DEEP HOLE DRILLING SYSTEMS

DEEP HOLE DRILLING MACHINES FOR A RANGE OF APPLICATIONS

MACHINES FOR GUNDRILL OR BTA TOOLS

DEEP HOLE DEPTH-TO-DIAMETER RATIOS

20:1 - 400:1
ABOUT UNISIG
UNISIG deep hole drilling machines bring powerful and intuitive capability to our industry-leading customers across the globe. Machines are engineered to handle a complete range of applications with confidence, and supported by our high level of knowledge and service.

UNISIG’s Process
UNISIG is committed to working closely with customers throughout the entire process.
- Initial application
- Review and propose solution
- Machine building
- Testing and Acceptance
- Installation
- Training
- Service
- Long Term Support

Machine Capabilities
UNISIG produces precision solutions to meet the production and specification demands across applications.

<table>
<thead>
<tr>
<th>TOOLING SYSTEMS</th>
<th>HOLE DIAMETER</th>
<th>HOLE DEPTH</th>
<th>HOLE LOCATION</th>
<th>WORKPIECE SHAPE</th>
<th>AUTOMATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>BTA GUNDRILLING</td>
<td>0.8 - 500 mm</td>
<td>&lt; 25 mm -</td>
<td>ON- OR OFF-CENTER</td>
<td>CYLINDRICAL OR CUBIC</td>
<td>OPTION</td>
</tr>
<tr>
<td></td>
<td>0.031 - 20.0 in</td>
<td>&gt;10.0 m</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Industries Served:
- Aerospace
- Cylinders
- Energy
- Molds
- Steel
- Automotive
- Defense
- Medical
- Oil and Gas
PRODUCTION DEEP HOLE DRILLING MACHINES
FOR SMALL AND MEDIUM SIZED HOLES

- Compact, 1- or 2-spindle machines allow any customer to have gundrilling with low cost and quick delivery
- Multi-spindle machines or machine cells, typically with automation, handle the highest production levels

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FIND FULL MODEL FAMILIES, SPECIFICATIONS, AND TECHNICAL INFORMATION
CNC DEEP HOLE DRILLING MACHINES
FOR PRECISION OFF-CENTER HOLES

- Multiple axes allow table positioning for on-center and off-center drilling
- Precision machine design drills accurate holes at extreme depths-to-diameter ratios

The most challenging deep holes are easily achieved.

www.UNISIG.com
FIND FULL MODEL FAMILIES, SPECIFICATIONS, AND TECHNICAL INFORMATION
ON-CENTER DEEP HOLE DRILLING MACHINES
FOR LARGER HOLES AND LONGER WORKPIECES

- High-power BTA machines can manage larger, longer workpieces, and the deepest holes
- Skiving and burnishing machines finish bores in hydraulic cylinders with unmatched throughput
- These machines maintain superior productivity and accuracy, even in extreme applications

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FIND FULL MODEL FAMILIES, SPECIFICATIONS, AND TECHNICAL INFORMATION
CNC MACHINES FOR DEEP HOLE DRILLING AND MACHINING

MULTIPLE PROCESSES IN ONE MACHINE

- Large capacity CNC deep hole drilling machines, typically used by mold and energy industries
- These machines are often equipped with additional machining capabilities for finishing a workpiece in fewer setups

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FIND FULL MODEL FAMILIES, SPECIFICATIONS, AND TECHNICAL INFORMATION
AUTOMATION

Automation is available for your deep hole drilling machine project. Loaders and robotic systems are easily combined and supported by UNISIG.

www.UNISIG.com
FIND AUTOMATION CAPABILITIES AND VIDEOS

TOOLING AND ACCESSORIES

Machine accessories are very important to complete any project. UNISIG has a complete line of workholding and tool system support components to ensure your success.

CONTROLS

UNISIG Smart Control programming overlays intuitive operation and real-time feedback on systems from global leaders of controls manufacturers.
UNISIG products are engineered and manufactured in the USA by experienced teams, dedicated to innovation in design and the application of manufacturing technologies. UNISIG is a product division of Entrust Manufacturing Technologies, Inc. which has been building precision machinery since 1973. UNISIG machines are installed and supported worldwide.

www.unisig.com

UNISIG division of Entrust Manufacturing Technologies, Inc.
NS8W14630 Shawn Circle
Menomonee Falls, WI 53051, USA

Contact Us
+1-262-252-3802
sales@unisig.com

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TOOLING REFERENCE

GUNDRILL SYSTEM
Internal Coolant
External Chip Exhaust

Types: Solid Carbide | Brazed | Indexable

BTA SYSTEM
External Coolant
Internal Chip Exhaust

Types: Brazed | Indexable

Tooling Methods and Typical Diameters

<table>
<thead>
<tr>
<th>GUNDRILL SYSTEM</th>
<th>BTA SYSTEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal Coolant</td>
<td>External Coolant</td>
</tr>
<tr>
<td>External Chip Exhaust</td>
<td>Internal Chip Exhaust</td>
</tr>
</tbody>
</table>

