MICROCUT

M Series

Linear Way Vertical Machining Center

BUFFALO MACHINERY CO., LTD.

56, Lane 318, Desheng Road, Daya District,
Taichung City 428-46, Taiwan
P.O. Box 320, Daya, Taichung City, Taiwan
Tel: +886-4-25 60 37 59 Fax: +886-4-25 60 37 69
E-mail: info@mail.buffalo.com.tw
www.buffalo-machinery.com

MICROCUT EUROPE

Ulica hrvatskih branitelja 3
10430 Samobor CROATIA
Tel. +385 1 3141 515
Fax. +385 1 3141 516
info@microcut-europe.eu
www.microcut-europe.eu

National Award of Outstanding

ISO 9001:2015 FM 538421

ISO 14001:2015 EMS 546518

ISO 50001:2011 ENMS 642457

2019/08/0000

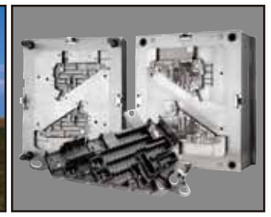
M Series

Vertical Machining Center

MICROCUT linear way VMC is designed and built to meet the ever-increasing demands for powerful and reliable machines with high efficiency, high accuracy machining performance.
MICROCUT M series uses roller type linear guideways, a high-precision main spindle with thermal expansion stability and a robust and compact structure design with high durability. Depending on machining needs, various travel lengths with great capacity satisfy all demands.

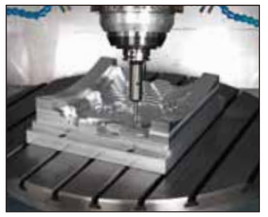
High-performance solutions for demanding applications

Green Energy Industry



Die & Mold Industry

Automobile Industry



Mechanical Engineering

M760

900 x 410 mm Table
XYZ: 760 x 440 x 460 mm
Table load: 350 kg
Spindle:10000 rpm(std);12000/15000 rpm(opt)

M800

900 x 520 mm Table
XYZ: 800 x 500 x 500 mm
Table load: 450 kg
Spindle: 10000 rpm(std); 12000/15000 rpm(opt)

M1050

1200 x 600 mm Table
XYZ: 1050 x 600 x 600 mm
Table load: 800 kg
Spindle: 10000 rpm(std); 12000/15000 rpm(opt)

M1200

1400 x 710 mm Table
XYZ: 1200 x 730 x 650 mm
Table load: 1000 kg
Spindle: 10000 rpm(std); 12000/15000 rpm(opt)

M1400

1500 x 700 mm Table
XYZ: 1400 x 730 x 700 mm
Table load: 1500 kg
Spindle: 10000 rpm(std); 12000/15000 rpm(opt)

M1600

1700 x 700 mm Table
XYZ: 1600 x 730 x 700 mm
Table load: 1500 kg
Spindle: 10000 rpm(std); 12000/15000 rpm(opt)

M1600P

1700 x 800 mm Table
XYZ: 1600 x 800 x 800 mm
Table load: 1800 kg
Spindle: 10000 rpm (std); 12000/15000 rpm(opt)

Rigid Construction

The tool magazine is assembled in structural ribs that are directly supported to the ground, thus increasing tool magazine size without compromising column rigidity.

Optimal Rigidity

The major structural component is made of Meehanite cast iron, which is heat treated to relive stress, and to assure rigidity and accuracy

Rib Enhancement

All casting is reinforced with heavy ribs to resist vibration. The base incorporates a durable ribbed box design for maximum structural loading.

Triangular Support Base

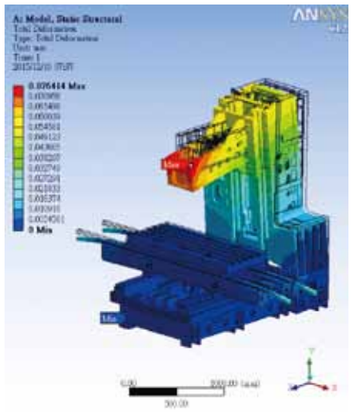
The triangular wide-distance foundation provides solid support for operation.

One-piece Design Headstock

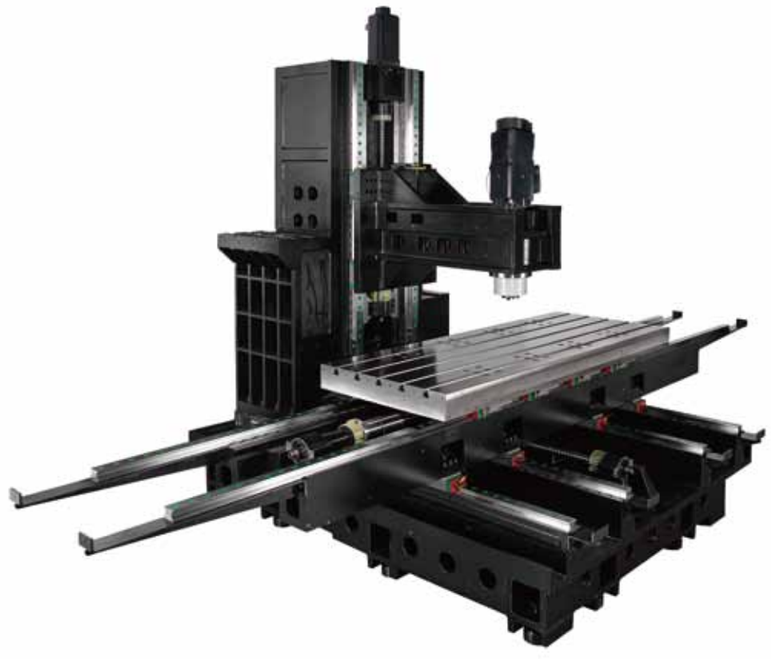
Offering high stability and capacity for heavy duty cutting

Structural Optimization

All structural components and whole machine frame of M series are analyzed by ANSYS mechanical system and Finite Element Method (FEM) to ensure structural optimization.



