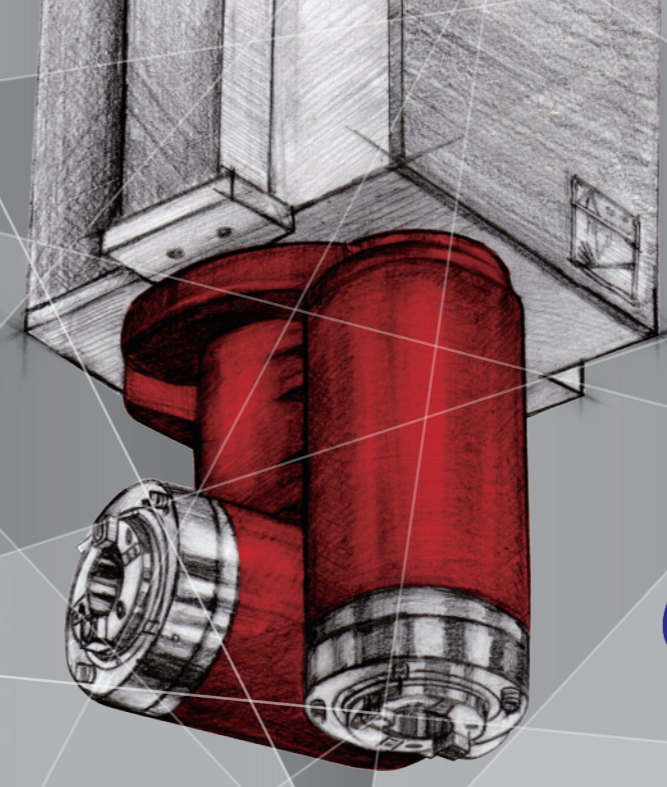


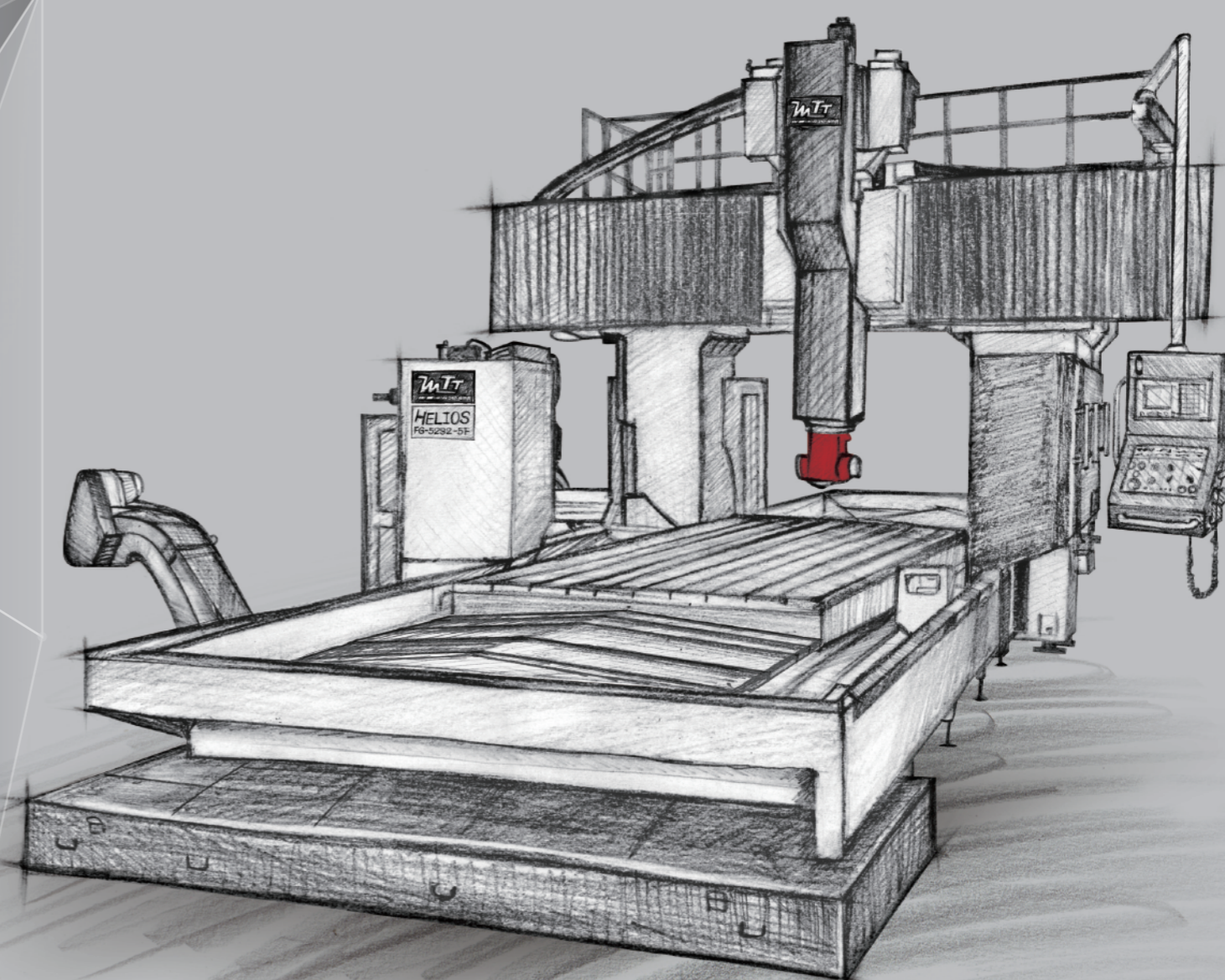
SOLUTION OF WORLDWIDE SALES NETWORK



HELIOS

Series

5 Face Bridge Type Machining Center



Twinhorn

CHI-FA MACHINERY MANUFACTURER CO., LTD.

