NIKKI DENSO
The Next Servo Power

English

τENGINE

Sophisticated Control Stage

τ Linear Stage

τ Linear X Stage ・τ Linear XY Stage

τ Linear X θ Stage ・τ Linear XY θ Stage

τ Linear Custom-made Stage

Nikki Denso Co., Ltd.

τ Linear Stage

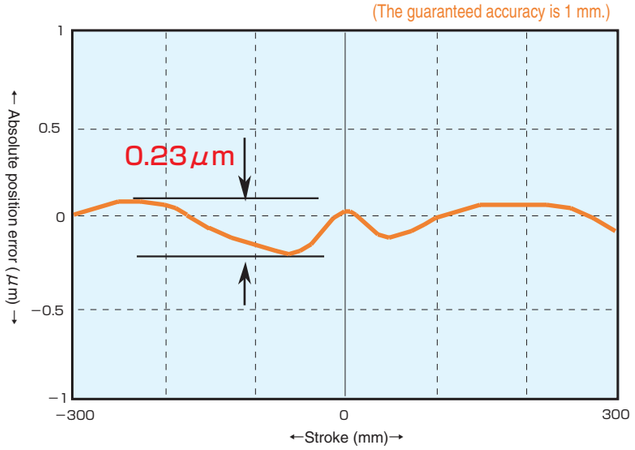
High precision stage equipped with a linear servo motor

Control stage realized in combination with servo control technology

High performance linear stage

- ***Speed variation performance guaranteed***
- ***Check and setting of user-requested operation specifications supported***
- ***Positioning accuracy guaranteed by using laser measurement correction data***

Example of positioning accuracy data measured with a stroke of 600 mm
(The guaranteed accuracy is 1 mm.)



(Positions measured by Renishaw's laser measurement system)

Rich lineup and custom-made stage available

- ***Standard lineup including X and XY stages***
- ***Lineup also including Xθ and XYθ stages equipped with high precision direct drive servo motor τ DISC series for the θ-axis***
- ***Custom-made stages such as a multi-head stage and XYZ-axis stage also available***

Selectable servo network system

- ***Following network system options available in combination with servo driver VC II series***

  Motion network : MECHATROLINK-Ⅲ and SSCNET Ⅲ

  Field network : CC-Link and DeviceNet

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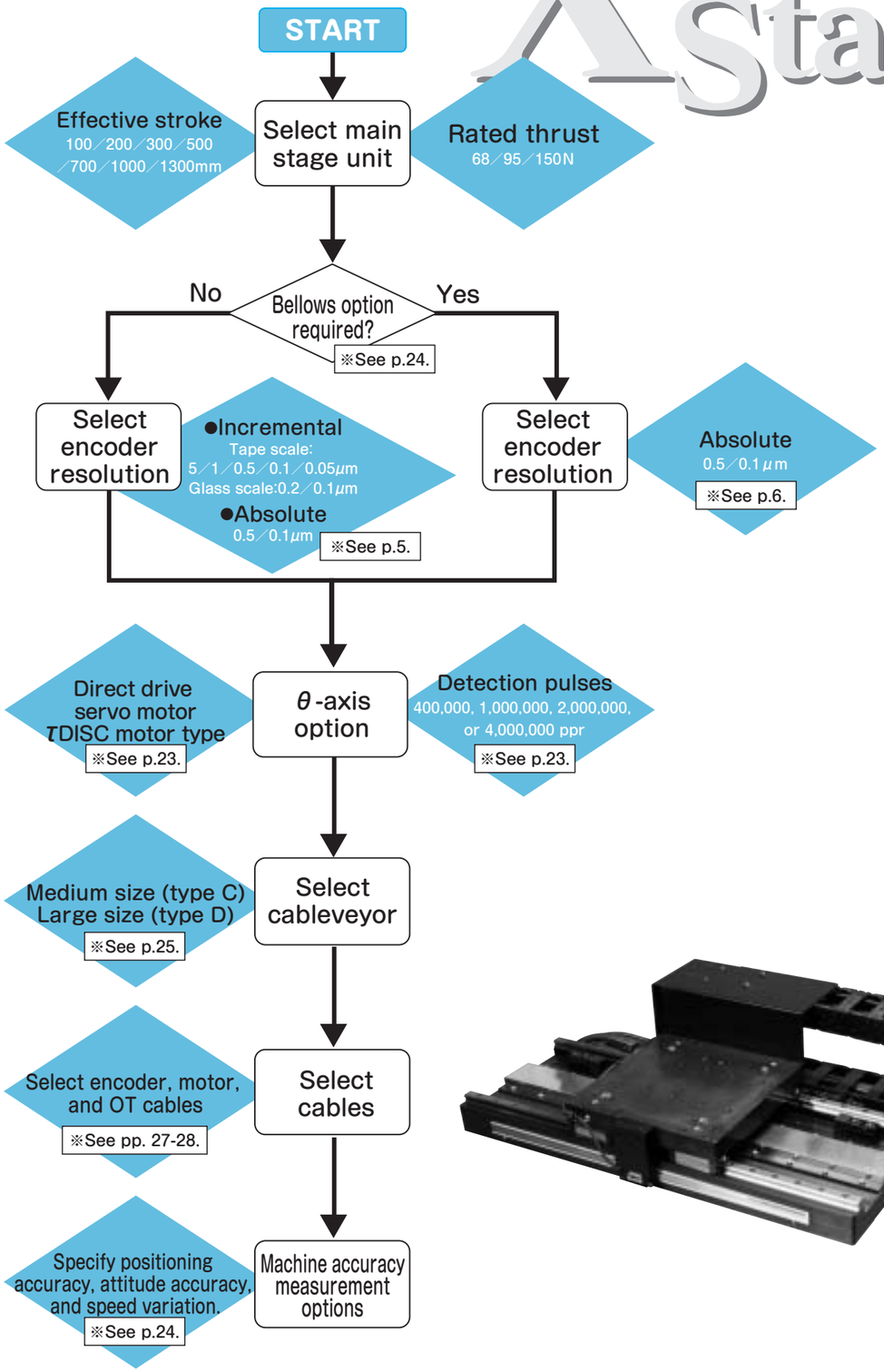
τ Linear X Stage

Standard X Stage Selection Chart



Explanation of the Model Number

NST-A	030	A3	A	P	NA-S01
①	②	③	④	⑤	⑥ ⑦

① τ linear X stage series name	
② Effective stroke	10 mm units. Example) 030→Stroke: 300 mm
③ Linear motor type/rated thrust ※ [ ] The boxed thrust indicates the thrust of the standard product of each type.	A : Flat coreless type (NVA-AM) [3 : 68N] 1 : 23N 2 : 45N 4 : 90N 5 : 135N B : High-thrust coreless type (NVA-BM) [3 : 150N] 1 : 50N 2 : 100N 4 : 200N 5 : 300N D : Standard coreless type (NLD-AM) [2 : 95N] 1 : 50N 3 : 150N 4 : 200N
④ Design order	A→B→C･･･ (Starting with A)
⑤ Code set by the manufacturer	
⑥ Bellows setting	NA : Without bellows JA : With bellows
⑦ Customization code	None : Standard specification S+serial-number : Customized specification

※If you want to use a model with a non-standard thrust, contact our sales representative.

General Specifications

Item		Specification
Ambient conditions	Temperature	22℃±2℃ ※Any accuracy is not guaranteed in any environment other than the above. ※The positioning accuracy, repetitive positioning accuracy, and accuracy in lost motion are guaranteed only when the temperature is kept constant at 22℃.
	Humidity	85% or less with no condensation
	Installation	Do not install the stage in any harmful atmosphere such as corrosive gas, cutting oil, metal dust, or oil.
	Altitude	1000 m or less
Cooling method		Natural cooling
Mounting orientation ※1		Without bellows : Mount the table horizontally upward or downward. ※2 With bellows : Mount the table horizontally upward.
Finishing		Base : Made of steel. Mainly black. Low-temperature black chrome treatment. Table : Made of aluminum alloy. Mainly black. Black alumite treatment. Rust prevention treatment applied appropriately for other parts unless otherwise stated.

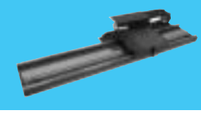
※1 : If you want to use the stage mounted on a wall, contact our sales representative.

※2 : ⚠ When mounting the stage downward, install a device for preventing the table from falling when the linear guide is broken. When the linear guide is broken, the table drops out of the rail.

Mounted Linear Servo Motor Specifications and Available Servo Drivers

Stage model number		NST-A	010A3＊＊～130A3＊＊	010B3＊＊～130B3＊＊	010D2＊＊～130D2＊＊
Mounted linear motor model number ※1			NVA-AMC30A2A□ Flat coreless type	NVA-BMC00A2A□ High-thrust coreless type	NLD-AM20SA2□ Standard coreless type
Rated thrust		N	68	150	95
Maximum thrust		N	204	450	275 (237.5 ※2)
Rated motor speed		m/s	3.0		
Maximum motor speed ※3		m/s	3.5		
Rated output		W	204	450	285
Rated current		A	2.55	2.85	3.4
Automatic magnetic pole detection method			Magnetic pole sensor used or magnetic pole automatically detected		
Available driver ※4	VC Ⅱ series		NCR-□DA□A2A-401D		
	VPS series		NCR-DC□0A2B-401□		NCR-DC□0A2-801□
Main power supply ※5			200 to 230 VAC 50/60 Hz Three-phase power supply (single-phase for VPS series NCR-DC□0A2A-401□)		

※1 : For details of motor specifications, refer to the τ Linear Servo Motor Brochure.
※2 : When a VPS series driver is used
※3 : The maximum speed as the stage depends on the maximum motor speed, maximum allowable speed according to the encoder resolution (see pp. 5-6), and maximum allowable bellows speed (see p.6), and is the slowest speed of them. The maximum speeds are determined out of consideration of the acceleration capability of the mass of the moving part of the stage.
※4 : For details of the VC Ⅱ series, see pp. 39-43. For details of the VPS series, see pp. 44-48.
※5 : If you want to use a 100-VAC power supply, contact our sales representative.



Stage Machine Specifications (without Bellows)

Stage model number (for □, choose from the right list.) NST-A□APNA			010A3	020A3	030A3	050A3	070A3	100A3	130A3
			010B3	020B3	030B3	050B3	070B3	100B3	130B3
			010D2	020D2	030D2	050D2	070D2	100D2	130D2
Stage effective stroke ※1		mm	100 (130)	200 (230)	300 (330)	500 (530)	700 (730)	1000 (1030)	1300 (1330)
Straightness ※6		μm	3	3	5	7	10	12	15
Parallelism B ※6		μm	10	10	15	20	25	30	35
Encoder type			Select the incremental or absolute type.						
Incremental tape scale (Upper:VCIIdriver Lower:VPS driver)	Encoder model number and corresponding resolution NSR-LABA□A1A05		A1:5μm B1:1μm C1:0.5μm E1:0.1μm F1:0.05μm A1:5μm B1:1μm C1:0.5μm ED:0.1μm FD:0.05μm						
	Maximum allowable encoder speed ※2		5μm:10m/s 1μm:5m/s 0.5μm:2.5m/s 0.1μm:1.3m/s 0.05μm:0.6m/s 5μm:10m/s 1μm:4m/s 0.5μm:2m/s 0.1μm:0.7m/s 0.05μm:0.3m/s						
Incremental glass scale	Encoder model number and corresponding resolution NSR-LJFB□J3A05		D1:0.2μm E1:0.1μm						
	Maximum allowable encoder speed ※2		0.2μm:0.8m/s 0.1μm:0.4m/s						
Absolute	Encoder model number and corresponding resolution NSR-LFDA□E5A10-＊＊＊		C2:0.5μm E2:0.1μm						
	Maximum allowable encoder speed ※2		0.5μm:5m/s 0.1μm:5m/s						
Repetitive positioning accuracy (encoder resolution) ※6		μm	±5 (with 5μm)		±1 (with 1μm)		±0.5 (with 0.5、0.2、0.1、0.05μm)		
Lost motion (encoder resolution) ※6		μm	10 (with 5μm)		2 (with 1μm)		1 (with 0.5、0.2、0.1、0.05μm)		
Load capacity ※4、※5		kg	200						
Assumed moving part mass ※5		kg	7						
Assumed mass ※5	NST-＊＊A3APNA	kg	36	42	48.5	61	73.5	92	110.5
	NST-＊＊B3APNA	kg	40.5	48.5	57.5	73	88.5	112	135
	NST-＊＊D2APNA	kg	38	45	52	65.5	79	99.5	119.5
Items related to options (values when machine accuracy measurement options are specified)									
Attitude accuracy: Pitch and yaw angles ※6		asec	10	10	15	15	15	20	25
Positioning accuracy (encoder resolution) ※3、※6		μm	10 (with 5μm)		2 (with 1、0.5μm)		1 (with 0.2、0.1、0.05μm)		
Speed variation ※6、※7		±%	Depends on the customized specification.						

※1 The value in parentheses indicates an approximate stroke between the mechanical stoppers.
※2 The maximum speed as the stage depends on the maximum motor speed (see p.4) and maximum allowable speed according to the encoder resolution, and is the slowest speed of them.
The maximum speeds are determined out of consideration of the acceleration capability of the mass of the moving part of the stage.
※3 The repetitive positioning accuracy and positioning accuracy depend on the encoder resolution.
※4 With the load capacity, the machine accuracy can be guaranteed. Use the stage in an equal load condition. If you want to use the stage in a variable or unequal load condition, contact our sales representative.
Bearing life depends on the operating conditions and others, so separate consideration is required.
※5 The mass with the θ-axis added is not included.
※6 For details of how to measure the accuracy, see "Accuracy Measurement Methods" on pp. 31-33.
For straightness, straightness A is measured when the effective stroke is 700 mm or less and straightness B is measured when it is 1000 mm or more.
※7 A customized specification is set for the speed variation individually depending on the use conditions (including the speed and load). For details, contact our sales representative.

※ If you want to use a higher precision product, contact our sales representative.

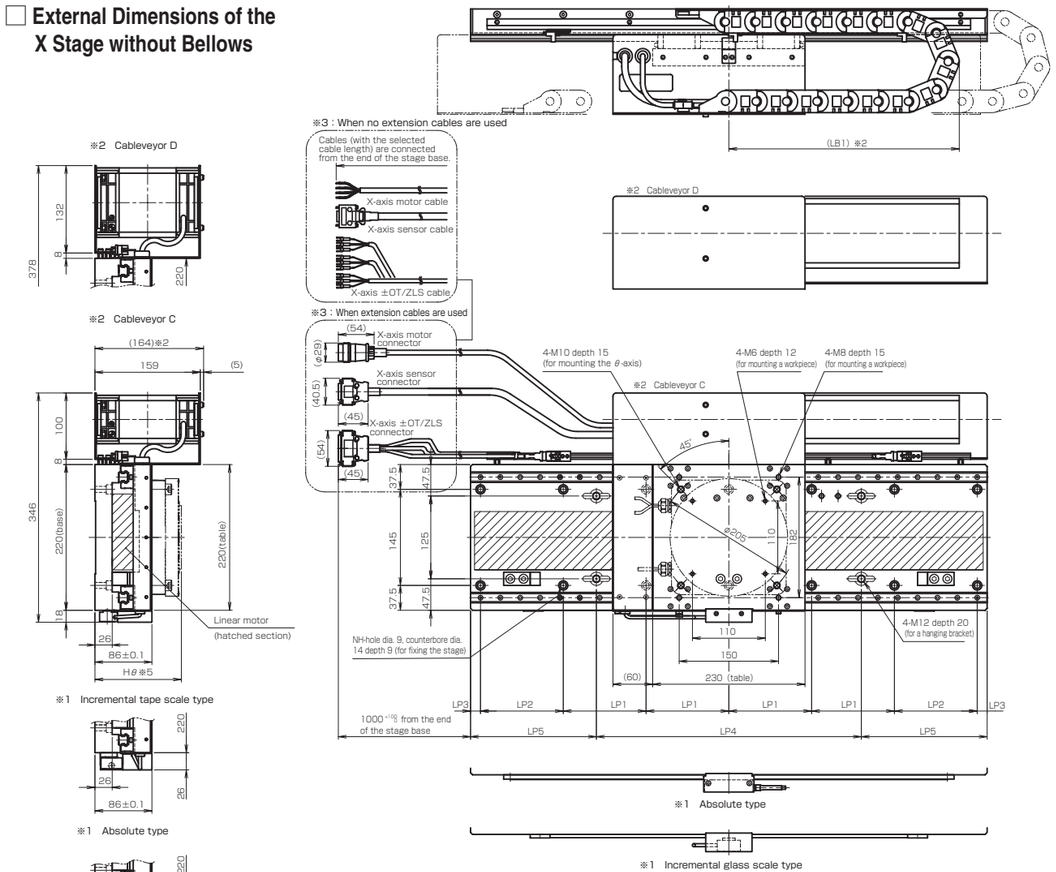
Stage Machine Specifications (with Bellows)

Stage model number (for □, choose from the right list.) NST-A□APJA			010A3	020A3	030A3	050A3	070A3	100A3	130A3
			010B3	020B3	030B3	050B3	070B3	100B3	130B3
			010D2	020D2	030D2	050D2	070D2	100D2	130D2
Stage effective stroke ※1		mm	100 (130)	200 (230)	300 (330)	500 (530)	700 (730)	1000 (1030)	1300 (1330)
Straightness ※6		μm	3	3	5	7	10	12	15
Parallelism B ※6		μm	10	10	15	20	25	30	35
Encoder type			Absolute						
Encoder model number and corresponding resolution NSR-LFDA□E5A10-＊＊＊			C2:0.5μm E2:0.1μm						
Maximum allowable encoder speed ※2		m/s	5						
Maximum allowable bellows speed ※2		m/s	1.6						
Repetitive positioning accuracy ※6		μm	±0.5						
Lost motion ※6		μm	1						
Load capacity ※4、※5		kg	200						
Assumed moving part mass ※5		kg	8						
Assumed mass ※5	NST-＊＊A3APJA	kg	37.5	43.5	50.5	63	76	95	114
	NST-＊＊B3APJA	kg	42	50	59.5	75	91	115	138.5
	NST-＊＊D2APJA	kg	39.5	46.5	54	67.5	81.5	102.5	123
Items related to options (values when machine accuracy measurement options are specified)									
Attitude accuracy: Pitch and yaw angles ※6、※7		asec	10	10	15	15	15	20	25
Positioning accuracy ※3、※6		μm	1						
Speed variation ※6、※7		±%	Depends on the customized specification.						

※1 The value in parentheses indicates an approximate stroke between the mechanical stoppers.
※2 The maximum speed as the stage depends on the maximum motor speed (see p.4), maximum allowable speed according to the encoder resolution, and maximum allowable bellows speed, and is the slowest speed of them.
The maximum speeds are determined out of consideration of the acceleration capability of the mass of the moving part of the stage.
※3 The repetitive positioning accuracy and positioning accuracy depend on the encoder resolution.
※4 With the load capacity, the machine accuracy can be guaranteed. Use the stage in an equal load condition. If you want to use the stage in a variable or unequal load condition, contact our sales representative. Bearing life depends on the operating conditions and others, so separate consideration is required.
※5 The mass with the θ-axis added is not included.
※6 For details of how to measure the accuracy, see "Accuracy Measurement Methods" on pp. 31-33.
※7 Each value indicates the accuracy when the relevant machine accuracy option is specified.
A customized specification is set for the speed variation individually depending on the use conditions (including the speed and load).
For details, contact our sales representative.

※ If you want to use a higher precision product, contact our sales representative.

External Dimensions of the X Stage without Bellows



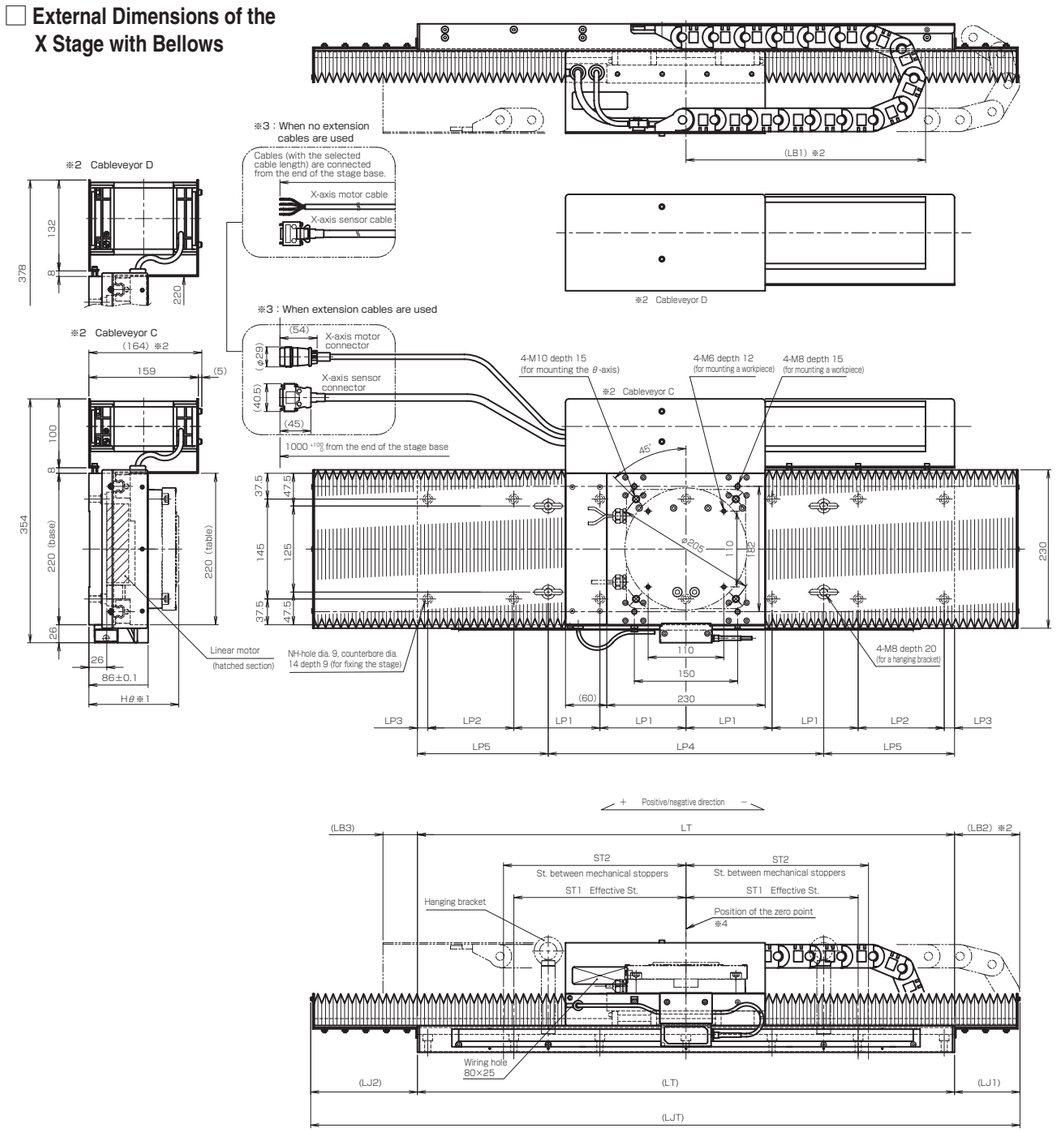
※1:In this figure, a slider is drawn at the center of the stroke.
For the encoder, check the specifications of the selected type.
Use the external dimensions of each selected encoder.
※2:No allowance for a bulging cableveyor is included.
For the cableveyor, check the specifications of the selected type.
Use the external dimensions of each selected cableveyor.
※3:For the cableveyor and extension cables, check the specifications of each selected type.
Use the external dimensions of each selected cable.
※4:The position of the zero point to be detected is at the center of the stroke.
※5:Hθ indicates the dimension when the τDISC Motor D170-040-F/FP (option) is mounted and the value in parentheses indicates the dimension when the τDISC Motor D170-100-F/FP is mounted.

Note) St. means stroke.

