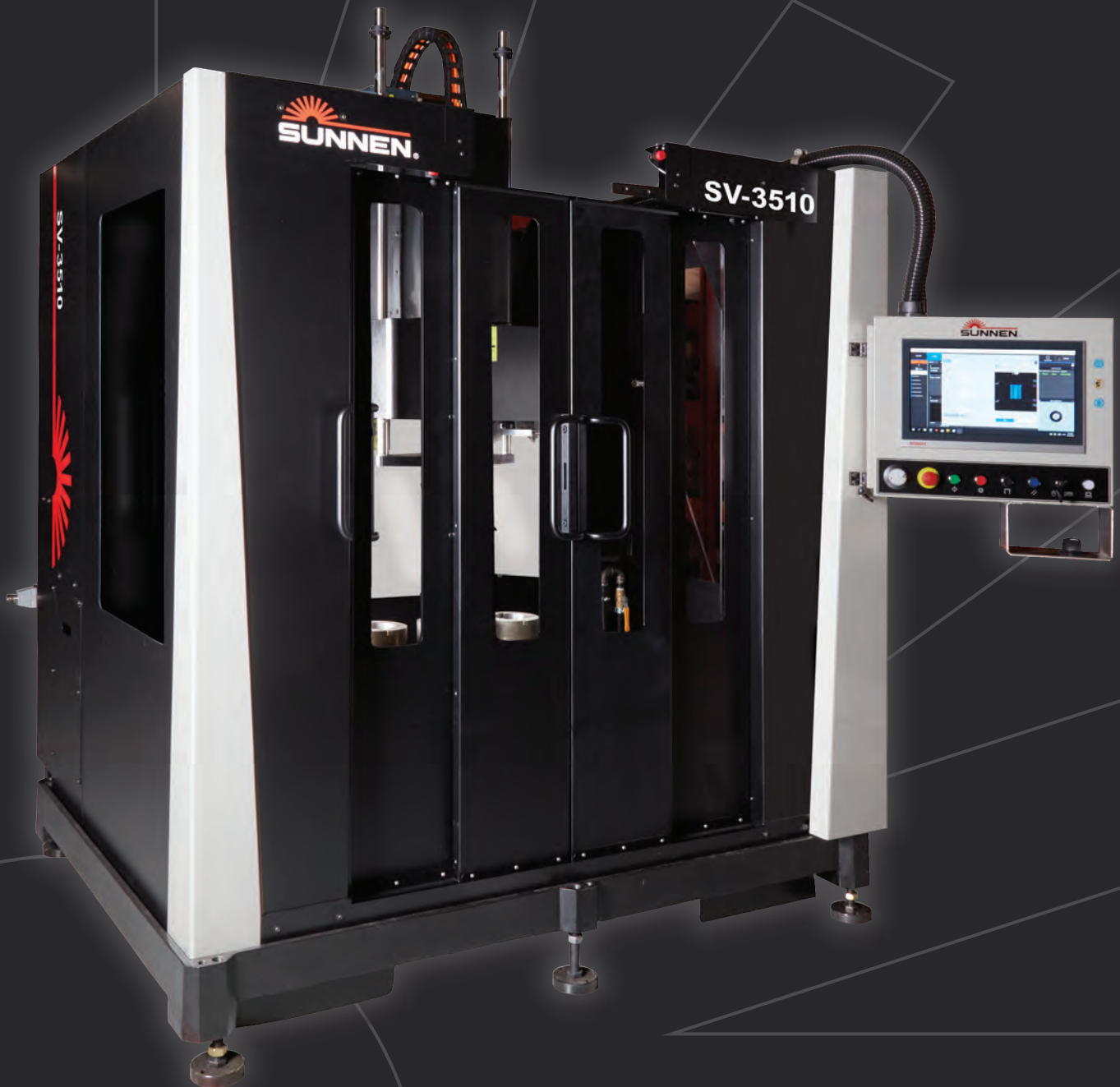




SV-3500 SERIES

PRECISION VERTICAL HONING SYSTEM





SUNNEN'S SV-3500 SERIES

Heavy Duty Servo-Controlled Honing Systems

The SV-3500 is the next step in the continuing evolution of the Sunnen SV Series. A new look combined with the new Sunnen2 controls. The SV-3500 Series heavy duty honing machines combine power, precision, durability and technology to make vertical honing more economical and productive than ever before.

