



**UNISIG**

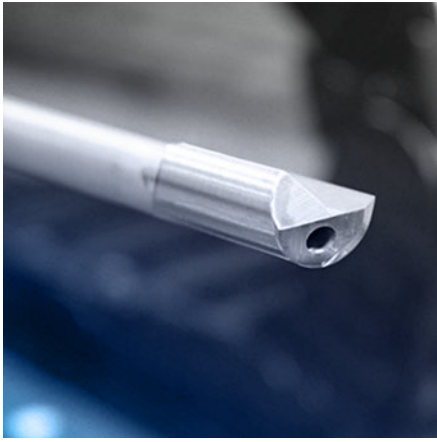
SOLUTIONS FOR GUN  
BARREL MANUFACTURING  
GUNDRILLING, REAMING, AND RIFLING

WE MAKE COMPLEX PROCESSES SIMPLE.

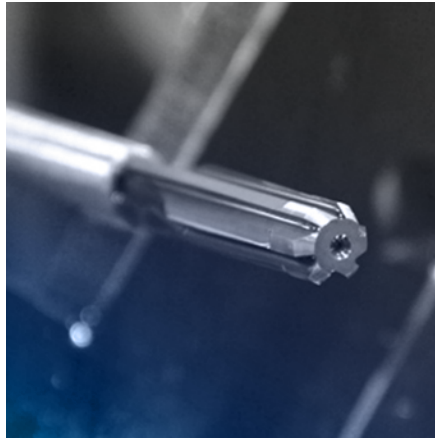
UNISIG.COM

## Nobody builds rifle barrel production equipment like UNISIG.

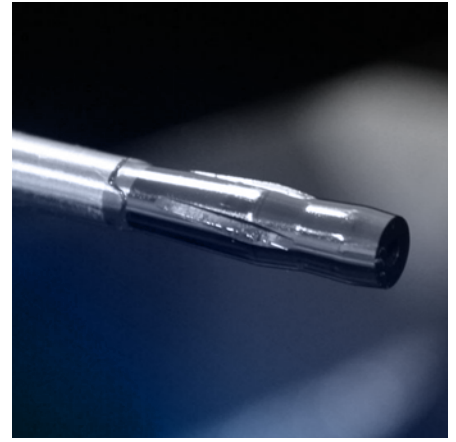
Before UNISIG, fully automated barrel production was only possible for the largest firearm OEMs. Now, UNISIG has opened the door for small to mid-sized as well as very large manufacturers by developing scalable barrel production cells, designed for productivity and reliability.



GUNDRILL



REAM



RIFLE

## UNISIG SOLUTIONS FOR THE FIREARMS INDUSTRY

### UNMATCHED INDUSTRY EXPERIENCE

Our 40 years of experience building high volume production gundrilling and machining systems is unmatched in the industry. UNISIG holds a unique position as a leader in firearms equipment manufacturing and automation.

### EXCEPTIONAL QUALITY FROM MODERN TECHNOLOGY

We offer individual machines for gundrilling, reaming, and rifling that are used to make rifle and pistol barrels of unsurpassed precision, with the reliability expected from modern manufacturing technology.

### VERSATILE AND RELIABLE FULL AUTOMATION

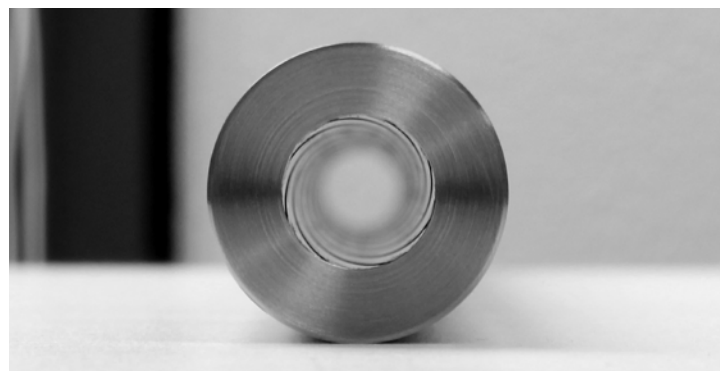
Fully automated barrel production was previously reserved only for the largest firearm OEMs. UNISIG has developed barrel production cells systemized for reliability that provide scalable solutions for small, mid-sized, and very large manufacturers.

### THE COMPLETE PACKAGE IN PRODUCTIVITY

UNISIG provides more than machines. Our training, process development, and long term support give first-time barrel producers everything they need to be productive upon install.

### UNISIG HAS THE RIGHT SOLUTION.

Certain products and technical services may require an export license and may not be available in all regions.



# MODERN BARREL MANUFACTURING

Rifle and pistol barrels have been produced for over a century and can be manufactured using common machine shop equipment and tooling. Industry organizations have now standardized dimensions, which are publicly available, so anyone interested in gunsmithing can make gun barrels.

Our machines are designed and built for high volume production and maximize the potential of existing tools. We integrate automation for improved efficiency which provides the ideal updated environment for productive, cost effective manufacturing of barrel blanks.

UNISIG's equipment and experience enables manufacturers to expand these established manufacturing processes and apply them to modern equipment. This modernizes gun barrel manufacturing processes, resulting in improved finished workpieces and repeatable production.

The customer investment in this technology results in improved production rates, part quality, and process reliability. UNISIG's technical support and experience also provides increased profitability and productivity.

PART STATUS	OPERATION	DESCRIPTION	TOOLING	LEGACY EQUIPMENT Manual, Attended Operation	MODERN EQUIPMENT Controlled, Unattended Operation
Raw Material ↓ Barrel Blank	MATERIAL BLANK	Cut to length and chamfer	Saw blade, turning tool or carbide parting tool	Bandsaw and chamfer station	CNC cutoff lathe with bar feeder
	DRILL	Produce center bore to semi-finish diameter tolerance	Gundrill/ELB (Single Lip Drill)	Engine lathe or vintage gundrilling machine	UNISIG Deep Hole Drilling Machine
	REAM	Improve roundness, diameter tolerance, surface finish of bore	Coolant fed reamer - push or pull type	Engine lathe or vintage reaming machine	UNISIG Deep Hole Reaming Machine
	STRAIGHTEN	Improve straightness of drilled hole	Vee-blocks and spacers	Arbor press	Not required - modern gundrilling achieves straightness requirements
	RIFLE	Create helical grooves in bore - cold form or cut form	Rifling button, Broach, or Single Point Tool	Retrofitted engine lathe or manual rifling machine	UNISIG Rifling Machine
	INSPECTION	Verify accuracy and quality of rifled blank		Dial indicators, vee-blocks, gauge pins, visual bore gauge	Air column gauge, profilometer, vision systems
Barrel Blank ↓ Finished Rifle Barrel	STRESS RELIEVE	Remove machining stresses from material to improve stability in finishing steps		Heat treat oven or vibratory stress reliever	Inert gas environmentally controlled furnace
	CONTOUR AND THREAD	Machine outside of workpiece	Carbide turning and threading tools	Engine lathe	CNC turning center
	ADDITIONAL MACHINING	Machine outside of workpiece	Drilling and milling tools	Manual mill	CNC machining center or multi-tasking CNC turning center
	CHAMBER	Produce matching chamber for desired ammunition	Carbide drills and chamber reamers	Engine lathe or manual mill	CNC machining or turning center
	TEST	Live fire testing of finished barrel		Firing Range	Dedicated test facilities with data collection

## PRODUCTIVITY ESTIMATES

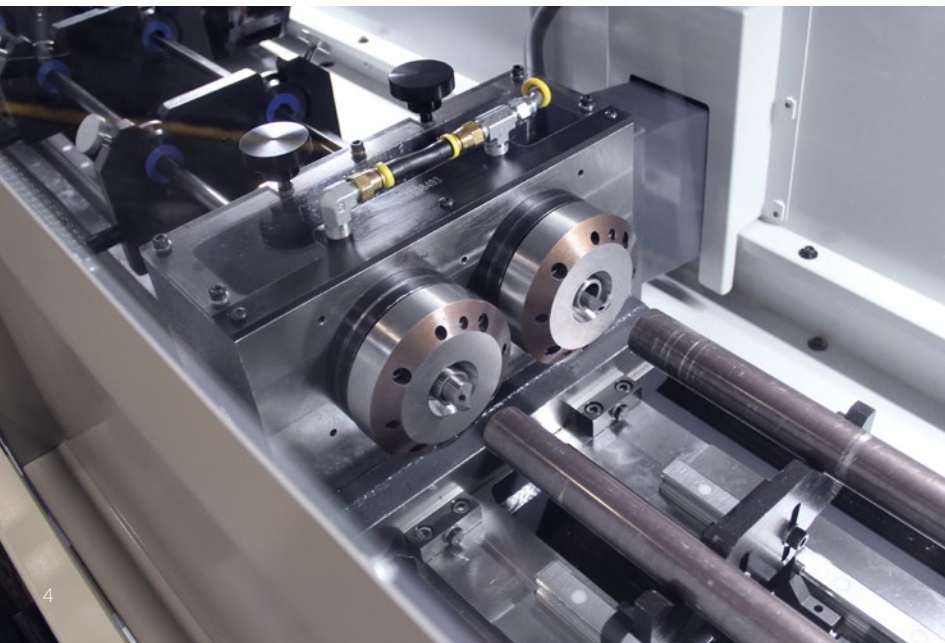
This table displays a simplified production estimate for a gundrilling operation which sets the pace for the rest of the production cell. These real-world results illustrate the significant advantage of modernizing with UNISIG equipment and engineered manufacturing processes.

Detailed process plans evaluate production steps, unique tolerances or materials, and integrated automation to reach production targets. The results are proved out through testing and technical training.

UNISIG equipment extracts maximum performance and economics from the cutting tools. This increases operational efficiency which can yield dramatic profit improvements.

