

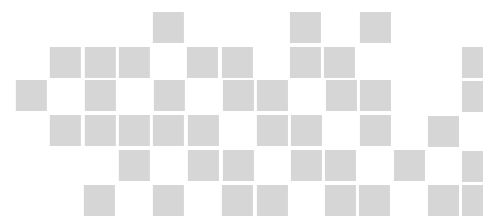
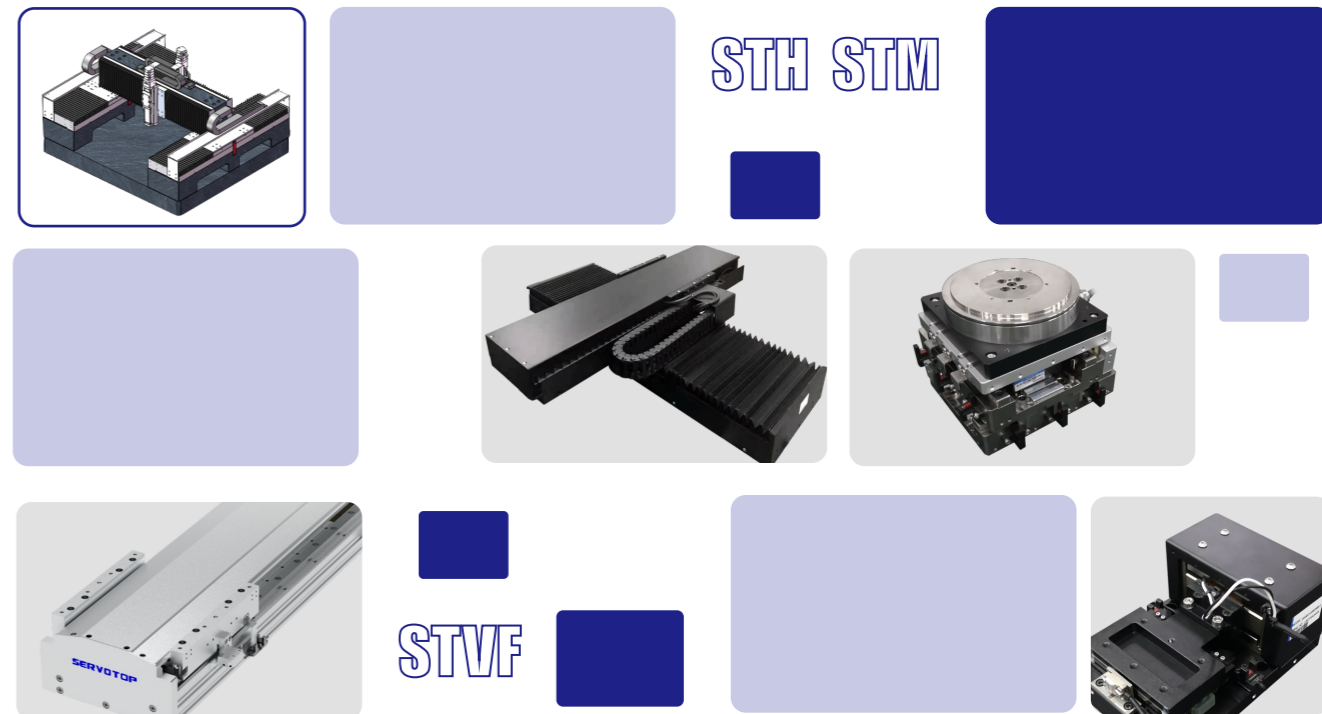


Standard Linear Motor Stage

# Standard Linear Motor Stages Precision Motion Stages

Precision Motion Stages

**Era of Direct Drive · Peak of Servo**



# Product catalog Content

## ■ Standard linear motor stages /Precision motion stages

### 05 Standard linear motor stages

Introduction to Linear Motor Stages	03
STH/STM Series Linear Motor Stages	
-STH5 Series	13
-STH8 Series	17
-STH12 Series	23
-STM6 Series	27
-STM8 Series	31
-STM10 Series	35
-STM12 Series	41
-STM14 Series	47
-STM15 Series	53
-STM17 Series	59
-STM21 Series	65
-STM27 Series	71

### 77 Miniature precision counterpoint platform

XYZ- $\theta$ precision alignment stage	77
-STVF80	
-STVF100	
-STVF120	
-STVF140	
-STVF170	
XYZ precision alignment stage	101
Z-axis stack alignment stage in a wedge structure	103

### 109 Nanometer-level air-floating precision motion stage

Air-floating single-axis linear precision motion stage	109
Air-floating gantry dual-drive precision motion stage	111

# Product catalog Content

## ■ Standard linear motor stages /Precision motion stages

### 115 Stacking precision motion stage

Marble superimposed cross precision motion stage	115
Marble fixed-beam cross precision motion stage	117
Fixed-beam dual-Y precision motion stage	119
Five-axis precision motion stage	121
Modular superimposed cross precision motion stage	123
Hollow cross precision motion stage	125
-STM-HXY-160	
-STM-HXY-150	

### 129 Gantry precision motion stage

Marble gantry single-drive precision motion stage	129
Marble gantry dual-drive precision motion stage	131
Modular gantry single-drive precision motion stage	133
Modular gantry double-drive precision motion stage	135

### 137 Mini voice coil motor

137

### 141 2-DOF module

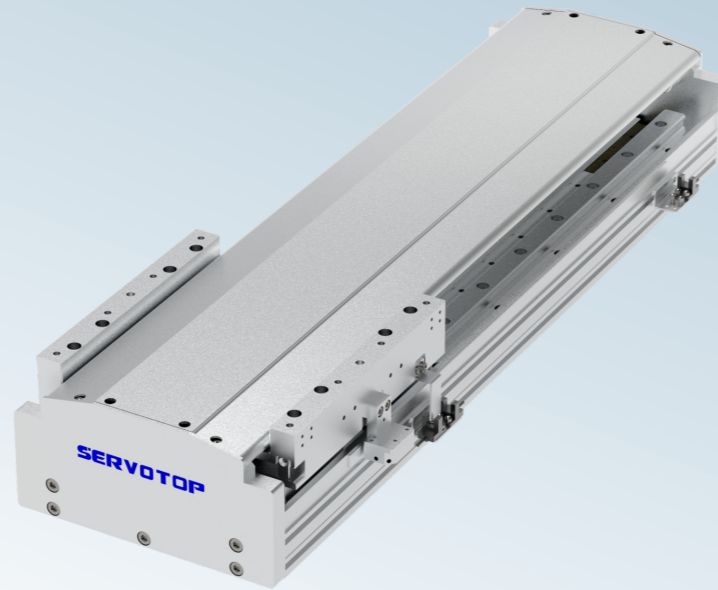
141

### 145 Drive and Control

Driver model selection	145
Wiring diagram	163
Selection guide	165
Accessories selection guide	167

# Standard linear motor stages

- Realizing motion at an ultra-high speed or an ultra-low speed
- Simple structure  
Contactless transfer of power is realized by using linear motors to drive, and direct connection with the load reduces the traditional mechanical conversion, resulting in fewer faults, high security and reliability, and long service life.
- High rigidity and high dynamic performance  
The linear motor actuator is directly connected with the load, and there is no need for no transmission backlash. When driving the load, the actuator has extremely high dynamic stiffness. The acceleration can be 2G to 5G, or even more than 10G for small loads, so it has very high dynamic response performance and short setting time.
- Smooth motion characteristics and high positioning accuracy  
The linear motor stage has low thrust fluctuation and speed fluctuation which are suitable for steady motion, and the positioning accuracy is only restricted by the accuracy of the feedback reading head, which can usually reach 1 um to 10 um.

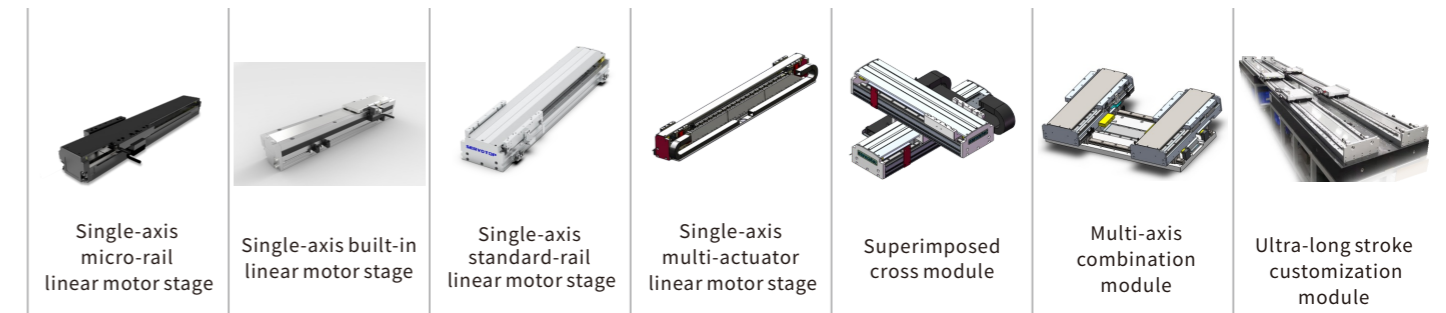


## Standard linear motor stages performance

- Repeatability:  $\pm 0.5 \mu\text{m}$  to  $\pm 5 \mu\text{m}$
- The maximum length of non-splicing is 6 m, and the splicing length can reach 30 m.  
Non-standard lengths exceeding 6 m can be customized.
- Number of actuators: 1 or more
- Wide speed range: 1 um/s to 5m/s
- Acceleration depends on the load
- High dynamic performance and high acceleration, up to 10G

# Standard linear motor stages

## Module type



## Thrust Range of Standard Linear Motor Stages

Module series	Motor series	Motor type	Continuous thrust (F <sub>cn</sub> ) / Peak thrust (F <sub>pk</sub> ) unit: N					Travel Stroke (mm) Note 1	Page No
			50	100	150	200	250		
STH5	SWL-CZY	CZY-S1	48	96				50-1300	15
STH8	SWL-RY	RY-S1	84			200		50-1300	19
		RY-S2	108			316		35-1285	20
STH12	SWL-RY	50S-R1	150			300		50-1200	25

Module series	Motor series	Motor type	Continuous thrust (F <sub>cn</sub> ) / Peak thrust (F <sub>pk</sub> ) unit: N					Travel Stroke (mm) Note 1	Page No
			50	100	150	200	250		
STM6	SWL-6Y	6Y-S1	35			105		86-536(896)	29
		6Y-S2	70			210		57-457(817)	30
STM8	SWL-JS	JS-S1	71			142		220-920	33
		JS-S2	141			282		120-820	34

Module series	Motor series	Motor type	Continuous thrust (F <sub>cn</sub> ) / Peak thrust (F <sub>pk</sub> ) unit: N					Travel Stroke (mm) Note 1	Page No
			200	400	600	800	1000		
STM10	SWL-JS	JS-S1	71					52-1884	37
		JS-S2	141						38
		JS-S3	212						39
STM12	SWL-KS	KS-S1	132					52-1884	43
		KS-S2	263						44
		KS-S3	397						45
STM14	SWL-KS	KS-S1	132					52-1884	49
		KS-S2	263						50
		KS-S3	397						51
STM15	SWL-BY	BY-S0	64					70-1790	55
		BY-S1	105						56
		BY-S2	210						57
		BY-S3	315						58

Note 1: A longer travel stroke can be customized according to application requirements.

# Standard linear motor stages

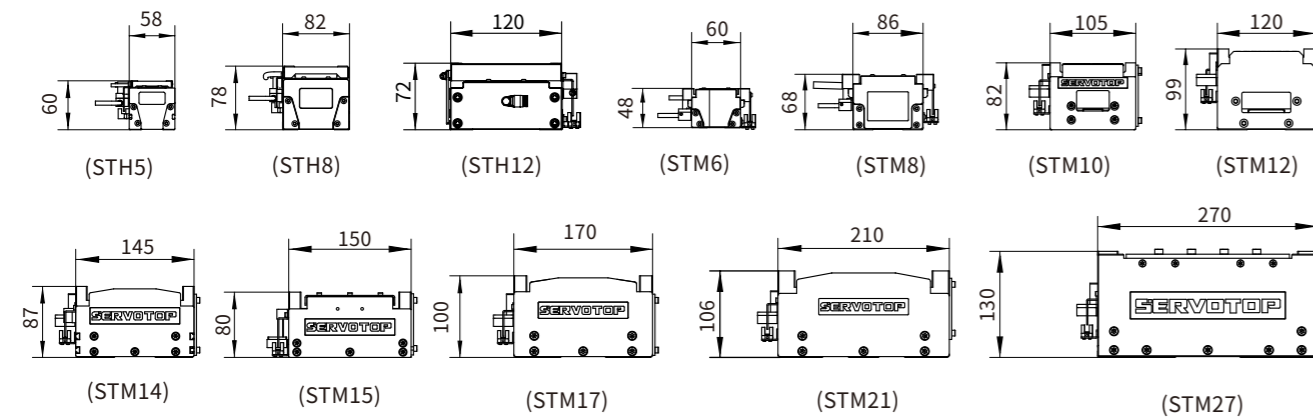
## Thrust Range of Standard Linear Motor Stages

Module series	Motor series	Motor type	Continuous thrust (F <sub>cn</sub> ) / Peak thrust (F <sub>pk</sub> ) unit : N					Travel Stroke (mm) Note 1	Page No
			400	800	1200	1600	2000		
STM17	SWL-LS	LS-S1	190	380				52-1884	61
		LS-S2	359	759					62
		LS-S3	573	1145					63
	SUM-DM3	DM3-S1	36	144					
		DM3-S2	72	288					
		DM3-S3	108	438					
STM21	SWL-MS	MS-S1	231	462				67	
		MS-S2	459	918				68	
		MS-S3	693	1386				69	
	SUM-DM4	DM4-S1	176	915					
		DM4-S2	232	1206					
		DM4-S3	292	1518					
		DM4-S4	362	1882					

Module series	Motor series	Motor type	Continuous thrust (F <sub>cn</sub> ) / Peak thrust (F <sub>pk</sub> ) unit : N							Travel Stroke (mm) Note 1	Page No
			500	1000	1500	2000	2500	3000	3500		
STM27	SWL-TE	TE-S1	580	1160	1740				30-4180	73	
		TE-S2	820	1640	2460					74	
		TE-S3	1100	2200	3300					75	
	SUM-DM5	DM5-S1	248	1240	1860						
		DM5-S2	353	1765	2649						
		DM5-S3	456	2280	3420						
		DM5-S4	585	2925	4388						

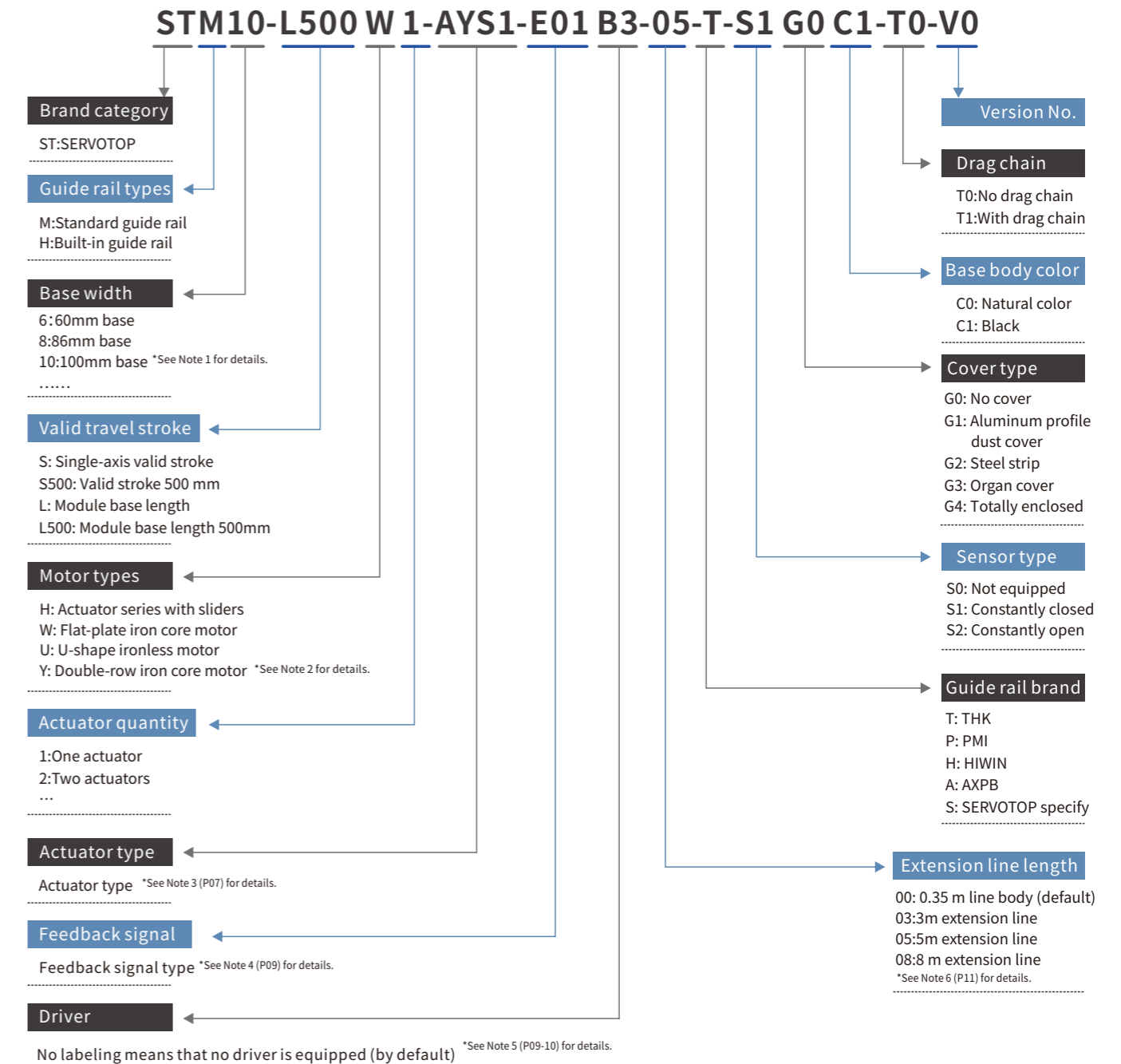
Note 1: A longer travel stroke can be customized according to application requirements.

### Width diagrams



# Standard linear motor stages

## Naming convention for standard linear motor stages



Example: STM15-L1010W2-BYS1-E00GA3-05T-S1G1C0-T0-V0, indicating the 15 series base and cover, total base length 1010 mm, two SWL-BY-S1 actuators, 1 um magnetic grating reading head, Servotronic 3 A pulse driver, THK guide rail, constantly closed sensor, aluminum dust cover, base in natural color, no drag chain, and version number V0.

Note 1: Bases are categorized into nine series: 6 to 60 mm, 8 to 86 mm, 10 to 100mm, 12 to 120 mm, 14 to 145 mm, 15 to 150 mm, 17 to 170 mm, 21 to 210 mm, and 27 to 270 mm.

Note 2: Actuator types: H: actuator series with sliders, W: flat-plate iron core motor series, U: U-shape ironless motor series.

## Standard linear motor stages

### Note 3 - Actuator model symbol table

#### Iron core motor series

Category	Motor Symbol	Motor model
SWL-6Y	6YS1	SWL-6Y-S1
	6YS2	SWL-6Y-S2
SWL-AY	AYS0	SWL-AY-S0
	AYS1	SWL-AY-S1
	AYS2	SWL-AY-S2
	AYS3	SWL-AY-S3
SWL-BY	BYS0	SWL-BY-S0
	BYS1	SWL-BY-S1
	BYS2	SWL-BY-S2
	BYS3	SWL-BY-S3
SWL-BZ	BZS0	SWL-BZ-S0
	BZS1	SWL-BZ-S1
	BZS2	SWL-BZ-S2
	BZS3	SWL-BZ-S3
SWL-CY	CYS0	SWL-CY-S0
	CYS1	SWL-CY-S1
	CYS2	SWL-CY-S2
SWL-MS	MSS1	SWL-MS-S1
	MSS2	SWL-MS-S2
	MSS3	SWL-MS-S3
SWL-TE	TES1	SWL-TE-S1
	TES2	SWL-TE-S2
	TES3	SWL-TE-S3
SWL-RY	RYS1	SWL-RY-S1
	RYS2	SWL-RY-S2
SWL-CZY	CZYS1	SWL-CZY-S1
	CZYS2	SWL-CZY-S2

#### Ironless motor series

Category	Motor Symbol	Motor model
SUM-DM3	D3S1	SUM-DM3-S1
	D3S2	SUM-DM3-S2
	D3S3	SUM-DM3-S3
	D3S4	SUM-DM3-S4
	D3S5	SUM-DM3-S5
SUM-DM4	D4S1	SUM-DM4-S1
	D4S2	SUM-DM4-S2
	D4S3	SUM-DM4-S3
	D4S4	SUM-DM4-S4
	D4S5	SUM-DM4-S5
SUM-DM5	D5S1	SUM-DM5-S1
	D5S2	SUM-DM5-S2
	D5S3	SUM-DM5-S3
	D5S4	SUM-DM5-S4
	D5S5	SUM-DM5-S5
SUM-DM6	D6S1	SUM-DM6-S1
	D6S2	SUM-DM6-S2
	D6S3	SUM-DM6-S3
	D6S4	SUM-DM6-S4
	D6S5	SUM-DM6-S5
	D6S6	SUM-DM6-S6
	D6S7	SUM-DM6-S7
	D6S8	SUM-DM6-S8

## Standard linear motor stages

### Note 4.1 - STM series encoder symbol table

Category	Encoder Symbol	Product model	Description	
Magnetic grating reading head	E00	MS-P20R10AB-V2.0	SERVOTOP 1um,AB differential signal	
	E01	MS-P20R10ABZ	SERVOTOP 1um,ABZ differential signal	
	E02	NS MS-P20L05ABZ	SERVOTOP 0.5um,ABZ differential signal, L series (discontinued)	
	E03	NS MS-P20L10ABZ	SERVOTOP 1um,ABZ differential signal, L series (discontinued)	
	E04	NS MS-P20M05ABZ	SERVOTOP 0.5um,mini model, ABZ differential signal	
	E05	NS MS-P20M10ABZ	SERVOTOP 1um,mini model, ABZ differential signal	
	E06	NS MS-P20M50ABZ	SERVOTOP 5um,mini model, ABZ differential signal	
	E07	NS MS-P20H05ABZ	SERVOTOP 0.5um,high precision, ABZ differential signal	
	E08	NS MS-P20H10ABZ	SERVOTOP 1um,high precision, ABZ differential signal	
	E09	NS MS-P20H10ABZR	SERVOTOP 1um,high precision, ABZ differential signal,Z signal only	
	E10	MS-P20M10C-D01	SERVOTOP new communication reading head, hole spacing 31.2 mm	
	E11	MS-P20M-150IN	SERVOTOP British system reading head, Resolution150DPI	
	E12	MS-P20M-180IN	SERVOTOP British system reading head, Resolution180DPI	
	E13	MS-P20M-360IN	SERVOTOP British system reading head, Resolution360DPI	
	E14	MS-P20M-720IN	SERVOTOP British system reading head, Resolution720DPI	
	E15	MS-P20M-900IN	SERVOTOP British system reading head, Resolution900DPI	
	E20	RLS LM101C001AB30A00	RLS 1um magnetic grating reading head	
	E21	RLS LM101C005AB30A00	RLS 5um magnetic grating reading head	
	...			
	Optical grating reading head	E50	RSF MS15 TTL*100zp	Digital 0.1 um reading head in RSF MS15 series
		E51	RSF MS15 TTL*50zp	Digital 0.2 um reading head in RSF MS15 series
E52		RSF MS15 TTL*20zp	Digital 0.5 um reading head in RSF MS15 series	
E53		RSF MS15 TTL*10zp	Digital 1 um reading head in RSF MS15 series	
E54		RSF MS15 1VPP	Analog reading head in RSF MS15 series	
E60		RH200H30A00A	Digital 0.05 um reading head in Renishaw RH200 seriesm	
E61		RH200Y30A00A	Digital 0.1 um reading head in Renishaw RH200 seriesm	
E62		RH200W30A00A	Digital 0.2 um reading head in Renishaw RH200 seriesm	
E63		RH200Z30A00A	Digital 0.5 um reading head in Renishaw RH200 seriesm	
E64		RH200X30A00A	Digital 1 um reading head in Renishaw RH200 seriesm	
E65		ATOM4T+Ti0400	Renishaw ATOM digital 0.05 um reading head	
E66		ATOM4T+Ti0200	Renishaw ATOM digital 0.1 um reading head	
E67		ATOM4T+Ti0100	Renishaw ATOM digital 0.2 um reading head	
E68		ATOM4T+Ti0040	Renishaw ATOM digital 0.5 um reading head	
E69		ATOM4T+Ti0020	Renishaw ATOM digital 1 um reading head	
E70		Dalian Banyan RU2LHFN03M	Dalian Banyan digital 20 nm reading head	
E71		Dalian Banyan RU2LGFN03M	Dalian Banyan digital 50 nm reading head	
E72		Dalian Banyan RU2LFFN03M	Dalian Banyan digital 0.1 um reading head	
E73		Dalian Banyan RU2LEFN03M	Dalian Banyan digital 0.2 um reading head	
E74		Dalian Banyan RU2LDFN03M	Dalian Banyan digital 0.5 um reading head	
E75		Dalian Banyan RU2LCFN03M	Dalian Banyan digital 1 um reading head	
E76		Dalian Banyan AL32B050	Dalian Banyan ABS absolute-value 50 nm reading head	
E77		Dalian Banyan AL32B100	Dalian Banyan ABS absolute-value 0.1 um reading head	
E78		Dalian Banyan AL32B500	Dalian Banyan ABS absolute-value 0.5 um reading head	
E80	Dalian Banyan AM4D40M30	Dalian Banyan AM4 series digital 1 um reading head		
E81	Dalian Banyan AM4D80M30	Dalian Banyan AM4 series digital 0.5 um reading head		

## Standard linear motor stages

### Note 4.2 - STH series encoder symbol table

Category	Encoder Symbol	Product model	Description
Magnetic grating reading head	C10	MS-P20M10C-D01	SERVOTOP 1um, communication model, not filled in, default symbol
	R10	MS-P20R10ABZ	SERVOTOP R series 1 um, ABZ differential signal
	H10	NS MS-P20H10ABZ	SERVOTOP H series 1 um, ABZ differential signal
	Z10	MS-P20H10ABZR	Magnetic grating reading head of the unique Z origin
	H05	NS MS-P20H05ABZ	SERVOTOP H series 0.5 um, ABZ differential signal

### Note 5 - Driver symbol table

Brand	Driver symbol	Driver model	Description
N/A	00	N/A	No driver included
SERVOTOP ST6 series	S6B3	ST6-A030-B020	3A, pulse type
	S6B6	ST6-A060-B020	6A, pulse type
	S6B10	ST6-A100-B020	10A, pulse type
	S6E3	ST6-A030-E020	3A, EtherCAT bus type
	S6E6	ST6-A060-E020	6A, EtherCAT bus type
	S6E10	ST6-A100-E020	10A, EtherCAT bus type
SERVOTOP ST7 series	S7B3	ST7-A030-B020	3A, pulse type
	S7B6	ST7-A060-B020	6A, pulse type
	S7B10	ST7-A100-B020	10A, pulse type
SERVOTOP ST8 series	S8B3	ST8-A030-B020	3A, pulse type
	S8B6	ST8-A060-B020	6A, pulse type
	S8B10	ST8-A100-B020	10A, pulse type
	S8E3	ST8-A030-E020	3A, EtherCAT bus type
	S8E6	ST8-A060-E020	6A, EtherCAT bus type
Servotronics first-generation pulse type	GA3	CDHD-0032AAP1	3A, pulse type
	GA4	CDHD-4D52AAP1	4.5A, pulse type
	GA6	CDHD-0062AAP1	6A, pulse type
	GA8	CDHD-0082AAP1	8A, pulse type
	GA10	CDHD-0102AAP1	10A, pulse type
Servotronics second-generation pulse type	G2A3	CDHD2-0032AAP1	3A, pulse type
	G2A4	CDHD2-4D52AAP1	4.5A, pulse type
	G2A6	CDHD2-0062AAP1	6A, pulse type
	G2A8	CDHD2-0082AAP1	8A, pulse type
	G2A10	CDHD2-0102AAP1	10A, pulse type

## Standard linear motor stages

### Note 5 - Driver symbol table (continued)

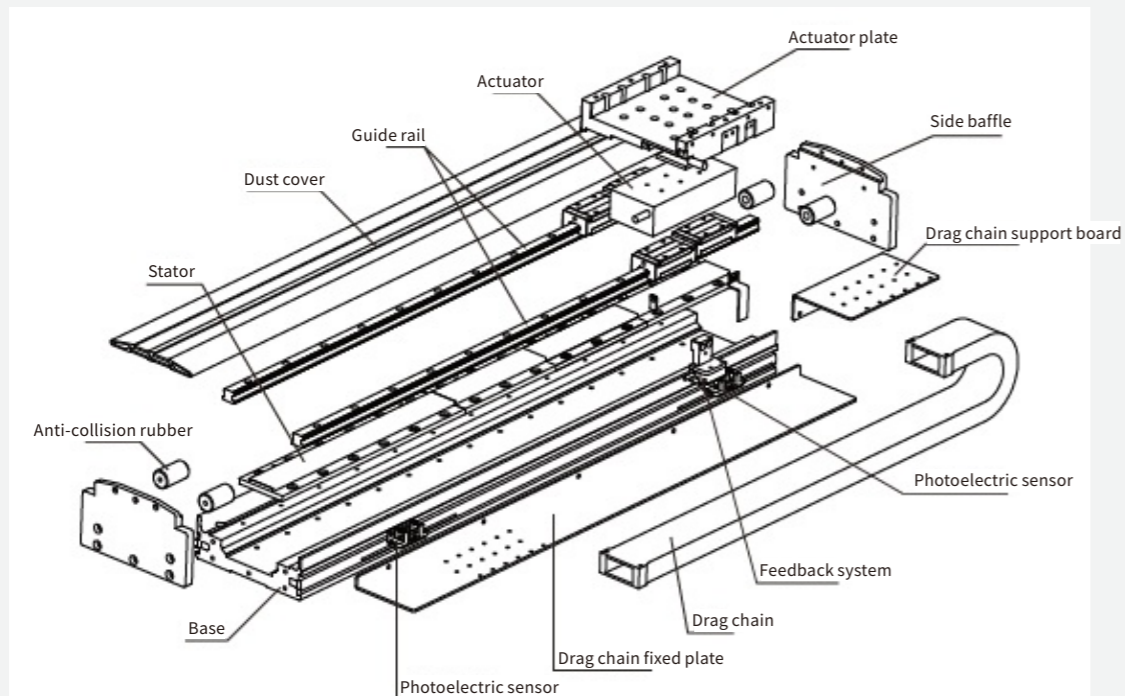
Brand	Driver symbol	Driver model	Description
Servotronics first-generation EC bus type	GE3	CDHD-0032AEC2	3A, EtherCAT bus type
	GE4	CDHD-4D52AEC2	4.5A, EtherCAT bus type
	GE6	CDHD-0062AEC2	6A, EtherCAT bus type
	GE8	CDHD-0082AEC2	8A, EtherCAT bus type
	GE10	CDHD-0102AEC2	10A, EtherCAT bus type
Servotronics second-generation EC bus type	G2E3	CDHD2-0032AEC2	3A, EtherCAT bus type
	G2E4	CDHD2-4D52AEC2	4.5A, EtherCAT bus type
	G2E6	CDHD2-0062AEC2	6A, EtherCAT bus type
	G2E8	CDHD2-0082AEC2	8A, EtherCAT bus type
Servotronics first-generation EC bus type	GF3	CDHD-0032AAF1	3A, canopen bus type
	GF4	CDHD-4D52AAF1	4.5A, canopen bus type
	GF6	CDHD-0062AAF1	6A, canopen bus type
	GF8	CDHD-0082AAF1	8A, canopen bus type
	GF10	CDHD-0102AAF1	10A, canopen bus type
Servotronics second-generation EC bus type	G2F3	CDHD2-0032AAF1	3A, canopen bus type
	G2F4	CDHD2-4D52AAF1	4.5A, canopen bus type
	G2F6	CDHD2-0062AAF1	6A, canopen bus type
	G2F8	CDHD2-0082AAF1	8A, canopen bus type
Servotronics LDHD2 series	GL3	LDHD2-0032AEC	3A, EtherCAT bus type
	GL6	LDHD2-0062AEC	6A, EtherCAT bus type
Servotronics CDHDE series	GAEP4	CDHDE-4D52AAP	4.5A, pulse type
	GAEB4	CDHDE-4D52AEB	4.5A, EtherCAT bus type
	GAEP10	CDHDE-0102AAP	10A, EtherCAT bus type
	GAEB10	CDHDE-0102AEB	10A, EtherCAT bus type

# Standard linear motor stages

## Note 6 - Cable length symbol table

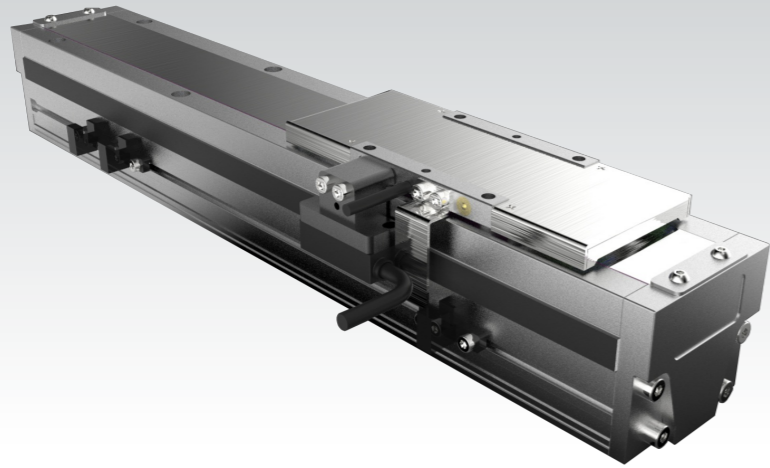
Symbol	body outgoing cable length(m)	Extension line length(m)	Total length(m)
00	0.35m	0	0.35m
03	0.35m	3m	3.35m
05	0.35m	5m	5.35m
08	0.35m	8m	8.35m
10	0.35m	10m	10.35m
13	0.35m	13m	13.35m
15	0.35m	15m	15.35m
T03	3m	0	3m
T05	5m	0	5m
T08	8m	0	8m
T10	10m	0	10m
T13	13m	0	13m
T15	15m	0	15m

## Linear motor stage structure

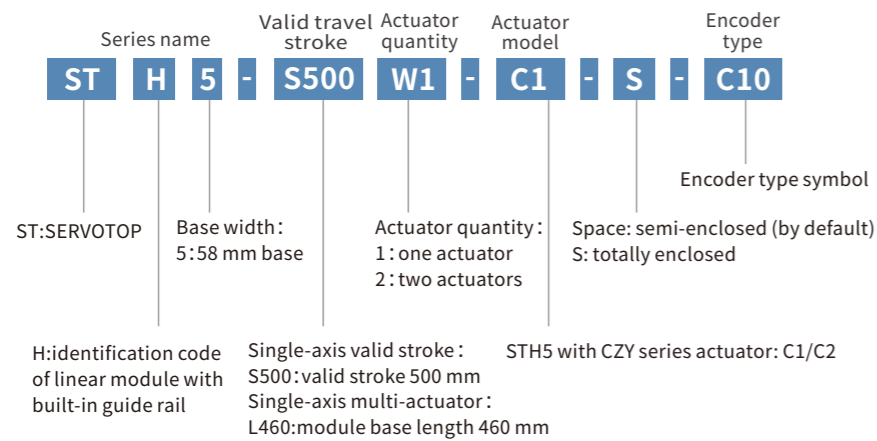


MEMO

STH5 series totally enclosed built-in linear motor stage



● STH5 series module naming convention



For example: Single-axis module, 600 mm travel stroke, one actuator, CZY-S1, totally enclosed module named STH5-S600W1-C1-S;  
Single-axis module, 860 mm base length, two actuators, CZY-S1, totally enclosed module named STH5-L860W2-C1-S.

- Note: 1. The STH5 bare metal module comes with three constantly closed photoelectric sensors. Its body is silver, its cable length 0.35 m, it is fully sealed with steel strip, and it is not equipped with any drag chain, driver, or extension line.
- 2. The STH5 series modules are equipped with the SERVOTOP encoder reading head and the SERVOTOP driver.
- 3. For driver models, refer to "ST Series Drivers" (P145 to P164).
- 4. For encoder models, refer to the "STH Encoder Symbol Table" (P09).
- 5. The cabling length of linear motor actuator and encoder reading head is 0.35 m.
- 6. For the model of the actuator extension line, refer to the "Power Extension Line Ordering Information" (P171).
- 7. For the model of the Encoder extension line, refer to the "Encoder Extension Line Ordering Information" (P167).

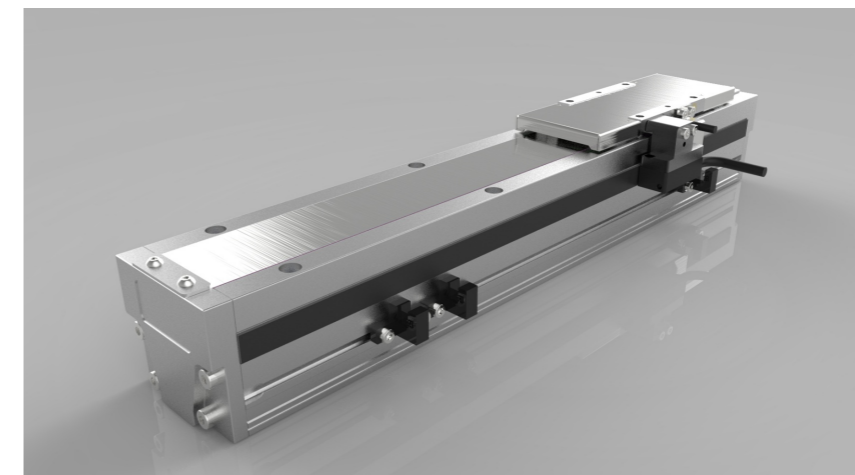
● Specifications

Model Parameter		SWL-CZY-S1
Driver*1	Pulse type	ST6-A030-B020
	Bus type	ST6-A030-E020
Resolution (um)		1
Max. speed (m/s) *2		1.5
Peak thrust (N) *3		96
Continuous thrust (N) *3		48
Continuous current (Arms)		2.5
Peak current (Arms)		7
Thrust constant(N/Arms)		20
Back electromotive force(V/m/s)		16.5
Motor constant(Nm/√w)		7.05
Inductance (mH)		8
Resistor(Ω)		3.4
Electromagnetic attraction force(KN)		0.22
Polar distance (N-S) (mm)		10
Guide rail specification		Built-in double guide rails
Straightness		±5um/300mm
Motion part mass(kg) *4		0.5
Repeatability (um) *5		±3 (Magnetic grating encoder)

Base length (mm)	Travel stroke between mechanical blocks(mm)*1
210	68
260	118
310	168
360	218
410	268
460	318
510	368
560	418
610	468
660	518
710	568
760	618
810	668
860	718
910	768
960	818
1010	868
1060	918
1110	968
1160	1018
1210	1068
1260	1118
1310	1168
1360	1218
1410	1268
1460	1318

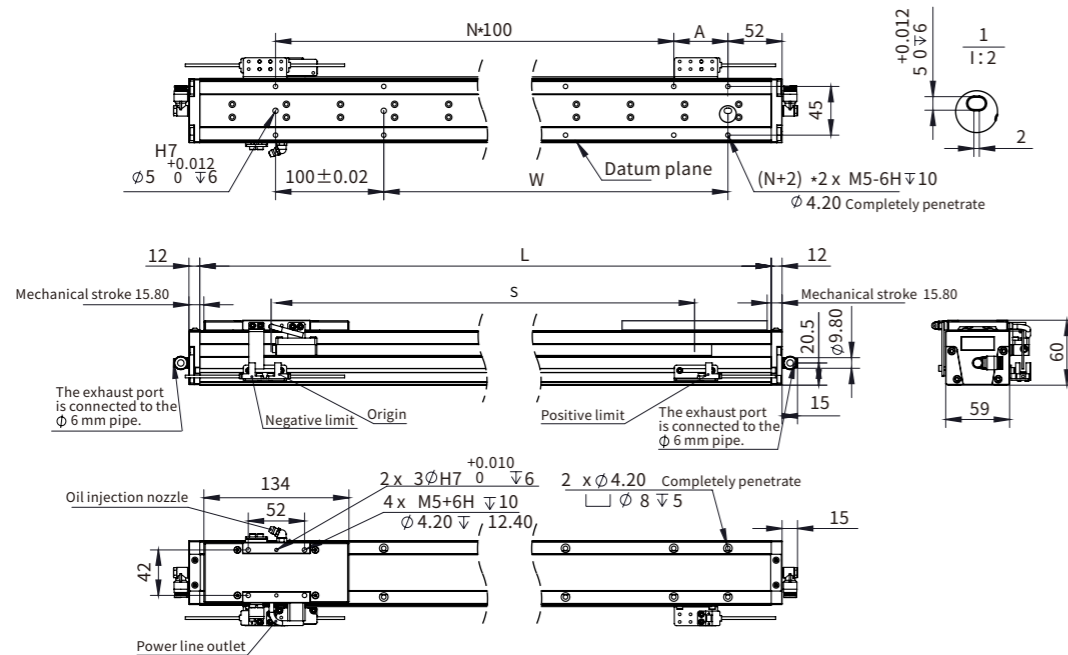
- Note 1: Driver model type.
- Note 2: The maximum speed is related to the back EMF of the motor and the resolution of the selected encoder.
- Note 3: The capability of a single motor at 25 °C.
- Note 4: The mass of parts such as load plate, slider, actuator, and reading head is included.
- Note 5: Feedback signal type.

Note 1: The mechanical stroke in the above table is the value of one slider. If n sliders are required, it is calculated as follows:  
Mechanical stroke = Base length (L) - n x Slide length - (n - 1) x 10 - 20. (n > 1)





## ● Dimensions of SWL-CZY-S1

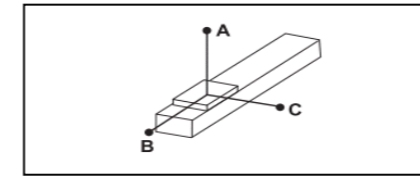


SWL-CZY-S1									
Valid travel stroke S(mm)	50	100	150	200	250	300	350	400	450
Base length L(mm)	210	260	310	360	410	460	510	560	610
A(mm)	25	75	25	75	25	75	25	75	25
N	1	1	2	2	3	3	4	4	5
W	25	75	125	175	225	275	325	375	425
Total length(mm)	234	284	334	384	434	484	534	584	634
Total mass(kg)	1.3	1.7	2.1	2.5	2.9	3.3	3.7	4.1	4.5

SWL-CZY-S1									
Valid travel stroke S(mm)	500	550	600	650	700	750	800	850	900
Base length L(mm)	660	710	760	810	860	910	960	1010	1060
A(mm)	75	25	75	25	75	25	75	25	75
N	5	6	6	7	7	8	8	9	9
W	475	525	575	625	675	725	775	825	875
Total length(mm)	684	734	784	834	884	934	984	1034	1084
Total mass(kg)	4.9	5.3	5.7	6.1	6.5	6.9	7.3	7.7	8.1

SWL-CZY-S1								
Valid travel stroke S(mm)	950	1000	1050	1100	1150	1200	1250	1300
Base length L(mm)	1110	1160	1210	1260	1310	1360	1410	1460
A(mm)	25	75	25	75	25	75	25	75
N	10	10	11	11	12	12	13	13
W	925	975	1025	1075	1125	1175	1225	1275
Total length(mm)	1134	1184	1234	1284	1334	1384	1434	1484
Total mass(kg)	8.5	8.9	9.3	9.7	10.1	10.5	10.9	11.3

## ● Allowable Moment

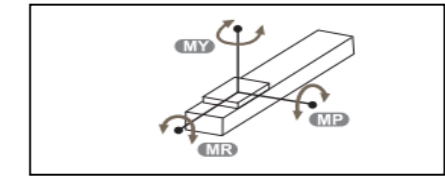


(Unit:mm)

Horizontal Installation				
STH5-CZY-S1	Load	A	B	C
	1kg	1200	902	1060
	3kg	620	301	353
	5kg	350	180	212

Note: The data in the table is calculated according to the acceleration of 1G

## ● Static Loading Moment



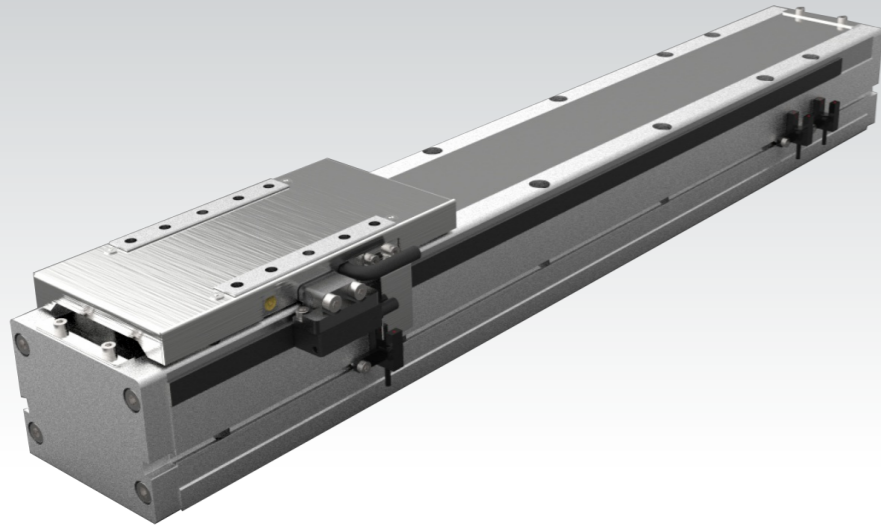
(Unit:N.m)

Static Loading Moment		
STH5-CZY-S1	MY	118
	MP	118
	MR	331

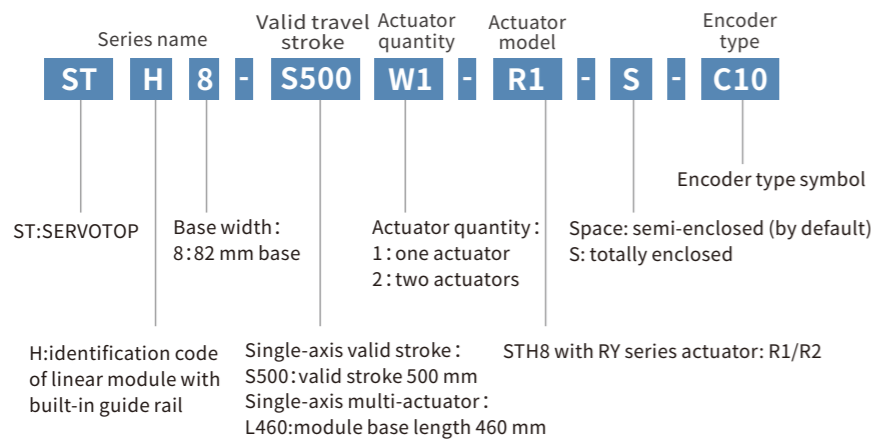
# STH8 series built-in linear motor stage

# STH8 series built-in linear motor stage

## STH8 series totally enclosed built-in linear motor stage



### STH8 series module naming convention



For example: Single-axis module, 600 mm travel stroke, one actuator, RY-S1, totally enclosed module named STH8-S600W1-R1-S;  
Single-axis module, 840 mm base length, two actuators, RY-S1, totally enclosed module named STH8-L840W2-R1-S.

