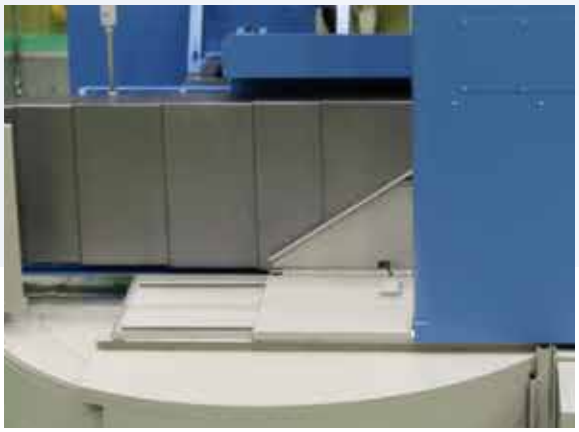
CNC Vertical Lathes / CNC Turning Centers

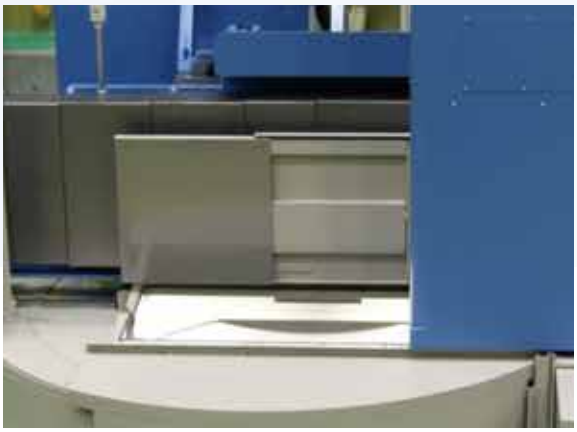
Neo-EX Series

O-M Ltd.

A picture of Neoα-28EX

A picture of Neoα-10EX Ⅱ



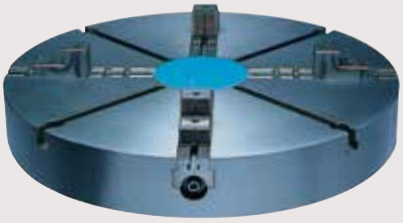


NEO-EX Series

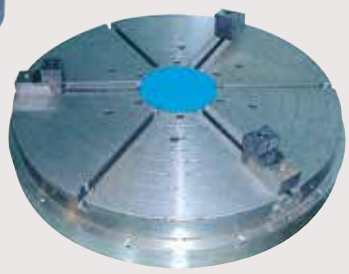
Basic Performance

Table

The optional hydraulic 3-jaw or 6-jaw chuck table (Simultaneous or 3 Leading and 3 Following) can also be chosen for ring shape workpiece holding.
Other chucks are available as well as the 4-jaw independent chuck table.



4-Jaw Independent
Chuck Table (Neo-10EXⅡ, Neo-12EXⅡ)



3-Jaw Hydraulic Chuck Table

4-Jaw Independent
Chuck Table (Neo-16EX～)

Column

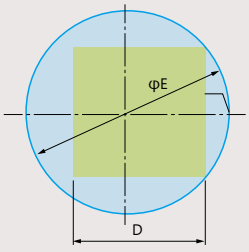
The ***Neo-EX Series*** box way design and high quality cast iron absorbs the dynamic load through the crossrail.

Column for ***Neo(α)-16, 20, 28EX***

Crossrail

Neo-EX & ***Neoα-EX Series*** crossrail ways are hardened and precisely ground for superior wear and long life, ensuring parallelism and accuracy.
The crossrail is positioned with 200mm (7.87inch) pitched steps and secured with powerful clamping.

Ram size
Minimum bore for ram pass
Z axis stroke



Model	Neo(α)-10EXⅡ		Neo(α)-16EX·20EX		Neo(α)-28EX	
	mm	inch	mm	inch	mm	inch
D	180	7.09	210	8.3	240	9.4
φE	φ260 (φ270)	10.2 (10.6)	300	11.8	330	13.0
Z axis stroke	800	31.5	1100	43.3	1250	49.2

* ( ) only for ***Neoα-10EXⅡ***

Neo-EX

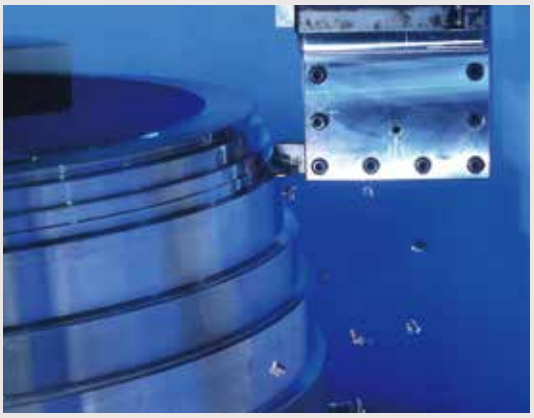
Neoα-EX

Main Construction

Tool Head

Neo-EX Series

The O-M's original powerful pull-stud and the Dual contact surface made up of a large-size taper and shoulder ensure highly accurate and powerful clamping.



