



Command Tooling Systems



Product Catalog





Table of Contents



Command/Uрма1 - 6

High Precision Modular Boring Systems	1 - 2
Boring System Overview.....	3
Orientation/Setup Instructions: Alpha Modul.....	4
Swap Out Program for Uрма Finish Boring Heads.....	5
Finish Boring/Straight Shank Toolholders.....	6

Alpha & Beta Modul®7 - 11

Toolholders.....	7 - 8
Extensions.....	9
Reducers.....	10
Request for Quote.....	11

MicroMax™ Boring System 12 - 18

Features.....	12
Setup.....	13
System Overview.....	14
Finish Boring Heads.....	15 - 16
Carbide Boring Bars.....	17
Indexable Steel Boring Bars.....	18

VersaMax™ Boring System 19 - 31

Performance Features/Setup Instructions	19
System Overview.....	20
Roughing Performance	21
Double Cutter Roughing Heads	22 - 23
Roughing Insert Holders.....	24
Diameter Adjustment Instructions	25
Finish Boring Heads.....	26 - 27
Balanceable Fine Boring Head Setup Instructions	28
Balanceable Finish Boring Heads.....	29
Finish Boring Insert Cartridges	30
LBS Deep Boring Toolholders/Carbide Boring Bars.....	31

IntraMax™ Boring System 32 - 39

Setup Instructions	32
Performance Features.....	33
System Overview.....	34
Intermediate Adapters/Integral Shank Adapters	35
Diameter Extenders/Diameter Turning Blocks	36
Roughing Heads	37
Finish Boring Heads/Insert Cartridges	38
Unique Applications	39

MegaMax™ Boring System 40 - 53

Performance Features.....	40
Setup Instructions	41
System Overview.....	42
Intermediate Adapters/Bore Depth Extensions.....	43
Diameter Extenders.....	44
Roughing Heads	45
Finish Boring Heads/Insert Cartridges	46
Roughing Inserts	47
Finishing Inserts	48 - 49
Operating/Speed & Feed Guide	50
Inserts Industry Coding System	51
Command Custom Boring.....	52
True Zero	53

CircoTec RX Straight..... 54 - 63

Fluted Inserts	54 - 55
Helical Inserts.....	56
Insert Holders.....	57
Holdes and Blank Bars.....	58
Shanks With Integrated Compensation Device	59
DEK Adaptor	60
Adjustment and Changing Inserts Instructions.....	61
Troubleshooting	62
Reamer Form.....	63

Terms Of Sale 64

INDEX 65 - 67

Command/Urma High Precision Modular Boring Systems



MicroMax™
.040 to 1.575"
(1-40 mm)



VersaMax™
Roughing: .768 to 6.024"
(19.5-153 mm)



VersaMax™
Finishing: .787 to
6.024" (20-153 mm)



Since forming a strategic alliance with Urma AG Werkzeug of Rapperswil, Switzerland in 1988, Command has marketed Urma modular boring tools in North America. Urma is noted worldwide as a premier manufacturer of high performance modular boring systems including the first adjustable balanced boring head (20,000 RPM capacity) available anywhere.

Their reputation for ingenuity continues to grow with the introduction of the Beta Modul® connection system and the IntraMax™ boring system. Command is a world leader in high performance high precision toolholders ideal for Urma precision boring systems. Tools are stocked at Command for immediate delivery.

US built Command toolholders and Swiss built UrmaBore™ precision boring tools combine for maximum boring performance.



Command/Urma High Precision Modular Boring Systems



CircoTec

.468 to 3.96" (11.9-100.6 mm)

The CircoTec RX Reamers are only available from Command Tooling Systems. Contact your sales representative or Command's Customer Service team today for more information. Information is also available for download at www.commandtool.com.



IntraMax™

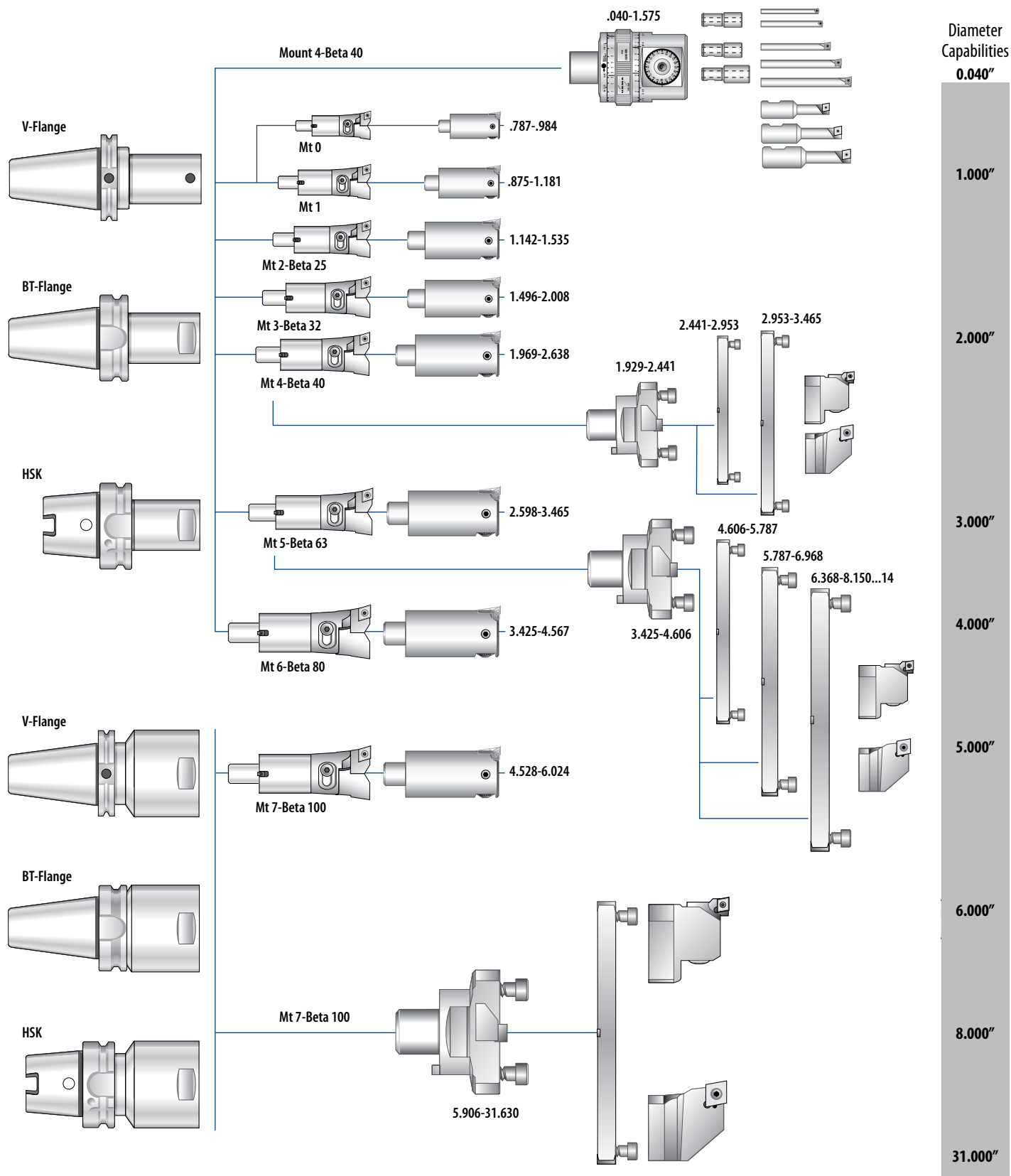
1.9 to 14" Boring (48.3-355.6 mm)
.35 to 9.8" O.D. Turning (9-248.9 mm)



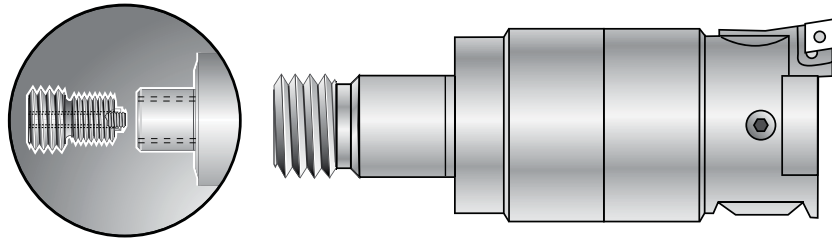
MegaMax™

5.9 to 31.7" (150-805 mm)

New Straight Shank Beta Modul® Toolholders for Lathes, page 6.
New Blank Bars with Beta Modul® Connection, page 58.



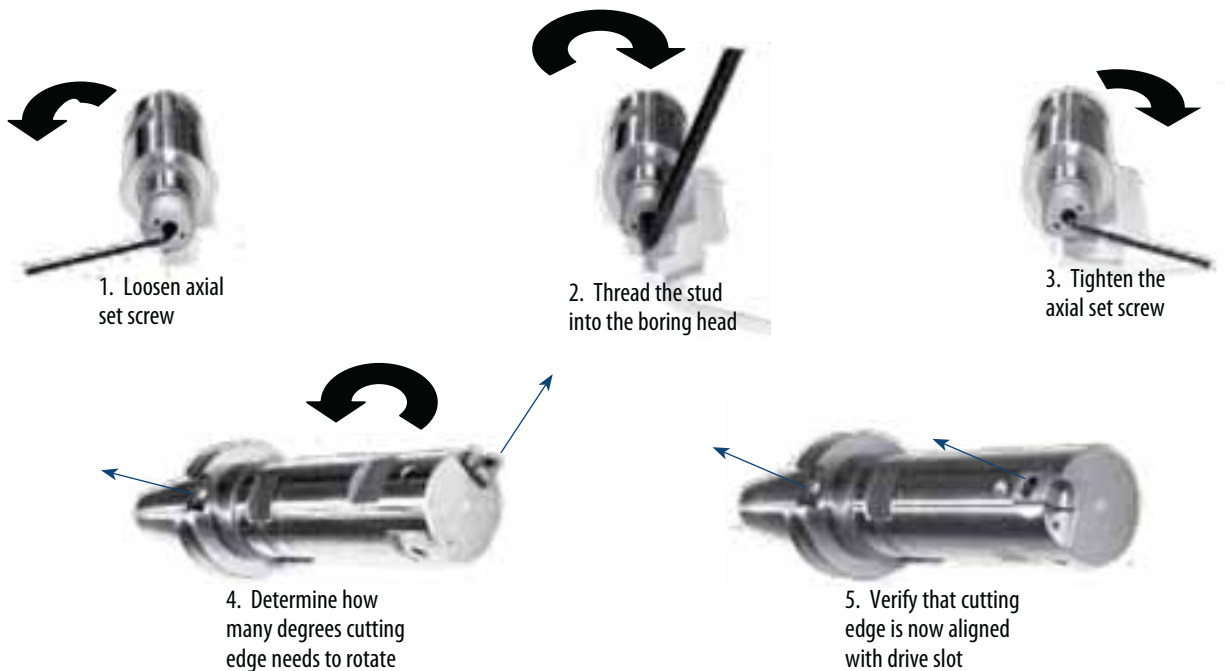
Orientation screw detail. Simple set screw adjustment for altering orientation screw depth



Orientation of the Cutting Edge:

The cutting edge of the Alpha Modul finishing head can be set to any position with regard to the toolholder's drive slots. This is important so that during the boring cycle a "drag line" is not created when the tool is removed from the bore. To accomplish this, the mounting threads of the finishing head are a double-threaded screw. This allows the "orientation screw" to be threaded out of the head, changing the distance from the thread lead to the connection face. Changing this distance changes where the cutting edge will be positioned. To do this quickly, follow these simple steps:

1. Before starting the adjustment, be sure that the orientation screw is "bottomed out" in the head. To do this, loosen the set screw that is located in the axial center of the screw and thread the screw into the boring head. Tighten the set screw and reassemble the tool, noticing the position of the cutting edge.
2. Looking at the tool with the cutting edge closest to you, decide how many degrees counterclockwise that the cutting edge must travel to get to the required position.
3. Disassemble the tool and loosen the axial set screw. Thread the orientation screw out of the head - counterclockwise - twice the number of degrees required to locate the cutting edge at the desired position. Tighten the axial set screw.
4. Reassemble the tool and verify that the cutting edge is correctly positioned. Repeat the procedure, if necessary.



Keyed Connection Assembly for Mounts 6 & 7:

The larger mounts in the Alpha Modul System use keys in their assembly. These keys prevent the connection from over-tightening during heavy metal removal operations.

1. The keyed components utilize the orientation stud to draw the key into the keyway. First, assemble the two components until the key makes contact with the mating face of the joining component. Rotate back until the key is aligned with the keyway.
2. Using the assembly X-wrench (53-74-96), insert the small end .314" (8) through the back of the joining component to loosen (counterclockwise) the axial set screw of the orientation stud. Reverse the X-wrench to the large end .472" (12), reinsert it into the back of the joining component and turn counterclockwise to draw the orientation stud into the joining component and the key into the keyway. Be sure that at this step the connection is fully tightened. This is where the pressure between the two joining components is developed.
3. Reverse the wrench once more to the smaller end and retighten the axial set screw.

Swap Out Program for Urma Finish Boring Heads



Swap Out Service Program For Urma Finish Boring Heads



After a time, everyone's tooling requires servicing to return the product to its original performance standards. Since this tool is used in your production, we understand you need a quick status evaluation and some options that enable you to return the tool to production as soon as possible.

Our program is as follows:

STEP ONE: Contact customer service for a Return Material Authorization (RMA) number and send the tool to Command for evaluation.

STEP TWO: The tool is evaluated and you are presented with the following options:

- 1) If the tool is found to have internal hardware problems only, it qualifies for the Swap Out Program and a replacement tool with brand new internal hardware is immediately available at a significantly discounted price.
- 2) If your head does not qualify for the Swap Out Program due to external damage, an estimate of repair charges will be provided.
- 3) If the head is found to have excessive damage, you have the opportunity to purchase a new product.

Due to the high performance standards of the Urma products and the complexity of the internal design, any disassembly of the product is done at Urma's factory in Switzerland. This assures the highest quality of performance that your production requires.

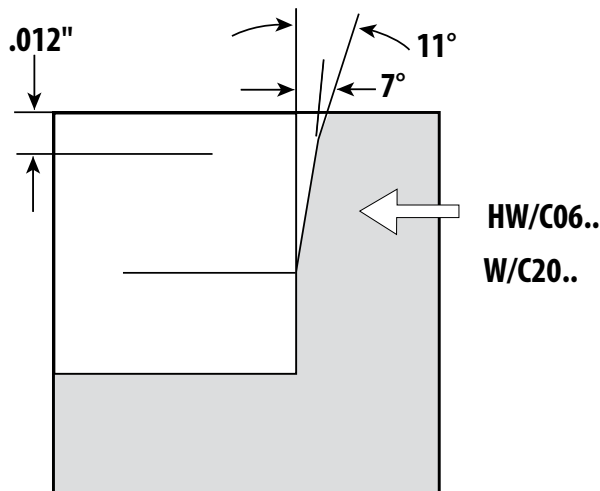


Finish Boring Insert Pockets

The standard Urma insert pocket is designed to utilize CCMT style inserts or 7° relief inserts. But, over time, Urma has determined that there can be advantages to using an insert with an 11° relief. It is for this reason that new products have been introduced using a new insert pocket design.

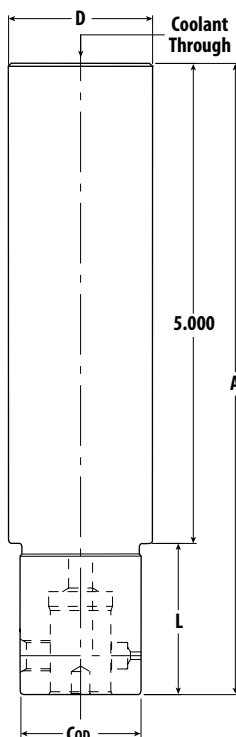
The new design is the W/C part number. The W/C pocket is made to support both a 7° as well as an 11° relief insert. Most insert pockets are milled with a particular draft to determine the angle that the cartridge will support.

The W/C pocket has both a 7° and 11° draft (see diagram below), so it can rigidly accommodate any CPMT, CPGT, or CCGT style insert.



If your work material is constantly changing, the advantage of using a multiple of insert geometries is immeasurable. This freedom allows you the ability to always have the best cutting edge geometry or grade available for all materials you may encounter.

Straight Shank Toolholders for Boring Tools on Lathes



Now for Lathe use! Double Feed Rate with Double Cutter Roughing Capability.

- Urma boring tools can be very effective on applications where the part is turning and the boring tool is stationary.
- The toolholders listed below have a Beta Modul® for the application of various MicroMax™, VersaMax™, or IntraMax™ tooling on machines that require a straight shank.
- All tools are coolant through.
- Variations of the standard designs listed below to suit other machine requirements are available upon request.

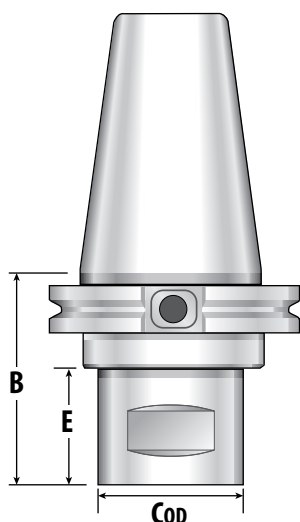
Straight Shank Beta Modul® Toolholders

Part No.	Beta	A	L	D	Cod	Weight
B1500-32-1575	32	6.575	1.575	1.5	1.259	3.0
B1500-40-1772	40	6.772	1.772	1.5	1.653	4.5
B1500-63-2362	63	7.362	2.362	1.5	2.480	5.0
B2000-63-2362	63	7.362	2.362	2.0	2.480	6.0

(NOTE: Double Cutter Roughing Head Sold Separately)



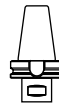
- These high quality, precision ground toolholders exceed industry standards for accuracy in taper and concentricity. AT3 or better shank taper ideal for a solid connection between the tool and the machine.
- Quick and easy assembly with Alpha connection. Rugged and completely symmetrical.
- Dimensions given in inches (mm).
- Weight given in lbs (kg).



Alpha					
V-Flange (V40)					
Part No.	Mount	B	E	Weight	
C4U3-0004	4	1.375 (35)	.75 (19)	1.8 (.81)	
C4U4-0001	1	2.244 (57)	0.866 (22)	2.2 (1.0)	
C4U4-0002	2	2.244 (57)	0.866 (22)	2.2 (1.0)	
C4U4-0003	3	2.677 (68)	1.299 (33)	2.4 (1.1)	
C4U4-0004	4	2.677 (68)	1.927 (49)	2.4 (1.1)	
C4U4-0005	5	3.307 (84)	2.557 (65)	2.5 (1.5)	
C4U4-0006	6†	4.500 (115)	3.750 (96)	6.4 (2.9)	
C4U4-0007	7†	5.625 (143)	4.875 (124)	9.5 (4.3)	
C4U5-0001	1	3.622 (92)	2.244 (57)	2.3 (1.0)	
C4U5-0002	2	4.016 (102)	2.638 (67)	2.6 (1.2)	
C4U5-0003	3	5.039 (128)	3.661 (93)	3.2 (1.5)	
C4U5-0004	4	5.827 (148)	4.449 (113)	4.3 (2.0)	



Alpha					
V-Flange (V50)					
Part No.	Mount	B	E	Weight	
C6U4-0001	1	2.244 (57)	0.866 (22)	4.8 (2.2)	
C6U4-0002	2	2.244 (57)	0.866 (22)	4.8 (2.2)	
C6U4-0003	3	2.677 (68)	1.299 (33)	5.0 (2.3)	
C6U4-0004	4	2.677 (68)	1.299 (33)	5.3 (2.4)	
C6U4-0005	5	3.307 (84)	1.929 (49)	5.8 (2.7)	
C6U4-0006	6†	3.543 (90)	2.793 (71)	6.6 (3.0)	
C6U4-0007	7†	3.543 (90)	2.793 (71)	9.5 (4.3)	
C6U5-0001	1	3.622 (92)	2.244 (57)	6.7 (3.0)	
C6U5-0002	2	4.016 (102)	2.638 (67)	7.0 (3.2)	
C6U5-0003	3	5.039 (128)	3.661 (93)	7.6 (3.5)	
C6U5-0004	4	5.827 (148)	4.449 (113)	8.7 (4.0)	



Alpha					
BT-Flange (BT30)					
Part No.	Mount	B	E	Weight	
B2U4-0001	1	1.732 (44)	0.866 (22)	1.0 (.45)	
B2U4-0002	2	1.732 (44)	0.866 (22)	1.0 (.45)	
B2U4-0003	3	2.165 (55)	1.299 (33)	1.2 (.56)	
B2U4-0004	4	2.165 (55)	1.299 (33)	1.4 (.65)	



Alpha					
BT-Flange (BT40)					
Part No.	Mount	B	E	Weight	
B4U4-0001	1	1.929 (49)	0.865 (22)	2.2 (1.0)	
B4U4-0002	2	1.929 (49)	0.865 (22)	2.2 (1.0)	
B4U4-0003	3	2.362 (60)	1.298 (33)	2.4 (1.1)	
B4U4-0004	4	2.362 (60)	1.298 (33)	2.4 (1.1)	
B4U4-0005	5	2.992 (76)	1.928 (49)	2.5 (1.5)	
B4U4-0006	6†	2.992 (76)	1.575 (40)	2.5 (1.5)	



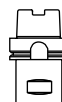
Alpha					
BT-Flange (BT50)					
Part No.	Mount	B	E	Weight	
B6U4-0001	1	2.362 (60)	0.858 (22)	6.8 (3.1)	
B6U4-0002	2	2.362 (60)	0.858 (22)	6.8 (3.1)	
B6U4-0003	3	2.795 (71)	1.291 (33)	7.0 (3.2)	
B6U4-0004	4	2.795 (71)	1.291 (33)	7.0 (3.2)	
B6U4-0005	5	3.425 (87)	1.921 (49)	7.3 (3.3)	
B6U4-0006	6†	3.661 (93)	2.157 (55)	9.0 (4.1)	
B6U4-0007	7†	3.661 (93)	2.157 (55)	9.5 (4.3)	

Alpha Mount	Cod*	Diameter
0+1	0.728 (18.5)	0.787 (20)-1.181 (30)
2	0.965 (24.5)	1.142 (29)-1.535 (39)
3	1.260 (32)	1.496 (38)-2.008 (51)
4	1.654 (42)	1.969 (50)-2.638 (67)
5	2.165 (55)	2.598 (66)-3.465 (88)
6	2.835 (72)	3.425 (87)-4.567 (116)
7	3.701 (94)	4.528 (115)-6.024 (153)

*Coupling OD

Standard Balance For Alpha Modul Toolholders

BT 30	G2.5 @ 20,000 RPM
BT 35	Not Rated
BT 40	G2.5 @ 18,000 RPM
BT 45	Not Rated
BT 50	G2.5 @ 15,000 RPM
V 30	Not Rated
V 40	G2.5 @ 18,000 RPM
V 45	Not Rated
V 50	G2.5 @ 15,000 RPM
HSK63	G2.5 @ 18,000 RPM
HSK100	G2.5 @ 15,000 RPM



Alpha					
HSK40A					
Taper	Part No.	Mount	B	E	Weight
HSK40A	H2U3A0004	4	2.640 (67)	.785 (20)	1.04 (26)
HSK63A					
HSK63A	H4U4A0003	3	2.638 (67)	1.614 (41)	2.1 (1.0)
HSK63A	H4U3A0004	4	2.875 (73)	1.850 (47)	2.1 (1.0)
HSK63A	H4U3A0005	5	3.307 (84)	2.283 (58)	3.1 (1.5)
HSK100A					
HSK100A	H6U3A0004	4	3.125 (79)	1.985 (50)	5.3 (2.4)
HSK100A	H6U3A0005	5	3.543 (90)	2.403 (61)	6.8 (3.1)
HSK100A	H6U3A0006	6†	4.134 (105)	2.994 (76)	8.7 (4.0)
HSK100A	H6U3A0007	7†	5.000 (127)	3.860 (98)	10.4 (4.7)

† Keyed Connection

- Beta Modul® Toolholders
- These high quality, precision ground toolholders exceed industry standards for accuracy in taper and concentricity. AT3 or better shank taper ideal for a solid connection between the tool and the machine.
- Quick & easy assembly with Beta connection.
- Beta Modul® interchangeable with other leading quick-change modular connections.
- Dimensions given in inches (mm).
- Weight given in lbs (kg).

Beta				
V-Flange (V40)				
Part No.	Beta	B	E	Weight
C4U4-B025	25	2.362 (60)	.984 (25)	1.8 (.8)
C4U4-B032	32	2.362 (60)	.984 (25)	2.0 (.9)
C4U4-B040	40	2.362 (60)	.984 (25)	2.0 (.9)
C4U4-B050	50	2.362 (60)	1.612 (41)	2.6 (1.2)
C4U4-B063	63	2.559 (65)	1.809 (46)	3.3 (1.5)
C4U5-B025	25	3.346 (85)	1.971 (50)	2.4 (1.1)
C4U5-B032	32	3.543 (90)	2.168 (55)	2.7 (1.2)
C4U5-B040	40	3.543 (90)	2.168 (55)	3.1 (1.4)
C4U5-B050	50	5.512 (140)	4.137 (105)	5.2 (2.4)
C4U5-B063	63	4.724 (120)	3.309 (84)	5.7 (2.6)
C4U6-B025	25	4.33 (110)	2.955 (75)	2.7 (1.2)
C4U6-B032	32	4.724 (120)	3.349 (85)	3.1 (1.4)
C4U6-B040	40	5.905 (150)	4.560 (116)	4.3 (1.9)

V-Flange (V50)				
Part No.	Beta	B	E	Weight
C6U4-B025	25	2.362 (60)	.984 (25)	6.2 (2.8)
C6U4-B032	32	2.362 (60)	.984 (25)	6.4 (2.9)
C6U4-B040	40	2.362 (60)	.984 (25)	6.6 (3.0)
C6U4-B050	50	2.362 (60)	.984 (25)	6.6 (3.0)
C6U4-B063	63	2.559 (65)	1.181 (30)	6.6 (3.0)
C6U4-B080	80	2.953 (75)	1.575 (40)	7.3 (3.3)
C6U4-B100	100	4.921 (125)	4.17 (106)	8.8 (4.0)
C6U5-B025	25	3.973 (100)	2.562 (65)	6.9 (3.1)
C6U5-B032	32	3.937 (100)	2.562 (65)	7.2 (3.3)
C6U5-B040	40	3.937 (100)	2.562 (65)	7.8 (3.5)
C6U5-B050	50	5.512 (104)	4.137 (105)	9.3 (4.2)
C6U5-B063	63	4.724 (120)	3.339 (85)	10.2 (4.6)
C6U5-B080	80	4.724 (120)	3.339 (85)	12.2 (5.5)
C6U5-B100	100	7.874 (200)	6.436 (103)	24.5 (11.1)
C6U6-B025	25	5.512 (140)	4.137 (105)	7.3 (3.3)
C6U6-B032	32	5.512 (140)	4.137 (105)	7.8 (3.5)
C6U6-B040	40	5.512 (140)	4.137 (105)	8.7 (3.9)
C6U6-B063	63	6.299 (106)	4.914 (125)	12.3 (5.6)
C6U7-B063	63	7.874 (200)	6.489 (165)	14.4 (6.5)

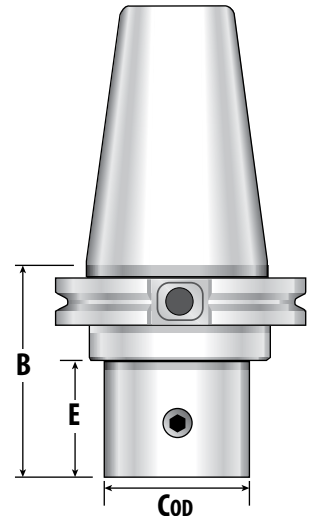
BT-Flange (BT40)				
Part No.	Beta	B	E	Weight
B4U4-B025	25	1.969 (50)	0.906 (23)	1.76 (.8)
B4U4-B032	32	1.969 (50)	0.906 (23)	2.0 (.9)
B4U4-B040	40	2.362 (60)	1.298 (33)	2.6 (1.2)
B4U4-B050	50	2.362 (50)	1.298 (33)	
B4U4-B063	63	2.756 (70)	1.693 (43)	3.0 (1.4)
B4U5-B032	32	3.937 (100)	2.873 (73)	
B4U5-B040	40	3.937 (100)	2.873 (73)	
B4U5-B063	63	4.724 (120)	3.535 (90)	

Beta				
BT-Flange (BT50)				
Part No.	Beta	B	E	Weight
B6U4-B032	32	2.756 (70)	1.253 (32)	
B6U4-B040	40	2.756 (70)	1.253 (32)	8.6 (3.9)
B6U4-B050	50	2.756 (70)	1.253 (32)	8.6 (3.9)
B6U4-B063	63	3.150 (80)	1.647 (42)	9.5 (4.3)
B6U4-B080	80	3.937 (100)	2.308 (59)	
B6U4-B100	100	4.331 (110)	2.828 (72)	15.4 (7.0)

HSK (HSK50A)				
Part No.	Beta	B	E	Weight
H3U4AB025	25	2.165 (55)	1.142 (29)	1.1 (.5)
H3U4AB032	32	2.362 (60)	1.339 (34)	1.3 (.6)
H3U4AB040	40	2.559 (65)	1.535 (39)	1.5 (.7)

HSK (HSK63A)				
Part No.	Beta	B	E	Weight
H4U3AB032	32	2.362 (60)	1.339 (34)	2.2 (1.0)
H4U3AB040	40	2.559 (65)	0.906 (23)	2.4 (1.1)
H4U4AB050	50	2.756 (70)	1.102 (28)	2.6 (1.2)
H4U3AB063	63	3.150 (80)	1.496 (38)	3.3 (1.5)

HSK (HSK100A)				
Part No.	Beta	B	E	Weight
H6U3AB040	40	3.150 (80)	1.378 (35)	5.0 (2.3)
H6U3AB063	63	3.150 (80)	1.378 (35)	6.2 (2.8)
H6U4AB080	80	3.543 (90)	1.772 (45)	8.4 (3.8)
H6U4AB100	100	3.937 (100)	2.165 (55)	8.8 (4.0)

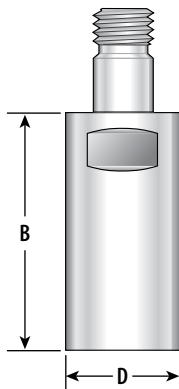


Beta	Cod*
B025	0.984 (25)
B032	1.260 (32)
B040	1.654 (42)
B050	2.362 (50)
B063	2.480 (63)
B080	3.150 (80)
B100	3.937 (100)
*Coupling OD	

Replacement Parts	
For Beta	Actuation Screws Part No.
25	Z00-25-24
32	Z00-32-24
40	Z00-40-24
50	Z00-50-24
63	Z00-63-24
80	Z00-80-24
100	Z00-100-24

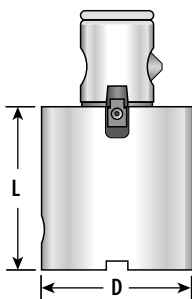
Standard Balance For Alpha Modul Toolholders	
BT 40	G2.5 @ 18,000 RPM
BT 50	G2.5 @ 15,000 RPM
V 40	G2.5 @ 18,000 RPM
V 50	G2.5 @ 15,000 RPM
HSK50	Not Rated
HSK63	G2.5 @ 18,000 RPM
HSK100	G2.5 @ 15,000 RPM

- Increase the overall bore depth capability by using a combination of reducers or extensions.
- For rigidity, keep assemblies as short as possible.
- Through-spindle coolant capabilities.
- Dimensions given in inches (mm).
- Weight given in lbs (kg).

