NT
(NT…V, NT…H, NT…XZ, NT…XZH)

NT

C-Lube
Maintenance-free

Linear motor

Linear motion

Ultracompact, state-of-the-art linear motor table NT series!

Nano Linear NT is a moving magnet type linear motor table with extremely low profile.

For guiding parts of the moving table, Linear Way or Crossed Roller Way well-established in the area of miniature linear motion rolling guides is used in combination with linear motor and high-resolution linear encoder to realize highly accurate positioning.

Thanks to adoption of high-performance neodymium magnet, large thrust force can be acquired and therefore high-speed and highly responsive positioning is possible, despite its very small body. In addition, high cleanliness is realized as the mechanical contact part is only the linear motion rolling guide thanks to adoption of a landmark driving method without moving cables.
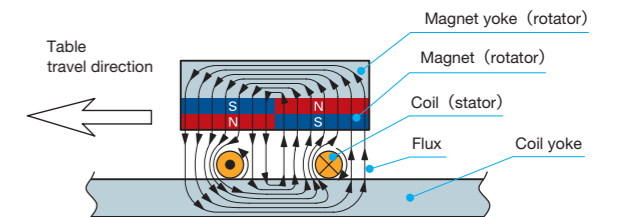
Nano Linear NT specifications list

Model and size	Standard type NT…V						
	NT38V10	NT38V18	NT55V25	NT55V65	NT80V25	NT80V65	NT80V120
Sectional shape	38 / 26 / 11		55 / 14		80 / 16		
Maximum thrust N	3	3	25	25	36	36	36
Rated thrust N	0.6	0.8	7	7	8	8	8
Maximum load mass kg	0.5	0.5	5	5	5	5	5
Effective stroke length mm	10	18	25	65	25	65	120
Resolution μm	0.1	0.5	0.1	0.5	0.1	0.5	0.1	0.5	0.1	0.5	0.1	0.5	0.1	0.5
Maximum speed mm/s	270	500	270	500	270	1000	1300	270	1000	1300	270	1000	1300	270	1000	1300
Positioning repeatability μm	±0.5	±0.5	±0.5	±0.5	±0.5	±0.5	±0.5

Model and size	High accuracy type NT…H		Pick and place unit NT…XZ		High thrust pick and place unit NT…XZH	
	NT88H25	NT88H65	NT80XZ4510		NT90XZH2510	
Sectional shape	88 / 25		210 / 18 / 153 / 18 / 5		(268) / 260 / 29.5 / 29.5 / 160 / (168)	
			X-axis	Z-axis	X-axis	Z-axis
Maximum thrust N	25	25	50	25	70	70
Rated thrust N	5	5	10	2.5	Natural air cooling: 16 Air cooling: 20	Natural air cooling: 16 Air cooling: 20
Maximum load mass kg	5	5	–	0.1	–	0.2
Effective stroke length mm	25	65	45	10	25	10
Resolution μm	0.01	0.05	0.01	0.05	0.1	0.5	0.1	0.5	0.1	0.5	0.1	0.5
Maximum speed mm/s	90	400	90	400	270	1000	1300	270	800	800	270	1000	1300	270	1000	1000
Positioning repeatability μm	±0.1	±0.1	±0.5	±0.5	±0.5	±0.5

Major product specifications

Driving method	Linear motor
Linear motion rolling guide	Linear Way（ball type） Crossed Roller Way（roller type）
Built-in lubrication part	Lubrication part "C-Lube" is built-in （except for NT38V, NT55V and NT…H）
Material of table and bed	High carbon steel
Sensor	Provided as standard

Accuracy

unit: mm

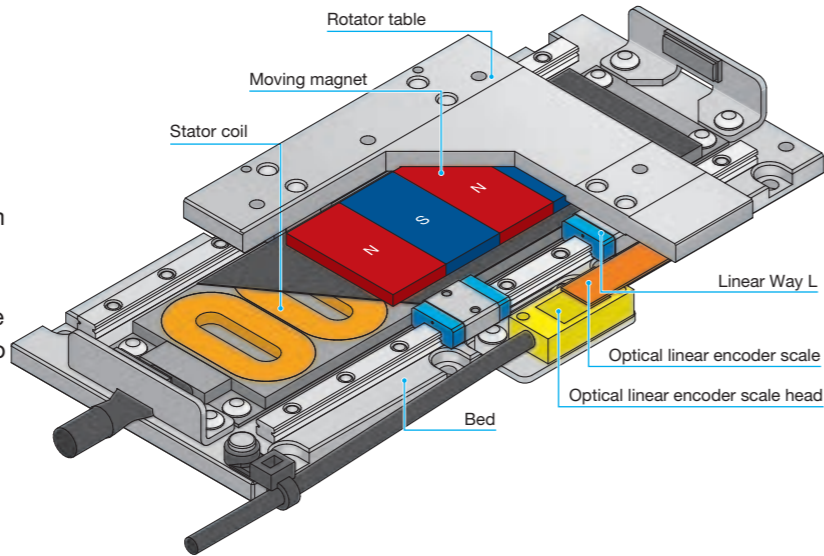| Positioning repeatability	±0.0001～0.0005
Positioning accuracy	–
Lost motion	–
Parallelism in table motion A	–
Parallelism in table motion B	–
Attitude accuracy	–
Straightness	–
Backlash	–

Operating principle of Nano Linear NT

Nano Linear NT is structured with magnet and optical linear encoder scale deployed as a rotator, and an air-core coil and optical linear encoder scale head deployed as a stator within its compact body. As indicated in the right figure, the coil is subject to horizontal force due to flux that always works in vertical direction by the magnet and coil yoke, and rotational flux that is generated around the coil by the coil current (Fleming's left-hand rule). By switching the coil current to certain direction corresponding to the flux direction, continuous thrust force in a certain direction can be obtained and linear motions of the rotator is maintained. Traveling and accurate positioning are performed by acceleration control by current amount and feedback by linear encoder.

Table travel direction

Magnet yoke（rotator）
Magnet（rotator）
Coil（stator）
Flux
Coil yoke

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

NT

NT···V

[Standard type]

NT···V is a linear motor table with excellent cost effectiveness realized by use of Linear Way L for miniature linear motion rolling guide in the cable guiding parts, reduction of number of parts and review of parts shapes. NT38V10, the smallest in the series, is only 11mm in sectional height, 38mm in table width and 62mm in overall length. It contributes further miniaturization of positioning mechanism. Motion network EtherCAT compatible driver and SSCNETⅢ/H compatible driver are also available and smoother and higher speed and accuracy motions are realized by streamlined wiring.

- Rotator table
- Moving magnet
- Stator coil
- Linear Way L
- Optical linear encoder scale
- Optical linear encoder scale head
- Bed

Points

1 ● Ultracompact

We pursued further miniaturization thoroughly. Especially, NT38V10, the smallest in the series, is only 11mm in sectional height, 38mm in table width and 62mm in overall length. The occupied space is not increased even when many tables are layered, so further miniaturization of the positioning mechanism is promoted.

| Model and size	NT38V10	NT38V18	NT55V25	NT55V65	NT80V25	NT80V65	NT80V120
Sectional shape (mm)	38 × 11		55 × 14		80 × 16		

2 ● Compatible with vertical mounting structure

Falling of moving table in power shutdown is prevented by integration of individual spring system balance mechanism. Making use of low profile and compact characteristics of NT···V, multiple pick and place mechanism can be established.
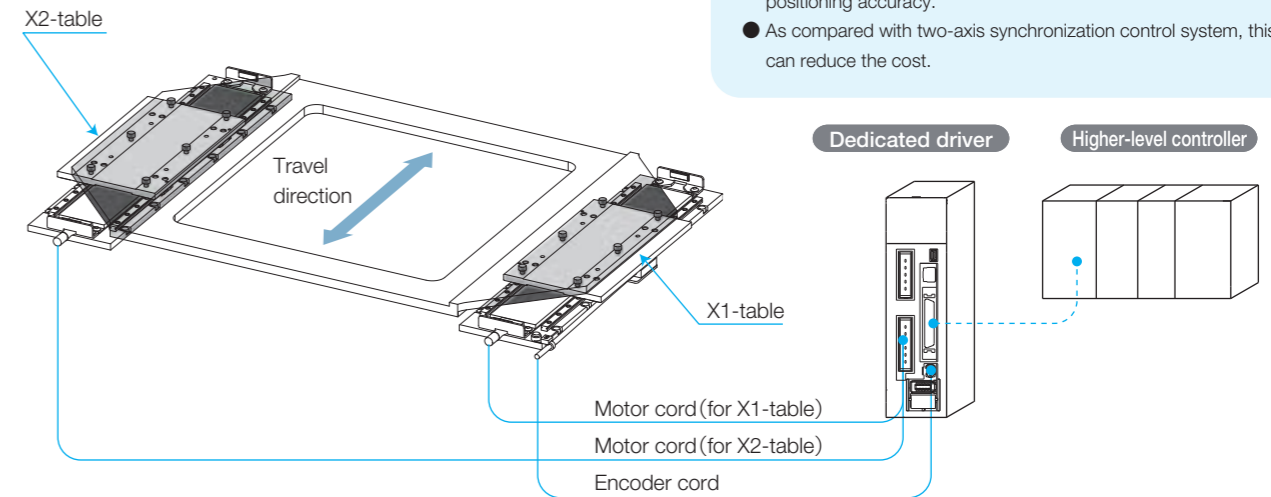
Multiple pick and place mechanism (image)

Spring system balance mechanism
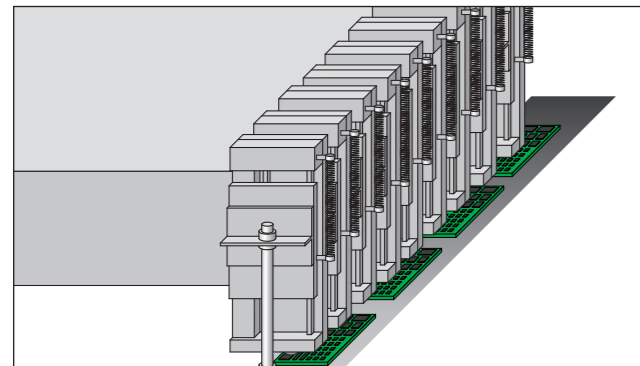
- Spring
- Moving table
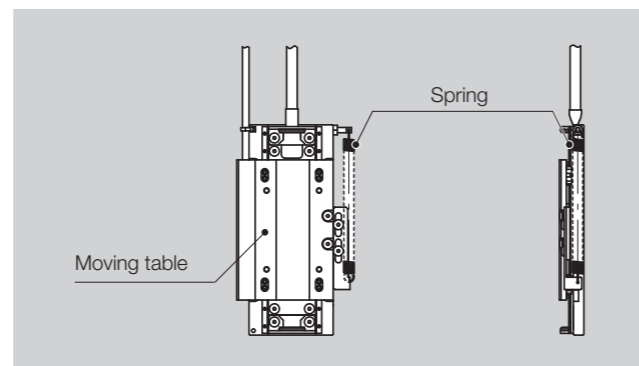
Remark: Vertical mounting structure is prepared based on respective usages. As we select spring according to your use conditions, please contact IKO.

3 ● Two-axis parallel operation

Performing rigid-connection of two units of NT···V arranged in parallel and driving with a single specific driver enables high thrust force and stable attitude accuracy.


- X2-table
- Travel direction
- X1-table
- Motor cord (for X1-table)
- Motor cord (for X2-table)
- Encoder cord

Remark: If two-axis parallel operation is required, please contact IKO.

Features of two-axis parallel operation

- ● Large thrust force can be obtained by two-axis driving.
- ● Driving right and left tables can minimize the table delay and flame torsion.
- ● Table delay and flame torsion are minimized, which ensures high positioning accuracy.
- ● As compared with two-axis synchronization control system, this can reduce the cost.
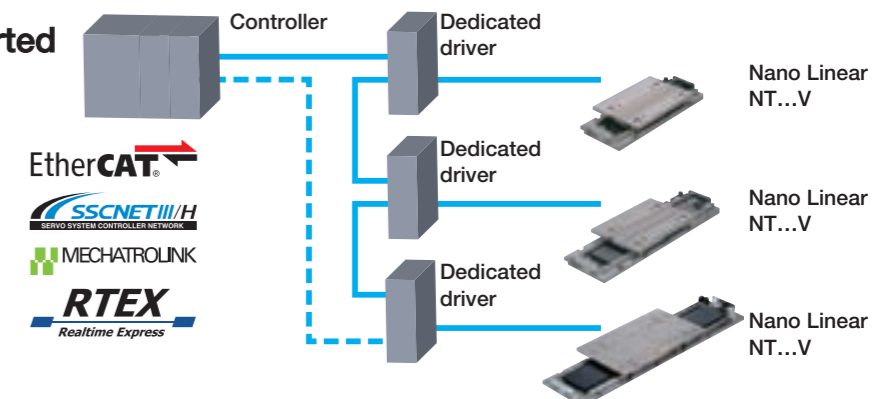
Dedicated driver   Higher-level controller

4 ● XY two-axis combination specification

Two units of NT80V can be used in combination without any special attachment and XY-table with low profile can be easily established.

- 160
- 120
- 80
- 68
- Y-axis (stroke length: 25mm)
- X-axis (stroke length: 65mm)
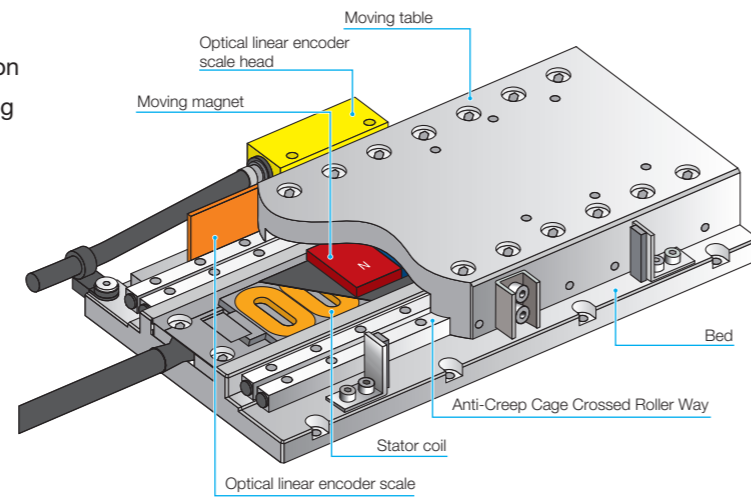- 80
- 32
- 16
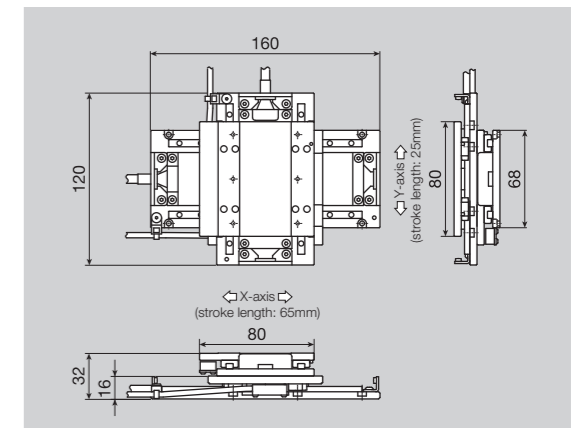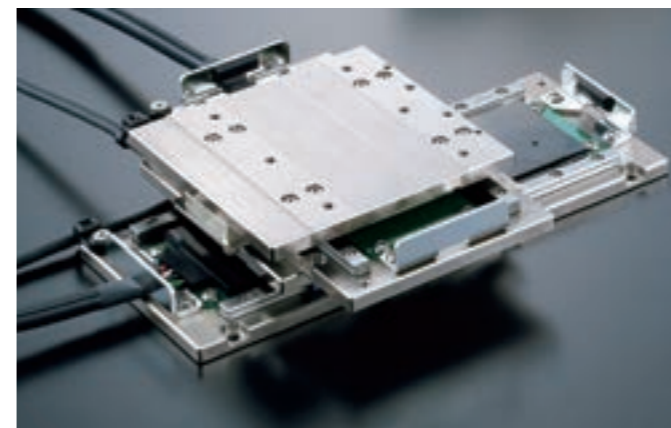
5 ● Motion network is supported

Drivers compatible with motion network EtherCAT, SSCNETⅢ/H, MECHATROLINK, and RTEX are also available, so an advanced system with streamlined wiring can be configured.