- Note: 1. The STH8 bare metal module comes with three constantly closed photoelectric sensors. Its body is silver, its cable length 0.35 m, it is fully sealed with steel strip, and it is not equipped with any drag chain, driver, or extension line.
- 2. The STH8 series modules are equipped with the SERVOTOP encoder reading head and the SERVOTOP driver.
- 3. For driver models, refer to "ST Series Drivers" (P145 to P164).
- 4. For encoder models, refer to the "STH Encoder Symbol Table" (P09).
- 5. The cabling length of linear motor actuator and encoder reading head is 0.35 m.
- 6. For the model of the actuator extension line, refer to the "Power Extension Line Ordering Information" (P171).
- 7. For the model of the Encoder extension line, refer to the "Encoder Extension Line Ordering Information" (P167).

### Specifications

Model Parameter	SWL-RY series		
	SWL-RY-S1	SWL-RY-S2	
Driver*1	Pulse type	ST6-A030-B020	ST6-A030-B020
	Bus type	ST6-A030-E020	ST6-A030-E020
Resolution (um)	1	1	
Max. speed (m/s) *2	2	2	
Peak thrust (N) *3	200	316	
Continuous thrust (N) *3	84	108	
Continuous current (Arms)	3	2.5	
Peak current (Arms)	9	11.5	
Thrust constant(N/Arms)	28	38.5	
Back electromotive force(V/m/s)	23	3.16	
Motor constant(Nm/√w)	9.2	8.1	
Inductance (mH)	15	17	
Resistor(Ω)	3.4	6.1	
Electromagnetic attraction force(KN)	0.31	0.93	
Polar distance (N-S) (mm)	10	10	
Guide rail specification	Built-in double guide rails		
Straightness	±5um/300mm		
Motion part mass(kg) *4	1.2	1.5	
Repeatability (um) *5	±3 (Magnetic grating encoder)		

- Note 1: Driver model type.
- Note 2: The maximum speed is related to the back EMF of the motor and the resolution of the selected encoder.
- Note 3: The capability of a single motor at 25 °C.
- Note 4: The mass of parts such as load plate, slider, actuator, and reading head is included.
- Note 5: Feedback signal type.

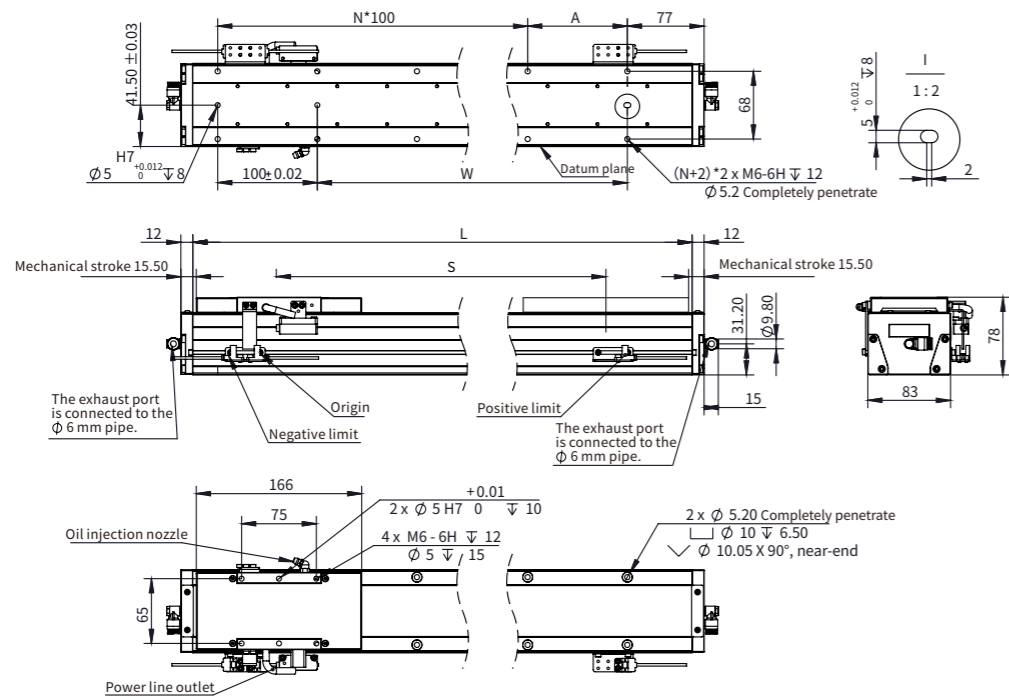
Item	Travel stroke between mechanical blocks(mm)*1	
	RY-S1	RY-S2
Base length L (mm)		
240	66	51
290	116	101
340	166	151
390	216	201
440	266	251
490	316	301
540	366	351
590	416	401
640	466	451
690	516	501
740	566	551
790	616	601
840	666	651
890	716	701
940	766	751
990	816	801
1040	866	851
1090	916	901
1140	966	951
1190	1016	1001
1240	1066	1051
1290	1116	1101
1340	1166	1151
1390	1216	1201
1440	1266	1251
1490	1316	1301

Note 1: The mechanical stroke in the above table is the value of one slider. If n sliders are required, it is calculated as follows:  
Mechanical stroke = Base length (L) - n x Slide length - (n - 1) x 10 - 20. (n > 1)



# ■ STH8 series built-in linear motor stage

## ● Dimensions of SWL-RY-S1



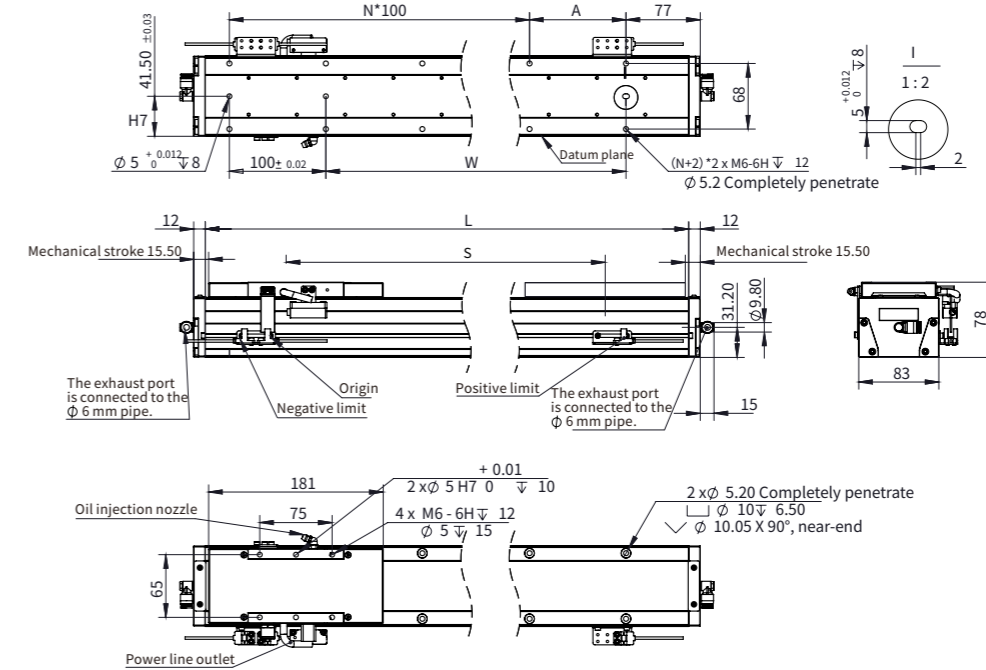
SWL-RY-S1									
Valid travel stroke S(mm)	50	100	150	200	250	300	350	400	450
Base length L(mm)	240	290	340	390	440	490	540	590	640
A(mm)	50	100	50	100	50	100	50	100	50
N	1	1	2	2	3	3	4	4	5
W	50	100	150	200	250	300	350	400	450
Total length(mm)	264	314	364	414	464	514	564	614	664
Total mass(kg)	1	1.7	2.4	3.1	3.8	4.5	5.2	5.9	6.6

SWL-RY-S1									
Valid travel stroke S(mm)	500	550	600	650	700	750	800	850	900
Base length L(mm)	690	740	790	840	890	940	990	1040	1090
A(mm)	100	50	100	50	100	50	100	50	100
N	5	6	6	7	7	8	8	9	9
W	500	550	600	650	700	750	800	850	900
Total length(mm)	714	764	814	864	914	964	1014	1064	1114
Total mass(kg)	7.3	8	8.7	9.4	10.1	10.8	11.5	12.2	12.9

SWL-RY-S1								
Valid travel stroke S(mm)	950	1000	1050	1100	1150	1200	1250	1300
Base length L(mm)	1140	1190	1240	1290	1340	1390	1440	1490
A(mm)	50	100	50	100	50	100	50	100
N	310	10	11	11	12	12	13	13
W	950	1000	1050	1100	1150	1200	1250	1300
Total length(mm)	1164	1214	1264	1314	1364	1414	1464	1514
Total mass(kg)	13.6	14.3	15	15.7	16.4	17.1	17.8	18.5

# ■ STH8 series built-in linear motor stage

## ● Dimensions of SWL-RY-S2



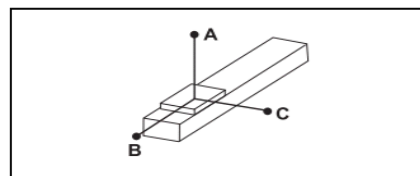
SWL-RY-S2									
Valid travel stroke S(mm)	35	85	135	185	235	285	335	385	435
Base length L(mm)	240	290	340	390	440	490	540	590	640
A(mm)	50	100	50	100	50	100	50	100	50
N	1	1	2	2	3	3	4	4	5
W	50	100	150	200	250	300	350	400	450
Total length(mm)	264	314	364	414	464	514	564	614	664
Total mass(kg)	3.5	4.2	4.9	5.6	6.3	7	7.7	8.4	9.1

SWL-RY-S2									
Valid travel stroke S(mm)	485	535	585	635	685	735	785	835	885
Base length L(mm)	690	740	790	840	890	940	990	1040	1090
A(mm)	100	50	100	50	100	50	100	50	100
N	5	6	6	7	7	8	8	9	9
W	500	550	600	650	700	750	800	850	900
Total length(mm)	714	764	814	864	914	964	1014	1064	1114
Total mass(kg)	9.8	10.5	11.2	11.9	12.6	13.3	14	14.7	15.4

SWL-RY-S2								
Valid travel stroke S(mm)	935	985	1035	1085	1135	1185	1235	1285
Base length L(mm)	1140	1190	1240	1290	1340	1390	1440	1490
A(mm)	50	100	50	100	50	100	50	100
N	10	10	11	11	12	12	13	13
W	950	1000	1050	1100	1150	1200	1250	1300
Total length(mm)	1164	1214	1264	1314	1364	1414	1464	1514
Total mass(kg)	16.1	16.8	17.5	18.2	18.9	19.6	20.3	21

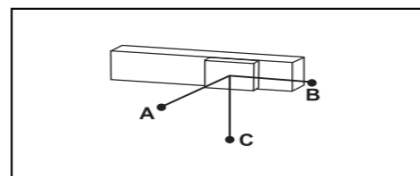
# STH8 series built-in linear motor stage

## ● Allowable Moment



(Unit:mm)

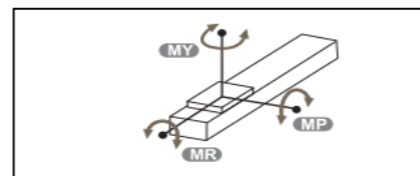
Horizontal Installation				
	Load	A	B	C
STH8-RY-S1	3kg	1500	414	526
	5kg	800	248	315
	10kg	420	124	158
STH8-RY-S2	5kg	1600	1454	1173
	10kg	1200	436	352
	15kg	900	291	235



(Unit:mm)

Wall Installation				
	Load	A	B	C
STH8-RY-S1	3kg	986	1175	986
	5kg	591	705	591
	10kg	296	353	296
STH8-RY-S2	5kg	704	1454	1173
	10kg	352	436	352
	15kg	235	291	235

## ● Static Loading Moment



(Unit:N.m)

Static Loading Moment		
STH8-RY-S1	MY	336
	MP	336
	MR	621
STH8-RY-S2	MY	352
	MP	352
	MR	739

Note: The data in the table is calculated according to the acceleration of 1G

## MEMO

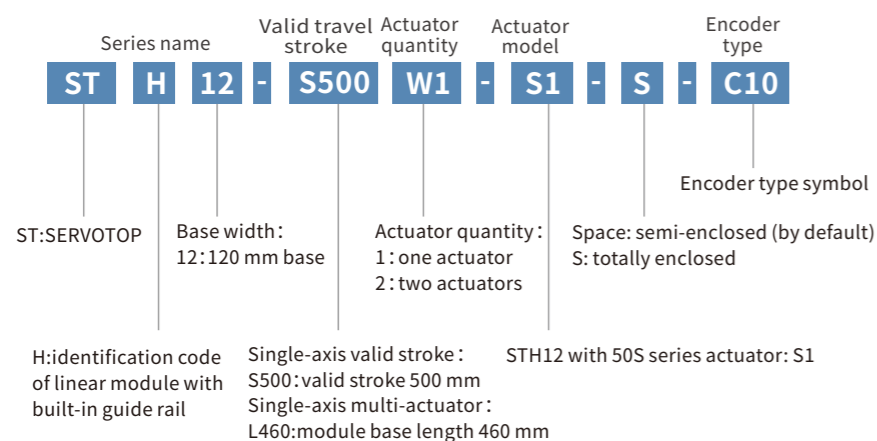
# STH12 series built-in linear motor stage

# STH12 series built-in linear motor stage

## STH12 series totally enclosed built-in linear motor stage



### STH12 series module naming convention



For example: Single-axis module, 600 mm travel stroke, one actuator, 50S-S1, totally enclosed module named STH12-S600W1-S1-S;  
Single-axis module, 850 mm base length, two actuators, 50S-S1, totally enclosed module named STH12-L850W2-S1-S.

- Note: 1. The STH12 bare metal module comes with three constantly closed photoelectric sensors. Its body is silver, its cable length 0.35 m, it is fully sealed with steel strip, and it is not equipped with any drag chain, driver, or extension line.
- 2. The STH12 series modules are equipped with the SERVOTOP encoder reading head and the SERVOTOP driver.
- 3. For driver models, refer to "ST Series Drivers" (P145 to P164).
- 4. For encoder models, refer to the "STH Encoder Symbol Table" (P09).
- 5. The cabling length of linear motor actuator and encoder reading head is 0.35 m.
- 6. For the model of the actuator extension line, refer to the "Power Extension Line Ordering Information" (P171).
- 7. For the model of the Encoder extension line, refer to the "Encoder Extension Line Ordering Information" (P167).

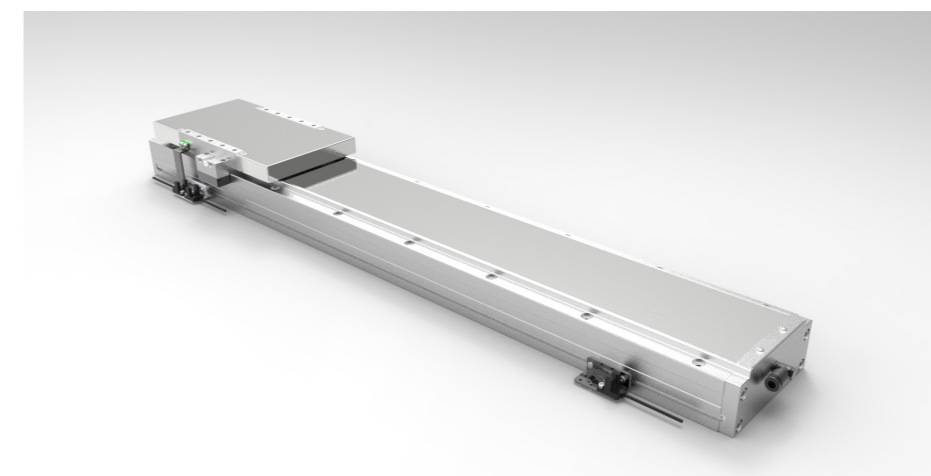
### Specifications

Model Parameter		SWL-50S-S1
Driver*1	Pulse type	ST6-A060-B020
	Bus type	ST6-A060-E020
Resolution (um)		1
Max. speed (m/s) *2		2
Peak thrust (N) *3		300
Continuous thrust (N) *3		150
Continuous current (Arms)		4.5
Peak current (Arms)		9
Thrust constant(N/Arms)		33.3
Back electromotive force(V/m/s)		27.3
Motor constant(Nm/√w)		16.2
Inductance (mH)		17
Resistor(Ω)		4.1
Electromagnetic attraction force(KN)		0.65
Polar distance (N-S) (mm)		16
Guide rail specification		Built-in double guide rails
Straightness		±5um/300mm
Motion part mass(kg) *4		2.3
Repeatability (um) *5		±3 (Magnetic grating encoder)

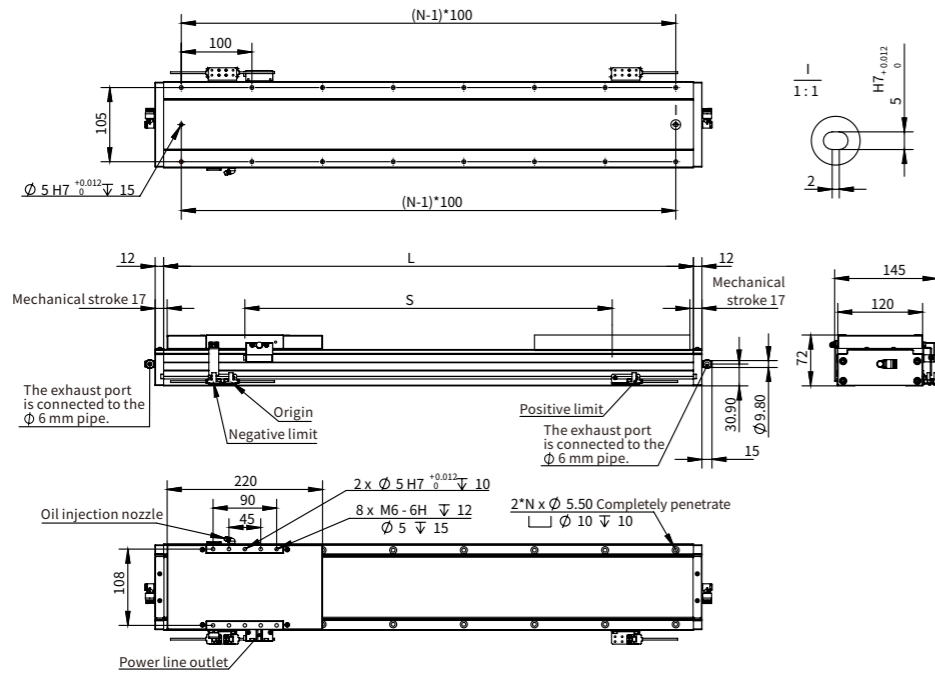
- Note 1: Driver model type.
- Note 2: The maximum speed is related to the back EMF of the motor and the resolution of the selected encoder.
- Note 3: The capability of a single motor at 25 °C.
- Note 4: The mass of parts such as load plate, slider, actuator, and reading head is included.
- Note 5: Feedback signal type.

Base length (mm)	Travel stroke between mechanical blocks(mm)*1
300	70
350	120
400	170
450	220
500	270
550	320
600	370
650	420
700	470
750	520
800	570
850	620
900	670
950	720
1000	770
1050	820
1100	870
1150	920
1200	970
1250	1020
1300	1070
1350	1120
1400	1170
1450	1220

Note 1: The mechanical stroke in the above table is the value of one slider. If n sliders are required, it is calculated as follows:  
Mechanical stroke = Base length (L) - n x Slide length - (n - 1) x 10 - 20. (n > 1)



## ● Dimensions of SWL-50S-S1

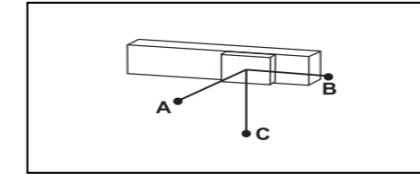
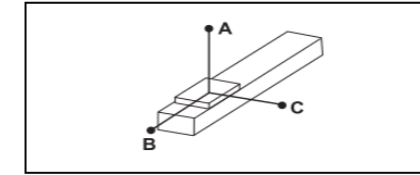


SWL-50S-S1									
Valid travel stroke S(mm)	50	100	150	200	250	300	350	400	450
Base length L (mm)	300	350	400	450	500	550	600	650	700
N	3	4	4	5	5	6	6	7	7
Total length (mm)	324	374	424	474	524	574	624	674	724
Total mass (kg)	3.2	3.9	4.6	5.3	6	6.7	7.4	8.1	8.8

SWL-50S-S1									
Valid travel stroke S(mm)	500	550	600	650	700	750	800	850	900
Base length L (mm)	750	800	850	900	950	1000	1050	1100	1150
N	8	8	9	9	10	10	11	11	12
Total length (mm)	774	824	874	924	974	1024	1074	1124	1174
Total mass (kg)	9.5	10.2	10.9	11.6	12.3	13	13.7	14.4	15.1

SWL-50S-S1						
Valid travel stroke S(mm)	950	1000	1050	1100	1150	1200
Base length L (mm)	1200	1250	1300	1350	1400	1450
N	12	13	13	14	14	15
Total length (mm)	1224	1274	1324	1374	1424	1474
Total mass (kg)	15.8	16.5	17.2	17.9	18.6	19.3

## ● Allowable Moment



(Unit:mm)

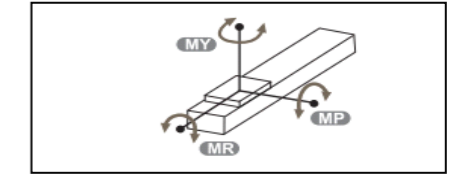
(Unit:mm)

Horizontal Installation				
STH12-50S-S1	Load	A	B	C
	8kg	3000	2600	2533
	15kg	2800	520	507
	20kg	1000	390	380

Wall Installation				
STH12-50S-S1	Load	A	B	C
	8kg	950	2600	2533
	15kg	507	520	507
	20kg	380	390	380

Note: The data in the table is calculated according to the acceleration of 1G

## ● Static Loading Moment



(Unit:N.m)

Static Loading Moment		
STH12-50S-S1	MY	630
	MP	630
	MR	1590

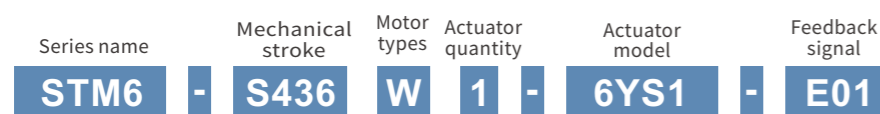
# STM6 series linear motor stage

# STM6 series linear motor stage

## STM6 series micro-rail linear motor stage



### STM6 series module naming convention



STM6: SERVOTOP adopts the identification code of the linear module using the standard guide rail with the base width of 60 mm.

W: flat-plate iron core motor

6YS1: SWL-6Y-S1  
6YS2: SWL-6Y-S2

Single-axis Mechanical stroke  
S436: Mechanical stroke 436mm

Actuator quantity:  
1: one actuator  
2: two actuators

Feedback signal type  
No labeling: indicates that the SERVOTOP 1 um communication reading head is not equipped.  
E01: indicates that the SERVOTOP 1 um ABZ reading head is equipped.

- Note: 1. The STM6 bare metal module comes with three constantly closed photoelectric sensors. Its body is silver, its cable length 0.35 m, it is fully sealed with steel strip, and it is not equipped with any drag chain, driver.  
2. The STM6 series modules are equipped with the SERVOTOP encoder reading head and the SERVOTOP driver.  
3. For driver models, refer to "ST Series Drivers" (P145 to P164).  
4. For encoder models, refer to the "STH Encoder Symbol Table" (P08).  
5. The cabling length of linear motor actuator and encoder reading head is 0.35 m.  
6. For the model of the actuator extension line, refer to the "Power Extension Line Ordering Information" (P171).

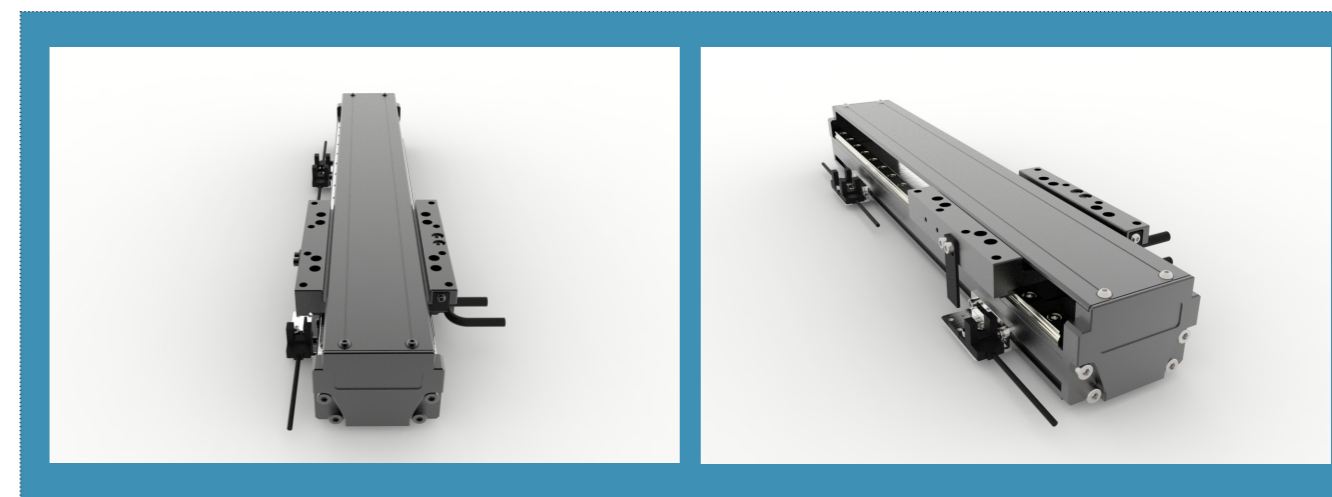
### Specifications

Model Parameter		SWL-6Y	
		6Y-S1	6Y-S2
Driver*1	Pulse type	ST6-A030-B020	
	Bus type	ST6-A030-E020	
Resolution (um)		1	1
Max. speed (m/s) *2		1	1
Peak thrust (N) *3		135	270
Continuous thrust (N) *3		42	84
Max. Load(kg)*4		5	10
Continuous current (Arms)		2.5	2.5
Peak current (Arms)		11.5	11.5
Thrust constant(N/Arms)		14	30
Back electromotive force(V/m/s)		11.5	23
Motor constant(Nm/√w)		5.8	7.9
Inductance (mH)		7.2	18
Resistor(Ω)		3.5	6.5
Electromagnetic attraction force(KN)		0.11	0.22
Polar distance(N-S)(mm)		10	10
Guide rail specification		9mm mini linear guide rail	
Sliders quantity		4	4
Motion part mass(kg) *5		0.86	1.13
Repeatability (um) *6		± 3 (Magnetic grating encoder)	

Item	Travel stroke between mechanical blocks(mm)*1	
	6Y-S1	6Y-S2
Base length L (mm)		
200	86	/
250	136	57
350	236	157
450	336	257
550	436	357
650	536	457

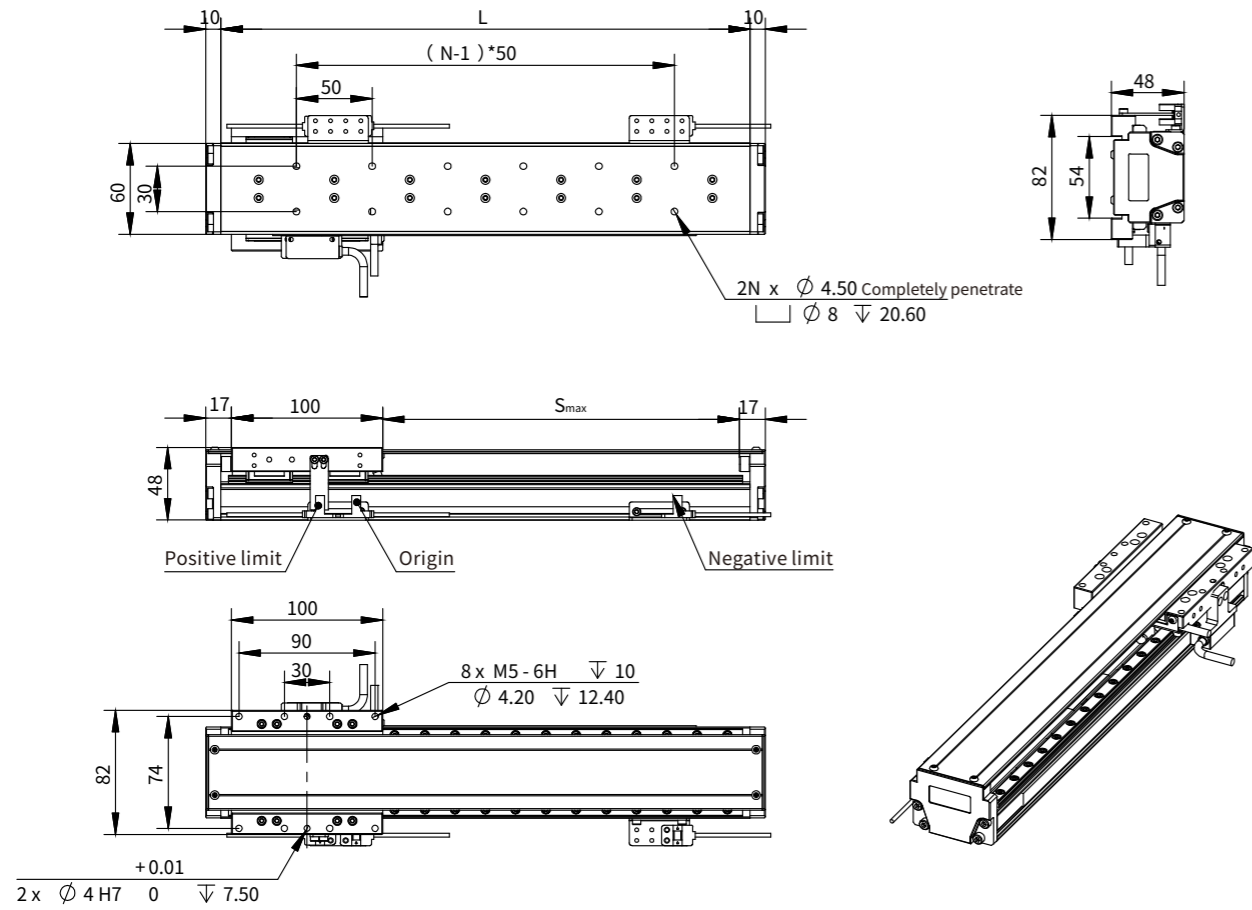
Note 1: The mechanical stroke in the above table is the value of one slider. If n sliders are required, it is calculated as follows:  
Mechanical stroke = Base length (L) - n x Slide length - (n - 1) x 10 - 20. (n > 1)

- Note 1: Driver model type.  
Note 2: The maximum speed is related to the back EMF of the motor and the resolution of the selected encoder.  
Note 3: The capability of a single motor at 25 °C.  
Note 4: The maximum load is a theoretical value in horizontal placement when the acceleration is 1G, the pause interval is 0.5s, and the speed is 1000 mm/s, which is used for reference only. The actual load is affected by various factors, such as the motion speed, acceleration, thrust, and load installation mode.  
Note 5: The mass of parts such as load plate, slider, actuator, and reading head is included.  
Note 6: Feedback signal type.



# STM6 series linear motor stage

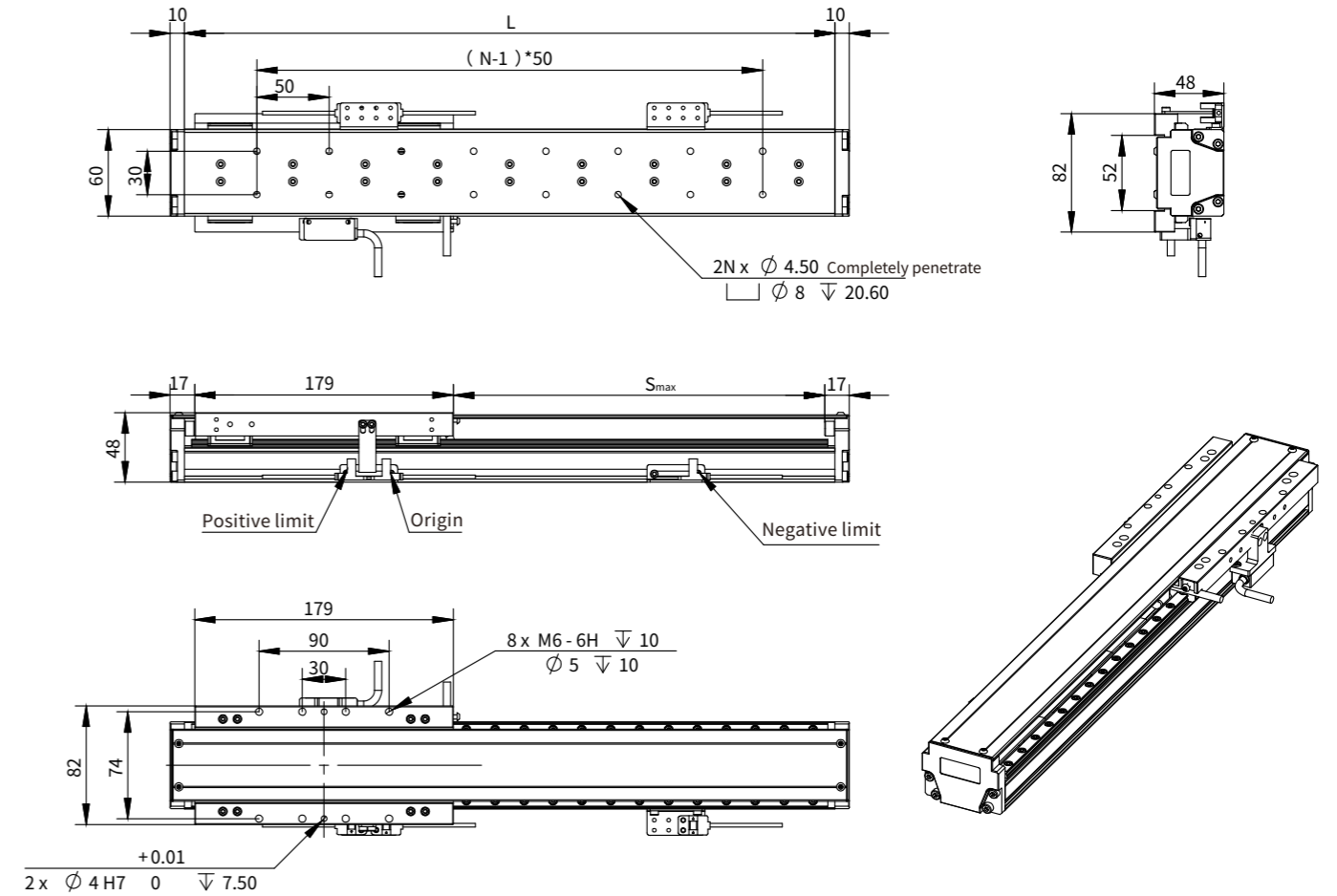
## Dimensions of 6Y-S1



6Y-S1						
Mechanical stroke $S_{max}$ (mm)	86	136	236	336	436	536
Base length L(mm)	200	250	350	450	550	650
N	3	4	6	8	10	12
Total length (mm)	220	270	370	470	570	670
Total mass (kg)	2.65	3.09	3.53	3.97	4.41	4.85

# STM6 series linear motor stage

## Dimensions of 6Y-S2



6Y-S2						
Mechanical stroke $S_{max}$ (mm)	/	57	157	257	357	457
Base length L(mm)	200	250	350	450	550	650
N	/	4	6	8	10	12
Total length (mm)	/	270	370	470	570	670
Total mass (kg)	/	3.39	3.83	4.27	4.71	5.15

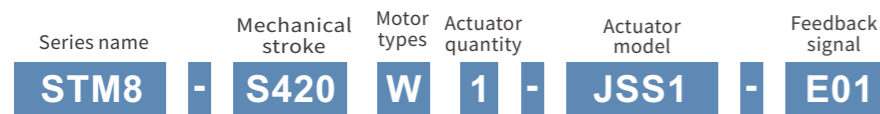


# STM8 series linear motor stage

# STM8 series linear motor stage



## STM8 series module naming convention



**STM8:** SERVOTOP adopts the identification code of the linear module using the standard guide rail with the base width of 60 mm.

**W:** flat-plate iron core motor

**JSS1:** SWL-JS-S1  
**JSS2:** SWL-JS-S2

**Single-axis Mechanical stroke**  
S420: Mechanical stroke 420mm

**Actuator quantity:**  
1: one actuator  
2: two actuators

**Feedback signal type**  
No labeling: indicates that the SERVOTOP 1 um communication reading head is not equipped.  
E01: indicates that the SERVOTOP 1 um ABZ reading head is equipped.

- Note: 1. The STM8 bare metal module comes with three constantly closed photoelectric sensors. Its body is silver, its cable length 0.35 m, it is fully sealed with steel strip, and it is not equipped with any drag chain, driver.  
2. The STM8 series modules are equipped with the SERVOTOP encoder reading head and the SERVOTOP driver.  
3. For driver models, refer to "ST Series Drivers" (P145 to P164).  
4. For encoder models, refer to the "STH Encoder Symbol Table" (P08).  
5. The cabling length of linear motor actuator and encoder reading head is 0.35 m.  
6. For the model of the actuator extension line, refer to the "Power Extension Line Ordering Information" (P171).

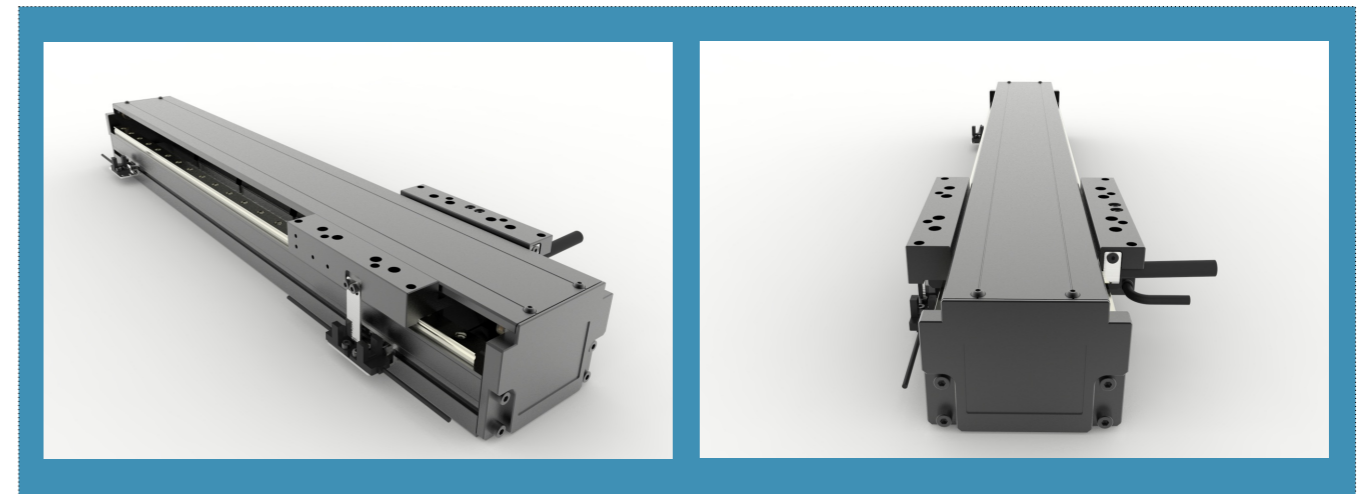
## Specifications

Model Parameter		SWL-JS	
		JS-S1	JS-S2
Driver*1	Pulse type	ST6-A030-B020	
	Bus type	ST6-A030-E020	
Resolution (um)		1	1
Max. speed (m/s) *2		1.5	1.5
Peak thrust (N) *3		142	282
Continuous thrust (N) *3		71	141
Max. Load(kg)*4		7	14
Continuous current (Arms)		3	3
Peak current (Arms)		6	6
Thrust constant(N/Arms)		23.7	47
Back electromotive force(V/m/s)		19.5	38.5
Motor constant(Nm/√w)		8.4	11.8
Inductance (mH)		11.5	17
Resistor(Ω)		1.4	2.7
Electromagnetic attraction force(KN)		0.48	1.06
Polar distance(N-S)(mm)		16	16
Guide rail specification		12 mm guide rail (double guide rails)	
Sliders quantity		4	4
Motion part mass(kg) *5		1.21	2.31
Repeatability (um) *6		± 3 (Magnetic grating encoder)	

Item	Travel stroke between mechanical blocks(mm)*1	
	JS-S1	JS-S2
Base length L (mm)		
344	220	120
444	320	220
544	420	320
644	520	420
744	620	520
844	720	620
944	820	720
1044	920	820

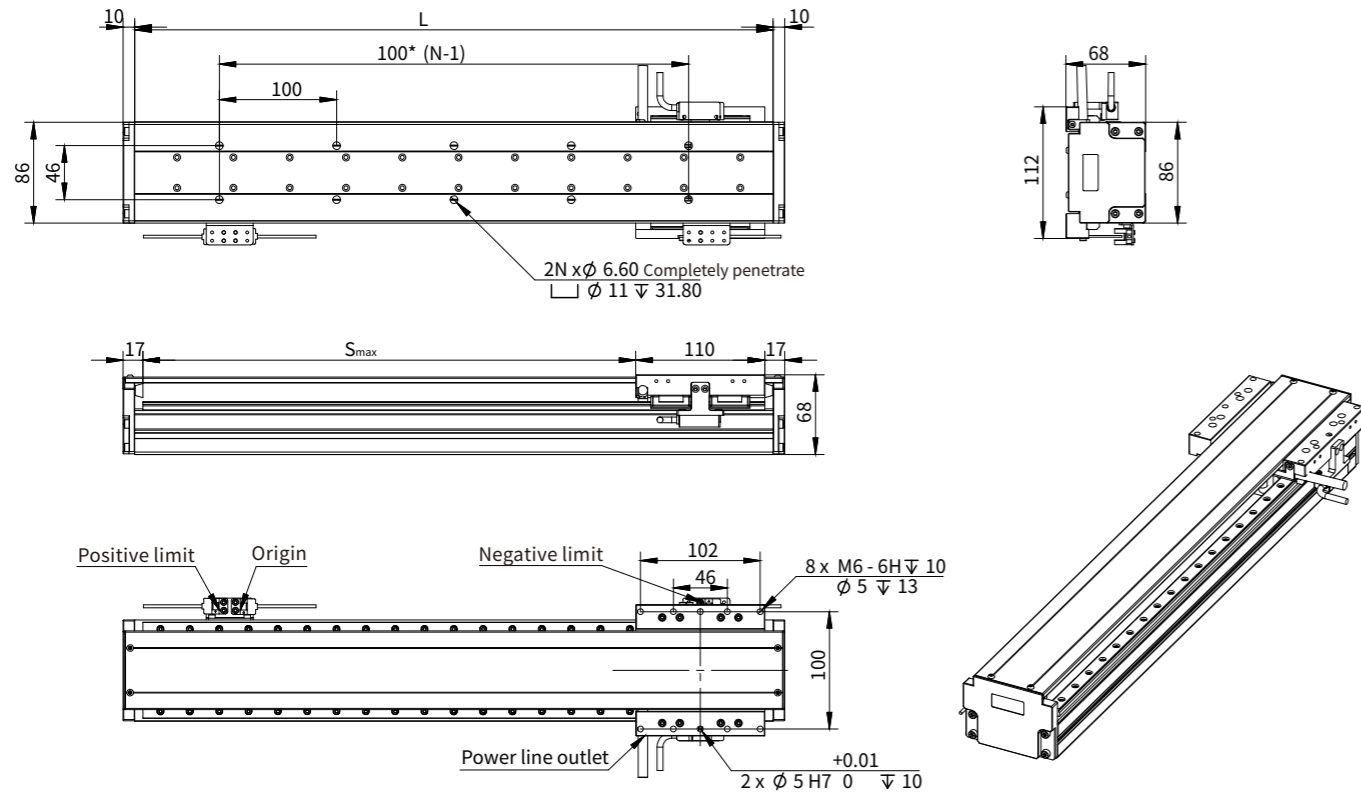
Note 1: The mechanical stroke in the above table is the value of one slider. If n sliders are required, it is calculated as follows:  
Mechanical stroke = Base length (L) - n x Slide length - (n - 1) x 10 - 20. (n > 1)

- Note 1: Driver model type.  
Note 2: The maximum speed is related to the back EMF of the motor and the resolution of the selected encoder.  
Note 3: The capability of a single motor at 25 °C.  
Note 4: The maximum load is a theoretical value in horizontal placement when the acceleration is 1G, the pause interval is 0.5s, and the speed is 1000 mm/s, which is used for reference only. The actual load is affected by various factors, such as the motion speed, acceleration, thrust, and load installation mode.  
Note 5: The mass of parts such as load plate, slider, actuator, and reading head is included.  
Note 6: Feedback signal type.