X Stage Dimensions (Unit : mm NH : Number of holes)

No.	Model number	LT	ST1	ST2	NH	LP1	LP2	LP3	LP4	LP5	※2 LB1	※2 LB2	LB3	※5 Hθ
1	NST-A010**APNA	380	50	65	8	120	120	10	320	30	255.9	94.6	50	130.5 (190.5)
2	NST-A020**APNA	480	100	115	8	140	140	30	450	15	274.9	94.6	50	
3	NST-A030**APNA	580	150	165	10	125	125	40	540	20	301.9	94.6	50	
4	NST-A050**APNA	780	250	265	14	125	125	15	400	190	347.9	94.6	50	
5	NST-A070**APNA	980	350	365	18	125	100	15	550	215	393.9	94.6	50	
6	NST-A100**APNA	1280	500	515	22	125	125	15	700	290	485.9	101.1	50	
7	NST-A130**APNA	1580	650	665	26	125	125	40	850	365	550.9	101.1	50	

External Dimensions of the X Stage with Bellows



※1:Hθ indicates the dimension when the τDISC Motor D170-040-F/FP (option) is mounted and the value in parentheses indicates the dimension when the τDisc Motor D170-100-F/FP is mounted.
※2:No allowance for a bulging cableveyor is included.
For the cableveyor, check the specifications of the selected type.
Use the external dimensions of each selected cableveyor.
※3:For the cableveyor and extension cables, check the specifications of each selected type.
Use the external dimensions of each selected cable.
※4:The position of the zero point to be detected is at the center of the stroke.

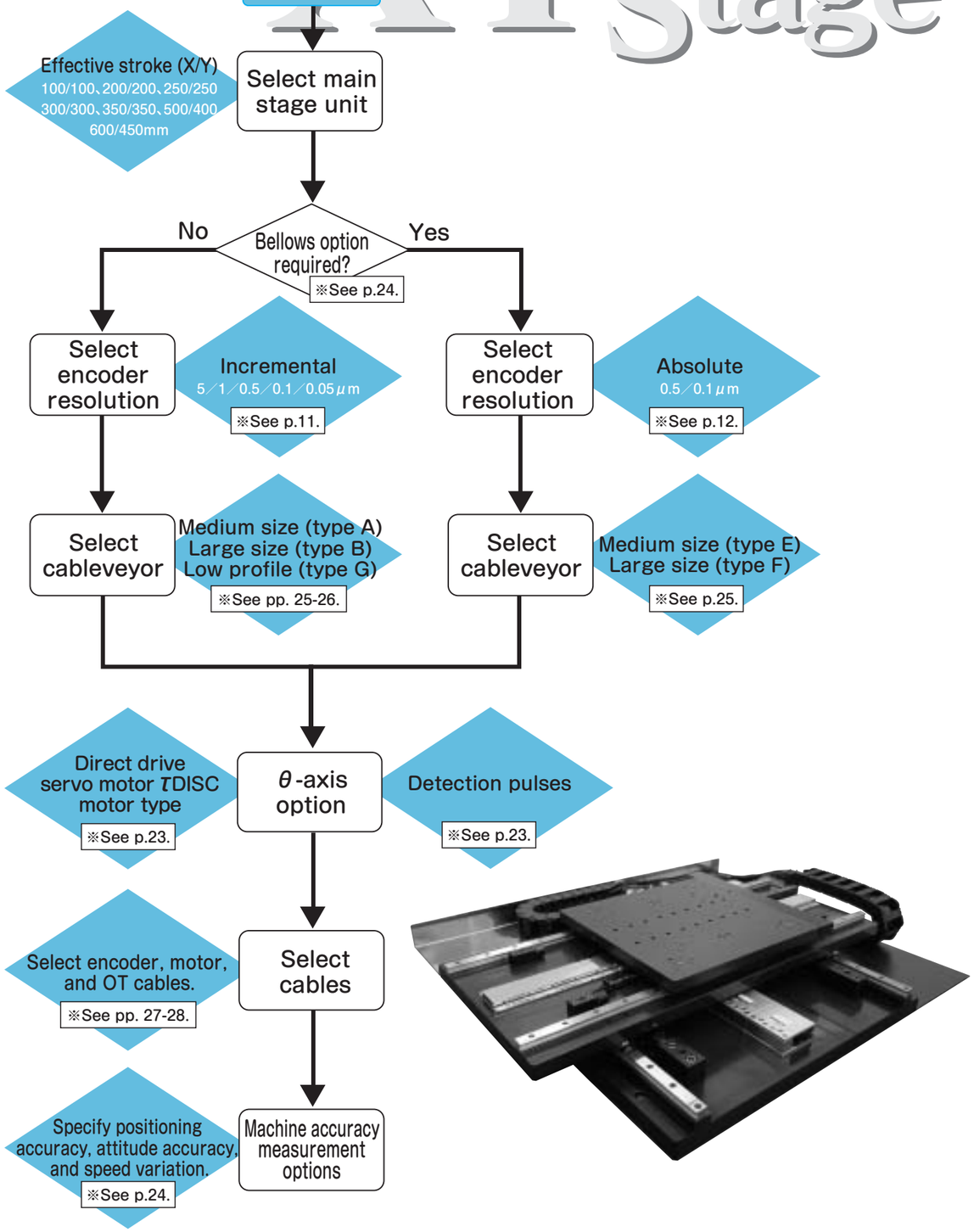
Notes) ·In this figure, a slider is drawn at the center of the stroke.
Only the absolute type of encoder is available and another type of encoder can be selected.
·St. means stroke.

X Stage Dimensions (Unit : mm NH : Number of holes)

No.	Model number	LT	ST1	ST2	NH	LP1	LP2	LP3	LP4	LP5	※2 LB1	※2 LB2	LB3	LJ1	LJ2	LJT	※1 Hθ
1	NST-A010**APJA	380	50	65	8	120	120	10	320	30	255.9	94.6	50	30	90	500	130.5 (190.5)
2	NST-A020**APJA	480	100	115	8	140	140	30	450	15	274.9	94.6	50	45	105	630	
3	NST-A030**APJA	580	150	165	10	125	125	40	540	20	301.9	94.6	50	65	125	770	
4	NST-A050**APJA	780	250	265	14	125	125	15	400	190	347.9	94.6	50	95	155	1030	
5	NST-A070**APJA	980	350	365	18	125	100	15	550	215	393.9	94.6	50	130	190	1300	
6	NST-A100**APJA	1280	500	515	22	125	125	15	700	290	485.9	101.1	50	180	240	1700	
7	NST-A130**APJA	1580	650	665	26	125	125	40	850	365	550.9	101.1	50	235	295	2110	

XY τ Linear Stage

☐ Standard XY Stage Selection Chart



☐ Explanation of the Model Number

NST-D	30	B	4／30	A	4	A	P	NA	-S01
①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪

① τ linear XY stage series name	
② X-axis effective stroke	10 mm units. Example) 030→Stroke: 300 mm
③ X-axis linear motor type	B : High-thrust coreless type (NVA-BM)
④ X-axis linear motor rated thrust	1 : 50N 2 : 100N 3 : 150N 4 : 200N 5 : 300N ※The linear motor type and rated thrust of each standard product are listed in the table below.
⑤ Y-axis effective stroke	10 mm units. Example) 030→Stroke: 300 mm
⑥ Y-axis linear motor type	A : Flat coreless type (NVA-AM)
⑦ Y-axis linear motor rated thrust	1 : 23N 2 : 45N 3 : 68N 4 : 90N 5 : 135N ※The linear motor type and rated thrust of each standard product are listed in the table below.
⑧ Design order	A→B→C··· (Starting with A)
⑨ Code set by the manufacturer	
⑩ Bellows setting	NA : Without bellows (Medium-size cableveyor : Type A/Large-size cableveyor : Type B) JA : With bellows (Medium-size cableveyor : Type E/Large-size cableveyor : Type F)
⑪ Customization code	None : Standard specification S+serial-number : Customized specification

※Linear motor type and rated thrust of each standard product

XY stage model number (② to ⑦ above)	X- and Y-axis effective strokes	Linear motor type and rated thrust (X- and Y-axes)
10B3/10A3	X : 100mm Y : 100mm	X : High-thrust coreless type (NVA-BM) 150N Y : Flat coreless type (NVA-AM) 68N
20B3/20A3	X : 200mm Y : 200mm	
25B4/20A4	X : 250mm Y : 250mm	X : High-thrust coreless type (NVA-BM) 200N Y : Flat coreless type (NVA-AM) 90N
30B4/30A4	X : 300mm Y : 300mm	
35B4/35A4	X : 350mm Y : 350mm	
50B5/40A5	X : 500mm Y : 400mm	X : High-thrust coreless type (NVA-BM) 300N Y : Flat coreless type (NVA-AM) 135N
60B5/45A5	X : 600mm Y : 450mm	

※If you want to use a model with a non-standard thrust, contact our sales representative.

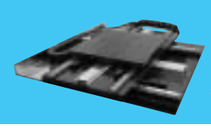
☐ General Specifications

Item		Specification
Ambient conditions	Temperature	22℃±2℃ ※Any accuracy is not guaranteed in any environment other than the above. ※The positioning accuracy, repetitive positioning accuracy, and accuracy in lost motion are guaranteed only when the temperature is kept constant at 22℃.
	Humidity	85% or less with no condensation
	Installation	Do not install the stage in any harmful atmosphere such as corrosive gas, cutting oil, metal dust, or oil.
	Altitude	1000 m or less
Cooling method		Natural cooling
Mounting orientation		Mount the table horizontally upward.
Finishing		Main sections X-axis : Mainly black Base : Made of steel. Low-temperature black chrome treatment. Y-axis : Mainly black Base : Made of steel. Low-temperature black chrome treatment. Table : Made of aluminum alloy. Black alumite treatment. Rust prevention treatment applied appropriately for other parts unless otherwise stated. ※The main finished color is black and white mixed together.

☐ Mounted Linear Servo Motor Specifications and Available Servo Drivers

Stage model number		NST-D	10B3／10A3＊＊ 20B3／20A3＊＊		25B4／25A4＊＊ 30B4／30A4＊＊ 35B4／35A4＊＊		50B5／40A5＊＊ 60B5／45A5＊＊	
X-/Y-axis			X	Y	X	Y	X	Y
Mounted linear motor model number ※1		NVA–	BMC00A2A□	AMC30A2A□	BMD00A2A□	AMD30A2A□	BME00A2A□	AME30A2A□
			X-axis : High-thrust coreless type Y-axis : Flat coreless type					
Rated thrust		N	150	68	200	90	300	135
Maximum thrust		N	450	204	600	261 (225 ※2)	900	405
Rated motor speed		m/s	3.0					
Maximum motor speed ※3		m/s	3.5					
Rated output		W	450	204	600	270	900	405
Rated current		A	2.85	2.55	3.8	3.4	5.7	5.1
Automatic magnetic pole detection method			Magnetic pole sensor used or magnetic pole automatically detected					
Available driver ※4	VC Ⅱ series NCR-□D		A□A2A-401D		A□A2A-801D	A□A2A-401D	A□A2A-801D	
	VPS series NCR-DC		□0A2B-401□		□0A2B-801□	□0A2B-401□	□0A2B-801□	
Main power supply ※5			200 to 230 VAC 50/60 Hz Three-phase power supply (single-phase for VPS series NCR-DC□0A2B-401□)					

※1:For details of motor specifications, refer to the τ Linear Servo Motor Brochure.
※2:When a VPS series driver is used
※3:The maximum speed as the stage depends on the maximum motor speed, maximum allowable speed according to the encoder resolution (see pp. 11-12), and maximum allowable bellows speed (see p.12), and is the slowest speed of them. The maximum speeds are determined out of consideration of the acceleration capability of the mass of the moving part of the stage.
※4:For details of the VC Ⅱ series, see pp. 39-43. For details of the VPS series, see pp. 44-48.
※5:If you want to use a 100-VAC power supply, contact our sales representative.



☐ Stage Machine Specifications (without Bellows)

Stage model number (for □, choose from the right list.) NST-D□APNA		10B3/10A3		20B3/20A3		25B4/25A4		30B4/30A4		35B4/35A4		50B5/40A5		60B5/45A5	
X-/Y-axis		X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
Stage effective stroke ※1	mm	100 (130)	100 (130)	200 (230)	200 (230)	250 (280)	250 (280)	300 (330)	300 (330)	350 (380)	350 (380)	500 (530)	400 (430)	600 (630)	450 (480)
Straightness A ※6	μm	3	3	3	3	5	5	5	5	5	5	10	10	15	15
Squareness A ※6	μm	3		5		10		10		10		15		25	
Parallelism B ※6	μm	15		15		15		15		15		25		25	
Encoder type		Incremental													
Encoder model number and corresponding resolution NSR-LBBA□A2A05		A1 : 5μm B1 : 1μm C1 : 0.5μm E1 : 0.1μm F1 : 0.05μm													
Maximum allowable encoder speed ※2 (Lower : When the VPS driver is used)		5μm:10m/s 1μm:5m/s 0.5μm:2.5m/s 0.1μm:0.7m/s 0.05μm:0.35m/s 5μm:10m/s 1μm:4m/s 0.5μm:2m/s 0.1μm:0.7m/s 0.05μm:0.35m/s													
Repetitive positioning accuracy (encoder resolution) ※6	μm	±5 (with 5μm)				±1 (with 1μm)				±0.5 (with 0.5、0.1、0.05μm)					
Lost motion (encoder resolution) ※6	μm	10 (with 5μm)				2 (with 1μm)				1 (with 0.5、0.1、0.05μm)					
Load capacity ※4、※5	kg	50				100									
Assumed moving part mass ※5	kg	32.5	7	37.5	7	54	9	57	9	60.5	9	126.5	19	132	19
Assumed mass ※5	kg	69.5		81.5		145.5		156		167.5		378		431.5	
Items related to options (values when machine accuracy measurement options are specified)															
Attitude accuracy : Pitch and yaw angles ※6	asec	15	15	15	15	15	15	15	15	15	15	20	20	20	20
Positioning accuracy (encoder resolution)※3、※6、※7	μm	10 (with 5μm)				2 (with 1、0.5μm)				1 (with 0.1、0.05μm)					
Speed variation ※6、※7	±%	Depends on the customized specification.													

※1 The value in parentheses indicates an approximate stroke between the mechanical stoppers.
※2 The maximum speed as the stage depends on the maximum motor speed (see p.10) and maximum allowable speed according to the encoder resolution, and is the slowest speed of them.
※3 The repetitive positioning accuracy and positioning accuracy depend on the encoder resolution.
※4 With the load capacity, the machine accuracy can be guaranteed. Use the stage in an equal load condition. If you want to use the stage in a variable or unequal load condition, contact our sales representative.
Bearing life depends on the operating conditions and others, so separate consideration is required.
※5 The mass with the θ-axis added is not included.
※6 For details of how to measure the accuracy, see "Accuracy Measurement Methods" on pp. 31-33.
※7 A customized specification is set for the speed variation individually depending on the use conditions (including, the speed and load). For details, contact our sales representative.

※ If you want to use a higher precision product, contact our sales representative.

☐ Stage Machine Specifications (with Bellows)

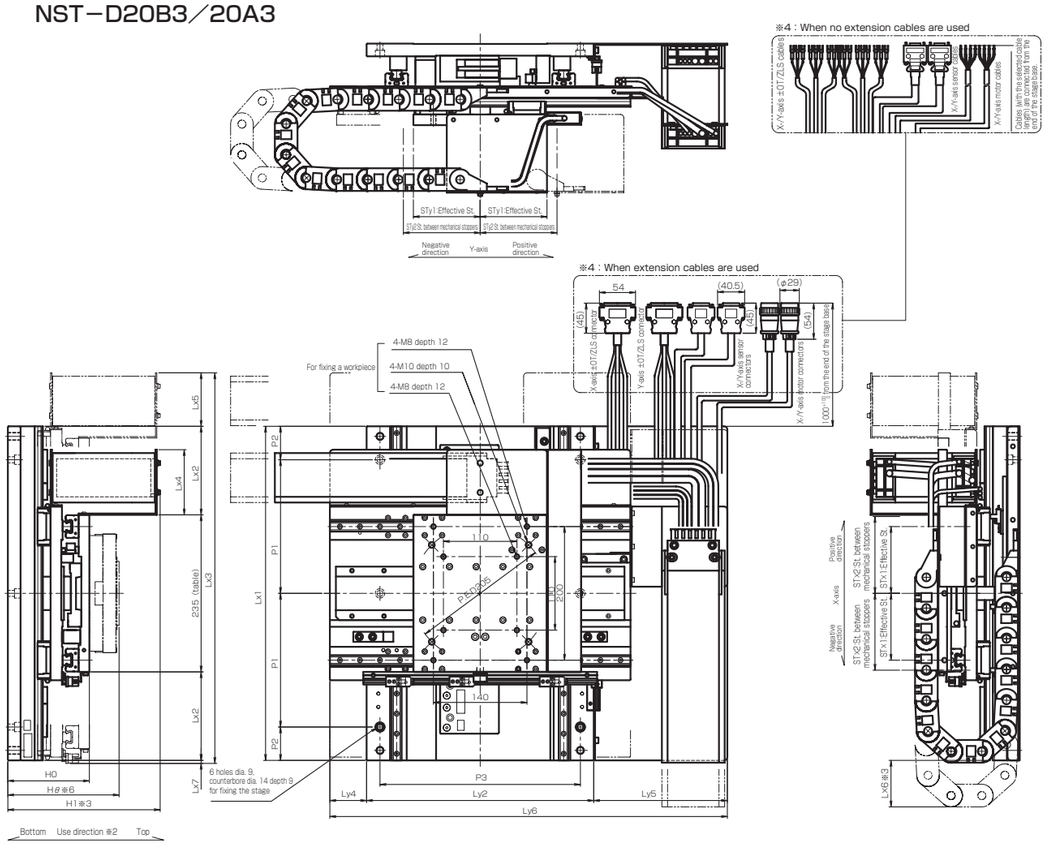
Stage model number (for □, choose from the right list.) NST-D□APJA NST-D□APJB		10B3/10A3		20B3/20A3		25B4/25A4		30B4/30A4		35B4/35A4		50B5/40A5		60B5/45A5	
X-/Y-axis		X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
Stage effective stroke ※1	mm	100 (130)	100 (130)	200 (230)	200 (230)	250 (280)	250 (280)	300 (330)	300 (330)	350 (380)	350 (380)	500 (530)	400 (430)	600 (630)	450 (480)
Straightness A ※6	μm	3	3	3	3	5	5	5	5	5	5	10	10	15	15
Squareness A ※6	μm	3		5		10		10		10		15		25	
Parallelism B ※6	μm	15		15		15		15		15		25		25	
Encoder type		Absolute													
Encoder model number and corresponding resolution NSR-LFDA□2E5A10-＊＊＊		C : 0.5μm E : 0.1μm													
Maximum allowable bellows speed ※2	m/s	1.6													
Maximum allowable encoder speed ※2	m/s	5													
Repetitive positioning accuracy ※6	μm	±0.5													
Lost motion ※6	μm	1													
Load capacity ※4、※5	kg	50				100									
Assumed moving part mass ※5	kg	33.7	10.6	38.7	10.7	55.3	13.5	58.3	13.5	61.8	13.7	128.1	24.9	133.6	25.1
Assumed mass	kg	75		87.5		153		163.5		175.5		389.5		443.5	
Items related to options (values when machine accuracy measurement options are specified)															
Attitude accuracy : Pitch and yaw angles ※6	asec	15	15	15	15	15	15	15	15	15	15	20	20	20	20
Positioning accuracy ※3、※6	μm	1													
Speed variation ※6、※7	±%	Depends on the customized specification.													

※1 The value in parentheses indicates an approximate stroke between the mechanical stoppers.
※2 The maximum speed as the stage depends on the maximum motor speed (see p.10), maximum allowable speed according to the encoder resolution, and maximum allowable bellows speed, and is the slowest speed of them. The maximum speeds are determined out of consideration of the acceleration capability of the mass of the moving part of the stage.
※3 The repetitive positioning accuracy and positioning accuracy depend on the encoder resolution.
※4 With the load capacity, the machine accuracy can be guaranteed. Use the stage in an equal load condition. If you want to use the stage in a variable or unequal load condition, contact our sales representative. Bearing life depends on the operating conditions and others, so separate consideration is required.
※5 The mass with the θ-axis added is not included.
※6 For details of how to measure the accuracy, see "Accuracy Measurement Methods" on pp. 31-33.
※7 Value when the relevant machine accuracy measurement option is specified
A customized specification is set for the speed variation individually depending on the use conditions (including, the speed and load).
For details, contact our sales representative.

※ If you want to use a higher precision product, contact our sales representative.

External Dimensions of the XY Stage (without Bellows/Medium- or Large-Size Cableveyor)

NST−D10B3／10A3
NST−D20B3／20A3



※1:Hθ indicates the dimension when the τDISC Motor D170-040-F/FP (option) is mounted and the value in parentheses indicates the dimension when the τDISC Motor D170-100-F/FP is mounted.
※2:This stage is mounted horizontally upward.
※3:No allowance for a bulging cableveyor is included.
※4:For the cableveyor and extension cables, check the specifications of each selected type.
※5:A⇒Cableveyor type A B⇒Cableveyor type B

Notes)・St. means stroke.
・In this figure, all axes are drawn at the center of the stroke.

Tolerances not designated in the figure					
Dimension	Tolerance	Dimension	Tolerance	Dimension	Tolerance
L≦6	±0.1	30<L≦120	±0.3	315<L≦1000	±0.8
6<L≦30	±0.2	120<L≦315	±0.5	1000<L≦2000	±1.2

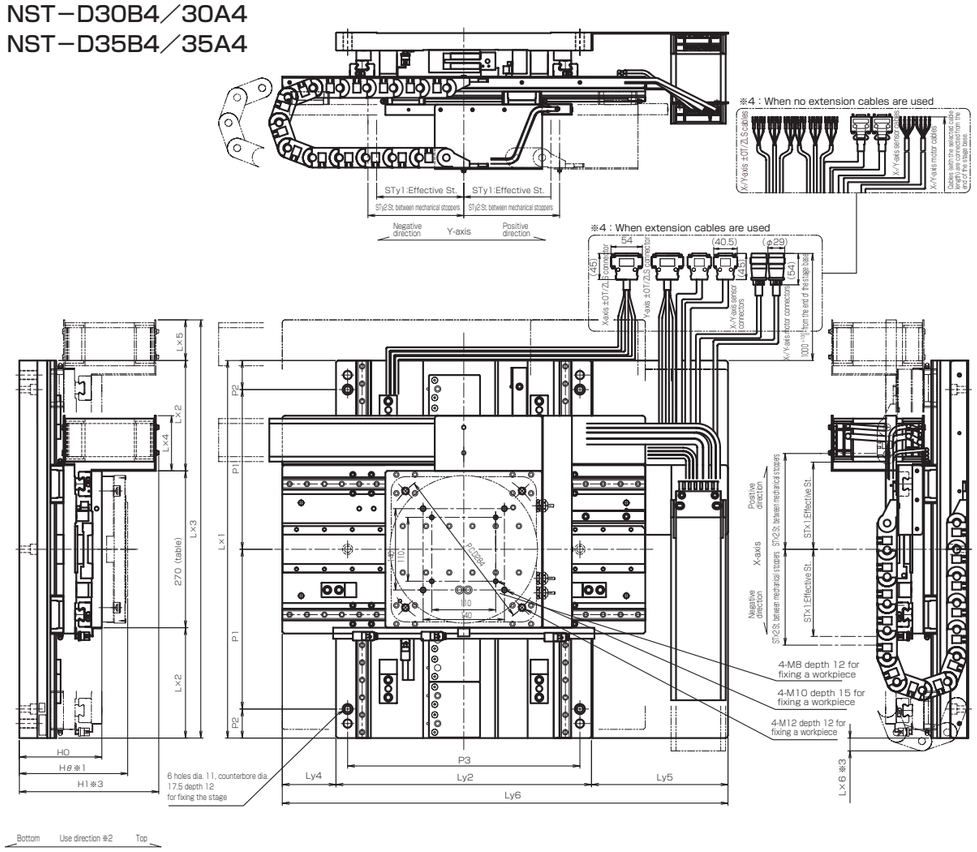
※Hole pitch tolerances not designated in the figure are all ±0.2.

