34-... |
| Standard | 4.5xD | 1.875 - 2.000 | 9-1/32 | 9-29/32 | 13-29/32 | 1-1/2 | 4 | 1/4 | R34X45-150L | C34-... |
| Stacked Plate | 2.2xD | 1.875 - 2.000 | 4-27/64 | 5-5/16 | 9-5/16 | 1-1/2 | 4 | 1/4 | SP34X22-150L | C34SP-... |

*Holder includes cartridges; however, inserts are sold separately.



Straight Shank Metric

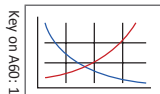
| Style | Length | D_1 Range | Holder | | | Shank | | | Part No.* | Cartridges |
|---------------|--------|---------------|--------|--------|--------|-------|-------|-------|-------------|------------|
| | | | L_2 | L_4 | L_1 | D_2 | L_7 | P_1 | | |
| Standard | 2.2xD | 47.63 - 50.80 | 114.94 | 137.36 | 207.36 | 40.00 | 70.00 | - | R34X22-40M | C34-... |
| Standard | 3.5xD | 47.63 - 50.80 | 178.44 | 200.86 | 270.86 | 40.00 | 70.00 | - | R34X35-40M | C34-... |
| Standard | 4.5xD | 47.63 - 50.80 | 229.24 | 251.66 | 321.66 | 40.00 | 70.00 | - | R34X45-40M | C34-... |
| Stacked Plate | 2.2xD | 47.63 - 50.80 | 112.40 | 134.80 | 204.80 | 40.00 | 70.00 | - | SP34X22-40M | C34SP-... |

*Holder includes cartridges; however, inserts are sold separately.

A
DRILLINGB
BORINGC
REAMINGD
BURNISHINGE
THREADINGX
SPECIALS

A60: 28 - 29

A60: 2 - 4

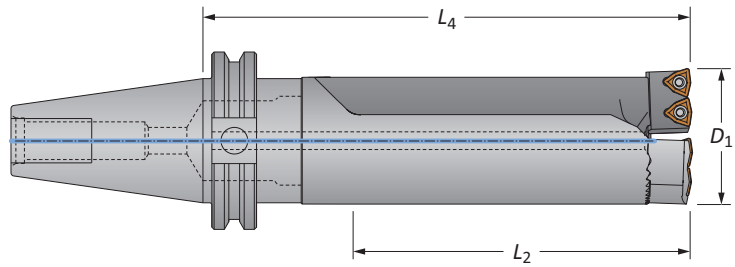


i = Imperial (in)
m = Metric (mm)



Revolution Drill Holders

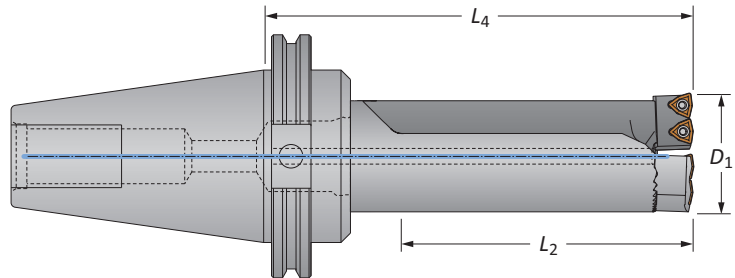
34 Series | Diameter Range: 1.875" - 2.000" (47.63 mm - 50.80 mm)



CV40 Shank

| Style | Length | D ₁ Range | Holder | | Shank | Part No.* | Cartridges |
|---------------|--------|----------------------|----------------|----------------|-------|--------------|------------|
| | | | L ₂ | L ₄ | | | |
| Standard | 2.2xD | 1.875 - 2.000 | 4-17/32 | 6-25/32 | CV40 | R34X22-CV40 | C34-... |
| Standard | 3.5xD | 1.875 - 2.000 | 7-1/32 | 9-9/32 | CV40 | R34X35-CV40 | C34-... |
| Standard | 4.5xD | 1.875 - 2.000 | 9-1/32 | 11-9/32 | CV40 | R34X45-CV40 | C34-... |
| Stacked Plate | 2.2xD | 1.875 - 2.000 | 4-27/64 | 6-11/16 | CV40 | SP34X22-CV40 | C34SP-... |

*Holder includes cartridges; however, inserts are sold separately.



CV50 Shank

| Style | Length | D ₁ Range | Holder | | Shank | Part No.* | Cartridges |
|---------------|--------|----------------------|----------------|----------------|-------|--------------|------------|
| | | | L ₂ | L ₄ | | | |
| Standard | 2.2xD | 1.875 - 2.000 | 4-17/32 | 6-25/32 | CV50 | R34X22-CV50 | C34-... |
| Standard | 3.5xD | 1.875 - 2.000 | 7-1/32 | 9-9/32 | CV50 | R34X35-CV50 | C34-... |
| Standard | 4.5xD | 1.875 - 2.000 | 9-1/32 | 11-9/32 | CV50 | R34X45-CV50 | C34-... |
| Stacked Plate | 2.2xD | 1.875 - 2.000 | 4-27/64 | 6-11/16 | CV50 | SP34X22-CV50 | C34SP-... |

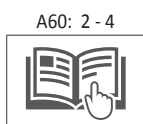
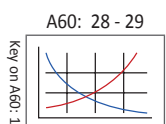
*Holder includes cartridges; however, inserts are sold separately.

Cartridges

| Holder Part No. | Replacement Cartridges | Qty. Inserts Needed | Mounting Screw | Key Size | Adjusting Screw | Driver |
|-----------------|------------------------|---------------------|----------------|----------|-----------------|--------|
| R34... | C34-FIX | 2 | MS-17M-1 | 5 mm | AS-16T9-1 | 8T-9 |
| | C34-ADJ | 2 | MS-17M-1 | 5 mm | AS-16T9-1 | 8T-9 |
| SP34... | C34SP-FIX | 2 | MS-17M-1 | 5 mm | AS-16T9-1 | 8T-9 |
| | C34SP-ADJ | 2 | MS-17M-1 | 5 mm | AS-16T9-1 | 8T-9 |

IC Inserts

| Carbide Grade | Geometry | Part No. | | | Insert Screws | Driver |
|---------------|-----------|---------------|---------------|--------------|---------------|--------|
| | | AM300® | AM200® | TiN | | |
| C5 (P35) | Standard | OP-05T308-P | OP-05T308-H | OP-05T308-T | IS-10-1 | 8T-9 |
| C1 (K35) | Standard | OP-05T308-1P | OP-05T308-1H | OP-05T308-1T | IS-10-1 | 8T-9 |
| C2 (K25) | Standard | OP-05T308-2P | OP-05T308-2H | - | IS-10-1 | 8T-9 |
| C5 (P35) | High Rake | OP-05T308-PHR | OP-05T308-HHR | - | IS-10-1 | 8T-9 |



Mounting screws sold in multiples of 4 | Adjusting screws sold in multiples of 4
 IC inserts sold in multiples of 10 | Insert screws sold in multiples of 10

I = Imperial (in)
M = Metric (mm)

A

DRILLING

B

BORING

C

REAMING

D

BURNISHING

E

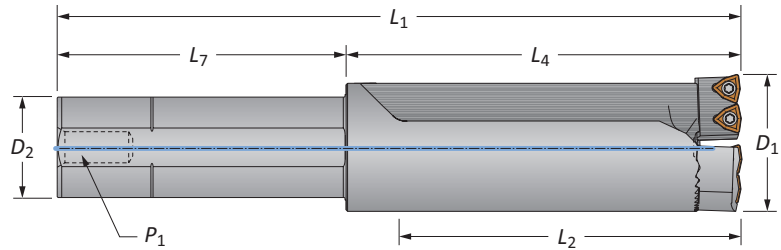
THREADING

X

SPECIALS

Revolution Drill Holders

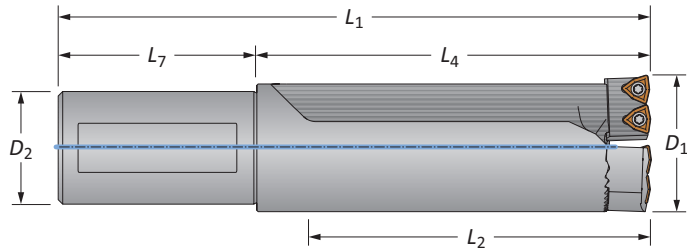
36 Series | Diameter Range: 2.000" - 2.200" (50.80 mm - 55.88 mm)



Straight Shank Imperial

| Style | Length | D ₁ Range | Holder | | | Shank | | | Part No.* | Cartridges |
|---------------|--------|----------------------|----------------|----------------|----------------|----------------|----------------|----------------|--------------|------------|
| | | | L ₂ | L ₄ | L ₁ | D ₂ | L ₇ | P ₁ | | |
| Standard | 2.2xD | 2.000 - 2.200 | 4-61/64 | 5-57/64 | 9-57/64 | 1-1/2 | 4 | 1/4 | R36X22-150L | C36-... |
| Standard | 3.5xD | 2.000 - 2.200 | 7-45/64 | 8-41/64 | 12-41/64 | 1-1/2 | 4 | 1/4 | R36X35-150L | C36-... |
| Standard | 4.5xD | 2.000 - 2.200 | 9-61/64 | 10-57/64 | 14-57/64 | 1-1/2 | 4 | 1/4 | R36X45-150L | C36-... |
| Stacked Plate | 2.2xD | 2.000 - 2.200 | 4-57/64 | 5-13/16 | 9-13/16 | 1-1/2 | 4 | 1/4 | SP36X22-150L | C36SP-... |

*Holder includes cartridges; however, inserts are sold separately.



Straight Shank Metric

| Style | Length | D ₁ Range | Holder | | | Shank | | | Part No.* | Cartridges |
|---------------|--------|----------------------|----------------|----------------|----------------|----------------|----------------|----------------|-------------|------------|
| | | | L ₂ | L ₄ | L ₁ | D ₂ | L ₇ | P ₁ | | |
| Standard | 2.2xD | 50.80 - 55.88 | 125.96 | 149.58 | 219.58 | 40.00 | 70.00 | - | R36X22-40M | C36-... |
| Standard | 3.5xD | 50.80 - 55.88 | 195.81 | 219.43 | 289.43 | 40.00 | 70.00 | - | R36X35-40M | C36-... |
| Standard | 4.5xD | 50.80 - 55.88 | 252.96 | 276.58 | 346.58 | 40.00 | 70.00 | - | R36X45-40M | C36-... |
| Stacked Plate | 2.2xD | 50.80 - 55.88 | 125.96 | 147.60 | 217.60 | 40.00 | 70.00 | - | SP36X22-40M | C36SP-... |

*Holder includes cartridges; however, inserts are sold separately.

A DRILLING

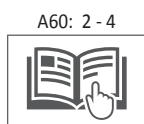
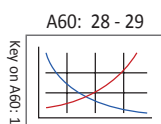
B BORING

C REAMING

D BURNISHING

F THREADING

X SPECIALS

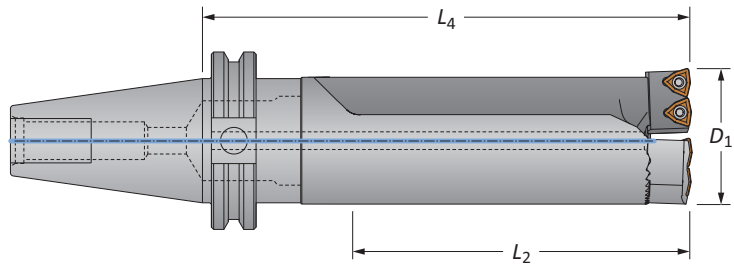


i = Imperial (in)
m = Metric (mm)



Revolution Drill Holders

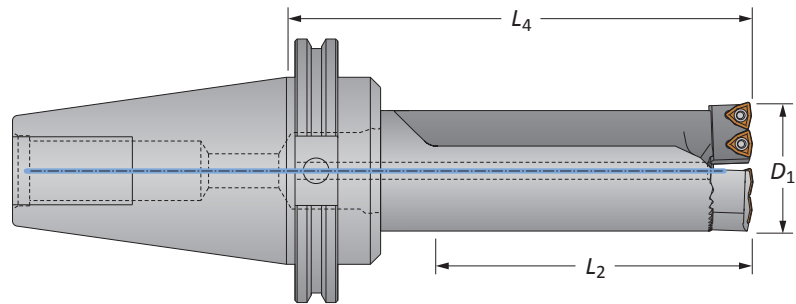
36 Series | Diameter Range: 2.000" - 2.200" (50.80 mm - 55.88 mm)



CV40 Shank

| Style | Length | D ₁ Range | Holder | | Shank | Part No.* | Cartridges |
|---------------|--------|----------------------|----------------|----------------|-------|--------------|------------|
| | | | L ₂ | L ₄ | | | |
| Standard | 2.2xD | 2.000 - 2.200 | 4-61/64 | 7-17/64 | CV40 | R36X22-CV40 | C36-... |
| Standard | 3.5xD | 2.000 - 2.200 | 7-45/64 | 10-1/64 | CV40 | R36X35-CV40 | C36-... |
| Standard | 4.5xD | 2.000 - 2.200 | 9-61/64 | 12-17/64 | CV40 | R36X45-CV40 | C36-... |
| Stacked Plate | 2.2xD | 2.000 - 2.200 | 4-57/64 | 7-35/64 | CV40 | SP36X22-CV40 | C36SP-... |

*Holder includes cartridges; however, inserts are sold separately.