# STM8 series linear motor stage

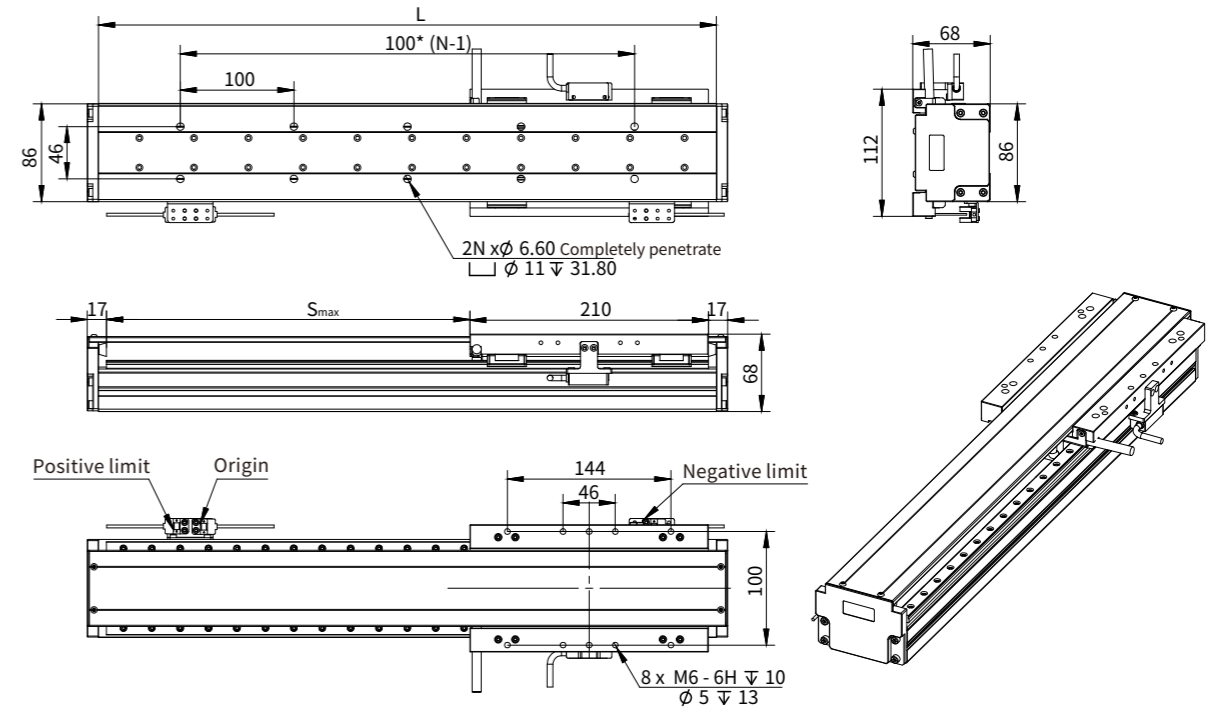
## ● Dimensions of JS-S1



JS-S1								
Mechanical stroke $S_{max}$ (mm)	220	320	420	520	620	720	820	920
Base length L (mm)	344	444	544	644	744	844	944	1044
N	3	4	5	6	7	8	9	10
Total length (mm)	364	464	564	664	764	864	964	1064
Total mass (kg)	4.17	4.81	5.45	6.09	6.73	7.37	8.01	8.65

# STM8 series linear motor stage

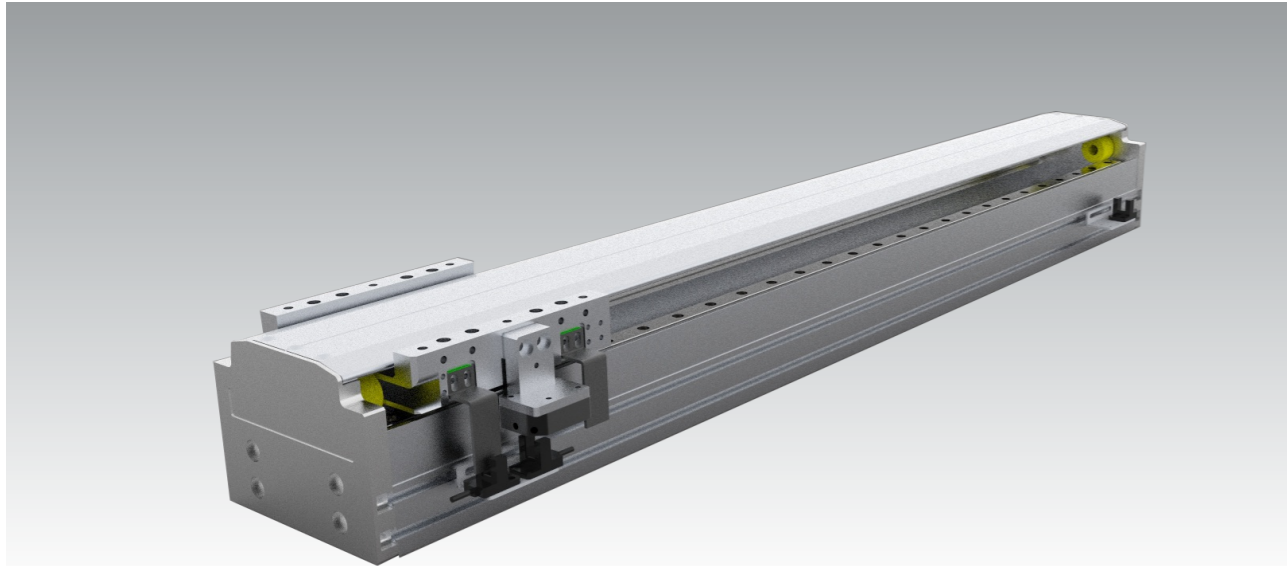
## ● Dimensions of JS-S2



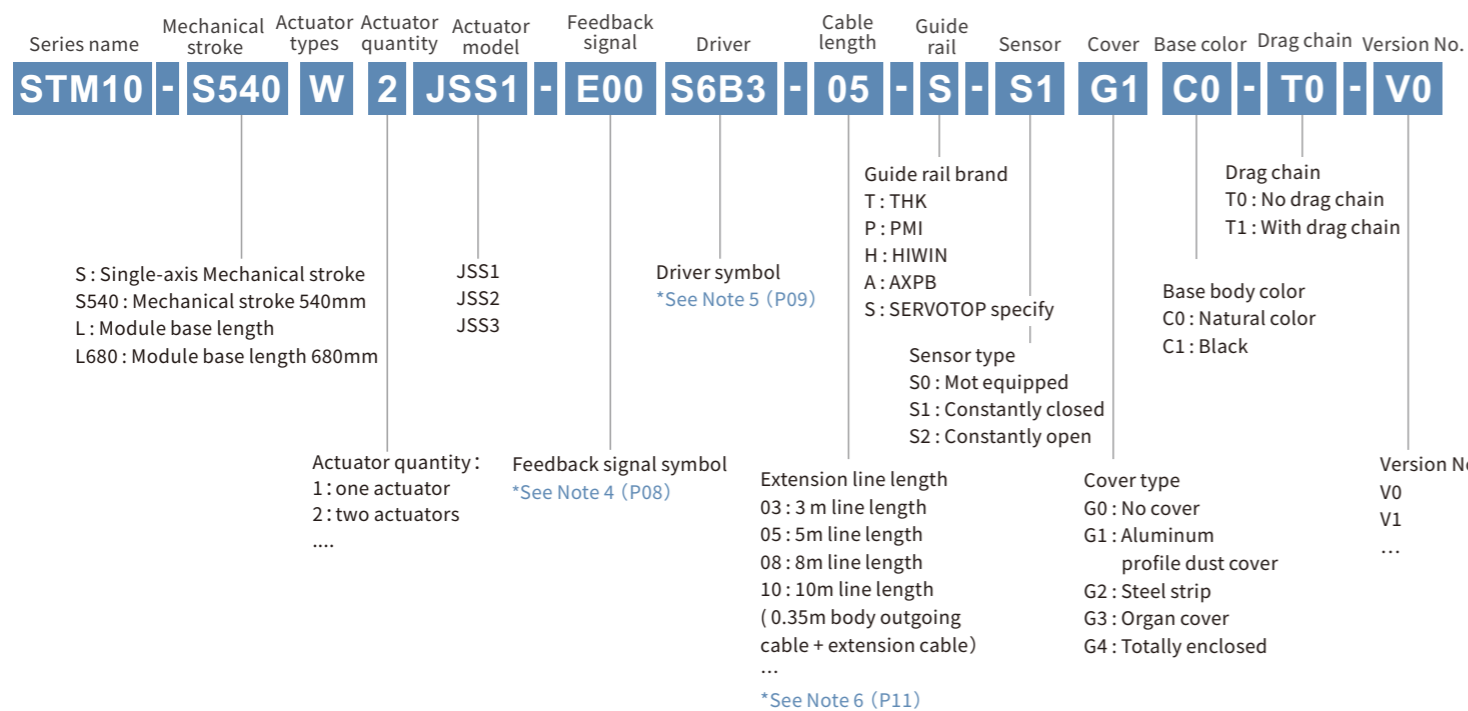
JS-S2								
Mechanical stroke $S_{max}$ (mm)	120	220	320	420	520	620	720	820
Base length L (mm)	344	444	544	644	744	844	944	1044
N	3	4	5	6	7	8	9	10
Total length (mm)	364	464	564	664	764	864	964	1064
Total mass (kg)	4.54	5.18	5.82	6.46	7.1	7.74	8.38	9.02

# STM10 series linear motor stage

# STM10 series linear motor stage



## STM10 series module naming convention



Example: STM10-L1160W2-JSS1-E00GA3-05-T-S1G1C0-T0-V0, indicating :the 100 series base and cover, total base length 1160 mm, two SWL-JS-S1 actuators, 1 um magnetic grating reading head, Servotronic 3 A pulse driver, THK guide rail, constantly closed sensor, aluminum dust cover, base in natural color, no drag chain, and version number V0.

## Specifications

Model Parameter	SWL-JS		
	SWL-JS-S1	SWL-JS-S2	SWL-JS-S3
Driver*1	Pulse type	ST6-A060-B020	
	Bus type	ST6-A060-E020	
Resolution (um) [Max. speed(m/s)]	Digital quantity: 0.5um[2.4m/s], 1um[3.2m/s], Simulated quantity:[5m/s]		
Max. speed (m/s) *2	5	5	5
Peak thrust (N) *3	142	282	425
Continuous thrust (N) *3	71	141	212
Max. Load(kg)*4	9	18	27
Continuous current(Arms)	3	3	4.5
Peak current(Arms)	11.5	11.5	11.5
Thrust constant (N/Arms)	23.7	47	47.1
Back electromotive force (V/m/s)	19.5	38.5	38.6
Motor constant (Nm/√w)	8.4	11.8	14.5
Inductance (mH)	11.5	17	41
Resistor (Ω)	1.4	2.7	3.6
Electromagnetic attraction force (KN)	0.48	1.06	1.63
Polar distance (N-S)(mm)	16	16	16
Actuator mass (Kg)	0.7	1.3	2.2
Stator mass (Kg/m)	3	3	3
Guide rail specification and quantity	Specification: 12; Quantity: 2		
Sliders quantity	4	4	4
Motion part mass(kg) *5	1.4	2.3	3.7
Repeatability (um) *6	± 1 (Optical grating encoder) / ± 3 (Magnetic grating encoder)		

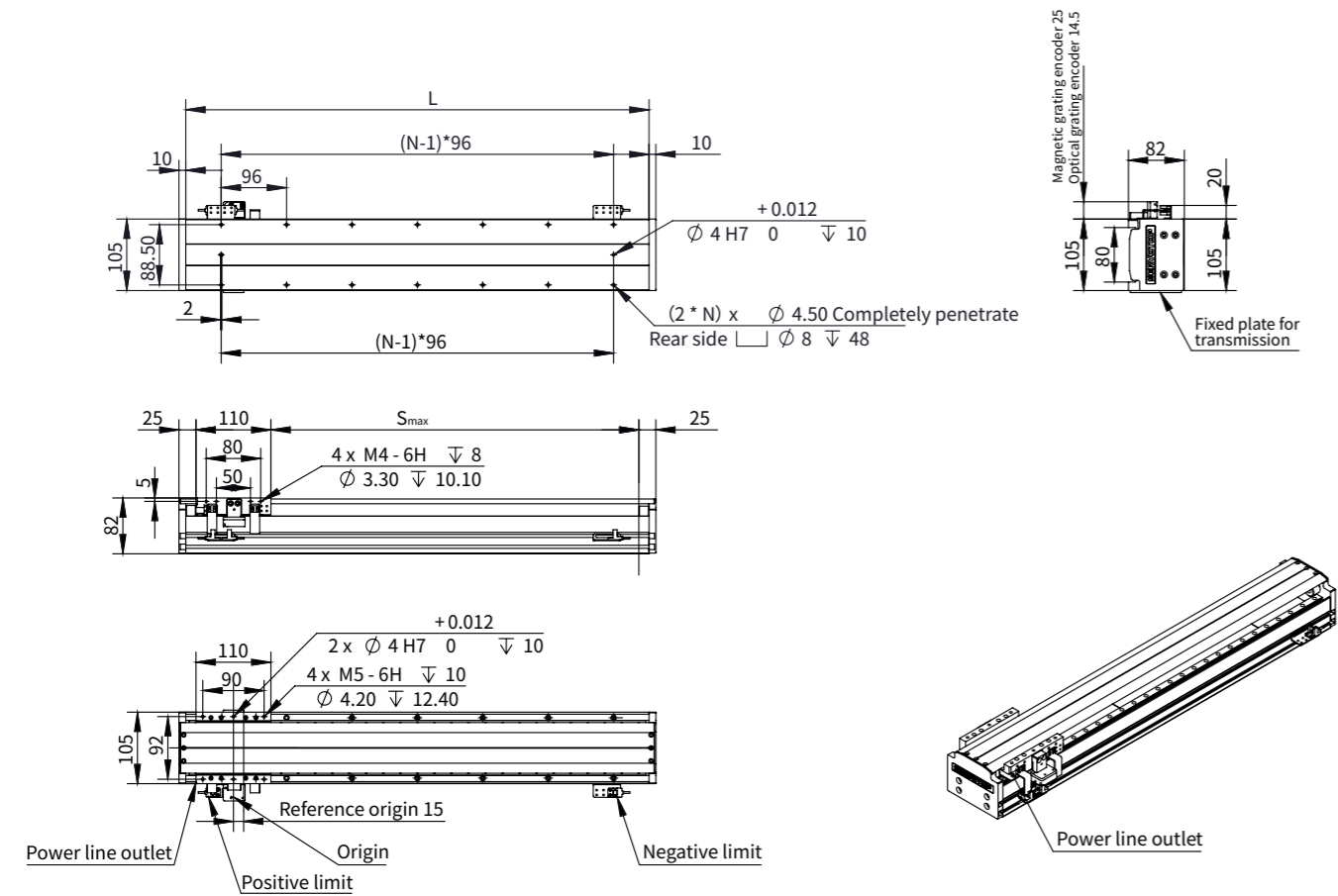
Item	Travel stroke between mechanical blocks(mm)*1		
	JS-S1	JS-S2	JS-S3
Base length L (mm)			
200	60	/	/
296	156	56	/
392	252	152	52
488	348	248	148
584	444	344	244
680	540	440	340
776	636	536	436
872	732	632	532
968	828	728	628
1064	924	824	724
1160	1020	920	820
1256	1116	1016	916
1352	1212	1112	1012
1448	1308	1208	1108
1544	1404	1304	1204
1640	1500	1400	1300
1736	1596	1496	1396
1832	1692	1592	1492
1928	1788	1688	1588
2024	1884	1784	1684

Note 1: The mechanical stroke in the above table is the value of one slider. If n sliders are required, it is calculated as follows:  
Mechanical stroke = Base length (L) - n x Slide length - (n - 1) x 10 - 20. (n > 1)

- Note 1: Driver model type.
- Note 2: The maximum speed is related to the back EMF of the motor and the resolution of the selected encoder.
- Note 3: The capability of a single motor at 25 °C.
- Note 4: The maximum load is a theoretical value in horizontal placement when the acceleration is 1G, the pause interval is 0.5s, and the speed is 1000 mm/s, which is used for reference only. The actual load is affected by various factors, such as the motion speed, acceleration, thrust, and load installation mode.
- Note 5: The mass of parts such as load plate, slider, actuator, and reading head is included.
- Note 6: Feedback signal type.

# STM10 series linear motor stage

## ● Dimensions of SWL-JS-S1

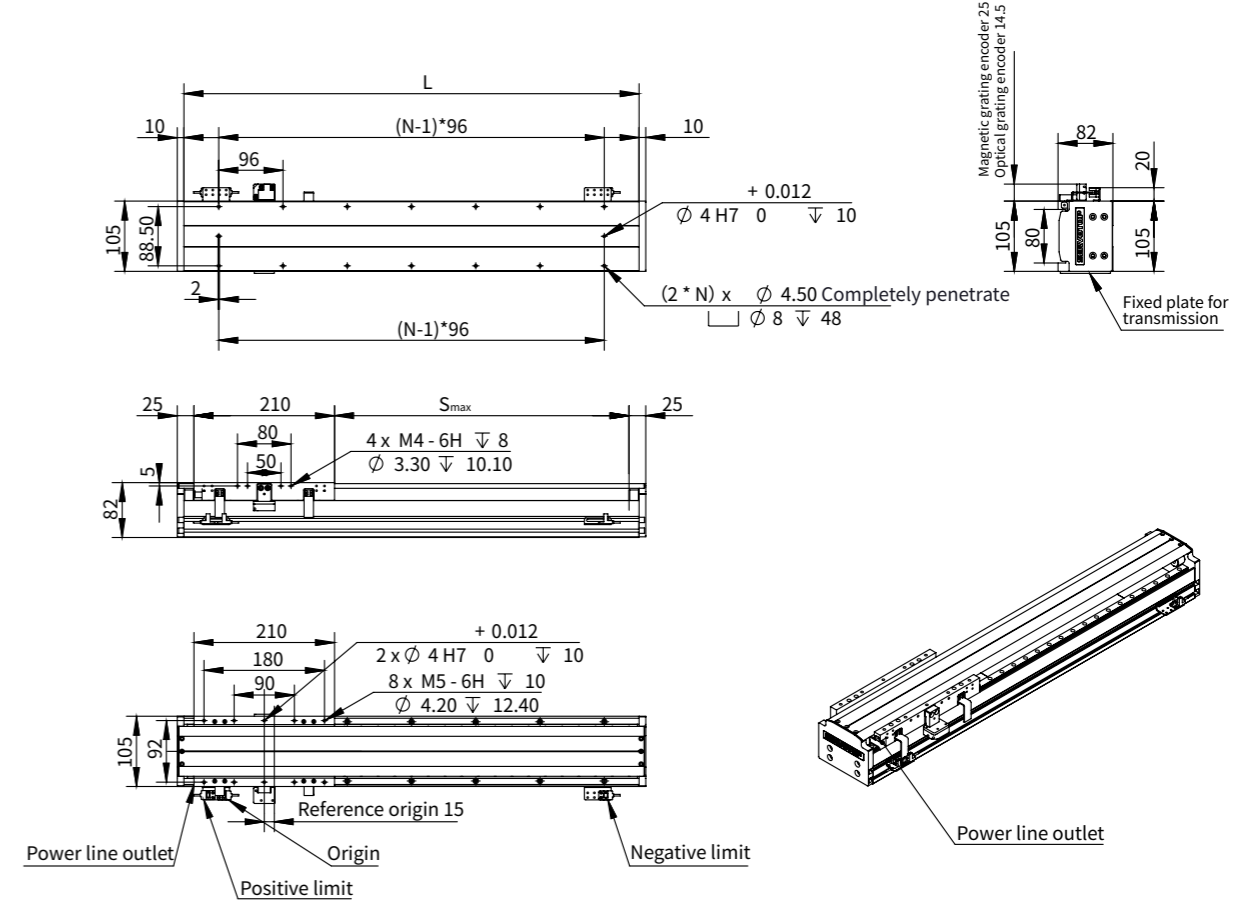


SWL-JS-S1										
Mechanical stroke $S_{max}$ (mm)	60	156	252	348	444	540	636	732	828	924
Base length L (mm)	200	296	392	488	584	680	776	872	968	1064
N	2	3	4	5	6	7	8	9	10	11
Total length (mm)	220	316	412	508	604	700	796	892	988	1084
Total mass (kg)	3.75	4.85	5.95	7.05	8.15	9.25	10.35	11.45	12.55	13.65

Mechanical stroke $S_{max}$ (mm)	1020	1116	1212	1308	1404	1500	1596	1692	1788	1884
Base length L (mm)	1160	1256	1352	1448	1544	1640	1736	1832	1928	2024
N	12	13	14	15	16	17	18	19	20	21
Total length (mm)	1180	1276	1372	1468	1564	1660	1756	1852	1948	2044
Total mass (kg)	14.75	15.85	16.95	18.05	19.15	20.25	21.35	22.45	23.55	24.65

# STM10 series linear motor stage

## ● Dimensions of SWL-JS-S2

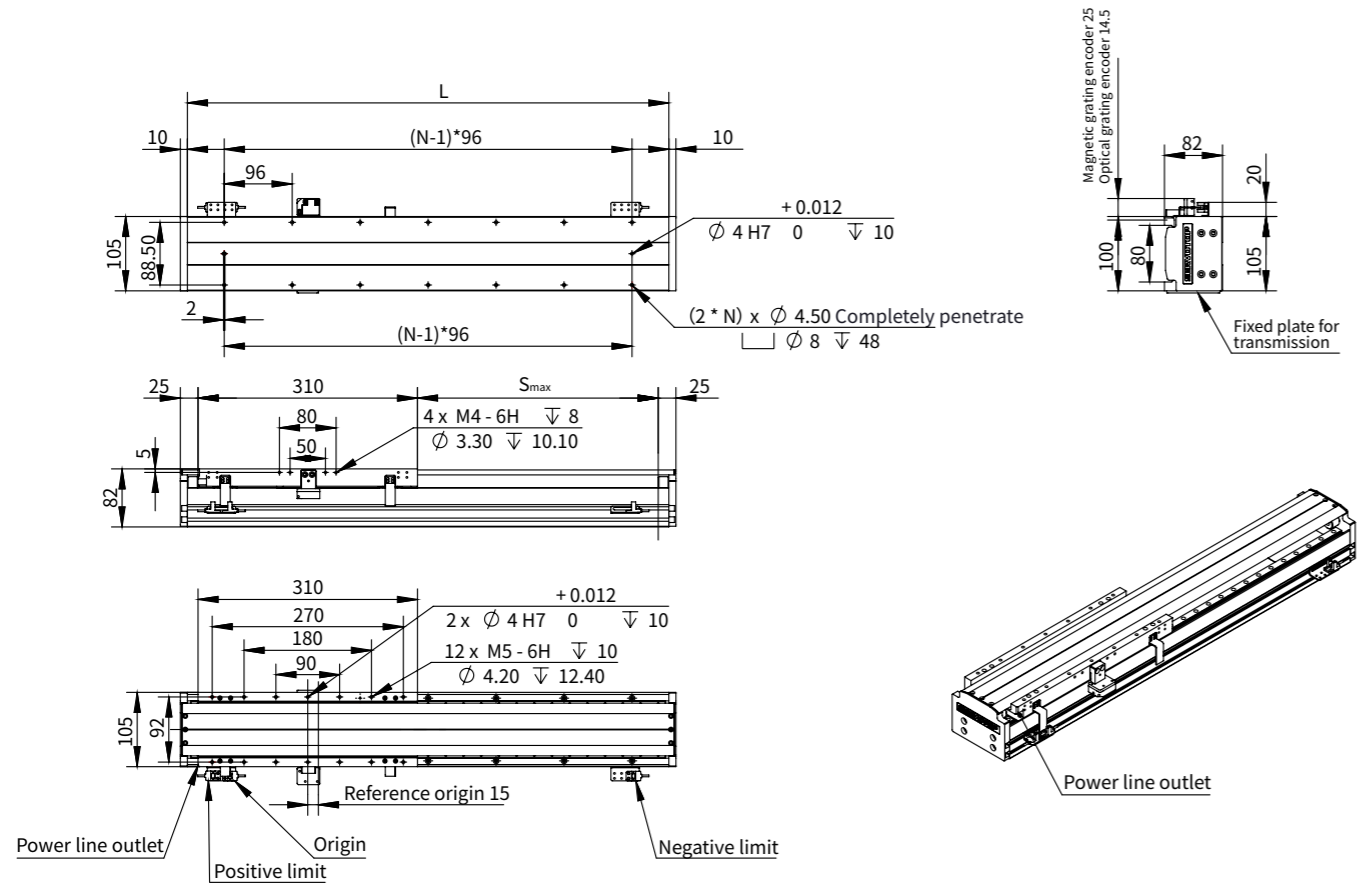


SWL-JS-S2										
Mechanical stroke $S_{max}$ (mm)	/	56	152	248	344	440	536	632	728	824
Base length L (mm)	200	296	392	488	584	680	776	872	968	1064
N	/	3	4	5	6	7	8	9	10	11
Total length (mm)	/	316	412	508	604	700	796	892	988	1084
Total mass (kg)	/	5.85	6.95	8.05	9.15	10.25	11.35	12.45	13.55	14.65

Mechanical stroke $S_{max}$ (mm)	920	1016	1112	1208	1304	1400	1496	1592	1688	1784
Base length L (mm)	1160	1256	1352	1448	1544	1640	1736	1832	1928	2024
N	12	13	14	15	16	17	18	19	20	21
Total length (mm)	1180	1276	1372	1468	1564	1660	1756	1852	1948	2044
Total mass (kg)	15.75	16.85	17.95	19.05	20.15	21.25	22.35	23.45	24.55	25.65

# STM10 series linear motor stage

## ● Dimensions of SWL-JS-S3



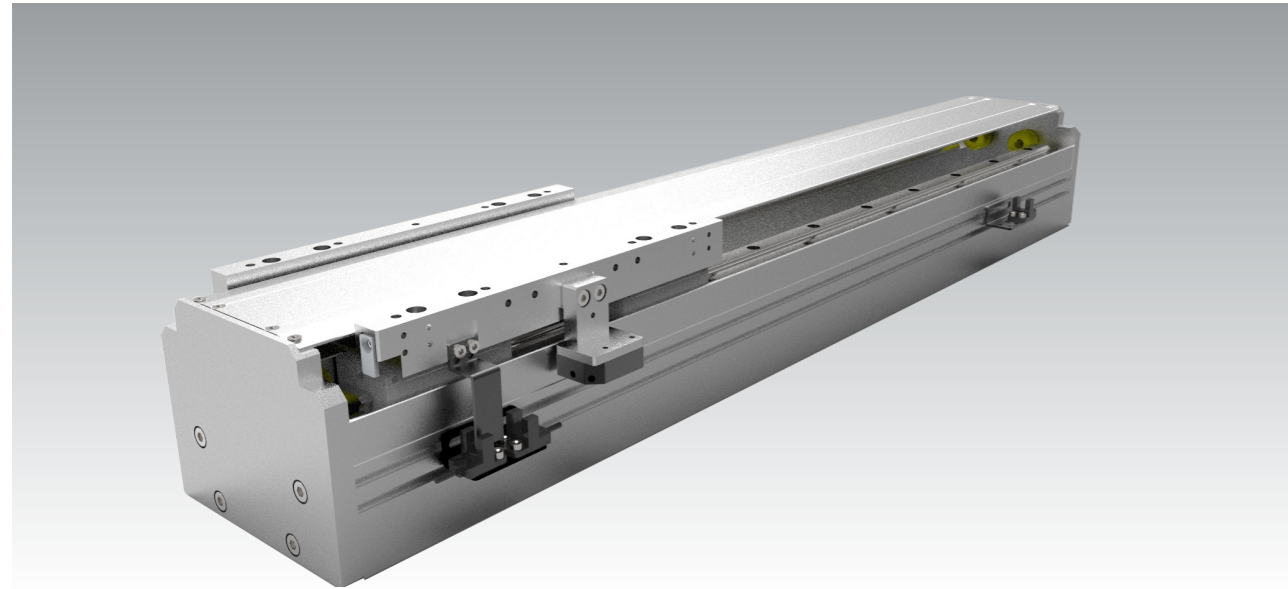
SWL-JS-S3										
Mechanical stroke $S_{max}$ (mm)	/	/	52	148	244	340	436	532	628	724
Base length L (mm)	200	296	392	488	584	680	776	872	968	1064
N	2	3	4	5	6	7	8	9	10	11
Total length (mm)	/	/	412	508	604	700	796	892	988	1084
Total mass (kg)	/	/	8.25	9.35	10.45	11.55	12.65	13.75	14.85	15.95

Mechanical stroke $S_{max}$ (mm)	820	916	1012	1108	1204	1300	1396	1492	1588	1684
Base length L (mm)	1160	1256	1352	1448	1544	1640	1736	1832	1928	2024
N	12	13	14	15	16	17	18	19	20	21
Total length (mm)	1180	1276	1372	1468	1564	1660	1756	1852	1948	2044
Total mass (kg)	17.05	18.15	19.25	20.35	21.45	22.55	23.65	24.75	25.85	26.95

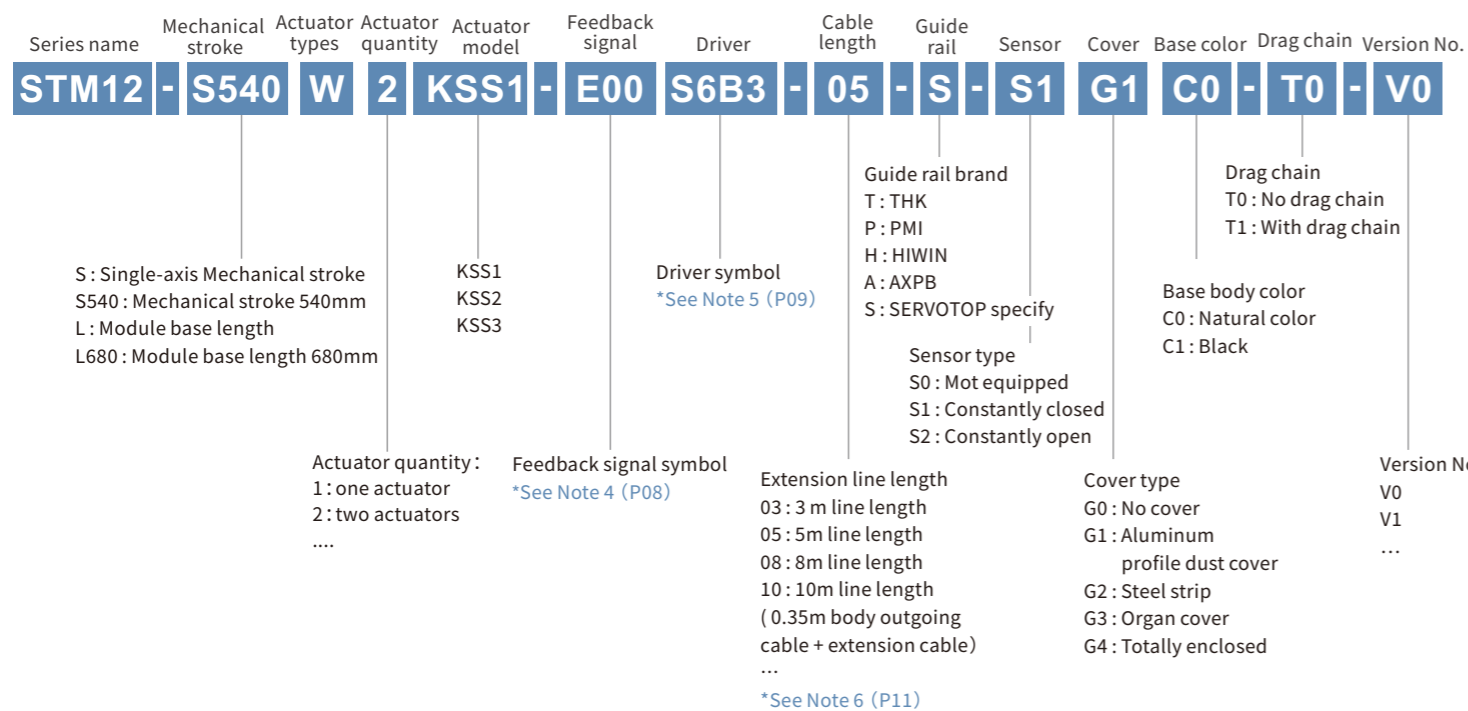
MEMO

# STM12 series linear motor stage

# STM12 series linear motor stage



## STM12 series module naming convention



Example: STM12-L1160W2-KSS1-E00GA3-05-T-S1G1C0-T0-V0, indicating :the 120 series base and cover, total base length 1160 mm, two SWL-KS-S1 actuators, 1 um magnetic grating reading head, Servotronic 3 A pulse driver, THK guide rail, constantly closed sensor, aluminum dust cover, base in natural color, no drag chain, and version number V0.

## Specifications

Model Parameter	SWL-KS		
	SWL-KS-S1	SWL-KS-S2	SWL-KS-S3
Driver*1	Pulse type	ST6-A060-B020	
	Bus type	ST6-A060-E020	
Resolution (um) [Max. speed(m/s)]	Digital quantity: 0.5um[2.4m/s], 1um[3.2m/s], Simulated quantity:[5m/s]		
Max. speed (m/s) *2	5	5	3.3
Peak thrust (N) *3	264	526	794
Continuous thrust (N) *3	132	263	397
Max. Load(kg)*4	17	25	50
Continuous current(Arms)	4.5	4.5	4.5
Peak current(Arms)	11.5	11.5	11.5
Thrust constant (N/Arms)	29.3	58.4	88
Back electromotive force (V/m/s)	24	47.9	72
Motor constant (Nm/√w)	11.3	13.2	19.8
Inductance (mH)	16	30	49.6
Resistor (Ω)	2.3	4	5.9
Electromagnetic attraction force (KN)	0.63	1.43	2.23
Polar distance (N-S)(mm)	16	16	16
Actuator mass (Kg)	0.9	1.7	2.6
Stator mass (Kg/m)	4.3	4.3	4.3
Guide rail specification and quantity	Specification: 15; Quantity: 2		
Sliders quantity	2	4	4
Motion part mass(kg) *5	2	3.7	5.2
Repeatability (um) *6	± 1 (Optical grating encoder) / ± 3 (Magnetic grating encoder)		

Item	Travel stroke between mechanical blocks(mm)*1		
	KS-S1	KS-S2	KS-S3
Base length L (mm)			
200	60	/	/
296	156	56	/
392	252	152	52
488	348	248	148
584	444	344	244
680	540	440	340
776	636	536	436
872	732	632	532
968	828	728	628
1064	924	824	724
1160	1020	920	820
1256	1116	1016	916
1352	1212	1112	1012
1448	1308	1208	1108
1544	1404	1304	1204
1640	1500	1400	1300
1736	1596	1496	1396
1832	1692	1592	1492
1928	1788	1688	1588
2024	1884	1784	1684

Note 1: The mechanical stroke in the above table is the value of one slider. If n sliders are required, it is calculated as follows:  
Mechanical stroke = Base length (L) - n x Slide length - (n - 1) x 10 - 20. (n > 1)

Note 1: Driver model type.

Note 2: The maximum speed is related to the back EMF of the motor and the resolution of the selected encoder.

Note 3: The capability of a single motor at 25 °C.

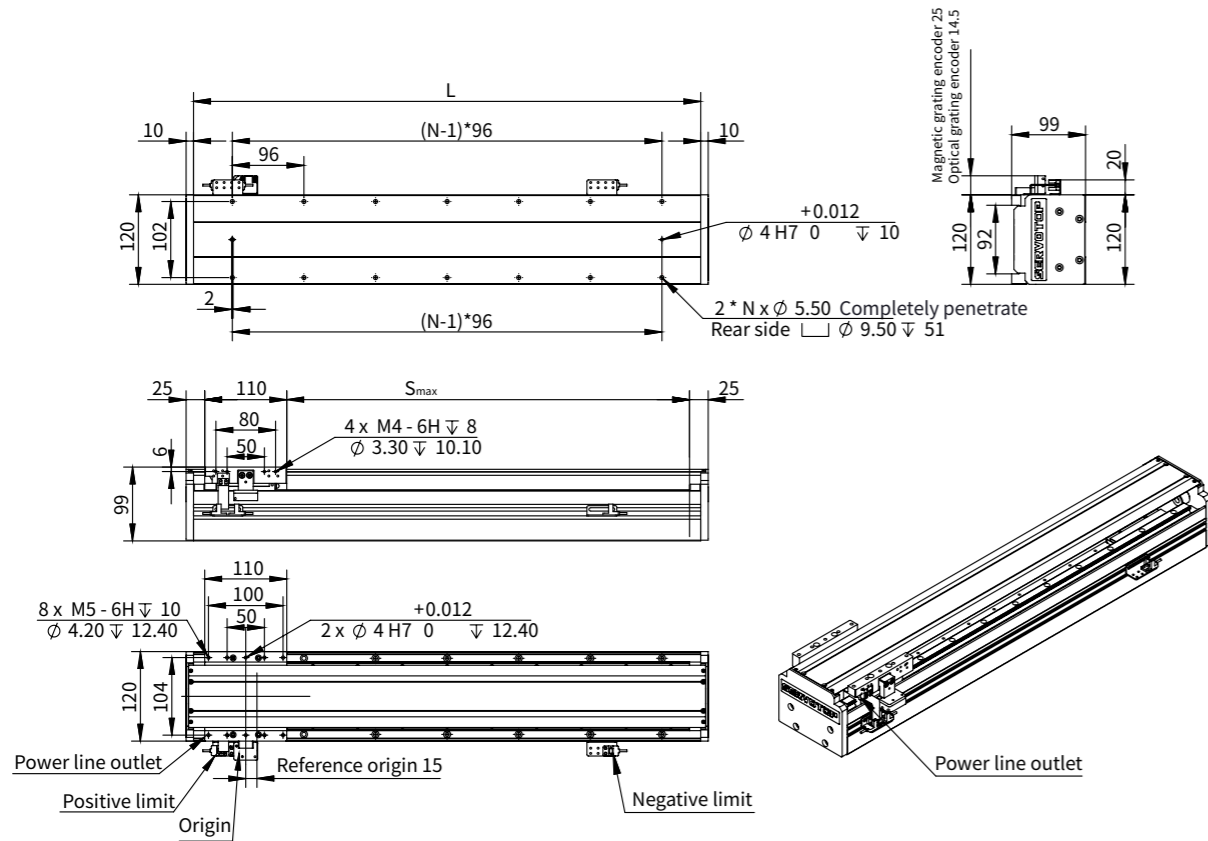
Note 4: The maximum load is a theoretical value in horizontal placement when the acceleration is 1G, the pause interval is 0.5s, and the speed is 1000 mm/s, which is used for reference only. The actual load is affected by various factors, such as the motion speed, acceleration, thrust, and load installation mode.

Note 5: The mass of parts such as load plate, slider, actuator, and reading head is included.

Note 6: Feedback signal type.