- EtherCAT
- SSCNETⅢ/H SERVO SYSTEM CONTROLLER NETWORK
- MECHATROLINK
- RTEX Realtime Express

- Controller
- Dedicated driver
- Nano Linear NT…V
- Dedicated driver
- Nano Linear NT…V
- Dedicated driver
- Nano Linear NT…V

Remarks: EtherCAT® is registered trademark and patented technology, licensed by BeckhoffAutomation GmbH, Germany.
SSCNETⅢ/H is a motion network communication system for servo system control developed by Mitsubishi Electric Corporation.
MECHATROLINK is an open field network controlled by MECHATROLINK Members Association.
Realtime Express and RTEX are registered trademarks of Panasonic Corporation. Realtime Express is a high-speed synchronization motion network developed by Panasonic Corporation.

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

NT

NT···H [High accuracy type]

NT···H is a high-accuracy linear motor table that has realized high rigidity and smooth motions without pulsation comparative with air static pressure bearing by positioning accuracy and running straightness below 1μm, using roller type Anti-Creep Cage Crossed Roller Way in the table guiding parts.

Moving table
Optical linear encoder scale head
Moving magnet
Bed
Anti-Creep Cage Crossed Roller Way
Stator coil
Optical linear encoder scale

NT···XZ [Pick and place unit]

NT···XZ is a linear motor drive pick and place unit with ultra thin profile with 18mm thickness, realized by integrating X-axis moving table and Z-axis bed, using C-Lube Linear Way ML for miniature linear motion rolling guide in the table guiding parts. By entering a positioning program, you may set flexible operation patterns and change strokes according to works easily.

C-Lube Linear Way ML
Optical linear encoder scale head
Optical linear encoder scale
Bed
Stator coil
Moving magnet
Moving table

Points

● High attitude accuracy

1 Combination of parts processed with high accuracy and Anti-Creep Cage Crossed Roller Way realizes attitude accuracy of 5 sec or less. Variations in attitude due to movement is minimized, which ensures high positioning repeatability.
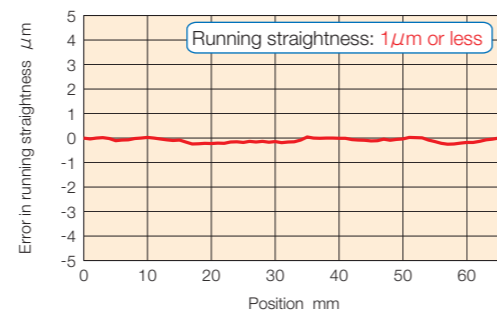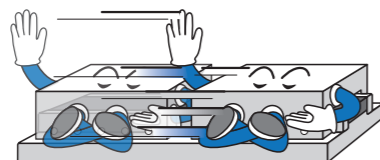
Attitude accuracy: 5 sec or less
Pitching
Yawing
Attitude accuracy sec
Position mm
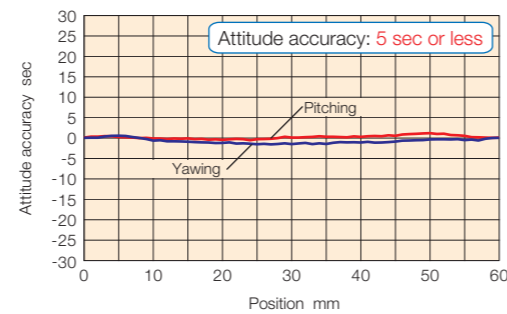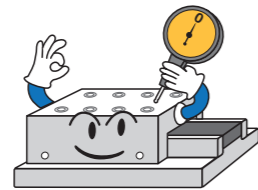
● High speed stability

2 Speed stability is improved further thanks to smooth-motion Crossed Roller Way, coreless moving magnet type linear motor and high-performance servo driver.
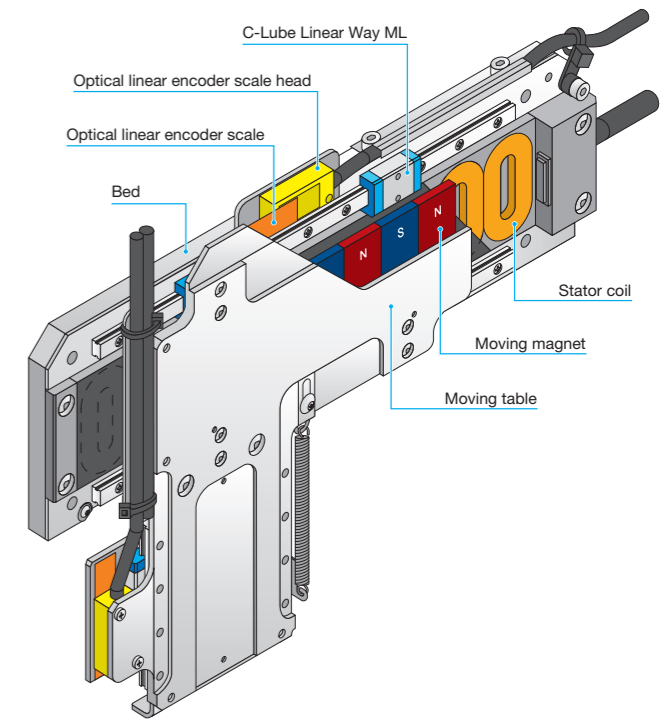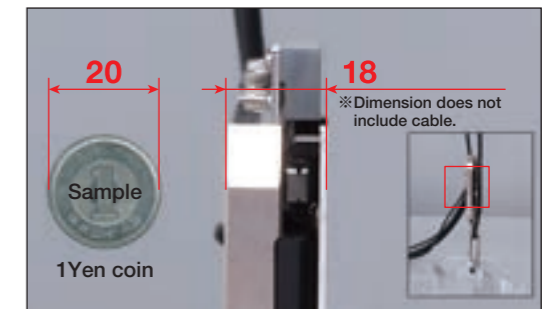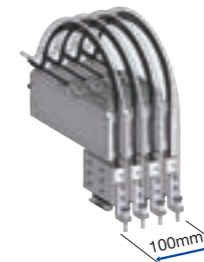
10mm/s speed stability (measured frequency: 1 000Hz): ±1% or less
Speed mm/s
Time s

● High running accuracy
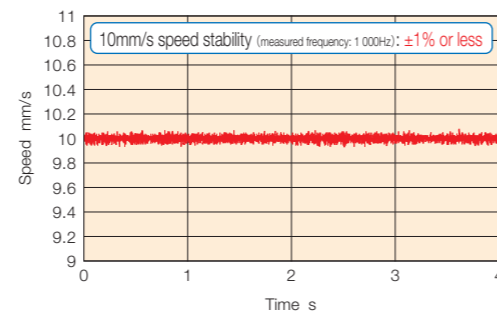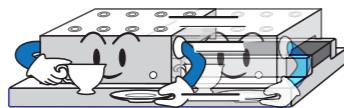
3 High running accuracy as good as less than 1μm running straightness is realized by precise finishing and assembly of components.

Running straightness: 1μm or less
Error in running straightness μm
Position mm

Points

● High-tact positioning

1 Pick & place unit of unparalleled structure with linear motor drive. Optical linear encoders are installed on both axes to realize accurate and high-tact positioning.
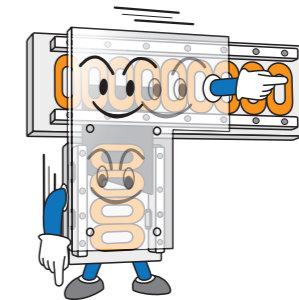
● Ultrathin and space saving

2 Ultra thin profile of 18mm thickness is realized by integrating X-axis moving table and Z-axis bed. Parallel install of four units in a space of 100mm width is possible, and such space saving arrangement contributes to improvement of efficiency.
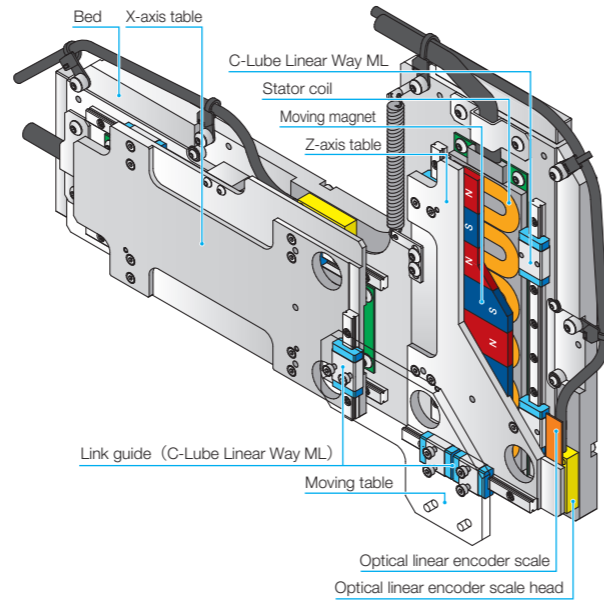
100mm

20
18
※Dimension does not include cable.
Sample
1Yen coin

● Operation monitoring function

3 The track can be verified from PC by using the driver monitoring function.

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

NT

NT···XZH

[High thrust pick and place unit]

NT···XZH is a linear motor drive high thrust pick and place unit with compact integral X- and Z- axis, using C-Lube Linear Way ML for miniature linear motion rolling guide in the table guiding parts. Thanks to adoption of a system to drive moving table by using a link mechanism, it realizes both higher thrust force of the linear motor and weight reduction of the moving parts and reduces tact time. By entering a positioning program, you may set flexible operation patterns and change strokes according to works easily.

Bed
X-axis table
C-Lube Linear Way ML
Stator coil
Moving magnet
Z-axis table
Link guide（C-Lube Linear Way ML）
Moving table
Optical linear encoder scale
Optical linear encoder scale head

Points

1 ● High thrust and high tact

Thanks to X- and Z-axis motor located on the flat surface and adoption of a system to drive moving table by using a link mechanism, it realizes both higher thrust force of the linear motor and weight reduction of the moving parts and significantly reduces tact time.
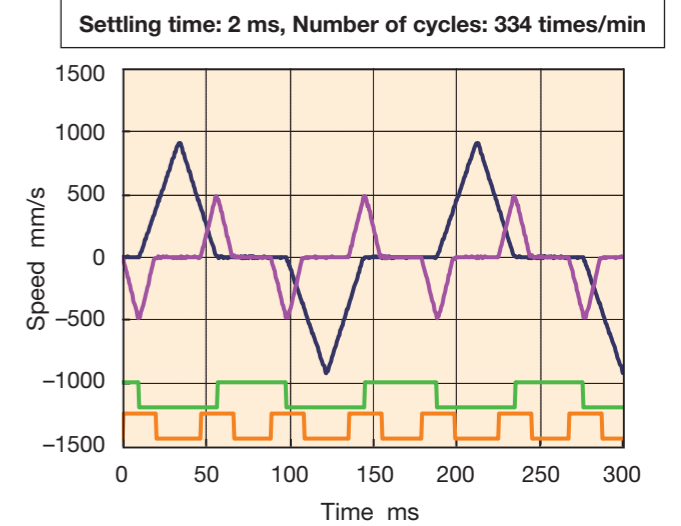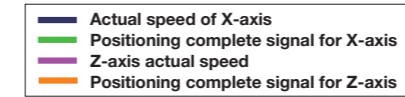
Moving part on X-axis

Moving part on Z-axis

X-axis motor
Z-axis motor
Link guide
(C-Lube Linear Way ML)
Moving table
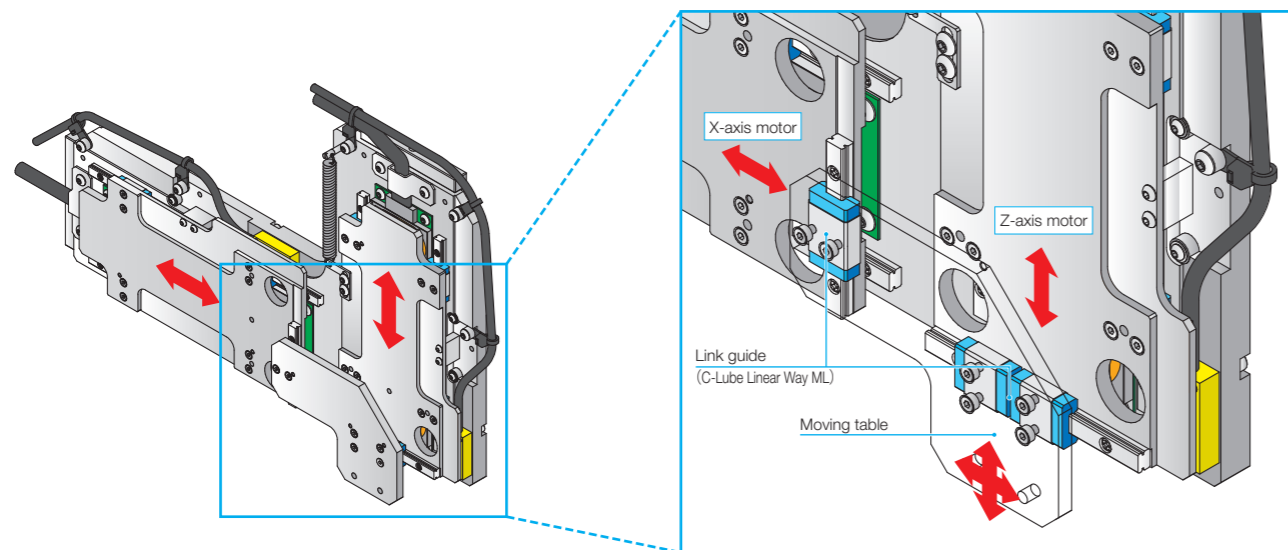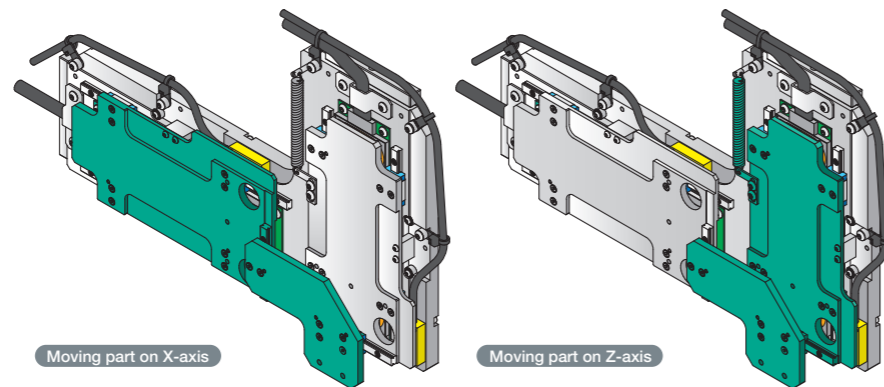
2 ● High resolution and high responsiveness

Performing fully-closed loop control by incorporating an optical linear encoder in both axes enables high resolution and high response.
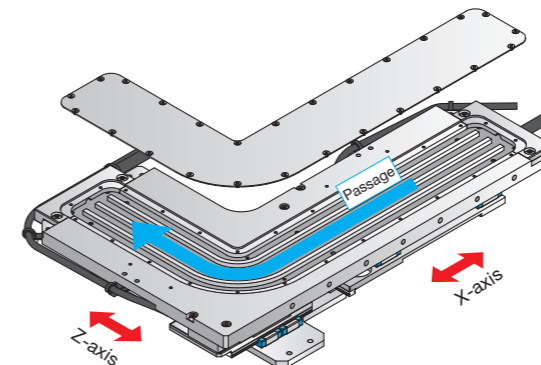
Measuring condition

NT90XZH2510/5	
Effective thrust force	: X-axis; 14.8 N, Z-axis; 15.7 N
Carrying mass	: 150 g
Stroke	: X-axis; 22 mm, Z-axis; 5 mm
Acceleration / deceleration time	: X-axis; 24 ms, Z-axis; 9 ms

- ▬ Actual speed of X-axis
- ▬ Positioning complete signal for X-axis
- ▬ Z-axis actual speed
- ▬ Positioning complete signal for Z-axis

Enables high-speed positioning!