M1050



M1600

Motion Control

1 Ballscrew

C3 Class Pretensioned Ballscrew

Class C3 ballscrews are pretensioned on each axis to reduce heat deformation for high accurary and repeatability.

Direct-coupled Servo Ballscrew Motor

Direct-coupled servo motor can enhance positioning accuracy and provide better contouring and threading

2 Guideway

High Precision Linear Guideways

Installed for all axes to ensure high load carrying capacity and rigidity with high running and positional accuracy as well as low friction.

2 Ball Type linear Guideway

M760

The recirculation ball guideways for each axis are preloaded to provide zero clearance between the moving surfaces. This increases rigidity in all directions while providing higher accuracy and reliability

Roller Type Linear Guideway

M800/ M1050/ M1200/ M1400/ M1600/ M1600P

High rigidity steel on roller guideway provides high durability. Roller guideway on the three axes enables a fast feed rate of 30 m/min, ensuring smooth movement and accuracy.

3 4-guideway base to support saddle

M1400/M1600/M1600P

The bigger models of M series mount 4 linear guideways in the Y axis to ensure the maximum rigidity with high loading capacity

Spindle

M series is built with innovative machine concepts by using a wide range of high-performance spindles to present consistent precision performance and dynamic machining for various application.

Extensive options of spindle types and motor configuration are provided to meet industrial demands. The higher horsepower motors are also available to optimize the strength of machine for ultimate machining performance.

• Belt Drive spindle

The standard 10,000 rpm belt drive spindle with ISO 40 tapper.

• In-line spindle (Opt)

The powerful direct drive of 12,000 and 15,000 rpm spindles with ISO 40 tapper ensure high machining performances.

Spindle Dynamic Balancing

The online dynamic balancing instrument offers calibration for spindle displacement, speed and acceleration of full speed range

High rigidity Spindle

With preloaded angular-contact bearings throughout and with a large spacer between front bearings to improve radial thrust capacity. Cartridge spindle design makes maintenance easy.

Spindle oil cooler (opt)

All machines are available to equip with spindle oil cooler to prevent thermal expansion effects and thermal deformation, allowing high accuracy machining, perfect finish and long lifetime of spindle as well.

Tool Management

24T Arm type ATC

40T chain type ATC

Fast and Reliable

Arm type ATC

Providing stable and quicker tool selection

It is activated by electric motor and driven by cam mechanism. The bi-direction tool selection is controlled by PLC software for quicker tool selection to reduce non-cutting time.

Standard

Random arm type 24 Tools - all series

Optional

Carrousel type16 Tools - M760
Random drum type 30 Tools - all series
Random chain type 40 Tools - M1050, M1200, M1400, M1600 M1600P

40 tool chain type magazine is accessible from back of machine for easy loading and unloading of tools while machine automatic operation.

Tool selection panel

Coolant Through Spindle (opt)

Coolant through spindle uses high pressure pump to supply coolant through tool, cooling the cutting edge directly. This clears chips during deep-hole and tapping, increases tool life and allows higher cutting speeds.

CTS system options:

- CTS 20 bar built-in type
- CTS 20 bar separate type
- CTS 20 bar separate type with paper filter
- CTS 70 bar programmable separate type with paper filter

CTS 20 bar built-in type

CTS 20 bar separate type

CTS 20 bar separate type with paper filter

Auxiliary Coolant Filter

Individual CTS tank is supplied with a re-usable 25-micron iron filter. Built-in system provides 25-micron filter. Both filters take away contamination and particles from the coolant before coolant is recycled through the coolant pump.

Chip Removal

- Efficient Free-flow enclosure guard design
- Efficient chip conveyor carries out chips to save operation time
- Drainage outlet design
- Multiple chip flush solution offers easy chip clean
  - Rear wash down with high pressure pumps(opt)
  - Spindle with coolant nozzle

Multiple chip flush solution

Free-flow enclosure guard design

Drainage outlet & Chip conveyor

Spindle with coolant nozzle

Coolant gun

Control

FANUC 0iMF CONTROL

- High reliable
- High-speed, high-precision and high-quality machining with AI contour control
- Machining condition selection function
- Enriched basic functions: rigid tapping, tool life management
- Advanced digital servo technology
- User friendly operation: Program editing, memory card, data server

Excellent Operation

Integration operation & programming guidance with extremely simplified operations

FANUC MANUAL GUIDE 0i (std)

Integrated operation guidance for NC program

FANUC MANUAL GUIDE i (opt)

- Programming guidance
- With extremely simplified operations

MITSUBISHI M80H CONTROL

- Panel-in type, a control unit with integrated display
- Windows-less display provides easy operability
- A touchscreen display as standard
- Smartphone-like intuitive touch operation
- View 3D model at any desired size for 3D graphic check, supporting both turning and milling