CV50 Shank

| Style | Length | D ₁ Range | Holder | | Shank | Part No.* | Cartridges |
|---------------|--------|----------------------|----------------|----------------|-------|--------------|------------|
| | | | L ₂ | L ₄ | | | |
| Standard | 2.2xD | 2.000 - 2.200 | 4-61/64 | 7-17/64 | CV50 | R36X22-CV50 | C36-... |
| Standard | 3.5xD | 2.000 - 2.200 | 7-45/64 | 10-1/64 | CV50 | R36X35-CV50 | C36-... |
| Standard | 4.5xD | 2.000 - 2.200 | 9-61/64 | 12-17/64 | CV50 | R36X45-CV50 | C36-... |
| Stacked Plate | 2.2xD | 2.000 - 2.200 | 4-57/64 | 7-35/64 | CV50 | SP36X22-CV50 | C36SP-... |

*Holder includes cartridges; however, inserts are sold separately.

Cartridges

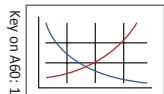
| Holder Part No. | Replacement Cartridges | Qty. Inserts Needed | Mounting Screw | Key Size | Adjusting Screw | Driver |
|-----------------|------------------------|---------------------|----------------|----------|-----------------|--------|
| R36... | C36-FIX | 2 | MS-17M-1 | 5 mm | AS-18T9-1 | 8T-9 |
| | C36-ADJ | 2 | MS-17M-1 | 5 mm | AS-18T9-1 | 8T-9 |
| SP36... | C36SP-FIX | 2 | MS-17M-1 | 5 mm | AS-18T9-1 | 8T-9 |
| | C36SP-ADJ | 2 | MS-17M-1 | 5 mm | AS-18T9-1 | 8T-9 |

IC Inserts

| Carbide Grade | Geometry | Part No. | | | Insert Screws | Driver |
|---------------|-----------|---------------|---------------|--------------|---------------|--------|
| | | AM300® | AM200® | TiN | | |
| C5 (P35) | Standard | OP-05T308-P | OP-05T308-H | OP-05T308-T | IS-10-1 | 8T-9 |
| C1 (K35) | Standard | OP-05T308-1P | OP-05T308-1H | OP-05T308-1T | IS-10-1 | 8T-9 |
| C2 (K25) | Standard | OP-05T308-2P | OP-05T308-2H | - | IS-10-1 | 8T-9 |
| C5 (P35) | High Rake | OP-05T308-PHR | OP-05T308-HHR | - | IS-10-1 | 8T-9 |

A60: 28 - 29

A60: 2 - 4

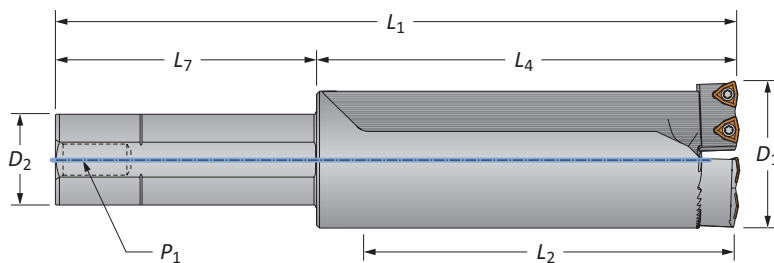


Mounting screws sold in multiples of 4 | Adjusting screws sold in multiples of 4
IC inserts sold in multiples of 10 | Insert screws sold in multiples of 10

I = Imperial (in)
M = Metric (mm)

Revolution Drill Holders

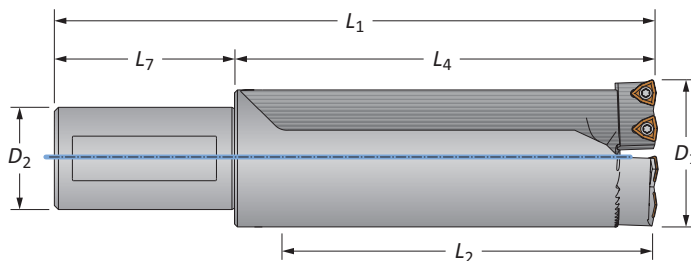
38 Series | Diameter Range: 2.200" - 2.400" (55.88 mm - 60.96 mm)



Straight Shank Imperial

| Style | Length | D ₁ Range | Holder | | | Shank | | | Part No.* | Cartridges |
|---------------|--------|----------------------|----------------|----------------|----------------|----------------|----------------|----------------|--------------|------------|
| | | | L ₂ | L ₄ | L ₁ | D ₂ | L ₇ | P ₁ | | |
| Standard | 2.2xD | 2.200 - 2.400 | 5-29/64 | 6-25/64 | 10-25/64 | 1-1/2 | 4 | 1/4 | R38X22-150L | C38-... |
| Standard | 3.5xD | 2.200 - 2.400 | 8-29/64 | 9-25/64 | 13-25/64 | 1-1/2 | 4 | 1/4 | R38X35-150L | C38-... |
| Standard | 4.5xD | 2.200 - 2.400 | 10-61/64 | 11-57/64 | 15-57/64 | 1-1/2 | 4 | 1/4 | R38X45-150L | C38-... |
| Stacked Plate | 2.2xD | 2.200 - 2.400 | 5-3/8 | 6-19/64 | 10-19/64 | 1-1/2 | 4 | 1/4 | SP38X22-150L | C38SP-... |

*Holder includes cartridges; however, inserts are sold separately.



Straight Shank Metric

| Style | Length | D ₁ Range | Holder | | | Shank | | | Part No.* | Cartridges |
|---------------|--------|----------------------|----------------|----------------|----------------|----------------|----------------|----------------|-------------|------------|
| | | | L ₂ | L ₄ | L ₁ | D ₂ | L ₇ | P ₁ | | |
| Standard | 2.2xD | 55.88 - 60.96 | 138.66 | 162.20 | 232.20 | 40.00 | 70.00 | - | R38X22-40M | C38-... |
| Standard | 3.5xD | 55.88 - 60.96 | 214.86 | 238.40 | 308.40 | 40.00 | 70.00 | - | R38X35-40M | C38-... |
| Standard | 4.5xD | 55.88 - 60.96 | 278.36 | 301.90 | 371.90 | 40.00 | 70.00 | - | R38X45-40M | C38-... |
| Stacked Plate | 2.2xD | 55.88 - 60.96 | 138.66 | 159.99 | 230.00 | 40.00 | 70.00 | - | SP38X22-40M | C38SP-... |

*Holder includes cartridges; however, inserts are sold separately.

A DRILLING

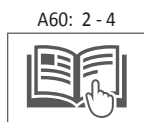
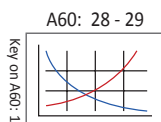
B BORING

C REAMING

D BURNISHING

F THREADING

X SPECIALS

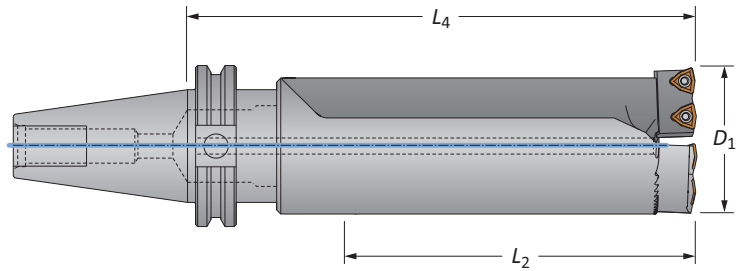


i = Imperial (in)
m = Metric (mm)



Revolution Drill Holders

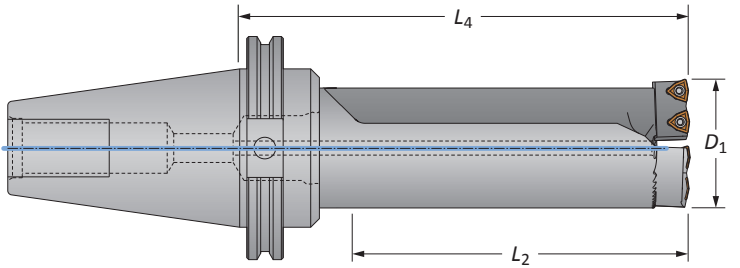
38 Series | Diameter Range: 2.200" - 2.400" (55.88 mm - 60.96 mm)



CV40 Shank

| Style | Length | D ₁ Range | Holder | | Shank | Part No.* | Cartridges |
|---------------|--------|----------------------|----------------|----------------|-------|--------------|------------|
| | | | L ₂ | L ₄ | | | |
| Standard | 2.2xD | 2.200 - 2.400 | 5-29/64 | 7-49/64 | CV40 | R38X22-CV40 | C38-... |
| Standard | 3.5xD | 2.200 - 2.400 | 8-29/64 | 10-49/64 | CV40 | R38X35-CV40 | C38-... |
| Standard | 4.5xD | 2.200 - 2.400 | 10-61/64 | 13-17/64 | CV40 | R38X45-CV40 | C38-... |
| Stacked Plate | 2.2xD | 2.200 - 2.400 | 5-3/8 | 7-43/64 | CV40 | SP38X22-CV40 | C38SP-... |

*Holder includes cartridges; however, inserts are sold separately.



CV50 Shank

| Style | Length | D ₁ Range | Holder | | Shank | Part No.* | Cartridges |
|---------------|--------|----------------------|----------------|----------------|-------|--------------|------------|
| | | | L ₂ | L ₄ | | | |
| Standard | 2.2xD | 2.200 - 2.400 | 5-29/64 | 7-49/64 | CV50 | R38X22-CV50 | C38-... |
| Standard | 3.5xD | 2.200 - 2.400 | 8-29/64 | 10-49/64 | CV50 | R38X35-CV50 | C38-... |
| Standard | 4.5xD | 2.200 - 2.400 | 10-61/64 | 13-17/64 | CV50 | R38X45-CV50 | C38-... |
| Stacked Plate | 2.2xD | 2.200 - 2.400 | 5-3/8 | 7-43/64 | CV50 | SP38X22-CV50 | C38SP-... |

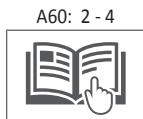
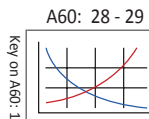
*Holder includes cartridges; however, inserts are sold separately.

Cartridges

| Holder Part No. | Replacement Cartridges | Qty. Inserts Needed | Mounting Screw | Key Size | Adjusting Screw | Driver |
|-----------------|------------------------|---------------------|----------------|----------|-----------------|--------|
| R38... | C38-FIX | 2 | MS-17M-1 | 5 mm | AS-18T9-1 | 8T-9 |
| | C38-ADJ | 2 | MS-17M-1 | 5 mm | AS-18T9-1 | 8T-9 |
| SP38... | C38SP-FIX | 2 | MS-17M-1 | 5 mm | AS-18T9-1 | 8T-9 |
| | C38SP-ADJ | 2 | MS-17M-1 | 5 mm | AS-18T9-1 | 8T-9 |

IC Inserts

| Carbide Grade | Geometry | Part No. | | | Insert Screws | Driver |
|---------------|-----------|---------------|---------------|--------------|---------------|--------|
| | | AM300® | AM200® | TiN | | |
| C5 (P35) | Standard | OP-05T308-P | OP-05T308-H | OP-05T308-T | IS-10-1 | 8T-9 |
| C1 (K35) | Standard | OP-05T308-1P | OP-05T308-1H | OP-05T308-1T | IS-10-1 | 8T-9 |
| C2 (K25) | Standard | OP-05T308-2P | OP-05T308-2H | - | IS-10-1 | 8T-9 |
| C5 (P35) | High Rake | OP-05T308-PHR | OP-05T308-HHR | - | IS-10-1 | 8T-9 |



