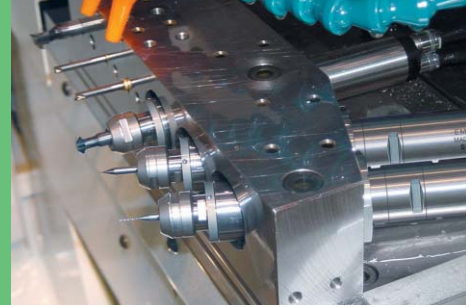


ASTRO Series

Air System



- The ASTRO Series spindles were designed for small diameter drilling, milling, grinding and slitting saw applications. These spindles are high-precision, compact motor spindles that are ideal for adding to the capabilities of existing machinery or incorporating into the design of special purpose machines.
- The ASTRO Series air motor and air turbine spindles were specifically designed for using in NC and CNC machines. In spite of their compact size, the motors feature high output with very little heat generation allowing for long term continuous operation.
- The ASTRO Series is perfect for small diameter, high-precision machining operations such as drilling, milling, slitting and grinding applications. Depending on the intended application please select the appropriate model spindle considering size, speed, rotating direction, and required torque, etc.

AIR MOTOR SPINDLE

Series Code	Outside Diameter	Speed (min ⁻¹)	Output (W)
MS-19 Series MS-20 Series	ø19.05 mm ø20 mm	30,000	63
		8,000	63
		2,000	63
MST-23 Series	ø23 mm	30,000	108
		8,000	108
		2,000	108
MS-25 Series	ø25 mm	24,000	130
		6,000	130
		1,500	130

HIGH-OUTPUT POWER AIR MOTOR SPINDLE

Series Code	Outside Diameter	Speed (min ⁻¹)	Output (W)
AMS-20 Series	ø53 mm	2,200	131
AMS-50 Series	ø53 mm	4,000	131
AMS-150 Series	ø53 mm	15,000	132
AMS-250	ø47 mm	25,000	105

HIGH-SPEED AIR TURBINE SPINDLE

Series Code	Outside Diameter	Speed (min ⁻¹)	Output (W)
AMS-600	ø64 mm	65,000	34
AMS-1200	ø22.8 mm	120,000	21
AMS-1500	ø44.5 mm	150,000	21

- MS Series
 - Straight Type



- 90° Angle Type



- AMS-20



- AMS-50



- AMS-150



- AMS-250



- AMS-600



- AMS-1200



- AMS-1500



1	E-max
	ROTUS
	ESPERT
	VIVA-MATE 3
	PNEU-SONIC
	IMPULSE
	PRESTO MIRACLE
	SHEENUS
	SONIC CUTTER
2	ASTRO-E 500Z
	ASTRO-E 800Z
	ASTRO-E 2550
	ASTRO-E 250
	ASTRO-E 6040
3	ASTRO SYSTEM
	ø22.8
	ø25
	ø30
	ASTRO SERIES
	ø19.05
	ø20
	ø23
	ø25
	HIGH OUTPUT
4	ABS
5	ASTRO-X
6	PS · PSA
	PST
	TECHNICAL DATA
7	HES
	SMS
	HTS
	BANTAM
	PLANET
8	FALCON
9	AIR LINE KIT
10	PARTS
11	APPLICATION EXAMPLES
	TECHNICAL DATA

1 E-max ROTUS ESPERT VIVA-MATE 3 PNEU-SONIC IMPULSE PRESTO MIRACLE SHEENUS SONIC CUTTER

ASTRO Series can be used in conjunction with water or oil based coolants.

The ASTRO Series AMS-400 / 800 / 1600 have been changed to the ABS Series ABS-400 / 800 / 1600. Please refer to 4-p2, 4-p3 for details.

SMALL-DIAMETER AIR MOTOR SPINDLE MS · MST SERIES

MS-19 (ø 19.05) · MS-20 (ø 20) · MST-23 (ø 23) · MS-25 (ø 25)

Model Code Example

• **Straight Type**
 [1] SERIES CODE [2] OUTSIDE DIAMETER [3] SPEED [4] R=FORWARD (Right) · L=REVERSE (Left)

MS 19 08 R L

• **90° Angle Type**
 [1] SERIES CODE [2] OUTSIDE DIAMETER [3] SPEED [4] R=FORWARD (Right) · L=REVERSE (Left) [5] CODE FOR 90° ANGLE TYPE

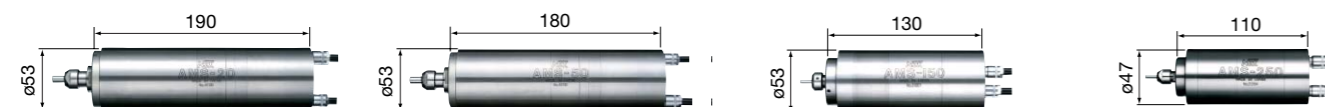
MS 19 08 R L A



HIGH-OUTPUT POWER AIR MOTOR SPINDLE AMS SERIES

AMS-20 <Outside Diameter ø53> AMS-50 <Outside Diameter ø53> AMS-150 <Outside Diameter ø53> AMS-250 <Outside Diameter ø47>

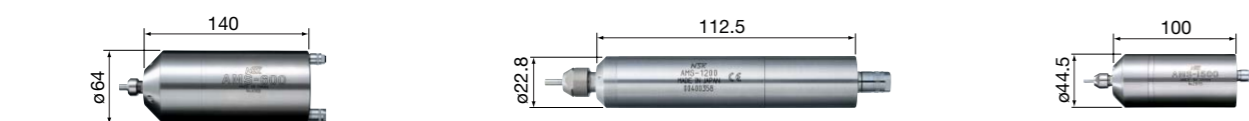
Forward 2,200 min⁻¹ <Output 131W> Reverse 2,100 min⁻¹ Forward 4,000 min⁻¹ <Output 131W> Reverse 3,800 min⁻¹ 15,000 min⁻¹ <Output 132W> 25,000 min⁻¹ <Output 105W>



HIGH-SPEED AIR TURBINE SPINDLE AMS SERIES

AMS-600 <Outside Diameter ø64> AMS-1200 <Outside Diameter ø22.8> AMS-1500 <Outside Diameter ø44.5>

65,000 min⁻¹ <Output 34W> 120,000 min⁻¹ <Output 21W> 150,000 min⁻¹ <Output 21W>



Drilling Capacity Reference Table for Air Motors

This table summarizes the drilling capacity for the ASTRO Series spindles. Please use this table as a guide for the selection of the proper model given the torque, speed and size requirements for your application. Data is given for three materials Medium Carbon Steel (S45C), aluminum and brass.

*Conditions : High speed steel drill was used with a feed rate of 60mm/min. Tool life was not considered in determining the above capacities. Use this table as a reference to extrapolate suitability for a given application.

Series Code	Speed (min ⁻¹)	Output (W)	Max. Torque (cN·m)	Max. Dia. of Drill (mm)		
				S45C	Aluminum	Brass
MS-19 Series <Outside Diameter ø 19.05> MS-20 Series <Outside Diameter ø 20>	30,000	63	7.8	ø1.0	ø1.5	ø2.0
	8,000	63	30.4	ø2.0	ø3.0	ø3.5
	2,000	63	120	ø3.0	ø4.0	ø4.0
MST-23 Series <Outside Diameter ø 23>	30,000	108	13.7	ø1.5	ø2.0	ø3.0
	8,000	108	52	ø2.5	ø3.5	ø4.0
	2,000	108	202	ø4.0	ø4.6	ø5.2
MS-25 Series <Outside Diameter ø 25>	24,000	130	22.5	ø2.0	ø3.0	ø3.5
	6,000	130	85	ø2.7	ø3.8	ø4.4
	1,500	130	332	ø4.3	ø5.2	ø5.5
AMS-20 Series	2,200	131	210	ø3.8	ø4.4	ø5.0
AMS-50 Series	4,000	131	122	ø3.1	ø3.9	ø4.6
AMS-150 Series	15,000	132	31.4	ø2.2	ø3.0	ø3.6
AMS-250	25,000	105	14.7	ø1.5	ø2.0	ø3.0

Configuration & Characteristics

Outer Housing Material

The outer housing is (SUS416) precision ground to +0/-0.01mm.

