

HELLER out-facing head: maximum efficiency for turning operations

Despite the enormous technological progress made in recent years, there are still numerous machining operations that are expensive and time consuming. Among these are turning operations on machining centres. However, that has changed now.

The HELLER out-facing head provides interested users with a technically and economically viable solution.

Put in a nutshell, the operating principle behind this technology is based on an additional axis

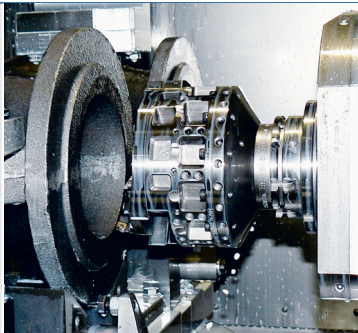
provided by the tool that enables radial feed movement of the cutting edge.

The benefits of this system are manifold: compared to conventional solutions, the HELLER out-facing head reduces machining and idle times and offers maximum

process dependability to the user. This issue of usersnews illustrates the various concepts employed in turning solutions for machining centres available on the market, their differences and the benefits of the HELLER out-facing head.

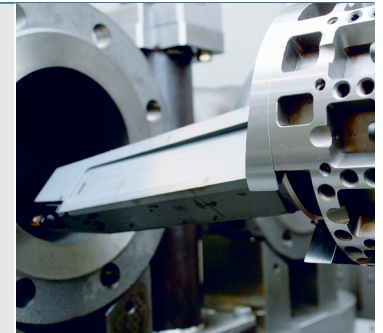
HELLER out-facing head – performing turning operations

- Including internal/external contouring, face turning, grooving
- Allows to generate turned surfaces (e.g. sealing surfaces) on a machining centre
- No changeover of the workpiece, e.g. to a turning machine required
- Reduced cycle times
- Higher efficiency



HELLER out-facing head – safe application

- Programmed as NC axis
- No additional collision path
- No contamination of the drive
- Changeover from tool magazine
- Retrofitting is possible



HELLER out-facing head: perfect package to replace conventional add-on systems

In contrast to any other out-facing head concept for integration into a machining centre, the HELLER out-facing head is a package solution. Simply put, this package includes a drive, a connecting link (the adjusting shaft) and a facing head onto which any type of tool can be mounted. The benefits this provides to the user become apparent when taking a closer look at this technology and comparing it to conventional add-on systems.

Until a few years ago, users of machining centres without the ability

to perform turning operations had no other choice: the workpiece needed to be unclamped for further machining on a turning machine. Today, there are mainly three different types of integrated solutions available for use on a machining centre. The first type are conventional mechanical heads that are coupled to the spindle. The second type take a different approach. They are designed as mechatronic systems. The idea behind them: drive and facing head form an integral unit. Energy and data are transmitted across an air gap by means of an induction loop.