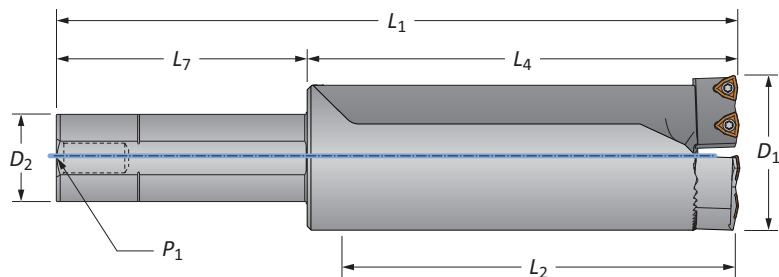
Mounting screws sold in multiples of 4 | Adjusting screws sold in multiples of 4
 IC inserts sold in multiples of 10 | Insert screws sold in multiples of 10

i = Imperial (in)
m = Metric (mm)



Revolution Drill Holders

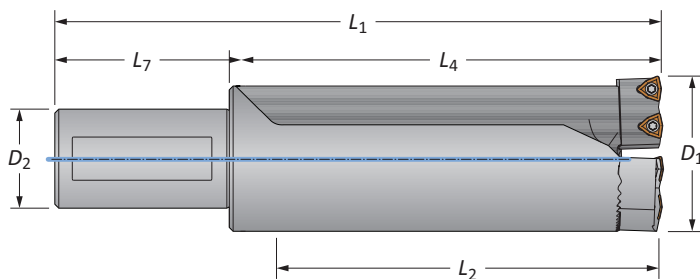
42 Series | Diameter Range: 2.400" - 2.600" (60.96 mm - 66.04 mm)



Straight Shank Imperial

| Style | Length | D ₁ Range | Holder | | | Shank | | | Part No.* | Cartridges |
|---------------|--------|----------------------|----------------|----------------|----------------|----------------|----------------|----------------|--------------|------------|
| | | | L ₂ | L ₄ | L ₁ | D ₂ | L ₇ | P ₁ | | |
| Standard | 2.2xD | 2.400 - 2.600 | 5-45/64 | 6-49/64 | 10-49/64 | 1-1/2 | 4 | 1/4 | R42X22-150L | C42-... |
| Standard | 3.5xD | 2.400 - 2.600 | 9-13/64 | 10-17/64 | 14-17/64 | 1-1/2 | 4 | 1/4 | R42X35-150L | C42-... |
| Standard | 4.5xD | 2.400 - 2.600 | 11-45/64 | 12-49/64 | 16-49/64 | 1-1/2 | 4 | 1/4 | R42X45-150L | C42-... |
| Stacked Plate | 2.2xD | 2.400 - 2.600 | 5-3/4 | 6-13/16 | 10-13/16 | 1-1/2 | 4 | 1/4 | SP42X22-150L | C42SP-... |

*Holder includes cartridges; however, inserts are sold separately.

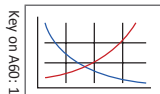


Straight Shank Metric

| Style | Length | D ₁ Range | Holder | | | Shank | | | Part No.* | Cartridges |
|---------------|--------|----------------------|----------------|----------------|----------------|----------------|----------------|----------------|-------------|------------|
| | | | L ₂ | L ₄ | L ₁ | D ₂ | L ₇ | P ₁ | | |
| Standard | 2.2xD | 60.96 - 66.04 | 144.88 | 171.68 | 241.68 | 40.00 | 70.00 | - | R42X22-40M | C42-... |
| Standard | 3.5xD | 60.96 - 66.04 | 233.78 | 260.58 | 330.58 | 40.00 | 70.00 | - | R42X35-40M | C42-... |
| Standard | 4.5xD | 60.96 - 66.04 | 297.28 | 324.08 | 394.08 | 40.00 | 70.00 | - | R42X45-40M | C42-... |
| Stacked Plate | 2.2xD | 60.96 - 66.04 | 146.10 | 172.90 | 242.90 | 40.00 | 70.00 | - | SP42X22-40M | C42SP-... |

*Holder includes cartridges; however, inserts are sold separately.

A60: 28 - 29



A60: 2 - 4

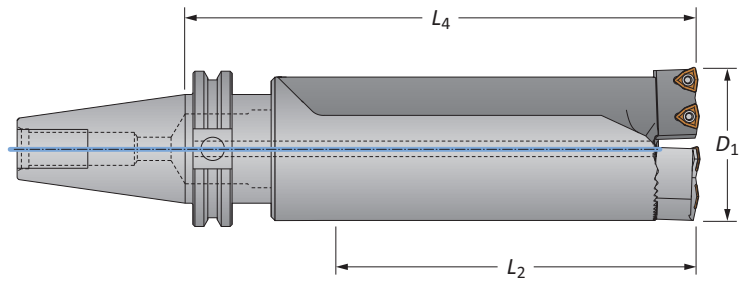


i = Imperial (in)
m = Metric (mm)



Revolution Drill Holders

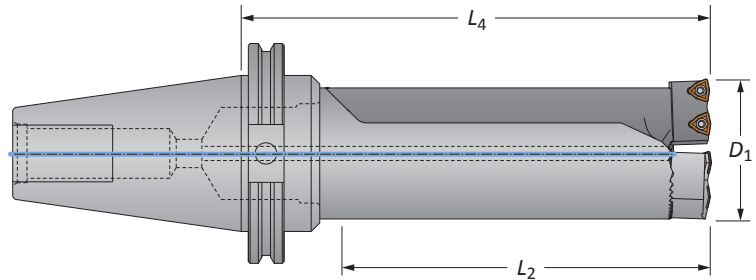
42 Series | Diameter Range: 2.400" - 2.600" (60.96 mm - 66.04 mm)



CV40 Shank

| Style | Length | D ₁ Range | Holder | | Shank | Part No.* | Cartridges |
|---------------|--------|----------------------|----------------|----------------|-------|--------------|------------|
| | | | L ₂ | L ₄ | | | |
| Standard | 2.2xD | 2.400 - 2.600 | 5-45/64 | 8-9/64 | CV40 | R42X22-CV40 | C42-... |
| Standard | 3.5xD | 2.400 - 2.600 | 9-13/64 | 11-41/64 | CV40 | R42X35-CV40 | C42-... |
| Standard | 4.5xD | 2.400 - 2.600 | 11-45/64 | 14-9/64 | CV40 | R42X45-CV40 | C42-... |
| Stacked Plate | 2.2xD | 2.400 - 2.600 | 5-3/4 | 8-3/16 | CV40 | SP42X22-CV40 | C42SP-... |

*Holder includes cartridges; however, inserts are sold separately.



CV50 Shank

| Style | Length | D ₁ Range | Holder | | Shank | Part No.* | Cartridges |
|---------------|--------|----------------------|----------------|----------------|-------|--------------|------------|
| | | | L ₂ | L ₄ | | | |
| Standard | 2.2xD | 2.400 - 2.600 | 5-45/64 | 8-9/64 | CV50 | R42X22-CV50 | C42-... |
| Standard | 3.5xD | 2.400 - 2.600 | 9-13/64 | 11-41/64 | CV50 | R42X35-CV50 | C42-... |
| Standard | 4.5xD | 2.400 - 2.600 | 11-45/64 | 14-9/64 | CV50 | R42X45-CV50 | C42-... |
| Stacked Plate | 2.2xD | 2.400 - 2.600 | 5-3/4 | 8-3/16 | CV50 | SP42X22-CV50 | C42SP-... |

*Holder includes cartridges; however, inserts are sold separately.

Cartridges

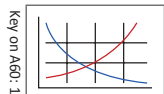
| Holder Part No. | Replacement Cartridges | Qty. Inserts Needed | Mounting Screw | Key Size | Adjusting Screw | Driver |
|-----------------|------------------------|---------------------|----------------|----------|-----------------|--------|
| R42... | C42-FIX | 2 | MS-19M-1 | 6 mm | AS-18T9-1 | 8T-9 |
| | C42-ADJ | 2 | MS-19M-1 | 6 mm | AS-18T9-1 | 8T-9 |
| SP42... | C42SP-FIX | 2 | MS-19M-1 | 6 mm | AS-18T9-1 | 8T-9 |
| | C42SP-ADJ | 2 | MS-19M-1 | 6 mm | AS-18T9-1 | 8T-9 |

IC Inserts

| Carbide Grade | Geometry | Part No. | | | Insert Screws | Driver |
|---------------|-----------|---------------|---------------|--------------|---------------|--------|
| | | AM300® | AM200® | TiN | | |
| C5 (P35) | Standard | OP-05T308-P | OP-05T308-H | OP-05T308-T | IS-10-1 | 8T-9 |
| C1 (K35) | Standard | OP-05T308-1P | OP-05T308-1H | OP-05T308-1T | IS-10-1 | 8T-9 |
| C2 (K25) | Standard | OP-05T308-2P | OP-05T308-2H | - | IS-10-1 | 8T-9 |
| C5 (P35) | High Rake | OP-05T308-PHR | OP-05T308-HHR | - | IS-10-1 | 8T-9 |

A60: 28 - 29

A60: 2 - 4



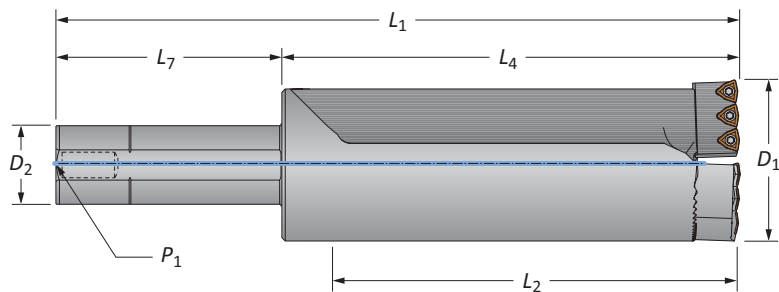
Mounting screws sold in multiples of 4 | Adjusting screws sold in multiples of 4
IC inserts sold in multiples of 10 | Insert screws sold in multiples of 10

i = Imperial (in)
m = Metric (mm)



Revolution Drill Holders

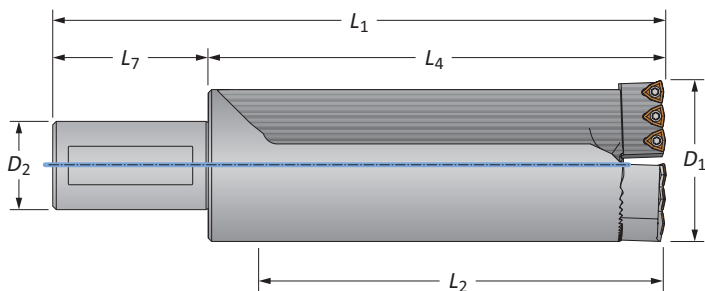
44 Series | Diameter Range: 2.600" - 2.800" (66.04 mm - 71.12 mm)



Straight Shank Imperial

| Style | Length | D ₁ Range | Holder | | | Shank | | | Part No.* | Cartridges |
|---------------|--------|----------------------|----------------|----------------|----------------|----------------|----------------|----------------|--------------|------------|
| | | | L ₂ | L ₄ | L ₁ | D ₂ | L ₇ | P ₁ | | |
| Standard | 2.2xD | 2.600 - 2.800 | 6-13/64 | 7-1/2 | 11-1/2 | 1-1/2 | 4 | 1/4 | R44X22-150L | C44-... |
| Standard | 3.5xD | 2.600 - 2.800 | 9-61/64 | 11-1/4 | 15-1/4 | 1-1/2 | 4 | 1/4 | R44X35-150L | C44-... |
| Stacked Plate | 2.2xD | 2.600 - 2.800 | 6-1/4 | 7-35/64 | 11-35/64 | 1-1/2 | 4 | 1/4 | SP44X22-150L | C44SP-... |

*Holder includes cartridges; however, inserts are sold separately.

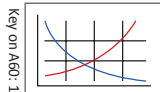


Straight Shank Metric

| Style | Length | D ₁ Range | Holder | | | Shank | | | Part No.* | Cartridges |
|---------------|--------|----------------------|----------------|----------------|----------------|----------------|----------------|----------------|-------------|------------|
| | | | L ₂ | L ₄ | L ₁ | D ₂ | L ₇ | P ₁ | | |
| Standard | 2.2xD | 66.04 - 71.12 | 157.63 | 190.65 | 260.65 | 40.00 | 70.00 | - | R44X22-40M | C44-... |
| Standard | 3.5xD | 66.04 - 71.12 | 252.88 | 285.90 | 355.90 | 40.00 | 70.00 | - | R44X35-40M | C44-... |
| Stacked Plate | 2.2xD | 66.04 - 71.12 | 158.70 | 191.69 | 261.70 | 40.00 | 70.00 | - | SP44X22-40M | C44SP-... |

*Holder includes cartridges; however, inserts are sold separately.