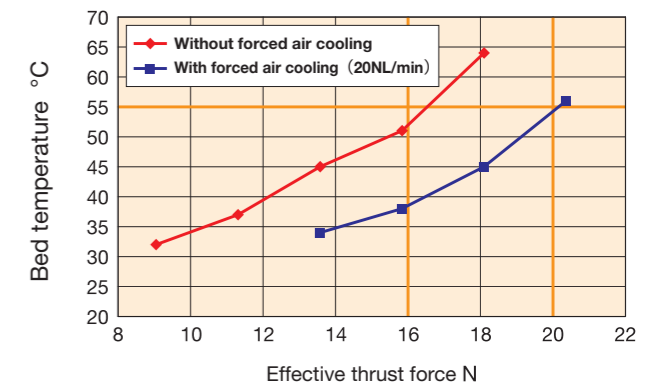Settling time: 2 ms, Number of cycles: 334 times/min

Speed mm/s
Time ms

3 ● Air cooling

With the structure that heat-generating coils are converged at the stator, cooling and heat discharge to the mounting base are easy. When the air cooling option is specified, tact time can be shortened further.
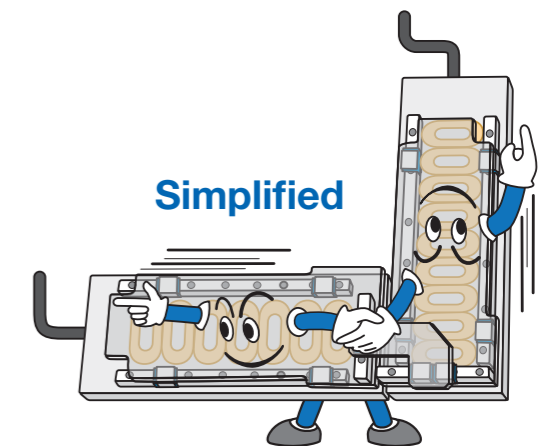
Passage
X-axis
Z-axis

NT90XZH temperature (ambient temperature: 20°C)

- ◆ Without forced air cooling
- ■ With forced air cooling（20NL/min）

Bed temperature °C
Effective thrust force N

4 ● Cableless moving parts

Though it is multi-axial unit, wiring is easy and higher cleanliness is realized by adopting cableless moving magnet system for the moving parts.
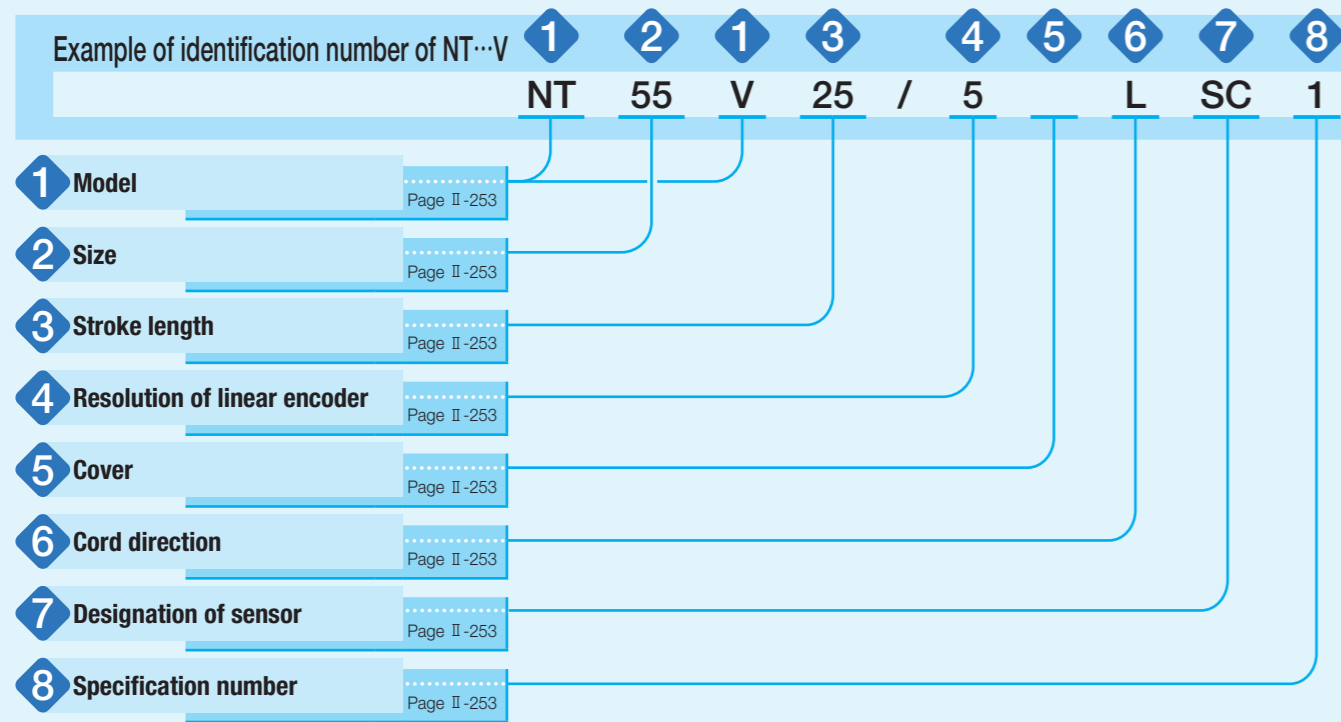
Simplified

5 ● Operation monitoring function

As with NT···XZ, the track can be verified from PC by using the driver monitoring function.

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

Identification Number

Example of identification number of NT···V

①	②	①	③	④	⑤	⑥	⑦	⑧
NT	55	V	25	/	5		L	SC	1

1 **Model** — Page Ⅱ-253
2 **Size** — Page Ⅱ-253
3 **Stroke length** — Page Ⅱ-253
4 **Resolution of linear encoder** — Page Ⅱ-253
5 **Cover** — Page Ⅱ-253
6 **Cord direction** — Page Ⅱ-253
7 **Designation of sensor** — Page Ⅱ-253
8 **Specification number** — Page Ⅱ-253

Identification Number and Specification

1 Model
NT···V: Nano Linear NT···V

2 Size
38: Width 38mm
55: Width 55mm
80: Width 80mm

3 Stroke length
  10: 10mm （applicable to NT38V）
  18: 18mm （applicable to NT38V）
  25: 25mm （applicable to NT55V and NT80V）
  65: 65mm （applicable to NT55V and NT80V）
120: 120mm （applicable to NT80V）

4 Resolution of linear encoder
1 : 0.1μm
1F: 0.1μm High speed specification (applicable to NT55V and NT80V) When 1F is selected, a system configuration using dedicated driver ADVA is necessary.
5 : 0.5μm

5 Cover
No symbol: Without cover
D: With cover （applicable to NT38V）

6 Cord direction
L : Leftward
R: Rightward
Select from the cord direction indicated in Fig. 1. (direction for pulling out a cord when placing an encoder on the lower side)

7 Designation of sensor
No symbol: Without sensor
SC   : With sensor （limit and pre-origin） and sensor bracket
        Applicable to NT55V and NT80V
two types of dedicated drivers, ADVA and MR-J4-10B ready for SSCNETⅢ/H, are available for Nano Linear NT55V and NT80V. If MR-J4-10B is used, SC must be selected.

8 Specification number
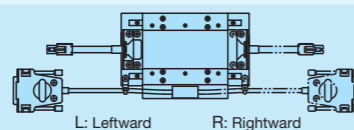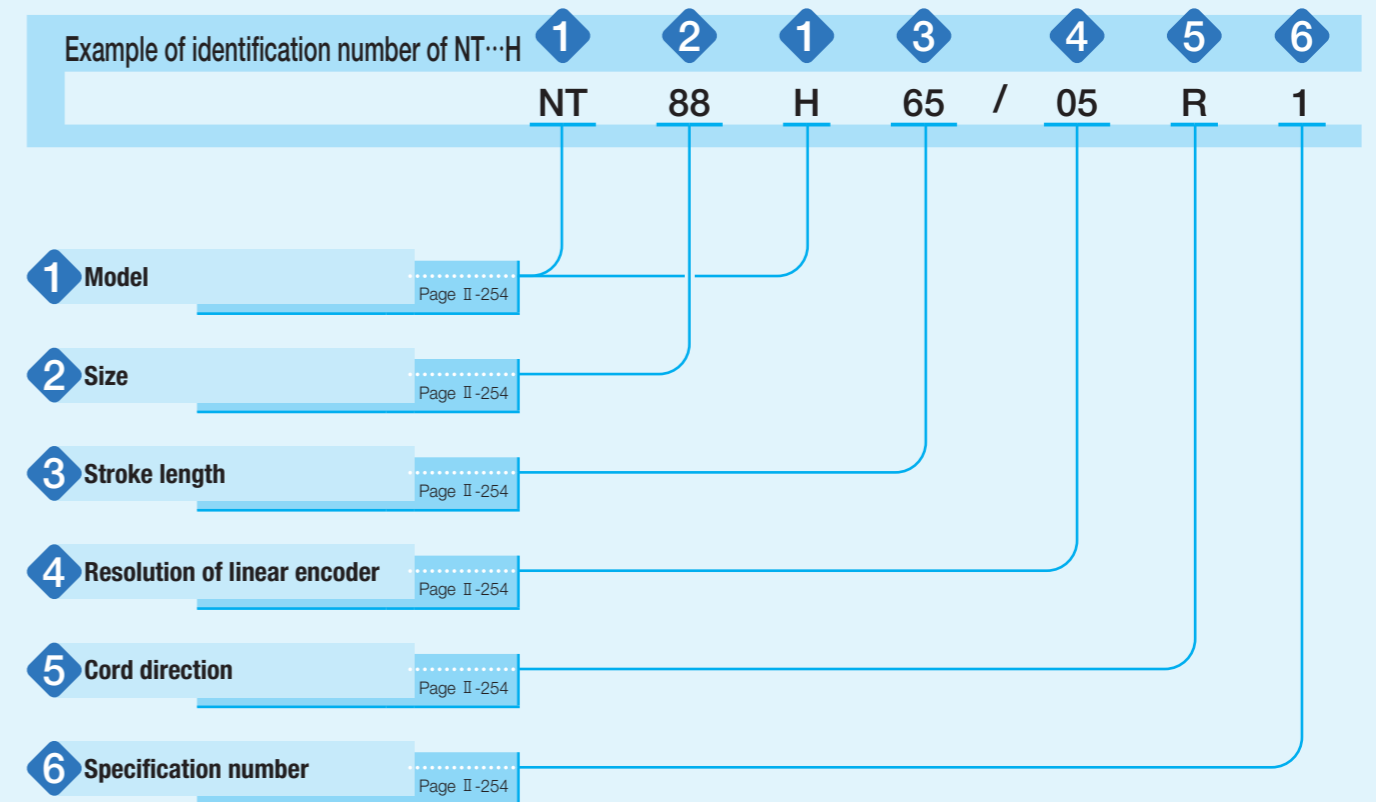1: Specification number 1
The specification number is limited to 1.

L: Leftward   R: Rightward

Fig. 1 NT···V cord direction

Identification Number

Example of identification number of NT···H

①	②	①	③	④	⑤	⑥
NT	88	H	65	/	05	R	1

1 **Model** — Page Ⅱ-254
2 **Size** — Page Ⅱ-254
3 **Stroke length** — Page Ⅱ-254
4 **Resolution of linear encoder** — Page Ⅱ-254
5 **Cord direction** — Page Ⅱ-254
6 **Specification number** — Page Ⅱ-254

Identification Number and Specification

1 Model
NT···H: Nano Linear NT···H

2 Size
88: Width 88mm

3 Stroke length
25: 25mm
65: 65mm

4 Resolution of linear encoder
01: 0.01μm
05: 0.05μm

5 Cord direction
L : Leftward
R: Rightward
Select from the direction indicated in Fig. 2. (direction for pulling out a cord when placing an encoder on the lower side)

6 Specification number
1 : Specification number 1
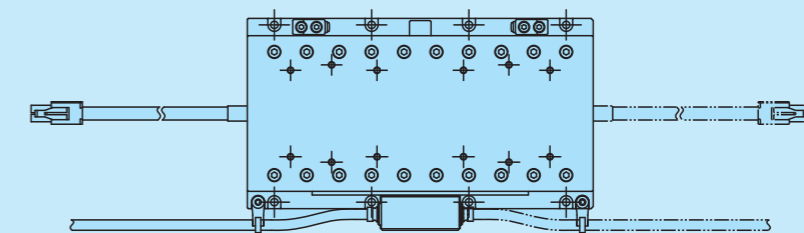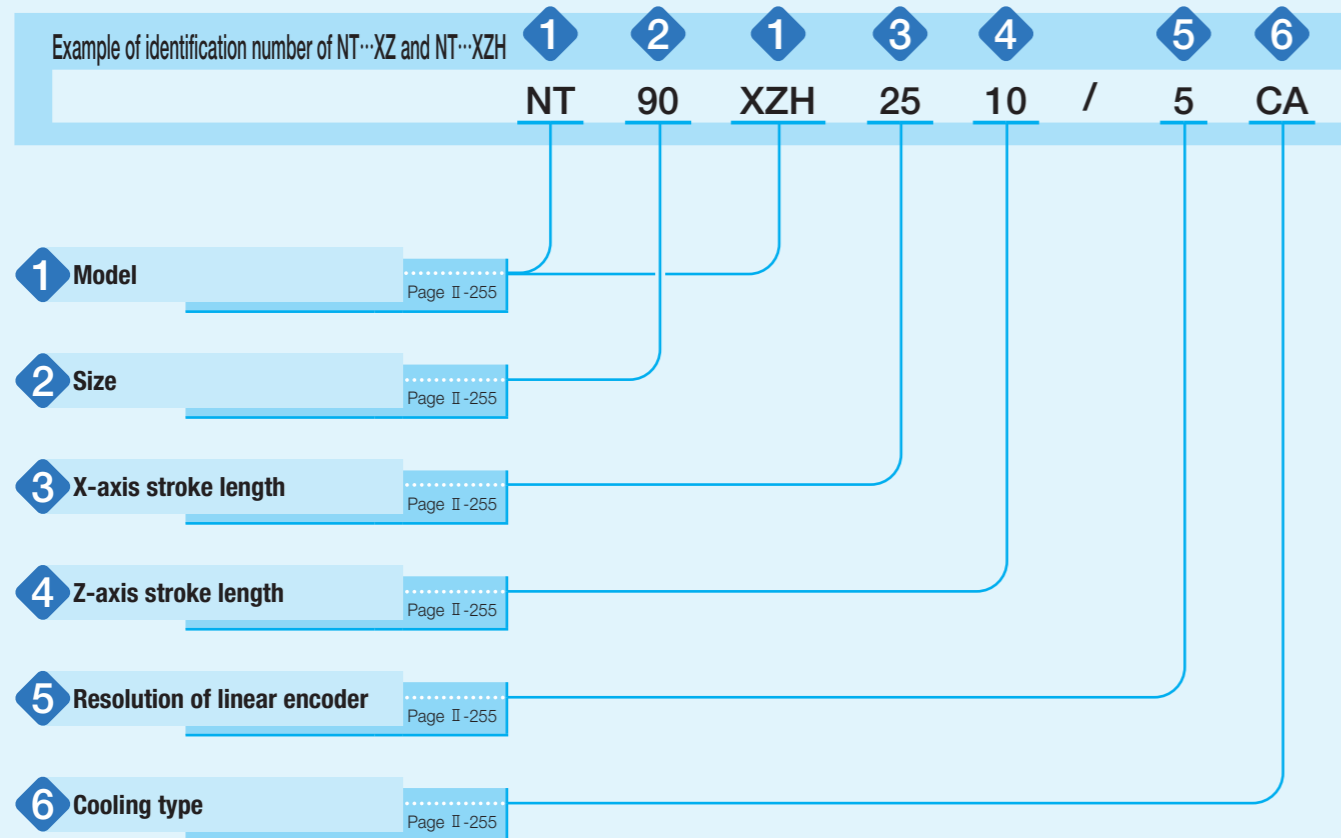The specification number is limited to 1.