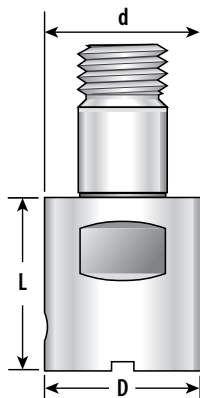


Replacement Parts			
	Drive Key	Cap Screw	Orientation Screw
			
For ø D	Part No.	Part No.	Part No.
72	Z00-00-72	C00-22-11	Z00-14-74
94	Z00-00-94	C00-24-17	Z00-14-96

Alpha - Alpha				
Alpha-Alfa Extensions				
Part No.	Mount	B	D	Weight
13-18-01	1/short	0.984 (25)	.728 (18.5)	
13-18-11	1/long	1.378 (35)	.728 (18.5)	0.22 (0.1)
13-24-01	2/short	1.181 (30)	.965 (24.5)	0.22 (0.1)
13-24-11	2/long	1.772 (45)	.965 (24.5)	0.44 (0.2)
13-32-01	3/short	1.575 (40)	1.260 (32)	0.44 (0.2)
13-32-11	3/long	2.362 (60)	1.260 (32)	0.66 (0.3)
13-42-01	4/short	1.969 (50)	1.654 (42)	1.10 (0.5)
13-42-11	4/long	3.150 (80)	1.654 (42)	1.76 (0.8)
13-55-01	5/short	2.756 (70)	2.165 (55)	2.64 (1.2)
13-55-11	5/long	4.134 (105)	2.165 (55)	3.96 (1.8)
13-72-01	6†/short	2.953 (75)	2.835 (72)	4.84 (2.2)
13-72-11	6†/long	5.315 (135)	2.835 (72)	8.58 (3.9)
13-94-01	7†/short	3.937 (100)	3.701 (94)	11.2 (5.1)
13-94-11	7†/long	7.087 (180)	3.701 (94)	19.8 (9.0)



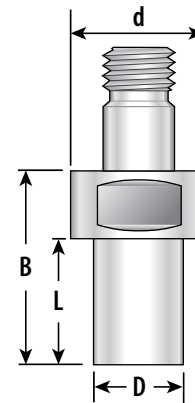
Beta - Beta				
Beta-Beta Extensions				
Part No.	Beta	L	D	Weight
B13-25-25-045	25	1.772 (45)	0.984 (25)	0.44 (0.2)
B13-25-25-070	25	2.756 (70)	0.984 (25)	0.66 (0.3)
B13-32-32-035	32	1.378 (35)	1.260 (32)	0.44 (0.2)
B13-32-32-070	32	2.756 (70)	1.260 (32)	0.88 (0.4)
B13-40-40-045	40	1.772 (45)	1.654 (42)	0.88 (0.4)
B13-40-40-070	40	2.756 (70)	1.654 (42)	1.54 (0.7)
B13-63-63-060	63	2.362 (60)	2.480 (63)	2.86 (1.3)
B13-63-63-125	63	4.921 (125)	2.480 (63)	6.38 (2.9)
B13-80-80-080	80	3.150 (80)	3.150 (80)	6.38 (2.9)
B13-80-80-160	80	6.299 (160)	3.150 (80)	13.20 (6.0)
B13-100-100-080	100	3.150 (80)	3.937 (100)	10.80 (4.9)
B13-100-100-180	100	7.087 (180)	3.937 (100)	24.00 (10.9)



Alpha - Beta					
Alpha - Beta Extensions					
Part No.	Beta	L	D	d	Weight
B13-24-25-030	2 to 25	1.181 (30)	0.984 (25)	0.965 (24.5)	0.22 (0.1)
B13-32-32-040	3 to 32	1.575 (40)	1.260 (32)	1.260 (32)	0.44 (0.2)
B13-42-40-045	4 to 40	1.772 (45)	1.654 (42)	1.654 (42)	1.10 (0.5)
B13-55-63-060	5 to 63	2.362 (60)	2.480 (63)	2.165 (55)	2.86 (1.3)
B13-72-80-080	†6 to 80	3.150 (80)	3.150 (80)	2.835 (72)	6.38 (2.9)
B13-94-100-080	†7 to 100	3.150 (80)	3.937 (100)	3.701 (94)	9.00 (4.1)

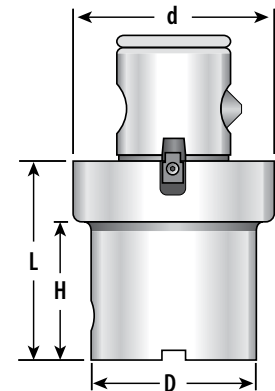
† Supplied with a drive key

Alpha - Alpha						
Alpha - Alpha Reducers						
Part No.	Mount	B	L	d	D	Weight
12-24-02	2 to 1	1.181 (30)	0.591 (15)	.965 (24.5)	.728 (18.5)	0.22 (0.1)
12-32-02	3 to 1	1.181 (30)	0.591 (15)	1.260 (32)	.728 (18.5)	0.44 (0.2)
12-32-07	3 to 2	1.575 (40)	0.984 (25)	1.260 (32)	.965 (24.5)	0.66 (0.3)
12-42-02	4 to 1	1.378 (35)	0.591 (15)	1.575 (42)	.728 (18.5)	0.88 (0.4)
12-42-07	4 to 2	1.772 (45)	0.984 (25)	1.575 (42)	.965 (24.5)	0.88 (0.4)
12-42-12	4 to 3	1.772 (45)	0.984 (25)	1.575 (42)	1.260 (32)	0.88 (0.4)
12-55-02	5 to 1	1.575 (40)	0.591 (15)	2.165 (55)	.728 (18.5)	1.54 (0.7)
12-55-07	5 to 2	1.969 (50)	0.984 (25)	2.165 (55)	.965 (24.5)	1.54 (0.7)
12-55-12	5 to 3	1.969 (50)	0.984 (25)	2.165 (55)	1.260 (32)	1.54 (0.7)
12-55-17	5 to 4	2.165 (55)	1.181 (30)	2.165 (55)	1.654 (42)	1.76 (0.8)
12-72-12	6† to 3	2.165 (55)	0.984 (25)	2.835 (72)	1.260 (32)	3.30 (1.5)
12-72-17	6† to 4	2.362 (60)	1.181 (30)	2.835 (72)	1.654 (42)	3.52 (1.6)
12-72-22	6† to 5	2.362 (60)	1.181 (30)	2.835 (72)	2.165 (55)	3.74 (1.7)
12-94-12	7† to 3	2.362 (60)	0.984 (25)	3.701 (94)	1.260 (32)	6.38 (2.9)
12-94-22	7† to 5	2.559 (65)	1.181 (30)	3.701 (94)	2.165 (55)	6.82 (3.1)
12-94-27	7† to 6†	3.150 (80)	1.772 (45)	3.701 (94)	2.835 (72)	7.70 (3.5)

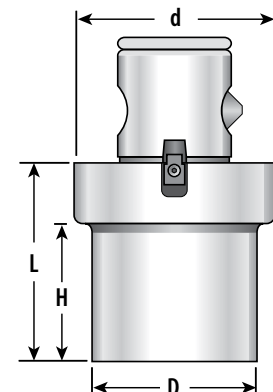


- Dimensions given in inches (mm)
- Weight given in lbs (kg).

Beta - Beta						
Beta - Beta Reducers						
Part No.	Beta	L	H	D	d	Weight
B12-32-25-040	32 to 25	1.575 (40)	0.984 (25)	0.984 (25)	1.260 (32)	0.44 (0.2)
B12-40-25-040	40 to 25	1.575 (40)	0.984 (25)	0.984 (25)	1.654 (42)	0.66 (0.3)
B12-40-32-045	40 to 32	1.772 (45)	1.181 (30)	1.260 (32)	1.654 (42)	0.66 (0.3)
B12-50-40-050	50 to 40	1.969 (50)	1.378 (35)	1.654 (42)	1.969 (50)	1.10 (0.5)
B12-63-25-045	63 to 25	1.772 (45)	0.984 (25)	0.984 (25)	2.480 (63)	1.54 (0.7)
B12-63-32-050	63 to 32	1.969 (50)	1.181 (30)	1.260 (32)	2.480 (63)	1.98 (0.9)
B12-63-40-055	63 to 40	2.165 (55)	1.378 (35)	1.654 (42)	2.480 (63)	2.42 (1.1)
B12-80-40-060	80 to 40	2.362 (60)	1.378 (35)	1.654 (42)	3.150 (80)	4.84 (2.2)
B12-80-63-060	80 to 63	2.362 (60)	1.378 (35)	2.480 (63)	3.150 (80)	5.28 (2.4)
B12-100-40-060	100 to 40	2.362 (60)	1.378 (35)	1.654 (42)	3.937 (100)	6.82 (3.1)
B12-100-63-060	100 to 63	2.362 (60)	1.378 (35)	2.480 (63)	3.937 (100)	7.26 (3.3)
B12-100-80-075	100 to 80	2.953 (75)	1.969 (50)	3.150 (80)	3.937 (100)	7.70 (3.5)



Beta - Alpha						
Beta - Alpha Reducers						
Part No.	Beta	L	H	D	d	Weight
B12-25-18-040	25 to 1	1.575 (40)	0.984 (25)	.728 (18.5)	0.984 (25)	0.22 (0.1)
B12-32-18-040	32 to 1	1.575 (40)	0.984 (25)	.728 (18.5)	1.260 (32)	0.22 (0.1)
B12-40-18-040	40 to 1	1.575 (40)	0.984 (25)	.728 (18.5)	1.654 (42)	0.44 (0.2)
B12-50-18-040	50 to 1	1.575 (40)	0.591 (15)	.728 (18.5)	1.969 (50)	0.44 (0.2)
B12-50-24-050	50 to 2	1.969 (50)	0.984 (25)	.965 (24.5)	1.969 (50)	0.66 (0.3)
B12-50-32-050	50 to 3	1.969 (50)	0.984 (25)	1.260 (32)	1.969 (50)	0.88 (0.4)
B12-50-42-055	50 to 4	2.165 (55)	1.181 (30)	1.654 (42)	1.969 (50)	1.32 (0.6)
B12-63-18-045	63 to 1	1.772 (45)	0.591 (15)	.728 (18.5)	2.480 (63)	1.76 (0.8)
B12-63-24-055	63 to 2	2.165 (55)	0.984 (25)	.965 (24.5)	2.480 (63)	1.98 (0.9)
B12-63-32-055	63 to 3	2.165 (55)	0.984 (25)	1.260 (32)	2.480 (63)	2.42 (1.1)
B12-63-42-060	63 to 4	2.362 (60)	1.181 (30)	1.654 (42)	2.480 (63)	2.64 (1.2)
B12-63-55-060	63 to 5	2.362 (60)	1.181 (30)	2.165 (55)	2.480 (63)	3.08 (1.4)



† Supplied with a drive key

Request for Quotation Form

- Contact us for help with your application
- Include a sketch or print of the work piece
 - Custom boring tools available

A) Bore Diameter

What is the finish bore diameter size: _____ What is the starting bore diameter size: _____

B) Bore Depth

What is the finish bore depth or how deep do you have to bore: _____

How long does your boring bar have to be from the spindle face to the cutting tip (gage length): _____

C) Hole Type

Is the bore a through hole (enters and exits at the same diameter) or a blind hole (ends at a shoulder or counterbore flat bottom):

☐ Through hole

☐ Blind hold

D) Finish Requirement

Is this a roughing or finishing operation: Roughing _____ Finishing _____

What is the surface finish requirement (optional: typical is a 32 RMS or Ra): _____

E) Material to be Machined

What material are you machining (steel, cast iron, aluminum, titanium): _____

What is the hardness of the material (if known) or specification number (A36 steel, 6061 aluminum):

Rockwell hardness _____ Rc or Brinell hardness _____ Bhn

F) Machine Specifications

Spindle taper size: 30 _____ 40 _____ 50 _____ other _____

Coolant delivery: Through-Spindle _____ Through-Flange _____ External _____ No Coolant _____

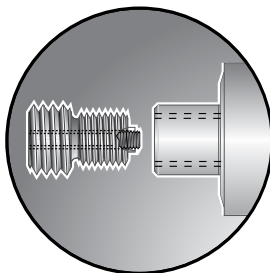
Flange type: _____ V/Cat/CT _____ BT _____ NMTB _____ HSK _____ Other _____

Machine name and model (if known): _____ RPM range _____ Power available _____

Fax to: 1-800-555-7694 or 763-576-6911

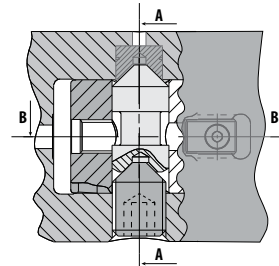
Alpha Modul

Alpha Modul is the original threaded connection system. This strong, simple design has been ensuring maximum rigidity since 1965. The Alpha Modul has the ability to orientate the cutting edge 360° for control and convenience when finish boring. The simple rugged design utilizes no moving parts and creates a more economical solution to your boring needs.



Beta Modul®

Beta Modul® is Urma's "quick-change" connection. The side lock connection allows for quick and easy assembly without the use of setup fixtures. The Beta Modul's design delivers better concentricity without giving up any rigidity. **Beta Modul® is interchangeable with other leading quick-change systems for total flexibility.** Beta Modul® is a better solution for convenience and concentricity.



Only Urma gives you the choice between two connection systems, Alpha or Beta. Whatever you choose, your satisfaction is guaranteed.

MicroMax™ Boring System:

- **MicroMax™ adjusts accurately with minimal backlash**—Allowing you to balance precisely for each specific diameter. The result is improved bore concentricity, roundness, surface finish, and improved tool life.
- **Micro-adjustable balanceable and non-balanceable boring heads**—Accurate adjustment with graduations of .0001" (.0025) to adjust down to .0002" on diameter up to 20,000 RPM.
- **MicroMax™ balanceable boring head allows our boring bars to cover a wide range**—You bore precise, round holes vibration-free at recommended cutting speeds. With this balanced system, you can reach recommended cutting speeds without typical out-of-roundness and vibration problems. Inserts easily shear the material from the bore wall at the appropriate cutting speeds.
- **Industry standard indexable inserts used in all Urma tools**—This means you can benefit from leading edge carbide grades and geometries for best performance and cost.
- **Two distinct connections**—Alpha Modul and Beta Modul® share the same advantages, creating the most rigid and versatile modular boring system available.
- **Beta Modul® is interchangeable with other systems**—This quick-change adaption is interchangeable with other systems, offering increased flexibility in converting to the Urma program.
- **Taper tolerance and balance that exceeds industry standards**—Provides less vibration and better repeatability. A variety of industry standard tapers manufactured to Command's Mass Symmetry design.
- **Complete assemblies provided**—All items include insert screws, cartridge screws, lock screws, and wrenches required for adjustments and securing inserts.
- **All tooling coolant through**—All individual tools and assemblies are coolant through unless noted.
- **Ask about our Tool Trial Program!**—Try Command/Urma boring tools in your shop and we guarantee your toughest operation will become your most productive!



The MicroMax™ Boring System allows you to bore precise, round holes vibration free at recommended cutting speeds. Balancing the boring system allows you to reach these cutting speeds without the usual out of roundness and vibration. Inserts easily shear the material from the bore wall at the appropriate cutting speeds.

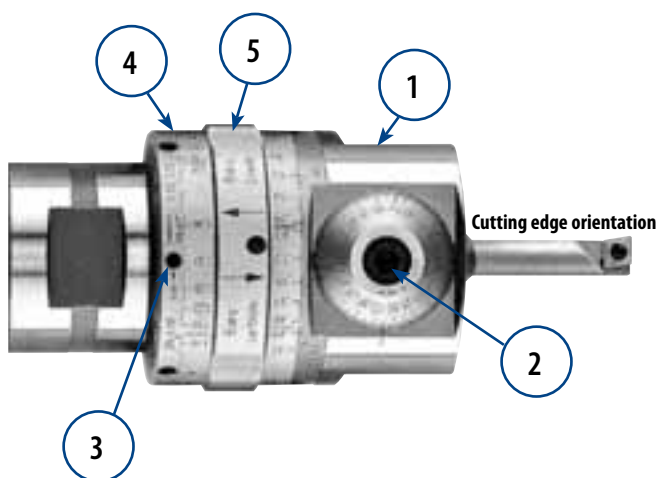
Urma MicroMax™ Balanced Boring Head Setup Instructions

1. Clean the pilot, bore, and both faces before attempting to assemble. When assembling the Alpha connection, insert the Fine Boring Head pilot into toolholder bore and thread together. To assemble the Beta connection, line up the orientation pin and pin bore. Then tighten the connection to the recommended torque value.

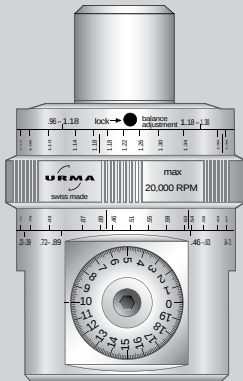
MAXIMUM TORQUE VALUES FOR ALPHA & BETA CONNECTIONS

Alpha 4 = 295 ft-lbs Beta 40 = 13 ft-lbs

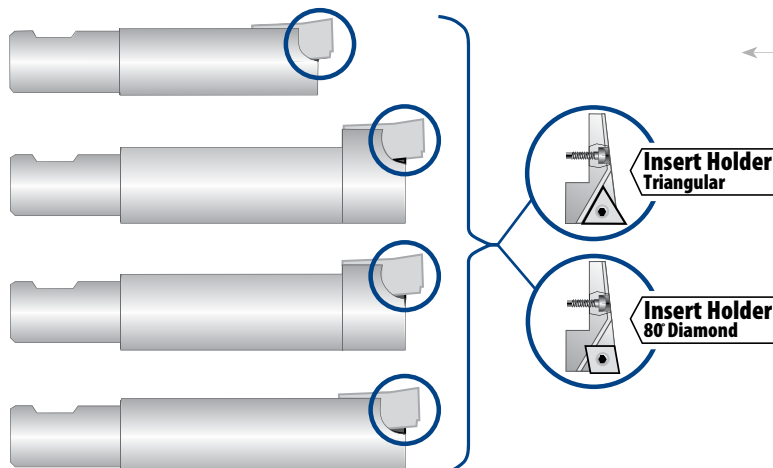
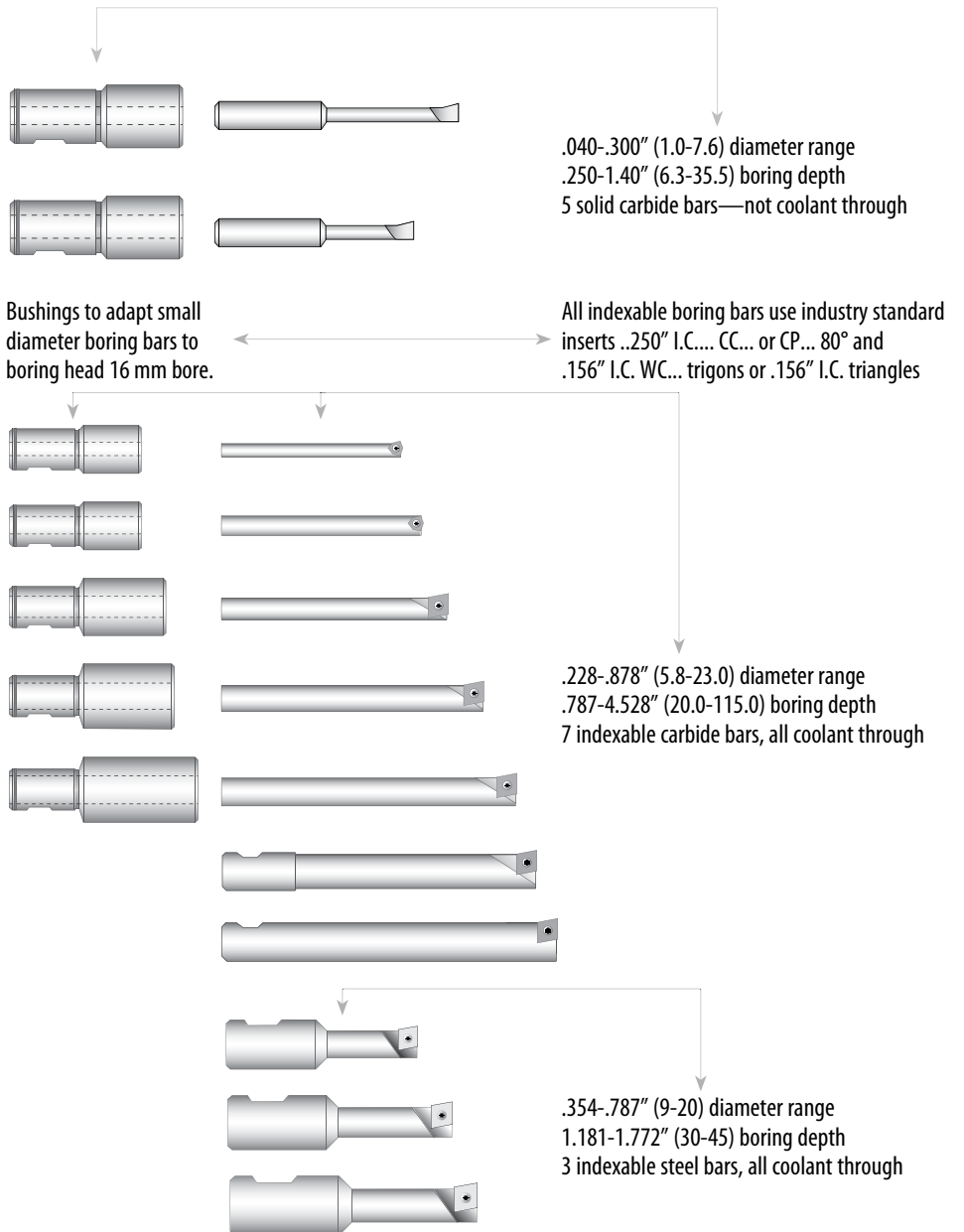
2. **CAUTION:** Before turning the fine adjustment dial, be sure to loosen the side locking set screw (1). If the locking screw is not fully loosened and the dial is turned, this will decrease the life and accuracy of the adjustment mechanism. Loosen the side locking set screw and turn the dial (2) to achieve the desired size. Tighten side locking set screw (1). Do not over tighten.
3. To set balance adjustment rings: First, loosen the balance collar locking set screw (3) in the collar housing. Next, find the range of the particular boring bar that is to be used (the ranges are found in the catalog). Locate that range on the boring head body (4). The ranges for steel bars are located closer to the connecting pilot; ranges for the carbide bars are located closer to the adjustment dial. These same ranges are marked on the balance collar in .040 increments (5). Rotate the collar until the desired bore size lines up with the mark on the boring head body. Tighten the locking set screw (3). Your Balanced Boring Head is now balanced for the required bore diameter.
4. You are now ready to bore a test hole. Measure the test hole size and adjust the boring head, if necessary, to compensate for cutting pressure (see step 2).
5. Once a month, depending on use, you need to lubricate the adjustment mechanism. First, adjust the boring head to its smallest diameter. Next, locate the grease fitting opposite of the diameter adjustment locking screw. Fill reservoir using lithium type grease.
6. After use disassemble, clean, and oil parts to prevent rust while in storage.



- MicroMax™ Adjustable boring head with .0001" (0.0025) graduations for .0002" (0.005) adjustments on diameter for up to 20,000 RPM.



- Simple adjustments to balance complete assemblies for improved performance in finish, tool life, concentricity, and roundness.
- Available in Alpha Mount 4 or Beta 40 adaption with .630" (16) dia. bore for boring bar shanks.
- Beta adaption interchangeable with other leading quick-change modular connections.
- All heads are coolant through.



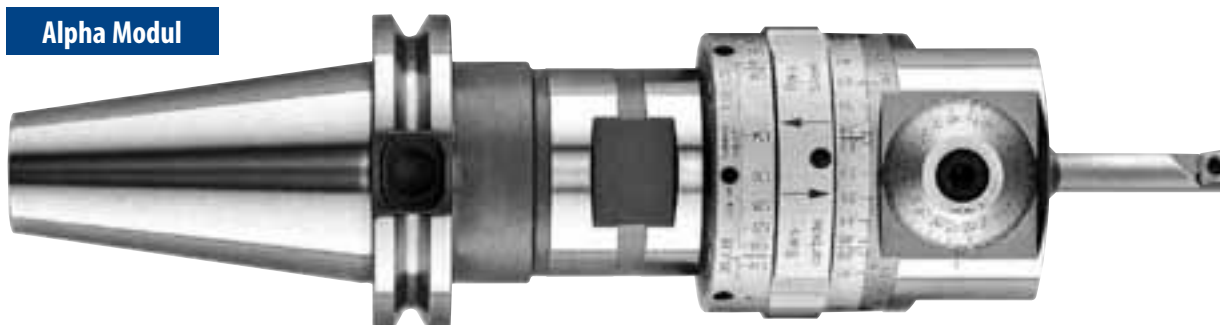
787-1.575" (20-40) diameter range
2.362-2.953" (60-75) boring depth
 4 indexable cartridge steel bars,
 all coolant through

Notes

- Uses Industry Standard ISO Inserts.

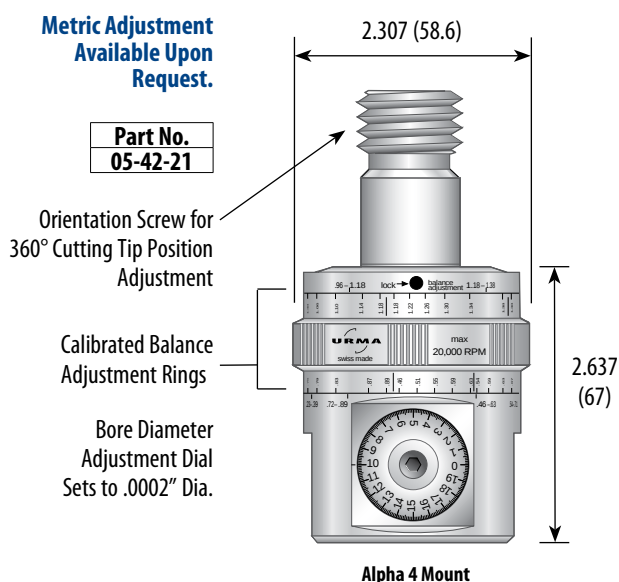
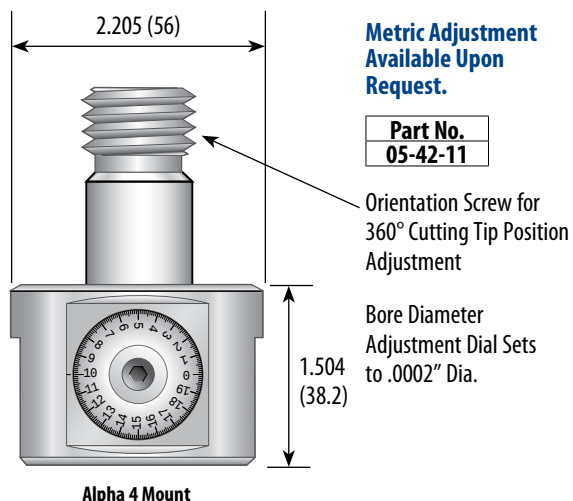
- The MicroMax™ Boring System allows you to bore precise, round holes, vibration free at recommended cutting speeds. Balancing the boring system allows you to reach these cutting speeds without the usual out of roundness and vibration. Inserts easily shear the material from the bore wall at the appropriate cutting speeds.
- This is the tool industry's first boring head with patented micro-adjustable balancing. Fits either Alpha Mount 4 or Beta 40 toolholders and extensions.
- Vibration free boring at any speed within boring bar's capability (up to 20,000 RPM).
- To balance boring head for boring bar offset, simply turn balance ring to match the desired bore diameter.
- Set bore diameter to .0001" accuracy directly off dial.
- Boring head has a total of .197" (5) of adjustment; requiring fewer boring bars to cover a larger range.
- Through-spindle coolant — internal passageways — deliver cutting fluid directly to the cutting area without contaminating adjustment mechanism.

Alpha Modul



Micro-Adjustable Finish Boring Head

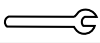
Balanceable Micro-Adjustable Finish Boring Head



Notes

- Boring Bars Pages, 17 & 18.
- Alpha Modul Cutting Edge Orientation Detail, Page 4.

Replacement Parts

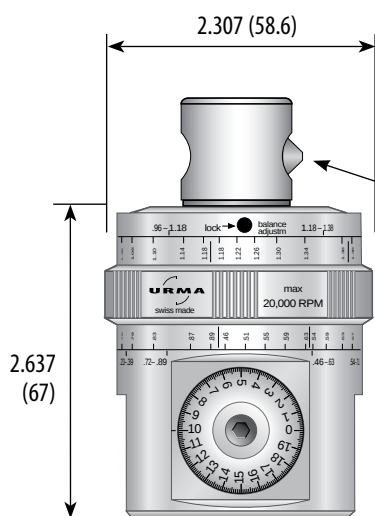
50mm Open End Wrench	Orientation Screw	Boring Bar Lock Screw	Diameter Locking Screw	2.5mm Hex Key	3mm Hex Key	5mm Hex Key
						
Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.
53-00-50	Z00-22-42	Z00-05-01	Z00-23-01	G00-02-03	G00-02-04	G00-02-06



Beta Modul®

Balanceable Micro-Adjustable Finish Boring Head

Starter Kits Available



**Metric Adjustment
Available Upon
Request!**

Part No.
B05-40-21-067

Beta 40 Adaption
Interchangeable
With Other Modular
Boring Systems

Calibrated Balance
Adjustment Rings

Bore Diameter
Adjustment Dial
Sets to .0002" Dia.

