



UNISIG

SOLUTIONS FOR MOLD
MANUFACTURERS

DEEP HOLE DRILLING AND MACHINING CENTERS

WE MAKE COMPLEX PROCESSES SIMPLE.

UNISIG.COM



MAKING MOLDS PRESENTS UNIQUE CHALLENGES

- Managing a range of part sizes, regularly including extreme sizes and weights
- Incredibly complex geometry with compound 2D and 3D features
- Challenging deep holes at compound angles and intersections
- Large metal removal rates in difficult material
- Small quantity, new designs, short lead times and no room for error
- Pressure to keep up with the rapid pace of both demand and technology

UNISIG HAS THE RIGHT SOLUTION.

UNISIG SOLUTIONS FOR MOLD MANUFACTURING

DEEP HOLE DRILLING AND MILLING IN A SINGLE MACHINE

Eliminate unnecessary handling and setup while improving repeatability. Streamline manufacturing to reduce lead time and change what is possible in part design and process planning.

FASTER DEEP HOLE DRILLING

Machine intelligence uses active process control to allow operators to optimize feed rates without risk, maximizing the potential of deep hole drilling tools.

UNISIG machines can use new generation indexable gundrills that raise expectations of the gundrill process, while BTA waterline drilling offers unmatched performance.

5-AXIS POSITIONING, WITH REACH

Reach 4 sides of your parts, from small components to large blocks, for complex machining and deep hole drilling at compound angles.

HEAVY WEIGHT CAPACITY WITHOUT EXCESSIVELY LARGE TABLES

Confidently handle the machining of full parts, not just sides, no matter the weight of the block. Robust tables efficiently handle the demands of large mold manufacturing.

AUTOMATIC TOOL CHANGERS FOR MILLING TOOLS

Reduce setups with increased tool capacity to further automatic manufacturing processes. Machines offer maximum tool length of 24 in [600 mm], for conventional drilling tools.

DEEP HOLE DRILLING REFERENCE Top: Inches, Bottom: Millimeters

P20 MOLD STEEL	FEED RATE — in/min													
MACHINE PROCESS	Conventional Drilling (Coolant Fed)				Deep Hole Drilling (High Pressure Coolant)									
TOOL TYPE	Carbide Twist Drill		Indexable Spade Drill		Brazed Gundrill		Indexable Gundrill		Brazed BTA		Indexable BTA		Spade Drill BTA	
DEPTH TO DIAMETER	20xD		30xD		100xD		100xD		100xD		100xD		100xD	
HOLE SIZE (in)	min	max	min	max	min	max	min	max	min	max	min	max	min	max
0.13	18.3	27.5	--	--	2.2	3.3	--	--	--	--	--	--	--	--
0.25	15.3	22.9	--	--	1.7	2.5	--	--	--	--	--	--	--	--
0.50	12.2	18.3	3.7	5.5	1.4	2.1	--	--	--	--	--	--	--	--
0.63	11.0	16.5	4.4	6.6	1.5	2.3	5.9	8.8	6.6	9.9	7.3	11.0	4.9	7.3
0.75	10.2	15.3	4.9	7.3	1.6	2.4	6.1	9.2	6.7	10.1	7.3	11.0	6.1	9.2
1.00	--	--	4.6	6.9	1.5	2.2	5.5	8.3	6.0	8.9	6.4	9.6	6.1	9.2
1.50	--	--	3.7	5.5	1.2	1.7	3.8	5.8	4.3	6.4	4.9	7.3	4.1	6.1
2.00	--	--	3.2	4.8	1.0	1.6	2.9	4.3	3.6	5.4	4.6	6.9	3.8	5.7
2.50	--	--	2.8	4.1	--	--	--	--	--	--	--	--	--	--
3.00	--	--	2.3	3.4	--	--	--	--	--	--	--	--	--	--

