



ABOVE AND BEYOND HONING

SH-4000

NEXT GENERATION POWER STROKED HONING MACHINE



SUNNEN'S SH-4000 HORIZONTAL HONING MACHINE REDEFINES HONING



From its designer styling and lack of manual controls to its digital repeatability and touchscreen HMI, Sunnen's new SH-4000 builds on the 21-year heritage of the successful EC and ML series machines. Simply stated, the SH-4000 takes honing to the next level of capability.

The SH-4000 is the result of a four-year development process with input from around the globe. All aspects of the machine have been analyzed for improvement and tested. The machine is engineered to improve operator productivity.

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

With 45 percent fewer parts, the SH-4000 is more reliable and durable.



0.18	A-B
0.025	LG H
0.013/20"	LG H

ACHINE



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:

- PLC controls replace outdated circuit card control. All machine settings are accessible via the large 225 mm (9") touch screen. No manual levers, knobs, and switches to set.
- Setups can now 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 a removable fixture mounting plate (standard) that accepts all current EC/ML standard fixtures. For custom fixturing additional blank plates can be ordered.



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



THE SH-4000 POWER STROKED HONING MACHINE . . . ITS PERFORMANCE MATCHES ITS LOOKS

STANDARD & OPTIONAL FEATURES

- 1 Patent pending digital-servo, linear hybrid tool feed and cutting pressure control for consistent, predictable performance. The system provides precise settings at the touch of a button to maximize process control and productivity. Can be adjusted in 4.4 N (1 lbf) increments with 2225 N (500 lbf) available, doubling the feed force of earlier machines.

Superior feed control at low pressure for small bore processing. Step feed capability for rough and finish pressures in one setup.

20 mm (.79 in) of additional feed travel allows for increased diameter range for high production MMT tool applications.

- 2 Standard true running spindle with direct collet connection for quick changeover with production MMT tooling. Includes an easy setup runout adjustable adapter for Sunnen standard tooling. Ultra precision spindle cartridge is optional.

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 setup and truing in mandrels.
- 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 and 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 70 percent larger than earlier machine models at 208 L (55 gallon) capacity and is equipped with quick disconnect lines and a level gage. It removes from the front on easy-to-roll casters and is available with an optional magnetic separator.



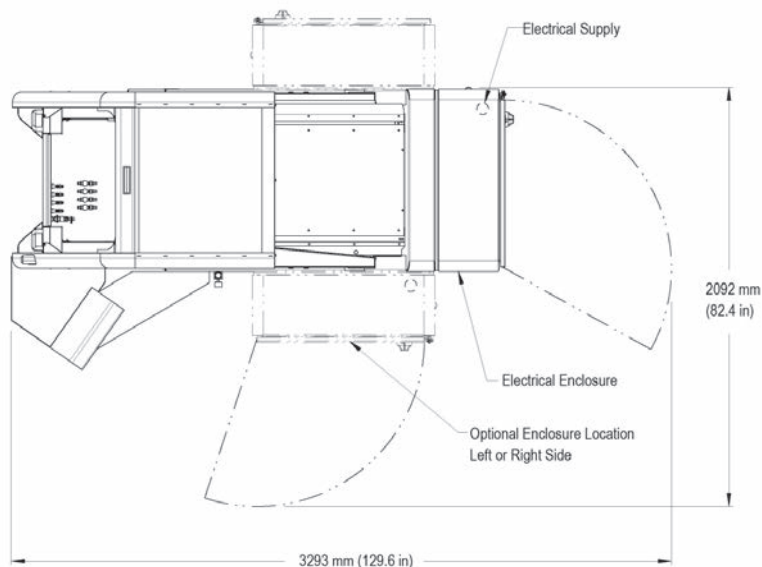


INTUITIVE TOUCHSCREEN PUTS YOU IN CONTROL

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

- Large 225 mm (9 in) display.
- Intuitive touch screens allow inexperienced operators to run the machine efficiently.
- Stroker jog 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 infinite saved setups, stone wear compensation, feed speed regulation (stone saver), two-step feed, spindle reverse, ability to change speeds in process, inch/metric selectable, system diagnostics, cycle dwell, in-process short stroking, part counter and 13 operator languages.

