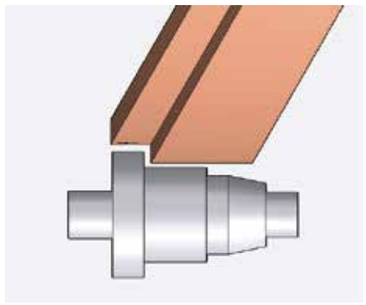
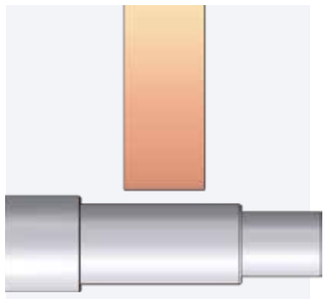
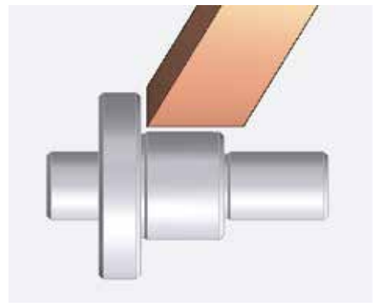
EGP, EGA & EGP-A CNC*Printed in Taiwan*E6*12/2024*en

CNC Cylindrical Grinder

EGP, EGA & EGP-A series







Grinder Professionals

Headquarters
No. 12, Longshan 2nd St., Daya Dist.,
Taichung City 42863, Taiwan (R.O.C.)
TEL : +886-4-2568-6418
Mail : info@etechtw.com

U.S. Company
6435 Alondra Blvd, Paramount, CA.90723
TEL : +1(562)220-1675
Mail : info@supertecusa.com

Shanghai Company
201700 Room 502, No. 79, Green Age Mansion,
Baihe Town, Qingpu District, Shanghai 201700, China
Phone : +86-1347-2898433
TEL : +86-21-5825-5706
Mail : hz@etechtw.com

WEB
www.etechtw.com

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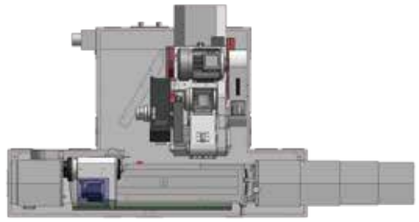
e-tech Machinery Grinder Professional

EGP, EGA & EGP-A Series High Precision CNC cylindrical Grinder

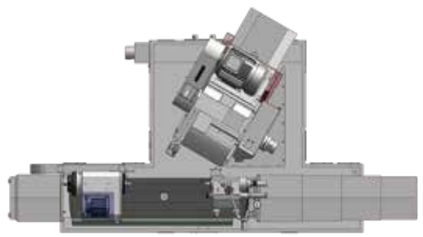
EGP, EGA & EGP-A Series ginders are designed for high precision, high efficiency, and ease of operation. They are suitable for various applications including but not limited automotive, aerospace, medical instrument, tooling, job shop, and mold industries.

Features

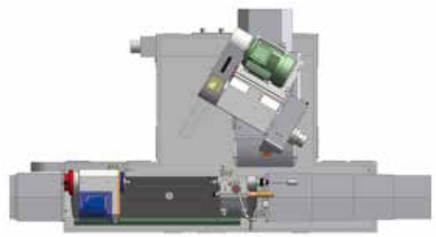
e-tech Machinery Inc. introduces EGP, EGA & EGP-A series CNC cylindrical grinders with superb grinding capabilities and choice of control options. The customers' requirements can be met with a choice of many machine options such as a touch probe, automatic sizing device, or swing down ID grinding attachment. The complete product line offers a wide range of between center distances and center heights in both plunge and angular wheelhead designs. Automation and turnkey solutions can be offered optional equipment.



EGP - Plunge Wheelhead
Max. Grinding OD: 230-480 mm
Distance between Centers: 500-3000 mm



EGA - Angular Wheelhead
Max. Grinding OD: 230-480 mm
Distance between Centers: 500-2000 mm



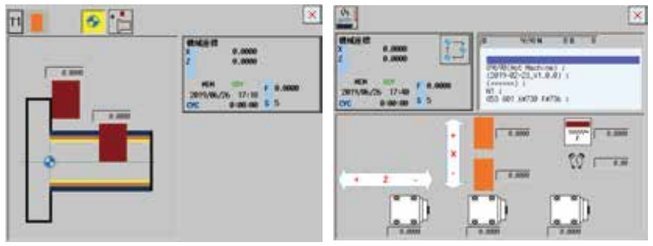
EGP-A - Angular Wheelhead Plunge type
Max. Grinding OD: 360-480 mm
Distance between Centers: 600-2000 mm

CNC Controller

- A selection of CNC control systems including Fanuc, Mitsubishi, Siemens, PC-BASE are available.
- For small and medium size workpiece grinding operations, e-tech incorporates the iGrind graphic conversational programing software.