No. 44-8, MING-CHUNG RD., SHENG-KANG DIST.,
TAICHUNG CITY, TAIWAN 42948
Tel: +886-4-2562-8747 (Rep.)
Fax: +886-4-2561-4199
E-mail: inquiry@twinhorn.com.tw
www.twinhorn.com



HELIOS Series

5 Face Bridge Type Machining Center

Widely used in various fields

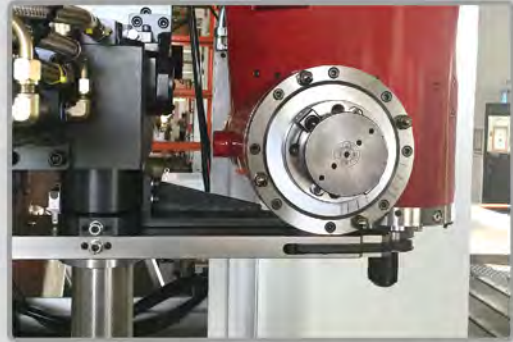
- automotive industry, railway industry, shipbuilding industry
- Construction Machinery, petrochemical industry, aerospace industry
- Military Enterprise



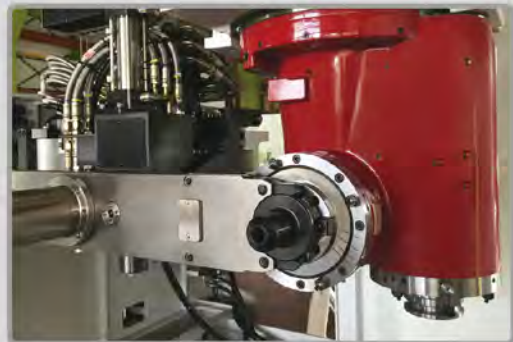
◀ 5 Face Double Column
Machining Center-VIDEO

FG-5232-5F
Semi-enclosed splash guard

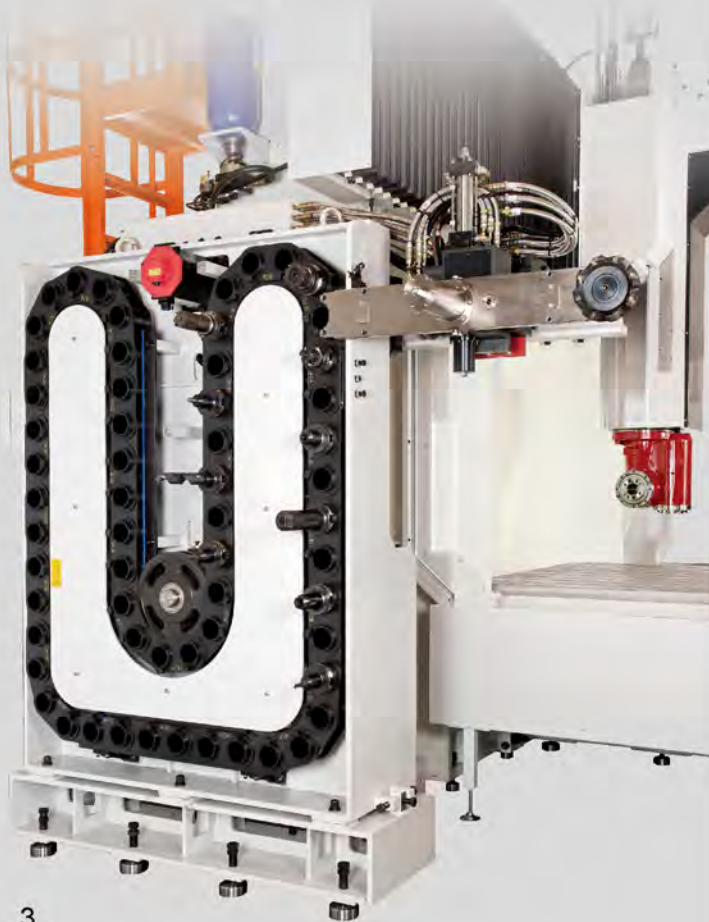
Combined vertical & horizontal milling head, Servo driven tool indexing to reduce tool changing time.