L: Leftward   R: Rightward

Fig. 2 NT88H cord direction

NT

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

Identification Number

Example of identification number of NT···XZ and NT···XZH

①	②	①	③	④		⑤	⑥
NT	90	XZH	25	10	/	5	CA

① Model

② Size

③ X-axis stroke length

④ Z-axis stroke length

⑤ Resolution of linear encoder

⑥ Cooling type

Identification Number and Specification

① Model

NT···XZ : Nano Linear NT···XZ
NT···XZH: Nano Linear NT···XZH, high thrust type

② Size

80: Z-axis width of 80mm （applicable to NT···XZ）
90: Z-axis width of 90mm （applicable to NT···XZH）

③ X-axis stroke length

25: 25mm （applicable to NT···XZH）
45: 45mm （applicable to NT···XZ）

④ Z-axis stroke length

10: 10mm

⑤ Resolution of linear encoder

1 : 0.1μm
1F: 0.1μm High speed specification
5 : 0.5μm

⑥ Cooling type

No symbol: Natural air cooling
CA   : Air cooling （applicable to NT···XZH）

Specifications

Table 1 Specification / Performance of NT38V

Item	Model and size	NT38V10		NT38V18	
Maximum thrust[1]	N	3			
Rated thrust[2]	N	0.6		0.8	
Maximum load mass	kg	0.5			
Effective stroke length	mm	10		18	
Resolution	μm	0.1	0.5	0.1	0.5
Maximum speed[3]	mm/s	270	500	270	500
Positioning repeatability[4]	μm	±0.5			
Mass of moving table	kg	0.036 （with cover 0.040）		0.048 （with cover 0.052）	
Total mass[5]	kg	0.190 （with cover 0.198）		0.230 （with cover 0.239）	
Ambient temperature and humidity in operation		0～40℃・20～80%RH （keep dewdrop free）			

Notes (1) The duration of maximum thrust is up to 1 second.
(2) This is based on the case of mounting on a metal mating member material at an ambient temperature of 20℃.
(3) This maximum speed may not be reached depending on the maximum output frequency of the controller used, and the driver type or settings.
(4) When the temperature of the product is constant.
(5) Mass of the cord is not included.

Table 2 Specification / Performance of NT55V

Item	Model and size	NT55V25		NT55V65	
Maximum thrust[1]	N	25			
Rated thrust[2]	N	7			
Maximum load mass	kg	5			
Effective stroke length	mm	25		65	
Resolution	μm	0.1	0.5	0.1	0.5
Maximum speed[3]	mm/s	270 / 1 000[6]	1 300	270 / 1 000[6]	1 300
Positioning repeatability[4]	μm	±0.5			
Mass of moving table	kg	0.17		0.17	
Total mass[5]	kg	0.42		0.5	
Ambient temperature and humidity in operation		0～40℃・20～80%RH （keep dewdrop free）			

Notes (1) The duration of maximum thrust is up to 1 second.
(2) This is based on the case of mounting on a metal mating member material at an ambient temperature of 20℃.
(3) This maximum speed may not be reached depending on the maximum output frequency of the controller used, and the driver type or settings.
(4) When the temperature of the product is constant.
(5) Mass of the cord is not included.
(6) Applicable to high speed specification.

Table 3 Specification / Performance of NT80V

Item	Model and size	NT80V25		NT80V65		NT80V120	
Maximum thrust[1]	N	36					
Rated thrust[2]	N	8					
Maximum load mass	kg	5					
Effective stroke length	mm	25		65		120	
Resolution	μm	0.1	0.5	0.1	0.5	0.1	0.5
Maximum speed[3]	mm/s	270 / 1 000[6]	1 300	270 / 1 000[6]	1 300	270 / 1 000[6]	1 300
Positioning repeatability[4]	μm	±0.5					
Mass of moving table	kg	0.28		0.28		0.47	
Total mass[5]	kg	0.68		0.83		1.4	
Ambient temperature and humidity in operation		0～40℃・20～80%RH （keep dewdrop free）					

Notes (1) The duration of maximum thrust is up to 1 second.
(2) This is based on the case of mounting on a metal mating member material at an ambient temperature of 20℃.
(3) This maximum speed may not be reached depending on the maximum output frequency of the controller used, and the driver type or settings.
(4) When the temperature of the product is constant.
(5) Mass of the cord is not included.
(6) Applicable to high speed specification.

NT

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

Table 4 Specification / Performance of NT···H

Item / Model and size		NT88H25		NT88H65	
Maximum thrust[1]	N	25			
Rated thrust[2]	N	5			
Maximum load mass	kg	5			
Effective stroke length	mm	25		65	
Resolution	μm	0.01	0.05	0.01	0.05
Maximum speed [3]	mm/s	90	400	90	400
Positioning accuracy [4]	μm	1			
Positioning repeatability[5]	μm	±0.1			
Parallelism in motion A	μm	5			
Attitude accuracy[6]	Sec	5			
Straightness in vertical and straightness in horizontal	μm	1			
Mass of moving table	kg	0.7		0.9	
Total mass[7]	kg	1.6		2	
Ambient temperature and humidity in operation		0～40℃・20～80%RH（keep dewdrop free）			

Notes (1) The duration of maximum thrust is up to 1 second.
(2) This is based on the case of mounting on a metal mating member material at an ambient temperature of 20℃.
(3) This maximum speed may not be reached depending on the maximum output frequency of the controller used, and the driver type or settings.
(4) The value is for the temperature of ambient and product being 20℃.
(5) When the temperature of the product is constant.
(6) This represents accuracy in pitching and yawing.
(7) Mass of the cord is not included.

Table 5 Specification / Performance of NT···XZ and NT···XZH

Item / Model and size		NT80XZ4510				NT90XZH2510			
		X-axis		Z-axis		X-axis		Z-axis	
Maximum thrust[1]	N	50		25		70			
Rated thrust[2]	N	10		2.5		Natural air cooling: 16 Air cooling[6]：20			
Maximum load mass	kg	0.1				0.2			
Effective stroke length	mm	45		10		25		10	
Resolution	μm	0.1	0.5	0.1	0.5	0.1	0.5	0.1	0.5
Maximum speed[3]	mm/s	270	1 000[7]	1 300	270	800[7]	800	270	1 000[7]	1 300	270	1 000[7]	1 000
Positioning repeatability[4]	μm	±0.5				±0.5			
Mass of moving table	kg	0.6[8]		0.12		0.38		0.35	
Total mass[5]	kg	1.6				2.8			
Ambient temperature and humidity in operation		0～40℃・20～80%RH（keep dewdrop free）							

Notes (1) The duration of maximum thrust is up to 1 second.
(2) This is based on the case of mounting on a metal mating member material at an ambient temperature of 20℃.
(3) This maximum speed may not be reached depending on the maximum output frequency of the controller used, and the driver type or settings.
(4) When the temperature of the product is constant.
(5) Mass of the cord is not included.
(6) This is under air flow of 20NL/min.
(7) Applicable to high speed specification.
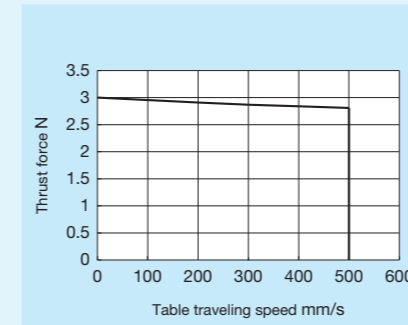(8) Mass of moving table of Z-axis is included.

■ Thrust characteristics of NT···V

NT38V
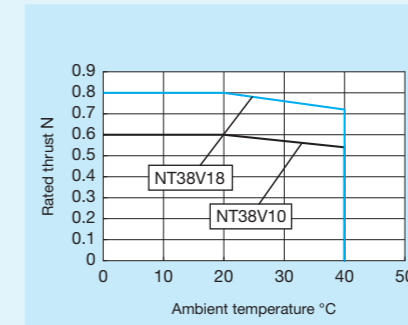

Fig. 3 Thrust characteristic of NT38V
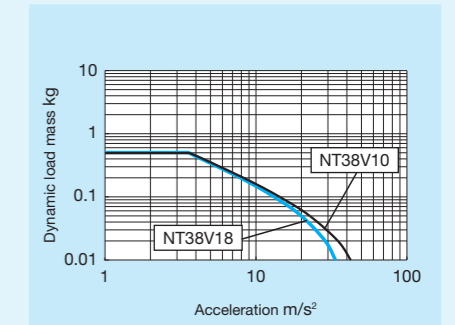

Fig. 4 Rated thrust characteristic of NT38V

Remark: This is a case when mounting on a metal mating member material.

Fig. 5 Dynamic load mass of NT38V

Remark: This is a value calculated based on the thrust force with table moving speed set to 500mm/s.
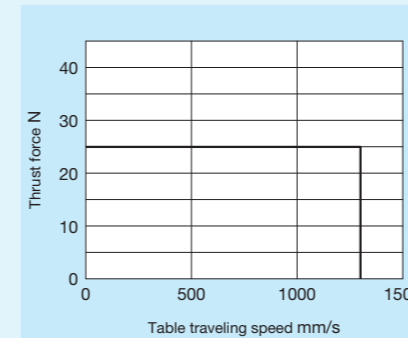
NT55V

● Use with driver ADVA-01NL or MR-J4

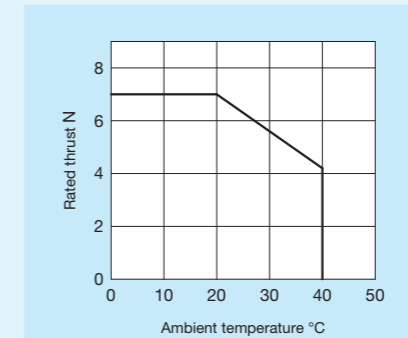Fig. 6 Thrust characteristic of NT55V
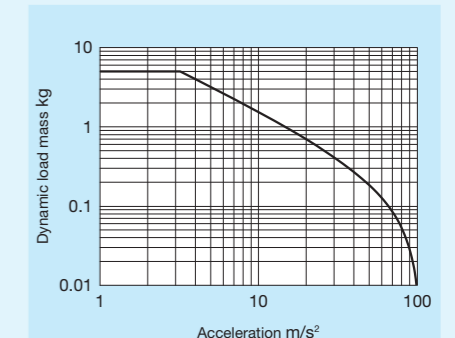

Fig. 7 Rated thrust characteristic of NT55V

Remark: This is a case when mounting on a metal mating member material.

Fig. 8 Dynamic load mass of NT55V

Remark: This is a value calculated based on the thrust force with table moving speed set to 500mm/s.
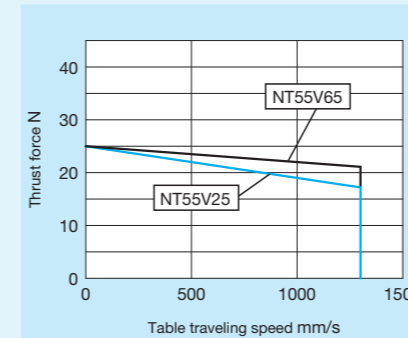
● Use with driver ADVA-R5ML

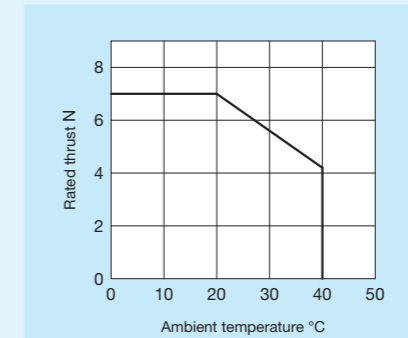
Fig. 9 Thrust characteristic of NT55V
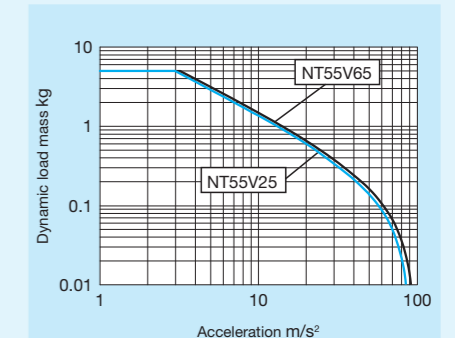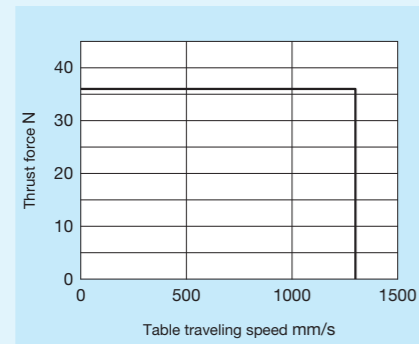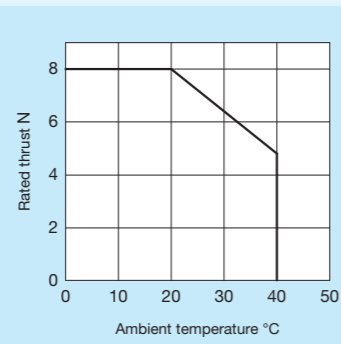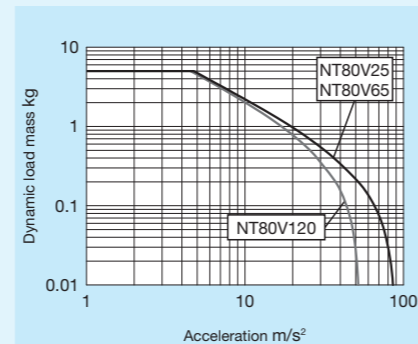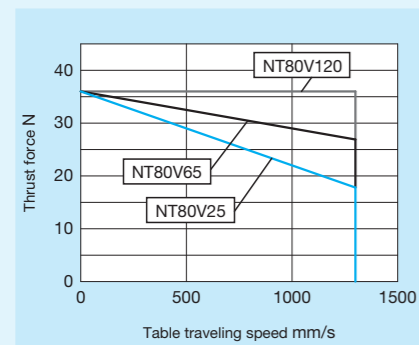

Fig. 10 Rated thrust characteristic of NT55V

Remark: This is a case when mounting on a metal mating member material.

Fig. 11 Dynamic load mass of NT55V

Remark: This is a value calculated based on the thrust force with table moving speed set to 500mm/s.

NT

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

NT80V

● Use with driver ADVA-01NL or MR-J4

Fig. 12 Thrust characteristic of NT80V

Fig. 13 Rated thrust characteristic of NT80V

Remark: This is a case when mounting on a metal mating member material.

Fig. 14 Dynamic load mass of NT80V

Remark: This is a value calculated based on the thrust force with table moving speed set to 500mm/s.

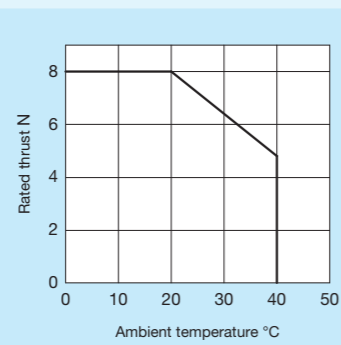● Use with driver ADVA-R5ML

Fig. 15 Thrust characteristic of NT80V
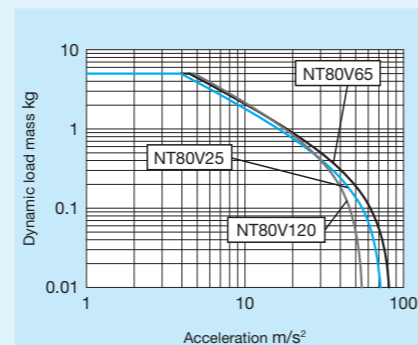

Fig. 16 Rated thrust characteristic of NT80V

Remark: This is a case when mounting on a metal mating member material.

Fig. 17 Dynamic load mass of NT80V

Remark: This is a value calculated based on the thrust force with table moving speed set to 500mm/s.
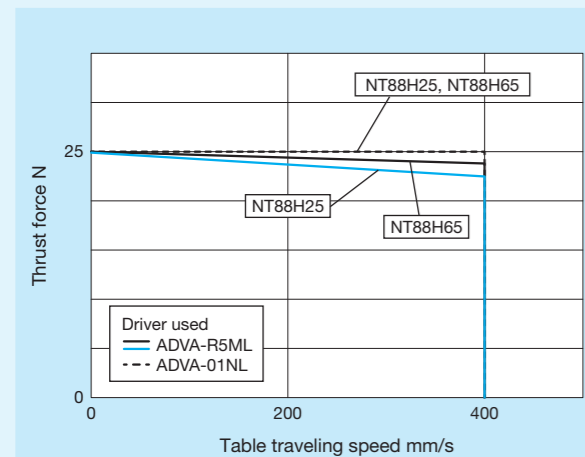
■ Thrust characteristics of NT···H

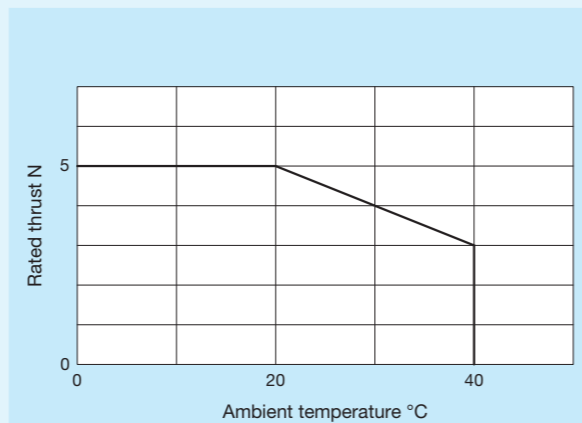**Fig. 18 Thrust characteristic of NT88H**

Fig. 19 Rated thrust characteristic of NT88H

Remark: This is a case when mounting on a metal mating member material.

