ALLIED MACHINE & ENGINEERING | WOHLHAUPTER®

Holemaking Solutions for Today's Manufacturing

Precision Boring Heads

with VARIOBORE 3E TECH

Adjustment accuracy of .002mm or .0001" on dia.

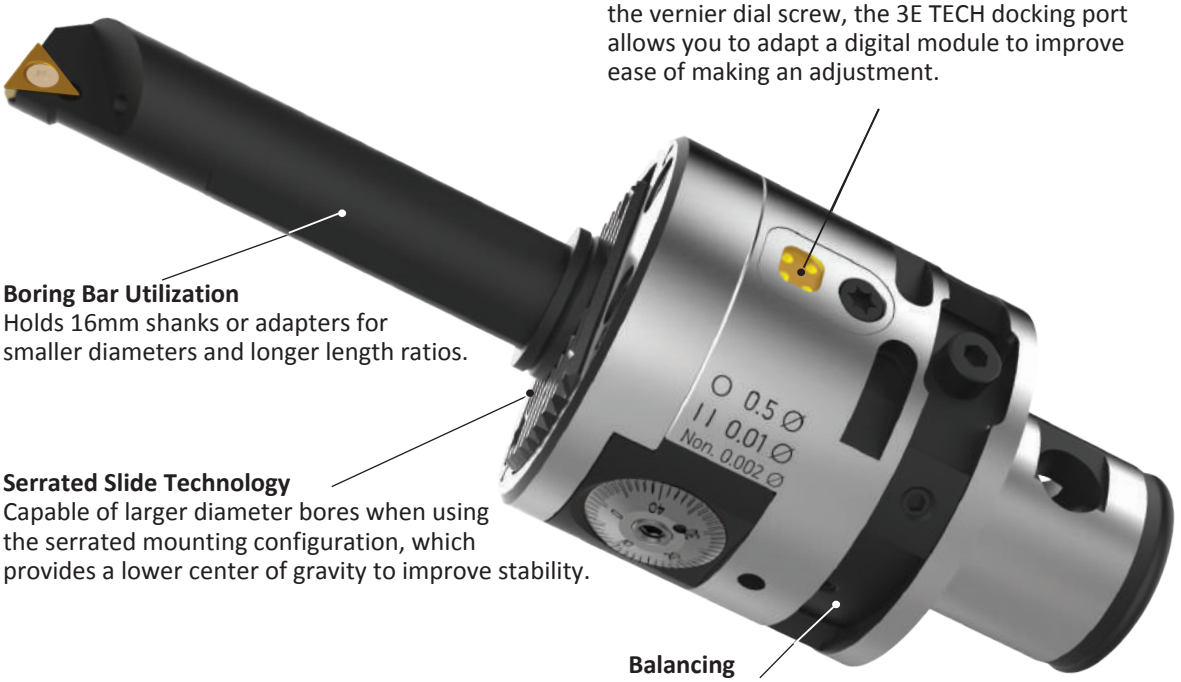
Boring

- *Wohlhaupter® VarioBore*

VARIO BORE

The VarioBore Head offers versatility and precision even without integrating the 3E TECH digital readout module.

- Boring Range:
  0.016" – 5.984" (0.4mm – 152mm)
- Accuracy:
  .0001" (0.002mm) vernier adjust on diameter
- Radial Stroke Adjustment:
  .098" (2.5mm)
- Speeds:
  Approaching 25,000 rpm when balanced
- Balancing:
  Manual mechanism
- Coolant:
  Internal throughout the system, up to IP 65
- MVS connection:
  Can be used on any machine
  (see master shanks on page 19)



3E TECH Docking Port
Although diameter adjustments can be read on the vernier dial screw, the 3E TECH docking port allows you to adapt a digital module to improve ease of making an adjustment.

Boring Bar Utilization
Holds 16mm shanks or adapters for smaller diameters and longer length ratios.

Serrated Slide Technology
Capable of larger diameter bores when using the serrated mounting configuration, which provides a lower center of gravity to improve stability.

Balancing
A balanced boring head allows you to increase spindle speed and improve surface finish. The VarioBore has external counter weights allowing for precise balancing.

3E TECH

Easy. External. Electronic.

Accurate – to .0001" (0.002mm) on diameter

Adjustments – easier to read while keeping the tool inside the machine (no cable or blue-tooth connection needed)

Backlash – becomes irrelevant through direct measurement of digital readout

Cost Savings – one digital readout module can be used on many VarioBore heads

Damage Protection – The module is automatically released from the tool preventing accidental damage at 500 rpm

Battery Life – allows up to 5,000 settings and automatically turns itself off after 30 seconds of inactivity

3E TECH Docking Port

Magnetic Locating Slots

Compatibility

Tools compatible with…

MINIDIGI

Mini-Boring Tools, Coated Carbide
Ø .016" – .256" (Ø 0.4mm – 6.5mm) WHC 126

Tool Holders in Tool Steel
Ø .236" – .787" (Ø 6mm – 20mm) · Form 20, 101, 211

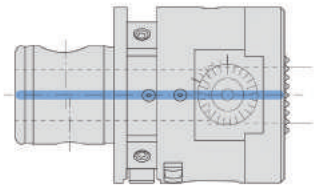
Tool Holders in Carbide
Ø .236" – .787" (Ø 6mm – 20mm) · Form 20, 101, 211

Reducing Sleeves
D16: 4mm, 5mm,
6mm, 7mm, 8mm,
10mm, 12mm

Serrated Tool Bodies in Tool Steel
Ø .787" – 1.339" (Ø 20mm – 34mm)

Serrated Tool Bodies in Carbide
Ø .787" – 1.339" (Ø 20mm – 34mm)

Universal Digital Readout Module



VARIOBORE

Tool Holder in Heavy Metal
Ø .236" – .394: (Ø 6mm – 10mm) · Form 211

Tool Holders in Steel
Ø .236" – 1.063" (Ø 6mm – 27mm) · Form 20, 101, 211

Tool Holders in Carbide
Ø .394" – .787" (Ø 10mm – 20mm) · Form 20, 101

Insert Holders
Form 20, 101

Serrated Tool Bodies
Ø .787" – 1.260" (Ø 20mm – 32mm)