A60: 28 - 29



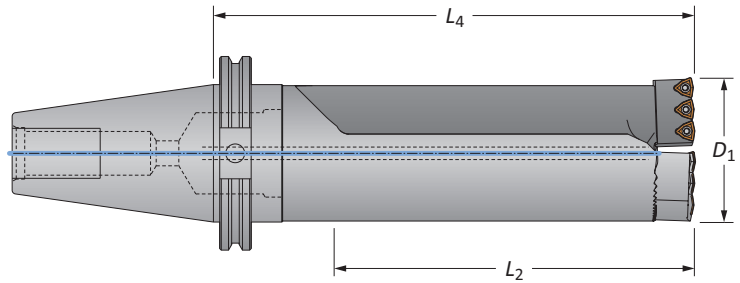
A60: 2 - 4





Revolution Drill Holders

44 Series | Diameter Range: 2.600" - 2.800" (66.04 mm - 71.12 mm)



CV50 Shank

| Style | Length | D_1 Range | Holder | | Shank | Part No.* | Cartridges |
|---------------|--------|---------------|---------|---------|-------|--------------|------------|
| | | | L_2 | L_4 | | | |
| Standard | 2.2xD | 2.600 - 2.800 | 6-13/64 | 8-7/8 | CV50 | R44X22-CV50 | C44-... |
| Standard | 3.5xD | 2.600 - 2.800 | 9-61/64 | 12-5/8 | CV50 | R44X35-CV50 | C44-... |
| Stacked Plate | 2.2xD | 2.600 - 2.800 | 6-1/4 | 8-59/64 | CV50 | SP44X22-CV50 | C44SP-... |

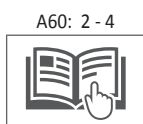
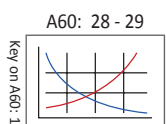
*Holder includes cartridges; however, inserts are sold separately.

Cartridges

| Holder Part No. | Replacement Cartridges | Qty. Inserts Needed | Mounting Screw | Key Size | Adjusting Screw | Driver |
|-----------------|------------------------|---------------------|----------------|----------|-----------------|--------|
| R44... | C44-FIX | 3 | MS-19M-1 | 6 mm | AS-18T9-1 | 8T-9 |
| | C44-ADJ | 3 | MS-19M-1 | 6 mm | AS-18T9-1 | 8T-9 |
| SP44... | C44SP-FIX | 3 | MS-19M-1 | 6 mm | AS-18T9-1 | 8T-9 |
| | C44SP-ADJ | 3 | MS-19M-1 | 6 mm | AS-18T9-1 | 8T-9 |

IC Inserts

| Carbide Grade | Geometry | Part No. | | | Insert Screws | Driver |
|---------------|-----------|---------------|---------------|--------------|---------------|--------|
| | | AM300® | AM200® | TiN | | |
| C5 (P35) | Standard | OP-05T308-P | OP-05T308-H | OP-05T308-T | IS-10-1 | 8T-9 |
| C1 (K35) | Standard | OP-05T308-1P | OP-05T308-1H | OP-05T308-1T | IS-10-1 | 8T-9 |
| C2 (K25) | Standard | OP-05T308-2P | OP-05T308-2H | - | IS-10-1 | 8T-9 |
| C5 (P35) | High Rake | OP-05T308-PHR | OP-05T308-HHR | - | IS-10-1 | 8T-9 |



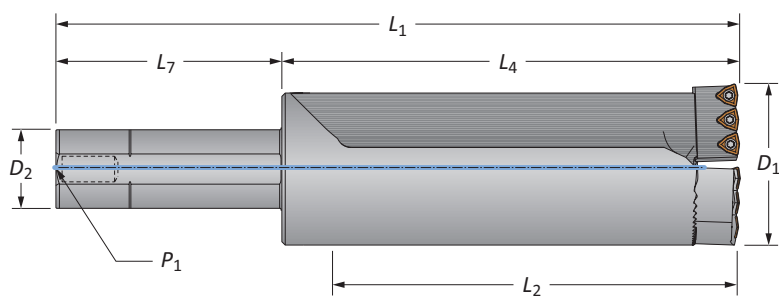
Mounting screws sold in multiples of 4 | Adjusting screws sold in multiples of 4
 IC inserts sold in multiples of 10 | Insert screws sold in multiples of 10

i = Imperial (in)
m = Metric (mm)



Revolution Drill Holders

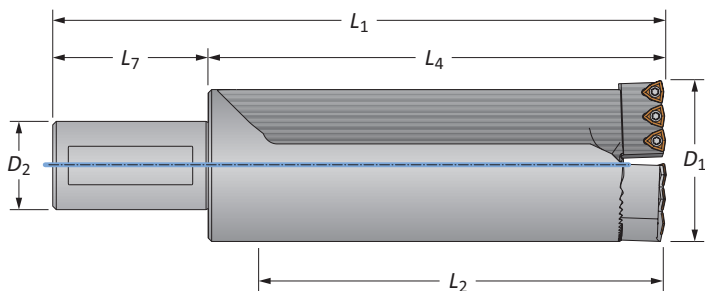
46 Series | Diameter Range: 2.800" - 3.000" (71.12 mm - 76.20 mm)



Straight Shank Imperial

| Style | Length | D ₁ Range | Holder | | | Shank | | | Part No.* | Cartridges |
|---------------|--------|----------------------|----------------|----------------|----------------|----------------|----------------|----------------|--------------|------------|
| | | | L ₂ | L ₄ | L ₁ | D ₂ | L ₇ | P ₁ | | |
| Standard | 2.2xD | 2.800 - 3.000 | 6-45/64 | 8 | 12 | 1-1/2 | 4 | 1/4 | R46X22-150L | C46-... |
| Standard | 3.5xD | 2.800 - 3.000 | 10-29/64 | 11-3/4 | 15-3/4 | 1-1/2 | 4 | 1/4 | R46X35-150L | C46-... |
| Stacked Plate | 2.2xD | 2.800 - 3.000 | 6-3/4 | 8-3/64 | 12-3/64 | 1-1/2 | 4 | 1/4 | SP46X22-150L | C46SP-... |

*Holder includes cartridges; however, inserts are sold separately.



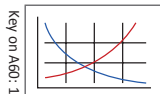
Straight Shank Metric

| Style | Length | D ₁ Range | Holder | | | Shank | | | Part No.* | Cartridges |
|---------------|--------|----------------------|----------------|----------------|----------------|----------------|----------------|----------------|-------------|------------|
| | | | L ₂ | L ₄ | L ₁ | D ₂ | L ₇ | P ₁ | | |
| Standard | 2.2xD | 71.12 - 76.20 | 170.36 | 203.38 | 273.38 | 40.00 | 70.00 | - | R46X22-40M | C46-... |
| Standard | 3.5xD | 71.12 - 76.20 | 265.61 | 298.63 | 368.63 | 40.00 | 70.00 | - | R46X35-40M | C46-... |
| Stacked Plate | 2.2xD | 71.12 - 76.20 | 171.40 | 204.39 | 274.40 | 40.00 | 70.00 | - | SP46X22-40M | C46SP-... |

*Holder includes cartridges; however, inserts are sold separately.

A60: 28 - 29

A60: 2 - 4

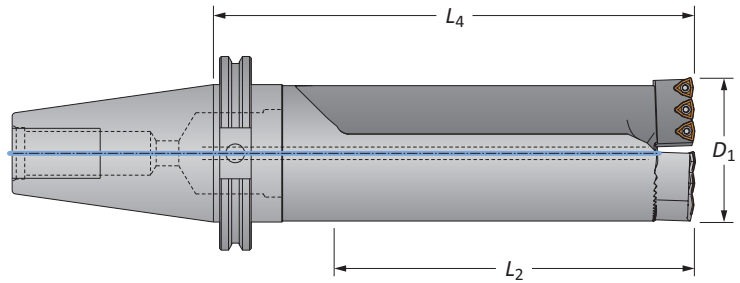


i = Imperial (in)
m = Metric (mm)



Revolution Drill Holders

46 Series | Diameter Range: 2.800" - 3.000" (71.12 mm - 76.20 mm)



CV50 Shank

| Style | Length | D ₁ Range | Holder | | Shank | Part No.* | Cartridges |
|---------------|--------|----------------------|----------------|----------------|-------|--------------|------------|
| | | | L ₂ | L ₄ | | | |
| Standard | 2.2xD | 2.800 - 3.000 | 6-45/64 | 9-25/64 | CV50 | R46X22-CV50 | C46-... |
| Standard | 3.5xD | 2.800 - 3.000 | 10-29/64 | 13-1/8 | CV50 | R46X35-CV50 | C46-... |
| Stacked Plate | 2.2xD | 2.800 - 3.000 | 6-3/4 | 9-27/64 | CV50 | SP46X22-CV50 | C46SP-... |

*Holder includes cartridges; however, inserts are sold separately.

Cartridges

| Holder Part No. | Replacement Cartridges | Qty. Inserts Needed | Mounting Screw | Key Size | Adjusting Screw | Driver |
|-----------------|------------------------|---------------------|----------------|----------|-----------------|--------|
| R46... | C46-FIX | 3 | MS-21M-1 | 8 mm | AS-18T9-1 | 8T-9 |
| | C46-ADJ | 3 | MS-21M-1 | 8 mm | AS-18T9-1 | 8T-9 |
| SP46... | C46SP-FIX | 3 | MS-21M-1 | 8 mm | AS-18T9-1 | 8T-9 |
| | C46SP-ADJ | 3 | MS-21M-1 | 8 mm | AS-18T9-1 | 8T-9 |

IC Inserts

| Carbide Grade | Geometry | Part No. | | | Insert Screws | Driver |
|---------------|-----------|---------------|---------------|--------------|---------------|--------|
| | | AM300® | AM200® | TiN | | |
| C5 (P35) | Standard | OP-05T308-P | OP-05T308-H | OP-05T308-T | IS-10-1 | 8T-9 |
| C1 (K35) | Standard | OP-05T308-1P | OP-05T308-1H | OP-05T308-1T | IS-10-1 | 8T-9 |
| C2 (K25) | Standard | OP-05T308-2P | OP-05T308-2H | - | IS-10-1 | 8T-9 |
| C5 (P35) | High Rake | OP-05T308-PHR | OP-05T308-HHR | - | IS-10-1 | 8T-9 |

A60: 28 - 29

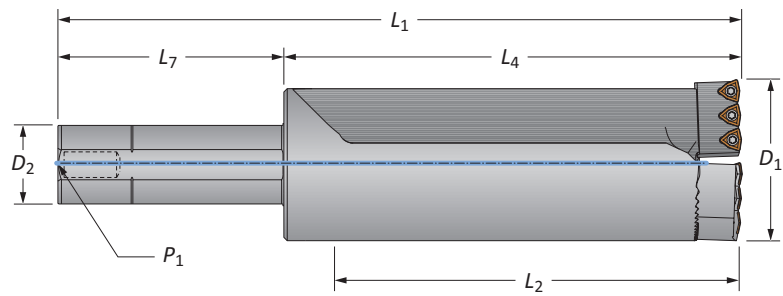
A60: 2 - 4

Mounting screws sold in multiples of 4 | Adjusting screws sold in multiples of 4
 IC inserts sold in multiples of 10 | Insert screws sold in multiples of 10

I = Imperial (in)
M = Metric (mm)

Revolution Drill Holders

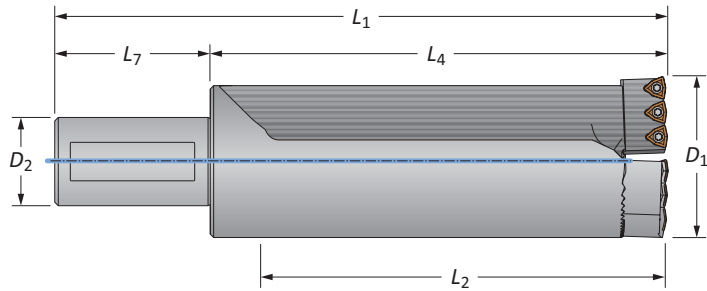
48 Series | Diameter Range: 3.000" - 3.200" (76.20 mm - 81.28 mm)



Straight Shank Imperial

| Style | Length | D ₁ Range | Holder | | | Shank | | | Part No.* | Cartridges |
|---------------|--------|----------------------|----------------|----------------|----------------|----------------|----------------|----------------|--------------|------------|
| | | | L ₂ | L ₄ | L ₁ | D ₂ | L ₇ | P ₁ | | |
| Standard | 1.0xD | 3.000 - 3.200 | 3-5/32 | 4-33/64 | 9-1/64 | 2 | 4-1/2 | 1/4 | R48X10-200L | C48-... |
| Standard | 2.5xD | 3.000 - 3.200 | 7-29/32 | 9-17/64 | 13-49/64 | 2 | 4-1/2 | 1/4 | R48X25-200L | C48-... |
| Stacked Plate | 1.0xD | 3.000 - 3.200 | 3-15/64 | 4-19/32 | 9-3/32 | 2 | 4-1/2 | 1/4 | SP48X10-200L | C48SP-... |
| Stacked Plate | 2.5xD | 3.000 - 3.200 | 7-63/64 | 9-11/32 | 13-27/32 | 2 | 4-1/2 | 1/4 | SP48X25-200L | C48SP-... |

*Holder includes cartridges; however, inserts are sold separately.