# STM12 series linear motor stage

## Dimensions of SWL-KS-S1

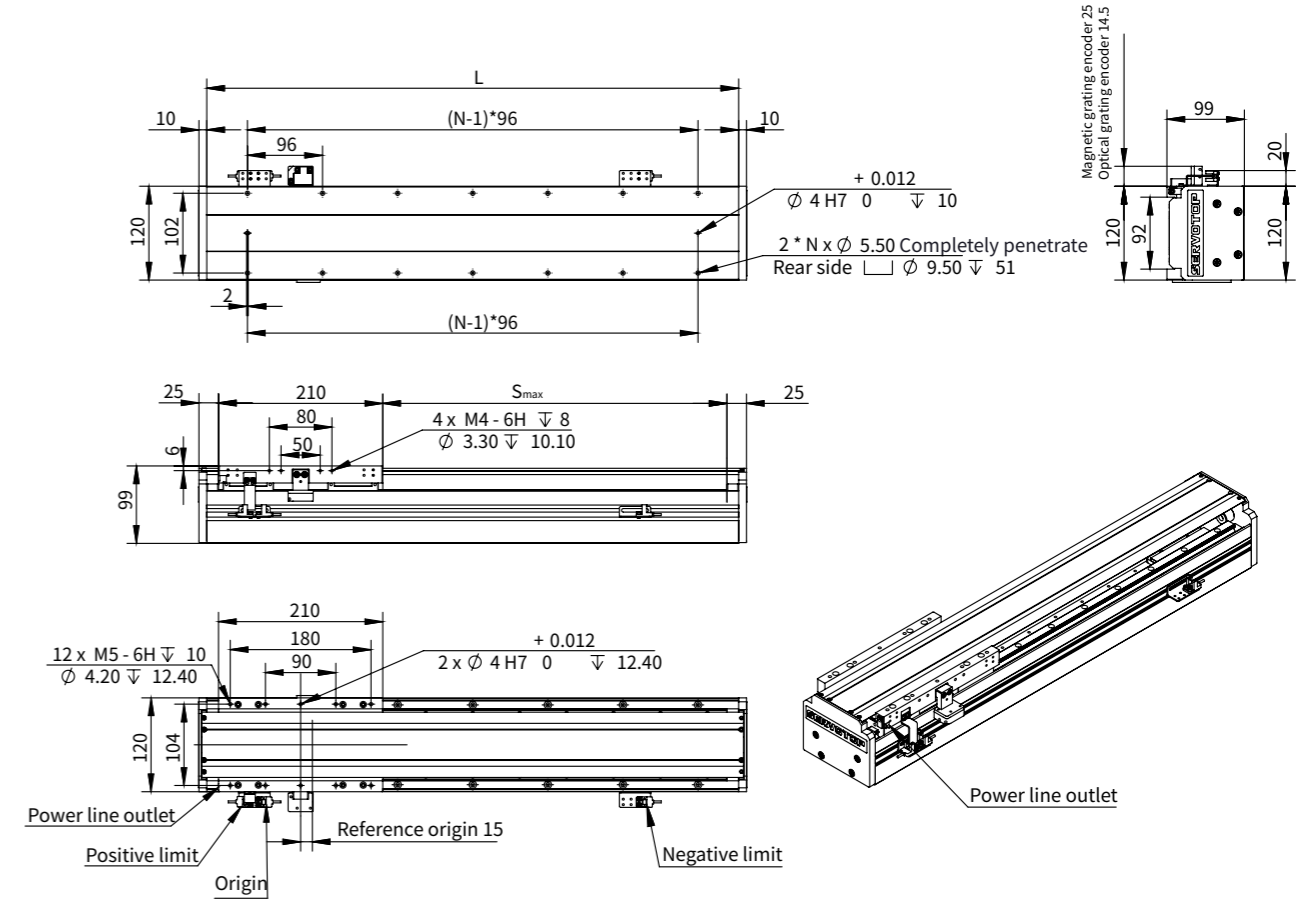


SWL-KS-S1										
Mechanical stroke $S_{max}$ (mm)	60	156	252	348	444	540	636	732	828	924
Base length L (mm)	200	296	392	488	584	680	776	872	968	1064
N	2	3	4	5	6	7	8	9	10	11
Total length (mm)	220	316	412	508	604	700	796	892	988	1084
Total mass (kg)	4.3	5.7	7.1	8.5	9.9	11.3	12.7	14.1	15.5	16.9

Mechanical stroke $S_{max}$ (mm)	1020	1116	1212	1308	1404	1500	1596	1692	1788	1884
Base length L (mm)	1160	1256	1352	1448	1544	1640	1736	1832	1928	2024
N	12	13	14	15	16	17	18	19	20	21
Total length (mm)	1180	1276	1372	1468	1564	1660	1756	1852	1948	2044
Total mass (kg)	18.3	19.7	21.1	22.5	23.9	25.3	26.7	28.1	29.5	30.9

# STM12 series linear motor stage

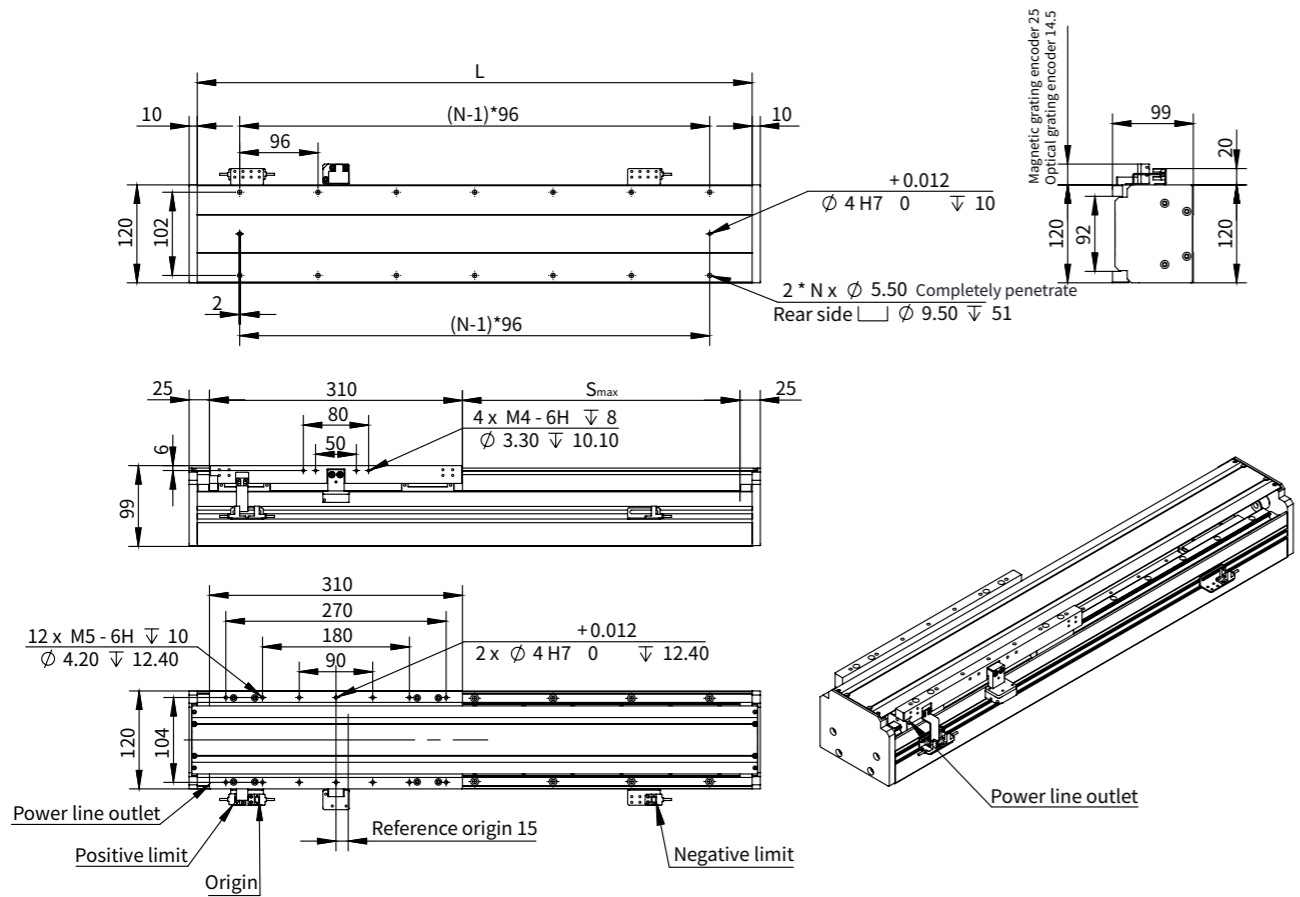
## Dimensions of SWL-KS-S2



SWL-KS-S2										
Mechanical stroke $S_{max}$ (mm)	/	56	152	248	344	440	536	632	728	824
Base length L (mm)	200	296	392	488	584	680	776	872	968	1064
N	2	3	4	5	6	7	8	9	10	11
Total length (mm)	/	316	412	508	604	700	796	892	988	1084
Total mass (kg)	/	7.5	8.9	10.3	11.7	13.1	14.5	15.9	17.3	18.7

Mechanical stroke $S_{max}$ (mm)	920	1016	1112	1208	1304	1400	1496	1592	1688	1784
Base length L (mm)	1160	1256	1352	1448	1544	1640	1736	1832	1928	2024
N	12	13	14	15	16	17	18	19	20	21
Total length (mm)	1180	1276	1372	1468	1564	1660	1756	1852	1948	2044
Total mass (kg)	20.1	21.5	22.9	24.3	25.7	27.1	28.5	29.9	31.3	32.7

## Dimensions of SWL-KS-S3



SWL-KS-S3										
Mechanical stroke $S_{max}$ (mm)	/	/	52	148	244	340	436	532	628	724
Base length L (mm)	200	296	392	488	584	680	776	872	968	1064
N	2	3	4	5	6	7	8	9	10	11
Total length (mm)	/	/	412	508	604	700	796	892	988	1084
Total mass (kg)	/	/	10.4	11.8	13.2	14.6	16	17.4	18.8	20.2

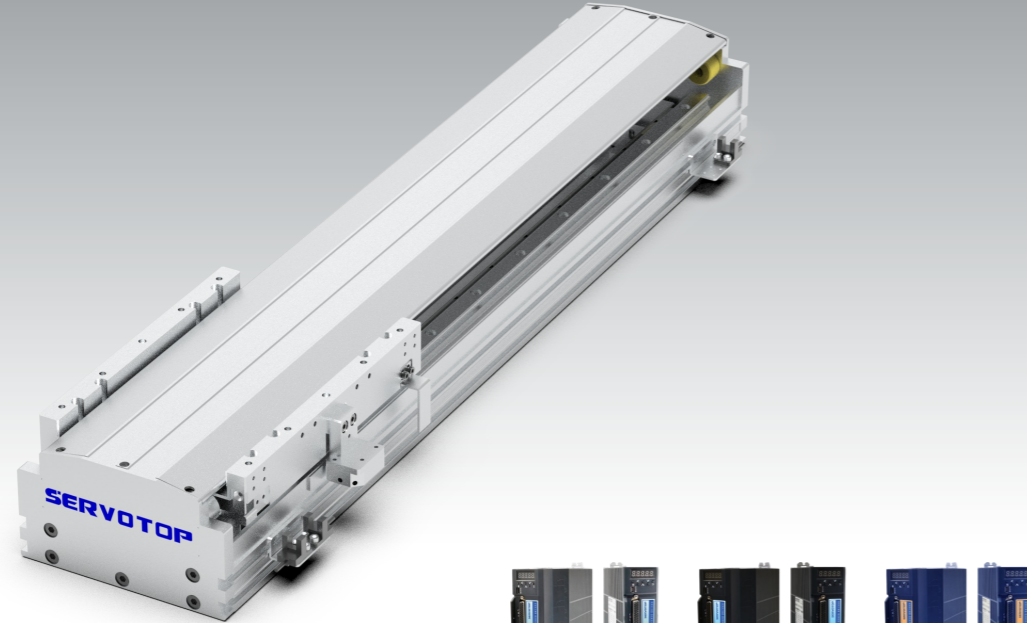
Mechanical stroke $S_{max}$ (mm)	820	916	1012	1108	1204	1300	1396	1492	1588	1684
Base length L (mm)	1160	1256	1352	1448	1544	1640	1736	1832	1928	2024
N	12	13	14	15	16	17	18	19	20	21
Total length (mm)	1180	1276	1372	1468	1564	1660	1756	1852	1948	2044
Total mass (kg)	21.6	23	24.4	25.8	27.2	28.6	30	31.4	32.8	34.2

MEMO

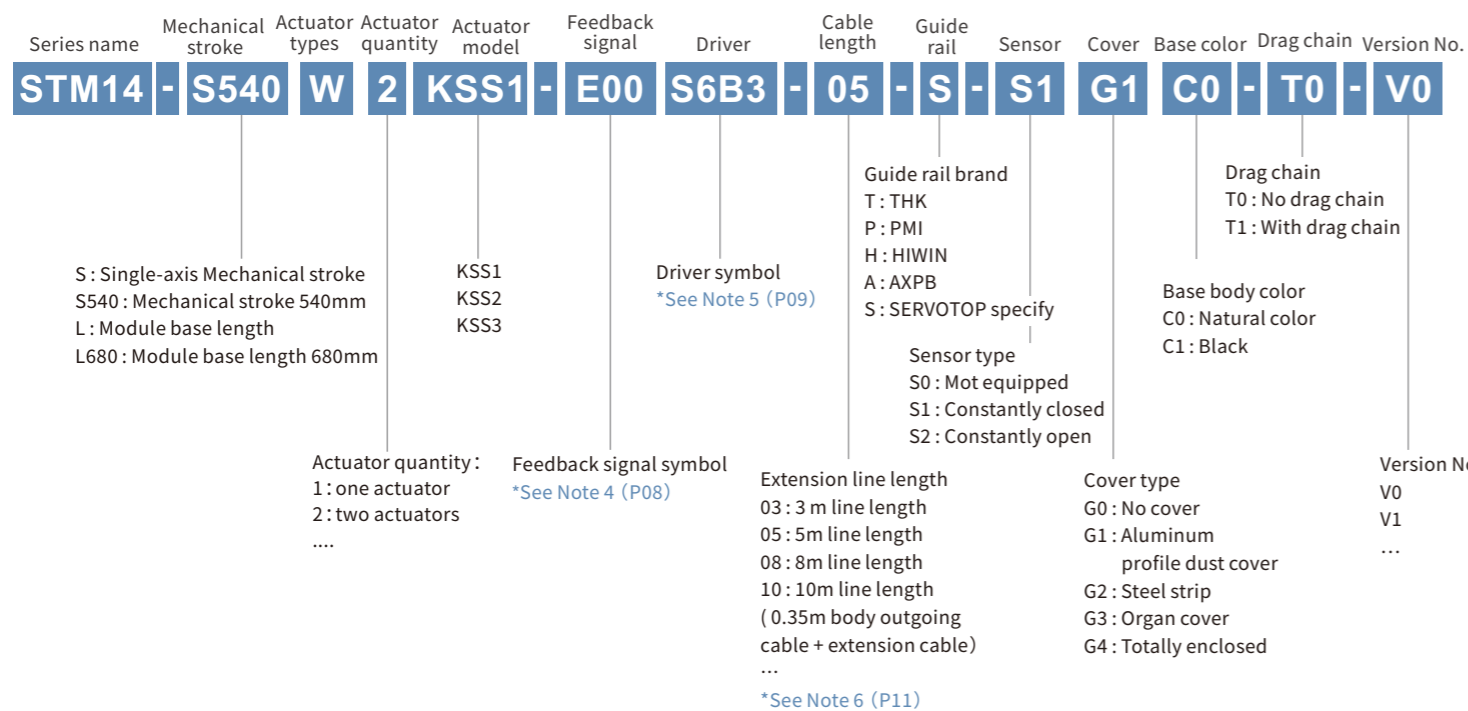


# STM14 series linear motor stage

# STM14 series linear motor stage



## STM14 series module naming convention



Example: STM14-L1160W2-KSS1-E00GA3-05-T-S1G1C0-T0-V0, indicating :the 145 series base and cover, total base length 1160 mm, two SWL-KS-S1 actuators, 1 um magnetic grating reading head, Servotronic 3 A pulse driver, THK guide rail, constantly closed sensor, aluminum dust cover, base in natural color, no drag chain, and version number V0.

## Specifications

Model Parameter	SWL-KS		
	SWL-KS-S1	SWL-KS-S2	SWL-KS-S3
Driver*1	Pulse type	ST6-A060-B020	
	Bus type	ST6-A060-E020	
Resolution (um) [Max. speed(m/s)]	Digital quantity: 0.5um[2.4m/s], 1um[3.2m/s], Simulated quantity:[5m/s]		
Max. speed (m/s) *2	5	5	3.3
Peak thrust (N) *3	264	526	794
Continuous thrust (N) *3	132	263	397
Max. Load(kg)*4	17	25	50
Continuous current(Arms)	4.5	4.5	4.5
Peak current(Arms)	11.5	11.5	11.5
Thrust constant (N/Arms)	29.3	58.4	88
Back electromotive force (V/m/s)	24	47.9	72
Motor constant (Nm/√w)	11.3	13.2	19.8
Inductance (mH)	16	30	49.6
Resistor (Ω)	2.3	4	5.9
Electromagnetic attraction force (KN)	0.63	1.43	2.23
Polar distance (N-S)(mm)	16	16	16
Actuator mass (Kg)	0.9	1.7	2.6
Stator mass (Kg/m)	4.3	4.3	4.3
Guide rail specification and quantity	Specification: 15; Quantity: 2		
Sliders quantity	2	4	4
Motion part mass(kg) *5	2.1	4	5.4
Repeatability (um) *6	± 1 (Optical grating encoder) / ± 3 (Magnetic grating encoder)		

Item	Travel stroke between mechanical blocks(mm)*1		
	KS-S1	KS-S2	KS-S3
Base length L (mm)			
200	60	/	/
296	156	56	/
392	252	152	52
488	348	248	148
584	444	344	244
680	540	440	340
776	636	536	436
872	732	632	532
968	828	728	628
1064	924	824	724
1160	1020	920	820
1256	1116	1016	916
1352	1212	1112	1012
1448	1308	1208	1108
1544	1404	1304	1204
1640	1500	1400	1300
1736	1596	1496	1396
1832	1692	1592	1492
1928	1788	1688	1588
2024	1884	1784	1684

Note 1: The mechanical stroke in the above table is the value of one slider. If n sliders are required, it is calculated as follows:  
Mechanical stroke = Base length (L) - n x Slide length - (n - 1) x 10 - 20. (n > 1)

Note 1: Driver model type.

Note 2: The maximum speed is related to the back EMF of the motor and the resolution of the selected encoder.

Note 3: The capability of a single motor at 25 °C.

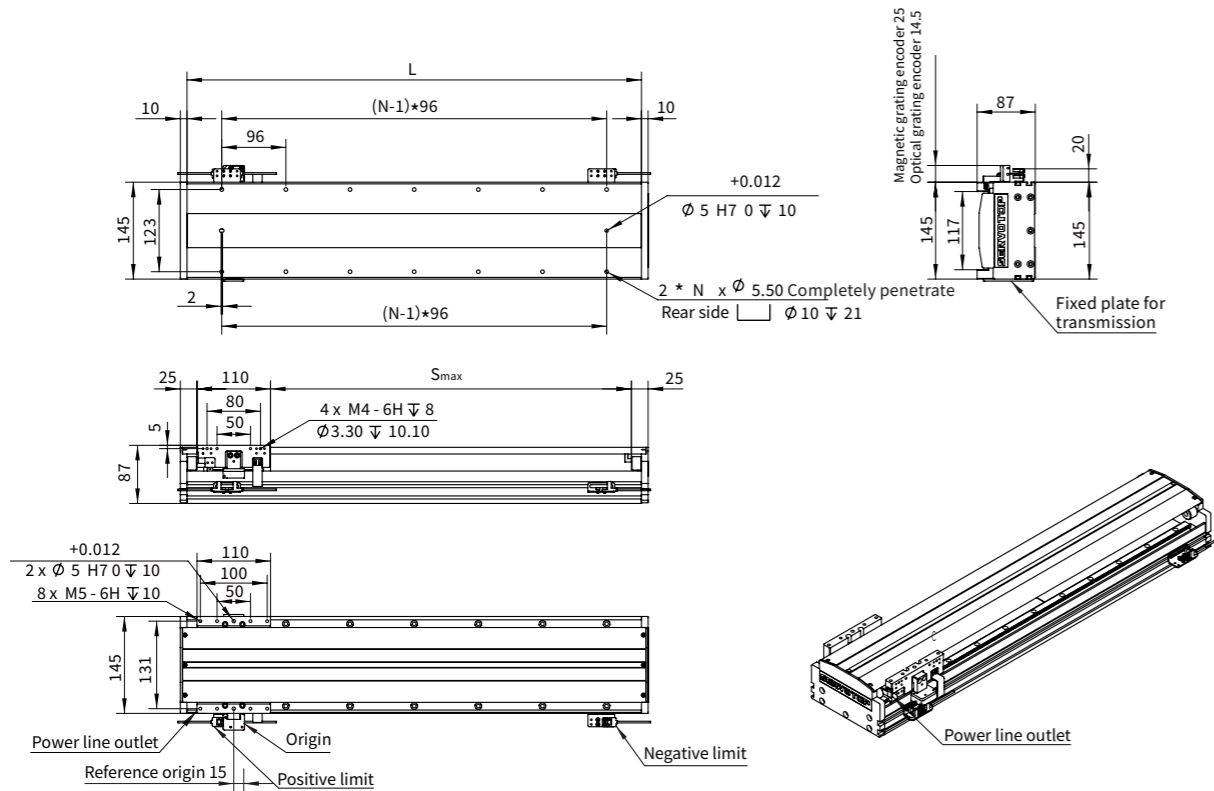
Note 4: The maximum load is a theoretical value in horizontal placement when the acceleration is 1G, the pause interval is 0.5s, and the speed is 1000 mm/s, which is used for reference only. The actual load is affected by various factors, such as the motion speed, acceleration, thrust, and load installation mode.

Note 5: The mass of parts such as load plate, slider, actuator, and reading head is included.

Note 6: Feedback signal type.

# STM14 series linear motor stage

## ● Dimensions of SWL-KS-S1

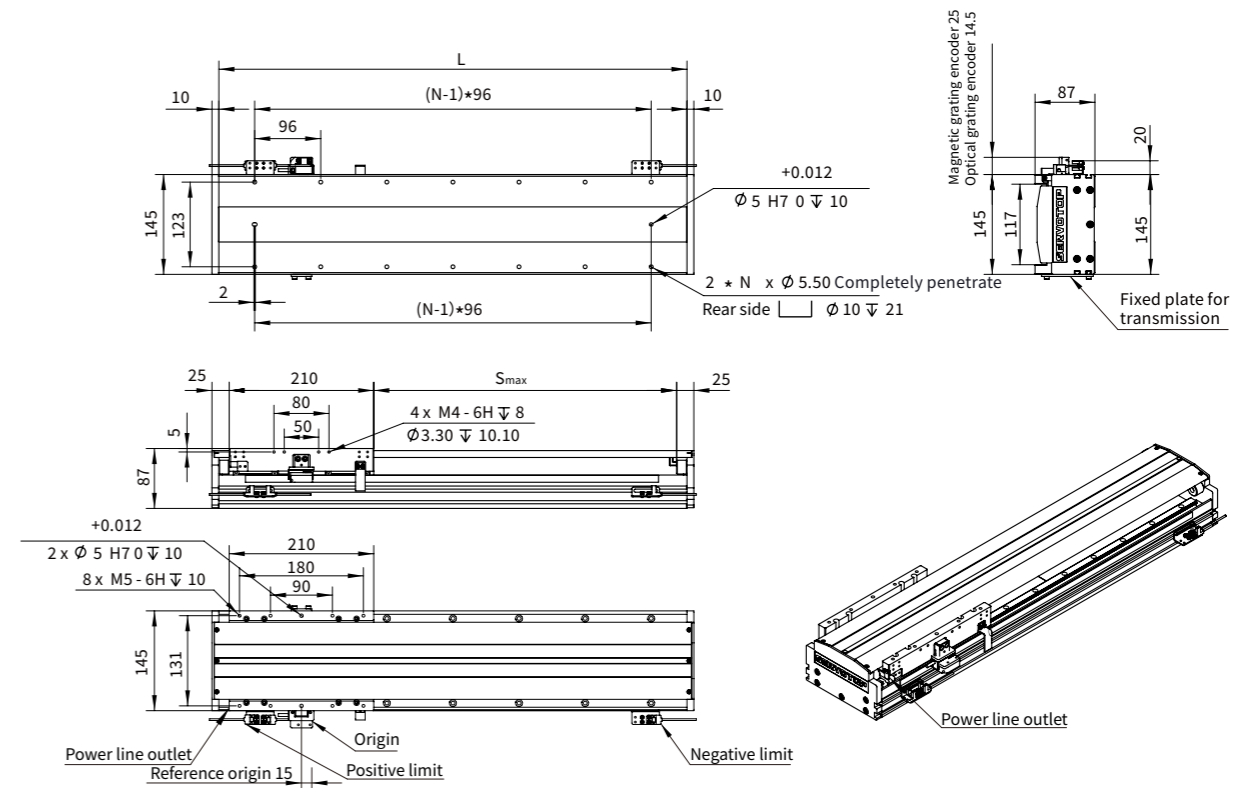


SWL-KS-S1										
Mechanical stroke $S_{max}$ (mm)	60	156	252	348	444	540	636	732	828	924
Base length L (mm)	200	296	392	488	584	680	776	872	968	1064
N	2	3	4	5	6	7	8	9	10	11
Total length (mm)	220	316	412	508	604	700	796	892	988	1084
Total mass (kg)	6.6	8.1	9.6	11.1	12.6	14.1	15.6	17.1	18.6	20.1

Mechanical stroke $S_{max}$ (mm)	1020	1116	1212	1308	1404	1500	1596	1692	1788	1884
Base length L (mm)	1160	1256	1352	1448	1544	1640	1736	1832	1928	2024
N	12	13	14	15	16	17	18	19	20	21
Total length (mm)	1180	1276	1372	1468	1564	1660	1756	1852	1948	2044
Total mass (kg)	21.6	23.1	24.6	26.1	27.6	29.1	30.6	32.1	33.6	35.1

# STM14 series linear motor stage

## ● Dimensions of SWL-KS-S2

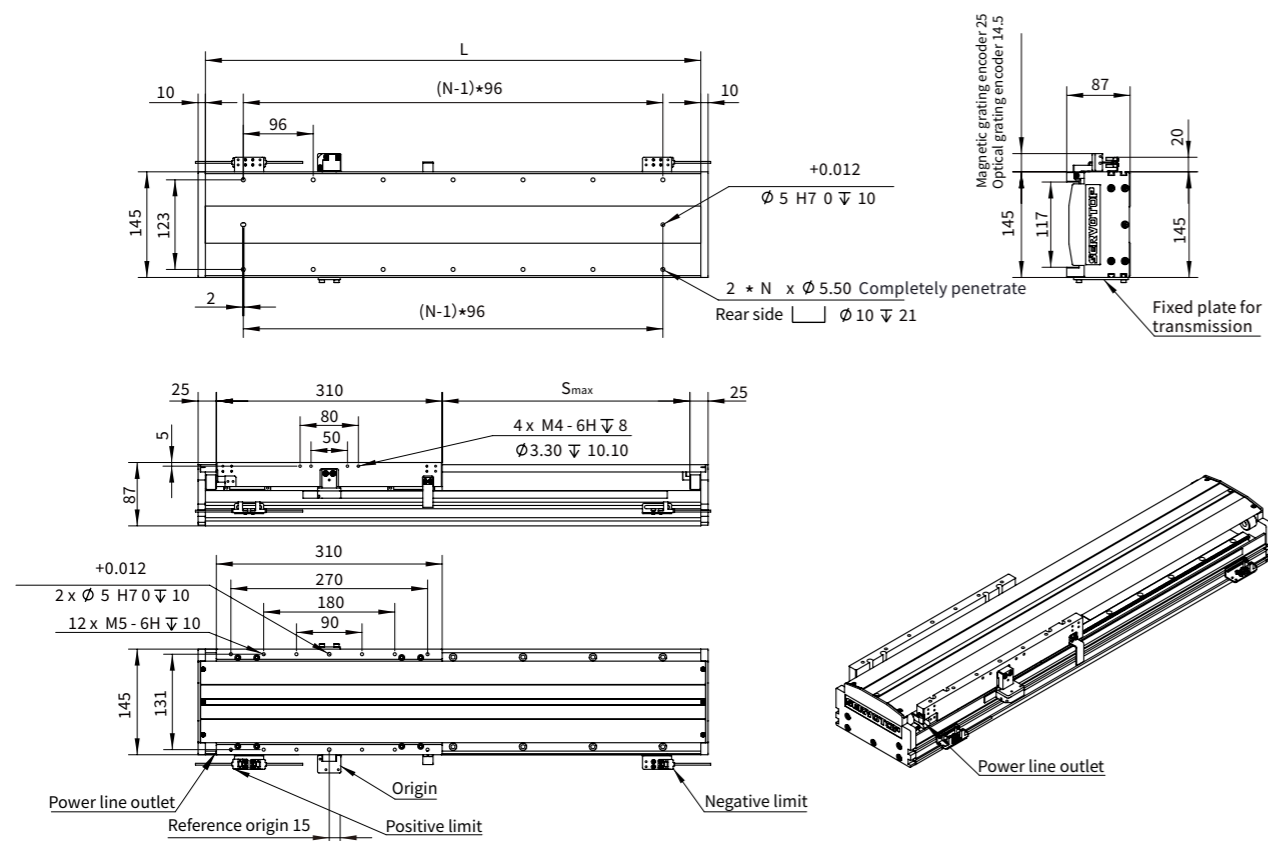


SWL-KS-S2										
Mechanical stroke $S_{max}$ (mm)	/	56	152	248	344	440	536	632	728	824
Base length L (mm)	200	296	392	488	584	680	776	872	968	1064
N	2	3	4	5	6	7	8	9	10	11
Total length (mm)	/	316	412	508	604	700	796	892	988	1084
Total mass (kg)	/	10	11.5	13	14.5	16	17.5	19	20.5	22

Mechanical stroke $S_{max}$ (mm)	920	1016	1112	1208	1304	1400	1496	1592	1688	1784
Base length L (mm)	1160	1256	1352	1448	1544	1640	1736	1832	1928	2024
N	12	13	14	15	16	17	18	19	20	21
Total length (mm)	1180	1276	1372	1468	1564	1660	1756	1852	1948	2044
Total mass (kg)	23.5	25	26.5	28	29.5	31	32.5	34	35.5	37

# STM14 series linear motor stage

## ● Dimensions of SWL-KS-S3



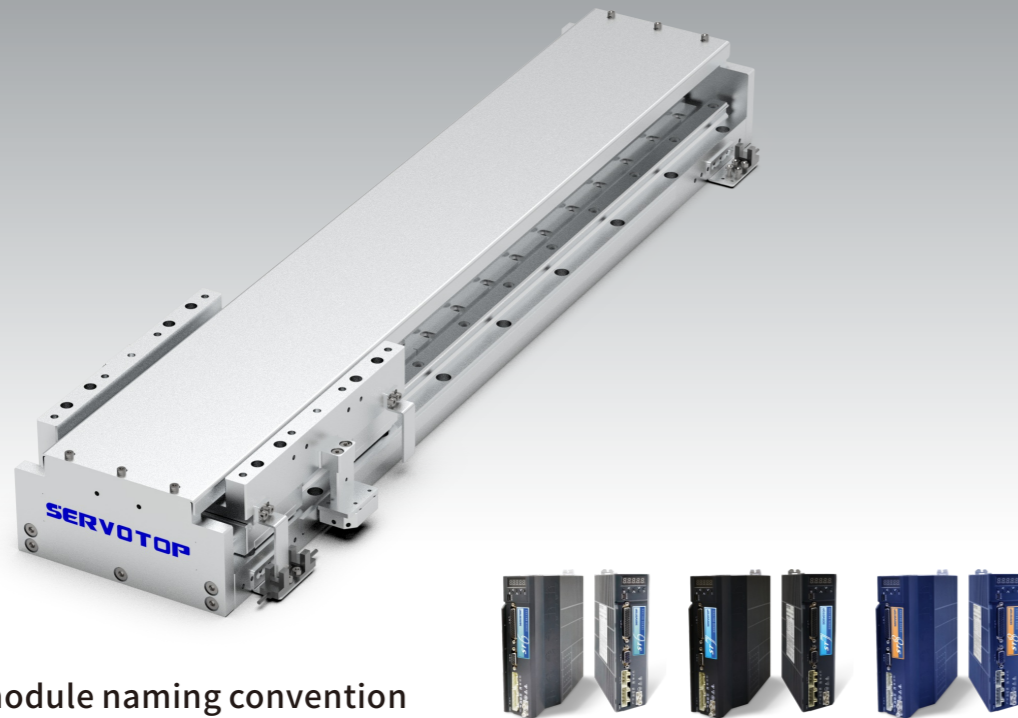
SWL-KS-S3										
Mechanical stroke $S_{max}$ (mm)	/	/	52	148	244	340	436	532	628	724
Base length L (mm)	200	296	392	488	584	680	776	872	968	1064
N	2	3	4	5	6	7	8	9	10	11
Total length (mm)	/	/	412	508	604	700	796	892	988	1084
Total mass (kg)	/	/	13	14.5	16	17.5	19	20.5	22	23.5

Mechanical stroke $S_{max}$ (mm)	820	916	1012	1108	1204	1300	1396	1492	1588	1684
Base length L (mm)	1160	1256	1352	1448	1544	1640	1736	1832	1928	2024
N	12	13	14	15	16	17	18	19	20	21
Total length (mm)	1180	1276	1372	1468	1564	1660	1756	1852	1948	2044
Total mass (kg)	25	26.5	28	29.5	31	32.5	34	35.5	37	38.5

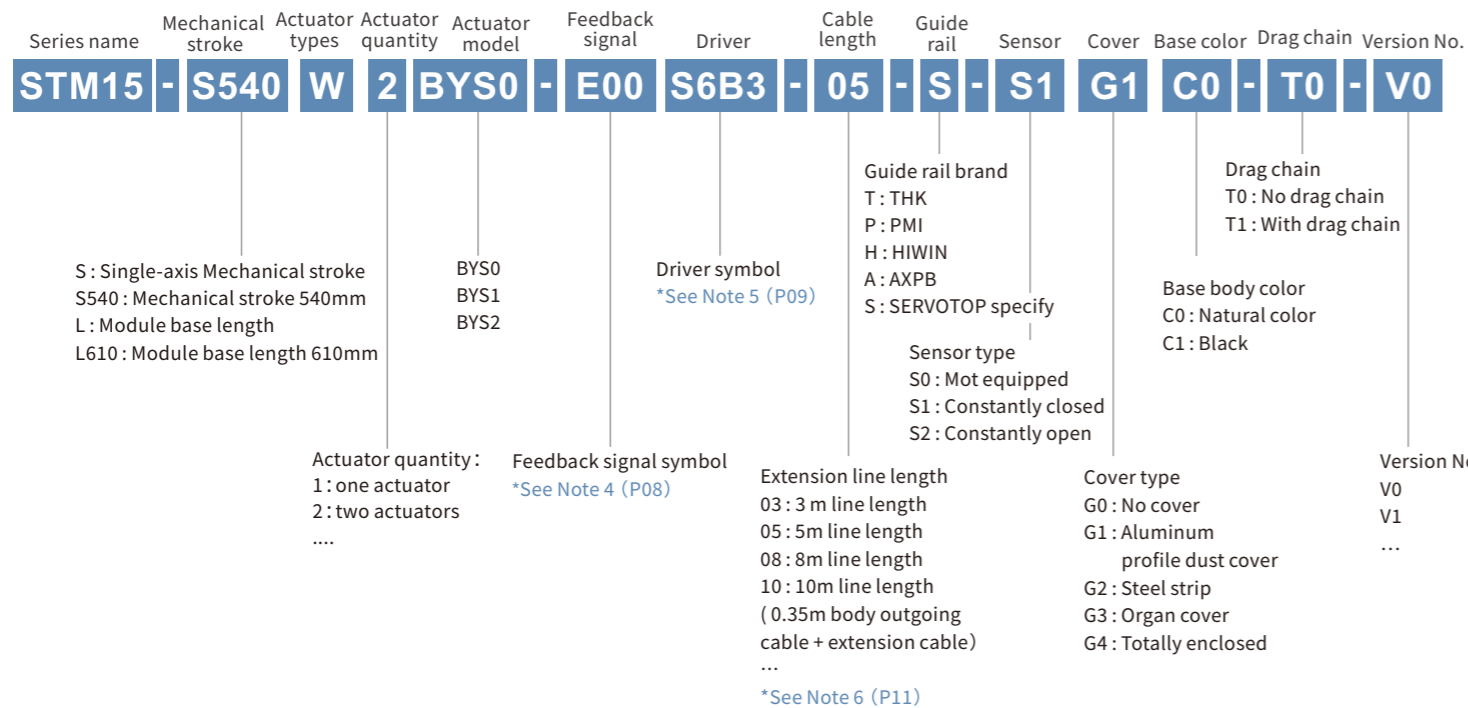
MEMO

# STM15 series linear motor stage

# STM15 series linear motor stage



## ● STM15 series module naming convention



Example: STM15-L1010W2-BYS1-E00GA3-05-T-S1G1C0-T0-V0, indicating :the 150 series base and cover, total base length 1010 mm, two SWL-BY-S1 actuators, 1 um magnetic grating reading head, Servotronic 3 A pulse driver, THK guide rail, constantly closed sensor, aluminum dust cover, base in natural color, no drag chain, and version number V0.

## ● Specifications

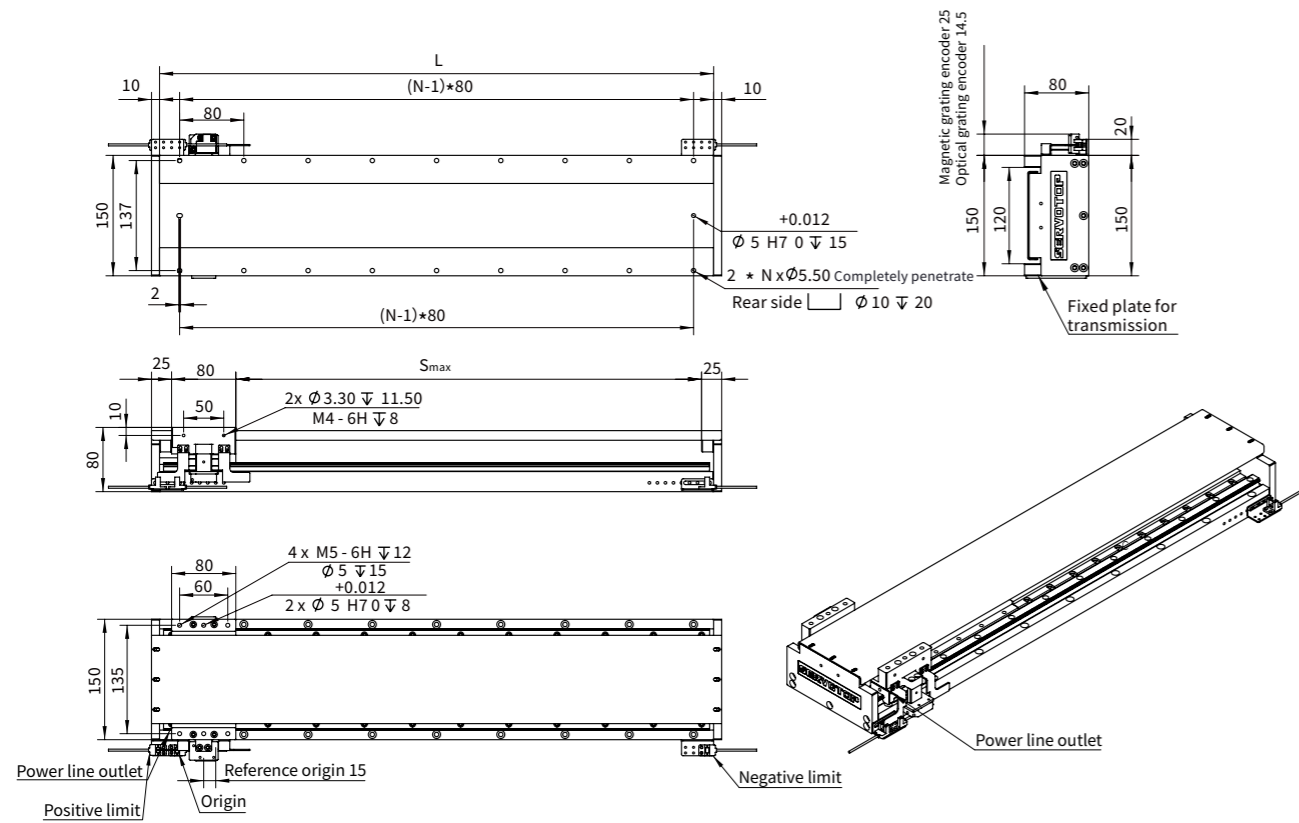
Model Parameter	SWL-BY			
	SWL-BY-S0	SWL-BY-S1	SWL-BY-S2	SWL-BY-S3
Driver*1	Pulse type	ST6-A030-B020		ST6-A060-B020
	Bus type	ST6-A030-E020		ST6-A060-E020
Resolution (um) [Max. speed(m/s)]	Digital quantity: 0.5um[2.4m/s], 1um[3.2m/s], Simulated quantity:[5m/s]			
Max. speed (m/s) *2	5	5	4.1	4.1
Peak thrust (N) *3	213	350	700	1050
Continuous thrust (N) *3	64	105	210	315
Max. Load(kg)*4	8	14	28	42
Continuous current(Arms)	2.5	3	3	3
Peak current(Arms)	11.5	13.8	13.8	13.8
Thrust constant (N/Arms)	21.3	35	70	70
Back electromotive force (V/m/s)	17.5	28.7	57.4	57.4
Motor constant (Nm/√w)	8	10.2	14.1	17.7
Inductance (mH)	15.5	19	38	55.3
Resistor (Ω)	5.6	4	8	4.8
Electromagnetic attraction force (KN)	0.47	0.8	1.57	2.36
Polar distance (N-S)(mm)	10	10	10	10
Actuator mass (Kg)	0.8	1.2	2	3
Stator mass (Kg/m)	5.25	5.25	5.25	5.25
Guide rail specification and quantity	Specification: 15; Quantity: 2			
Sliders quantity	2	2	4	4
Motion part mass(kg) *5	1.9	2.5	4.2	5.7
Repeatability (um) *6	± 1 (Optical grating encoder) / ± 3 (Magnetic grating encoder)			

Item	Travel stroke between mechanical blocks(mm)*1			
	BY-S0	BY-S1	BY-S2	BY-S3
Base length L (mm)				
370	260	230	150	70
450	340	310	230	150
530	420	390	310	230
610	500	470	390	310
690	580	550	470	390
770	660	630	550	470
850	740	710	630	550
930	820	790	710	630
1010	900	870	790	710
1090	980	950	870	790
1170	1060	1030	950	870
1250	1140	1110	1030	950
1330	1220	1190	1110	1030
1410	1300	1270	1190	1110
1490	1380	1350	1270	1190
1570	1460	1430	1350	1270
1650	1540	1510	1430	1350
1730	1620	1590	1510	1430
1810	1700	1670	1590	1510
1890	1790	1750	1670	1590

Note 1: The mechanical stroke in the above table is the value of one slider. If n sliders are required, it is calculated as follows:  
Mechanical stroke = Base length (L) - n x Slide length - (n - 1) x 10 - 20. (n > 1)

- Note 1: Driver model type.
- Note 2: The maximum speed is related to the back EMF of the motor and the resolution of the selected encoder.
- Note 3: The capability of a single motor at 25 °C.
- Note 4: The maximum load is a theoretical value in horizontal placement when the acceleration is 1G, the pause interval is 0.5s, and the speed is 1000 mm/s, which is used for reference only. The actual load is affected by various factors, such as the motion speed, acceleration, thrust, and load installation mode.
- Note 5: The mass of parts such as load plate, slider, actuator, and reading head is included.
- Note 6: Feedback signal type.