FAGOR 8065/8055 CONTROL

- High speed machining, large look-ahead buffer and a high speed block processing time
- Graphically assisted set up user interfaces
- Preparation help on tool management
- Various programming languages provide improved operator ease & efficiency:
  - Wide range of ICON conversational cycles
  - ISO code languages

HEIDENHAIN iTNC 620 CONTROL

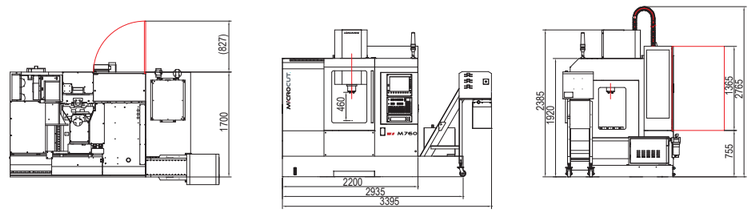
- Minimize setup times
- Graphic support in any situation
- Straight forward function keys for complex contours
- Programming contours unconventionally
- Field-proven cycles for recurring operations
- Smar T.NC the alternative operating mode
- Program off line
- Fast data transfer
- The iTNC programming station
- Setup, presetting and measuring with touch trigger

SIEMENS SINUMERIK 828D CONTROL

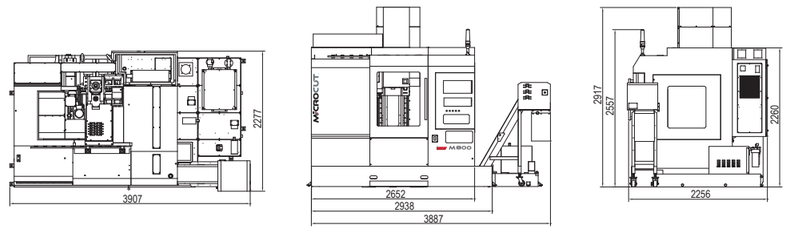
- Easy data exchange thanks to USB, CF and Ethernet interfaces on the panel
- ShopMill machining step programming
- SINUMERIK CNC programming language with high-level elements and program guide
- Online ISO dialect interpreter: maximum CNC program compatibility
- Advanced Surface: Innovative, high-performance CNC functions
- Animated Elements: Optimized operator guidance
- Easy input of pictographic languages directly via the CNC keyboard
- Easy Message: Integrated mobile radio modem for optimum process monitoring via mobile telephone.