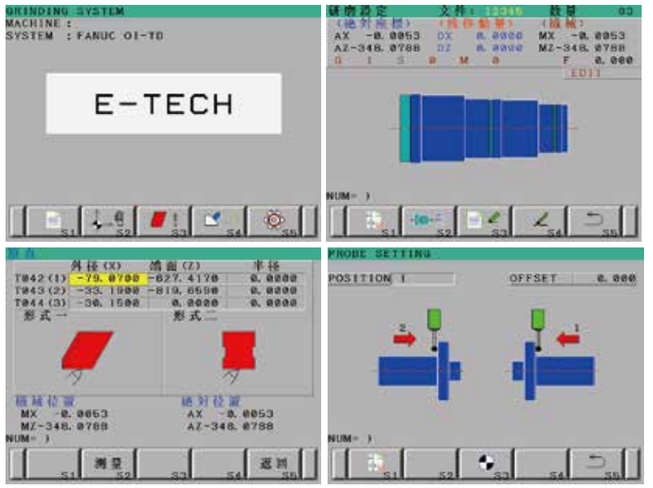
• FANUC Controller

• Mitsubishi Controller

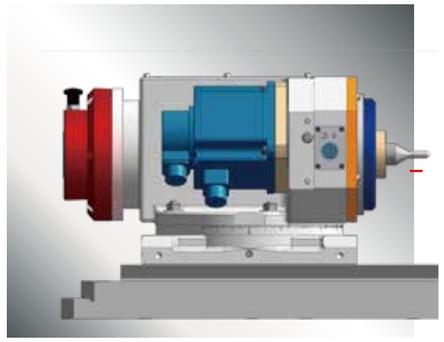


Mitsubishi Controller

- OD Grinding / End Face Grinding / Form Grinding
- Form Dressing w/ Auto Compensation
- Multiple Section Grinding Sequences
- Setup Parameter Storage
- Graphic Parameter Instruction

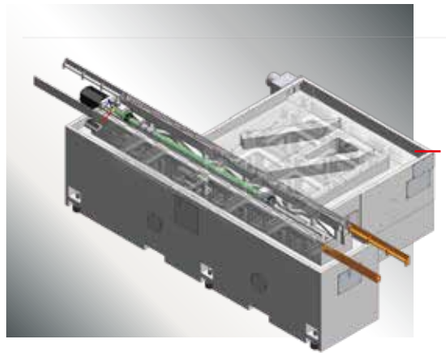


FANUC Controller



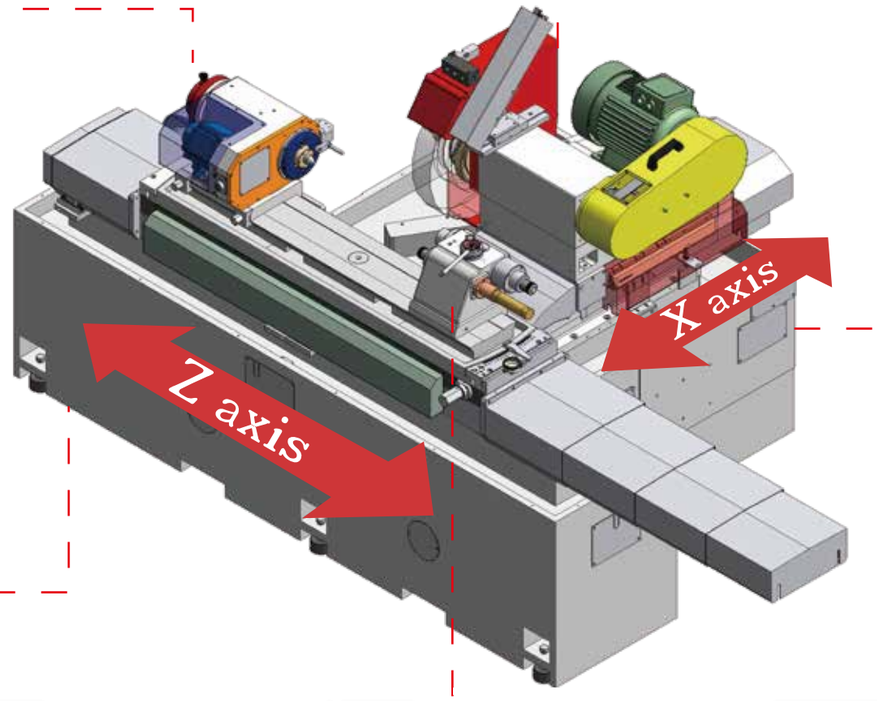
Work Head

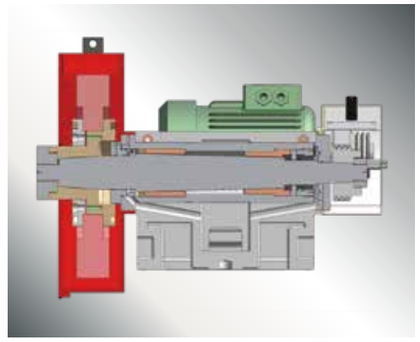
NN bearing designed work spindle offers heavy duty load capacity, optimal rotation accuracy, and high rigidity. The servo motor drive offers steady speed and torque during the grinding operation. A positive air purge system keeps grinding swarf and coolant out of the work head, thus it prolongs its life.



Rigid Machine Base

The machine based is designed to ensure the table is fully supported on both ends. The heavily ribbed box-type base is made of Meehanite casting, providing excellent rigidity and stability of the machine.

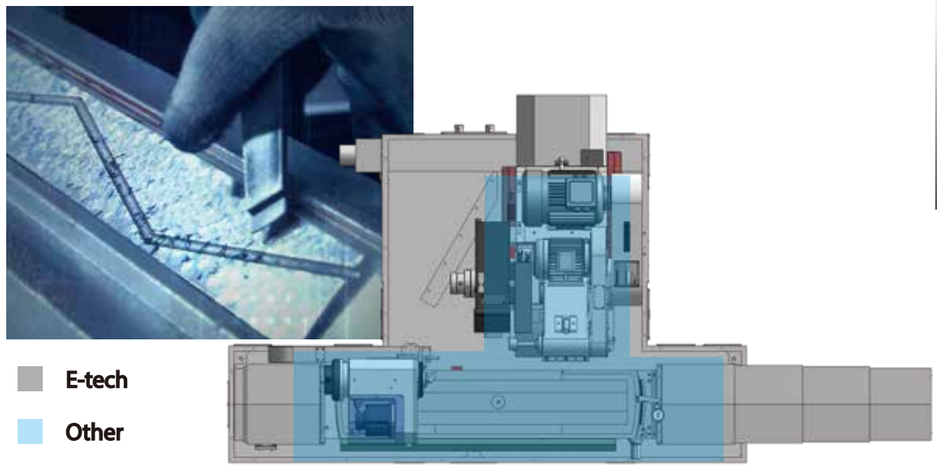


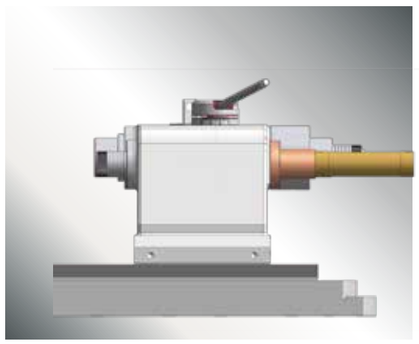


Wheel head Spindle Bearing Options:

Standard — Contact Bearing Type Spindle is easy to maintain, environmentally friendly and minimizes thermal growth issues.