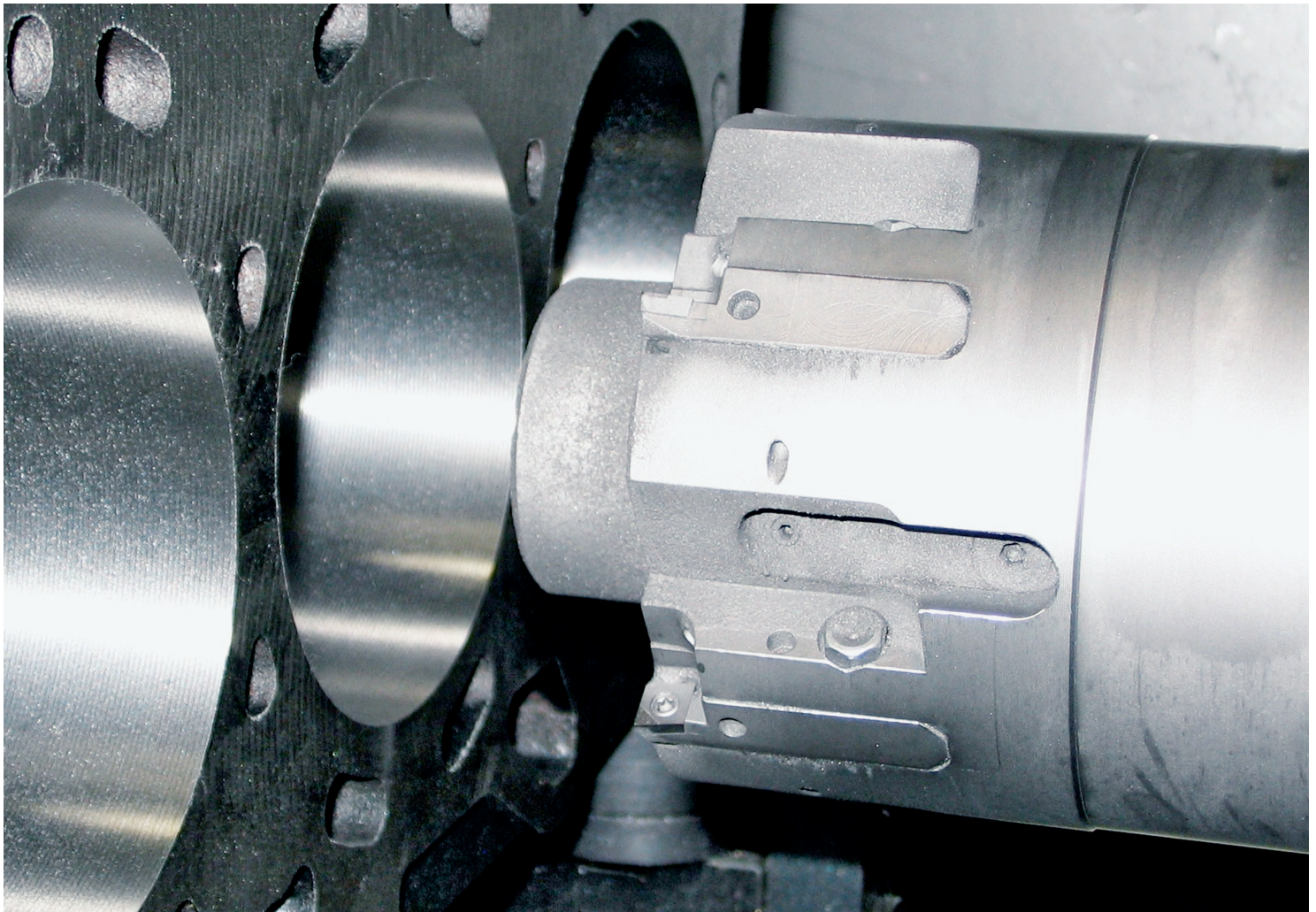
Superior through a maximum level of integration

The package solution provided by the HELLER out-facing head is based on the concept of maximum system integration into the machining centre. The result is convincing: in HELLER's out-facing head solution, the drive is integrated into the machining unit. The drive unit is coupled to the facing head by means of the adjusting shaft integrated into the spindle. The facing head carrying the cutting tools is controlled via the U axis. It has been designed as a fully functional machine axis and can be programmed in the control. The rotational direction of the adjusting shaft determines the control direction of the U axis, i.e. the direction of movement of the tool (larger or smaller diameter). It is obvious that this concept provides quite a number of benefits.

Two of them are immediately evident: as a result of the integrated design there is no collision path inside the work area, and since the tools are not equipped with a separate drive, their weight is considerably reduced. The HELLER out-facing head provides another advantage that makes it superior to mechatronic solutions: the system has a significantly shorter design resulting in a reduced tilting moment. Together with the reduced tool weight this has a positive effect on cutting performance and handling.

Technology that provides economic efficiency

The HELLER out-facing head also provides benefits in other areas. First example: when a facing head is placed into the spindle, the adjusting shaft integrated into the machining unit is directly coupled



to the facing head. Thus, there are no uncovered interfaces.

On conventional solutions these would be exposed to coolant and chips and could cause failures. Another benefit of the HELLER concept not to be underestimated is the fixed connection between the head and the drive by means of the adjusting shaft. As a result, the facing head is always placed into the spindle in a defined position and therefore the position of the cutting edge is known in advance.

Therefore the facing head is ready for immediate use without a previous reference run.

The benefits at a glance

Maximum versatility

- HELLER out-facing heads are ideal for the machining of plane surfaces and sealing surfaces, bores, contours of any kind, spherical segments and grooves.