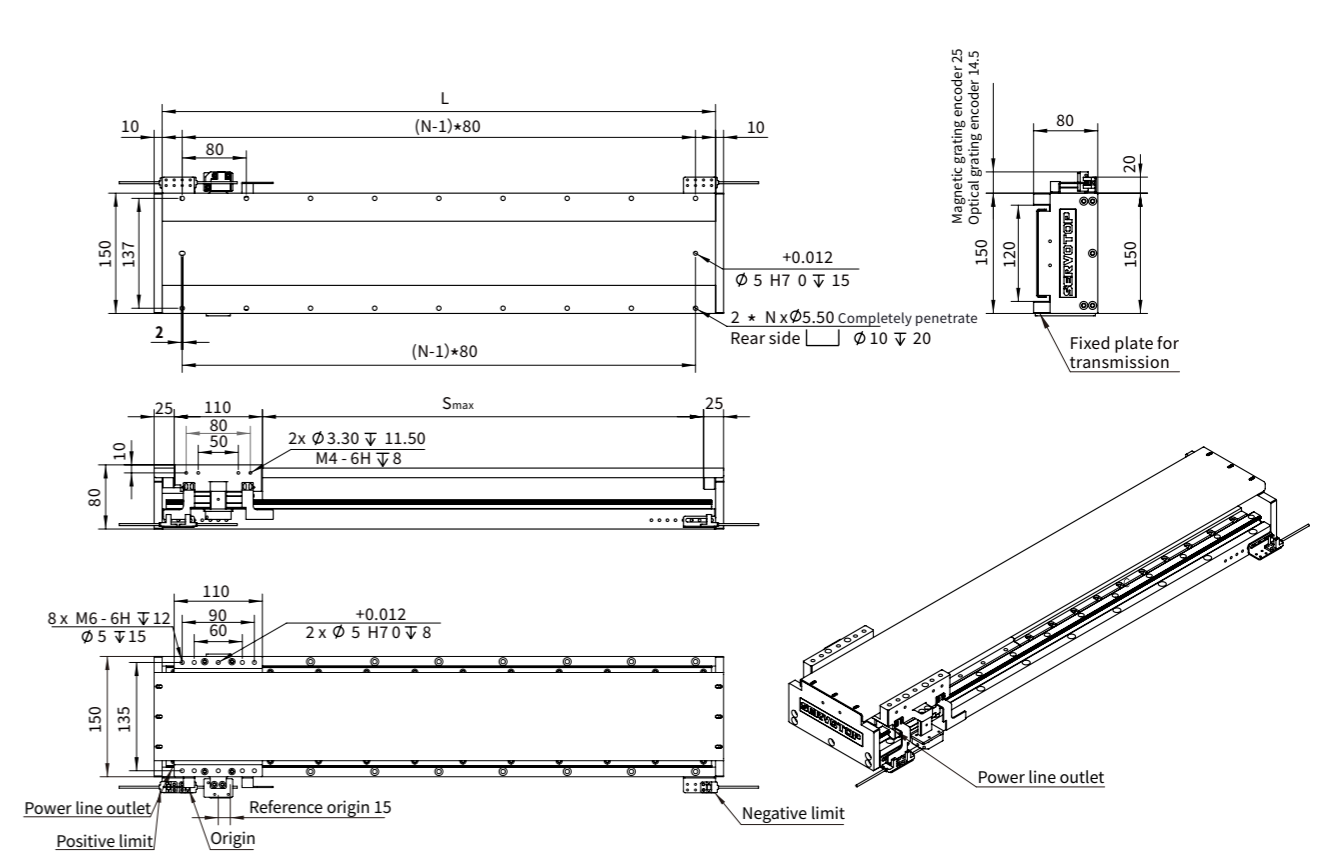
## ● Dimensions of SWL-BY-S0



SWL-BY-S0										
Mechanical stroke $S_{max}$ (mm)	260	340	420	500	580	660	740	820	900	980
Base length L(mm)	370	450	530	610	690	770	850	930	1010	1090
N	5	6	7	8	9	10	11	12	13	14
Total length (mm)	390	470	550	630	710	790	870	950	1030	1110
Total mass (kg)	6.4	8	9.6	11.2	12.8	14.4	16	17.6	19.2	20.8

Mechanical stroke $S_{max}$ (mm)	1060	1140	1220	1300	1380	1460	1540	1620	1700	1780
Base length L(mm)	1170	1250	1330	1410	1490	1570	1650	1730	1810	1890
N	15	16	17	18	19	20	21	22	23	24
Total length (mm)	1190	1270	1350	1430	1510	1590	1670	1750	1830	1910
Total mass (kg)	22.4	24	25.6	27.2	28.8	30.4	32	33.6	35.2	36.8

## ● Dimensions of SWL-BY-S1

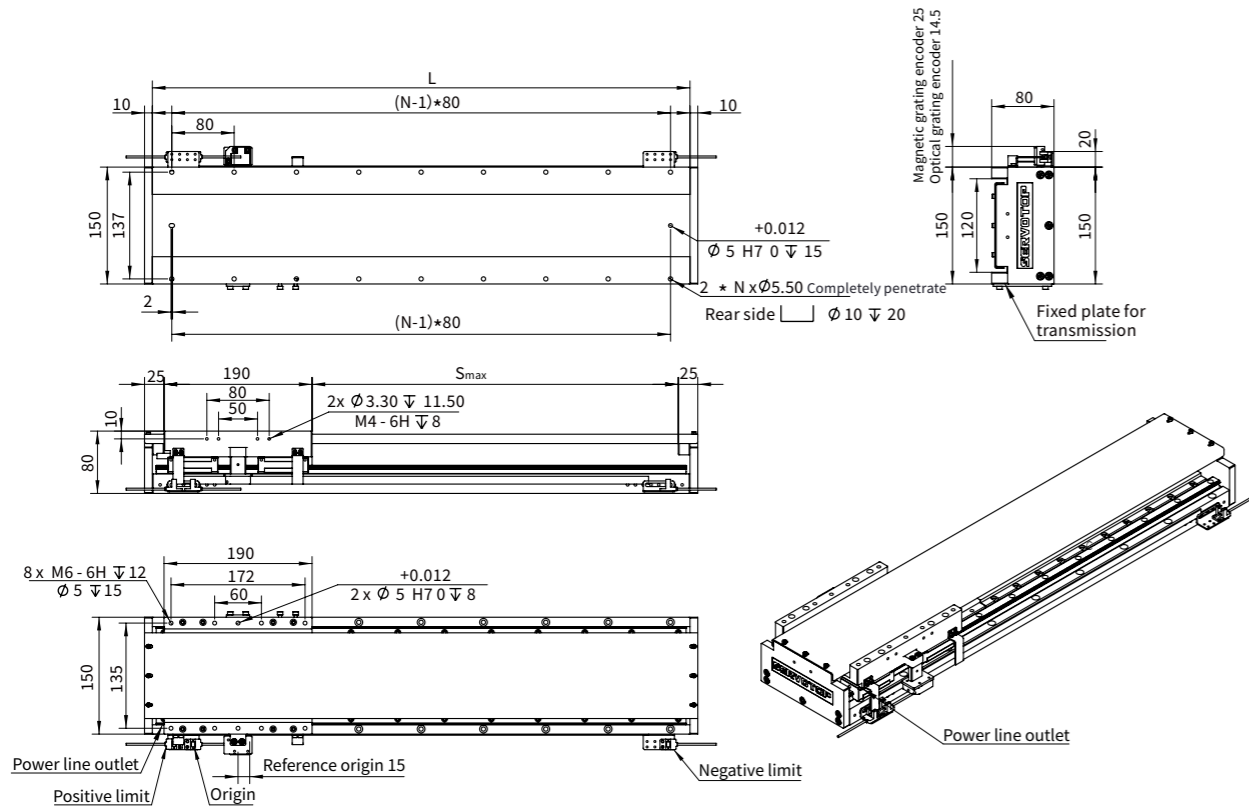


SWL-BY-S1										
Mechanical stroke $S_{max}$ (mm)	230	310	390	470	550	630	710	790	870	950
Base length L(mm)	370	450	530	610	690	770	850	930	1010	1090
N	5	6	7	8	9	10	11	12	13	14
Total length (mm)	390	470	550	630	710	790	870	950	1030	1110
Total mass (kg)	6.4	8	9.6	11.2	12.8	14.4	16	17.6	19.2	20.8

Mechanical stroke $S_{max}$ (mm)	1030	1110	1190	1270	1350	1430	1510	1590	1670	1750
Base length L(mm)	1170	1250	1330	1410	1490	1570	1650	1730	1810	1890
N	15	16	17	18	19	20	21	22	23	24
Total length (mm)	1190	1270	1350	1430	1510	1590	1670	1750	1830	1910
Total mass (kg)	22.4	24	25.6	27.2	28.8	30.4	32	33.6	35.2	36.8

# STM15 series linear motor stage

## Dimensions of SWL-BY-S2

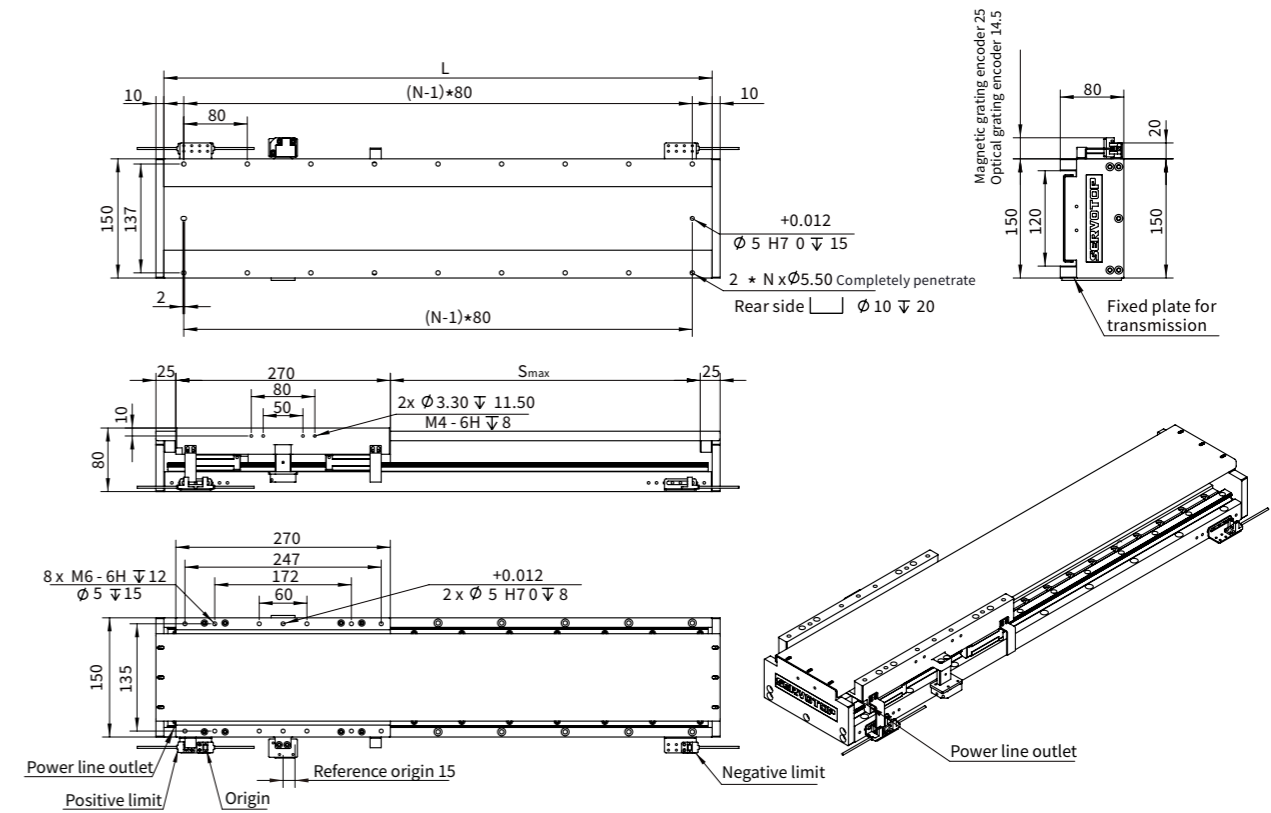


SWL-BY-S2										
Mechanical stroke $S_{max}$ (mm)	150	230	310	390	470	550	630	710	790	870
Base length L(mm)	370	450	530	610	690	770	850	930	1010	1090
N	5	6	7	8	9	10	11	12	13	14
Total length (mm)	390	470	550	630	710	790	870	950	1030	1110
Total mass (kg)	6.4	8	9.6	11.2	12.8	14.4	16	17.6	19.2	20.8

Mechanical stroke $S_{max}$ (mm)	950	1030	1110	1190	1270	1350	1430	1510	1590	1670
Base length L(mm)	1170	1250	1330	1410	1490	1570	1650	1730	1810	1890
N	15	16	17	18	19	20	21	22	23	24
Total length (mm)	1190	1270	1350	1430	1510	1590	1670	1750	1830	1910
Total mass (kg)	22.4	24	25.6	27.2	28.8	30.4	32	33.6	35.2	36.8

# STM15 series linear motor stage

## Dimensions of SWL-BY-S3

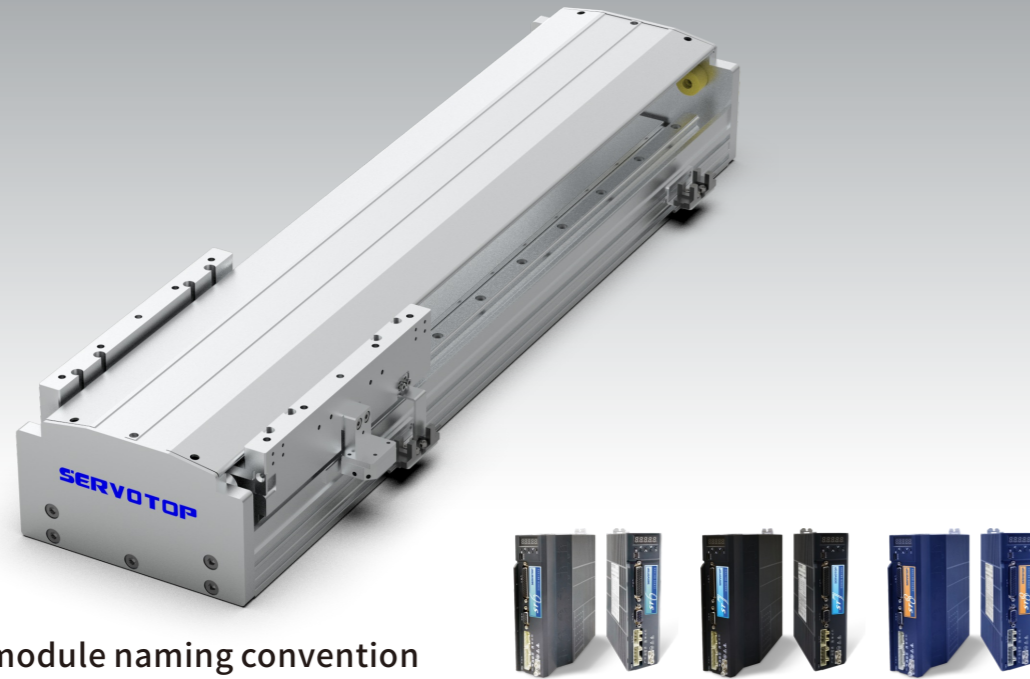


SWL-BY-S3										
Mechanical stroke $S_{max}$ (mm)	70	150	230	310	390	470	550	630	710	790
Base length L(mm)	370	450	530	610	690	770	850	930	1010	1090
N	5	6	7	8	9	10	11	12	13	14
Total length (mm)	390	470	550	630	710	790	870	950	1030	1110
Total mass (kg)	6.4	8	9.6	11.2	12.8	14.4	16	17.6	19.2	20.8

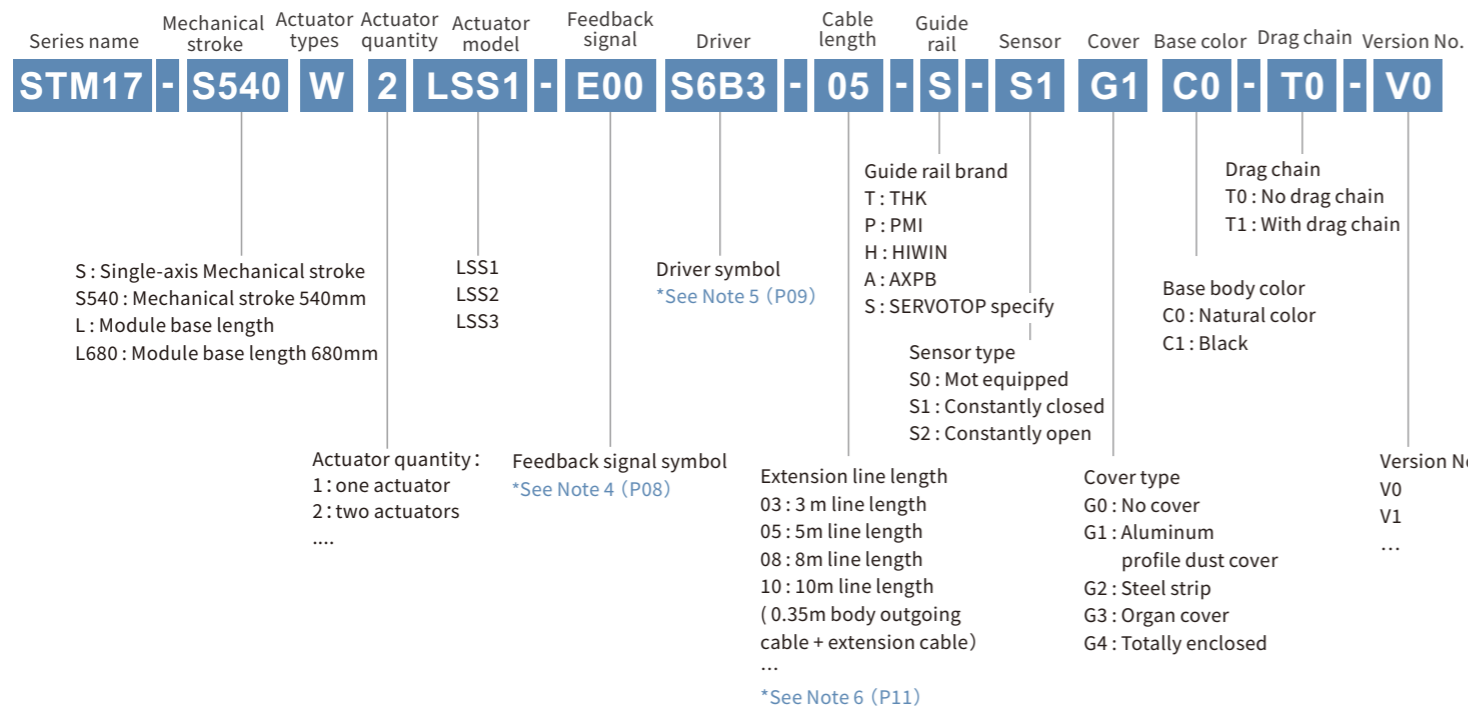
Mechanical stroke $S_{max}$ (mm)	870	950	1030	1110	1190	1270	1350	1430	1510	1590
Base length L(mm)	1170	1250	1330	1410	1490	1570	1650	1730	1810	1890
N	15	16	17	18	19	20	21	22	23	24
Total length (mm)	1190	1270	1350	1430	1510	1590	1670	1750	1830	1910
Total mass (kg)	22.4	24	25.6	27.2	28.8	30.4	32	33.6	35.2	36.8

# STM17 series linear motor stage

# STM17 series linear motor stage



## STM17 series module naming convention



Example: STM17-L1160W2-LSS1-E00GA4-05-T-S1G1C0-T0-V0, indicating :the 170 series base and cover, total base length 1160mm, two SWL-LS-S1 actuators, 1 um magnetic grating reading head, Servotronic 4.5 A pulse driver, THK guide rail, constantly closed sensor, aluminum dust cover, base in natural color, no drag chain, and version number V0.

## Specifications

Model Parameter	SWL-LS		
	SWL-LS-S1	SWL-LS-S2	SWL-LS-S3
Driver*1	Pulse type	ST6-A060-B020	ST6-A100-B020
	Bus type	ST6-A060-E020	ST6-A100-E020
Resolution (um) [Max. speed(m/s)]	Digital quantity: 0.5um[2.4m/s], 1um[3.2m/s], Simulated quantity:[5m/s]		
Max. speed (m/s) *2	5	3.5	4
Peak thrust (N) *3	380	759	1145
Continuous thrust (N) *3	190	379	573
Max. Load(kg)*4	25	52	80
Continuous current(Arms)	4.5	4.5	8
Peak current(Arms)	11.5	11.5	16
Thrust constant (N/Arms)	42	74	71.6
Back electromotive force (V/m/s)	34.6	69	58.6
Motor constant (Nm/√w)	13.9	19.4	23.2
Inductance (mH)	17	41	23.5
Resistor (Ω)	2.8	5	3.1
Electromagnetic attraction force (KN)	0.92	2.1	3.2
Polar distance (N-S)(mm)	16	16	16
Actuator mass (Kg)	1.1	2.4	3.1
Stator mass (Kg/m)	5.8	5.8	5.8
Guide rail specification and quantity	Specification: 15; Quantity: 2		
Sliders quantity	2	4	4
Motion part mass(kg) *5	2.9	5.6	7.6
Repeatability (um) *6	± 1 (Optical grating encoder) / ± 3 (Magnetic grating encoder)		

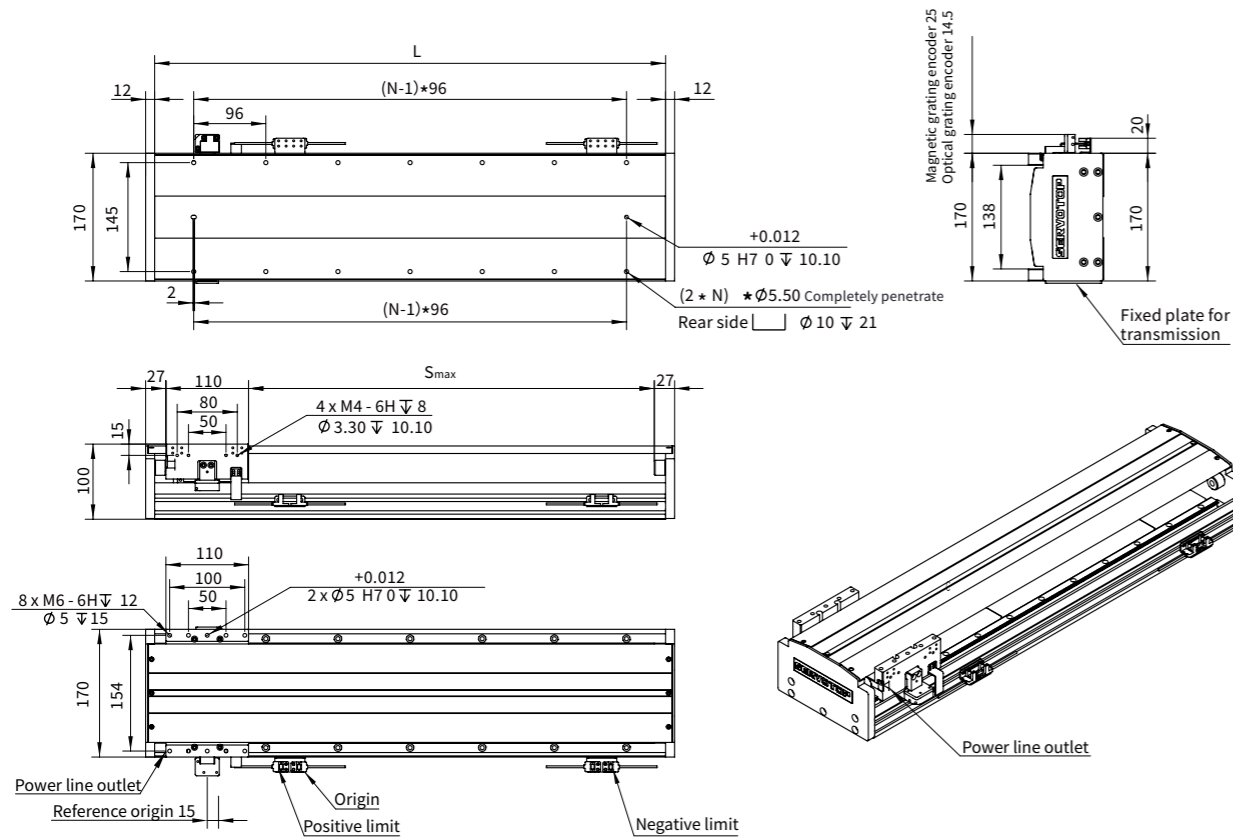
Item	Travel stroke between mechanical blocks(mm)*1		
	LS-S1	LS-S2	LS-S3
Base length L (mm)			
200	60	/	/
296	156	56	/
392	252	152	52
488	348	248	148
584	444	344	244
680	540	440	340
776	636	536	436
872	732	632	532
968	828	728	628
1064	924	824	724
1160	1020	920	820
1256	1116	1016	916
1352	1212	1112	1012
1448	1308	1208	1108
1544	1404	1304	1204
1640	1500	1400	1300
1736	1596	1496	1396
1832	1692	1592	1492
1928	1788	1688	1588
2024	1884	1784	1684

Note 1: The mechanical stroke in the above table is the value of one slider. If n sliders are required, it is calculated as follows:  
Mechanical stroke = Base length (L) - n x Slide length - (n - 1) x 10 - 20. (n > 1)

- Note 1: Driver model type.
- Note 2: The maximum speed is related to the back EMF of the motor and the resolution of the selected encoder.
- Note 3: The capability of a single motor at 25 °C.
- Note 4: The maximum load is a theoretical value in horizontal placement when the acceleration is 1G, the pause interval is 0.5s, and the speed is 1000 mm/s, which is used for reference only. The actual load is affected by various factors, such as the motion speed, acceleration, thrust, and load installation mode.
- Note 5: The mass of parts such as load plate, slider, actuator, and reading head is included.
- Note 6: Feedback signal type.

# STM17 series linear motor stage

## Dimensions of SWL-LS-S1

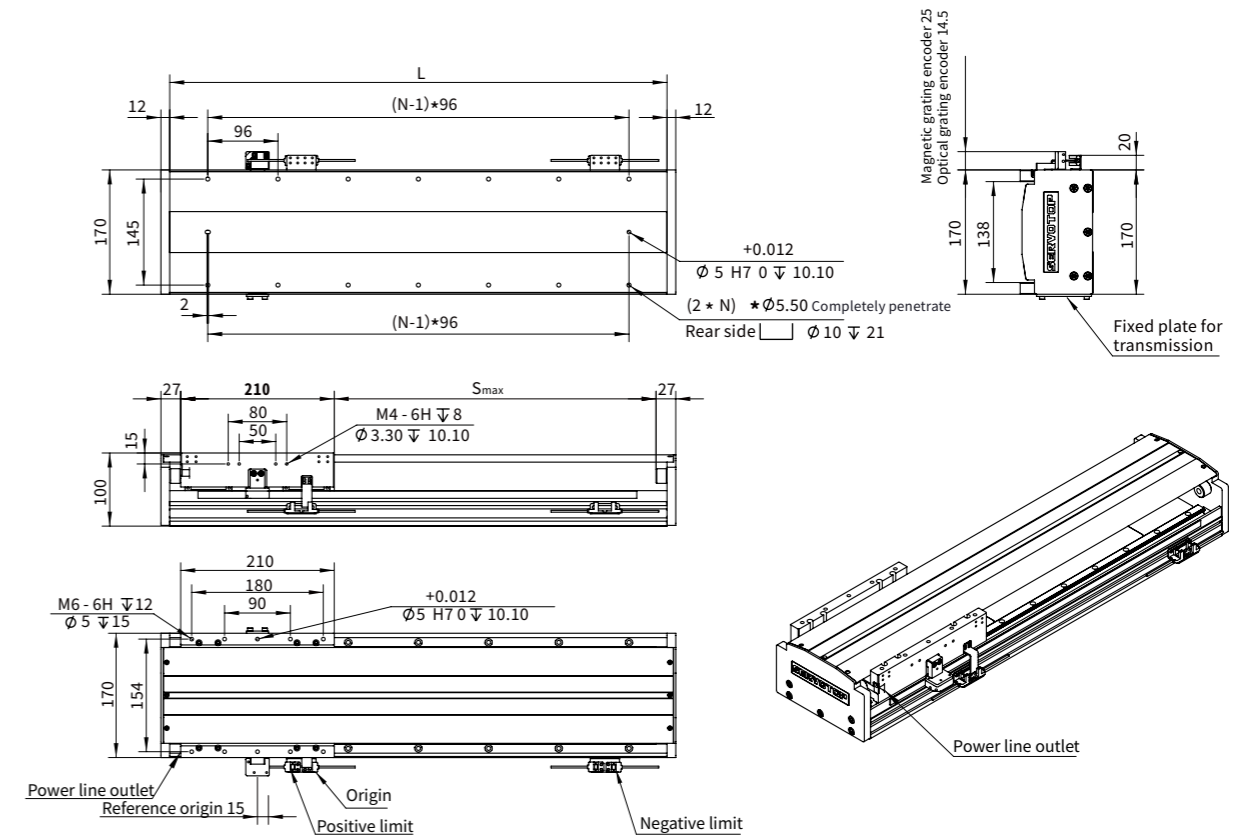


SWL-LS-S1										
Mechanical stroke $S_{max}$ (mm)	60	156	252	348	444	540	636	732	828	924
Base length L (mm)	200	296	392	488	584	680	776	872	968	1064
N	2	3	4	5	6	7	8	9	10	11
Total length (mm)	224	320	416	512	608	704	800	896	992	1088
Total mass (kg)	7.4	9.3	11.2	13.1	15	16.9	18.8	20.7	22.6	24.5

Mechanical stroke $S_{max}$ (mm)	1020	1116	1212	1308	1404	1500	1596	1692	1788	1884
Base length L (mm)	1160	1256	1352	1448	1544	1640	1736	1832	1928	2024
N	12	13	14	15	16	17	18	19	20	21
Total length (mm)	1184	1280	1376	1472	1568	1664	1760	1856	1952	2048
Total mass (kg)	26.4	28.3	30.2	32.1	34	35.9	37.8	39.7	41.6	43.5

# STM17 series linear motor stage

## Dimensions of SWL-LS-S2



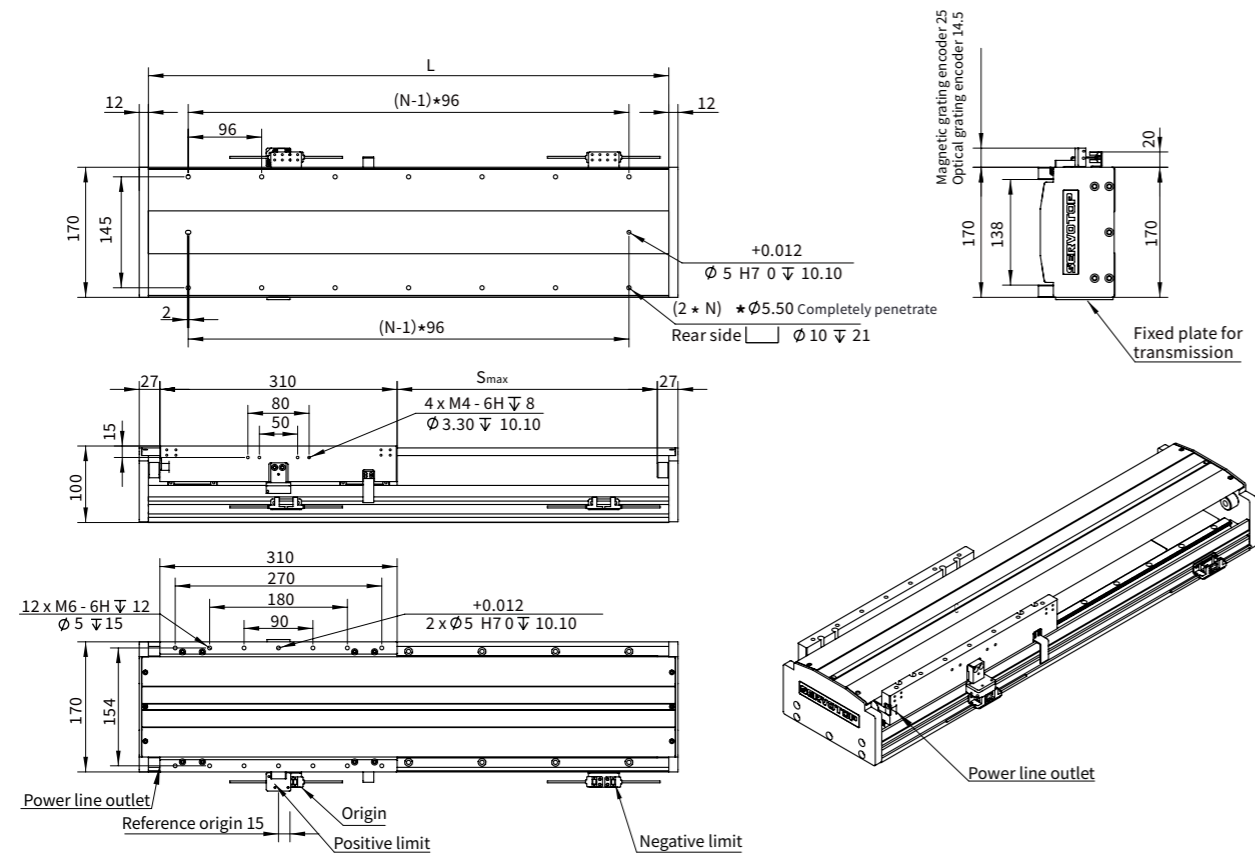
SWL-LS-S2										
Mechanical stroke $S_{max}$ (mm)	/	56	152	248	344	440	536	632	728	824
Base length L (mm)	200	296	392	488	584	680	776	872	968	1064
N	2	3	4	5	6	7	8	9	10	11
Total length (mm)	/	320	416	512	608	704	800	896	992	1088
Total mass (kg)	/	12.1	14	15.9	17.8	19.7	21.6	23.5	25.4	27.3

Mechanical stroke $S_{max}$ (mm)	920	1016	1112	1208	1304	1400	1496	1592	1688	1784
Base length L (mm)	1160	1256	1352	1448	1544	1640	1736	1832	1928	2024
N	12	13	14	15	16	17	18	19	20	21
Total length (mm)	1184	1280	1379	1472	1568	1664	1760	1856	1952	2048
Total mass (kg)	29.2	31.1	33	34.9	36.8	38.7	40.6	42.5	44.4	46.3



# STM17 series linear motor stage

## ● Dimensions of SWL-LS-S3



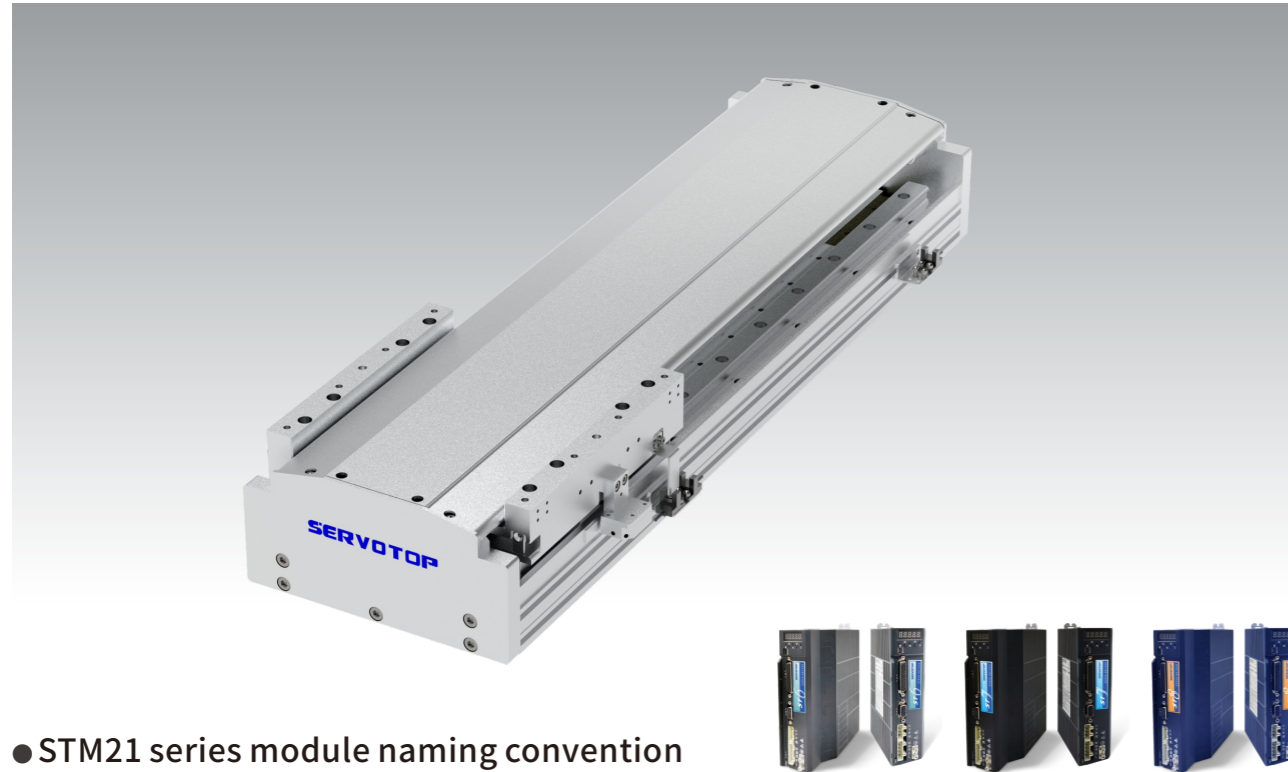
SWL-LS-S3										
Mechanical stroke $S_{max}$ (mm)	/	/	52	148	244	340	436	532	628	724
Base length L (mm)	200	296	392	488	584	680	776	872	968	1064
N	2	3	4	5	6	7	8	9	10	11
Total length (mm)	/	/	416	512	608	704	800	896	992	1088
Total mass (kg)	/	/	16	17.9	19.8	21.7	23.6	25.5	27.4	29.3

Mechanical stroke $S_{max}$ (mm)	820	916	1012	1108	1204	1300	1396	1492	1588	1684
Base length L (mm)	1160	1256	1352	1448	1544	1640	1736	1832	1928	2024
N	12	13	14	15	16	17	18	19	20	21
Total length (mm)	1184	1280	1376	1472	1568	1664	1760	1856	1952	2048
Total mass (kg)	31.2	33.1	35	36.9	38.8	40.7	42.6	44.5	46.4	48.3

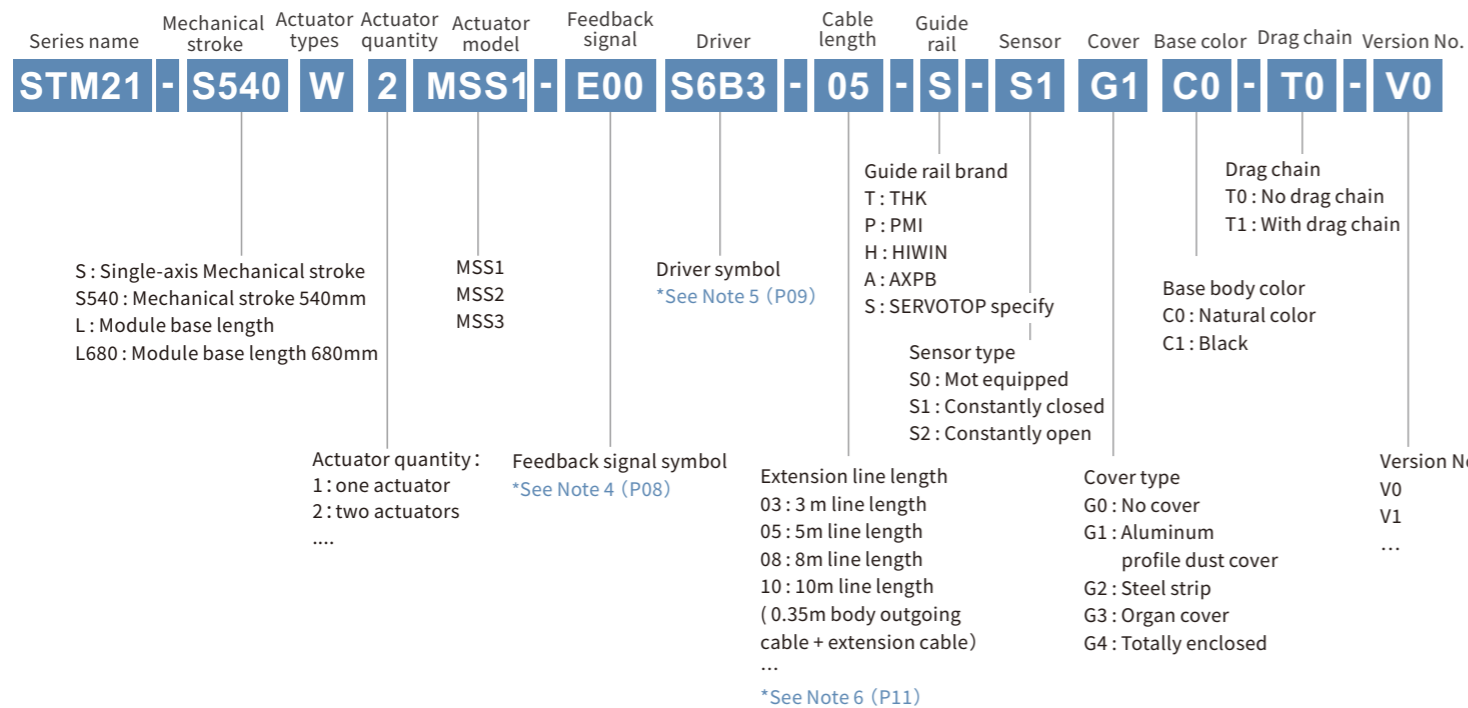
MEMO

# STM21 series linear motor stage

# STM21 series linear motor stage



## STM21 series module naming convention



Example: STM21-L1160W2- MSS1-E00GA6-05-T-S1G1C0-T0-V0, indicating :the 210 series base and cover, total base length 1160mm, two SWL-MS-S1 actuators, 1 um magnetic grating reading head, Servotronic 6 A pulse driver, THK guide rail, constantly closed sensor, aluminum dust cover, base in natural color, no drag chain, and version number V0.

## Specifications

Model Parameter	SWL-MS		
	SWL-MS-S1	SWL-MS-S2	SWL-MS-S3
Driver*1	Pulse type	ST6-A060-B020	ST6-A100-B020
	Bus type	ST6-A060-E020	ST6-A100-E020
Resolution (um) [Max. speed(m/s)]	Digital quantity: 0.5um[2.4m/s], 1um[3.2m/s], Simulated quantity:[5m/s]		
Max. speed (m/s) *2	5	3	3.4
Peak thrust (N) *3	462	918	1386
Continuous thrust (N) *3	231	459	693
Max. Load(kg)*4	30	60	90
Continuous current(Arms)	4.5	4.5	8
Peak current(Arms)	11.5	11.5	16
Thrust constant (N/Arms)	51.5	102	86.6
Back electromotive force (V/m/s)	35.5	79.2	71
Motor constant (Nm/√w)	39	53	73
Inductance (mH)	23	61	22.6
Resistor (Ω)	3	6.7	2.6
Electromagnetic attraction force (KN)	1.1	2.5	3.9
Polar distance (N-S)(mm)	16	16	16
Actuator mass (Kg)	1.9	3.8	5.7
Stator mass (Kg/m)	7.2	7.2	7.2
Guide rail specification and quantity	Specification: 20; Quantity: 2		
Sliders quantity	2	4	4
Motion part mass(kg) *5	4.4	8.1	11.4
Repeatability (um) *6	± 1 (Optical grating encoder) / ± 3 (Magnetic grating encoder)		

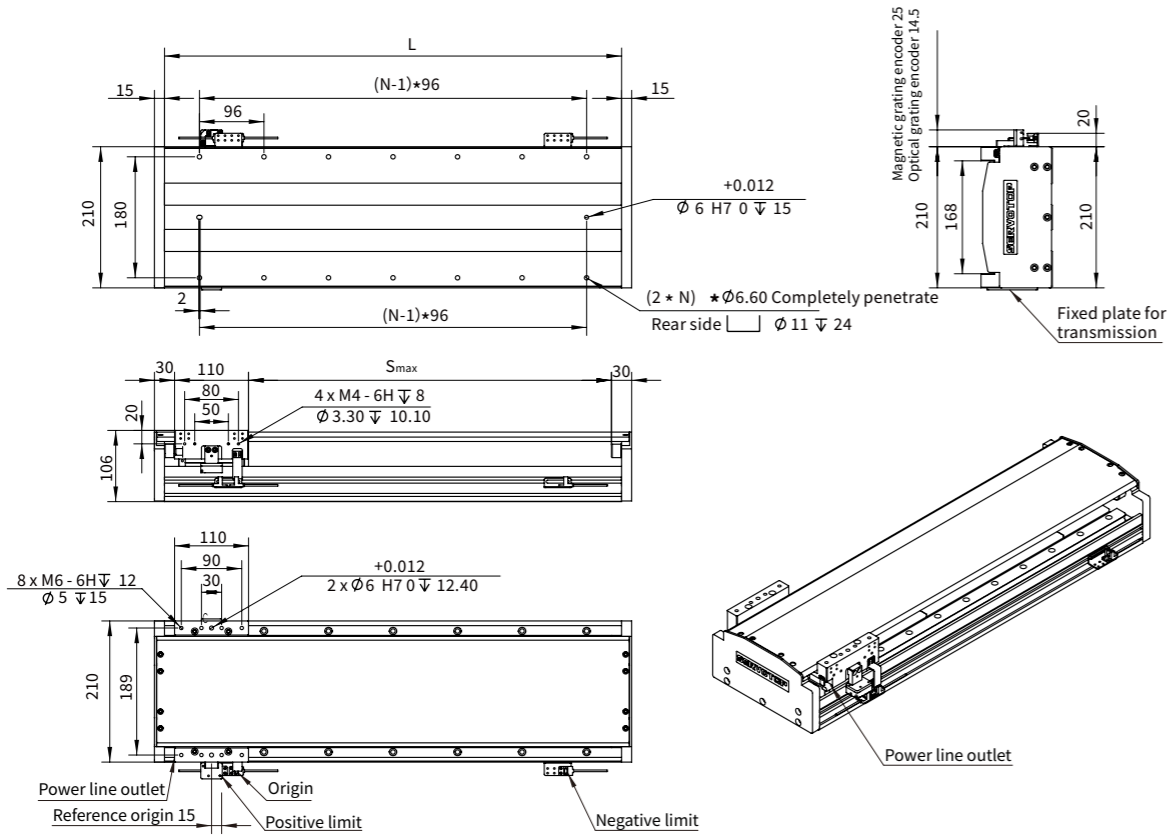
Item	Travel stroke between mechanical blocks(mm)*1		
	MS-S1	MS-S2	MS-S3
Base length L (mm)			
200	60	/	/
296	156	56	/
392	252	152	52
488	348	248	148
584	444	344	244
680	540	440	340
776	636	536	436
872	732	632	532
968	828	728	628
1064	924	824	724
1160	1020	920	820
1256	1116	1016	916
1352	1212	1112	1012
1448	1308	1208	1108
1544	1404	1304	1204
1640	1500	1400	1300
1736	1596	1496	1396
1832	1692	1592	1492
1928	1788	1688	1588
2024	1884	1784	1684

Note 1: The mechanical stroke in the above table is the value of one slider. If n sliders are required, it is calculated as follows:  
Mechanical stroke = Base length (L) - n x Slide length - (n - 1) x 10 - 20. (n > 1)

- Note 1: Driver model type.
- Note 2: The maximum speed is related to the back EMF of the motor and the resolution of the selected encoder.
- Note 3: The capability of a single motor at 25 °C.
- Note 4: The maximum load is a theoretical value in horizontal placement when the acceleration is 1G, the pause interval is 0.5s, and the speed is 1000 mm/s, which is used for reference only. The actual load is affected by various factors, such as the motion speed, acceleration, thrust, and load installation mode.
- Note 5: The mass of parts such as load plate, slider, actuator, and reading head is included.
- Note 6: Feedback signal type.