XY Stage External Dimensions

Model number NST-D		Lx1 ※5	Lx2	Lx3 ※3	Lx4	Lx5	Lx6 ※3	Lx7	Ly1	Ly2	Ly3 ※3	Ly4 ※3	Ly5	Ly6	Ly7 ※3	P1	P2	P3	STx1	STx2	STy1	STy2	H0	H1 ※3	Hθ ※1
10B3/10A3	A	400	82.5	484.5	97.5	80	68	4.5	350	340	75	5	150	495	147	150	50	300	50	65	50	65	122±0.2	228	166.5±0.3 (226.5±0.3)
APNA	B			514.5	127.5	110							175	520											
20B3/20A3	A	500	132.5	584.5	97.5	80	70	4.5	450		125	55	200	595	149	200	50		100	115	100	115			
APNA	B			614.5	127.5	110							225	620											

External Dimensions of the XY Stage (without Bellows/Medium- or Large-Size Cableveyor)

NST−D25B4／25A4
NST−D30B4／30A4
NST−D35B4／35A4



※1:Hθ indicates the dimension when the τDISC Motor D250-40-F/FP (option) is mounted.
※2:This stage is mounted horizontally upward.
※3:No allowance for a bulging cableveyor is included.
※4:For the cableveyor and extension cables, check the specifications of each selected type.
※5:A⇒Cableveyor type A B⇒Cableveyor type B

Notes) ・St. means stroke.
・In this figure, all axes are drawn at the center of the stroke.

Tolerances not designated in the figure					
Dimension	Tolerance	Dimension	Tolerance	Dimension	Tolerance
L≦6	±0.1	30<L≦120	±0.3	315<L≦1000	±0.8
6<L≦30	±0.2	120<L≦315	±0.5	1000<L≦2000	±1.2

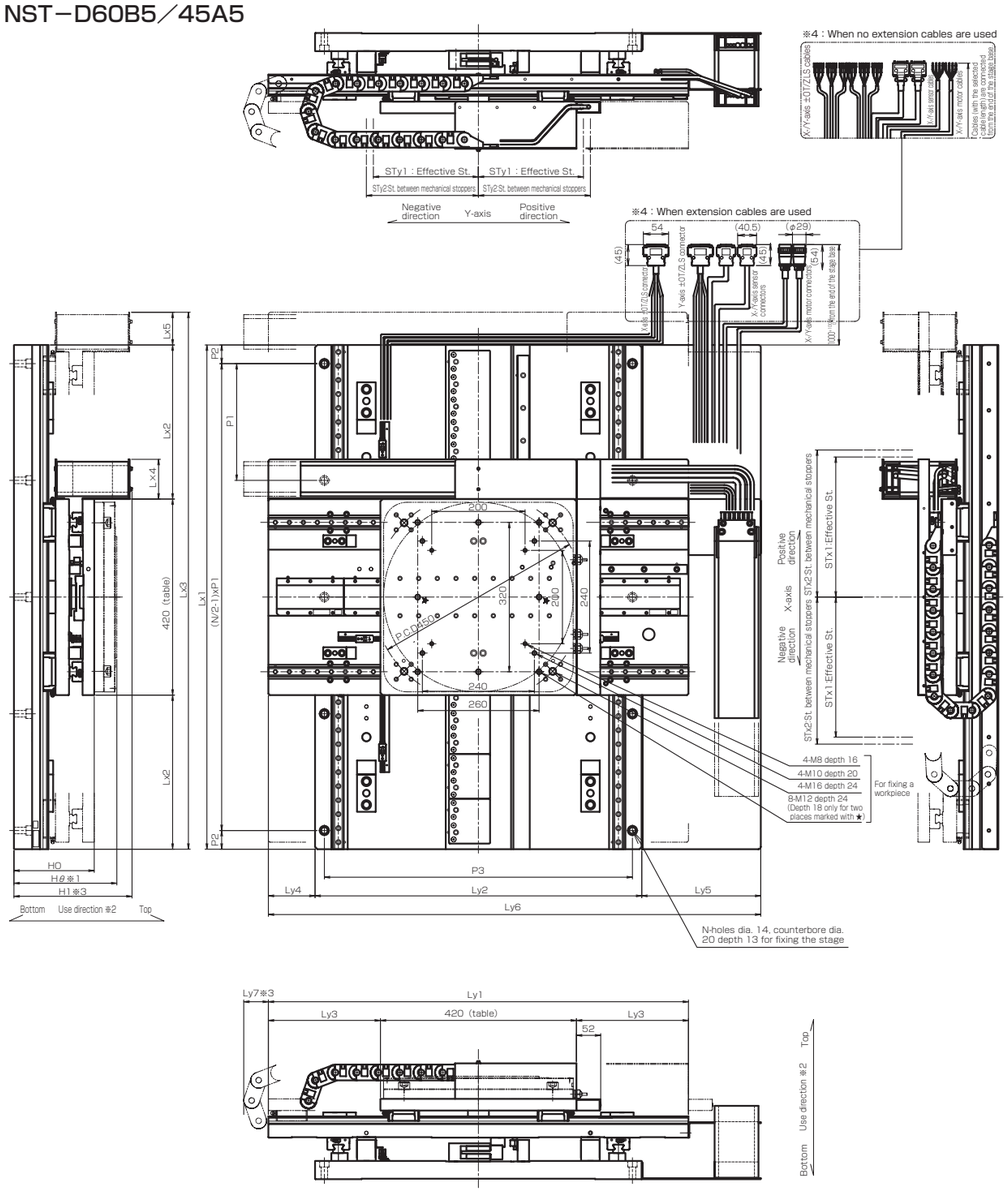
※Hole pitch tolerances not designated in the figure are all ±0.2.

XY Stage External Dimensions

Model number NST-D		Lx1 ※5	Lx2	Lx3 ※3	Lx4	Lx5	Lx6 ※3	Ly1	Ly2	Ly3 ※3	Ly4 ※3	Ly5	Ly6	Ly7 ※3	P1	P2	P3	STx1	STx2	STy1	STy2	H0	H1 ※3	Hθ ※1
25B4/25A4	A	600	165	670	95	70	28	580	440	155	70	212.5	722.5	113	250	50	400	125	140	125	140	142±0.2	240	186.5±0.3
APNA	B			700	125	100						237.5	747.5											
30B4/30A4	A	650	190	720	95	70	22	625		177.5	92.5	235	767.5	110	275	50		150	165	150	165			
APNA	B			750	125	100						260	792.5											
35B4/35A4	A	700	215	770	95	70	26	680		205	120	262.5	822.5	111	300	50		175	190	175	190			
APNA	B			800	125	100						287.5	847.5											

External Dimensions of the XY Stage (without Bellows/Medium- or Large-Size Cableveyor)

NST−D50B5／40A5
NST−D60B5／45A5



※1:Hθ indicates the dimension when the τDISC Motor D400-40-F/FP (option) is mounted.
※2:This stage is mounted horizontally upward.
※3:No allowance for a bulging cableveyor is included.
※4:For the cableveyor and extension cables, check the specifications of each selected type.
※5:A⇒Cableveyor type A B⇒Cableveyor type B

Notes) ·St. means stroke.
·In this figure, all axes are drawn at the center of the stroke.

Tolerances not designated in the figure					
Dimension	Tolerance	Dimension	Tolerance	Dimension	Tolerance
L≦6	±0.1	30<L≦120	±0.3	315<L≦1000	±0.8
6<L≦30	±0.2	120<L≦315	±0.5	1000<L≦2000	±1.2

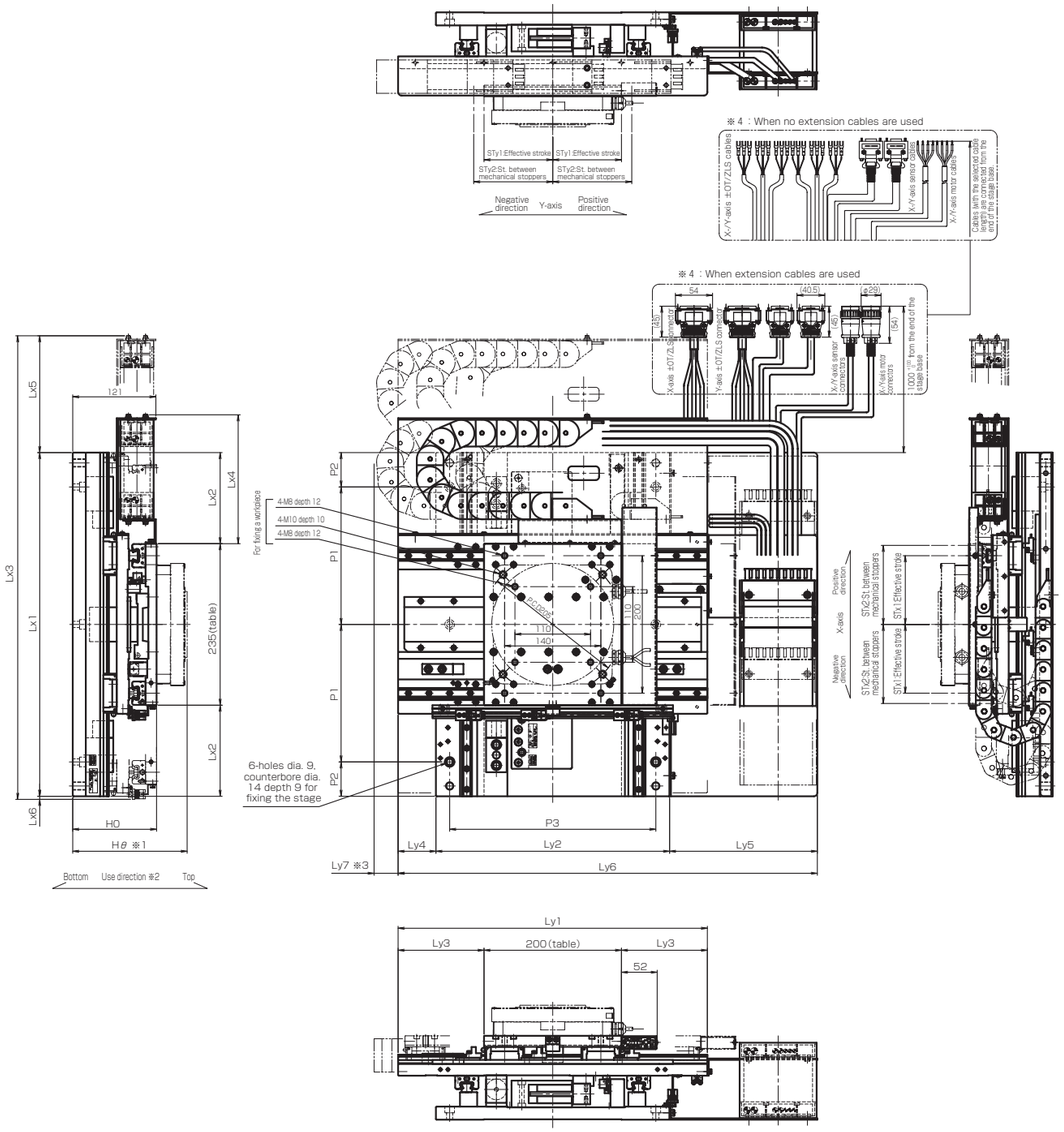
※Hole pitch tolerances not designated in the figure are all ±0.2.

XY Stage External Dimensions

Model number NST-D	※5	Lx1	Lx2	Lx3	Lx4	Lx5	Ly1	Ly2	Ly3	Ly4	Ly5	Ly6	※3 Ly7	N	P1	P2	P3	STx1	STx2	STy1	STy2	H0	※3 H1	※1 Hθ
50B5/40A5APNA	A	980	280	1050	85	70	850	700	215	75	230	1005	42	8	250	115	660	250	265	200	215	172±0.2	253	220.5±0.3
	B			1080	115	100					255	1030												
60B5/45A5APNA	A	1080	330	1150	85	70	900		240	100	255	1055	53	10	250	40		300	315	225	240			
	B			1180	115	110					280	1080												

External Dimensions of the XY Stage (without Bellows/Low-Profile Cableveyor)

NST−D10B3／10A3
NST−D20B3／20A3



※1:Hθ indicates the dimension when the τDISC Motor D170-40-F/FP (option) is mounted and the value in parentheses indicates the dimension when the τDISC Motor D170-100-F/FP is mounted.
※2:This stage is mounted horizontally upward.
※3:No allowance for a bulging cableveyor is included.
※4:For the extension cables, check the specifications of each selected type.

Notes) ·St. means stroke.
·In this figure, all axes are drawn at the center of the stroke.

Tolerances not designated in the figure					
Dimension	Tolerance	Dimension	Tolerance	Dimension	Tolerance
L≦6	±0.1	30<L≦120	±0.3	315<L≦1000	±0.8
6<L≦30	±0.2	120<L≦315	±0.5	1000<L≦2000	±1.2

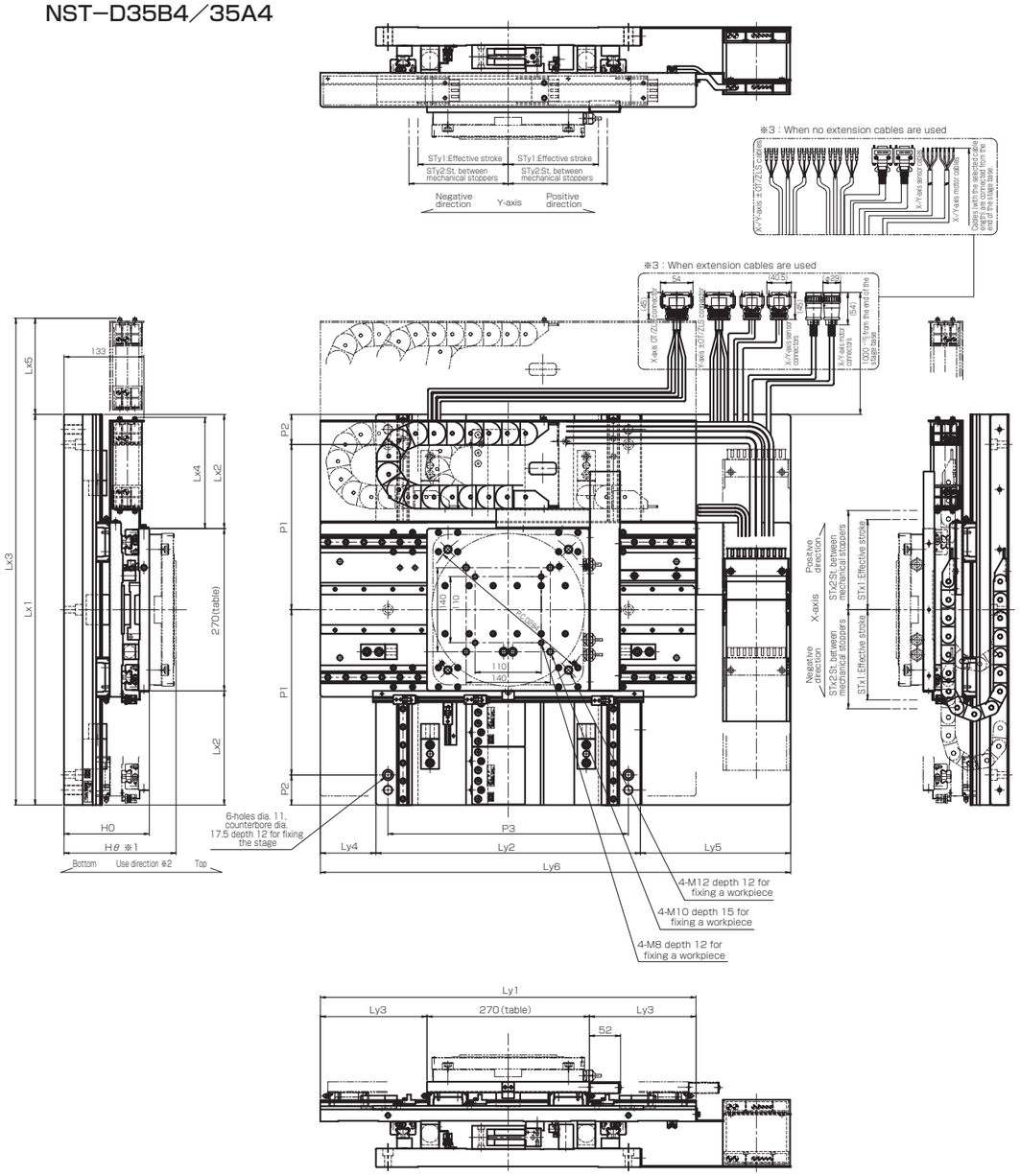
※Hole pitch tolerances not designated in the figure are all ±0.2.

XY Stage External Dimensions

Model number NST-D	Lx1	Lx2	Lx3	Lx4	Lx5	Lx6	Ly1	Ly2	Ly3	Ly4	Ly5	Ly6	※3 Ly7	P1	P2	P3	STx1	STx2	STy1	STy2	H0	※1 Hθ
10B3/10A3APNA	400	82.5	574.5	187.5	170	4.5	350	340	75	5	165	510	45	150	50	300	50	65	50	65	122±0.2	166.5±0.3
20B3/20A3APNA	500	132.5	674.5				450		125	55	215	610	35	200			100	115	100	115		(226.5±0.3)

External Dimensions of the XY Stage (without Bellows/Low-Profile Cableveyor)

NST−D25B4／25A4
NST−D30B4／30A4
NST−D35B4／35A4



※1:Hθ indicates the dimension when the τDISC Motor D250-40-F/FP (option) is mounted.
※2:This stage is mounted horizontally upward.
※3:For the extension cables, check the specifications of each selected type.

Notes) ·St. means stroke.
·In this figure, all axes are drawn at the center of the stroke.

Tolerances not designated in the figure					
Dimension	Tolerance	Dimension	Tolerance	Dimension	Tolerance
L≦6	±0.1	30<L≦120	±0.3	315<L≦1000	±0.8
6<L≦30	±0.2	120<L≦315	±0.5	1000<L≦2000	±1.2

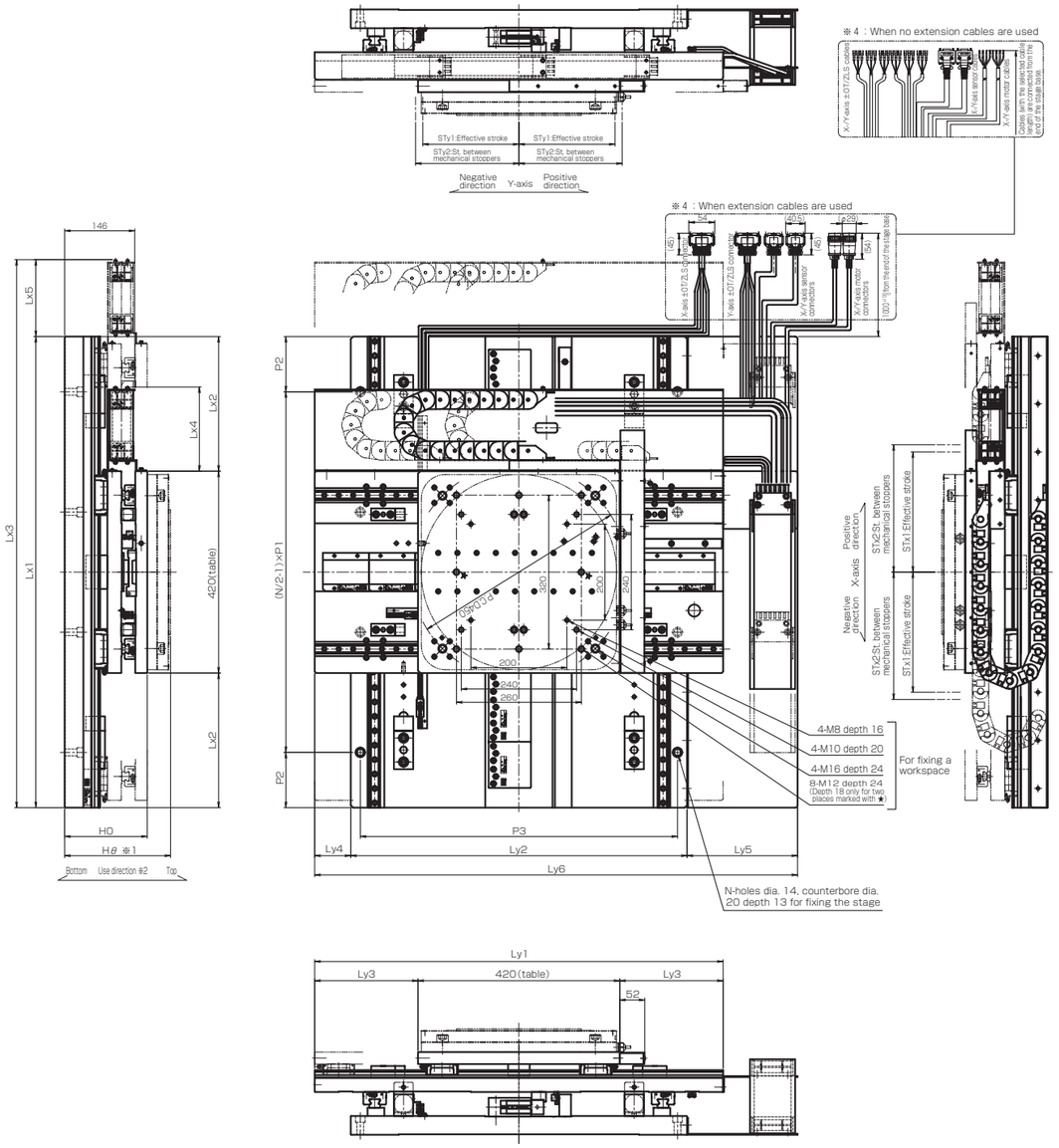
※Hole pitch tolerances not designated in the figure are all ±0.2.

XY Stage External Dimensions

Model number NST-D	Lx1	Lx2	Lx3	Lx4	Lx5	Ly1	Ly2	Ly3	Ly4	Ly5	Ly6	P1	P2	P3	STx1	STx2	STy1	STy2	H0	Hθ ※1
25B4/25A4APNA	600	165	760	185	160	580	440	155	70	227.5	737.5	250	50	400	125	140	125	140	142±0.2	186.5±0.3
30B4/30A4APNA	650	190	810			625		177.5	92.5	250	782.5	275			150	165	150	165		
35B4/35A4APNA	700	215	860			680		205	120	277.5	837.5	300			175	190	175	190		

External Dimensions of the XY Stage (without Bellows/Low-Profile Cableveyor)

NST−D50B5／40A5
NST−D60B5／45A5



※1:Hθ indicates the dimension when the τDISC Motor D400-40-F/FP (option) is mounted.
※2:This stage is mounted horizontally upward.
※3:No allowance for a bulging cableveyor is included.
※4:For the extension cables, check the specifications of each selected type.

Notes) ·St. means stroke.
·In this figure, all axes are drawn at the center of the stroke.