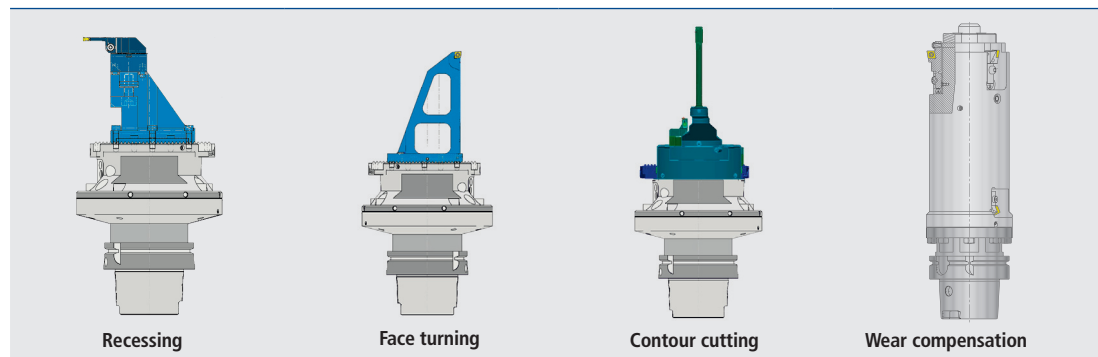
Optimum flexibility

- Ready for use with facing heads from different manufacturers
- Easy tool change from standard tool magazine
- Full NC axis functionality guaranteed

Maximum process dependability

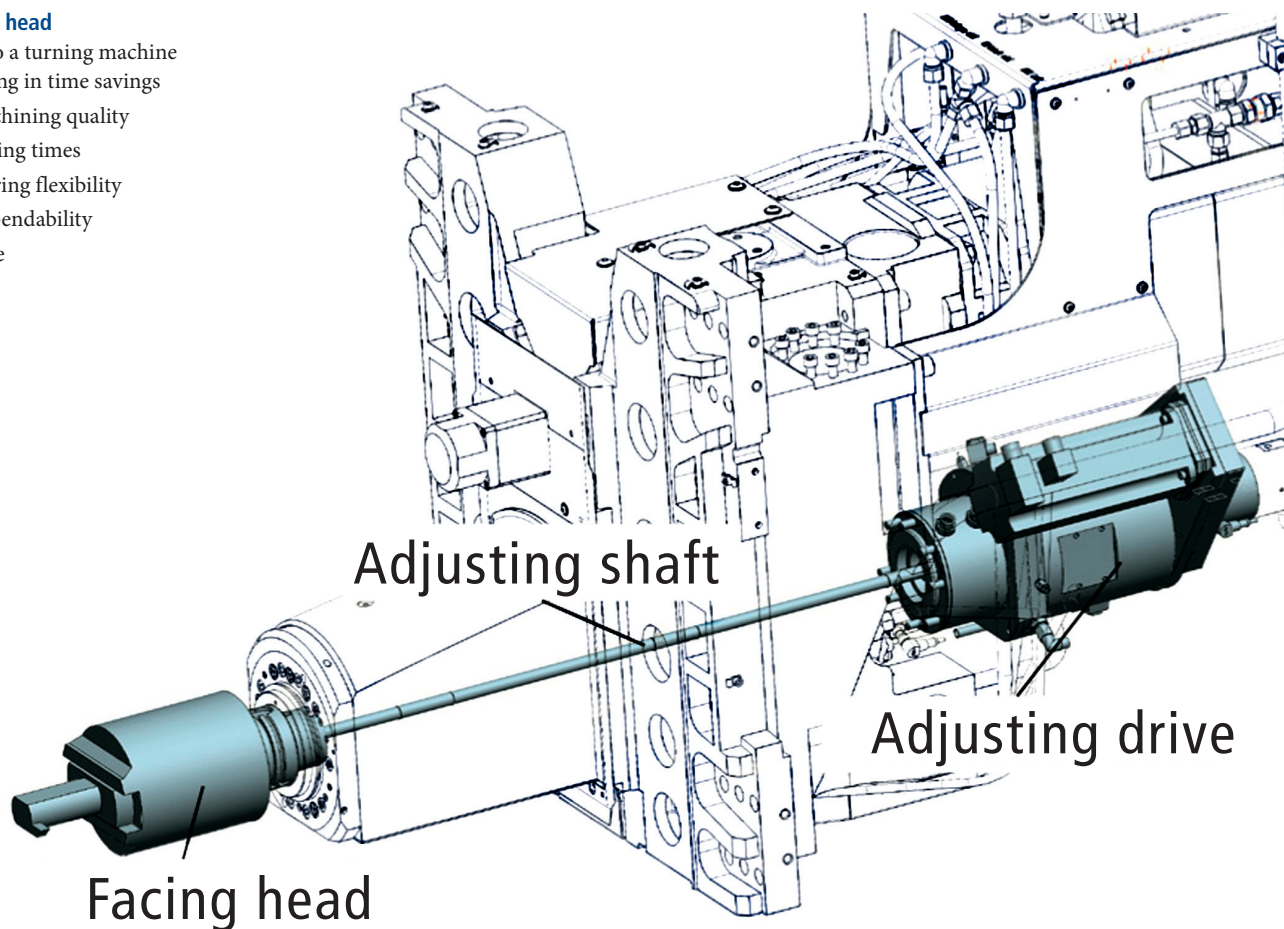
- Spatial separation of tool and drive
- Drive is located outside the coolant and chip area
- All interfaces are on the inside