Vertical tool Change



Horizontal tool Change



Structural characteristic



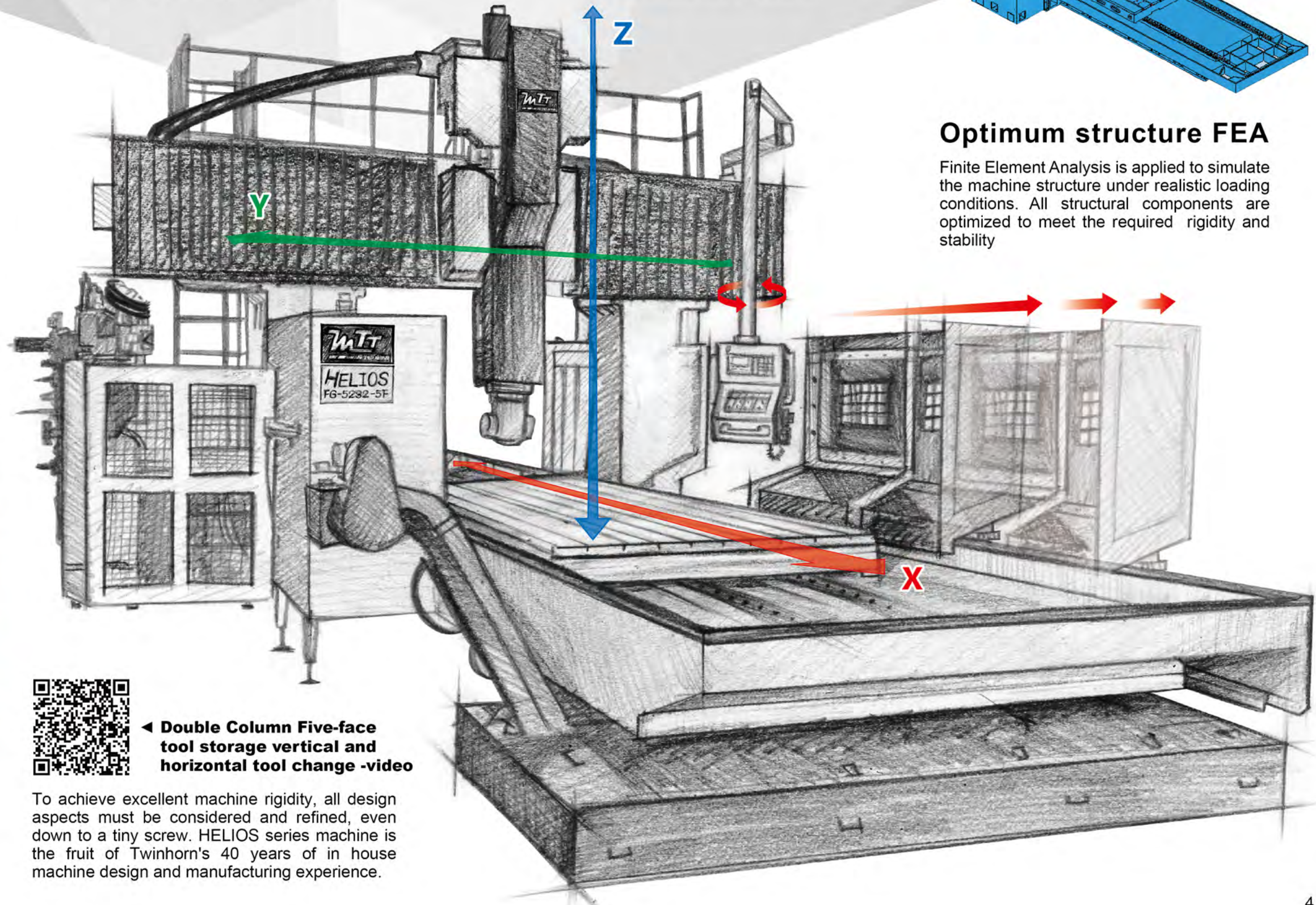
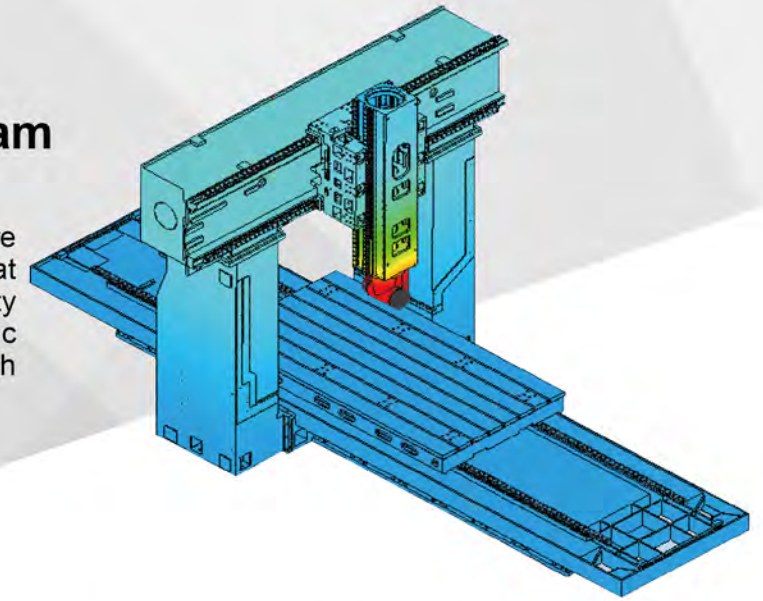
High rigidity cross-roller linear guides

X, Y, Z Axes adopts rigid, high-precision and smooth running guide ways. Multiple blocks and guide ways along the same axis enhance the static and dynamic loading capacity, thus guarantee accuracy and long service life.