Insert Holders
Ø 1.142" – 2.087" (Ø 29mm – 53mm)
Form 20, 101

Serrated Tool Bodies
Ø 1.142" – 2.087" (Ø 29mm – 53mm)

Outside Turning
Ø .157" – 2.598" (Ø 4mm – 66mm)
Form 20

Insert Holders
Ø 2.047" – 4.016"
(Ø 52mm – 102mm)
Form 20, 101

Serrated Slides
Ø 2.677" – 5.984"
(Ø 68mm – 152mm)

Insert Holders
Ø 2.677" – 5.984"
(Ø 68mm – 152mm)
Form 20, 101

Tools compatible with…

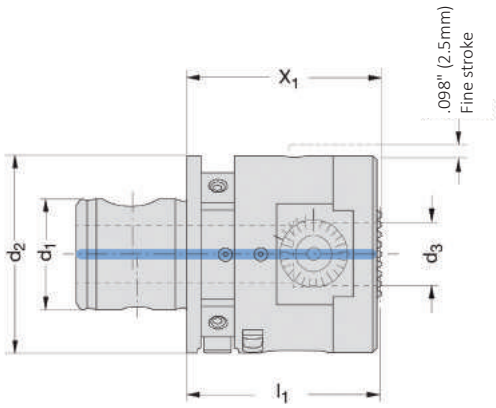
DIGIBORE

Outside Turning
Ø 0.079" – 2.283"
(Ø 2mm – 58mm)

Coolant Delivery Section

Counter Weight

VARIOBORE Boring Head



Head Type	MVS Connection		Dimensions						Boring Range		Weight		Order No.	
	d_2	d_2	in	mm	in	mm	in	mm	in	mm	lbs	kg	in	mm
Standard	50 - 28		.63	16	1.969	50	1.949	49.5	0.016 - 5.984	0.4 - 152	1.543	0.7	**563 001**	**536 001**
3E TECH	50 - 28		.63	16	1.969	50	1.949	49.5	0.016 - 5.984	0.4 - 152	1.543	0.7	**563 002**	**536 002**

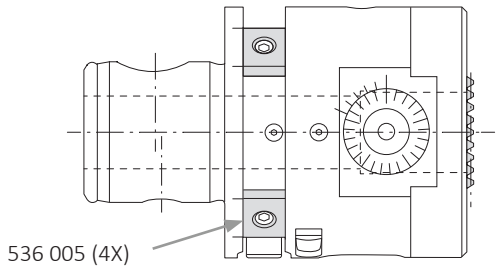
Compatible with Kaiser master shanks

3E TECH

Easy. External. Electronic.
Digital Readout Module

*3E TECH Digital Readout Module Order No.	
in	mm
563 010	**536 010**

Balance Compensation



Insert Holding Body		
Nominal Size	Key Size / Type	Order No.
M8 x 8	1,2 x 6,6 / K	536 005

VARIO BORE STARTER KITS

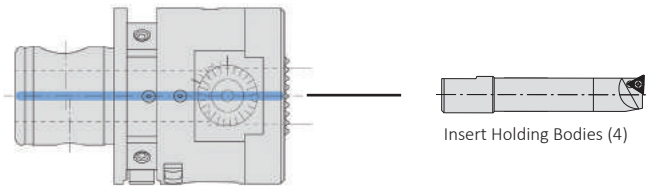
Ø.394" to 1.181" (Ø10mm – 30mm)

Insert Style: CC..0602..

Head Type	Dial Screw Units	Head Part No. (included in kit)	Kit Order No.
Standard	in	563 001	**104 050**
Standard	mm	536 001	**103 050**
with 3E TECH	in	563 002	**104 046**
with 3E TECH	mm	536 002	**103 046**

Digital readout module sold separately. See page 5.
Master shanks sold separately. See page 19.

Contents



VarioBore Head

Insert Holding Bodies (4)

Kit Boring Tools (CC..0602..)

Insert Holding Body		
in	mm	Part No.
.394 - .591	10 - 15	218 048
.591 - .787	15 - 20	081 041
.787 - .984	20 - 25	081 043
.984 - 1.181	25 - 30	081 043

Driver / Wrenches	
Type	Part No.
s2,5	115 575
s4,0	215 403
T7	115 591

Ø.394" to 4.016" (Ø10mm – 102mm)

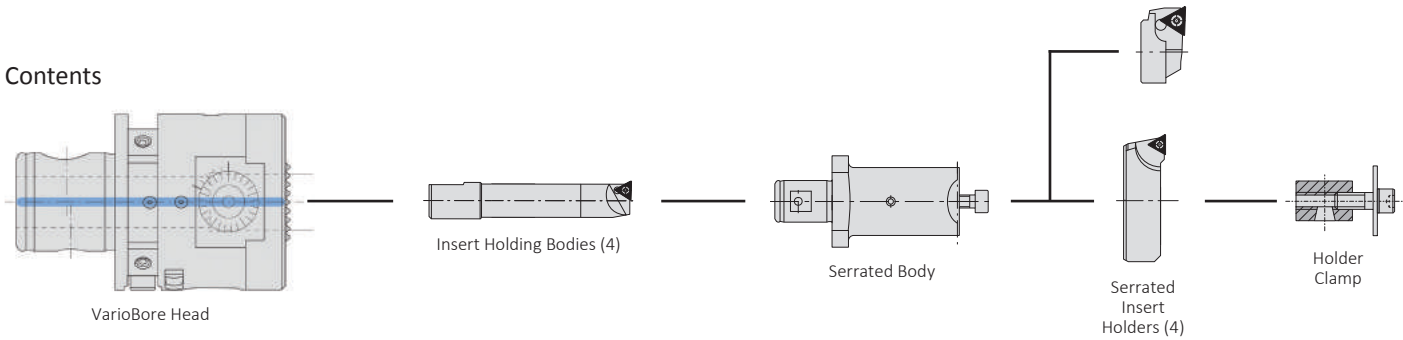
Insert Style: CC..0602..