# STM21 series linear motor stage

## ● Dimensions of SWL-MS-S1

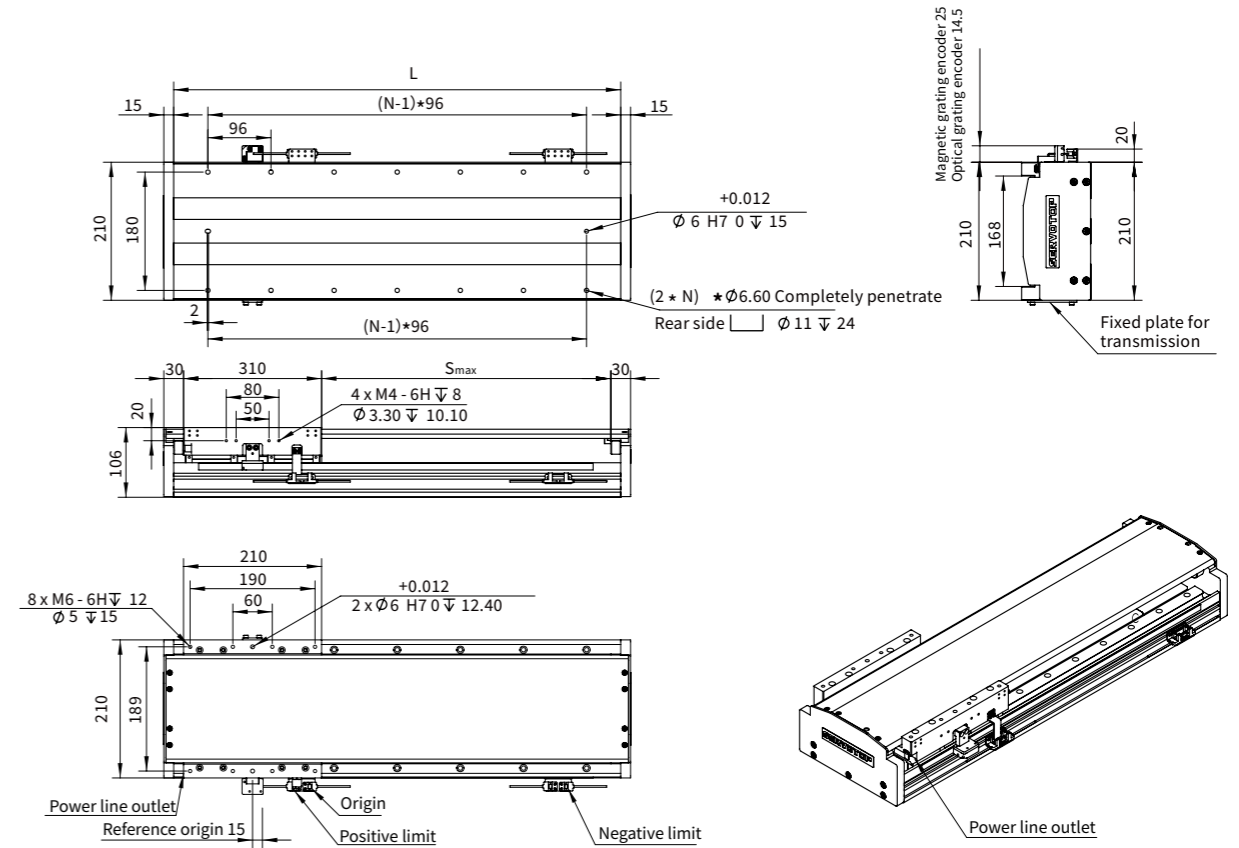


SWL-MS-S1										
Mechanical stroke $S_{max}$ (mm)	60	156	252	348	444	540	636	732	828	924
Base length L (mm)	200	296	392	488	584	680	776	872	968	1064
N	2	3	4	5	6	7	8	9	10	11
Total length (mm)	230	326	422	518	614	710	806	902	998	1094
Total mass (kg)	19.1	21.7	24.3	26.9	29.5	32.1	34.7	37.3	39.9	42.5

Mechanical stroke $S_{max}$ (mm)	1020	1116	1212	1308	1404	1500	1596	1692	1788	1884
Base length L (mm)	1160	1256	1352	1448	1544	1640	1736	1832	1928	2024
N	12	13	14	15	16	17	18	19	20	21
Total length (mm)	1190	1286	1382	1478	1574	1670	1766	1862	1958	2054
Total mass (kg)	45.1	47.7	50.3	52.9	55.5	58.1	60.7	63.3	65.9	68.5

# STM21 series linear motor stage

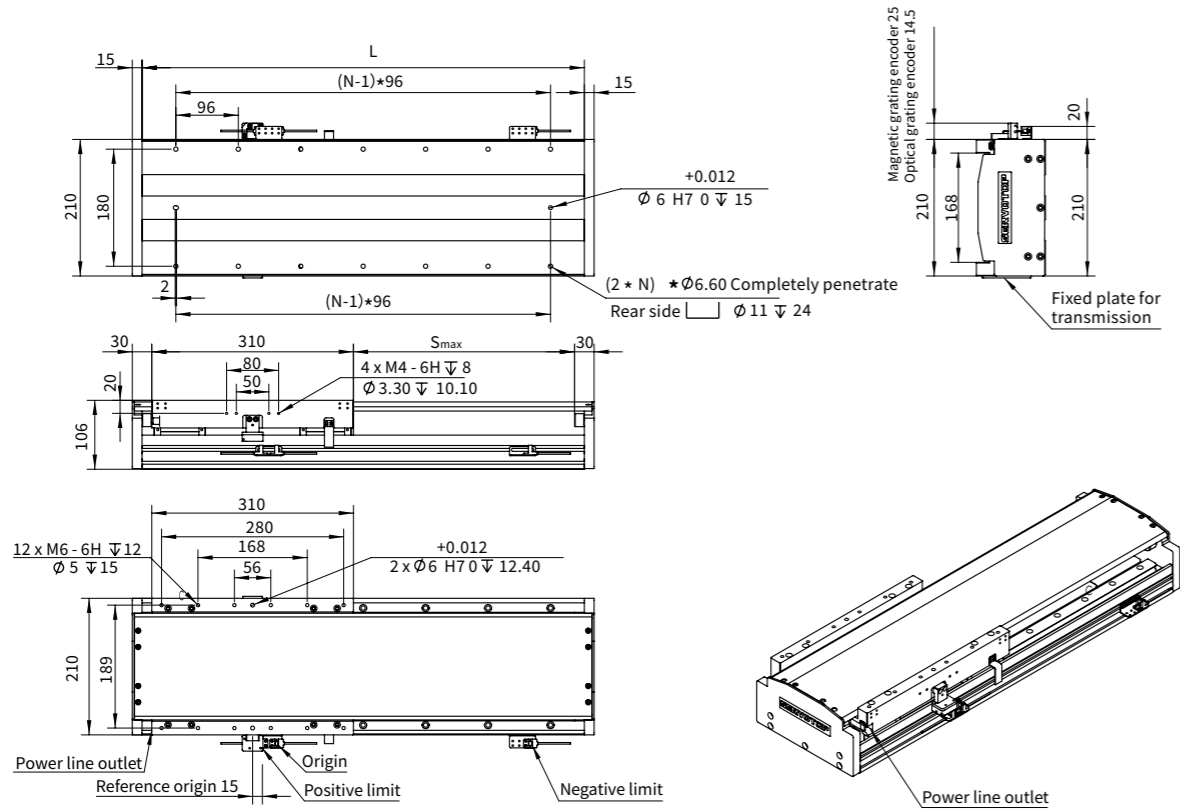
## ● Dimensions of SWL-MS-S2



SWL-MS-S2										
Mechanical stroke $S_{max}$ (mm)	/	56	152	248	344	440	536	632	728	824
Base length L (mm)	200	296	392	488	584	680	776	872	968	1064
N	2	3	4	5	6	7	8	9	10	11
Total length (mm)	/	326	422	518	614	710	806	902	998	1094
Total mass (kg)	/	21.7	24.3	26.9	29.5	32.1	34.7	37.3	39.9	42.5

Mechanical stroke $S_{max}$ (mm)	920	1016	1112	1208	1304	1400	1496	1592	1688	1784
Base length L (mm)	1160	1256	1352	1448	1544	1640	1736	1832	1928	2024
N	12	13	14	15	16	17	18	19	20	21
Total length (mm)	1190	1286	1382	1478	1574	1670	1766	1862	1958	2054
Total mass (kg)	45.1	47.7	50.3	52.9	55.5	58.1	60.7	63.3	65.9	68.5

## ● Dimensions of SWL-MS-S3



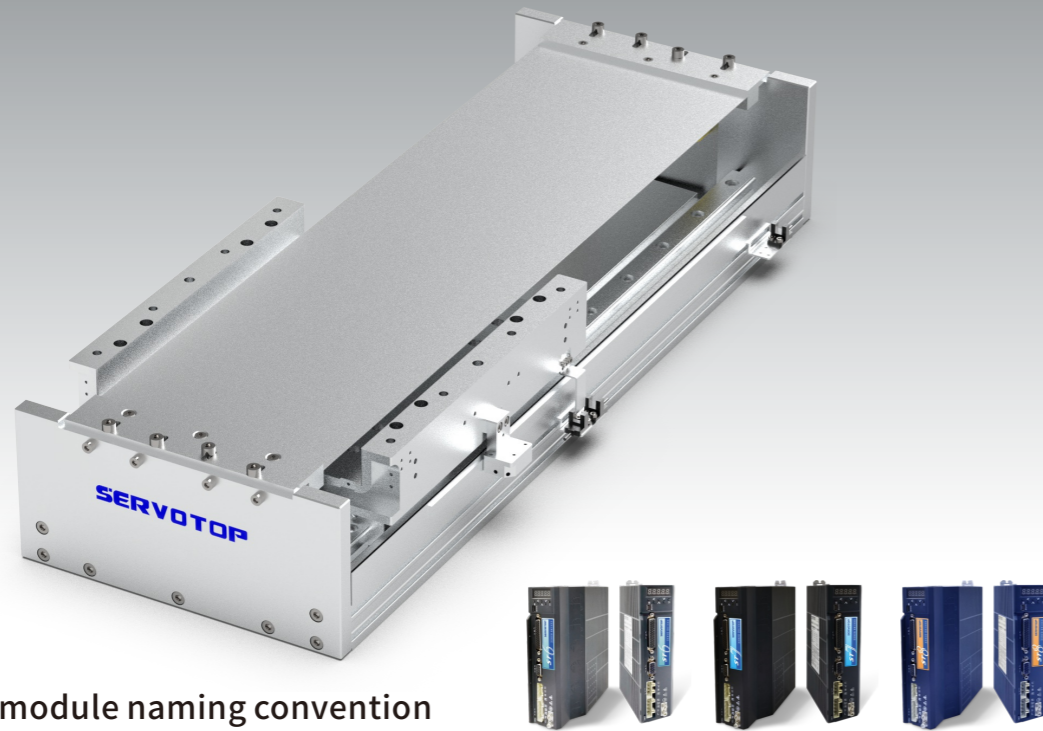
SWL-MS-S3										
Mechanical stroke $S_{max}$ (mm)	/	/	52	148	244	340	436	532	628	724
Base length $L$ (mm)	200	296	392	488	584	680	776	872	968	1064
N	2	3	4	5	6	7	8	9	10	11
Total length (mm)	/	/	422	518	614	710	806	902	998	1094
Total mass (kg)	/	/	24.3	26.9	29.5	32.1	34.7	37.3	39.9	42.5

Mechanical stroke $S_{max}$ (mm)	820	916	1012	1108	1204	1300	1396	1492	1588	1684
Base length $L$ (mm)	1160	1256	1352	1448	1544	1640	1736	1832	1928	2024
N	12	13	14	15	16	17	18	19	20	21
Total length (mm)	1190	1286	1382	1478	1574	1670	1766	1862	1958	2054
Total mass (kg)	45.1	47.7	50.3	52.9	55.5	58.1	60.7	63.3	65.9	68.5

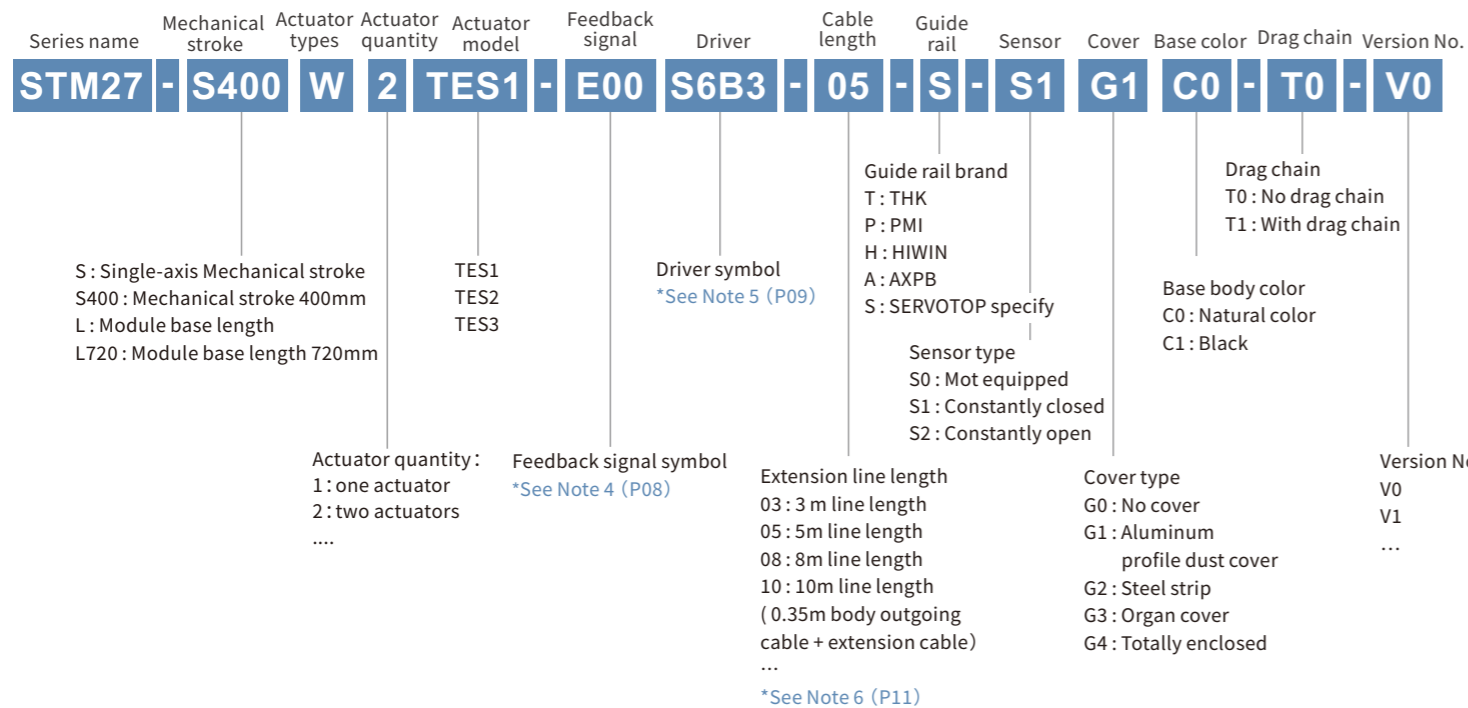
MEMO

# STM27 series linear motor stage

# STM27 series linear motor stage



## ● STM27 series module naming convention



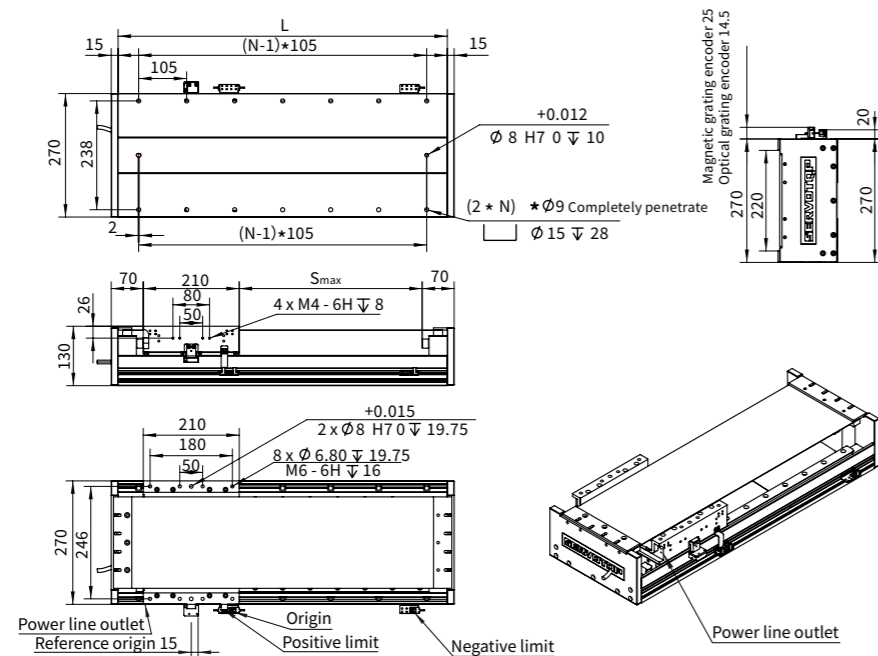
Example: STM27-L1140W2-TES1-E00GA8-05-T-S1G1C0-T0-V0, indicating :the 270 series base and cover, total base length 1140mm, two SWL-TE-S1 actuators, 1 um magnetic grating reading head, Servotronic 8 A pulse driver, THK guide rail, constantly closed sensor, aluminum dust cover, base in natural color, no drag chain, and version number V0.

## ● Specifications

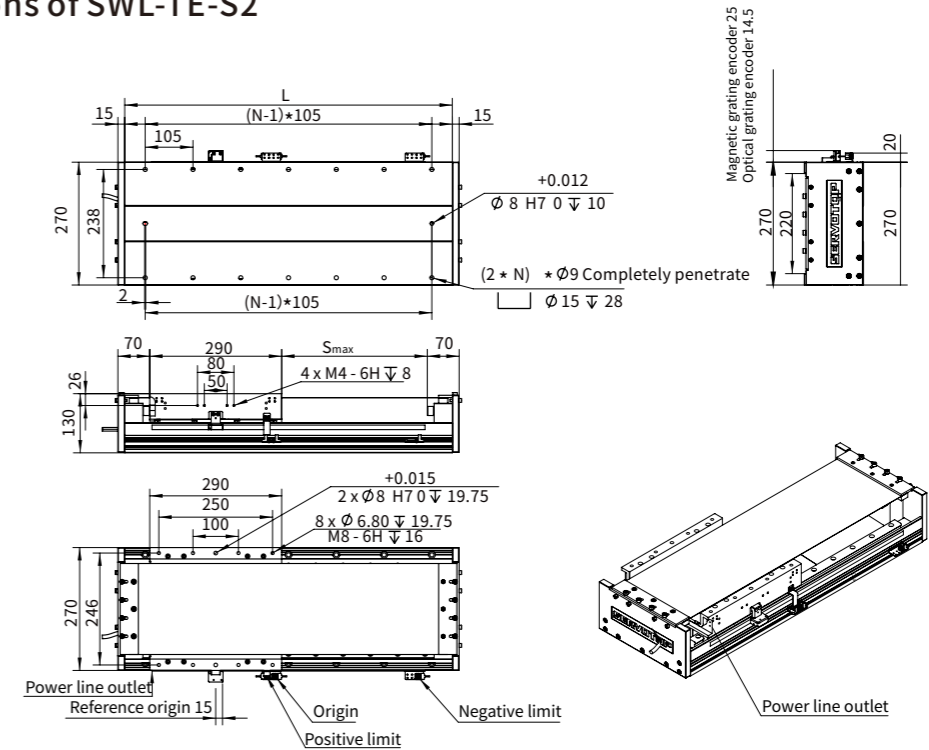
Model Parameter	SWL-TE			Item	Travel stroke between mechanical blocks(mm) <sup>*1</sup>			Item	Travel stroke between mechanical blocks(mm) <sup>*1</sup>			
	SWL-TE-S1	SWL-TE-S2	SWL-TE-S3		Base length L (mm)	TE-S1	TE-S2		TE-S3	Base length L (mm)	TE-S1	TE-S2
Driver <sup>*1</sup>	Pulse type	ST6-A100-B020			405	85	/	/	2505	2185	2105	2025
	Bus type	ST6-A100-E020			510	190	110	30	2610	2290	2210	2130
Resolution (um) [Max. speed(m/s)]	Digital quantity: 0.5um[2.4m/s], 1um[3.2m/s], Simulated quantity:[5m/s]			615	295	215	135	2715	2395	2315	2235	
Max. speed (m/s) <sup>*2</sup>	4.2	3	2.2	720	400	320	240	2820	2500	2420	2340	
Peak thrust (N) <sup>*3</sup>	1740	2460	3300	825	505	425	345	2925	2605	2525	2445	
Continuous thrust (N) <sup>*3</sup>	580	820	1100	930	610	530	450	3030	2710	2630	2550	
Max. Load(kg) <sup>*4</sup>	76	108	146	1035	715	635	555	3135	2815	2735	2655	
Continuous current(Arms)	8	8	8	1140	820	740	660	3240	2920	2840	2760	
Peak current(Arms)	24	24	24	1245	925	845	765	3345	3025	2945	2865	
Thrust constant (N/Arms)	72.5	102.5	137.5	1350	1030	950	870	3450	3130	3050	2970	
Back electromotive force (V/m/s)	59.4	84	112.7	1455	1135	1055	975	3555	3235	3155	3075	
Motor constant (Nm/√w)	43.5	49.4	60.5	1560	1240	1160	1080	3660	3340	3260	3180	
Inductance (mH)	18	28	36	1665	1345	1265	1185	3765	3445	3365	3285	
Resistor (Ω)	1.8	2.5	3.6	1770	1450	1370	1290	3870	3550	3470	3390	
Electromagnetic attraction force (KN)	3	4.5	6	1875	1555	1475	1395	3975	3655	3575	3495	
Polar distance (N-S)(mm)	21	21	21	1980	1660	1580	1500	4080	3760	3680	3600	
Actuator mass (Kg)	5.8	8.4	11.2	2085	1765	1685	1605	4185	3865	3785	3705	
Stator mass (Kg/m)	9.5	9.5	9.5	2190	1870	1790	1710	4290	3970	3890	3810	
Guide rail specification and quantity	Specification: 25; Quantity: 2			2295	1975	1895	1815	4395	4075	3995	3915	
Sliders quantity	4	4	6	2400	2080	2000	1920	4500	4180	4100	4020	
Motion part mass(kg) <sup>*5</sup>	12.6	17	22.8	Note 1: The mechanical stroke in the above table is the value of one slider. If n sliders are required, it is calculated as follows: Mechanical stroke = Base length (L) - n x Slide length - (n - 1) x 10 - 20. (n > 1)								
Repeatability (um) <sup>*6</sup>	±1 (Optical grating encoder) /±3 (Magnetic grating encoder)											

- Note 1: Driver model type.
- Note 2: The maximum speed is related to the back EMF of the motor and the resolution of the selected encoder.
- Note 3: The capability of a single motor at 25 °C.
- Note 4: The maximum load is a theoretical value in horizontal placement when the acceleration is 1G, the pause interval is 0.5s, and the speed is 1000 mm/s, which is used for reference only. The actual load is affected by various factors, such as the motion speed, acceleration, thrust, and load installation mode.
- Note 5: The mass of parts such as load plate, slider, actuator, and reading head is included.
- Note 6: Feedback signal type.

## ● Dimensions of SWL-TE-S1



## ● Dimensions of SWL-TE-S2



SWL-TE-S1										
Mechanical stroke $S_{max}$ (mm)	85	190	295	400	505	610	715	820	925	1030
Base length L (mm)	405	510	615	720	825	930	1035	1140	1245	1350
N	4	5	6	7	8	9	10	11	12	13
Total length (mm)	435	540	645	750	855	960	1065	1170	1275	1380
Total mass (kg)	26.6	30	33.4	36.8	40.2	43.6	47	50.4	53.8	57.2

Mechanical stroke $S_{max}$ (mm)	1135	1240	1345	1450	1555	1660	1765	1870	1975	2080
Base length L (mm)	1455	1560	1665	1770	1875	1980	2085	2190	2295	2400
N	14	15	16	17	18	19	20	21	22	23
Total length (mm)	1485	1590	1695	1800	1905	2010	2115	2220	2325	2430
Total mass (kg)	60.6	64	67.4	70.8	74.2	77.6	81	84.4	87.8	91.2

Mechanical stroke $S_{max}$ (mm)	2185	2290	2395	2500	2605	2710	2815	2920	3025	3130
Base length L (mm)	2505	2610	2715	2820	2925	3030	3135	3240	3345	3450
N	24	25	26	27	28	29	30	31	32	33
Total length (mm)	2535	2640	2745	2850	2955	3060	3165	3270	3375	3480
Total mass (kg)	94.6	98	101.4	104.8	108.2	111.6	115	118.4	121.8	125.2

Mechanical stroke $S_{max}$ (mm)	3235	3340	3445	3550	3655	3760	3865	3970	4075	4180
Base length L (mm)	3555	3660	3765	3870	3975	4080	4185	4290	4395	4500
N	34	35	36	37	38	39	40	41	42	43
Total length (mm)	3585	3690	3795	3900	4005	4110	4215	4320	4425	4530
Total mass (kg)	128.6	132	135.4	138.8	142.2	145.6	149	152.4	155.8	159.2

SWL-TE-S2										
Mechanical stroke $S_{max}$ (mm)	/	110	215	320	425	530	635	740	845	950
Base length L (mm)	405	510	615	720	825	930	1035	1140	1245	1350
N	/	5	6	7	8	9	10	11	12	13
Total length (mm)	/	540	645	750	855	960	1065	1170	1275	1380
Total mass (kg)	/	34.4	37.8	41.2	44.6	48	51.4	54.8	58.2	61.6

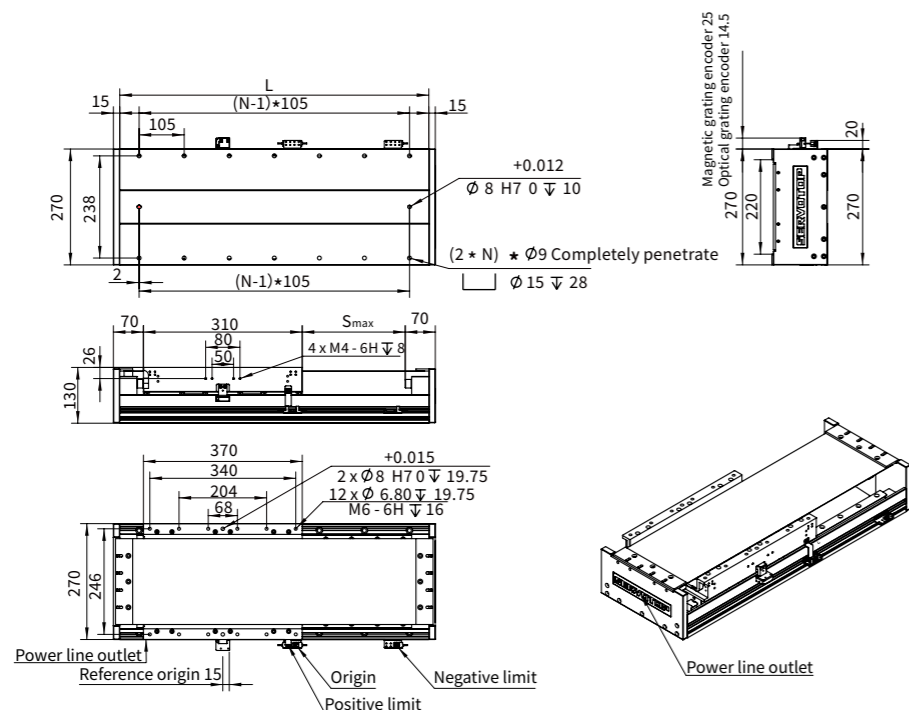
Mechanical stroke $S_{max}$ (mm)	1055	1160	1265	1370	1475	1580	1685	1790	1895	2000
Base length L (mm)	1455	1560	1665	1770	1875	1980	2085	2190	2295	2400
N	14	15	16	17	18	19	20	21	22	23
Total length (mm)	1485	1590	1695	1800	1905	2010	2115	2220	2325	2430
Total mass (kg)	65	68.4	71.8	75.2	78.6	82	85.4	88.8	92.2	95.6

Mechanical stroke $S_{max}$ (mm)	2105	2210	2315	2420	2525	2630	2735	2840	2945	3050
Base length L (mm)	2505	2610	2715	2820	2925	3030	3135	3240	3345	3450
N	24	25	26	27	28	29	30	31	32	33
Total length (mm)	2535	2640	2745	2850	2955	3060	3165	3270	3375	3480
Total mass (kg)	99	102	106	109	113	116	119	123	126	130

Mechanical stroke $S_{max}$ (mm)	3155	3260	3365	3470	3575	3680	3785	3890	3995	4100
Base length L (mm)	3555	3660	3765	3870	3975	4080	4185	4290	4395	4500
N	34	35	36	37	38	39	40	41	42	43
Total length (mm)	3585	3690	3795	3900	4005	4110	4215	4320	4425	4530
Total mass (kg)	133	136	140	143	147	150	153	157	160	164

# STM27 series linear motor stage

## Dimensions of SWL-TE-S3



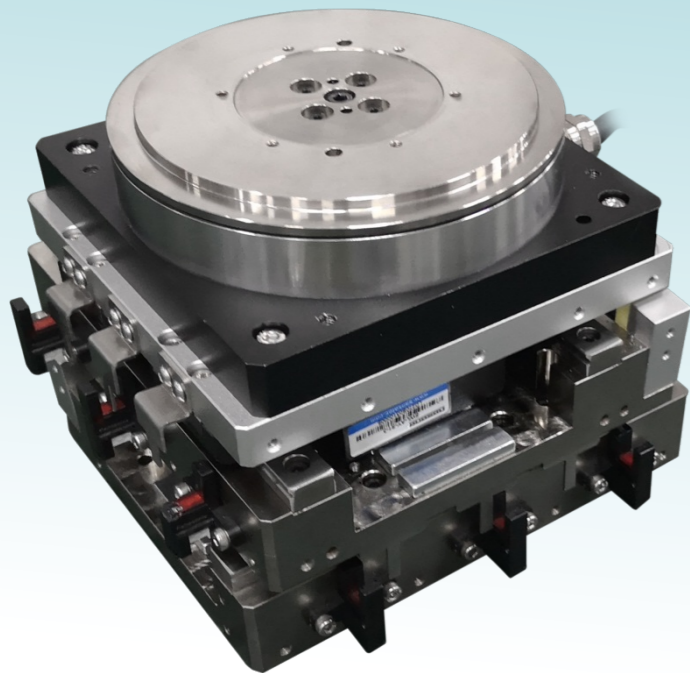
SWL-TE-S3										
Mechanical stroke $S_{max}$ (mm)	/	30	135	240	345	450	555	660	765	870
Base length L (mm)	405	510	615	720	825	930	1035	1140	1245	1350
N	/	5	6	7	8	9	10	11	12	13
Total length (mm)	/	540	645	750	855	960	1065	1170	1275	1380
Total mass (kg)	/	40.1	43.5	46.9	50.3	53.7	57.1	60.5	63.9	67.3

Mechanical stroke $S_{max}$ (mm)	975	1080	1185	1290	1395	1500	1605	1710	1815	1920
Base length L (mm)	1455	1560	1665	1770	1875	1980	2085	2190	2295	2400
N	14	15	16	17	18	19	20	21	22	23
Total length (mm)	1485	1590	1695	1800	1905	2010	2115	2220	2325	2430
Total mass (kg)	70.7	74.1	77.5	80.9	84.3	87.7	91.1	94.5	97.9	101

Mechanical stroke $S_{max}$ (mm)	2025	2130	2235	2340	2445	2550	2655	2760	2865	2970
Base length L (mm)	2505	2610	2715	2820	2925	3030	3135	3240	3345	3450
N	24	25	26	27	28	29	30	31	32	33
Total length (mm)	2535	2640	2745	2850	2955	3060	3165	3270	3375	3480
Total mass (kg)	105	108	112	115	118	122	125	129	132	135

Mechanical stroke $S_{max}$ (mm)	3075	3180	3285	3390	3495	3600	3705	3810	3915	4020
Base length L (mm)	3555	3660	3765	3870	3975	4080	4185	4290	4395	4500
N	34	35	36	37	38	39	40	41	42	43
Total length (mm)	3585	3690	3795	3900	4005	4110	4215	4320	4425	4530
Total mass (kg)	139	142	146	149	152	156	159	163	166	169

MEMO



## ■ XYZθ precision alignment stage

The STVF series XYZ θ mini alignment stage adopts the direct drive mode for motion and is equipped with a high-resolution encoder for full closed-loop control, thus achieving high precision and small size. This stage can be collocated flexibly, realizing free combination of single layer (X axis) and multi-layers (XY axis, Xθ axis, XYZθ axis), realizing compact space and flexible installation.

The XYZθ alignment stage can replace the conventional UVW alignment stage. Compared with the latter, the XYZθ alignment stage adopts the direct drive straight line (DDL) and the direct drive rotation (DDR) power, which features a simpler structure, higher positioning accuracy, shorter alignment time, and simpler control algorithm demand for the host computer.



## ■ Naming convention of the XYZθ mini alignment stage

### STVF 120 - XYZθ - YY

XYZθ mini alignment stage logo

Series symbol

80: 80 series,  
X/Y-axis width 80mm  
100: 100 series,  
X/Y-axis width 100mm  
120: 120 series,  
X/Y-axis width 120mm  
140: 140 series,  
X/Y-axis width 140mm  
170: 170 series,  
X/Y-axis width 170mm

Feedback signal and resolution

G0: 0.1μm optical grating  
G1: 0.5μm optical grating  
M2: 1μm magnetic grating

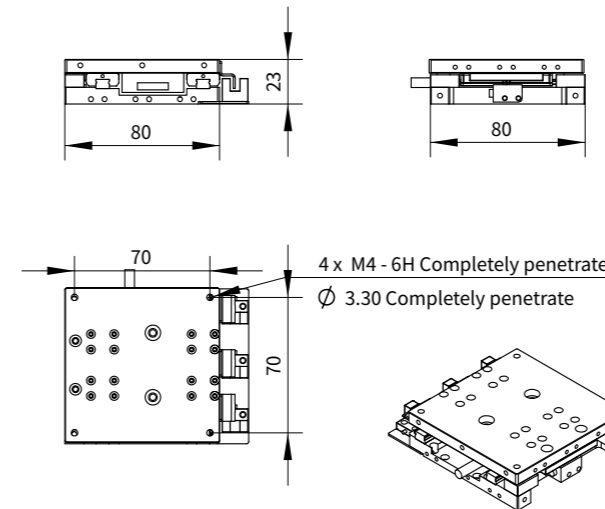
Platform type

X: Straight axis in horizontal direction  
Z: Single axis in vertical direction  
XY: Linear superimposed cross stage  
Xθ: Xθ linear rotatory superimposed stage  
XYθ: XYθ linear rotatory superimposed stage  
XYZθ: XYZθ linear rotatory superimposed stage

For example: STVF120-XYθ-M2 indicates the XYθ mini alignment stage, where the base length in the X and Y axis is 120 mm and the 1 μm magnetic grating is used.

## ■ STVF80 series alignment stage

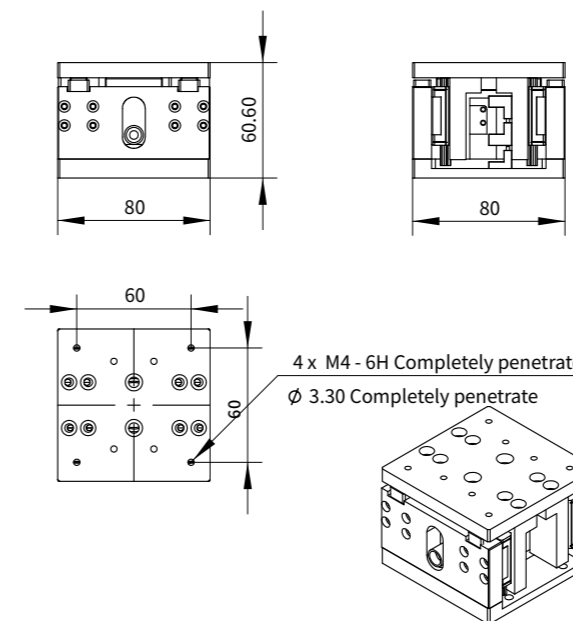
### STVF80- X horizontal single-axis alignment stage



#### ● Basic parameter

Parameter	X Axis
Continuous thrust (N)	12
Peak thrust (N)	25
Continuous current (Arms)	2.5
Peak current (Arms)	11.5
Positioning time (ms)	<100
Allowable load (Kg)	<3
Resolution (μm)	0.1, 0.5, 1
Repeatability (μm)	±1
Straightness (μm)	±1.5
Flatness (μm)	±2
Travel stroke (mm)	15
Dimension H x W x D(mm) (excluding sensor)	80×80×23
Weight (Kg)	1.8

### STVF80-Z vertical single-axis alignment stage



#### ● Basic parameter

Parameter	Z Axis
Continuous thrust (N)	15
Peak thrust (N)	45
Continuous current (Arms)	4.8
Peak current (Arms)	13.4
Positioning time (ms)	<100
Allowable load (Kg)	<5
Resolution (μm)	0.1, 0.5, 1
Repeatability (μm)	±1
Straightness (μm)	±1.5
Flatness (μm)	±2
Travel stroke (mm)	8
Dimension H x W x D(mm) (excluding sensor)	80×80×60.6
Weight (Kg)	1.3

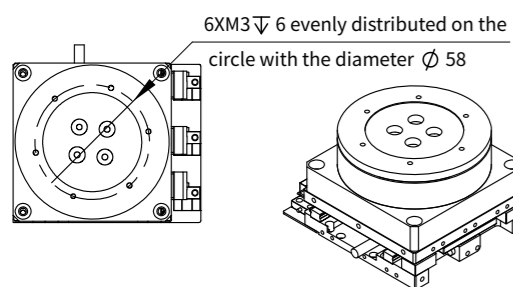
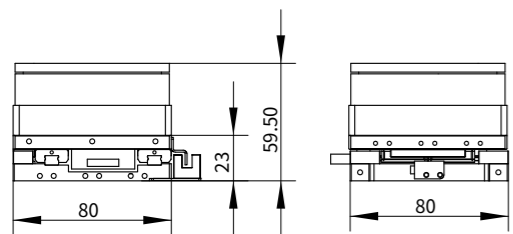


# ■ XYZθ precision alignment stage

# ■ XYZθ precision alignment stage

## STVF80- Xθ dual-axis superimposed alignment stage

● Basic parameter

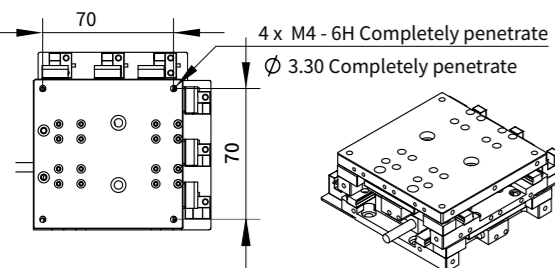
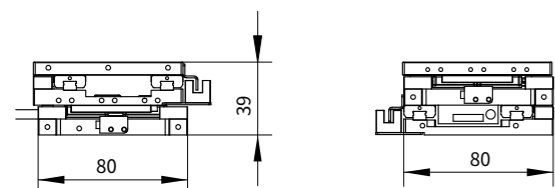


Parameter	X Axis	Parameter	θ Axis
Continuous thrust (N)	12	Continuous torque (Nm)	0.8
Peak thrust (N)	25	Peak torque (Nm)	4
Continuous current (Arms)	2.5	Continuous current (Arms)	2
Peak current (Arms)	11.5	Peak current (Arms)	10
Positioning time (ms)	<100	Rated rotational speed (rpm)	100
Allowable load (Kg)	<3	Max. rotational speed (rpm)	200
Resolution (um)	0.1、0.5、1	Repeatability positioning precision (°)	±0.005
Repeatability (um)	±1	Absolute positioning precision (°)	
Straightness (um)	±1.5	Angle range (°)	360° unrestricted
Flatness (um)	±2	Diameter (mm)	97
Travel stroke (mm)	15	Rotor inertia (KG · m <sup>2</sup> )	0.00113
Dimension H x W x D(mm) (excluding sensor)	80×80×23	Weight (kg)	1.2

Stage dimension H x W x D(mm) (excluding sensor)	80×80×59.5
Stage weight (kg)	3

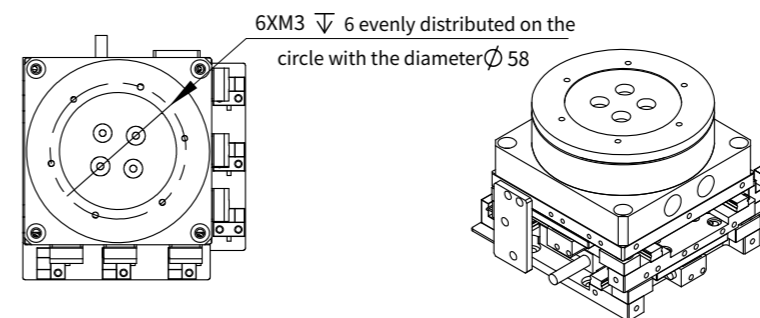
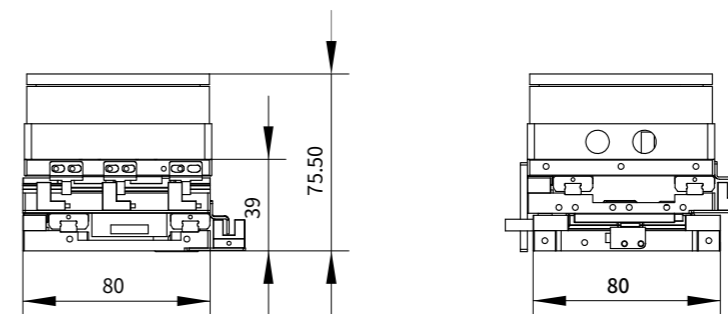
## STVF80- XY dual-axis superimposed alignment stage

● Basic parameter



Parameter	X Axis	Y Axis
Continuous thrust (N)	12	
Peak thrust (N)	25	
Continuous current (Arms)	2.5	
Peak current (Arms)	11.5	
Positioning time (ms)	<100	
Allowable load (Kg)	<3	<3+X
Resolution (um)	0.1、0.5、1	
Repeatability (um)	±1	
Straightness (um)	±1.5	
Flatness (um)	±4.0	
Travel stroke (mm)	15	
Dimension H x W x D(mm) (excluding sensor)	80×80×39	
Weight (Kg)	2.8	

## STVF80- XYθ 3-axis superposed alignment stage



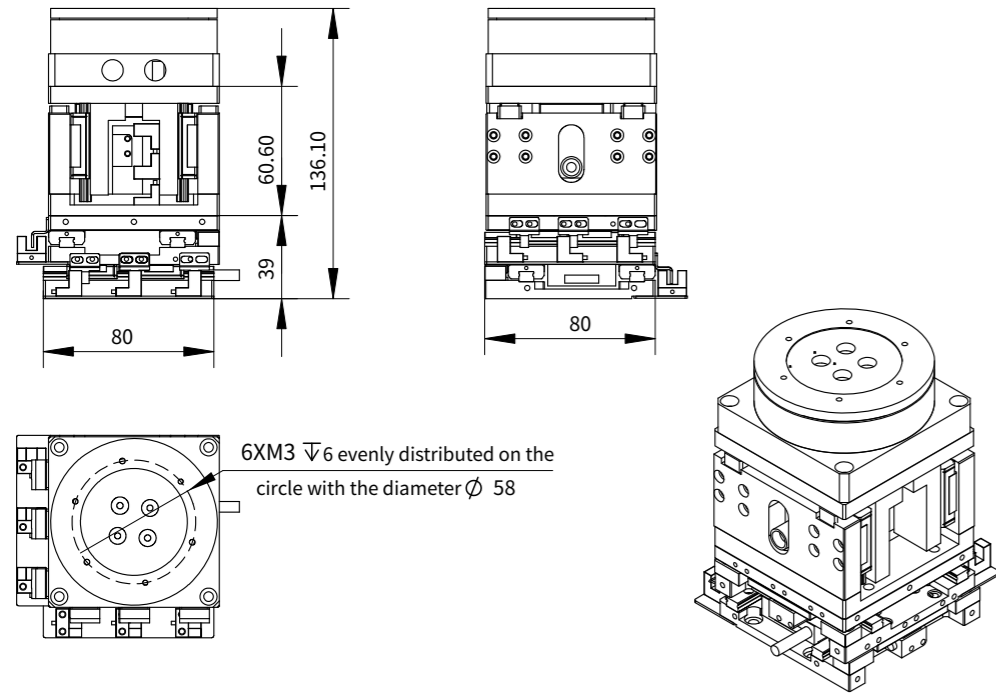
● Basic parameter

Parameter	X Axis	Y Axis	Parameter	θ Axis
Continuous thrust (N)	12		Continuous torque (Nm)	0.8
Peak thrust (N)	25		Peak torque (Nm)	4
Continuous current (Arms)	2.5		Continuous current (Arms)	2
Peak current (Arms)	11.5		Peak current (Arms)	10
Positioning time (ms)	<100		Rated rotational speed (rpm)	100
Allowable load (Kg)	<3	<3+X	Max. rotational speed (rpm)	200
Resolution (um)	0.1、0.5、1		Repeatability positioning precision (°)	±0.005
Repeatability (um)	±1		Absolute positioning precision (°)	
Straightness (um)	±1.5		Angle range (°)	360° unrestricted
Flatness (um)	±2		Diameter (mm)	97
Travel stroke (mm)	15		Rotor inertia (KG · m <sup>2</sup> )	0.00113
Weight (Kg)	1.8	1	Weight (kg)	1.2

Stage flatness (um)	±5
Stage dimension H x W x D(mm) (excluding sensor)	80×80×75.5
Stage weight (kg)	4

# XYZθ precision alignment stage

## STVF80-XYZθ 4-axis superposed alignment stage



### Basic parameter

Parameter	X Axis	Y Axis	Z Axis
Continuous thrust (N)	12	15	
Peak thrust (N)	25	45	
Continuous current (Arms)	2.5	4.8	
Peak current (Arms)	11.5	13.4	
Positioning time (ms)	<100	<100	
Allowable load (Kg)	<3	<3+X	<5+X
Resolution (um)	0.1, 0.5, 1		
Repeatability (um)	±1		
Straightness (um)	±1.5		
Flatness (um)	±2		
Travel stroke (mm)	15		8
Dimension H x W x D(mm) (excluding sensor)	80 x 80		80 x 80
Weight (Kg)	1.8	1	1.3

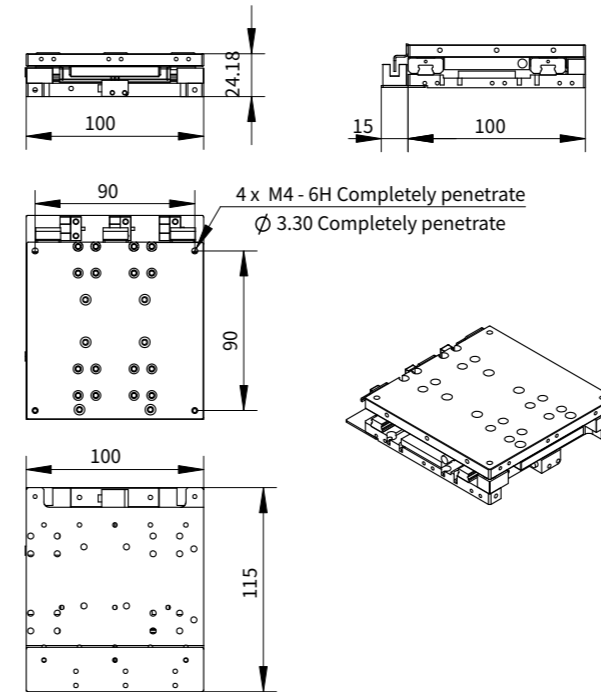
Parameter	θ Axis
Continuous torque (Nm)	0.8
Peak torque (Nm)	4
Continuous current (Arms)	2
Peak current (Arms)	10
Rated rotational speed (rpm)	100
Max. rotational speed (rpm)	200
Repeatability positioning precision (°)	±0.005
Absolute positioning precision (°)	
Angle range (°)	360° unrestricted
Diameter (mm)	97
Rotor inertia (KG·m <sup>2</sup> )	0.00113
Weight (kg)	1.2