Optional — Hydrodynamic Babbit Bearing Type Spindle applies SNCM220 super alloy steel with multiple heat treatments makes the surface hardness of spindle up to HRC 62. These features ensure maximum cutting capability and best part finish performance in the grinding operation.

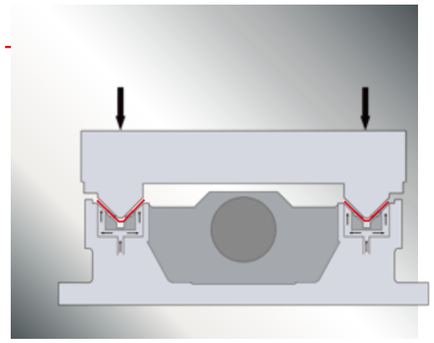




Tail Stock

A coolant nozzle is installed on the top of the tailstock for cooling the center tip. An air floating devise allows for smoother movement and protection of the table.

- An optional tailstock quill travel of 75mm helps to load/unload the workpiece with ease. The quill is oil-bathed to ensure smooth movement.
- An optional tailstock taper adjustment feature allows the operator to easily adjust for taper error.



X-axis Guideway

The hand scraped Double V guideways provide maximum support to the wheel head for greater stability and grinding capacity. This design insures superior accuracy over the life of the machine.

High Precision Grinding Technology

Plunge Grinding Example :

Model EGP-3260CNC

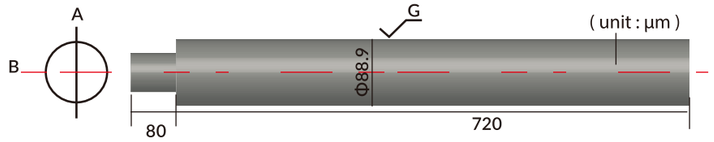
Grinding Conditions :

Wheel : WA60K(Φ405mm)

Workpiece

Name: Standard Grinding Test Workpiece

Material: SCM435



(unit : μm)	1	2	3	4	5	6	7	8	9
A	0.0	0.0	0.0	+1.0	+1.0	+1.0	0.0	0.0	0.0
B	0.0	0.0	0.0	+1.0	+1.0	+1.0	0.0	0.0	0.0

Cylindricity

Traverse Grinding Example :

Model EGP-3260CNC

Grinding Conditions :

Wheel : WA60K(Φ405mm)

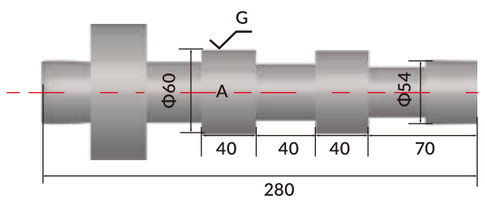
Workpiece

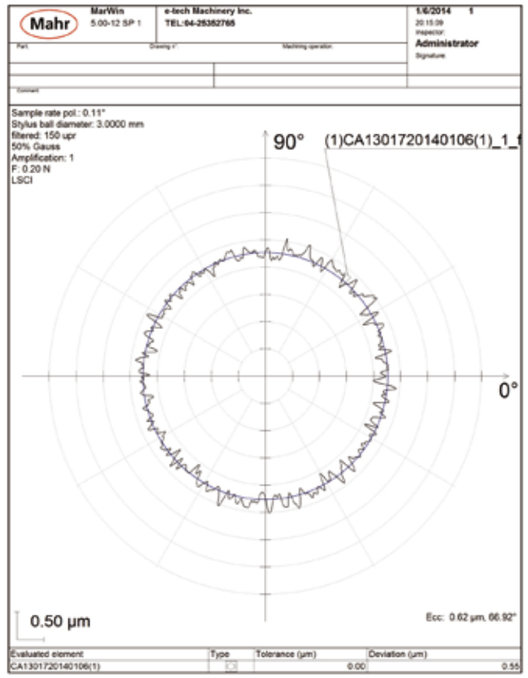
Name: Standard Grinding Test Workpiece

Material: SCM435

Roundness :

Part A 0.50 μm



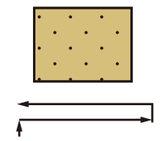


The grinding tests are grinding examples and do not represent actual grinding accuracies.

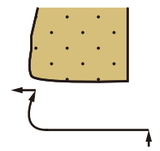
Wheel Dressing Cycle

Plunge Type

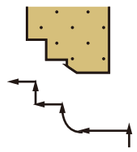
Straight – Parallel



LHS Radius and Concave below

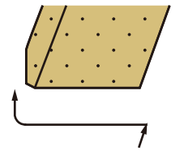


Steps Wheel (option) (Under 15 points)

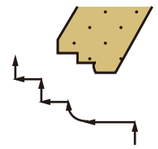


Angular Type

Wheel with radius



Steps Wheel (option) (Under 15 points)



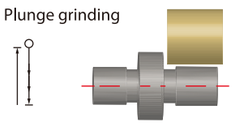
Remarks :

1. Max. 5 types of wheel profile can be saved.
2. Dressing condition can setup rough, intermediate and fine dressing
3. Machine with ID attachment, the dressing operation of ID wheel is manual operated.