VARIO BORE STARTER KITS

Head Type	Dial Screw Units	Head Part No. (included in kit)	Kit Order No.
Standard	in	563 001	**104 052**
Standard	mm	536 001	**103 052**
with 3E TECH	in	563 002	**104 048**
with 3E TECH	mm	536 002	**103 048**

Digital readout module sold separately. See page 5.
Master shanks sold separately. See page 19.

Contents

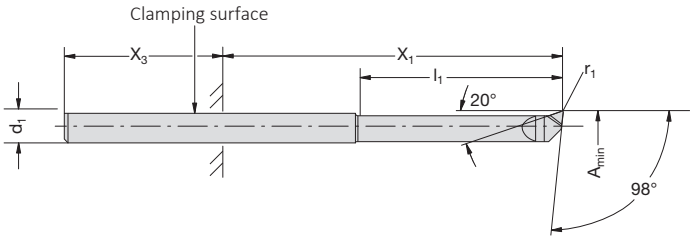


Kit Boring Tools (CC..0602..)

Insert Holding Body			Serrated Body	Serrated Insert			Holder Clamp	Driver / Wrenches	
in	mm	Part No.		in	mm	Part No.		Type	Part No.
.394 - .591	10 - 15	218 048	236 021	1.142 - 1.614	29 - 41	236 023	236 020	s2,5	115 575
.591 - .787	15 - 20	081 041		1.575 - 2.087	40 - 53	236 025		s4,0	215 403
.787 - .984	20 -25	081 042		2.047 - 3.031	52 - 77	236 027		s5,0	215 521
.984 - 1.181	25 - 30	081 043		2.992 - 4.016	76 - 102	236 029		T8	115 590

Ø .016" – .256" (Ø 0.4mm – 6.5mm)

Mini Boring Tools, Coated Carbide



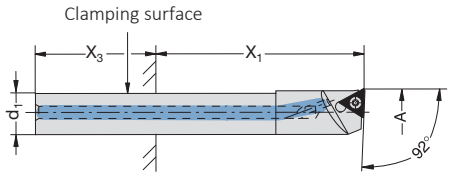
Boring Range		Dimensions										Order No.
A_{min}		d_1		X_1		$X_{3\ min}$		l_1		r_1		
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	
.016	.04	.157	4*	.118 - .669	3.0 - 170	.98	25	.079	2.0	.001	0.03	**081401 WHC126**
.024	0.6	.157	4*	.157 - .709	4.0 - 18.0	.98	25	.118	3.0	.002	0.04	**081402 WHC126**
.031	0.8	.157	4*	.197 - .748	5.0 - 19.0	.98	25	.157	4.0	.002	0.04	**081403 WHC126**
.039	1.0	.157	4*	.236 - .787	6.0 - 20.0	.98	25	.197	5.0	.0025	0.05	**081404 WHC126**
.059	1.5	.157	4*	.335 - .886	8.5 - 22.5	.98	25	.295	7.5	.0025	0.05	**081405 WHC126**
.079	2.0	.157	4*	.433 - .984	11.0 - 25.0	.98	25	.394	10.0	.0025	0.05	**081406 WHC126**
.098	2.5	.157	4*	.531 - 1.083	13.5 - 27.5	.98	25	.492	12.5	.0025	0.05	**081407 WHC126**
.110	2.8	.157	4*	.591 - 1.142	15.0 - 29.0	.98	25	.551	14.0	.003	0.07	**081408 WHC126**
.138	3.5	.157	4*	.748 - 1.299	19.0 - 33.0	.98	25	.689	17.5	.004	0.10	**081409 WHC126**
.157	4.0	.157	4*	.827 - 1.378	21.0 - 35.0	.98	25	.787	20.0	.004	0.10	**081410 WHC126**
.197	5.0	.197	5*	1.043 - 1.614	26.5 - 41.0	.98	25	.984	25.0	.005	0.12	**081411 WHC126**

* Fixture through reducing sleeves

Other versions are available on request.

Ø .236" – .787" (Ø 6mm – 20mm)

Steel Boring Bars with 92° Approach Angle



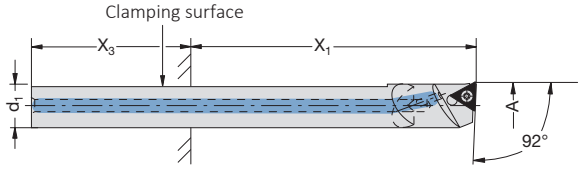
Boring Range		Dimensions								Insert Form		Insert Form	
A		d_1		X_1		$X_{3\ min}$		Weight			Order No.		Order No.
in	mm	in	mm	in	mm	in	mm	lbs	kg				
.236 - .315	6 - 8	.197*	5*	.492 - 1.772	12.5 - 45.0	.984	25	.022	0.01	-	-	211	**514 032**
.315 - .394	8 - 10	.276*	7*	.689 - 2.205	17.5 - 56.0	.984	25	.044	0.02	-	-	211	**514 033**
.394 - .472	10 - 12	.315*	8*	.787 - 2.362	20.0 - 60.0	.984	25	.066	0.03	101	**514 003**	20	**514 004**
.472 - .551	12 - 14	.394*	10*	.984 - 2.953	25.0 - 75.0	.984	25	.110	0.05	101	**514 005**	20	**514 006**
.551 - .630	14 - 16	.472*	12*	1.181 - 3.307	30.0 - 84.0	1.181	30	.198	0.09	101	**514 007**	20	**514 008**
.630 - .709	16 - 18	.551*	14*	2.205 - 3.583	56.0 - 91.0	1.181	30	.287	0.13	101	**514 009**	20	**514 010**
.709 - .787	18 - 20	.551*	14*	2.205 - 3.583	56.0 - 91.0	1.181	30	.287	0.13	101	**514 011**	20	**514 012**

* Fixture through reducing sleeves

Other versions available on request

Ø .236" – .787" (Ø 6mm – 20mm)

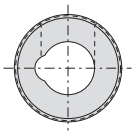
Carbide Boring Bars with 92° Approach Angle