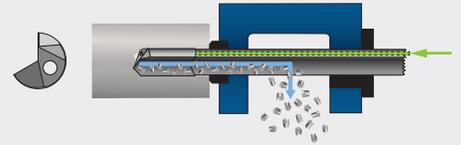
P20 MOLD STEEL	FEED RATE — mm/min													
MACHINE PROCESS	Conventional Drilling (Coolant Fed)				Deep Hole Drilling (High Pressure Coolant)									
TOOL TYPE	Carbide Twist Drill		Indexable Spade Drill		Brazed Gundrill		Indexable Gundrill		Brazed BTA		Indexable BTA		Spade Drill BTA	
DEPTH TO DIAMETER	20xD		30xD		100xD		100xD		100xD		100xD		100xD	
HOLE SIZE (mm)	min	max	min	max	min	max	min	max	min	max	min	max	min	max
3	466	699	--	--	56	84	--	--	--	--	--	--	--	--
6	388	582	--	--	42	63	--	--	--	--	--	--	--	--
13	310	466	93	140	35	53	--	--	--	--	--	--	--	--
16	279	419	112	168	39	59	149	224	168	251	186	279	124	186
19	259	388	124	186	41	62	155	233	171	256	186	279	155	233
25	--	--	116	175	38	57	140	210	151	227	163	244	155	233
38	--	--	93	140	30	44	98	147	109	163	124	186	103	155
51	--	--	81	122	26	40	73	110	92	138	116	175	97	146
64	--	--	70	105	--	--	--	--	--	--	--	--	--	--
76	--	--	58	87	--	--	--	--	--	--	--	--	--	--

Approximate feed rates under optimal conditions to illustrate productivity differences between tooling systems. Contact UNISIG for more information.

DEEP HOLE DRILLING SYSTEMS

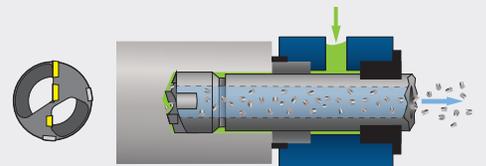
GUNDRILL SYSTEM

Internal Coolant
External Chip Exhaust



BTA SYSTEM

External Coolant
Internal Chip Exhaust



Brazed Gundrill Indexable Gundrill Brazed BTA Indexable BTA Spade Drill BTA

UNISIG MACHINE TECHNOLOGY



HEIDENHAIN TNC 640 CNC

This latest control provides ease of use, coupled with unbeatable performance in 2D and 3D machining.

- DCM Collision monitoring — Avoid costly errors
- KinematicsComp — Volumetric compensation
- KinematicsOPT — Automatic calibration of rotary axes
- Tool Presetter — Automatic offset of diameter and length
- Workpiece Probing — Inspect and verify your parts

HEIDENHAIN MOTORS AND DRIVES

Matched performance with absolute encoders eliminate homing of axes and improve dynamic performance. Energy efficient regenerative drives reduce your operating costs.

HEIDENHAIN GLASS SCALES AND ANGULAR ENCODERS

Customers that demand improved positional accuracy and the elimination of variables from their process benefit from this upgraded option.

USC-2M | USC-3M UNIVERSAL SPINDLE GUNDRILLING AND MILLING

Gundrilling and machining are combined in a universal spindle machine for versatile mold manufacturing with exceptionally quick changeover between processes.