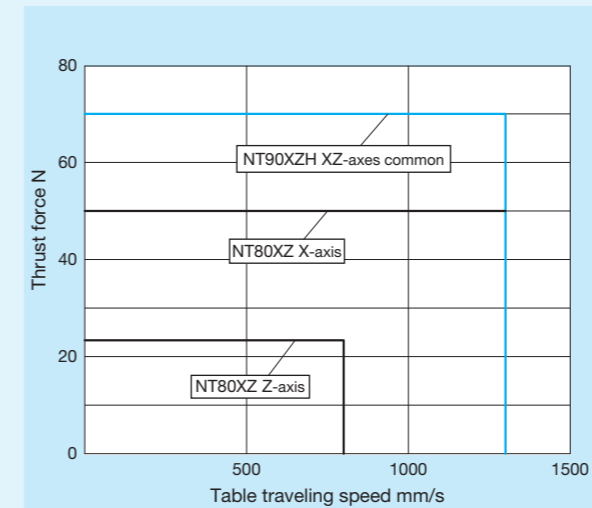### ■ Thrust characteristics of NT···XZ and NT···XZH

● Use with driver ADVA-01NL

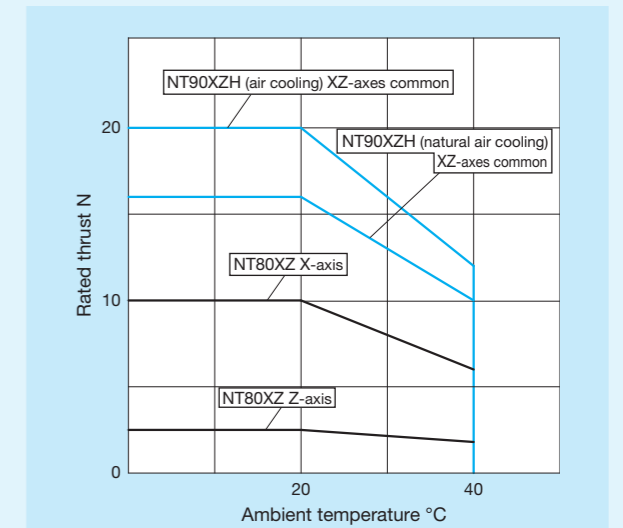
Fig. 20 Thrust characteristics of NT···XZ and NT···XZH
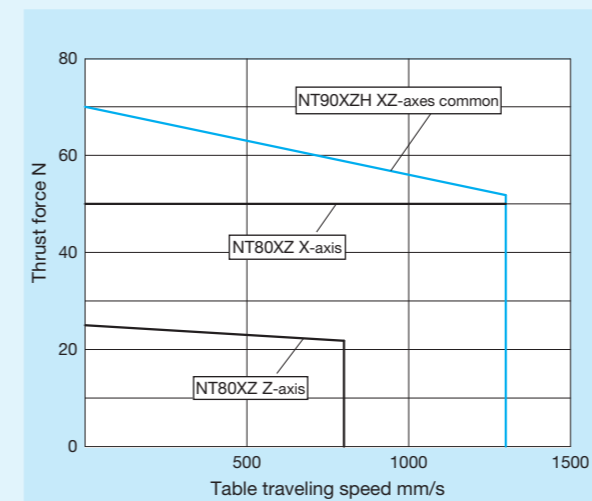
● Use with driver ADVA-R5ML

Fig. 22 Thrust characteristics of NT···XZ and NT···XZH

Fig. 21 Rated thrust characteristics of NT···XZ and NT···XZH

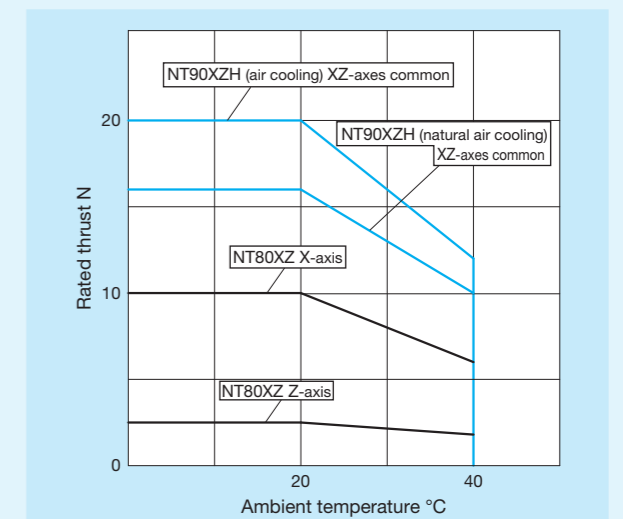Remark: This is a case when mounting on a metal mating member material.

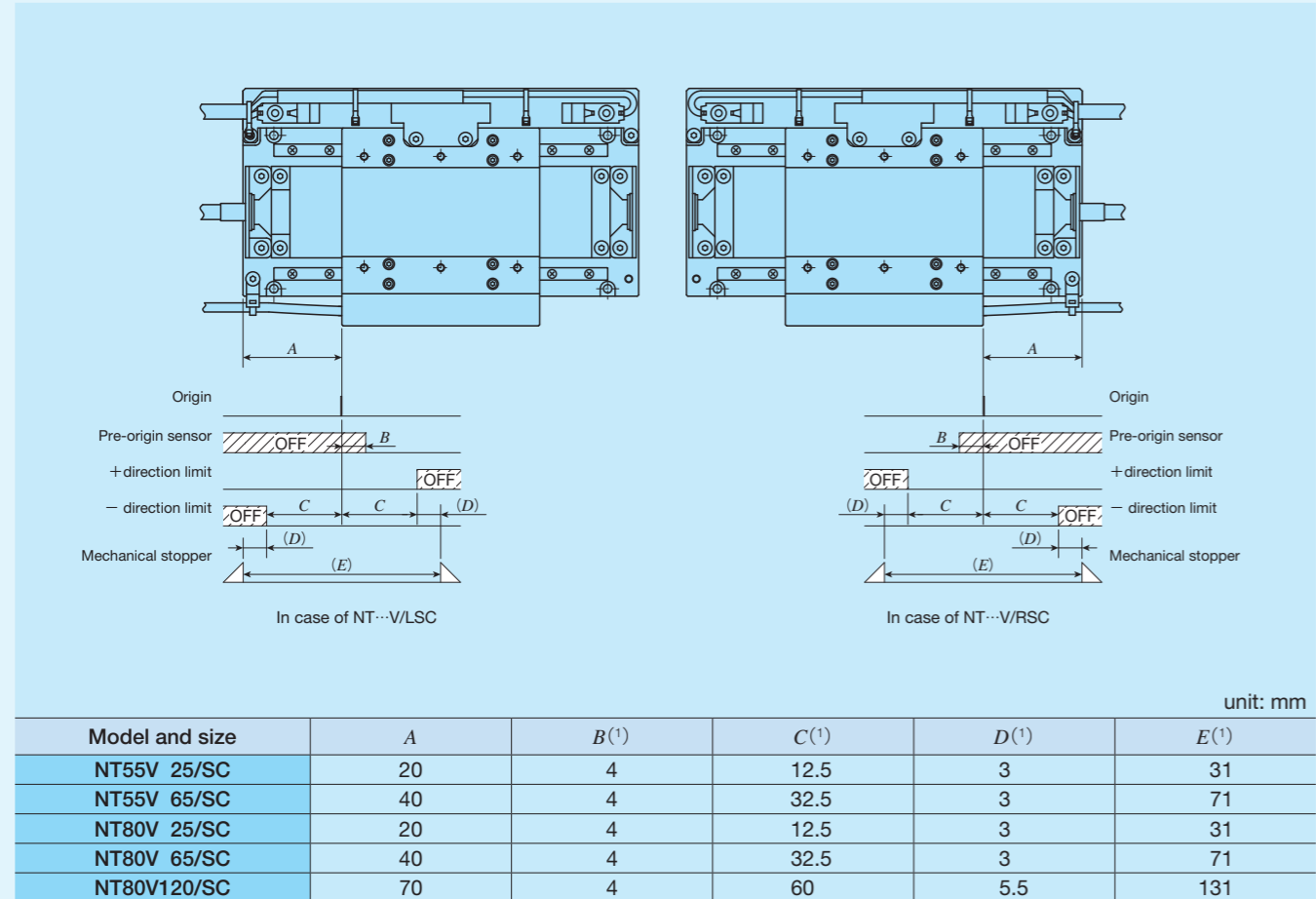**Fig. 23 Rated thrust characteristics of NT···XZ and NT···XZH**

Remark: This is a case when mounting on a metal mating member material.

NT

Mounting

For the processing accuracy of the Precision Positioning Table mounting surface and the tightening torque of the fixing screws, see page Ⅲ-36.

Sensor Specification

Table 6 Sensor timing chart for NT55V/SC and NT80V/SC

In case of NT···V/LSC

In case of NT···V/RSC

unit: mm

Model and size	A	$B^{(1)}$	$C^{(1)}$	$D^{(1)}$	$E^{(1)}$
NT55V 25/SC	20	4	12.5	3	31
NT55V 65/SC	40	4	32.5	3	71
NT80V 25/SC	20	4	12.5	3	31
NT80V 65/SC	40	4	32.5	3	71
NT80V120/SC	70	4	60	5.5	131

Note (1) Respective values are for reference and are not guaranteed values.
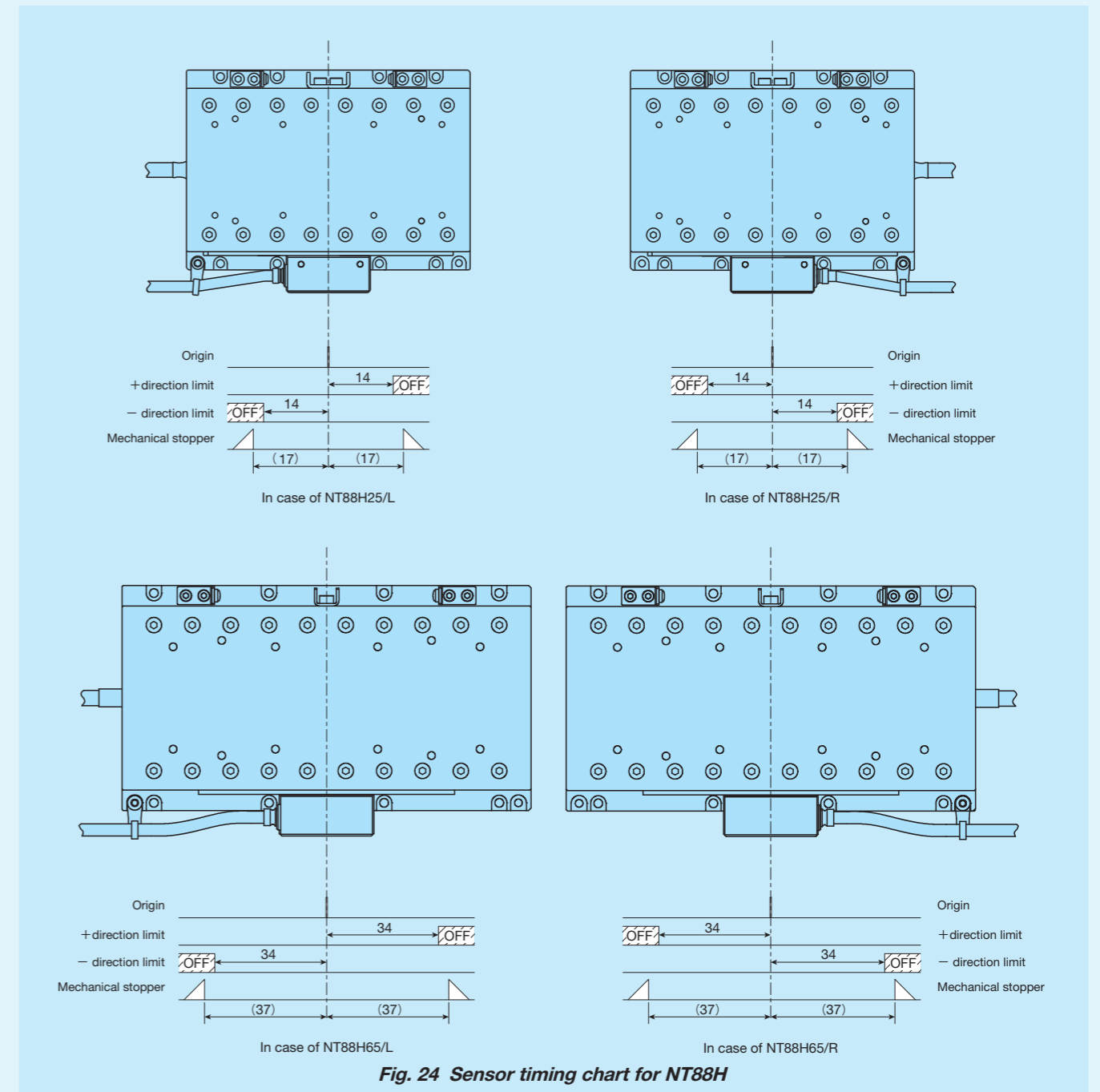For detailed dimensions, please contact IKO.

Remark: For the specifications of respective sensors, please see the section of sensor specification in General Explanation.

● NT···V, NT···XZ and NT···XZH do not have a built-in sensor

Return to origin operation in a system configuration using driver ADVA and the system configuration for NT38V is conducted by external input. In the return to origin operation, the moving table turns around after contacting the mechanical stopper, and then stops at the origin position. Since, however, a limit sensor and a pre-origin sensor can be mounted on NT55V and NT80V with a supplemental signal (/SC), the return to origin operation using each sensor is also possible.
Forward / backward direction limit detection in a system configuration using the driver ADVA is performed by driver's software limit function. The stroke range can be set by parameters for driver. In addition, the software limit function is only enabled in position control mode and return to origin must be completed. In case of speed control mode and thrust force control mode, mount an external sensor.

In case of NT88H25/L

In case of NT88H25/R

In case of NT88H65/L

In case of NT88H65/R

Fig. 24 Sensor timing chart for NT88H

Note (1)　　Respective values are for reference and are not guaranteed values.
For detailed dimensions, please contact IKO.

Remarks 1. For return to origin operation in a standard system configuration, use the return to origin function (limit inversion method) of the driver. It is necessary to input the limit signal output from the encoder interface to the driver.
2. Pre-origin sensor is not provided.
3. For the specifications of respective sensors, please see the section of sensor specification in General Explanation.

NT

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

System Configuration

■ System configuration for NT38V

There are dedicated drivers for Nano Linear NT38V, and the system configuration is shown in Table 7. For detailed driver specifications, see the driver specification section on page Ⅱ-371. Please contact IKO if the use of other drivers is required. When you place an order, please specify desired identification numbers from the list of Table 7.