PRODUCTIVITY ESTIMATE		LEGACY EQUIPMENT			UNISIG EQUIPMENT		
Workpiece length	inch	16					
Drilling feed rate	inch/min	1.0			2.8		
Drilling cycle time	min	16.0			5.7		
Workpiece exchange time	min	1.00			0.5		
Total cycle time	min	17.0			6.2		
Number of spindles	n	1	2	4	1	2	4
Gross production rate	parts/hour	3.5	7.1	14.1	9.7	19.3	38.6
Hours per shift	hours	8					
Shifts per week	days	5					
Weeks per year	weeks	50					
Hours per year	hours	2000					
Gross annual production per shift	parts/year	7,059	14,118	28,235	19,310	38,621	77,241
Production efficiency	%	50%			85%		
Net annual production per shift	parts/year	3,529	7,059	14,118	16,414	32,828	65,655
Net monthly production per shift	parts/month	294	588	1,176	1,368	2,736	5,471
PRODUCTIVITY IMPROVEMENT					465%		

## GUNDRILLING MACHINES 2-SPINDLE

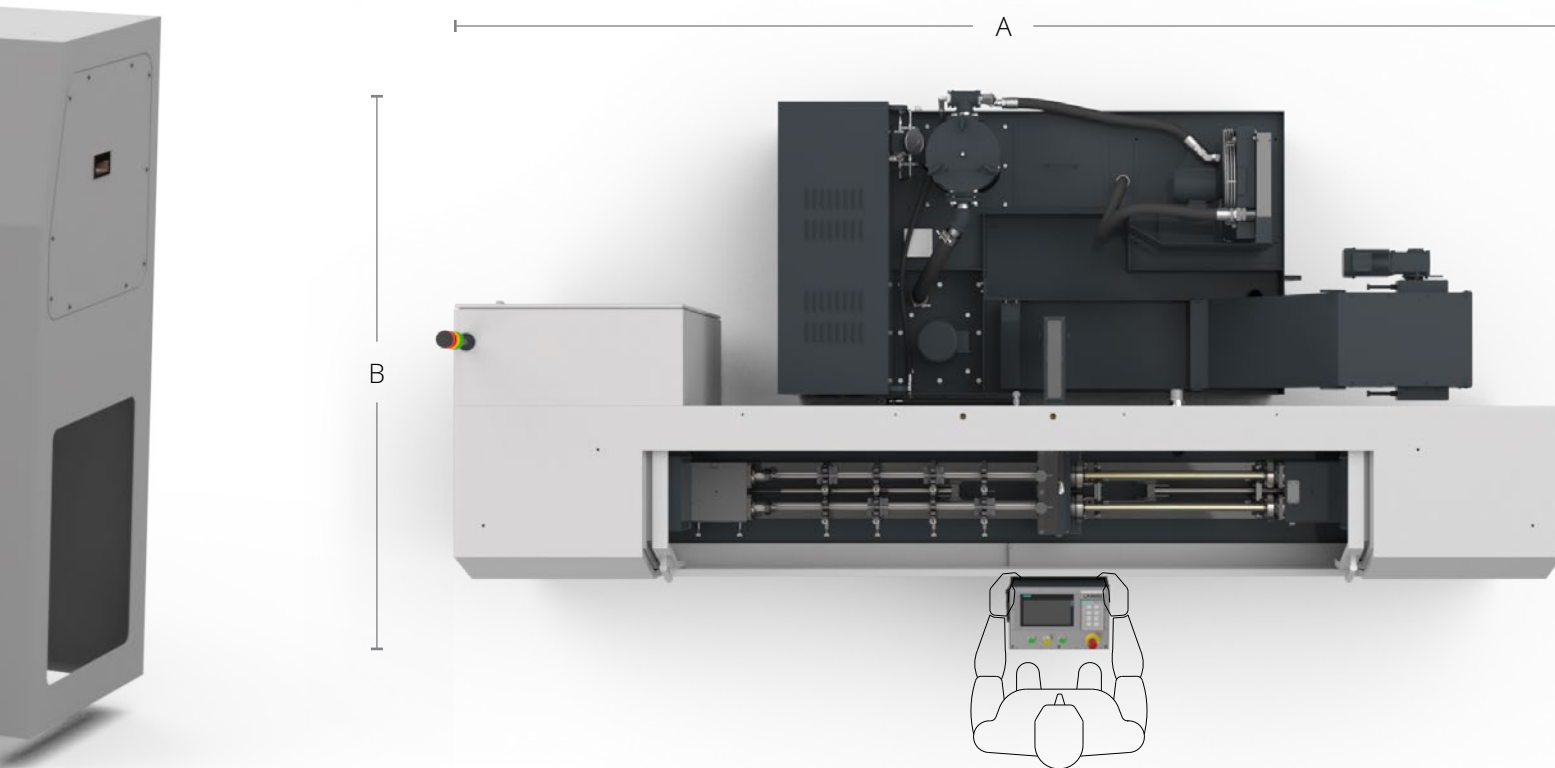


### FEATURES

- Very high accuracy machine base, machined on all sides in a single set-up
- Counter-rotation of tool and workpiece for extreme concentricity
- Servo driven work headstock for precision adjustment of part length and clamp force
- Programmable coolant system delivers the optimum flow to the drill tip to benefit chip evacuation
- Full enclosure for clean floor, quiet operation, and safe work environment

## SPECIFICATIONS

GUNDRILLING	UNE12-2-750-CR		UNE12-2-1000-CR		UNE12-2-1500-CR		UNE20-2-750-CR		UNE20-2-1000-CR		UNE20-2-1500-CR	
Number of spindles	2						2					
Drill diameter max.	12 mm		0.5 in				20 mm		0.8 in			
Drill diameter max. single spindle mode	19 mm		0.75 in				25 mm		1 in			
Part length maximum	750 mm	30 in	1,000 mm	40 in	1,500 mm	60 in	750 mm	30 in	1000 mm	40 in	1500 mm	60 in
<b>PERFORMANCE</b>												
Tool spindle speed maximum	12,000 rpm						8,000 rpm					
Work spindle speed maximum	900 rpm						600 rpm					
<b>INSTALLED DIMENSIONS</b>												
<b>A</b>	4,350 mm	171.3 in	4,900 mm	192.9 in	6,460 mm	254.3 in	4,350 mm	171.3 in	4,900 mm	192.9 in	6,460 mm	254.3 in
<b>B</b>	2,314 mm			91.1 in			2,314 mm			91.1 in		



## UNISIG ACCESSORIES TO IMPROVE PERFORMANCE | UNE SERIES MACHINES



**HINGED BELT CHIP CONVEYOR**  
Upgrade from standard chip basket to reduce labor.



**MAGNETIC CHIP CONVEYOR**  
Upgrade from hinged belt conveyor for more efficient removal of chips.

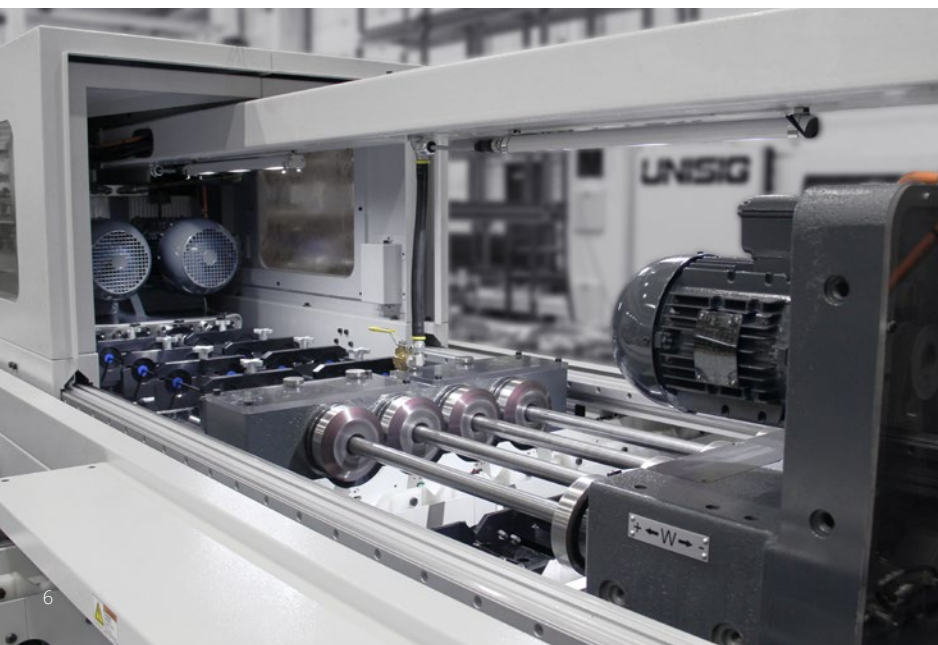


**COOLANT HEAT EXCHANGER**  
Remove heat from process and improve tool life, accuracy, and reduce mist.



**COOLANT REFRIGERANT CHILLER**  
Upgrade from heat exchanger for precise temperature control regardless of ambient temperature.

## GUNDRILLING MACHINES 4-SPINDLE



### FEATURES

- Counter-rotation for minimized centerline drift and high concentricity
- Programmable workpiece headstock position and clamping force
- Automatic loading system, adjustable for workpiece length and diameter
- Compact construction for installation in a CNC machining cell or larger integrated drilling system

## SPECIFICATIONS

GUNDRILLING	UNI12-4-750-CR		UNI12-4-1000-CR		UNI20-4-750-CR		UNI20-4-1000-CR	
Number of spindles	4				4			
Drill diameter max.	12 mm		0.5 in		20 mm		0.8 in	
Part length maximum	750 mm	30 in	1,000 mm	40 in	750 mm	30 in	1000 mm	40 in
PERFORMANCE								
Tool spindle speed maximum	8,400 rpm				5,500 rpm			
Work spindle speed maximum	900 rpm				1,700 rpm			
INSTALLED DIMENSIONS								
A	7,010 mm	276 in	7,560 mm	297.6 in	7,400	291.3 in	7,900 mm	311 in
B	4,000 mm		157.5 in		4,000 mm		157.5 in	



## UNISIG ACCESSORIES TO IMPROVE PERFORMANCE | UNI SERIES MACHINES



### AUTOMATIC CONVEYOR LOADER

Reduces labor and systemizes production.