Neoα-EX Series

■ Dual contact surface (BIG-PLUS® can be used)

BT50 is used for live spindle. Dual contact surface tool, "BIG-PLUS®" can be used as standard.

■ Angular bearing is adopted for high accuracy & high speed

Max. speed of live spindle for Neoα-EX Series is 2500min^{-1}

■ Center through coolant can be added

Center through coolant can be used with standard collet chuck. Rotary joint, which is used for machining center is adopted. The construction prevents coolant from getting into bearing even if coolant is leaked.

■ Sufficient live spindle motor power & torque

FANUC AC spindle motor 18.5KW (25HP) is adopted. It slows down at approximately 1:3 by timing belt and brings sufficient torque.

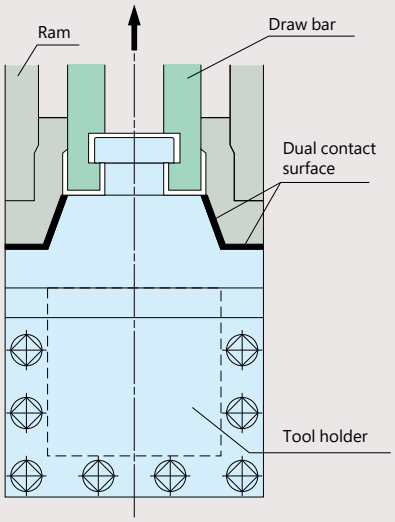
■ Rigid tapping can be performed

Improve followability for rigid tapping by detecting spindle rotation directly with FANUC α iBz sensor.

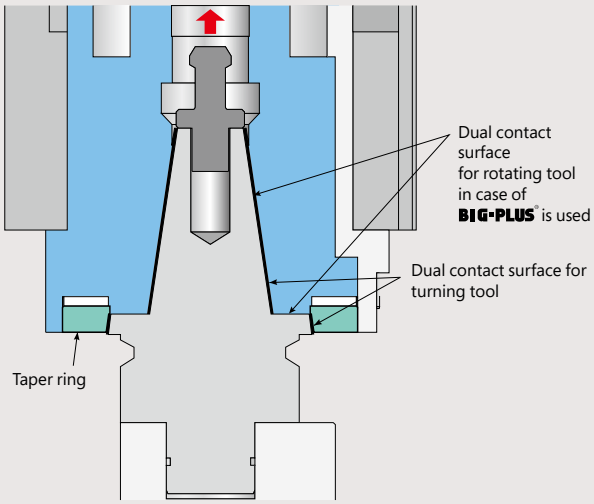
■ Tool clamping device

Milling tool is clamped by disk spring like machining center at 18KN.

Neo-EX Series Tool-Clamping Mechanism



Neoα-EX Series Tool-Clamping Mechanism



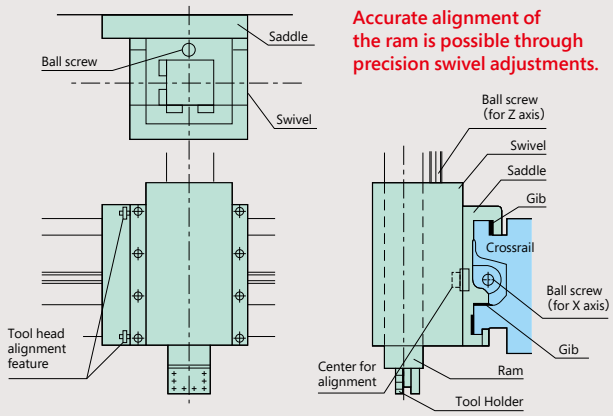
Basic Performance

Feed Drive Mechanism

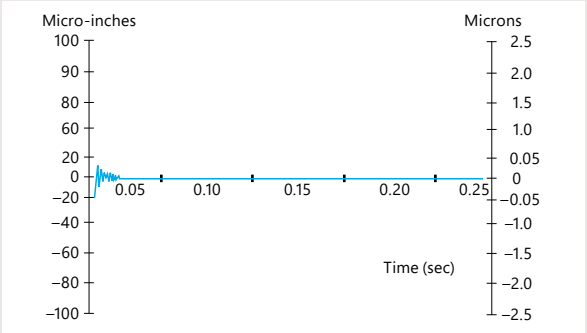
Both the Z axis (vertical movement) , and the X axis (horizontal movement) , are driven by AC servo motors and ball screws. Hardened and ground box ways utilize low abrasion liners, absorb shock and vibration during interrupted cutting, grooving and heavy cutting.