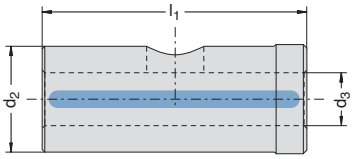


Boring Range		Dimensions								Insert Form		Insert Form	
A		d_1		X_1		$X_{3\ min}$		Weight			Order No.		Order No.
in	mm	in	mm	in	mm	in	mm	lbs	kg				
.236 - .315	6 - 8	.197*	5*	.492 - 1.772	12.5 - 65.0	.984	25	.044	0.02	-	-	211	**514 034**
.315 - .394	8 - 10	.276*	7*	.827 - 3.307	21.0 - 84.0	.984	25	.110	0.05	-	-	211	**514 035**
.394 - .472	10 - 12	.315*	8*	.866 - 3.622	22.0 - 92.0	.984	25	.154	0.07	101	**514 015**	20	**514 016**
.472 - .551	12 - 14	.394*	10*	2.008 - 4.528	51.0 - 115.0	.984	25	.287	0.13	101	**514 017**	20	**514 018**
.551 - .630	14 - 16	.472*	12*	2.677 - 5.197	68.0 - 132.0	1.181	30	.485	0.22	101	**514 019**	20	**514 020**
.630 - .709	16 - 18	.551*	14*	3.301 - 4.409	77.0 - 112.0	1.181	30	.573	0.26	101	**514 021**	20	**514 022**
.630 - .709	16 - 18	.551*	14*	4.409 - 5.787	112.0 - 147.0	1.181	30	.827	0.33	101	**514 023**	20	**514 024**
.709 - .787	18 - 20	.551*	14*	3.031 - 4.409	77.0 - 112.0	1.181	30	.573	0.26	101	**514 025**	20	**514 026**
.709 - .787	18 - 20	.551*	14*	4.409 - 5.787	112.0 - 147.0	1.181	30	.827	0.33	101	**514 027**	20	**514 028**

* Fixture through reducing sleeves

Reducing Sleeves

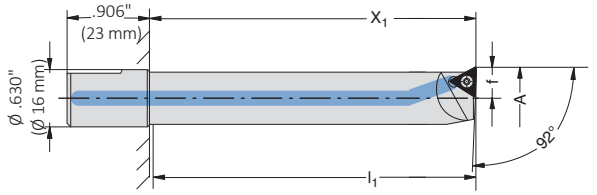




Dimensions						Order No.
d_2		d_3		l_1		
in	mm	in	mm	in	mm	
.630	16	.157	4	1.260	32	**450 129**
.630	16	.197	5	1.260	32	**450 130**
.630	16	.276	7	1.260	32	**450 132**
.630	16	.315	8	1.260	32	**450 133**
.630	16	.397	10	1.260	32	**450 134**
.630	16	.472	12	1.260	32	**450 135**
.630	16	.556	14	1.260	32	**450 136**

Ø .236" – 1.063" (Ø 6mm – 27mm)

Tool Steel Boring Bars with 16mm Shanks

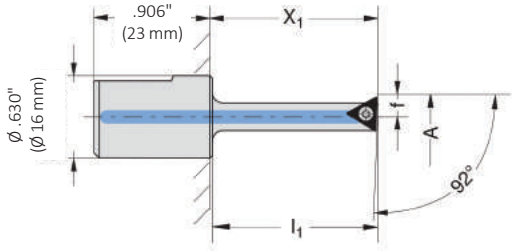


Boring Range		Dimensions								Insert Form		Insert Form	
A		X_1		l_1		f		Weight			Order No.		Order No.
in	mm	in	mm	in	mm	in	mm	lbs	kg				
.236 - .315	6 - 8	.866	22	.748	19	.110	2.8	.07	0.03	-	-	211	**081 053**
.315 - .394	8 - 10	1.181	30	1.063	27	.150	3.8	.09	0.04	-	-	211	**218 071**
.394 - .472	10 - 12	1.772	45	1.654	42	.189	4.8	.11	0.05	-	-	20	**081 044**
.394 - .472	10 - 12	.984	25	.866	22	.189	4.8	.09	0.04	101	**218 047**	20	**218 058**
.394 - .472	10 - 12	1.378	35	1.260	32	.189	4.8	.11	0.05	101	**218 048**	20	**218 059**
.472 - .551	12 - 14	1.181	30	1.063	27	.228	5.8	.11	0.05	101	**218 012**	20	**218 014**
.472 - .551	12 - 14	1.772	45	1.654	42	.228	5.8	.13	0.06	101	**218 049**	20	**218 060**
.551 - .630	14 - 16	1.378	35	1.260	32	.268	6.8	.13	0.06	101	**218 050**	20	**218 061**
.551 - .630	14 - 16	1.969	50	1.850	47	.268	6.8	.18	0.08	101	**218 051**	20	**218 062**
.591 - .669	15 - 17	1.457	37	1.339	34	.291	7.4	.13	0.06	-	-	20	**081 048**
.591 - .669	15 - 17	2.362	60	2.244	57	.291	7.4	.18	0.08	101	**081 041**	20	**081 045**
.630 - .709	16 - 18	1.575	40	1.457	37	.307	7.8	.18	0.08	101	**218 052**	20	**218 063**
.630 - .709	16 - 18	2.362	60	2.244	57	.307	7.8	.20	0.09	101	**218 053**	20	**218 064**
.787 - .866	20 - 22	1.457	37	1.299	33	.386	9.8	.15	0.07	-	-	20	**081 049**
.787 - .866	20 - 22	2.756	70	2.480	63	.386	9.8	.24	0.11	101	**081 042**	20	**081 046**
.984 - 1.063	25 - 27	1.457	37	1.299	33	.484	12.3	.15	0.07	-	-	20	**081 050**
.984 - 1.063	25 - 27	2.756	70	2.638	67	.484	12.3	.24	0.11	101	**081 043**	20	**081 047**

Other tool holders are available on request.