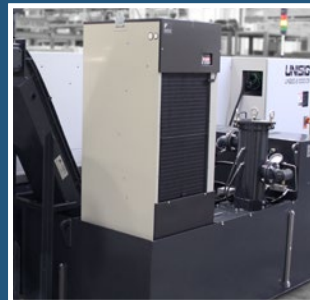
### BULK FEEDER

Increase the length of time unattended machining can run by loading up more parts.



### MAGNETIC CONVEYOR

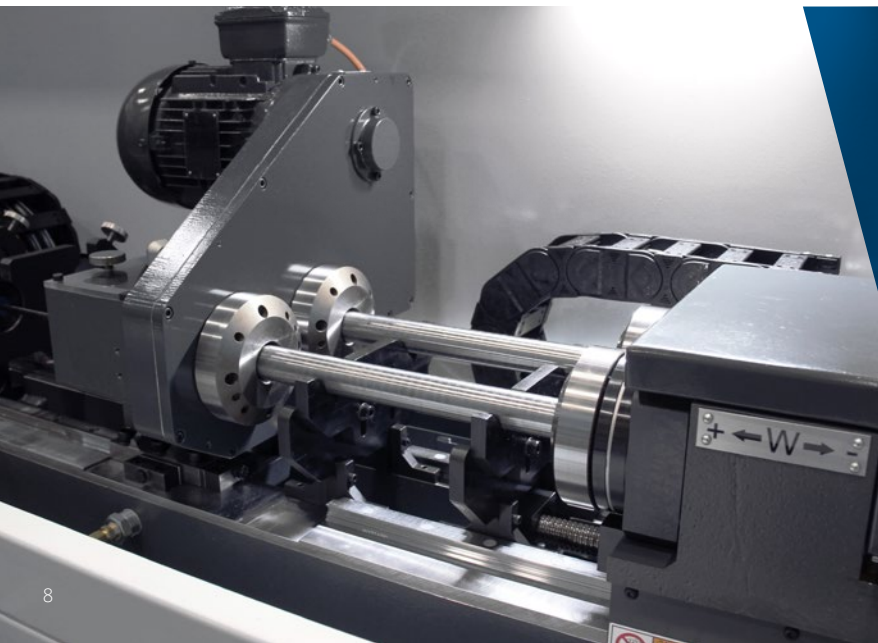
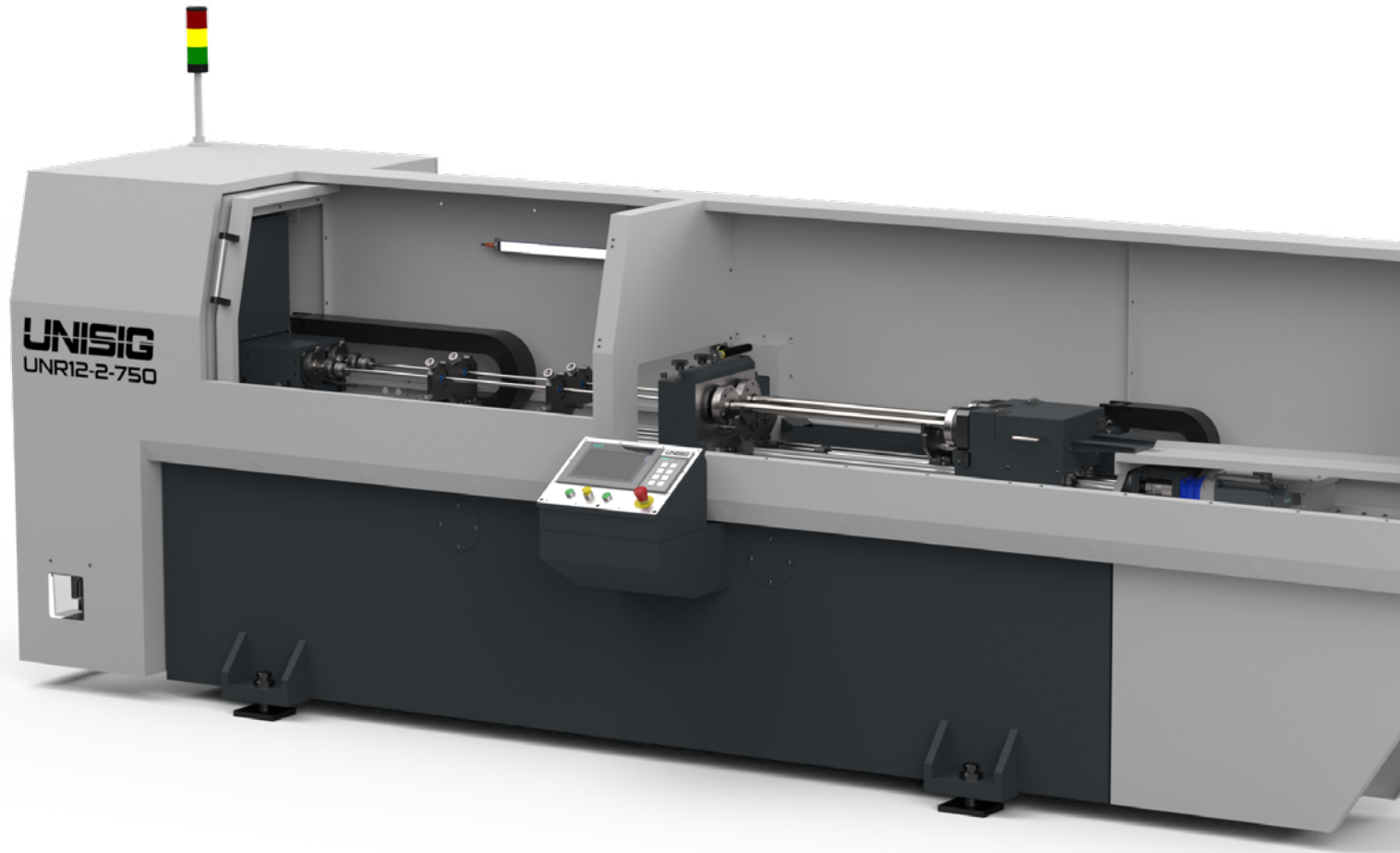
Upgrade from hinged belt conveyor for more efficient removal of chips.



### REFRIGERANT CHILLER

Precise temperature control regardless of ambient temperature.

## REAMING MACHINES 2-SPINDLE



### OPTIONAL GUNDRILL CONVERSION

Available on twin-spindle machines, this option allows the machine to be changed between reaming mode and gundrilling mode, with counter-rotation, within a single machine.