Kit contains:

- MicroMax™ Balanceable Boring Head (Alpha or Beta)
- .196" (5) Bushing (**07-00-05**)
- .196" (5) Carbide Boring Bar (**H06-05-06**)
- 2 Steel Boring Bars (**W06-16-10** & **W06-16-15**)
- Inserts (**CCGT-21.51-UM** & **WCGT-020102-UM**)
- Wrenches, and Replacement Parts.
- Specify Toolholder

Covers:

- Boring Range of .228 - .787" (5.8-19.99)

Alpha Modul Part No.	Beta Modul® Part No.
05-42-40	B05-40-21-40

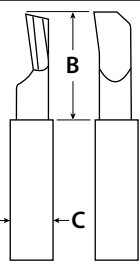


Replacement Parts						
Floating Assembly Pin	Orientation Pin	Boring Bar Lock Screw	Diameter Locking Screw	2.5mm Hex Key	3mm Hex Key	5mm Hex Key
Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.
Z00-40-21	Z00-40-32	Z00-05-01	Z00-23-01	G00-02-03	G00-02-04	G00-02-06

- MicroMax™ boring bars equipped for .630" (16) dia. shanks through bushings or integral shanks.
- Sub-Micron Grain Carbide for superior toughness and long tool life.
- Helical back rake creates high positive cutting geometry for efficient chip creation.
- Dimensions given in inches (mm).

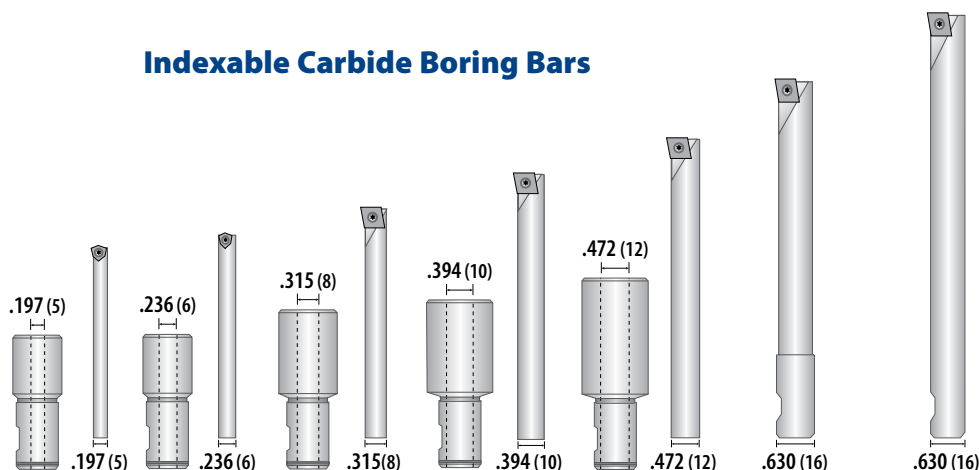
Solid Carbide Boring Bars .040-.300" (1.0-7.6)

- Not Coolant Through

		Part No.	Diameter	B	C
	To be used with Bushing Part No. 07-00-05	M040-05	.040-.080 (1.0-2.0)	.250 (6)	.197 (5)
		M070-05	.070-.120 (1.8-3.0)	.437 (11)	.197 (5)
		M120-05	.120-.200 (3.0-5.1)	.800 (20)	.197 (5)
	To be used with Bushing Part No. 07-00-06	M180-06	.180-.240 (4.6-6.1)	1.200 (30)	.236 (6)
		M225-06	.225-.300 (5.7-7.6)	1.400 (35)	.236 (6)

Replacement Parts			
		For ød	Part No.
	Bushing Set Screw	.197, .236 (5, 6) .315, .394 (8, 10) .472, .630 (12, 16)	C00-07-01 C00-25-03 C00-07-02
	Bushing Hex Key	.197, .236 (5, 6) .315, .394 (8, 10) .472, .630 (12, 16)	G00-02-03 G00-02-04 G00-02-04
	Insert Screw	.197, .236 (5, 6) .315, .394 (8, 10) .472, .630 (12, 16)	C00-20-10 C00-20-01 C00-20-01
	Insert Wrench	.197, .236 (5, 6) .315, .394 (8, 10) .472, .630 (12, 16)	G00-20-01 G00-20-05 G00-20-05

Indexable Carbide Boring Bars



- Coolant Through
- Boring bar length can be adjusted by telescoping in and out of the bushing.

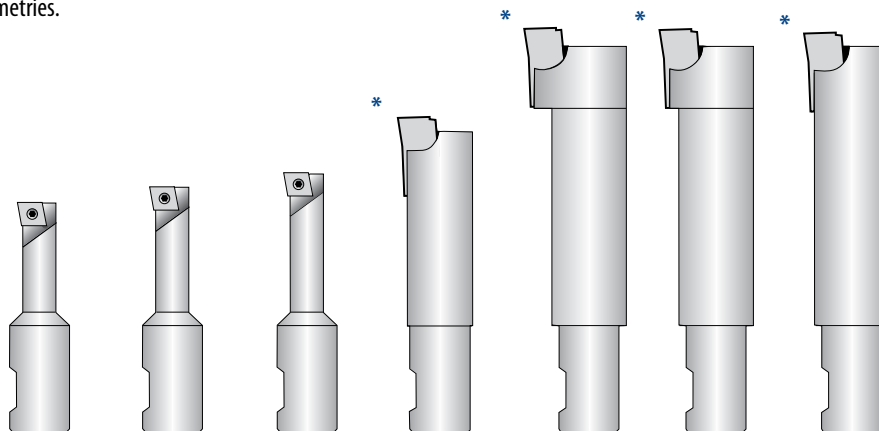
Bushing Part No.	07-00-05	07-00-06	07-00-08	07-00-10	07-00-12		
Boring Bar Part No.	H06-05-06	H06-06-07	HW/C06-08-09	HW/C06-10-12	HW/C06-12-14	HW/C06-16-16	HW/C06-16-18
Cutting Diameter	.228-.393 (5.8-10.0)	.287-.453 (7.3-11.5)	.346-.524 (8.8-13.3)	.464-.642 (11.8-16.3)	.543-.720 (13.8-18.3)	.622-.800 (15.8-20.3)	.698-.878 (18.3-23.0)
Bore Depth	.787-1.575 (20-40)	.945-1.890 (24-48)	1.575-2.520 (40-64)	1.969-3.150 (50-80)	2.362-3.780 (60-96)	3.937 (100)	4.528 (115)

Available Inserts

WCMT-020102-UM WCMT-020102-UC WCMT-020102-CVC								
CCGT-21.50.04-UC CCGT-21.50.04-UM CCGT-21.50-UC CCGT-21.51-UC CCGT-21.51-UM								
CPMW-21.50-PCD CPMW-21.51-PCD								
CPGT-21.50.04-UC CPGT-21.50.04-PVM CPGT-21.50-UC CPGT-21.50-UM								
CPMT-21.50-CVC CPMT-21.50-UM CPMT-21.51-UC CPMT-21.51-UM CPMT-21.51-CVC CPMT-21.51-PVM								

- MicroMax™ boring bars equipped with .630" (16) diameter shanks.
- All of the steel bars are coolant through to direct coolant right to the cutting edge.
- All pockets are designed and manufactured to seat inserts securely — use only inserts with correct relief angle.
- All inserts are industry standard geometries.
- Dimensions given in inches (mm).

Boring Bars

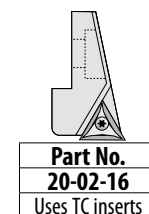
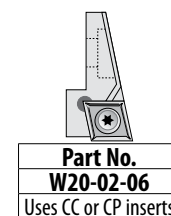
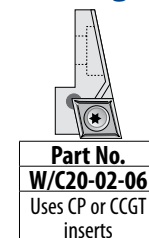


Part Number	W06-16-09	W06-16-10	W06-16-15	06-16-20	06-16-25	06-16-30	06-16-35
Bore Range	.354-.551 (9-14)	.394-.591 (10-15)	.591-.787 (15-20)	.787-.984 (20-25)	.984-1.181 (25-30)	1.181-1.378 (30-35)	1.378-1.575 (35-40)
Bore Depth	1.181 (30)	1.378 (35)	1.772 (45)	2.362 (60)	2.953 (75)	2.953 (75)	2.953 (75)

Available Inserts

CCGT-21.50.04-UC CCGT-21.50.04-UM CCGT-21.50-UC CCGT-21.50-UM CCGT-21.51-UC								
CCMT-21.51-CVC CCMT-21.51-PVM								
CPGT-21.50.04-PVM CPGT-21.50.04-UC CPGT-21.50-UC CPGT-21.50-UM								
CPMT-21.50-CVC CPMT-21.50-UM CPMT-21.51-CVC CPMT-21.51-PVM CPMT-21.51-UC CPMT-21.51-UM								
CPMW-21.50-PCD CPMW-21.51-PCD								
TCMT-520-UC TCMT-520-UM TCMT-521-CVC TCMT-521-UM								

*Insert Cartridges



Replacement Parts		
Boring Bar	Torque Wrench	Torque Screw
Part No.	Part No.	Part No.
W06-16-09	G00-20-05	C00-20-01
W06-16-10	G00-20-05	C00-20-01
W06-16-15	G00-20-05	C00-20-01

Replacement Parts			
Boring Bars	Cartridge Screw	Cartridge Wrench	Insert Cartridge*
Part No.	Part No.	Part No.	Part No.
06-16-20	C00-25-11	G00-20-07	W20-02-06
06-16-25	C00-25-11	G00-20-07	W/C20-02-06
06-16-30	C00-25-11	G00-20-07	20-02-16
06-16-35	C00-25-11	G00-20-07	

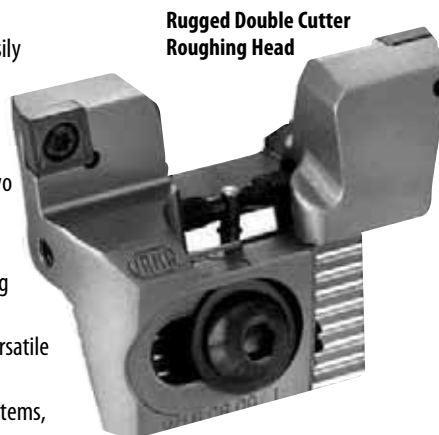
Notes

- *Insert Cartridges Sold Separately Cartridges In This Column Fit Any 06-16-20 Thru 35 Boring Bar.
- Uses Industry Standard Inserts, Command Finishing Inserts, Pages 48 & 49.
- Finish Insert Pocket Detail, Page 6.

.787-6.024" (20-153)

VersaMax™ Boring System:

- **Seven versatile boring heads** – Increased, overlapping diameter ranges per head for minimum tool inventory and easily matched roughing and finishing tools.
- **Rugged double-cutter rougher design** – Directs the cutting forces back into the spindle.
- **Superior surface finishes** – With easy-to-use balanceable finish boring head.
- **Easy adjustment of individual roughing heads** – To set the tools with minimal run out for improved tool life with two effective roughing operations.
- **Radial offsetting for greater radial metal removal rates per pass** – Optimizing each roughing operation.
- **Industry standard indexable inserts offered for Urma tools** – Up to $\frac{5}{8}$ " I.C. roughing inserts for dependable roughing and $\frac{3}{8}$ " I.C. finishing inserts to hold precision tolerances.
- **Two distinct connections** – Alpha Modul and Beta Modul® share the same advantages, creating the most rigid and versatile modular boring system available.
- **Beta Modul® is interchangeable with other systems** – This quick-change adaption is interchangeable with other systems, offering increased flexibility in converting to the Urma program.
- **Taper tolerance and balance that exceeds industry standards** – Provides less vibration and better repeatability. A variety of industry standard tapers manufactured to AT3 standard or better.
- **Complete assemblies provided** – All items include insert screws, cartridge screws, lock screws, and wrenches required for adjustments and securing inserts.
- **All tooling coolant through** – All individual tools and assemblies are coolant through unless noted.
- **Ask about our Tool Trial Program!** – Try Command/Urma boring tools in your shop and we guarantee your toughest operation will become your most productive.



VersaMax™ Setup Instructions

Urma VersaMax™ Double Cutter Rough Boring Head

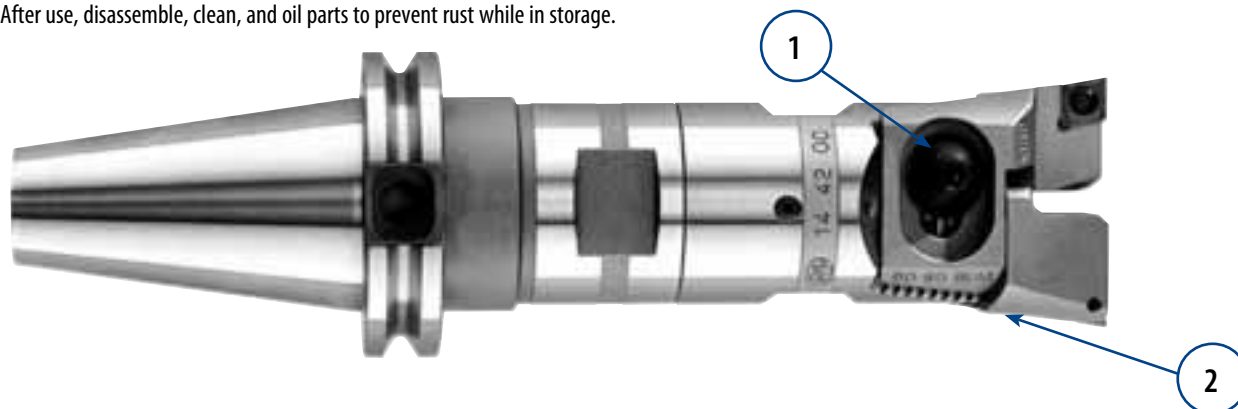
Setup Instructions

1. Clean the pilot, bore, and both faces before attempting to assemble. When assembling the Alpha connection apply an anti-seize grease to the threads, insert the Double Cutter Roughing Head pilot into toolholder bore, and thread together. To assemble the Beta connection line up the orientation pin and pin bore. Then tighten the connection to the recommended torque value.

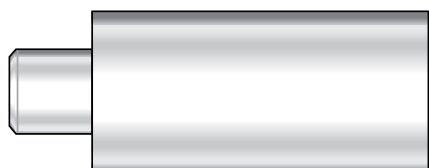
MAXIMUM TORQUE VALUES FOR ALPHA & BETA CONNECTIONS	
Alpha 1 = 37 ft-lbs	Beta 25 = 44 in-lbs
Alpha 2 = 59 ft-lbs	Beta 32 = 7.2 ft-lbs
Alpha 3 = 118 ft-lbs	Beta 40 = 13 ft-lbs
Alpha 4 = 295 ft-lbs	Beta 50 = 21 ft-lbs
Alpha 5 = 516 ft-lbs	Beta 63 = 40 ft-lbs
Alpha 6 = 1000 ft-lbs*	Beta 80 = 52 ft-lbs
Alpha 7 = 1200 ft-lbs*	Beta 100 = 74 ft-lbs

*If connection is keyed, see "Keyed Connection" instructions, page 4.

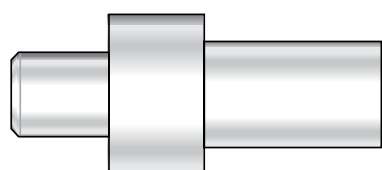
2. Mount the two Roughing Insert Holders to the Double Cutter Roughing Head using the two button head screws (1). Leaving a slight amount of pressure on the two screws, use the adjustment set screw to line up the "tick marks" on either side of the boring head to set for size.
3. Adjustment of size is accomplished by turning the adjustment screw (2) away from center until the cutting edge is to size. It's recommended you use a presetter to maintain an equal distance from center line to balance cutting pressures. Tighten the button head screw. Rotate the boring head 180° and repeat the process.
4. You are now ready to bore a test hole. Then Measure the test hole's size and adjust the boring head, if necessary, to compensate for cutting pressure (see step 3).
5. After use, disassemble, clean, and oil parts to prevent rust while in storage.



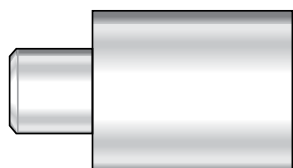
Extensions



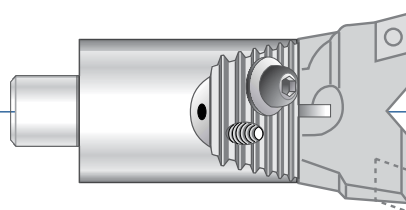
Reducers



Extensions



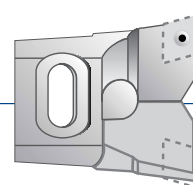
Double Cutter Roughing Heads



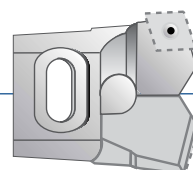
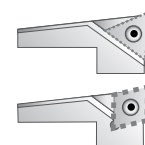
Finish Boring Heads



Roughing Insert Holders



Finishing Insert Holders

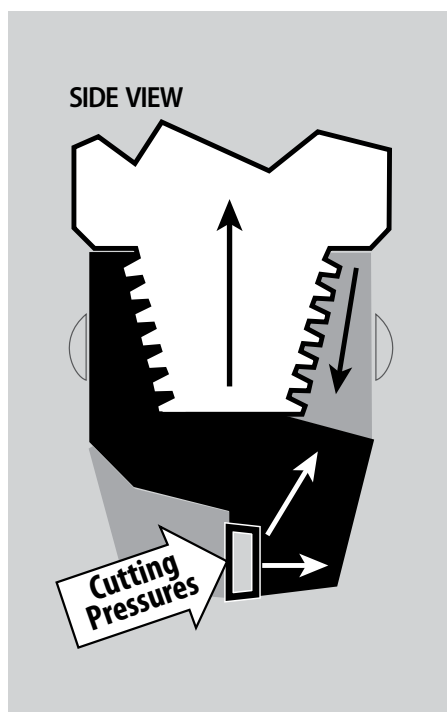


Notes

- Straight Shank Beta Modul® Toolholders For Lathes, Page 6.
- Blank Bars With Beta Modul® Connection, Page 58.

Rugged Roughing Toolholders Designed To Deliver Superior Performance Where It Counts.

- Three ground surfaces for precision seating and positioning of the heads on the toolholder body.
- Patented design to direct cutting forces directly back into the machine tool spindle and maximize radial loading, which delivers all of your machine's power directly into the workpiece, providing for the highest metal removal rate possible.
- Individual radial adjustment to eliminate run out that balances the cutting forces and maximizes tool life, yet also allows for radial offsetting in increase metal removal rates when required.
- Offered in 90° lead angle to maximize radial depth of cut and minimize radial forces and also 75° lead angle.
- Simple, yet very rugged design for dependable continued performance long after other products have failed.



Rugged design directly counteracts cutting forces

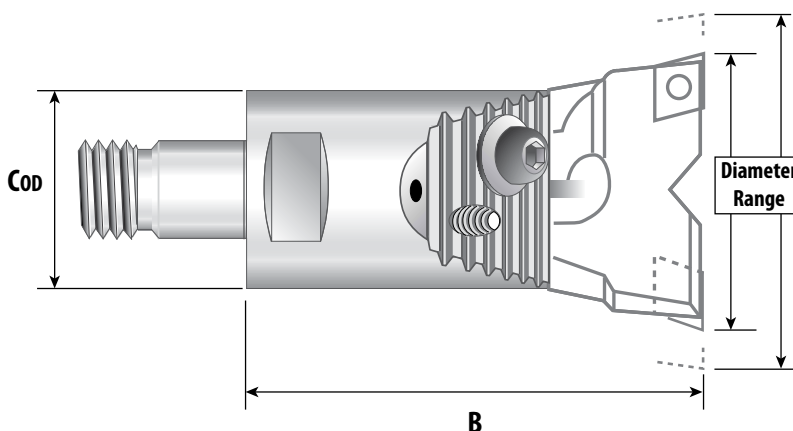


Ask About Our Tool Trial Program!

Test these tools in your shop and we guarantee your toughest operation will become your most productive with our products.

.768-6.024" (19.5-153)

- Smoother and faster than a single point tool. Two cutting edges help balance cutting pressures and double the feed rate.
- Designed to use industry standard inserts, giving you the ability to use the most current insert technology available.
- Through-spindle coolant is standard on all Urma boring heads. Gets coolant to the cutting edge to lubricate and help clear chips.
- Dimensions given in inches (mm).
- Weight given in lbs (kg).



Double Cutter Roughing Heads

Alpha Mount	Part No.	Diameter Range	B	Cod	Weight
1	14-18-00	0.768-1.181 (19.5-30)	1.575 (40)	0.728 (18.5)	0.22 (0.1)
2	14-24-00	1.142-1.535 (29-39)	1.968 (50)	0.965 (24.5)	0.44 (0.2)
3	14-32-00	1.496-2.008 (38-51)	2.559 (65)	1.260 (32)	0.66 (0.3)
4	14-42-00	1.969-2.638 (50-67)	3.543 (90)	1.654 (42)	1.32 (0.6)
5	14-55-00	2.598-3.465 (66-88)	4.528 (115)	2.165 (55)	2.86 (1.3)
6	14-72-00	3.425-4.567 (87-116)	5.906 (150)	2.835 (72)	6.38 (2.9)
7	14-94-00	4.528-6.024 (115-153)	7.677 (195)	3.701 (94)	13.86 (6.3)

Replacement Parts

	Button Head Screw	Hex Key	Diameter Setting Pin	Spring Washer	Drive Key	Cap Screw	Assembly X-Wrench	Open End Wrench
For Alpha Mount	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.
1	B00-22-01	G00-20-23	C00-12-01	K00-02-01				53-00-17
2	B00-22-02	G00-02-04	C00-12-01	K00-02-02				53-00-22
3	B00-22-03	G00-02-05	C00-12-08	K00-02-03				53-00-27
4	B00-22-04	G00-02-06	C00-12-04	K00-02-04				53-00-36
5	B00-22-05	G00-02-07	C00-12-05	K00-02-05				53-00-46
6	B00-22-06	G00-02-08	C00-12-06	K00-02-06	Z00-00-72	C00-22-11	53-74-96	53-00-60
7	B00-22-07	G00-02-10	C00-12-07	K00-02-07	Z00-00-94	C00-24-17	53-74-96	53-00-75

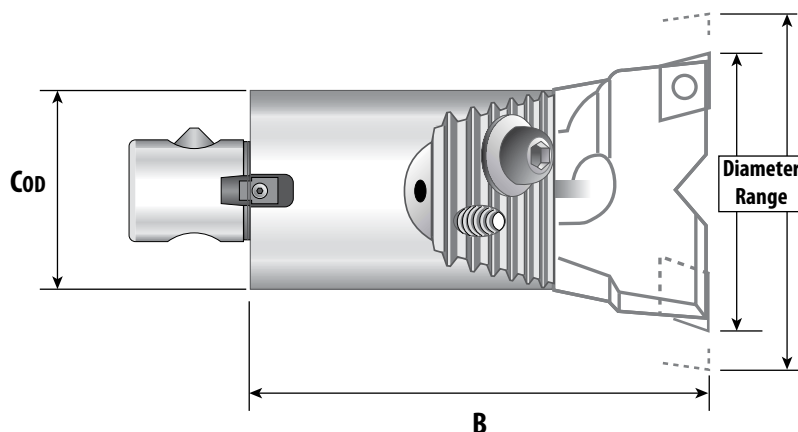
Notes

- For Alpha & Beta Modul® Toolholders, See Pages 7 & 8.
- For Extensions, See Page 9.
- For Reducers, See Page 10
- For Roughing Inserts, See Page 47.

VersaMax™ Boring System Double Cutter Roughing Heads

1.142-6.024" (29-153)

- Quick and easy assembly using Beta connection. Interchangeable with other leading quick-change modular connections.
- Smoother and faster than a single point tool. Two cutting edges help balance cutting pressures and double the feed rate.
- Designed to use industry standard inserts, giving you the ability to use the most current insert technology available.
- Through-spindle coolant is standard on all Urma boring heads. Gets coolant to the cutting edge to lubricate and help clear chips.
- Dimensions given in inches (mm).
- Weight given in lbs (kg).



Double Cutter Roughing Heads					
Beta	Part No.	Diameter Range	B	Cod	Weight
25	B14-25-00-050	1.142-1.535 (29-39)	1.968 (50)	0.984 (25)	0.44 (0.2)
32	B14-32-00-065	1.496-2.008 (38-51)	2.559 (65)	1.260 (32)	0.66 (0.3)
40	B14-40-00-090	1.969-2.638 (50-67)	3.543 (90)	1.575 (40)	1.32 (0.6)
63	B14-63-00-100	2.598-3.465 (66-88)	3.937 (100)	2.480 (63)	3.30 (1.5)
80	B14-80-00-115	3.425-4.567 (87-116)	4.527 (115)	3.150 (80)	5.50 (2.5)
100	B14-100-00-145	4.528-6.024 (115-153)	5.709 (145)	3.937 (100)	9.70 (4.4)

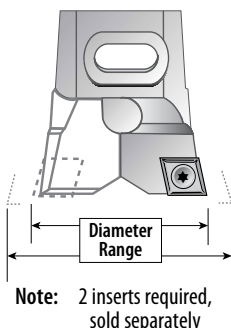
Replacement Parts								
	Floating Assembly Pin	Orientation Pin	Orientation Key	Socket Head Screw	Button Head Screw	Hex Key	Diameter Setting Pin	Spring Washer
								
For Beta	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.
25	Z00-25-21	Z00-25-23			B00-22-02		C00-12-01	K00-02-02
32	Z00-32-21	Z00-32-23			B00-22-03	G00-02-05	C00-12-08	K00-02-03
40	Z00-40-21	Z00-40-23	Z00-40-25	C00-22-58	B00-22-04	G00-02-06	C00-12-04	K00-02-04
63	Z00-63-21	Z00-63-23	Z00-63-25	C00-22-05	B00-22-05	G00-02-07	C00-12-05	K00-02-05
80	Z00-80-21	Z00-80-23	Z00-80-25	C00-22-07	B00-22-06	G00-02-08	C00-12-06	K00-02-06
100	Z00-100-21	Z00-100-23	Z00-100-25	C00-22-71	B00-22-07	G00-02-10	C00-12-07	K00-02-07

Notes

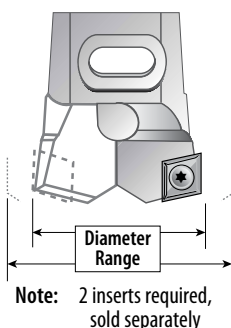
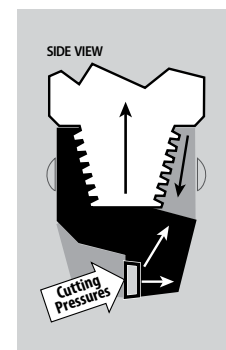
- For Alpha & Beta Modul® Toolholders, See Pages 7 & 8.
- For Extensions, See Page 9.
- For Reducers, See Page 10
- For Roughing Inserts, See Page 47.

.768-6.024" (19.5-153)

- **Insert holders sold separately** — 2 insert holders are required for Double Cutter Roughing Head.
- Patented rigid design interlocks the insert holders to support each other. Cutting pressures are balanced and transferred back through the serrations to boring head body.
- Designed to use industry standard inserts, giving you the ability to use the most current insert technology available.
- Dimensions given in inches (mm).
- Weight given in lbs (kg).

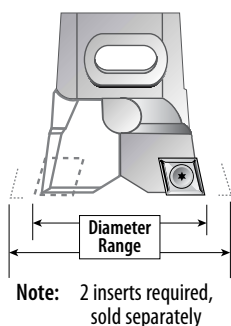


Two effective insert holders for balanced cutting forces					
Alpha Mount	Beta	90° Part No.	Diameter Range	Insert I.C.	Weight
0		W16-01-06	0.768-0.984 (19.5-25)	$\frac{1}{4}$ (6)	-----
1		W16-02-06	0.875-1.181 (22.3-30)	$\frac{1}{4}$ (6)	-----
2	25	W16-04-06	1.142-1.535 (29-39)	$\frac{1}{4}$ (6)	-----
3	32	W16-06-09	1.496-2.008 (38-51)	$\frac{3}{8}$ (9)	-----
4	40	W16-08-09	1.969-2.638 (50-67)	$\frac{3}{8}$ (9)	0.22 (0.1)
5	63	W16-10-12P	2.598-3.465 (66-88)	$\frac{1}{2}$ (12)	0.44 (0.2)
6	80	W16-12-16P	3.425-4.567 (87-116)	$\frac{5}{8}$ (16)	1.10 (0.5)
7	100	W16-14-16P	4.528-6.024 (115-153)	$\frac{5}{8}$ (16)	2.86 (1.3)



Two effective insert holders for balanced cutting forces					
Alpha Mount	Beta	75° Part No.	Diameter range	Insert I.C.	Weight
1		W18-02-06	0.875-1.181 (22.3-30)	$\frac{1}{4}$ (6)	-----
2	25	W18-04-06	1.142-1.535 (29-39)	$\frac{1}{4}$ (6)	-----
3	32	W18-06-09	1.496-2.008 (38-51)	$\frac{3}{8}$ (9)	-----
4	40	W18-08-09	1.969-2.638 (50-67)	$\frac{3}{8}$ (9)	0.22 (0.1)
5	63	W18-10-12P	2.598-3.465 (66-88)	$\frac{1}{2}$ (12)	0.44 (0.2)
6	80	W18-12-16P	3.425-4.567 (87-116)	$\frac{5}{8}$ (16)	1.10 (0.5)
7	100	W18-14-16P	4.528-6.024 (115-153)	$\frac{5}{8}$ (16)	2.86 (1.3)

Unique patented design applies cutting forces from one insert holder to the supporting surface of the other; locking the insert holders tighter into the ground serrations. This is why the Urma double cutter is the most rigid roughing head available.