USC-2M
DEEP HOLE
MACHINING

TABLE
20 t

TABLE
1250

DRILL
1500

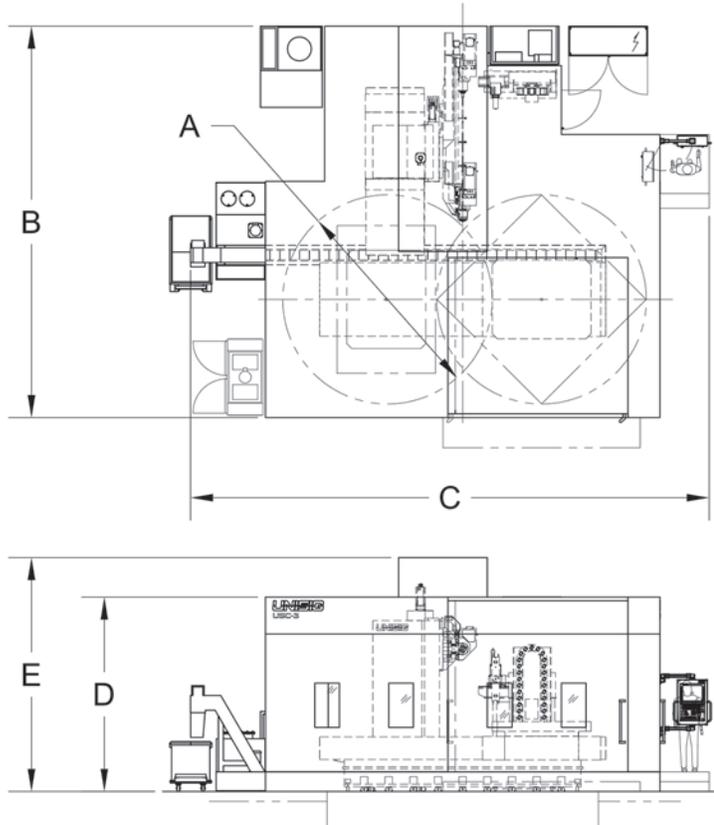
X-AXIS
2100

Y-AXIS

SPECIFICATIONS

SPECIFICATION	USC-2M		USC-3M	
Nominal Drilling Depth	1500 mm	59.1 in	1800 mm	70.9 in
Gundrilling diameter, min	4 mm	0.16 in	4 mm	0.16 in
Gundrilling diameter, indexable max	50 mm	2 in	50 mm	2 in
Gundrilling diameter, brazed max	50 mm	2 in	50 mm	2 in
BTA drilling diameter, max	-	-	-	-
TRAVELS				
X-axis (horizontal)	2100 mm	82.7 in	3100 mm	122 in
Y-axis (vertical)	1750 mm	68.9 in	1750 mm	68.9 in
Z-axis (horizontal)	850 mm	33.5 in	1300 mm	51.2 in
W-axis (spindle)	2300 mm	90.6 in	2700 mm	106.3 in
A-axis (inclination)	+30/-15 deg		+30/-15 deg	
B-axis (rotary table)	360,000 position		360,000 position	
TABLE				
Top surface	1250 x 1600 mm	49.2 x 63 in	1600 x 2000 mm	63 x 78.7 in
Weight capacity	20 t	44,100 lbs	30 t	66,615 lbs
SPINDLE				
Spindle Nose	SK 50 / CAT 50		SK 50 / CAT 50	
Maximum Speed	4500 rpm		4500 rpm	
Power (480V S1 100%/ S6 60%)	24 kW / 30 kW	32 hp / 40 hp	24 kW / 30 kW	32 hp / 40 hp

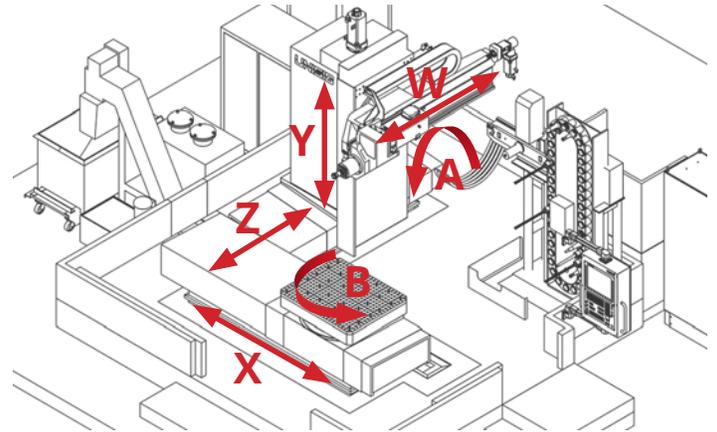
DIMENSIONS



ABOVE FLOOR INSTALLATION - REINFORCED PAD REQUIRED

DIMENSION	USC-2M		USC-3M	
A — Swing clearance	2850 mm	112.2 in	4250 mm	167.3 in
B — Length	6.4 m	21 ft	8.1 m	26 ft 7 in
C — Width	9 m	29 ft 6 in	10.8 m	35 ft 5 in
D — Enclosure height	4 m	13 ft 1 in	4 m	13 ft
E — Maximum height	4.6 m	15 ft 1 in	4.8 m	15 ft 7 in

AXIS DESIGNATION



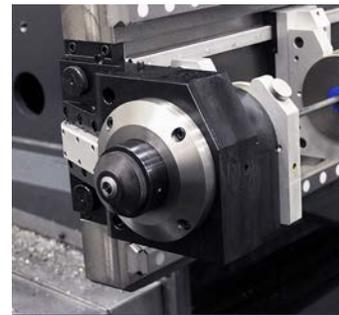
- 4-axis machine - **X Y Z W**
- 5-axis machine - **X Y Z W + B** rotary table
- 6-axis machine - **X Y Z W B + A**-axis inclining headstock

MACHINE OPTIONS

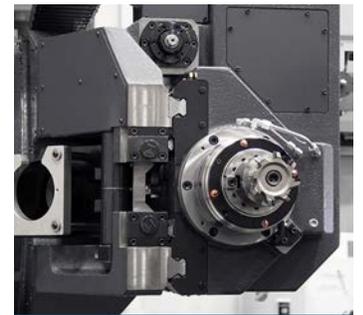
- 40-60 Position milling tool changer
- Glass scales for improved accuracy

SPINDLE FUNCTION DETAILS

Spindle changeover is effortless with a simple pivot and lock. Optimize your milling and deep hole drilling operations without removing the chip box or bushing.



