

3 of the best springs



iSpeed3

NAKANISHI INC. 2022



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PR-K368E Ver.1 2022-02-28 03. 440

※Specifications and design are subject to change without notice.


SERIES **iSpeed3**
ULTRA-HIGH-SPEED & SUPER-PRECISION

The Finger Tips


You can arrange this finger spindle as you wish and realize a magical machining

Max. power 140W, Max. rpm 80,000min⁻¹


Max. power 150W, Max. rpm 60,000min⁻¹

 **Spindle accuracy within 1 μm**

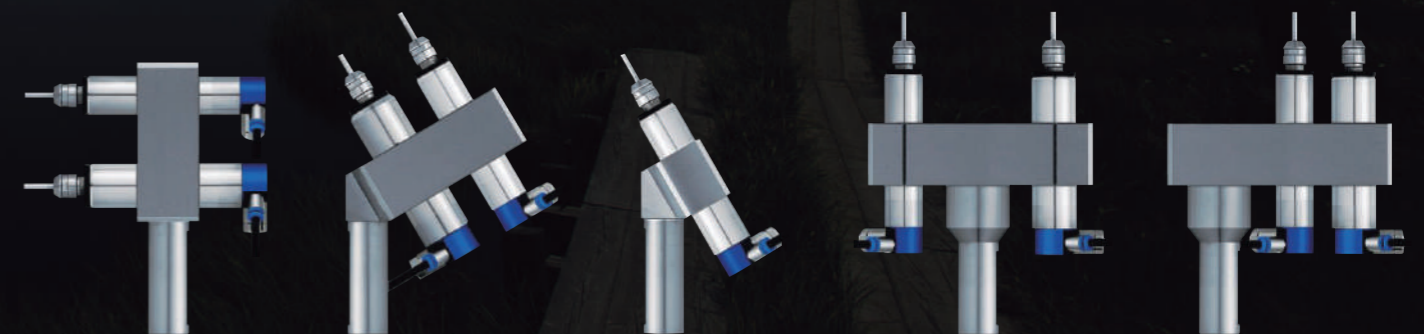
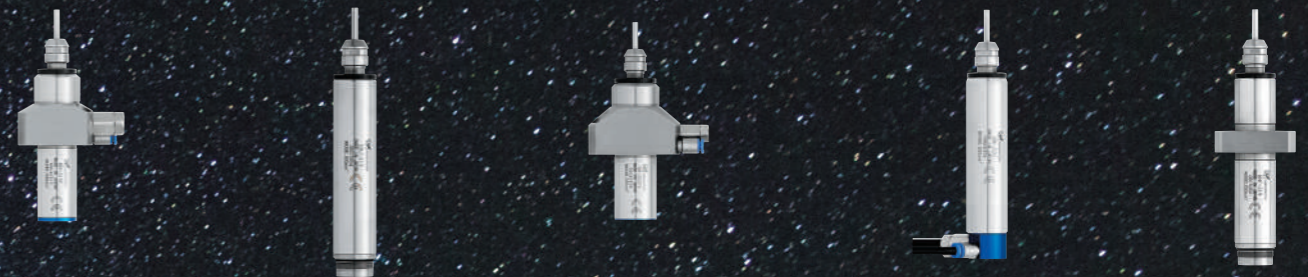
- Optimum for high-precision machining
- Longer tool life

 **Ceramic Bearing**

- Longer bearing life
- Higher rigidity for heavy cutting

 **Brushless motor**

- No need to replace carbon brushes to enable maintenance-free operation
- Carbon brush dust will no longer penetrate the bearing to extend the product life



Index

Flange type motor spindle

BM-319F p.5
With 50cm joint cord
Max.rpm 80,000min⁻¹



BM-320F p.5
With 50cm joint cord
Max.rpm 80,000min⁻¹



BM-322FL p.7
With 50cm joint cord
Max.rpm 60,000min⁻¹



BM-322FR p.7
With 50cm joint cord
Max.rpm 60,000min⁻¹



BM-322FS p.9
With 50cm joint cord
Max.rpm 60,000min⁻¹



BMF-319 p.11
Max.rpm 80,000min⁻¹



Straight type motor spindle

BMJ-319 p.13
Max.rpm 80,000min⁻¹



BMJ-320 p.13
Max.rpm 80,000min⁻¹



BMJ-322 p.15
Max.rpm 60,000min⁻¹



BM-319 p.17
With 50cm joint cord
Max.rpm 80,000min⁻¹



BM-320 p.17
With 50cm joint cord
Max.rpm 80,000min⁻¹



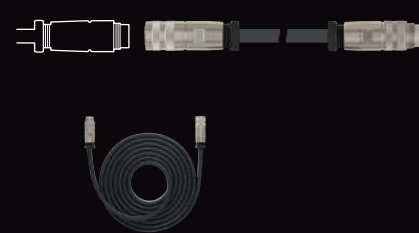
BM-322 p.19
With 50cm joint cord
Max.rpm 60,000min⁻¹



Motor cord

1. Joint type

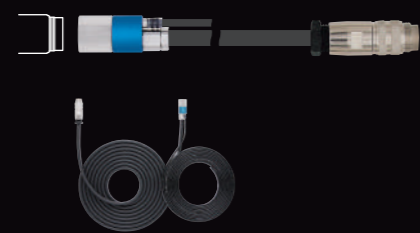
[Feature] Connection possible out of the machine
[Length] 3m, 5m, 7m