High rigidity crossbeam structure design

The multi-layered steel column structure is specially reinforced and widened at the base to achieve the stability, rigidity and vibration damping characteristic required during high precision and high chip removal rate operations.



Optimum structure FEA

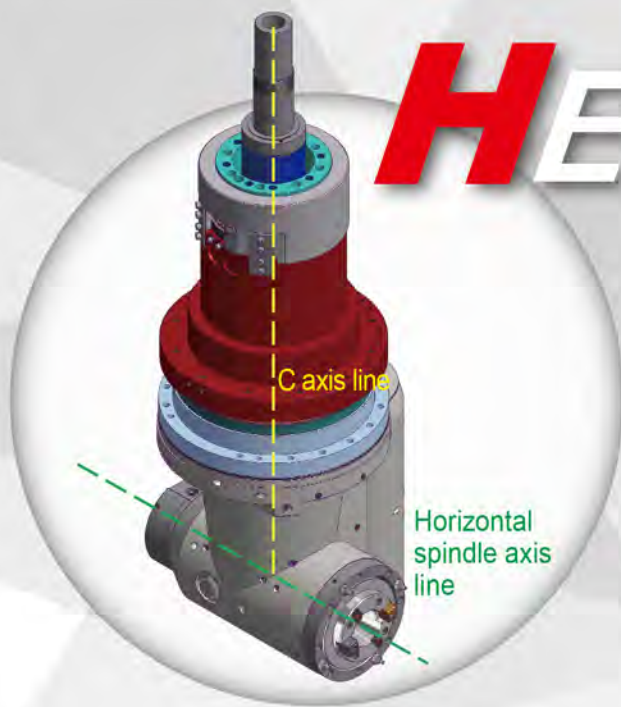
Finite Element Analysis is applied to simulate the machine structure under realistic loading conditions. All structural components are optimized to meet the required rigidity and stability



◀ **Double Column Five-face tool storage vertical and horizontal tool change -video**

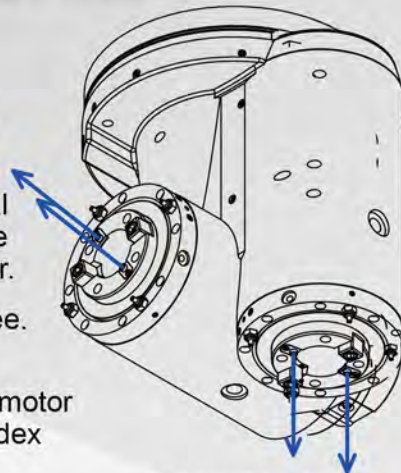
To achieve excellent machine rigidity, all design aspects must be considered and refined, even down to a tiny screw. HELIOS series machine is the fruit of Twinhorn's 40 years of in house machine design and manufacturing experience.

HELIOS Series

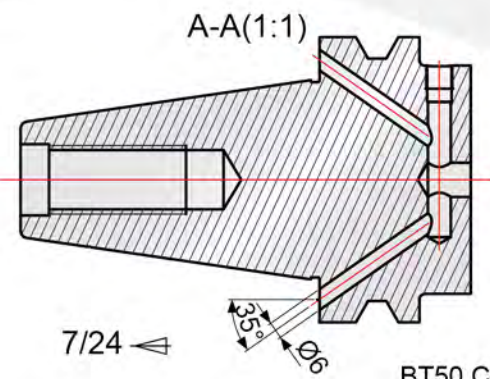


High performance five-face milling head

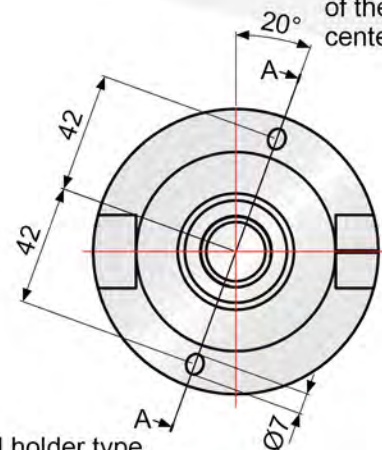
- Combined vertical & horizontal milling head, horizontal spindle center is aligned with C-ax center.
- C-axis rotating range ± 185 degree.
- C-axis positioning:
Standard: 5° indexed by spindle motor
Optional: 0.001°, independent index



Schematic diagram of the coolant through center outlet



BT50 Coolant through tool holder type
DIN 69871 B Type



Machining capabilities

| DRILING | | FACE MILLING | | TAPPING | |
|-----------------------|----------------|-----------------------|-----------------------------------|-----------------------|-----------------------------------|
| Cutting specification | Ø40 mm, HSS | Cutting specification | Ø160 mm Face mill cutter, Dry cut | Cutting specification | M30P3.5 spiral wire tapping (HSS) |
| Workpiece material | S45C (HRC 18°) | Workpiece material | S45C (HRC 18°) | Workpiece material | S45C (HRC 18°) |
| Spindle speed | 253 rpm | Spindle speed | 320 rpm | Spindle speed | 200 rpm |
| Feed rate | 101 mm/min | Feed rate | 1250 mm/min | Feed rate | 700 mm/min |
| Material removal rate | 127 cc/min | Cutting width | 135 mm | Tooth size | 3.5 mm |
| Spindle load | 80 % | Cutting depth | 5 mm | Spindle load | 38 % |
| | | Material removal rate | 844 cc/min | | |
| | | Spindle load | 123 % | | |