Straight Shank Metric

| Style | Length | D ₁ Range | Holder | | | Shank | | | Part No.* | Cartridges |
|---------------|--------|----------------------|----------------|----------------|----------------|----------------|----------------|----------------|-------------|------------|
| | | | L ₂ | L ₄ | L ₁ | D ₂ | L ₇ | P ₁ | | |
| Standard | 1.0xD | 76.20 - 81.28 | 80.21 | 114.50 | 194.50 | 50.00 | 80.00 | - | R48X10-50M | C48-... |
| Standard | 2.5xD | 76.20 - 81.28 | 200.86 | 235.15 | 315.15 | 50.00 | 80.00 | - | R48X25-50M | C48-... |
| Stacked Plate | 1.0xD | 76.20 - 81.28 | 80.21 | 116.51 | 196.52 | 50.00 | 80.00 | - | SP48X10-50M | C48SP-... |
| Stacked Plate | 2.5xD | 76.20 - 81.28 | 200.86 | 237.21 | 317.22 | 50.00 | 80.00 | - | SP48X25-50M | C48SP-... |

*Holder includes cartridges; however, inserts are sold separately.

A DRILLING

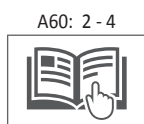
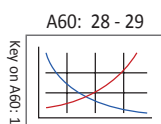
B BORING

C REAMING

D BURNISHING

F THREADING

X SPECIALS

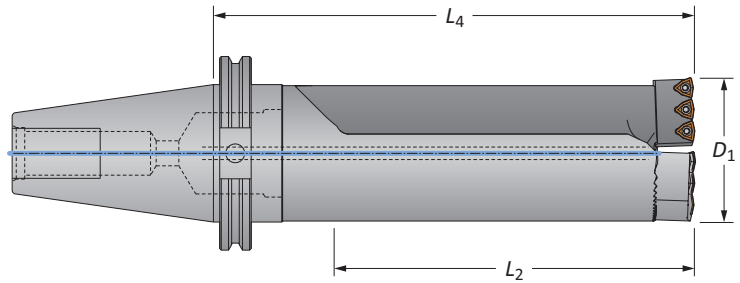


i = Imperial (in)
m = Metric (mm)



Revolution Drill Holders

48 Series | Diameter Range: 3.000" - 3.200" (76.20 mm - 81.28 mm)



CV50 Shank

| Style | Length | D ₁ Range | Holder | | Shank | Part No.* | Cartridges |
|---------------|--------|----------------------|----------------|----------------|-------|--------------|------------|
| | | | L ₂ | L ₄ | | | |
| Standard | 1.0xD | 3.000 - 3.200 | 3-5/32 | 5-57/64 | CV50 | R48X10-CV50 | C48-... |
| Standard | 2.5xD | 3.000 - 3.200 | 7-29/32 | 10-41/64 | CV50 | R48X25-CV50 | C48-... |
| Stacked Plate | 1.0xD | 3.000 - 3.200 | 3-15/64 | 5-31/32 | CV50 | SP48X10-CV50 | C48SP-... |
| Stacked Plate | 2.5xD | 3.000 - 3.200 | 7-63/64 | 10-23/32 | CV50 | SP48X25-CV50 | C48SP-... |

*Holder includes cartridges; however, inserts are sold separately.

Cartridges

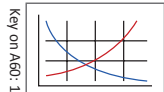
| Holder Part No. | Replacement Cartridges | Qty. Inserts Needed | Mounting Screw | Key Size | Adjusting Screw | Driver |
|-----------------|------------------------|---------------------|----------------|----------|-----------------|--------|
| R48... | C48-FIX | 3 | MS-21M-1 | 8 mm | AS-18T9-1 | 8T-9 |
| | C48-ADJ | 3 | MS-21M-1 | 8 mm | AS-18T9-1 | 8T-9 |
| SP48... | C48SP-FIX | 3 | MS-21M-1 | 8 mm | AS-18T9-1 | 8T-9 |
| | C48SP-ADJ | 3 | MS-21M-1 | 8 mm | AS-18T9-1 | 8T-9 |

IC Inserts

| Carbide Grade | Geometry | Part No. | | | Insert Screws | Driver |
|---------------|-----------|---------------|---------------|--------------|---------------|--------|
| | | AM300® | AM200® | TiN | | |
| C5 (P35) | Standard | OP-05T308-P | OP-05T308-H | OP-05T308-T | IS-10-1 | 8T-9 |
| C1 (K35) | Standard | OP-05T308-1P | OP-05T308-1H | OP-05T308-1T | IS-10-1 | 8T-9 |
| C2 (K25) | Standard | OP-05T308-2P | OP-05T308-2H | - | IS-10-1 | 8T-9 |
| C5 (P35) | High Rake | OP-05T308-PHR | OP-05T308-HHR | - | IS-10-1 | 8T-9 |

A60: 28 - 29

A60: 2 - 4

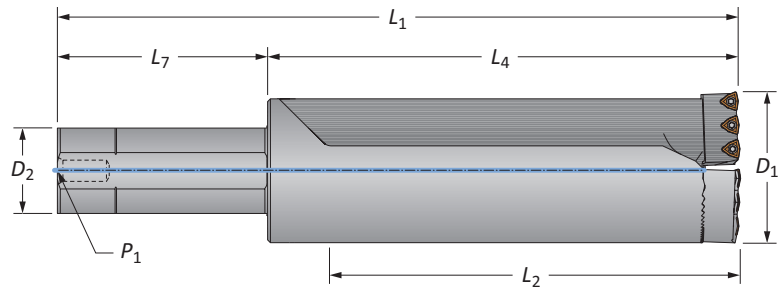


Mounting screws sold in multiples of 4 | Adjusting screws sold in multiples of 4
IC inserts sold in multiples of 10 | Insert screws sold in multiples of 10

I = Imperial (in)
M = Metric (mm)

Revolution Drill Holders

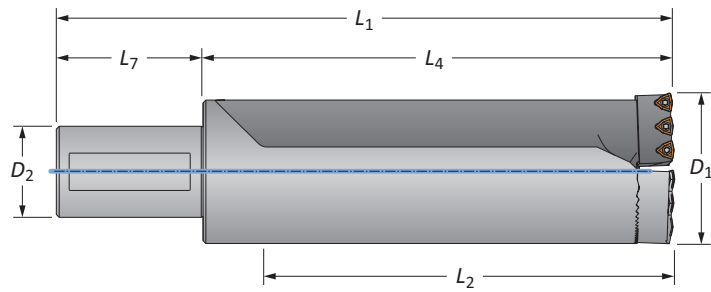
52 Series | Diameter Range: 3.200" - 3.400" (81.28 mm - 86.36 mm)



Straight Shank Imperial

| Style | Length | D ₁ Range | Holder | | | Shank | | | Part No.* | Cartridges |
|---------------|--------|----------------------|----------------|----------------|----------------|----------------|----------------|----------------|--------------|------------|
| | | | L ₂ | L ₄ | L ₁ | D ₂ | L ₇ | P ₁ | | |
| Standard | 1.0xD | 3.200 - 3.400 | 3-27/64 | 5-1/64 | 9-33/64 | 2 | 4-1/2 | 1/4 | R52X10-200L | C52-... |
| Standard | 2.5xD | 3.200 - 3.400 | 8-27/64 | 10-1/64 | 14-33/64 | 2 | 4-1/2 | 1/4 | R52X25-200L | C52-... |
| Stacked Plate | 1.0xD | 3.200 - 3.400 | 3-31/64 | 5-5/64 | 9-37/64 | 2 | 4-1/2 | 1/4 | SP52X10-200L | C52SP-... |
| Stacked Plate | 2.5xD | 3.200 - 3.400 | 8-31/64 | 10-5/64 | 14-37/64 | 2 | 4-1/2 | 1/4 | SP52X25-200L | C52SP-... |

*Holder includes cartridges; however, inserts are sold separately.



Straight Shank Metric

| Style | Length | D ₁ Range | Holder | | | Shank | | | Part No.* | Cartridges |
|---------------|--------|----------------------|----------------|----------------|----------------|----------------|----------------|----------------|-------------|------------|
| | | | L ₂ | L ₄ | L ₁ | D ₂ | L ₇ | P ₁ | | |
| Standard | 1.0xD | 81.28 - 86.36 | 86.72 | 127.23 | 207.23 | 50.00 | 80.00 | - | R52X10-50M | C52-... |
| Standard | 2.5xD | 81.28 - 86.36 | 213.72 | 254.02 | 334.02 | 50.00 | 80.00 | - | R52X25-50M | C52-... |
| Stacked Plate | 1.0xD | 81.28 - 86.36 | 88.60 | 129.11 | 209.12 | 50.00 | 80.00 | - | SP52X10-50M | C52SP-... |
| Stacked Plate | 2.5xD | 81.28 - 86.36 | 215.60 | 256.11 | 336.12 | 50.00 | 80.00 | - | SP52X25-50M | C52SP-... |

*Holder includes cartridges; however, inserts are sold separately.

A

DRILLING

B

BORING

C

REAMING

D

BURNISHING

E

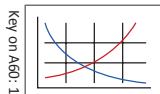
THREADING

X

SPECIALS

A60: 28 - 29

A60: 2 - 4

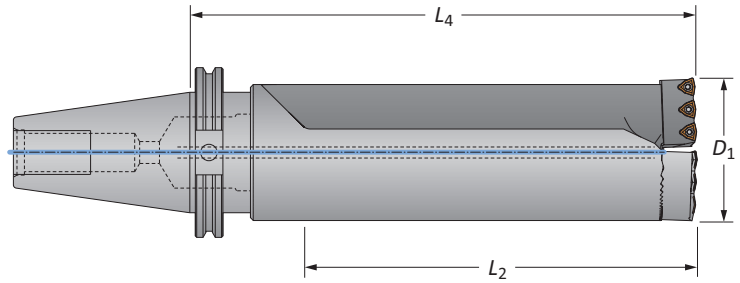


i = Imperial (in)
m = Metric (mm)



Revolution Drill Holders

52 Series | Diameter Range: 3.200" - 3.400" (81.28 mm - 86.36 mm)



CV50 Shank

| Style | Length | D ₁ Range | Holder | | Shank | Part No.* | Cartridges |
|---------------|--------|----------------------|----------------|----------------|-------|--------------|------------|
| | | | L ₂ | L ₄ | | | |
| Standard | 1.0xD | 3.200 - 3.400 | 3-27/64 | 6-25/64 | CV50 | R52X10-CV50 | C52-... |
| Standard | 2.5xD | 3.200 - 3.400 | 8-27/64 | 11-25/64 | CV50 | R52X25-CV50 | C52-... |
| Stacked Plate | 1.0xD | 3.200 - 3.400 | 3-31/64 | 6-29/64 | CV50 | SP52X10-CV50 | C52SP-... |
| Stacked Plate | 2.5xD | 3.200 - 3.400 | 8-31/64 | 11-29/64 | CV50 | SP52X25-CV50 | C52SP-... |

*Holder includes cartridges; however, inserts are sold separately.