This innovative solution incorporates a patented stroking system that produces a true vertical stroke and can dwell in any part of the hole, end-to-end, producing the straightest, roundest bore possible with a consistent crosshatch pattern with the new easy to use and setup Sunnen2 controls. Linear tool feed allows for the use of dedicated PH and GH style heavy duty hones.

With its 6.3 kW (8.5 HP) servo spindle motor and powerful 8.0 kW (10.8 HP) stroking motor, the SV-3500 Series can handle almost any job. It is perfect for mid- to high-volume

production in large bores 19 mm to 250 mm (0.75 in. to 10 in.) and is well suited for a wide range of applications, including:

- Brake drums
- Diesel liners up to 229 mm (9 in.)
- All types of engine blocks
- Landing gear components
- Large hydraulic blocks
- Mud pump liners

For ease of setup, the SV-3500 Series features a multi-axis hand wheel for fine-tuning the vertical stroke, honing tool position, column position (SV-3510 only) and optional cradle position. And, because it's built on a proven, modular platform, this system can be automated or otherwise customized to meet your exact requirements.

THE SUNNEN SERVICE TEAM

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.

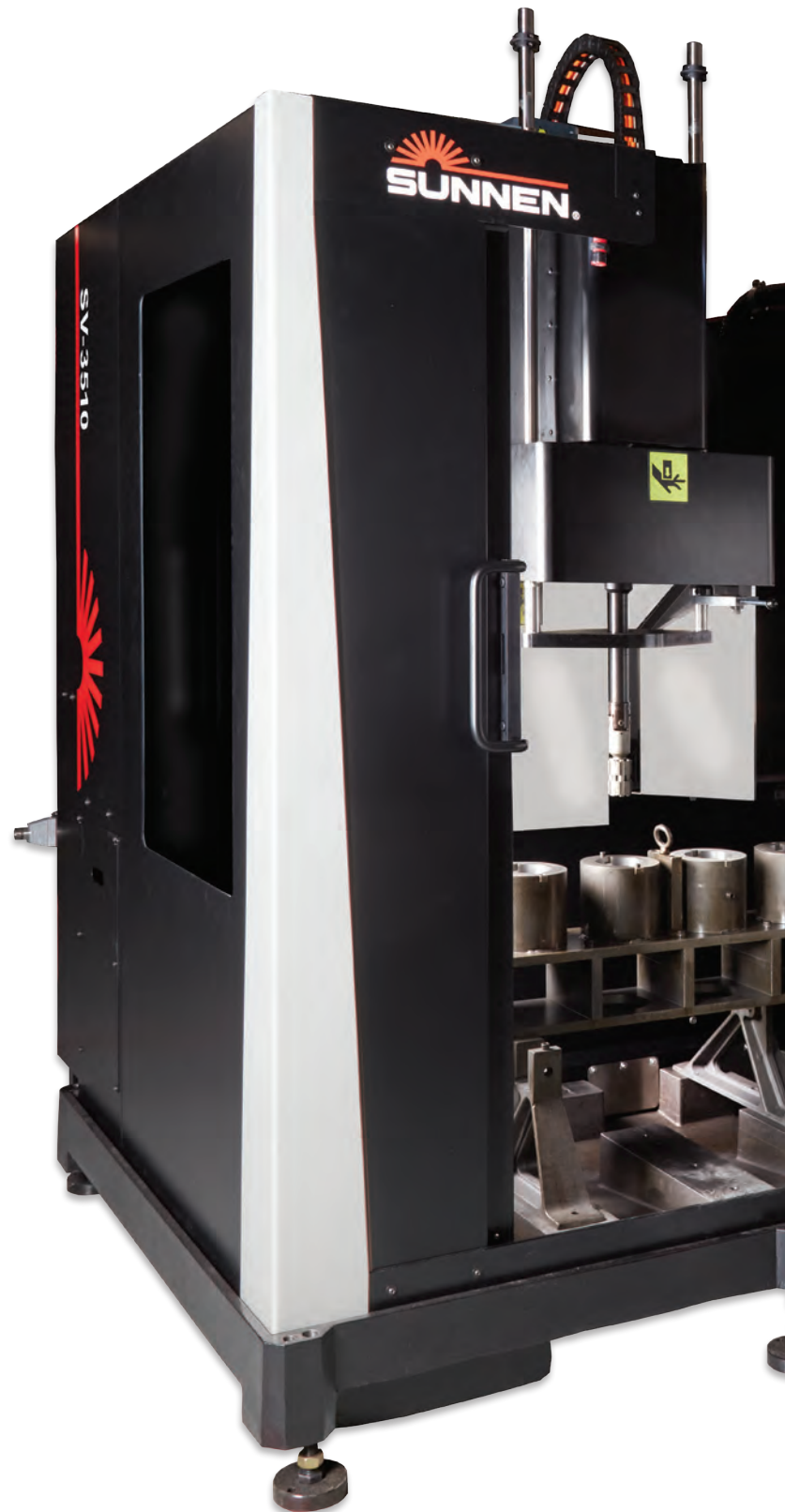
To find the Sunnen representative nearest you, visit our website at www.sunnen.com