One effective axial and radial offset insert holders for increased radial depth of cut						
Alpha Mount	Beta	90° Part No.	Diameter Range	Axial Offset	Insert I.C.	Weight
1		WV16-02-06	0.875-1.181 (22.3-30)	.008 (0.2)	$\frac{1}{4}$ (6)	0.22 (0.1)
2	25	WV16-04-06	1.142-1.535 (29-39)	.008 (0.2)	$\frac{1}{4}$ (6)	0.22 (0.1)
3	32	WV16-06-09	1.496-2.008 (38-51)	.008 (0.2)	$\frac{3}{8}$ (9)	0.22 (0.1)
4	40	WV16-08-09	1.969-2.638 (50-67)	.010 (0.25)	$\frac{3}{8}$ (9)	0.44 (0.2)
5	63	WV16-10-12P	2.598-3.465 (66-88)	.012 (0.3)	$\frac{1}{2}$ (12)	1.10 (0.5)
6	80	WV16-12-12P*	3.425-4.567 (87-116)	.012 (0.3)	$\frac{1}{2}$ (12)	2.86 (1.3)
7	100	WV16-14-16P	4.528-6.024 (115-153)	.016 (0.4)	$\frac{5}{8}$ (16)	6.70 (3.0)

*** This specific insert holder takes the Alpha 5 mount (or 63 Beta) for the following items: the insert shim, insert pin, insert clamp & clamping screw.**

Replacement Parts									
		Adjusting Screw	Hex Key	Insert Screw	Insert Wrench	Insert Shim	Insert Pin	Insert Clamp	Clamping Screw
Alpha Mount	Beta	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.
1		C00-02-10	G00-02-01	C00-20-01	G00-20-05				
2	25	C00-02-11	G00-02-01	C00-20-01	G00-20-05				
3	32	C00-02-12	G00-02-02	C00-20-02	G00-20-03				
4	40	C00-02-13	G00-02-03	C00-20-02	G00-20-03				
5	63	C00-02-14	G00-02-03		G00-20-03	A00-12-11	Z00-12-02	A00-02-17	A00-32-07
6	80	C00-02-15	G00-02-04		G00-20-03	A00-12-12	Z00-16-03	A00-02-16	A00-32-08
7	100	C00-02-16	G00-02-05		G00-20-03	A00-12-12	Z00-16-03	A00-02-16	A00-32-08

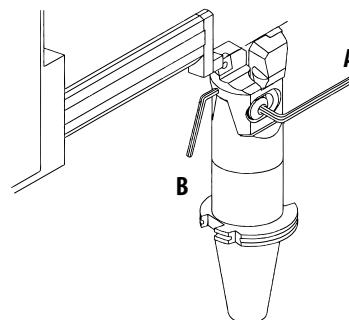
VersaMax™ Boring System Diameter Adjustment Instructions

.787-6.024" (20-153)

For Alpha & Beta:

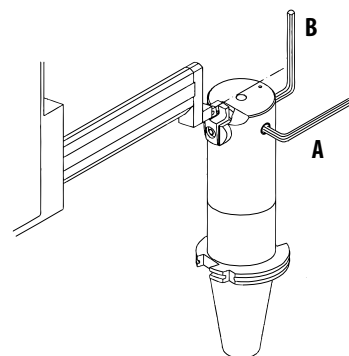
Diameter Adjustment for Roughing Heads:

1. After assembling the boring tool, the insert holders should be preset to the desired bore diameter. Leaving a slight amount of pressure on the button head screw (A). Use the adjustment set screw (B) to line up the "tick marks" on either side of the boring head. The insert holders adjust independently, so after adjusting each side, use a vernier caliper to determine diameter size. Remember, if the insert holders are not equal distance from the center of rotation, the bore produced will be oversized.
2. To verify that the insert holders are equal distance from center, the easiest method (other than using a presetter) is to place the tool into the machine spindle. Then, using a magnetic base indicator, spin the tool to verify that the reading is equal.
3. Once the diameter is set, tighten the button head screws on each side of the boring head.



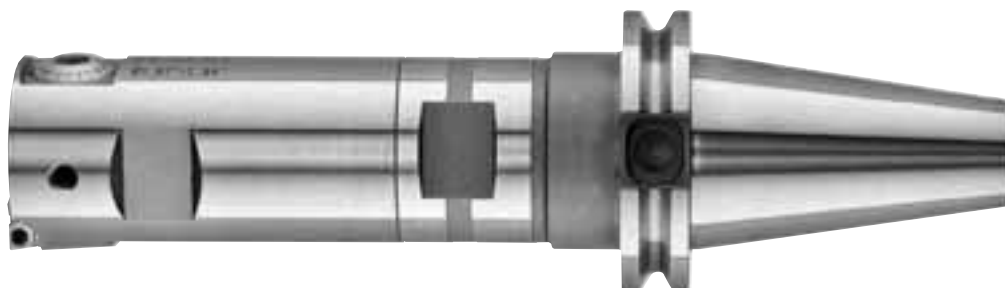
Diameter Adjustment for Finishing Heads:

1. **BE SURE TO LOOSEN SIDE SET SCREW (A) BEFORE ANY DIAMETER ADJUSTMENT IS MADE!** If the dial is turned without fully loosening the locking mechanism, damage to the adjustment mechanism will surely occur.
2. After loosening the side set screw (A), turn the dial (B) the direction needed to achieve desired diameter. The dial is in increments of .0002" on diameter. Once you have obtained the target diameter, tighten the locking set screw before using. There is no reason to "overtighten" this set screw.
3. Now, you are ready to bore a test bore. Typically, there is a need for further adjustment after the test due to deflection caused by cutting pressures. If this is the case, repeat the above procedure.



Beta Modul® Assembly Torque Specifications		
Hex Key Part No.	Beta Modul® Size	Maximum Torque (ft-lbs)
G00-02-04 (3)	25	3.6
G00-02-05 (4)	32	7.2
G00-02-06 (5)	40	13
G00-02-07 (6)	50	21
G00-02-08 (8)	63	40
G00-02-09 (10)	80	52
G00-02-10 (12)	100	74

Alpha Modul Assembly Torque Specifications		
Alpha Modul Mount	Maximum Torque (ft-lbs)	Open End Wrench Part No.
1	37	53-00-17 (17)
2	59	53-00-22 (22)
3	118	53-00-27 (27)
4	295	53-00-36 (36)
5	516	53-00-46 (46)
6	Keyed	53-00-60 (60)
7	Keyed	53-00-75 (75)

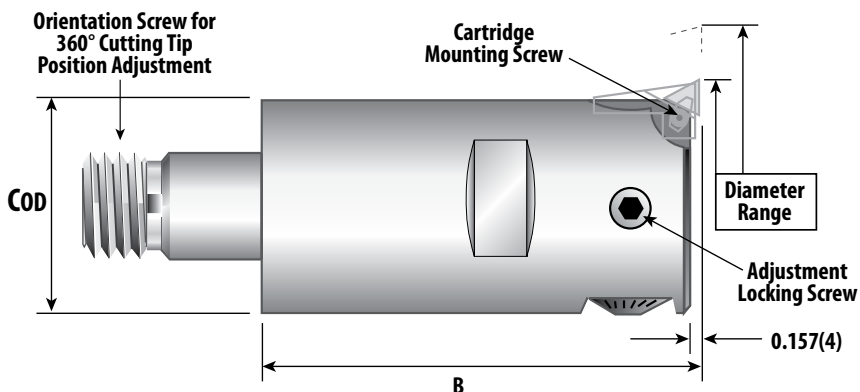
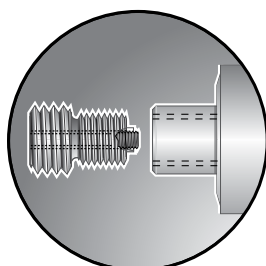


.787-6.024" (20-153)

- Adjustability is .0002" on diameter. VersaMax™ is simple and smooth to adjust. Minimal backlash gives superior diameter adjustability.
- No movement between lock & unlock
- Tool locking function independent of tool adjustment.
- Through-spindle coolant is standard for all fine boring heads. The coolant is directed right to the cutting edge.
- Diameter adjustment also available in metric increments (.01) upon request.
- Dimensions given in inches (mm).
- Weight given in lbs (kg).

**Metric adjustment
available upon
request!**

Orientation screw
detail. Simple set screw
adjustment for altering
orientation screw depth



Alpha Finish Boring Heads 0.787-6.024" (20-153)

Alpha mount	Part No.	Diameter Range	B	Cod	Weight
0	25-08-01	0.787-.984 (20-25)	1.575 (40)	0.775 (19.7)	0.20 (0.1)
1	25-18-01	0.875-1.181 (22.3-30)	1.575 (40)	0.787 (20)	0.22 (0.1)
2	25-24-01	1.142-1.535 (29-39)	1.969 (50)	1.024 (26)	0.44 (0.2)
3	25-32-01	1.496-2.008 (38-51)	2.559 (65)	1.260 (32)	0.88 (0.4)
4	25-42-01	1.969-2.638 (50-67)	3.543 (90)	1.654 (42)	2.20 (1.0)
5	25-55-01	2.598-3.465 (66-88)	4.528 (115)	2.165 (55)	4.40 (2.2)
6	25-72-01	3.425-4.567 (87-116)	2.952 (75)	2.835 (72)	5.50 (2.5)
7	25-94-01	4.528-6.024 (115-153)	3.740 (95)	3.701 (94)	11.44 (5.2)

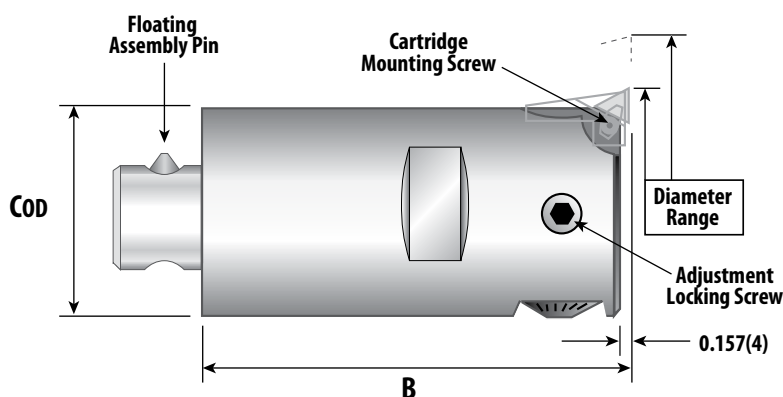
Replacement Parts

	Adjustment Locking Screw	Cartridge Mounting Screw	Diameter Adj. Wrench	Cartridge Wrench	Orientation Screw	Assembly Wrench
Alpha Mount	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.
1	C00-25-01	C00-25-11	G00-02-03	G00-20-07	Z00-10-18	53-00-17
2	C00-25-02	C00-25-11	G00-02-03	G00-20-07	Z00-12-24	53-00-22
3	C00-25-03	C00-25-12	G00-02-04	G00-20-03	Z00-16-32	53-00-27
4	C00-25-04	C00-25-12	G00-02-04	G00-20-03	Z00-22-42	53-00-36
5	C00-25-05	C00-25-13	G00-02-06	G00-02-05	Z00-27-55	53-00-46
6	C00-25-05	C00-25-13	G00-02-06	G00-02-05	Z00-14-74	53-00-55
7	C00-25-05	C00-25-13	G00-02-06	G00-02-05	Z00-14-96	53-00-55



1.142-6.024" (29-153)

- Quick and easy assembly using Beta connection. Interchangeable with other leading quick-change modular connections.
- Adjustability is .0002" on diameter. VersaMax™ is simple and smooth to adjust. Minimal backlash gives superior diameter adjustability.
- No movement between lock & unlock
- Tool locking function independent of tool adjustment.
- Through-spindle coolant is standard for all fine boring heads. The coolant is directed right to the cutting edge.
- Diameter adjustment also available in metric increments (.01) upon request.
- Dimensions given in inches (mm).
- Weight given in lbs (kg).



Beta Finish Boring Heads 1.142-6.024 (29-153)

For Beta	Part No.	Diameter	B	COD	Weight
25	B25-25-01-050	1.142-1.535 (29-39)	1.969 (50)	0.984 (25)	0.44 (0.2)
32	B25-32-01-065	1.496-2.008 (38-51)	2.559 (65)	1.260 (32)	0.88 (0.4)
40	B25-40-01-090	1.969-2.638 (50-67)	3.543 (90)	1.575 (40)	2.20 (1.0)
63	B25-63-01-100	2.598-3.465 (66-88)	3.937 (100)	2.480 (63)	5.50 (2.5)
80	B25-80-01-115	3.425-4.567 (87-116)	4.528 (115)	3.150 (80)	9.50 (4.3)
100	B25-100-01-145	4.528-6.024 (115-153)	5.709 (145)	3.937 (100)	20.00 (9.2)

Replacement Parts						
	Floating Assembly Pin	Orientation	Adjustment Locking Screw	Cartridge Mounting Screw	Diameter Adj. Wrench	Cartridge Wrench
						
For Beta	Part No.	Pin Part No.	Part No.	Part No.	Part No.	Part No.
25	Z00-25-21	Z00-25-23	C00-25-02	C00-25-11	G00-02-03	G00-20-07
32	Z00-32-21	Z00-32-23	C00-25-03	C00-25-12	G00-02-04	G00-20-03
40	Z00-40-21	Z00-40-23	C00-25-04	C00-25-12	G00-02-04	G00-20-03
63	Z00-63-21	Z00-63-23	C00-25-05	C00-25-13	G00-02-06	G00-20-05
80	Z00-80-21	Z00-80-23	C00-25-06	C00-25-13	G00-02-06	G00-20-05
100	Z00-100-21	Z00-100-23	C00-25-07	C00-25-13	G00-02-06	G00-20-05

VersaMax™ Boring System Balanceable Fine Boring Head Setup Instructions

.787-6.024" (20-153)

Urma VersaMax™ Balanceable Fine Boring Head Setup Instructions

1. Clean the pilot, bore, and both faces before attempting to assemble. The Alpha connection is assembled by inserting the pilot into the toolholder bore and threading together. Tighten the connection to the recommended torque value.

MAXIMUM TORQUE VALUES FOR ALPHA CONNECTION

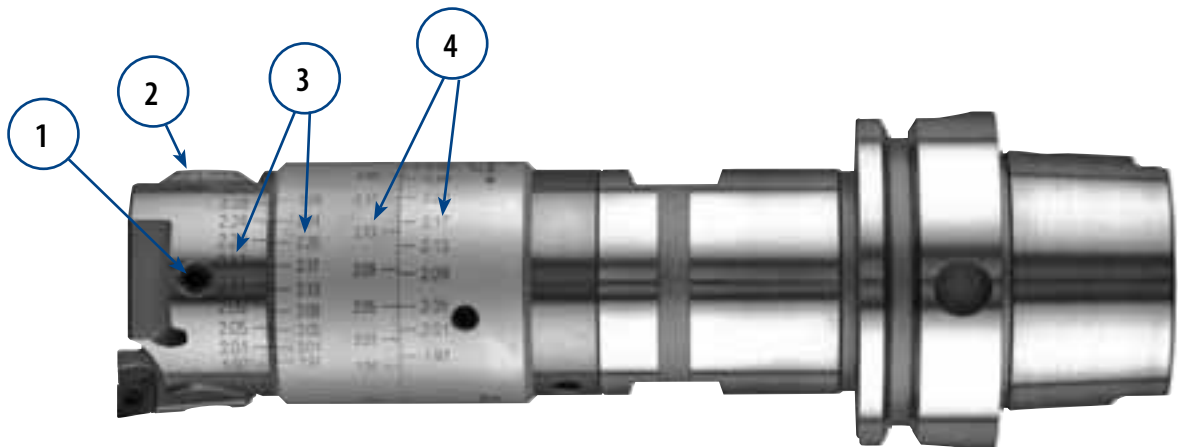
Alpha 1 = 37 ft-lbs

Alpha 2 = 59 ft-lbs

Alpha 3 = 118 ft-lbs

Alpha 4 = 295 ft-lbs

2. Mount the Fine Boring Insert Holder to the Fine Boring Head using the button head screw.
3. **CAUTION:** before turning the fine adjustment dial, be sure to loosen the side locking set screw (1). If the locking screw is not fully loosened and the dial is turned, the life and accuracy of the adjustment mechanism will decrease. Loosen the side locking set screw and turn the dial (2) to achieve the desired size. Tighten side locking set screw (1) (**CAUTION: DO NOT OVER TIGHTEN**).
4. To balance the head, adjust the top collar (closest to the cutting edge) such that the desired bore diameter marking on the head and collar line up (3). Some interpolation may be necessary. Lock the collar in place. Next, line up the bore target marking on the bottom collar with the marking on the top collar (4). Lock the bottom collar in place.
5. You are now ready to bore a test hole. Measure the test hole size and adjust the boring head, if necessary, to compensate for cutting pressure (see step 3).
6. After use, disassemble, clean, and oil parts to prevent rust while in storage.



VersaMax™ Boring System Balanceable Finish Boring Heads

.787-2.638" (20-67)

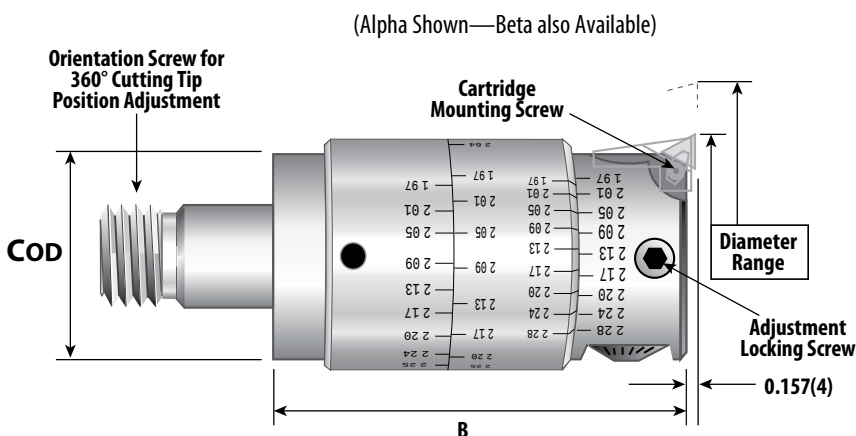


- Vibration-free boring at any speed up to 20,000 RPM.
- No movement between lock & unlock
- Tool locking function independent of tool adjustment.
- Improved roundness, accuracy, repeatability, and surface finish.
- High speed performance for shorter cycle times and longer tool life.
- Capable of limiting residual imbalance as low as 10g - mm.
- Easy to use. Set bore diameter to .0002" accuracy directly off dial. Vernier scale allows adjustments to .0001".
- Through-spindle coolant—internal passageways deliver cutting fluid directly to the cutting area without contaminating adjustment mechanism.
- Dimensions given in inches (mm).

Easy To Use:

To balance boring head, (example: for 2.05" bore diameter) simply position the calibrated balance adjustment rings to match the desired bore diameter and lock.

**Metric adjustment
available upon
request!**



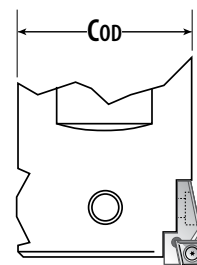
Alpha Balanceable Finish Boring Heads						
For Alpha Mount	Part No.	Diameter Range	B	D	Cod	Assembly Wrench Part No.
1	A25-08-01	.787-.984 (20-25)	1.575 (40)	.775 (19.7)	.728 (18.5)	53-00-17
1	A25-18-01	.875-1.181 (22.3-30)	1.575 (40)	.827 (21)	.728 (18.5)	53-00-17
2	A25-24-01	1.142-1.535 (29-39)	1.969 (50)	1.063 (27)	1.024 (26)	53-00-22
3	A25-32-01	1.496-2.008 (38-51)	2.559 (65)	1.358 (34.5)	1.260 (32)	53-00-27
4	A25-42-01	1.969-2.638 (50-67)	3.543 (90)	1.772 (45)	1.654 (42)	53-00-36

Beta Balanceable Finish Boring Heads						
For Beta	Part No.	Diameter Range	B	D	Cod	
25	A25-25-01-050	1.142-1.535 (29-39)	1.969 (50)	1.063 (27)	1.024 (26)	
32	A25-32-01-065	1.496-2.008 (38-51)	2.559 (65)	1.358 (34.5)	1.260 (32)	
40	A25-40-01-090	1.969-2.638 (50-67)	3.543 (90)	1.772 (45)	1.654 (42)	

.787-6.024" (20-153)

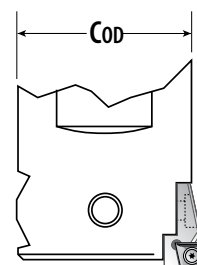
- Insert pockets designed to fit industry standard geometries.
- Dimensions given in inches (mm).

90° lead insert cartridges for industry inserts with 7° clearance angle				
Alpha Mount	For Beta	Part No.	Diameter	
0+1		W20-02-06	0.787-1.181 (20-30)	CC.. 21.5..
2	25	W20-02-06	1.142-1.535 (29-39)	CC.. 21.5..
3	32	W20-04-06	1.496-2.008 (38-51)	CC.. 21.5..
4	40	W20-04-06	1.969-2.638 (50-67)	CC.. 21.5..
5	63	W20-06-09	2.598-3.465 (66-88)	CC.. 32.5..
6	80	W20-06-09	3.425-4.567 (88-116)	CC.. 32.5..
7	100	W20-06-09	4.528-6.024 (116-153)	CC.. 32.5..



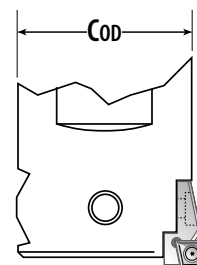
NOTE: Will not leave a flat bottom

5° lead wiper insert cartridges with 7° clearance angle—Double the feed rate!				
Alpha Mount	For Beta	Part No.	Diameter	
0+1		WW20-02-06	0.787-1.181 (20-30)	WiperCC.. 21.5..
2	25	WW20-02-06	1.142-1.535 (29-39)	WiperCC.. 21.5..
3	32	WW20-04-06	1.496-2.008 (38-51)	WiperCC.. 21.5..
4	40	WW20-04-06	1.969-2.638 (50-67)	WiperCC.. 21.5..
5	63	WW20-06-09	2.598-3.465 (66-88)	WiperCC.. 32.5..
6	80	WW20-06-09	3.425-4.567 (88-116)	WiperCC.. 32.5..
7	100	WW20-06-09	4.528-6.024 (116-153)	WiperCC.. 32.5..



NOTE: Will not leave a flat bottom

90° lead combination insert cartridges with 11° and 7° clearance angle*				
Alpha Mount	For Beta	Part No.	Diameter	
0+1		W/C20-02-06	0.787-1.181 (20-30)	CC../CP.. 0602..
2	25	W/C20-02-06	1.142-1.535 (29-39)	CC../CP.. 0602..
3	32	W/C20-04-06	1.496-2.008 (38-51)	CC../CP.. 0602..
4	40	W/C20-04-06	1.969-2.638 (50-67)	CC../CP.. 0602..
5	63	W/C20-06-06	2.598-3.465 (66-88)	CC../CP.. 0602..
6	80	W/C20-06-06	3.425-4.567 (88-116)	CC../CP.. 0602..
7	100	W/C20-06-06	4.528-6.024 (116-153)	CC../CP.. 0602..



90° lead insert cartridges for industry Triangle insert				
Alpha Mount	For Beta	Part No.	Diameter	
0+1		20-02-16	0.787-1.181 (20-30)	TC.. 52..
2	25	20-02-16	1.142-1.535 (29-39)	TC.. 52..

Replacement Parts					
					
		Insert Screw	Insert Wrench	Insert Screw	Insert Wrench
					
Alpha Mount	For Beta	Part No.	Part No.	Part No.	Part No.
0-2	25	C00-20-04	G00-20-05	C00-20-11	G00-20-11
3-4	32-40	C00-20-01	G00-20-05		
5-7 (W&W)	63-100	C00-20-02	G00-20-03		
5-7 (for W/C)	63-100	C00-20-01	G00-20-05		

Notes

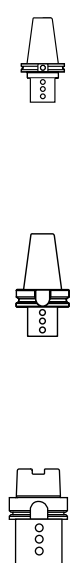
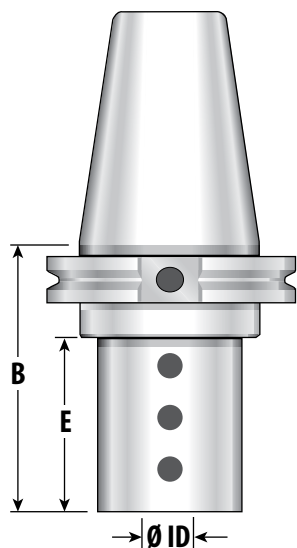
- Finish Insert Pocket Detail, Page 6.
- Uses Industry Standard Inserts. Command Finishing Inserts, Pages 48 & 49.

Versamax™ Boring System LBS Deep Boring Toolholders And Carbide Boring Bars

LBS: Long Boring System

- LBS adapters are designed to work with the LBS Carbide Boring Bars to successfully machine deep bores.
- Holders are manufactured to allow the boring bar to be “telescoped” in or out — adjusting to the exact length that you need.

- LBS utilizes 4 set screws for clamping — for the ultimate in rigidity.
- Dimensions given in inches (mm).
- Weight given in lbs (kg).

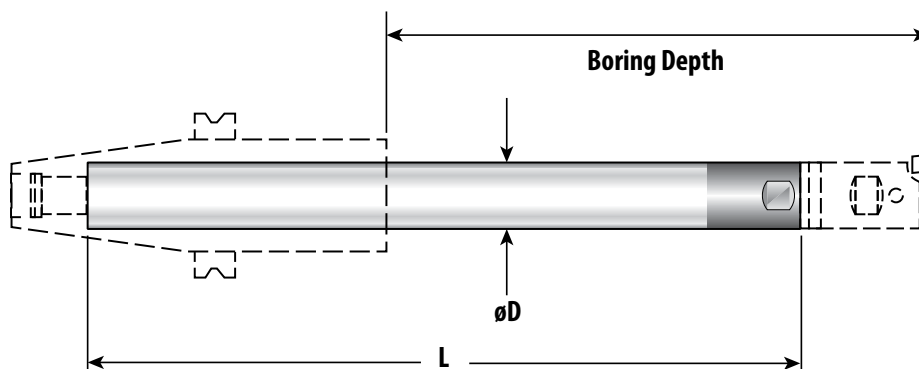


V-Flange					
Taper	Ø ID	Part No.	B	E	Weight
V 40	0.728 (18.5)	C4U4-L018	2.404 (61)	1.654 (42)	2.4 (1.1)
V 40	0.984 (25)	C4U4-L025	3.094 (78)	2.344 (59)	2.6 (1.2)
V 50	0.728 (18.5)	C6U4-L018	3.114 (79)	1.739 (44)	6.6 (3.0)
V 50	0.984 (25)	C6U4-L025	3.823 (97)	2.385 (60)	7.0 (3.2)
V 50	1.260 (32)	C6U4-L032	4.492 (114)	3.117 (79)	7.9 (3.6)
BT-Flange					
Taper	Ø ID	Part No.	B	E	Weight
BT 40	0.728 (18.5)	B4U4-L018	2.639 (67)	1.575 (40)	2.6 (1.2)
BT 40	0.984 (25)	B4U4-L025	3.308 (84)	2.244 (57)	2.6 (1.2)
BT 50	0.728 (18.5)	B6U4-L018	3.866 (98)	2.362 (60)	8.8 (4.0)
BT 50	0.984 (25)	B6U4-L025	4.575 (116)	3.071 (78)	9.2 (4.2)
BT 50	1.260 (32)	B6U4-L032	5.244 (133)	3.740 (95)	9.9 (4.5)
HSK					
Taper	Ø ID	Part No.	B	E	Weight
HSK63A	0.728 (18.5)	H4U4AL018	4.744 (120)	3.976 (101)	3.5 (1.6)
HSK63A	0.984 (25)	H4U4AL025	5.334 (135)	4.606 (117)	4.0 (1.8)

LBS Deep Boring Carbide Boring Bars

LBS: Long Boring System Carbide Boring Bars

- LBS carbide bars allow vibration free deep boring operations. Bore depths up to 10 x D.
- LBS carbide bars available in either Alpha or Beta Finish Boring Heads.
- All bars coolant through.
- Dimensions given in inches (mm).
- Weight given in lbs (kg).



Alpha LBS Deep Boring Bars

Alpha Mount	Ø D	Part No.	Boring Depth	L	Weight
1	0.728 (18.5)	H06-18-A18-200	5.47-7.28 (139-185)	7.874 (200)	1.4 (.65)
2	0.984 (25)	H06-25-A24-234	6.57-8.23 (167-209)	9.212 (234)	3.1 (1.4)
2	0.984 (25)	H06-25-A24-276	8.23-9.88 (209-251)	10.866 (276)	3.4 (1.7)
3	1.260 (32)	H06-32-A32-351	9.45-12.60 (240-320)	13.819 (351)	7.7 (3.5)

Beta LBS Deep Boring Bars

Beta	Ø D	Part No.	Boring Depth	L	Weight
25	0.984 (25)	H06-25-B25-234	6.57-8.23 (167-209)	9.212 (234)	3.1 (1.4)
25	0.984 (25)	H06-25-B25-276	8.23-9.88 (209-251)	10.866 (276)	3.4 (1.7)
32	1.260 (32)	H06-32-B32-351	9.45-12.60 (240-320)	13.819 (351)	7.7 (3.5)

Notes

- VersaMax™ Finish Boring Heads, Pages 26, 27 & 29.
- Roughing Boring Heads, Pages 22 & 23.

Diameter Adjustment for Roughing Heads:

1. After assembling the insert holders to the diameter extender, you are ready to preset the head to the desired bore size. Leaving a slight amount of pressure on the two cap screws, use the adjustment set screw to line up the "tick marks" on either side of the diameter extender. The insert holders adjust independently. So after adjusting each side, use a vernier caliper to determine diameter size. Remember, if the insert holders are not equal distance from the center of rotation, the bore produced will be oversized.
2. To verify that the insert holders are equal distance from center, the easiest method (other than using a presetter) is to place the tool into the machine spindle. Then, using a magnetic base indicator, spin the tool to verify that the reading is equal.
3. Once the diameter is set, tighten the cap screws on each side of the boring head.