5-axis milling head (TTFG1) 4-axis simultaneous

Sturdy, accurate, efficient adaptable design.

| | |
|----------------------------|---------------------------------------|
| C-axis travel | $\pm 200^\circ$ 1470/3670 Nm |
| B-axis travel | $\pm 95^\circ$ 1470/3670 Nm |
| B-axis resolution | 0.001° (index) |
| C-axis resolution | 5°, opt. 0.001° (cont.) |
| Spindle type | 4000 rpm BT-50(DIN-50) Gear-driven |
| Spindle power (S1) | 34 kw (380 V) |
| Spindle torque (S1/S6-40%) | 860/1100 Nm |



Universal milling Head (TT2i)

Simple, accurate and adaptable universal head.

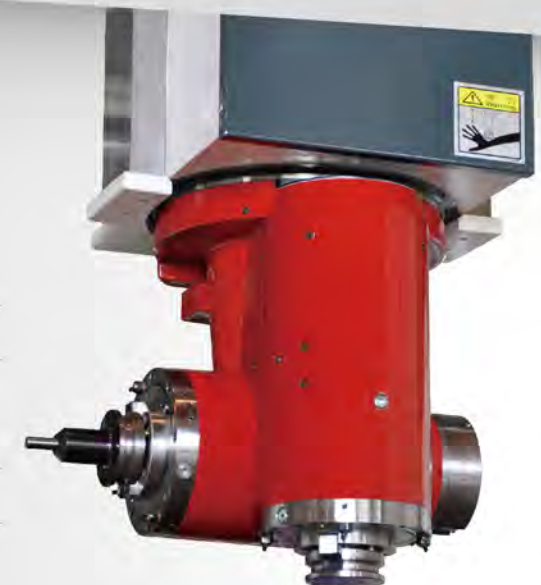
| | |
|----------------------------|---------------------------------------|
| B-axis travel | 0~90° |
| C-axis travel | $\pm 185^\circ$, 1200/1700 Nm |
| B-axis resolution | 2.5°(index), opt.0.001°(index) |
| C-axis resolution | 5°, opt. 0.001° (cont.) |
| Spindle type | 5000 rpm BT-50(DIN-50) Gear-driven |
| Spindle power (S1) | 37 kw (380 V) |
| Spindle torque (S1/S6-40%) | 500/700 Nm(S1/S6-40%) |



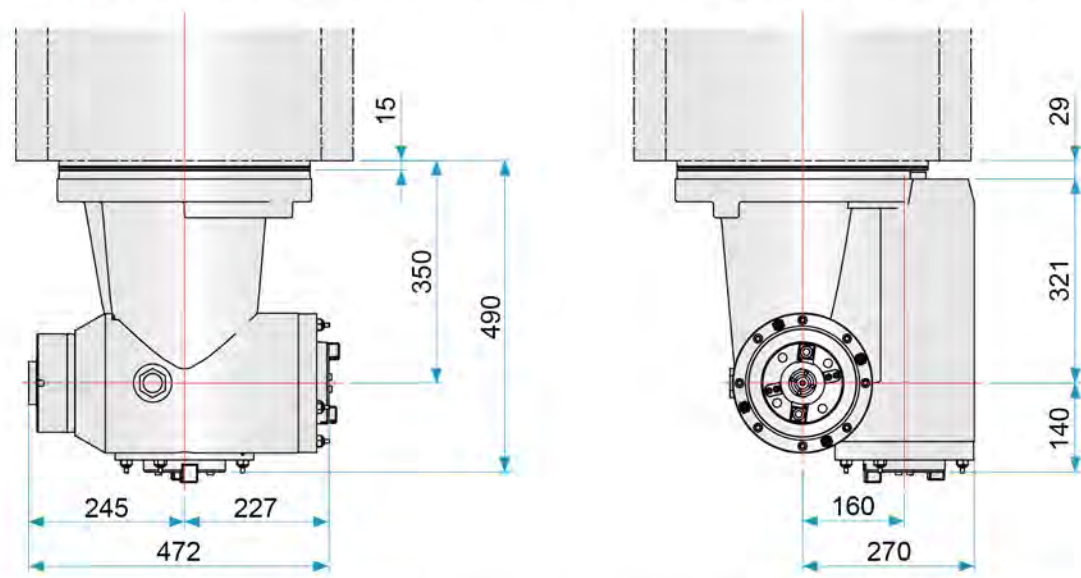
5-face milling Head (TT2S)

Rigidity being optimized while remaining slim.
Best suited for multiple face milling operation.

