

UNISIG deep-hole drilling for Industrial & General Manufacturing

Precision gundrilling and BTA drilling for long, straight, tight-tolerance holes in oilfield and aerospace parts. This paper covers what the machine does, the industrial & general manufacturing parts we produce with it, the alloys we run, the tolerances and finishes industrial & general manufacturing buyers expect, and the documentation package.

Long-bore capability — high L/D ratios
ENVELOPE

1994
SINCE

ISO 9001:2015
QMS

Same-week / rig-down direct
RESPONSE



Deep Hole · Long-bore capability — high L/D ratios · gundrilling / BTA deep-hole drilling machine

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Executive summary

Machine: UNISIG Deep-Hole Drilling Machine (shop nickname: *Deep Hole*). gundrilling / BTA deep-hole drilling machine at B&R Productions, running from our New Waverly, Texas shop under an ISO 9001:2015 quality system.

Application: Precision gundrilling and BTA drilling for long, straight, tight-tolerance holes in oilfield and aerospace parts for Industrial & General Manufacturing customers — Industrial equipment OEMs, custom machinery builders, pump and valve manufacturers outside oilfield, food and pharma equipment suppliers, mining and heavy-equipment operators, reverse-engineering customers, sustainment for out-of-production industrial equipment.

Envelope: Long-bore capability — high L/D ratios. **Tolerance:** ± 0.0005 " routine on critical features. **Traceability:** Material by heat and lot on every job.

The machine, in context

Deep, straight, concentric holes are one of the hardest features to produce on any CNC platform without a purpose-built machine. Most job shops don't have one. Downhole tool bodies, valve stems with long bores, hydraulic cylinders, and any part that needs a straight bore longer than a few diameters routinely gets outsourced — or worse, made poorly on an inadequate setup. UNISIG deep-hole drilling is a genuine capability moat.

Full specifications

Machine type	UNISIG deep-hole drilling center — gundrill + BTA capable
Manufacturer	UNISIG (Menomonee Falls, WI) — US-built purpose machines
Platform depth capability	From a few inches to over 65 ft (20 m) per drilled hole
Platform diameter range	Under 1 mm gundrill through ~1 m BTA-class bores
Common configurations	USC-M series combines gundrilling + BTA + up to 120 tools in one guarded machine
Reference model USC-3M	71" drill depth per side; angled holes at +30° / -15°; 63" × 78" rotating table; workpieces to 66,150 lb
Straightness control	Sub-thousandth-per-foot drift on typical setups

Concentricity	Held tighter than conventional CNC-lathe drilling can offer
Coolant strategy	High-pressure through-tool
Materials	Inconel, Super Duplex, 17-4 PH, 4140/4340, Monel, titanium

Values marked "platform" reflect the machine manufacturer's published spec range for this platform family; B&R's working spec is what we quote on this specific unit.

Who this serves in Industrial & General Manufacturing

Typical buyer: Industrial equipment OEMs, custom machinery builders, pump and valve manufacturers outside oilfield, food and pharma equipment suppliers, mining and heavy-equipment operators, reverse-engineering customers, sustainment for out-of-production industrial equipment.

What's hard about industrial & general manufacturing work: Legacy parts with no OEM support, one-off replacement components, small-lot production runs, materials that don't fit standard shop capabilities, and tight lead times on repair work where a down-machine is losing money by the day.

Typical Industrial & General Manufacturing parts we produce on Deep Hole

- Hydraulic cylinders for industrial equipment
 - Long spindle and shaft bores
 - Rolling mill and press component bores
 - Heat exchanger tube sheets and headers
 - Custom deep-bored replacement parts

Above list is representative; if your part isn't shown, call and ask — most oilfield / aerospace / defense / industrial turned or milled work fits somewhere in the shop.

Alloys we run for Industrial & General Manufacturing

Standard range: Stainless (304, 316, 17-4 PH) · Tool steels · 4140 / 4340 · Brass · Bronze · Aluminum · Cast iron · Specialty alloys per customer requirement.

Industrial work covers the widest alloy range because the applications are the widest. Food and pharma often specify 316L or 17-4 PH; mining and heavy equipment specify tool steels and 4140/4340; pump manufacturers outside oilfield use everything from bronze bushings to stainless impellers. We work with the customer's spec sheet — if you tell us the alloy, we'll tell you honestly whether we can machine it and how quickly.

What "we run these weekly" means: we stock or reliably source the common alloys in the industry's typical spec range. Sharp tooling, proven feeds and speeds, and process control specific to each alloy family. Your part is not the one we're experimenting on.

How we machine it — our 5-step process

This is the process B&R runs on every job, industrial & general manufacturing or otherwise. The specifics of feeds, speeds, and tooling shift by alloy and machine; the discipline is universal.