Configuration

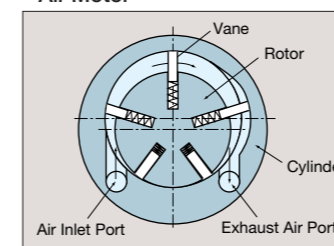
Either straight or 90° air connection types are available depending on the mounting and plumbing restrictions in your installation.

Rotating Direction

Forward (Right) or Reverse (Left) rotation is available.

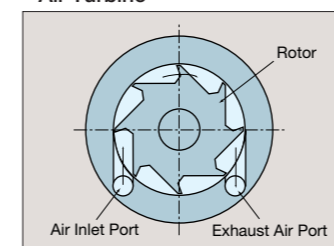
The design of NSK's air motors and air turbines gives the highest output power is this small spindle class.

Air Motor



The rotor of the air motor rotates off center in the cylinder. The vanes are pushed by compressed air and this rotates the rotor. This small air motor produces high torque making it suitable for small diameter drilling, milling, slitting and grinding.

Air Turbine



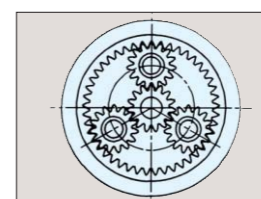
The rotor is rotated by the velocity of the air stream making this type of spindle perfect for applications requiring very high speed rotation.

Silencer

By utilizing a silencer on the exhaust air tubing the noise generated by the motor or turbine is greatly reduced.

Speed Reduction System

A planetary gear speed reduction system is incorporated in some of the ASTRO Series motor/spindles. The speed reduction ratio is either 1/4 or 1/16. This maintains a high motor speed while giving very high torque, low speed rotation at the spindle. By carefully selecting only the highest grade materials for the planetary gear reducers we can ensure high load capacity.



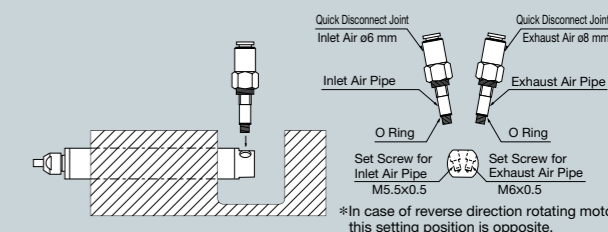
1/4 · 1/16 : Planetary Gear System

Installation of 90° Angle Type

MS · MST series angle (RA/LA) type drive air and exhaust air pipes can be removed enabling the motor spindle installed through the front of a holder with backside restriction as shown in the illustration.

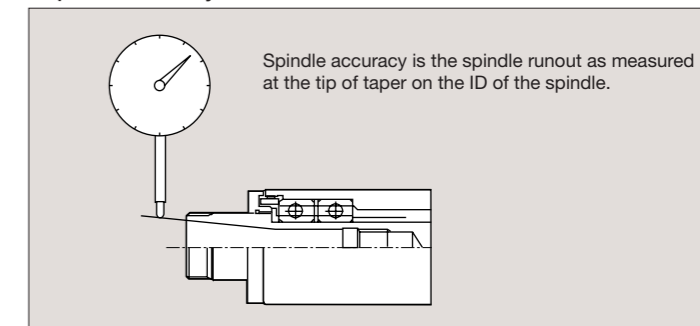
Installation

- Remove Inlet and Exhaust Air Pipes from motor spindle.
 - Insert the straight spindle from the front side of holder and fix it.
 - Mount the inlet and exhaust air pipes to the spindle fixed on the holder and attach a hose to the quick disconnect joint.
- Urethane hose of 6 x 4 for inlet air and 8 x 5 for exhaust air can be installed.



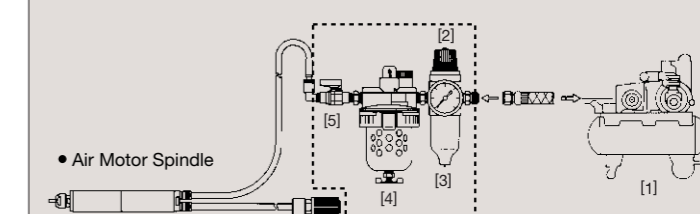
Very high spindle accuracy makes ultra-precision machining possible.

Spindle Accuracy



ASTRO Series Set-Up Chart (Air line kit is required for operation)

The ASTRO Series spindles are specifically designed for long term continuous use in high speed machining applications such as small diameter drilling, milling, slitting and grinding applications. It runs by connecting the air line kit to Compressor [1] directly. Stably adjusted air pressure is supplied through Air Regulator [2] that also controls the speed of spindle. Air is purified by Air Filter [3] and Lubricator [4] supplies lubricant automatically to the air spindle while in operation. Switch [5] controls the operation of air spindle ON and OFF.



Air Line Kit Refer to 3-p34

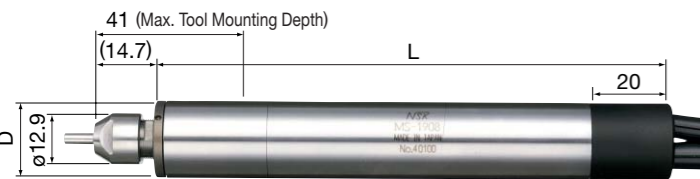
*The motor speed of 90° Angle air connection type motor / spindles are 10% less than that of the straight type.

AIR MOTOR SPINDLE OUTSIDE DIAMETER $\phi 19.05 \cdot \phi 20$ mm <Output 63W>

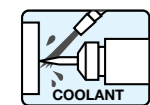
- The MS-19 and MS-20 Series Air Motor Spindles incorporate a specially designed 30,000 min⁻¹ air motor. The (8,000 and 2,000 min⁻¹) versions also utilize a high-precision small planetary gear speed reducer system which provides high torque, high output power and excellent durability.
 - 8,000 min⁻¹ : 1/4 motor speed reduction, Torque is 4 times greater than motor torque.
 - 2,000 min⁻¹ : 1/16 motor speed reduction, Torque is 16 times greater than motor torque.
- This MS-19 and MS-20 ASTRO Series motor spindles are designed to be mounted in a $\phi 19.05$ and $\phi 20$ mm holder respectively. This greatly extends the capabilities of existing NC and CNC lathes and also makes them very easy to incorporate in the design of special purpose machinery.