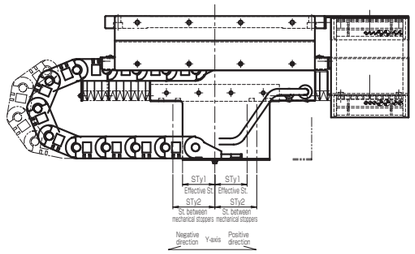
Tolerances not designated in the figure					
Dimension	Tolerance	Dimension	Tolerance	Dimension	Tolerance
L≦6	±0.1	30<L≦120	±0.3	315<L≦1000	±0.8
6<L≦30	±0.2	120<L≦315	±0.5	1000<L≦2000	±1.2

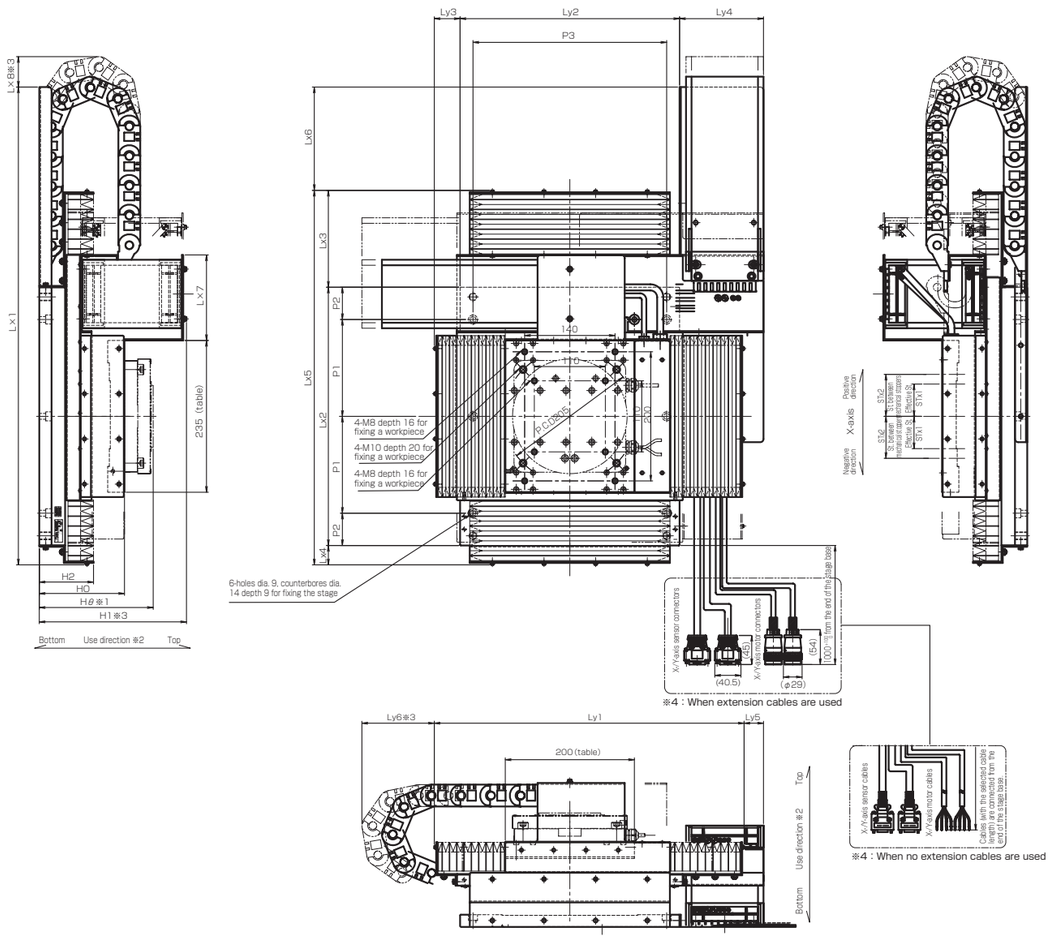
※Hole pitch tolerances not designated in the figure are all ±0.2.

XY Stage External Dimensions

Model number NST-D	Lx1	Lx2	Lx3	Lx4	Lx5	Ly1	Ly2	Ly3	Ly4	Ly5	Ly6	N	P1	P2	P3	STx1	STx2	STy1	STy2	H0	Hθ ※1
50B5/40A5APNA	980	280	1140	175	160	850	700	215	75	230	1005	8	250	115	660	250	265	200	215	172±0.2	220.5±0.3
60B5/45A5APNA	1080	330	1240			900		240	100	255	1055	10		40		300	315	225	240		

External Dimensions of the XY Stage (with Bellows)
NST−D10B3／10A3





※1:Hθ indicates the dimension when the τDISC Motor D170-40-F/FP (option) is mounted and the value in parentheses indicates the dimension when the τDISC Motor D170-100-F/FP is mounted.
※2:This stage is mounted horizontally upward.
※3:No allowance for a bulging cableveyor is included.
※4:For the extension cables, check the specifications of each selected type.

Notes) ·St. means stroke.
·In this figure, all axes are drawn at the center of each stroke.

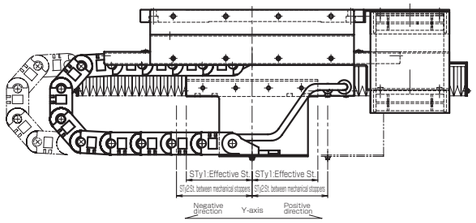
Tolerances not designated in the figure					
Dimension	Tolerance	Dimension	Tolerance	Dimension	Tolerance
L≦6	±0.1	30<L≦120	±0.3	315<L≦1000	±0.8
6<L≦30	±0.2	120<L≦315	±0.5	1000<L≦2000	±1.2

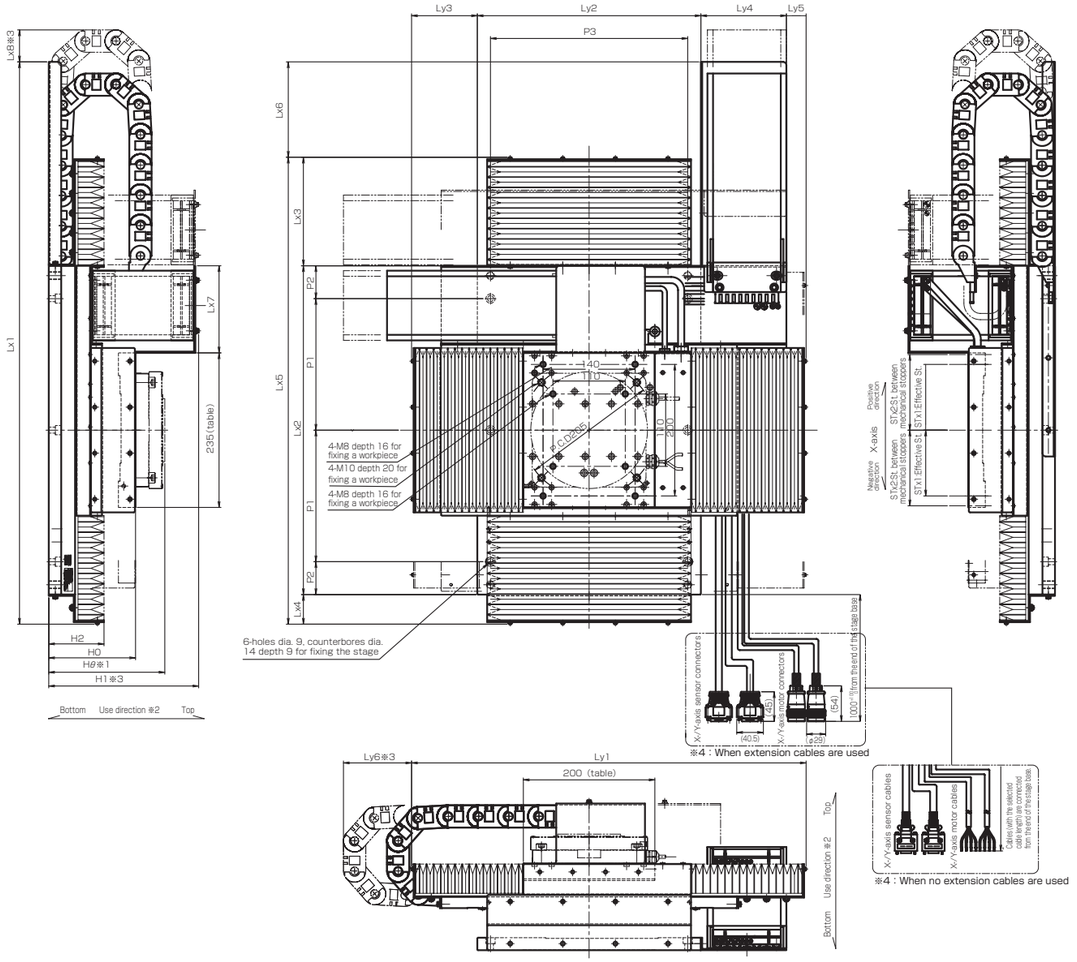
※Hole pitch tolerances not designated in the figure are all ±0.2.

XY Stage External Dimensions

Model number NST-D	Lx1	Lx2	Lx3 ※3	Lx4	Lx5	Lx6	Lx7	Lx8 ※3	Ly1	Ly2	Ly3	Ly4 ※3	Ly5	Ly6	P1	P2	P3	STx1	STx2	STy1	STy2	H0	H1 ※3	Hθ ※1	H2
10B3/10A3APJA	740	400	120	30	550	190	97.5	42	480	340	40	105	5	112	150	50	300	50	65	50	65	132±0.2	228	176.5±0.3	84
10B3/10A3APJB			150		580	160	132.5	47				130	30											(236.5±0.3)	

External Dimensions of the XY Stage (with Bellows)
NST−D20B3／20A3





※1:Hθ indicates the dimension when the τDISC Motor D170-040-F/FP (option) is mounted and the value in parentheses indicates the dimension when the τDISC Motor D170-100-F/FP is mounted.
※2:This stage is mounted horizontally upward.
※3:No allowance for a bulging cableveyor is included.
※4:For the extension cables, check the specifications of each selected type.

Notes) ·St. means stroke.
·In this figure, all axes are drawn at the center of each stroke.

Tolerances not designated in the figure					
Dimension	Tolerance	Dimension	Tolerance	Dimension	Tolerance
L≦6	±0.1	30<L≦120	±0.3	315<L≦1000	±0.8
6<L≦30	±0.2	120<L≦315	±0.5	1000<L≦2000	±1.2

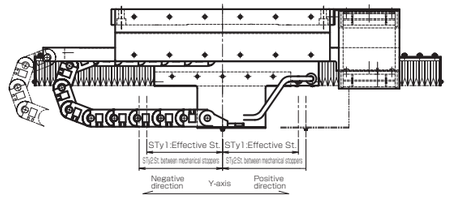
※Hole pitch tolerances not designated in the figure are all ±0.2.

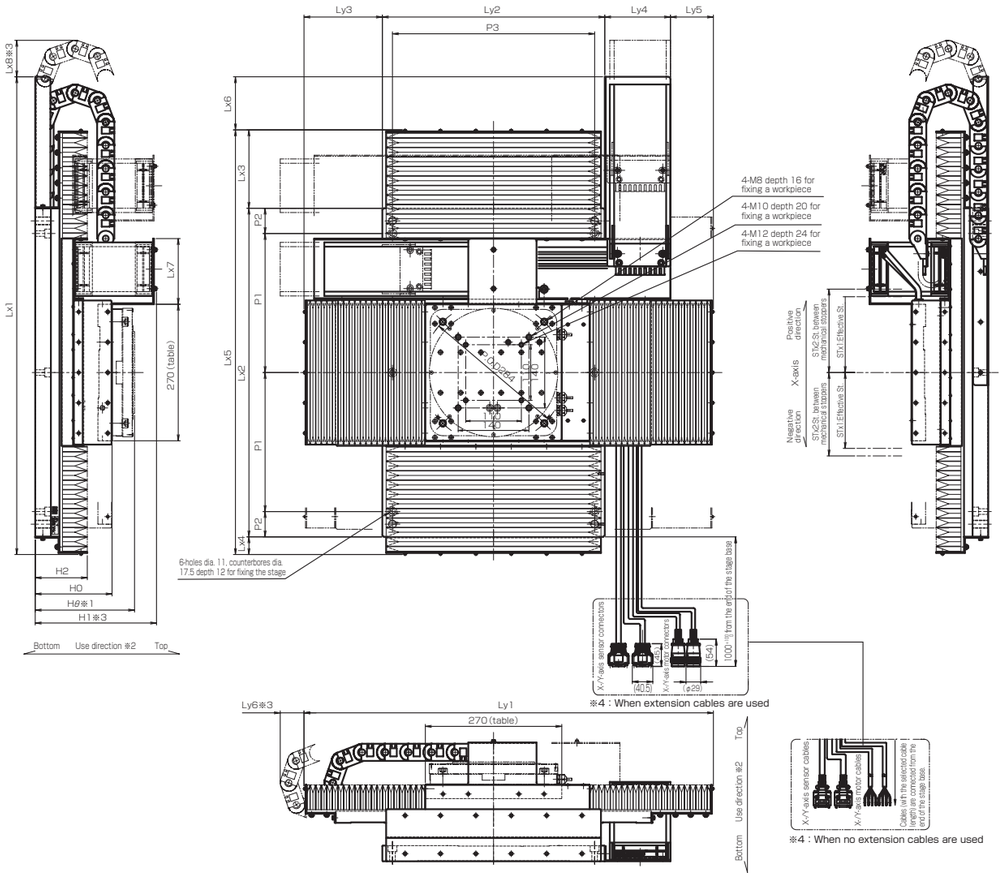
XY Stage External Dimensions

Model number NST-D	Lx1	Lx2	Lx3 ※3	Lx4	Lx5	Lx6	Lx7	Lx8 ※3	Ly1	Ly2	Ly3	Ly4 ※3	Ly5	Ly6	P1	P2	P3	STx1	STx2	STy1	STy2	H0	H1 ※3	Hθ ※1	H2
20B3/20A3APJA	855	500	135	45	680	175	97.5	44	600	340	100	105	55	104	200	50	300	100	115	100	115	132±0.2	228	176.5±0.3	84
20B3/20A3APJB			165		710	145	132.5	49				130	30											(236.5±0.3)	

External Dimensions of the XY Stage (with Bellows)

NST−D25B4／25A4
NST−D30B4／30A4
NST−D35B4／35A4





※1:Hθ indicates the dimension when the τDISC Motor D250-40-F/FP (option) is mounted.
※2:This stage is mounted horizontally upward.
※3:No allowance for a bulging cableveyor is included.
※4:For the extension cables, check the specifications of each selected type.

Notes) ·St. means stroke.
·In this figure, all axes are drawn at the center of each stroke.

Tolerances not designated in the figure					
Dimension	Tolerance	Dimension	Tolerance	Dimension	Tolerance
L≦6	±0.1	30<L≦120	±0.3	315<L≦1000	±0.8
6<L≦30	±0.2	120<L≦315	±0.5	1000<L≦2000	±1.2

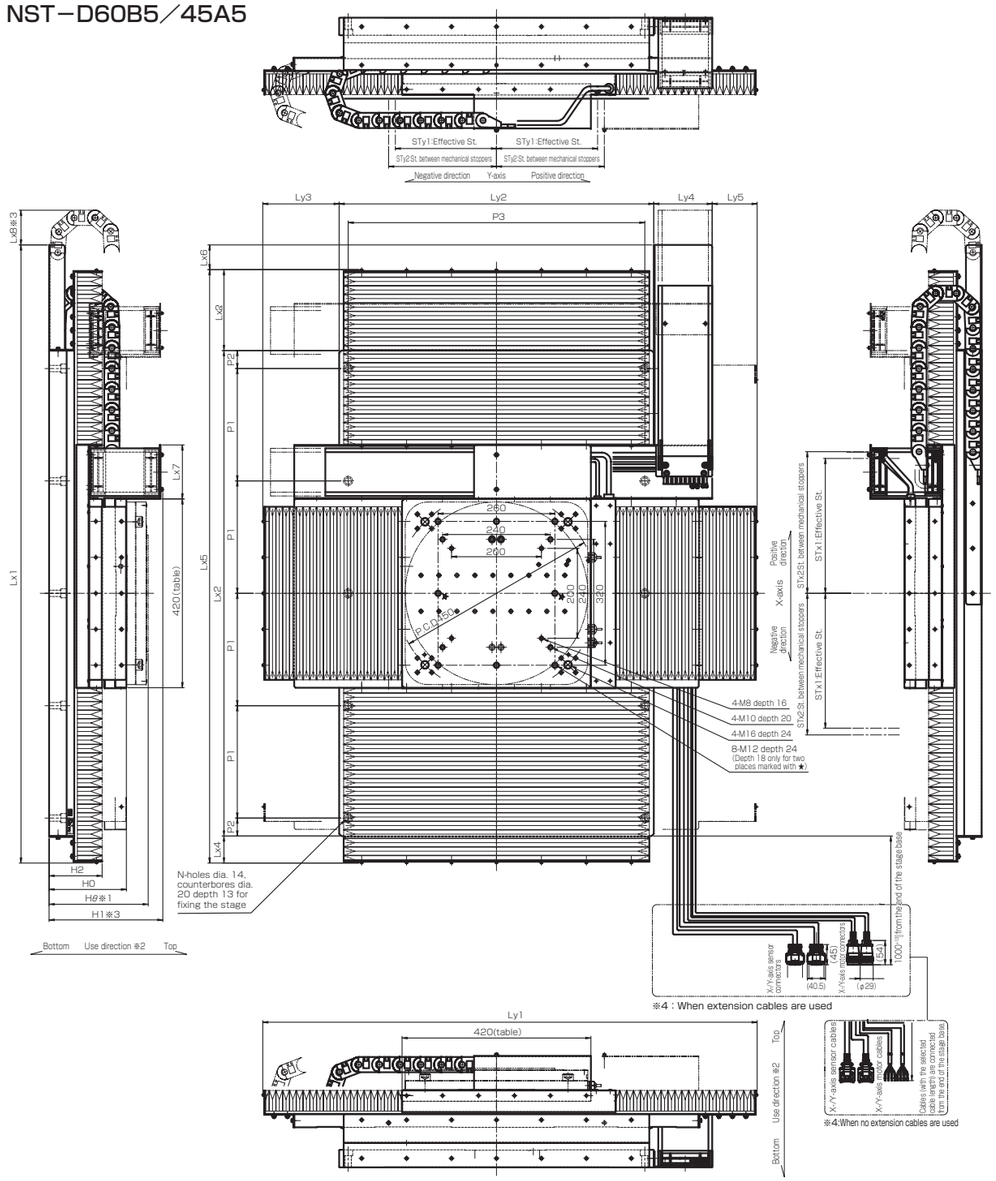
※Hole pitch tolerances not designated in the figure are all ±0.2.

XY Stage External Dimensions

Model number NST-D	Lx1	Lx2	Lx3 ※3	Lx4	Lx5	Lx6	Lx7	Lx8	Ly1	Ly2	Ly3	Ly4 ※3	Ly5	Ly6	P1	P2	P3	STx1	STx2	STy1	STy2	H0	H1 ※3	Hθ ※1	H2
25B4/25A4APJA	890	600	120	30	750	140	95	77	750		125	105	80	58	250	50		125	140	125	140				
25B4/25A4APJB			150		780	110	130					130	55												
30B4/30A4APJA	945	650	125	35	810	135	95	72	810	440	155	105	110	47	275	50	400	150	165	150	165	152±0.2	240	196.5±0.3	103
30B4/30A4APJB			155		840	105	130					130	85												
35B4/35A4APJA	995	700	125	35	860	135	95	76	880		190	105	145	41	300	50		175	190	175	190				
35B4/35A4APJB			155		890	105	130					130	120												

External Dimensions of the XY Stage (with Bellows)

NST−D50B5／40A5
NST−D60B5／45A5



※1:Hθ indicates the dimension when the τDISC Motor D400-40-F/FP (option) is mounted.
※2:This stage is mounted horizontally upward.
※3:No allowance for a bulging cableveyor is included.
※4:For the extension cables, check the specifications of each selected type.

Notes) ·St. means stroke.
·In this figure, all axes are drawn at the center of each stroke.

Tolerances not designated in the figure					
Dimension	Tolerance	Dimension	Tolerance	Dimension	Tolerance
L≦6	±0.1	30<L≦120	±0.3	315<L≦1000	±0.8
6<L≦30	±0.2	120<L≦315	±0.5	1000<L≦2000	±1.2

※Hole pitch tolerances not designated in the figure are all ±0.2.

XY Stage External Dimensions

Model number NST-D	Lx1	Lx2	Lx3 ※3	Lx4	Lx5	Lx6	Lx7	Lx8	Ly1	Ly2	Ly3	Ly4 ※3	Ly5 ※3	N	P1	P2	P3	STx1	STx2	STy1	STy2	H0	H1 ※3	Hθ ※1	H2
50B5/40A5APJA	1265	980	140	50	1170	95	85	75	1040	700	140	105	95	8	250	115	660	250	265	200	215	172±0.2	253	220.5±0.3	118
50B5/40A5APJB			170		1200	65	120					130	70												
60B5/45A5APJA	1375	1080	150	60	1290	85	85	77	1100		170	105	125	10	250	40		300	315	225	240				
60B5/45A5APJB			180		1320	55	120					130	100												

☐ Standard Stage Options

※You can select and add the following items according to your specifications as standard stage options.

●Adding *θ*-axis, bellows, and machine accuracy measurement options
●Selecting encoder type (resolution), cable length, and cableveyor

θ-axis option　You can mount a high precision direct drive servo motor, τDISC motor, on the *θ*-axis on the X or XY stage.

The following table lists τDISC motors that can be mounted on each X or XY stage model.

Stage	X stage NST-A	XY stage NST-D		
	All models	10B3/10A3** 20B3/20A3**	25B4/25A4** 30B4/30A4** 35B4/35A4**	50B5/40A5** 60B5/45A5**
Available τDISC motor type	D170-040-F(P)	D170-040-F(P)	D250-040-F(P)	D400-040-F(P)
	D170-100-F(P)	D170-100-F(P)		

※ If you want to mount another τDISC motor, contact our sales representative.

☐ τDISC Motor Specifications

τDISC motor types		D170-040-F	D170-100-F	D250-040-F	D400-040-F
		D170-040-FP	D170-100-FP	D250-040-FP	D400-040-FP
τDISC motor model numbers	NMR-	FDDBA2D-201A	FDFBA2C-701A	FEDBA2C-401A	FFDBA2C-801A
		FDDBA2D-201AP	FDFBA2C-701AP	FEDBA2C-401AP	FFDBA2C-801AP
Rated torque	N·m	7.5	22.5	20.7	67
Maximum torque	N·m	22.5	67	62(51.75 ※1)	134
Detection pulses	ppr	Choose from among 400,000, 1,000,000, 2,000,000, and 4,000,000.		Choose from among 900,000, 1,800,000, 3,600,000, and 7,200,000.	
Rated speed (based on the number of detection pulses)	rps	5 (at 400,000, 1,000,000, or 2,000,000 ppr) 2.5 (at 4,000,000 ppr)		3 (at 900,000, 1,800,000, or 3,600,000 ppr) 1.5 (at 7,200,000 ppr)	2 (at 900,000, 1,800,000, or 3,600,000 ppr) 1.5 (at 7,200,000 ppr)
Rated output	W	235	700	400	800
Rated current	A	2.1	4.8	3.4	6.3
Automatic magnetic pole detection method		Both magnetic pole sensor and automatic magnetic pole detection available			
Mass	kg	5.5	13.0	9.5	28.0
Available driver: VCⅡseries	NCR–	□DA□A2A-401B	□DA□A2A-801B	□DA□A2A-401B	□DA□A2A-801B
Available driver: VPS series	NCR–	DC□0A2B-401B	DC□0A2B-801B	DC□0A2B-401B	DC□0A2B-801B
Main power supply		200 to 230 VAC 50/60 Hz Three-phase power supply (single-phase for VPS series NCR-DC□0A2B-401B)			

※ For type D***-***FP of τDISC motor, the high precision machining specification with a radial/axial runout of up to 10 μm is applied.
※ Note that adding a τDISC motor changes the mass of the moving portion along each axis.
※ For the outline of each τDISC motor, see "External Dimensions τDISC Motors for the *θ*-Axis" on pp. 29-30.
※ For details of τDISC motor specifications, refer to the τDISC Brochure.
※1: When a VPS series driver is used

Bellows option　You can add a bellows option to protect the stage from foreign matters.

A bellows option provides the following protection: "Preventing nonmagnetic materials at least 5 mm in diameter from entering the stage".
For the outline of the stage to which a bellows option is added, see "External Dimensions of the X Stage with Bellows" on p.8 for【X stage】or "External Dimensions of the XY Stage (with Bellows)" on pp. 19-22 for【XY stage】.
For a stage with bellows, the absolute type of linear encoder is available.
For the XY stage, two types of bellows options are available according to the cableveyor size.

