

WS 11

WS 11-SP

The precision
of a Swiss watch



Key parameters

The WS 11/WS 11-SP are universal grinding machines offering the greatest precision for small to the smallest precision tools and production parts. For use in both production and regrinding operations. They machine tools up to 25 mm diameter. The greater the tool precision, the greater its use.



Grinding



Eroding



Laser



Measuring



Software



Customer Care

Ewag AG

The origins of Ewag AG date back to 1946 when the company manufactured precision tool grinding machines for the Swiss watch industry. Today the EWAG product range includes manual machines for grinding and regrinding tools as well as the production of small precision parts, CNC tool grinding machines for grinding as well as laser machines for indexable cutting inserts and rotationally symmetrical tools made from carbide.

Ewag AG is part of the UNITED GRINDING Group. Together with our sister company, Walter Maschinenbau GmbH, we consider ourselves to be a supplier of systems and solutions for the complete machining of tools and can offer a wide range of products, including grinding, rotary eroding, laser machining, measurement and software.

Our customer focus and our global sales and service network of company-owned locations and employees has been appreciated by our customers for decades.

WS 11

WS 11-SP

These two universal grinding machines have proven their excellence in the Swiss watch industry. Each with four linear and three or four rotary axes, they grind complex, delicate geometries with maximum precision and just a single clamping. They are distinguished in this field and highly flexible in application.



Grinding



Grinding

The WS 11 / WS 11-SP at a glance

Application

- Production/regrinding of small rotationally symmetrical tools
- Production of small volume production precision parts
- Diameter up to 25 mm
- Materials HSS, carbide

The machine

- Compact, space-saving design
- Solid machine base Alu/cast iron
- Linear axes X, Y, (V), Z
- Rotary axes A, B, C, (D)
- SP model with additional grinding stroke axis V for spiral grinding
- Measuring optics for visible chip removal process and control measurements
- Ergonomical axis arrangement for fatigue-free operation
- Precise continuous performance for smallest tolerances thanks to hydrostatic grinding spindle with consistent heat expansion
- Large range of accessories for optimum adaptation to wide range of tasks



WS 11 universal grinding machine.

Geometries

- Sophisticated machine kinematics for ultra-precise reproduction of complex geometries
- Display of highly precise measurements
- Grinding and measuring in a single clamping – quality control
- Grinding of cylindrical, conical and spiral geometry in a single clamping



WS 11-SP universal grinding machine with additional grinding spindle inclined axis D and spindle height positioning axis V.

Groundbreaking in manual grinding techniques

1





Assured and convenient work at the WS 11: the operator always has the entire compact machine in sight. All axes are within reach and can be quickly and easily operated. Perfect ergonomics, a standard for precision.

In the SP model, the D and V axis are additionally integrated within the machine kinematics. It can be used to machine tools with spiral toothings.



Tool examples:
Grinding on the WS 11 / WS 11-SP

Details of precise grinding performance

Pivoting grinding spindle

The pivoting and height-adjustable grinding spindle of the WS 11-SP makes the machining of spiral tools easy.

1



2



3



Hydrostatic spindle

The grinding spindle is hydrostatic to ensure maximum grinding precision. Quiet operation and minimal heat expansion are the advantages which impact positively on the grinding result.

Kinematics

The WS 11 and WS 11-SP universal grinding machines are marked by the special arrangement of their kinematics. As a result, the operator can accurately machine the most complex of tools.



Hand wheels

The X, Y and Z linear axes can be positioned accurately within microns.



Digital display

With this optional feature, the key axis settings can be displayed clearly to an accuracy of 1 micrometre.

Sine bar

All spiral angles can be adjusted within a stepless range directly on the WS 11-SP with the sine bar.



Tool carrier C axis

The flexible W20 or W25 interface is used as a tool holder. This enables maximum runout and the tool can be machined either in rotary grinding or ultra-precise indexing mode.



Accessories for greater flexibility



Radius and spherical grinding attachment

This allows radii and forms with optimum tangent transition to be ground on tools in one clamping with high accuracy.

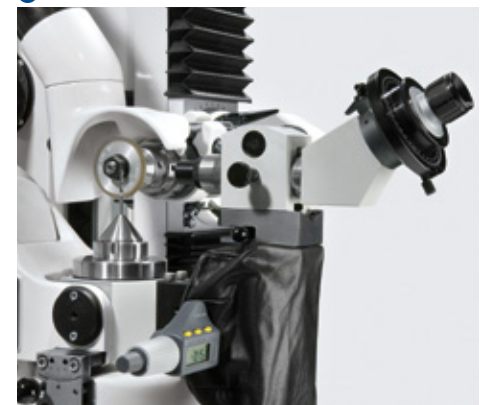


High-frequency spindle

It works at up to 100,000 rpm and can thus grind the smallest inside diameters and outer forms. This opens the door to the micro range.

