# TECHNICAL DATA SHEET
## CNC - Gantry type portal milling machine

| | |
|---|---|
| Manufacturer | **TRIMILL** |
| Type | **VF3016** |
| Built | **2017** |
| Control | **HEIDENHAIN iTNC530 HSCI** |


**Highlights**

- Extremely stable, 5-axis machine, specially developed for tool, mold and die making as well as for demanding single-part production.
- 5-sided machining in one clamping with 2-axis fork milling head.
- Designed as an overhead gantry, resulting in controlled dynamics and accuracy.
- Travel speeds up to 40,000 mm/min to increase productivity
- Closed design of the double beam and cross slide with internal, all-round guided milling slide (box-in-box design).
- Consistently good milling results due to load and thermosymmetric design.
- Stationary workpiece for consistently good surface quality
- Very compact dimensions with large working area
- High productivity due to roughing and finishing in one set-up.
- Ergonomic operation due to ground level accessibility

| Travels | | |
|---|---|---|
| X-Axis (Longitudinal): | 3.000 | mm |
| Y-Axis (Cross): | 1.600 | mm |
| Z-Axis (Vertical): | 1.200 | mm |
| B-Axis (Swivel-Axis Milling Head) | +/- 100 | ° |
| C-Axis (Rotational-Axis Milling Head) | +/- 240 | ° |

## Deisgn/ Axis concept

AC servo motors with digital control for all axes

Gantry drive of the X-axis

Rack and pinion drive in the X-axis, backlash-free due to electrically preloaded, water-cooled motors

2 ball screws each in the Y and Z axes

Guides of all linear axes are designed as preloaded roller guides

Hydro-pneumatic counterbalance of the Z-axis via 2 cylinders

Stationary frame components made of mineral casting, main moving components made of gray or nodular cast iron

Double beam in load- and thermo-symmetrical design, movable together with the milling slide in longitudinal direction (X-axis)

4-fold guided cross slide movable within the double beam (Y-axis)

Milling slide also guided 4 times, can be moved vertically in the cross slide (Z-axis)

Thermosymmetrical guidance of the slide, thus maintaining the linearity when traveling in "Z

Machine table fixed on the foundation independently of the machine

| Feeds and rapid traverse | | |
|---|---|---|
| Rapid traverse X-, Y- and Z-Axis: | 40.000 | mm/min |
| Rapid traverse B- and C-Axis: | 50 | U/min |
| Accelerations (X, Y and Z) | 4 | m/s² |

| Machine table | | | |
|---|---|---|---|
| Clamping surface | 3.500 x 1.750 | mm | |
| T-slots | 27 x 22 mm | mm | H12 |
| T-slots spacing | 125 | mm | |
| Max. workpiece weight | 7.000 | kg/m2 | |
| Max. distance table to spindle nose | 1.356 | mm | |

## CNC Control HEIDENHAIN iTNC530

Heidenhain iTNC530 with TFT flat-panel display and vertical and horizontal soft-key rows

Main operating panel with alphanumeric keyboard, machine operating panel, override potentiometers, PC key set and touch pad
HR550 FS portable radio handwheel

TRIMILL Teleservice - remote service

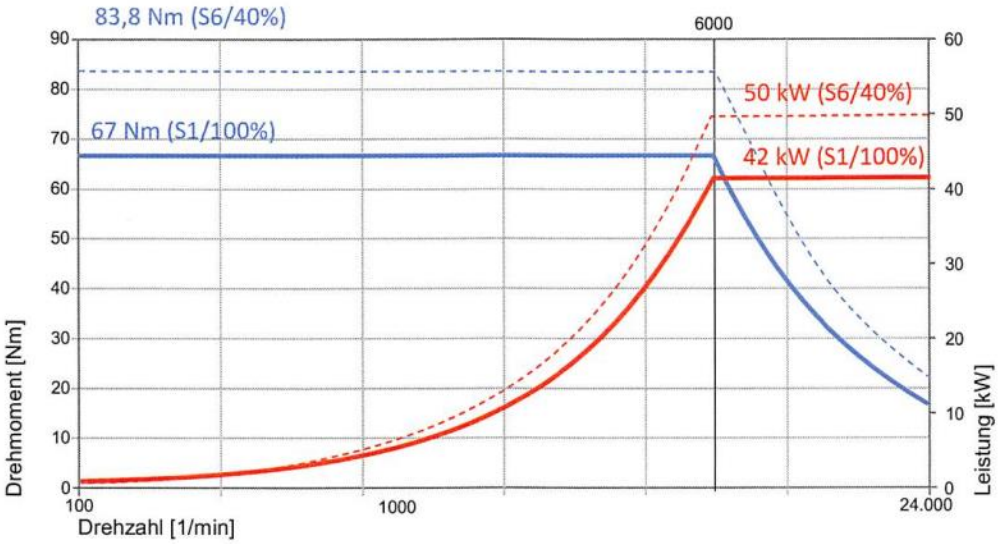
TRIMILL Kinematics - Automatic adjustment and control of the rotary axis kinematics
(The kinematics adjustment is done with a calibration ball with the help of the 3D measuring probe)