Caution: ① A bellows does not have a mechanically perfect protection structure. Periodically open the bellows and clean the inside.
② Note that you cannot add a bellows after purchasing a standard stage.
③ The maximum allowable speed of the stage with bellows is 1.6 m/s.
The stage can be used only horizontally upward.

Machine accuracy options　You can specify each machine accuracy option to guarantee the relevant accuracy.

For the value of each accuracy, see "Stage Machine Specifications" on pp. 5-6 for【X stage】or "Stage Machine Specifications" on pp. 11-12 for【XY stage】.
(Note that when a machine accuracy option is not specified, the listed value of the relevant accuracy is not obtained.)

●Positioning accuracy option
●Attitude accuracy option (pitch/yaw)
●Speed variation option : Customized individually depending on the use conditions (including the speed and load).

※ If you want to use a higher precision product or another accuracy option, contact our sales representative.

Encoder type (resolution) selection　You can select an encoder type and resolution.

For details of the encoder types and resolution for【X stage】, see "Stage Machine Specifications" on pp. 5-6. For details of the encoder types and resolution for【XY stage】, see "Stage Machine Specifications" on pp. 11-12.

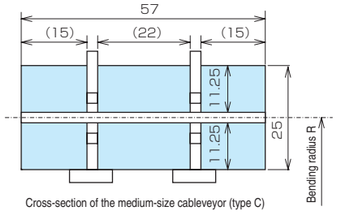
Cableveyor selection　You can select a medium- or large-size cableveyor according to additional wiring for your system and, for the XY stage, you can also select a low-profile type with no top projecting part.

【X/Xθ stage】

You can choose between the following two types of cableveyors: Medium-size (type C) and large-type (type D).

Medium size (type C)

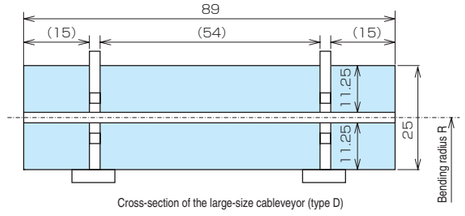
Model 2500.05.055 manufactured by IGUS, low-dust specification
(Bending radius R = 55 mm, for the capacity, see the figure below.)



Cross-section of the medium-size cableveyor (type C)

Large size (type D)

Model 2500.09.055 manufactured by IGUS, low-dust specification
(Bending radius R = 55 mm, for the capacity, see the figure below.)



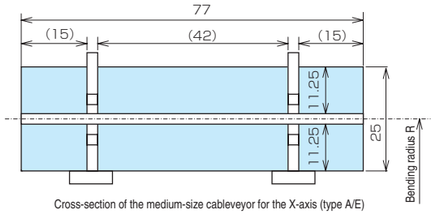
Cross-section of the large-size cableveyor (type D)

【XY/XYθ stage】

Without bellows: You can choose from among the following three types of cableveyors: Medium-size (type A), large-type (type B), and low-profile type (type G).
With bellows: You can choose between the following two types of cableveyors: Medium-size (type E) and large-type (type F).

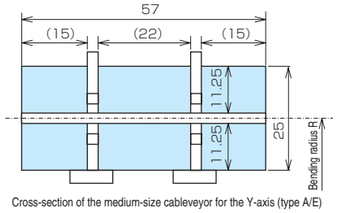
Medium size (without bellows:Type A with bellows:Type E)

X-axis:Model 2500.07.055 manufactured by IGUS, low-dust specification
(Bending radius R = 55 mm, for the capacity, see the figure below.)



Cross-section of the medium-size cableveyor for the X-axis (type A/E)

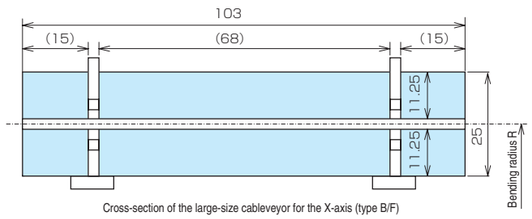
Y-axis:Model 2500.05.055 manufactured by IGUS, low-dust specification
(Bending radius R = 55 mm, for the capacity, see the figure below.)



Cross-section of the medium-size cableveyor for the Y-axis (type A/E)

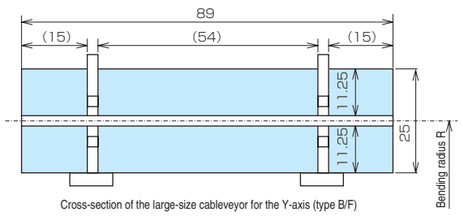
Large size (without bellows:Type B with bellows:Type F)

X-axis:Model 2500.10.055 manufactured by IGUS, low-dust specification
(Bending radius R = 55 mm, for the capacity, see the figure below.)



Cross-section of the large-size cableveyor for the X-axis (type B/F)

Y-axis:Model 2500.09.055 manufactured by IGUS, low-dust specification
(Bending radius R = 55 mm, for the capacity, see the figure below.)



Cross-section of the large-size cableveyor for the Y-axis (type B/F)

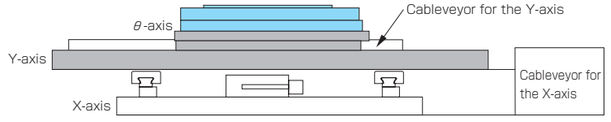
※ For the size of each type of cableveyor when mounted on the stage, see "External Dimensions" on pp. 6-7.
※ When adding cables by yourself, be careful about the bending radius and capacity of the cableveyor.
※ You can move the vertical partitions at any place as long as the horizontal partition can be held with balance.

【XY/XYθ stage】

Low-profile type (available only for a stage without bellows:Type G)

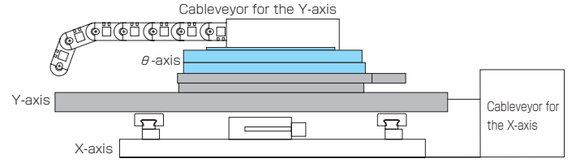
This type of cableveyor does not have any stage component at a position higher than the top of the table.
You can efficiently use the space above the stage.

≪Rough drawing of the XYθ stage with low-profile type cableveyors≫

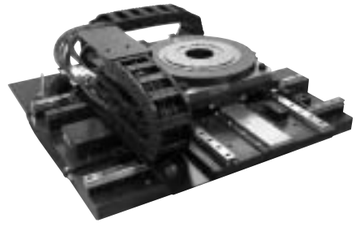


For detail dimensions, see pp. 16-18.

≪Rough drawing of the XYθ stage with medium- or large-size cableveyors≫

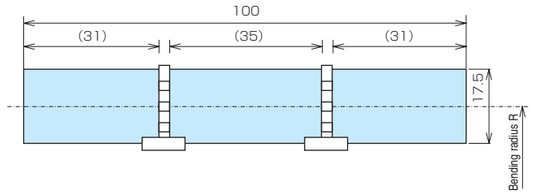


For detail dimensions, see pp. 13-15.



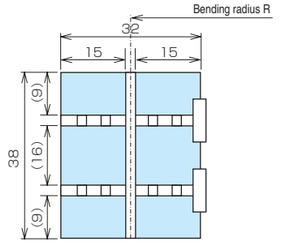
①Applicable stage models
NST-D10B3/10A3APNA　NST-D20B3/20A3APNA　NST-D25B4/25A4APNA
NST-D30B4/30A4APNA　NST-D35B4/35A4APNA

X-axis:Model B15.07.038 manufactured by IGUS, low-dust specification
(Bending radius R = 38 mm, for the capacity, see the figure below.)



Cross-section of the low-profile type cableveyor for the X-axis (type G)

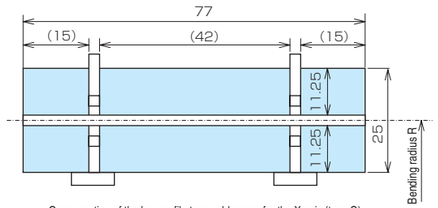
Y-axis:Model B17.03.048 manufactured by IGUS, low-dust specification
(Bending radius R = 48 mm, for the capacity, see the figure below.)



Cross-section of the low-profile type cableveyor for the Y-axis (type G)

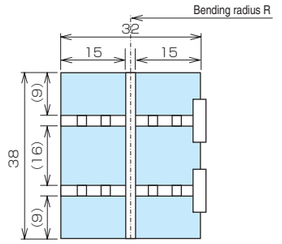
②Applicable stage models
NST-D50B5/40A5APNA　NST-D60B5/45A5PNA

X-axis:Model 2500.07.055 manufactured by IGUS, low-dust specification
(Bending radius R = 55 mm, for the capacity, see the figure below.)



Cross-section of the low-profile type cableveyor for the X-axis (type G)

Y-axis:Model B17.03.048 manufactured by IGUS, low-dust specification
(Bending radius R = 48 mm, for the capacity, see the figure below.)



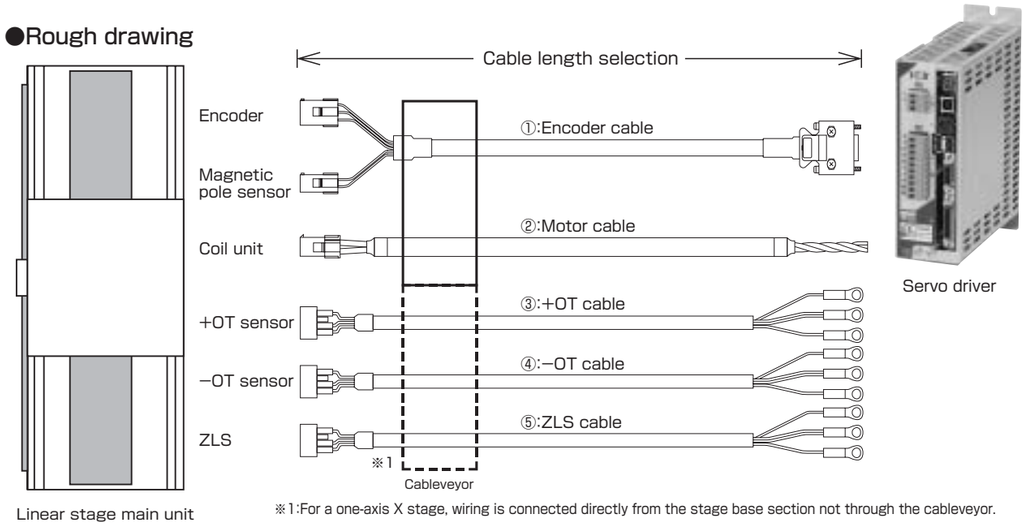
Cross-section of the low-profile type cableveyor for the Y-axis (type G)

※ The cableveyor of this type has a smaller bending radius to lower the height. It generates more dust than other types since it is used with placed horizontally. Carefully use this type of cableveyor.
※ You can move the vertical partitions at any place as long as the horizontal partition can be held with balance.

Cable selection You can select whether to use extension cables and the length of each of the encoder, motor, ±OT, and ZLS cables along each axis on the X/XY(θ) stage.

When no extension cables are used

●Rough drawing



※1:For a one-axis X stage, wiring is connected directly from the stage base section not through the cableveyor.

●Features

- There is no connection section on the wiring path, so cables can fit into an appropriate section.
- A cable must be replaced throughout its length when required.

●Selecting each cable

①:Encoder cable

Encoder type	Encoder cable length	Cable model you order
INC tape scale	3·5 10·15m	NCR-XBCMA −□□□ (About 9.5 mm)
INC glass scale	3·5·10m	NCR-XBCZA −□□□ (About 9.5 mm)
ABS	3·5·10·15 20·30m	NCR-XBCPA −□□□ (About 8.5 mm)
θ-axis (τDISC)	3·5 10·15m	NCR-XBCNA −□□□ (About 9.5 mm)

②:Motor cable

Shield required?	Motor cable length for linear/θ-axis	Cable model you order
No	3·5·10·15 20·30 m	NCR-XBBBA −□□□ (About 6.5 mm)
Yes	3·5·10·15 20·30 m	NCR-XBBCA −□□□ (About 7 mm)

③④:±OT cables

±OT cable length	Cable model you order
+OT 3·5·10·15 20·30m	NCR-XBA6A −□□□ (About 5.5 mm)
−OT 3·5·10·15 20·30m	NCR-XBA7A −□□□ (About 5.5 mm)

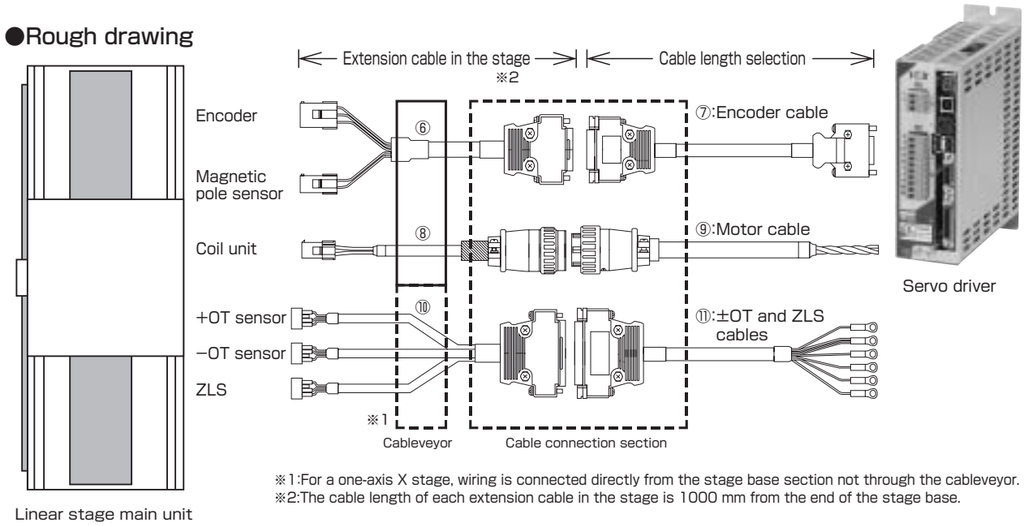
⑤:ZLS cable

ZLS cable length	Cable model you order
3·5·10·15 20·30 m	NCR-XBA8A −□□□ (About 5.5 mm)

※ □□□ in the cable model number indicates the cable length. Example: 5m ⇒ 050
※ The INC glass scale type of encoder is available only for the X stage.
※ Each cable is flex-resistant.
※ The value in parentheses under the cable model number indicates the finished outside diameter.
※ For the θ-axis, ±OT and ZLS sensors are not used.
※ Note that the system may not operate normally with a cable longer than the lengths listed above.

When extension cables are used

●Rough drawing



※1:For a one-axis X stage, wiring is connected directly from the stage base section not through the cableveyor.
※2:The cable length of each extension cable in the stage is 1000 mm from the end of the stage base.

●Features

- Only the faulty section of a cable needs to be replaced when required, which makes replacement easy.
- There is a connection section on the wiring path, so some space is required for the section.

●Selecting each cable

⑥⑦:Encoder cables

Encoder type	Encoder cable length	Cable models you order		
INC tape scale	3·5·10m	NCR-XBG1A −050 (About 9.5 mm)	+	NCR-XBG5A −□□□ (About 9.5 mm)
INC glass scale	3·5·10m	NCR-XBG2A −050 (About 9.5 mm)	+	NCR-XBG5A −□□□ (About 9.5 mm)
ABS	3·5·10·15 20·30m	NCR-XBG3A −050 (About 8.5 mm)	+	NCR-XBCPA −□□□ (About 8.5 mm)
θ-axis (τDISC)	3·5·10m	NCR-XBG4A −050 (About 9.5 mm)	+	NCR-XBG5A −□□□ (About 9.5 mm)

Extension cable in the stage

⑧⑨:Motor cables

Motor cable length for linear/θ-axis	Cable models you order		
3·5·10·15 20·30m	NCR-XBEHA −050 (About 7 mm)	+	NCR-XBEAA −□□□ (About 7 mm)

Shielded — Extension cable in the stage

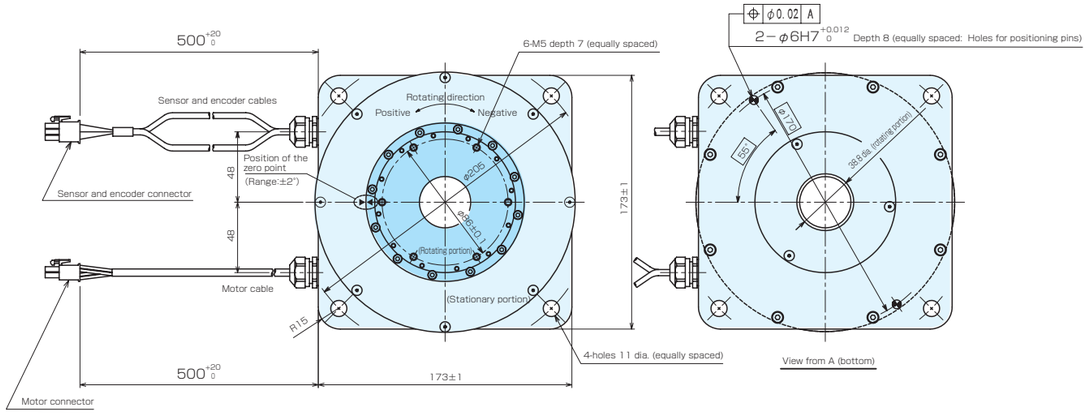
⑩⑪:±OT and ZLS cables

±OT and ZLS cable length	Cable models you order		
3·5·10m	NCR-XBA9A −050 (Three cables about 5 mm in outside diameter are bundled to connect them to the connector.)	+	NCR-XBAAA −□□□ (About 7 mm)

Extension cable in the stage

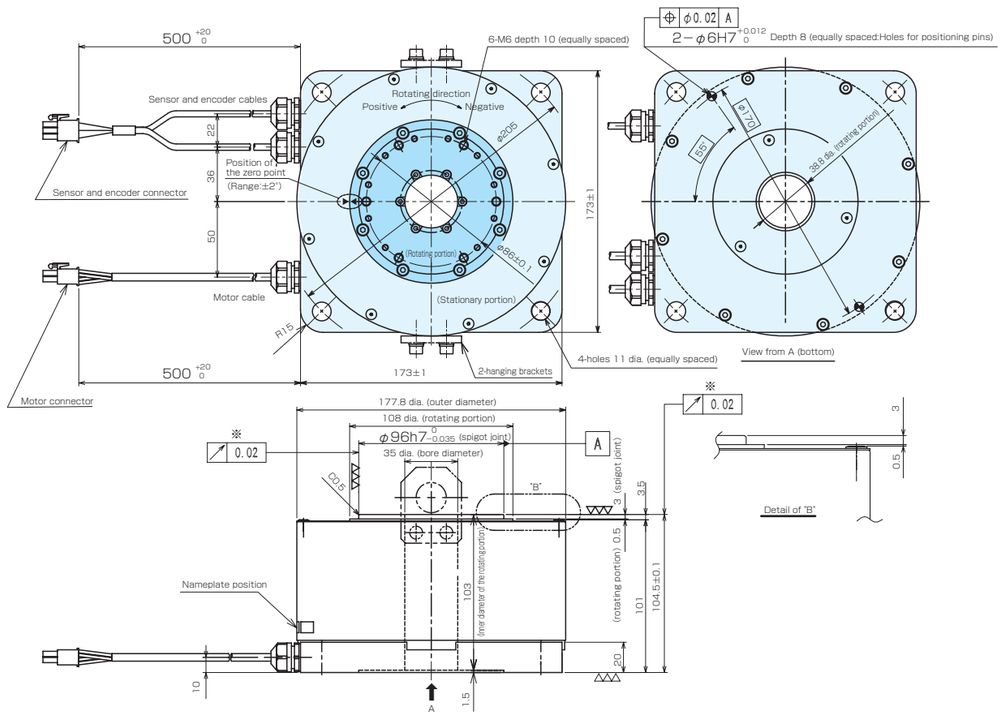
※ □□□ in the cable model number indicates the cable length. Example: 5 m ⇒ 050
※ The INC glass scale type of encoder is available only for the X stage.
※ Each cable is flex-resistant.
※ The value in parentheses under the cable model number indicates the finished outside diameter.
※ For the θ-axis, ±OT and ZLS sensors are not used.
※ Note that the system may not operate normally with a cable longer than the lengths listed above.

□ Type D170-040-F(P) Model NMR-FDDBA2D-201A(P)



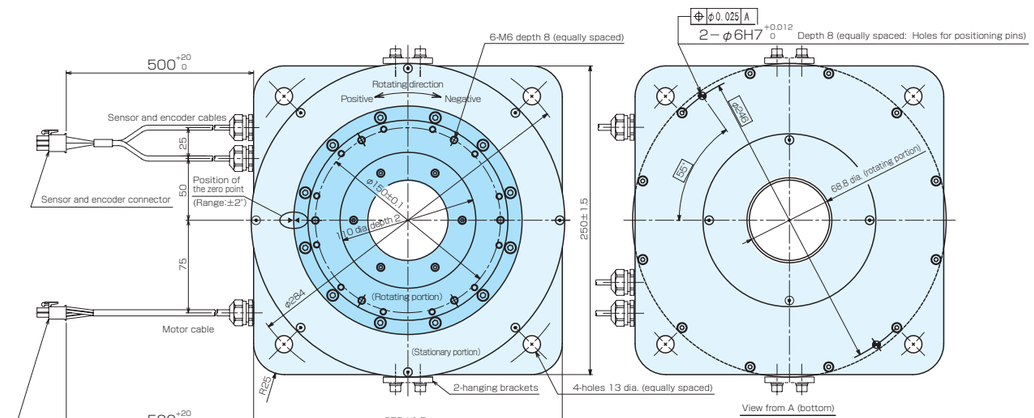
※0.01 for high-precision machining specification type D170-040-FP

□ Type D170-100-F(P) Model NMR-FDFBA2C-701A(P)



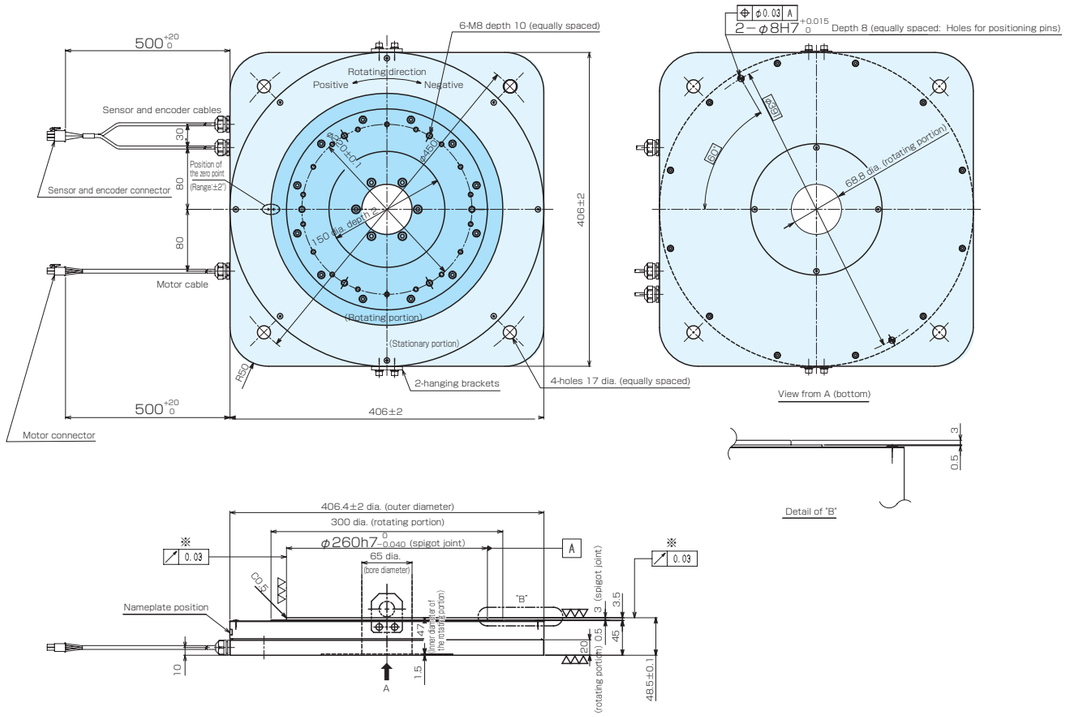
※0.01 for high-precision machining specification type D170-100-FP

□ Type D250-040-F(P) Model NMR-FEDBA2C-401A(P)



※0.01 for high-precision machining specification type D250-040-FP

□ Type D400-040-F(P) Model NMR-FFDBA2C-801A(P)



※0.01 for high-precision machining specification type D400-040-FP

Accuracy Measurement Methods

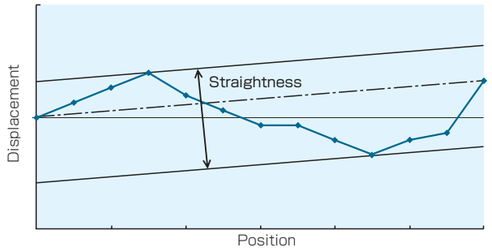
To measure accuracy of a multiaxis stage such as the XY stage, fix the axes other than the target axis for measurement to the center position of the stroke, move only the target axis.
Measure accuracy in an environment at a temperature of 22℃±5℃.