- 1 Material verification.** Every job starts with material traceability. Heat and lot numbers documented against the mill test report. For customer-supplied material, we verify against the CofC before touching the stock.
- 2 First-article layout.** Stock is measured and laid out before any cutting starts. Concentricity, roundness, and squareness of the starting material established; if the stock is out of tolerance we call the customer before wasting time on a bad blank.
- 3 Roughing with process control for the alloy.** Feeds, speeds, and coolant strategy set for the specific alloy family — sharp coated carbide (or PCD for high-volume Ti Grade 5), positive rake, high-pressure through-tool coolant on 2507 and Inconel to control cutting temperature. Interrupted cuts get extra attention because they cycle heat into the workpiece.
- 4 Finish pass to spec.** Finish pass with a fresh insert, controlled DOC, and measured surface-finish targets. Critical features (bore concentricity, seat grooves, sealing surfaces) are held tighter than most job-shop lathes can offer.
- 5 CMM verification + documentation.** Every critical dimension CMM-verified. First-article report generated. Certificate of conformance issued with delivery. Customer-specific ITPs and PPAP-style packages produced on demand.

Tolerance and finish expectations in Industrial & General Manufacturing

±0.0005" routine on critical features. Industrial applications range from precision (pump seal areas, close-fit bushings) to structural (mining and heavy-equipment brackets); we adjust the inspection plan to what the part actually needs. Surface finish measured on parts where finish drives function.

Documentation and quality workflow

Documentation calibrated to customer requirement. Material traceability standard for critical parts. Certificates of conformance issued with delivery. NDAs on request for proprietary designs or reverse-engineered legacy parts.

Response time and emergency work

Down-machine and production-critical work prioritized. Lead times honestly quoted — no false promises. For legacy reverse-engineering, we typically confirm feasibility on the first phone call. Call (936) 291-7827.

How we compare

Compared to sourcing a new OEM part: we're often faster and cheaper for one-offs and small runs, and for legacy parts where the OEM has moved on we're often the only realistic option. Compared to a cheapest-bidder job shop: we hold tolerance, document material, and don't ruin the part.

Working with B&R Productions

New customer or existing, the process starts the same way: call (936) 291-7827 or send a print through the quote form. Prints are accepted as PDF, STEP, IGES, DWG, or DXF; if you only have a sample part, we reverse-engineer routinely. NDAs on request. ITAR-controlled prints handled under document control with prints staying in-shop.

Quotes typically come back within 24 hours for standard work, same-day for repeat customers on stocked materials, and near-immediately by phone for emergency and rig-down situations. Lead times are quoted honestly — we don't promise Wednesday and deliver next month.

Frequently asked questions

8 questions covering the UNISIG deep-hole drilling platform and Industrial & General Manufacturing work. Also indexed as FAQ schema for AI answer engines.

What's the max depth the UNISIG can drill?

The UNISIG platform can drill from a few inches to over 65 ft (20 m) per hole. Diameter range from under 1 mm gundrill through ~1 m BTA-class. Send us your part dimensions and we confirm feasibility.

Why can't a CNC lathe drill deep holes the same way?

Straightness and concentricity fall apart at high L/D ratios on a conventional lathe — chip evacuation, drill drift, and tool support don't scale. A purpose-built deep-hole machine keeps sub-thousandth-per-foot drift on long bores; a lathe can't.

Can the UNISIG drill angled holes?

Yes on capable USC-M configurations — reference USC-3M supports +30° / -15° angled holes with a 63" × 78" rotating table holding workpieces up to 66,150 lb.

What kind of industrial customers does B&R work with?

Industrial equipment OEMs, custom machinery builders, non-oilfield pump and valve manufacturers, food and pharma equipment suppliers, mining and heavy-equipment operators, and any customer who needs a legacy or reverse-engineered part made right.

Do you machine one-off replacement parts?

Yes — a lot of our industrial work is exactly this. Send the sample or drawing; if the material is on the shelf, we're often faster than the OEM. Reverse-engineered legacy parts across almost every sector.

What materials do you run for industrial work?

Full range — stainless (304, 316, 17-4 PH), tool steels, 4140/4340, brass, bronze, aluminum, cast iron, and specialty alloys per customer requirement. If you need something unusual, ask.

Do you offer emergency turnaround on down-machine parts?

Yes for repeat customers with material on the shelf. Same-day and next-day realistic when we already have the alloy. Call (936) 291-7827 and describe what's down.

Can you do small-batch production or is B&R just one-offs?

Both. Prototype and small-batch through repeat production. Small production runs where a big shop's minimum order would kill the economics are exactly where we fit.

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Ready to talk about your Industrial & General Manufacturing work?

Send us a print or a sample photo and specs. Emergencies: call direct and say "rig-down."

Published by B&R Productions — a precision CNC machining shop in New Waverly, Texas, in business since 1994. ISO 9001:2015 certified. Serving oil & gas, aerospace, defense, and industrial customers across Texas and the Gulf Coast.

Written by the B&R Productions team. Machine specs verified against manufacturer data. Alloy and process notes reflect shop practice as of 2026-01-15.

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