| | |
|----------------------------|---------------------------------------|
| C-axis travel | $\pm 185^\circ$, 1200/1700 Nm |
| C-axis resolution | 5°, opt.0.001°(cont.) |
| Spindle type | 4000 rpm BT-50(DIN-50) Gear-driven |
| Spindle power (S1/S3-25%) | 18.5/30 kw (220 V) |
| Spindle torque (S1/S3-25%) | 698/1130 Nm |



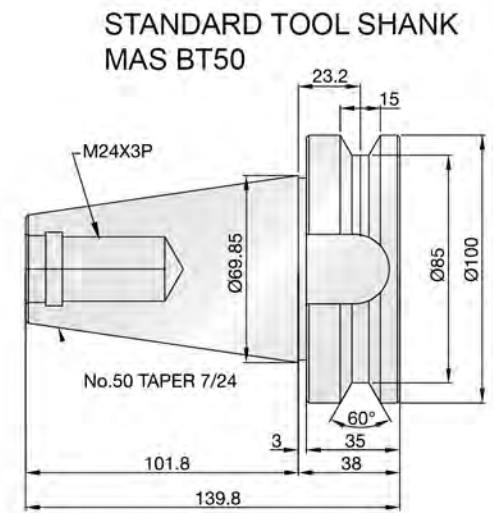
Vertical-horizontal head + C-axis Outline diagram



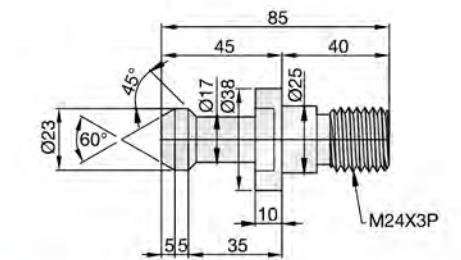
Output Power-Speed & Torque-Speed Characteristic



Pull Stud and Tool Shank dimensions



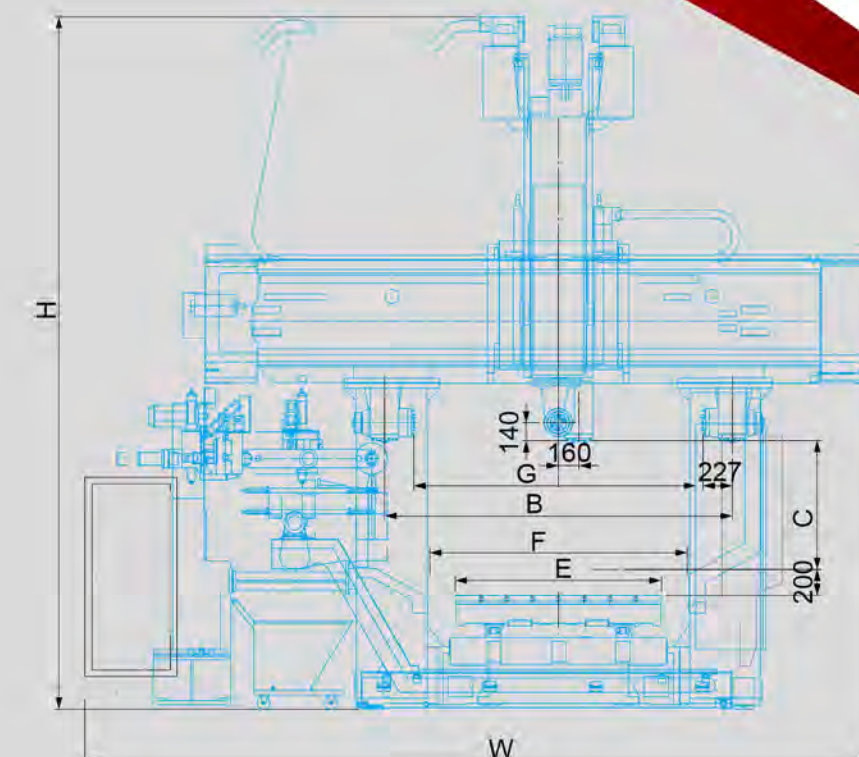
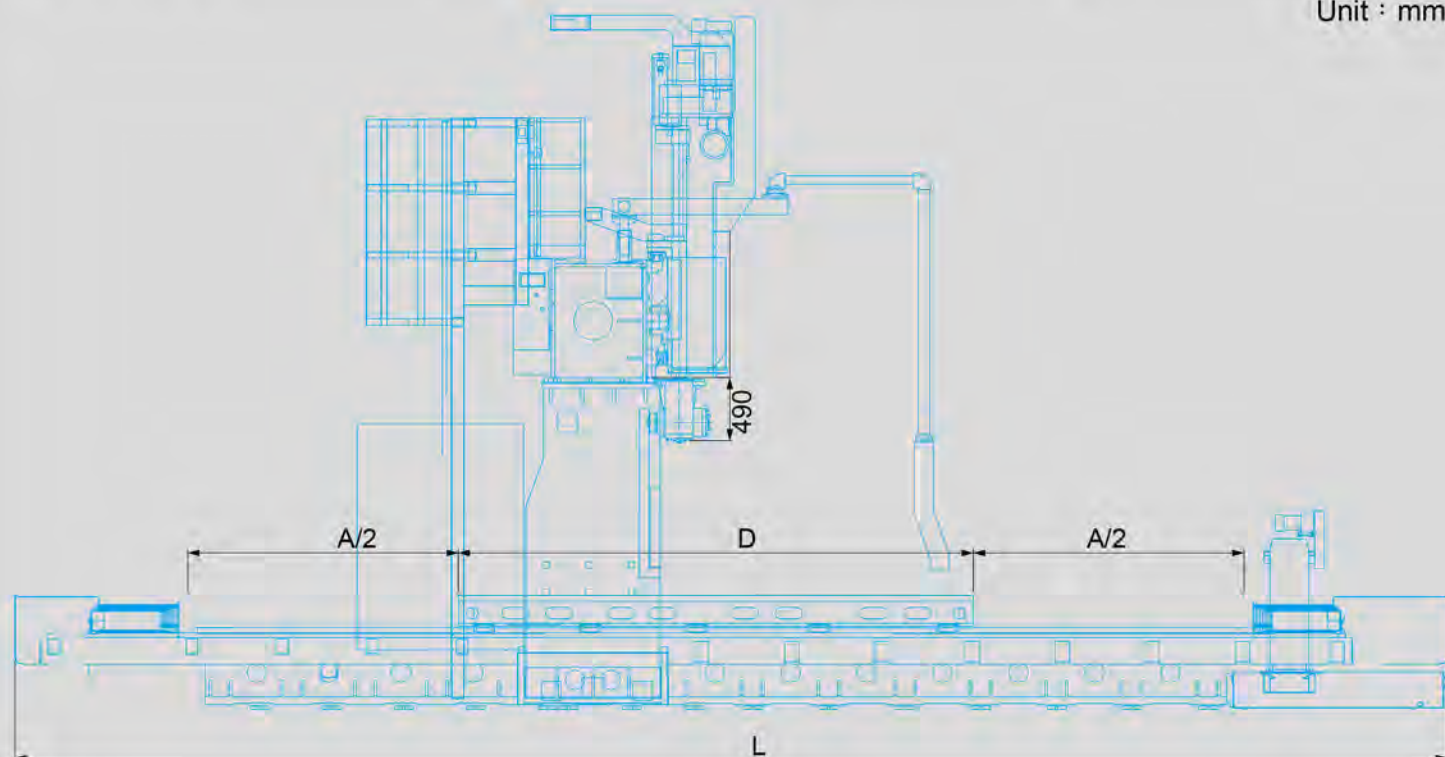
STANDARD PULL STUD MAS 403-P50T-1