EMCD-BM3 p.22
Joint type motor cord

2. Straight type

[Feature] Connection at the body end
[Length] 4m, 6m, 8m



EMCD-BM3S p.22
Straight type motor cord

3. Angle type

[Feature] Connection at the body end into 90° degrees
[Length] 4m, 6m, 8m



EMCD-BM3A p.22
Angle type motor cord

Controller

iSpeed3 CONTROLLER
Controller p.21

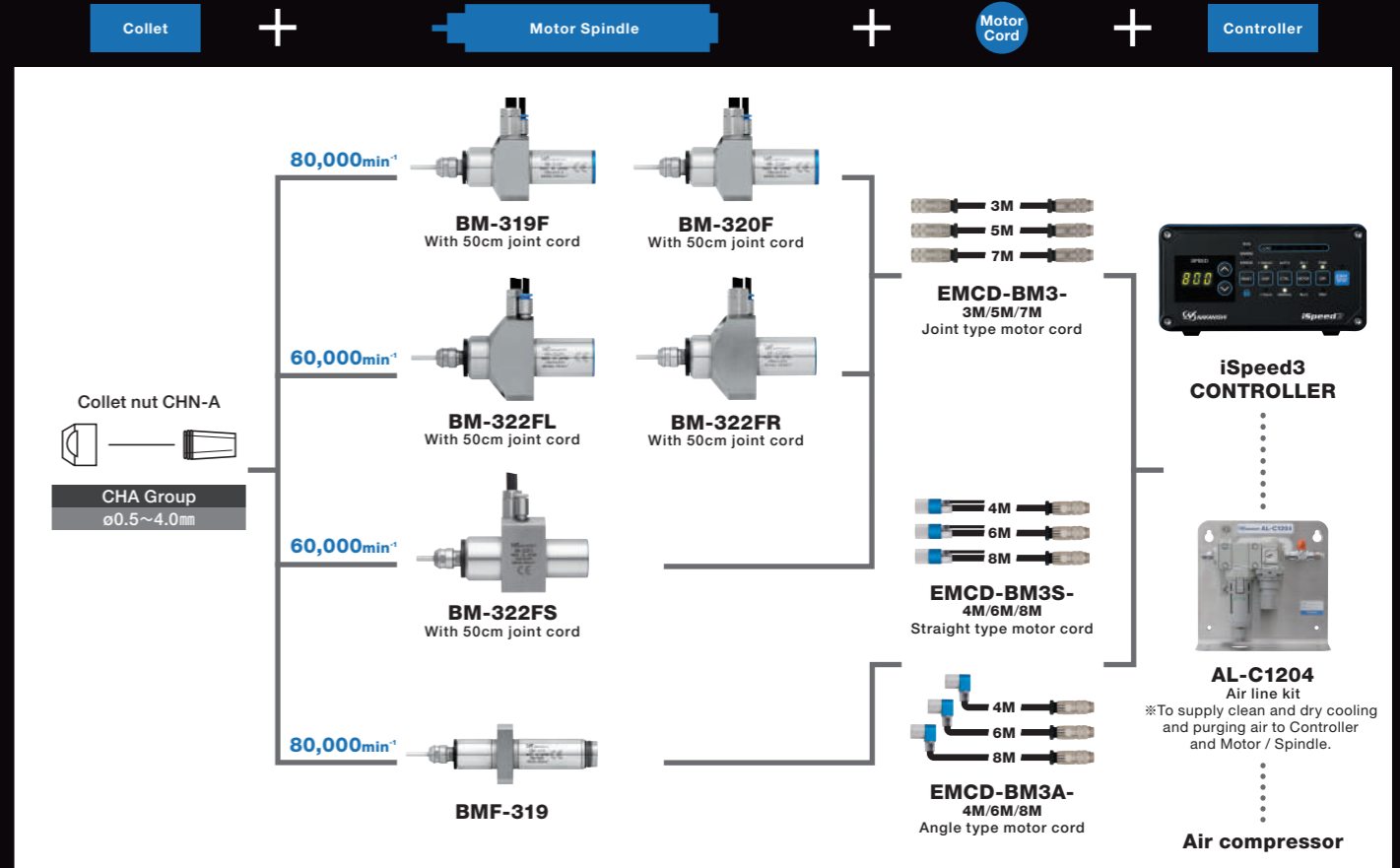
Accessories

AL-C1204
Air line kit p.22

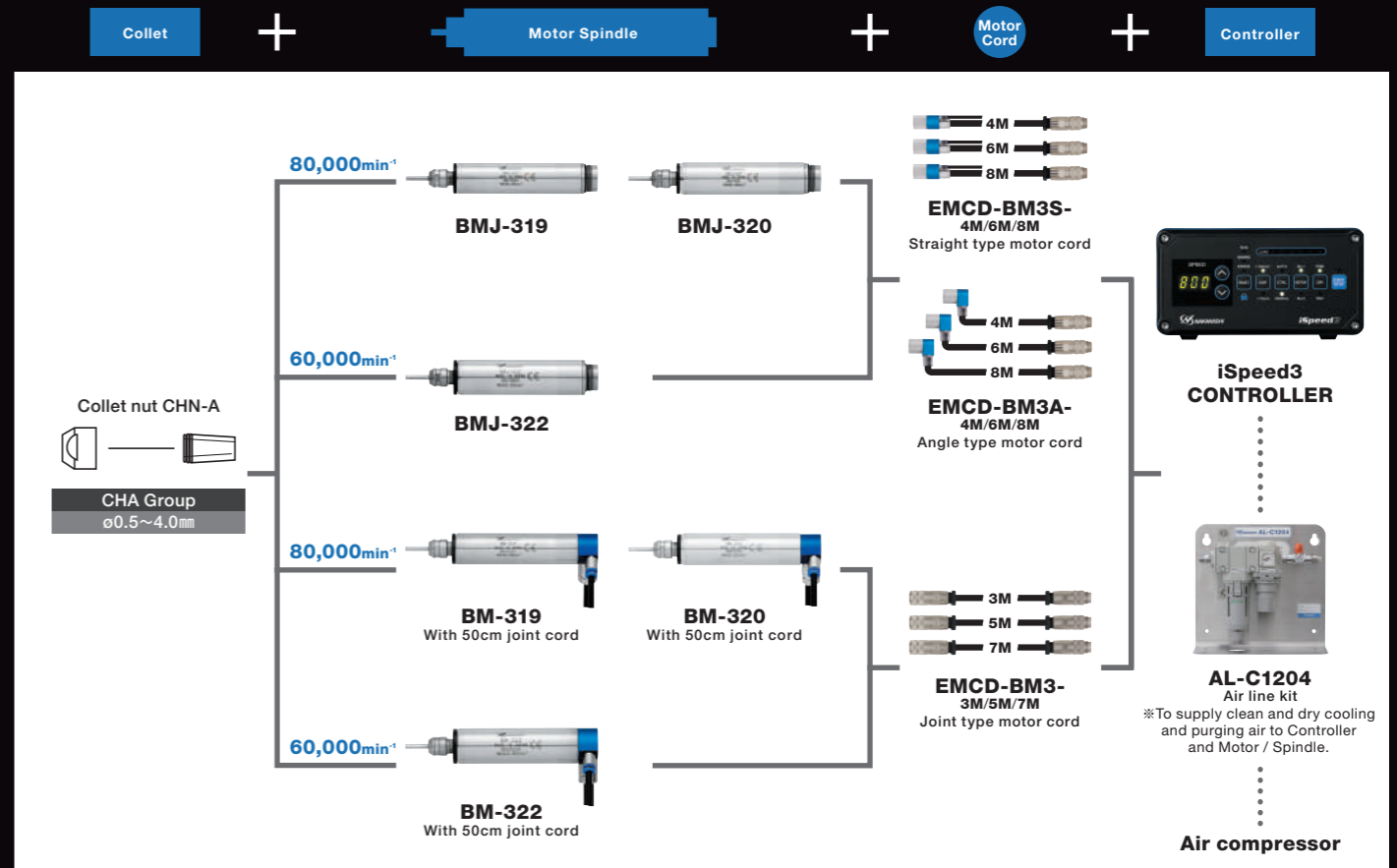
CHA / CHN-A
Collet / Collet nut p.23

System Chart

Flange type motor spindle



Straight type motor spindle



Spindle Guide



BM-319F



BM-320F



EMCD-BM3



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AL-C1204

iSpeed3 SERIES

Shown In Actual Size

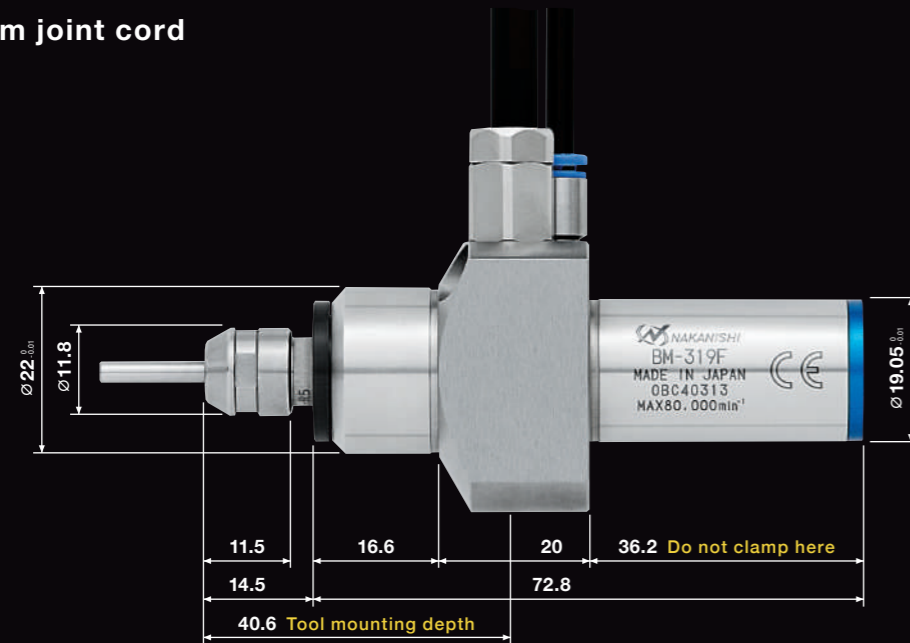
Flange type motor spindle

BM-319F

With 50cm joint cord



O.D. ϕ 19.05mm

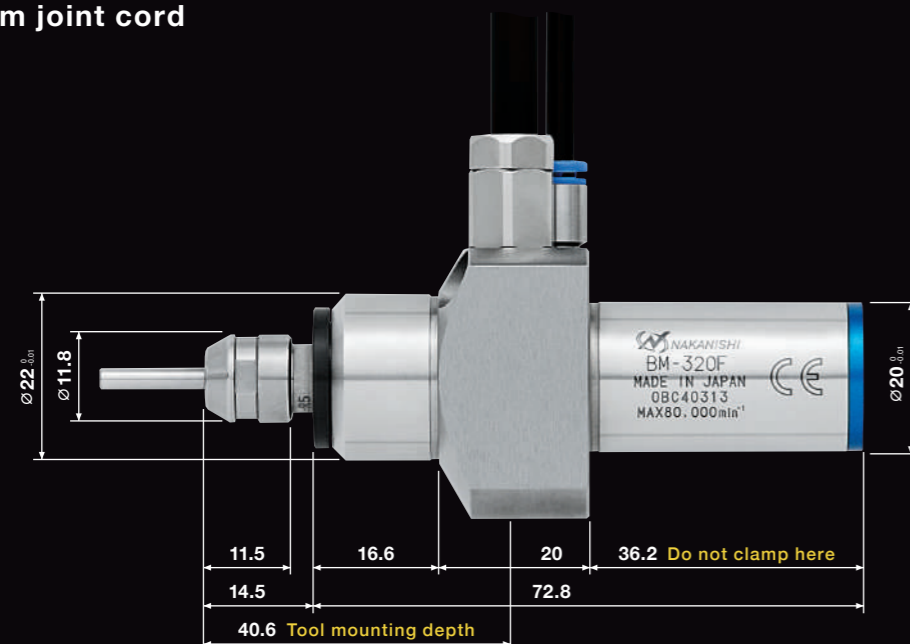


BM-320F

With 50cm joint cord



O.D. ϕ 20mm



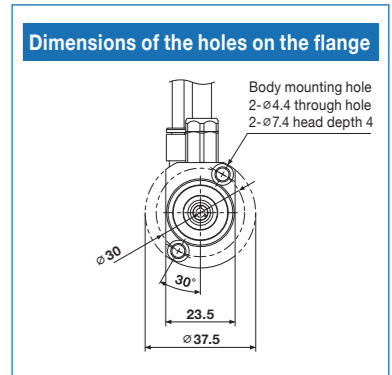
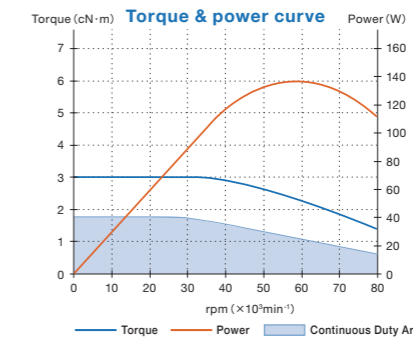
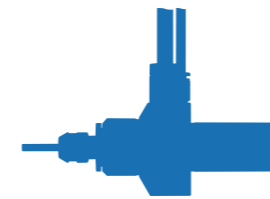
Specifications

DXF data DXF files are available on our website

Order by Code No.

BM-319F

Code No. **7813** Model **BM-319F**

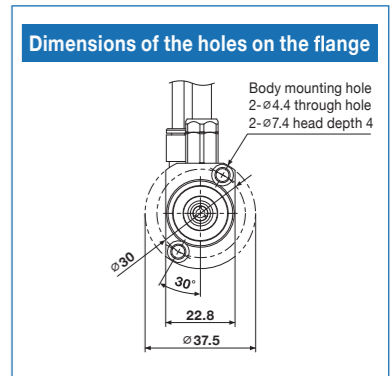
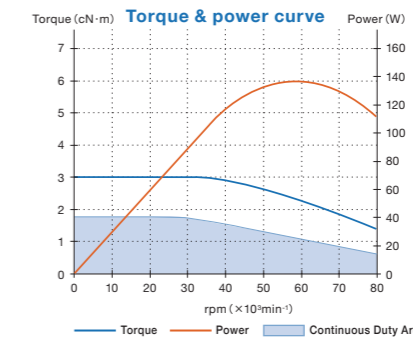
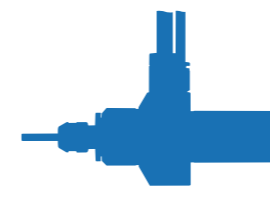


O.D.	Max. rpm	Max. power	Spindle Accuracy	Weight