Layout Dimension

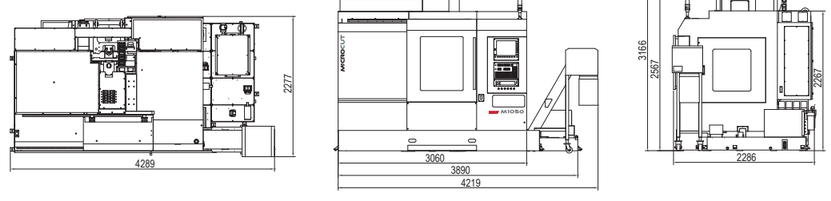
M760



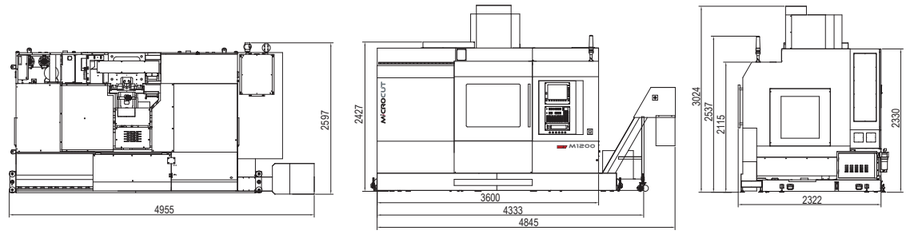
M800



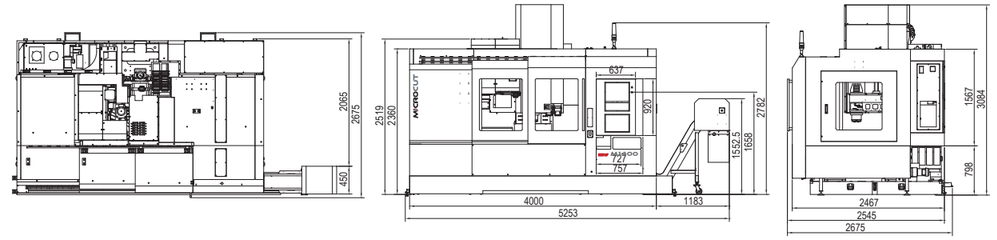
M1050



M1200



M1400



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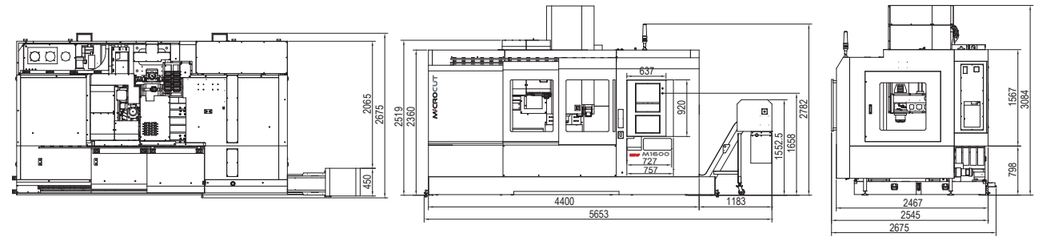
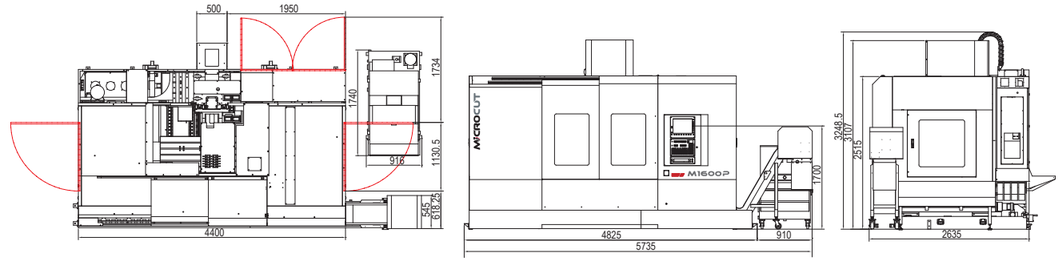


M1600P



Spindle Power & Torque Chart

Controller / Spindle / Motor Availability Table

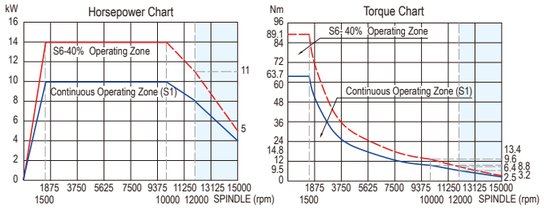
ISO40 Taper		Heidenhain 620		Siemens 828D		Fanuc 0iM		Fagor 8055/8065		Mitsubishi M80H	
		STD Power	Upgrade Power	STD Power	Upgrade Power	STD Power	Upgrade Power	STD Power	Upgrade Power	STD Power	Upgrade Power
M760	10000 rpm belt-driven		**QAN200U** 10/14 kW 63.7/89.1 Nm	**1PH8105** 7/10.5 kW 44.5/66.8 Nm	**1PH8107** 10.5/15.8 kW 63/94.5 Nm	**Beta iI8** 7.5/11kW 47.8/70 Nm		**FM7-A075** 7.5/11 kW 47.8/71.5 Nm		**SJ-DG11** 7.5/11 kW 47.7/70 Nm	
	12000 rpm in-line		**QAN200UH** 10/14 kW 63.7/89.1 Nm			**Alpha iIT8** 7.5/11kW 47.8/70 Nm		**FM7-D075** 7.5/11 kW 47.7/70 Nm		**SJ-VS11** 7.5/11 kW 47.7/70 Nm	
	15000 rpm in-line			**1PH8105** 7.5/11.3 kW 53.5/80.2 Nm	**1PH8107** 8.5/12.8 kW 42/80 Nm	**Alpha iIT8** 9/11 kW 57.3/70 Nm					
M800	10000 rpm belt-driven		**QAN200U** 10/14 kW 63.7/89.1 Nm	**1PH8105** 7/10.5 kW 44.5/66.8 Nm	**1PH8107** 10.5/15.8 KW 63/94.5 Nm	**Beta iI8** 7.5/11 kW 47.8/70 Nm	**Beta iI12** 11/15 kW 70/95.5 Nm	**FM7-A075** 7.5/11 kW 47.8/71.5 Nm	**FM7-A110** 11/15.5 kW 70/100.4 Nm	**SJ-DG11** 7.5/11 kW 47.7/70 Nm	**SJ-V22** 11/15 kW 70/95.5 Nm
	12000 rpm in-line		**QAN200UH** 10/14 kW 63.7/89.1 Nm			**Alpha iIT8** 7.5/11 kW 47.8/70 Nm	**Alpha iIT12** 11/15 kW 70/95.5 Nm	**FM7-D075** 7.5/11 kW 47.7/70 Nm	**FM7-D110** 11/15.5 kW 70/98.7 Nm	**SJ-VS11** 7.5/11 kW 47.7/70 Nm	**SJ-VKS15** 11/15 kW 70/95.5 Nm
	15000 rpm in-line			**1PH8105** 7.5/11.3 kW 53.5/80.2 Nm	**1PH8107** 8.5/12.8 kW 42/80 Nm	**Alpha iIT8** 9/11 kW 57.3/70 Nm			**1PH8107** 8.5/12.8 kW 63/95.5 Nm		**SJ-VKS30** 11(15)/18.5 kW 70/95.5 Nm
M1050 M1200 M1400 M1600 M1600P	10000 rpm belt-driven	**QAN200U** 10/14 kW 63.7/89.1 Nm	**1PH8133** 20/30 kW 133.7/200.6 Nm	**1PH8107** 10.5/15.8 kW 63/94.5 Nm (Only M1050/M1200)	**1PH8133** 15/22.5 kW 126/189.1 Nm	**Alpha iI12** 11/15 kW 70/95.5 Nm	**Alpha iIT15** 15/18.5 kW 102/126 Nm	**FM7-A110** 11/15.5 kW 70/100.4 Nm	**FM7-A150** 15/22 kW 95.5/143.9 Nm	**SJ-V22** 11/15 kW 70/95.5 Nm	**SJ-V18.5** 11/15 kW 95.5/118 Nm
	12000 rpm in-line	**QAN200UH** 10/14 kW 63.7/89.1 Nm			**1PH8133** 20/30 kW 133.7/200.6 Nm	**Alpha iIT12** 11/15 kW 70/95.5 Nm		**FM7-D110** 11/15.5 kW 70/98.7 Nm	**FM7-D185** 18.5/32 kW 117.8/165.5 Nm	**SJ-VKS15** 11/15 kW 70/95.5 Nm	**SJ-VKS30** 11(15)/18.5 kW 75/95.5 Nm
	15000 rpm in-line			**1PH8107** 8.5/12.8 kW 63/91.7 Nm (Only M1050/M1200)		**Alpha iIT15** 15/18.5 kW 102/126 Nm		**1PH8107** 8.5/12.8 kW 63/95.5 Nm	**1PH8133** 20/30 kW 133.7/200.6 Nm	**SJ-VKS30** 11(15)/18.5 kW 75/102 Nm	