Ø .236" - .394" (Ø 6mm - 10mm)

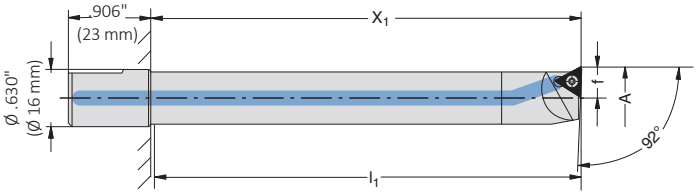
HEAVY METAL Tool Holders with 16mm Shanks
with 92° Lead Angle for Deeper Boring Depths



Boring Range		Dimensions								Insert Form	
A		X_1		l_1		f		Weight			Order No.
in	mm	in	mm	in	mm	in	mm	lbs	kg		
.236 - .315	6 - 8	1.260	32	1.142	29	.110	2.8	.176	0.08	211	**081 055**
.315 - .394	8 - 10	1.772	45	1.654	42	.150	3.8	.198	0.09	211	**218 072**

Ø .394" – .787" (Ø 10mm – 20mm)

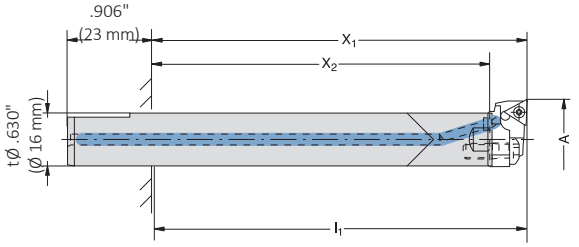
Carbide Boring Bars with 16mm Shanks



Boring Range		Dimensions								Insert Form		Insert Form	
A		X_1		l_1		f		Weight			Order No.		Order No.
in	mm	in	mm	in	mm	in	mm	lbs	kg				
.394 - .472	10 - 12	2.165	55	2.047	52	.189	4.8	.154	0.07	101	**218 042**	20	**218 037**
.394 - .472	10 - 12	2.953	75	2.835	72	.189	4.8	.198	0.09	101	**218 032**	20	**218 029**
.472 - .551	12 - 14	2.756	70	2.638	67	.228	5.8	.220	0.10	101	**218 043**	20	**218 038**
.472 - .551	12 - 14	3.543	90	3.425	87	.228	5.8	.331	0.15	101	**218 033**	20	**218 030**
.551 - .630	14 - 16	2.953	75	2.835	72	.268	6.8	.353	0.16	101	**218 044**	20	**218 039**
.551 - .630	14 - 16	3.937	100	3.819	97	.268	6.8	.441	0.20	101	**218 045**	20	**218 040**
.630 - .787	16 - 20	3.543	90	3.425	87	.307	7.8	.573	0.26	101	**218 046**	20	**218 041**
.630 - .787	16 - 20	4.724	120	4.606	117	.307	7.8	.728	0.33	101	**218 034**	20	**218 031**

Ø .787" – 1.260" (Ø 20mm – 32mm)

Carbide Serrated Tool Bodies with 16mm Shanks



Serrated Tool Body	Boring Range A		Dimension X1		X2		l1		Weight		Order No.
	in	mm	in	mm	in	mm	in	mm	lbs	kg	
Carbide	.787 - 1.260	20 - 32	4.724	120	4.252	108	4.606	117	.882	0.4	**236 091**

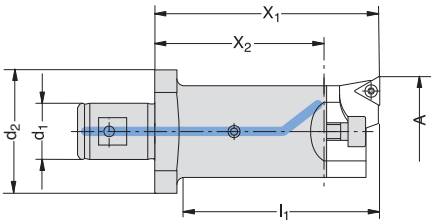
Insert holder is sold separately. See following chart.

Insert Holder with 92° Lead Angle

Boring Range A		Dimensions X1		f		Weight		Insert Form	Order No.	Insert Form	Order No.
in	mm	in	mm	in	mm	lbs	kg				
.787 - .866	20 - 22	.472	12	.386	9.8	.022	0.01	101	**502 052**	20	**502 046**
.866 - .945	22 - 24	.472	12	.425	10.8	.022	0.01	101	**502 053**	20	**502 047**
.945 - 1.024	24 - 26	.472	12	.465	11.8	.022	0.01	101	**502 054**	20	**502 048**
1.024 - 1.102	26 - 28	.472	12	.504	12.8	.022	0.01	101	**502 055**	20	**502 049**
1.102 - 1.181	28 - 30	.472	12	.543	13.8	.022	0.01	101	**502 056**	20	**502 050**
1.181 - 1.260	30 - 32	.472	12	.583	14.8	.022	0.01	101	**502 057**	20	**502 051**

Ø 1.142" – 2.087" (Ø 29mm – 53mm)

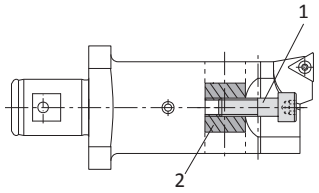
Serrated Tool Bodies



Connection d1		d2		Boring Range A		Dimension X1		X2		l1		Weight		Order No.
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	lbs	kg	
.630	16	1.379	35	1.142 - 2.087	29 - 53	2.520	64	1.890	48	2.205	56	.441	0.2	**236 021**
.630	16	1.379	35	1.142 - 2.087	29 - 53	3.937	100	3.307	84	3.622	92	.661	0.3	**236 031**

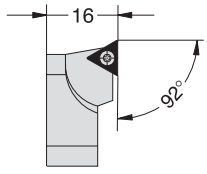
Insert holder and clamping pieces are sold separately. See following chart.

Cap Screw (1) Order No.	Hex Size	Clamping Piece (2) Order No.
027 154	s4	**145 184**



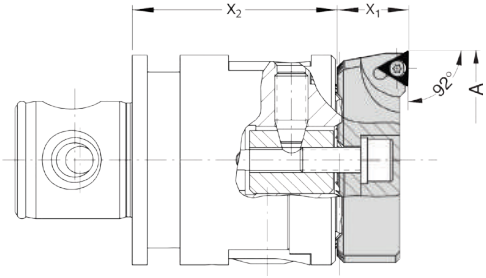
Insert Holders

Turning Range A		Weight		Insert Form	Order No.
in	mm	lbs	kg		
1.142 - 1.614	29 - 41	.088	0.04	101	**236 023**
1.142 - 1.614	29 - 41	.088	0.04	20	**236 022**
1.575 - 2.087	40 - 53	.132	0.06	101	**236 025**
1.575 - 2.087	40 - 53	.132	0.06	20	**236 024**



Ø 2.047" - 4.016" (Ø 52mm - 102mm)

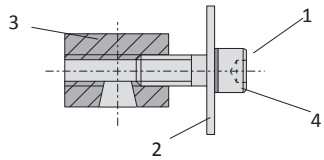
Insert Holders



Boring Range A		Dimensions X_1		X_2		Weight		Insert Form	Order No.
in	mm	in	mm	in	mm	lbs	kg		
1.142 - 1.614	29 - 41	2.598	66	1.949	49.5	.132	0.06	101	**236 027**
1.142 - 1.614	29 - 41	2.598	66	1.949	49.5	.132	0.06	20	**236 026**
1.575 - 2.087	40 - 53	2.598	66	1.949	49.5	.220	0.10	101	**236 029**
1.575 - 2.087	40 - 53	2.598	66	1.949	49.5	.220	0.10	20	**236 028**

Clamping element is sold separately. See following chart.