Cartridges

| Holder Part No. | Replacement Cartridges | Qty. Inserts Needed | Mounting Screw | Key Size | Adjusting Screw | Driver |
|-----------------|------------------------|---------------------|----------------|----------|-----------------|--------|
| R52... | C52-FIX | 3 | MS-19M-1 | 6 mm | AS-18T9-1 | 8T-9 |
| | C52-ADJ | 3 | MS-19M-1 | 6 mm | AS-18T9-1 | 8T-9 |
| SP52... | C52SP-FIX | 3 | MS-19M-1 | 6 mm | AS-18T9-1 | 8T-9 |
| | C52SP-ADJ | 3 | MS-19M-1 | 6 mm | AS-18T9-1 | 8T-9 |

IC Inserts

| Carbide Grade | Geometry | Part No. | | | Insert Screws | Driver |
|---------------|-----------|---------------|---------------|--------------|---------------|--------|
| | | AM300® | AM200® | TiN | | |
| C5 (P35) | Standard | OP-05T308-P | OP-05T308-H | OP-05T308-T | IS-10-1 | 8T-9 |
| C1 (K35) | Standard | OP-05T308-1P | OP-05T308-1H | OP-05T308-1T | IS-10-1 | 8T-9 |
| C2 (K25) | Standard | OP-05T308-2P | OP-05T308-2H | - | IS-10-1 | 8T-9 |
| C5 (P35) | High Rake | OP-05T308-PHR | OP-05T308-HHR | - | IS-10-1 | 8T-9 |

A60: 28 - 29 A60: 2 - 4

Key on A60: 1

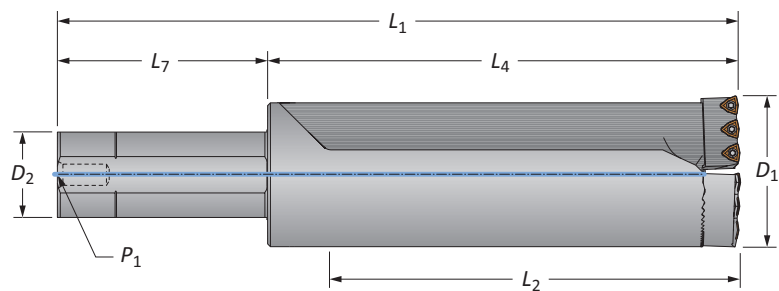
Mounting screws sold in multiples of 4 | Adjusting screws sold in multiples of 4
 IC inserts sold in multiples of 10 | Insert screws sold in multiples of 10

I = Imperial (in)
M = Metric (mm)



Revolution Drill Holders

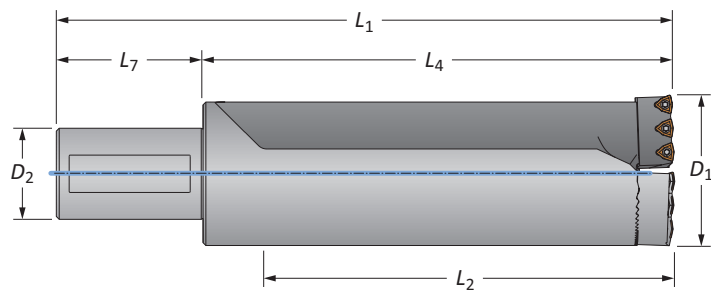
54 Series | Diameter Range: 3.400" - 3.600" (86.36 mm - 91.44 mm)



Straight Shank Imperial

| Style | Length | D ₁ Range | Holder | | | Shank | | | Part No.* | Cartridges |
|---------------|--------|----------------------|----------------|----------------|----------------|----------------|----------------|----------------|--------------|------------|
| | | | L ₂ | L ₄ | L ₁ | D ₂ | L ₇ | P ₁ | | |
| Standard | 1.0xD | 3.400 - 3.600 | 3-21/32 | 5-17/64 | 9-49/64 | 2 | 4-1/2 | 1/4 | R54X10-200L | C54-... |
| Standard | 2.5xD | 3.400 - 3.600 | 8-29/32 | 10-33/64 | 15-1/64 | 2 | 4-1/2 | 1/4 | R54X25-200L | C54-... |
| Stacked Plate | 1.0xD | 3.400 - 3.600 | 3-23/32 | 5-21/64 | 9-53/64 | 2 | 4-1/2 | 1/4 | SP54X10-200L | C54SP-... |
| Stacked Plate | 2.5xD | 3.400 - 3.600 | 8-31/32 | 10-37/64 | 15-5/64 | 2 | 4-1/2 | 1/4 | SP54X25-200L | C54SP-... |

*Holder includes cartridges; however, inserts are sold separately.



Straight Shank Metric

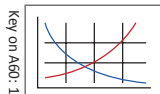
| Style | Length | D ₁ Range | Holder | | | Shank | | | Part No.* | Cartridges |
|---------------|--------|----------------------|----------------|----------------|----------------|----------------|----------------|----------------|-------------|------------|
| | | | L ₂ | L ₄ | L ₁ | D ₂ | L ₇ | P ₁ | | |
| Standard | 1.0xD | 86.36 - 91.44 | 92.94 | 133.58 | 213.58 | 50.00 | 80.00 | – | R54X10-50M | C54-... |
| Standard | 2.5xD | 86.36 - 91.44 | 226.29 | 266.93 | 346.93 | 50.00 | 80.00 | – | R54X25-50M | C54-... |
| Stacked Plate | 1.0xD | 86.36 - 91.44 | 94.50 | 135.10 | 215.10 | 50.00 | 80.00 | – | SP54X10-50M | C54SP-... |
| Stacked Plate | 2.5xD | 86.36 - 91.44 | 227.81 | 268.50 | 348.51 | 50.00 | 80.00 | – | SP54X25-50M | C54SP-... |

*Holder includes cartridges; however, inserts are sold separately.

A
DRILLINGB
BORINGC
REAMINGD
BURNISHINGE
THREADINGX
SPECIALS

A60: 28 - 29

A60: 2 - 4

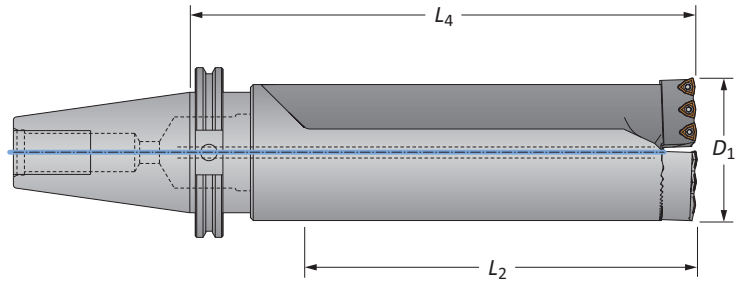


i = Imperial (in)
m = Metric (mm)



Revolution Drill Holders

54 Series | Diameter Range: 3.400" - 3.600" (86.36 mm - 91.44 mm)



CV50 Shank

| Style | Length | D_1 Range | Holder | | Shank | Part No.* | Cartridges | |
|-------|---------------|-------------|---------------|---------|----------|-----------|--------------|-----------|
| | | | L_2 | L_4 | | | | |
| i | Standard | 1.0xD | 3.400 - 3.600 | 3-21/32 | 6-41/64 | CV50 | R54X10-CV50 | C54-... |
| | Standard | 2.5xD | 3.400 - 3.600 | 8-29/32 | 11-57/64 | CV50 | R54X25-CV50 | C54-... |
| | Stacked Plate | 1.0xD | 3.400 - 3.600 | 3-23/32 | 6-11/16 | CV50 | SP54X10-CV50 | C54SP-... |
| | Stacked Plate | 2.5xD | 3.400 - 3.600 | 8-31/32 | 11-15/16 | CV50 | SP54X25-CV50 | C54SP-... |

*Holder includes cartridges; however, inserts are sold separately.

Cartridges

| Holder Part No. | Replacement Cartridges | Qty. Inserts Needed | Mounting Screw | Key Size | Adjusting Screw | Driver |
|-----------------|------------------------|---------------------|----------------|----------|-----------------|--------|
| R54... | C54-FIX | 3 | MS-19M-1 | 6 mm | AS-18T9-1 | 8T-9 |
| | C54-ADJ | 3 | MS-19M-1 | 6 mm | AS-18T9-1 | 8T-9 |
| SP54... | C54SP-FIX | 3 | MS-19M-1 | 6 mm | AS-18T9-1 | 8T-9 |
| | C54SP-ADJ | 3 | MS-19M-1 | 6 mm | AS-18T9-1 | 8T-9 |

IC Inserts

| Carbide Grade | Geometry | Part No. | | | Insert Screws | Driver |
|---------------|-----------|---------------|---------------|--------------|---------------|--------|
| | | AM300® | AM200® | TiN | | |
| C5 (P35) | Standard | OP-05T308-P | OP-05T308-H | OP-05T308-T | IS-10-1 | 8T-9 |
| C1 (K35) | Standard | OP-05T308-1P | OP-05T308-1H | OP-05T308-1T | IS-10-1 | 8T-9 |
| C2 (K25) | Standard | OP-05T308-2P | OP-05T308-2H | - | IS-10-1 | 8T-9 |
| C5 (P35) | High Rake | OP-05T308-PHR | OP-05T308-HHR | - | IS-10-1 | 8T-9 |

A60: 28 - 29 A60: 2 - 4

Key on A60: 1

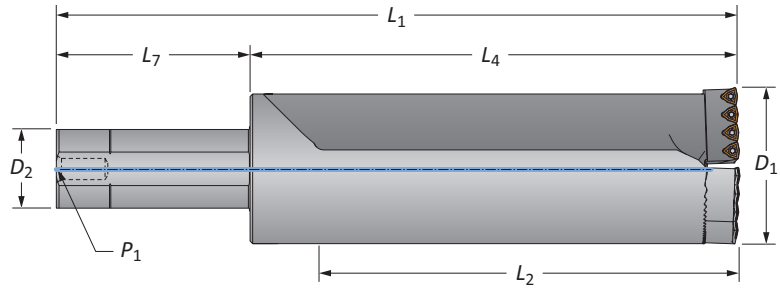
Mounting screws sold in multiples of 4 | Adjusting screws sold in multiples of 4
 IC inserts sold in multiples of 10 | Insert screws sold in multiples of 10

i = Imperial (in)
 m = Metric (mm)

Revolution Drill Holders

56 Series | Diameter Range: 3.600" - 3.800" (91.44 mm - 96.52 mm)

A DRILLING



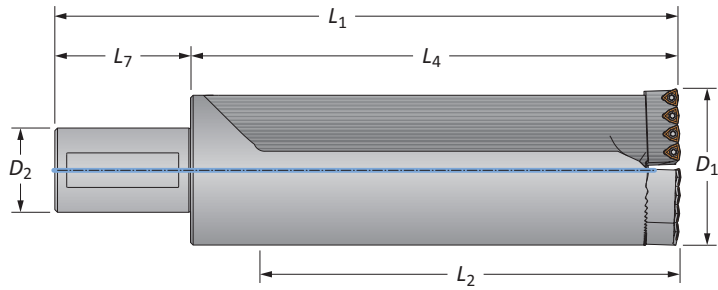
Straight Shank Imperial

| Style | Length | D ₁ Range | Holder | | | Shank | | | Part No.* | Cartridges |
|---------------|--------|----------------------|----------------|----------------|----------------|----------------|----------------|----------------|--------------|------------|
| | | | L ₂ | L ₄ | L ₁ | D ₂ | L ₇ | P ₁ | | |
| Standard | 1.0xD | 3.600 - 3.800 | 3-7/8 | 5-3/4 | 10-1/4 | 2 | 4-1/2 | 1/4 | R56X10-200L | C56-... |
| Standard | 2.5xD | 3.600 - 3.800 | 9-3/8 | 11-1/4 | 15-3/4 | 2 | 4-1/2 | 1/4 | R56X25-200L | C56-... |
| Stacked Plate | 1.0xD | 3.600 - 3.800 | 3-15/16 | 5-13/16 | 10-5/16 | 2 | 4-1/2 | 1/4 | SP56X10-200L | C56SP-... |
| Stacked Plate | 2.5xD | 3.600 - 3.800 | 9-7/16 | 11-5/16 | 15-13/16 | 2 | 4-1/2 | 1/4 | SP56X25-200L | C56SP-... |

*Holder includes cartridges; however, inserts are sold separately.

B BORING

C REAMING



Straight Shank Metric

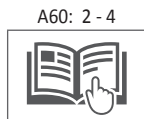
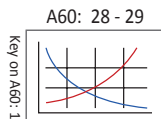
| Style | Length | D ₁ Range | Holder | | | Shank | | | Part No.* | Cartridges |
|---------------|--------|----------------------|----------------|----------------|----------------|----------------|----------------|----------------|-------------|------------|
| | | | L ₂ | L ₄ | L ₁ | D ₂ | L ₇ | P ₁ | | |
| Standard | 1.0xD | 91.44 - 96.52 | 98.60 | 146.23 | 226.23 | 50.00 | 80.00 | - | R56X10-50M | C56-... |
| Standard | 2.5xD | 91.44 - 96.52 | 238.30 | 285.93 | 365.93 | 50.00 | 80.00 | - | R56X25-50M | C56-... |
| Stacked Plate | 1.0xD | 91.44 - 96.52 | 99.90 | 147.60 | 227.61 | 50.00 | 80.00 | - | SP56X10-50M | C56SP-... |
| Stacked Plate | 2.5xD | 91.44 - 96.52 | 239.60 | 287.30 | 367.31 | 50.00 | 80.00 | - | SP56X25-50M | C56SP-... |

*Holder includes cartridges; however, inserts are sold separately.

