

ENERGY SAVING

FOR THE HELITRONIC TOOL GRINDING
AND ERODING MACHINES



In the development of our tool grinding and erosion machines of the HELITRONIC series, we have always laid great importance to the continuous improvement of environmental properties. This starts with the design of the machine, continues through production, and on to the complete life cycle of the machine including the optimisation of operating costs and ends with the scrapping of the machine at the end of its life.

[walter-machines.com](https://www.walter-machines.com)



OUR CLAIM

For many years now, we have always looked at our tool grinding and eroding machines as a whole. This means that we not only consider how we can save energy directly at the drives in the machine, but also how the operation of the entire machine including part loading, compressed air and extraction can be made more efficient. The measures described below give an overview of what we have done and achieved to improve energy efficiency. With this information, we also want to present our energy efficiency measures implemented in the past to our customers who operate an energy management system according to ISO 50001.

The focus of this brochure is on energy saving during machine operation in our customers production process. To the same extent, of course, we also pay attention to the energy consumption in our own production and thus reduce the energy consumption during the entire life cycle of the machine. We also have all our measures independently assessed by external experts, from the German Steinbeis Kompetenzzentrum "Nachhaltige Energie" (Steinbeis Sustainable Energy Competence Center) who examine all our activities to ensure that we are doing the right thing in every case and that our promises to save energy are fulfilled.

BLUE COMPETENCE

Walter Maschinenbau GmbH is a partner of the BLUE COMPETENCE sustainability initiative of the VDMA mechanical and plant engineering industry. For more information on this initiative, please visit www.vdma.org.

What does Blue Competence want?

- Raise awareness for sustainable production technology
- Bundle research and industry activities for sustainability and efficiency in industrial applications
- Promote the development of environmentally friendly manufacturing by using energy-saving subsystems
- Develop future-oriented assessment standards for sustainability in manufacturing technology
- Provide guidelines for the energy-saving operation of machine tools
- Conduct dialogue on sustainable manufacturing technology with customers and suppliers

THE ENERGY SAVING MEASURES AT A GLANCE

TECHNOLOGY IMPROVEMENTS IN THE MACHINE

1. Feed and spindle drives

Here we rely on highly efficient synchronous motors and regenerative braking energy feedback into the power grid. The drives are optimally designed. For the machines HELITRONIC VISION 400 L, HELITRONIC MICRO and HELITRONIC VISION DIAMOND 400 L, we use a linear motor in the vertical axis and rely on passive weight compensation.

2. Coolant supply

Coolant is supplied by a frequency-controlled coolant pump. Motors with high efficiency (IE4) and up to 6 individually switchable coolant valves optimize the coolant supply in an energy-saving manner.

3. LED machine light

We use energy-saving LED machine lights in all machines. The machine status light also uses LED technology. In addition to the energy saving during operation with practically no heating of the light, the LED technology guarantees a long service life of the light.

4. Efficient central lubrication

The central lubrication of our machines is designed as impulse lubrication and is optimized for the utilization of the machine. For example, the lubricating oil pump only runs for a few seconds until the lubricating pressure is built up, the pump is then switched off for many minutes until the next lubrication cycle.

5. Vapour separation

Since mid-2017, the electrostatic mist and vapour separator in our machines has been equipped with a potentiometer control and a free-running fan wheel, which allows an optimal adjustment of the extraction volume. The EC motors comply with efficiency class IE4.

TECHNOLOGY IMPROVEMENTS FOR MACHINE OPERATION

1. Off-work switching

Our machines are equipped with a so called off-hours switch. If the machine is still switched on beyond the end of the shift, it goes into standby mode after the last tool has been processed. In this mode the coolant pumps, the extraction system, the hydraulics, the grinding spindles are set to "OFF" and the axes drives are set to pulse lock.

2. Warm-up program

The machine warm-up can be automatically started at the selected date and time. Until the machine is started, it is in extended stand-by mode (see also offwork switching). One hour before the start of work, the machine starts to warm up, so when the operator arrives at the start of work, the machine is at operating temperature and can go into production immediately with minimum influence of heat changes.

3. Reduction of energy consumption during breaks

During work breaks or in case of "inactivity" the following units are switched off: Electrostatic mist and vapour separator, coolant pumps and sealing air after 3 minutes at the spindle, axes and measuring systems.

4. Motor cooling heats buildings

Machines of the HELITRONIC series with linear and torque motors have a central supply and return of the motor cooling medium. We offer our customers the option of using the waste heat generated, e.g. for heating buildings.

5. Simulation of the machining process

With the grinding software HELITRONIC TOOL STUDIO or Cybergrinding, tools can be simulated in advance on an external PC workstation. This saves valuable working time, reduces the test operation and the consumption of "test parts".