Stage flatness (um)	±5
Stage dimension H x W x D(mm) (excluding sensor)	80 x 80 x 136.1
Stage weight (kg)	5.3

# XYZθ precision alignment stage

## STVF100 series alignment stage

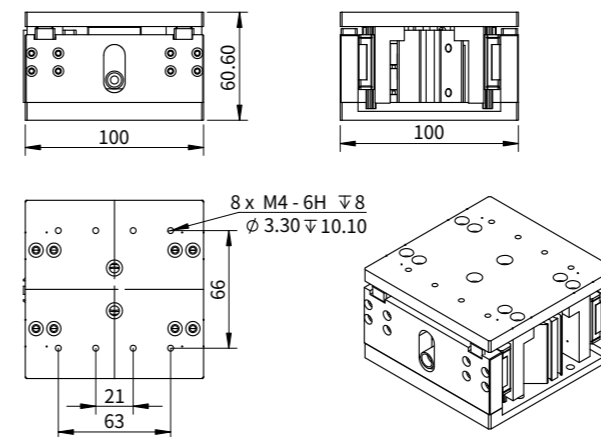
### STVF100- X horizontal single-axis alignment stage



### Basic parameter

Parameter	X Axis
Continuous thrust (N)	25
Peak thrust (N)	80
Continuous current (Arms)	3
Peak current (Arms)	13.8
Positioning time (ms)	<100
Allowable load (Kg)	<3
Resolution (um)	0.1, 0.5, 1
Repeatability (um)	±1
Straightness (um)	±1.5
Flatness (um)	±2
Travel stroke (mm)	20
Dimension H x W x D(mm) (excluding sensor)	100 x 100 x 24.18
Weight (Kg)	2.2

### STVF100-Z vertical axis alignment stage



### Basic parameter

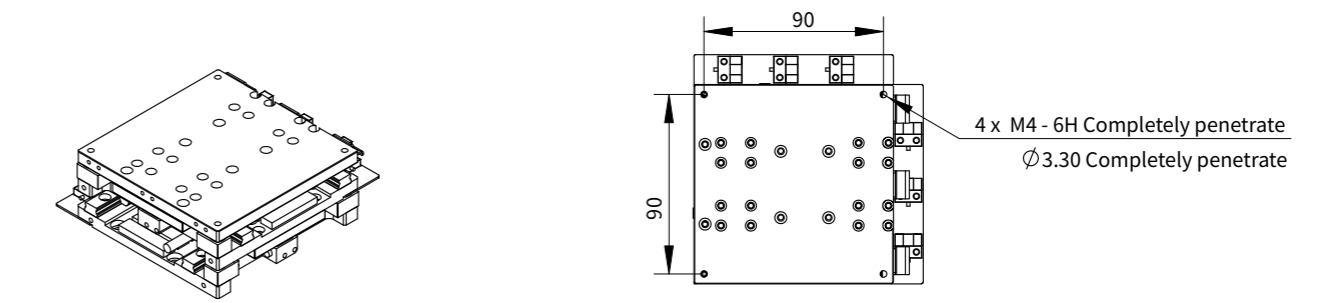
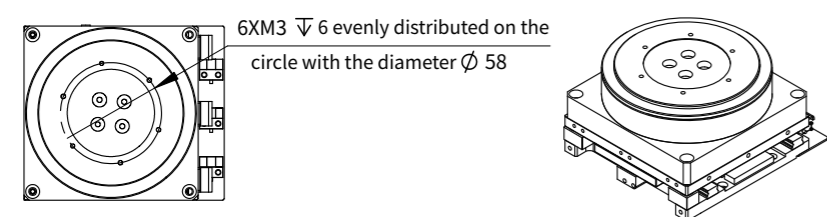
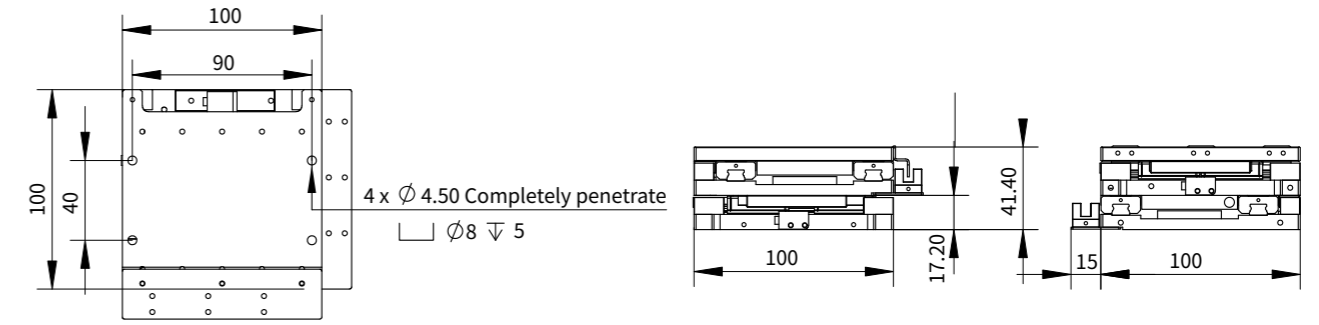
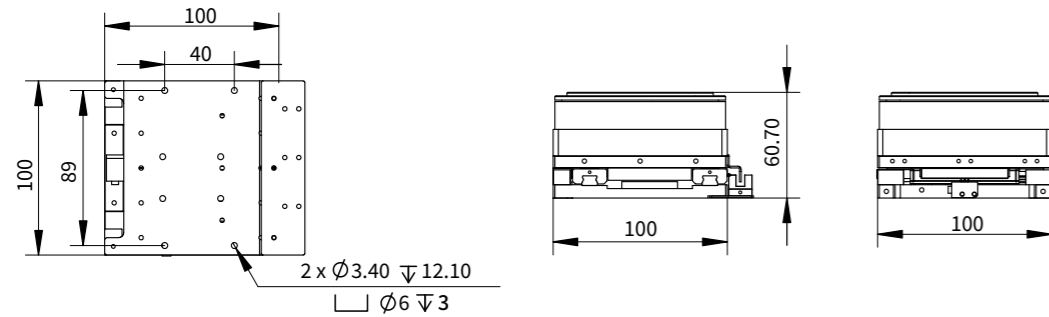
Parameter	Z Axis
Continuous thrust (N)	15
Peak thrust (N)	45
Continuous current (Arms)	4.8
Peak current (Arms)	13.4
Positioning time (ms)	<100
Allowable load (Kg)	<5
Resolution (um)	0.1, 0.5, 1
Repeatability (um)	±1
Straightness (um)	±1.5
Flatness (um)	±2
Travel stroke (mm)	8
Dimension H x W x D(mm) (excluding sensor)	100 x 100 x 60.6
Weight (Kg)	1.3

■ XYZθ precision alignment stage

■ XYZθ precision alignment stage

STVF100- Xθ dual-axis superimposed alignment stage

STVF100- XY dual-axis superimposed alignment stage



● Basic parameter

Parameter	X Axis	Parameter	θ Axis
Continuous thrust (N)	25	Continuous torque (Nm)	0.3
Peak thrust (N)	80	Peak torque (Nm)	2.5
Continuous current (Arms)	3	Continuous current (Arms)	2
Peak current (Arms)	13.8	Peak current (Arms)	10
Positioning time (ms)	<100	Rated rotational speed (rpm)	100
Allowable load (Kg)	<3	Max. rotational speed (rpm)	200
Resolution (um)	0.1、0.5、1	Repeatability positioning precision (°)	±0.005
Repeatability (um)	±1	Absolute positioning precision (°)	
Straightness (um)	±1.5	Angle range (°)	360°
Flatness (um)	±2	Diameter (mm)	97
Travel stroke (mm)	20	Rotor inertia (KG·m <sup>2</sup> )	0.00113
Dimension H x W x D(mm)	100×100×24.18	Weight (kg)	1.2
Weight (Kg)	2.2		

● Basic parameter

Parameter	X Axis	Y Axis
Continuous thrust (N)	25	
Peak thrust (N)	80	
Continuous current (Arms)	2.5	
Peak current (Arms)	11.5	
Positioning time (ms)	<100	
Allowable load (Kg)	<3	<3+X
Resolution (um)	0.1、0.5、1	
Repeatability (um)	±1	
Straightness (um)	±1.5	
Flatness (um)	±4.0	
Travel stroke (mm)	20	
Dimension H x W x D(mm) (excluding sensor)	100×100×41.4	
Weight (Kg)	4.2	

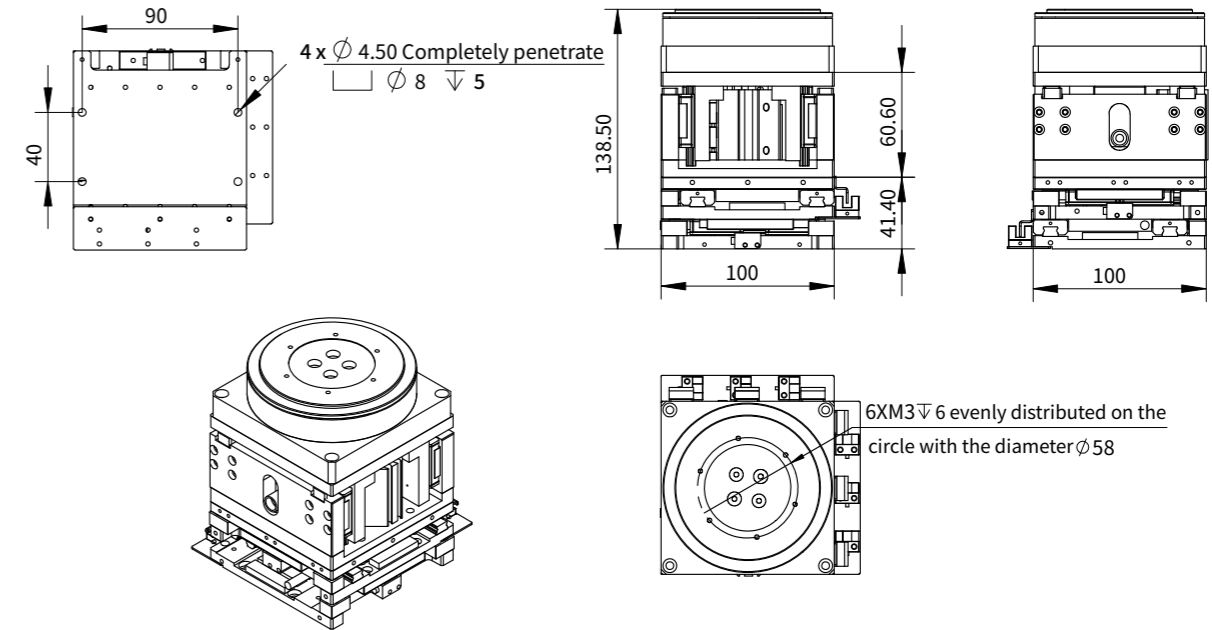
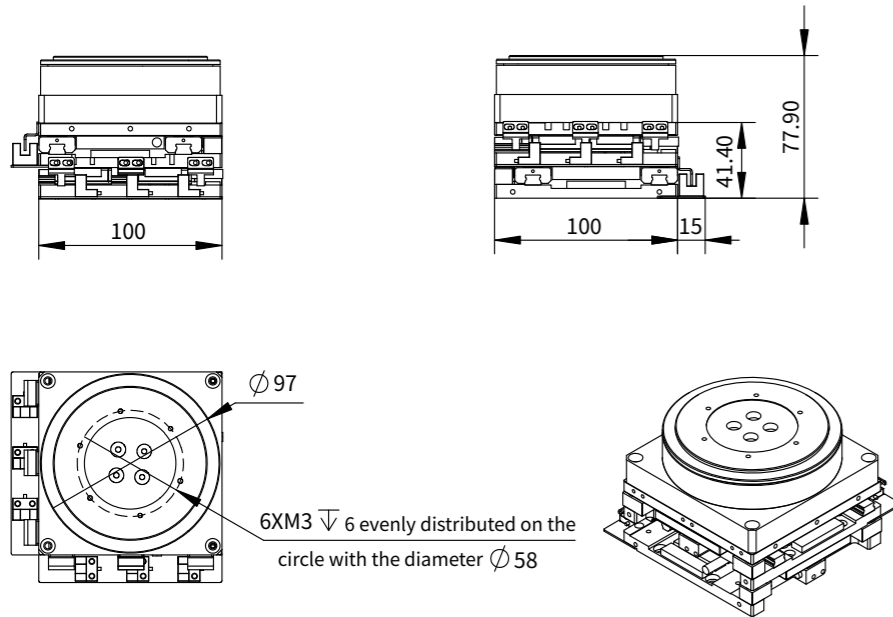
Stage dimension H x W x D(mm) (excluding sensor)	100×100×60.7
Stage weight (kg)	2.2

# ■ XYZθ precision alignment stage

# ■ XYZθ precision alignment stage

## STVF100-XYZθ 3-axis superposed alignment stage

## STVF100-XYZθ 4-axis superposed alignment stage



### ● Basic parameter

Parameter	X Axis	Y Axis
Continuous thrust (N)	25	
Peak thrust (N)	80	
Continuous current (Arms)	2.5	
Peak current (Arms)	11.5	
Positioning time (ms)	<100	
Allowable load (Kg)	<3	<3+X
Resolution (um)	0.1、0.5、1	
Repeatability (um)	±1	
Straightness (um)	±1.5	
Flatness (um)	±2	
Travel stroke (mm)	20	
Weight (Kg)	2.2	2

Parameter	θ Axis
Continuous torque (Nm)	0.8
Peak torque (Nm)	4
Continuous current (Arms)	2
Peak current (Arms)	10
Rated rotational speed (rpm)	100
Max. rotational speed (rpm)	200
Repeatability positioning precision (°)	±0.005
Absolute positioning precision (°)	
Angle range (°)	360° unrestricted
Diameter (mm)	97
Rotor inertia (KG·m <sup>2</sup> )	0.00113
Weight (kg)	1.2

Stage flatness (um)	±5
Stage dimension H x W x D(mm) (excluding sensor)	100 × 100 × 77.9
Stage weight (kg)	5.6

### ● Basic parameter

Parameter	X Axis	Y Axis	Z Axis
Continuous thrust (N)	25		15
Peak thrust (N)	80		45
Continuous current (Arms)	2.5		4.8
Peak current (Arms)	11.5		13.4
Positioning time (ms)	<100		<100
Allowable load (Kg)	<3	<3+X	<5+X
Resolution (um)	0.1、0.5、1		
Repeatability (um)	±1		
Straightness (um)	±1.5		
Flatness (um)	±2		
Travel stroke (mm)	20		8
Dimension H x W x D(mm)	100 × 100		100 × 100
Weight (Kg)	2.2	2	1.3

Parameter	θ Axis
Continuous torque (Nm)	0.8
Peak torque (Nm)	4
Continuous current (Arms)	2
Peak current (Arms)	10
Rated rotational speed (rpm)	100
Max. rotational speed (rpm)	200
Repeatability positioning precision (°)	±0.005
Absolute positioning precision (°)	
Angle range (°)	360° unrestricted
Diameter (mm)	97
Rotor inertia (KG·m <sup>2</sup> )	0.00113
Weight (kg)	1.2

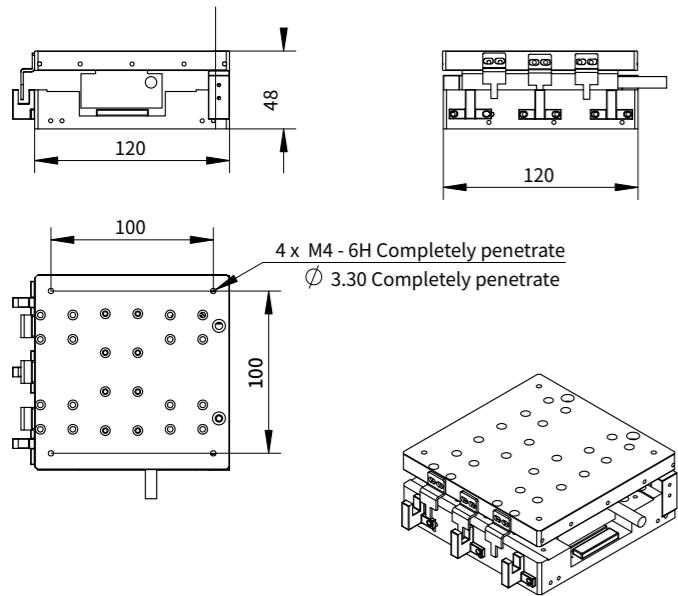
Stage flatness (um)	±5
Stage dimension H x W x D(mm) (excluding sensor)	100 × 100 × 138.5
Stage weight (kg)	6.9

■ XYZθ precision alignment stage

■ XYZθ precision alignment stage

■ STVF120 series alignment stage

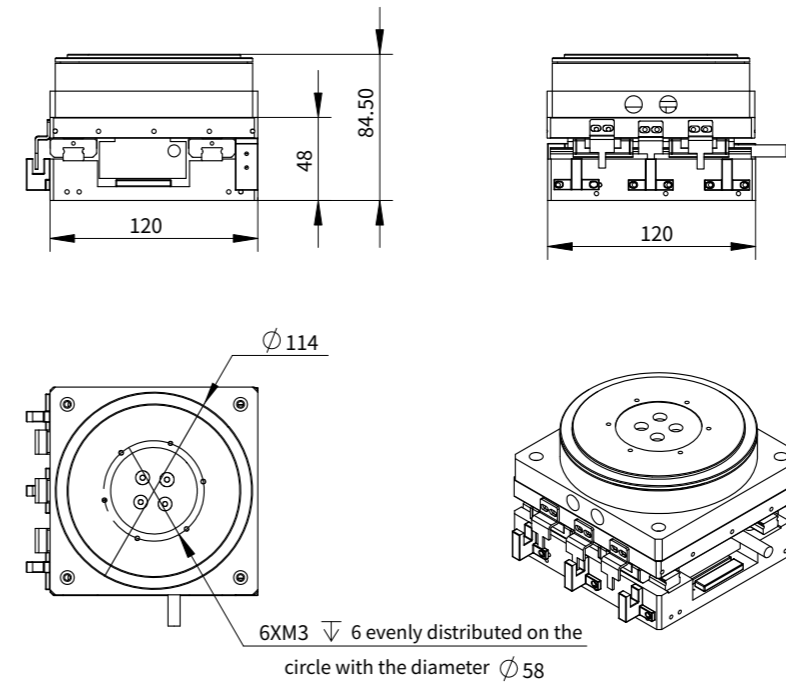
STVF120-X horizontal single-axis alignment stage



● Basic parameter

Parameter	X Axis
Continuous thrust (N)	39
Peak thrust (N)	129
Continuous current (Arms)	3
Peak current (Arms)	13.8
Positioning time (ms)	<100
Allowable load (Kg)	<3
Resolution (um)	0.1、0.5、1
Repeatability (um)	±1
Straightness (um)	±1.5
Flatness (um)	±2
Travel stroke (mm)	20
Dimension H x W x D(mm) (excluding sensor)	120x120x48
Weight (Kg)	3.2

STVF120-Xθ dual-axis superimposed alignment stage



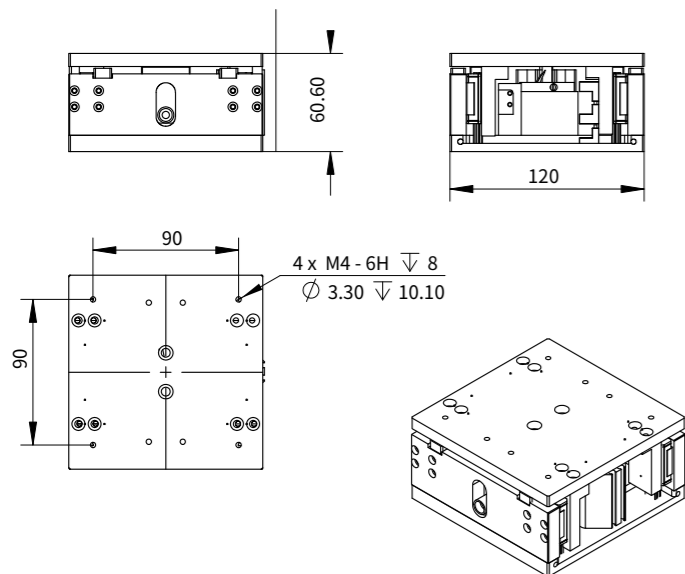
● Basic parameter

Parameter	X Axis
Continuous thrust (N)	39
Peak thrust (N)	129
Continuous current (Arms)	2.5
Peak current (Arms)	11.5
Positioning time (ms)	<100
Allowable load (Kg)	<3
Resolution (um)	0.1、0.5、1
Repeatability (um)	±1
Straightness (um)	±1.5
Flatness (um)	±2
Travel stroke (mm)	15
Dimension H x W x D(mm) (excluding sensor)	120×120×48
Weight (Kg)	3.2

Parameter	θ Axis
Continuous torque (Nm)	1.1
Peak torque (Nm)	5.5
Continuous current (Arms)	2
Peak current (Arms)	10
Rated rotational speed (rpm)	100
Max. rotational speed (rpm)	200
Repeatability positioning precision (°)	±0.005
Absolute positioning precision (°)	
Angle range (°)	360°
Diameter (mm)	114
Rotor inertia (KG·m <sup>2</sup> )	0.00213
Weight (kg)	1.8

Stage dimension H x W x D(mm) (excluding sensor)	120×120×84.5
Stage weight (kg)	5

STVF120-Z vertical axis alignment stage



● Basic parameter

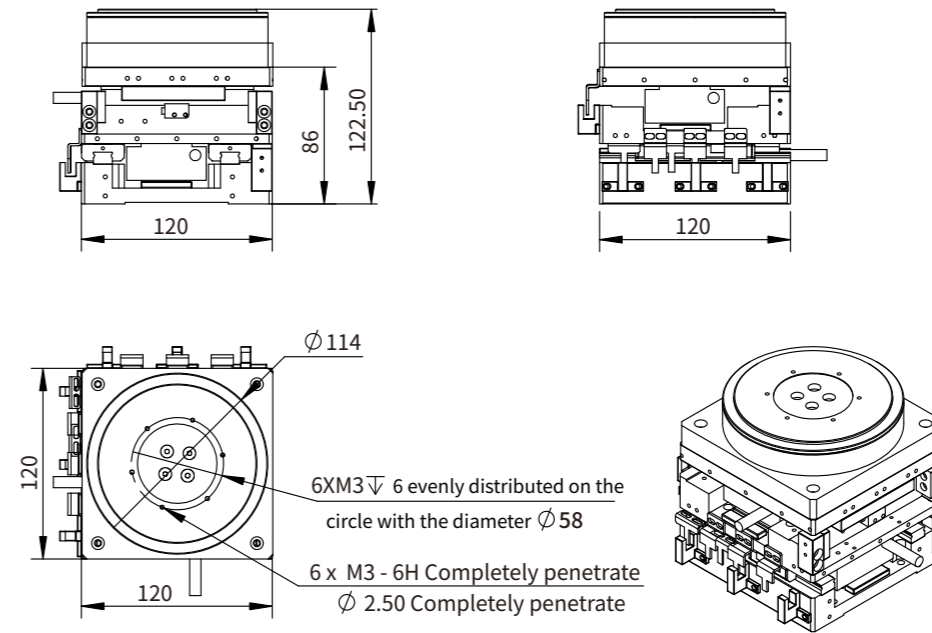
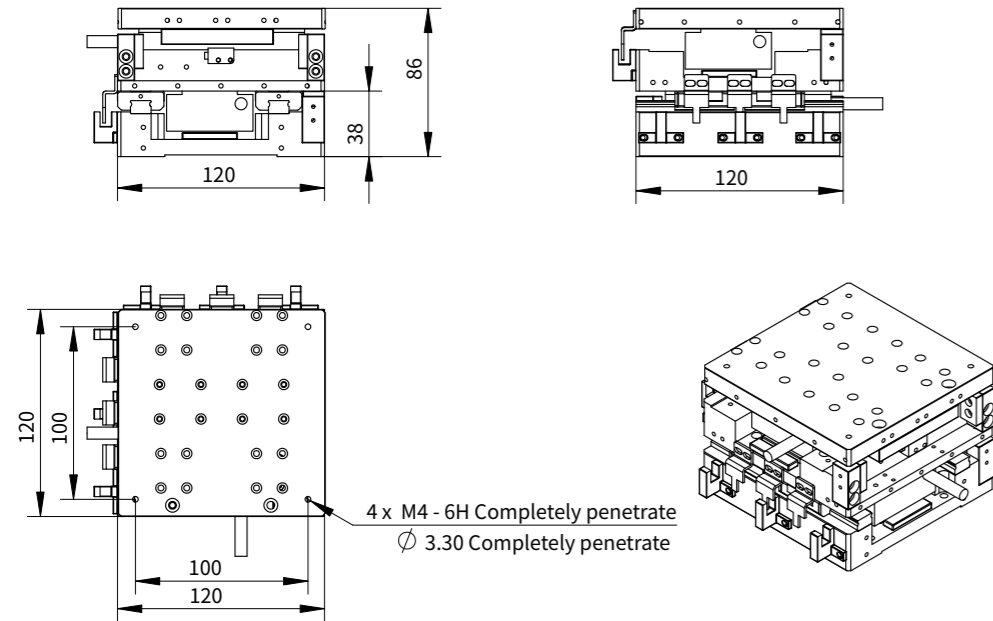
Parameter	Z Axis
Continuous thrust (N)	22.6
Peak thrust (N)	89
Continuous current (Arms)	3.8
Peak current (Arms)	11.4
Positioning time (ms)	<100
Allowable load (Kg)	<5
Resolution (um)	0.1、0.5、1
Repeatability (um)	±1
Straightness (um)	±1.5
Flatness (um)	±2
Travel stroke (mm)	8
Dimension H x W x D(mm) (excluding sensor)	120×120×60.6
Weight (Kg)	1.8

■ XYZθ precision alignment stage

■ XYZθ precision alignment stage

STVF120-XY dual-axis superimposed alignment stage

STVF120-XYθ 3-axis superposed alignment stage



● Basic parameter

Parameter	X Axis	Y Axis
Continuous thrust (N)	39	
Peak thrust (N)	129	
Continuous current (Arms)	3	
Peak current (Arms)	13.8	
Positioning time (ms)	<100	
Allowable load (Kg)	<3	<3+X
Resolution (um)	0.1、0.5、1	
Repeatability (um)	±1	
Straightness (um)	±1.5	
Flatness (um)	±4.0	
Travel stroke (mm)	20	
Dimension H x W x D(mm) (excluding sensor)	120 × 120 × 86	
Weight (Kg)	6.2	

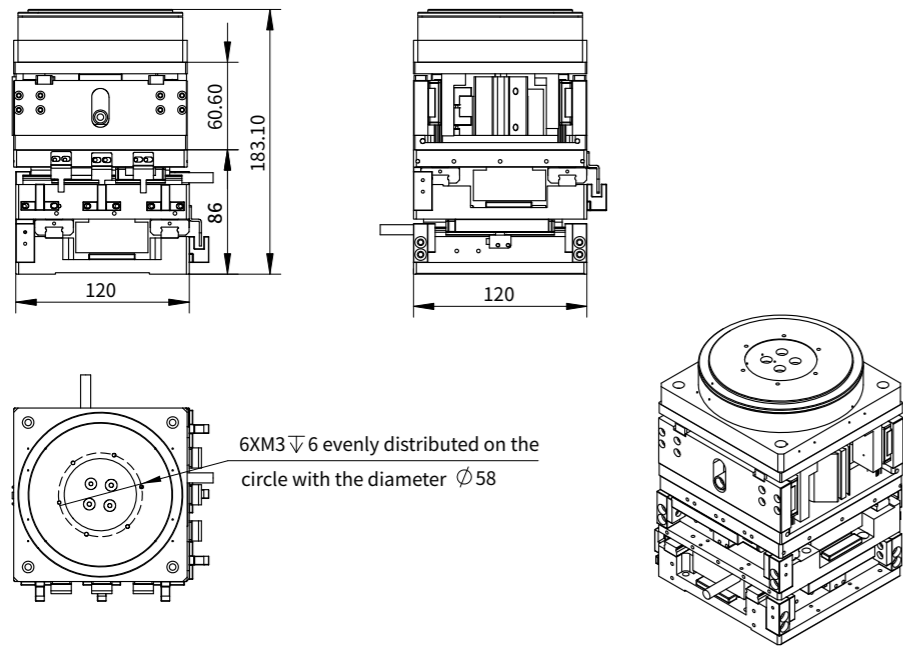
● Basic parameter

Parameter	X Axis	Y Axis	θ Axis
Continuous thrust (N)	39		
Peak thrust (N)	129		
Continuous current (Arms)	3		
Peak current (Arms)	13.8		
Positioning time (ms)	<100		
Allowable load (Kg)	<3	<3+X	
Resolution (um)	0.1、0.5、1		
Repeatability (um)	±1		
Straightness (um)	±1.5		
Flatness (um)	±2		
Travel stroke (mm)	20		
Weight (Kg)	3.2	3	
Continuous torque (Nm)			1.1
Peak torque (Nm)			5.5
Continuous current (Arms)			2
Peak current (Arms)			10
Rated rotational speed (rpm)			100
Max. rotational speed (rpm)			200
Repeatability positioning precision (°)			±0.005
Absolute positioning precision (°)			
Angle range (°)			360°
Diameter (mm)			114
Rotor inertia (KG · m <sup>2</sup> )			0.00213
Weight (kg)			1.8

Stage flatness (um)	±5
Stage dimension H x W x D(mm) (excluding sensor)	120 × 120 × 122.5
Stage weight (kg)	8

# XYZθ precision alignment stage

## STVF120-XYZθ 4-axis superposed alignment stage



### Basic parameter

Parameter	X Axis	Y Axis	Z Axis
Continuous thrust (N)	39		22.6
Peak thrust (N)	129		89
Continuous current (Arms)	3		3.8
Peak current (Arms)	13.8		11.4
Positioning time (ms)	<100		<100
Allowable load (Kg)	<3	<3+X	<5+X
Resolution (um)	0.1、0.5、1		
Repeatability (um)	±1		
Straightness (um)	±1.5		
Flatness (um)	±2		
Travel stroke (mm)	20		8
Dimension H x W x D(mm) (excluding sensor)	100x100		100 x 100
Weight (Kg)	2.2	2	1.3

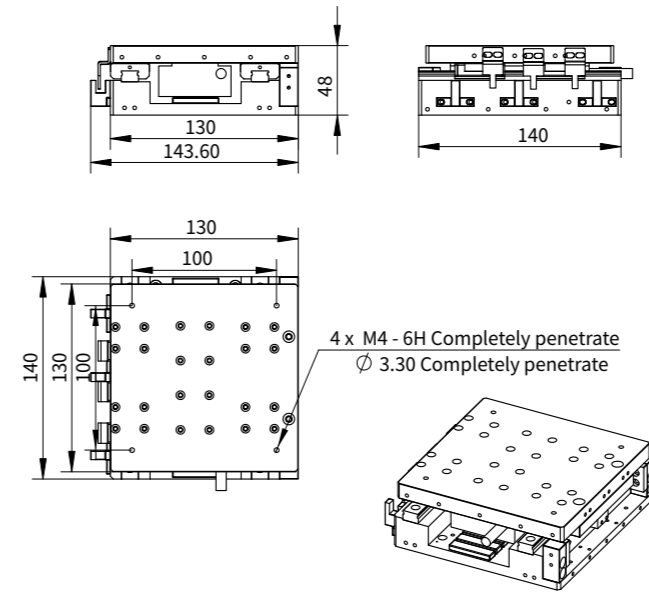
Parameter	θ Axis
Continuous torque (Nm)	1.1
Peak torque (Nm)	5.5
Continuous current (Arms)	2
Peak current (Arms)	10
Rated rotational speed (rpm)	100
Max. rotational speed (rpm)	200
Repeatability positioning precision (°)	±0.005
Absolute positioning precision (°)	
Angle range (°)	360°
Diameter (mm)	114
Rotor inertia (KG · m <sup>2</sup> )	0.00213
Weight (kg)	1.8

Stage flatness (um)	±5
Stage dimension H x W x D(mm) (excluding sensor)	120×120×183.1
Stage weight (kg)	9.8

# XYZθ precision alignment stage

## STVF140 series alignment stage

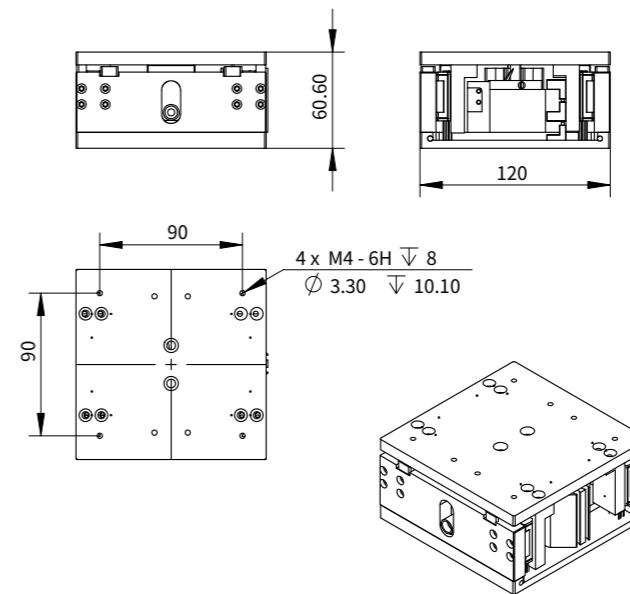
### STVF140-X horizontal single-axis alignment stage



### Basic parameter

Parameter	X Axis
Continuous thrust (N)	62
Peak thrust (N)	206
Continuous current (Arms)	3
Peak current (Arms)	13.8
Positioning time (ms)	<100
Allowable load (Kg)	<3
Resolution (um)	0.1、0.5、1
Repeatability (um)	±1
Straightness (um)	±1.5
Flatness (um)	±2
Travel stroke (mm)	20
Dimension H x W x D(mm) (excluding sensor)	130×140×48
Weight (Kg)	3.6

### STVF140-Z vertical axis alignment stage



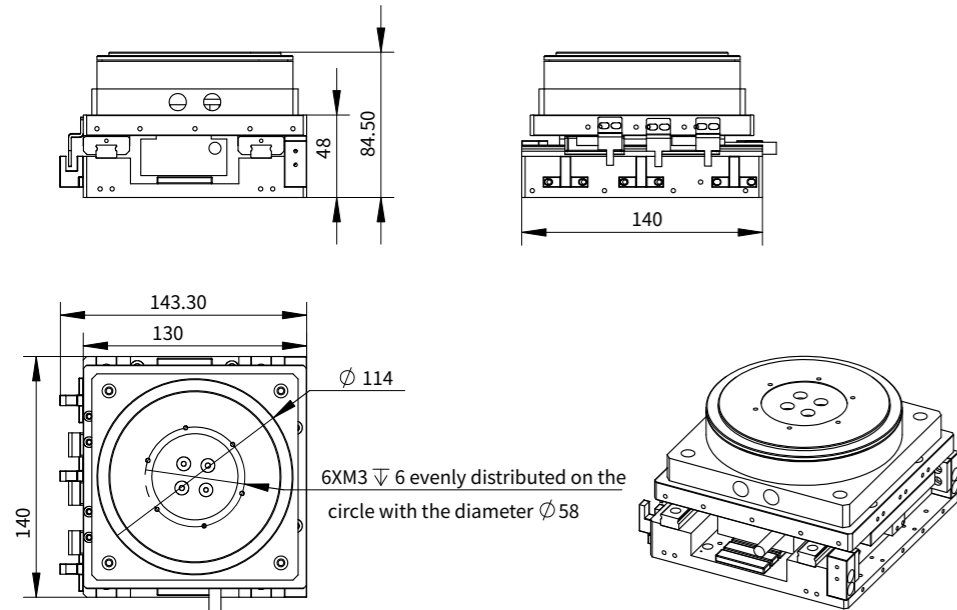
### Basic parameter

Parameter	Z Axis
Continuous thrust (N)	22.6
Peak thrust (N)	89
Continuous current (Arms)	3.8
Peak current (Arms)	11.4
Positioning time (ms)	<100
Allowable load (Kg)	<5
Resolution (um)	0.1、0.5、1
Repeatability (um)	±1
Straightness (um)	±1.5
Flatness (um)	±2
Travel stroke (mm)	8
Dimension H x W x D(mm) (excluding sensor)	120×120×60.6
Weight (Kg)	1.8

■ XYZθ precision alignment stage

■ XYZθ precision alignment stage

STVF140-Xθ dual-axis superimposed alignment stage

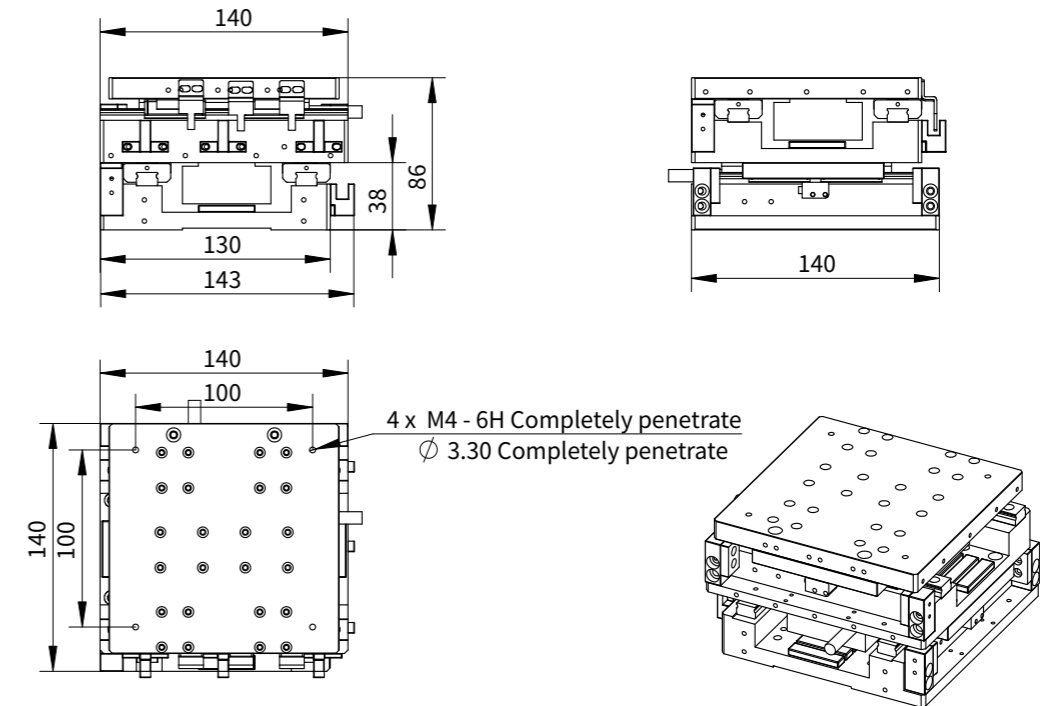


● Basic parameter

Parameter	X Axis	Parameter	θ Axis
Continuous thrust (N)	62	Continuous torque (Nm)	1.1
Peak thrust (N)	206	Peak torque (Nm)	5.5
Continuous current (Arms)	3	Continuous current (Arms)	2
Peak current (Arms)	13.8	Peak current (Arms)	10
Positioning time (ms)	<100	Rated rotational speed (rpm)	100
Allowable load (Kg)	<3	Max. rotational speed (rpm)	200
Resolution (um)	0.1、0.5、1	Repeatability positioning precision (°)	±0.005
Repeatability (um)	±1	Absolute positioning precision (°)	
Straightness (um)	±1.5	Angle range (°)	360°
Flatness (um)	±2	Diameter (mm)	114
Travel stroke (mm)	20	Rotor inertia (KG·m <sup>2</sup> )	0.00213
Dimension H x W x D(mm) (excluding sensor)	130×140×48	Weight (kg)	1.8
Weight (Kg)	3.6		

Stage dimension H x W x D(mm) (excluding sensor)	130×140×84.5
Stage weight (kg)	5.4

STVF140-XY dual-axis superimposed alignment stage



● Basic parameter

Parameter	X Axis	Y Axis
Continuous thrust (N)		62
Peak thrust (N)		206
Continuous current (Arms)		3
Peak current (Arms)		13.8
Positioning time (ms)		<100
Allowable load (Kg)	<3	<3+X
Resolution (um)		0.1、0.5、1
Repeatability (um)		±1
Straightness (um)		±1.5
Flatness (um)		±4.0
Travel stroke (mm)		20
Dimension H x W x D(mm) (excluding sensor)		140×140×86
Weight (Kg)		6.9

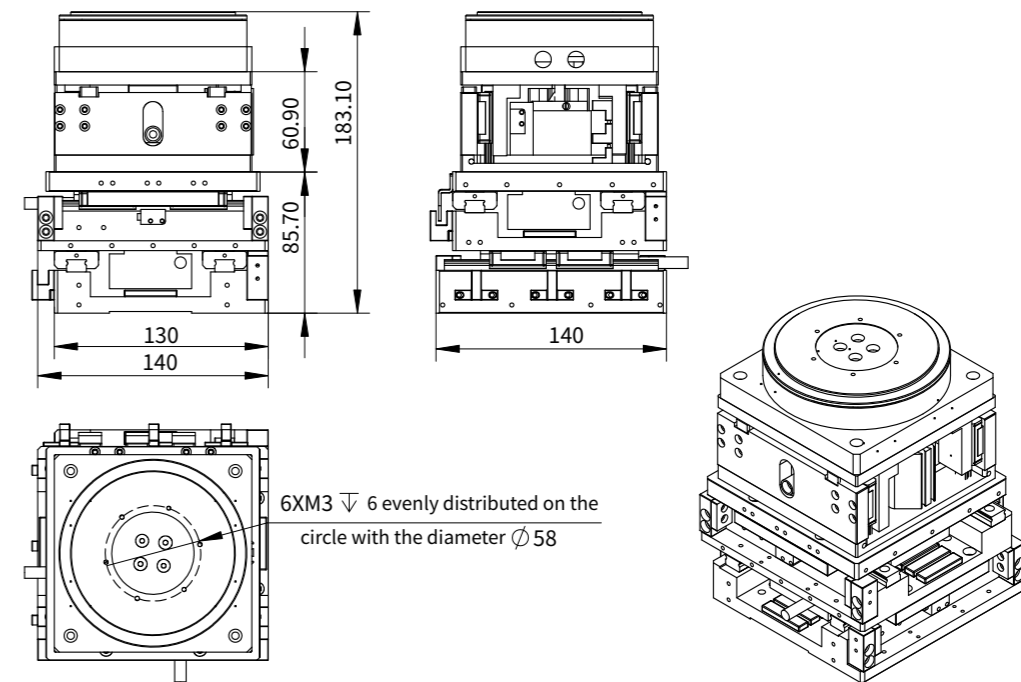
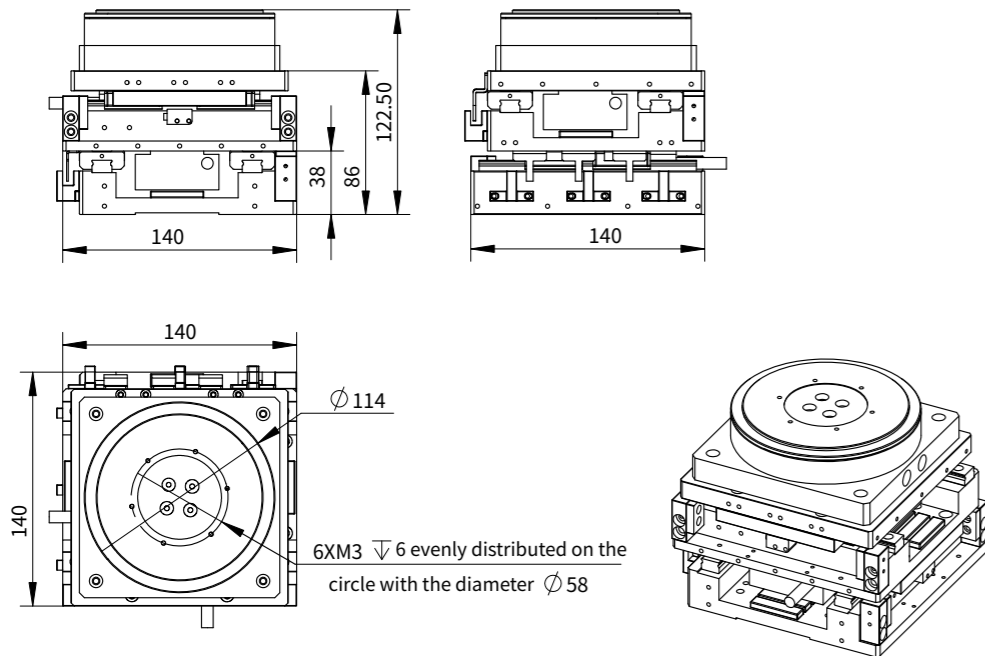