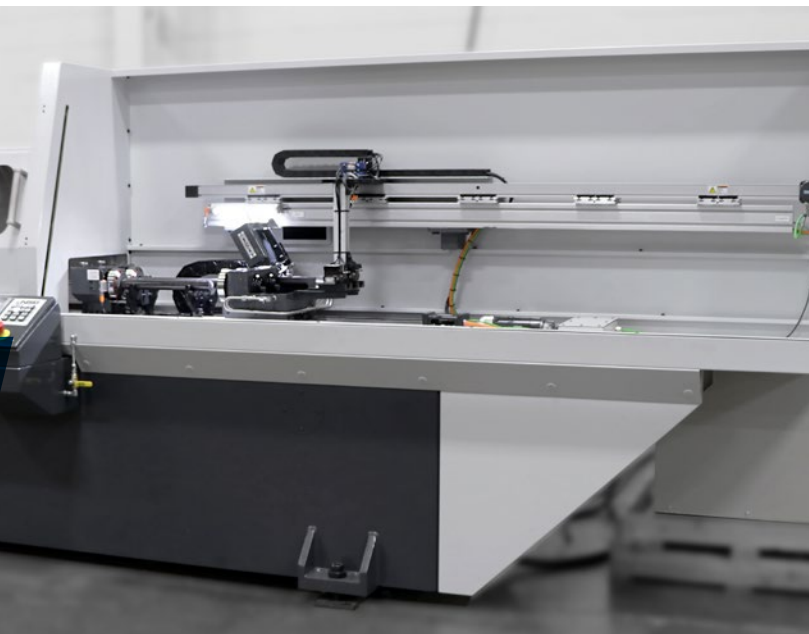
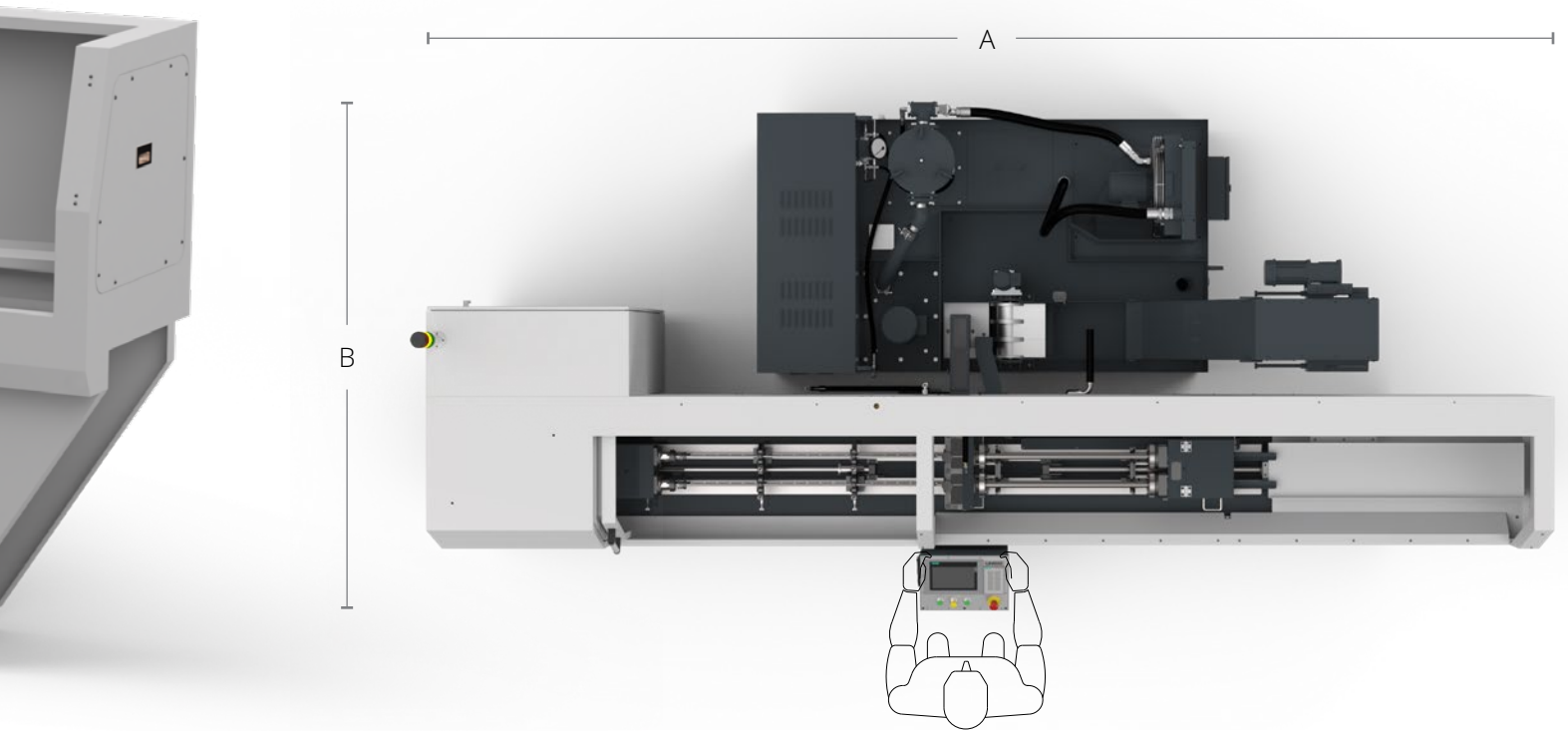
### AUTOMATIC TOOL RETURN

Auto-pull reaming tool return eliminates manual tool intervention, improving throughput. It is also essential to building a fully automated barrel production cell.

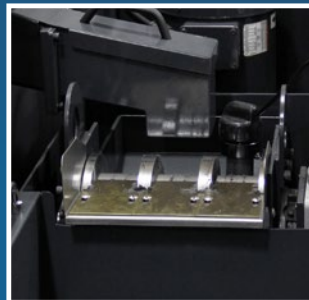


## SPECIFICATIONS

REAMING/ OPTIONAL GUNDRILLING	UNR12-2-750-CR		UNR12-2-1000-CR		UNR12-2-1500-CR		UNR20-2-750-CR		UNR20-2-1000-CR		UNR20-2-1500-CR					
Number of spindles	2															
Reaming/Drilling diameter max.	12 mm				0.5 in				20 mm				0.8 in			
Reaming/Drilling diameter max. single spindle mode	19 mm				0.75 in				25 mm				0.98 in			
Part length maximum	750 mm	30 in	1,000 mm	40 in	1,500 mm	60 in	750 mm	30 in	1000 mm	40 in	1500 mm	60 in				
PERFORMANCE																
Tool spindle speed maximum	12,000 rpm						8,000 rpm									
Work spindle speed maximum	900 rpm						600 rpm									
INSTALLED DIMENSIONS																
A	5,005 mm	197 in	5,900 mm	232.3 in	8,000 mm	315 in	5,005 mm	197 in	5,900 mm	232.3 in	8,000 mm	315 in				
B	2,314 mm				91.1 in				2,314 mm				91.1 in			



### UNISIG ACCESSORIES TO IMPROVE PERFORMANCE UNR SERIES MACHINES



#### INDEXING MAGNETIC SEPARATOR

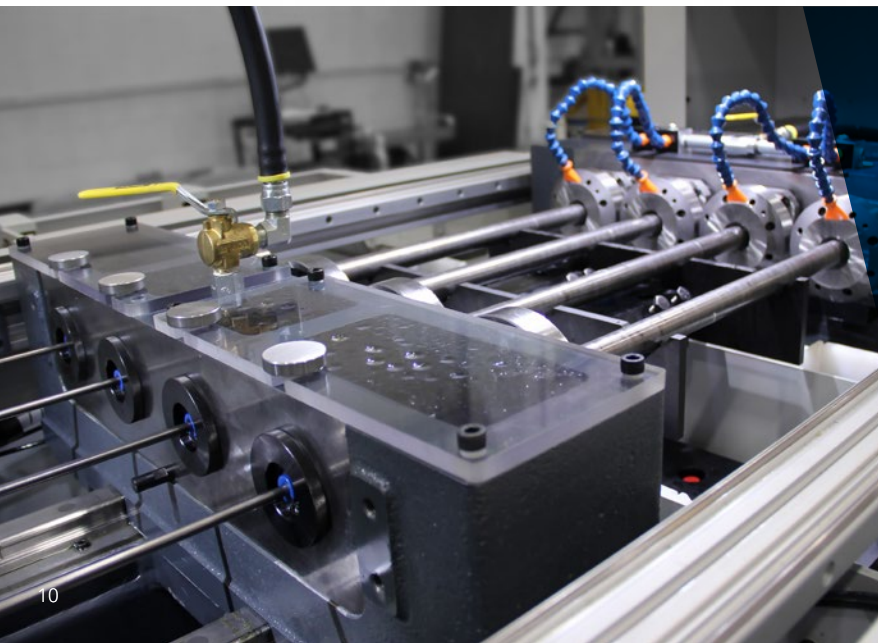
Remove very fine particles from reaming operation and extend filter life.



#### DRAG FLIGHT CONVEYOR

Elevates reamer fines and gundrill chips into hopper without operator effort.

## REAMING MACHINES 4-SPINDLE



### WORKPIECE CONVEYOR - THROUGH FEED

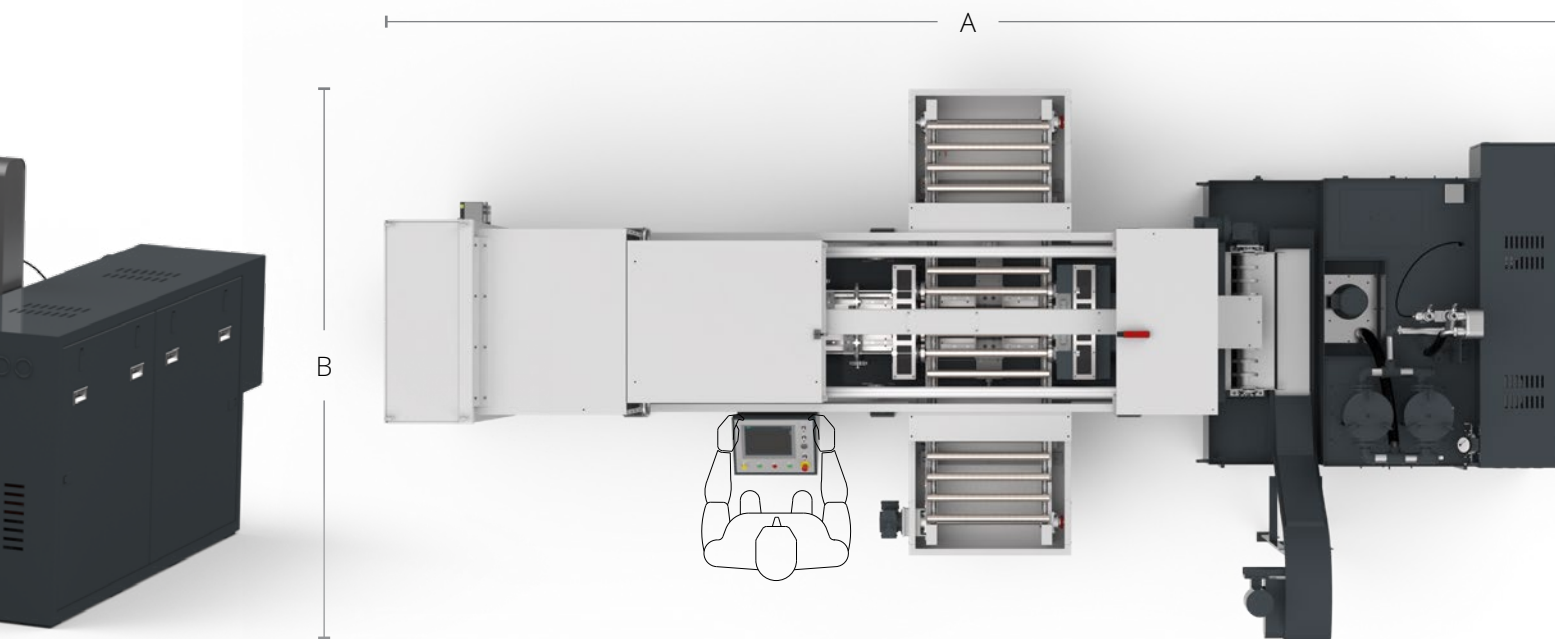
4-spindle machines produce a lot of blanks every shift. The smart conveyor system allows single-piece-flow and maximizes spindle uptime. This option works with a manually loaded machine as well as being compatible with robotic automation.