Accurate alignment of the ram is possible through precision swivel adjustments.

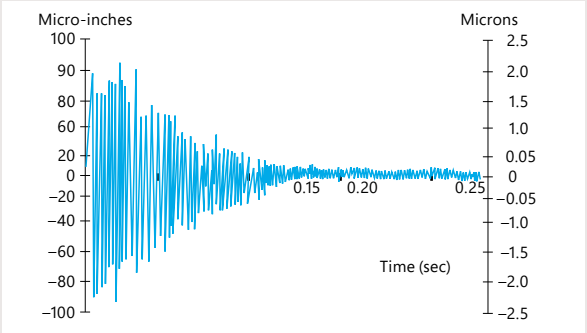
Actual measured accuracies on both axes are ± 0.002/540mm (±0.0001/21.25") for positioning and ± 0.002mm (±0.0001") for repeatability.



■ Boxway accelerometer reading



■ Linear way accelerometer reading



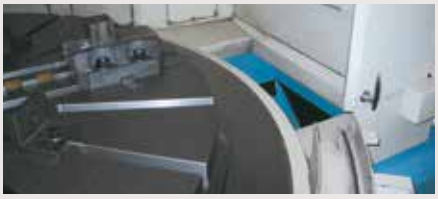
Data from a study done at Penn State University

Automatic Tool Changer

The tool changer magazine is located on the right end of the crossrail, and is protected from chips by the automatic shutter.

Chip Flow and Removal

Chips fallen down from chip shoot, are discharged automatically by Chip conveyor.



FANUC Control with "CNC and Manual" Operation

The *Neo-EX Series* & *Neoα-EX Series* can be controlled by CNC or manual operation.

Machine operations are controlled through the CNC control panel and 10.4 inch full color LCD displays, which facilitates the editing programs. Safety devices, trouble information monitoring, and self diagnostic functions can be displayed on the LCD, as an aid to quick trouble shooting and analysis.

FANUC CNC control

Neo-EX Series
Operation Panel

Optional Features

Main Motor Power Up

1.2 times larger than standard table torque can be chosen to respond to heavy cutting.

Model	Unit	Standard（Motor Power）	Option（Motor Power）
Neo-16EX	N・m	20,000（AC37kW）	23,900（AC55kW）
	lbs・ft	14,750（AC50HP）	17,630（AC75HP）
Neo-20EX	N・m	27,000（AC37kW）	32,000（AC55kW）
	lbs・ft	19,190（AC50HP）	23,600（AC75HP）
Neo-28EX	N・m	40,000（AC37kW）	48,000（AC55kW）
	lbs・ft	29,500（AC50HP）	35,400（AC75HP）

* Also Available for Neoα-EX Series * It is not available for Neo-10, 12EXII & Neoα-10, 12EXII
The α series' motor for spindle AC 18.5kw（25HP）
Spindle speed : 25 ～ 2,500min^{-1}

Automatic Tool Changer Capacity Up

Optional increased tool capacity allows unmanned operation and spare tools.

Neo-EX Series

〈 Standard 〉

12 tools

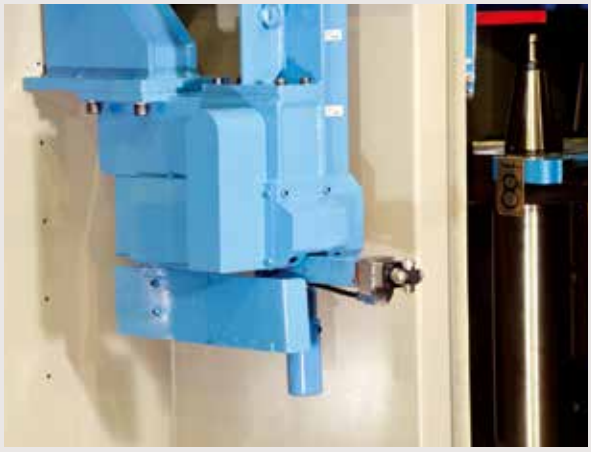
〈 Option 〉

16 tools

* 24 tools capacity for Neoα-EX Series

Tool Presetter

Tool offset data, geometry and wear can be automatically entered into the CNC control.



Slotting Mode

The table can be indexed in milling mode and the key way on workpiece can be machined in turning mode by using the slotting mode with special tool holder on Neoα-EX series .