Application areas



HELLER out-facing head

- No changeover to a turning machine required - resulting in time savings
- Outstanding machining quality
- Reduced machining times
- High manufacturing flexibility
- High process dependability
- Low maintenance



Typical application

example: integrated out-facing head minimises cycle time at KSB AG

To be successful in global competition, companies need to continuously increase their productivity – regardless of the industry they operate in. That is just one reason why KSB AG, one of the world's leading suppliers of pumps and valves, opted for a HELLER solution for the manufacture of valve housings. The company uses a single HELLER machining centre model MCH 280 with out-facing head for the complex production of approx. 40,000 bodies/year. This has resulted in a 50 percent reduction in net machining time and a significant increase in process dependability.

One of the main reasons, why the manufacturer based in Frankenthal opted for the HELLER out-facing head was the new machining strategy enabling the company to perform two different machining processes on the same machine without any problem. This process includes facing of the sealing flanges

and machining of a defined turned groove in grey cast iron and ferro-cast components. The tools used previously include a multi-edge milling cutter with 12 cutting inserts and an additional cutting tool.

With HELLER's out-facing head, machining of the plane surface can be performed in a single step.

Ideal for complex machining contents

From this example it becomes quite clear in which cases HELLER's out-facing head is particularly useful. The general rule is: whenever a workpiece requires multiple machining operations allowing full exploitation of the advantages of

the out-facing head. The out-facing head is often the perfect solution for the machining of undercuts or internal and external contours. And what is more, the technology also guarantees economic efficiency and flexibility: HELLER machines with out-facing head allow integration of any given number of facing heads from different suppliers.

Cost-effective, complete solution from a single source

Besides the benefit of being an open system, the out-facing head has further advantages over add-on solutions offered by competitors: instead of requiring

an individual drive for each facing head, HELLER's solution only uses one drive incorporated in the machine. As a result, the cost benefit increases with the number of facing heads used.

There is another aspect that will please users from the most diverse industries: the HELLER out-facing head is available from a single source, regardless which tool supplier is chosen.

Machines available with out-facing head



Machine	H 2000 - H 4000	H 5000 - H 6000	MCH 250 - 460
Spindle	HSK - A63	HSK - A100	HSK - A100
Unit	PowerCutting	Power-, HighPower- und SpeedCutting	all gear units

Facing head

Radial stroke (mm)

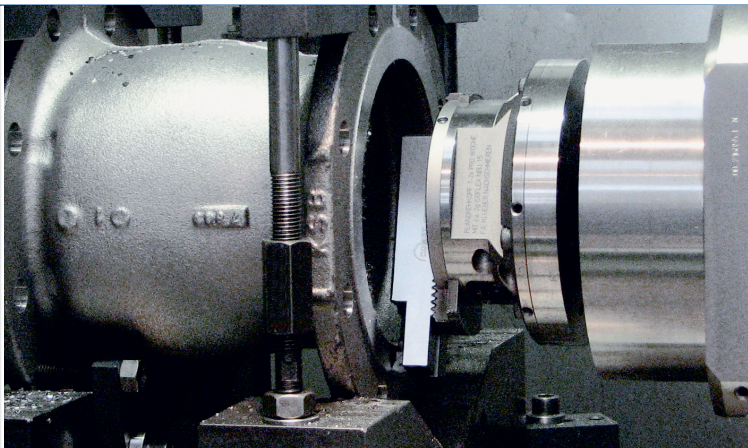
Standard design: 22/50/70
Special design: > 70 on request

Stroke (mm/rev)

Standard design: 0.2
Special design: according to accuracy requirements

Manufacturer

Free choice of manufacturer, e.g. Mapal, Komet



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