### ROBOT READY OPTION

As you grow, meet increased volume and reduce operation time by incorporating robot-ready options to your production cell.

## SPECIFICATIONS

REAMING	UNR12-4-750-CR		UNR12-4-1000-CR		UNR20-4-750-CR		UNR20-4-1000-CR	
Number of spindles	4				4			
Reaming diameter max.	12 mm		0.5 in		20 mm		0.8 in	
Part length maximum	750 mm	30 in	1,000 mm	40 in	750 mm	30 in	1000 mm	40 in
PERFORMANCE								
Tool spindle speed maximum	8,400 rpm				5,500 rpm			
INSTALLED DIMENSIONS								
A	7,010 mm	276 in	7,560 mm	297.6 in	7,400	291.3 in	7,900 mm	311 in
B	4,000 mm		157.5 in		4,000 mm		157.5 in	



### UNISIG ACCESSORIES TO IMPROVE PERFORMANCE UNR SERIES MACHINES



#### INDEXING MAGNETIC SEPARATOR

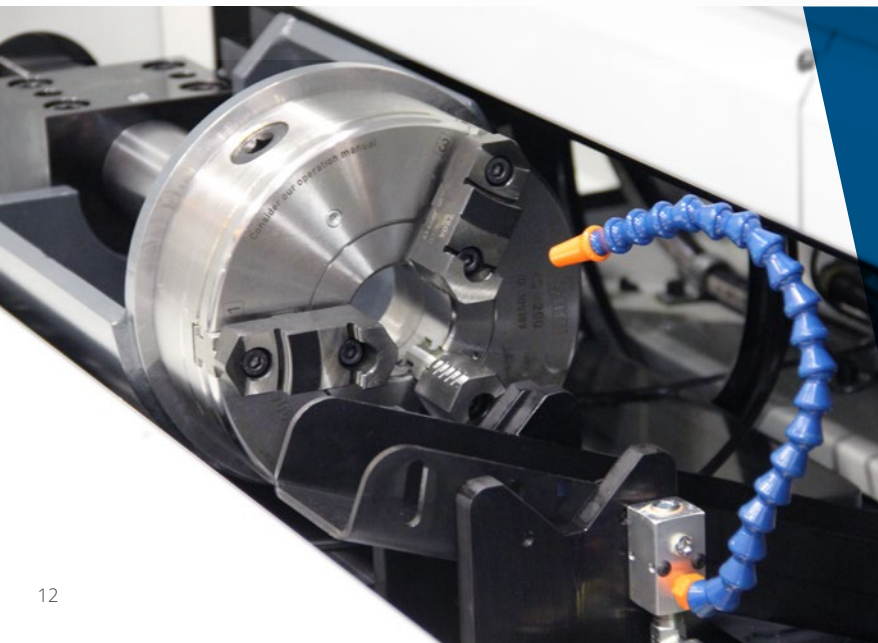
Remove very fine particles from reaming operation and extend filter life.



#### AUTOMATIC TOOL RETURN

Auto-pullreaming tool return eliminates manual tool intervention, improving throughput.

## BUTTON RIFLING MACHINES 1-2 SPINDLE



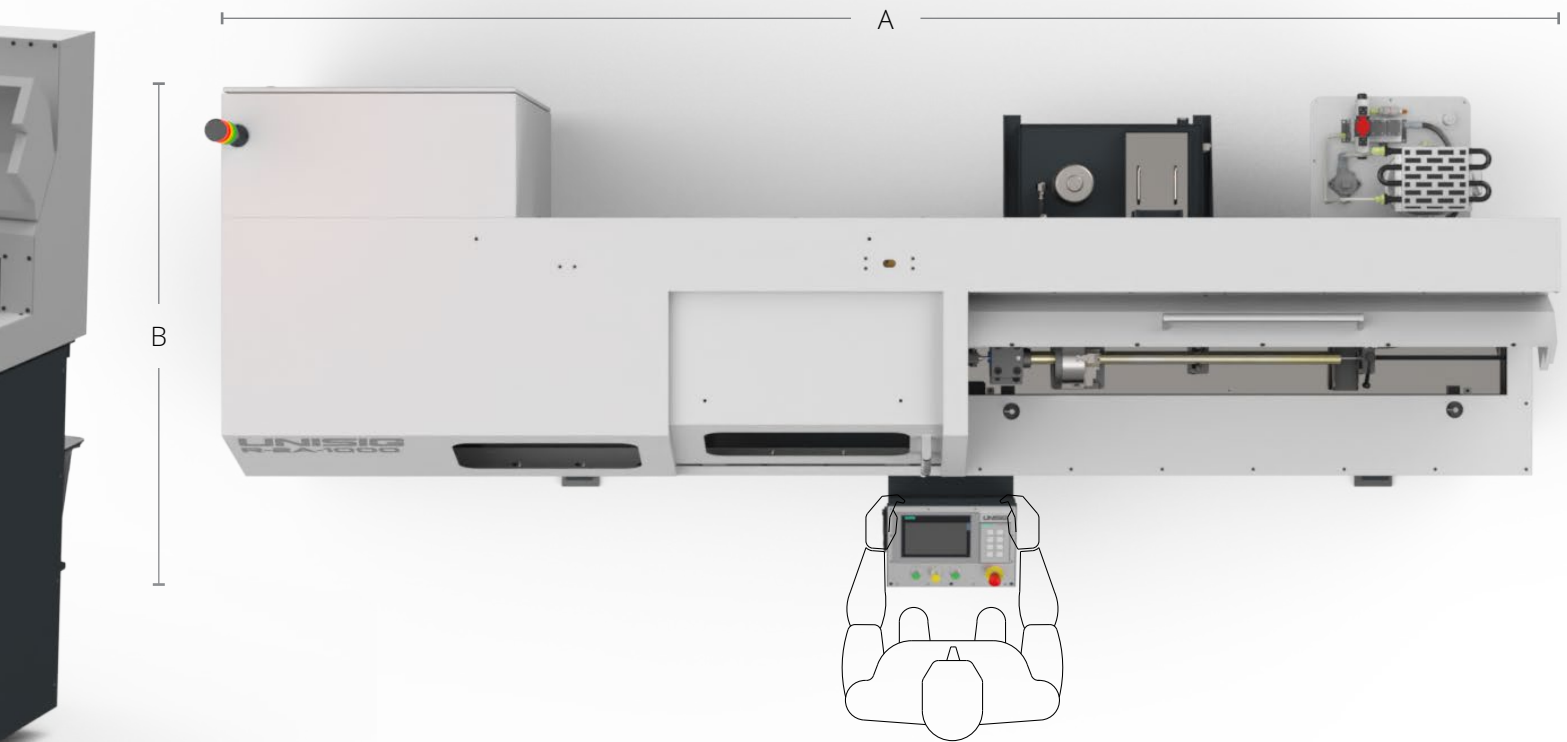
### MANUALLY LOADED MACHINES

Manual workholding is simple and reliable. The workpiece is clamped in a 3-jaw chuck, centralizing the workpiece to the machine centerline.

A thrust bushing offsets the pull force which eliminates extreme effort when tightening the workpiece.

## SPECIFICATIONS

RIFLING	R-2A-1000		R-2A-2-1000		R-2A-1500		R-2A-2-1500	
Number of spindles	1		2		1		2	
Max pull force	6,800 kg		15,000 lbs		6,800 kg		15,000 lbs	
Rifling diameter max.	12 mm		0.5 in		12 mm		0.5 in	
Part length max.	1000 mm		40 in		1500 mm		60 in	
PERFORMANCE								
Tool spindle speed maximum	130 rpm				130 rpm			
INSTALLED DIMENSIONS								
A	4,090 mm	161 in	5,400 mm	212.6 in	5,015 mm	197.4 in	6,325 mm	257.7 in
B	1,600 mm	63 in	1,820 mm	71.7 in	1,600 mm	63 in	1,820 mm	71.7 in