Straightness A

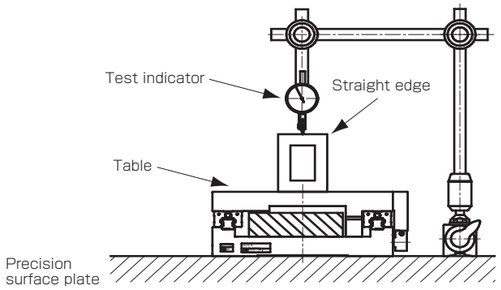
Place a straight edge on the table, touch the contact of the test indicator fixed on the stage installation surface plate to the straight edge, and record values. Straightness A is obtained as follows: Connect the values of both ends when the table is moved by the effective stroke length as a reference line. Determine an area enclosing all measurement values that is made by two lines parallel to the reference line.
The shortest interval between the two parallel lines is straightness A.

Measurement items : Horizontal and vertical directions
Measuring devices : Straight edge and test indicator

Measuring straightness



Measuring straightness A

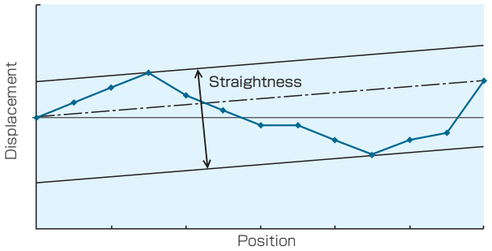


Straightness B

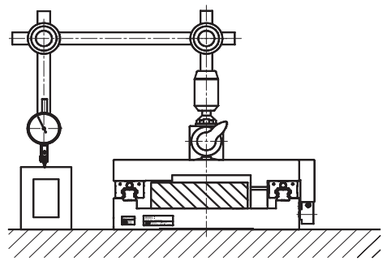
Place a straight edge on the surface plate, touch the contact of the test indicator fixed on the table to the straight edge, and record values. Straightness B is obtained as follows: Connect the values of both ends when the table is moved by the effective stroke length as a reference line. Determine an area enclosing all measurement values that is made by two lines parallel to the reference line. The shortest interval between the two parallel lines is straightness B.

Measurement items : Horizontal and vertical directions
Measuring devices : Straight edge and test indicator

Measuring straightness



Measuring straightness B

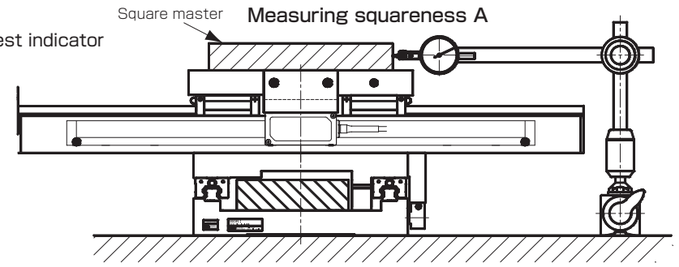


Squareness A

Fix a square master on the table based on the axis having the shorter stroke and attach the test indicator perpendicular to the reference moving axis. The maximum reading within the travel distance of that axis is assumed to be squareness A.
The measurement distance is up to 150 mm for reasons of the size of the square master. To measure a longer distance, convert the value measured for 150 mm to the value for the stroke of the target axis by calculating it as the ratio of the stroke to 150 mm.

Measuring devices : Square master and test indicator

Measuring squareness A

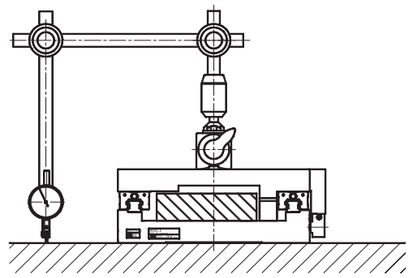


Parallelism B

Touch the contact of the test indicator fixed on the table to the stage installation surface plate and move the table by the effective stroke length. The maximum value is used as parallelism B.

Measuring devices : Precision surface plate and test indicator

Measuring parallelism B

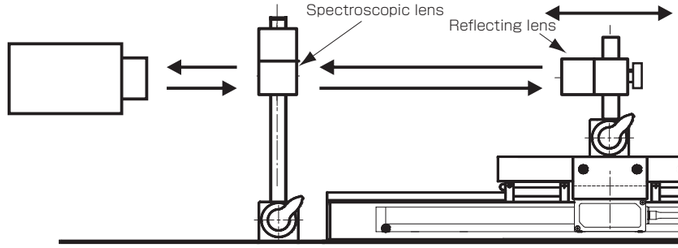


Repetitive positioning accuracy

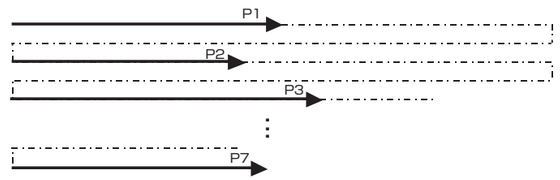
Repeat positioning from a point in the same direction and measure the stop position seven times. Then, obtain 1/2 of the maximum reading difference. Perform this measurement at the center and at both almost ends of the travel distance of the effective stroke length in principle. The maximum value that is obtained is assumed to be the measurement value. Place the reflecting lens at the center of the table and the spectroscopic lens on the installation surface plate to perform measurement.

Measurement value : $=\pm 1/2\{\max(P1,P2\cdots P6,P7)-\min(P1,P2\cdots P6,P7)\}$
Measuring device : Laser length measuring machine

Measuring repetitive positioning accuracy



Repetitive positioning measurement pattern

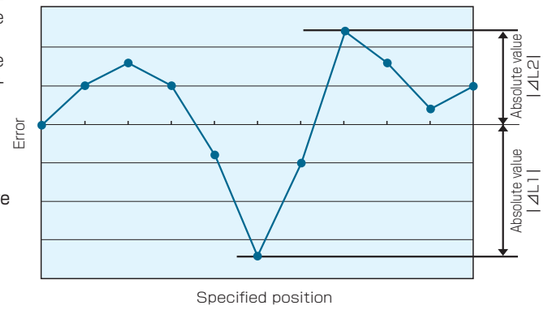


Positioning accuracy

Sequentially perform positioning in the same direction within the effective stroke. Obtain the difference between the measurement value and specified value at each position. Positioning accuracy is indicated by the absolute value of the maximum difference.
Place the reflecting lens at the center of the table and the spectroscopic lens on the installation surface plate to perform measurement.

Measuring device : Laser length measuring machine
The figure indicating measuring positioning accuracy is the same as "Measuring repetitive positioning accuracy".

Measuring positioning accuracy



τ Linear Stage Measurement Methods

Lost motion

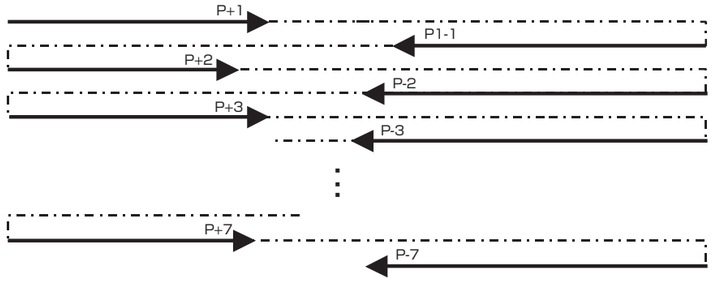
First, perform positioning to a point in the positive direction and measure the position. Move the stage in the same positive direction with the same positioning command, perform positioning from that point in the negative position with the same command, and measure the position. Then, move the stage in the negative position with a positioning command, move it in the positive direction with the same command, perform positioning in the positive direction, and measure the position.
Repeat this operation and measurement seven times in each of the positive and negative directions. Obtain the average of the positioning stop positions. Perform this measurement at the center and at both almost ends of the travel distance of the effective stroke length. The maximum value that is obtained is assumed to be the lost motion measurement value.
Place the reflecting lens at the center of the table and the spectroscopic lens on the installation surface plate to perform measurement.

Measurement value=｜1／7（P+1,P+2･･･P+6,P+7）−1／7（P-1,P-2･･･P-6,P-7）｜max

Measuring device : Laser length measuring machine

The figure indicating measuring lost motion is the same as "Measuring repetitive positioning accuracy".

Lost motion measurement pattern



Attitude accuracy

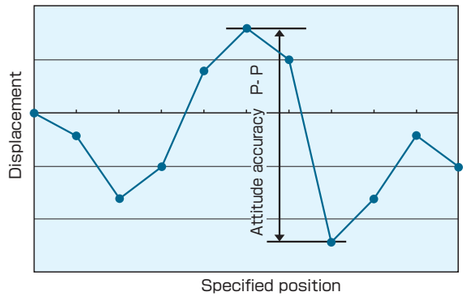
Sequentially perform positioning in the same direction within the effective stroke and measure the value at each position. Attitude accuracy is indicated by the maximum obtained difference.
Place the reflecting lens at the center of the table and the spectroscopic lens on the installation surface plate to perform measurement.

Measurement items : Pitch and yaw angles

Measuring device : Laser length measuring machine

The figure indicating measuring lost motion is the same as "Measuring repetitive positioning accuracy".

Measuring attitude accuracy



Speed variation

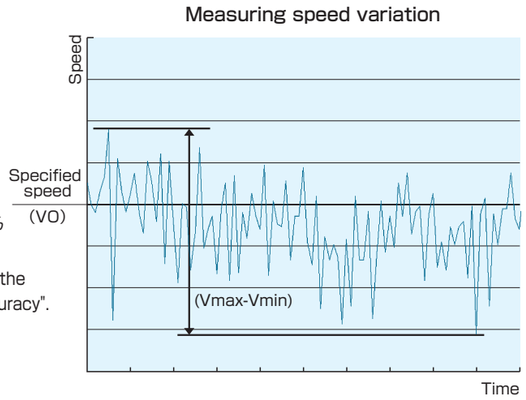
Move the stage at any speed you specify and measure the travel distance at sampling intervals. Obtain the speed during a minute interval using the measured travel distance during the sampling interval and the sampling interval. Divide the maximum speed difference during the constant speed interval by the specified speed VO. The speed variation is 1/2 of the obtained value with 7 that is expressed in percentage. Place the reflecting lens at the center of the table and the spectroscopic lens on the installation surface plate to perform measurement.

Measurement value=± ｛（Vmax−Vmin）／VO／2×100｝%

Measuring device : Laser length measuring machine

The figure indicating measuring lost motion is the same as "Measuring repetitive positioning accuracy".

Measuring speed variation



Zero Point of the X/XY Stage, and Zero Point Deceleration and Overtravel Sensors

To fine-tune the position of the zero point, set the zero point set distance (offset distance) when using a VCⅡ series driver together or set the zero point offset distance from the master controller when using a VPS series driver.

When you specify the incremental (INC) type of encoder

①Zero return operation

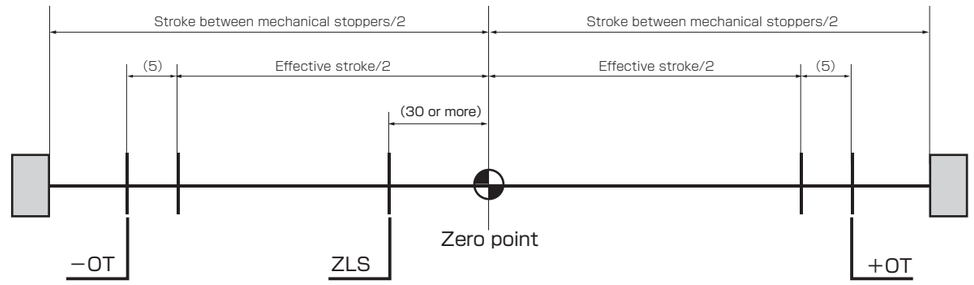
The "OT return and zero return method" is recommended for zero return operation.
When a VCⅡ driver is used together, a built-in OT return and zero return function is provided.
When you specify zero return operation from the master controller, OT return and zero return operation is also recommended.

②Position of the zero point

As the position of the zero point along each of the X- and Y-axes, a zero point marker is mechanically set roughly at the center of the relevant effective stroke.
To fine-tune the position of the zero point, set the zero point distance parameter (zero point offset distance) in the VCⅡ driver when using the OT return and zero return function on the VCⅡ driver. Set the zero point offset distance from the master controller when specifying zero return operation on the controller.
Repetitive zero point positioning accuracy is equivalent to repetitive positioning accuracy listed in the X/XY stage machine specifications only for zero return from one direction.

③Zero point deceleration and overtravel sensors

Along each axis on the stage, a zero point deceleration (ZLS) sensor and forward/reverse overtravel (±OT) sensors are mounted and connected.
Sensor model number: PM-Y54 (output can be selected between light on and dark on.) manufactured by SUNX.
※The ±OT sensors are connected in the light-on mode and the ZLS sensors are connected in the dark-on mode.
Each sensor is mounted in the position shown below on the sensor rail. You can loosen the fixing bolt to move the sensor to a desired position and adjust the position.
±OT : Position 5 mm apart from each end of the effective stroke in the positive direction
ZLS : Position 30 mm or more apart from the position of the zero point in the negative direction
※The position of the ZLS sensor is adjusted so that forward zero return is enabled.



When you specify the absolute (ABS) type of encoder

①Position of the zero point

As the position of the zero point along each of the X- and Y-axes, the absolute position of the zero point is electrically set roughly at the center of the relevant effective stroke.
Repetitive zero point positioning accuracy is equivalent to repetitive positioning accuracy listed in the X/XY stage machine specifications only for zero return from one direction.

②Zero point deceleration and overtravel sensors

The ZLS and ±OT sensors are not required for the absolute type of encoder.

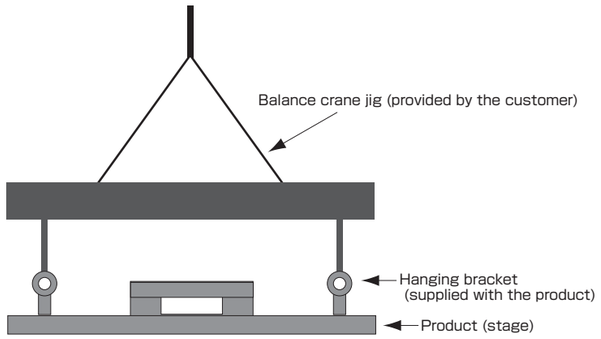
Acceptance Inspection, Delivery, and Warranty

Acceptance inspection

Delivery of the product you ordered to the place you specified after various types of measurement in our factory is assumed to be acceptance inspection.

Delivery and caution at delivery

The product you ordered is delivered to the place you specified on a free-on-truck basis.
To lift the product, use the hanging brackets supplied with the product.
Use a balance crane jig (see the figure below) and lift the product vertically as much as possible so that wire ropes do not interfere with the product.



Crane operation is recommended.

Warranty

The warranty period for our product is one year from the date of shipment or 3000 operation hours, whichever comes first. However, note that failures and abnormalities resulting from the following causes are not covered by this warranty:

①Repair by a manufacturer other than Nikki Denso or modifications by the customer
②Improper use different from the description in this manual
③Natural disasters
④Improper connection with any manufacturer's product not approved by Nikki Denso
⑤Change in the dimension of a part with age, failure due to the life of the product, and replacement of consumable parts

This warranty shall cover only repair of the main unit of the product. Any damage and loss of chance at your side, which will be induced by a failure of the delivered product, is excluded from the warranty.
If you find a failure or abnormality during or not during the warranty period, contact our sales representative.

⚠ Caution

- Our products have been designed and manufactured for general-purpose applications in the general industry and are not intended to be used in any equipment or system that may be involved with human life.
  For this reason, Nikki Denso assumes no responsibility if our product is used for any other application than we intend.
  (Examples: Applications in equipment and systems for atomic, aerospace, medical, and passenger vehicles that may greatly be involved with human-life and assets)
- If you want to install the product on a device for which a serious accident or loss may occur by a motor failure or external noise higher than the specified noise resistance level, install an appropriate backup or failsafe function in the system.
- When the motor is used in an environment in which sulfur or sulfidizing gas is generated, a chip resistor may be corroded and broken and a contact failure may occur.

Required Specification List

Fill out the list according to the required specifications of the linear stage you order.
Place a check mark in ☐ and write a required item in parentheses.
For an unknown or unnecessary item, leave the field blank.

Date of entry: Year Month Day

Application and device name	( )		
Stage axis configuration	☐ 1axis ☐ XY-axes ☐ Xθ-axes ☐ XYθ-axes ☐Others ( ) axes		
Table dimensions	W : ( ) mm × L : ( ) mm		
External dimensions	W : ( ) mm × L : ( ) mm × H : ( ) mm		
	Cableveyor ☐ Included ☐Not included		
Item \ Driving axis	X	Y	
Effective stroke (OT not included)	( ) mm	( ) mm	
Repetitive positioning accuracy	±( ) μm	±( ) μm	
Lost motion	( ) μm	( ) μm	
Scale resolution	( ) μm/p	( ) μm/p	
Maximum speed	( ) mm/s	( ) mm/s	
Positioning accuracy (absolute value)	( ) μm	( ) μm	
Squareness (based on the shorter stroke)		( ) μm	
Straightness Vertical	( ) μm	( ) μm	
Straightness Horizontal	( ) μm	( ) μm	
Parallelism	☐ Parallelism A ☐ Parallelism B ( ) μm		
Table flatness	( ) μm ※Accuracy only required for the part, not accuracy after assembly.		
Attitude accuracy Pitching	( ) asec	( ) asec	
Attitude accuracy Yawing	( ) asec	( ) asec	
Operation accuracy Speed variation (sampling Hz)	±( ) % @( ) mm/s、( ) Hz	±( ) % @( ) mm/s、( ) Hz	
Operation accuracy Tracking accuracy (position error)	±( ) μm	±( ) μm	
Load (such as the mass of a workpiece)	( ) kg		
Load direction, load condition, etc.	( )		
Load and direction when stopped (external force, etc.)	( ) Direction、( ) N)		

Check items
- Use environment (general atmosphere and clean environment supported)
- Whether to require a mounting base
  (With a precision maintenance base
  User precision JIS class ___ mount)
- Operation time (acceleration)
- Whether to require ZLS/OT sensors, positions, whether to require wiring
- Allowance of the cableveyor (for additional customer wiring)
- Linear guide specifications
  (Whether to require precompression, sealing, and surface treatment
  Materials, grease)
- Materials of the stage (Al, copper, steel)
- Surface treatment (Raydent, electroless nickel plating, etc.)
- Whether to require a magnetic pole sensor and emergency brake (dynamic brake)

Item \ Driving axis	θ	
Rotation angle	( ) deg	
Repetitive positioning accuracy	±( ) asec	
Lost motion	( ) asec	
Encoder resolution	( ) asec/p or ( ) ppr	
Maximum speed	( ) rps	
Positioning accuracy (absolute value)	( ) asec/( ) deg	
Runout · Axial	( ) μm	
Runout Radial	( ) μm	
Parallelism	( ) μm	
Moment rigidity	( ) N·m/rad	
Load (such as the mass of a workpiece)	( ) kg	
Load direction, load condition, etc.	( )	
Load when stopped (external force, etc.)	( ) N	

Check items
- Positioning accuracy on the τDISC table, operation time (acceleration)
- Materials, surface treatment, finishing
- Bearing specifications
  (Whether to require precompression, sealing, and surface treatment, materials, grease)

●Write other requirements and outline drawing if any.

■ Company			
■ Department		■ Person in charge	
■ e-mail		■ TEL	

Custom-made stages

Nikki Denso provides stages tailored to the needs of each customer.

◎Semi-custom-made stages

Based on a standard stage, the following items are customized.

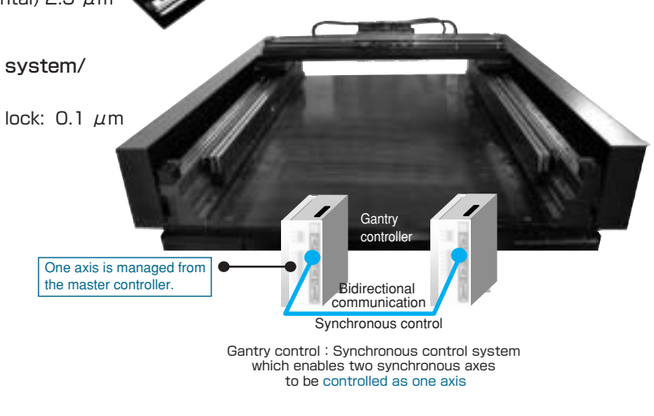
- ●Changes the stroke, linear motor, linear scale, non-standard θ-axis, linear guide, position of the zero point, table/base mounting holes, surface treatment, materials, top table size, cableveyor, etc.
- ● Increases machine precision/dynamic precision.

◎Custom-made stages

Nikki Denso provides special specification stages including a multi-head stage, long stroke stage, and stage with a mount.

Sample custom-made stages

□High precision X-axis stage
Stroke : 400 mm
Positioning precision : 0.2 μm
Repetitive positioning precision : ±0.1 μm
Straightness : (Vertical) 1.5 μm (Horizontal) 2.5 μm



□X-axis gantry stage + gantry control system/
Y-axis three-head stage
Gantry synchronization accuracy : At servo lock: 0.1 μm
During driving at 100 mm/sec : 0.7 μm

Synchronous control

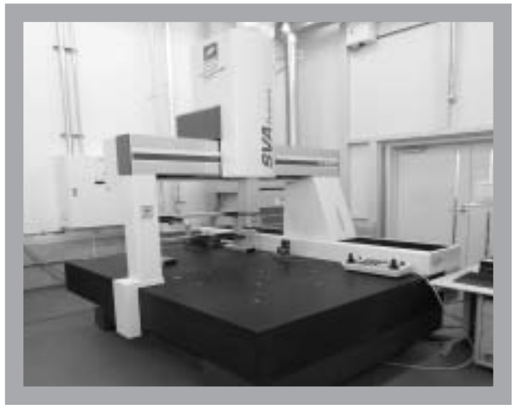
Gantry control : Synchronous control system which enables two synchronous axes to be controlled as one axis

High quality stage

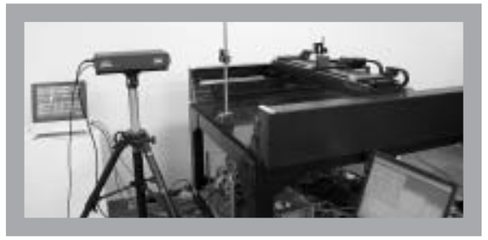
Nikki Denso has excellent measuring environment systems to always provide high-quality, high precision stages to the customers.