DRILLING CONFIGURATION

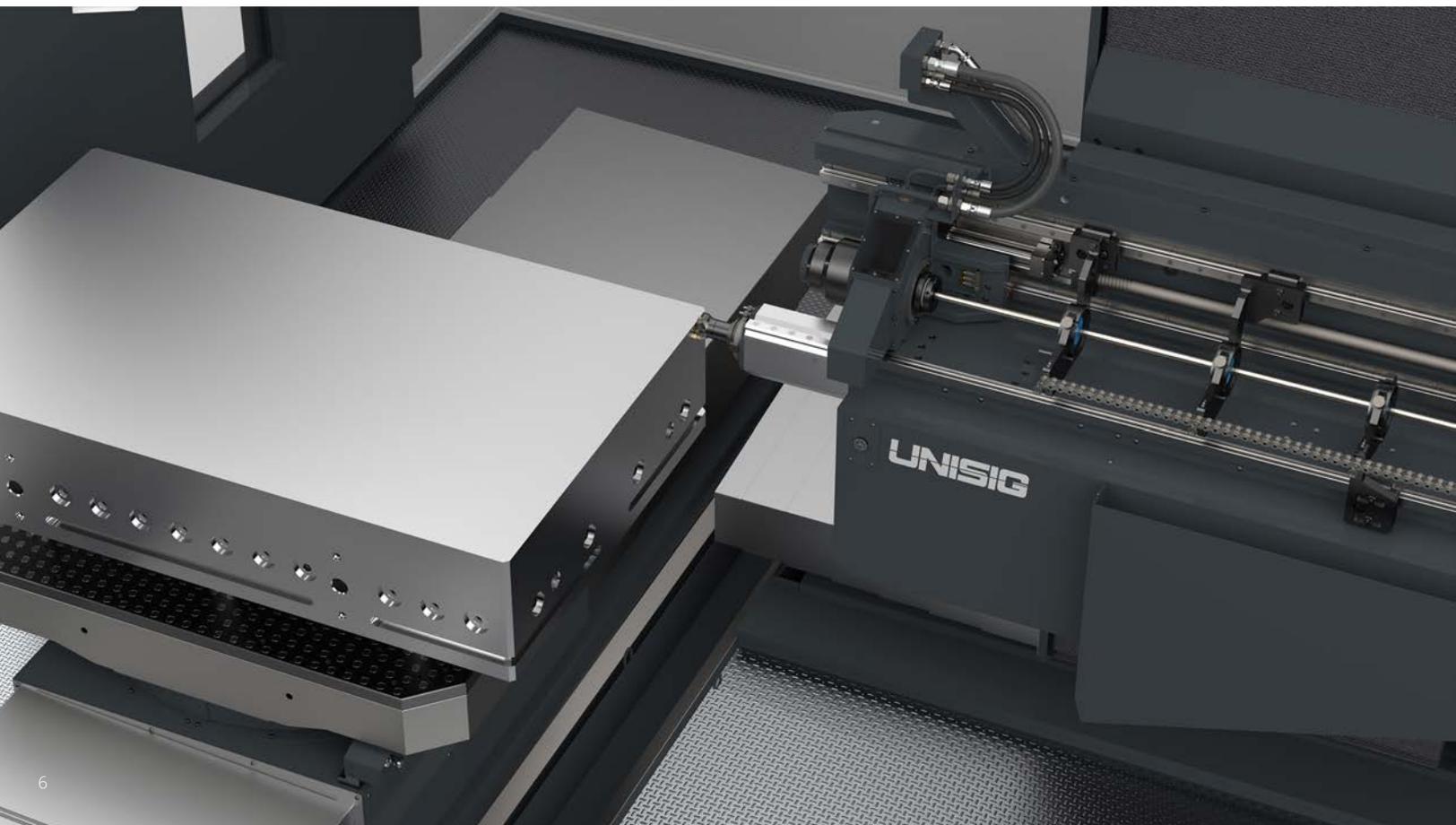
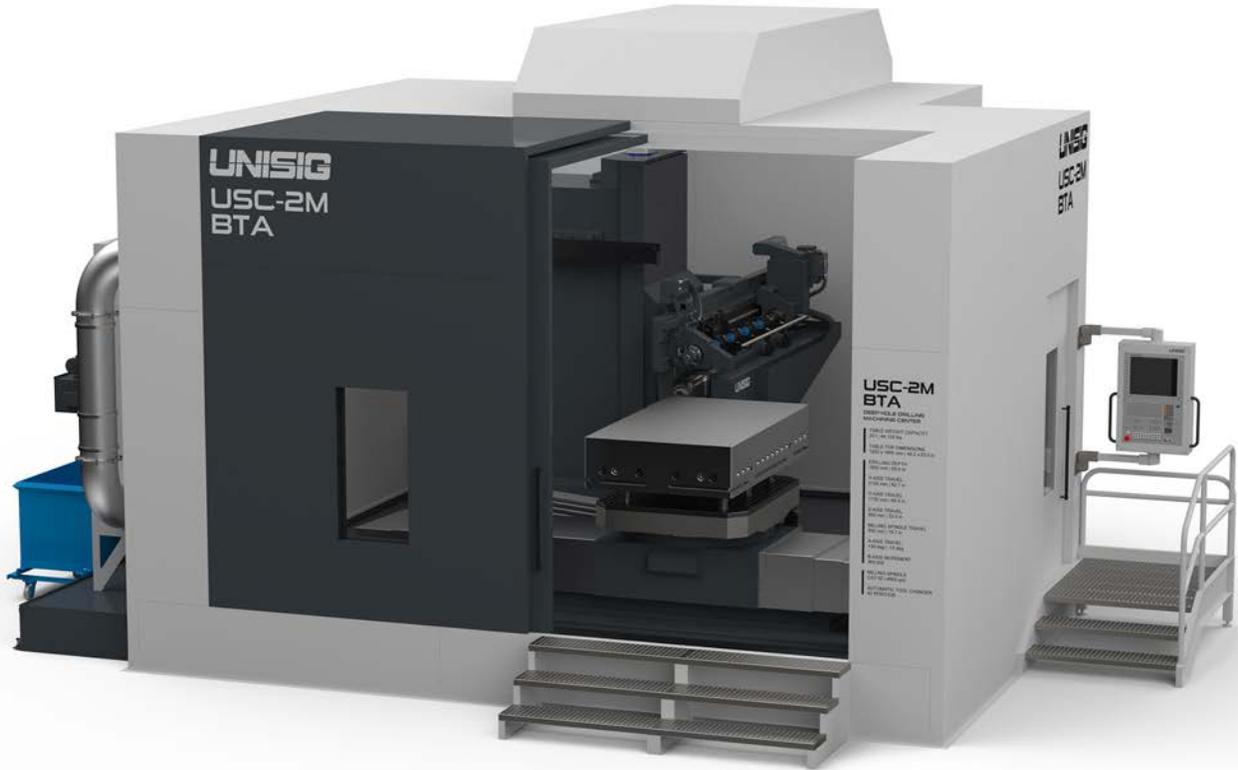


