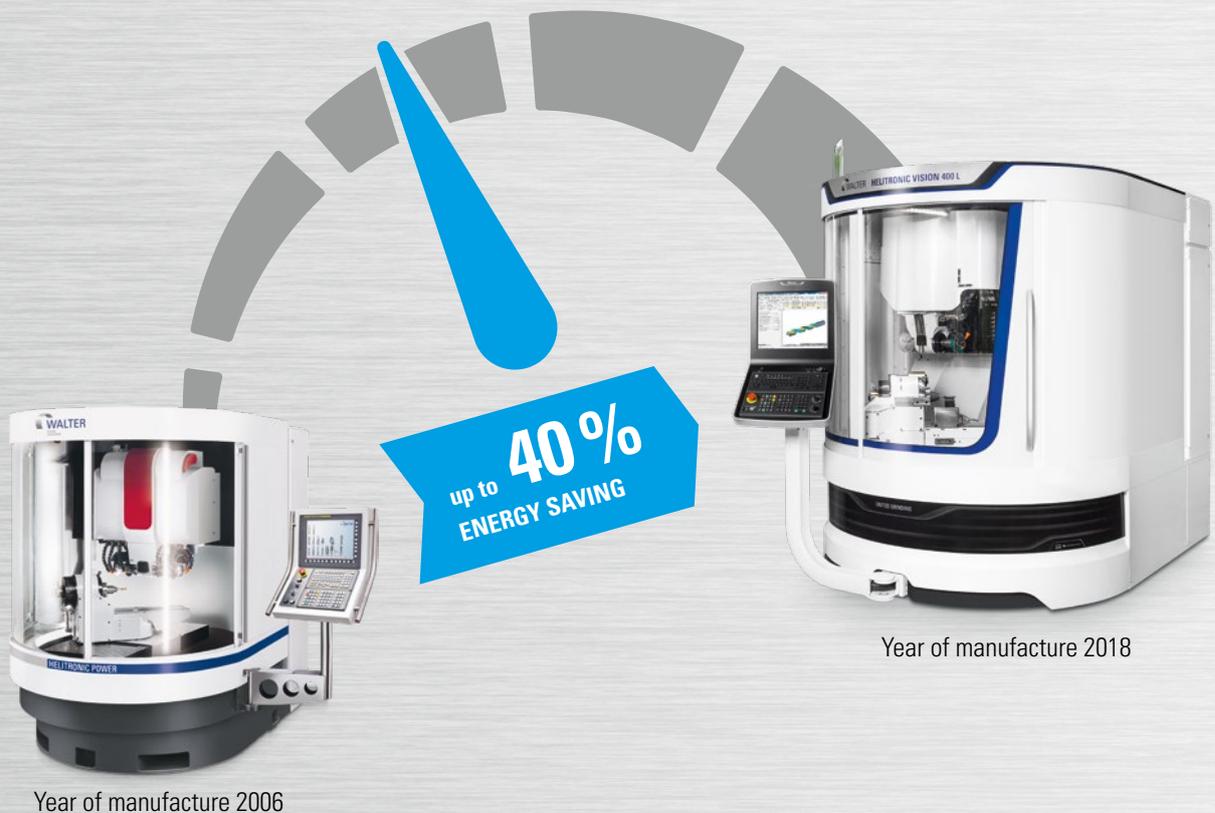


WALTER INFO 10/2020

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.

The energy saving measures at a glance

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 50.001.

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.

Energy efficiency 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 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: Vapour extraction, coolant pumps and sealing air after 3 minutes at the spindle, axes and measuring systems.

4. Motor cooling heats buildings

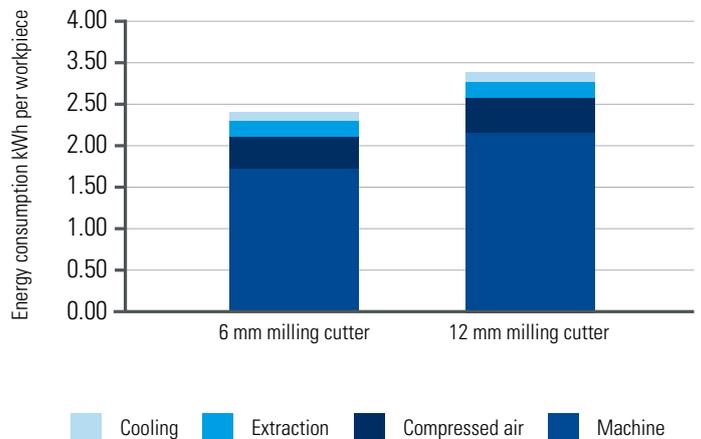
Machines of the HELITRONIC series with linear and torque motors have a central supply and return of the motor cooling medium. We offer our customers the option of using the waste heat generated, e.g. for heating buildings.

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".

In the future we will measure and balance the energy consumption of all machine types before delivery in the future. This is the only way to know how much energy is actually required for the production of a workpiece: not only for the machine, but also to provide all operating media. The measurement setups and routines were developed together with experts from the Steinbeis Kompetenzzentrum Nachhaltige Energie (Steinbeis Competence Center for Sustainable Energy).

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 2005, an 11 % 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.



Savings through modern machine

Savings per workpiece (average)	0.34 kWh
Savings per year*	4,800 kWh
CO ₂ reduction per year	2,370 kg CO₂
Cost savings per year	860 Euro

In cooperation with



*Assumptions: 3,500 operating hours, production mix 6/12 mm milling cutter, electricity price 18 cents/kWh, CO₂ factor electricity mix D 2017:0.489 kg/kWh



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