MS-19 · MS-20 SERIES STRAIGHT · 90° ANGLE TYPE 30,000 · 8,000 · 2,000 min⁻¹

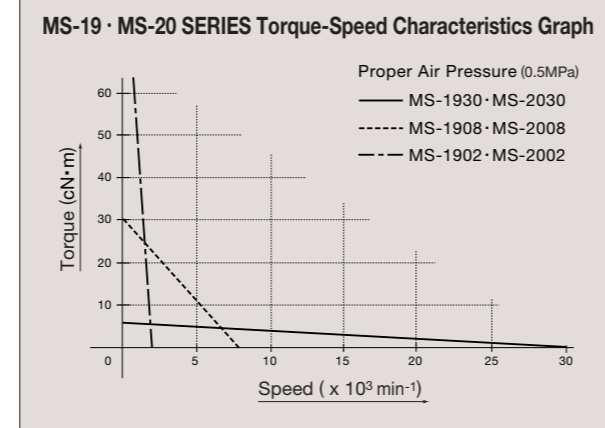
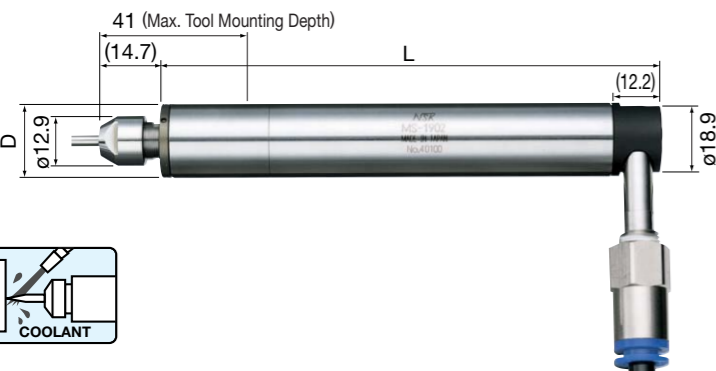
MS-19 · MS-20 Series STRAIGHT TYPE (R. L)



- Proper Air Pressure 0.3~0.5MPa
- Air Consumption 130NL/min
- Spindle Accuracy Within 2 μ m
- Length of Motor Hose 2 m
- Hose Diameter (R. L-type) : Air Inlet $\phi 5.7$ mm (O.D.)
: Exhaust Air $\phi 6.5$ mm (O.D.)
- Hose Diameter (RA. LA-type) : Air Inlet $\phi 6.0$ mm (O.D.)
: Exhaust Air $\phi 8.0$ mm (O.D.)
- Standard Size Collet Chuck (CHA-3.0) $\phi 3.0$ mm
- < Optional >
- Collet Chuck (CHA-□□) $\phi 0.5$ mm~ $\phi 4.0$ mm in 0.1 mm increments and $\phi 2.35$, $\phi 3.175$ mm
- Chuck Nut (K-263) For Collet Chuck (CHA)
- Metal Saw Axis (KCH-01A) For $\phi 6$ (I.D.) x $\phi 30$ mm (O.D.)
- Drill Chuck Axis (DCH-J0A) For Jacob's Taper No. 0
- Grindstone Axis (AGM-01A) For grinding wheel with I.D. of $\phi 5$ mm



MS-19 · MS-20 Series 90° ANGLE TYPE (RA. LA)



MS-19 Series (D= $\phi 19.05$ mm)		MS-20 Series (D= $\phi 20$ mm)		30,000 min ⁻¹					
CAT. No.	Model	CAT. No.	Model	Shape	Rotating Direction	Max. Output	Max. Torque	Length	Weight (MS-19 / MS-20)
1676	MS-1930R	1710	MS-2030R	Straight	FWD. (CW)	63W	7.8 cN · m	110.9 mm	171 g / 190 g
1678	MS-1930RA	1712	MS-2030RA	90° Angle				103.1 mm	219 g / 239 g
1677	MS-1930L	1711	MS-2030L	Straight	REV. (CCW)	63W	7.8 cN · m	110.9 mm	171 g / 190 g
1679	MS-1930LA	1713	MS-2030LA	90° Angle				103.1 mm	219 g / 239 g
				8,000 min⁻¹ 1/4 Speed Reduction					
CAT. No.	Model	CAT. No.	Model	Shape	Rotating Direction	Max. Output	Max. Torque	Length	Weight (MS-19 / MS-20)
1601	MS-1908R	1609	MS-2008R	Straight	FWD. (CW)	63W	30.4 cN · m	126.8 mm	202 g / 225 g
1603	MS-1908RA	1611	MS-2008RA	90° Angle				119.0 mm	250 g / 274 g
1602	MS-1908L	1610	MS-2008L	Straight	REV. (CCW)	63W	30.4 cN · m	126.8 mm	202 g / 225 g
1604	MS-1908LA	1612	MS-2008LA	90° Angle				119.0 mm	250 g / 274 g
				2,000 min⁻¹ 1/16 Speed Reduction					
CAT. No.	Model	CAT. No.	Model	Shape	Rotating Direction	Max. Output	Max. Torque	Length	Weight (MS-19 / MS-20)
1605	MS-1902R	1613	MS-2002R	Straight	FWD. (CW)	63W	120 cN · m	141.0 mm	216 g / 241 g
1607	MS-1902RA	1615	MS-2002RA	90° Angle				133.2 mm	264 g / 290 g
1606	MS-1902L	1614	MS-2002L	Straight	REV. (CCW)	63W	120 cN · m	141.0 mm	216 g / 241 g
1608	MS-1902LA	1616	MS-2002LA	90° Angle				133.2 mm	264 g / 290 g

Standard Equipment · Accessories

- Collet Chuck $\phi 3.0$ mm (CHA-3.0) : 1 pc. • Chuck Nut (K-263) • Spanner (8 x 5), (10 x 10) : 1 pc. each • Hose (K-221) (R. L type) : 2 m
- Hose (K-215) (RA. LA type) : $\phi 6$ mm x 2 m • Hose (K-216) (RA. LA type) : $\phi 8$ mm x 1 m • Silencer (K-209) (R. L type) • Silencer (K-208) (RA. LA type)

AIR MOTOR SPINDLE OUTSIDE DIAMETER $\phi 23$ mm <Output 108W>

[SUPER TORQUE TYPE]

- The MST-23 Series Air Motor Spindles incorporate a specially designed 30,000 min⁻¹ air motor. The (8,000 and 2,000 min⁻¹) versions also utilize a high-precision small planetary gear speed reducer system which provides high torque, high output power and excellent durability.
 - 8,000 min⁻¹ : 1/4 motor speed reduction, Torque is 4 times greater than motor torque.
 - 2,000 min⁻¹ : 1/16 motor speed reduction, Torque is 16 times greater than motor torque.
- This MST-23 ASTRO Series motor spindles are designed to be mounted in a $\phi 23$ mm holder. This greatly extends the capabilities of existing NC and CNC lathes and also makes them very easy to incorporate in the design of special purpose machinery.

MST-23 SERIES STRAIGHT · 90° ANGLE TYPE 30,000 · 8,000 · 2,000 min⁻¹

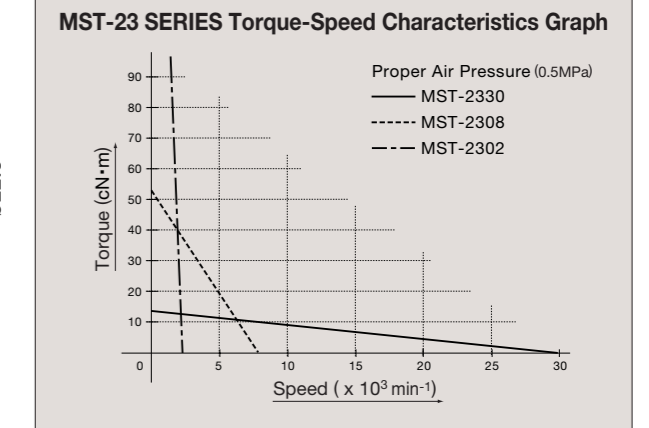
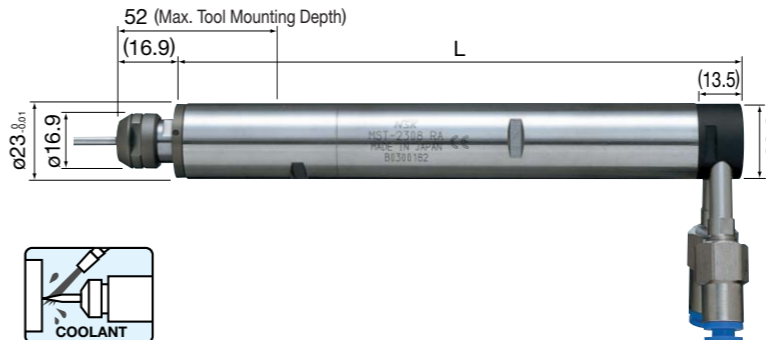
MST-23 Series STRAIGHT TYPE (R. L)