Clamping Elements for Insert Holders

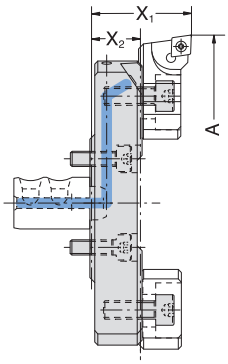


Boring Range A		Cap Screw (1)	Hex Size	Washer (2)	Clamping Piece (3)	Locking Washer (4)	Complete Set (includes 1, 2, 3, & 4)
in	mm	Order No.	mm	Order No.	Order No.	Order No.	Order No.
.157 - 1.181	4 - 30	070 153	s5	315 155	236 120	215 254	**236 088**
1.142 - 2.598	29 - 66	070 153	s5	315 156	236 120	215 254	**236 089**
2.047 - 4.016	52 - 102	115 147	s5	115 725	236 120	-	**236 020**

Ø 2.677" - 5.984" (Ø 68mm - 152mm)

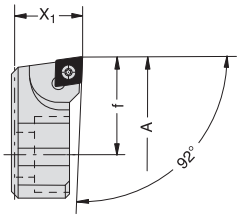
Serrated Slides

Boring Range A		Dimensions X_1		X_2		Weight		Order No.
in	mm	in	mm	in	mm	lbs	kg	
2.677 - 3.780	68 - 96	.630	16	1.280	32.5	.220	0.10	**501 054**
3.780 - 4.881	98 - 124	.630	16	1.280	32.5	.220	0.10	**501 055**
4.881 - 5.984	124 -152	.630	16	1.280	32.5	.441	0.20	**501 056**



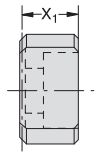
Insert Holders

Boring Range A		Dimensions X_1		f		Weight		Insert Form	Order No.
in	mm	in	mm	in	mm	lbs	kg		
2.677 - 8.189	68 - 208	.650	16.5	.776	19.7	.110	0.05	101	**502 064**
2.677 - 8.189	68 - 208	.650	16.5	.776	19.7	.110	0.05	20	**502 069**



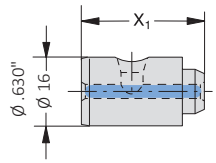
Counter Weight

Dimensions X_1		Weight		Order No.
in	mm	lbs	kg	
.528	13.4	.110	0.05	**502 165**



Coolant Delivery Section

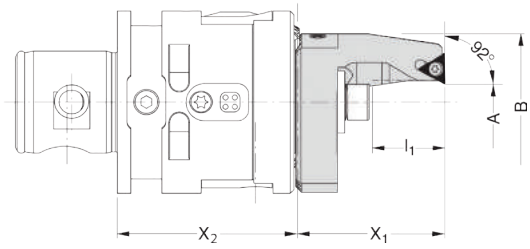
Dimensions X_1		Weight		Order No.
in	mm	lbs	kg	
1.004	25.5	.022	0.01	**450 137**



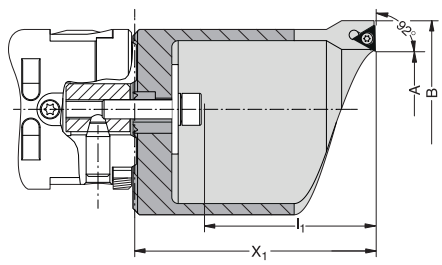
Ø 0.157" - 2.598" (Ø 4mm - 66mm)

Insert Holders for Outside Turning

Type A



Type B



With through-the-tool coolant

Turning Range A		Dimensions X_1		X_2		l_1		B		Weight		Type	Insert Form*	Order No.
in	mm	in	mm	in	mm	in	mm	in	mm	lbs	kg			
.157 - .689	4 - 17.5	3.543	90	1.949	49.5	.787	20	1.772	45.0	.220	0.1	A	20	**236 081**
.650 - 1.181	16.5 - 30	3.937	100	1.949	49.5	1.181	30	2.067	52.5	.220	0.1	A	20	**236 082**
1.142 - 1.732	29 - 44	4.921	125	1.949	49.5	2.126	54	2.482	63.5	.661	0.3	B	20	**236 083**
1.693 - 2.598	43 - 66	5.905	150	1.949	49.5	3.110	79	3.366	85.5	.882	0.4	B	20	**236 084**

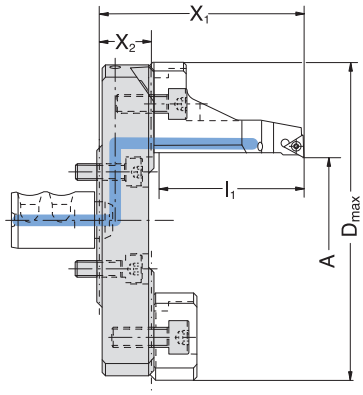
* Clockwise and neutral execution

Clamping element sold separately, see page 13

Ø .079" – 2.283" (Ø 2mm – 58mm)

Serrated Slides

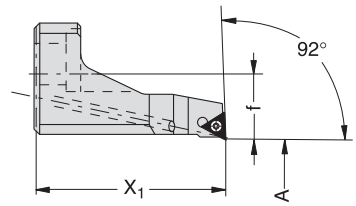
Outside Turning Range A		Dimensions X_1		X_2		l_1		Weight		Interfering ø D_{max}		Order No.
in	mm	in	mm	in	mm	in	mm	lbs	kg	in	mm	
.079 - 1.181	2 - 30	.630	16	2.874	73	2.165	55	.220	0.10	3.976	101	**501 055**
1.181 - 2.283	30 - 58	.630	16	2.874	73	2.165	55	.441	0.20	5.079	129	**501 056**