ISO50 Taper		Heidenhain 620		Siemens 828D		Fanuc 0iM		Fagor 8055/8065		Mitsubishi M80H	
		STD Power	Upgrade Power	STD Power	Upgrade Power	STD Power	Upgrade Power	STD Power	Upgrade Power	STD Power	Upgrade Power
M1400 M1600 M1600P	8000 rpm belt+gearbox	**QAN260M** 15/25 kW	**QAN260L** 20/30 kW	**1PH8133** 20/30 kW		**Alpha iI15** 15/18.5 kW	**Alpha iI18** 18.5/22 kW	**FM7-A150** 15/22 kW	**FM7-A185** 18.5/26 kW	**SJ-D18.5** 15/18.5 kW	**SJ-D22** 18.5/22 kW
	Ratio 1:1	95.5/159.2Nm	127/191Nm	133.7/200.6 Nm		95.5/117.7 Nm	118/140 Nm	95.5/143.9 Nm	117.8/165 Nm	95.5/118 Nm	118/140 Nm
	Ratio 1:4	382/636.7 Nm	509/768 Nm	534.8/802.4 Nm		382/470.8 Nm	472/560 Nm	382/575.6 Nm	471.2/660 Nm	382/472 Nm	472/560 Nm

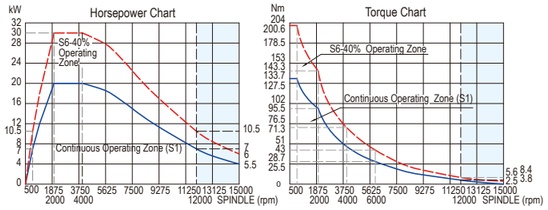
Power & Torque Chart

ISO40 spindle motor

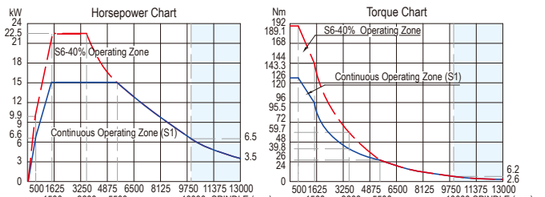
Heidenhain QAN200U/QAN200UH 10/14 kW



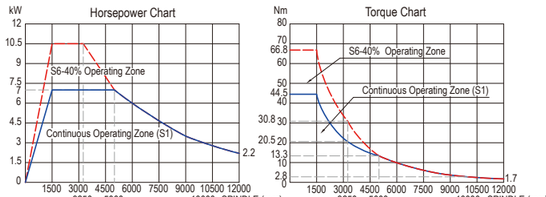
Siemens 1PH8133 20/30 kW



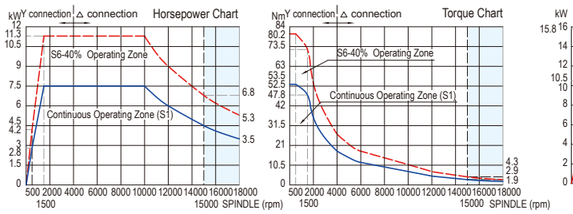
Siemens 1PH8133 15/22.5 kW



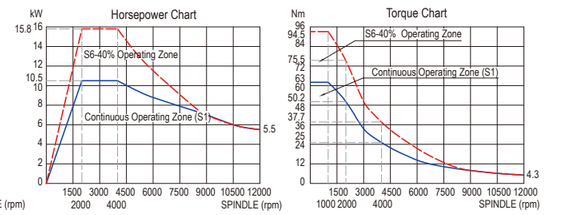
Siemens 1PH8105 7/10.5 kW



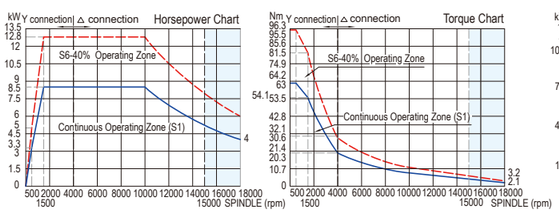
Siemens 1PH8105 7.5/11.3 kW



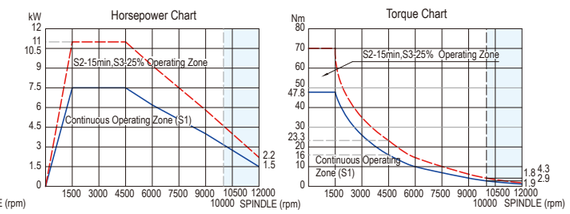
Siemens 1PH8107 10.5/15.8 kW



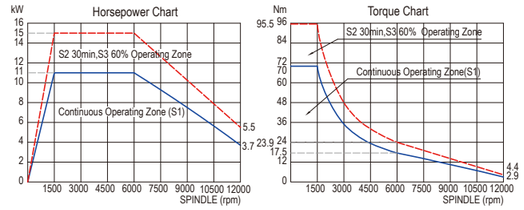
Siemens 1PH8107 8.5/12.8 kW



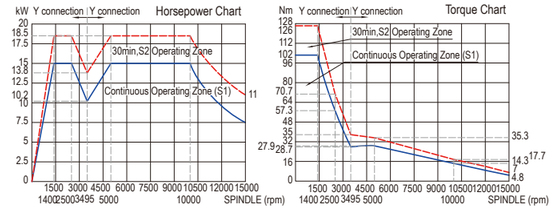
Fanuc beta iI8/alpha iI8 7.5/11 kW



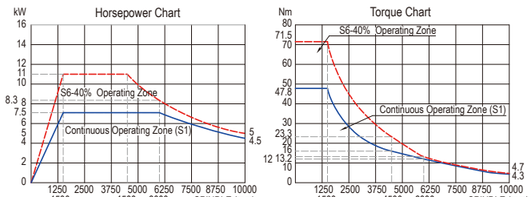
Fanuc αiIT12 11/15 kW



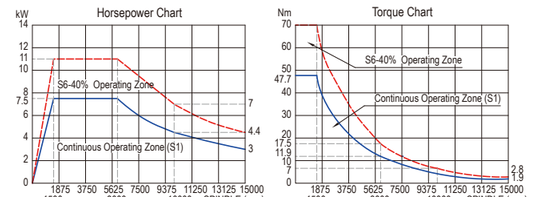
Fanuc αiIT15 15/18 kW



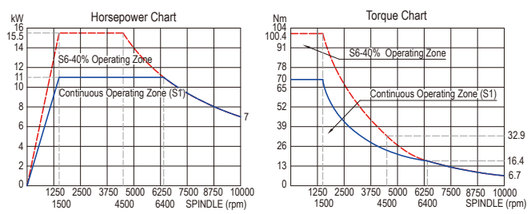
Fagor FM7-A075 7.5/11 kW



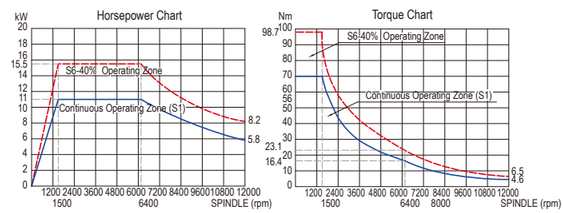
Fagor FM7-D075 7.5/11 kW