Superior features put the SV-3500 in a class by itself.

STANDARD & OPTIONAL FEATURES

- New look with a focus on ergonomics and ease of use combined with the new Sunnen2 controls and proven Beckhoff controls.
- Precision 8.0 kW (10.8 HP) servo ball screw stroking system assures accurate tool positioning and stroking control.
- Servo spindle 6.3 kW (8.5 HP).
- Patented load-sensing feed system can operate in constant rate or pressure mode to optimize the process.
- Superior PH and GH tooling delivers extremely precise bores for a variety of applications.
- T-Slot table and optional elevated fixture frame allow optimal fixturing versatility. T-slot table standard on SV-3560 and optional on SV-3510.
- Heavy duty vertical slide and horizontal slide stroke guide ways ensure superior performance and long, trouble-free life. Auto lubrication system is standard for critical components.
- The wide-open door design allows full access to the work area for either manual or fully automated robotic parts loading.
- Synchronized servo stroke and spindle maintain constant crosshatch finishing throughout the bore from end to end for the most demanding surface finish requirements.
- Add an optional SVF coolant system or connect the system to a central coolant system.
- Optional tool guide pot assembly aligns tool with bore as tool is indexed (SV-3510 only).
- Hone longer bores with the SV-3500 series featuring a vertical stroke travel of: 762 mm/30 in. (SV-3500/3510) ; 1475 mm /58 in. (SV-3560).
- Heavy-duty cast iron base (SV-3510/3560).
- Optional servo rollover cradle (on the SV-3510 only).
- Standard LED work area lighting.
- Latest in safety technology including safety PLC, Safe Drive System, and secondary brake on column stroking system, European Machinery Directive (CE) compliant – all standard.