MILLING CONFIGURATION



USC-2M-BTA | USC-3M-BTA DEDICATED SPINDLE - BTA GUNDRILLING AND MILLING

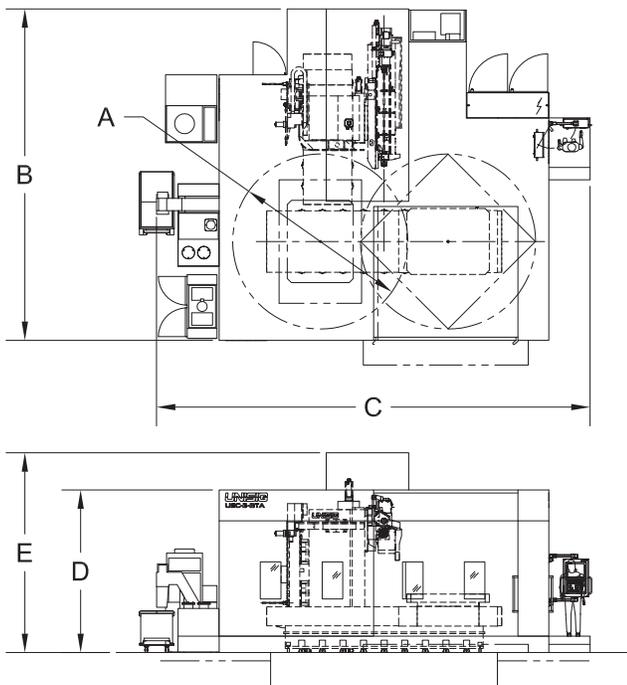
Dedicated milling and deep hole drilling spindles allow mold manufacturers to achieve high productivity across multiple operations in a single machine.