Measurement room : Vibration-absorbing floor
Temperature-controlled room (22℃ ±0.5℃)

Three-dimensional measurement system (manufactured by TOKYO SEIMITSU)
Model XYZAX SVA FUSION 9/10/6



Laser measurement system (manufactured by Renishaw)
Model ML 10



AC Servo driver/controller

VCⅡ Series

High performance servo driver series that maximizes motor performance from high response operation to ultralow operation
"Versatile servo driver series" including the controller type with the program positioning control function (VCⅡ-C1) or free curve control function (VCⅡ-C6)
Stage positioning accuracy ensured by using the absolute position compensation function option

VCⅡ- Type D
High performance driver
Pulse train control, speed control, torque control, simple positioning, and mode selection

VCⅡ-Type C1
Program positioning controller
Built-in program positioning, speed, torque, and other functions

VCⅡ-Type C6
Free curve controller
Free curve motion enabled

- ●RoHS satisfied
- ●Conforming to CE marking (all models) and UL/cUL (up to 800 W)
- ●Network-compatible (option)

CE c UL us LISTED

Field network : ≪CC-Link≫·≪DeviceNet≫
Motion network : ≪SSCNETⅢ≫·≪MECHATROLINK-Ⅲ≫

AC Servo driver

VPS Series

Servo driver series developed in pursuit of user friendliness and cost performance
Equipped with 7-point positioning and zero return functions as standard
Stage positioning accuracy ensured by using the absolute position compensation function option

I/O type

CC-Link type
Equipped with a CC-Link interface as standard

- ●RoHS satisfied
- ●Conforming to CE marking and UL/cUL

CE c UL us LISTED

Explanation of the Model Number

NCR - D D A 0 A2 A - 401 B - T99
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

① AC servo driver/controller series name	
② Product type	D : Driver type C : Controller type
③ Series name	D : VC Ⅱ series
④ Model type	A : τ linear/τDISC motor B : Synchronous AC servo motor C : Induction AC servo motor
⑤ Function type	0 : Driver function 1 : Positioning control function 6 : Free curve control function
⑥ Input power specification	A1 : 100 VAC system A2 : 200 VAC system
⑦ Design order	A→B→C··· (Starting with A)
⑧ Output capacity	Upper two figures : Significant figures Lower one figure : Power of 10 Example) 40 1=40×10¹= 400W
⑨ Available motor	None : Synchronous/induction AC servo motor B : Linear motor type NLA-M/N or τDISC motor C : τ linear motor type NLA-S D : τ linear motor type NVA/NLD
⑩ Special specification	None : Standard specification T＊＊ : Special specification

General Specifications

Item		Specification
Ambient conditions	Temperature	Operating temperature : 0℃ to 55℃ 0℃ to 50℃ (to comply with UL standards) Storage temperature : 20℃ to 60℃※
	Humidity	85% or less with no condensation ※
	Installation place	Do not install the stage in any harmful atmosphere such as corrosive gas, cutting oil, metal dust, or oil.
	Altitude	1000 m or less
Cooling method		When the capacity is 800 W or less : Natural cooling When the capacity is at least 1.2 kW : Forced air cooling
Mounting orientation		Mounted on a panel
Vibration resistance		0.5G (10～50Hz)
Impact resistance		5G
Noise tolerance		FT/B : ±2000 V (Frequency: 5/100 kHz Cycle: 300 ms) for one minute Radiation noise : ±1000 V (50 ns, 10 cm) for one minute Electrostatic noise : ±10 kVA (between the ground and housing)

※ : Avoid use under a high temperature or humidity condition since the life largely varies depending on the temperature and humidity conditions.

Electrical Specifications

Item			Specification			
Model	NCR-□D		A□A2A-101D	A□A2A-201D	A□A2A-401D	A□A2A-801D
Output capacity		W	100	200	400	800
Input power supply	Voltage specification		AC200～230V、50／60Hz three-phase			
	Allowable voltage fluctuation		AC180～242V、50／60Hz			
Driving method			Three-phase sine wave PWM			
Power capacity (at rated output)		kVA	0.3	0.6	1.1	1.8
Continuous output current		Arms	1.1	2.0	3.4	5(6.8)※4
Instantaneous output current		Arms	3.3	6.0	9.9	17.0
Control method			Semi-closed loop by encoder (linear sensor) feedback			
Brake method			Regenerative braking : External regenerative resistor			
Carrier frequency		k Hz	25			
Speed control range ※1			1 : 5000			
Maximum speed frequency		Mpps	20			
Circuit breaker (rated current) ※2		A	5	5	5	10
Mass ※3		kg	1.0	1.0	1.4	2.4
Accessories			–			Regenerative resistor (see p.42.)

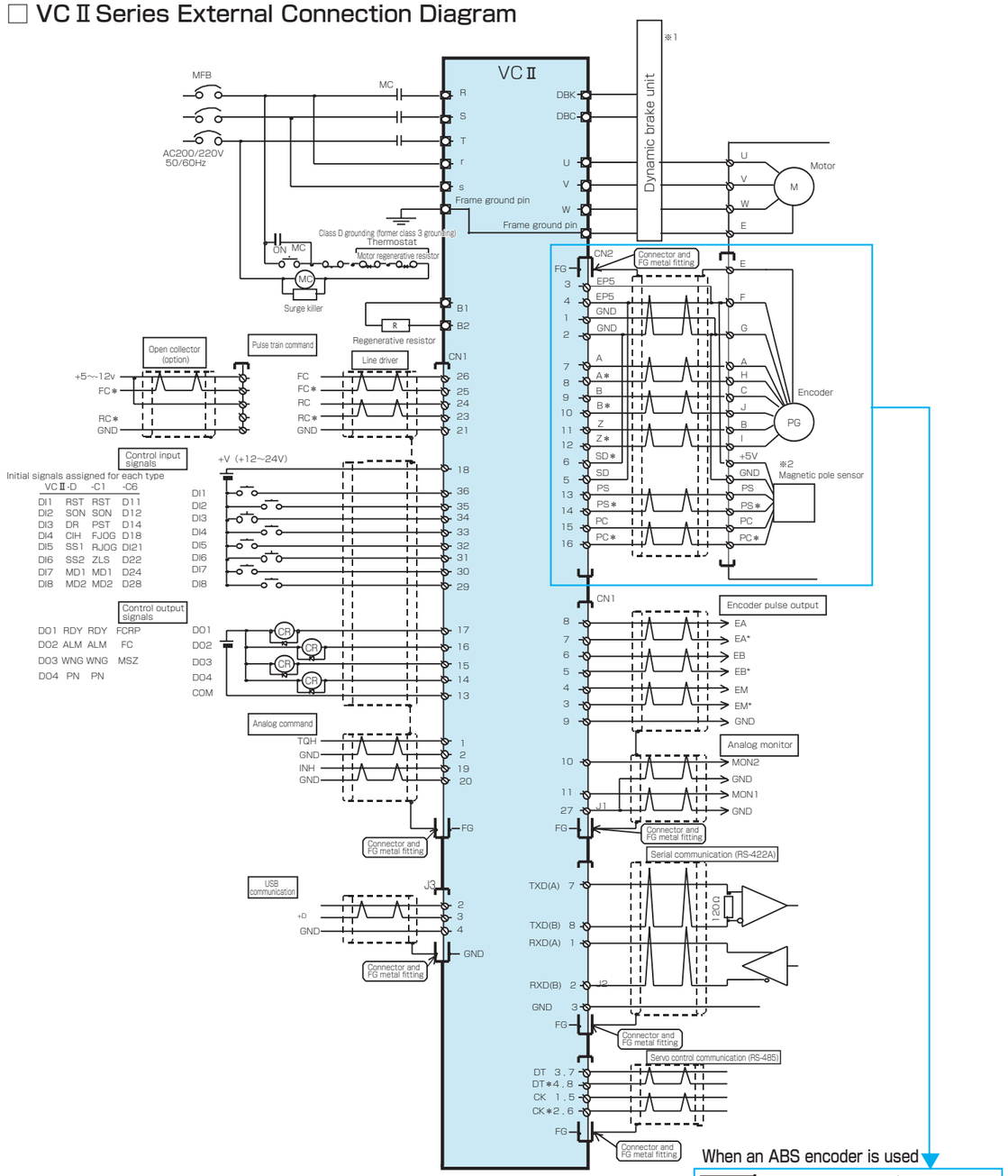
※1:The condition is that a motor does not stop with 100% load.
※2:Choose a circuit breaker model having a sufficient shutdown capacity that can conduct protective coordinate with the power supply capacity.
※3:When no option is attached
※4:The rated current is 6.8 A when not comply with UL standards.

Function Specifications

Item		Specification		
Type		VC Ⅱ-D (NCR-DDA0)	VC Ⅱ-C1 (NCR-CDA1)	VC Ⅱ-C6 (NCR-CDA6)
Number of controlled axes		1		
Encoder feedback input frequency		25 Mpps (quadruple of the encoder pulse frequency, however)		20 Mpps (quadruple of the encoder pulse frequency, however)
Run mode		Speed control, torque control, pulse train control, and simple positioning	Auto, manual, zero return, and pulse train	Auto, manual, zero return, and servo lock
Command input system	VC Ⅱ- type D/C1 Pulse train command VC Ⅱ- type C6 Master axis position command	①90°different phase pulse ②Directional pulse ③Directional signal + feed pulse		
		≪Line driver or open collector output (option) available. However, the line driver method is recommended for reasons of noise.≫		
		≪Maximum input frequency: 6.25 Mpps≫		≪Maximum input frequency:5 Mpps≫
		≪Be careful about noise since the same GND is used for the line receiver input≫		
		④Servo control communication		
		-		⑤Internal master axis command
	Analog command	Speed control run and torque control run		-
		DC -10V～ +10V、input resolution 14bit		
	Internal command	Simple positioning/zero return/manual run with internal pulse train commands	Program run with 280 internal stored data items (addresses 0 to 255 set by control signals)	
Main functions	Common to each type	Zero return run, manual (jog) run, serial communication run, self-diagnosis, torque limit, and electronic thermal		
	For each type	Pulse train run, simple positioning, and pulse train command compensation	Pulse train run, program run, (positioning, simple continuous positioning, external trigger positioning, four arithmetic/logic operations, timer, unconditional/conditional jump, subroutine, and spinner control), electric gear ratio set, and backlash compensation	
			Program run (continuous control)	Program run (free curve control)
Acceleration/deceleration pattern		Linear acceleration/deceleration and S-curve acceleration/deceleration		
Auto-tuning function		Available, by parameter setting, even when the inertia ratio is a little high		
Gain selection function		①Can select four types of gain by combining GSEL signals.		
		②Can also select position loop gain.		
Control input signals (external input signals, eight basic signals) ※1		Servo ON (SON(＊)), reset (RST), mode select (MD1 and MD2), command pulse input inhibit (CIH(＊)), emergency stop (EMG＊), proportion control (PC), forward jog (FJOG), reverse jog (RJOG), zero point deceleration (ZLS), speed override (OR1 to OR4), deviation clear (CLR), forward overtravel (FOT＊), reverse overtravel (ROT＊), gain select (GSEL), gain select 2 (GSEL2), forced brake ON (BRON), and torque limit (TL)		
		Drive (DR), speed/torque select (SS1 and SS2), simple positioning start (PST), address set (PS1 to PS3), zero return (ORG), and command direction select (SSD)	Auto start (PST), address set (PS1 to PS8), hold (HLD), external trigger (TRG), M complete (MFIN), program cancel (PCAN), block stop (BSTP), external auto start inhibit (EPIH), and jog speed change (JOSP)	
			Command direction select (SSD)	Phase lead (D11), phase delay (D12), electronic clutch (D14), master axis select (D18), cycle end (D21), pattern select (D22/D24/D28), and internal master axis speed select (MSSP)
Output signals (four basic signals) ※1		Servo ready (RDY), alarm (ALM(＊)), warning (WNG(＊)), positioning complete (PN), in torque limit (LIM), speed zero (SZ), break release (BRK), software limit switch (SLSA and SLSB), and encoder marker (OCM)		
		In speed run (SMOD), in torque run (TMOD), in simple positioning run (NMOD), and in pulse train run (PMOD)	Rough matching (PRF), program end (PEND), auto run ready (PRDY), in manual run (MMOD), in auto run (AMOD), in zero return run (HMOD), M strobe (MSTB), general output (OUT1 to OUT8), and M output (MO1 to MO80)	
			In pulse train run (PMOD)	Electronic clutch stop (FCRP), in free curve run (FC), master axis speed zero (MSZ), in servo lock (PMOD)
Encoder pulse output		90- different phase pulse train output (can be output at a divided frequency. The maximum output frequency of the two signals, phase A and B signals, is 20 Mpps when the encoder pulse frequency is quadrupled.)		
Operation and display functions		The LCD module on the front panel or optional SDI device allows the user to input various types of data and display various statuses.		
Filter functions		Notch filter, torque command filter, disturbance compensation filter, and vibration filter		
Monitor functions		①Displays the control signal status in the signal display section on the LCD module on the front panel or optional SDI device. ②Displays various types of operation status and setting status (data), and detected error history in the data display section on the LCD module on the front panel or optional SDI device. ③Analog monitor Two types of operation status (Can monitor two types of operation status selected using the relevant parameter.) ④USB-compatible. Can monitor various types of data using a dedicated editor (option).		
Data retention function		Retains the following data in non-volatile memory. (The non-volatile memory can be rewritten up to 10000 times.): Parameters and alarm history (The last five history items are retained. If any of the five items is the same as the last generated alarm, it is not registered.)		
Protective functions		Provided against the following items: IPM fault, overvoltage, undervoltage, overspeed, overload (electronic thermal), overload on the regenerative resistor, deviation overflow, communication, error, data error, CPU fault, encoder fault, automatic magnetic pole detection error, absolute encoder fault, etc.		
Communication functions		Can transmit and receive various types of data by serial communication (RS-422A).		
		Can communicate with the dedicated editor through USB (compliant with the 1.1 and 2.0 standards).		

※1:For the initial signals assigned for eight external input and four output signals, see "External Connection Diagram" on p.41.
For other than the initial signals, signals can be assigned by remote control or external I/O signal assignment.
An asterisk (＊) attached to a signal code indicates negative logic. An asterisk (＊) enclosed with parentheses indicates a signal of which logic can be changed by parameters.

□ VC Ⅱ Series External Connection Diagram

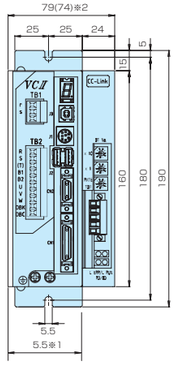


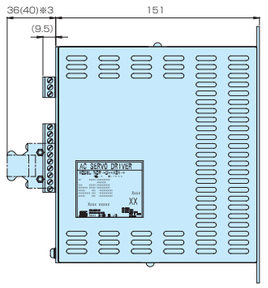
※1 : The dynamic brake unit is optional.
※2 : Connected when a magnetic pole sensor is used.

Notes) · Prepare a power supply at the specified voltage and current for the control input signals.
· In connector CN1, COM is common to control I/O signals and GND is common to the internal control power supply (+5 V).
· COM and GND in CN1 are isolated, so do not put them in common cables or bundles.
· The status of the switch connected to each control input signal indicates the OFF condition of the signal.
· Pins not described in this diagram are NC.
· Connect GND for the pulse train command when the line receiver is input.

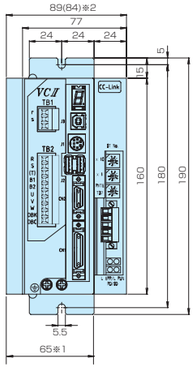
□ VC Ⅱ Series External Dimensions

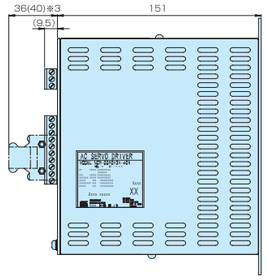
■VC Ⅱ main unit
NCR-□DA□A2A-201□



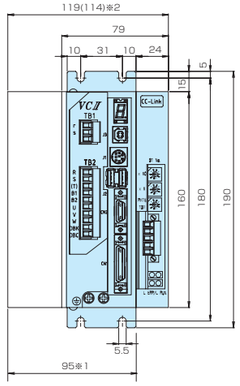


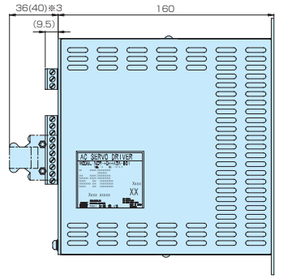
NCR-□DA□A2A-401□





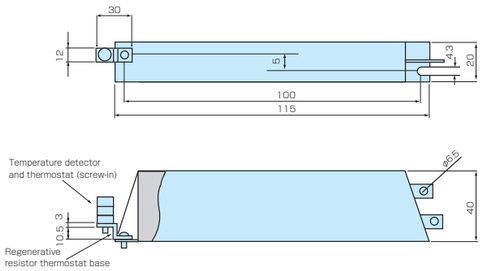
NCR-□DA□A2A-801□





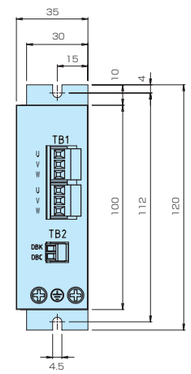
※1 : Indicates the dimension of the VC Ⅱ series main unit.
※2 : Indicates the dimension of the VC Ⅱ series when CC-Link and DeviceNet interface unit options are attached. The value in parentheses indicates the dimension when the additional control I/O unit is attached.
※3 : The value in parentheses indicates the dimension of the projecting connector when the additional control I/O unit is attached.

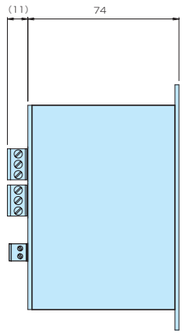
■Accessory of the NCR-□DA□A2A-801□
Regenerative resistor (60W/82Ω)



※Optional for the NCR-□DA□A2A-201□/401□

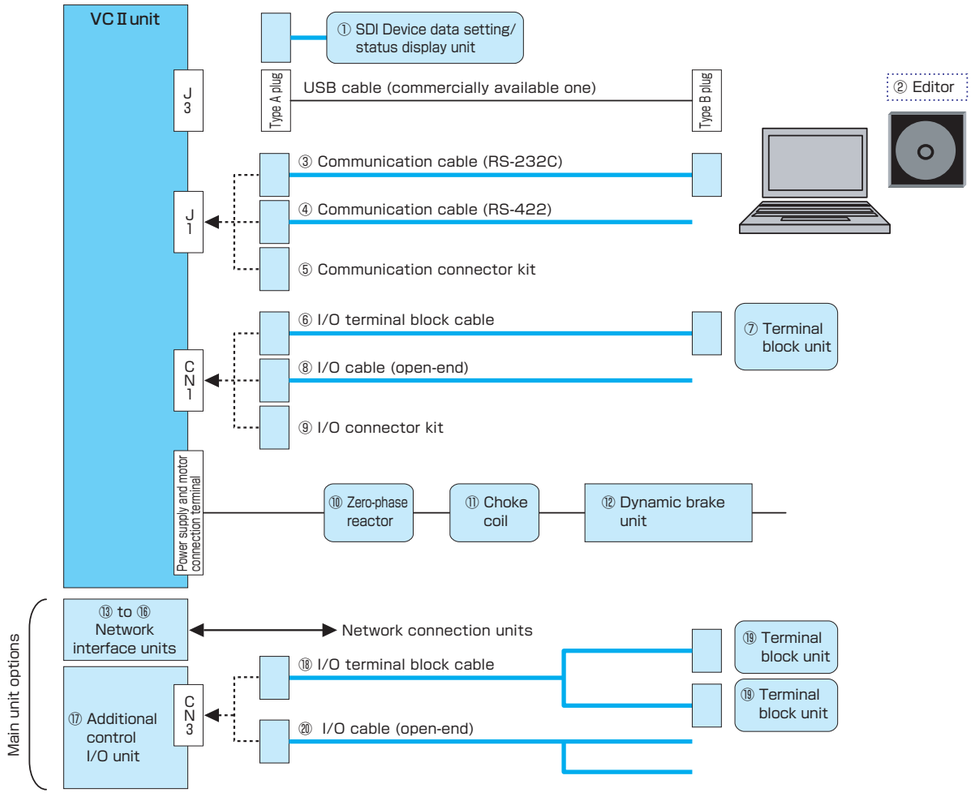
■Dynamic brake unit (option)
NCR-XABCA2B-801-UL





AC Servo driver/controller
VC Ⅱ Series

☐ Configuration of VC Ⅱ Options



☐ VC Ⅱ Series Options

	Part name/specification		Model number	Description
①	SDI Device data setting/status display unit		NCR-XAA1D1A	
②	PC editor	Japanese version	NCR-XCM000	
		English version	NCR-XCN000	
③	Communication cable (RS-232C)		NCR-XBF1A-□□□	Cable lengths : 1m、3m、5m、10m
④	Communication cable (RS-422)		NCR-XBF5A-□□□	Cable lengths : 1m、3m、5m、10m
⑤	Communication connector kit		NCR-XBDPA	
⑥	I/O terminal block cable		NCR-XBA2A-□□□	Cable lengths : 1m,2m,3m
⑦	Terminal block unit	Screw-in	ZTB-400	40 terminals
		Cage clamp	NCR-XABND3A	40 terminals
			NCR-XABQD3A	Required to insert multiple cables into one terminal.
⑧	I/O cable		NCR-XBA1A-□□□	Cable lengths : 1m, 2m, and 3m Open at either end
⑨	I/O connector kit		CSZ-INF	
⑩	Zero-phase reactor for protection against noise		NCR-XAB4A	For the common mode
⑪	Choke coil for protection against noise		NCR-XAC2A	For the normal mode Connected to U, V, and W in series.
⑫	Dynamic brake unit		NCR-XABCA2A-801-UL	For external dimensions, see p.42.
⑬	CC-Link interface unit	Main unit option	NCR-XAB7D1A-201/401	Applicable VC Ⅱ unit : NCR-＊A＊-051/101/201/401
			NCR-XAB7D1A-801	Applicable VC Ⅱ unit : NCR-＊A2＊-801
⑭	DeviceNet interface unit	Main unit option	NCR-XAB6D1A-201/401	Applicable VC Ⅱ unit : NCR-＊A＊-051/101/201/401
			NCR-XAB6D1A-801	Applicable VC Ⅱ unit : NCR-＊A2＊-801
⑮	MECHATROLINK-Ⅲ interface unit	Main unit option	NCR-XABPD1A-201/401	Applicable VC Ⅱ unit : NCR-＊A＊-051/101/201/401
			NCR-XABPD1A-801	Applicable VC Ⅱ unit : NCR-＊A2＊-801
⑯	SSCNETⅢ interface unit	Main unit option	NCR-XABLD1A-201/401	Applicable VC Ⅱ unit : NCR-＊A＊-051/101/201/401
			NCR-XABLD1A-801	Applicable VC Ⅱ unit : NCR-＊A2＊-801
⑰	Additional control I/O unit 1	Main unit option	NCR-XAA2D1A-201/401	Applicable VC Ⅱ unit : NCR-＊A＊-051/101/201/401
			NCR-XAA2D1A-801	Applicable VC Ⅱ unit : NCR-＊A2＊-801
⑱	I/O terminal block cable for additional control I/O unit 1		FTTC-□□□	Cable lengths : 1m,2m,3m
⑲	I/O terminal block unit for additional control I/O unit 1	Screw-in	ZTB-500／ZTB-200	50 terminals/20 terminals
		Cage clamp	NCR-XABPD3A／XABMD3A	50 terminals/20 terminals
			NCR-XABQD3A	Required to insert multiple cables into one terminal.
⑳	I/O cable for additional control I/O unit 1		NCR-XBA3A-□□□	Cable lengths : 1m, 2m, and 3m Open at either end

※ □□□ in the cable model number indicates the cable length. Example : 5m ⇒ 050
※ The main unit options are incorporated to the VC Ⅱ unit at shipment.
※ For external dimensions and details of each optional product, refer to "VC/VC Ⅱ Series Option Manual".