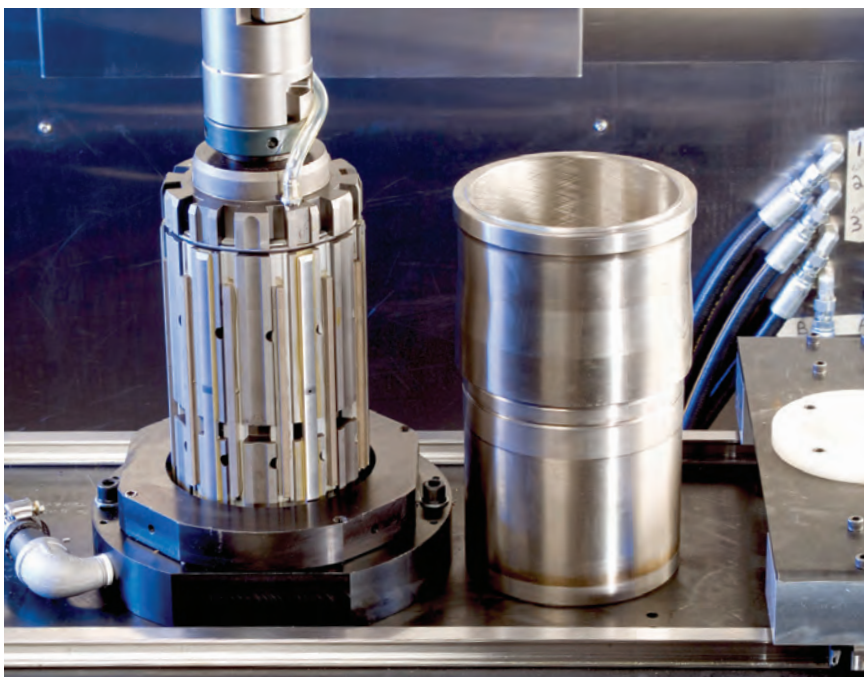




NEW

Sunnen2 Control System

- Windows®-based PC touch screen control system coupled with servo tool feed provides optimum process control with ease of set-up.
- Intuitive touch screen ensures new machine operators are quickly trained. Setup time is minimized.
- Infinite adjustability of honing parameters allows processing of complex bore configurations such as blind bores, thin wall parts, etc.
- State of the art Beckhoff electronics.
- Bore profile display shows bore straightness during the cycle.
- Large 470 mm (18.5 in.) color touch screen.
- Servo Control X-axis (left-right 1143 mm (45 in.) travel) allows programming positions for multiple in-line bore honing. Available on SV-3510 only.
- Configurable, multi-level permissions allow varying levels of access depending on user role.
- Optional post-process gaging system with industry leading SPC software allows data collection and machine process control to sub-micron tolerances.
- Optional OPC-UA interface allows access for remote monitoring.
- Fast, simple setup using hand wheel control for tool feed, vertical, servo left-to-right position [SV-3510 only] and optional servo cradle.
- Advanced servo stroke control delivers a consistent crosshatch pattern and allows the machine to short stroke or dwell in any part of the bore, end-to-end for incredibly precise honing.
- Patented load-sensing feed can operate in either constant spindle load or constant rate mode.
- Auto-Dwell feature corrects bore straightness automatically (great for blind holes).
- Optional automation interface.
- Includes EtherCAT industrial communications protocol to minimize machine response time and increase level of control.
- Multiple languages available.



Customize the SV-3500 To Your Exact Requirements

Sunnen's high-precision SV honing systems represent the very finest solutions available anywhere in the world. With over 600 systems delivered globally, they are reliable, durable, and flexible systems designed to deliver the production quality and precision our customers have grown to expect.

From design to delivery, you have the Sunnen commitment to service and quality assurance. Our technical experts will work with you to determine the number of spindles, style of tooling, fixturing, abrasives, in-process and/or post-process gaging, and method of parts loading and unloading (including robotics) you require. Then we'll provide you a written proposal.

After your system is built, we'll set up a live run-off demonstration at our facility. Once it meets all specifications, we'll commission your system and train your staff.

SV-3500 Series Automation Options

Our automation options are designed to increase the operational efficiency of your precision honing system. They shorten cycle times, increase tool life, and – most importantly – radically reduce labor costs. Sunnen automation solutions can keep your system running 24 hours a day, seven days a week.

A two-axis or multi-axis servo robot can be integrated into a Sunnen modular honing system.



Specifications

DIAMETER RANGE*

19 to 250 mm (0.75 to 10 in.)

WORKPIECE WEIGHT*

900 kg (2,000 lbs.)

WORK AREA ENVELOPE (TABLE)

1016 x 1778 mm (40 x 70 in.)

CARRIAGE TRAVEL

SV-3500/SV-3510: Up to 762 mm (30 in.)

SV-3560: Up to 1475 mm (60 in.)

RECIPROICATION RATE (STROKE)

SV-3500/SV-3510/SV-3560:

10 to 160 strokes per minute

STROKER MOTOR

8.0 kW (10.8 HP)

SPINDLE SPEEDS

SV-3500/SV-3510-1/SV-3560:

1 to 300 rpm

SV-3510-2: 1 to 600 rpm

SPINDLE MOTOR

6.3 kW (8.5 HP)

TOOL FEED

Servo linear push/pull

X-AXIS (SV-3510 ONLY)

Travel: 1143 mm (45 in.)

Speed: 0.001 to 0.085 mps
(0.04 – 3.35 IPS)

COOLANT SUMP PUMP

Centrifugal Pump

0.5 kW (0.67 HP)

225 lpm (68 gpm)

FLOOR SPACE *(Coolant Tank Not Included)*

SV-3500/SV-3510: 2546 W x 2309 D x
2436 H mm (100 W x 91 D x 96 H in.)

SV-3560: 2625 W x 3950 D x
4010 H mm (103 W x 156 D x 158 H in.)

FLOOR WEIGHT *(Dry)*

SV-3500/SV-3510: 4350 kg (9,590 lbs.)

SV-3560: 5500 kg (12,125 lbs.)

PNEUMATIC REQUIREMENTS

5.5 to 6.9 Bar (80 to 100 psi)
(required for certain options).