SPECIFICATIONS

SPECIFICATION	USC-2M-BTA		USC-3M-BTA	
Nominal Drilling Depth	1650 mm	65 in	1650 mm	65 in
Gundrilling diameter, min	4 mm	0.16 in	4 mm	0.16 in
Gundrilling diameter, indexable max	50 mm	2 in	50 mm	2 in
Gundrilling diameter, brazed max	50 mm	2 in	50 mm	2 in
BTA drilling diameter, max	38 mm	1.5 in	38 mm	1.5 in
TRAVELS				
X-axis (horizontal)	2100 mm	82.7 in	3100 mm	122 in
Y-axis (vertical)	1750 mm	68.9 in	1750 mm	68.9 in
Z-axis (horizontal)	850 mm	33.5 in	1300 mm	51.2 in
U-axis (spindle)	2000 mm	78.7 in	2000 mm	78.7 in
W-axis (machining spindle)	500 mm	19.7 in	500 mm	19.7 in
A-axis (inclination)	+30/-15 deg		+30/-15 deg	
B-axis (rotary table)	360,000 position		360,000 position	
TABLE				
Top surface	1250 x 1600 mm	49.2 x 63 in	1600 x 2000 mm	63 x 78.7 in
Weight capacity	20 t	44,100 lbs	30 t	66,615 lbs
DRILLING SPINDLE				
Spindle Nose	DHD		DHD	
Maximum Speed	4500 rpm		4500 rpm	
Power (480V S1 100%/ S6 60%)	15 kW / 20 kW	20 hp / 27 hp	15 kW / 20 kW	20 hp / 27 hp
MACHINING SPINDLE				
Spindle Nose	SK 50 / CAT 50		SK 50 / CAT 50	
Maximum Speed	4500 rpm		4500 rpm	
Power (480V S1 100%/ S6 60%)	20 kW / 25 kW	27 hp / 34 hp	20 kW / 25 kW	27 hp / 34 hp

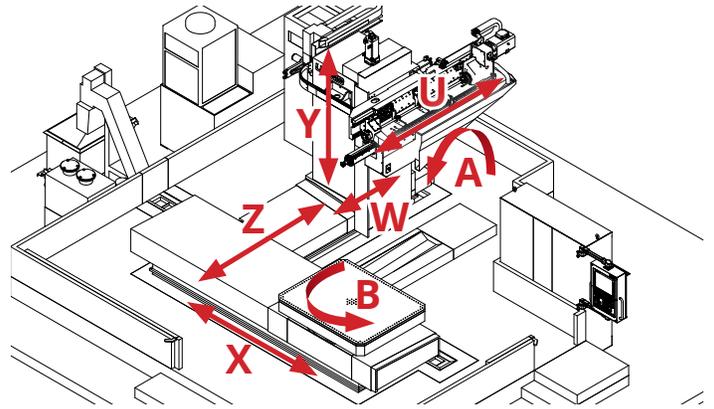
DIMENSIONS



ABOVE FLOOR INSTALLATION - REINFORCED PAD REQUIRED

DIMENSION	USC-2M-BTA		USC-3M-BTA	
A — Swing clearance	2850 mm	112.2 in	4250 mm	167.3 in
B — Length	6.9 m	22 ft 8 in	8.1 m	26 ft 7 in
C — Width	9.9 m	32 ft 6 in	10.8 m	35 ft 5 in
D — Enclosure height	4.3 m	14 ft 1 in	4.3 m	14 ft 1 in
E — Maximum height	5 m	16 ft 5 in	5 m	16 ft 5 in

AXIS DESIGNATION



- 5-axis machine - **XYZWU**
- 6-axis machine - **XYZWU + B** rotary table
- 7-axis machine - **XYZWUB + A**-axis inclining headstock

MACHINE OPTIONS

- 40 Position milling tool changer
- Glass scales for improved accuracy

SPINDLE FUNCTION DETAILS

Two dedicated spindles enable mold manufacturers to achieve high feed rates for deep hole drilling, while also handling complex machining operations.



USC-M38 | USC-M50 DEEP HOLE DRILLING AND MACHINING CENTERS



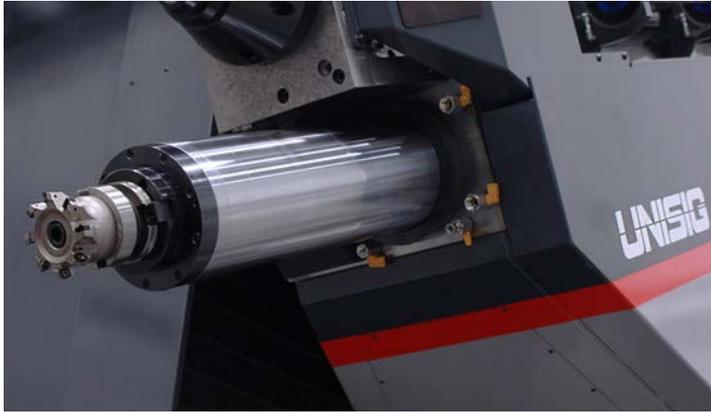
Revolutionize mold manufacturing with 7-axis dynamic performance. Powerful machining and deep hole drilling are combined with the right selection of features for unmatched productivity and accuracy.