Turning Test Cut Data

O.D. Heavy Cutting

Cutting condition	Workpiece Material Cast Steel（JIS SC480）
Insert Chip Material	GC4035
Insert Chip	SNMM190612-PR (SANDVIK)
Tool Shank	PSBNR3232P19 (SANDVIK)
Workpiece Dia.	φ830mm（32.7"）
Table Speed	30min^{-1}
Cutting Speed	80m/min（262.5ft/min）
Cutting Depth	12.5mm（0.5"）
Feed Rate	1.0mm/rev（0.04inch/rev）
Cutting Force	25,000N（5,620lbs）
Ram Head Projection	245～395mm (9.65"～15.55")
Removable Stock Rate：1055mL/min（0.28gal/min）	

F.C. Heavy Cutting

Cutting condition	Workpiece Material Cast Steel（JIS SC480）	
Insert Chip Material	GC4035	
Insert Chip	SNMM190612-PR (SANDVIK)	
Tool Shank	PSBNR3232P19 (SANDVIK)	
Workpiece Dia.	φ635mm (25")	φ720mm (28.3")
Table Speed	50～54min^{-1}	44～54min^{-1}
	Constant surface speed control	
Cutting Speed	100m/min（328ft/min）	
Cutting Depth	5mm (0.2")	9mm (0.35")
Feed Rate	0.5mm/rev (0.02inch/rev)	0.9mm/rev (0.04inch/rev)
Cutting Force	4,900N (1,100lbs)	15,900N (3,570lbs)
Ram Head Projection	303mm (11.9")	120mm (4.7")
Cutting State	Intermittent	Continuity

O.D. Grooving

Cutting condition	Workpiece Material Cast Steel（JIS SC480）
Insert Chip Material	SAFM/P25
Insert Chip	MS-12（MIRCONA）
Tool Shank	R151S-4032×30×12/ 300-00（MIRCONA）
Workpiece Dia.	φ961mm（37.8"）
Table Speed	27min^{-1}
Cutting Speed	80m/min（262.4ft/min）
Cutting Depth	12mm（0.47"）
Feed Rate	0.15mm/rev（0.006inch/rev）
Ram Head Projection	451mm（17.7"）

Finishing

Tool Holder: Standard NH1-140-32

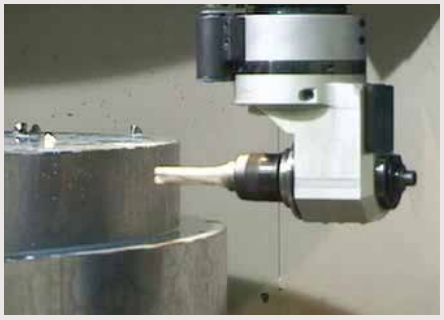
Cutting condition	O.D.	F.C.
Insert Chip Material	NX33	
Insert Chip	TNMG160408-C（MITSUBISHI MATERIAL）	
Tool Shank	MTJNR2525M16M1 (SANDVIK)	MTJNL2525M16M1 (SANDVIK)
Cutting Dia.	φ1,022mm (40.2")	φ920 - 870mm (36.2 - 34.2")
Table Speed	62min^{-1}	69～73min^{-1} Constant surface speed control
Cutting Speed	200m/min（656.1ft/min）	
Cutting Depth	0.1mm（0.004"）	
Feed Rate	0.1mm/rev（0.004inch/rev）	
Surface Roughness	Ry 3.7S	Ry 4.7S
Ram Head Projection	954 - 974mm (37.5 - 38.3")	954mm (37.5")

Workpiece Material : Cast Steel（JIS SC480）

* All of cutting conditions described above are measured values not guaranteed values.

Milling Test Cut Data (Neoα-EX Series)

Drilling



Test Cut Condition

Cutting condition	Face Drilling		Side Drilling
Workpiece Material	Cast Steel (JIS SC480)		
Drill Bit Material	Carbide (BIG FULLCUT Drill)		
Drill Dia.	φ50mm (2")	φ80mm (3.15")	φ19.5mm (0.77")
Spindle Speed	640min^{-1}	480min^{-1}	1600min^{-1}
Cutting Speed	120m/min (393.7ft/min)		100m/min (328.1ft/min)
Feed Rate	0.12mm/rev (0.0047inch/rev)		0.1mm/rev (0.004inch/rev)

* The tapping size in metric of M30×3.5 and M42×4.5 are equivalent to UNC1-1/4" 7 threads and UNC1-5/8" 5 threads in inch respectively.