Diameter Adjustment for Finishing Heads:

1. After installing the insert cartridge onto the finish boring head, install the finishing head onto the diameter extender. Before tightening the cap screws, use the rough adjustment screw to position the boring head close to the final bore size.
2. Before turning the adjustment dial, **be sure to loosen side locking set screw**. Do not leave any pressure on the locking mechanism when adjusting for size. This will decrease the life and accuracy of the adjustment mechanism.
3. After loosening the side lock set screw, turn the dial to achieve the desired diameter. The dial is in increments of .0002" on diameter. Once you have obtained the target diameter, tighten the locking set screw before using. There is no need to "overtighten" this set screw.
4. Now you are ready to bore a test bore. Typically, there is a need for further adjustment after the test cut due to deflection caused by cutting pressures. If this is the case, repeat the above procedure.

OD Turning:

The IntraMax™ System also allows the ability to turn outside diameters up to 3.9" on your milling machine. To set the boring tool up, just reverse the heads. In this configuration, you can double cut rough or finish turn applications up to 2.280" long when using the OD extension blocks. The extension blocks not only give you the extra travel, but also allow the use of the rough adjustment mechanism to help preset the tool. Because OD turning requires the spindle to be reversed, it is required that the Beta Modul® be used when OD turning.



Setup for
OD Turning

IntraMax™ Boring System Performance Features

1.9-14" Boring (48.3-355.8)

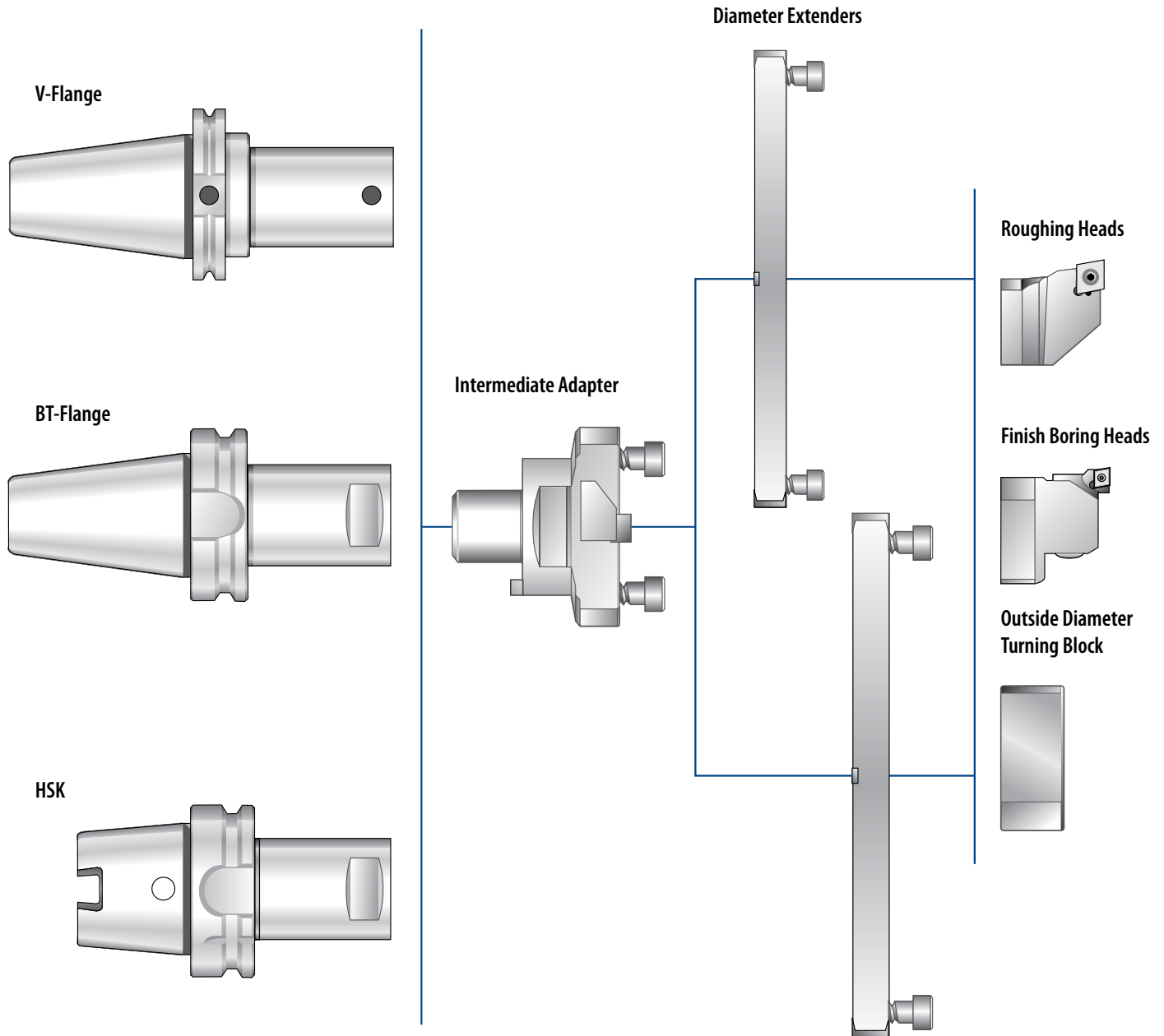
.35-9.8" OD Turning (9-248.9)

IntraMax™ Boring System:

- **Cost effective flexibility to optimize your machine's operations** – IntraMax™ offers unprecedented flexibility that allows you to bore a wide range of diameters – with varied stock conditions – using very few parts.
 - Only 7 components required to bore under 2" and up to 3.5" diameter – reaching 5.5" deep – with over .300" stock per side
 - Only 8 components required to bore over 8" diameter – reaching 7.2" deep – with over .400" stock per side
- **Assemblies compact enough and light enough to go through tool changers** – So you can do more in a single setup.
- **Simultaneous single pass rough and finish** – Axial and radial offsetting features allow for a wide range of stock conditions often resulting in a single-pass operation. Design also makes double cutter finishing and OD turning possible.
- **Easy-to-use rough and fine adjustment** – Rough adjustment gets you in the range and fine dial adjustment with .0001" graduations allows you to hold required tight tolerances.
- **Industry standard indexable inserts used in all Urma tools** – This means you can benefit from leading edge carbide grades and geometries for best performance and cost.
- **Two distinct connections** – Alpha Modul and Beta Modul® share the same advantages, creating the most rigid and versatile modular boring system available.
- **Beta Modul® is interchangeable with other systems** – This quick-change adaption is interchangeable with other systems, offering increased flexibility in converting to the Urma program.
- **Taper tolerance and balance that exceeds industry standards** – Provides less vibration and better repeatability. A variety of industry standard tapers manufactured to AT3 standard or better shank taper.
- **Complete assemblies provided** – All items include insert screws, cartridge screws, lock screws, and wrenches required for adjustments and securing inserts.
- **All tooling coolant through** – All individual tools and assemblies are coolant through unless noted.
- **Ask about our Tool Trial Program** – Try Command/Urma boring tools in your shop. We guarantee your toughest operation will become your most productive.



Setup for Simultaneous
Rough & Finish



Notes

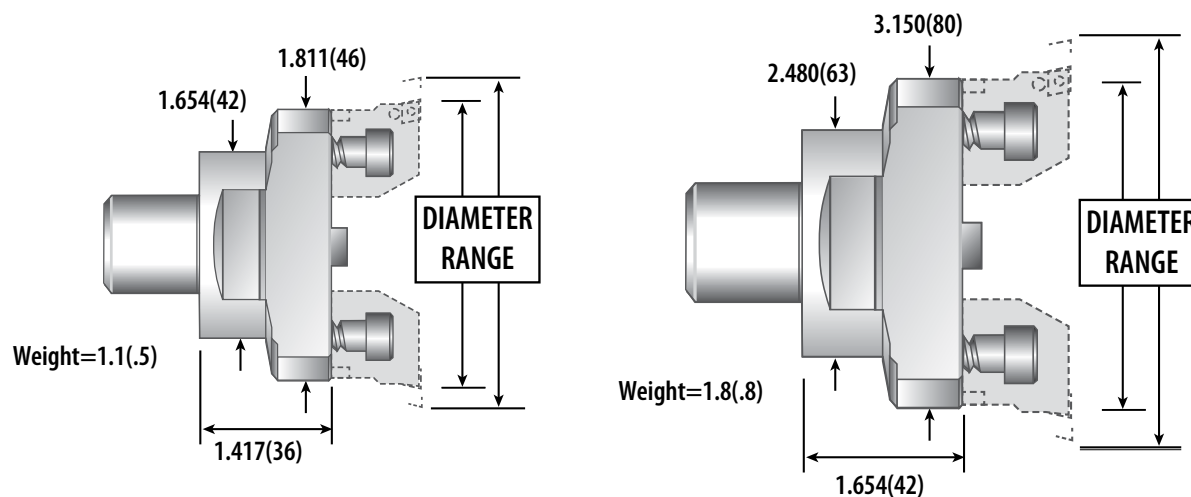
- For Toolholder Selection, Page 7 & 8.
- For Extension Selection, Page 9.

IntraMax™ Boring System Intermediate Adapters & Integral Shank Adapters

1.9-14" Boring (48.3-355.8)

.35-9.8" OD Turning (9-248.9)

- Rough and finish in a single pass or double cut rough or double cut finish for both ID's and OD's.
- Mount boring heads directly to intermediate adapter or use diameter extensions to increase bore diameter capability.
- Dimensions given in inches (mm).
- Weight given in lbs (kg).



Intermediate Adapters					
Alpha	Part No.	Diameter Range	Beta	Part No.	Diameter Range
Mount 4	21-42-46-036	1.929 – 2.441 (49-62)	40	B21-40-46-036	1.929 – 2.441 (49-62)
Mount 5	21-55-80-042	3.425 – 4.606 (87-117)	63	B21-63-80-042	3.425 – 4.606 (87-117)

Replacement Parts											
For Intermediate Adapter	Socket Head Screw	Spring Washer	Hex Key	Alpha Orient. Screw	Floating Assembly Pin	Orientation Pin	Drive Key	Socket Head Screw	Center Stud	Diameter Setting Pin	Assembly Wrench
	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	
21-42-46-036	C00-22-12	K00-02-01	G00-02-04	Z00-22-42						C00-12-08	53-00-36
21-55-80-042	C00-22-02	K00-02-20	G00-02-06	Z00-27-55					Z00-21-20		55-00-55
B21-40-46-036	C00-22-12	K00-02-01	G00-02-04		Z00-40-21	Z00-40-23	Z00-40-25	C00-22-58		C00-12-08	
B21-63-80-042	C00-22-02	K00-02-20	G00-02-06		Z00-63-21	Z00-63-23	Z00-63-25	C00-22-05	Z00-21-20		

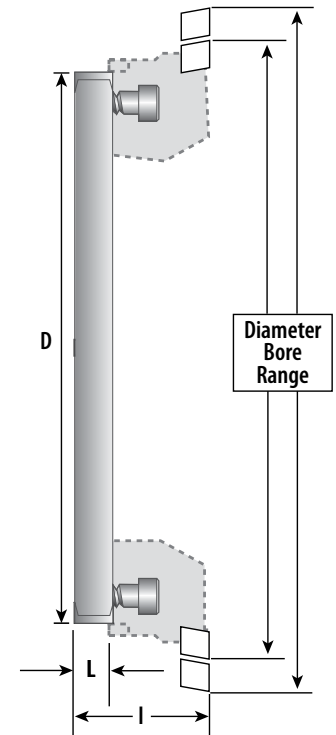
IntraMax™ Boring System Diameter Extenders & Outside Diameter Turning Blocks

1.9-14" Boring (48.3-355.8)
.35-9.8" OD Turning (9-248.9)

- Modular construction extends your boring capabilities.
- Lightweight, rigid design enables bore diameters up to 14" (355).
- Ground serrations on the mating faces make a rigid connection.
- Dimensions given in inches (mm).
- Weight given in lbs (kg).

Diameter Extenders

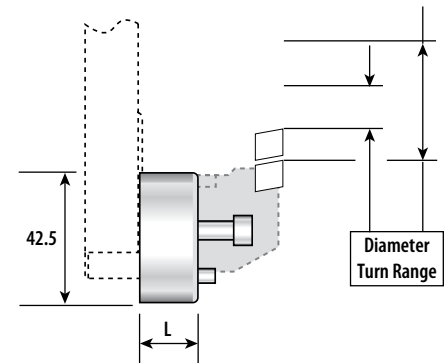
Alpha Mt. 4/Beta 40					
Part No.	Diameter Bore Range	D	L	I	Weight
1.9-2.441 (49-62) See Page 35.					
22-03-06-012	2.441-2.953 (62-75)	2.323 (59)	.472 (12)	1.574 (40)	.4 (.2)
22-03-07-012	2.953-3.465 (75-88)	2.835 (72)	.472 (12)	1.574 (40)	.7 (.3)
Alpha Mt. 5/Beta 63					
Part No.	Diameter Bore Range	D	L	I	Weight
3.425-4.606 (87-117) See Page 35.					
22-01-11-018	4.606-5.787 (117-147)	4.331 (110)	.709 (18)	2.283 (58)	1.8 (0.8)
22-01-14-018	5.787-6.968 (147-177)	5.512 (140)	.709 (18)	2.283 (58)	2.2 (1.0)
22-01-17-018	6.968-8.150 (177-207)	6.693 (170)	.709 (18)	2.283 (58)	2.6 (1.2)
22-01-20-023	8.150-9.330 (207-237)	7.875 (200)	.709 (18)	2.283 (58)	3.0 (1.3)
22-01-23-023	9.330-10.511 (237-267)	9.055 (230)	.709 (18)	2.283 (58)	3.5 (1.5)
22-01-26-028	10.511-11.692 (267-297)	10.236 (260)	.709 (18)	2.283 (58)	4.0 (1.8)
22-01-29-028	11.692-12.874 (297-327)	11.417 (290)	.709 (18)	2.283 (58)	4.5 (2.0)
22-01-32-028	12.874-14.055 (327-357)	12.599 (320)	.709 (18)	2.283 (58)	5.0 (2.3)



Outside Diameter Turning Blocks

- OD Turning Blocks allow cutting heads to be reversed for turning outside diameters while maintaining the rough adjustment system. When turning outside diameters, the Beta Modul® is recommended due to the requirement of running these tools in the counterclockwise rotation.

Alpha Mt. 4/Beta 40				
Turning Block Part No.	Diameter Turn Range	Required Diameter Extender Part No.	L	Weight
22-04-00-012	.354-.866 (9-22)	22-03-06-012	.472 (12)	.2 (.1)
22-04-00-012	.866-1.378 (22-35)	22-03-07-012	.472 (12)	.2 (.1)
Alpha Mt. 5/Beta 63				
Turning Block Part No.	Diameter Turn Range	Required Diameter Extender Part No.	L	Weight
22-02-00-018	0.354-1.535 (9-39)	22-01-11-018	.709 (18)	.6 (.3)
22-02-00-018	1.535-2.717 (39-69)	22-01-14-018	.709 (18)	.6 (.3)
22-02-00-018	2.717-3.898 (69-99)	22-01-17-018	.709 (18)	.6 (.3)
22-02-00-018	3.898-5.078 (99-129)	22-01-20-023	.709 (18)	.6 (.3)
22-02-00-018	5.078-6.259 (129-159)	22-01-23-023	.709 (18)	.6 (.3)
22-02-00-018	6.259-7.441 (159-189)	22-01-26-028	.709 (18)	.6 (.3)
22-02-00-018	7.441-8.622 (189-219)	22-01-29-028	.709 (18)	.6 (.3)
22-02-00-018	8.622-9.803 (219-249)	22-01-32-028	.709 (18)	.6 (.3)



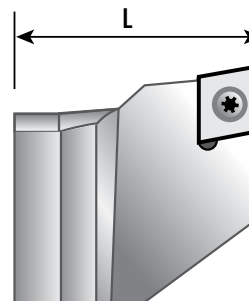
Replacement Parts				
For Alpha Mount	For Beta	Socket Head Screw	Spring Washer	Diameter Setting Pin
		Part No.	Part No.	Part No.
4	40	C00-22-12	K00-02-01	C00-12-16
5	63	C00-22-74	K00-02-20	C00-12-61

IntraMax™ Boring System Roughing Heads

1.9-14" Boring (48.3-355.8)

.35-9.8" OD Turning (9-248.9)

- Ground serrations on the mating faces make rigid connections. The result is stable performance and repeatability.
- Designed to use industry standard inserts. This gives you the ability to use the most current insert technology available. Let Command show you how much money can be saved by using the optimal insert for your application.
- Diameter adjustment of the roughing head is achieved by using a fine threaded set screw to push off of a roll pin installed in the diameter extender.
- Dimensions given in inches (mm).
- Weight given in lbs (kg).



Roughing Heads						
For Alpha Mount	For Beta	Part No.	Diameter	L	Weight	Insert
4	40	W17-02-09-028	1.929-3.465 (49-88)	1.102	.2 (.1)	CCMT-32.5...
5	63	W17-01-12-040	3.425-8.150 (87-207)	1.575	.7 (.3)	CNMM-43...

Insert Holder for Offset Roughing						
For Alpha Mount	For Beta	Part No.	Diameter	L	Weight	Insert
5	63	WV17-01-12-040	3.425-8.150 (87-207)	1.563	.7 (.3)	CN.. 1204..

Replacement Parts								
		Diameter Adjusting Screw	Hex Key	Insert Clamping Screw	Insert Wrench	Insert Shim	Insert Clamp	Clamping Screw
								
For Alpha Mount	For Beta	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.
4	40	C00-02-86	G00-02-01	Z00-20-02	G00-20-03			
5	63	C00-02-79	G00-02-02	Z00-12-02	G00-20-03	A00-12-11	A00-02-17	A00-32-07
5	63	C00-02-79	G00-02-02	Z00-12-02	G00-20-03	A00-12-11	A00-02-17	A00-32-07

Notes

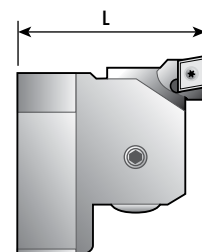
- Uses Industry Standard Inserts. Command Roughing Inserts, Page 47.

IntraMax™ Boring System Finish Boring Heads and Insert Cartridges

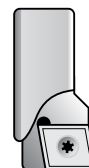
1.9-14" Boring (48.3-355.8)
.35-9.8" OD Turning (9-248.9)

- The IntraMax™ Fine Boring Head is simple and smooth to adjust. Adjustability is .0002" on diameter. Minimal backlash gives superior diameter adjustability.
- Designed to use industry standard inserts. This gives you the ability to use the most current insert technology available. Let Command show you how much money can be saved by using the optimal insert for your application.
- Ground serrations on the mating faces make rigid connections. The result is stable performance and repeatability.
- Diameter adjustment also available in metric increments (.01) upon request.
- Dimensions given in inches (mm).
- Weight given in lbs (kg).

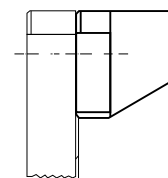
Finish Boring Head – insert cartridge sold separately					
For Alpha Mount	For Beta	Part No.	Diameter	L	Weight
4	40	23-02-11-028	1.929-3.465 (49-88)	1.102 (28)	.4 (.2)
5	63	23-01-11-040	3.425-8.150 (87-207)	1.575 (40)	.9 (.4)



Fine Boring Insert Cartridge			
For Alpha Mount	For Beta	Part No.	Insert
4	40	W20-12-06-000	CC..21.5..
5	63	W20-10-06-000	CC..21.5..
90° Insert Cartridge – axial and radial adjustment			
For Alpha Mount	For Beta	Part No.	Insert
4	40	W/C20-12-06-000	CC or CP.. 21.5..
5	63	W/C20-10-06-000	CC or CP.. 21.5..
95° Wiper Insert Cartridge – Double the feed rate!			
For Alpha Mount	For Beta	Part No.	Insert
4	40	WW20-12-06-000	WiperCC.. 21.5..
5	63	WW20-10-06-000	WiperCC.. 21.5..
*NOTE: Will Not Allow a Flat Bottom on the Pocket			



Counterweight – for balancing single point finishing assembly		
For Alpha Mount	For Beta	Part No.
4	40	23-02-10-024
5	63	23-01-10-036



Replacement Parts									
	Adjusting Screw	Hex Key	Cap Screw	Spring Washer	Hex Key	Height Adj. Screw Set	Height Adj. Screw	Torque Screw	Torque Wrench
									
For Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.
23-02-10-028	C00-02-86	G00-02-01	C00-22-56	K00-02-44	G00-02-03	C00-25-01	Z00-23-02		
23-01-10-040	C00-02-79	G00-02-02	C00-22-11	K00-02-01	G00-02-03	C00-07-01	Z00-23-02		
W/C-20-10-06-000								C00-20-01	G00-20-05
W/C-20-12-06-000								C00-20-01	G00-20-05

Notes

- Finish Insert Pocket Detail, Page 6.
- Uses Industry Standard Inserts. Command Finishing Inserts, Pages 48 & 49.

IntraMax™ Boring System Unique Applications

1.9-14" Boring (48.3-355.8)

.35-9.8" OD Turning (9-248.9)

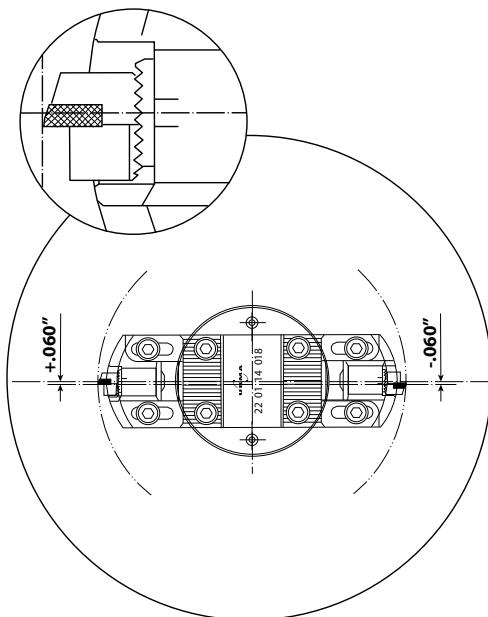
Double Cutter Finishing (Adding the 3rd Dimension):

Everyone has heard the benefits that double cut roughing has to offer: The balancing of cutting pressures, the doubling of feed rates, the improved roundness, and surface finishes. Now, these benefits can be applied to your finishing operations. The IntraMax™ System allows the use of two finishing heads, but also has the ability to be oriented and withdrawn without leaving draglines.

The IntraMax™ Fine Boring Head allows the insert cartridge to be adjusted in three dimensions:

- x = diameter setting
- z = distance from spindle
- y = above or below centerline (in lathe terms).

Because of this ability to adjust above or below centerline, we can now preset the tool to be removed from the bore without leaving draglines.



In assembly, one of the cartridges is set below centerline and the other is set above centerline (see diagram).

Now, preset the tool for size as you would any other boring tool.

This assembly technique has removed the cutting edges from the centerline so that when the boring operation is complete, the tool can be oriented, the cutting edges jogged back to centerline, and removed from the bore without scratching the bore wall.

This clever design feature dramatically reduces cycle times while not diminishing accuracy or repeatability. A true boring breakthrough!

Rough and Finish Boring Simultaneously:

The IntraMax™ System offers dramatic cycle time reductions in production by allowing the setup of one roughing head along with a finishing head. This not only reduces the cycle time but also saves the cost of purchasing two separate tools. This reduction of cycle time and tool savings create an unequalled advantage for IntraMax™ when boring holes in production!

To set the tooling correctly, we attempt to balance the cutting pressures slightly by taking a heavier than usual finishing depth of cut. Ideally, the roughing pass should not exceed .060"-.070" per side and then leave .020"-.030" for the finishing pass. This means that the total material removal should be .150"-.200" on diameter (.080"-.100" radially). Keep in mind that the finishing insert cartridge can be adjusted in all three planes, so we can be sure that the roughing insert leads the finishing insert by at least .006".

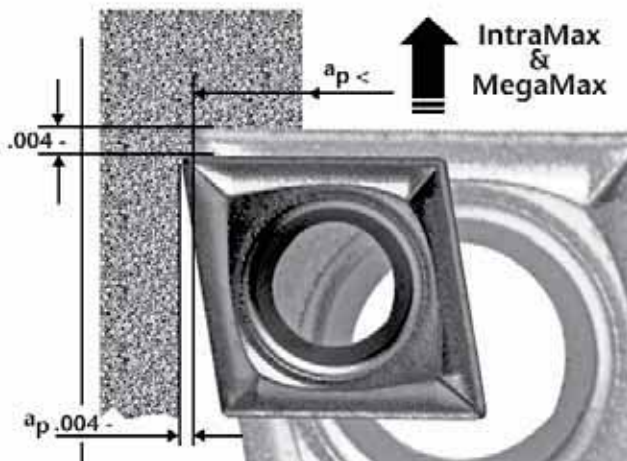
The height differential is defined by the size of the insert nose radius being used. We recommend the roughing head use a .016" nose radius insert while the finishing head uses an insert with a .032" nose radius. This allows us to operate at a feed rate of .006"-.008" per rev. feed rates and achieve a 32 micro-inch surface quality. This ability to combine operations is unique to the IntraMax™ System. Nowhere else can accuracy and efficiency be so dramatic!



MegaMax™ Boring System:

- **Flexibility for the toughest jobs with a boring tool that delivers all the power your machine has available** – MegaMax™ offers unprecedented flexibility that allows you to bore a wide range of diameters – with varied stock conditions – using very few components.
- **Only 6 components per assembly required to bore starting under 6" to over 31" in diameter** – reaching 11.8" deep – with over .500" stock per side.
- **Easy-to-use rough and fine adjustment** – Rough adjustment gets you in the range and fine dial adjustment with .0001" graduations allows you to hold required tight tolerances.
- **Axial and radial offsetting features allow for a wide range of stock conditions** – Often resulting in a single-pass operation.
- **Industry standard indexable inserts offered for Urma tools** – This means you can benefit from leading edge carbide grades and geometries for best performance and cost; $\frac{3}{8}$ " I.C. roughing inserts and $\frac{1}{4}$ " I.C. finishing inserts for the most rugged assemblies in the industry.
- **Two distinct connections** – Alpha Modul and Beta Modul® share the same advantages, creating the most rigid and versatile modular boring system available.
- **Beta Modul® is interchangeable with other systems** – This quick-change adaption is interchangeable with other systems, offering increased flexibility in converting to the Urma program.
- **Taper tolerance and balance that exceeds industry standards** – Provides less vibration and better repeatability. A variety of industry standard tapers manufactured to AT3 or better shank taper.
- **Complete assemblies provided** – All items include insert screws, cartridge screws, lock screws, and wrenches required for adjustments and securing inserts.
- **All tooling coolant through** – All individual tools and assemblies are coolant through unless noted.
- **Ask about our Tool Trial Program** – Try Command/Urma boring tools in your shop. We guarantee your toughest operation will become your most productive.

To rough and finish bore simultaneously,
setup with Axial & Radial offsets.



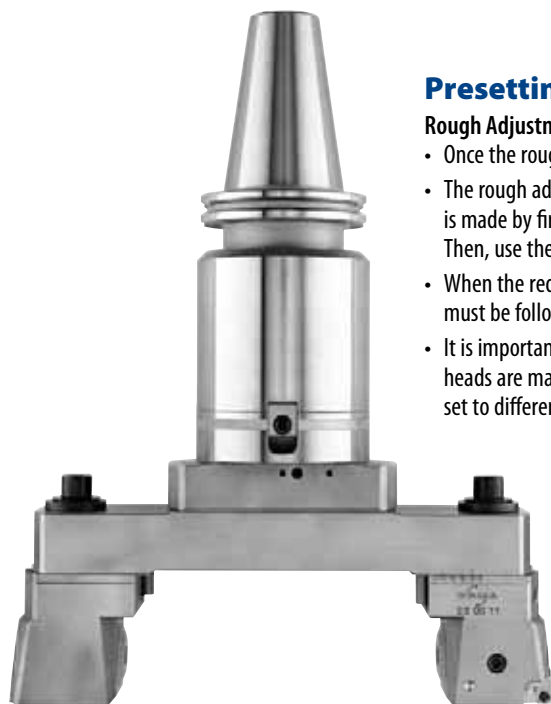
Assembling the Boring Heads to the Diameter Extenders

After assembling the Intermediate Adapter to the holder or extensions that are required (see Keyed Connection Assembly on page 4 if using Alpha Modul), attach the diameter extender to the Intermediate Adapter by using the four cap screws supplied.

1. Next, the boring heads have to be installed onto the diameter extenders. The boring heads are fixed to the diameter extenders by the use of T-bolts. The T-bolts need to be lifted up and turned 90° to allow the heads to be slid onto them and rotated back to align the ground serrations. Then, tighten the T-bolts down to drive the serrations together for maximum rigidity.
2. If the diameter extender is intended to bore eight inches or less, the side lock screw needs to be completely removed before the T-bolt can be turned or lifted enough to slide the boring heads on. Remember which way the T-bolt was rotated or the side lock screw will not completely thread back into the diameter extender.
3. If the diameter extender is designed for eight inches or larger bores, the T-bolts are raised and lowered by the large cap screws on the backside of the extenders.

In either case, the T-slot milled into the heads is not milled through. This is to prevent the heads from being thrown from the tool should they not be installed fully tight. Keep in mind that this safety feature does not apply should the heads be installed to create an outside diameter turn.

PLEASE FOLLOW THESE ASSEMBLY DIRECTIONS CAREFULLY!