Insert Holder

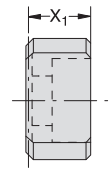
Outside Turning Range A		Dimensions X_1		f		Weight		Insert Form*	Order No.
in	mm	in	mm	in	mm	lbs	kg		
.079 - 4.488	2 - 114	2.244	57.0	.776	19.7	.331	0.15	20	**502 082**

* Clockwise and neutral execution



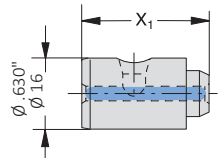
Counter Weight

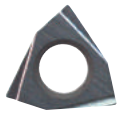
Dimensions X_1		Weight		Order No.
in	mm	lbs	kg	
.945	24.0	.331	0.15	**502 183**

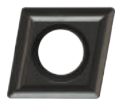
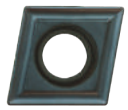
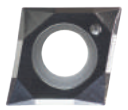


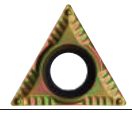
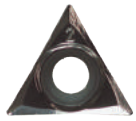
Coolant Delivery Section

Dimensions X_1		Weight		Order No.
in	mm	lbs	kg	
1.004	25.5	.022	0.01	**450 137**

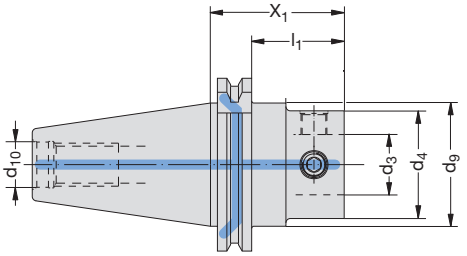


ISO Material Groups		Form 211	Nose Radius	Item Number	Order Number
P	Non/Low Alloyed		.004" (0.1mm)	F211 01GN121 WHC19	**397675WHC19**
			.008" (0.2mm)	F211 02GN121 WHC19	**397676WHC19**
	High Alloyed		.004" (0.1mm)	F211 01GL650 WHT12	**097755WHT12**
			.008" (0.2mm)	F211 02GL650 WHT12	**097454WHT12**
M	Ferritic		.004" (0.1mm)	F211 01GN121 WHC19	**397675WHC19**
			.008" (0.2mm)	F211 02GN121 WHC19	**397676WHC19**
	Austenitic		.004" (0.1mm)	F211 01GN121 WHC111	**397675WHC111**
			.008" (0.2mm)	F211 02GN121 WHC111	**397676WHC111**
K	Grey Cast		.004" (0.1mm)	F211 01GL650 WHC136	**097755WHC136**
			.008" (0.2mm)	F211 02GL650 WHC136	**097454WHC136**
	Nodular		.004" (0.1mm)	F211 01GN121 WHC111	**397675WHC111**
			.008" (0.2mm)	F211 02GN121 WHC111	**397676WHC111**
N	Aluminum		.004" (0.1mm)	F211 01GL650 WHC18	**097755WHC18**
			.008" (0.2mm)	F211 02GL650 WHC18	**097454WHC18**
	Non-Ferrous		.004" (0.1mm)	F211 01GL650 WHC18	**097755WHC18**
			.008" (0.2mm)	F211 02GL650 WHC18	**097454WHC18**
S	Superalloys		.004" (0.1mm)	F211 01GN121 WHC19	**397675WHC19**
			.008" (0.2mm)	F211 02GN121 WHC19	**397676WHC19**
	Titanium Alloys		.004" (0.1mm)	F211 01GN121 WHC111	**397675WHC111**
			.008" (0.2mm)	F211 02GN121 WHC111	**397676WHC111**
H	Hard Materials		.004" (0.1mm)	F211 01GN121 WHC111	**397675WHC111**
			.008" (0.2mm)	F211 02GN121 WHC111	**397676WHC111**

ISO Material Groups		Form 101	Nose Radius	Item Number	Order Number
P	Non/Low Alloyed		.008" (0.2mm)	F101 02GN112 WHT32	**297485WHT32**
			.016" (0.4mm)	F101 04MN112 WHT32	**297434WHT32**
	High Alloyed		.008" (0.2mm)	F101 02MN199 WHC114	**397164WHC114**
			.016" (0.4mm)	F101 04MN199 WHC114	**397165WHC114**
M	Ferritic		.008" (0.2mm)	F101 02MN192 WHC19	**297531WHC19**
			.016" (0.4mm)	F101 04MN192 WHC19	**297658WHC19**
	Austenitic		.008" (0.2mm)	F101 02MN199 WHC114	**397164WHC114**
			.016" (0.4mm)	F101 04MN199 WHC114	**397165WHC114**
K	Grey Cast		.008" (0.2mm)	F101 02MN158 WHC79	**297248WHC79**
			.016" (0.4mm)	F101 04MN158 WHC79	**297377WHC79**
	Nodular		.008" (0.2mm)	F101 02MN158 WHC111	**297248WHC111**
			.016" (0.4mm)	F101 04MN158 WHC111	**297377WHC111**
N	Aluminum		.002" (0.05mm)	F101 005GN129 WHW16	**397738WHW16**
			.004" (0.1mm)	F101 01GN129 WHW16	**397737WHW16**
			.008" (0.2mm)	F101 02GN129 WHW16	**297545WHW16**
			.016" (0.4mm)	F101 04GN129 WHW16	**297546WHW16**
	Non-Ferrous		.008" (0.2mm)	F101 02GN127 WHW16	**097529WHW16**
			.016" (0.4mm)	F101 04GN127 WHW16	**097445WHW16**
S	Superalloys		.008" (0.2mm)	F101 02MN199 WHC114	**397164WHC114**
			.016" (0.4mm)	F101 04MN199 WHC114	**397165WHC114**
	Titanium Alloys		.008" (0.2mm)	F101 02GN200 WHC111	**397585WHC111**
			.016" (0.4mm)	F101 04GN200 WHC111	**397586WHC111**
H	Hard Materials		.008" (0.2mm)	F101 02GN200 WHC111	**397585WHC111**
			.016" (0.4mm)	F101 04GN200 WHC111	**397586WHC111**