Tapping

Test Cut Condition

Cutting condition	Face Tapping	
Workpiece Material	SC480	
Tap Dia.	M30 (1.18")	M42 (1.65")
Thread Pitch	3.5mm (0.14")	4.5mm (0.18")
Tap Dill Dia.	26.5mm (1.0") (95%)	37.5mm (1.5") (95%)
Tap Material	HSS (High Speed Steel)	
Spindle Speed	64min^{-1}	46min^{-1}
Cutting Speed	6m/min (20ft/min)	
Feed Rate	224mm/min (8.8inch/min)	207mm/min (8.15inch/min)

Actual Accuracies

(By O-M standards conform with JIS (Japan Industrial Standards))

Unit : mm (inch)

Test Item	Tolerance	Measured Value
Run Out of Table Surface	0.02 (0.0008)	0.007 (0.0003)
Run Out of Table Side	0.02 (0.0008)	0.007 (0.0003)

Unit : mm (inch)

Test Item	Tolerance	Measured Value
Positioning of Linear Axes	±0.007/500 (±0.0003/19.7)	±0.002/540 (±0.00008/21.3)
Repeatability of Linear Axes	±0.005 (±0.0002)	±0.002 (±0.00008)

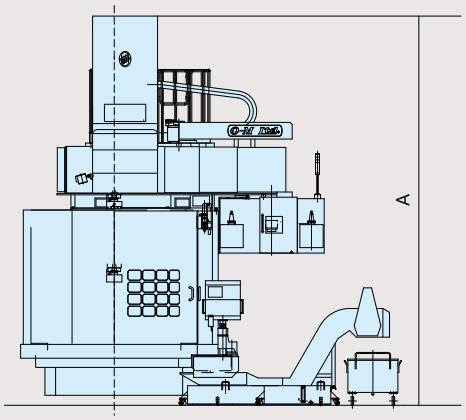
Unit : sec

Test Item	Tolerance	Measured Value
Positioning of C Axis	±10	±4
Repeatability of C Axis	±5	±1

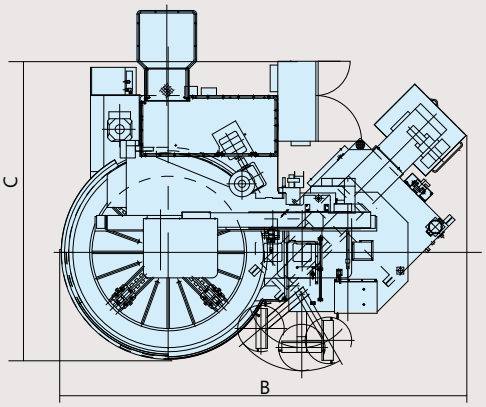
* Measured value are not guaranteed values.

Dimensions

Machine Height



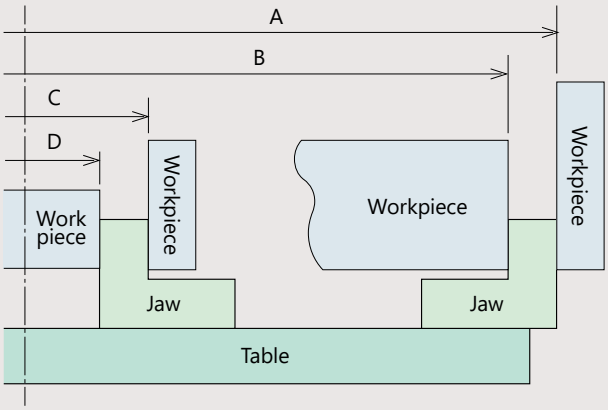
Floor Layout



mm (inch)

		10EXII	16EX	20EX	28EX
A	Neo-EX	3590/3790(141.3/149.2)	5310(209.1)	5810(228.7)	6170(242.9)
	Neoα-EX	3820/4020(150.4/158.3)	5340(210.2)	5840(229.9)	
B	Neo-EX	3825(150.6)	4740(186.6)	5345(210.4)	5815(228.9)
	Neoα-EX	3975(156.5)			
C	Neo-EX	3955(155.7)	4060(159.8)	4260(167.7)	4795(188.8)
	Neoα-EX		3770(148.4)	4070(160.2)	4405(173.4)

Work Holding Capacities



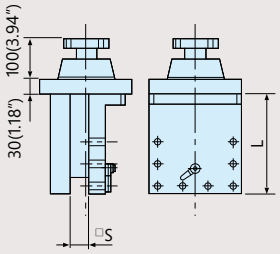
mm (inch)

	Table Dia.	A	B	C	D
Neo-10EXII	φ1100(43.3)	φ1100(43.3)	φ1000(39.4)	φ390(15.4)	φ270(10.6)
Neo-16EX	φ1600(63.0)	φ1665(65.6)	φ1555(61.2)	φ445(17.5)	φ335(13.2)
Neo-20EX	φ2000(78.7)	φ2085(82.1)	φ1975(77.8)	φ505(19.9)	φ395(15.6)
Neo-28EX	φ2800(110.2)	φ2855(112.4)	φ2745(108.1)	φ465(18.3)	φ355(14.0)