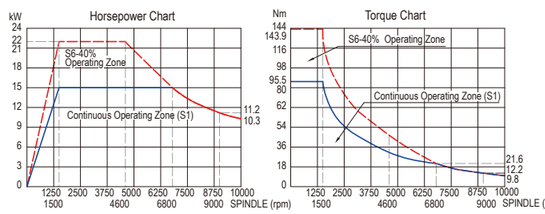
Fagor FM7-A110 11/15 kW



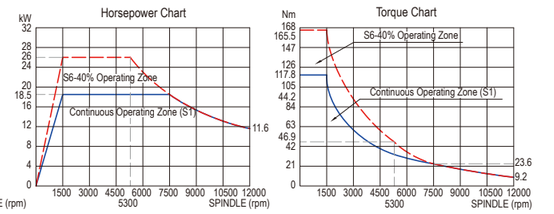
Fagor FM7-D110 11/15 kW



Fagor FM7-A150 15/22 kW

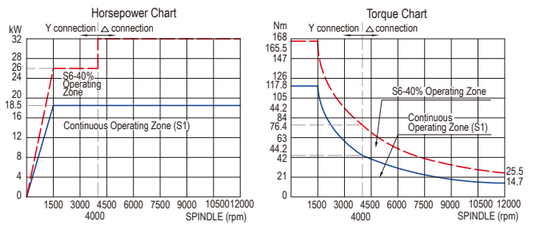


Fagor FM7-D185 18.5/32 kW

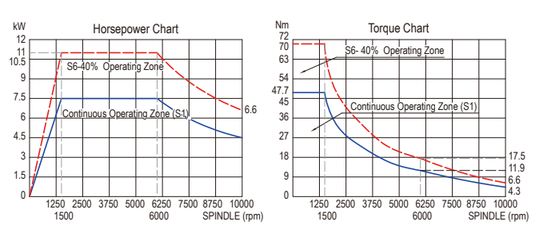


Power & Torque Chart

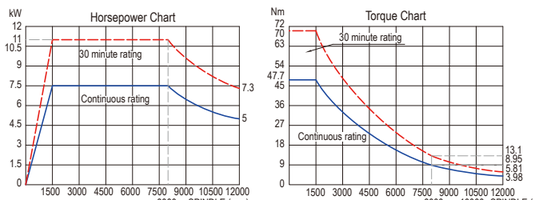
Fagor FM7-D185 18.5/32 kW



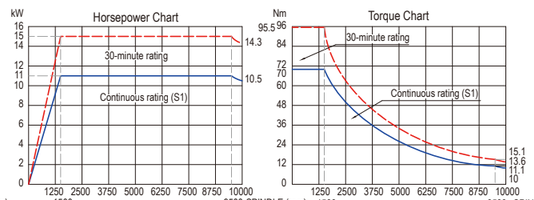
Mitsubishi SJ-DG11 7.5/11 kW



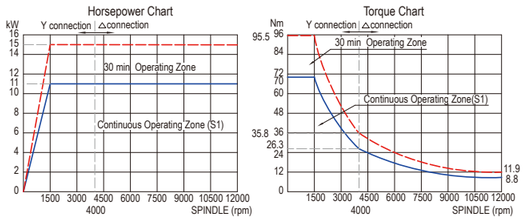
Mitsubishi SJ-VS11 7.5/11 kW



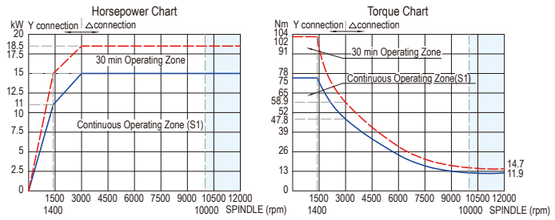
Mitsubishi SJ-V22 11/15 kW



Mitsubishi SJ-VKS15 11/15 kW

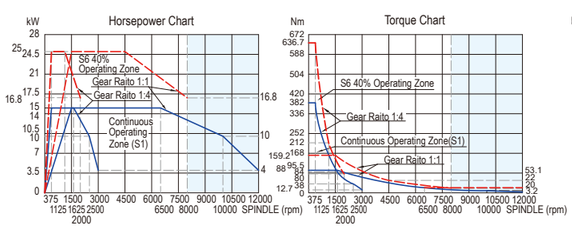


Mitsubishi SJ-VKS30 11(15)/18 kW

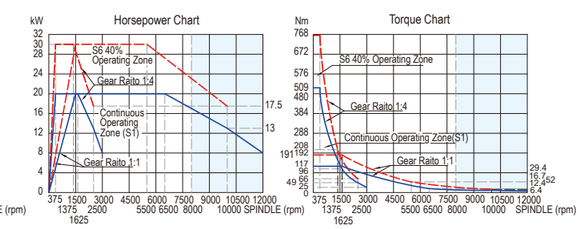


ISO50 spindle motor

Heidenhain QAN 260M 15/25 kW

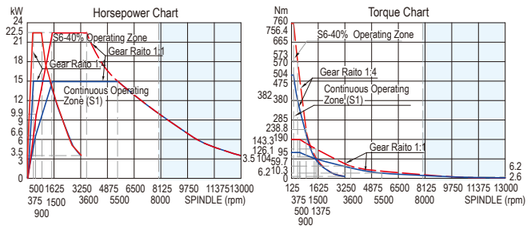


Heidenhain QAN 260L 20/30 kW

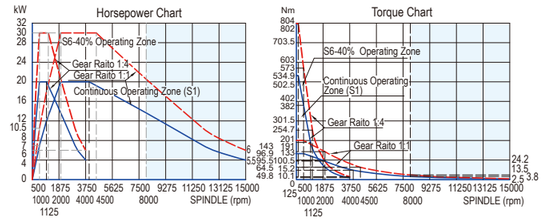


ISO50 spindle motor

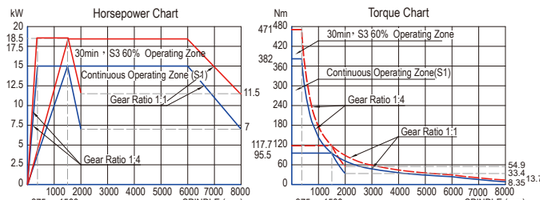
Siemens 1PH8133 15/22.5 kW



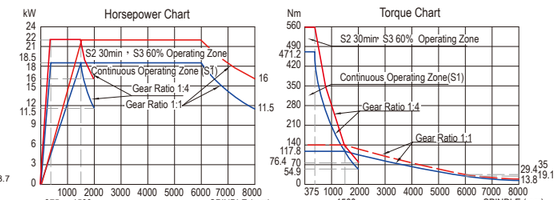
Siemens 1PH8133 20/30 kW



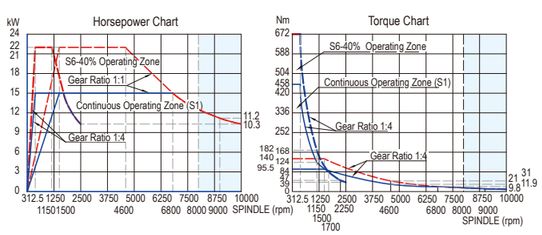
Fanuc αil15 15/18 kW



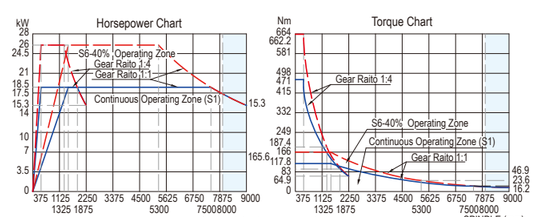
Fanuc αil18 18.5/22 kW



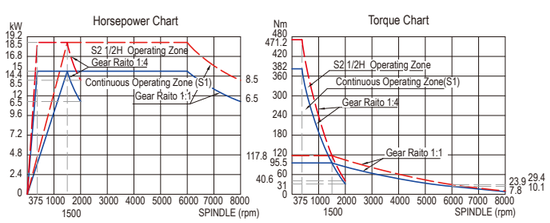
Fagor FM7-A150 15/22 kW



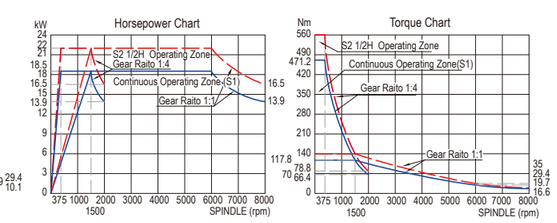
Fagor FM7-A185 18.5/26 kW



Mitsubishi SJ-D18.5 15/18.5 kW



Mitsubishi SJ-D22 18.5/22 kW



Technical data

Table	Unit	M760	M800	M1050	M1200	M1400	M1600	M1600P
Table size	mm	900 x 410	900 x 520	1200 x 600	1400 x 710	1500 x 700	1700 x 700	1700 x 800
Table loading	kg	350	450	800	1000	1500	1500	1800
Traval								
X axis	mm	760	800	1050	1200	1400	1600	1600