D BURNISHING

F THREADING

X SPECIALS

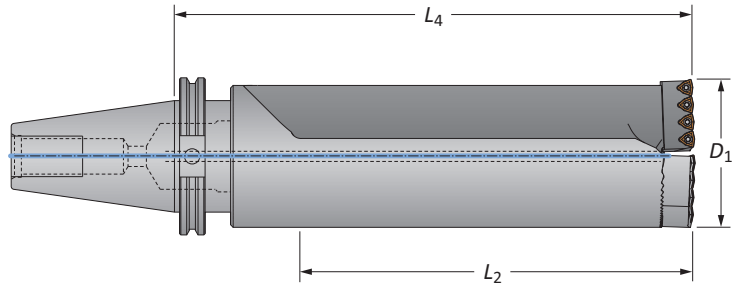


i = Imperial (in)
m = Metric (mm)



Revolution Drill Holders

56 Series | Diameter Range: 3.600" - 3.800" (91.44 mm - 96.52 mm)



CV50 Shank

| Style | Length | D_1 Range | Holder | | Shank | Part No.* | Cartridges |
|---------------|--------|---------------|---------|----------|-------|--------------|------------|
| | | | L_2 | L_4 | | | |
| Standard | 1.0xD | 3.600 - 3.800 | 3-7/8 | 7-1/8 | CV50 | R56X10-CV50 | C56-... |
| Standard | 2.5xD | 3.600 - 3.800 | 9-3/8 | 12-5/8 | CV50 | R56X25-CV50 | C56-... |
| Stacked Plate | 1.0xD | 3.600 - 3.800 | 3-15/16 | 7-3/16 | CV50 | SP56X10-CV50 | C56SP-... |
| Stacked Plate | 2.5xD | 3.600 - 3.800 | 9-7/16 | 12-11/16 | CV50 | SP56X25-CV50 | C56SP-... |

*Holder includes cartridges; however, inserts are sold separately.

Cartridges

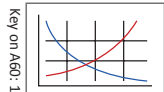
| Holder Part No. | Replacement Cartridges | Qty. Inserts Needed | Mounting Screw | Key Size | Adjusting Screw | Driver |
|-----------------|------------------------|---------------------|----------------|----------|-----------------|--------|
| R56... | C56-FIX | 4 | MS-21M-1 | 8 mm | AS-18T9-1 | 8T-9 |
| | C56-ADJ | 4 | MS-21M-1 | 8 mm | AS-18T9-1 | 8T-9 |
| SP56... | C56SP-FIX | 4 | MS-21M-1 | 8 mm | AS-18T9-1 | 8T-9 |
| | C56SP-ADJ | 4 | MS-21M-1 | 8 mm | AS-18T9-1 | 8T-9 |

IC Inserts

| Carbide Grade | Geometry | Part No. | | | Insert Screws | Driver |
|---------------|-----------|---------------|---------------|--------------|---------------|--------|
| | | AM300® | AM200® | TiN | | |
| C5 (P35) | Standard | OP-05T308-P | OP-05T308-H | OP-05T308-T | IS-10-1 | 8T-9 |
| C1 (K35) | Standard | OP-05T308-1P | OP-05T308-1H | OP-05T308-1T | IS-10-1 | 8T-9 |
| C2 (K25) | Standard | OP-05T308-2P | OP-05T308-2H | - | IS-10-1 | 8T-9 |
| C5 (P35) | High Rake | OP-05T308-PHR | OP-05T308-HHR | - | IS-10-1 | 8T-9 |

A60: 28 - 29

A60: 2 - 4

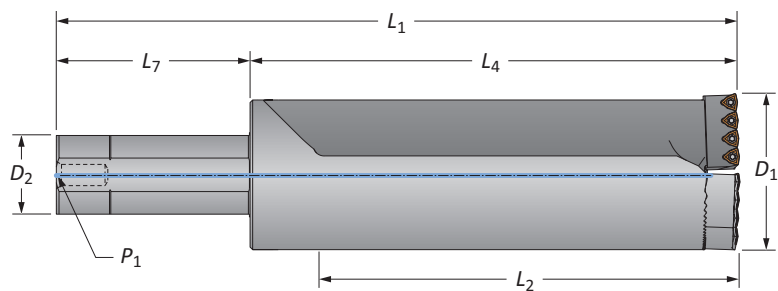


Mounting screws sold in multiples of 4 | Adjusting screws sold in multiples of 4
 IC inserts sold in multiples of 10 | Insert screws sold in multiples of 10

I = Imperial (in)
M = Metric (mm)

Revolution Drill Holders

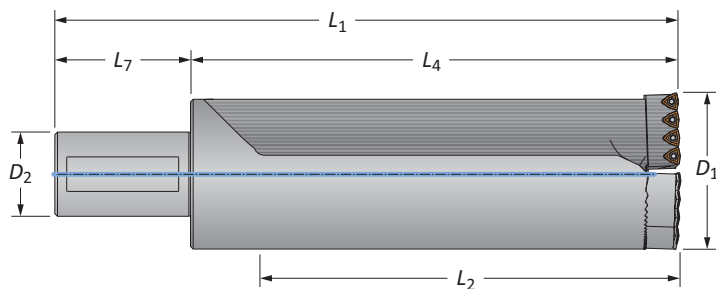
58 Series | Diameter Range: 3.800" - 4.000" (96.52 mm - 101.60 mm)



Straight Shank Imperial

| Style | Length | D_1 Range | Holder | | | Shank | | | Part No.* | Cartridges |
|---------------|--------|---------------|---------|----------|---------|-------|-------|-------|---------------------|------------|
| | | | L_2 | L_4 | L_1 | D_2 | L_7 | P_1 | | |
| Standard | 1.0xD | 3.800 - 4.000 | 3-7/8 | 5-3/4 | 10-1/4 | 2 | 4-1/2 | 1/4 | R58X10-200L | C58-... |
| Standard | 2.5xD | 3.800 - 4.000 | 9-7/8 | 11-3/4 | 16-1/4 | 2 | 4-1/2 | 1/4 | R58X25-200L | C58-... |
| Stacked Plate | 1.0xD | 3.800 - 4.000 | 3-15/16 | 5-13/16 | 10-5/16 | 2 | 4-1/2 | 1/4 | SP58X10-200L | C58SP-... |
| Stacked Plate | 2.5xD | 3.800 - 4.000 | 9-15/16 | 11-13/16 | 16-5/16 | 2 | 4-1/2 | 1/4 | SP58X25-200L | C58SP-... |

*Holder includes cartridges; however, inserts are sold separately.



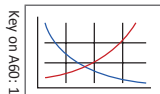
Straight Shank Metric

| Style | Length | D_1 Range | Holder | | | Shank | | | Part No.* | Cartridges |
|---------------|--------|----------------|--------|--------|--------|-------|-------|-------|--------------------|------------|
| | | | L_2 | L_4 | L_1 | D_2 | L_7 | P_1 | | |
| Standard | 1.0xD | 96.52 - 101.60 | 98.60 | 146.20 | 226.20 | 50.00 | 80.00 | – | R58X10-50M | C58-... |
| Standard | 2.5xD | 96.52 - 101.60 | 251.00 | 298.60 | 378.60 | 50.00 | 80.00 | – | R58X25-50M | C58-... |
| Stacked Plate | 1.0xD | 96.52 - 101.60 | 99.80 | 147.40 | 227.41 | 50.00 | 80.00 | – | SP58X10-50M | C58SP-... |
| Stacked Plate | 2.5xD | 96.52 - 101.60 | 252.20 | 299.80 | 379.81 | 50.00 | 80.00 | – | SP58X25-50M | C58SP-... |

*Holder includes cartridges; however, inserts are sold separately.

A
DRILLINGB
BORINGC
REAMINGD
BURNISHINGE
THREADINGX
SPECIALS

A60: 28 - 29



A60: 2 - 4

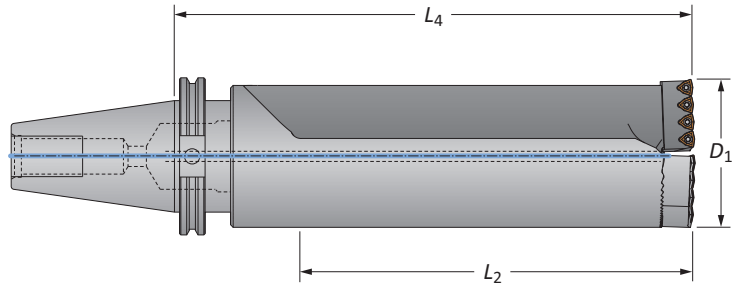


i = Imperial (in)
m = Metric (mm)



Revolution Drill Holders

58 Series | Diameter Range: 3.800" - 4.000" (96.52 mm - 101.60 mm)



CV50 Shank

| Style | Length | D ₁ Range | Holder | | Shank | Part No.* | Cartridges |
|---------------|--------|----------------------|----------------|----------------|-------|--------------|------------|
| | | | L ₂ | L ₄ | | | |
| Standard | 1.0xD | 3.800 - 4.000 | 3-7/8 | 7-1/8 | CV50 | R58X10-CV50 | C58-... |
| Standard | 2.5xD | 3.800 - 4.000 | 9-7/8 | 13-1/8 | CV50 | R58X25-CV50 | C58-... |
| Stacked Plate | 1.0xD | 3.800 - 4.000 | 3-15/16 | 7-3/16 | CV50 | SP58X10-CV50 | C58SP-... |
| Stacked Plate | 2.5xD | 3.800 - 4.000 | 9-15/16 | 13-3/16 | CV50 | SP58X25-CV50 | C58SP-... |

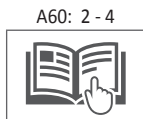
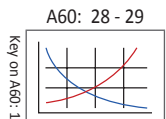
*Holder includes cartridges; however, inserts are sold separately.

Cartridges

| Holder Part No. | Replacement Cartridges | Qty. Inserts Needed | Mounting Screw | Key Size | Adjusting Screw | Driver |
|-----------------|------------------------|---------------------|----------------|----------|-----------------|--------|
| R58... | C58-FIX | 4 | MS-21M-1 | 8 mm | AS-18T9-1 | 8T-9 |
| | C58-ADJ | 4 | MS-21M-1 | 8 mm | AS-18T9-1 | 8T-9 |
| SP58... | C58SP-FIX | 4 | MS-21M-1 | 8 mm | AS-18T9-1 | 8T-9 |
| | C58SP-ADJ | 4 | MS-21M-1 | 8 mm | AS-18T9-1 | 8T-9 |

IC Inserts

| Carbide Grade | Geometry | Part No. | | | Insert Screws | Driver |
|---------------|-----------|---------------|---------------|--------------|---------------|--------|
| | | AM300® | AM200® | TiN | | |
| C5 (P35) | Standard | OP-05T308-P | OP-05T308-H | OP-05T308-T | IS-10-1 | 8T-9 |
| C1 (K35) | Standard | OP-05T308-1P | OP-05T308-1H | OP-05T308-1T | IS-10-1 | 8T-9 |
| C2 (K25) | Standard | OP-05T308-2P | OP-05T308-2H | - | IS-10-1 | 8T-9 |
| C5 (P35) | High Rake | OP-05T308-PHR | OP-05T308-HHR | - | IS-10-1 | 8T-9 |






Mounting screws sold in multiples of 4 | Adjusting screws sold in multiples of 4
 IC inserts sold in multiples of 10 | Insert screws sold in multiples of 10

I = Imperial (in)
M = Metric (mm)



Recommended Cutting Data | Imperial (inch)

| ISO | Material | Hardness (BHN) | Speed (SFM) | | | Feed Rate (IPR) |
|-----|--|----------------|--|---|---|-----------------|
| | | |  AM300® |  AM200® |  TiN | |
| P | Free-Machining Steel 1118, 1215, 12L14, etc. | 100 - 250 | 900 - 1300 | 850 - 1200 | 700 - 900 | .0035 - .007 |
| | Low-Carbon Steel 1010, 1020, 1025, 1522, 1144, etc. | 85 - 275 | 850 - 1250 | 800 - 1150 | 650 - 850 | .003 - .0065 |
| | Medium-Carbon Steel 1030, 1040, 1050, 1527, 1140, 1151, etc. | 125 - 325 | 800 - 1050 | 750 - 950 | 600 - 850 | .0035 - .0065 |
| | Alloy Steel 4140, 5140, 8640, etc. | 125 - 375 | 750 - 1000 | 700 - 900 | 600 - 850 | .0035 - .0065 |
| | High-Strength Alloy 4340, 4330V, 300M, etc. | 225 - 400 | 600 - 850 | 550 - 750 | 400 - 650 | .003 - .005 |
| | Structural Steel A36, A285, A516, etc. | 100 - 350 | 850 - 1050 | 800 - 950 | 650 - 850 | .003 - .0065 |
| | Tool Steel H-13, H-21, A-4, O-2, S-3, etc. | 150 - 250 | 400 - 800 | 350 - 700 | 250 - 650 | .0025 - .005 |
| S | High-Temp Alloy Hastelloy B, Inconel 600, etc. | 140 - 310 | 250 - 450 | 250 - 350 | 150 - 300 | .0025 - .005 |
| M | Stainless Steel 400 Series 416, 420, etc. | 185 - 350 | 600 - 850 | 550 - 750 | 400 - 650 | .003 - .006 |
| | Stainless Steel 300 Series 304, 316, 17-4PH, etc. | 135 - 275 | 600 - 850 | 550 - 750 | 400 - 650 | .003 - .006 |
| | Super Duplex Stainless Steel | 135 - 275 | 500 - 750 | 450 - 650 | 300 - 550 | .002 - .005 |
| K | Nodular, Grey, Ductile Cast Iron | 120 - 320 | 700 - 900 | 650 - 800 | 500 - 700 | .004 - .008 |
| N | Cast Aluminum | 30 - 180 | 1250 - 1650 | 1200 - 1550 | 950 - 1100 | .006 - .012 |
| | Wrought Aluminum | 30 - 180 | 1250 - 1650 | 1200 - 1550 | 950 - 1100 | .006 - .012 |
| | Brass | 30 - 100 | 950 - 1350 | 900 - 1250 | 750 - 1100 | .005 - .009 |