SUSTAINABLE

It is our claim to measure and balance the energy consumption of each machine type once a year before delivery. This is the only way we know how much energy is actually required for the production of a workpiece: not only for the machine, but also for the provision of all operating media. The measurement set-ups and routines were developed together with experts from the Steinbeis Kompetenzzentrums „Nachhaltige Energie“ (Steinbeis Competence Centre "Sustainable Energy").

As a special service we now also offer our customers for "their new machine" an individual proof of consumption which can then be used e.g. for applying for subsidies or for similar purposes.

Energy consumption



Maschine:	HELITRONIC Serie	Datum:	xx.xx.2022
Maschinennummer:	XXXX-XXXX	Name:	n.n.
Hersteller:	Walter Maschinenbau GmbH		

	Fräser 6 mm		Fräser 12 mm		Beladen / Entladen	
	Erstellung	Erstellung	Erstellung	Erstellung	Erstellung	Erstellung
Schleifzeit:	XXX [s]	XXX [s]	XXX [s]	XXX [s]	XXX [m/h]	XXX [m/h]
Druckluftverbrauch:	XXX [m³]	XXX [m³]	XXX [m³]	XXX [m³]	XXX [m³/h]	XXX [m³/h]
Elektrische Energie zur Druckluftbereitstellung: (ISO 14955-2, A.2):	XXX [Wh]	XXX [Wh]	XXX [Wh]	XXX [Wh]	XXX [Wh]	XXX [Wh]
Durchschnittliche elektrische Leistung (gesamt):	XXX [W]	XXX [W]	XXX [W]	XXX [W]	XXX [W]	XXX [W]
Elektrische Gesamtarbeit:	XXX [Wh]	XXX [Wh]	XXX [Wh]	XXX [Wh]	XXX [Wh]	XXX [Wh]
Elektrische Gesamtarbeit ohne Nebenaggregate:	XXX [Wh]	XXX [Wh]	XXX [Wh]	XXX [Wh]	XXX [Wh]	XXX [Wh]
Durchschnittliche Leistungsaufnahmen						
Leistungsaufnahme des Dunstabscheiders:	xxx [W]	xxx [W]	xxx [W]	xxx [W]	xxx [W]	xxx [W]
Leistungsaufnahme der Kühlschneidmittelpumpe:	xxx [W]	xxx [W]	xxx [W]	xxx [W]	xxx [W]	xxx [W]
Leistungsaufnahme der Motor Kühlung:	xxx [W]	xxx [W]	xxx [W]	xxx [W]	xxx [W]	xxx [W]
Leistungsaufnahme der Schleifkühlung:	xxx [W]	xxx [W]	xxx [W]	xxx [W]	xxx [W]	xxx [W]
Leistungsaufnahme der KSS - Anlage:	xxx [W]	xxx [W]	xxx [W]	xxx [W]	xxx [W]	xxx [W]
Wärmelieferung						
Wärmegabe des Schleifzick:	xxx [W]	xxx [W]	xxx [W]	xxx [W]	xxx [W]	xxx [W]
Wärmegabe der Motorkühlung:	xxx [W]	xxx [W]	xxx [W]	xxx [W]	xxx [W]	xxx [W]
Wärmegabe der Schleifkühlung:	xxx [W]	xxx [W]	xxx [W]	xxx [W]	xxx [W]	xxx [W]
Hydraulische Leistung						
Hydraulische Leistungsaufnahme des Schleifzick:	xxx [W]	xxx [W]	xxx [W]	xxx [W]	xxx [W]	xxx [W]
Hydraulische Leistungsaufnahme der Motorkühlung:	xxx [W]	xxx [W]	xxx [W]	xxx [W]	xxx [W]	xxx [W]
Hydraulische Leistungsaufnahme der Schleifkühlung:	xxx [W]	xxx [W]	xxx [W]	xxx [W]	xxx [W]	xxx [W]

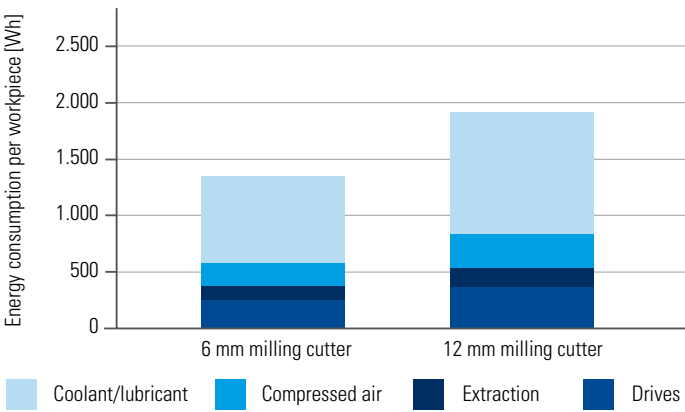
Fräser 6 mm

Fräser 12 mm

Messsystem:

Elektrische Messungen:
 Messwandler: CA1.2, 10/5A, Genauigkeitsklasse 0,5 S; + Messwertwandler: Rawat s.r.o., ACH-201M, Genauigkeit $\pm 0,2\%$
 Druckluftmessung:
 Durchfluss: Teda 6411 DN 25-50, Genauigkeit $\pm 1,3\%$; + Messwertwandler: Rawat s.r.o., PXL312, Genauigkeit 0,03%
 Druck: PPH P5040, Genauigkeit $\pm 1,0\%$; + Messwertwandler: Rawat s.r.o., PXL312, Genauigkeit 0,03%

Temperaturmessung:
 Sensoren: Rawat s.r.o., PT106 - Pt1000A, Genauigkeit 0,15-0,0002%; + Messwertwandler: Rawat s.r.o., PPL112, Genauigkeit 0,05% (0,2°C)
 Messung mit Glas:
 Durchfluss: DPA 540005, Genauigkeit $\pm 1,7\%$ Messwert + 2% Messbereichsrandwert; + Messwertwandler: Rawat s.r.o., PXL312, Genauigkeit 0,03%
 Druck: PPH P5040, P5042, Genauigkeit $\pm 1,0\%$; + Messwertwandler: Rawat s.r.o., PXL312, Genauigkeit 0,03%



Highly efficient components

By using highly efficient components, energy consumption has been significantly reduced in recent years. Analysis by the Steinbeis Competence Center show that by using the components used in the machine today, compared to the components that were common and available on the market in 2018, a 30 % reduction in energy consumption has been achieved. This increase in efficiency results purely from the direct operation of the machine. Significantly higher savings of 30 % – 40 % can be achieved through the sensible use of warm-up and shutdown programs, the recovery of thermal energy and the optimization of machining with the grinding software. However, this can only ever be calculated by means of an energy balance as well as individual consideration of the operating and maintenance times before and after a machine replacement.

Sustainability from A to Z:

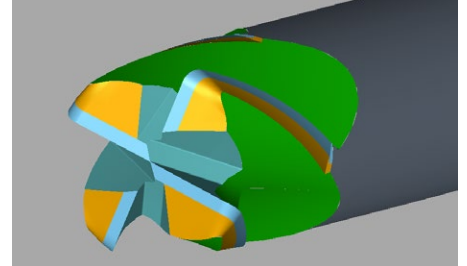
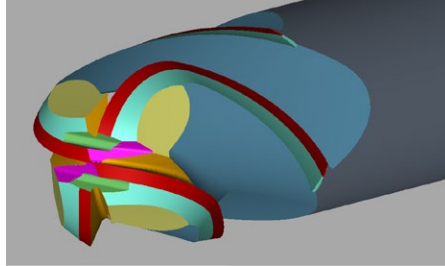
Under the brand UNITED GRINDING Digital Solutions™, we develop solutions to help you simplify processes, increase the efficiency of your machines and boost overall productivity. You can find more information about this on our homepage under the menu item "Digitalization". We use up to 80% recyclable materials in our machines. We also take back used machines, which we then completely overhaul and resell as a "new old machine". Of course, our Customer Care also offers maintenance contracts that extend the service life of machines and their components.

In cooperation with



REFERENCE PARTS

Since up to now no reference parts have been defined, as is the case for example, with milling machines, Walter Maschinenbau GmbH has developed its own defined reference parts for for the creation of consumption certificates, which we now use in the production of our grinding machine types:



E	Schle.	St.	M	S	K	F	Farbe	Operation
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			Längenposition tasten
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			Radialposition tasten
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	F		Spanraum
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			Vollradius Vorschliefen
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	F		Spanfläche Vollradius
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	F		Rücken am Vollradius
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			Standard Stirspanraum Vollradius
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			Auslücken Vollradius
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	F		2. Freiwinkel Vollradius Onepass
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E	Schle.	St.	M	S	K	F	Farbe	Operation
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			Längenposition tasten
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			Radialposition tasten
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	F		Spanraum
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			Eckenradius vorschliefen
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	D		Rücken am Radius
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			Stirspanraum Eckenradius
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			Spanfläche Eckenradius
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<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	F		2. Freiwinkel Eckenradius Onepass
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	F		1. Freiwinkel Eckenradius Onepass

Reference part 1:
Full radius milling cutter Ø 6 mm
 Programming interface HELITRONIC TOOL STUDIO

Reference part 2:
Corner radius milling cutter Ø 12 mm
 Programming interface HELITRONIC TOOL STUDIO



Year of manufacture 2018



Year of manufacture 2022

In direct comparison
30% savings

With optimized operating mode and energy recovery
30 – 40 % savings

SAVINGS POTENTIAL OF THE CURRENT GENERATION OF MACHINES

Savings per workpiece (average)	0.685 kWh
Savings per year*	9,644 kWh
CO ₂ -reduction per year	4,050 kg CO ₂
Cost savings per year	2,122 €

* Assumptions: 3,520 operating hours, 4 cutters per h, Production mix 6/12 mm cutters, electricity price 22 cents/kWh, CO₂ factor electricity mix D 2021:0.42 kg/kWh



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