- Proper Air Pressure 0.3~0.5MPa
- Air Consumption 220NL/min
- Spindle Accuracy Within 2 μ m
- Length of Motor Hose 2 m
- Hose Diameter (R. L-type) : Air Inlet $\phi 6.7$ mm (O.D.)
: Exhaust Air $\phi 7.5$ mm (O.D.)
- Hose Diameter (RA. LA-type) : Air Inlet $\phi 6.0$ mm (O.D.)
: Exhaust Air $\phi 8.0$ mm (O.D.)
- Standard Size Collet Chuck (CHK-3.0) $\phi 3.0$ mm
- < Optional >
- Collet Chuck (CHK-□□) $\phi 0.5$ mm~ $\phi 6.0$ mm in 0.1 mm increments and $\phi 2.35$, $\phi 3.175$, $\phi 6.35$ mm
- Chuck Nut (K-265) For Collet Chuck (CHK)
- Metal Saw Axis (KCH-03) For $\phi 6$ (I.D.) x $\phi 30$ mm (O.D.)
- Drill Chuck Axis (DCH-J0K) For Jacob's Taper No. 0
- Grindstone Axis (AGM-03) For grinding wheel with I.D. of $\phi 5$ mm



MST-23 Series 90° ANGLE TYPE (RA. LA)



MST-23 Series (D= $\phi 23$ mm)				30,000 min ⁻¹					
CAT. No.	Model	Shape	Rotating Direction	Max. Output	Max. Torque	Length	Weight		
1637	MST-2330R	Straight	FWD. (CW)	108W	13.7 cN · m	127.3 mm	328 g		
1639	MST-2330RA	90° Angle				133.8 mm	369 g		
1638	MST-2330L	Straight	REV. (CCW)	108W	13.7 cN · m	127.3 mm	328 g		
1640	MST-2330LA	90° Angle				133.8 mm	369 g		
				8,000 min⁻¹ 1/4 Speed Reduction					
CAT. No.	Model	Shape	Rotating Direction	Max. Output	Max. Torque	Length	Weight		
1645	MST-2308R	Straight	FWD. (CW)	108W	52 cN · m	160.1 mm	415 g		
1647	MST-2308RA	90° Angle				166.6 mm	456 g		
1646	MST-2308L	Straight	REV. (CCW)	108W	52 cN · m	160.1 mm	415 g		
1648	MST-2308LA	90° Angle				166.6 mm	456 g		
				2,000 min⁻¹ 1/16 Speed Reduction					
CAT. No.	Model	Shape	Rotating Direction	Max. Output	Max. Torque	Length	Weight		
1653	MST-2302R	Straight	FWD. (CW)	108W	202 cN · m	164.4 mm	405 g		
1655	MST-2302RA	90° Angle				170.9 mm	446 g		
1654	MST-2302L	Straight	REV. (CCW)	108W	202 cN · m	164.4 mm	405 g		
1656	MST-2302LA	90° Angle				170.9 mm	446 g		

Standard Equipment · Accessories

- Collet Chuck $\phi 3.0$ mm (CHK-3.0) : 1 pc. • Chuck Nut (K-265) • Spanner (12 x 14) : 2 pcs. • Hose (K-204) (R. L type) : 2 m
- Hose (K-215) (RA. LA type) : $\phi 6$ mm x 2 m • Hose (K-216) (RA. LA type) : $\phi 8$ mm x 1 m • Silencer (K-209) (R. L type) • Silencer (K-208) (RA. LA type)

AIR MOTOR SPINDLE OUTSIDE DIAMETER $\phi 25$ mm <Output 130W>

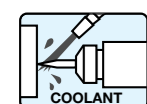
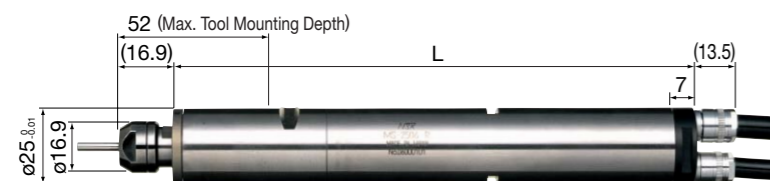
[SUPER TORQUE TYPE]

- The MS-25 Series Air Motor Spindles incorporate a specially designed 30,000 min⁻¹ air motor. The (8,000 and 2,000 min⁻¹) versions also utilize a high-precision small planetary gear speed reducer system which provides high torque, high output power and excellent durability.
- 8,000 min⁻¹ : 1/4 motor speed reduction, Torque is 4 times greater than motor torque.
- 2,000 min⁻¹ : 1/16 motor speed reduction, Torque is 16 times greater than motor torque.
- This MS-25 ASTRO Series motor spindles are designed to be mounted in a $\phi 25$ mm holder respectively. This greatly extends the capabilities of existing NC and CNC lathes and also makes them very easy to incorporate in the design of special purpose machinery.

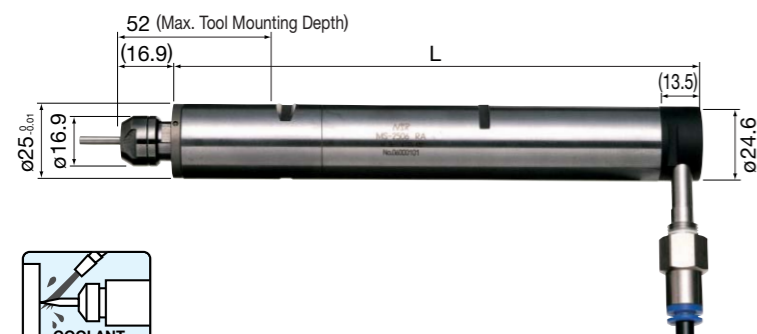
MS-25 SERIES STRAIGHT · 90° ANGLE TYPE

24,000 · 6,000 · 1,500 min⁻¹

● MS-25 Series STRAIGHT TYPE (R. L)



● MS-25 Series 90° ANGLE TYPE (RA. LA)



24,000 min⁻¹

CAT. No.	Model	Shape	Rotating Direction	Max. Output	Max. Torque	Length	Weight
1690	MS-2524R	Straight	FWD. (CW)	130W	22.5 cN · m	131.3 mm	395 g
1692	MS-2524RA	90° Angle				137.8 mm	436 g
1691	MS-2524L	Straight	REV. (CCW)			131.3 mm	395 g
1693	MS-2524LA	90° Angle				137.8 mm	436 g