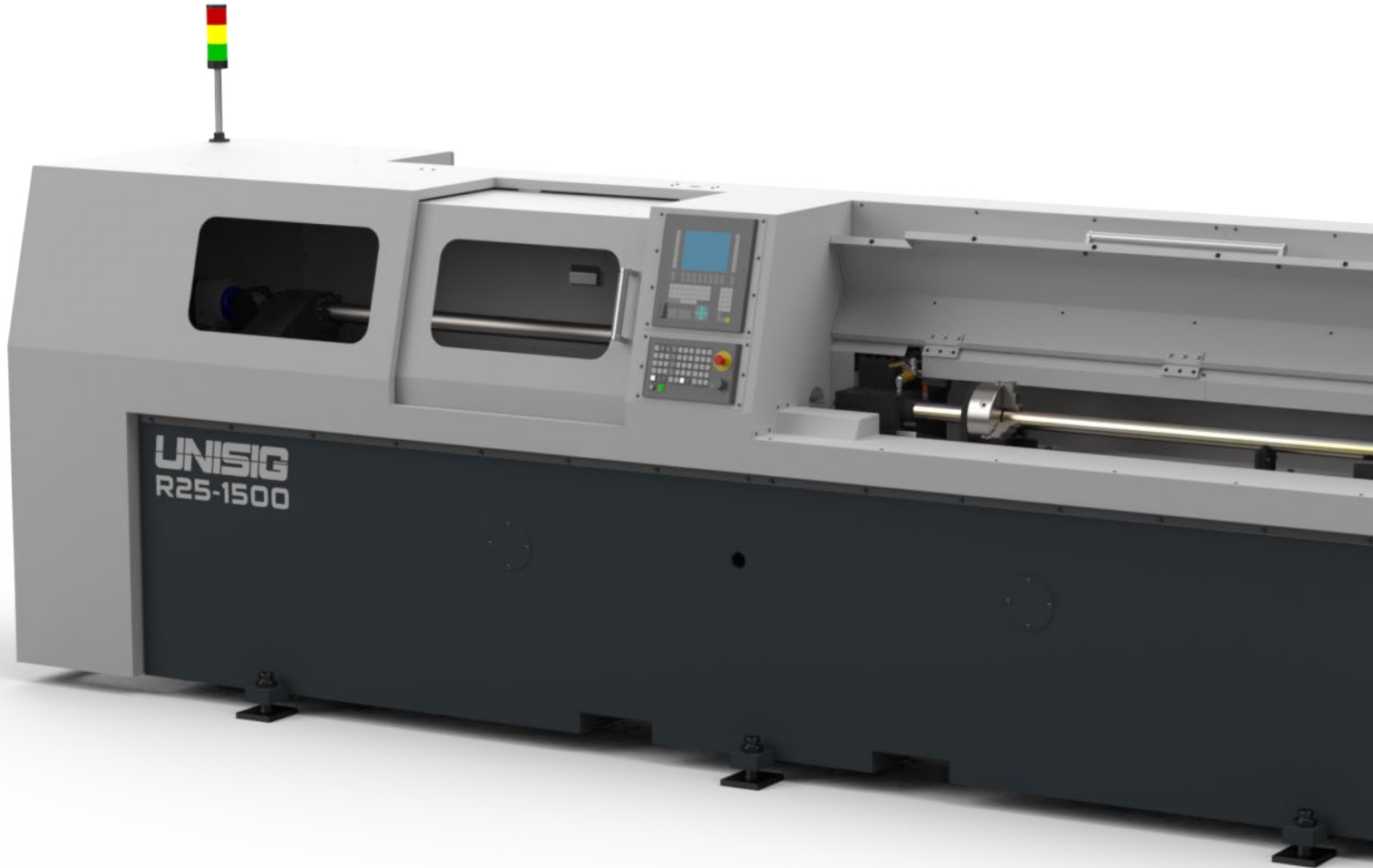


### AUTOMATION READY MACHINES

Rifling machines in automated cells require an automatic clamping system for the workpiece, and an automated tool return for the rifling button. UNISIG automated rifling cells standardize these loading features.



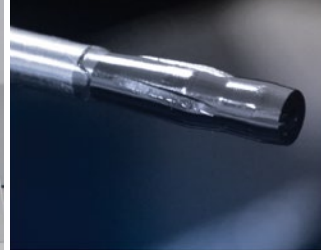
## CNC RIFLING MACHINES CUT & BUTTON RIFLING



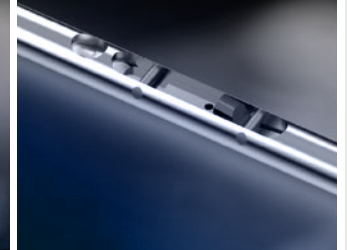
### CNC VERSATILITY

The R25 servo-rifling machines are CNC controlled to allow the user to develop their own unique rifling profile. Quantity of grooves, groove depth as well as straight or gain twist grooves can all be programmed from the machine control.

BUTTON RIFLE

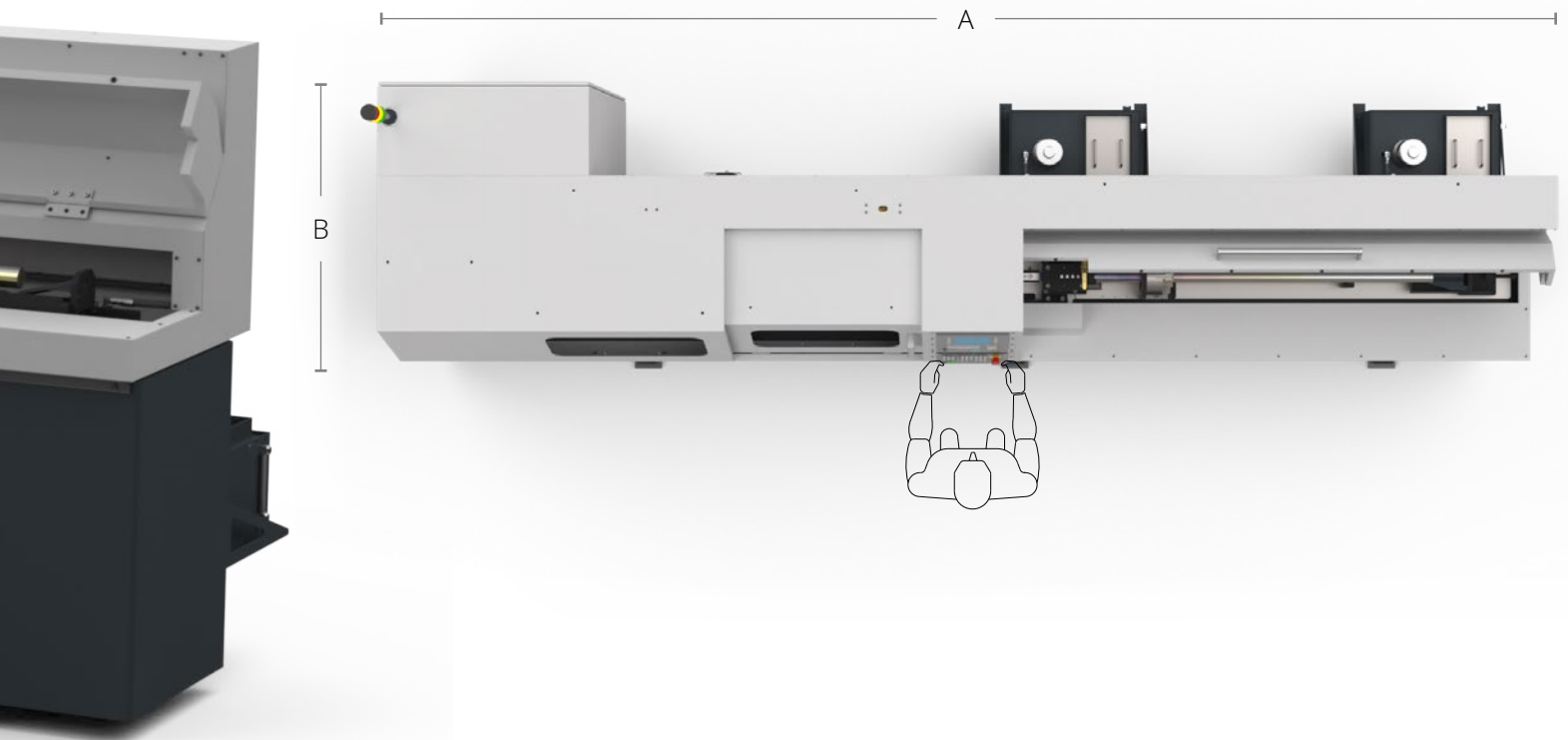


CUT RIFLE



## SPECIFICATIONS

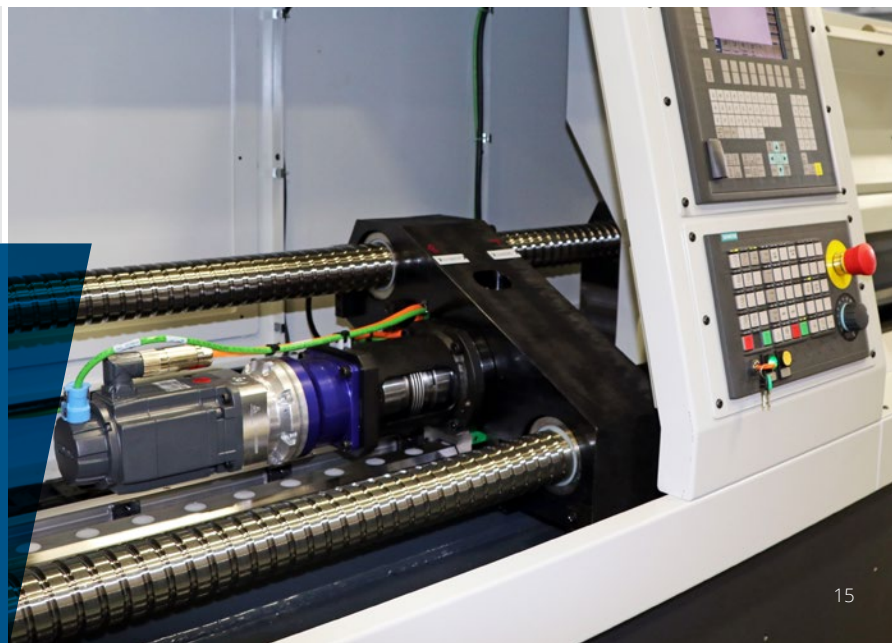
RIFLING	R25-1000		R25-1500	
Number of spindles	1			
Max pull force	15,000 lbs		6,800 kg	
Button Rifling diameter max.	12 mm		0.5 in	
Cut Rifling diameter max.	25 mm		1 in	
Part length maximum	1000 mm	40 in	1500 mm	60 in
PERFORMANCE				
Tool spindle speed maximum	130 rpm			
INSTALLED DIMENSIONS				
A	4,090 mm	161 in	5,015 mm	197.4 in
B		1,300 mm		51.2 in



### POWER AND CONTROL

When button rifling, a lot of force is required to cold form the profile. A cut rifle tool needs much less force, but very precise control of the motion profile and index per groove.

The R25 machine allows both tooling systems to be used due to highly rigid construction and pre-loaded ballscrew drives.



## CELL CONFIGURATION | PROCESS COLLABORATION

### BUILD YOUR BARREL MANUFACTURING SOLUTION

UNISIG follows this process as we define and create a unified and effective barrel production cell for our customers.