Table 7 System configuration for NT38V
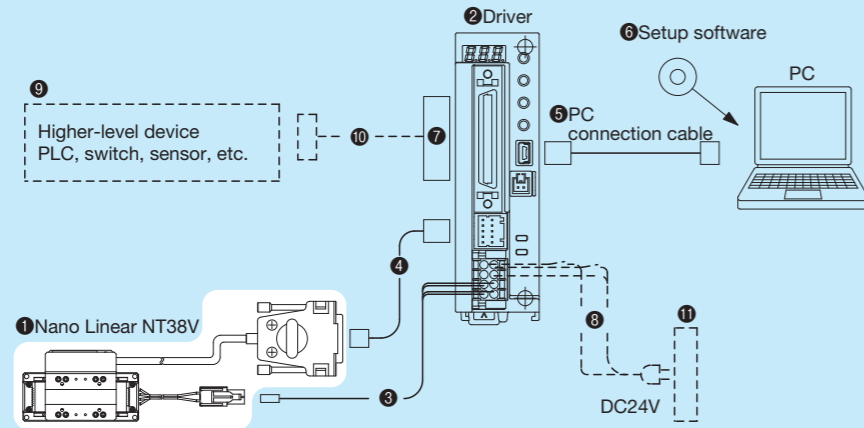
No.	Name	Identification number
❶	Nano Linear NT⋯V	NT38V
❷	Driver	MR-J4-03A6-NL156J154 (NT38V10) MR-J4-03A6-NL156J155 (NT38V18)
❸	Motor extension cord (3m[1])	TAE20W2-AM03
❹	Encoder extension cord (2m[1])	TAE20W3-EC02
❺	PC connection cable (3m)	MR-J3USBCBL3M
❻	Setup software	SW1DNC-MRC2-J
❼	Connectors for input & output signal	TAE20R5-CN [2]
❽	Power cord	This must be prepared by customer.
❾	Higher-level device, Sensor [3]	
❿	Higher-level device, Sensor connection cord [3]	
⓫	DC24V power supply	

Notes [1] For specific cord length, please contact IKO.
[2] Connectors for input & output signal TAE20R5-CN is a combined product of 10150-3000PE (connector) and 10350-52F0-008 (cover) from 3M Japan Limited.
[3] Depending on the higher-level device connected, a sensor may be required for return to origin. For details, contact IKO.

■ System configuration for Nano Linear NT (excluding NT38V)

There are dedicated drivers for each model of the Nano Linear NT (excluding NT38V), and the system configuration varies depending on the driver used. Table 8 shows the applicability of Nano Linear models and driver types. Table 9 shows the example of identification number for ADVA, and Table 10 shows the tables and model number of the applicable MR-J4. For detailed driver specifications, see the driver specifications on pages Ⅱ-370 to Ⅱ-373.
Please also note that the drivers compatible with MECHATROLINK will be prepared upon request. If needed, please contact IKO.

Table 8 Applicability table of Nano Linear models and driver types

Driver	Command type	Nano Linear model				
		NT55V	NT80V	NT88H	NT80XZ	NT90XZH
ADVA	EtherCAT	○ (¹)	○ (¹)	○ (²)	○ (²)	○ (²)
	Pulse train command	○	○	○	○	○
MR-J4	SSCNETⅢ/H	○ (¹)	○ (¹)	◇ (²)	—	—
	Pulse train command	◇ (¹)	◇ (¹)	◇ (²)	—	—
SGD7S (Σ-7)	MECHATROLINKⅢ	◇ (¹)	◇ (¹)	—	◇ (²)	◇ (²)
	Pulse train command	◇ (¹)	◇ (¹)	—	◇ (²)	◇ (²)
MADL (MINAS A6)	EtherCAT	◇ (¹)	◇ (¹)	◇ (²)	◇ (²)	◇ (²)
	RTEX	◇ (¹)	◇ (¹)	◇ (²)	◇ (²)	◇ (²)
	Pulse train command	◇ (¹)	◇ (¹)	◇ (²)	◇ (²)	◇ (²)

Note (¹) We recommend combination with sensor-included specification / SC. For non-sensor specifications, confirm the return to origin action of higher-level controller devices, or use an external sensor, etc., to enable a return to origin situation.
Note (²) Confirm the return to origin action of higher-level controller devices, or use an external sensor, etc., to enable a return to origin situation.
Remark: ◇ is individually corresponding. If needed, please contact IKO.
Drivers other than those listed above, including those from CKD Nikki Denso Co., Ltd., can be considered. If needed, please contact IKO.

Table 9 Model number for ADVA

ADVA – 01NL EC / NT55V25
① Model   ②   ③   ④

② Power supply voltage	
01NL	Single-phase / Three-phase 200 V
R5ML	Single-phase 100 V

③ Command type	
No symbol	Pulse train command
EC	EtherCAT

④ Applicable Nano Linear model	
NT55V 25	NT55V 25
NT55V 65	NT55V 65
NT80V 25	NT80V 25
NT80V 65	NT80V 65
NT80V120	NT80V120
NT88H 25	NT88H 25
NT88H 65	NT88H 65
NT80XZ-X	NT80XZ X-axis
NT80XZ-Z	NT80XZ Z-axis
NT90XZH	For both NT90XZH X-axis and Z-axis

Table 10 Nano Linear NT55V, NT80V and model number of applicable MR-J4

Model number of table	Model number of driver
NT55V 25	MR-J4-10B-RJ/NT55V25
NT55V 65	MR-J4-10B-RJ/NT55V65
NT80V 25	MR-J4-10B-RJ/NT80V25
NT80V 65	MR-J4-10B-RJ/NT80V65
NT80V120	MR-J4-10B-RJ/NT80V120

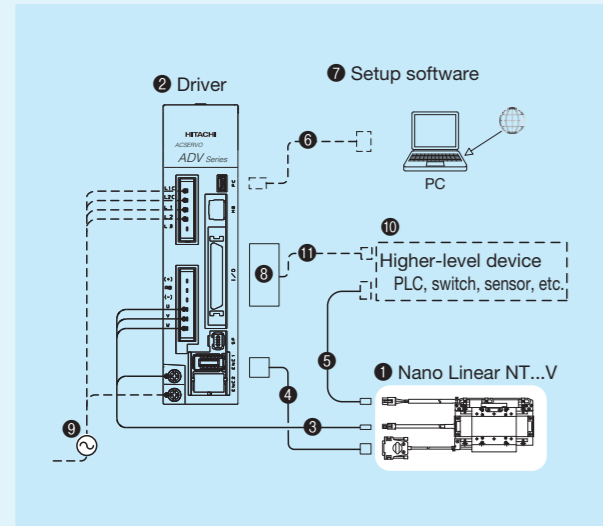Remark: MR-J4-10B is only applicable to sensor-included specification / SC.

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

Table 11 NT55V, NT80V, NT88H, NT80XZ, NT90XZH and applicable MINAS A6 part numbers

Driver part no.	Power supply voltage	Command type	Type	Safety function
MADLN 05 SL	Single-phase / Three-phase 200V	Pulse train command	Position Control Type	None
MADLT 05 SM			Multifunction Type	Yes
MADLN 05 NL		RTEX	Standard Type	None
MADLT 05 NM			Multifunction Type	Yes
MADLN 05 BL		EtherCAT	Standard Type	None
MADLT 05 BM			Multifunction Type	Yes
MADLN 01 SL	Single-phase 100V	Pulse train command	Position Control Type	None
MADLT 01 SM			Multifunction Type	Yes
MADLN 01 NL		RTEX	Standard Type	None
MADLT 01 NM			Multifunction Type	Yes
MADLN 01 BL		EtherCAT	Standard Type	None
MADLT 01 BM			Multifunction Type	Yes

Remark: Available for purchase from Panasonic Corporation. Configure the parameters listed on the IKO website prior to use.
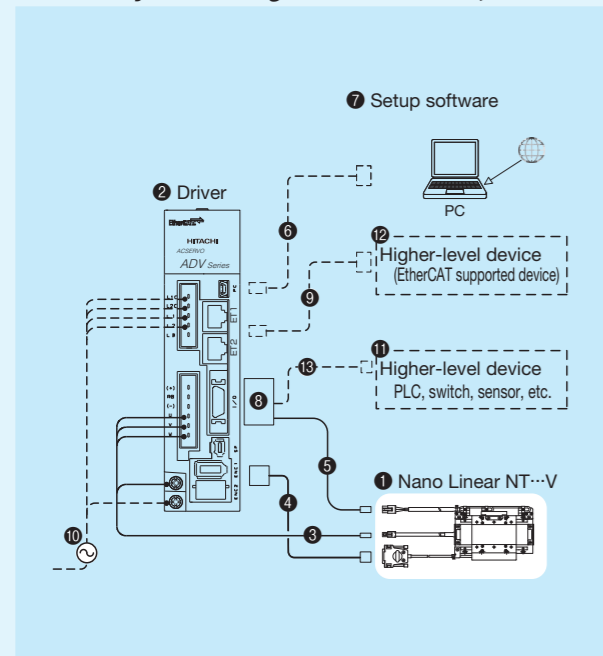
Table 12 System configuration for NT55V, NT80V with driver ADVA

No.	Name	Model and size
❸	Motor extension cord (3m) [1]	TAE20V3-AM03
❹	Encoder extension cord (2m) [1]	TAE20V4-EC02
❺	Sensor extension cord [2]	TAE10V8-LC□□
❻	PC connection cable	USB mini B cable This must be prepared by customer.
❼	Setup software	ProDriveNext Please download from the official website of Hitachi Industrial Equipment Systems Co., Ltd.
❽	I/O connector	TAE20R5-CN [3]
❾	Power cord	This must be prepared by customer.
❿	Higher-level device	
⓫	I/O connector connection cable	

Notes [1] For specific cord length, please contact IKO.
　　　[2] The lengths of the sensor extension cord is specified in the fields of □□ located at the end of the identification number with a length from 3 to 10m in units of 1m.
　　　[3] I/O connector TAE20R5-CN is a combined product of 10150-3000PE (connector) and 10350-52F0-008 (cover) from 3M Japan Limited.
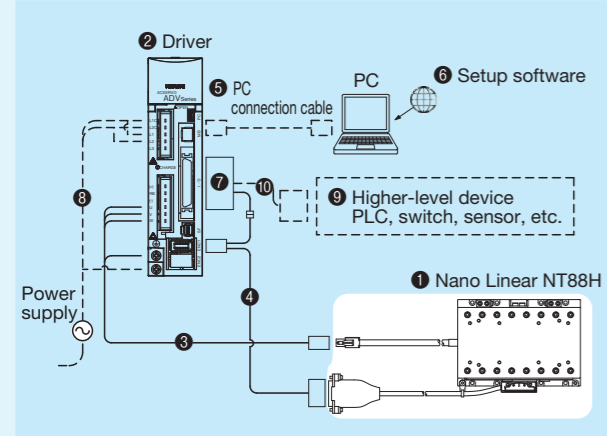
Table 13 System configuration for NT55V, NT80V with driver ADVA…EC

No.	Name	Model and size
❸	Motor extension cord (3m) [1]	TAE20V3-AM03
❹	Encoder extension cord (2m) [1]	TAE20V4-EC02
❺	Sensor extension cord [2]	TAE10V8-LC□□
❻	PC connection cable	USB mini B cable This must be prepared by customer.
❼	Setup software	ProDriveNext Please download from the official website of Hitachi Industrial Equipment Systems Co., Ltd.
❽	I/O connector	TAE20V5-CN [3]
❾	Ethernet cable	This must be prepared by customer.
❿	Power cord	
⓫	Higher-level device	
⓬	Higher-level device (EtherCAT supported device)	
⓭	I/O connector connection cable	

Notes [1] For specific cord length, please contact IKO.
　　　[2] The lengths of the sensor extension cord is specified in the fields of □□ located at the end of the identification number with a length from 3 to 10m in units of 1m.
　　　[3] I/O connector TAE20V5-CN is a combined product of 10120-3000PE (connector) and 10320-52F0-008 (cover) from 3M Japan Limited.

Table 14 System configuration for NT55V and NT80V with driver MR-J4-10B (SSCNET Ⅲ/H compatible)
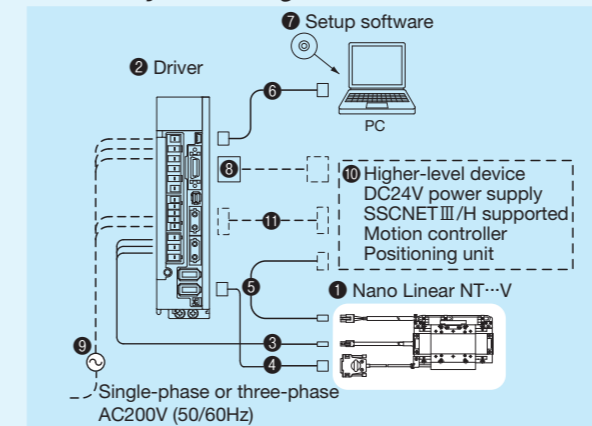
No.	Name	Identification Number
❸	Motor extension cord (3m) [1]	TAE20V3-AM03
❹	Encoder extension cord (2m) [1]	TAE20V6-EC02
❺	Sensor extension cord [2]	TAE10V8-LC□□
❻	PC connection cable (3m)	MR-J3USBCBL3M
❼	Setup software	SW1DNC-MRC2-J
❽	I/O connection connector	MR-CCN1 [3]
❾	Power cord	This must be prepared by customer.
❿	Higher-level device [4]	
⓫	SSCNETⅢ/H connection cable	

Notes [1] For specific cord length, please contact IKO.
　　　[2] The lengths of the sensor extension cord is specified in the fields of □□ located at the end of the identification number with a length from 3 to 10m in units of 1m.
　　　[3] Connectors for input/output connection MR-CCN1 is a combined product of 10120-3000PE (connector) and 10320-52F0-008 (cover) from 3M Japan Limited.
　　　[4] The higher-level devices are a motion controller, positioning unit and DC24V power supply ready for SSCNETⅢ/H from Mitsubishi Electric Corporation.
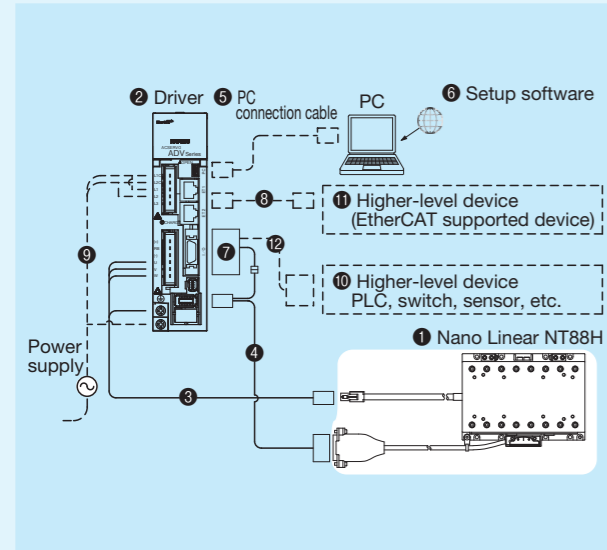
1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

Table 15 System configuration for NT88H with driver ADVA

No.	Name	Identification number
❸	Motor extension cord	TAE20V3-AM03（3m）[1]
❹	Encoder extension cord	TAE20W5-EC02（2m）[1]
❺	PC connection cable	USB mini B cable This must be prepared by the customer.
❻	Setup software	ProDriveNext Please download from the official website of Hitachi Industrial Equipment Systems Co., Ltd.
❼	Connector set	TAE20W6-CN[2]
❽	Power cord	This must be prepared by the customer.
❾	Higher-level device	
❿	I/O connector connection cable	

Notes　[1] For specific cord length, please contact IKO.
　　　　[2] The connector set TAE20W6-CN is a set of I/O connector and connector for sensor (crimp wired (200mm)).
　　　　The I/O connector is a combined product of 10150-3000PE (connector) and 10350-52F0-008 (cover) from 3M Japan Limited.
　　　　The connector for sensor is a combined product of 170365-1 (contact) and 172157-1 (housing) from Tyco Electronics Japan G.K..

Table 16 System configuration for NT88H with driver ADVA…EC

No.	Name	Identification number
❸	Motor extension cord	TAE20V3-AM03（3m）[1]
❹	Encoder extension cord	TAE20W5-EC02（2m）[1]
❺	PC connection cable	USB mini B cable This must be prepared by the customer.
❻	Setup software	ProDriveNext Please download from the official website of Hitachi Industrial Equipment Systems Co., Ltd.
❼	Connector set	TAE20W7-CN[2]
❽	Ethernet cable	This must be prepared by the customer.
❾	Power cord	
❿	Higher-level device	
⓫	Higher-level device (EtherCAT supported device)	
⓬	I/O connector connection cable	

Notes　[1] For specific cord length, please contact IKO.
　　　　[2] The connector set TAE20W7-CN is a set of I/O connector and connector for sensor (crimp wired (200mm)).
　　　　The I/O connector is a combined product of 10120-3000PE (connector) and 10320-52F0-008 (cover) from 3M Japan Limited.
　　　　The connector for sensor is a combined product of 170365-1 (contact) and 172157-1 (housing) from Tyco Electronics Japan G.K..