Y axis	mm	440	500	600	730	730	730	800
Z axis	mm	460	500	600	650	700	700	800
Spindle (std)								
Driven system		Belt-driven				Gear box / Belt-driven		
Spindle speed	rpm	10000				8000(opt) /10000(std)		
Interface		ISO40				BT50 (8000)/ISO40(10000)		
Spindle (opt)								
Driven system		In-line driven						
Spindle speed	rpm	12000(opt) /15000(opt)						
Interface		ISO40						
Axes feed rate								
X/Y/Z rapid feed	m/min	30/30/30	30/30/30	30/30/30	30/30/30	30/30/30	30/30/30	30/30/30
Guideway								
X/Y/Z guideway type	mm	Linear / 35 (Ball)	Linear / 35(Roller)	Linear / 45 (Rolle r)	Linear / 45(Roller)	Linear / 45(Roller)	Linear / 45(Roller)	Linear / 45(Roller)
Number of guides in Y axis		2	2	2	2	4	4	4
Accuracy (ISO 10791-4)								
Positioning accuracy	mm	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Repeatability	mm	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Automatic Tool Changer								
ATC type		Arm type 24T(std) / 30T(opt) Carrousel type 16T(opt)	Arm type 24T(std) / 30T(opt)	Arm type 24T (std) / 30 T(opt)	Arm type 24T(std) / 30T(opt)	Arm type 24T(std) / 30T(opt)	Arm type 24T(std) / 30T(opt)	Arm type 30T(std) / 40T(opt)
Tool taper		BT / CAT / DIN 40	BT/CAT/DIN 40	BT/CAT/DIN 40	BT/CAT/DIN 40	BT/CAT/DIN 40	BT/CAT/DIN 40	BT/CAT/DIN 40
Tool changing time (T-T)	sec	1.94(50Hz) /1.64(60Hz)	1.94(50Hz) /1.64(60Hz)	1.94(50Hz) /1.64 (60 Hz)	1.94(50Hz) /1.64(60Hz)	1.94(50Hz) /1.64(60Hz)	1.94(50Hz) /1.64(60Hz)	1.94(50Hz) /1.64(60Hz)
Max. tool dia.	mm	ø75	ø75	ø75	ø75	ø75	ø75	ø75
Max. tool dia. with next tool empty	mm	ø125	ø125	ø125	ø125	ø125	ø125	ø125
Max. tool length	mm	300	300	300	300	300	300	300