1. Determine your production needs
2. Discuss the growth potential
3. Identify equipment needed
4. Outline future upgrade path

#### Production Capabilities

GUNDRILLING	ACCESSORIES
REAMING	TRAINING
RIFLING	PROCESS DEVELOPMENT
TOOLS	

#### Process collaboration

UNISIG will work with you from project initiation to part completion in order to build your perfect barrel production operation. Our process technicians stay with you through the entire development cycle ensuring the exact outcome to provide day one operation upon installation.

UNISIG provides startup assistance to customers entering barrel production by offering application engineering services, initial tooling selection, test machining for customer workpieces and training on best practices for high productivity. These services are quoted with the machines and can also include startup assistance and training on site in addition to factory training.







## MANUAL BARREL PRODUCTION CELLS R-CELL 2-1 & 2-2-1

### R-CELL 2-1

Manual load, batch production

UNR 2-Spindle Reaming  
with optional Gundrill Conversion  
R-2A Rifling

Available lengths:

750 mm [ 30 in ]

1000 mm [ 40 in ]

1500 mm [ 60 in ]

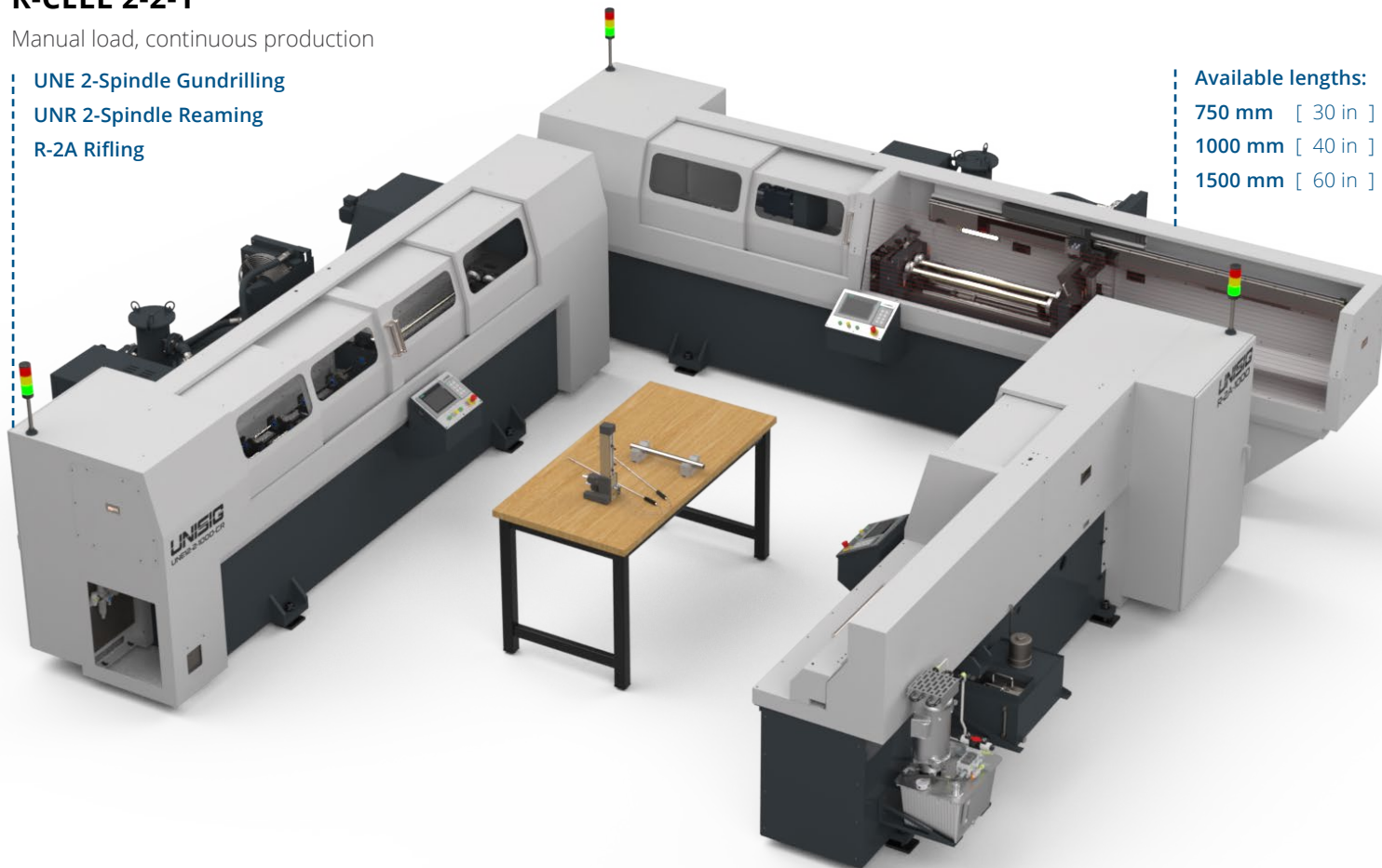


## R-CELL 2-2-1

Manual load, continuous production

- UNE 2-Spindle Gundrilling
- UNR 2-Spindle Reaming
- R-2A Rifling

- Available lengths:
- 750 mm [ 30 in ]
  - 1000 mm [ 40 in ]
  - 1500 mm [ 60 in ]



## UNISIG ACCESSORIES TO IMPROVE PERFORMANCE | R-CELL PRODUCTION CELLS



### CUTTING OIL

Improve penetration rates, extend tool life, and create exceptional bore finish.



### GUNDRILL SHARPENING SYSTEM

Bring improved tool life, surface finish, hole size and straightness in-house and save time doing it.



### AIR GAUGING

Measure lands and grooves with extreme accuracy to verify barrel specifications.

## AUTOMATED BARREL PRODUCTION CELLS

### R-CELL 2-2-1 & 4-2-2

## UNISIG MACHINES ENGINEERED FOR AUTOMATION

A successful automation project doesn't happen by simply adding a robot. The automation embedded in each machine has been engineered to meet your needs, while designs support precision machining and tool monitoring to ensure reliability.

UNISIG automated barrel production cells are systemized to scale with your operation. These standard cells eliminate headaches associated with special installations and are well supported with parts and service from UNISIG.

**Semi-automatic cell** - A robot transfers raw parts from magazines through gun drilling and reaming process automatically. An operator rifles blanks in batches and has time to move parts in and out of the cell and manage tooling.

**Fully-automated cell** - A bulk feeding system keeps the gun drilling machine continuously fed with bar stock. A robot services the gun drilling, reaming, and rifling machines. Finished barrels are removed from discharge magazine by an operator. Possible lights-out production.

### R-CELL 2-2-1 SEMI-AUTO

Continuous production, manual rifling

- UNE 2-Spindle Gun Drilling
- UNR 2-Spindle Reaming
- R-2A Rifling
- 6-Axis Robot
- UNISIG Cell Controller

- Available lengths:
- 750 mm [ 30 in ]
- 1000 mm [ 40 in ]
- 1500 mm [ 60 in ]



### AUTOMATION COMPONENTS

- |                            |                              |
|----------------------------|------------------------------|
| Servo Positioned Workheads | Infeed and Outfeed Magazines |
| Automatic Doors            | Blowoff Station              |
| Automatic Tool Exchange    | Robot Ready Interface        |
| Automatic Part Transfer    | Robotic Automation           |
| Bulk Material Feeders      | Light Curtain/Laser Scanners |

## R-CELL 2-2-1 FULL-AUTO

Continuous production, automatic rifling

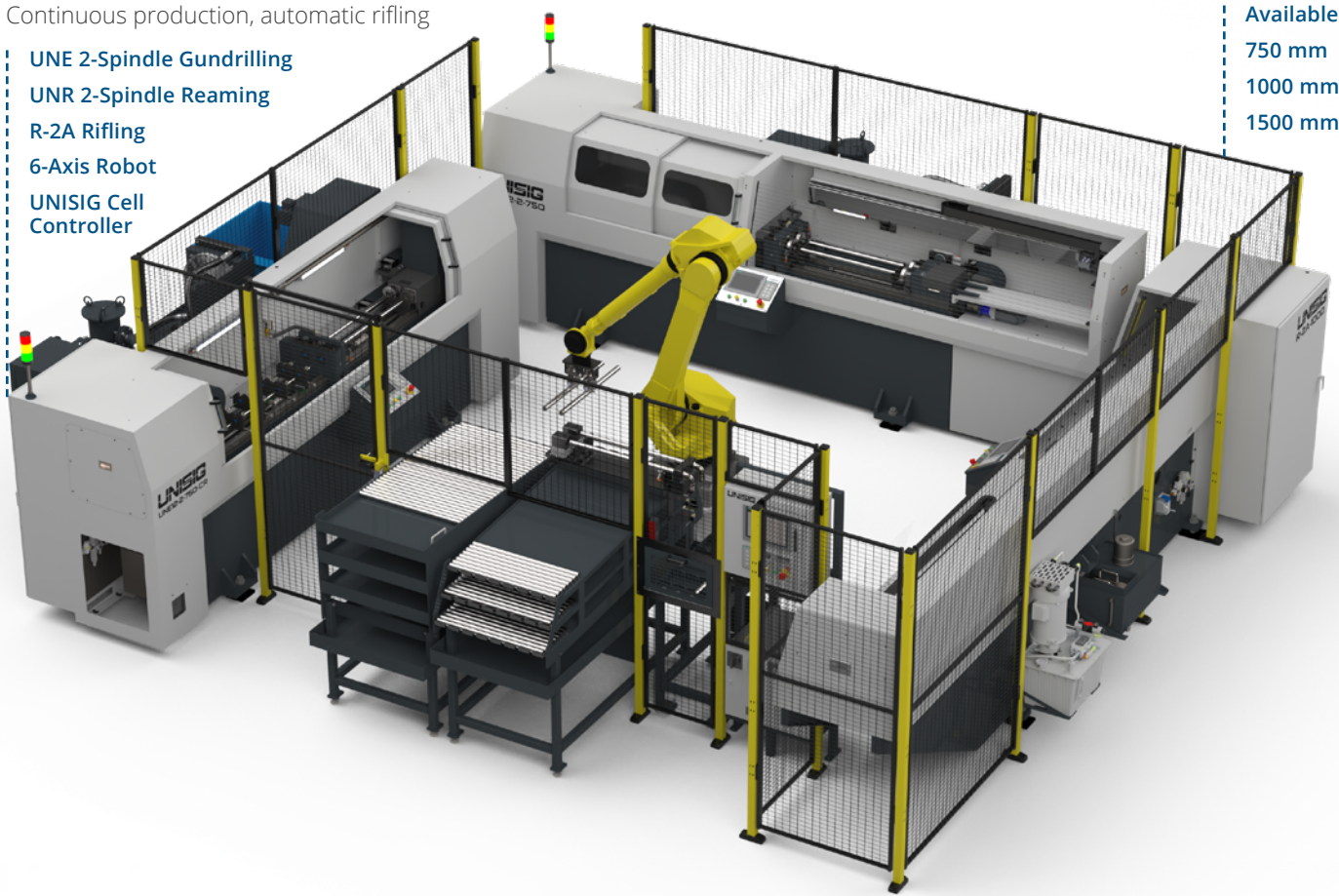
- UNE 2-Spindle Gundrilling
- UNR 2-Spindle Reaming
- R-2A Rifling
- 6-Axis Robot
- UNISIG Cell Controller