Table 17 System configuration for NT80XZ, NT90XZH
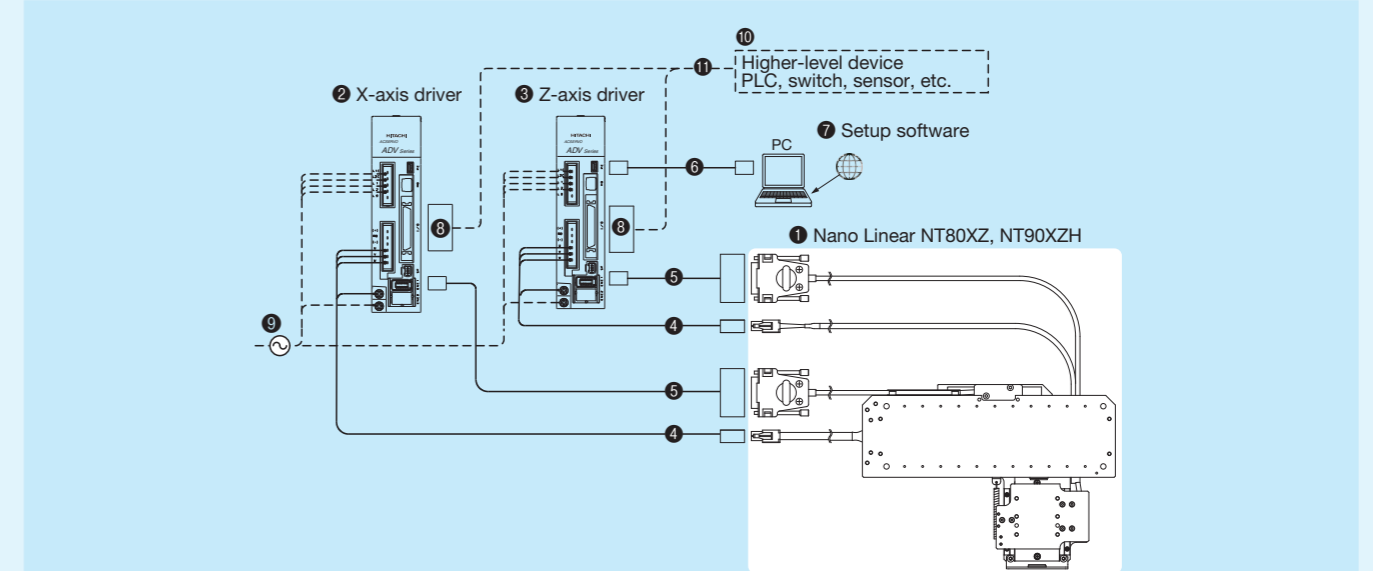
No.	Name	数量	Model and size	
❶	Nano Linear NT80XZ, NT90XZH	1	NT80XZ4510	NT90XZH2510
❷	Driver for X-axis	1	ADVA-01NL/NT80XZ-X (200 V specs) ADVA-R5ML/NT80XZ-X (100 V specs)	ADVA-01NL/NT90XZH (200 V specs) ADVA-R5ML/NT90XZH (100 V specs)
❸	Driver for Z-axis	1	ADVA-01NL/NT80XZ-Z (200 V specs) ADVA-R5ML/NT80XZ-Z (100 V specs)	ADVA-01NL/NT90XZH (200 V specs) ADVA-R5ML/NT90XZH (100 V specs)
❹	Motor extension cord（3m）[1]	2	TAE20V3-AM03	
❺	Encoder extension cord（2m）[1]	2	TAE20V4-EC02	
❻	PC connection cable	1	USB mini B cable (This must be prepared by customer.)	
❼	Setup software	1	ProDriveNext Please download from the official website of Hitachi Industrial Equipment Systems Co., Ltd.	
❽	I/O connector	2	TAE20R5-CN[2]	
❾	Power cord	—	This must be prepared by customer.	
❿	Higher-level device	—		
⓫	I/O connector connection cable	—		

Notes　[1] For specific cord length, please contact IKO.
　　　　[2] I/O connector TAE20R5-CN is a combined product of 10150-3000PE (connector) and 10350-52F0-008 (cover) from 3M Japan Limited.

● Setup software, data editing software

To operate Nano Linear NT, initial setting of driver parameters is required. Parameter setting for driver is performed using the setup software or data editing software.

In the driver, the setup software (or data editing software) and PC connection cable are not provided. These can be shared in plural drivers but at least 1 set is required. Please prepare these on your own or place an order separately according to your requirement.
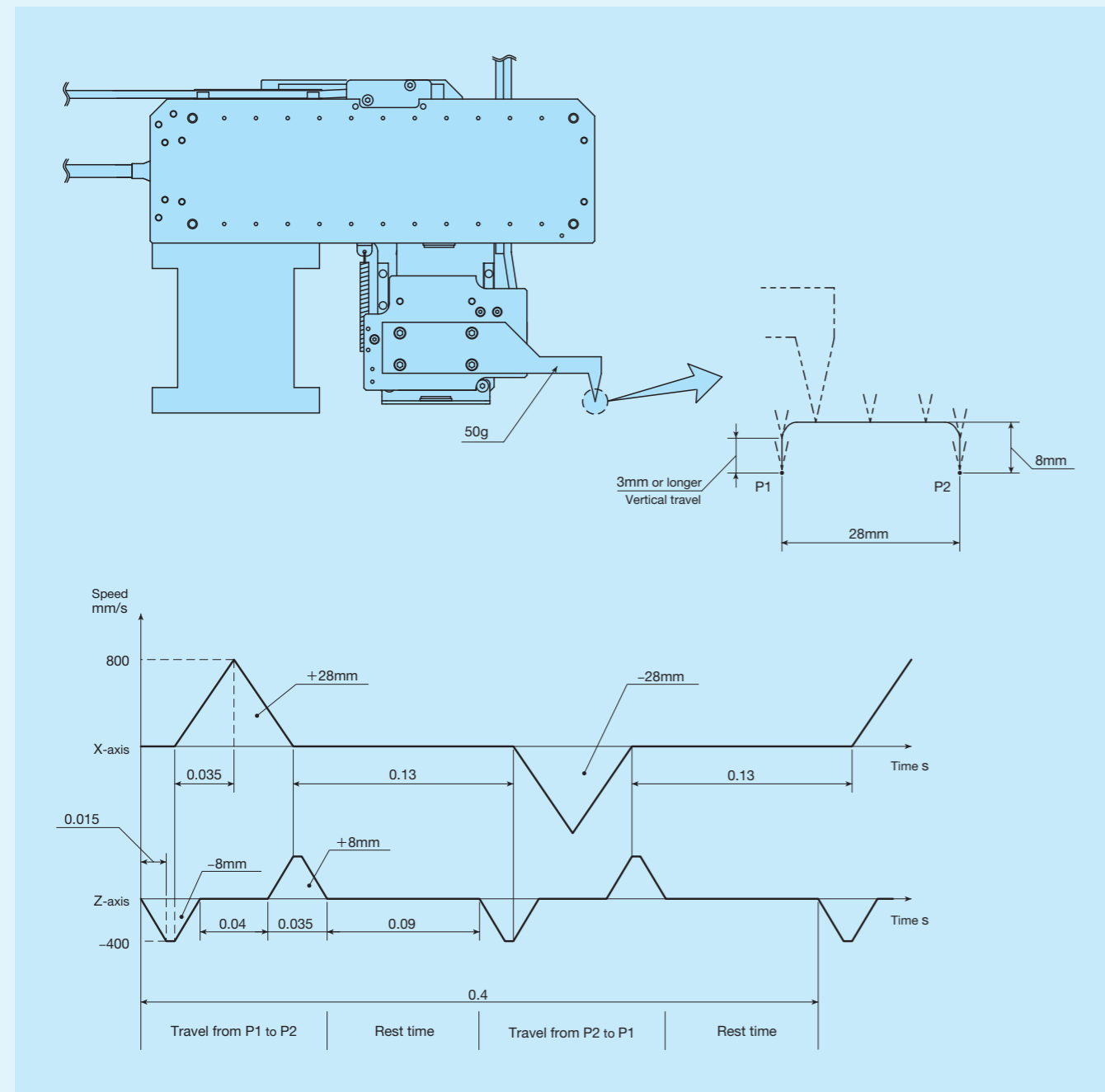
NT

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

Example Operation Pattern

■ Example operation pattern of NT···XZ pick and place

Described below is a representative example of operation pattern of pick and place.

Table 18 Operational conditions

Item		Operational conditions
Carrying mass	g	50
X-axis travel distance	mm	28
Z-axis travel distance	mm	8
Rest time in P1 and P2	s	0.09
1 cycle time	s	0.4
X-axis effective thrust force	N	8.9
Z-axis effective thrust force	N	2.5

50g

3mm or longer
Vertical travel

P1   P2   8mm

28mm

Speed mm/s

800

X-axis

0.035   0.13   0.13   Time s

+28mm   −28mm

0.015

+8mm
−8mm

Z-axis

0.04   0.035   0.09   Time s

−400

0.4

Travel from P1 to P2 | Rest time | Travel from P2 to P1 | Rest time

Remark: The speed pattern diagram shows a program pattern, not actual motions.

IKO Nano Linear NT

NT38V10
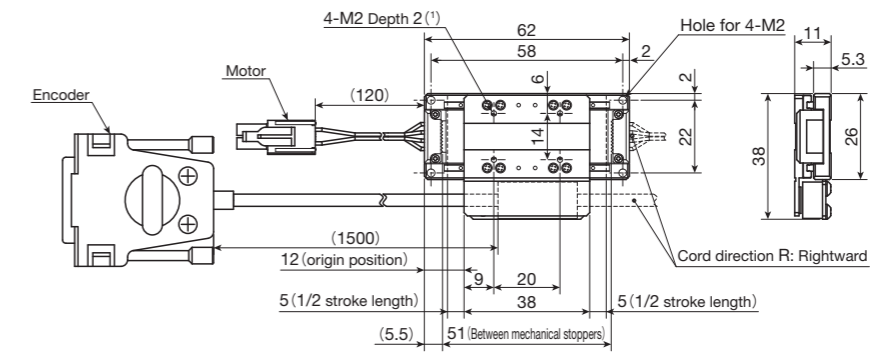
NT38V18
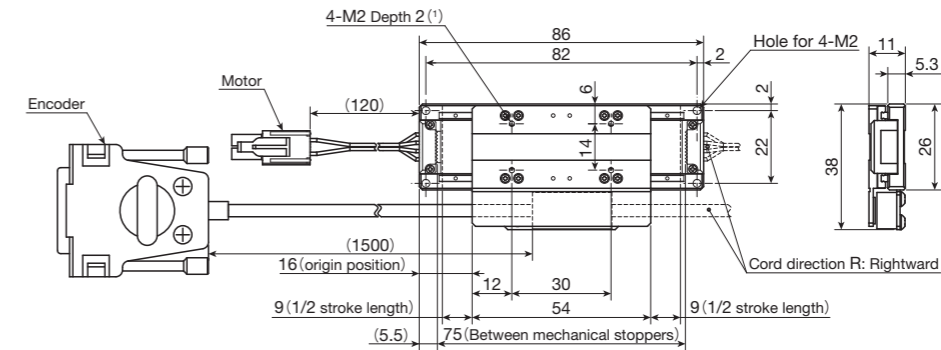
NT38V10/D
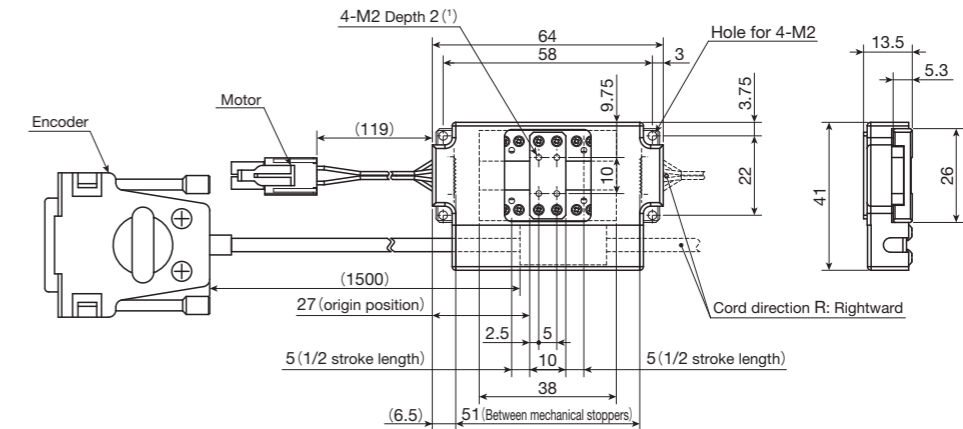
NT38V18/D
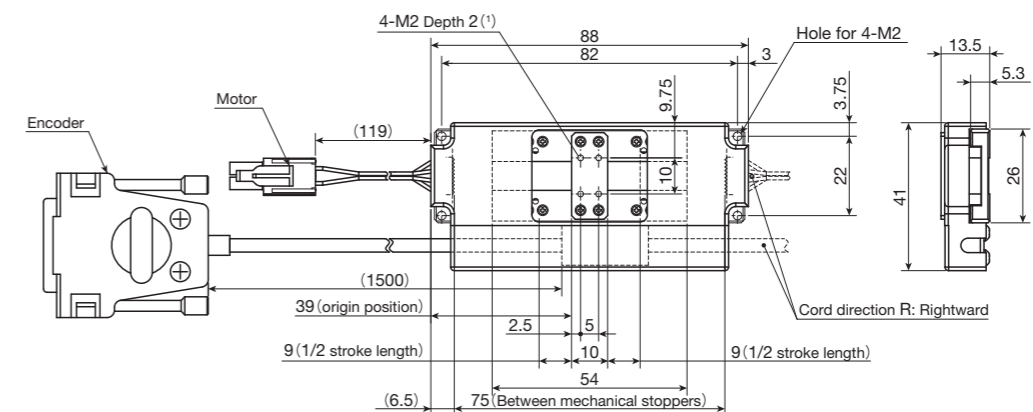
Note (¹) Too deep insertion depth of the mounting bolt may affect the running performance of the moving table, so never insert a bolt longer than the depth of the through hole.

1N=0.102kgf=0.2248lbs.
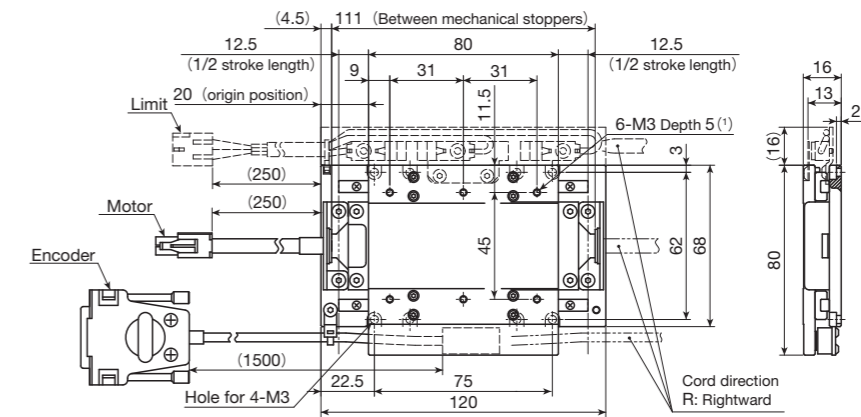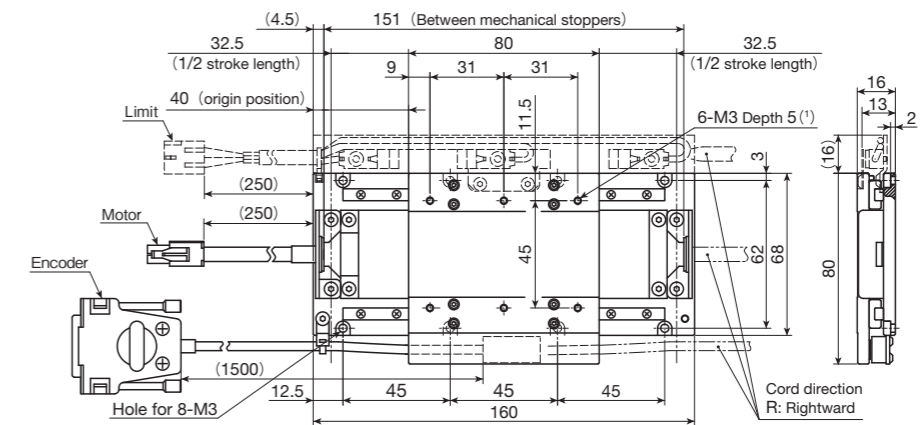1mm=0.03937inch

NT55V25
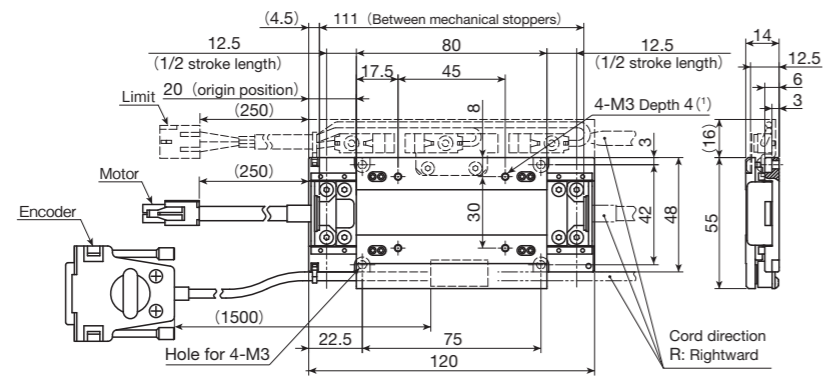
NT55V65
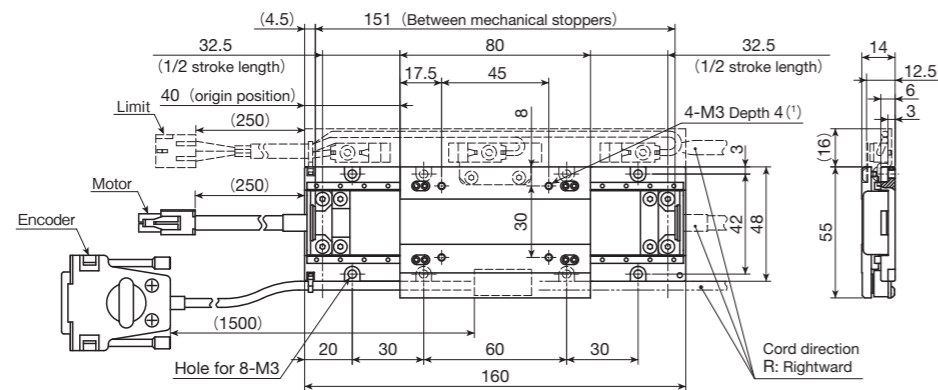
Note ([1]) Too deep insertion depth of the mounting bolt may affect the running performance of the moving table, so never insert a bolt longer than the depth of the through hole.