ϕ 19.05mm	80,000 min^{-1}	140w	Within1 μm	260g
Standard Accessories	Collet nut (CHN-A) / Wrench (8 \times 5) · (9 \times 11) : 1pc. each / Bolt : 2pcs. (M4 \times L25)			
Options	Collet (CHA Group) : ϕ 0.5~ ϕ 4.0mm p.23 Motor cord : Length 3m (9261), 5m (9262), 7m (9263)			

※ Cord length L=0.5m
※ Collet is sold separately.

BM-320F

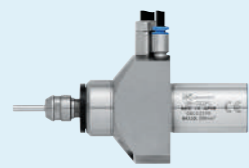
Code No. **7816** Model **BM-320F**



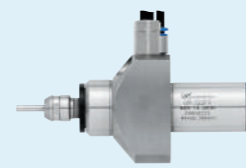
O.D.	Max. rpm	Max. power	Spindle Accuracy	Weight
ϕ 20mm	80,000 min^{-1}	140w	Within1 μm	270g
Standard Accessories	Collet nut (CHN-A) / Wrench (8 \times 5) · (9 \times 11) : 1pc. each / Bolt : 2pcs. (M4 \times L25)			
Options	Collet (CHA Group) : ϕ 0.5~ ϕ 4.0mm p.23 Motor cord : Length 3m (9261), 5m (9262), 7m (9263)			

※ Cord length L=0.5m
※ Collet is sold separately.

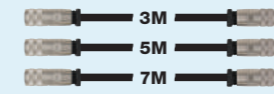
Spindle Guide



BM-322FL



BM-322FR



EMCD-BM3



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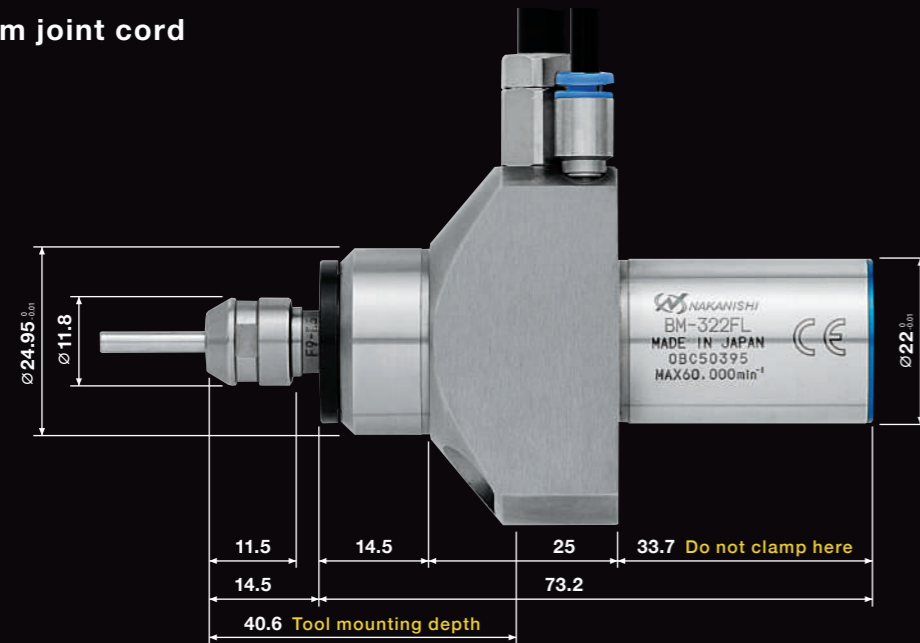
Shown In Actual Size

Flange type motor spindle

BM-322FL
With 50cm joint cord



O.D. ϕ 22mm



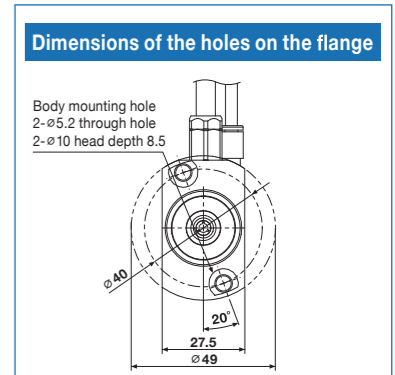
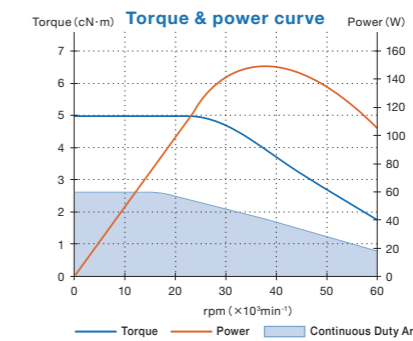
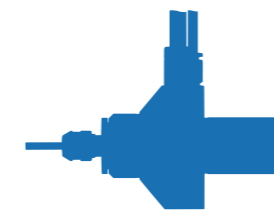
Specifications

DXF data DXF files are available on our website

Order by Code No.