## 2-Axis Fork Milling Head T21C

TRIMILL fork milling head T21C mounted under the milling slide with swiveling high-frequency main spindle and built-in rotary (C) and swiveling axis (B)

- Both axes with hydraulic, centric clamping (B-axis on both sides)
- B and C axes are designed as simultaneous axes
- Jacket cooling of the main spindle
- Automatic tool clamping
- Blow-off device for tool holder and tool taper
- B-Axis bearing on both sides, drive via 2 water-cooled torque motors
- Drive of C-axis via water-cooled torque motor
- Direct angle measuring systems in the C axis (incremental) and B axis (absolute)

| | | |
|---|---|---|
| Spindle manufacturer: | FISCHER | |
| Speed range: | 10 – 24.000 | $min^{-1}$ |
| Characteristic speed: | 6.000 | $min^{-1}$ |
| Drive power (S1/S6): | 42/50 | kW |
| Torque (S1/S6): | 67/84 | Nm |
| Tool holder: | HSK-A 63 | |
| Front bearing inner Ø: | 65 | mm |
| Swivel range B axis: | ± 100 | ° |
| C-axis swivel range: | ± 240 | ° |
| Clamping torque B-axis: | 4.000 | Nm |
| Clamping torque C axis: | 4.000 | Nm |
| B-axis swivel torque: | 600 | Nm |
| C axis torque: | 700 | Nm |
| Clamping force of the spindle | 18.000 | N |
| Max. Coolant pressure internal/ outer spray nozzles | 50/6 | bar |




**Power diagram Milling head T21C**

| **Tool magazine** | | | |
|---|---|---|---|
| Number of tool places | 50 | | |
| Tool holder type | | | DIN 69873 HSK A63 |
| Changing time | 15 – 20 | s | |
| Max. Ø tool | 115 | mm | |
| Max. Ø Tool with free auxiliary space | 125 | mm | |
| Max. Tool length | 300 | mm | |
| Max. tool Tool weight | 12 | Kg | |
| Total mass of all tools in the magazine | 400 | Kg | |

| **Coolant and filtration unit KNOLL** | | |
|---|---|---|
| Tank capacity | 1.400 | l |
| Internal cooling - pump capacity | 4 | kW |
| Internal cooling - pump capacity | 25,9 | l/min |
| external cooling - pump capacity | 2,2 | kW |
| external cooling - flow rate | 90 | l/min |
| Belt skimmer for oil separation | | |
| Filtration and cleaning via paper belt filter KNOLL KF200, fleece width 710mm | | |

| **Dimensions** | | |
|---|---|---|
| Machine weight | ca. 58.500 | kg |
| Machine main dimensions | ca. 8,6 x 5,9 x 5,2 | m |

## Connection data

| | | | |
|---|---|---|---|
| Operating voltage | 3 x 400 | V | 50 Hz |
| Total connected load | 90 | kVA | |
| Nominal fuse protection | 160 | A | |
| Compressed air connection | min. 6 | bar | |

## Equipment / Accessories

- 5-axis vertical portal milling machine in Gantry design.
- Fork milling head T21C for simultaneous milling operation with FISCHER spindle, 42kW, 67Nm, 24.000 rpm, HSK-A63
- Manually operated textile roof
- Tool changer chain 50-fold, change orientation vertical
- 3D probe for workpiece measurement
- Process monitoring system MONTRONIX incl. installed vibration sensors for detection of abnormal vibrations during the machining process.
  Alarm triggering, feed rate reduction or machine stop are carried out via the control system
- HEIDENHAIN HR550 handwheel (wireless)
- BLUM LaserControl NT for non-contact tool measurement with automatic cover, enables increased process reliability through automatic form and wear control of the tools used
- Coolant system KNOLL for cooling lubrication with supply via spray nozzles and supply through the main spindle (ICS)
- TRIMILL Kinematics - application for rotary axes
- TRIMILL Teleservice - remote support
- Linear, absolute and direct path measuring systems make HEIDENHAIN in X, Y and Z axis with a resolution of 0,001mm
- Hydraulic power unit
- 1 lubrication unit for the machine
- 1 lubrication unit for the milling spindle
- 1 cooling unit for cooling the milling head
- 1 cooling unit for cooling the axis motors
- 1 pc. Air extraction unit for oil and cooling lubricant emulsion with three-stage filtering, power consumption 2.2 kW, max. extraction capacity 2,000 m³. Extraction capacity 2.000 m³/h
- 2 scraper belt conveyors, positioned along the X-axis to the left and right of the machine table, discharge height approx. 1,050mm

program hours on the machine: approx. 8.000h