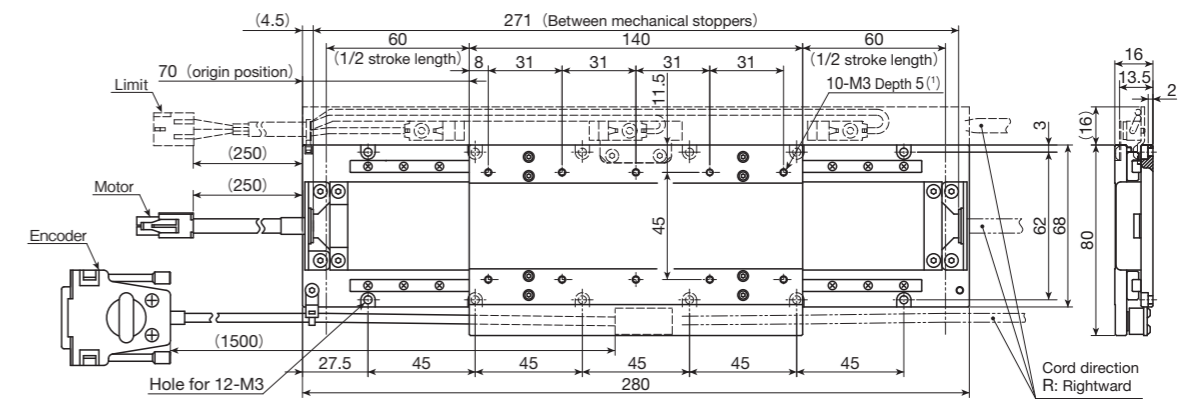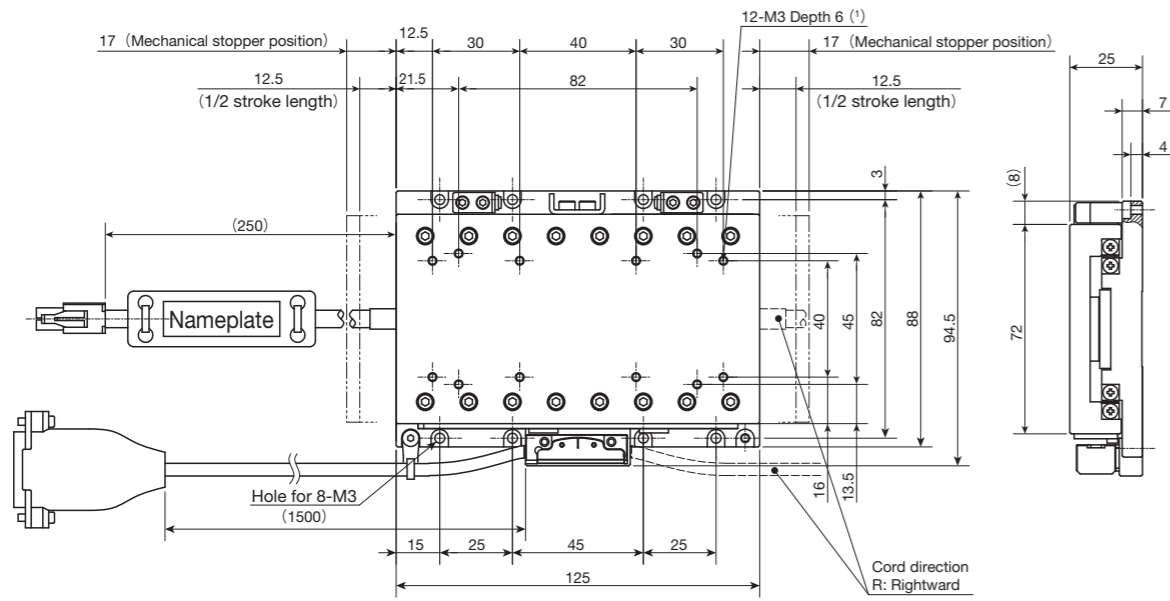Remark: Dashed line portions in the dimensional figures indicate the sensor-included specification / SC.

NT80V25

NT80V65

NT80V120

Note ([1]) Too deep insertion depth of the mounting bolt may affect the running performance of the moving table, so never insert a bolt longer than the depth of the through hole.
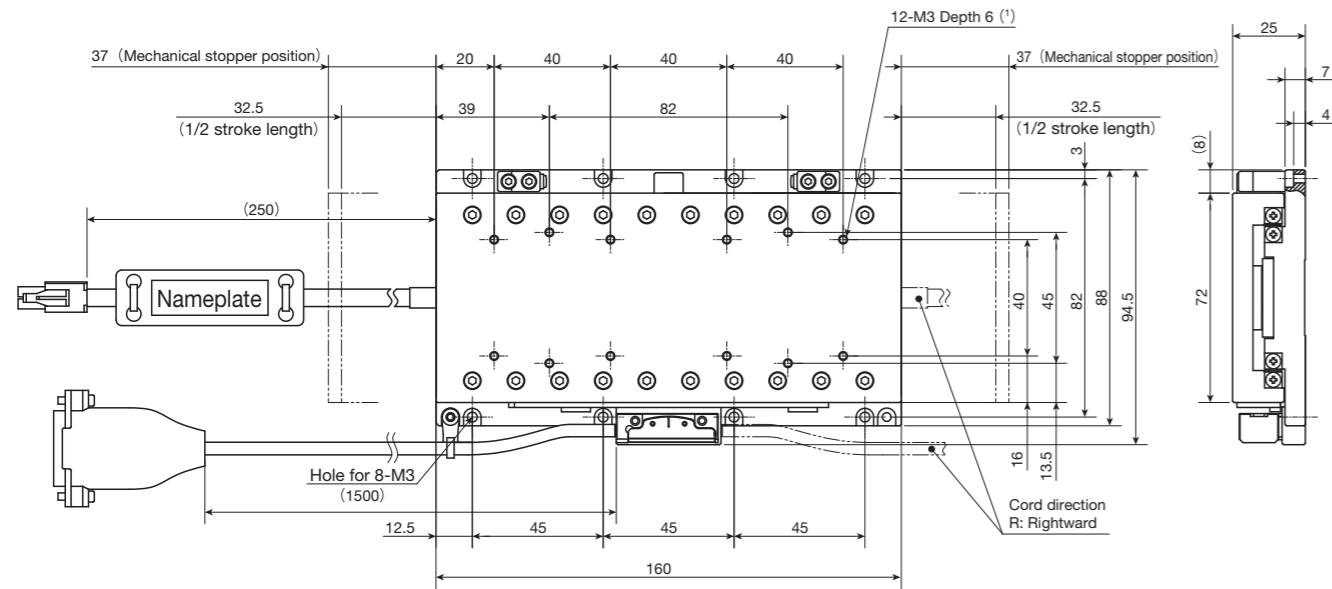
Remarks 1. Dashed line portions in the dimensional figures indicate the sensor-included specification / SC.
2. XY two-axis specification table combined with NT80V with NT80V25 used as an upper axis is assembled in IKO before shipping.
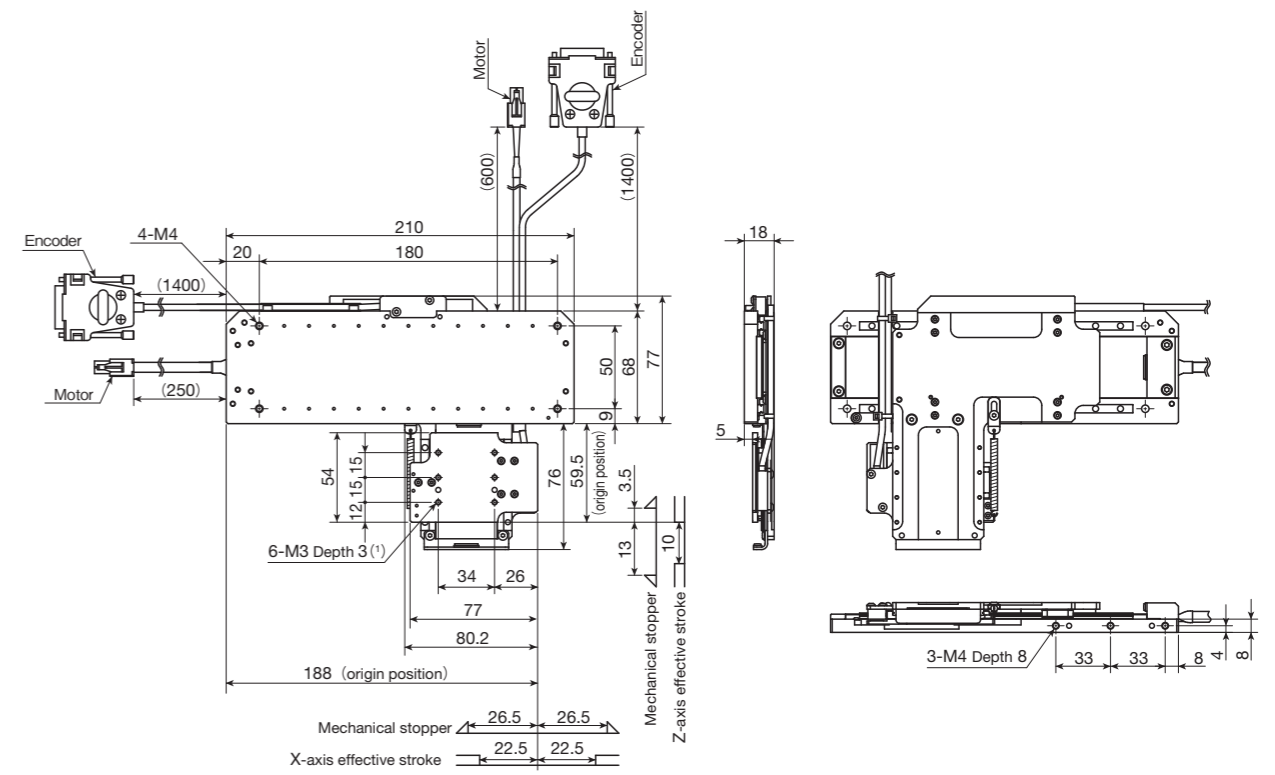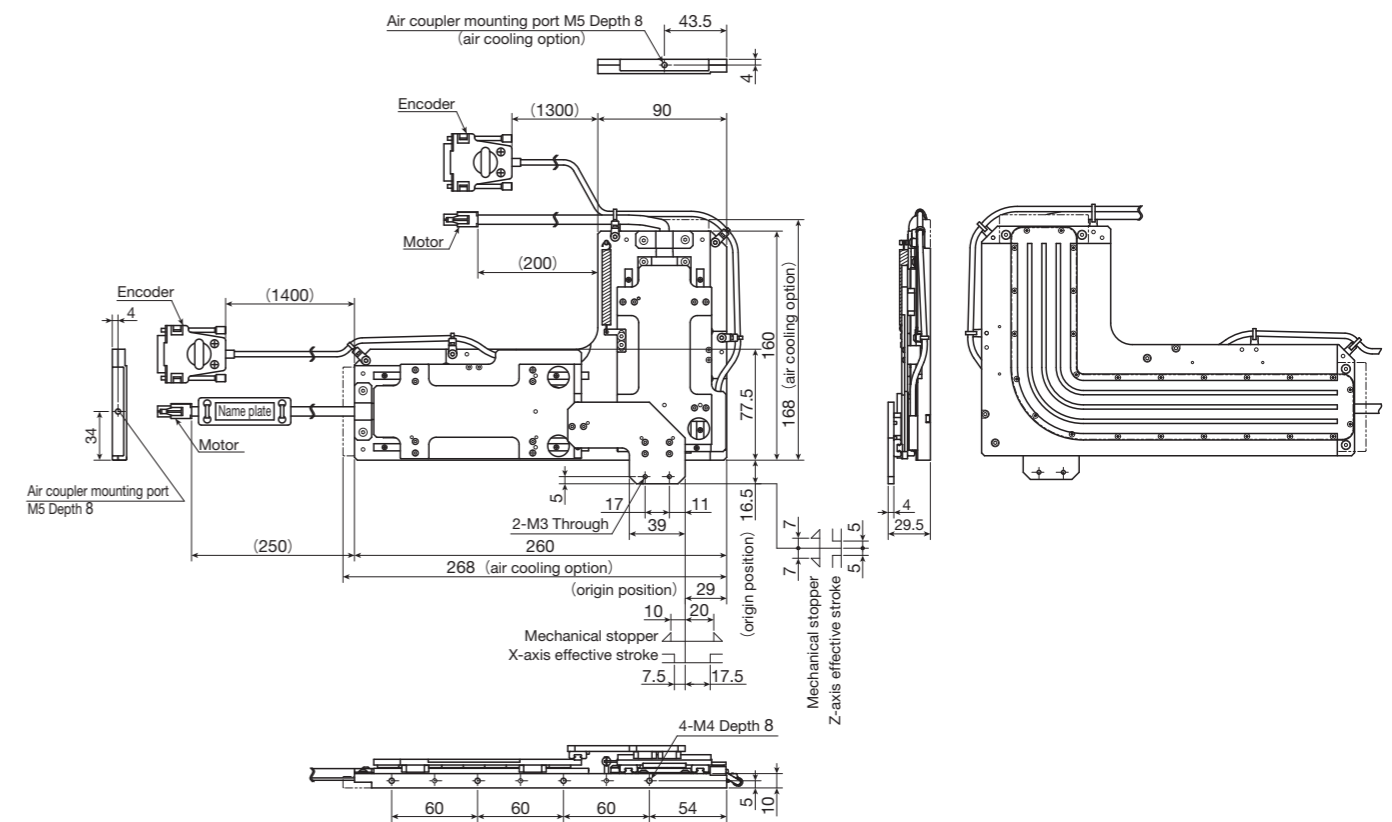
NT

NT88H25

NT88H65

Note ([1]) Too deep insertion depth of the mounting bolt may affect the running performance of the moving table, so never insert a bolt longer than the depth of the tapped hole.

NT80XZ

NT90XZH

Note ([1]) Too deep insertion depth of the mounting bolt may affect the running performance of the moving table, so never insert a bolt longer than the depth of the through hole.

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

NT