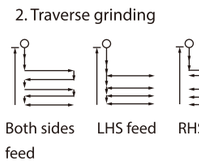
Grinding Cycle

Plunge Type

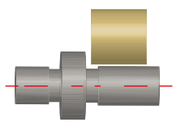
1. Plunge grinding



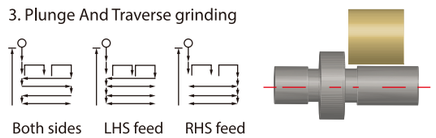
2. Traverse grinding



Both sides feed | LHS feed | RHS feed



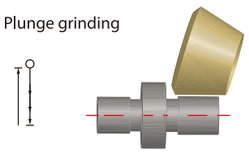
3. Plunge And Traverse grinding



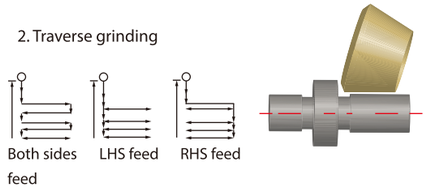
Both sides feed | LHS feed | RHS feed

Angular Type

1. Plunge grinding

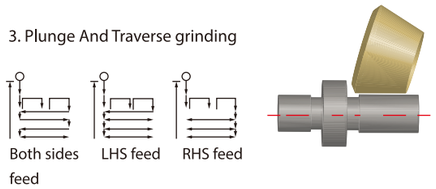


2. Traverse grinding



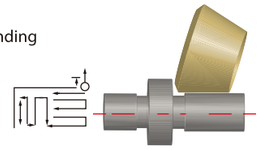
Both sides feed | LHS feed | RHS feed

3. Plunge And Traverse grinding



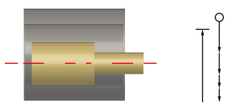
Both sides feed | LHS feed | RHS feed

4. OD +End Face Grinding

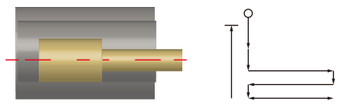


ID Grinding Cycle (using OD Grinding Cycle)

1. Plunge



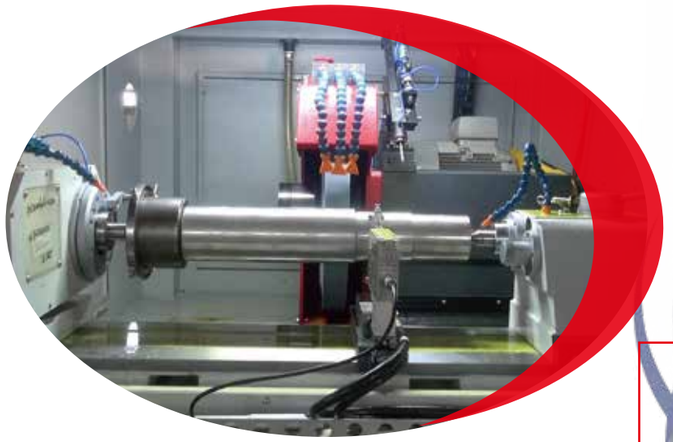
2. Traverse



Remarks :

1. All cycles can be separated into rough grinding and fine grinding cycles.
2. Plunge type end face grinding can be implemented by manual operation and offsets.
3. ID grinding coordinate display is not the same to the dimension of the workpiece
4. Multiple steps ID grinding can be implemented by manual operation.

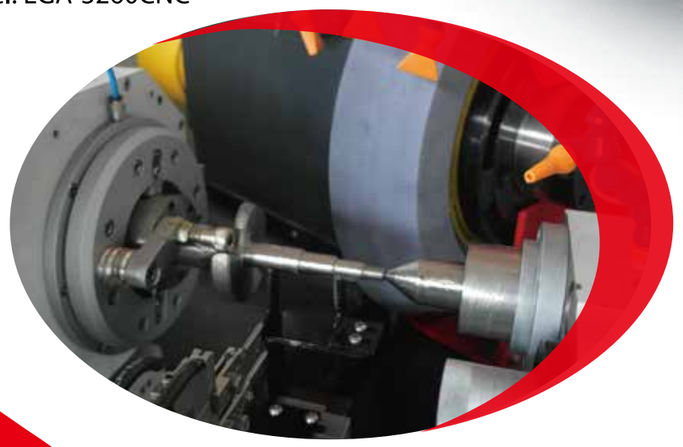
Spindle Shaft
Model: EGP-38200CNC

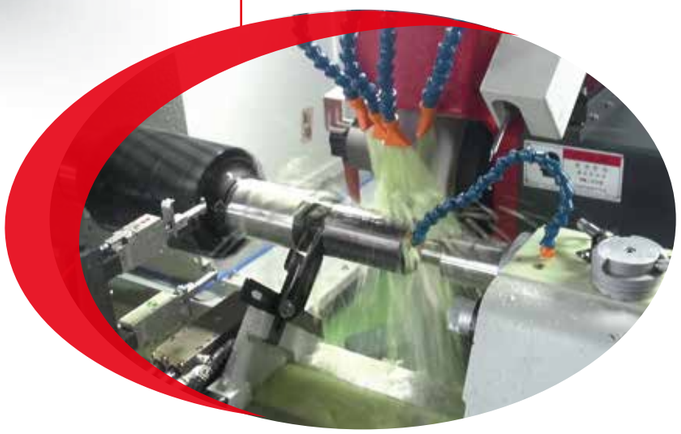


Rotor
Model: EGP-3260CNC

Printer Roller
Model: EGP-38200CNC

Crank Shaft
Model: EGA-3260CNC





Gear Box Helical Gear
Model: EGP-3260CNC

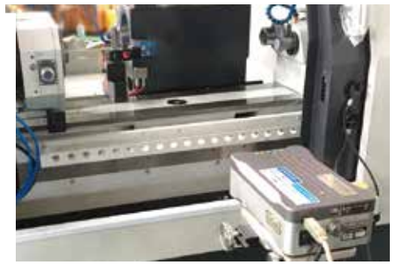
Quality Assurance

Accumulated inspection time of over 100 hours for each machine produced.

