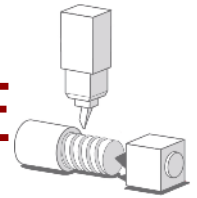


MILLING MACHINE and LATHE



ISAC proposes powerful solutions for *CNC milling machines and lathes* that need to execute also complex working programs. These systems are able to render completely automatic the entire producing process, because they can manage the axes, the spindles and the tools. For example, if necessary, the CN can compensate the tool's waste and automatically replace it; then it can self-learn the new tool's dimensions and restart the machining. The productions are quick and efficient:: starting from the raw material it is possible to get the finished piece, without human presence. The operator only needs to set the working program and periodically check the execution through the graphic interface.

ISAC CN controls for milling machines and lathes consent to realize any shape. With only one working program it is possible to perform complex operations, such us cylinder borings, drillings, cuts, smoothings,... The openness and the flexibility of ISAC CNC consent to take better advantage of the hardware and software resources to realize simples but effective retrofits.

CHARACTERISTICS

The functionalities of ISAC controllers can fit all machining needs:

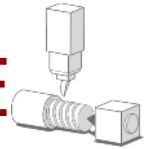
- they control drivers for step motors, inverters, AC motors with encoder, analogical and pulses/direction motors;
- they can manage up to 12 linear or rotating axes, with acceleration speed and space control; they can be controlled in several interpolations: linear, circular, RTCP helical and tabular (with electronic cam) and with following axis; this defines a third axis (the follower) that follows the other two axes on the plane. The RTCP (*Rotation Tool Center Point*) is for rotating axes and consents to program the trajectory on the tool's point independently by its orientation;
- ISAC CNC milling machines can handle the axes synchronization or *gantry*; the rapport of the movement can be freely set, with inverted or direct proportionality;
- they can control auxiliaty axes for machinings and complementary movings; in lathes, for example, it allows the motion of the rest and lathe centres.

ISAC CN guarantees the maximum working precision through several continuous compensations:

- compensation of the screw pitch error, of the structural setting for arm-type axes, thermal, of the motion lost during the inversion of the axes movement and of the speed/time characteristic dead zone;
- direct compensation of the measure errors is performed with the analysis of 1024 points on one or several axes.



MILLING MACHINE and LATHE



SPINDLE MANAGEMENT

ISAC CN controllers manage the spindle in fully automatic way or can assist the operator in the manual jobs. The CNC performs the compensation of spindle rotation speed according to the type of machining: cutting with constant velocity (revolutions per minute), programmed velocity (meters per minute) or tool removing (millimetres of advance per revolution).

TOOLS MANAGEMENT

ISAC CNC for milling machines and lathes manages the tools, it determines automatically the dimensions of the used tool, applies the relative compensations before starting and during the machining phases. The tools' storage management is done according the tools sizes.

The controller considers the waste and the time usage for each tool, then it can use an alternative one. It supports up to 300 tools database.

In lathes, the CNC calculates the tool's radial compensation on one of nine possible planes or quadrants; moreover, it can manage two turrets.

CAD-CAM

ISAC CN controls are provided with CAD-CAM oriented to design on the plane (2D and half); in particular, can implement specific utilities for machines dedicated for metals machining such as general milling, milling of pockets and slots, levelling, milling and internal and external milling-slotting of cylinders, drilling, compensated tapping, rigid tapping, ...

CNC PROGRAMMING

ISAC CNC for milling machines and lathes can be programmed with ISO 6983 language (G code). Moreover, they are provided with an interactive graphic editor (GIE) that allows to program with blocks and to visualize the graphic preview of the result.

Some of the several CNC functionalities are:

- selection of the contouring plane;
- smoothing and joint of implicit angle;
- starting point with tangent arc or helicoids to the profile;
- over-metal programming;
- arithmetic, trigonometric and Boolean functions; program flux management functions;
- functions to manage programs priorities;
- functions for processes and events synchronization;
- function for axes-process association.