* Same capacities for Neoα-EX Series

Neo-EX Series Tool Holder

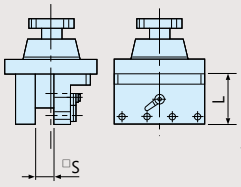
■ Tool Holder
Type : RH1



mm (inch)

Type	L	□S
RH1-150-1¼"	150 (5.91)	31.75 (1.25)
RH1-200-1¼"	200 (7.87)	31.75 (1.25)

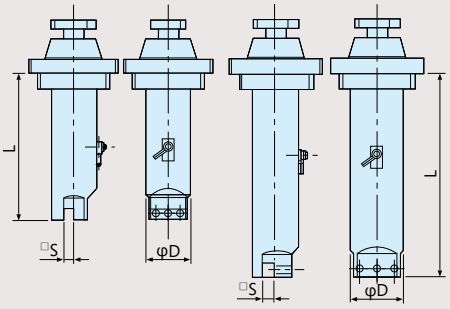
■ Tool Holder
Type : RH2



mm (inch)

Type	L	□S
RH2-100-1¼"	100 (3.94)	31.75 (1.25)
RH2-100-1½"	100 (3.94)	38.1 (1.5)

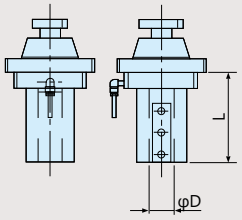
■ Boring Bar
Type : RB1



mm (inch)

Type	φD	L	□S
RB1-90-300-¾"	90 (3.54)	300 (11.8)	19.1 (0.75)
RB1-100-450-1"	100 (3.94)	450 (17.7)	25.4 (1)

■ Flange Holder
Type : RS2

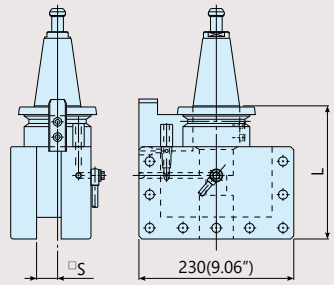


mm (inch)

Type	L	φD
RS2-1¼"	180 (7.09)	31.75 (1.25)
RS2-1½"	180 (7.09)	38.1 (1.5)
RS2-2"	180 (7.09)	50.8 (2)

Neoα-EX Series Tool Holder

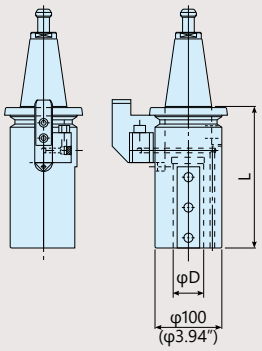
■ Tool Holder



mm (inch)

Type	L	□S
ANH1-200-1¼"	200 (7.87)	31.75 (1.25)
ANH1-250-1¼"	250 (9.84)	31.75 (1.25)
ANH2-170-1¼"	170 (6.69)	31.75 (1.25)

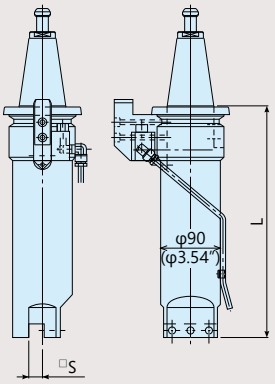
■ Flange Holder



mm (inch)

Type	L	□S
ANS2-1¼"	210 (8.27)	31.75 (1.25)
ANS2-1½"	210 (8.27)	38.1 (1.5)
ANS2-2"	210 (8.27)	50.4 (2)

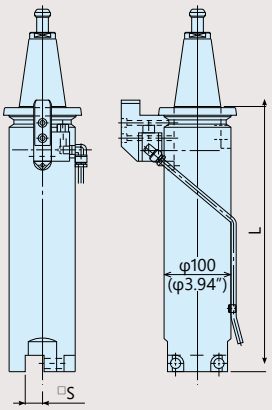
■ Boring Bar (φ90)



mm (inch)

Type	L	□S
ANB1-90-300-¾"	300 (11.8)	19.1 (0.75)
ANB1-90-350-¾"	350 (13.8)	19.1 (0.75)

■ Boring Bar (φ100)



mm (inch)

Type	L	□S
ANB1-100-300-1"	300 (11.8)	25.4 (1)
ANB1-100-400-1"	400 (15.7)	25.4 (1)

* Tool shank can't be set vertically to ANH2-170-1¼"