BM-322FL

Code No. **7815** Model **BM-322FL**



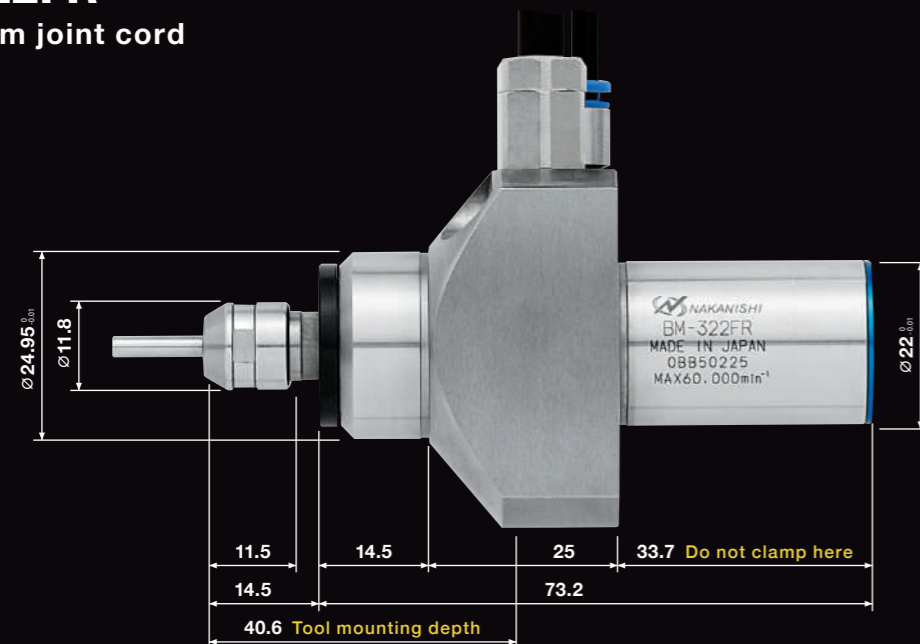
O.D.	Max. rpm	Max. power	Spindle Accuracy	Weight
ϕ 22mm	60,000min ⁻¹	150w	Within1 μ m	360g
Standard Accessories	Collet nut (CHN-A) / Wrench (8×5) · (9×11) : 1pc. each / Bolt : 2pcs. (M5×L25)			
Options	Collet (CHA Group) : ϕ 0.5~ ϕ 4.0mm p.23 Motor cord : Length 3m (9261), 5m (9262), 7m (9263)			

※ Cord length L=0.5m
※ Collet is sold separately.

BM-322FR
With 50cm joint cord

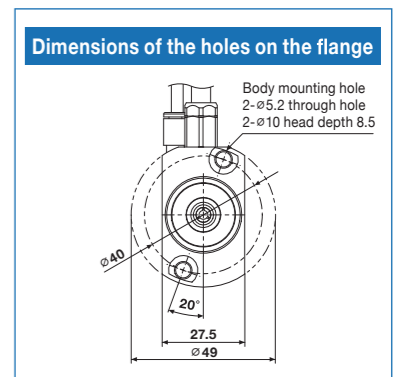
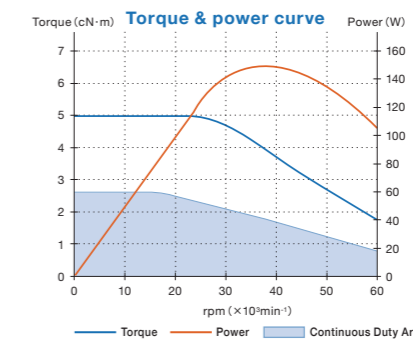
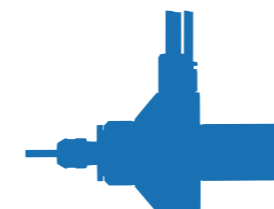


O.D. ϕ 22mm



BM-322FR

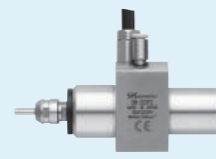
Code No. **7817** Model **BM-322FR**



O.D.	Max. rpm	Max. power	Spindle Accuracy	Weight
ϕ 22mm	60,000min ⁻¹	150w	Within1 μ m	360g
Standard Accessories	Collet nut (CHN-A) / Wrench (8×5) · (9×11) : 1pc. each / Bolt : 2pcs. (M5×L25)			
Options	Collet (CHA Group) : ϕ 0.5~ ϕ 4.0mm p.23 Motor cord : Length 3m (9261), 5m (9262), 7m (9263)			

※ Cord length L=0.5m
※ Collet is sold separately.

Spindle Guide



BM-322FS



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iSpeed3 SERIES

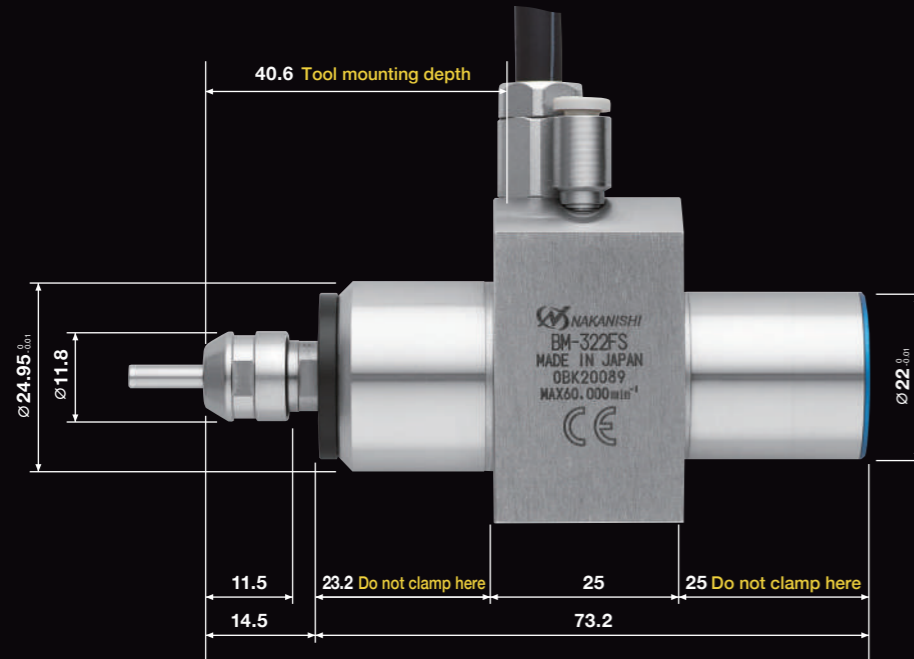
Shown In Actual Size

Flange type motor spindle

BM-322FS
With 50cm joint cord



O.D. 22mm



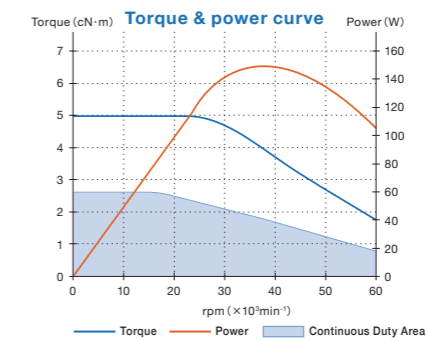
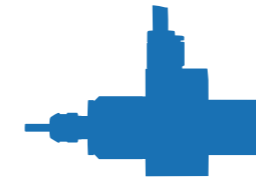
Specifications

DXF data DXF files are available on our website

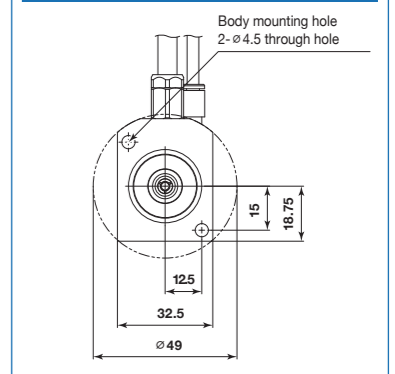
Order by Code No.