USC-M38 | USC-M50 DEEP HOLE DRILLING AND MACHINING CENTERS

POWERFUL MILLING SPINDLE

Our dual-range geared transmission and final gear drive provide strong milling performance and a wide speed range for rough and finish cuts. Thermal management and tight spindle control integration give customers an edge when finding ways to reduce time and expense from production.



CHIP CONTROL

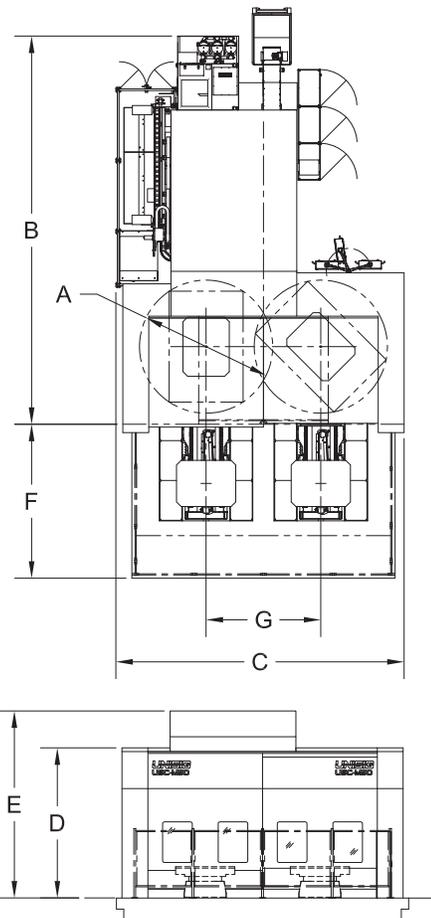
Multiple chip conveyors and chip shedding concepts allow for longer unattended machining.



SPECIFICATIONS

SPECIFICATION	USC-M38		USC-M50	
Nominal Drilling Depth	1500 mm	59.1 in	1830 mm	72 in
Gundrilling diameter, min	4 mm	0.16 in	4 mm	0.16 in
Gundrilling diameter, indexable max	50 mm	2 in	50 mm	2 in
Gundrilling diameter, brazed max	50 mm	2 in	50 mm	2 in
BTA drilling diameter, max	38 mm	1.5 in	50 mm	2 in
TRAVELS				
X-axis (horizontal)	2200 mm	86.6 in	3100 mm	122 in
Y-axis (vertical)	1700 mm	66.9 in	2500 mm	98.4 in
Z-axis (horizontal)	1000 mm	39.4 in	1550 mm	61 in
U-axis (spindle)	1830 mm	72 in	2450 mm	96.5 in
W-axis (machining spindle)	500 mm	19.7 in	500 mm	19.7 in
A-axis (inclination)	+30/-15 deg		+30/-20 deg	
B-axis (rotary table)	360,000 position		360,000 position	
TABLE				
Top surface	1000 x 1200 mm	39.4 x 47.2 in	1250 x 1600 mm	49.2 x 63 in
Weight capacity	15 t	33,069 lbs	23 t	50,715 lbs
DRILLING SPINDLE				
Spindle Nose	DHD		DHD	
Maximum Speed	5000 rpm		5000 rpm	
Power (480V S1 100%/ S6 60%)	15 kW / 20 kW	20 hp / 27 hp	24 kW / 30 kW	32 hp / 40 hp
MACHINING SPINDLE				
Spindle Nose	SK 50 / CAT 50		SK 50 / CAT 50	
Maximum Speed	4000 rpm		4000 rpm	
Power (480V S1 100%/ S6 60%)	20 kW / 25 kW	27 hp / 34 hp	24 kW / 30 kW	32 hp / 40 hp
DIMENSION				
	USC-M38		USC-M50	
A — Swing clearance	2850 mm	112.2 in	3600 mm	141.7 in
B — Length	8.7 m	28 ft 7 in	10.5 m	34 ft 5 in
C — Width	7.4 m	24 ft 4 in	8.5 m	27 ft 10 in
D — Enclosure height	3.7 m	12 ft	4.1 m	13 ft 4 in
E — Maximum height	4.5 m	14 ft 8 in	5.1 m	16 ft 7 in
F — Pallet system length	3 m	9 ft 10 in	3 m	9 ft 10 in
G — Pallet load centers	2.2 m	7 ft 3 in	3.1 m	10 ft