Presetting the Boring Heads

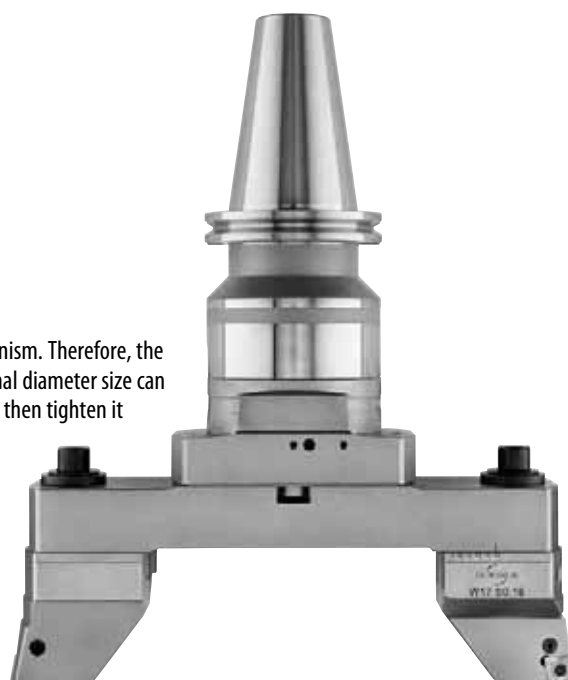
Rough Adjustment

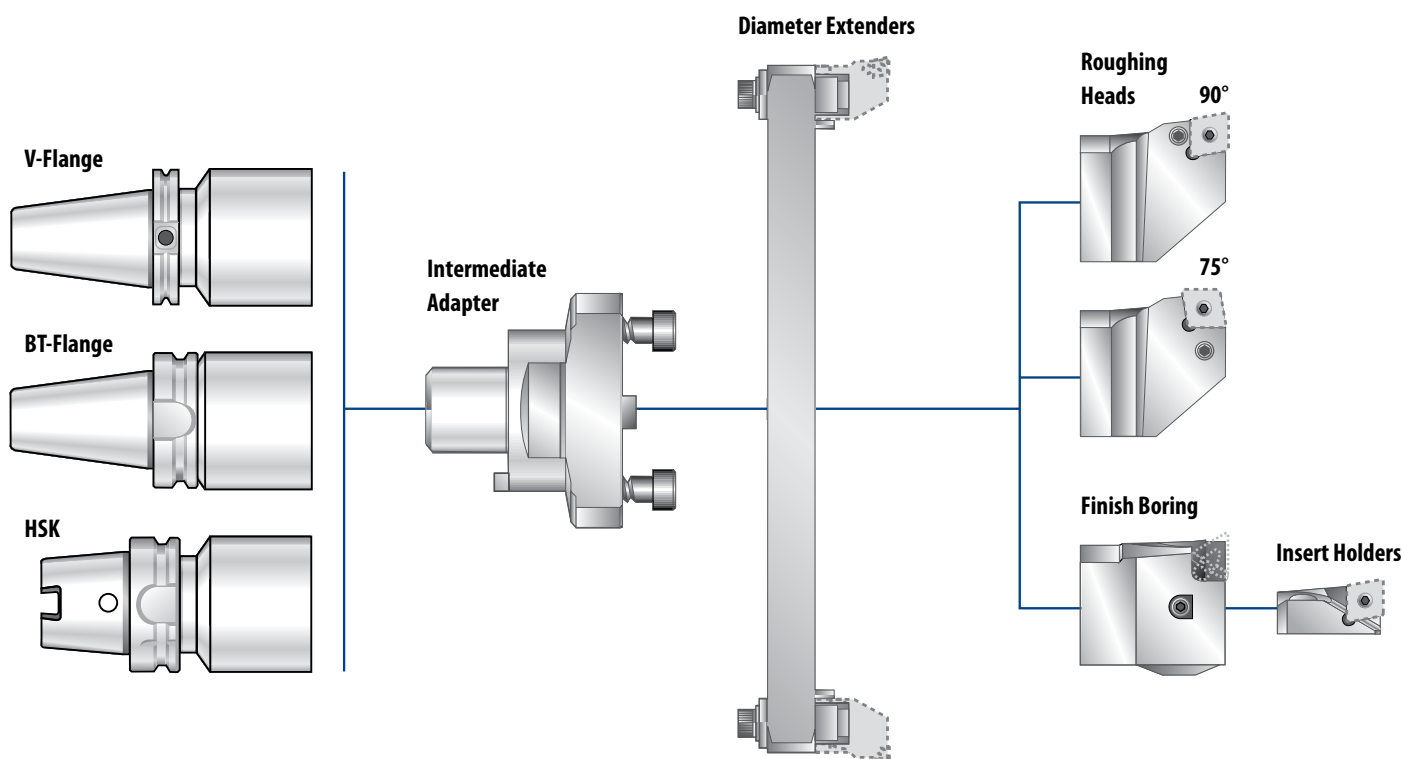
- Once the roughing heads are installed onto the diameter extender, they will have to be adjusted for size.
- The rough adjustment screw is located below the insert cartridge or the insert pocket. The adjustment is made by first loosening the T-bolt enough so that the adjustment screw can push the head off center. Then, use the screw to make the required adjustment.
- When the required size is met, fully lock the T-bolt down. After adjusting one side, the same procedure must be followed again on the other head.
- It is important to note that when roughing, the two heads must be set to the same diameter. The roughing heads are made such that they match in height. Therefore, one cannot lead the other and should not be set to different diameter settings.

Finish Size Adjustment

The finishing heads are designed such that there is limited travel in the fine adjustment mechanism. Therefore, the rough adjustment setting has to be within .079" (2) of the finish dimension. From there, the final diameter size can be set with .0002" diametrical accuracy. Just loosen the locking set screw to adjust the dial and then tighten it down after size has been set.

MegaMax™ does have the ability to install two finishing heads on one assembly. This allows you to double the feed rate in a finishing operation. It is for this application that the insert cartridges come with the ability to adjust the height of the cutting edge with respect to the other. When presetting two finishing heads, this is a dimension that you will want to verify.





Notes

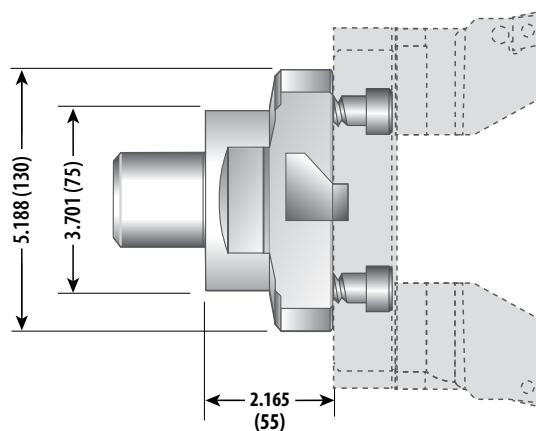
- For Extensions & Reducers, Page 9 & 10.
- Toolholders, Page 7 & 8.

MegaMax™ Boring System Intermediate Adapters & Bore Depth Extensions

5.9-31.7" (150-805)

Intermediate Adapters

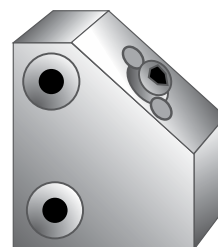
- Just one adapter connects toolholders to all bore diameter extenders on the following page – from 6" to 31" – for maximum flexibility.
- Toolholder locks into adapter with a large key to assure rigidity and nonslip transmittal of spindle torque; cuts smoother, inserts last longer.
- Through-spindle coolant flows through adapter and coolant nozzle to remove heat and help clear chips.
- Coolant nozzle directs coolant directly to cutting edge. Ball valve is adjustable to cover all diameters.
- Dimensions given in inches (mm).
- Weight given in lbs (kg).



Alpha Modul			
Mount	Part No.	Length	Weight
7	21-94-01	2.165 (55)	9.5 (4.3)

Beta Modul®			
Beta	Part No.	Length	Weight
100	B21-100-01-055	2.165 (55)	10.4 (4.7)

Optional Coolant Nozzle
Part No.
Z00-21-10



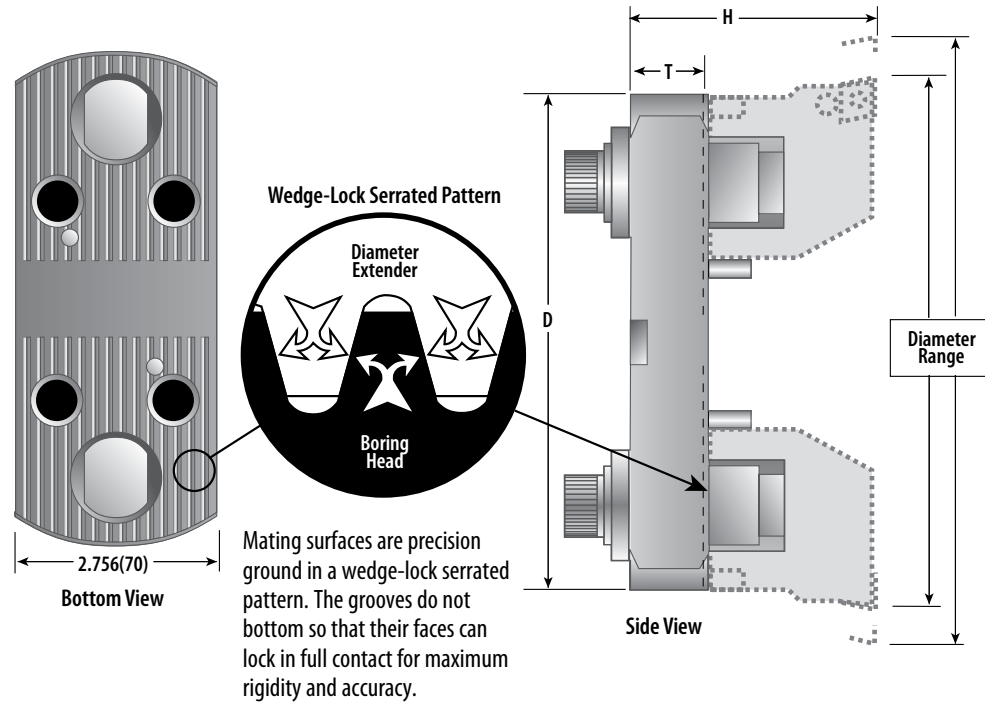
Replacement Parts									
Floating Assembly Pin	Orientation Pin	Beta Orientation Key	Socket Head Screw	Alpha Orientation Key	Socket Head Screw	Face Key	Socket Head Screw	Socket Head Screw	Assembly X-Wrench
									
Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.
Z00-100-21	Z00-100-23	Z00-100-25	C00-22-71	Z00-00-94	C00-24-17	Z00-21-02	C00-22-11	C00-22-03	53-74-96

Notes

- Straight Shank Beta Modul® Toolholders For Lathes, Page 6.
- Blank Bars With Beta Modul® Connection, Page 58.

Diameter Extenders

- Double cutter operation capable in roughing and finishing. Two cutters balance the assembly as well as the cutting pressures for smooth, vibration-free boring up to 3250 surface feet.
- All assembly surfaces utilize ground serrations for maximum rigidity. Large cap screws hold components together tightly for faultless transmission of torques and cutting forces.



Diameter Extenders					
Diameter Range	Part No.	D	T	H	Weight
5.906- 8.000 (150-205)	22-00-13	5.118 (130)	1.181 (30)	4.134 (105)	3.96 (1.8)
7.874-10.039 (200-255)	22-00-18	7.087 (180)	1.181 (30)	4.134 (105)	5.72 (2.6)
9.843-12.008 (250-305)	22-00-23	9.055 (230)	1.378 (35)	4.331 (110)	8.80 (4.0)
11.811-13.976 (300-355)	22-00-28	11.024 (280)	1.378 (35)	4.331 (110)	11.00 (5.0)
13.780-15.945 (350-405)	22-00-33	12.992 (330)	1.575 (40)	4.528 (115)	14.96 (6.8)
15.748-17.913 (400-455)	22-00-38	14.961 (380)	1.575 (40)	4.528 (115)	17.38 (7.9)
17.717-19.882 (450-505)	22-00-43	16.929 (430)	1.575 (40)	4.528 (115)	19.80 (9.0)
19.685-21.850 (500-555)	22-00-48	18.898 (480)	1.772 (45)	4.724 (120)	25.08 (11.4)
21.654-23.819 (550-605)	22-00-53	20.866 (530)	1.772 (45)	4.724 (120)	27.94 (12.7)
23.622-25.787 (600-655)	22-00-58	22.835 (580)	1.772 (45)	4.724 (120)	30.80 (14.0)
25.591-27.756 (650-705)	22-00-63	24.803 (630)	1.772 (45)	4.724 (120)	33.66 (15.3)
27.559-29.724 (700-755)	22-00-68	26.772 (680)	1.772 (45)	4.724 (120)	36.52 (16.6)
29.528-31.693 (750-805)	22-00-73	28.740 (730)	1.772 (45)	4.724 (120)	39.38 (17.9)

Replacement Parts						
	T-Lock Stud	Adjustment Pin	Locking Set Screw	Shim Washer	Socket Head Screw	Spring Washer
For Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.
22-00-13 to 18	Z00-22-24	Z00-22-21	Z00-22-23			
22-00-23 to 28	Z00-22-16	Z00-22-21		Z00-22-15	C00-24-04	K00-02-06
22-00-33 to 43	Z00-22-16	Z00-22-21		Z00-22-15	C00-24-07	K00-02-06
22-00-48 to 73	Z00-22-16	Z00-22-21		Z00-22-15	C00-26-09	K00-02-06

- Roughing heads adjust by fine threaded adjustment screw; cutting inserts mount directly on heads.
- Two heads are needed, one for each end of the diameter extender. This results in a double cutter design that doubles feed rate, balances masses, and balances cutting pressures.
- Designed to use industry standard inserts. This gives you the ability to use the most current insert technology available. Let Command show you how much money can be saved by using the optimal insert for your application.

Insert Holder 90° for Offset Roughing

Part No.	Diameter Range	L	Weight	Insert	ap
WV17-00-12P	6-31.7 (150-805)	2.941 (74.7)	3.3 (1.5)	CN.. 1204..	0.236 (6)
WV17-00-16P	6-31.7 (150-805)	2.941 (74.7)	3.3 (1.5)	CN.. 1606..	0.315 (8)

Insert Holder 90°

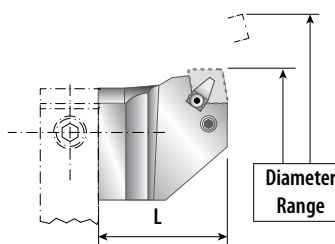
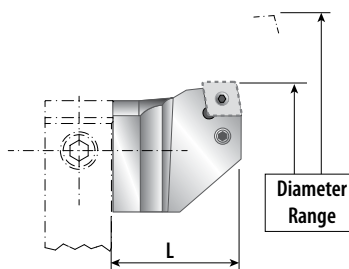
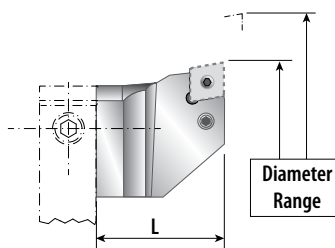
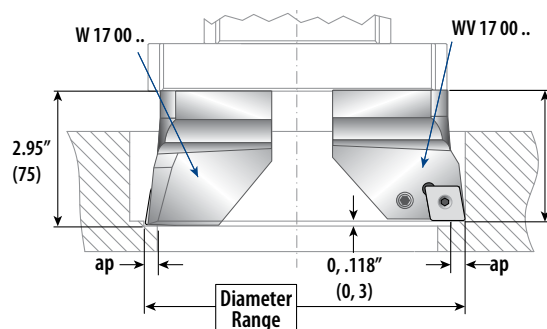
Part No.	Diameter Range	L	Weight	Insert
W17-00-12P	6-31.7 (150-805)	2.953 (75)	3.3 (1.5)	CNMM-43...
W17-00-16P	6-31.7 (150-805)	2.953 (75)	3.3 (1.5)	CNMG-54...

Insert Holder 75°

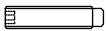
Part No.	Diameter Range	L	Weight	Insert
W19-00-12P	6-31.7 (150-805)	2.953 (75)	3.3 (1.5)	CNMM-43...
W19-00-16P	6-31.7 (150-805)	2.953 (75)	3.3 (1.5)	CNMG-54...

Insert Holder 75° for Ceramic Inserts

Part No.	Diameter Range	L	Weight	Insert
K19-00-15	6-31.7 (150-805)	2.953 (75)	3.3 (1.5)	SN.. 1507..



Replacement Parts

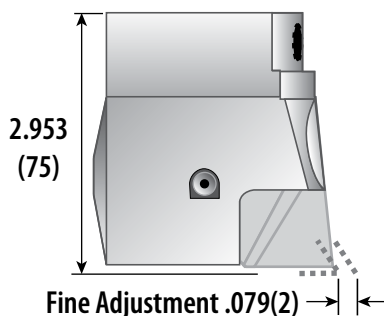
Insert	Rough Adjustment Screw	Rough Adjustment Hex Key	Carbide Shim	Insert Clamping Screw	Insert Wrench	Insert Clamp	Clamping Screw
							
	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.
CN.. 1204	C00-02-17	G00-02-06	A00-12-11	Z00-16-02	G00-20-03	A00-02-17	A00-32-07
CN.. 1606	C00-02-17	G00-02-06	A00-12-12	Z00-16-03	G00-20-03	A00-02-16	A00-32-08
SN.. 1507	C00-02-17	G00-02-06	A00-12-18			A00-02-14	A00-42-05

Notes

- Uses Industry Standard Inserts.
Command Roughing Inserts, Page 47.

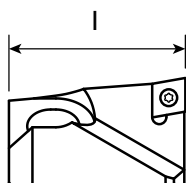
- Unique Urma boring heads are adjustable for both diameter and length. Two heads may be used, one for each end of the diameter extender. This results in a double cutter design that doubles feed rate, balances masses, and balances cutting pressures.
- Finishing heads preset on the serrations and micro-set by graduated dial to .0002" diameter. Choice of triangular or 80° diamond insert holders.
- Designed to use industry standard inserts. This gives you the ability to use the most current insert technology available. Let Command show you how much money can be saved by using the optimal insert for your application.

Finish Boring Head – one size covers all applications. (Insert cartridge sold separately.)

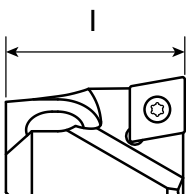


Finish Boring Head	
Part No.	Weight
23-00-11	5.0 (2.3)

Replacement Parts (Finish Boring Head)			
Rough Adjustment Screw	Rough Adjustment Hex Key	Diameter Locking Screw	Insert Cartridge Screw
Part No.	Part No.	Part No.	Part No.
C00-02-17	G00-02-06	Z00-23-01	C00-23-01

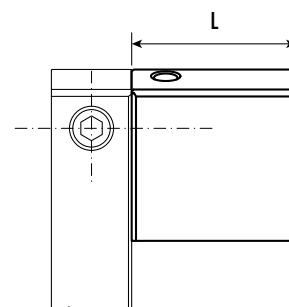


Fine Boring Insert Holder 90°		
Part No.	L	Insert
W/C20 00 06	1.339 (34)	CP../CC..21.5
W20-00-09	1.339 (34)	CC..32.5
Insert Cartridge 95° Wiper		
Part No.	L	Insert
WW20 00 09	1.339 (34)	Wiper CC..32.5



Roughing-Finishing-Process (RFP) Insert Holder 90°		
Part No.	L	Insert
W20 00 09RFP	1.221 (31)	CC.. 32.5
Insert Cartridge 95° Wiper		
Part No.	L	Insert
WW20 00 09RFP	1.221 (31)	Wiper CC.. 32.5

Counterweight for balancing single point finishing assembly

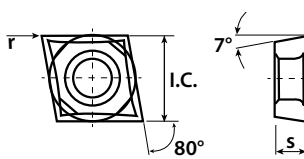
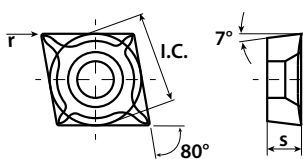
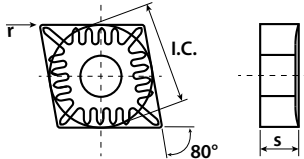


Counterweight	
Part No.	Weight
23-10-10	4.9 (2.3)

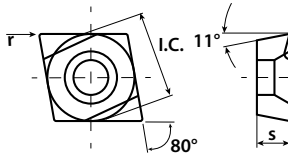
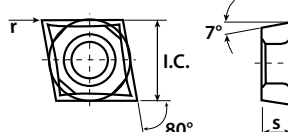
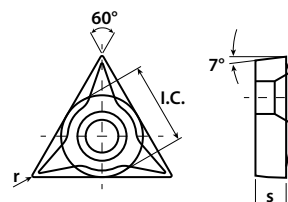
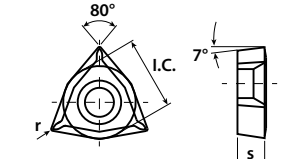
Replacement Parts (Insert Cartridges)							
For Insert Cartridges	Height Adj. Screw	Adjustment Hex Key	Torque Screw	Insert Torque Wrench	Insert Clamp	Cap Screw	Hex Key
	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.
CC.. 32.5.	C00-02-12	G00-02-02	C00-20-02	G00-20-03			
TP22..	C00-02-12	G00-02-02			A00-02-11	C00-22-30	G00-02-03
CC../CP.. 21.5.	C00-02-12	G00-02-02	C00-20-04	G00-20-05			
CC .. 32.5.	C00-02-12	G00-02-02	C00-20-02	G00-20-03			

Notes

- Finish Insert Pocket Detail, Page 6.
- Uses Industry Standard Inserts. Command Finishing Inserts, Pages 48 & 49.

Adapts to Insert holders	Insert Part No.	Description	Insert Dimensions			
			I.C.	Thickness (s)	Radius (r)	
High Positive Roughing Inserts						
		MicroMax™, VersaMax™				
W16..06 W18..06	CCGT-21.51-UC	High Positive Uncoated Carbide CCGT060204	0.250	0.094	0.016	
		VersaMax™				
W16..09 W18..09	CCGT-32.52-UC	High Positive Uncoated Carbide CCGT09T308	0.375	0.156	0.031	
Positive Roughing Inserts						
		MicroMax™, VersaMax™				
W16..06 W18..06	CCMT-21.51-CVC	CVD Coated Carbide CCMT060204	0.250	0.094	0.016	
	CCMT-21.52-CVC	CVD Coated Carbide CCMT060208	0.250	0.094	0.031	
	CCMT-21.52-UC	Uncoated Carbide CCMT060208	0.250	0.094	0.031	
		VersaMax™, IntraMax™				
W16..09 W18..09	CCMT-32.51-CVC	CVD Coated Carbide CCMT09T304	0.375	0.156	0.016	
	CCMT-32.52-CVC	CVD Coated Carbide CCMT09T308	0.375	0.156	0.031	
	CCMT-32.52-UC	Uncoated Carbide CCMT09T308	0.375	0.156	0.031	
Negative Roughing Inserts						
		VersaMax™, IntraMax™				
W16-10-12P W18-10-12P W17-12...	CNMG-431-CVC	CVD Coated Carbide CNMG120404	0.500	0.187	0.016	
	CNMG-431-UC	Uncoated Carbide CNMG120404	0.500	0.187	0.016	
	CNMG-432-CVC	CVD Coated Carbide CNMG120408	0.500	0.187	0.031	
	CNMG-432-UC	Uncoated Carbide CNMG120408	0.500	0.187	0.031	
		VersaMax™, MegaMax™				
W17..16 W18..16	CNMG-542-CVC	CVD Coated Carbide CNMG160608	0.625	0.250	0.031	
	CNMG-542-UC	Uncoated Carbide CNMG160608	0.625	0.250	0.031	
	CNMM-543-CVC	CVD Coated Carbide CNMG160612	0.625	0.250	0.047	
	CNMG-543-UC	Uncoated Carbide CNMG160612	0.625	0.250	0.047	

Adapts to Insert Holders	Insert Part No.	Description	Insert Dimensions		
			I.C.	Thickness (s)	Radius (r)
High-Positive Ground Finishing Inserts					
		MicroMax™, VersaMax™, IntraMax™			
W/C06 16.. W20..06 HW/C 06..	CCGT-21.50.04-UC	Uncoated Carbide CCGT060201	0.250	0.094	0.004
	CCGT-21.50.04-UM	Uncoated Cermet CCGT060201	0.250	0.094	0.004
	CCGT-21.50-UC	Uncoated Carbide CCGT060202	0.250	0.094	0.008
	CCGT-21.50-UM	Uncoated Cermet CCGT060202	0.250	0.094	0.008
	CCGT-21.51-UM	Uncoated Cermet CCGT060204	0.250	0.094	0.016
		VersaMax™, MegaMax™			
W20-06-09 W20-00-09	CCGT-32.51-UC	Uncoated Carbide CCGT09T304	0.375	0.156	0.016
	CCGT-32.51-UM	Uncoated Cermet CCGT09T302	0.375	0.156	0.016
High-Positive Ground Finishing Inserts					
		MicroMax™, VersaMax™, IntraMax™			
W20-02-06	CCGT-21.51-UC	Uncoated Carbide CCGT060204	0.250	0.094	0.016
		VersaMax™, MegaMax™			
W20-06-09	CCGT-32.50-UC	Uncoated Carbide CCGT09T302	0.375	0.156	0.008
PCD Finishing Inserts					
		MicroMax™, VersaMax™, IntraMax™			
W/C20-02-06 W/C20-04-06	CPMW-21.50-PCD	PCD Diamond CPMW060202	0.250	0.094	0.008
	CPMW-21.51-PCD	PCD Diamond CPMW060204	0.250	0.094	0.016
		VersaMax™, MegaMax™			
W20-06-09	CCMW-32.51-PCD	PCD Diamond CCMW09T304	0.375	0.156	0.016
Coated Finishing Inserts					
		MicroMax™, VersaMax™, IntraMax™			
W20-02-06 W20 04..	CCMT-21.51-CVC	CVD Carbide CCMT060204	0.250	0.094	0.016
	CCMT-21.51-PVM	PVD Cermet CCMT060204	0.250	0.094	0.016
		VersaMax™, MegaMax™			
W20-02-09 W20-00-09	CCMT-32.50-PVM	PVD Cermet CCMT09T302	0.375	0.156	0.008
	CCMT-32.51-CVC	CVD Carbide CCMT09T304	0.375	0.156	0.016
	CCMT-32.51-PVM	PVD Cermet CCMT09T304	0.375	0.156	0.016
Positive Wiper Finishing Inserts					
		VersaMax™, IntraMax™			
WW20-02-06 WW20-04-06 WW20-12-06-000	CCMT-21.51-UCW	Uncoated Carbide CCMT2 (1.5)1-KF	0.250	0.094	0.016
		VersaMax™, IntraMax™			
WW20 10-06-000 WW20-06-09	CCMT-32.51-UCW	Uncoated Carbide CCMT3 (2.5)1-KF	0.375	0.156	0.016

Adapts to Insert Holders	Insert Part No.	Description	Insert Dimensions			
			I.C.	Thickness (s)	Radius (r)	
High-Positive Ground Finishing Inserts						
		MicroMax™, VersaMax™, IntraMax™				
W/C20-02-06 W/C-06-16.. HW/C 06..	CPGT-21.50.04-PVM	PVD Coated Cermet CPGT060201	0.250	0.094	0.004	
	CPGT-21.50.04-UC	Uncoated Carbide CPGT060201	0.250	0.094	0.004	
	CPGT-21.50-UC	Uncoated Carbide CPGT060202	0.250	0.094	0.008	
	CPGT-21.50-UM	Uncoated Cermet CPGT060202	0.250	0.094	0.008	
High-Positive Finishing Inserts						
		MicroMax™, VersaMax™, IntraMax™				
W/C20-02-06 W/C-06-16.. HW/C 06..	CPMT-21.50-CVC	CVD Coated Carbide CPMT060202	0.250	0.094	0.008	
	CPMT-21.50-UM	Uncoated Cermet CPMT060202	0.250	0.094	0.008	
	CPMT-21.51-CVC	CVD Coated Carbide CPMT060204	0.250	0.094	0.016	
	CPMT-21.51-PVM	PVD Coated Cermet CPMT060204	0.250	0.094	0.016	
	CPMT-21.51-UC	Uncoated Carbide CPMT060204	0.250	0.094	0.016	
	CPMT-21.51-UM	Uncoated Cermet CPMT060204	0.250	0.094	0.016	
Screw-Down Triangular Inserts						
		MicroMax™, VersaMax™				
20-02-16	TCMT-520-UC	Uncoated Carbide TCMT06T102	0.156	0.094	0.008	
	TCMT-520-UM	Uncoated Cermet TCMT06T102	0.156	0.094	0.008	
	TCMT-521-CVC	CVD Coated Carbide TCMT06T104	0.156	0.094	0.016	
	TCMT-521-UM	Uncoated Cermet TCMT06T104	0.156	0.094	0.016	
Trigon Finishing Inserts						
		MicroMax™				
H06...	WCMT-020102-CVC	CVD Coated Carbide WCMT020102	0.156	0.063	0.008	
	WCMT-020102-UC	Uncoated Carbide WCMT020102	0.156	0.063	0.008	
	WCMT-020102-UM	Uncoated Cermet WCMT020102	0.156	0.063	0.008	

Feed Rates

Finishing: For a 32 RMS finish, your advance per revolution should be from $\frac{1}{4}$ - $\frac{1}{3}$ of the nose radius on your finishing insert.

NOTE: The larger the radius, the better the finish. But above .016" insert radius on bores under 2.0" diameter may cause deflection or chatter due to excessive tool pressure.

Example:	Nose Radius	Feed Rate	
	.004"	.001" - .0015" ipr	(ipr = inches per revolution or advance per revolution)
	.008"	.002" - .003" ipr	
	.016"	.004" - .005" ipr	

Roughing: When using any of the Urma tools without extensions or reducers, start with suggested chip loads listed below and increase your feed rate until you start breaking the chip.

Example:	MicroMax™	Tools .003" api	
	VersaMax™	Tools .005" api	(api = advance per insert)
	IntraMax™	Tools .008" api	
	MegaMax™	Tools .010" api	

Calculating RPM:

SFM (surface feet per minute) is how you are assured of running all of your tools no matter what the size at the proper RPM for the material you are cutting.

Example:

Look up the suggested SFM listed below for the material you are cutting. Medium Carbon Steel 500 SFM for a 2.5" diameter boring bar. Formula for computing the RPM is:

$$\text{RPM} = (3.82 \times \text{SFM}) / \text{tool diameter}, \text{RPM} = (3.82 \times 500) / 2.5 = 764 \text{ RPM}$$

If you know the RPM of an existing cutter that is running well in your material but is a different diameter, you can compute the SFM of the tool and use that to figure the proper RPM for the new tool.