BM-322FS

Code No. **7823** Model **BM-322FS**



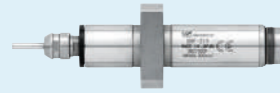
Dimensions of the holes on the flange



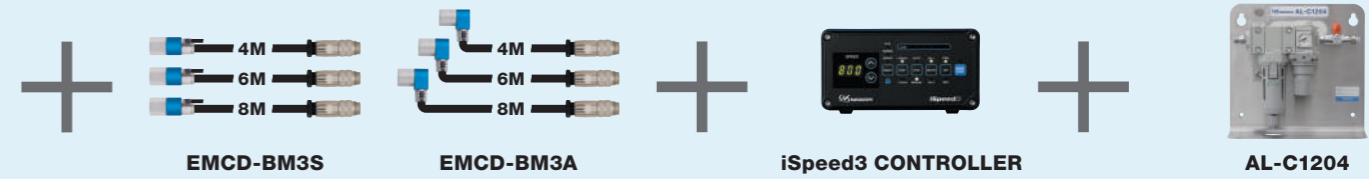
O.D.	Max. rpm	Max. power	Spindle Accuracy	Weight
$\varnothing 22 \text{mm}$	60,000 min^{-1}	150w	Within 1 μm	430g
Standard Accessories	Collet nut (CHN-A) / Wrench (8×5) · (9×11) : 1pc. each / Bolt : 2pcs. (M4×L35)			
Options	Collet (CHA Group) : $\varnothing 0.5 \sim \varnothing 4.0 \text{mm}$ p.23 Motor cord : Length 3m (9261), 5m (9262), 7m (9263)			

※ Cord length L=0.5m
※ Collet is sold separately.

Spindle Guide



BMF-319



iSpeed3 SERIES

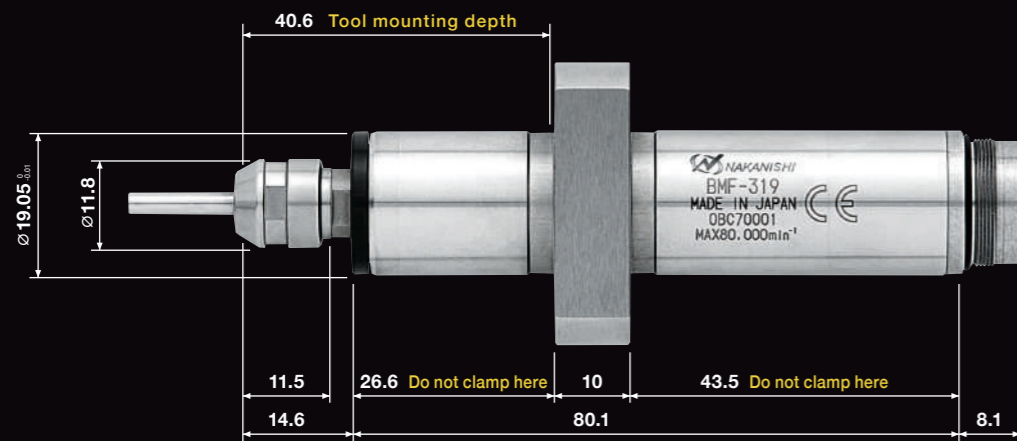
Shown In Actual Size

Flange type motor spindle

BMF-319



O.D. ϕ 19.05mm



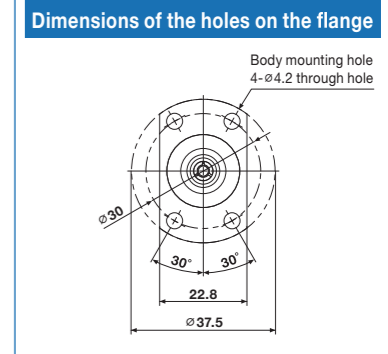
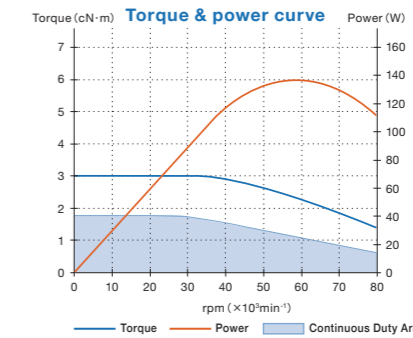
Specifications

DXF data DXF files are available on our website

Order by Code No.

BMF-319

Code No. **7822** Model **BMF-319**



O.D.	Max. rpm	Max. power	Spindle Accuracy	Weight
ϕ 19.05mm	80,000min ⁻¹	140w	Within1 μ m	180g
Standard Accessories	Collet nut (CHN-A) / Wrench (8×5) · (9×11) : 1pc. each / Bolt : 2pcs. (M4×L16)			
Options	Collet (CHA Group) : ϕ 0.5~ ϕ 4.0mm p.23			
	Motor cord (Straight) : Length 4m (9264), 6m (9265), 8m (9266)			
	Motor cord (Angle) : Length 4m (9267), 6m (9268), 8m (9269)			

※ Collet is sold separately.

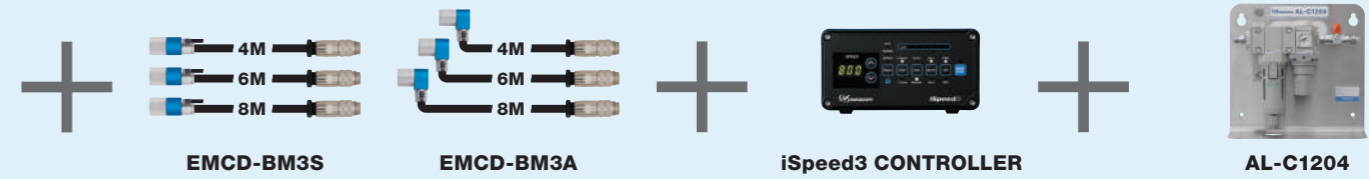
Spindle Guide



BMJ-319



BMJ-320



iSpeed3 SERIES

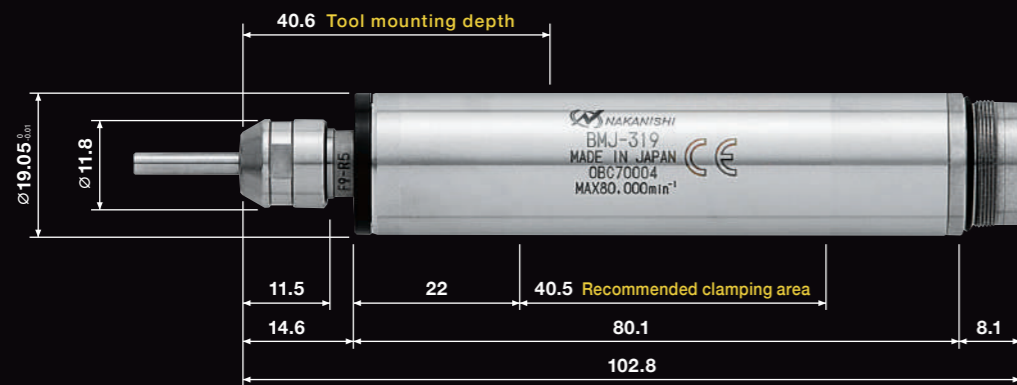
Shown In Actual Size

Straight type motor spindle

BMJ-319

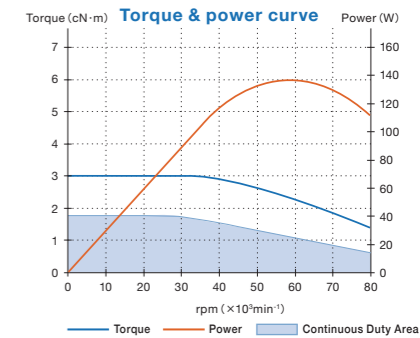


O.D. ϕ 19.05mm



BMJ-319

Code No. **7819** Model **BMJ-319**



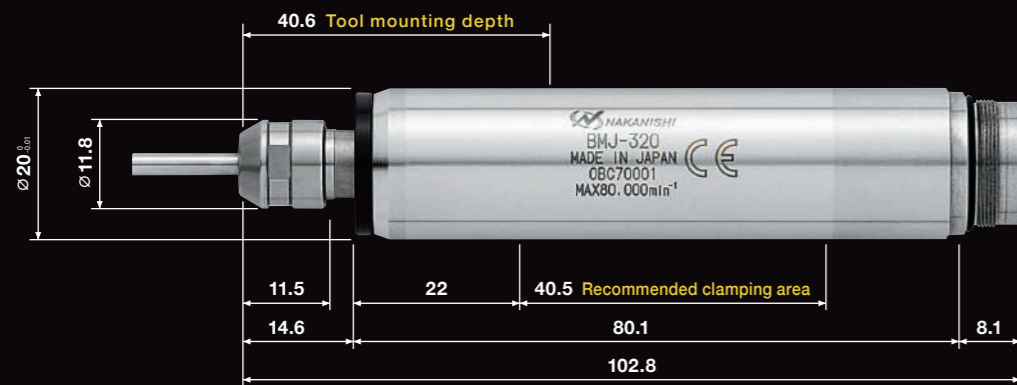
O.D.	Max. rpm	Max. power	Spindle Accuracy	Weight
ϕ 19.05mm	80,000min ⁻¹	140w	Within1 μ m	145g
Standard Accessories	Collet nut (CHN-A) / Wrench (8×5) · (9×11) : 1pc. each			
Options	Collet (CHA Group) : ϕ 0.5~ ϕ 4.0mm p.23 Motor cord (Straight) : Length 4m (9264), 6m (9265), 8m (9266) Motor cord (Angle) : Length 4m (9267), 6m (9268), 8m (9269)			