Measuring optics

Displays the grinding process at a magnification of up to 100:1. At the same time, it checks and measures angles and diameters. A key control measure for grinding precision.



Customer Care

WALTER and EWAG deliver systems and solutions worldwide for all areas of tool machining. Our claim is based on ensuring maximum availability of our machines over their entire service life. For this we have thus bundled numerous services in our customer care program.

From "Start up" through "Prevention" to "Retrofit", our customers enjoy tailor made services for their particular machine configuration. Around the world, our customers can use helplines, which can generally solve a problem using remote service. In addition to that, you will also find a competent service team in your vicinity around the world. For our customers, this means:

- Our team is close by and can quickly be with you.
- Our team will support you to improve your productivity.
- Our team works quickly, focuses on the problem and its work is transparent.
- Our team solves every problem in the field of machining tools, in an innovative and sustainable manner.



Start up

Commissioning
Extension of the guarantee



Qualification

Training
Support for production



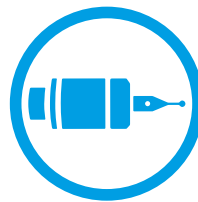
Prevention

Maintenance
Inspection



Service

Customer service
Customer advice
Helpline
Remote service



Material

Spare parts
Replacement parts
Accessories



Rebuild

Machine overhauling
Refurbishing of assemblies



Retrofit

Conversions
Retrofitting parts
Taking machines back

Technical data, dimensions

Axes

X axis	100 mm
Y axis	100 mm
Z axis	100 mm
V axis (WS 11-SP)	184 mm
A axis	- 135 to + 30°
B axis	∞
D axis (WS 11-SP)	+/- 35°

Drives

Grinding spindle

Grinding spindle performance	0.3 kW
Grinding spindle speed	2,500 – 8,000 rpm
Max. grinding wheel diameter	75 mm

Tool spindle

Tool spindle performance	0.37 kW
Tool spindle speed	100 – 1,300 rpm
Tool spindle	W20 / W25

Accuracy

Linear resolution with digital display	0.001 mm
Radial resolution, rotational axes A,C	1°
Radial resolution, rotational axis B with angle micrometer	2°

Tool data¹⁾

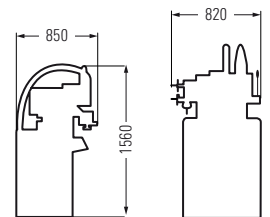
Max. diameter	25 mm
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Options

- Dust extraction
- Digital display

Accessories

- Diverse wheel adapters
- Dressing attachment
- Digital micrometer with optics
- Measuring system diameter (0.0001 mm)
- Touch-Test TT
- Dividing head
- Eccentric grinding attachment
- Radius grinding attachment
- Spherical grinding attachment
- Spiral grinding attachment
- High-frequency spindle
- Further accessories on request



WS 11/WS 11-SP

¹⁾ The maximum tool dimensions depend on the type of tool and its geometry, as well as the type of machining.

Measurements in mm. Subject to modifications due to technical progress and errors. No guarantee is provided for this information.

Creating Tool Performance

WALTER and EWAG are globally acting market-oriented technology and service companies, and are system and solution partners for all areas of tool machining. Our range of services is the basis for innovative machining

solutions for practically all tool types and materials typical for the market with a high degree of added value in terms of quality, precision, durability and productivity.



Grinding – Grinding of rotationally symmetrical tools and workpieces

WALTER machines	Use	Materials	Tool dimensions ¹⁾ max. length ²⁾ / diameter
HELITRONIC ESSENTIAL	P R	HSS TC C/C CBN	255 mm / Ø1 – 100 mm
HELITRONIC MINI POWER	P R	HSS TC C/C CBN	255 mm / Ø1 – 100 mm
HELITRONIC MINI AUTOMATION	P R	HSS TC C/C CBN	255 mm / Ø1 – 100 mm
HELITRONIC BASIC	P R	HSS TC C/C CBN	350 mm / Ø3 – 290 (320) mm
HELITRONIC POWER	P R	HSS TC C/C CBN	350 mm / Ø3 – 290 (320) mm
HELITRONIC POWER 400	P R	HSS TC C/C CBN	520 mm / Ø3 – 315 mm
HELITRONIC VISION 400	P R	HSS TC C/C CBN	370 mm / Ø3 – 315 mm
HELITRONIC VISION 400 L	P R	HSS TC C/C CBN	420 mm / Ø3 – 315 mm
HELITRONIC VISION 700 L	P R	HSS TC C/C CBN	700 mm / Ø3 – 200 mm
HELITRONIC MICRO	P R	HSS TC C/C CBN HSS TC C/C CBN	120 mm / Ø0.1 – 12.7 mm 120 mm / Ø3 – 12.7 mm