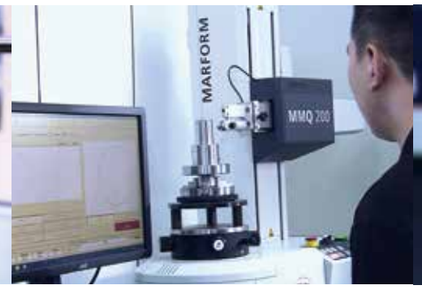
We know how it runs and we know how it is inspected

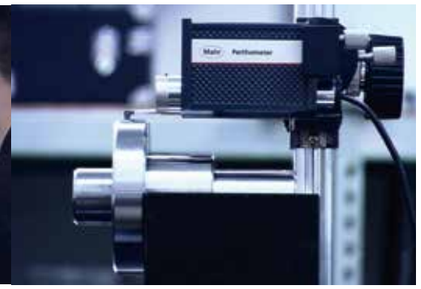
In-Process Inspections

(Wenzel CMM LH65)



Workpiece Inspections





Mitutoyo Profilemeter : C-4500
Mahr cylinder formtester: MMQ400
Mahr Surface Roughness Tester: PERTHOETER M2

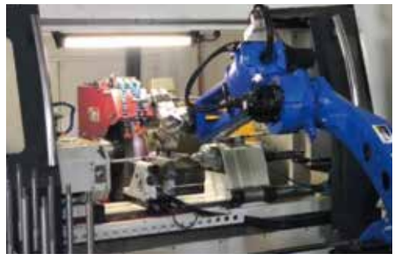
Automation Solutions

Due to our extensive engineering knowledge and vast supplier network, we can provide the best grinding solutions.

1. In Process Gauging/Automation

> General purpose production

2. Standard Automation Systems

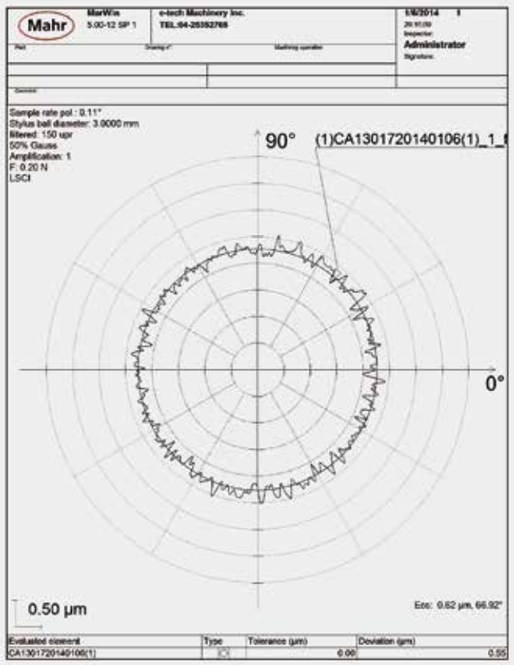


> Load / Unloading solutions
> Gantry Type and 6-axis Robot solution

3. Flexible Automation

> High Production Units
> Offers total solution for customized production process, grinders with the automation system, and turnkey operations.

MAHR MMQ400 Roundness Measurement



Specification : EGP Series

Model			EGP-3260	EGP-32100	EGP-32150	EGP-32200	EGP-32250	EGP-32300
Grinding Capacity	Swing over table	mm	Ø320	Ø320	Ø320	Ø320	Ø320	Ø320
	Distance between centers	mm	600	1000	1500	2000	2500	3000
	Max. grinding daimeter	mm	Ø300	Ø300	Ø300	Ø300	Ø300	Ø300
	Max. load held between center	kg	150	150	150	250	250	250
	Center distance between spindle & slide table	mm	162	162	162	162	162	162
Grinding Wheel	Diameter x Width x Bore	mm	Ø510x50-100xØ152.4(6") Opt.Ø510x50 ~ 100xØ203.2(8")					
	Motor rated power / max. torque	kW/Nm	7.5kW/49Nm(Opt.11kW/ 71Nm)					
	Wheel speed	rpm	1250 (Opt.1650)					
Workhead	Swiveling angle	deg	90					
	Spindle speed (infinite variable)	rpm	10 ~ 600					
	Motor rated power / max. torque	kW	1.5					
	Center taper	-	MT4 (Opt. MT5)					
	Spindle type	-	Fixed or Rotary					
	Diameter of bore	mm	Ø23					
Tailstock	Quill travel	mm	25 (Opt.50/75)					
	Cente taper	-	MT4 (Opt. MT5)					
X Axis	Travel	mm	270					
	Max. rapid feedrate	m/min	6					
	Heidenhain linear scale resolution	um	0.05					
	Min. increment	mm	0.0001					
	Servo motor rated power	kW	1.8(F)/2.2(M)					
Z Axis	Travel	mm	850	1250	1850	2450	3050	3650
	Swiveling angle	deg	±9	±7	±5	±5	±3	±2
	Max. rapid feedrate	m/min	10					
	Min. increment	mm	0.0001					
	Servo motor rated power	kW	1.8(F)/2.2(M)	1.8(F)/2.2(M)	2.5(F)/3.5(M)	2.5(F)/3.5(M)	2.5(F)/3.5(M)	2.5(F)/3.5(M)
Motor	Hydraulic pump	kW	0.38					
	Hydrodynamic GW spindle lubrication pump	kW	0.2					
	Guide way lubrication pump	kW	0.2					
	Coolant pump	kW	0.2					
Machine	Net Weight (semi-enclosed splash guard)	kg	5600	5900	6300	6700	7100	7500
	Gross Weight	kg	6400	6700	7100	7500	7900	8300