Main Specifications

Item	Neo-10EXII		Neo-16EX		Neo-20EX		Neo-28EX	
	Metric	Inch · pound	Metric	Inch · pound	Metric	Inch · pound	Metric	Inch · pound
Table diameter	φ1100	43.31	φ1600	62.99	φ2000	78.74	φ2800	110.24
Max. turning diameter	φ1250	49.21	φ2000	78.74	φ2500	98.43	φ3000	118.11
Max. swing	φ1400	55.12	φ2000	78.74	φ2500	98.43	φ3000	118.11
Max. turning height	600/800	23.62/31.50	1500	59.06	2000	78.74	2000	78.74
Max. mass of workpiece	3000kg	6610lbs	8000kg	17640lbs	15000kg	33070lbs	20000kg	44100lbs
Max. torque for turning	13000N·m	9590lbs·ft	20000N·m	14750lbs·ft	27000N·m	19910lbs·ft	40000N·m	29500lbs·ft
Max. cutting force	25000N	5620lbs	25000	5620lbs	25000	5620lbs	25000	5620lbs
Vertical travel of ram	800	31.50	1100	43.31	1100	43.31	1250	49.21
Ram size	180 × 180	7.09×7.09	210×210	8.27×8.27	210×210	8.27×8.27	240×240	9.45×9.45
Min. bore for ram pass	φ260	φ10.24	φ300	φ11.81	φ300	φ11.81	φ330	φ12.99
Horizontal travel from table center	R1150 / L475	R45.28 / L18.70	R1525 / L100	R60.04 / L3.94	R1775 / L100	R69.88 / L3.94	R2025 / L100	R79.72 / L3.94
Length from gauge line to table top	805 / 1005	31.69/39.57	1705	67.13	2205	86.81	2205	86.81
Magazine capacity	12tool	12tool	12tool	12tool	12tool	12tool	12tool	12tool
X & Z Rapid feed speed	X : 15000 Z : 12000 mm/min	X : 590.55 Z : 472.44 inch/min	10000 mm/min	393.70 inch/min	10000 mm/min	393.70 inch/min	10000 mm/min	393.70 inch/min
Number of table speed range	2step	2step	2step	2step	2step	2step	2step	2step
Table speed for turning	2 ~ 420min^{-1}	2 ~ 420min^{-1}	1 ~ 300min^{-1}	1 ~ 300min^{-1}	1 ~ 230min^{-1}	1 ~ 230min^{-1}	1 ~ 130min^{-1}	1 ~ 130min^{-1}
Vertical travel of crossrail	Fixed	Fixed	800	31.50	1200	47.24	1200	47.24
Main motor	VAC 30/37KW	VAC 40/50HP	VAC 30/37KW	VAC 40/50HP	VAC 30/37KW	VAC 40/50HP	VAC 30/37KW	VAC 40/50HP
Total power capacity	80KVA	80KVA	80KVA	80KVA	80KVA	80KVA	80KVA	80KVA
Mass of machine	12500kg	27560lbs	19000kg	41890lbs	24000kg	52910lbs	32500kg	71650lbs

Standard Equipments

- Independent four-jaw chuck table
- 12 tools ATC
- Standard tool holder for turning
- Chip cover (manual open/close type)
- Chip conveyor
- X axis telescopic cover
- Coolant unit (Ram through)
- Automatic lubrication unit
- Table lubricant chiller
- X axis scale feedback
- Crossrail positioning unit (Except for Neo-10EX Ⅱ/12EX Ⅱ)
- Work light
- Signal tower
- NC unit (FANUC 0iT)
- Energy-saving function
- *Automatic power off unit
- Column top handrail and ladder (Except for Neo-10EX Ⅱ/12EX Ⅱ)
- Disassembly operations tools
- Foundation parts for installation

Optional Accessories

- Hydraulic three-jaw chuck table (with high and low pressure control)
- Combination chuck (with high and low pressure control)
- 16 tools ATC
- Tool holder
- Tool presetter
- Work probe (Radius measuring)
- Z axis scale feedback
- Table motor power up AC55kW (AC75HP)
- Control panel height adjustment
- Manual guide i