EWAG machines	Use	Materials	Tool dimensions ¹⁾ max. length ²⁾ / diameter
EWAMATIC LINEAR	P R	HSS TC C/C CBN PCD	200 mm / Ø0.2 – 200 mm
PROFILE LINE	P R	HSS TC C/C CBN	255 mm / Ø1 – 100 mm
WS 11/WS 11-SP	P R M	HSS TC	– / up to Ø25 mm
RS 15	P R M	HSS TC C/C CBN PCD	– / up to Ø25 mm



Eroding – Electrical discharge machining and grinding of rotationally symmetrical tools

WALTER machines	Use	Materials	Tool dimensions ¹⁾ max. length ²⁾ / diameter
HELITRONIC DIAMOND EVOLUTION	P R	HSS TC C/C CBN PCD	185/255 mm / Ø1 – 165 mm
HELITRONIC POWER DIAMOND	P R	HSS TC C/C CBN PCD	350 mm / Ø3 – 290 (400) mm
HELITRONIC POWER DIAMOND 400	P R	HSS TC C/C CBN PCD	520 mm / Ø3 – 380 mm
HELITRONIC VISION DIAMOND 400	P R	HSS TC C/C CBN PCD	370 mm / Ø3 – 315 mm
HELITRONIC VISION DIAMOND 400 L	P R	HSS TC C/C CBN PCD	420 mm / Ø3 – 315 mm



Software – The intelligence of tool machining and measuring for production and regrinding



Customer Care – Comprehensive range of services

Use: P Production R Regrinding M Measuring

Materials: HSS High speed steel TC Tungsten carbide C/C Cermet/ceramics CBN Cubic boron nitride PCD Polycrystalline diamond CVD-D Chemical vapour deposition MCD/ND Monocrystalline diamond/natural diamond



Grinding – Grinding of indexable inserts

EWAG machines	Use	Materials	Indexable inserts ¹⁾ Inscribed / circumscribed circle
EWAMATIC LINEAR	P R	HSS TC C/C CBN PCD	Ø3 mm / Ø50 mm
PROFILE LINE	P R	HSS TC C/C CBN	Ø3 mm / Ø50 mm
COMPACT LINE	P R	HSS TC C/C CBN PCD	Ø3 mm / Ø50 mm
INSERT LINE	P R	HSS TC C/C CBN	Ø3 mm / Ø75 mm
RS 15	P R M	HSS TC C/C CBN PCD	– / up to Ø25 mm



Laser – Laser machining of indexable inserts and/or rotationally symmetrical tools

EWAG machines	Use	Materials	Tool dimensions ¹⁾ max. length / diameter
LASER LINE ULTRA	P R	TC C/C CBN PCD CVD-D MCD/ND	250 mm / Ø0.1 – 200 mm
LASER LINE PRECISION	P R	CBN PCD CVD-D MCD/ND	250 mm / Ø0.1 – 200 mm

EWAG machines	Use	Materials	Indexable inserts ¹⁾ Inscribed / circumscribed circle
LASER LINE ULTRA	P R	TC C/C CBN PCD CVD-D MCD/ND	Ø3 mm / Ø50 mm
LASER LINE PRECISION	P R	CBN PCD CVD-D MCD/ND	Ø3 mm / Ø50 mm



Measuring – Contactless measurement of tools, workpieces and grinding wheels

WALTER machines	Use	Tool dimensions ¹⁾ max. length / diameter
HELICHECK PRECISION	M	420 mm / Ø1 – 320 mm
HELICHECK ADVANCED	M	420 mm / Ø1 – 320 mm
HELICHECK PRO	M	300 mm / Ø1 – 200 mm
HELICHECK PRO LONG	M	730 mm / Ø1 – 200 mm
HELICHECK PLUS	M	300 mm / Ø0.1 – 200 mm
HELICHECK PLUS LONG	M	730 mm / Ø0.1 – 200 mm
HELICHECK 3D	M	420 mm / Ø3 – 80 mm
HELISSET PLUS	M	400 mm / Ø1 – 350 mm
HELISSET	M	400 mm / Ø1 – 350 mm

¹⁾ Maximum tool dimensions are dependent on the tool type and geometry, as well as the type of machining.

²⁾ From the theoretical taper diameter of the workpiece holder.



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