Model			EGP-3860	EGP-38100	EGP-38150	EGP-38200	EGP-38250	EGP-38300
Grinding Capacity	Swing over table	mm	Ø380	Ø380	Ø380	Ø380	Ø380	Ø380
	Distance between centers	mm	600	1000	1500	2000	2500	3000
	Max. grinding daimeter	mm	Ø360	Ø360	Ø360	Ø360	Ø360	Ø360
	Max. load held between center	kg	150	150	150	250	250	250
	Center distance between spindle & slide table	mm	192	192	192	192	192	192
Grinding Wheel	Diameter x Width x Bore	mm	Ø510x50-100xØ152.4(6") Opt.Ø610x50 ~ 100xØ203.2(8")					
	Motor rated power / max. torque	kW/Nm	7.5kW/49Nm(Opt.11kW/ 71Nm)					
	Wheel speed	rpm	1250 (Opt.1650)					
Workhead	Swiveling angle	deg	90					
	Spindle speed (infinite variable)	rpm	10 ~ 600					
	Motor rated power / max. torque	kW	1.5					
	Center taper	-	MT4 (Opt. MT5)					
	Spindle type	-	Fixed or Rotary					
	Diameter of bore	mm	Ø23					
Tailstock	Quill travel	mm	25 (Opt.50/75)					
	Cente taper	-	MT4 (Opt. MT5)					
X Axis	Travel	mm	270					
	Max. rapid feedrate	m/min	6					
	Heidenhain linear scale resolution	um	0.05					
	Min. increment	mm	0.0001					
	Servo motor rated power	kW	1.8(F)/2.2(M)					
Z Axis	Travel	mm	850	1250	1850	2450	3050	3650
	Swiveling angle	deg	±9	±7	±5	±5	±3	±2
	Max. rapid feedrate	m/min	10					
	Min. increment	mm	0.0001					
	Servo motor rated power	kW	1.8(F)/2.2(M)	1.8(F)/2.2(M)	2.5(F)/3.5(M)	2.5(F)/3.5(M)	2.5(F)/3.5(M)	2.5(F)/3.5(M)
Motor	Hydraulic pump	kW	0.38					
	Hydrodynamic GW spindle lubrication pump	kW	0.2					
	Guide way lubrication pump	kW	0.2					
	Coolant pump	kW	0.2					
Machine	Net Weight (semi-enclosed splash guard)	kg	5700	6000	6400	6800	7200	7600
	Gross Weight	kg	6500	6800	7200	7600	8000	8400

Standard Accessories

- Infinite variable workhead w/servo motor
- Diamond Dresser and Stand
- Automatic wheel speed change (15 steps)
- Carbide tip center
- X Axis Heidenhain/Mitsubishi linear scale (resolution 0.05 um)
- Levelling bolts and blocks
- Operation manual and part lists
- Fanuc CNC Controller (0i TF)
- Grinding Wheel + Wheel Flange
- Standard oil cooler (cooling fan)
- Standard coolant tank 140L
- MPG handwheel 2 Axes control
- Touch probe (for EGA series only)
- LED working light
- Tools and Tool Box
- Electricity cabinet w/ heat exchanger
- Semi-enclosed splash guard
- Wheel Extractor
- 4-color indication signal light
- Electrical wiring diagram
- Roller type balancing stand/ arbor

* E-tech reserves the right to change specifications without notice

Optional Accessories

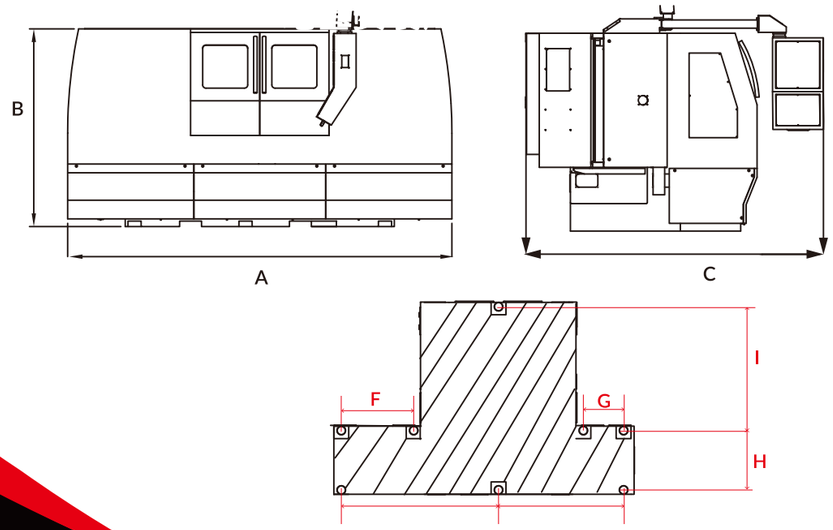
- BS VM25 Integration system (OD gauging+ crash & gap control + dynamic balance system)
- BS VM15 Integration system (OD gauging+ crash & gap control)
- Hydraulic tailstock (w/ foot pedal)
- Z Axis linear scale (resolution 0.05 um)
- Manual grinding wheel balance system (vibrator)
- Grinding wheel dynamic (balance system)
- Wheel spindle lubrication oil cooler for hydrodynamic spindle
- Gap & crash control device
- Safety door lock
- Workhead spindle adjustment arbor
- Auto gauging device
- Coolant system with magnetic separator & paper filter
- Coolant system with magnetic separator
- Coolant system with paper filter
- Oil & mist collecting system
- Spare grinding wheel flange
- Full-Carbide center tip
- FANUC 0i-TF i-Grind program
- Mitsubishi controller (M80) i-Grind program
- Electrical cabinet air conditioner
- Internal grinding attachment (for EGP series only)
- Workhead upgrade to MT4 or MT5
- Tailstock upgrade to MT4 or MT5
- Automatic 3-jaw hydraulic chuck
- CE standard electrical cabinet
- Touch probe
- Transformer
- Workpiece carrier
- Full-enclosed splash guard
- Workpiece supporting seat, 2pc / set
- 2 Point Steady Rest
- 3-point steady rest
- 3-jaw scroll chuck
- 4-jaw scroll chuck