※ Collet is sold separately.

BMJ-320

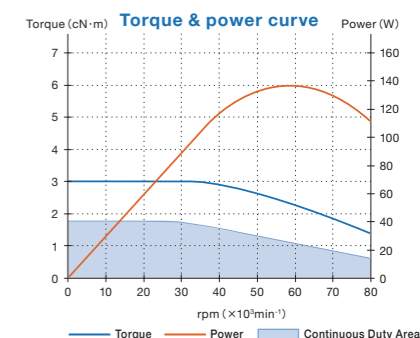


O.D. ϕ 20mm



BMJ-320

Code No. **7820** Model **BMJ-320**

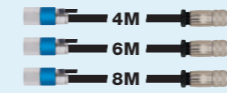


O.D.	Max. rpm	Max. power	Spindle Accuracy	Weight
ϕ 20mm	80,000min ⁻¹	140w	Within1 μ m	160g
Standard Accessories	Collet nut (CHN-A) / Wrench (8×5) · (9×11) : 1pc. each			
Options	Collet (CHA Group) : ϕ 0.5~ ϕ 4.0mm p.23 Motor cord (Straight) : Length 4m (9264), 6m (9265), 8m (9266) Motor cord (Angle) : Length 4m (9267), 6m (9268), 8m (9269)			

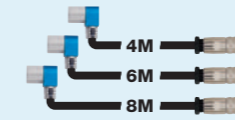
※ Collet is sold separately.

Spindle
Guide

BMJ-322



EMCD-BM3S



EMCD-BM3A



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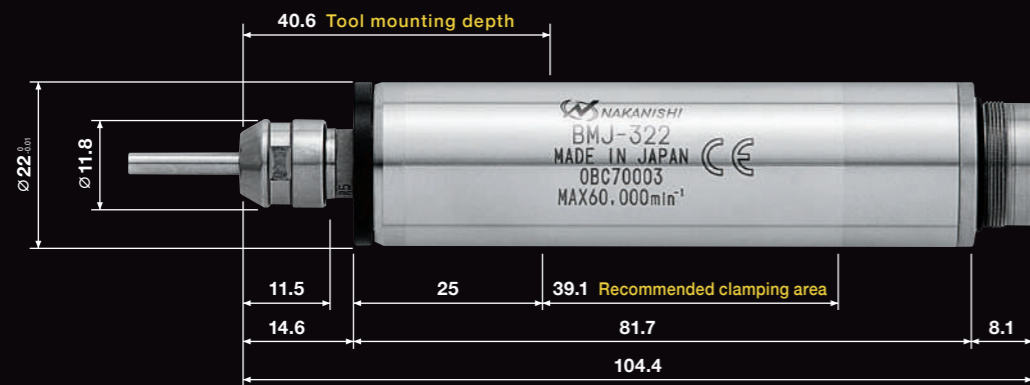
AL-C1204

iSpeed3 SERIES

Shown In Actual Size

Straight type motor spindle

BMJ-322

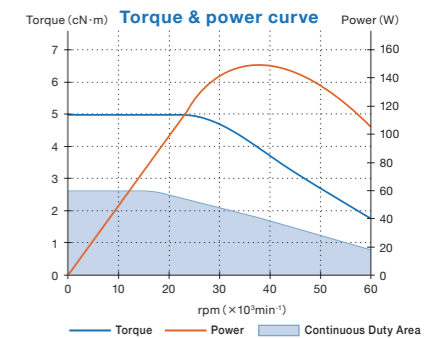
O.D. ϕ 22mm

Specifications

DXF data DXF files are available on our website

Order by Code No.

BMJ-322

Code No. **7821** Model **BMJ-322**

O.D.	Max. rpm	Max. power	Spindle Accuracy	Weight
ϕ 22mm	60,000min ⁻¹	150w	Within1 μ m	190g
Standard Accessories	Collet nut (CHN-A) / Wrench (8×5) · (9×11) : 1pc. each			
Options	Collet (CHA Group) : ϕ 0.5~ ϕ 4.0mm p.23			
	Motor cord (Straight) : Length 4m (9264), 6m (9265), 8m (9266)			
	Motor cord (Angle) : Length 4m (9267), 6m (9268), 8m (9269)			

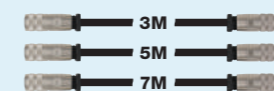
* Collet is sold separately.

Spindle
Guide

BM-319



BM-320



EMCD-BM3



iSpeed3 CONTROLLER



AL-C1204

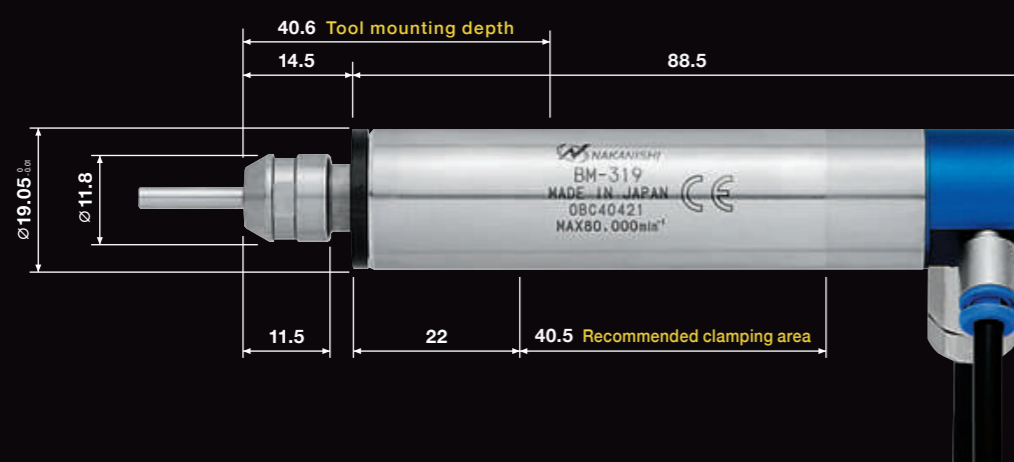
iSpeed3 SERIES

Shown In Actual Size

Straight type motor spindle

BM-319

With 50cm joint cord

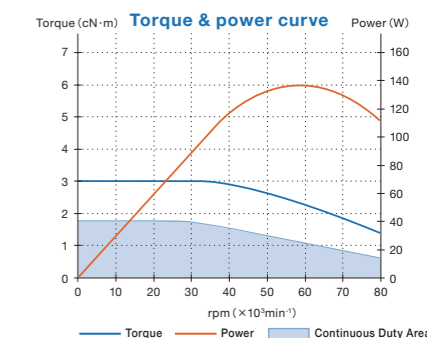
O.D. ϕ 19.05mm

Specifications

DXF data DXF files are available on our website

Order by Code No.