6,000 min⁻¹ 1/4 Speed Reduction

CAT. No.	Model	Shape	Rotating Direction	Max. Output	Max. Torque	Length	Weight
1698	MS-2506R	Straight	FWD. (CW)	130W	85 cN · m	164.1 mm	485 g
1700	MS-2506RA	90° Angle				170.6 mm	526 g
1699	MS-2506L	Straight	REV. (CCW)			164.1 mm	485 g
1701	MS-2506LA	90° Angle				170.6 mm	526 g

1,500 min⁻¹ 1/16 Speed Reduction

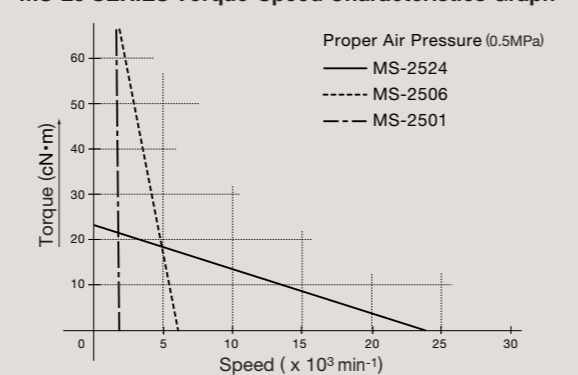
CAT. No.	Model	Shape	Rotating Direction	Max. Output	Max. Torque	Length	Weight
1706	MS-2501R	Straight	FWD. (CW)	130W	332 cN · m	168.5 mm	475 g
1708	MS-2501RA	90° Angle				175.0 mm	516 g
1707	MS-2501L	Straight	REV. (CCW)			168.5 mm	475 g
1709	MS-2501LA	90° Angle				175.0 mm	516 g

Standard Equipment · Accessories	
• Collet Chuck $\phi 3.0$ mm (CHK-3.0) : 1 pc.	• Chuck Nut (K-265) • Spanner (12 x 14) : 2 pcs.
• Hose (K-204) (R. L type) : 2 m	• Hose (K-215) (RA. LA type) : $\phi 6$ mm x 2 m
• Hose (K-216) (RA. LA type) : $\phi 8$ mm x 1 m	• Silencer (K-209) (R. L type) • Silencer (K-208) (RA. LA type)

*Outside diameter $\phi 25.4$ mm type are also available.

- Proper Air Pressure 0.3~0.5MPa
 - Air Consumption 230NL/min
 - Spindle Accuracy Within 2 μ m
 - Length of Motor Hose 2 m
 - Hose Diameter (R. L-type) : Air Inlet $\phi 6.7$ mm (O.D.)
: Exhaust Air $\phi 7.5$ mm (O.D.)
 - Hose Diameter (RA. LA-type) : Air Inlet $\phi 6.0$ mm (O.D.)
: Exhaust Air $\phi 8.0$ mm (O.D.)
 - Standard Size Collet Chuck (CHK-3.0) $\phi 3.0$ mm
- < Optional >
- Collet Chuck (CHK-□□) $\phi 0.5$ mm~ $\phi 6.0$ mm in 0.1 mm increments and $\phi 2.35$, $\phi 3.175$, $\phi 6.35$ mm
 - Chuck Nut (K-265) For Collet Chuck (CHK)
 - Metal Saw Axis (KCH-03) For $\phi 6$ (I.D.) x $\phi 30$ mm (O.D.)
 - Drill Chuck Axis (DCH-J0K) For Jacob's Taper No. 0
 - Grindstone Axis (AGM-03) For grinding wheel with I.D. of $\phi 5$ mm

MS-25 SERIES Torque-Speed Characteristics Graph



1

E-max

ROTUS

ESPERT

VIVA-MATE 3

PNEU-SONIC

IMPULSE

PRESTO MIRACLE

SHEENUS

SONIC CUTTER

2

ASTRO-E 500Z

ASTRO-E 800Z

ASTRO-E 2550

ASTRO-E 250

ASTRO-E 6040

3

ASTRO SYSTEM

$\phi 22.8$

$\phi 25$

$\phi 30$

ASTRO SERIES

$\phi 19.05$

$\phi 20$

$\phi 23$

$\phi 25$

HIGH OUTPUT

4

ABS

5

ASTRO-X

6

PS · PSA

PST

7

HES

SMS

HTS

BANTAM

PLANET

8

FALCON

9

AIR LINE KIT

10

PARTS

11

APPLICATION EXAMPLES

TECHNICAL DATA

1

E-max

ROTUS

ESPERT

VIVA-MATE 3

PNEU-SONIC

IMPULSE

PRESTO MIRACLE

SHEENUS

SONIC CUTTER

2

ASTRO-E 500Z

ASTRO-E 800Z

ASTRO-E 2550

ASTRO-E 250

ASTRO-E 6040

3

ASTRO SYSTEM

$\phi 22.8$

$\phi 25$

$\phi 30$

ASTRO SERIES

$\phi 19.05$

$\phi 20$

$\phi 23$

$\phi 25$

HIGH OUTPUT

4

ABS

5

ASTRO-X

6

PS · PSA

PST

7

HES

SMS

HTS

BANTAM

PLANET

8

FALCON

9

AIR LINE KIT

10

PARTS

11

APPLICATION EXAMPLES

TECHNICAL DATA

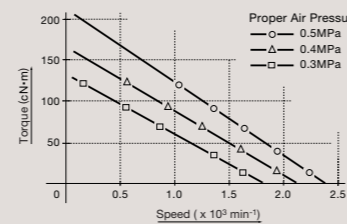
HIGH-OUTPUT POWER AIR MOTOR SPINDLE "ASTRO SERIES"

CAT. No.	1534	AMS-20R (Forward Rotation)	O. D. ϕ 53 mm <Output 131W>	2,200 min⁻¹
CAT. No.	1538	AMS-20L (Reverse Rotation)	O. D. ϕ 53 mm <Output 131W>	2,100 min⁻¹

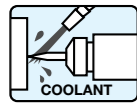


- Proper Air Pressure 0.3~0.5MPa
- Air Consumption 172NL/min
- Spindle Accuracy Within 2 μ m
- Length of Motor Hose 2 m
- Hose Diameter : Air Inlet ϕ 7.0 mm (O.D.)
: Exhaust Air ϕ 8.0 mm (O.D.)
- Standard Size Collet Chuck (CH5-6.0) ϕ 6.0 mm
- Useable Max. Diameter of Grindstone ϕ 125 mm
- < Optional >
- Collet Chuck (CH5-□□) ϕ 0.3 mm~ ϕ 6.0 mm in 0.1 mm increments and ϕ 2.35, ϕ 3.175, ϕ 6.35 mm
- Chuck Nut (CHN-02) For Collet Chuck (CH5)
- Grindstone Flange AGF-19

AMS-20 Torque-Speed Characteristics Graph



• The AMS-20 Series spindle incorporates a vane type air motor, spindle and geared speed reducer. The motor/spindle can be selected for either Right or Left rotation. This spindle is ideal for drilling, milling and slitting applications and if used in conjunction with the optional grindstone flange it is perfect for ID grinding.