Specification : EGA Series

Model			EGA-3260	EGA-32100	EGA-32150	EGA-32200	EGA-32250	EGA-32300
Grinding	Swing over table	mm	Ø320	Ø320	Ø320	Ø320	Ø320	Ø320
Capacity	Distance between centers	mm	600	1000	1500	2000	2500	3000
	Max. grinding diameter	mm	Ø300	Ø300	Ø300	Ø300	Ø300	Ø360
	Max. grinding length - dresser on workhead side	mm	450	850	1350	1850	2350	2850
	- dresser on tailstock side (Opt.)	mm	600	1000	1500	2000	2500	3000
	Max. load held between center	kg	150	150	150	250	250	250
	Center distance between spindle and slide table	mm	162	162	162	162	162	162
Grinding	Infeed angle	deg	60	60	60	60	60	60
Wheel	Diameter x Width x Bore	mm	Ø510x50-100xØ152.4 (6") Opt. Ø510x50 ~ 100xØ203.2 (8")					
	Motor rated power / max. torque	kW/Nm	7.5kW/49Nm(Opt.11kW/ 71Nm)					
	Wheel speed	rpm	1250 (Opt.1650)					
Workhead	Swiveling angle	deg	90					
	Spindle speed (infinite variable)	rpm	10 ~ 600					
	Motor rated power / max. torque	kW	1.3(Opt.1.8)					
	Center taper	-	MT4 (Opt. MT5)					
	Spindle type	-	Fixed or Rotary					
	Diameter of bore	mm	Ø23					
Tailstock	Quill travel	mm	25 (Opt.50/75)		50 (Opt.75)			75
	Cente taper	-	MT4 (Opt. MT5)					
X Axis	Travel	mm	270					
	Max. rapid feedrate	m/min	6					
	Heidenhain linear scale resolution	um	0.05					
	Min. increment	mm	0.0001					
	Servo motor rated power	kw	1.8(F)/2.2(M)					
Z Axis	Travel	mm	850	1250	1850	2450	3050	3600
	Swiveling angle	deg	±9	±7	±5	±5	±3	±3
	Max. rapid feedrate	m/min	10					
	Min. increment	mm	0.0001					
	Servo motor rated power	kW	2.5(F)/3.5(M)					
Motor	Hydraulic pump	kW	0.38					
	Hydrodynamic GW spindle lubrication pump	kW	0.2					
	Guide way lubrication pump	kW	0.2					
	Coolant pump	kW	0.2					
Machine	Net Weight (semi-enclosed splash guard)	kg	5600	5900	6300	6700	7100	7500
	Gross Weight	kg	6400	6700	7100	7500	7900	8300

Model			EGA-3860	EGA-38100	EGA-38150	EGA-38200	EGA-38250	EGA-38300
Grinding	Swing over table	mm	Ø380	Ø380	Ø380	Ø380	Ø380	Ø380
Capacity	Distance between centers	mm	600	1000	1500	2000	2500	3000
	Max. grinding diameter	mm	Ø360	Ø360	Ø360	Ø360	Ø360	Ø360
	Max. grinding length - dresser on workhead side	mm	450	850	1350	1850	2350	2850
	- dresser on tailstock side (Opt.)	mm	600	1000	1500	2000	2500	3000
	Max. load held between center	kg	150	150	150	250	250	250
	Center distance between spindle and slide table	mm	192	192	192	192	192	192
Grinding	Infeed angle	deg	60	60	60	60	60	60
Wheel	Diameter x Width x Bore	mm	Ø510x50-100xØ152.4 (6") Opt. Ø610x50 ~ 100xØ203.2 (8")					
	Motor rated power / max. torque	kW/Nm	7.5kW/49Nm (Opt.11kW/ 71Nm)					
	Wheel speed	rpm	1250 (Opt.1650)					
Workhead	Swiveling angle	deg	90					
	Spindle speed (infinite variable)	rpm	10 ~ 600					
	Motor rated power / max. torque	kW	1.3 (Opt.1.8)					
	Center taper	-	MT4 (Opt. MT5)					
	Spindle type	-	Fixed or Rotary					
	Diameter of bore	mm	Ø23	Ø23	Ø23	Ø23	Ø23	Ø65
Tailstock	Quill travel	mm	25 (Opt.50/75)		50 (Opt.75)			75
	Cente taper	-	MT4 (Opt. MT5)					
X Axis	Travel	mm	270					
	Max. rapid feedrate	m/min	6					
	Heidenhain linear scale resolution	um	0.05					
	Min. increment	mm	0.0001					
	Servo motor rated power	kW	1.8(F)/2.2(M)					
Z Axis	Travel	mm	850	1250	1850	2450	3050	3600
	Swiveling angle	deg	±9	±7	±5	±5	±3	±3
	Max. rapid feedrate	m/min	10					
	Min. increment	mm	0.0001					
	Servo motor rated power	kW	2.5(F)/3.5(M)					
Motor	Hydraulic pump	kW	0.38					
	Hydrodynamic GW spindle lubrication pump	kW	0.2					
	Guide way lubrication pump	kW	0.2					
	Coolant pump	kW	0.2					
Machine	Net Weight (semi-enclosed splash guard)	kg	5700	6000	6400	6800	7200	7600
	Gross Weight	kg	6500	6800	7200	7600	8000	8400