Material Constants

| Type of Material | Hardness (BHN) | K _m (lbs/in ²) |
|------------------------------|----------------|---------------------------------------|
| Free-Machining Steel | 100 - 250 | 0.75 |
| Low-Carbon Steel | 85 - 275 | 0.85 |
| Medium-Carbon Steel | 125 - 325 | 0.90 |
| Alloy Steel | 125 - 375 | 1.00 |
| High-Strength Steel | 225 - 400 | 1.15 |
| Structural Steel | 100 - 350 | 1.00 |
| Tool Steel | 150 - 250 | 0.90 |
| High-Temperature Alloy | 140 - 310 | 1.44 |
| Titanium Alloy | 140 - 310 | 0.72 |
| Aerospace Alloy | 185 - 350 | 0.70 |
| Stainless Steel 400 Series | 185 - 350 | 1.08 |
| Stainless Steel 300 Series | 135 - 275 | 0.94 |
| Super Duplex Stainless Steel | 135 - 275 | 0.94 |
| Wear Plate | 400 - 600 | 1.60 |
| Hardened Steel | 300 - 500 | 1.40 |
| Nodular, Ductile Cast Iron | 120 - 320 | 0.65 |
| Grey Cast Iron | 120 - 320 | 0.75 |
| Cast Aluminum | 30 - 180 | 0.40 |
| Wrought Aluminum | 30 - 180 | 0.40 |
| Aluminum Bronze | 100 - 250 | 0.50 |
| Brass | 100 | 0.35 |
| Copper | 60 | 0.30 |




Formulas

| | |
|----|--|
| 1. | RPM = $(3.82 \cdot \text{SFM}) / \text{DIA}$ where: RPM = revolutions per minute (rev/min) SFM = speed (ft/min) DIA = diameter of drill (inch) |
| 2. | HP = $(0.6676 \cdot \text{DIA}^2 \cdot \text{IPR} \cdot \text{RPM} \cdot \text{K}_m) / 0.80$ where: Tool Power = tool power (HP) DIA = diameter of drill (inch) IPR = feed rate (in/rev) RPM = revolutions per minute (rev/min) K _m = specific cutting energy (lbs/in ²) machine efficiency (using 0.80 as constant) |
| 3. | Thrust = $148,500 \cdot \text{IPR} \cdot \text{DIA} \cdot \text{K}_m$ where: Thrust = axial thrust (lbs) IPR = feed rate (in/rev) DIA = diameter of drill (inch) K _m = specific cutting energy (lbs/in ²) |
| 5. | Torque = $(\text{HP} \cdot 5252) / \text{RPM}$ where: Torque = torque (ft/lbs) HP = tool power (HP) RPM = revolutions per minute (rev/min) |

The table and equations on this page are found in the *Machinery's Handbook*. Permission to simplify and print the equations is granted by the Editor of the *Machinery's Handbook*.

IMPORTANT: The speeds and feeds listed above are considered a general starting point for all applications. Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

Recommended Cutting Data | Metric (mm)

| ISO | Material | Hardness (BHN) | Speed (M/min) | | | Feed Rate (mm/rev) |
|-----|---|----------------|--|---|---|--------------------|
| | | |  AM300® |  AM200® |  TiN | |
| P | Free-Machining Steel 1118, 1215, 12L14, etc. | 100 - 250 | 274 - 396 | 259 - 366 | 213 - 274 | 0.09 - 0.18 |
| | Low-Carbon Steel 1010, 1020, 1025, 1522, 1144, etc. | 85 - 275 | 259 - 381 | 244 - 351 | 198 - 259 | 0.08 - 0.17 |
| | Medium-Carbon Steel 1030, 1040, 1050, 1527, 1140, 1151, etc. | 125 - 325 | 244 - 320 | 229 - 290 | 183 - 259 | 0.09 - 0.17 |
| | Alloy Steel 4140, 5140, 8640, etc. | 125 - 375 | 229 - 305 | 213 - 274 | 183 - 259 | 0.09 - 0.17 |
| | High-Strength Alloy 4340, 4330V, 300M, etc. | 225 - 400 | 183 - 259 | 168 - 229 | 122 - 198 | 0.08 - 0.13 |
| | Structural Steel A36, A285, A516, etc. | 100 - 350 | 259 - 320 | 244 - 290 | 198 - 259 | 0.08 - 0.17 |
| | Tool Steel H-13, H-21, A-4, O-2, S-3, etc. | 150 - 250 | 122 - 244 | 107 - 213 | 76 - 198 | 0.06 - 0.13 |
| S | High-Temp Alloy Hastelloy B, Inconel 600, etc. | 140 - 310 | 76 - 137 | 76 - 107 | 46 - 91 | 0.06 - 0.11 |
| M | Stainless Steel 400 Series 416, 420, etc. | 185 - 350 | 183 - 259 | 168 - 229 | 122 - 198 | 0.08 - 0.15 |
| | Stainless Steel 300 Series 304, 316, 17-4PH, etc. | 135 - 275 | 183 - 259 | 168 - 229 | 122 - 198 | 0.08 - 0.15 |
| | Super Duplex Stainless Steel | 135 - 275 | 152 - 228 | 137 - 198 | 91 - 152 | 0.05 - 0.12 |
| K | Nodular, Grey, Ductile Cast Iron | 120 - 320 | 213 - 274 | 198 - 244 | 152 - 213 | 0.10 - 0.20 |
| N | Cast Aluminum | 30 - 180 | 381 - 503 | 381 - 472 | 290 - 335 | 0.15 - 0.30 |
| | Wrought Aluminum | 30 - 180 | 381 - 503 | 381 - 472 | 290 - 335 | 0.15 - 0.30 |
| | Brass | 30 - 100 | 290 - 411 | 274 - 381 | 229 - 335 | 0.13 - 0.23 |

Material Constants

| Type of Material | Hardness (BHN) | K _m (kPa) |
|------------------------------|----------------|----------------------|
| Free-Machining Steel | 100 - 250 | 5.17 |
| Low-Carbon Steel | 85 - 275 | 5.86 |
| Medium-Carbon Steel | 125 - 325 | 6.21 |
| Alloy Steel | 125 - 375 | 6.90 |
| High-Strength Steel | 225 - 400 | 7.93 |
| Structural Steel | 100 - 350 | 6.90 |
| Tool Steel | 150 - 250 | 6.21 |
| High-Temperature Alloy | 140 - 310 | 9.93 |
| Titanium Alloy | 140 - 310 | 4.97 |
| Aerospace Alloy | 185 - 350 | 4.48 |
| Stainless Steel 400 Series | 185 - 350 | 7.45 |
| Stainless Steel 300 Series | 135 - 275 | 6.48 |
| Super Duplex Stainless Steel | 135 - 275 | 6.48 |
| Wear Plate | 400 - 600 | 11.04 |
| Hardened Steel | 300 - 500 | 9.66 |
| Nodular, Ductile Cast Iron | 120 - 320 | 4.48 |
| Grey Cast Iron | 120 - 320 | 5.17 |
| Cast Aluminum | 30 - 180 | 2.76 |
| Wrought Aluminum | 30 - 180 | 2.76 |
| Aluminum Bronze | 100 - 250 | 3.45 |
| Brass | 100 | 2.41 |
| Copper | 60 | 2.07 |

Formulas

| | |
|------------------|--|
| 1. RPM | = (318.31 • M/min) / DIA where: RPM = revolutions per minute (rev/min) M/min = speed (M/min) DIA = diameter of drill (mm) |
| 2. kW | = (DIA² • mm/rev • RPM • K_m) / 181,018 where: kW = tool power (kW) DIA = diameter of drill (mm) mm/rev = feed rate (mm/rev) RPM = revolutions per minute (rev/min) K _m = specific cutting energy (kPa) machine efficiency (using 181,018 as constant) |
| 3. Thrust | = 148.78 • mm/rev • DIA • K_m where: Thrust = axial thrust (N) mm/rev = feed rate (mm/rev) DIA = diameter of drill (mm) K _m = specific cutting energy (kPa) |
| 5. Torque | = (kW • 9549.3) / RPM where: Torque = torque (Nm) HP = tool power (kW) RPM = revolutions per minute (rev/min) |

The table and equations on this page are found in the *Machinery's Handbook*. Permission to simplify and print the equations is granted by the Editor of the *Machinery's Handbook*.

IMPORTANT: The speeds and feeds listed above are considered a general starting point for all applications. Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

A
DRILLING
B
BORING
C
REAMING
D
BURNISHING
E
THREADING
X
SPECIALS

Guaranteed Test / Demo Application Form

| | |
|------------------|--|
| Distributor PO # | |
|------------------|--|

The following must be filled out completely before your test will be considered

Distributor Information

Company Name: _____
 Contact: _____
 Account Number: _____
 Phone: _____
 Email: _____

End User Information

Company Name: _____
 Contact: _____
 Industry: _____
 Phone: _____
 Email: _____

Current Process List all tooling, coatings, substrates, speeds and feeds, tool life, and any problems you are experiencing

Test Objective List what would make this a successful test (i.e. penetration rate, finish, tool life, hole size, etc.)

Application Information

| | | |
|-----------------------------------|---------------------------|--|
| Hole Diameter: _____ in/mm | Tolerance: _____ | Material: _____ (4150 / A36 / Cast Iron / etc.) |
| Preexisting Diameter: _____ in/mm | Depth of Cut: _____ in/mm | Hardness: _____ (BHN / Rc) |
| Required Finish: _____ RMS | State: _____ | (Casting / Hot rolled / Forging) |

Machine Information

| | | |
|--|--|------------------------------|
| Machine Type: _____ (Lathe / Screw machine / Machine center / etc.) | Builder: _____ (Haas, Mori Seiki, etc.) | Model #: _____ |
| Shank Required: _____ (CAT50 / Morse taper, etc.) | | Power: _____ HP/KW |
| Rigidity: _____ | Orientation: _____ | Tool Rotating: _____ |
| <input type="checkbox"/> Excellent | <input type="checkbox"/> Vertical | <input type="checkbox"/> Yes |
| <input type="checkbox"/> Good | <input type="checkbox"/> Horizontal | <input type="checkbox"/> No |
| <input type="checkbox"/> Poor | | Thrust: _____ lbs/N |

Coolant Information

| | |
|--|-----------------------------------|
| Coolant Delivery: _____ (Through tool / Flood) | Coolant Pressure: _____ PSI / bar |
| Coolant Type: _____ (Air mist, oil, synthetic, water soluble, etc.) | Coolant Volume: _____ GPM / LPM |

Requested Tooling

| QTY | Item Number |
|-----|-------------|
| | |
| | |
| | |
| | |
| | |
| | |

| QTY | Item Number |
|-----|-------------|
| | |
| | |
| | |
| | |
| | |
| | |



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 Toll Free USA & Canada: (800) 321-5537
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Allied Machine & Engineering ("Allied Machine") warrants to original equipment manufacturers, distributors, industrial and commercial users of its products for one year from the original date of sale that each new product manufactured or supplied by Allied Machine shall be free from defects in material and workmanship.

Allied Machine's sole and exclusive obligation under this warranty is limited to, at its option, without additional charge, replacing or repairing this product or issuing a credit. For this warranty to be applied, the product must be returned freight prepaid to the plant designated by an Allied Machine representative and which, upon inspection, is determined by Allied Machine to be defective in material and workmanship.

Complete information as to operating conditions, machine, setup, and the application of cutting fluid should accompany any product returned for inspection. This warranty shall not apply to any Allied Machine products which have been subjected to misuse, abuse, improper operating conditions, improper machine setup or improper application of cutting fluid or which have been repaired or altered if such repair or alteration, in the judgement of Allied Machine, would adversely affect the performance of the product.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Allied Machine shall have no liability or responsibility for any claim, whether in contract, tort or otherwise, for any loss or damage arising out of, connected with, or resulting from the manufacture, sale, delivery or use of any product sold hereunder, in excess of the cost of replacement or repair as provided herein.

Allied Machine shall not be liable in contract or in tort (including, without limitation, negligence, strict liability or otherwise) for economic losses of any kind or for any special, incidental, indirect, consequential, punitive or exemplary damages arising in any way out of the performance of, or failure to perform this agreement.

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