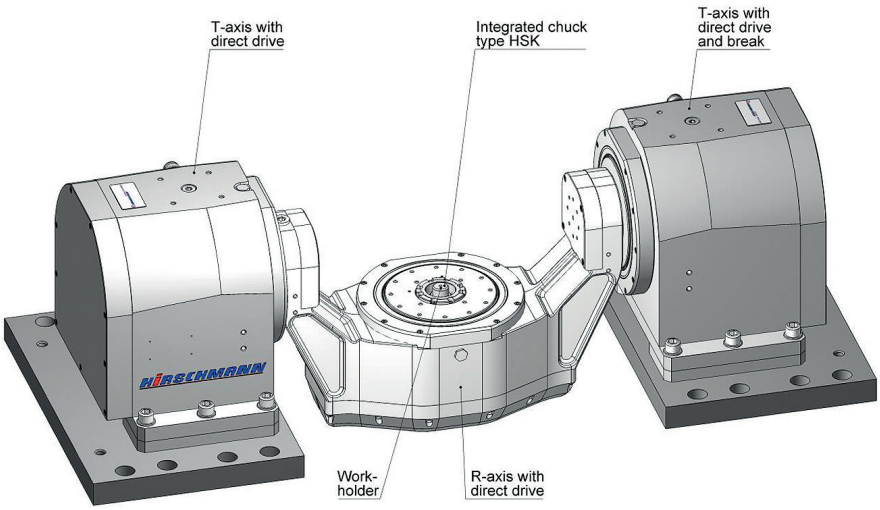
New rotating-tilting table for tool manufacturing combines highest dynamics with precision

New developed 2-axial rotary indexing table by Hirschmann GmbH for laser applications in tool manufacturing for the first time combines maximum speed and highest precision. Designed on behalf of customer's order this solution could be seen on trade fair EMO in Hannover. The innovation is setting new standards in efficient laser machining of parts with tight curve radius or complex shapes. The presented changes of motion require acceleration profiles, lying at the limits of technical possibilities. „In this motion combination of rotating and tilting extremely high acceleration values on the T-axis and the R-axis are reached" says Rainer Harter, CTO of Hirschmann GmbH. In cooperation with engine manufacturer Etel the company succeeded to reach the speeds requested by customer on a 2-axial rotary indexing table. For machining of parts a simultaneous motion between tilting and rotating axis is necessary, controlled by overall control system of production line. With this application in serial production extremely robust tools for milling and turning processes are made. The contour is cutted out of basic material by an water guided and thus cooled laser beam, that is responsible also for finishing. The task of the rotary indexing table is to pass the work pieces – PCD (polycrystalline diamonds) or MCD (monocrystalline diamonds), hard metals or ceramics – directly along the laser beam. And this in an exactly defined angle, in appropriate radius and with constant speed. Rainer Harter: „Even this was the special challenge. Because the laser has a defined energy content, a constant traverse speed is requested for precise material removal." The new development of Hirschmann GmbH meets all parameters, requested by Synova, a manufacturer from Switzerland specialized on manufacturing of laser machining equipment. "Hereby we reach acceleration values, that will enter new dimensions" says Rainer Harter. To reach this level intensive coordination with engine manufacturer Etel was necessary. The rotating-tilting table has a direct drive in both T-axial modules (tilting) and also integrated is a high-precise measuring system and the break function. The R-axis (rotation) is designed as rocker, equipped with own drive and an additional measuring system. Integrated in R-axis is the high-precise chuck HSK - A 63, developed by Hirschmann, for clamping of work pieces to be machined. This compact clamper is especially designed for applications in tool machining. "The great advantage for our customers is, that we can deliver all out of one sorce. As a result of a complex manufacturing process and sophisticated assembling methods the component parts are adjusted to each other precisely and harmonize at its best", so Rainer Harter. The 2-axial rotating-tilting table is delivered by Hirschmann as completely assembled unit, putting into service is made at works on a special test bench. "This allows us to guarantee functioning, to measure accuracy and to check performance data", argues Hirschmann CTO. At the first step the 2-axial rotary indexing table made by Hirschmann is used for laser applications. But it is planned, that the innovation is applied also for milling operation and other cutting actions, where higher accuracies are required. Thus precision of parts and machining processes can be improved and operating efficiency can be increased significantly.



2-axial Rotary Indexing Table for seriell laser machining with maximum speed (Picture: Hirschmann GmbH, Fluorn-Winzeln, Germany)