CAT. No.	Model	Speed	Shape	Rotating Direction	Max. Output	Max. Torque	Weight
1534	AMS-20R	2,200 min ⁻¹	Straight	FWD. (CW)	131W	210 cN·m	2,620 g
1538	AMS-20L	2,100 min ⁻¹		REV. (CCW)			

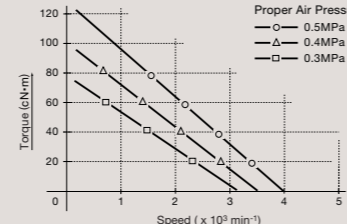
Applicable Axis	• Axis for Metal Saw (KCH-01E) • Axis for Drill Chuck (DCH-J0E) • Grindstone Flange (AGF-19)
Standard Equipment · Accessories	• Collet Chuck ϕ 6.0 mm (CH5-6.0) : 1 pc. • Chuck Nut (CHN-02) • Spanner (12 x 14), (20 x 24) : 1 pc. each • Inlet Air Hose (K-257) : ϕ 7 mm x 2 m • Exhaust Air Hose (K-258) : ϕ 8 mm x 1 m • Silencer (K-209) • Filter Joint (FJ-03)

CAT. No.	1528	AMS-50R (Forward Rotation)	O. D. ϕ 53 mm <Output 131W>	4,000 min⁻¹
CAT. No.	1539	AMS-50L (Reverse Rotation)	O. D. ϕ 53 mm <Output 131W>	3,800 min⁻¹

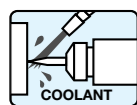


- Proper Air Pressure 0.3~0.5MPa
- Air Consumption 172NL/min
- Spindle Accuracy Within 2 μ m
- Length of Motor Hose 2 m
- Hose Diameter : Air Inlet ϕ 7.0 mm (O.D.)
: Exhaust Air ϕ 8.0 mm (O.D.)
- Standard Size Collet Chuck (CH5-6.0) ϕ 6.0 mm
- Useable Max. Diameter of Grindstone ϕ 125 mm
- < Optional >
- Collet Chuck (CH5-□□) ϕ 0.3 mm~ ϕ 6.0 mm in 0.1 mm increments and ϕ 2.35, ϕ 3.175, ϕ 6.35 mm
- Chuck Nut (CHN-02) For Collet Chuck (CH5)
- Grindstone Flange AGF-19

AMS-50 Torque-Speed Characteristics Graph



• The AMS-50 Series spindle incorporates a vane type air motor, spindle and geared speed reducer. The motor/spindle can be selected for either Right or Left rotation. This spindle is ideal for drilling, milling and slitting applications and if used in conjunction with the optional grindstone flange it is perfect for ID grinding.



CAT. No.	Model	Speed	Shape	Rotating Direction	Max. Output	Max. Torque	Weight
1528	AMS-50R	4,000 min ⁻¹	Straight	FWD. (CW)	131W	122 cN·m	2,500 g
1539	AMS-50L	3,800 min ⁻¹		REV. (CCW)			

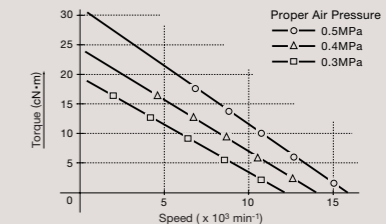
Applicable Axis	• Axis for Metal Saw (KCH-01E) • Axis for Drill Chuck (DCH-J0E) • Grindstone Flange (AGF-19)
Standard Equipment · Accessories	• Collet Chuck ϕ 6.0 mm (CH5-6.0) : 1 pc. • Chuck Nut (CHN-02) • Spanner (12 x 14), (20 x 24) : 1 pc. each • Inlet Air Hose (K-257) : ϕ 7 mm x 2 m • Exhaust Air Hose (K-258) : ϕ 8 mm x 1 m • Silencer (K-209) • Filter Joint (FJ-03)

CAT. No.	1529	AMS-150R (Forward Rotation)	O. D. ϕ 53 mm <Output 132W>	15,000 min⁻¹
CAT. No.	1853	AMS-150L (Reverse Rotation)	O. D. ϕ 53 mm <Output 132W>	15,000 min⁻¹

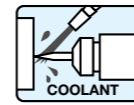


- Proper Air Pressure 0.3~0.5MPa
- Air Consumption 160NL/min
- Spindle Accuracy Within 2 μ m
- Length of Motor Hose 2 m
- Hose Diameter : Air Inlet ϕ 7.0 mm (O.D.)
: Exhaust Air ϕ 8.0 mm (O.D.)
- Standard Size Collet Chuck (CH5-3.0) ϕ 3.0 mm
- Useable Max. Diameter of Grindstone ϕ 40 mm
- < Optional >
- Collet Chuck (CH5-□□) ϕ 0.3 mm~ ϕ 6.0 mm in 0.1 mm increments and ϕ 2.35, ϕ 3.175, ϕ 6.35 mm
- Chuck Nut (K-218) For Collet Chuck (CH5)

AMS-150 Torque-Speed Characteristics Graph



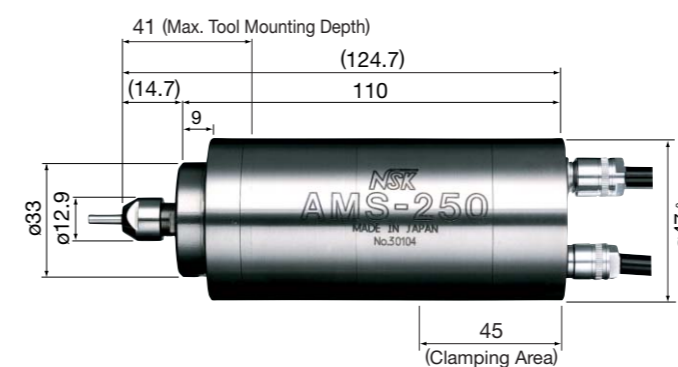
• The AMS-150 Series spindle incorporates a vane type air motor and spindle. The motor/spindle can be selected for either Right or Left rotation. This spindle is ideal for drilling, milling, slitting and grinding applications.



CAT. No.	Model	Speed	Shape	Rotating Direction	Max. Output	Max. Torque	Weight
1529	AMS-150R	15,000 min ⁻¹	Straight	FWD. (CW)	132W	31.4 cN·m	1,960 g
1853	AMS-150L			REV. (CCW)			

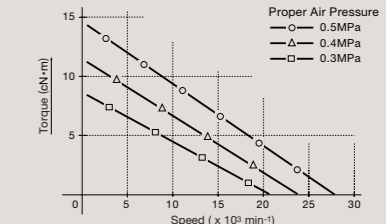
Standard Equipment · Accessories	• Collet Chuck ϕ 3.0 mm (CH5-3.0) : 1 pc. • Chuck Nut (K-218) • Spanner (10 x 10) : 1 pc. • Pin Spanner (K-222) : 1 pc. • Inlet Air Hose (K-257) : ϕ 7 mm x 2 m • Exhaust Air Hose (K-258) : ϕ 8 mm x 1 m • Silencer (K-209) • Filter Joint (FJ-03)
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CAT. No.	1530	AMS-250	O. D. ϕ 47 mm <Output 105W>	25,000 min⁻¹
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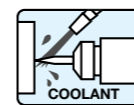


- Proper Air Pressure 0.3~0.5MPa
- Air Consumption 154NL/min
- Spindle Accuracy Within 2 μ m
- Length of Motor Hose 2 m
- Hose Diameter : Air Inlet ϕ 7.0 mm (O.D.)
: Exhaust Air ϕ 8.0 mm (O.D.)
- Standard Size Collet Chuck (CHA-3.0) ϕ 3.0 mm
- Useable Max. Diameter of Grindstone ϕ 25 mm
- < Optional >
- Collet Chuck (CHA-□□) ϕ 0.5 mm~ ϕ 4.0 mm in 0.1 mm increments and ϕ 2.35, ϕ 3.175 mm
- Chuck Nut (K-263) For Collet Chuck (CHA)

AMS-250 Torque-Speed Characteristics Graph



• The AMS-250 Series spindle incorporates a vane type air motor and spindle. The motor/spindle can be selected for either Right or Left rotation. This spindle is ideal for drilling, milling, slitting and grinding applications.