Main Specifications

Item	Neoα-10EXII		Neoα-16EX		Neoα-20EX		Neoα-28EX	
	Metric	Inch・pound	Metric	Inch・pound	Metric	Inch・pound	Metric	Inch・pound
Table diameter	φ1100	43.31	φ1600	62.99	φ2000	78.74	φ2800	110.24
Max. turning diameter	φ1250	49.21	φ2000	78.74	φ2500	98.43	φ3000	118.11
Max. swing	φ1400	55.12	φ2000	78.74	φ2500	98.43	φ3000	118.11
Max. turning height	600/800	23.62/31.50	1500	59.06	2000	78.74	2000	78.74
Max. mass of workpiece	3000kg	6610lbs	8000kg	17640lbs	15000kg	33070lbs	20000kg	44100lbs
Max. torque for turning	13000N・m	9590lbs・ft	20000N・m	14750lbs・ft	27000N・m	19910lbs・ft	40000N・m	29500lbs・ft
Max. cutting force	25000N	5620lbs	25000N	5620lbs	25000N	5620lbs	25000N	5620lbs
Vertical travel of ram	800	31.50	1100	43.31	1100	43.31	1250	49.21
Ram size	180×180	7.09×7.09	210×210	8.27×8.27	210×210	8.27×8.27	240×240	9.45×9.45
Min. bore for ram pass	φ270	φ10.63	φ300	φ11.81	φ300	φ11.81	φ330	φ12.99
Horizontal travel from table center	R1135 / L475	R44.69 / L18.70	R1510 / L100	R59.45 / L3.94	R1760 / L100	R69.29 / L3.94	R2010 / L100	R79.13 / L3.94
Length from gauge line to table top	790/990	31.10/ 38.98	1690	66.54	2190	86.22	2190	86.22
Magazine capacity	24tool	24tool	24tool	24tool	24tool	24tool	24tool	24tool
X & Z Rapid feed speed	X : 15000 Z : 12000 mm/min	X : 590.55 Z : 472.44 inch/min	10000 mm/min	393.70 inch/min	10000 mm/min	393.70 inch/min	10000 mm/min	393.70 inch/min
Max. diameter for drilling	80	3.15	80	3.15	80	3.15	80	3.15
Max. diameter for tapping	M42×P4.5	UNC1-1/2	M42×P4.5	UNC1-1/2	M42×P4.5	UNC1-1/2	M42×P4.5	UNC1-1/2
Number of table speed range	2step	2step	2step	2step	2step	2step	2step	2step
Table speed for turning	2 ～ 420min^{-1}	2 ～ 420min^{-1}	1 ～ 300min^{-1}	1 ～ 300min^{-1}	1 ～ 230min^{-1}	1 ～ 230min^{-1}	1 ～ 130min^{-1}	1 ～ 130min^{-1}
Number of spindle speed	1step	1step	1step	1step	1step	1step	1step	1step
Spindle speed	25 ～ 2500min^{-1}	25 ～ 2500min^{-1}	25 ～ 2500min^{-1}	25 ～ 2500min^{-1}	25 ～ 2500min^{-1}	25 ～ 2500min^{-1}	25 ～ 2500min^{-1}	25 ～ 2500min^{-1}

Item	Neoα-10EXⅡ		Neoα-16EX		Neoα-20EX		Neoα-28EX	
	Metric	Inch・pound	Metric	Inch・pound	Metric	Inch・pound	Metric	Inch・pound
Vertical travel of crossrail	Fixed	Fixed	800	31.50	1200	47.24	1200	47.24
Main motor	VAC 30/37KW	VAC 40/50HP	VAC 30/37KW	VAC 40/50HP	VAC 30/37KW	VAC 40/50HP	VAC 30/37KW	VAC 40/50HP
Spindle motor	VAC 15/18.5KW	VAC 20/25HP	VAC 15/18.5KW	VAC 20/25HP	VAC 15/18.5KW	VAC 20/25HP	VAC 15/18.5KW	VAC 20/25HP
Torque of spindle motor	330N・m	243.4lbs・ft	330N・m	243.4lbs・ft	330N・m	243.4lbs・ft	330N・m	243.4lbs・ft
Total power capacity	60KVA	60KVA	80KVA	80KVA	80KVA	80KVA	80KVA	80KVA
Mass of machine	13000kg	28660lbs	20000kg	44090lbs	25000kg	55110lbs	33000kg	72750lbs

Standard Equipments

- Independent four-jaw chuck table
- 24 tools ATC
- Standard tool holder for turning
- Chip cover (manual open/close type)
- Chip conveyor
- X axis telescopic cover
- Coolant unit (Ram through)
- *Coolant unit (Center through)
- *High pressure coolant preparation
- Automatic lubrication unit
- Table lubricant chiller
- X axis scale feedback
- C axis full-closed control
- Crossrail positioning unit (Except for Neo-10EXⅡ/12EXⅡ)
- Work light
- Signal tower
- NC unit (FANUC 0iT)
- Energy-saving function
- *Automatic power off unit
- Drilling cycle support software
- *Column top handrail and ladder (Except for Neoα-10EXⅡ/12EXⅡ)
- Disassembly operations tools
- Foundation parts for installation

Optional Accessories

- Hydraulic three-jaw chuck table (with high and low pressure control)
- Combination chuck (with high and low pressure control)
- Tool holder
- Tool presetter
- Work probe (Radius measuring)
- Z axis scale feedback
- Table motor power up AC55kW (AC75HP)
- Control panel height adjustment
- Slotter process function
- Manual guide i

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