



ABOVE AND BEYOND HONING

# SH-6000

NEXT GENERATION KROSSGRINDING® MACHINE



# SUNNEN'S SH-6000 KROSSGRINDING® MACHINE REDEFINES PRECISION



Sunnen's new SH-6000 builds on the 25-year heritage of the successful high precision CGM and KGM series machines. Simply stated, the SH-6000 takes precision honing to the next level. Both high speed and high torque models are available to replace existing CGM/KGM models.

The SH-6000 is the result of a two-year development process with input from around the globe. All aspects of the CGM and KGM machines have been analyzed for improvement. The machine is engineered to improve operator productivity and increase reliability.

The next generation of high precision KROSSGRINDING machines are suited for quick changeover for medium-to-high volume production with a higher level of control and new technology throughout.

Ø 137.185±0.025		
0.18	A-B	
0.025	LG H	
0.013/20°	LG H	



# LINE



The design focus of this machine makes it easy to setup, easy to operate with more features, more capability, and increased reliability and maintainability. Features include:

- Globally supported Siemens PLC controls provide an easy-to-use intuitive interface. All machine settings are accessible via the large 225 mm (9 in) touch screen. No manual levers, knobs, and switches to set.
- Setups can be saved and retrieved. No need to keep printed setup sheets for each part.
- New robust 25 mm Bosch Rexroth servo controlled ball screw stoker assures precise positioning and consistent performance
- New wider stoker carriage has an easily removable fixture mounting plate (standard) that accepts all current catalog fixtures. For custom fixturing additional blank plates can be ordered for quick changeover.

*Your Sunnen Technical Specialist will work with you to determine the best solution for your needs – it's all part of the added value you get with Sunnen. Plus, our worldwide sales and service team provides comprehensive support for the installation and operation of every system we make.*

*Whatever your need, we have the expertise and product range to create the right solution for you and the dedication to support you for the long run.*

*To find the Sunnen representative nearest you, visit our website:*  
[www.sunnen.com](http://www.sunnen.com)



## THE SH-6000 KROSSGRINDING® MACHINE BUILT FOR EXTREME PRECISION AND EASE OF USE

### STANDARD & OPTIONAL FEATURES

- 1 Capable of honing to the tightest tolerances in the industry with consistent and accurate bore size control to .00025 mm (.000010 in).

Superior to ID grinding.

Utilizes diamond plated or metalbonded abrasive tooling for maximum performance.

Available in both high speed and high torque models.

- 2 Standard run out adjustable spindle with direct CGT tooling connection.

Servo linear tool feed system with 30 percent more force for improved performance.

New digital honing indicator can be easily configured at the touch of a button.

- 3 Rear mounted large capacity electrical enclosure is standard. The enclosure can be special ordered on the right or left side to easily adapt to floor space limitations.

- 4 New, all-electric foot pedal for cycle start and truing in tooling.

- 5 Generous ergonomic work area.

- 6 A true global platform, CE Compliant guarding is standard. Easy-to-adjust canopy slides back for side access during setup ensures operator safety. Complete, integrated state-of-the-art safety system with guard interlocks, light curtain, and separate safety PLC with safe limited speed setup mode.



- 7 New, easy-to-maintain standard coolant system is almost 60 percent larger than earlier machine models at 208 L (55 gallon) capacity and is equipped with PF filter cartridge, magnetic separator, quick disconnect lines, and a level gage. Large capacity pump delivers double the flow rate. The system removes from the front on easy-to-roll casters.