4.0" dia. tool running at 350 rpm and you want to run a 1.75" tool Formula for computing the SFM is:

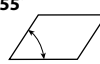
$$\text{SFM} = .262 \times \text{D} \times \text{RPM}, \text{SFM} = .262 \times 4.0 \times 350 = 366 \text{ SFM}$$

To compute the proper RPM for your new 1.75" tool, you use the above formula $(3.82 \times 366) / 1.75 = 798 \text{ RPM}$

Surface Speeds

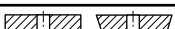
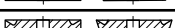
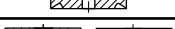
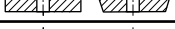
Work material		Carbide Grades				
		CVD	PCD	PVD	UC	UM
Carbon Steels	Low	650-1200		600-1000		1000-1500
	Medium	500-900		500-900		600-1200
	High	300-600				500-900
Alloy Steels	4000	400-700		500-900		600-900
	8000	350-900		600-1000		600-900
Stainless Steels	200/300	200-600		450-800	200-500	500-900
	400/500	300-750		350-500	300-600	500-900
Cast Iron Ductile/ Nodular		400-1000		300-500	350-500	800-1200
		400-800			200-400	700-900
Aluminum			1500-3500		1000-2000	1000-2000

C	P	G	T	4	3	2	CVC
1	2	3	4	5	6	7	8

(1) Insert shape and inscribed angle E_r	C 80° 	K 55° 	S 	T 	W 80° 
--	--	--	---	--	--

(2) Clearance angle at the main cutter a_n	B 	C 	P 	N 	O Other clearance angles
--	--	--	---	--	---------------------------------

(3) Tolerances (s and I.C.)		Class S	I.C.	
	G	$\pm .001$		
	M	$\pm .002 - .006$		
	U	$\pm .003 - .010$		
	Inscribed Circle I.C.		Tolerance Class	
			M	U
	5/32			
	7/32			
	1/4		$\pm .002$	$\pm .003$
	3/8			
	1/2		$\pm .003$	$\pm .005$
	5/8		$\pm .004$	$\pm .007$
	3/4		$\pm .005$	$\pm .010$
	1			

(4) Index Types			
N		Q	
R		U	
F		B	
A		H	
M		C	
G		J	
W		X	Special
T			

(5) Insert Size = Length of Cutting Edge				
I.C. Inch	C	S	T	W
				
5/32			5	02
7/32			7	
1/4	2		2	
3/8	3	3	3	06
1/2	4	4	4	08
5/8	5	5	5	
3/4	6	6	6	
1	8	8		

(6) Insert Thickness (s)

(1.5)	=	.094	=	3/32
2	=	.125	=	1/8
(2.5)	=	.156	=	5/32
3	=	.188	=	3/16
4	=	.250	=	1/4

(7) Apex Radius (r)

0.04	=	.004
0	=	.008
1	=	.016
2	=	.031
3	=	.047
4	=	.063

(8) Grade Descriptions

CVC Chemical Vapor Deposition Coated Inserts (CVD). This is the most common process of coating inserts. CVD coated inserts tend to be less expensive, mostly due to geometry tolerance. The coating process requires a honed edge or "land" on the cutting edge. While this adds strength, it makes it difficult to take light depths of cut. Our inserts are about as positive as any CVD coated inserts available, but are still limited in their application. This would be the "general purpose" grade.

Roughing: The coatings are typically triple coated consisting of layers of TiCN, AlO, and TiN.

Finishing: The coatings are typically coated with AlO+ TiN, or AlO+TiCN

PCD Poly-Crystalline Diamond. Industrial diamond tipped inserts primarily for finishing aluminum, brass, and plastics. PCD inserts improve surface finish and surface speed capability while increasing tool life dramatically.

PVM Physical Vapor Deposition Coated Cermet (PVD). This process allows for sharper cutting edges, which allows for light depths of cut. The coating helps preserve the cutting edge by deflecting the heat and adding lubricity. This allows the insert to last longer. Cermets are noted for their superior surface finish when cutting steels. The sharp edge inserts have a single coating of TiN. The .016" nose radius inserts have a double coating consisting of TiAlN+TiN.

UC Uncoated Carbide. Primarily used in roughing and finishing of aluminum, copper, plastics, and other nonferrous materials. The "G" tolerance inserts are very aggressive, high positive, ground inserts. Even the roughing inserts have aggressively positive chip breakers for semi-finish or light roughing operations. The "M" tolerance class of inserts are standard pressed inserts.

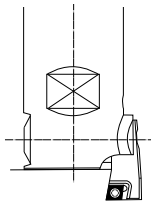
UM Uncoated Cermet. Ideal for finishing steels. The "G" tolerance inserts are very aggressive, high positive, ground inserts. The "M" tolerance class of inserts are standard pressed inserts.

Command Tooling Systems introduces custom designed tooling for high production part runs.

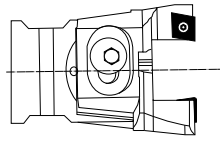
Whether your operation demands multiple cutting edges at different diameter settings or multi-flute cutters, we can deliver your tool fast – within 4-6 weeks after your order is received. If you have a long production run that has multiple operations on the same axis, you may be able to cut production time and save tooling costs with custom designed boring tools. With multiple operations being done simultaneously, think of the time saved in tool changes alone! Fill out the form below or send us your prints and we will create a proposal specifically for your operation – typically in less than 2 business days.

Command Tooling offers great solutions for your custom boring needs.

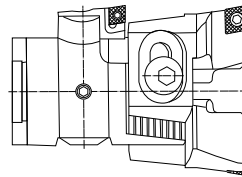
Command/Urma VersaMax™ line offers many options to best suit your application. Call Command Tooling to speak with one of the Boring Specialists to see what options would best fit your application. You might be surprised how easy it is to get custom boring for your shop. Below are just a couple of the custom options available to you!



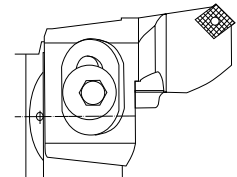
OD Turn Finish



OD Turn Rough



Rough & Finish



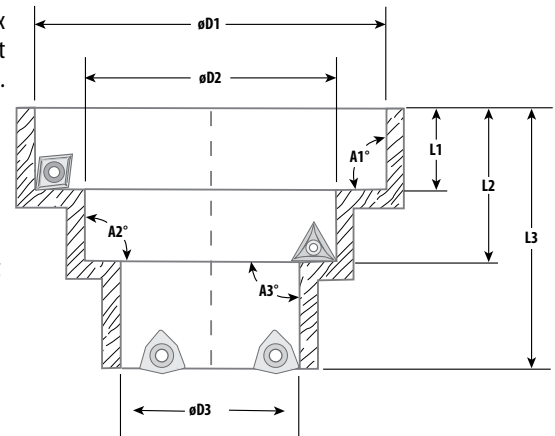
Various Angles
10°, 15°, 20°, 30°, 45°, 60°

This example is a simple design. For more complex operations, send a fax or E-mail us your print. Let us design your solution to faster part production.

Keep in mind –

- Quantities affect single piece prices since there are engineering charges for custom toolholder orders.
- If cutting tools are required for factory balancing, they must arrive at Command within two weeks after receipt of order.
- If special tooling is required to finish your product, it must be in house before we can start manufacturing.
- If a print is sent for approval, it must be returned within two business days to assure prompt order processing of custom toolholders

* Don't forget to include tolerances on all dimensions



Name: _____

Company: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ Fax: _____

E-mail: _____

Fax to: 800-555-7694 or 763-576-6911

email: support@commandtool.com

D1 = _____

L1 = _____

A1 = _____

D2 = _____

L2 = _____

A2 = _____

D3 = _____

L3 = _____

A3 = _____

Toolholder style:

V BT HSK NMTB

Taper size _____



The True Zero Collet offers:

- 6 point fine tune adjustment
- Eliminates the need for floating toolholders when reaming
- Increased tool life
- Improves surface finishes
- Adjustments can be made on the spindle or the turret
- Spindle concentricity errors can be compensated

True Zero	
True Zero Part No.	Corresponding Wrench Part No.
XGZN-0016	30mm Hex
XGZN-0020	XCCW-D025
XGZN-0025	XCCW-D032
XGZN-0032	XCCW-0040
XGZN-0040	XCCW-0050



True Zero Setup Instructions



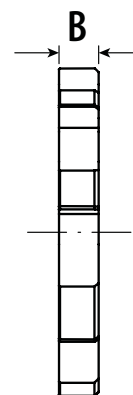
- Use collets with a standard capacity, no high precision collets.
- Use collets that are the closest fit to the shank of your tool. Example: 8mm diameter shank you should use a 7-8mm collet.
- Back off the adjusting screws so they do not contact the adjusting surface.
- Torque the True Zero nut to the appropriate specifications for the collet chuck. Do Not Over Tighten.
- Adjust the concentricity by using the 6 screws on the outside diameter of the collet nut.
- Take care that each screw is in contact with the clamped tool.
- Now you're ready to work.

Please find a live adjustment example in the category "video" on <http://www.ews-tools.de>

- CircoTec RX are the fastest inserts to change out.
- Dimensions given in mm
- Minimum order quantity 3 pieces.

Straight Fluted Inserts					
RX Size	Ø-range	B	No. Of Flutes	Package Quantity	
RX 016	11.900 - 15.6	4.3	6	4	
RX 019	15.601 - 18.6	4.3	6	4	
RX 024	18.601 - 23.6	4.3	6	4	
RX 029	23.601 - 28.6	4.3	8	2	
RX 036	28.601 - 35.6	4.3	8	1	

Straight Fluted Inserts					
RX Size	Ø-range	B	No. Of Flutes	Package Quantity	
RX 044	35.601 - 43.6	4.3	8	1	
RX 052	43.601 - 51.6	4.3	10	1	
RX 061	51.601 - 60.6	4.3	10	1	
RX 081	60.601 - 80.6	4.3	12	1	
RX 101	80.601 - 100.6	4.3	12	1	



Straight Fluted											
ISO	Material	HB HRC	Through hole	Blind hole	45° A01	45/8° C01	20° E01	90° F01	a _p		
									Ø < 20 mm	Ø 20-35 mm	Ø > 35 mm
					Curling Cut		Face Cutting				
P	Unalloyed carbon steel, General Structural Steel	<160	✱	✱	✱	✱		✱	0.05-0.12	0.08-0.15	0.10-0.25
	Low-alloy carbon steel, Structural steel, Tool steel, Low-alloy steel	140-325	✱	✱	✱	✱		✱	0.05-0.12	0.08-0.15	0.10-0.25
	Alloyed tool steel, Nitride steel	250-350	✱	✱	✱	✱		✱	0.05-0.10	0.08-0.15	0.10-0.25
	High alloyed steel		✱	✱	✱	✱		✱	0.05-0.10	0.08-0.15	0.10-0.20
	High alloyed steel		✱	✱	✱	✱		✱	0.05-0.10	0.08-0.15	0.10-0.20
	High speed steel		✱	✱	✱		✱	0.05-0.10	0.08-0.15	0.10-0.20	
H	Hardened steel	HRC>45									
M	Stainless steel martensitic		✱	✱	✱	✱		✱	0.05-0.10	0.08-0.15	0.08-0.20
	Stainless steel austenitic		✱	✱	✱	✱		✱	0.05-0.10	0.08-0.15	0.08-0.20
	Stainless heat resisting steel		✱	✱	✱	✱		✱	0.05-0.10	0.08-0.15	0.08-0.20
K	Grey cast iron, Alloyed grey cast iron	<250	✱	✱	✱	✱		✱	0.10-0.18	0.08-0.20	0.10-0.25
	Nodular iron ferritic		✱	✱	✱	✱		✱	0.10-0.18	0.08-0.20	0.10-0.25
	Nodular iron ferritic/pearlitic, Malleable iron		✱	✱	✱	✱		✱	0.10-0.18	0.08-0.20	0.10-0.25
	Aluminum <10 % Si, Alu-wrough alloys		✱	✱	✱	✱		✱	0.05-0.12	0.08-0.15	0.10-0.25
N	Alu-alloy > 10% Si		✱	✱	✱	✱		✱	0.05-0.12	0.08-0.15	0.10-0.25
	Nou ferrous alloys, Copper alloys, Brass, Bronzes		✱	✱	✱	✱		✱	0.08-0.15	0.08-0.15	0.10-0.25
	Titanium		✱	✱	✱	✱	✱	✱	0.05-0.10	0.05-0.12	0.08-0.18
	Nickel based alloys		✱	✱	✱	✱	✱	✱	0.05-0.10	0.05-0.12	0.08-0.18
	Thermo- Plastics , Duroplast		✱	✱	✱		✱	✱	0.10-0.18	0.05-0.12	0.10-0.25
S	Fibre reinforced plastics		✱	✱	✱		✱	✱	0.10-0.18	0.05-0.12	0.10-0.25
✱ = Standard		✱ = Optional									

✱ = Standard

✱ = Optional

URMA CircoTec RX Reamers:

- **Simple Handling** — Never before, have you been able to change your reamers this fast and straight forward!
- **High Reliability** — Accurate repeatability teamed with the high performance RX inserts makes your applications safer and reduces scrap rate.
- **High Flexibility** — With our patented insert holders and shank systems, we are able to offer a variety of insert grades along with a wide diameter range that starts at 11.9 mm and goes thru 100.6 mm.
- **Competitive Pricing** — Remarkably, with higher performance and lower prices for the inserts, you will lower your cost per bore while increasing your profits!
- **Longer Tool Life** — Lower cost per bore and lower cost for insert changing because no additional set up is required.
- **Perfect Bores** — Constant surface quality and tolerance throughout the entire tool life.

Urma inserts are made to meet the criteria listed in the following tables, pages 54 thru 56, and based on your projects needs. Due to high variability, Command does not have part numbers listed. Please contact Command Customer Service to place an order.



Straight Fluted

ISO	Material	HB HRC	F0500 HM		T1500 Cermet		12R / 08P AlCrN		02P TiAlN		01T TiN		10C DLC	
			Meters Per Min.	Feet Per Tooth	Meters Per Min.	Feet Per Tooth	Meters Per Min.	Feet Per Tooth	Meters Per Min.	Feet Per Tooth	Meters Per Min.	Feet Per Tooth	Meters Per Min.	Feet Per Tooth
P	Unalloyed carbon steel, General Structural Steel	<160	6-10	0.07-0.25	120-250	0.10-0.25	80-220	0.10-0.25	80-220	0.10-0.25	60-160	0.10-0.25		
	Low-alloy carbon steel, Structural steel, Tool steel, Low-alloy steel	140-325	6-10	0.07-0.25	120-250	0.10-0.25	80-220	0.10-0.25	80-220	0.10-0.25	60-160	0.10-0.25		
	Alloyed tool steel, Nitride steel	250-350	6-10	0.07-0.20	70-200	0.08-0.20	60-180	0.06-0.20	60-180	0.06-0.20	50-120	0.06-0.20		
	High alloyed steel		6-10	0.07-0.20			15-60	0.06-0.20	15-60	0.06-0.20	15-40	0.06-0.20		
	High alloyed steel		4-7	0.07-0.20			10-40	0.05-0.18	10-40	0.05-0.18	10-30	0.05-0.18		
	High speed steel		4-7	0.04-0.15			10-30	0.04-0.15	10-30	0.04-0.15	10-20	0.04-0.15		
H	Hardened steel	HRC>45												
M	Stainless steel martensitic		5-8	0.06-0.20			15-60	0.06-0.20	15-60	0.06-0.20	15-40	0.06-0.20		
	Stainless steel austenitic		4-7	0.05-0.18			10-40	0.05-0.18	10-40	0.05-0.18	10-30	0.05-0.18		
	Stainless heat resisting steel		4-7	0.05-0.18			10-40	0.05-0.18	10-40	0.05-0.18	10-30	0.05-0.18		
K	Grey cast iron, Alloyed grey cast iron	<250	10-25	0.05-0.25			80-220	0.12-0.30	80-220	0.12-0.30	40-100	0.10-0.25		
	Nodular iron ferritic		6-12	0.05-0.25	120-350	0.12-0.30	120-330	0.10-0.30	120-330	0.10-0.30	60-160	0.10-0.22		
	Nodular iron ferritic /pearlitic, Malleable iron		10-20	0.05-0.22	100-250	0.12-0.25	100-250	0.12-0.25	100-250	0.12-0.25	40-120	0.10-0.22		
	Aluminum <10 % Si, Alu-wrough alloys		10-25	0.08-0.30									100-250	0.12-0.30
N	Alu-alloy > 10% Si		8-20	0.08-0.30									100-250	0.10-0.30
	Nou ferrous alloys, Copper alloys, Brass, Bronzes		10-25	0.08-0.30	120-280	0.10-0.30	100-250	0.10-0.30			50-200	0.10-0.30		
	Titanium		6-14	0.05-0.15			10-25	0.05-0.15						
	Nickel based alloys		4-7	0.05-0.15			15-50	0.05-0.15	15-45	0.05-0.15	10-35	0.05-0.12		
S	Thermo- Plastics , Duroplast		10-30	0.06-0.20	10-30	0.06-0.20								
	Fibre reinforced plastics		4-12	0.04-0.15									10-35	0.05-0.15

- CircoTec RX are the fastest inserts to change out.
- Dimensions given in mm
- Minimum order quantity 3 pieces.

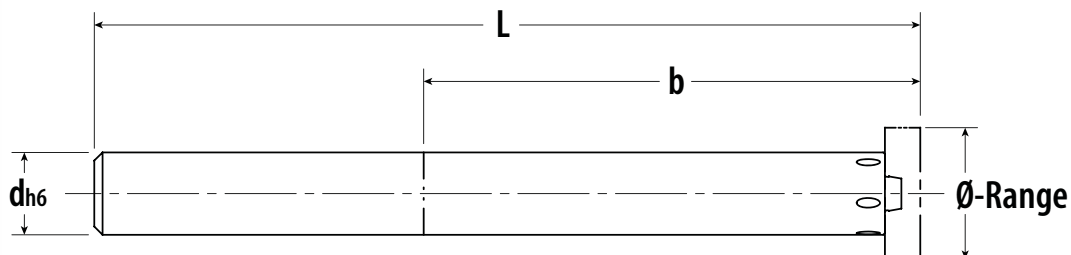
Left Helical Fluted Inserts					
RX Size	Ø-Range	B	No. Of Flutes	Package Quantity	
RX 016	11.900 - 15.6	4.3	6	4	
RX 019	15.601 - 18.6	4.3	6	4	
RX 024	18.601 - 23.6	4.3	6	4	
RX 029	23.601 - 28.6	4.3	8	2	
RX 036	28.601 - 35.6	4.3	8	1	

Left Helical Fluted Inserts					
RX Size	Ø-Range	B	No. Of Flutes	Package Quantity	
RX 044	35.601 - 43.6	4.3	8	1	
RX 052	43.601 - 51.6	4.3	10	1	
RX 061	51.601 - 60.6	4.3	10	1	
RX 081	60.601 - 80.6	4.3	12	1	
RX 101	80.601 - 100.6	4.3	12	1	

Left Helical Fluted									
ISO	Material	HB HRC	Through hole	Blind hole	25° B01	30/4° D01	a _p		
							Ø < 20 mm	Ø 20-35 mm	Ø > 35 mm
P	Unalloyed carbon steel, General Structural Steel	<160	✱		✱		0.05-0.12	0.08-0.15	0.10-0.25
	Low-alloy carbon steel, Structural steel, Tool steel, Low-alloy steel	140-325	✱		✱	✱	0.05-0.12	0.08-0.15	0.10-0.25
	Alloyed tool steel, Nitride steel	250-350	✱		✱	✱	0.05-0.10	0.08-0.15	0.10-0.25
	Hardened steel	HRC>45							
K	Grey cast iron, Alloyed grey cast iron	<250							
N	Titanium		✱		✱	✱	0.05-0.10	0.05-0.12	0.08-0.18
	Nickel based alloys		✱		✱	✱	0.05-0.10	0.05-0.12	0.08-0.18
✱ = Standard			✱ = Optional						

Left Helical Fluted												
ISO	Material	HB HRC	F0500 HM		T1500 Cermet		12R / 08P AlCrN		02P TiAlN		01T TiN	
			Meters Per Min.	Feet Per Tooth	Meters Per Min.	Feet Per Tooth	Meters Per Min.	Feet Per Tooth	Meters Per Min.	Feet Per Tooth	Meters Per Min.	Feet Per Tooth
P	Unalloyed carbon steel, General Structural Steel	<160	6-10	0.12-0.35	120-250	0.15-0.35	100-220	0.15-0.35	100-220	0.15-0.35	60-160	0.15-0.35
	Low-alloy carbon steel, Structural steel, Tool steel, Low-alloy steel	140-325	6-10	0.12-0.35	120-250	0.15-0.35	100-220	0.15-0.35	100-220	0.15-0.35	60-160	0.15-0.35
	Alloyed tool steel, Nitride steel	250-350	6-10	0.12-0.25	70-200	0.12-0.25	60-180	0.10-0.22				
	Hardened steel	HRC>45										
K	Grey cast iron, Alloyed grey cast iron	<250										
N	Titanium		6-14	0.06-0.18			10-25	0.06-0.18				
	Nickel based alloys		4-7	0.06-0.18			15-50	0.06-0.18	15-45	0.06-0.18	10-35	0.06-0.15
Omitted Materials have no data assigned to them												

- Straight shanks can be cut to shorter lengths by the user, if needed.
- Dimensions given in mm



Short Insert Holders

RX Size	Ø-Range mm	Part No. Through bore	Part No. Blind Hole	Ø d h6	L	b
RX 016	11.900 - 15.600	80501	80506	10	100	60
RX 019	15.601 - 18.600	80502	80507	12	115	70
RX 024	18.601 - 23.600	80503	80508	16	128	80
RX 029	23.601 - 28.600	80504	80509	20	145	95
RX 036	28.601 - 35.600	80505	80510	25	170	120

*1 set of screws included, Torque wrench sold separately.

Long Insert Holders

RX Size	Ø-Range mm	Part No. Through Bore	Part No. Blind Hole	Ø d h6	L	b
RX 016	11.900 - 15.600	80511	80516	10	160	60
RX 019	15.601 - 18.600	80512	80517	12	185	70
RX 024	18.601 - 23.600	80513	80518	16	208	80
RX 029	23.601 - 28.600	80514	80519	20	240	95
RX 036	28.601 - 35.600	80515	80520	25	274	120

*1 set of screws included, Torque wrench sold separately.

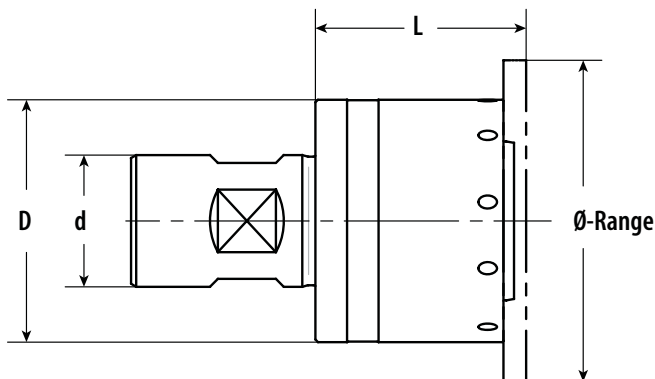
Replacement Parts

	Replacement Screws	Torque Screw Driver
		
For RX Size	Part No. (Pkg. Qt.)	Part No.
RX 016	C00 90 00 (3x)	G00 20 01
RX 019	C00 90 00 (3x)	G00 20 01
RX 024	C00 90 01 (3x)	G00 20 02
RX 029	C00 90 01 (4x)	G00 20 02
RX 036	C00 90 01 (4x)	G00 20 02

Notes

- For Compensation Holder Page 59.
- For Recommended Torque Wrench Page 60.

• Dimensions given in mm



Insert Holders

RX Size	Ø-Range mm	D	d	L	Part No.
RX 044	35.601 - 43.600	32	18	30	81029
RX 052	43.601 - 51.600	39	20	35	81030
RX 061	51.601 - 60.600	46	25	40	81031
RX 081	60.601 - 80.600	56	32	50	81032
RX 101	80.601 - 100.600	76	40	60	81033

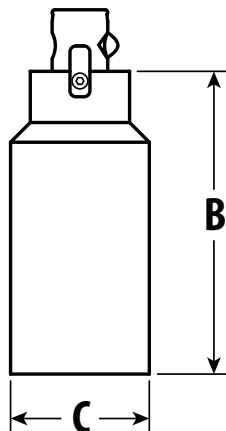
*1 set of screws included, Torque wrench sold separately.

Replacement Parts

	Replacement Screw	Torque Wrench	Center Bolt	Hex Key
For RX Size	Part No. (Pkg. Qt.)	Part No.	Part No.	Part No.
RX 044	C00 90 02 (4x)	G00 20 02	C00 26 23	G00 02 07
RX 052	C00 90 02 (5x)	G00 20 02	C00 26 38	G00 02 07
RX 061	C00 90 02 (5x)	G00 20 02	C00 26 26	G00 02 08
RX 081	C00 90 04 (4x)	G00 20 03	C00 26 37	G00 02 09
RX 101	C00 90 04 (4x)	G00 20 03	C00 26 31	G00 02 16

Blank Bars

• Dimensions given in inches



Blank Bars

Beta	Part No.	B	C
25	U1X3B0001	2.75	1.13
32	U2X3B0002	3.25	1.38
40	U3X3B0003	4.00	1.63
50	U4X3B0004	6.00	2.75
63	U5X4B0005	10.00	3.25
80	U6X4B0006	7.00	3.25
100	U7X4B0007	8.00	4.00

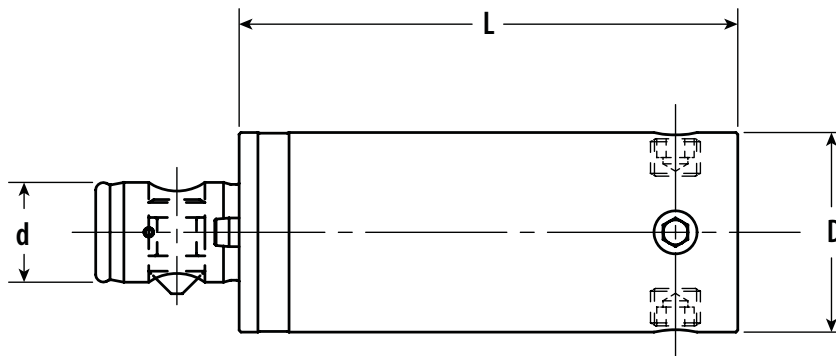
Notes

• For Recommended Torque Wrench Page 60.

CircoTec RX Shanks With Integrated Compensation Device

Ø 35.601 - 100.6

- Dimensions given in mm



RX Shanks With Integrated Compensation Device

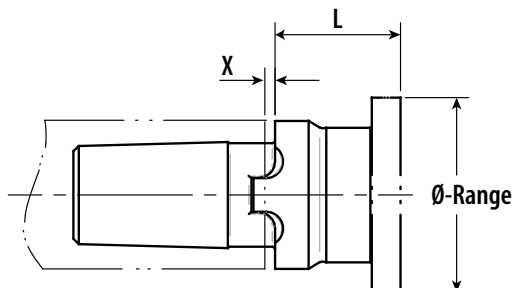
RX Size	Ø-Range mm	D	d	L	Part No.
RX 044	35.601 - 43.600	32	BM = Beta Modul - Urma 32	80	81004
		32	ZS = Cylindrical Shaft DIN 1835 - A 20	80	81001
		32	WD = Weldon DIN 1835 - B 20	80	81002
		32	WN = Whistle-Notch DIN 1835 - E 20	80	81003
RX 052	43.601 - 51.600	39	BM = Beta Modul - Urma 40	100	81008
		39	ZS = Cylindrical Shaft DIN 1835 - A 25	100	81005
		39	WD = Weldon DIN 1835 - B 25	100	81006
		39	WN = Whistle-Notch DIN 1835 - E 25	100	81007
RX 061	51.601 - 60.600	46	BM = Beta Modul - Urma 50	120	81012
		46	ZS = Cylindrical Shaft DIN 1835 - A 32	120	81009
		46	WD = Weldon DIN 1835 - B 32	120	81010
		46	WN = Whistle-Notch DIN 1835 - E 32	120	81011
RX 081	60.601 - 80.600	56	BM = Beta Modul - Urma 50	140	81020
		56	BM = Beta Modul - Urma 50	80	81019
		56	ZS = Cylindrical Shaft DIN 1835 - A 40	140	81014
		56	ZS = Cylindrical Shaft DIN 1835 - A 40	80	81013
		56	WD = Weldon DIN 1835 - B 40	140	81018
		56	WD = Weldon DIN 1835 - B 40	80	81015
		56	WN = Whistle-Notch DIN 1835 - E 40	140	81016
		56	WN = Whistle-Notch DIN 1835 - E 40	80	81017
RX 101	80.601 - 100.600	76	BM = Beta Modul - Urma 63	160	81028
		76	BM = Beta Modul - Urma 63	100	81027
		76	ZS = Cylindrical Shaft DIN 1835 - A 40	160	81022
		76	ZS = Cylindrical Shaft DIN 1835 - A 40	100	81021
		76	WD = Weldon DIN 1835 - B 40	160	81024
		76	WD = Weldon DIN 1835 - B 40	100	81023
		76	WN = Whistle-Notch DIN 1835 - E 40	160	81026
		76	WN = Whistle-Notch DIN 1835 - E 40	100	81025

1 hex Key Included

Replacement Parts

	Adjustment Locking Screw	Hex Key	Floating Assembly Pin	Orientation Pin
				
RX Size	Part No. (Pkg. Qt.)	Part No.	Part No.	Part No.
RX 044	C00 90 08 (4x)	G00 02 05	Z00 32 21	Z00 32 23
RX 052	C00 90 10 (4x)	G00 02 06	Z00 40 21	Z00 40 23
RX 061	C00 90 10 (4x)	G00 02 06	Z00 50 21	Z00 50 23
RX 081	C00 90 12 (4x)	G00 02 07	Z00 50 21	Z00 50 23
RX 101	C00 90 16 (4x)	G00 02 08	Z00 63 21	Z00 63 23

- Dimensions given in mm



DEK Adaptor

RX Size	Ø-Range mm		L	x	No. of Flutes	Part No.
RX 016	12.600 - 15.600	001	13.5	1.5	6	80521
RX 019	15.601 - 18.600	002	14.0	1.5	6	80522
RX 024	18.601 - 23.600	003	16.2	1.5	6	80523
RX 029	23.601 - 28.600	004	18.7	1.5	8	80524
RX 036	28.601 - 35.600	005	19.0	1.5	8	80525
RX 044	35.601 - 43.600	006	19.0	2.0	8	80526
RX 052	43.601 - 51.600	006	18.5	2.0	10	80527
RX 061	51.601 - 60.600	007	18.5	2.0	10	80528

*1 set of screws included, Torque wrench sold separately.