BM-319

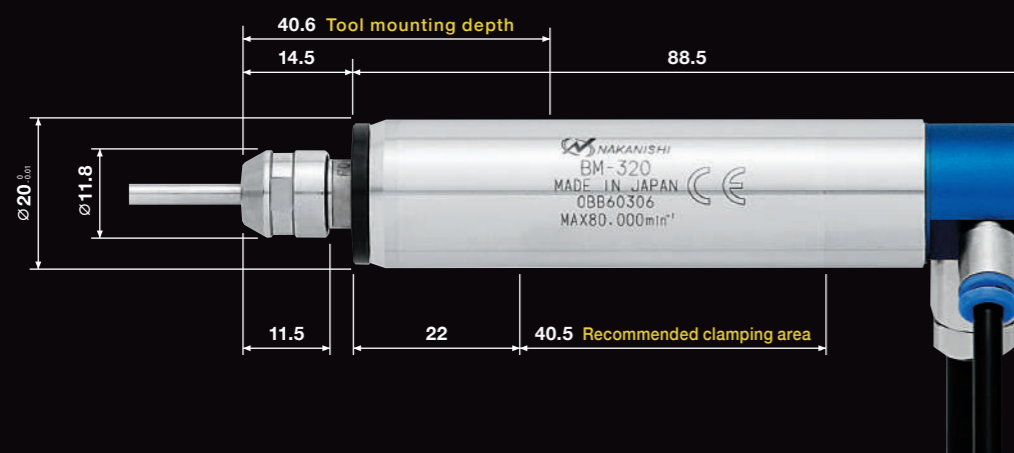
Code No. **7810** Model **BM-319**

O.D.	Max. rpm	Max. power	Spindle Accuracy	Weight
ϕ 19.05mm	80,000 min^{-1}	140w	Within1 μm	210g
Standard Accessories	Collet nut (CHN-A) / Wrench (8 \times 5) · (9 \times 11) : 1pc. each			
Options	Collet (CHA Group) : ϕ 0.5~ ϕ 4.0mm p.23 Motor cord : Length 3m (9261), 5m (9262), 7m (9263)			

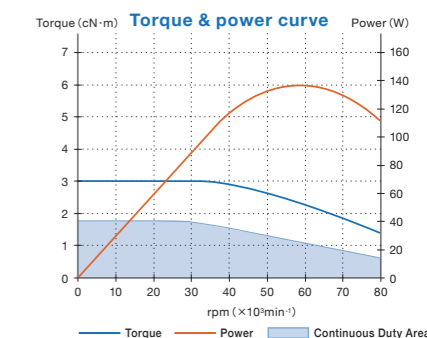
※ Cord length L=0.5m
 ※ Collet is sold separately.

BM-320

With 50cm joint cord

O.D. ϕ 20mm

BM-320

Code No. **7811** Model **BM-320**

O.D.	Max. rpm	Max. power	Spindle Accuracy	Weight
ϕ 20mm	80,000 min^{-1}	140w	Within1 μm	230g
Standard Accessories	Collet nut (CHN-A) / Wrench (8 \times 5) · (9 \times 11) : 1pc. each			
Options	Collet (CHA Group) : ϕ 0.5~ ϕ 4.0mm p.23 Motor cord : Length 3m (9261), 5m (9262), 7m (9263)			

※ Cord length L=0.5m
 ※ Collet is sold separately.

Spindle
Guide

BM-322



EMCD-BM3



iSpeed3 CONTROLLER



AL-C1204

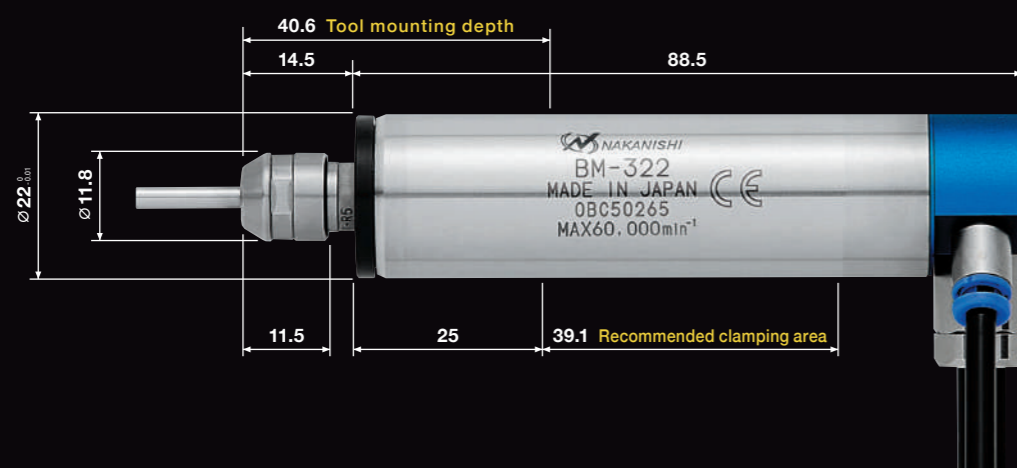
iSpeed3 SERIES

Shown In Actual Size

Straight type motor spindle

BM-322

With 50cm joint cord

O.D. \varnothing 22mm

Specifications

DXF data DXF files are available on our website

Order by Code No.

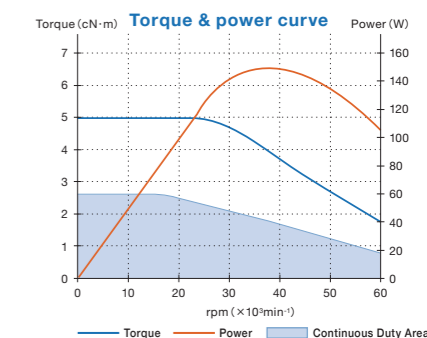
BM-322

Code No.

7814

Model

BM-322

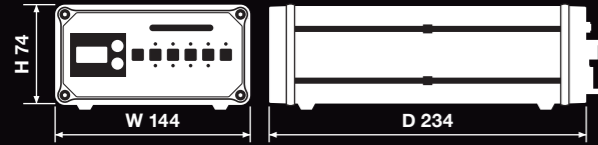


O.D.	Max. rpm	Max. power	Spindle Accuracy	Weight
\varnothing 22mm	60,000 min^{-1}	150w	Within 1 μm	250g
Standard Accessories	Collet nut (CHN-A) / Wrench (8 \times 5) · (9 \times 11) : 1pc. each			
Options	Collet (CHA Group) : \varnothing 0.5~ \varnothing 4.0mm p.23			
	Motor cord : Length 3m (9261), 5m (9262), 7m (9263)			

※ Cord length L=0.5m
 ※ Collet is sold separately.

iSpeed3 Controller

iSpeed3 CONTROLLER Controller



External Input / Output Control Signal Operation

- External Input
Motor Rotating / Stopped, Error Released, Rotating Direction, Motor Speed Setting and etc.
- External Monitor
Motor Current, Error, Warning, Rotating pulse and etc.
- Parameter Setting
Maximum motor speed setting, Fix the motor speed
※For more information, please refer to the operation manual on our website.

Plug type	Code No.
200V (C Type)	8479

※ 8477 (100V), 8478 (120V), 8480 (230V) are available.

Plug type	Area	Product
100V (A Type)	Japan	
120V (B Type)	USA Canada	
200V (C Type)	Without plug	
230V (D Type)	Europe	

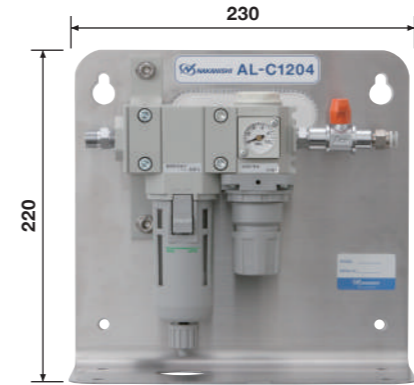
※ Please select Voltage for purchasing.



Motor output	Speed Range	Max. power	Power consumption	Air consumption	Weight
2 Motor spindles (Can't be operated simultaneously.)	1,000~80,000min ⁻¹	150w	0.65A (200V)	1 spindle : 30Nℓ/min (0.25MPa) 2 spindles : 60Nℓ/min (0.25MPa)	3.5kg
Standard Accessories	Power cord : 2m / Air hose with filter (K-251 : 2058) : 2m / Motor connector cap : 2pcs. Bracket : 2pcs. / Plate nut : 4pcs. / M3 bolt : 4pcs. / Fuse : 2pcs.				

