

ONE NEW DESIGN AT THE HORIZONTAL HIGH SPEED MACHINING CENTER CPH 800

Macedon GANEA¹, Gabriela POPA², Ciprian GAIDOS³, Sandor VEGH⁴

1. prof., PhD., eng., University of Oradea, e-mail:calin@rdslink.ro,

2, 3, 4. University of Oradea, students in the last year at IMT Faculty

Abstract

Keyword: *High speed machining center*

The high speed at machine tools and especially at milling centers is a new and modern concept. That means to choose the most modern solutions in order to perform the know how for this new machine, which can be build in the future. The authors created one team, having as objective the constructive documentation as modular system for the new machine. In order to can assure all the main characteristics, the constructive solutions adapted by the authors, are originals and innovative, including a special software modules. As remark is the using of the newest components from the market as follows: ceramic ball bearings, OTT cartridge for the cooling trough the spindle, and many others. As other remark is the missing of hydraulic installation at this machine, because all functions, including ATC are solved with electromechanical solutions. Many things make one new and original machine based on original ideas of his authors, which are students in the last year of study. The details are presented in a separate paper works.

MAIN FEATURES OF THE CPH 630 MACHINE

Main spindle:

- power at the main spindle 22 kw;
- spindle taper HSK 63;
- speed range 100-14000 rpm;
- cooling trough the spindle (30 bar, 20 l/min);
- Spindle orientation function;
- thread cutting function;
- tool locking force on spindle 20000 N;
- blast air trough the spindle;
- thermo stabilization of spindle;
- Fanuc built-in main motor;

Machine basic structure:

- travels: X=1250 mm (table transv. movement);
- Y=800 mm (vertical movement)
- Z=800 mm (long. column movement);
- B=360 deg (table/pallet rotation);
- table/pallet dimensions 800x800 mm;
- rapid traverse on all linear axes 40 m/min;
- max. working feed 20000 mm/min;
- rapid table rotation speed 120 rpm;
- max. table rotation working feed 120 rpm;
- Fanuc angular built-in servomotor on B axis;

ATC 40:

- tool magazine chain type;
- tool capacity 40 places;
- gestion type variable;
- tool magazine monitoring by CNC;
- tool magazine control by CNC axis;
- special software CNC magazine axis control synchronous to Y axis and tool choice on both directions;
- electro mechanic ATC manipulator with AC Fanuc servomotor driving;
- tool changing time 5 sec (chip to chip)

APC 2x800:

- two front fixed pallet supports;
- electro mechanic pallet transfer by chain on both supports;
- CNC gestion of working parts on pallets;

-- CNC subprograms at pallet transfer

Fanuc CNC 21i / four axes + spindle

Machine options:

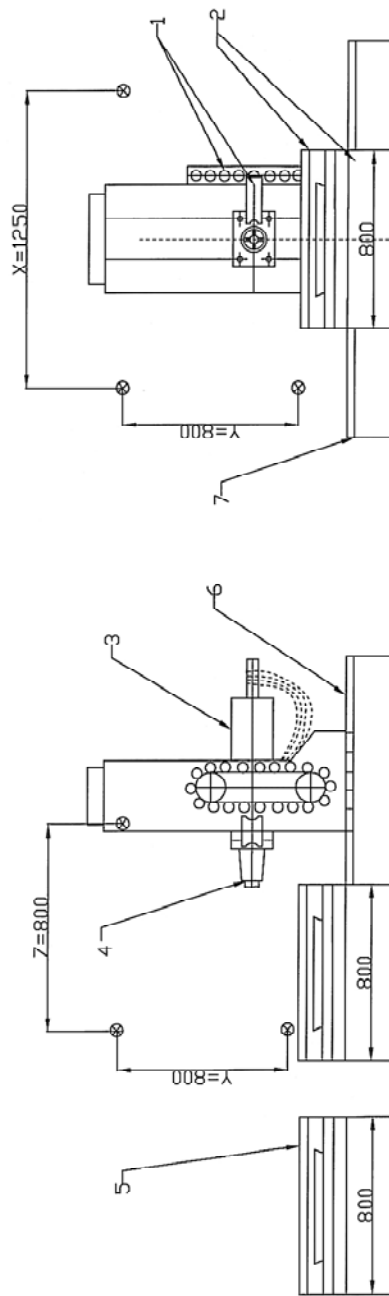
- pneumatic install, lub install, chip conveyor, guarding, mist lub. install.

CONCLUSIONS: The new design at this machine is performed by the students which worked in a team, as modular project on mechanical parts with good results.

REFERENCES:

- [1] – Ganea, M. – Masini Unelte si Sisteme Flexibile, Ed. Univ. din Oradea, 2001
- [2] – Catalog Mandelli-Italia, 2002.

Horizontal High Speed Machining Center CPH 800



1. Automatic Tool Changing Magazine with 40 places
2. Table/Palet 800 x 800
3. High speed spindle unit
4. The hollow shaft taper HSK63
5. Two front APC palet support
6. Longitudinal bed
7. Transversal bed

CPH 800
Power 22KW, 140-14000RPM
X1250,Y800,Z800,B360DEG,
Table/Palet 800 x 800,
ATC 40, APC 2 x 800