CAT. No.	Model	Speed	Shape	Rotating Direction	Max. Output	Max. Torque	Weight
1530	AMS-250	25,000 min ⁻¹	Straight	FWD. (CW)	150W	14.7 cN·m	1,320 g

Standard Equipment · Accessories	• Collet Chuck ϕ 3.0 mm (CHA-3.0) : 1 pc. • Chuck Nut (K-263) • Spanner (8 x 5), (10 x 10) : 1 pc. each • Inlet Air Hose (K-257) : ϕ 7 mm x 2 m • Exhaust Air Hose (K-258) : ϕ 8 mm x 1 m • Silencer (K-209) • Filter Joint (FJ-03)
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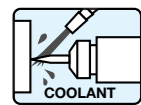
HIGH-SPEED AIR TURBINE SPINDLE "ASTRO SERIES"

● The combination of a high-speed air turbine and an ultra-precision spindle make the ASTRO Series High-Speed Air Turbine Spindles perfect for very high-speed small diameter drilling, milling and grinding applications.

CAT. No. 1531 AMS-600 O. D. ø64 mm <Output 34W> 65,000 min⁻¹



- Proper Air Pressure 0.3~0.5MPa
- Air Consumption 220NL/min
- Spindle Accuracy Within 2 µm
- Length of Motor Hose 2 m
- Hose Diameter : Air Inlet ø7.0 mm (O.D.)
: Exhaust Air ø8.0 mm (O.D.)
- Standard Size Collet Chuck (CH5-6.0) ø6.0 mm
- Useable Max. Diameter of Grindstone ø12 mm
- < Optional >
- Collet Chuck (CH5-□□) ø0.3 mm~ø6.0 mm in 0.1 mm increments and ø2.35, ø3.175, ø6.35 mm
- Chuck Nut (K-218) For Collet Chuck (CH5)
- Special Grindstone Axis for Slot 42 mm AX42
52 mm AX52
62 mm AX62



● The AMS-600 is an Air Turbine powered spindle that utilizes 4 ultra-precision angular ball bearings for very high rigidity. This spindle is ideal for very high-speed small diameter drilling, milling and grinding applications.

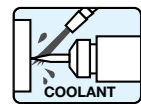
CAT. No.	Model	Speed	Shape	Rotating Direction	Max. Output	Weight
1531	AMS-600	65,000 min ⁻¹ (0.5MPa)	Straight	FWD. (CW)	34W	2,910 g

Applicable Axis	• Special Grindstone Axis for Slots (AX42, AX52, AX62)
Standard Equipment · Accessories	• Collet Chuck ø6.0 mm (CH5-6.0) : 1 pc. • Chuck Nut (K-218) • Spanner (10 x 10) : 1 pc. • Pin Spanner (K-222) : 1 pc. • Inlet Air Hose (K-257) : ø7 mm x 2 m • Exhaust Air Hose (K-258) : ø8 mm x 1 m • Silencer (K-209) • Filter Joint (FJ-03)

CAT. No. 1093 AMS-1200 O. D. ø22.8 mm <Output 21W> 120,000 min⁻¹



- Proper Air Pressure 0.3~0.4MPa
- Air Consumption 80NL/min
- Spindle Accuracy Within 1 µm
- Length of Motor Hose 2 m
- Hose Diameter : Air Inlet ø4.0 mm (I.D.) x ø6.0 mm (O.D.)
- Standard Size Collet Chuck (CHA-3.0) ø3.0 mm
- Useable Max. Diameter of Grindstone ø6.0 mm
- < Optional >
- Collet Chuck (CHA-□□) ø0.5 mm~ø4.0 mm in 0.1 mm increments and ø2.35, ø3.175 mm
- Chuck Nut (K-263) For Collet Chuck (CHA)

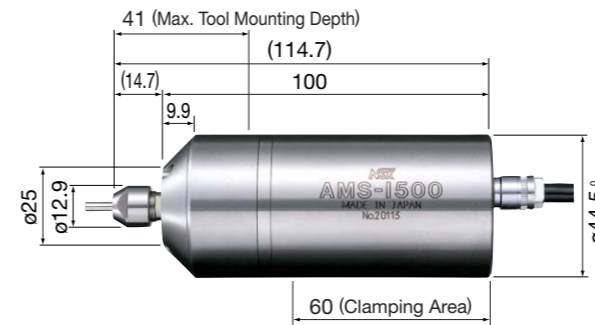


● The AMS-1200 is an Air Turbine powered 120,000 min⁻¹ spindle. This spindle is ideal for very high-speed small diameter drilling, milling and grinding applications. The very high-speed rotation makes this spindle perfect for machining of ceramic, cemented carbide or other very hard materials.

CAT. No.	Model	Speed	Shape	Rotating Direction	Max. Output	Weight
1093	AMS-1200	120,000 min ⁻¹ (0.4MPa)	Straight	FWD. (CW)	21W	320 g (w/o hose)

Standard Equipment · Accessories	• Collet Chuck ø3.0 mm (CHA-3.0) : 1 pc. • Chuck Nut (K-263) • Spanner (8 x 5), (10 x 10) : 1 pc. each • Hose (K-259) : ø6 mm x 2 m • Filter Joint (FJ-01)
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CAT. No. 1533 AMS-1500 O. D. ø44.5 mm <Output 21W> 150,000 min⁻¹



- Proper Air Pressure 0.3~0.5MPa
- Air Consumption 55NL/min
- Spindle Accuracy Within 2 µm
- Length of Motor Hose 2 m
- Hose Diameter : Air Inlet ø7.0 mm (O.D.)
- Standard Size Collet Chuck (CHA-3.0) ø3.0 mm
- Useable Max. Diameter of Grindstone ø4.0 mm
- < Optional >
- Collet Chuck (CHA-□□) ø0.5 mm~ø4.0 mm in 0.1 mm increments and ø2.35, ø3.175 mm
- Chuck Nut (K-263) For Collet Chuck (CHA)

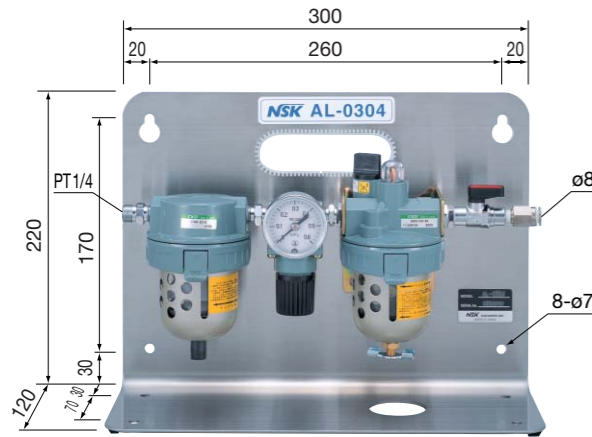


● The AMS-1500 is an Air Turbine powered 150,000 min⁻¹ spindle. This spindle is ideal for very high-speed small diameter drilling, milling and grinding applications. The very high-speed rotation makes this spindle perfect for machining of ceramic, cemented carbide or other very hard materials.