Available lengths:

750 mm [ 30 in ]

1000 mm [ 40 in ]

1500 mm [ 60 in ]



## R-CELL 4-2-2 FULL-AUTO

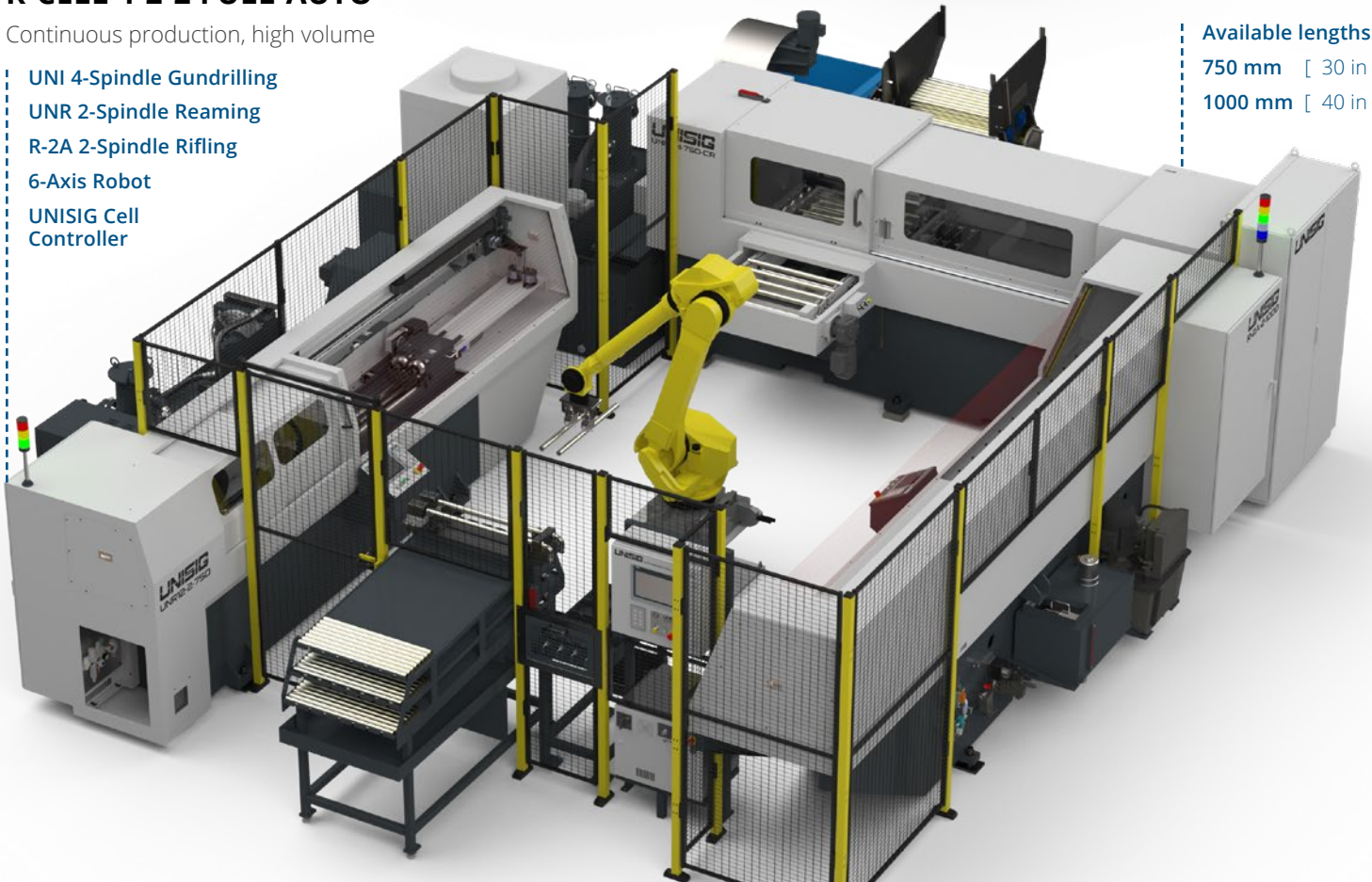
Continuous production, high volume

- UNI 4-Spindle Gundrilling
- UNR 2-Spindle Reaming
- R-2A 2-Spindle Rifling
- 6-Axis Robot
- UNISIG Cell Controller

Available lengths:

750 mm [ 30 in ]

1000 mm [ 40 in ]





## UNISIG AUTOMATED CELL CONTROLLER

Robotically tended automated cells are easy to operate and keep running with the UNISIG cell controller. All of the machine interfaces and the robot status are visible from a single panel.

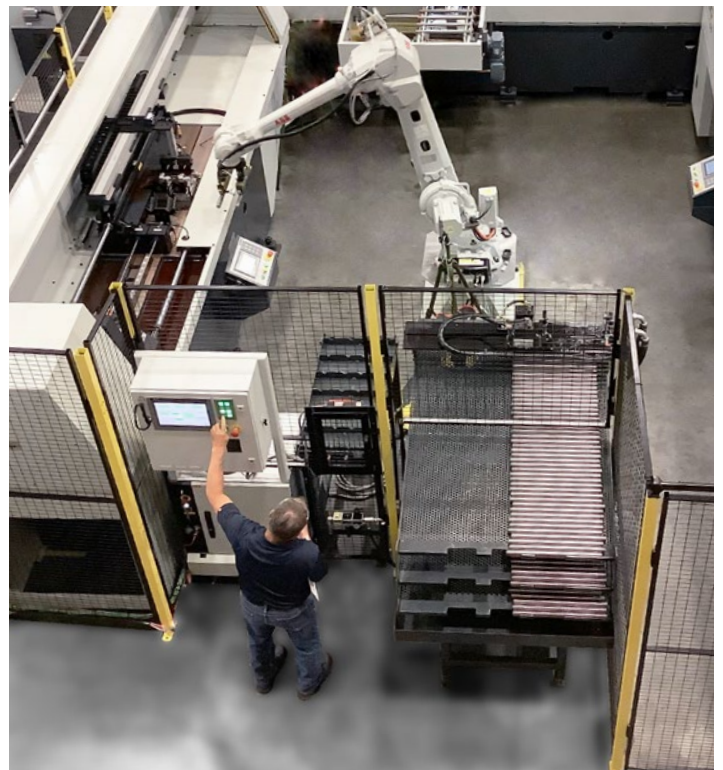
Machine setup, automation recovery, and robot troubleshooting are menu driven and easy to understand. Operator training is simplified and visual, utilizing an intuitive interface.

### **MACHINE CONNECTIVITY**

Ethernet Communications

MT Connect Industry 4.0

Remote Diagnostics



## CONFIGURE TO ORDER PRODUCTION CELLS

### SPECIAL AUTOMATION

UNISIG's manufacturing technology can be configured with special automation including custom-engineered feeders and loaders, optimized for production, application, budget, and facility requirements.

### SHOTGUN BARRELS

UNISIG Multi-spindle gundrilling and reaming machines may be used to produce exceptionally high-quality shotgun barrel blanks. Automation and modern manufacturing technology increase production rates and lower costs compared to use of legacy equipment.

### RECEIVER MANUFACTURING

High-performance indexable tools and powerful drilling spindles designed to maximize penetration rates can reset expectations when manufacturing receivers. Modernize receiver production in the industry by using multi-spindle machines with automatic loading systems.

### PISTOL BARREL BLANK PRODUCTION

Pistol barrel production starting with drilled, reamed, and rifled blanks creates automation opportunities for processing parts to a finished state with standard CNC turning and milling machines.



## MEDIUM AND LARGE CALIBER BARREL SOLUTIONS

UNISIG's medium caliber solutions use a UNI series counter-rotating drilling machine combined with a R25 or R50 for rifling. Our large caliber solutions start with our proven B-Series deep hole drilling machines for drilling and bore finishing and a R100

or R200 CNC rifling machine. UNISIG has the experience and standardized machines to produce rifled barrels over 155 mm caliber and at lengths of over 30 ft.

Contact us to discuss your large-scale defense projects.



# WITH YOU FROM START TO FINISH

Our combination of engineering 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 UNISIG 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.



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