DIMENSIONS



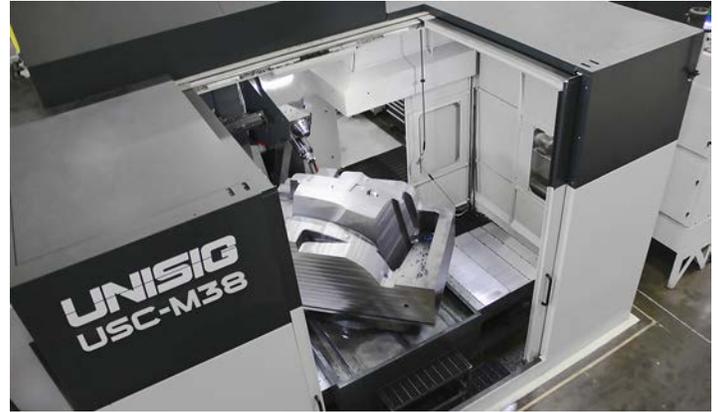
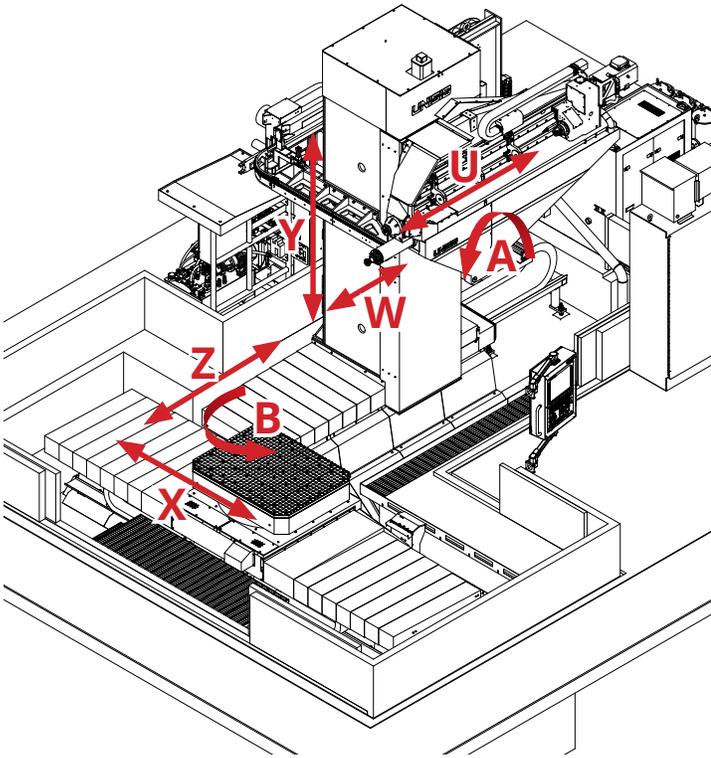
PARTIAL BELOW FLOOR INSTALLATION - REINFORCED FOUNDATION REQUIRED

DYNAMIC MOTION CONTROL

Servo and drive systems are selected for optimized inertia and power to hold machining paths and take advantage of advanced control technologies to reduce cycle time.

**GEOMETRIC ACCURACY**

Machine geometry is improved through hand-scraping. Local volumetric accuracy is verified by granite masters. The total volume of the machine is laser checked during build and brought to the highest standards of accuracy.

**AXIS DESIGNATION**

7-axis machine - **X Y Z W U** linear axes + **B**-axis rotary table
+ **A**-axis inclining headstock

MACHINE OPTIONS

- 120 Position tool changers
- Automatic pallet changer for workpieces weighing up to 25 tons



WITH YOU FROM START TO FINISH

Our combination of engineered expertise and process collaboration ensures that manufacturers confidently understand and utilize the full capabilities of their UNISIG system upon installation. Only UNISIG gives you the maximum proficiency for the application of deep hole drilling in your part production operation. **We make complex processes simple.**



APPLICATIONS AND TRAINING



EXTENSIVE SPARE PARTS INVENTORY



FIELD SERVICE

UNISIG offers a complete package. Contact your UNISIG representative about our expert applications support, factory OE parts, and trained service technicians. Our customers count on us every day to keep their deep hole drilling operations up and running smoothly.

GET STARTED WITH UNISIG

Visit [unisig.com](https://www.unisig.com) for full model details, videos, and submit your request for a quote.



UNISIG.COM

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