CAT. No.	Model	Speed	Shape	Rotating Direction	Max. Output	Weight
1533	AMS-1500	150,000 min ⁻¹ (0.5MPa)	Straight	FWD. (CW)	21W	1,300 g

Standard Equipment · Accessories	• Collet Chuck ø3.0 mm (CHA-3.0) : 1 pc. • Chuck Nut (K-263) • Spanner (8 x 5), (10 x 10) : 1 pc. each • Inlet Air Hose (K-257) : ø7 mm x 2 m • Filter Joint (FJ-03)
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CAT. No. 1542 AIR LINE KIT AL-0304



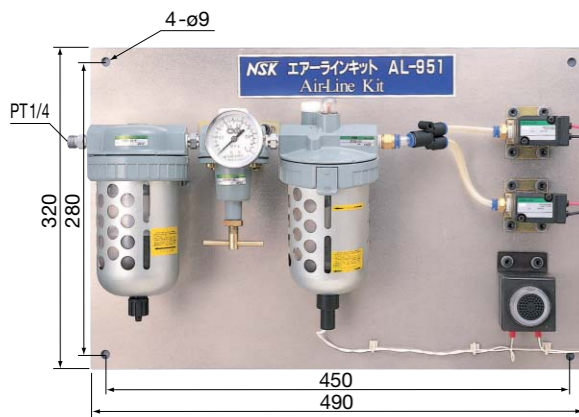
● The AL-0304 is designed to supply filtered, regulated, and lubricated air to NSK's air motor and air turbine spindles. An air line kit is required for proper operation of almost all NSK air motor and air turbine spindles. In some cases the air line kit alone may not provide sufficient filtering to prevent contamination of the motor and spindle, in these cases it is recommended to use an air dryer or large capacity filter between the compressor and the AL-0304.

Air Line Kit (For $\phi 6$ mm, $\phi 8$ mm Hose · Filter Mesh 0.3 μ m)

CAT. No.	Model	Standard Equipment · Accessories
1542	AL-0304	<ul style="list-style-type: none"> • Air Filter • Air Regulator • Air Pressure Gauge • Lubricator • Air ON-OFF Valve • Hose for Piping (K-260) : 2 m • Lubricating Oil (K-211) : 1 pc. • Reducer

* Reducer ($\phi 8$ - $\phi 6$ mm Adaptor) is provided.

CAT. No. 1030 AIR LINE KIT AL-951



● The AL-951 is equipped with a filter, regulator, lubricator, air solenoids and low oil alarm. This system is perfect for installations on CNC and NC lathes where automatic operation of the air motors and air turbines are required. An optional third air solenoid can be added to extend the capacity to three air motor spindles.

Air Line Kit (For $\phi 6$ mm Hose · Filter Mesh 5 μ m)

CAT. No.	Model	Standard Equipment · Accessories
1030	AL-951	<ul style="list-style-type: none"> • Air Filter • Air Regulator • Air Pressure Gauge • Lubricator • Solenoid Valve (DC 24V) : 2 pcs. • Buzzer (DC 24V) • Hose for Piping (K-260) : 2 m • Lubricating Oil (K-202) : 1 pc.

LUBRICATING OIL

● Use ISO VG15 Liquid Paraffin (Shell Ongina oil #15) for lubricator.

Lubricating Oil (70 cc)

CAT. No.	Model	Product
1057	K-211	

Lubricating Oil (1L)

CAT. No.	Model	Product
1058	K-202	

● The Ultra-precision drill stand ADM-30 is designed for ultra-precision small diameter drilling that requires high rotating speed. The fine mechanism allows for extremely delicate high precision movement for use with very small diameter drills.

CAT. No. 2601 ADM-30



FEATURES :

- Very small diameter drills can be used by mounting NSK's ASTRO motors and spindles.
- It used to be very difficult to use very small diameter drills in a hand drill press due to the stiff, jerky movement of the drill press. The ADM-30 utilizes a high-precision mechanism allowing an unprecedented delicate touch for use with very small diameter drills.
- The ASTRO motors and spindles run with extremely low vibration at very high speeds extending the service life of drills.
- Centering the work piece on the drill stand is very easy.

< Specifications >

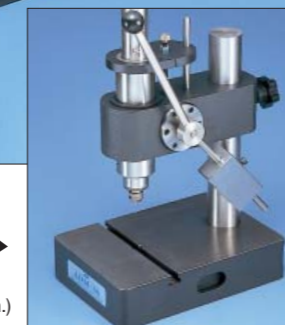
- Vertical Movement Range of Arm 100 mm
- Slide Stroke 35 mm
- Bush Inner Diameter $\phi 19.05$ ~ $\phi 30$ mm (or less)
- Table Size 230 x 160 mm
- Weight 15 kg

Inner Diameter of Optional Bushing

Product	d	CAT. No.
	$\phi 19.05$ mm	2617
	$\phi 20$ mm	2616
	$\phi 22$ mm	2615
	$\phi 22.8$ mm	2614
	$\phi 23$ mm	2613
	$\phi 25$ mm	2612
	$\phi 25.4$ mm	2611
	$\phi 30$ mm	2610

Application Example with Spindle

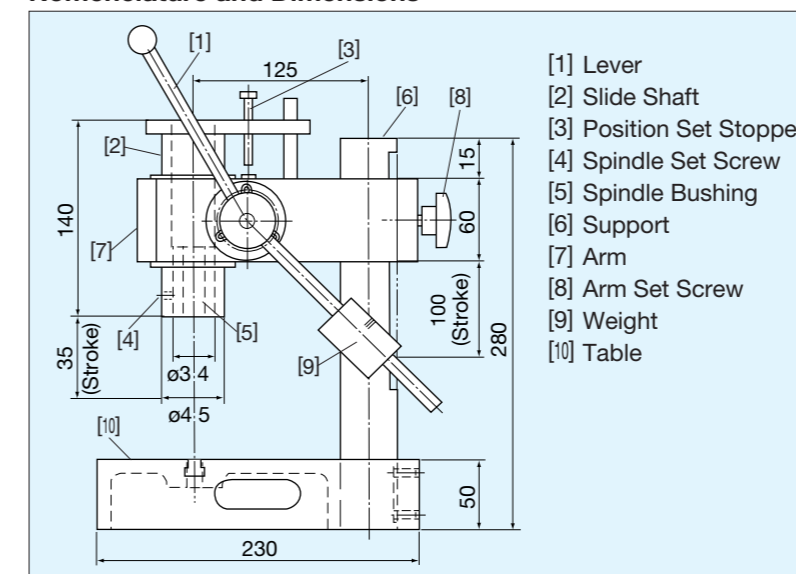
(Spindle is optional. Select depending on the application.)



Drill Stand

CAT. No.	Model	Standard Equipment · Accessories
2601	ADM-30	<ul style="list-style-type: none"> • Unit • Allen Wrench : 2.5 mm 1 pc., 3.0 mm 1 pc. • Order the bush separately to receive the size required.

Nomenclature and Dimensions



- [1] Lever
- [2] Slide Shaft
- [3] Position Set Stopper
- [4] Spindle Set Screw
- [5] Spindle Bushing
- [6] Support
- [7] Arm
- [8] Arm Set Screw
- [9] Weight
- [10] Table

Usable Spindles (Optional) Select a spindle from below.

Product	d	Speed	Page
ASTRO-E 500Z (Electric)	$\phi 30$ mm	2,000~50,000 min ⁻¹	2-p2 2-p14
ASTRO-E 2550 (Electric)	$\phi 25$ mm	5,000~50,000 min ⁻¹	2-p24 2-p31
ASTRO-E 250 (Electric)	$\phi 22.8$ mm	2,000~25,000 min ⁻¹	2-p32 2-p37
ASTRO System (Pneumatic)	$\phi 22.8$ mm $\phi 30$ mm	2,000~60,000 min ⁻¹	3-p2 3-p22
ASTRO Series (Pneumatic)	$\phi 19.05$ mm $\phi 25$ mm	1,500~120,000 min ⁻¹	3-p23 3-p34