5 Face Bridge Type Machining Center external Dimension Chart

| Dimension code | FG-3227/4227-5F | FG-4232/5232/6232-5F | FG-4237/5237/6237/8237-5F | FG-6242/8242-5F |
|---|-----------------|----------------------|---------------------------|-----------------|
| A (X-axis travel) | 3200/4200 | 4200/5200/6200 | 4200/5200/6200/8200 | 6200/8200 |
| B (Y-axis travel) | 2700 | 3200 | 3700 | 4200 |
| C (Z-axis travel) | 1000 | | | |
| D (Table length) | 3000/4000 | 4000/5000/6000 | 4000/5000/6000/8000 | 6000/8000 |
| E (Table width) | 1600 | 2000 | 2500 | 3000 |
| F (Distance between two columns) | 2000 | 2500 | 3000 | 3500 |
| G (Maximum distance between horizontal spindle) | 2246 | 2746 | 3246 | 3746 |
| L (Machine length) | 8990/11125 | 8990/11125/15000 | 8990/11125/15000/20000 | 15000/20000 |
| W (Machine width) | 5900 | 6450 | 6950 | 7500 |
| H (Machine height) | 5400 | 5450 | 5525 | 5600 |

Unit : mm



MACHINE SPECIFICATION

| MODEL | FG-3227-5F | FG-4227-5F | FG-4232-5F | FG-5232-5F | FG-6232-5F | FG-4237-5F | FG-5237-5F | FG-6237-5F | FG-8237-5F | FG-6242-5F | FG-8242-5F | |
|--|-------------------|------------------------------------|------------|------------------------------------|------------|------------------------------------|-----------------------------------|----------------------------|------------|----------------------------|------------|-------|
| Travel | | | | | | | | | | | | |
| X-axis travel | mm | 3200 | 4200 | 4200 | 5200 | 6200 | 4200 | 5200 | 6200 | 8200 | 6200 | 8200 |
| Y-axis travel | mm | 2700 | | 3200 | | 3700 | | 4200 | | 4200 | | |
| Z-axis travel | mm | 1000 | | | | | 1000 | | | | | |
| Vertical spindle nose end to worktable surface | mm | 200~1200 | | | | | 200~1200 | | | | | |
| Distance from horizontal spindle center end to worktable surface | mm | 340~1340 | | | | | 340~1340 | | | | | |
| Distance between two columns | mm | 2000 | | 2500 | | 3000 | | 3500 | | 3500 | | |
| Table | | | | | | | | | | | | |
| Table size (X direction) | mm | 3000 | 4000 | 4000 | 5000 | 6000 | 4000 | 5000 | 6000 | 8000 | 6000 | 8000 |
| Table size (Y direction) | mm | 1600 | | 2000 | | 2500 | | 3000 | | 3000 | | |
| T-slot (No. x size x distance) | | 7×22mm×200mm | | 9×22mm×200mm | | 9×28mm×250mm+2×28mm×150mm | | 11×28mm×250mm+2×28mm×150mm | | 11×28mm×250mm+2×28mm×150mm | | |
| Max. Table load | kg | 10000 | 12000 | 15000 | 18000 | 20000 | 18000 | 22000 | 25000 | 30000 | 30000 | 35000 |
| Spindle | | | | | | | | | | | | |
| Spindle taper | | BT50 | | | | | BT50 | | | | | |
| Spindle speed | min ⁻¹ | 4000 | | | | | 4000 | | | | | |
| Spindle diameter | mm | 90 | | | | | 90 | | | | | |
| C axis rotation angle | deg. | ±185°, 5°(index) | | | | | ±185°, 5°(index) | | | | | |
| Feedrate | | | | | | | | | | | | |
| Rapid feedrate (X/Y/Z) | m/min | 15/15/10 | | | 12/15/10 | | 15/15/10 | | 12/15/10 | | 10/15/10 | |