Accessories (Air line kit, Motor cord)

AL-C1204 Air line kit



※Recommendation of nominal filtration rating: 0.3μm, Pressure range: 0.1-1.0MPa
Recommendation of air filter: M2000-WS (CKD)

Code No.	4504	Model	AL-C1204
Standard Accessories	Hose pipe (K-260) : 2m		

Motor cord

Motor cord	Code No.	Model	Length	Standard Accessories	Compatible model
 Straight type 4M 6M 8M	9264	EMCD-BM3S-4M	4m	Air hose Connector cap (Included)	BMF-319 · BMF-320 BMF-322 · BMF-325 BMJ-319 · BMJ-320 BMJ-322 · BMJ-325
	9265	EMCD-BM3S-6M	6m		
	9266	EMCD-BM3S-8M	8m		
 Angle type 4M 6M 8M	9267	EMCD-BM3A-4M	4m	Air hose Connector cap (Included)	BMF-319 · BMF-320 BMF-322 · BMF-325 BMJ-319 · BMJ-320 BMJ-322 · BMJ-325
	9268	EMCD-BM3A-6M	6m		
	9269	EMCD-BM3A-8M	8m		
 Joint type 3M 5M 7M	9261	EMCD-BM3-3M	3m	Air hose Connector cap (Included)	BM-319F · BM-320F BM-322FL · BM-322FR BM-322FS BM-319 · BM-320 BM-322 · BM-325
	9262	EMCD-BM3-5M	5m		
	9263	EMCD-BM3-7M	7m		

Accessories (Collet, etc.)

Collet	Code No.	Model	I.D.	Compatible model	
<p>Collet CHA Group</p>	91494	CHA-3.0AA	ø3.0AA*	BMF-319 · BMF-320 BMF-322 · BMF-325 BMJ-319 · BMJ-320 BMJ-322 · BMJ-325 BM-319F · BM-320F BM-322FL · BM-322FR BM-322FS BM-319 · BM-320 BM-322 · BM-325	
	91496	CHA-3.175AA	ø3.175AA*		
	91495	CHA-4.0AA	ø4.0AA*		
	91492	CHA-2.35	ø2.35		
	91430	CHA-3.0	ø3.0		
	91493	CHA-3.175	ø3.175		
	91440	CHA-4.0	ø4.0		
	—	CHA-□□	ø0.5, ø0.6, ø0.7, ø0.8, ø0.9		*High precision type AA (Run-out Accuracy within 2 μm)
	—	CHA-□□	ø1.1, ø1.2, ø1.3, ø1.4, ø1.7, ø1.8, ø1.9 ø2.1, ø2.2, ø2.3, ø2.4, ø2.6, ø2.7, ø2.8, ø2.9 ø3.1, ø3.2, ø3.3, ø3.4, ø3.6, ø3.7, ø3.8, ø3.9		
	—	CHA-□□	ø1.0, ø1.5, ø2.0, ø2.5, ø3.5 ø1.6		

Collet nut	Code No.	Model	Description	Compatible model
	2102	CHN-A	Collet nut for CHA collet	BMF-319 · BMF-320 · BMF-322 BMF-325 · BMJ-319 · BMJ-320 BMJ-322 · BMJ-325 · BM-319F BM-320F · BM-322FL BM-322FR · BM-322FS BM-319 · BM-320 BM-322 · BM-325

Spacer · Bush	Code No.	Model	Description	Compatible model
	1882	SP-22×10L	Spacer (for BM-322FL / BM-322FR) Dimensions : ø22 (I.D.) × 10mm	BM-322FL · BM-322FR
	1875	RB-20×23	ø23 Bush Dimensions : ø20 (I.D.) × ø23 (O.D.) × 40mm	BMJ-320 · BM-320 BMF-320
	1876	RB-20×22.8	ø22.8 Bush Dimensions : ø20 (I.D.) × ø22.8 (O.D.) × 40mm	BMJ-320 · BM-320 BMF-320
	1877	RB-20×22	ø22 Bush Dimensions : ø20 (I.D.) × ø22 (O.D.) × 40mm	BMJ-320 · BM-320 BMF-320
	1878	RB-20×25	ø25 Bush Dimensions : ø20 (I.D.) × ø25 (O.D.) × 40mm	BMJ-320 · BM-320 BMF-320
	1879	RB-20×25.4	ø25.4 Bush Dimensions : ø20 (I.D.) × ø25.4 (O.D.) × 40mm	BMJ-320 · BM-320 BMF-320
	1883	RB-22×25×34L	ø25 Bush Dimensions : ø22 (I.D.) × ø25 (O.D.) × 33.5mm	BM-322FL · BM-322FR BM-322FS · BMF-322 BMJ-322 · BM-322
	1884	RB-22×25.4×34L	ø25.4 Bush Dimensions : ø22 (I.D.) × ø25.4 (O.D.) × 33.5mm	BM-322FL · BM-322FR BM-322FS · BMF-322 BMJ-322 · BM-322
1887	RB-19.05×25.4×36L	ø25.4 Bush Dimensions : ø19.05 (I.D.) × ø25.4 (O.D.) × 36mm	BM-319F · BMJ-319 BM-319 · BMF-319	

NAKANISHI Solutions LINE UP

Electric Motors & Spindles



Application for CNC lathes / Special purpose machines

Application for machining centers and milling machines

E4000 SERIES

1,000~40,000min⁻¹ Max.1,200W
[ø40mm]



- World's highest power in this class
- Max. power: 1,200W, Max. torque: 1.0N·m

E3000 SERIES

1,000~80,000min⁻¹ Max.350W
[ø30/25/20mm]



- The largest product lines for various processing
- Space-saving solution for small CNC lathe

HES SERIES

Max.80,000min⁻¹
[For small diameter endmills and drills only]



- The most cost effective solution to add high-speed machining capability
- 80,000min⁻¹, 6.0cN·m
- BT, HSK A63, ST shanks are available
- Driven by E3000 Controller

E2000 SERIES

1,000~50,000min⁻¹ Max.200W
[ø22.8/25mm]



- Small size spindle allows multi-axis installation in limited space

iSpeed3 SERIES

1,000~80,000min⁻¹ Max.150W
[ø19.05/20/22mm]



- Super short motor spindle
- High efficiency brushless motor



- 50,000min⁻¹, 8.75cN·m
- BT, NT, CAT, IT, HSK A, ST shanks are available
- Driven by E3000 Controller

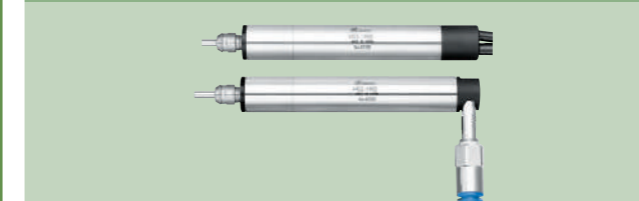
Air Motors & Spindles



Application for CNC lathes / Special purpose machines

Air-Speed SERIES One-piece type

Max.30,000min⁻¹ Max.130W
[ø25/23/20/19.05mm]



- Short body enables the spindle to mount in a limited space on a small NC/CNC lathe or on a special purpose machine

Air-Speed SERIES Modular type

Max.30,000min⁻¹ Max.130W
[ø30/25/22.8mm]



- Separate motor and spindle for flexible application changes
- Adjustable to various application through changing spindles

Air Turbine Spindles

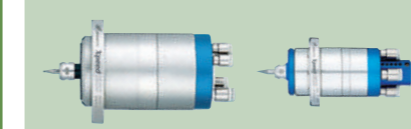


Application for CNC lathes / Special purpose machines

Application for machining centers and milling machines

Xpeed SERIES

Max.160,000min⁻¹
[ø65/40mm]



- Extreme accuracy-Runout 1μm
- For high precision small diameter drilling, internal grinding of ceramics
- Long life of spindle thanks to contactless rotation mechanism

PLANET SERIES

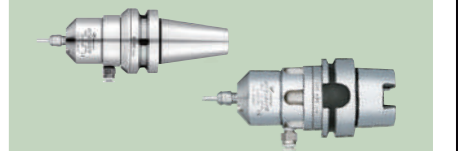
Max.65,000min⁻¹



- A milling machine turns into a jig grinder
- For high precision internal grinding

HTS SERIES

150,000min⁻¹
[For small diameter endmills and drills only]



- No thermal expansion on Z axis thanks to air turbine generating little heat
- Ultra high speed 150,000min⁻¹ with higher rigidity thanks to ceramic bearings
- BT, HSK E and straight (M2040) shanks are available