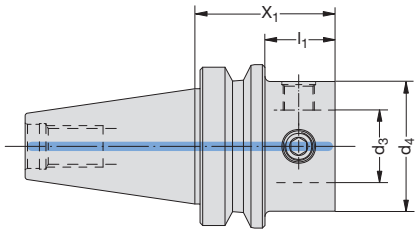
ISO Material Groups		Form 20	Nose Radius	Item Number	Order Number
P	Non / Low-alloyed		.008" (0.2mm)	F020 02MN155 WTC15	**397688WTC15**
			.016" (0.4mm)	F020 04MN155 WTC15	**397689WTC15**
	High Alloyed		.004" (0.1mm)	F020 01GL650 WHT12	**097153WHT12**
			.008" (0.2mm)	F020 02GL650 WHT12	**097546WHT12**
			.016" (0.4mm)	F020 04GL650 WHT12	**097599WHT12**
M	Ferritic		.004" (0.1mm)	F020 01GN121 WHC19	**397672WHC19**
			.008" (0.2mm)	F020 02GN121 WHC19	**397673WHC19**
			.016" (0.4mm)	F020 04GN121 WHC19	**397674WHC19**
	Austenitic		.004" (0.1mm)	F020 01GN121 WHC111	**397672WHC111**
			.008" (0.2mm)	F020 02GN121 WHC111	**397673WHC111**
			.016" (0.4mm)	F020 04GN121 WHC111	**397674WHC111**
K	Grey Cast		.004" (0.1mm)	F020 01GL650 WHC136	**097153WHC136**
			.008" (0.2mm)	F020 02GL650 WHC136	**097546WHC136**
			.004" (0.1mm)	F020 03GL650 WHC136	**097154WHC136**
			.016" (0.4mm)	F020 04GL650 WHC136	**097599WHC136**
			.004" (0.1mm)	F020 08GL650 WHC136	**397764WHC136**
	Nodular		.004" (0.1mm)	F020 01GN121 WHC111	**397672WHC111**
			.008" (0.2mm)	F020 02GN121 WHC111	**397673WHC111**
			.016" (0.4mm)	F020 04GN121 WHC111	**397674WHC111**
N	Aluminum		.008" (0.2mm)	F020 02GN128 WHW16	**297541WHW16**
			.016" (0.4mm)	F020 04GN128 WHW16	**297542WHW16**
	Non-Ferrous		.008" (0.2mm)	F020 02GN128 WHW16	**297541WHW16**
			.016" (0.4mm)	F020 04GN128 WHW16	**297542WHW16**
S	Superalloys		.004" (0.1mm)	F020 01GN121 WHC19	**397672WHC19**
			.008" (0.2mm)	F020 02GN121 WHC19	**397673WHC19**
			.016" (0.4mm)	F020 04GN121 WHC19	**397674WHC19**
	Titanium Alloys		.004" (0.1mm)	F020 01GN121 WHC111	**397672WHC111**
			.008" (0.2mm)	F020 02GN121 WHC111	**397673WHC111**
			.016" (0.4mm)	F020 04GN121 WHC111	**397674WHC111**
H	Hard Materials		.004" (0.1mm)	F020 01GN121 WHC111	**397672WHC111**
			.008" (0.2mm)	F020 02GN121 WHC111	**397673WHC111**
			.016" (0.4mm)	F020 04GN121 WHC111	**397674WHC111**

Master Shanks



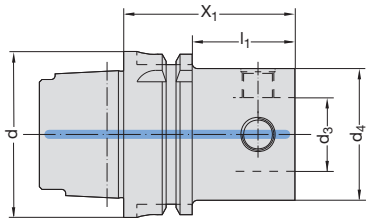
CAT

Size	MVS Connection		Dimensions									Order No.
			X_1		l_1		d_9		d_{10}	Weight		
	d_4	d_3	in	mm	in	mm	in	mm	in	lbs.	kg	
40	50	28	2.441	62	1.69	42.9	1.75	44.55	5/8 - 11	2.9	1.3	**353 004**
50	50	28	2.441	62	1.69	42.9	2.75	69.95	1 - 8	7.3	3.3	**353 007**



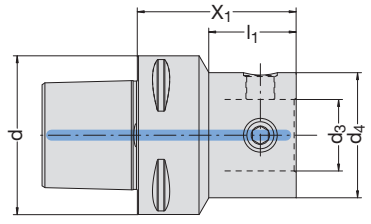
BT TAPER

Size	MVS Connection		Dimensions						Order No.
			X_1		l_1		Weight		
	d_4	d_3	in	mm	in	mm	lbs.	kg	
40	50	28	2.126	54	1.06	27.0	3.1	1.4	**327 019**
50	50	28	2.559	65	1.06	26.8	8.6	3.9	**327 021**



HSK - A

Size	MVS Connection		Dimensions						Order No.
			X_1		l_1		Weight		
	d_4	d_3	in	mm	in	mm	lbs.	kg	
63	50	28	2.559	65	1.54	39	3.5	1.6	**245 012**
100	50	28	2.559	65	1.42	36	5.3	2.4	**245 014**



Polygon Shank (PSC)

Size	MVS Connection		Dimensions						Order No.
			X_1		l_1		Weight		
	d_4	d_3	in	mm	in	mm	lbs.	kg	
63	50	28	2.559	65	1.555	39.5	2.866	1.3	**227 003**

Additional master shanks are available on request.

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Warranty Information

Allied Machine & Engineering warrants to original equipment manufacturers, distributors, industrial and commercial users of its products that each new product manufactured or supplied by Allied Machine shall be free from defects in material and workmanship.

Allied Machine's obligation under this warranty is limited to furnishing without additional charge a replacement or, at its option repairing or issuing credit for any product which shall within one year from the date of sale be returned freight prepaid to the plant designated by an Allied Machine representative and which upon inspection is determined by Allied Machine to be defective in materials or workmanship.

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

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Literature Order Number: WOHLVARIOBORE
Print Date: March 2018

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