| Cutting rate | mm/min | 1-1000 | | | | | 1-1000 | | | | | |
| Tool change | | | | | | | | | | | | |
| Number of tool | pcs | 60 | | | | | 60 | | | | | |
| Max. tool diameter/ w./w.o. adjacent tool | mm | 125/215 | | | | | 125/215 | | | | | |
| Max. tool length | mm | 400 | | | | | 400 | | | | | |
| Max. tool weight | kg | 20 | | | | | 20 | | | | | |
| Pull stud | | MAS403 P50T-1(45°) | | | | | MAS403 P50T-1(45°) | | | | | |
| Motor | | | | | | | | | | | | |
| Spindle motor | kw | 18.5/30(Cont./S3 25%)(oil18/7000) | | | | | 18.5/30(Cont./S3 25%)(oil18/7000) | | | | | |
| Spindle max torque | N-m | 1130(S3 25%) | | | | | 1130(S3 25%) | | | | | |
| Feed motor X/Y/Z(FANUC) | kw | (F)6/7/7(A40/A30/A30B) | | | | | (F)6/7/7(A40/A30/A30B) | | | | | |
| Tool magazine motor | kw | 4.0(α iF22B) | | | | | 4.0(α iF22B) | | | | | |
| Cutting fluid pump motor | kw | 2.6(50HZ)/4(60HZ) | | | | | 2.6(50HZ)/4(60HZ) | | | | | |
| Accuracy(VDI/DGQ 3441) | | | | | | | | | | | | |
| positioning accuracy P(X,Y,Z) | mm | 0.025 | 0.030 | 0.030 | 0.035 | 0.040 | 0.030 | 0.035 | 0.040 | 0.050 | 0.040 | 0.050 |
| Repeatability accuracy Ps(X,Y,Z) | mm | 0.020 | 0.025 | 0.025 | 0.030 | 0.035 | 0.025 | 0.030 | 0.035 | 0.045 | 0.035 | 0.045 |
| OTHER | | | | | | | | | | | | |
| Power capacity | | 65 kVA, 200/220V, 3 phase 50/60Hz | | | | | 65 kVA, 200/220V, 3 phase 50/60Hz | | | | | |
| Air pressure capacity | | 6kg/cm ² | | | | | 6kg/cm ² | | | | | |
| Each axis guide | | X 2 roller guide, Y 2 roller guide | | X 3 roller guide, Y 2 roller guide | | X 3 roller guide, Y 2 roller guide | | | | | | |
| | | Z Turcite & hardened box rail | | | | | Z Turcite & hardened box rail | | | | | |
| Machine dimension(L) | mm | 8300 | 11000 | 11000 | 13000 | 15000 | 11000 | 13000 | 15000 | 20000 | 15000 | 20000 |
| Machine dimension(W×H) | mm | 5900×5400 | | 6450×5450 | | 6950×5525 | | 7500×5600 | | 7500×5600 | | |
| Machine weight | kg | 30000 | 35000 | 36000 | 41000 | 48000 | 46000 | 53000 | 60000 | 75000 | 62000 | 78000 |

© The company reserves the right to change the mechanical specifications, accessories and appearance without prior notice.

Standard Accessories

- C-axis 5° (index)
- Half splash guard
- Y-axis bellows folding cover
- X-axis sheet metal telescoping cover
- Toolbox and tools
- Work light
- M30 Automatic power off
- signal light
- Leveling bolts and pads
- Spindle cooling system
- Coolant system
- Centralized lubrication system
- Electric cabinet heat exchanger
- Chip removal system and cart

Option Accessories

- Coolant through spindle
- Axes linear scale
- Auto tool length measurement device
- C-axis 0.001° (cont.)
- Auto workpiece measurement device
- Arm type magazine 80, 120 tools storage
- Electric cabinet air conditioner
- Transformer

Optional controller

- FANUC 0iMF
- SIEMENS 840Dsl
- MITSUBISHI M830S
- HEIDENHAIN TNC640