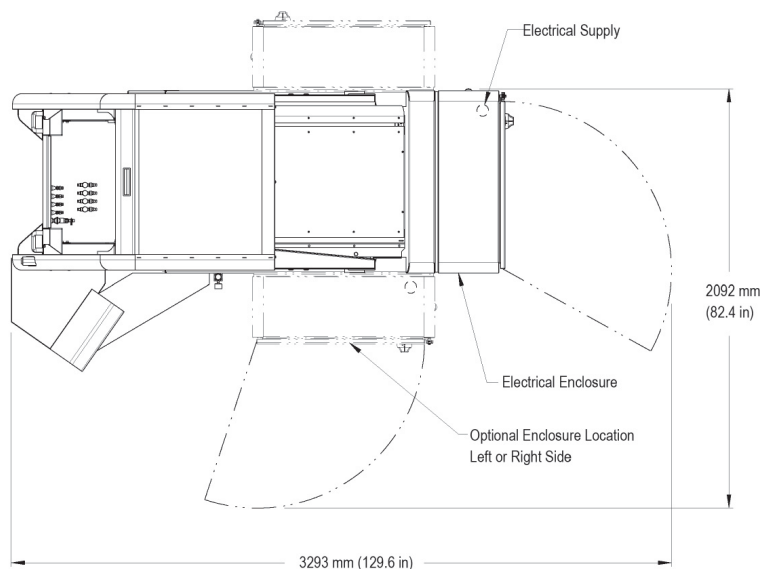


## INTUITIVE TOUCHSCREEN PUTS YOU IN CONTROL

**Proven, globally supported swivel-mounted Siemens PLC is easy-to-use with the following features standard:**

- Large 225 mm (9 in) display
- Intuitive HMI allows inexperienced operators to run the machine efficiently.
- Joystick for easy setup
- Safe setup mode switch and safe speed limits ensure operator safety during setup
- Conveniently located cycle start buttons (foot pedal may also be used).
- Other standard control system features include 1000+ saved setups, abrasive wear compensation, part counter, spindle reverse, ability to change speeds in process, inch/metric selectable, system diagnostics, cycle dwell, in-process short stroking and 12 operator languages.

*SH-6000 Floor Plan Layout*



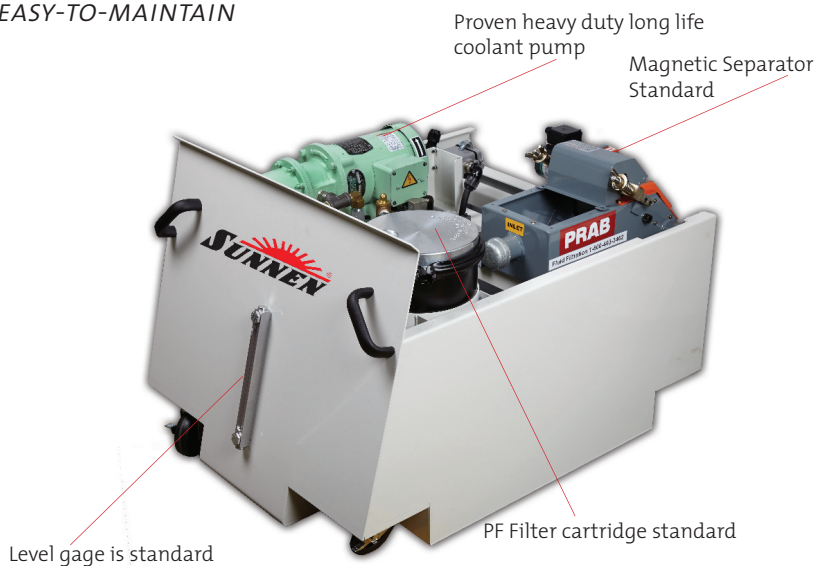
## UP CLOSE FEATURES ON THE SH-6000



Details make the difference:

- Easy-to-change stroker fixture plate standard (unit allows mounting of all standard fixtures). Additional plates can be ordered to mount custom fixtures or for quick change-over.
- Robust 25 mm servo controlled ball screw stroker assures precise positions and consistent performance.
- Front of work tray has 290 mm (11.4 in) of adjustment for ease of setup and operation.
- Increased work area - 90 mm (3.5 in) wider.

## SH-6000 COOLANT CART IS EASY-TO-MOVE AND EASY-TO-MAINTAIN



## SPECIFICATIONS:

### DIAMETER RANGE (ID):

CGT: 5,46 - 32 mm (.214 - 1.260 in)

CRT: 53,84 - 63,75 mm (2.120 - 2.510 in)

SRT: 35 - 90 mm (1.375 - 3.56 in)

TC: 25,4 - 75 mm (1.0 - 2.95 in)

### STROKE LENGTH:

6 - 392 mm (.24 - 15.43 in)

### SPINDLE:

3.8 Kw Servo (5 Hp) Maximum

### SPINDLE SPEED:

SH-6000: 200 - 3700 RPM

SH-6000HT: 20 -1000 RPM

### STROKER:

2.5 kW servo (3.4 hp) maximum

### STROKER RATE:

10 - 550 SPM (length dependent)