ELECTRICAL REQUIREMENTS

460V, 60Hz, 3Ph

400V, 50Hz, 3Ph

SV-3500

Tooling, Abrasives and Lubricants

The SV-3500 series features the latest technology in vertical honing for bores 19 mm to 250 mm (0.075 in. to 10 in.).*

PH PRECISION MULTI-STONE HONING TOOLS

New features on this line of multi-stone honing tools optimize bore geometry and efficiency in mid- and high-volume production applications. Tools can be built to meet any need, and are available in single-stage and two-stage models. PH tools can hold 12 or more stones to produce optimum straightness and roundness. Available with integral plug sizing or in-process air gaging.

Bore Diameter Range: 50 mm – 229 mm (2.00 in. – 8.0 in.)*

HEAVY-DUTY GH® TOOLING

The SV3500 Series models are compatible with Sunnen's heavy-duty GH tooling. Sunnen's GH tooling will allow the operator to effectively hone using either conventional abrasives or superabrasives for even greater accuracy and stock removal rates.

Bore Diameter Range: GH Tooling: 31.8 mm – 609.6 mm (1.25 in. – 24 in.)

SUNNEN MADE ABRASIVES

From aluminum oxide to silicon carbide to diamond and CBN, Sunnen offers 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.

SUNNEN PREMIUM HONING OILS & COOLANTS

Sunnen's premium 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.

SUNNEN DIAL BORE GAGES

Sunnen Dial Bore Gage system provides quick, easy to gage I.D.'s on bores with a wide range of sizes and lengths. Dial Bore Gages and Setting Fixtures are available to cover diameters from 13.71 mm to 152.5 mm (0.054 in. to 5 in.), optional to 309 mm (12 in.).



Well Suited for a Wide Range of Applications

The SV-3500 Vertical Honing System is ideal for diesel cylinder liners, mud pump liners, large hydraulic blocks, brake drums and other mid- to high-production applications.



Constant Crosshatch Capacity

Sunnen's SV-3500 has a synchronized servo stroke motor and spindle for a constant crosshatch finish throughout the bore with no rollover.



* For diameter sizes below 50, or above 30 mm, or for specially designed high production tools, contact your Sunnen Field Engineer.

A LEGACY OF EXCELLENCE SINCE 1924

Sunnen Worldwide

With world headquarters in St. Louis, Missouri, Sunnen is the largest fully integrated company in the world specializing in precision bore creation, sizing and finishing equipment. A Sunnen solution might include honing, lapping, skiving/roller burnishing or deep hole machining...or a combination of those processes.

Our 14 international affiliates and over 40 authorized distributors allow us to deliver top quality Sunnen machines, tools, service and training wherever they are needed around the globe.

SUNNEN PRODUCTS COMPANY

World Headquarters – St. Louis, USA
(314) 781-2100
(800) 325-3670
sunnen@sunnen.com
www.sunnen.com

AUSTRIA

Sunnen Austria GmbH
+43 5576 74194
sales@sunnen.eu
www.sunnen.com

BELGIUM

Sunnen Benelux BVBA
+32 38 80 2800
info@sunnen.be
www.sunnen.com

BRAZIL

Sunnen do Brasil LTDA
+55 11 4368-4900
sunnen@sunnen.com.br
www.sunnen.com

CANADA

Sunnen Products Company
(844) 356-0006
canadasales@sunnen.com
www.sunnen.com

CHINA

Shanghai Sunnen Mechanical Co. Ltd.
+86 21 5813 3990
sales@sunnensh.com
www.sunnen.com

CZECH REPUBLIC

Sunnen S.R.O.
+420 383 376 317
sunnen@sunnen.cz
www.sunnen.com

FRANCE

Sunnen SAS
+33 169 300 000
info@sunnen.fr
www.sunnen.com

GERMANY

Sunnen Deutschland, GmbH
+49 221 348 049 0
info@sunnen.de
www.sunnen.com

INDIA

Sunnen India Pvt. Ltd.
+91 22 6139 2800
sales@sunnen.in
www.sunnen.com

ITALY

Sunnen Italia S.r.l.
+39 02 383 417 1
sunnen@sunnenitalia.com
www.sunnenitalia.com

MEXICO

Sunnen Mexico
314-781-2100
sunnen@sunnen.com
www.sunnen.com

POLAND

Sunnen Polska Sp. z o.o.
+48 22 814 34 29
sunnen@sunnen.pl
www.sunnen.com

SWITZERLAND

Sunnen AG
+41 71 649 33 33
sales@sunnen.eu
www.sunnen.com

UNITED KINGDOM

UK – Sunnen Products Ltd.
+44 1442 39 39 39
hemel@sunnen.co.uk
www.sunnen.com