AC Servo driver
VPS Series

☐ Explanation of the Model Number

NCR - DCCO A2 B - 401 D - S(T)99
① ② ③ ④ ⑤ ⑥ ⑦

① AC servo driver/controller series name	
② Product type	DCCO : I/O specification type DCDO : CC-Link specification type
③ Input power specification	A1 : 100 VAC system A2 : 200 VAC system
④ Design order	A→B→C･･･ (Starting with A)
⑤ Output capacity	Upper two figures : Significant figures Lower one figure : Power of 10 Example) 40 1 =40×10 1= 400W
⑥ Available motor and encoder type	A : NA80/800 series AC servo motor and serial encoder
	B : NA80/800 series AC servo motor and 90° different phase pulse encoder
	C : τ linear series and IPU separate encoder
	D : τ linear series and 90° different phase pulse encoder
	E : τ DISC series and IPU separate encoder
	F : τ DISC series and 90- different phase pulse encoder
	G : τ linear series and ABS linear scale
⑦ Special specification	None : Standard specification S (T) ＊＊ : Special specification

☐ General Specifications

Item		Specification
Ambient conditions	Temperature	Operating temperature : 0℃ to 55℃ Storage temperature : 20℃ to 60℃ ※
	Humidity	85% or less with no condensation
	Installation place	Do not install the stage in any harmful atmosphere such as corrosive gas, cutting oil, metal dust, or oil.
	Altitude	1000 m or less
Cooling method		When the capacity is 800 W or less : Natural cooling When the capacity is at least 1.6 kW : Forced air cooling
Mounting orientation		Mounted on a panel
Vibration resistance		0.5G (10~50Hz)
Impact resistance		5G
Noise tolerance		Line noise : 2000 V (50 ns, 1 μs) for one minute Radiation noise : 1000 V (50 ns, 10 cm) for one minute Electrostatic noise 10 kVA (between the ground and housing)

※ : Avoid use under a high temperature or humidity condition since the life largely varies depending on the temperature and humidity conditions.

☐ Electrical Specifications

Item			Specification	
Model	NCR-DC		□0A2B-401□	□0A2B-801□
Output capacity		W	400	800
Input power supply	Voltage specification		AC200~230V、50／60Hz single-phase	AC200~230V、50／60Hz three-phase
	Allowable voltage fluctuation		AC180~242V、50／60Hz	AC180~242V、50／60Hz
Driving method			Three-phase sine wave PWM	
Power capacity (at rated output)		kVA	0.92	1.8
Continuous output current		Arms	3.5	6.8
Instantaneous output current		Arms	8.75	17
Control method			Semi-closed loop by encoder (linear sensor) feedback	
Brake method			Regenerative braking : External regenerative resistor	
Carrier frequency		k Hz	10	
Speed control range ※1			1 : 2000	
Maximum speed frequency		Mpps	16	
Circuit breaker (rated current) ※2		A	5	10
Mass		kg	Approx. 1.0	Approx. 1.5
Accessories			–	Regenerative resistor (see p.47.)

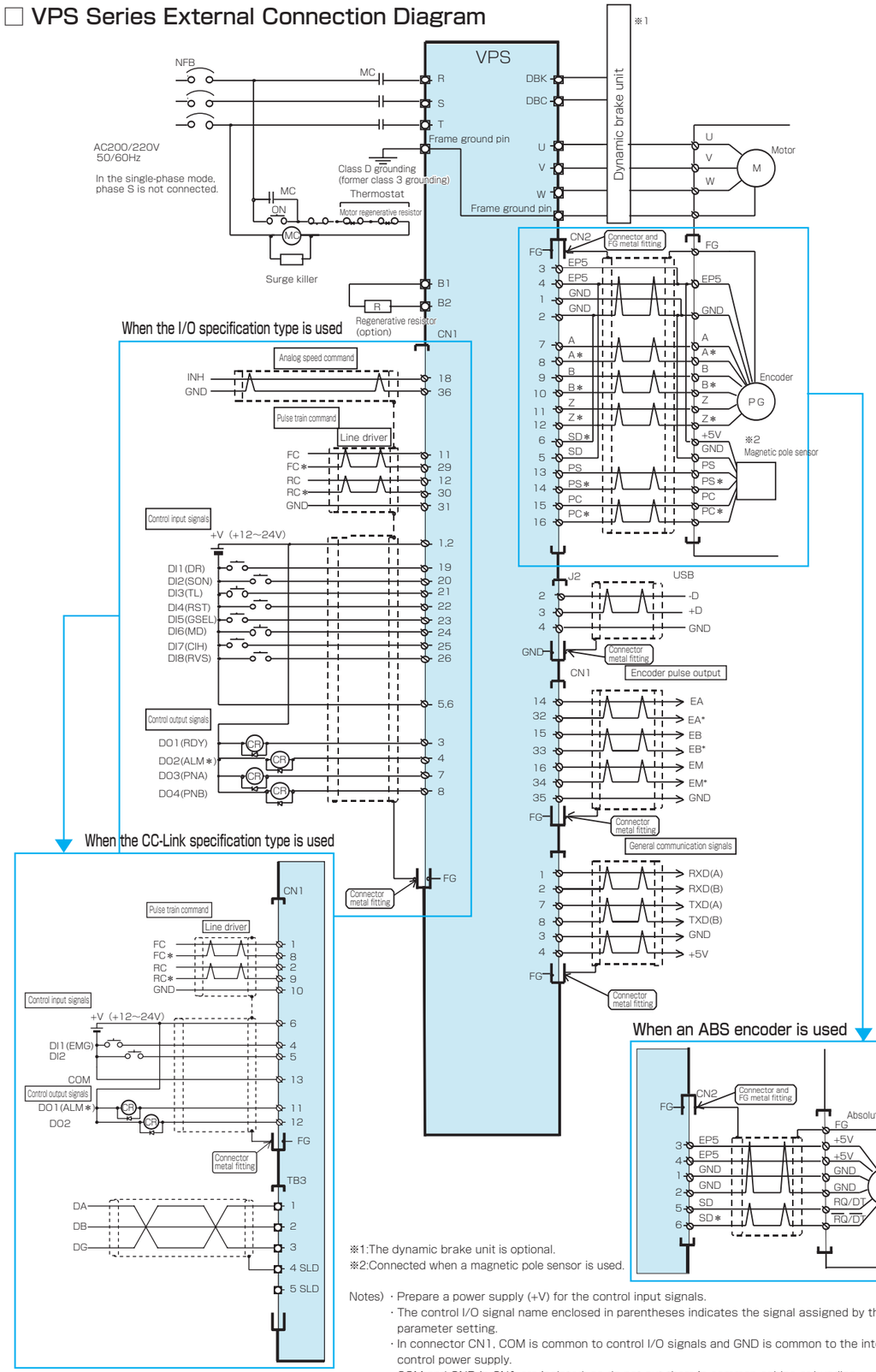
※1:The condition is that a motor does not stop with 100% load.
※2:Choose a circuit breaker model having a sufficient shutdown capacity that can conduct protective coordinate with the power supply capacity.

VPS Function Specifications

Item		Specification	
Type		I/O specification (NCR-DCCO)	CC-Link specification (NCR-DCDO)
Number of controlled axes		1	
Encoder feedback input frequency		16 Mpps (quadruple of the encoder pulse frequency, however)	
Run mode		Speed control and pulse train	
Command input system	Pulse train command	①90°different phase pulse ②Directional pulse ③Directional signal + feed pulse	
		≪Line driver output available. The maximum input frequency is 4 Mpps.≫	
	Analog command	Speed control run	-
		DC -10V～+10V、input resolution 13bit	
	Internal command	Positioning (7 points)/zero return/manual run with internal pulse train commands	
Main functions		Speed control run, pulse train run, zero return run, manual (jog) run, torque limit, self-diagnosis, electronic thermal, and auto-tuning function	
Acceleration/deceleration pattern		Linear acceleration/deceleration and S-curve acceleration/deceleration (by using the command averaging function)	
Gain selection function		Speed gain switching among three types (normal, low-speed, and change with GSEL)	
Control input signals (eight external input signals) ※		Drive (DR), servo ON (SON(✻)), reset (RST), mode select (MD), command pulse input inhibit (CIH), emergency stop (EMG), command select (SS1 to SS3), forward jog (FJ), reverse jog (RJ), zero point deceleration (ZLS), forward overtravel (FOT), reverse overtravel (ROT), gain select (GSEL), torque limit (TL), internal pulse start (ZST), zero point marker (ZMK), command direction reverse (RVS), and command data reflection inhibit (NRF)	
		Current position data output request (APRQ), alarm code output request (ALRQ), and ABS data output request (ABRQ)	-
Output signals (four basic signals) ※		Ready (RDY), alarm (ALM), deviation range A (PNA), deviation range B (PNB), speed zero (SZ), break release (BRK), marker output (OCEM), in emergency stop (EMGO), and zero return complete (HCP)	
Encoder pulse output		90° different phase pulse train output (can be output at a divided frequency. The maximum output frequency of the two signals, phase A and B signals, is 7.99 Mpps when the encoder pulse frequency is quadrupled.)	-
Operation and display functions		The operation panel on the front panel allows the user to display various statuses, edit parameters, and execute self diagnosis.	
Filter functions		Notch filter and torque command filter	
Monitor functions		①Displays a selected item including alarms, speed, torque, deviation, speed command input, input signals, and parameter status on the data display LEDs (four 7-segment LEDs) on the front panel. ②USB-compatible. Can monitor various types of data using a dedicated editor (option).	
Protective functions		Provided against the following items: IPM fault, overvoltage, undervoltage, overspeed, overload(electronic thermal), overcurrent on the regenerative resistor, deviation overflow, RAM error, encoder fault, magnetic pole detection error, DSP error, etc. Can display the last five alarm history items.	
Communication functions		Can transmit and receive various types of data by serial communication (RS-422A) or CC-Link.	
		Can communicate with the dedicated editor through USB (compliant with the 1.1 and 2.0 standards).	

※ : For the initial signals assigned for eight input and four output signals, see "External Connection Diagram" on p.46.
※ : For other than the initial signals, signals can be assigned by external I/O signal assignment or can be used for communication and CC-Link. (For CC-Link, OCEM can be used only as an external output signal.)
※ : The status of control input signals can be fixed.
※ : The logic of control output signals other than OCEM can be changed when they are assigned as external output signals.

VPS Series External Connection Diagram

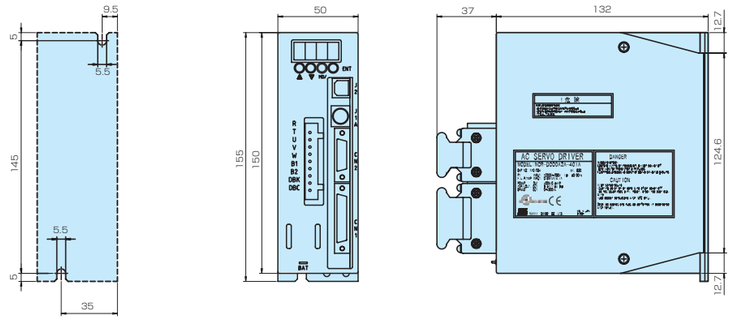


※1:The dynamic brake unit is optional.
※2:Connected when a magnetic pole sensor is used.

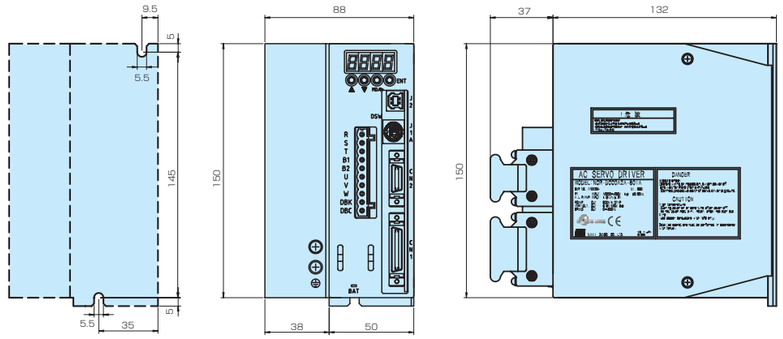
Notes) · Prepare a power supply (+V) for the control input signals.
· The control I/O signal name enclosed in parentheses indicates the signal assigned by the initial parameter setting.
· In connector CN1, COM is common to control I/O signals and GND is common to the internal control power supply.
· COM and GND in CN1 are isolated, so do not put them in common cables or bundles.

□ VPS Series External Dimensions

■VPS unit
NCR-DC□0A2B-401□

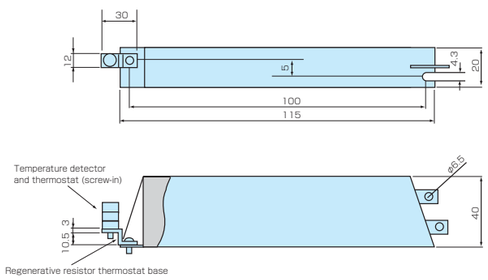


NCR-DC□0A2B-801□



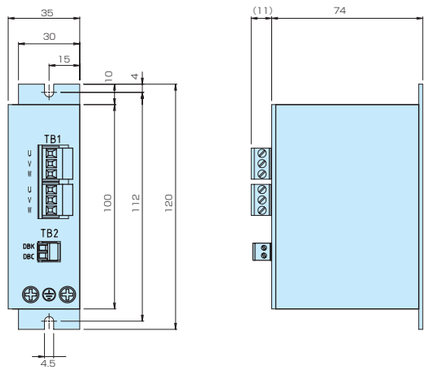
※The above figures show the I/O specification type. (The dimensions of the CC-Link type are the same.)

■Accessory of the NCR-DC□0A2B-801□
Regenerative resistor (60W/82Ω)



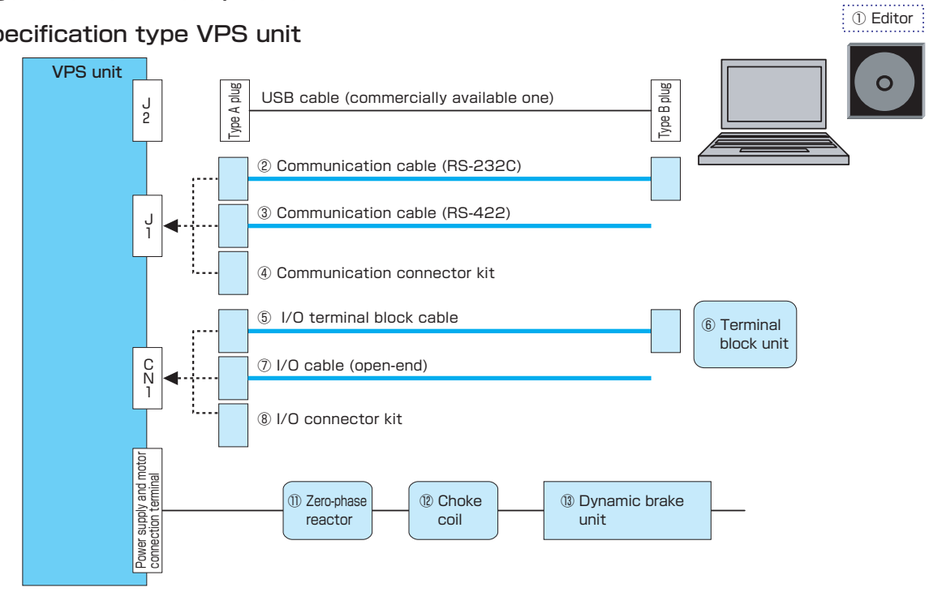
※Optional for the NCR-DC□0A2B-401□

■Dynamic brake unit (option)
NCR-XABCA2B-801-UL

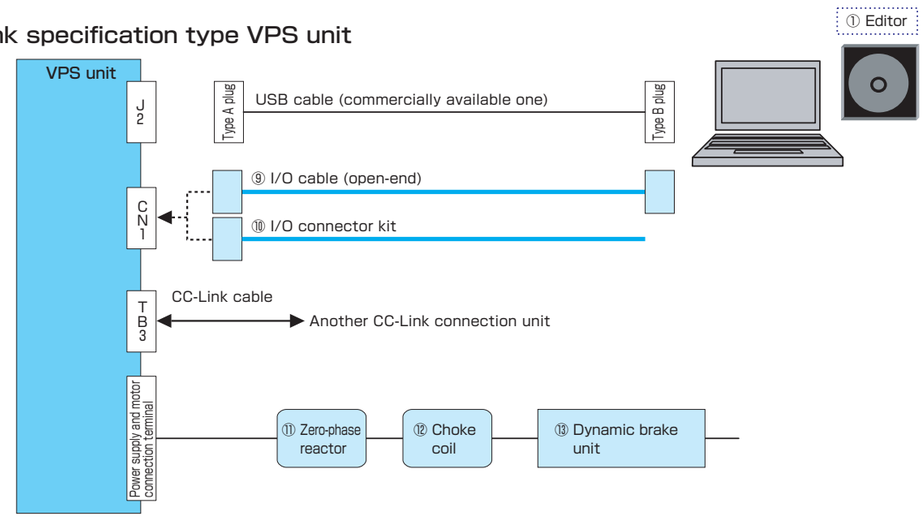


□ Configuration of VPS Options

●I/O specification type VPS unit



●CC-Link specification type VPS unit



□ VPS Series Options

	Part name/specification		Model number	Description
①	PC editor	Japanese version	NCR-XCB000	
		English version	NCR-XCE000	
②	Communication cable (RS-232C)		NCR-XBF1A-□□□	Cable lengths : 1m、3m、5m、10m
③	Communication cable (RS-422)		NCR-XBF5A-□□□	Cable lengths : 1m、3m、5m、10m
④	Communication connector kit		NCR-XBDPA	
⑤	I/O terminal block cable (for the I/O specification type VPS unit)		ZTTC-□□□	Cable lengths : 1m、3m
⑥	Terminal block unit (for the I/O specification type VPS unit)	Screw-in	ZTB-400	40 terminals
		Cage clamp	NCR-XABND3A	40 terminals
			NCR-XABQD3A	Required to insert multiple cables into one terminal.
⑦	I/O cable (for the I/O specification type VPS unit)		ZIC-□□□	Cable lengths : 2m and 3m Open at either end
⑧	I/O connector kit (for the I/O specification type VPS unit)		CSZ-INF	
⑨	I/O cable (for the CC-Link specification type VPS unit)		NCR-XBA5A-□□□	Cable lengths : 1m, 2m and 3m Open at either end
⑩	I/O connector kit (for the CC-Link specification type VPS unit)		ZCK-COM	
⑪	Zero-phase reactor for protection against noise		NCR-XAB4A	For the common mode
⑫	Choke coil for protection against noise		NCR-XAC2A	For the normal mode Connected to U, V, and W in series.
⑬	Dynamic brake unit		NCR-XABCA2A-801-UL	For external dimensions, see p.47.

※ □□□ in the cable model number indicates the cable length. Example : 5m ⇒ 050
※ For external dimensions and details of each optional product, refer to "VPS Series Option Manual".

Another Linear Stage

Linear Transfer Stage
Stage Block

Pursuing cost performance by adopting a scaleless linear sensor

Specifications when a scaleless linear sensor is used

◎ Costs significantly reduced
◎ Environment resistance improved
◎ Sensor resolution: 40/8192 μm (4.883 μm)
◎ Repetitive positioning accuracy: ±10 μm
◎ Lost motion: 10 μm
◎ Optical and magnetic linear encoders also available to bring out higher precision

Effective stroke selectable from 100 to 1140 mm

◎ Rich in variation, effective stroke selectable from 100 to 1140 mm and rated thrust selectable from 95／200 N
◎ Lineup including the long stroke type (effective stroke selectable from 1140 to 21320 mm)

XY/Xθ/XYθ stage easily configured by combining the Stage Block and low-profile direct drive motor τDISC series

Stage Blocks can be combined to configure an XY stage.
An Xθ/XYθ stage can also be configured by mounting low-profile direct drive motor τDISC series in combination with Stage Blocks.

For details, refer to the Stage Block Brochure.

Direct Drive Product Lineups Nikki Denso Offers

τDISC® Servo Motor

First direct drive servo motor that has satisfied stable performance at low speed, high takt operation, stable driving with high inertia, and other needs
τDISC Series developed as a pioneer pursuing performance

【D series】	**Low-profile high performance type**	Features	Overwhelming thickness of 44.5 mm that is provided by high magnetic flux density High performance direct drive servo motor having exceptionally stable performance at low speed and machine accuracy including runout.
		Rated torque	2～200N・m
		Applications	Wafer chamfering, precision θ-axis, camera platform, electronic drawing machine, and so on
	High torque type	Features	High torque direct drive servo motor which achieves stable positioning with high inertia load
		Rated torque	500～1500N・m
		Applications	（Maximum torque：1000 to 3000N・m） Large liquid crystal substrate alignment, roll coater, screen printer, and so on
【HD series】	**Fast response type**	Features	Fast response direct drive servo motor developed in pursuit of fast response performance with excellent stability that satisfies both high torque and low inertia structures in a higher state and has high motor rigidity
		Rated torque	21～115N・m
		Applications	High-speed indexing, handler, and so on
【ND-c series】 【ND series】	**Standard type**	Features	Standard type direct drive servo motor optimum for transfer, positioning, indexing, and other applications. Lineup also includes the absolute encoder type.
		Rated torque	2.4～500N・m
		Applications	Liquid crystal transfer, index device, picking and placement, and so on

τServo Compass® Round Operation Type

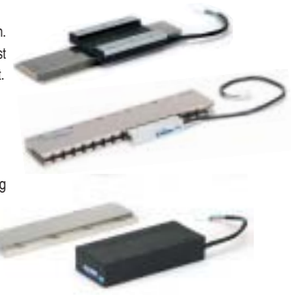
Unique round type linear servo motor for which magnets are mounted only at the required angle
Direct drive servo motor optimum for alignment applications

Limited operation angle type	Features	Circular operation only within the required operation angle enabled by combining arc magnet bases. Direct drive servo motor optimum for high precision positioning with high inertia load including alignment of a large FPD substrate by direct driving within the required angle.
	Operation radius	825mm/1525mm
	Applications	Large liquid crystal substrate alignment device
One-rotation available type	Features	Round type direct drive servo motor capable of one rotation by connecting eight 45-degree magnet bases In this case, the bore radius is 250 mm, which is optimum for driving requiring a hollow structure.
	Operation radius	178mm
	Application	Wafer inspection device, liquid crystal substrate alignment device, and so on

τLinear® Servo Motor

τ linear series capable of high precision and fast operation
Rich lineup allowing the user to choose a servo motor from various angles including operation specifications, thrust, and stroke.

Coreless type	Features	Linear servo motor which satisfies both excellent stable performance at low speed and high speed operation. Several types are available including the flat type having a straddle mounted slide structure and high-thrust type which provides high thrust in 70% of the conventional model space by reviewing the magnetic alignment.
	Rated thrust	7～1000N
	Applications	Wire bonder, connector manufacturing device, high precision measurement device, and so on
Core type	Features	High thrust density provides large thrust. Linear servo motor optimum for high-speed positioning of high mass load since the motor driving section has high rigidity
	Rated thrust	250～1500N
	Applications	Large substrate transfer, laser beam machine, electronic drawing device, and so on



For details of each series, refer to the brochure of each product.

Details of Warranty

Warranty period of our products is one year after shipment from our factory.
However, please note that any failure or abnormality resulting from the following causes will not be covered by the warranty.

◎ Modification by parties other than CKD Nikki Denso.

◎ Any non-standard operation that is different from rules and regulations stipulated by this catalog or our manual.

◎ Natural disasters.

◎ Connection with another maker's unit which is not approved by CKD Nikki Denso.

Warranty of the device is limited for repairing only. Any damage caused by the fault of delivered device, or lost opportunity on the customer's side, profit loss, secondary damage, and accident will not be covered.

Cautions

◎ The products may be damaged if it is hit or dropped. Please handle carefully.
◎ Please make sure to install the safety device in case the product is used in the system that may have a serious accident or loss if the product is failed.
◎ Since the unexpected noise, electrostatic, or incase of abnormal failure of input power source, wiring, and parts may be occurred although we put our effort to keep the product quality, please consider the fail-safe design and the safety in the range of movement before use.
◎ Please read the instruction manual carefully and understand fully before use the product.
Also, please pay attention to the cautions mentioned in the manual.
◎ In the product, strong magnets are used. Please do not stand near by the product if you have the pace maker device in the heart in order to avoid serious accident.
◎ Please make sure to unplug the all power supply cables before installing, checking, and maintenance of the product. Also, please make sure to take measures such as safety plug or locking the power supply cables to avoid re-inputting the power other than the operator.

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