### FEED SYSTEM:

Servo linear

### COOLANT PUMP:

.37 kW (.5 HP)/11.2 liters per minute (3 gpm)

### COOLANT CAPACITY:

208 Liters (55 gallons)

### MACHINE WEIGHT, INCLUDING COOLANT CART:

Dry Weight: 1130 kg (2490 lbs. )

### VOLTAGES AVAILABLE

Electrical System:

400 VAC 50 Hz 3 Phase

460 VAC 60 Hz 3 Phase

### PNEUMATIC SUPPLY PRESSURE:

5.5 bar (80 psig) min



# SH-6000 TOOLING, ABRASIVES AND LUBRICANTS

## ORDERING INFORMATION

### STANDARD EQUIPMENT

The SH-6000 comes standard with the following:

- Coolant cart
- SH-6550 Alignment Indicator
- Fixture Air Line Control
- Magnetic Separator

### OPTIONAL EQUIPMENT

(to be ordered as needed)

- SH-4500 Automatic Size Control Unit
- Long Fixture Support Bars
- EC-7100 Square Honing Fixture
- KKN980/990/995 Gimbal Fixtures
- EC-6100 Universal Honing Fixture
- PEM-1214 230 VAC Supply Transformer
- SH-6610 Anti-glazing (Cycle Time Control)
- SH-6420 MMT Adaptor
- Electrical Enclosure Air Conditioning Unit - *Recommended for temperatures exceeding 35°C (95°F) Ambient*

*The electrical enclosure comes standard on the back of the machine but can be special ordered on the right (operator station) side or left side of the machine.*

## TOOLING

The SH-6000 incorporates the latest technology in horizontal honing. Sunnen offers a wide range of tooling options.

### CGT KROSSGRINDING® DIAMOND PLATED TOOLS

CGT high-precision diamond-plated tools provide extreme accuracy, excellent stock removal capability and durable diamond grit for long tooling life. These tools provide consistent bore size and unparalleled roundness, holding tolerances to within 00025 mm (0.00010 in).

**BORE DIAMETER RANGE (I.D.):** 3 mm – 32 mm (.118 in. - 1.26 in.)\*

### SRT MULTI-STONE TOOLS

SRT multi-stone honing tools are known for their dependability for both production and high precision applications. Each uses a series of seven stone holder types, featuring replaceable abrasives to reach the specified diameter range.

**BORE DIAMETER RANGE (I.D.):** 35 mm – 90 mm (1.375 in. - 3.560 in.)\*

### CRT PRODUCTION TOOLS

CRT tools are plated diamond abrasive tools for long life and produce a round and straight bore. For added versatility, replaceable sleeves are available for all CRT tools.

**BORE DIAMETER RANGE (I.D.):** 53,84 to 63,75 mm (2.120 to 2.510 in.)\*

### TC HIGH PRECISION MANDRELS

Specially designed for 2-cycle engines or other interrupted bores. Abrasives are precisely arranged to ensure accurate bore geometry and no *washout* on the edges of the bore interruptions.

**BORE DIAMETER RANGE\* (ID):** 25,4 – 75 MM (1.0 TO 2.95 INCH)

\* FOR DIAMETER SIZES BELOW OR ABOVE THE STANDARD RANGE, OR FOR SPECIALLY DESIGNED TOOLS, CONTACT YOUR SUNNEN FIELD ENGINEER.

## SUNNEN ABRASIVES

From aluminum oxide to silicon carbide to diamond and CBN, Sunnen manufactures the industry's largest variety of mounted or un-mounted stick abrasives, bond types, grain sizes and stone configurations.

Before any stone is shipped, it is graded and qualified, maintaining the most exacting quality control standards in the industry to assure you of the most precise honing performance available.

## GET THE PRECISION YOU NEED WITH SUNNEN PREMIUM HONING OILS AND COOLANTS

Sunnen's premier line of honing oils and coolants provide extreme lubricity for higher honing pressure and harder abrasives, delivering faster, lower cost-per-part and ultimately more profitable cutting rates.





A LEGACY OF EXCELLENCE SINCE 1924.

## WORLDWIDE

Our global manufacturing, distribution, and sales and service network allows us to deliver quality Sunnen solutions worldwide.

And our state-of-the-art Technical Services Centers allow our technical experts to develop innovative solutions to customer application challenges. The Centers also provide answers for customer questions and training for Sunnen representatives around the world.

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