Types: Solid Carbide | Brazed | Indexable

PROCESS | HOLE SIZE | SURFACE FINISH | ROTATION | HOLE STRAIGHTNESS |
<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>μ-in Ra</td>
<td>μ-m Ra</td>
<td>(in/ft)</td>
</tr>
<tr>
<td>Gundrill</td>
<td>IT6-IT11</td>
<td>8-250</td>
<td>0.2-6.3</td>
<td>0.012</td>
</tr>
<tr>
<td>BTA</td>
<td>IT8-IT10</td>
<td>60-125</td>
<td>1.5-3.2</td>
<td>0.002-0.006</td>
</tr>
<tr>
<td>Pull bore</td>
<td>IT7-IT9</td>
<td>32-125</td>
<td>1.5-3.2</td>
<td>0.001-0.003</td>
</tr>
</tbody>
</table>

Gundrilling - Solid Drilling
Ø 0.8 - 50 mm
0.031 - 2.0 in

BTA Counterboring
Ø 20 - 500 mm
0.8 - 20 in

BTA Trepnanning
Ø 100 - 500 mm
3.9 - 20 in

Bottle Boring
Ø 50 - 500 mm
2.0 - 20 in

BTA Solid Drilling
Ø 12 - 500 mm
0.5 - 20 in

BTA Pull Counterboring
Ø 20 - 500 mm
0.8 - 20 in

BTA Bottom Forming
Ø 20 - 500 mm
0.8 - 20 in

Skiving and Burnishing
Ø 38 - 500 mm
1.5 - 20 in

Skiving and Burnishing
Ø < 8.0
< 0.2

as received

DIAMETER RANGE IT6 | IT7 | IT8 | IT9 | IT10 | IT11
| > | ≤ | tolerance - mm |
| 0 | 0.1181 | 0.0002 | 0.0004 | 0.0006 | 0.0010 | 0.0016 | 0.0024 |
| 0.1181 | 0.2362 | 0.0003 | 0.0005 | 0.0007 | 0.0012 | 0.0019 | 0.0030 |
| 0.2362 | 0.4724 | 0.0004 | 0.0006 | 0.0009 | 0.0014 | 0.0021 | 0.0035 |
| 0.4724 | 0.7087 | 0.0005 | 0.0007 | 0.0009 | 0.0015 | 0.0023 | 0.0039 |
| 0.7087 | 1.1811 | 0.0006 | 0.0008 | 0.0011 | 0.0017 | 0.0027 | 0.0043 |
| 1.1811 | 1.9685 | 0.0007 | 0.0010 | 0.0012 | 0.0019 | 0.0032 | 0.0051 |
| 1.9685 | 3.1496 | 0.0008 | 0.0012 | 0.0014 | 0.0022 | 0.0035 | 0.0057 |
| 3.1496 | 4.7244 | 0.0009 | 0.0014 | 0.0021 | 0.0034 | 0.0055 | 0.0087 |
| 4.7244 | 7.0666 | 0.0010 | 0.0016 | 0.0025 | 0.0039 | 0.0063 | 0.0108 |
| 7.0666 | 9.8425 | 0.0011 | 0.0018 | 0.0028 | 0.0045 | 0.0073 | 0.0114 |
| 9.8425 | 12.4016 | 0.0013 | 0.0023 | 0.0032 | 0.0051 | 0.0083 | 0.0126 |
| 12.4016 | 15.7480 | 0.0014 | 0.0025 | 0.0035 | 0.0055 | 0.0091 | 0.0142 |
| 15.7480 | 19.6850 | 0.0016 | 0.0025 | 0.0038 | 0.0061 | 0.0108 | 0.0172 |

DIAMETER RANGE IT6 | IT7 | IT8 | IT9 | IT10 | IT11
| > | ≤ | tolerance - in |
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| 0.1181 | 0.2362 | 0.0003 | 0.0005 | 0.0007 | 0.0012 | 0.0019 | 0.0030 |
| 0.2362 | 0.4724 | 0.0004 | 0.0006 | 0.0009 | 0.0014 | 0.0021 | 0.0035 |
| 0.4724 | 0.7087 | 0.0005 | 0.0007 | 0.0009 | 0.0015 | 0.0023 | 0.0039 |
| 0.7087 | 1.1811 | 0.0006 | 0.0008 | 0.0011 | 0.0017 | 0.0027 | 0.0043 |
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COMPANY OVERVIEW

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