SH-4000 Floor Plan Layout



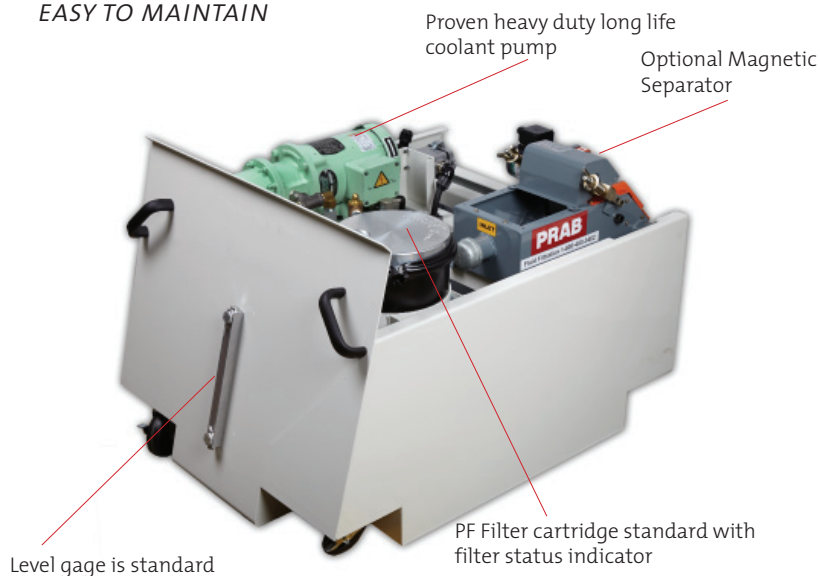
UP CLOSE FEATURES ON THE SH-4000



Details make the difference:

- Easy-to-change stroker fixture plate standard (unit allows mounting of all ML/EC style fixtures). Additional plates can be ordered to mount custom fixtures or for quick change-over.
- Robust 25 mm (1 in) servo controlled ball screw stroker assures precise positions and consistent performance.
- Increased 400 mm (15.75 in) maximum stroke travel allows for longer parts.
- Improved design ... the carriage is 52 mm (2 in) wider for improved access.

SH-4000 COOLANT CART IS EASY TO MOVE AND EASY TO MAINTAIN



SPECIFICATIONS:

DIAMETER RANGE (ID):

1.5 - 101.6 mm (.060 - 4.0 in)

STROKER CARRIAGE TRAVEL:

6 - 400 mm (.24 - 15.75 in)

SPINDLE SPEED:

200 - 3000 RPM

SPINDLE POWER:

4.1 kW (5.5 hp)

STROKER:

2.5 kW servo (3.4 hp) maximum

STROKER RATE:

10 - 550 SPM (length dependent)

FEED SYSTEM:

Servo linear, 2225 N (500 lbf) maximum

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: FLA 18.5

460 VAC 60 Hz 3 Phase: FLA 18.2

PNEUMATIC SUPPLY PRESSURE:

5.5 bar (80 psig) min

SH-4000 TOOLING, ABRASIVES AND LUBRICANTS

ORDERING INFORMATION

STANDARD EQUIPMENT

The SH-4000 comes standard with the following:

- EC-6100 Universal Honing Fixture with mounting plate
- Runout adjustable standard mandrel adapter
- Coolant cart with PF cartridge filtration
- SH-6550 Alignment Indicator
- ML-6190 Torque Arm
- EC-6031 Manual Torque Arm

OPTIONAL EQUIPMENT

(to be ordered as needed)

- SH-4500 Automatic Size Control Unit
- SH-2310 Precision ABEC-7 Collet Spindle
- MMT-SC1 17 mm MMT collet
- MMT-SC2 23 mm MMT collet
- MMT-SC3 25 mm MMT collet
- Long Fixture Support Bars
- EC-7100 Square Honing Fixture
- KKN980/990/995 Gimbal Fixtures
- SH-6620 Fixture Air Lines Package
- SH-5700 Magnetic Separator
- PEM-1214 230 VAC Supply Transformer
- SH-6610 Anti Glazing (Cycle Time Control)
- 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-4000 incorporates the latest technology in horizontal honing. Sunnen offers a wide range of tooling options from multi-stone mandrels to standard mandrels.

MMT HIGH-PRODUCTION MULTI-STONE MANDRELS

MMT mandrels offer faster cycle times, superior accuracy, longer time between stone changeovers, and maintain superior bore geometry and bore centerline. Every mandrel is manufactured using high-strength steel to ensure long production life.

BORE DIAMETER RANGE (I.D.): 4 mm - 65 mm (0.156 in. - 2.56 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 - 102 mm (1.4 in. - 4.0 in.)*

STANDARD MANDRELS

For bores under 150 mm (6 inch) in diameter, the industry standard Sunnen mandrels provide straightness and roundness with minimum stock removal. Standard mandrels can be supplied for blind hole honing, with multiple stones for honing long bores.

BORE DIAMETER RANGE (I.D.): 1.5 mm - 165 mm (.06 in. - 6.5 in.)*

* 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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