Replacement Parts

	Replacement Screws	Torque Wrench
		
RX Size	Part No. (Pkg Qt.)	Part No
RX 016	C00 90 00 (3x)	G00 20 01
RX 019	C00 90 00 (3x)	G00 20 01
RX 024	C00 90 00 (3x)	G00 20 02
RX 029	C00 90 01 (4x)	G00 20 02
RX 036	C00 90 01 (4x)	G00 20 02
RX 044	C00 90 02 (4x)	G00 20 02
RX 052	C00 90 02 (5x)	G00 20 02
RX 061	C00 90 02 (5x)	G00 20 02

Accessories



Torque Wrench

RX size of system	Part No..	Dimension	Torque
RX 016	81526	T6	0.9 Nm
RX 019	81527	T6	0.9 Nm
RX 024	81527	T8	1.5 Nm
RX 029	81527	T8	1.5 Nm
RX 036	81527	T8	1.5 Nm
RX 044	81527	T8	1.5 Nm
RX 052	81527	T8	1.5 Nm
RX 061	81527	T8	1.5 Nm
RX 081	81528	T15	3.5 Nm
RX 101	81528	T15	3.5 Nm

Adjusting

To achieve the best reaming results, a tool with zero run-out is desirable. In order to compensate for any errors due to run-out from the tool holders or the machine spindle, the following holders are recommended: compensation holders, hydraulic chucks, or shrink fit holders. CircoTec RX reamers can be measured with different methods:



Through Circular Land

Measure directly behind chamfer angle on external insert diameter. All interface errors are eliminated. This is the most accurate measuring method.



Through Insert Holder Short Taper

With the reamer disassembled measure directly on the insert holders short taper.



On the External Diameter

CircoTec RX tool holders are manufactured very accurately on all diameters. Easy method that offers accurate results.



Shanks With Integrated Compensation Device

Shanks with integrated compensation must be used for reaming diameters bigger than 35 mm



Handling

Secure central locking screw. Measure run out and set the cutting edge of the insert to the highest point. Compensate half of the total run out by using the adjustment screws. Check run out and repeat the adjustment, if necessary. Secure central locking screw according in chart below.

See manual on www.urma.ch

RX Size	1 Nm	2 Nm
RX 044	25	32
RX 052	25	32
RX 061	40	55
RX 081	65	85
RX 101	95	120

Changing Inserts Instructions

1. Don't take the shank out of the taper holder. Remove clamping screws and used insert.
2. Clean short taper of the shank carefully and check for possible damages.



3. Set new insert on position (pay attention to the positioning pin) and slightly tighten the clamping screws.
4. If available, use the torque screw driver (p. 59) to tighten the screws crosswise (see torque chart).



Measuring of Insert Diameter

CircoTec RX inserts have an unequally spaced pitch.

To measure the diameter, line up the two marked cutting edges. Measure directly on the chamfered angle because the inserts are ground with taper.



Torque Chart	
RX Size	Torque
RX 016	0.9 Nm
RX 019	0.9 Nm
RX 024	1.5 Nm
RX 029	1.5 Nm
RX 036	1.5 Nm
RX 044	1.5 Nm
RX 052	1.5 Nm
RX 061	1.5 Nm
RX 081	3.5 Nm
RX 101	3.5 Nm

Common Reamer Issues And Recommended Fixes



Hole too large

1. Reduce run out error and use compensation holder.
2. Reduce cutting speed.
3. Increase feed rate, increase coolant mix.
4. Reduce depth of cut.
5. Check tool wear especially build up edges.
6. Control reamer- ϕ .



Surface quality unsatisfactory

1. Check insert wear.
2. Reduce run out error and use compensation holder, check cutting data (pages 54 - 56).
3. Use tool with internal coolant supply.
4. Increase coolant mix.



Tapered hole

1. Reduce run out error and use compensation holder.
2. Reduce cutting speed and feed, check coolant mix.
3. Improve pre-machining.
4. Improve workpiece clamping.
5. Measure bore in clamped and unclamped condition.
6. Check chip flow.



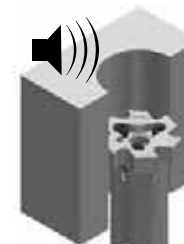
Retention marks in hole

1. Reduce run out error and use compensation holder.
2. Check insert wear (build up edges).
3. Reduce depth of cut.
4. Use a sharper geometry.
5. Reduce pull back feed.



Hole shows chatter marks

1. Reduce run out error and use compensation holder.
2. Change chamfer angle.
3. Improve workpiece clamping.
4. Reduce cutting speed.
5. Increase feed rate.



Reamer jams

1. Reduce coolant mix.
2. Increase depth of cut.
3. Check insert wear.
4. Change chamfer angle.



Hole too small

1. Change insert.
2. Reduce coolant mix.
3. Increase depth of cut.
4. Increase cutting speed.
5. Reduce feed rate.

Cutting Materials and Coatings

Uncoated		Coatings	
F0500 (HM-K05)	Uncoated micrograin carbide. Universal grade for most materials at low cutting speed.	12R AlCrN	First choice for Steel and cast iron. Extremely high hot hardness and high resistance against oxidation. Very good sliding properties and low adherence tendencies. For high cutting speed and with coolant or mist coolant. Copper colored.
UMW10 (HM-K10)	Uncoated micrograin carbide. Universal grade for most materials at low cutting speed. For Variopoint only.	08P AlCrN	Similar coating structure and application range to 12R. Grey colored.
T1500 UMT15* (HT-P15)	High-performance Cermet. Reaming of carbon and low alloyed steel of up to 1200 N/mm ² tensile strength and nodular cast iron at high cutting speed. Suitable for interrupted cuts due to high toughness. * For Variopoint only.	02P TiAlN	TiAlN-Coating. Good hot hardness and resistance against oxidation with excellent sliding properties. For medium to high cutting speed and mist coolant. Low tendency to adherence.
		01T TiN	TiN-Coating. Suitable for most materials. Produces good surface qualities. Medium cutting speed.
		10P DLC	PVD-DLC "Diamond-Like-Carbon". Very good sliding properties and low adherence tendencies. Excellent chemical stability as well as very high hardness. Particularly suitable for Aluminum with less than 12% Si at medium cutting speed.

Directions: Fill in the required information and attach any tooling and or part prints that are necessary

Machine Information

Machine Type: _____
Horizontal ☐ Vertical ☐
Spindle Taper: _____ Speed Range: _____
Feed Range: _____ Coolant Through: _____
Mixture Ratio: _____ Coolant Pressure: _____

Work Piece

Drawing No./Part No.: _____
Material Specs: _____
Hardness: _____
Number of Bores (per year): _____
Print Included: Yes No

Machining Requirements

Bore Diameter: _____ Tolerance: _____
Bore Length: _____ Surface Finish: _____
Roundness: _____ Parallelism: _____
Interruptions: _____
Material Allowance (per side): _____

Current Machining

RPM/SFM: _____ IPM/IPR: _____
Parts Per Fixture: _____ Tooling Print: Yes No

Retention Knob

Mfg: _____
P/N: _____
Machine Make & Model: _____
Notes: _____



Terms Of Sale



Payment Terms - Payment terms are net 30 days from shipment, for customers of satisfactory credit. No shipments will be made to delinquent accounts.

Prices, Freight Terms, and Order Minimum- All prices are subject to change without notice. All products are shipped FOB Command Tooling Systems Ramsey, MN USA. There is no minimum order quantity on Standard Command parts. Custom or Made to Order parts have a minimum order requirement two parts.

Return Goods

1. To return a product, contact Command's Customer Service Department for a Returned Material Authorization (RMA) number.
2. Credit for returned product is good for use toward purchases only and must be used within **60 days** of issuance, afterwards the credit will be null and void.
3. Be sure to include the RMA number on the return package for prompt processing.
4. Product may be returned for credit only upon prior approval from Command Tooling Systems and is subject to the following conditions:
 - a. Returns must be made within **60 days** from date of factory shipment. All exchanges must be accompanied by an order of equal or greater value. Restocking charge of 15% will apply to returns that do not include orders of equal or greater value.
 - b. Product must be received in like-new saleable condition and of current manufacture.
 - c. Product must be returned complete. All returns are subject to inspection.
 - d. "M" Made to order, modified standard, and custom manufactured products are non- returnable.
 - e. ThermoLock® products that have been heated are non-returnable.
 - f. Return transportation charges must be prepaid.

Exchanging Purchased Parts – The replacement order must be of greater or equal value of the original order to the original customer to avoid the 15% restocking fee. Returned product must be in like-new saleable condition, and of current manufacture. To return product, contact Command's Customer Service Department for a Returned Material Authorization (RMA) number. A new Purchase Order for replacement order must be placed at the same time to avoid the 15% re-stocking fee. Returned product must have the RMA number on the return package for prompt processing.

Cancellation Fees for Custom Manufactured Parts – A cancellation fee applies to custom manufactured orders. The fee is 25% of the order amount or the cost of labor & materials at the time of cancellation, whichever is higher.

Damage Claims & Shipping Shortages - Command Tooling Systems assumes no responsibility for loss or damage in transit. The consignee should present claims for such damage to the carrier. Our terms of sales are FOB Command Tooling Systems, Ramsey, Minnesota USA. **Shipping shortages must be reported to the factory within 5 business days after receipt of material.**

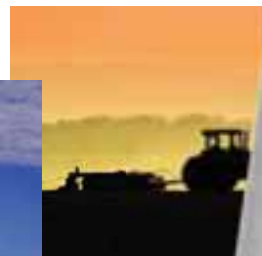
Warranty - Our policy of 100% unconditionally guaranteed materials and workmanship assures your satisfaction. Command Tooling Systems' manufactured products are covered by our 100% satisfaction guarantee. Should they prove to be defective in materials or workmanship, simply contact the Customer Service Department to obtain a RMA number and shipping instructions. Warranty determined by Command Tooling Systems within 60 days of factory shipment.

Command Tooling Systems disclaims any and all warranties, either expressed or implied, arising by law or otherwise, including but not limited to non-infringement and implied warranties of merchantability or fitness for a particular purpose. Command Tooling Systems' liability, if any, is limited to and shall not exceed the amount paid for a defective part. In no event will Command Tooling Systems be liable for any indirect, special or consequential damages, including but not limited to: lost profits or lost revenues, even if Command Tooling Systems has been advised of the possibility of these damages.

Symbols	22-00-28 – 44	80510 – 57	A00-02-16 – 24
05-42-11 – 15	22-00-33 – 44	80511 – 57	A00-02-17 – 24, 37, 45
05-42-21 – 15	22-00-38 – 44	80512 – 57	A00-02-18 – 45
05-42-40 – 16	22-00-43 – 44	80513 – 57	A00-12-11 – 24, 37, 45
06-10-20 – 18	22-00-48 – 44	80514 – 57	A00-12-12 – 24, 45
06-16-20 – 18	22-00-53 – 44	80515 – 57	A00-12-18 – 45
06-16-25 – 18	22-00-58 – 44	80516 – 57	A00-32-07 – 24, 37, 45
06-16-30 – 18	22-00-63 – 44	80517 – 57	A00-32-08 – 24, 45
06-16-35 – 18	22-00-68 – 44	80518 – 57	A00-42-05 – 45
07-00-05 – 16, 17	22-00-73 – 44	80519 – 57	A25-08-01 – 29
07-00-06 – 17	22-01-11-018 – 36	80520 – 57	A25-18-01 – 29
07-00-08 – 17	22-01-14-018 – 36	80521 – 60	A25-24-01 – 29
07-00-10 – 17	22-01-17-018 – 36	80522 – 60	A25-25-01-050 – 29
07-00-12 – 17	22-01-20-023 – 36	80523 – 60	A25-32-01 – 29
12-24-02 – 10	22-01-23-023 – 36	80524 – 60	A25-32-01-065 – 29
12-32-02 – 10	22-01-26-028 – 36	80525 – 60	A25-40-01-090 – 29
12-32-07 – 10	22-01-29-028 – 36	80526 – 60	A25-42-01 – 29
12-42-02 – 10	22-01-32-028 – 36	80527 – 60	B
12-42-07 – 10	22-02-00-018 – 36	80528 – 60	B00-22-01 – 22
12-42-12 – 10	22-03-06-012 – 36	81001 – 59	B00-22-02 – 22, 23
12-55-02 – 10	22-03-07-012 – 36	81002 – 59	B00-22-03 – 22, 23
12-55-07 – 10	22-04-00-012 – 36	81003 – 59	B00-22-04 – 22, 23
12-55-12 – 10	23-00-11 – 46	81004 – 59	B00-22-05 – 22, 23
12-55-17 – 10	23-01-10-036 – 38	81005 – 59	B00-22-06 – 22, 23
12-72-12 – 10	23-01-10-040 – 38	81006 – 59	B00-22-07 – 22, 23
12-72-17 – 10	23-01-11-040 – 38	81007 – 59	B2U4-0001 – 7
12-72-22 – 10	23-02-10-024 – 38	81008 – 59	B2U4-0002 – 7
12-94-12 – 10	23-02-10-028 – 38	81009 – 59	B2U4-0003 – 7
12-94-22 – 10	23-02-11-028 – 38	81010 – 59	B2U4-0004 – 7
12-94-27 – 10	23-10-10 – 46	81011 – 59	B4U4-0001 – 7
13-18-01 – 9	25-08-01 – 26	81012 – 59	B4U4-0002 – 7
13-18-11 – 9	25-18-01 – 26	81013 – 59	B4U4-0003 – 7
13-24-01 – 9	25-24-01 – 26	81014 – 59	B4U4-0004 – 7
13-24-11 – 9	25-32-01 – 26	81015 – 59	B4U4-0005 – 7
13-32-01 – 9	25-42-01 – 26	81016 – 59	B4U4-0006 – 7
13-32-11 – 9	25-55-01 – 26	81017 – 59	B4U4-B025 – 8
13-42-01 – 9	25-72-01 – 26	81018 – 59	B4U4-B032 – 8
13-42-11 – 9	25-94-01 – 26	81019 – 59	B4U4-B040 – 8
13-55-01 – 9	53-00-17 – 22, 25, 26, 29	81020 – 59	B4U4-B050 – 8
13-55-11 – 9	53-00-22 – 22, 25, 26, 29	81021 – 59	B4U4-B063 – 8
13-72-01 – 9	53-00-27 – 22, 25, 26, 29	81022 – 59	B4U4-L018 – 31
13-72-11 – 9	53-00-36 – 22, 25, 26, 29, 35	81023 – 59	B4U4-L025 – 31
13-94-01 – 9	53-00-46 – 22, 25, 26	81024 – 59	B4U5-B032 – 8
13-94-11 – 9	53-00-50 – 15	81025 – 59	B4U5-B040 – 8
14-18-00 – 22	53-00-55 – 26	81026 – 59	B4U5-B063 – 8
14-24-00 – 22	53-00-60 – 22, 25	81027 – 59	B05-40-21-40 – 16
14-32-00 – 22	53-00-75 – 22, 25	81028 – 59	B05-40-21-067 – 16
14-42-00 – 22	53-74-96 – 22, 43	81029 – 58	B6U4-0001 – 7
14-55-00 – 22	55-00-55 – 35	81030 – 58	B6U4-0002 – 7
14-72-00 – 22	80501 – 57	81031 – 58	B6U4-0003 – 7
14-94-00 – 22	80502 – 57	81032 – 58	B6U4-0004 – 7
20-02-16 – 18, 30	80503 – 57	81033 – 58	B6U4-0005 – 7
21-42-46-036 – 35	80504 – 57	81526 – 60	B6U4-0006 – 7
21-55-80-042 – 35	80505 – 57	81527 – 60	B6U4-0007 – 7
21-94-01 – 43	80506 – 57	81528 – 60	B6U4-B032 – 8
22-00-13 – 44	80507 – 57	A	B6U4-B040 – 8
22-00-18 – 44	80508 – 57	A00-02-11 – 46	B6U4-B050 – 8
22-00-23 – 44	80509 – 57	A00-02-14 – 45	B6U4-B063 – 8

B6U4-B080	— 8	B25-40-01-090	— 27	C00-25-12	— 26, 27	C6U4-L025	— 31
B6U4-B100	— 8	B25-63-01-100	— 27	C00-25-13	— 26, 27	C6U4-L032	— 31
B6U4-L018	— 31	B25-80-01-115	— 27	C00-26-09	— 44	C6U5-0001	— 7
B6U4-L025	— 31	B25-100-01-145	— 27	C00 26 23	— 58	C6U5-0002	— 7
B6U4-L032	— 31	B1500-32-1575	— 6	C00 26 26	— 58	C6U5-0003	— 7
B12-25-18-040	— 10	B1500-40-1772	— 6	C00 26 31	— 58	C6U5-0004	— 7
B12-32-18-040	— 10	B1500-63-2362	— 6	C00 26 37	— 58	C6U5-B025	— 8
B12-32-25-040	— 10	B2000-63-2362	— 6	C00 26 38	— 58	C6U5-B032	— 8
B12-40-18-040	— 10	C		C00 90 00	— 57, 60	C6U5-B040	— 8
B12-40-25-040	— 10	C00-02-10	— 24	C00 90 01	— 60	C6U5-B050	— 8
B12-40-32-045	— 10	C00-02-11	— 24	C00 90 02	— 58, 60	C6U5-B063	— 8
B12-50-18-040	— 10	C00-02-12	— 24, 46	C00 90 04	— 58	C6U5-B080	— 8
B12-50-24-050	— 10	C00-02-13	— 24	C00 90 08	— 59	C6U5-B100	— 8
B12-50-32-050	— 10	C00-02-14	— 24	C00 90 10	— 59	C6U6-B025	— 8
B12-50-40-050	— 10	C00-02-15	— 24	C00 90 12	— 59	C6U6-B032	— 8
B12-50-42-055	— 10	C00-02-16	— 24	C00 90 16	— 59	C6U6-B040	— 8
B12-63-18-045	— 10	C00-02-17	— 45, 46	C4U3-0004	— 7	C6U6-B063	— 8
B12-63-24-055	— 10	C00-02-35	— 17	C4U4-0001	— 7	C6U7-B063	— 8
B12-63-25-045	— 10	C00-02-79	— 37, 38	C4U4-0002	— 7	CCGT-21-50.04-UC	— 18
B12-63-32-050	— 10	C00-02-86	— 37, 38	C4U4-0003	— 7	CCGT-21.50.04-UC	— 17, 48
B12-63-32-055	— 10	C00-07-01	— 17, 38	C4U4-0004	— 7	CCGT-21-50.04-UM	— 18
B12-63-40-055	— 10	C00-07-02	— 17	C4U4-0005	— 7	CCGT-21.50.04-UM	— 17, 48
B12-63-42-060	— 10	C00-12-01	— 22, 23	C4U4-0006	— 7	CCGT-21.50-UC	— 17, 18, 48
B12-63-55-060	— 10	C00-12-04	— 22, 23	C4U4-0007	— 7	CCGT-21.50-UM	— 17, 18, 48
B12-80-40-060	— 10	C00-12-05	— 22, 23	C4U4-B025	— 8	CCGT-21.51-UC	— 17, 18, 47, 48
B12-80-63-060	— 10	C00-12-06	— 22, 23	C4U4-B032	— 8	CCGT-21.51-UM	— 16, 17, 48
B12-100-40-060	— 10	C00-12-07	— 22, 23	C4U4-B040	— 8	CCGT-32.50-UC	— 48
B12-100-63-060	— 10	C00-12-08	— 22, 23, 35	C4U4-B050	— 8	CCGT-32.51-UC	— 48
B12-100-80-075	— 10	C00-12-16	— 36	C4U4-B063	— 8	CCGT-32.51-UM	— 48
B13-24-25-030	— 9	C00-12-61	— 36	C4U4-L018	— 31	CCGT-32.52-UC	— 47
B13-25-25-045	— 9	C00-20-01	— 17, 18, 24, 30, 38	C4U4-L025	— 31	CCMT-21.51-CVC	— 18, 47, 48
B13-25-25-070	— 9	C00-20-02	— 24, 30, 46	C4U5-0001	— 7	CCMT-21.51-PVM	— 18, 48
B13-32-32-035	— 9	C00-20-04	— 30, 46	C4U5-0002	— 7	CCMT-21.51-UCW	— 48
B13-32-32-040	— 9	C00-20-10	— 17	C4U5-0003	— 7	CCMT-21.52-CVC	— 47
B13-32-32-070	— 9	C00-20-11	— 30	C4U5-0004	— 7	CCMT-21.52-UC	— 47
B13-40-40-045	— 9	C00-22-02	— 35	C4U5-B025	— 8	CCMT-32.50-PVM	— 48
B13-40-40-070	— 9	C00-22-03	— 43	C4U5-B032	— 8	CCMT-32.51-CVC	— 47, 48
B13-42-40-045	— 9	C00-22-05	— 23, 35	C4U5-B040	— 8	CCMT-32.51-PVM	— 48
B13-55-63-060	— 9	C00-22-07	— 23	C4U5-B050	— 8	CCMT-32.51-UCW	— 48
B13-63-63-060	— 9	C00-22-11	— 9, 22, 38, 43	C4U5-B063	— 8	CCMT-32.52-CVC	— 47
B13-63-63-125	— 9	C00-22-12	— 35, 36	C4U6-B025	— 8	CCMT-32.52-UC	— 47
B13-72-80-080	— 9	C00-22-30	— 46	C4U6-B032	— 8	CCMW-32.51-PCD	— 48
B13-80-80-080	— 9	C00-22-56	— 38	C4U6-B040	— 8	CNMG-431-CVC	— 47
B13-80-80-160	— 9	C00-22-58	— 23, 35	C6U4-0001	— 7	CNMG-431-UC	— 47
B13-94-100-080	— 9	C00-22-71	— 23, 43	C6U4-0002	— 7	CNMG-432-CVC	— 47
B13-100-100-080	— 9	C00-22-74	— 36	C6U4-0003	— 7	CNMG-432-UC	— 47
B13-100-100-180	— 9	C00-23-01	— 46	C6U4-0004	— 7	CNMG-542-CVC	— 47
B14-25-00-050	— 23	C00-24-04	— 44	C6U4-0005	— 7	CNMG-542-UC	— 47
B14-32-00-065	— 23	C00-24-07	— 44	C6U4-0006	— 7	CNMG-543-UC	— 47
B14-40-00-090	— 23	C00-24-17	— 9, 22, 43	C6U4-0007	— 7	CNMM-543-CVC	— 47
B14-63-00-100	— 23	C00-25-01	— 26, 38	C6U4-B025	— 8	CPGT-21.50.04-PVM	— 17, 18, 49
B14-80-00-115	— 23	C00-25-02	— 26, 27	C6U4-B032	— 8	CPGT-21.50.04-UC	— 17, 18, 49
B14-100-00-145	— 23	C00-25-03	— 26, 27	C6U4-B040	— 8	CPGT-21.50-UC	— 17, 18, 49
B21-40-46-036	— 35	C00-25-04	— 26, 27	C6U4-B050	— 8	CPGT-21.50-UM	— 17, 18, 49
B21-63-80-042	— 35	C00-25-05	— 26, 27	C6U4-B063	— 8	CPMT-21.50-CVC	— 17, 18, 49
B21-100-01-055	— 43	C00-25-06	— 27	C6U4-B080	— 8	CPMT-21.50-UM	— 17, 18, 49
B25-25-01-050	— 27	C00-25-07	— 27	C6U4-B100	— 8	CPMT-21.51-CVC	— 17, 18, 49
B25-32-01-065	— 27	C00-25-11	— 18, 26, 27	C6U4-L018	— 31	CPMT-21.51-PVM	— 17, 18, 49

CPMT-21.51-UC – 17, 18, 49	H6U3A0006 – 7	W18-04-06 – 24	Z00-12-24 – 26
CPMT-21.51-UM – 17, 18, 49	H6U3A0007 – 7	W18-06-09 – 24	Z00-14-74 – 9, 26
CPMW-21.50-PCD – 17, 18, 48	H6U3AB040 – 8	W18-08-09 – 24	Z00-14-96 – 9, 26
CPMW-21.51-PCD – 17, 18, 48	H6U3AB063 – 8	W18-10-12P – 24	Z00-16-02 – 45
G	H6U4AB080 – 8	W18-12-16P – 24	Z00-16-03 – 24, 45
G00-02-01 – 24, 37, 38	H6U4AB100 – 8	W18-14-16P – 24	Z00-16-32 – 26
G00-02-02 – 24, 37, 38, 46	HW/C06-08-09 – 17	W19-00-12P – 45	Z00-20-02 – 37
G00-02-03 – 15, 16, 17, 24, 26, 27, 38	HW/C06-10-12 – 17	W19-00-16P – 45	Z00-21-02 – 43
G00-02-04 – 15, 16, 17, 22, 24, 25, 26, 27, 35	HW/C06-12-14 – 17	W20-00-09 – 46	Z00-21-10 – 43
G00 02 05 – 59	HW/C06-16-16 – 17	W20 00 09RFP – 46	Z00-21-20 – 35
G00-02-05 – 22, 23, 24, 25, 26	HW/C06-16-18 – 17	W20-02-06 – 18, 30	Z00-22-15 – 44
G00 02 06 – 59	K	W20-04-06 – 30	Z00-22-16 – 44
G00-02-06 – 15, 16, 22, 23, 25, 26, 27, 35, 45, 46	K00-02-01 – 22, 35, 36, 38	W20-06-09 – 30	Z00-22-21 – 44
G00 02 07 – 58, 59	K00-02-02 – 22, 23	W20-10-06-000 – 38	Z00-22-24 – 44
G00-02-07 – 22, 23, 25	K00-02-03 – 22, 23	W20-12-06-000 – 38	Z00-22-42 – 15, 26, 35
G00 02 08 – 58, 59	K00-02-04 – 22, 23	W/C20 00 06 – 46	Z00-23-01 – 15, 16, 46
G00-02-08 – 22, 23, 25	K00-02-05 – 22, 23	W/C20-02-06 – 18, 30	Z00-23-02 – 38
G00 02 09 – 58	K00-02-06 – 22, 23, 44	W/C20-04-06 – 30	Z00-25-21 – 23, 27
G00-02-09 – 25	K00-02-07 – 22, 23	W/C20-06-06 – 30	Z00-25-23 – 23, 27
G00-02-10 – 22, 23, 25	K00-02-20 – 35, 36	W/C20-10-06-000 – 38	Z00-25-24 – 8
G00 02 16 – 58	K00-02-44 – 38	W/C20-12-06-000 – 38	Z00-27-55 – 26, 35
G00 20 01 – 57, 60	K19-00-15 – 45	WCGT-020102-UM – 16	Z00 32 21 – 59
G00-20-01 – 17	M	WCMT-020102-CVC – 17, 49	Z00-32-21 – 23, 27
G00 20 02 – 57, 58, 60	M040-05 – 17	WCMT-020102-UC – 17, 49	Z00 32 23 – 59
G00 20 03 – 58	M070-05 – 17	WCMT-020102-UM – 17, 49	Z00-32-23 – 23, 27
G00-20-03 – 24, 26, 27, 30, 37, 45, 46	M120-05 – 17	WV16-02-06 – 24	Z00-32-24 – 8
G00-20-05 – 17, 18, 24, 27, 30, 38, 46	M180-06 – 17	WV16-04-06 – 24	Z00 40 21 – 59
G00-20-07 – 18, 26, 27	M225-06 – 17	WV16-06-09 – 24	Z00-40-21 – 16, 23, 27, 35
G00-20-11 – 30	T	WV16-08-09 – 24	Z00 40 23 – 59
G00-20-23 – 22	TCMT-520-UC – 18, 49	WV16-10-12P – 24	Z00-40-23 – 23, 27, 35
G00-02-03 – 46	TCMT-520-UM – 18, 49	WV16-12-12P* – 24	Z00-40-24 – 8
H	TCMT-521-CVC – 18, 49	WV16-14-16P – 24	Z00-40-25 – 23, 35
H2U3A0004 – 7	TCMT-521-UM – 18, 49	WV17-00-12P – 45	Z00-40-32 – 16
H3U4AB025 – 8	U	WV17-00-16P – 45	Z00 50 21 – 59
H3U4AB032 – 8	U1X3B0001 – 58	WV17-01-12-040 – 37	Z00 50 23 – 59
H3U4AB040 – 8	U2X3B0002 – 58	WW20 00 09 – 46	Z00-50-24 – 8
H4U3A0004 – 7	U3X3B0003 – 58	WW20 00 09RFP – 46	Z00 63 21 – 59
H4U3A0005 – 7	U4X3B0004 – 58	WW20-02-06 – 30	Z00-63-21 – 23, 27, 35
H4U3AB032 – 8	U5X4B0005 – 58	WW20-04-06 – 30	Z00 63 23 – 59
H4U3AB040 – 8	U6X4B0006 – 58	WW20-06-09 – 30	Z00-63-23 – 23, 27, 35
H4U3AB063 – 8	U7X4B0007 – 58	WW20-10-06-000 – 38	Z00-63-24 – 8
H4U4A0003 – 7	W	WW20-12-06-000 – 38	Z00-63-25 – 23, 35
H4U4AB050 – 8	W06-16-09 – 18	X	Z00-80-21 – 23, 27
H4U4AL018 – 31	W06-16-10 – 16, 18	XCCW-0040 – 53	Z00-80-23 – 23, 27
H4U4AL025 – 31	W06-16-15 – 16, 18	XCCW-0050 – 53	Z00-80-24 – 8
H06-05-06 – 16, 17	W16-01-06 – 24	XCCW-D025 – 53	Z00-80-25 – 23
H06-06-07 – 17	W16-02-06 – 24	XCCW-D032 – 53	Z00-100-21 – 23, 27, 43
H06-18-A18-200 – 31	W16-04-06 – 24	XGZN-0016 – 53	Z00-100-23 – 23, 27, 43
H06-25-A24-234 – 31	W16-06-09 – 24	XGZN-0020 – 53	Z00-100-24 – 8
H06-25-A24-276 – 31	W16-08-09 – 24	XGZN-0025 – 53	Z00-100-25 – 23, 43
H06-25-B25-234 – 31	W16-10-12P – 24	XGZN-0032 – 53	
H06-25-B25-276 – 31	W16-12-16P – 24	XGZN-0040 – 53	
H06-32-A32-351 – 31	W16-14-16P – 24	Z	
H06-32-B32-351 – 31	W17-00-12P – 45	Z00-00-72 – 9, 22	
H6U3A0004 – 7	W17-00-16P – 45	Z00-00-94 – 9, 22, 43	
H6U3A0005 – 7	W17-01-12-040 – 37	Z00-05-01 – 15, 16	
	W17-02-09-028 – 37	Z00-10-18 – 26	
	W18-02-06 – 24	Z00-12-02 – 24, 37	



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