Max. tool weight	kg	7	7	7	7	7	7	8
Machine size								
Length x Width x Height (w/ conveyor)	mm	3395x1910x2720	3950x2300x2950	4300x2300x3200	4600x2620x3050	5253x2675x2800	5653x2675x2800	5735x3050x3115
Weight	kg	4300	5750	7000	8200	9500	9800	10500
Floor space (With chip conveyor)	mm	3395 x 1910	3950 x 2300	4300 x 2300	4600 x 2620	5253 x 2675	5653x2675	5735x3050

Specification are subject to change without notice.

Standard Accessories

- Belt drive spindle 10000 rpm
- Arm type 24T tool capacity - M760, M800, M1050, M1200, M1400, M1600
- Arm type 30T tool capacity - M1600P
- Roof with door opening for overhead crane
- C3 class precision ground ballscrew
- Linear guideway
- Automatic lubrication with low lubrication fault
- Coolant system
- Telescopic guideway covers
- Low voltage circuit system
- Chain type chip conveyor
- Rear wash down device
- CE standard electrical control system
- Fully enclosure with slide door
- Rigid tapping function
- EMC and Safety module
- CE-marking declaration
- Heat exchanger
- 3-color lamp of cycle finish

Optional Accessories

- In-line spindle 12000/15000 rpm
- Chip bucket
- Air conditioner
- Coolant gun
- Oil skimmer
- 4th axis
- 4th axis preparation
- CTS 20 bar built-in type
- CTS 20 bar separate type
- CTS 20 bar separate type with paper filter
- CTS 70 bar programmable separate type with paper filter
- Tool setting probe
- Workpiece probe
- Three axes with linear scales
- Carrousel type 16T tool capacity - M760
- Random drum type 30T tool capacity - M760, M800, M1050, M1200, M1400, M1600
- Random chain type 40T tool capacity - M1050, M1200, M1400, M1600,M1600P
- Transformer for 380V~440V