Measurement



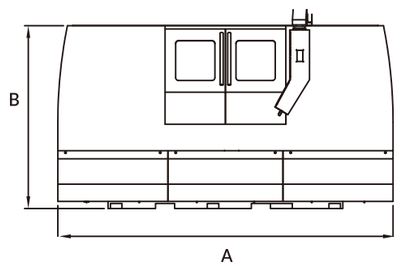
EGP	A	B	C	D	E	F	G	H	I
3260	3500	1800	2760	1270	1010	585	325	480	1000
32100	4300	1800	2760	1670	1410	985	725	480	1000
32150	5600	1800	2760	2270	2010	1585	1325	480	1000
32200	7124	1800	2850	2890	2630	2205	1945	560	1000
32250	8124	1800	2850	3390	3150	2700	2445	560	1000
32300	10060	1800	2850	3890	3630	3205	2945	560	1000
3860	3500	1800	2760	1270	1010	585	325	480	1000
38100	4300	1800	2760	1670	1410	985	725	480	1000
38150	5600	1800	2760	2270	2010	1585	1325	480	1000
38200	7055	1930	2665	2890	2630	2205	1945	560	1000
38250	8560	1800	2850	3390	3150	2700	2445	560	1000
38300	10025	2095	2850	4075	3820	3375	3115	560	1000

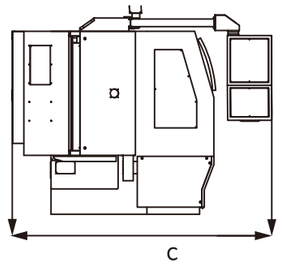
EGA	A	B	C	D	E	F	G	H	I
3260	3500	1800	2760	1270	1010	585	325	480	1000
32100	4300	1800	2760	1670	1410	985	725	480	1000
32150	5600	1800	2760	2270	2010	1585	1325	480	1000
32200	7055	1930	2665	2630	2890	1945	2205	560	1000
32250	8055	1930	2665	2630	2890	1945	2205	560	1000
32300	10025	2095	2850	4075	3820	3375	3115	560	1000
3860	3500	1800	2760	1270	1010	585	325	480	1000
38100	4300	1800	2760	1670	1410	985	725	480	1000
38150	5600	1800	2760	2270	2010	1585	1325	480	1000
38200	7055	1930	2665	2630	2890	1945	2205	560	1000
38250	8055	1930	2665	2630	2890	1945	2205	560	1000
38300	10025	2095	2850	4075	3820	3375	3115	560	1000

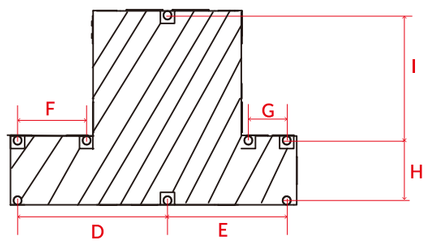
Specification : EGP-A Series

Model			EGP-3260A	EGP-32100A	EGP-32150A	EGP-38150A	EGP-38150A	EGP-38150A
Grinding Capacity	Swing over table	mm	Ø320	Ø320	Ø320	Ø380	Ø380	Ø380
	Distance between centers	mm	600	1000	1500	600	1000	1500
	Max. grinding diameter	mm	Ø300	Ø300	Ø300	Ø360	Ø360	Ø360
	Max. grinding length	kg	150	150	150	150	150	150
	Max. load held between center	mm	162	162	162	192	192	192
	Center distance between spindle & slide table	mm						
Grinding	Diameter x Width x Bore	mm	Ø510x50-75xØ152.4(6")			Ø510x50-75xØ152.4(6")		
Workhead	Motor rated power / max. torque	kW/Nm	7.5Kw/49Nm (Opt.11Kw/ 71Nm)			7.5kw/49Nm(Opt.11Kw/ 71Nm)		
	Wheel speed	rpm	1250 (Opt.1650)			1250 (Opt.1650)		
	Swiveling angle	deg	90			90		
	Spindle speed (infinite variable)	rpm	10～600			10～600		
	Motor rated power / max. torque	kW	1.3 (Opt.1.8)			1.3 (Opt.1.8)		
	Center taper	-	MT4 (Opt. MT5)			MT4 (Opt. MT5)		
	Spindle type	-	定心及同動			定心及同動		
	Diameter of bore	mm	Ø23			Ø23		
Tailstock	Quill travel	mm	25 (Opt.50/75)		50 (Opt.75)	25 (Opt.50/75)		50 (Opt.75)
	Center taper	-	MT4 (Opt. MT5)			MT4 (Opt. MT5)		
X Axis	Travel	mm	270			270		
	Max. rapid feedrate	m/min	6			6		
	Heidenhain liner scale resolution	um	0.05			0.05		
	Min. increment	mm	0.0001			0.0001		
	Servo motor rated power	kW	1.8(F)/2.2(M)			1.8(F)/2.2(M)		
Z Axis	Travel	mm	850	1250	1850	850	1250	1850
	Swiveling angle	deg	±9	±7	±5	±9	±7	±5
	Max. rapid feedrate	m/min		10			10	
	Min. increment	mm		0.0001			0.0001	
Motor	Servo motor rated power	kW	1.8(F)/2.2(M)		2.5(F)/3.5(M)	1.8(F)/2.2(M)		2.5(F)/3.5(M)
	Hydraulic pump	kW		0.38			0.38	
	Hydrodynamic GW spindle lubrication pump	kW		0.2			0.2	
	Guide way lubrication pump	kW		0.2			0.2	
Machine	Coolant pump	kW		0.2			0.2	
	Net Weight (semi-enclosed splash guard)	kg	6000	7000	8200	6200	7200	8400
	Gross Weight	kg	6500	7600	8900	6700	7800	9100

Measurement







EGP-A	A	B	C	D	E	F	G	H	I
3260	3700	1800	2760	1270	1010	585	325	480	1000
32100	4500	1800	2760	1670	1410	985	725	480	1000
32150	5800	1800	2760	2270	2010	1585	1325	480	1000
3860	3700	1800	2760	1270	1010	585	325	480	1000
38100	4500	1800	2760	1670	1410	985	725	480	1000
38150	5800	1800	2760	2270	2010	1585	1325	480	1000

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