■ XYZθ precision alignment stage

■ XYZθ precision alignment stage

STVF140-XYZθ 3-axis superposed alignment stage

STVF140-XYZθ 4-axis superposed alignment stage



● Basic parameter

Parameter	X Axis	Y Axis	Parameter	θ Axis
Continuous thrust (N)	62		Continuous torque (Nm)	1.1
Peak thrust (N)	206		Peak torque (Nm)	5.5
Continuous current (Arms)	3		Continuous current (Arms)	2
Peak current (Arms)	13.8		Peak current (Arms)	10
Positioning time (ms)	<100		Rated rotational speed (rpm)	100
Allowable load (Kg)	<3	<3+X	Max. rotational speed (rpm)	200
Resolution (um)	0.1, 0.5, 1		Repeatability positioning precision (°)	±0.005
Repeatability (um)	±1		Absolute positioning precision (°)	
Straightness (um)	±1.5		Angle range (°)	360°
Flatness (um)	±2		Diameter (mm)	114
Travel stroke (mm)	20		Rotor inertia (KG · m <sup>2</sup> )	0.00213
Weight (Kg)	3.6	3.3	Weight (kg)	1.8

Stage flatness (um)	±5
Stage dimension H x W x D(mm) (excluding sensor)	140×140×122.5
Stage weight (kg)	8.7

● Basic parameter

Parameter	X Axis	Y Axis	Z Axis	Parameter	θ Axis
Continuous thrust (N)	62		22.6	Continuous torque (Nm)	1.1
Peak thrust (N)	206		89	Peak torque (Nm)	5.5
Continuous current (Arms)	3		3.8	Continuous current (Arms)	2
Peak current (Arms)	13.8		11.4	Peak current (Arms)	10
Positioning time (ms)	<100		<100	Rated rotational speed (rpm)	100
Allowable load (Kg)	<3	<3+X	<5+X	Max. rotational speed (rpm)	200
Resolution (um)	0.1, 0.5, 1			Repeatability positioning precision (°)	±0.005
Repeatability (um)	±1			Absolute positioning precision (°)	
Straightness (um)	±1.5			Angle range (°)	360°
Flatness (um)	±2			Diameter (mm)	114
Travel stroke (mm)	20		8	Rotor inertia (KG · m <sup>2</sup> )	0.00213
Dimension H x W x D(mm)	130 × 140		100 × 100	Weight (kg)	1.8
Weight (Kg)	3.6	3.3	1.8		

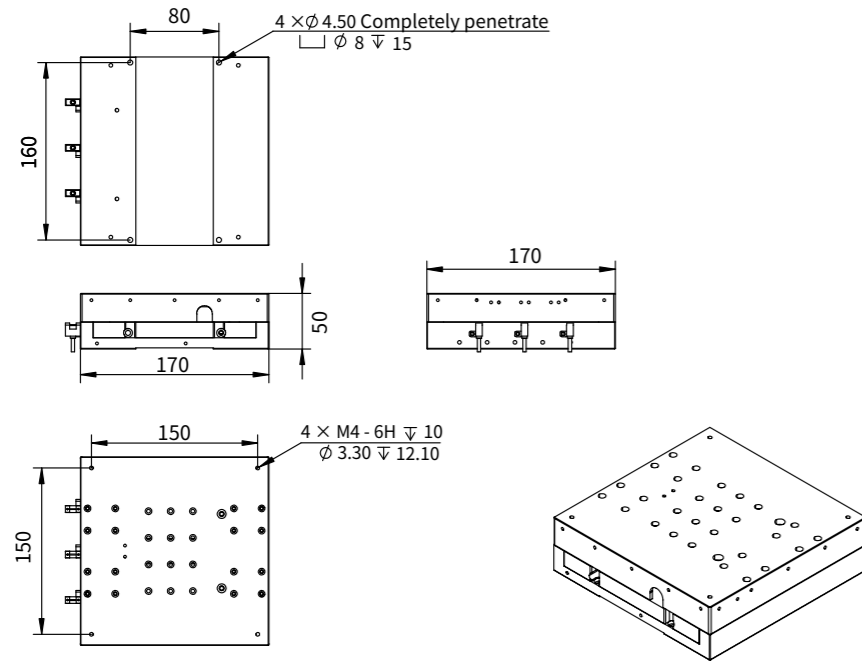
Stage flatness (um)	±5
Stage dimension H x W x D(mm) (excluding sensor)	140×140×183.1
Stage weight (kg)	10.5

■ XYZθ precision alignment stage

■ XYZθ precision alignment stage

■ STVF170 series alignment stage

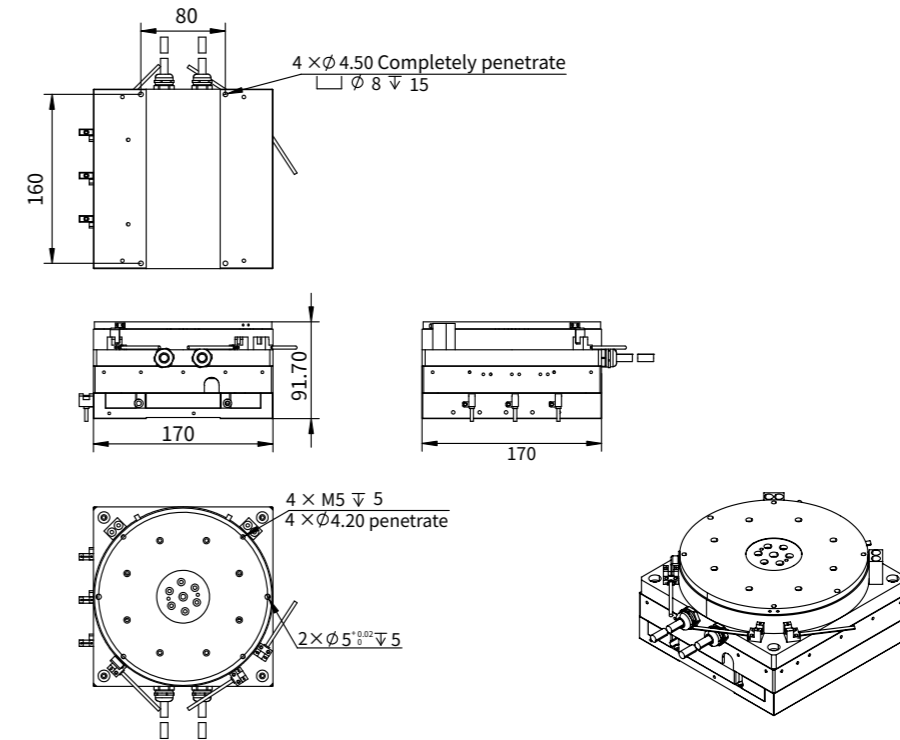
STVF170-X-M2 horizontal single-axis alignment stage



● Basic parameter

Parameter	X Axis
Continuous thrust (N)	105
Peak thrust (N)	350
Continuous current (Arms)	3
Peak current (Arms)	13.8
Positioning time (ms)	<100
Allowable load (Kg)	<12
Resolution (um)	1
Repeatability (um)	±2.5
Straightness (um)	≤10
Flatness (um)	≤10
Travel stroke (mm)	±10
Weight (Kg)	5.4

STVF170-Xθ-M2 dual-axis superimposed alignment stage



● Basic parameter

Parameter	X Axis
Continuous thrust (N)	105
Peak thrust (N)	350
Continuous current (Arms)	3
Peak current (Arms)	13.8
Positioning time (ms)	<100
Allowable load (Kg)	<12
Resolution (um)	1
Repeatability (um)	±2.5
Straightness (um)	≤10
Flatness (um)	≤10
Travel stroke (mm)	±10
Weight (Kg)	5.4

Parameter	θ Axis
Continuous torque (Nm)	4
Peak torque (Nm)	12
Continuous current (Arms)	3
Peak current (Arms)	9
Rated rotational speed (rpm)	120
Max. rotational speed (rpm)	240
Repeatability positioning precision (°)	±2
Absolute positioning precision (°)	±20
Angle range (°)	360°
Diameter (mm)	170
Rotor inertia (KG·m <sup>2</sup> )	0.0102
Weight (kg)	4.5

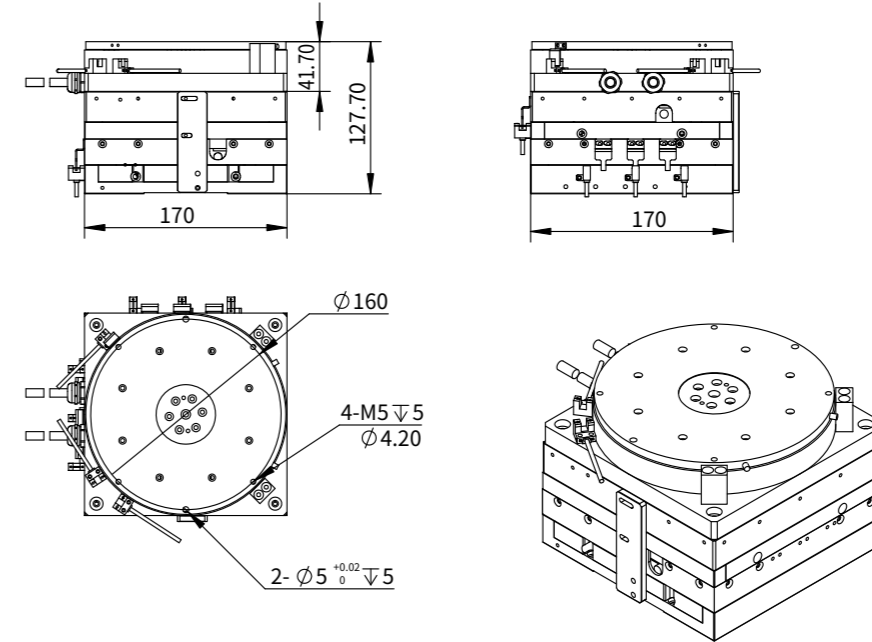
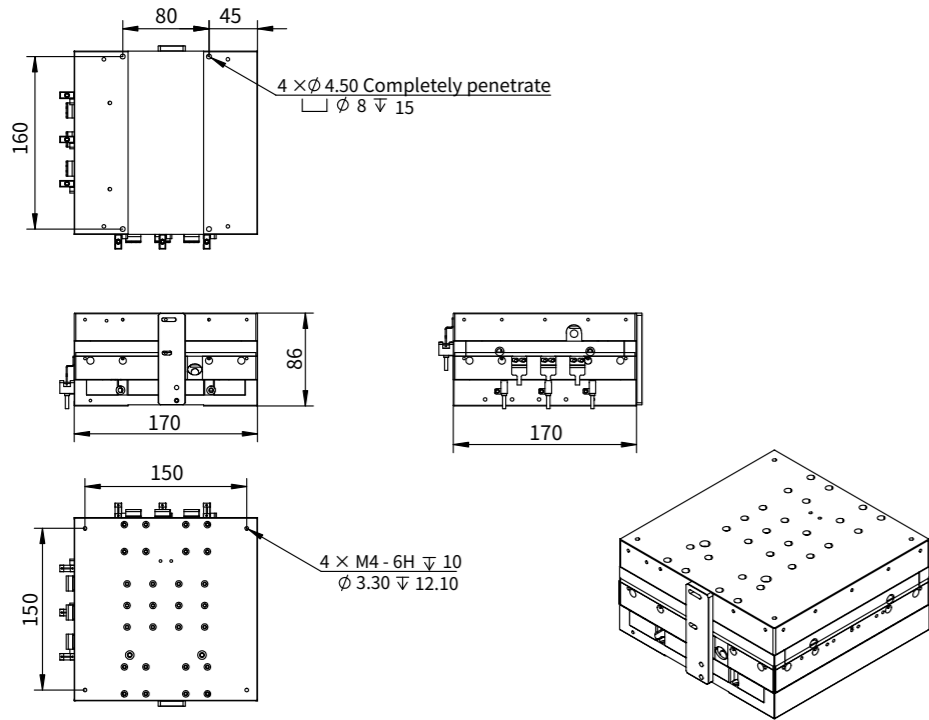
Stage flatness (um)	±5
Stage dimension H x W x D(mm) (excluding sensor)	170×170×91.7
Stage weight (kg)	9.9

# XYZθ precision alignment stage

# XYZθ precision alignment stage

## STVF170-XY-M2 dual-axis superimposed alignment stage

## STVF170-XYθ-M2 3-axis superposed alignment stage



### Basic parameter

Parameter	X Axis	Y Axis
Continuous thrust (N)	105	
Peak thrust (N)	350	
Continuous current (Arms)	3	
Peak current (Arms)	13.8	
Positioning time (ms)	<100	
Allowable load (Kg)	<12	<12+X
Resolution (um)	1	
Repeatability (um)	±2.5	
Straightness (um)	≤10	
Flatness (um)	≤10	
Travel stroke (mm)	±10	
Weight (Kg)	5.4	5

Stage flatness (um)	±5
Stage dimension H x W x D(mm) (excluding sensor)	170×170×86
Stage weight (kg)	10.4

### Basic parameter

Parameter	X Axis	Y Axis
Continuous thrust (N)	105	
Peak thrust (N)	350	
Continuous current (Arms)	3	
Peak current (Arms)	13.8	
Positioning time (ms)	<100	
Allowable load (Kg)	<12	<12+X
Resolution (um)	1	
Repeatability (um)	±2.5	
Straightness (um)	≤10	
Flatness (um)	≤10	
Travel stroke (mm)	±10	
Weight (Kg)	5.4	5

Parameter	θ Axis
Continuous torque (Nm)	4
Peak torque (Nm)	12
Continuous current (Arms)	3
Peak current (Arms)	9
Rated rotational speed (rpm)	120
Max. rotational speed (rpm)	240
Repeatability positioning precision (°)	±2
Absolute positioning precision (°)	±20
Angle range (°)	360°
Diameter (mm)	170
Rotor inertia (KG·m <sup>2</sup> )	0.0102
Weight (kg)	4.5

Stage flatness (um)	±5
Stage dimension H x W x D(mm) (excluding sensor)	170×170×127.7
Stage weight (kg)	15

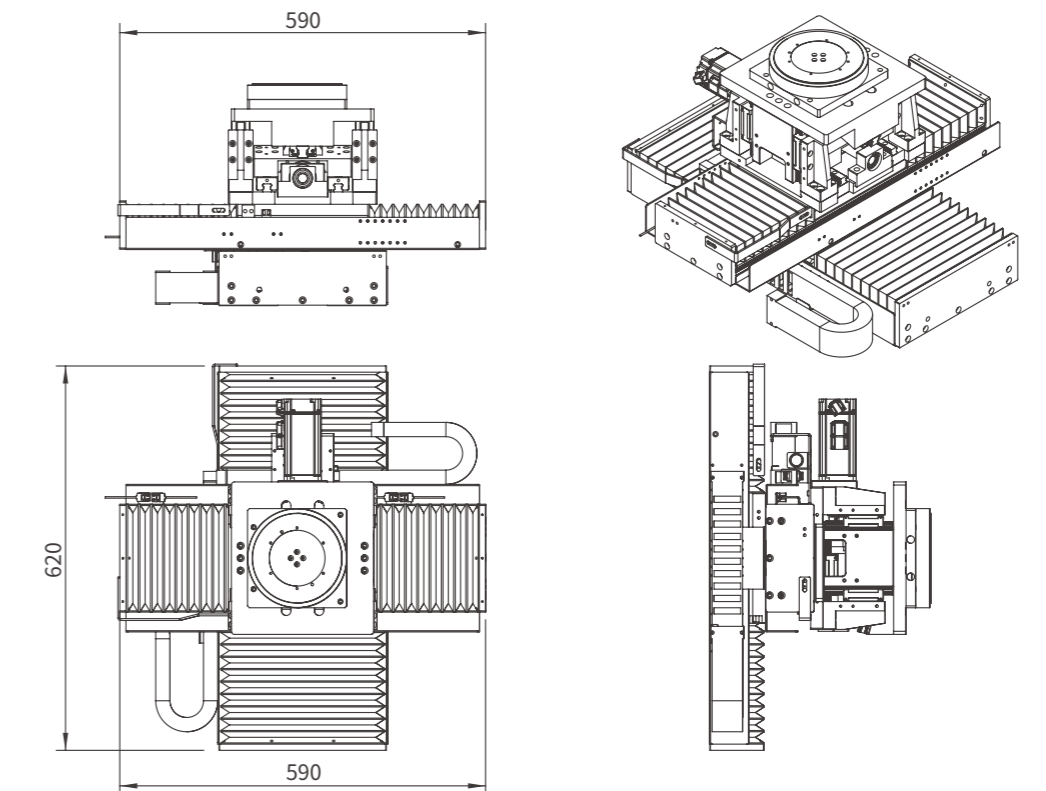
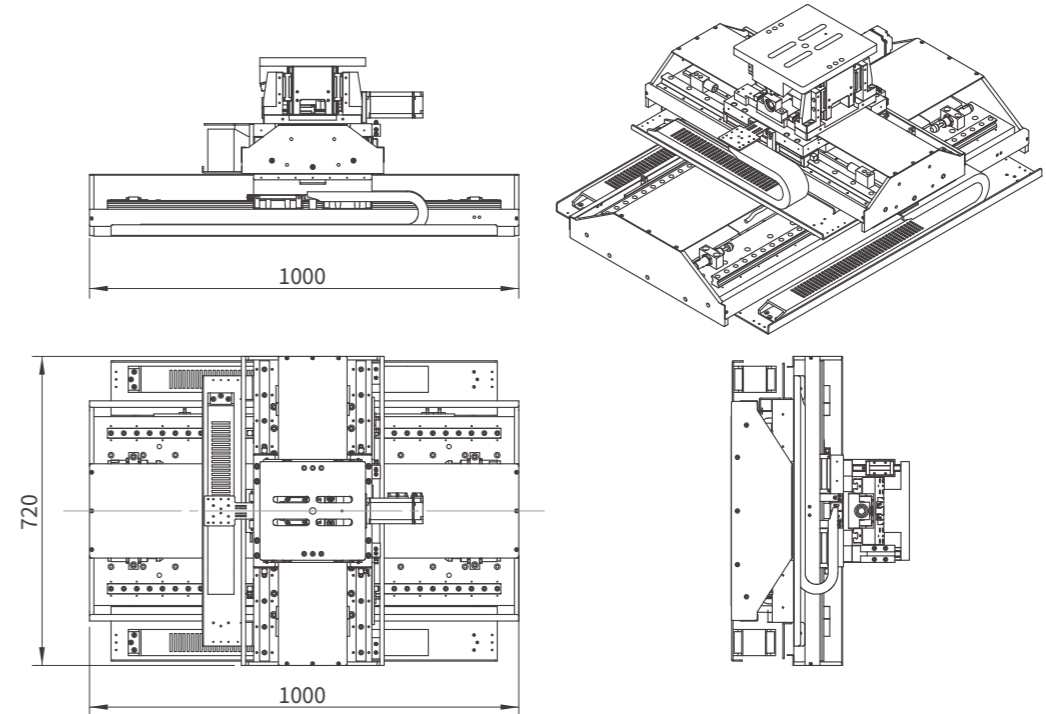
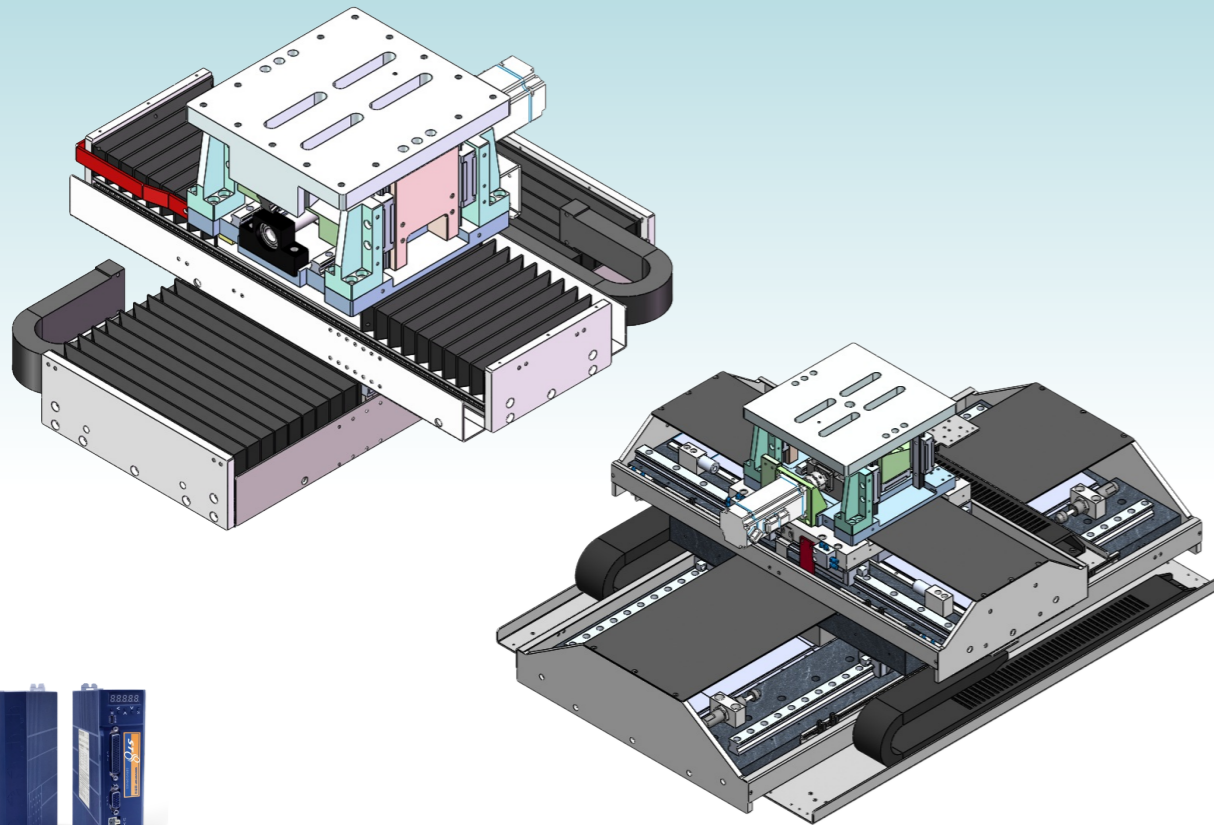
# XYZ precision alignment stage

# XYZ precision alignment stage

## XYZ precision alignment stage

## XYZ precision alignment stage

### ● Dimensions



Model Parameter	X axis (upper axis)	Y axis (lower axis)	Z axis (servo motor)
Load ( Kg)	/	/	On demand
Travel stroke ( mm)	Customized on demand (<1m)	Customized on demand (<1m)	Customized on demand (<50mm)
Max. speed ( mm/s)	<1.5m/s	<1.5m/s	<0.075m/s
Max. Acceleration	<2G	<2G	<0.1G
Positioning precision ( μm(after compensation))	<±2	<±2	<±5
Repeatability positioning precision ( μm)	<±1	<±1	<±3
Straightness ( μm)	<±3/300mm	<±3/300mm	<±2
Orthogonality ( μm)	<±4/300mm		
Material	Aluminum alloy/Marble	Aluminum alloy/Marble	Aluminum alloy
Optical grating resolution ( μm)	0.1, 0.5, and 1 for selection	0.1, 0.5, and 1 for selection	/

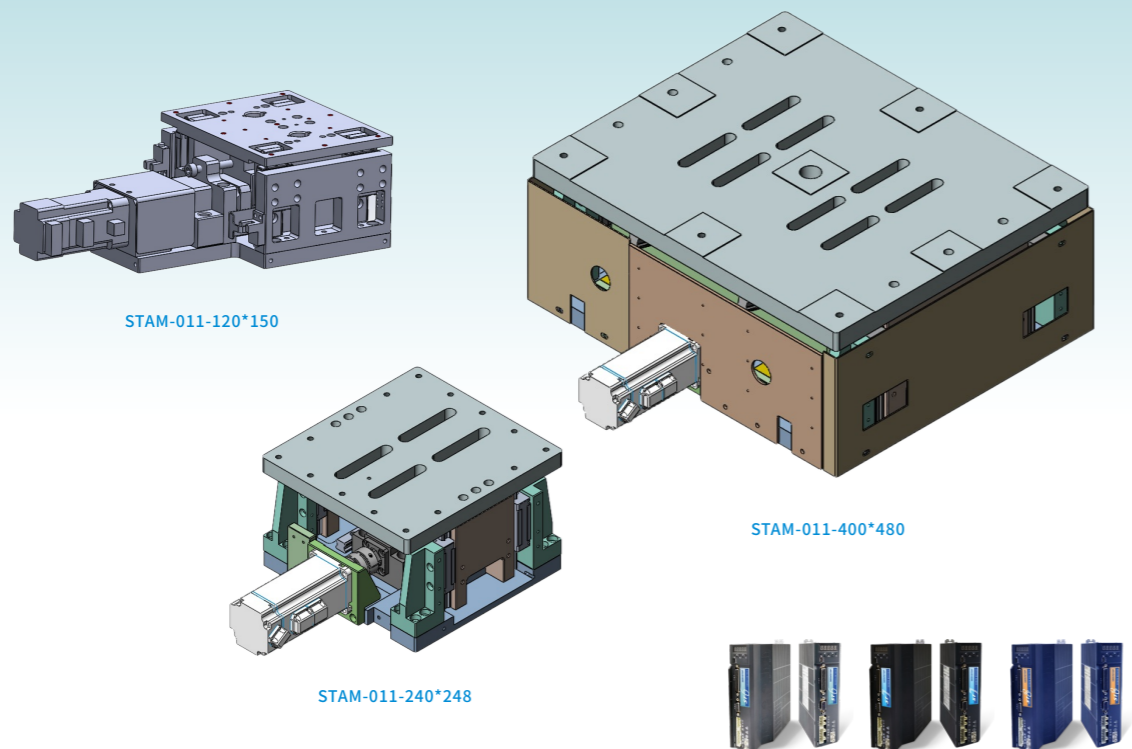
Linear motor stage  
Mini alignment stage  
Air-floating motion stage  
Stacking motion stage  
Gantry motion stage  
voice coil motor motion stage  
2-DOF module  
Drive and Control

Linear motor stage  
Mini alignment stage  
Air-floating motion stage  
Stacking motion stage  
Gantry motion stage  
voice coil motor motion stage  
2-DOF module  
Drive and Control

# Z-axis stack alignment stage in a wedge structure

# Z-axis stack alignment stage in a wedge structure

## Z-axis stack alignment stage in a wedge structure

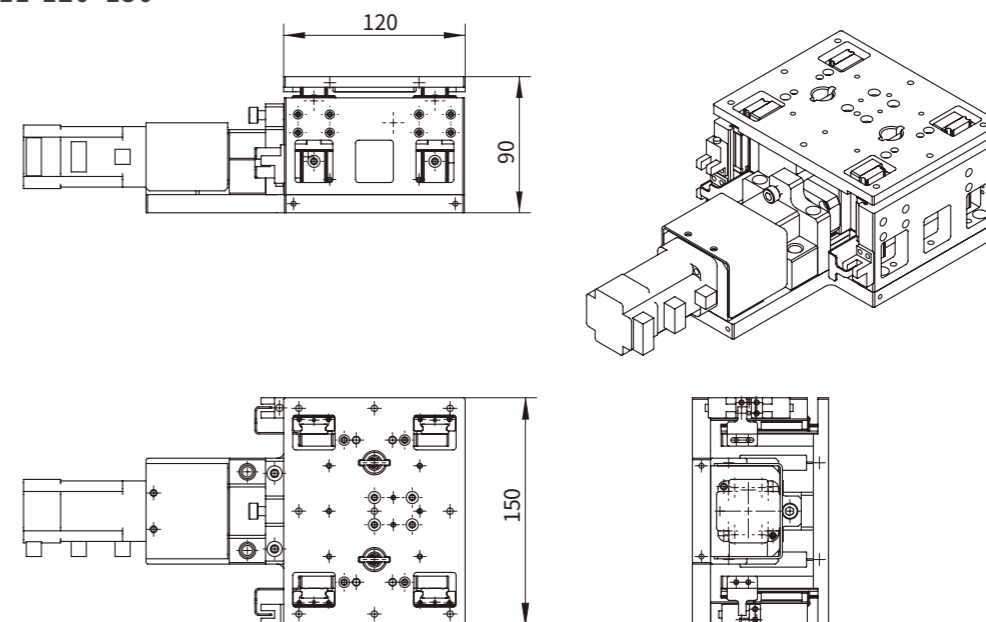


Model Parameter	STAM-011-120*150	STAM-011-240*248	STAM-011-400*480
Servo motor model	100W (including brakes)	200W (including brakes)	400W (including brakes)
Workbench dimension (mm)	120*150	240*248	400*480
Load (Kg)	On demand	On demand	On demand
Travel stroke (mm)	Customized on demand (<20mm)	Customized on demand (<20mm)	Customized on demand (<20mm)
Lead screw pitch (mm)	2	2	2
Max. speed (mm/s)	<0.075m/s	<0.075m/s	<0.075m/s
Max. Acceleration	<0.1G	<0.1G	<0.1G
Positioning precision (μm(after compensation))	<±8	<±5	<±5
Repeatability positioning precision (μm)	<±5	<±3	<±3
Machine material	Black anodizing of aluminum	Black anodizing of aluminum	Black anodizing of aluminum
Installation method	Horizontal installation	Horizontal installation	Horizontal installation

## Z-axis stack alignment stage in a wedge structure

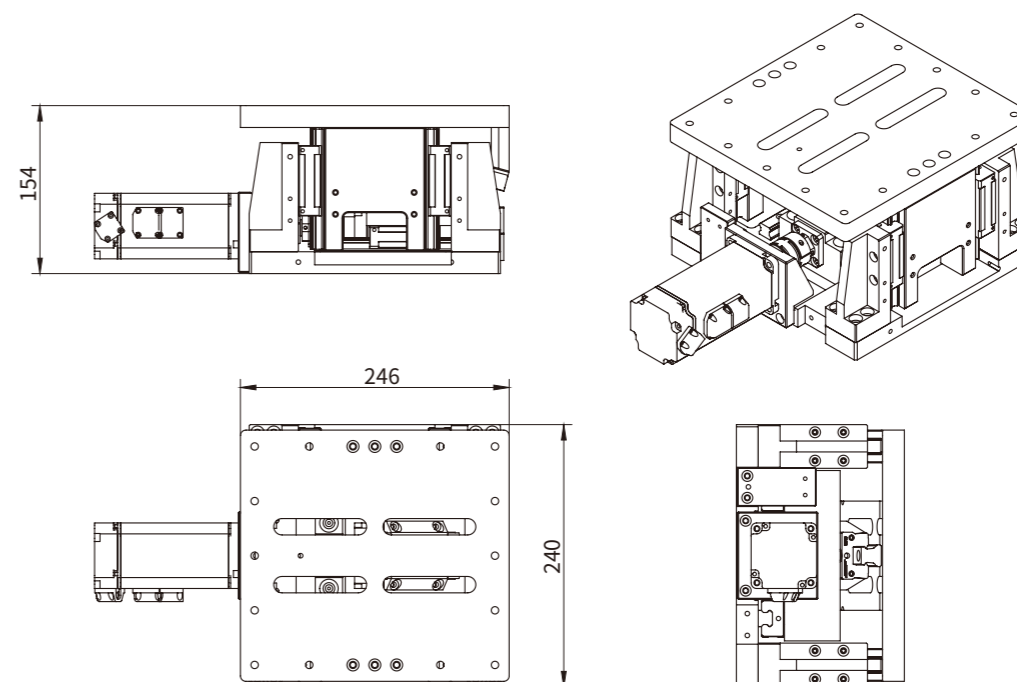
### ● Dimensions

STAM-011-120\*150



### ● Dimensions

STAM-011-240\*248

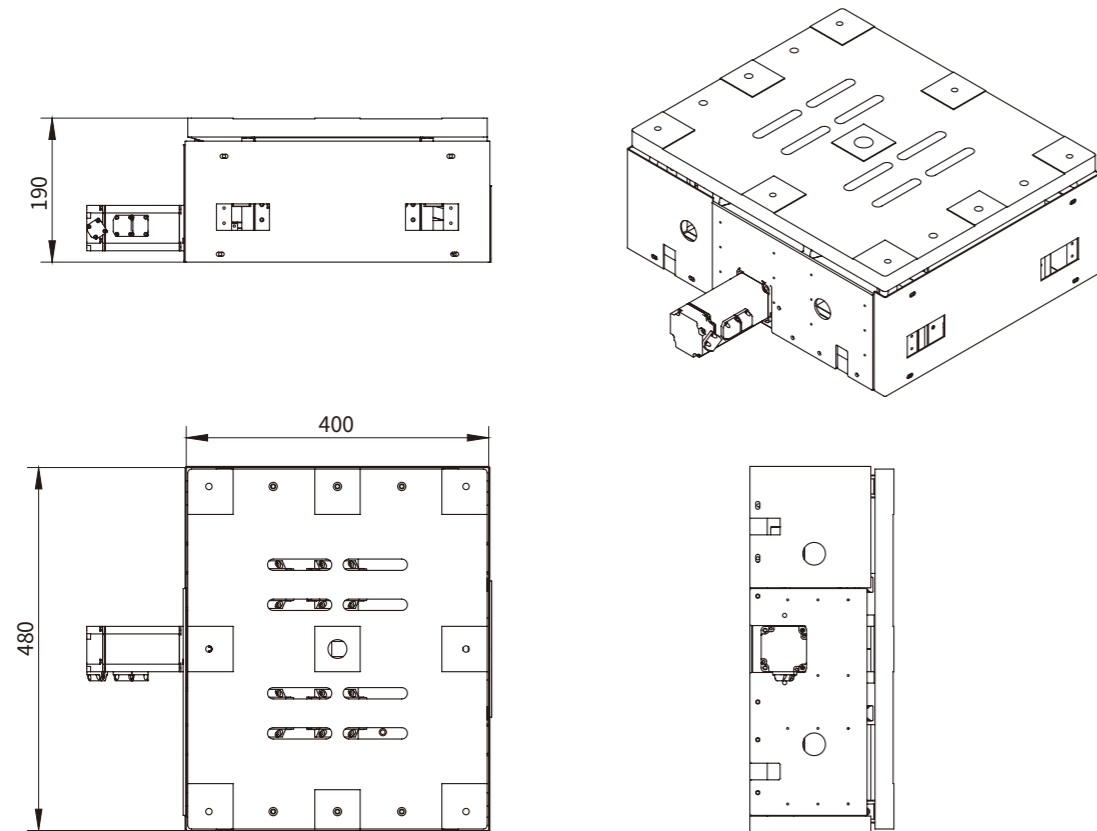


# Z-axis stack alignment stage in a wedge structure

## Z-axis stack alignment stage in a wedge structure

### Dimensions

STAM-011-400\*480



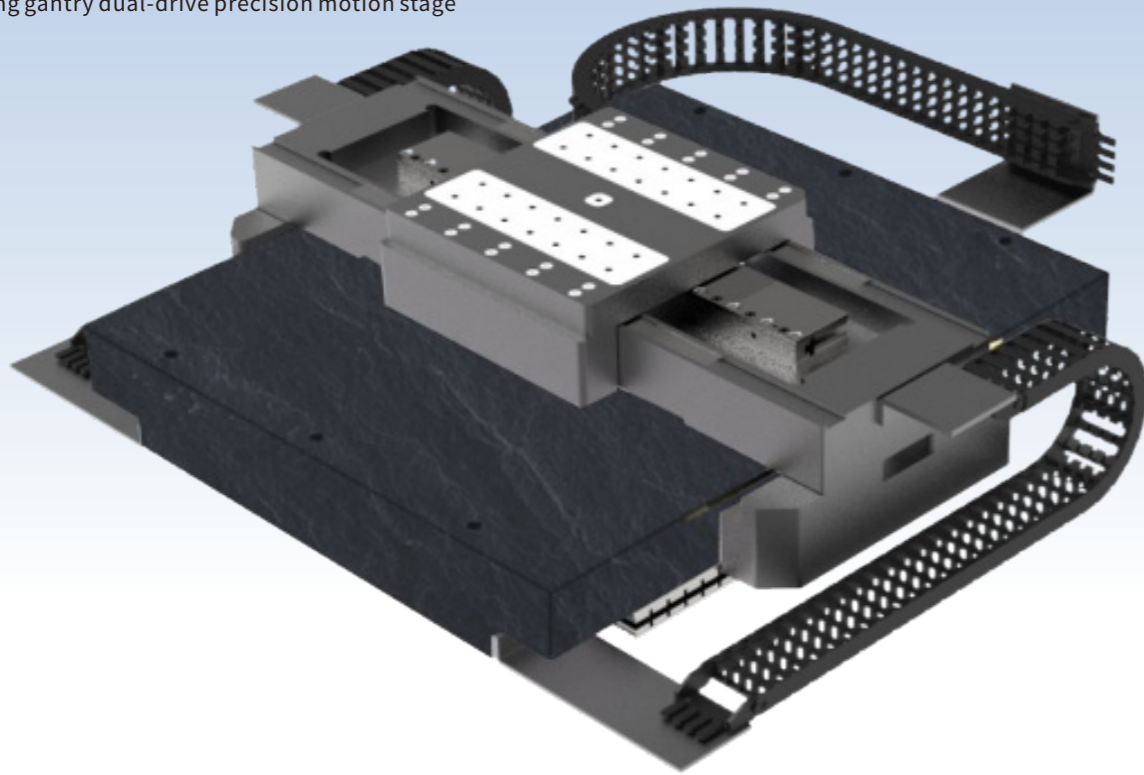
MEMO

## Nanometer-level air-floating precision motion stage

### • Nanometer-level air-floating precision motion stage

Air-floating single-axis linear precision motion stage

Air-floating gantry dual-drive precision motion stage



## ■ Nanometer-level air-floating precision motion stage

### ● Product features

- Driven by the direct drive linear motor
- Stability of the marble stage system
- Nanometer-level positioning accuracy can be achieved
- Optimized cable management and oil line management system
- Customized on demand

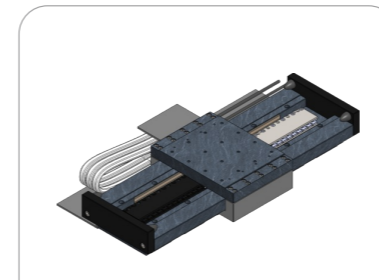
### ● Product usage

- Semiconductor processing and testing equipment
- Glass testing industry
- Laser industry
- Precision CNC machine tool
- High-end medical apparatus and instruments
- Mobile phone testing industry and other fields

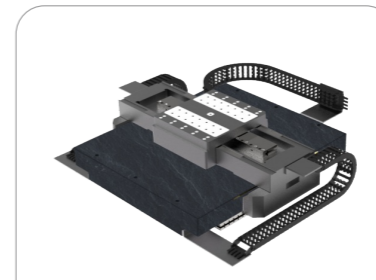
## ■ Nanometer-level air-floating precision motion stage

SERVOTOP

### ● Nanometer-level air-floating precision motion stage



Air-floating single-axis linear precision motion stage



Air-floating gantry dual-drive precision motion stage



Kit matching

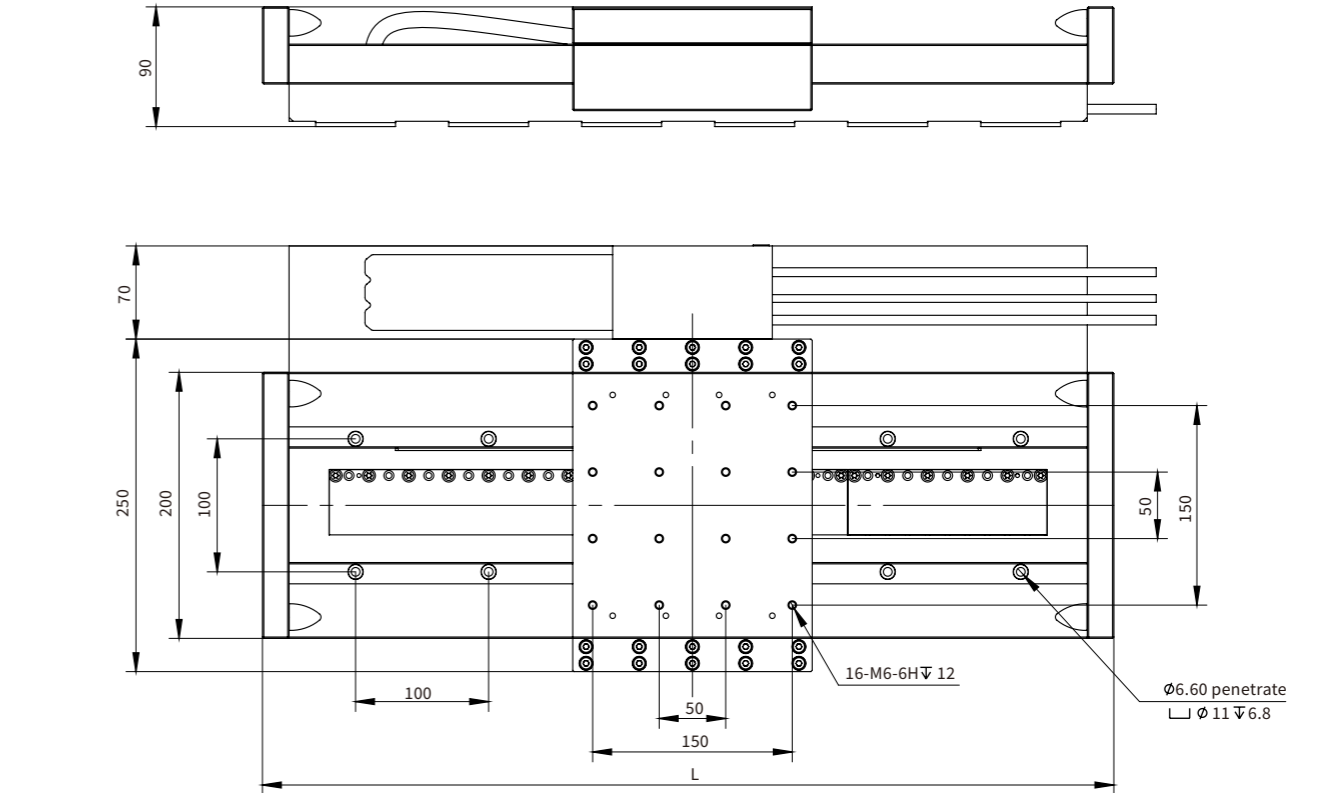
# ■ Nanometer-level air-floating precision motion stage

# ■ Nanometer-level air-floating precision motion stage

## Air-floating single-axis linear precision motion stage

## ■ Air-floating single-axis linear precision motion stage

### ● Dimensions



### ● Basic parameter

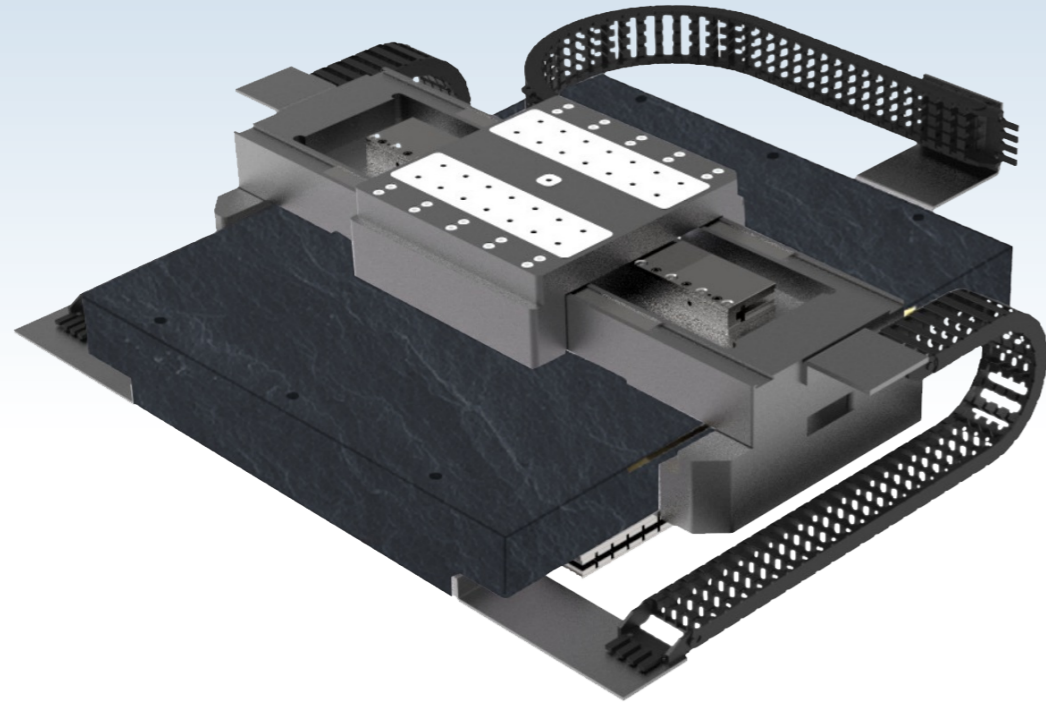
Model Parameter	STAM25-100	STAM25-200	STAM25-300	STAM25-400	STAM25-500	STAM25-600
Travel stroke (mm)	100	200	300	400	500	600
Optical grating resolution	5nm (simulated quantity) Other optical grating resolutions can also be selected					
Repeatability positioning precision (nm)	±50	±50	±100	±150	±200	±250
Positioning precision (μm)	2μm/100mm (less than 0.3 μm/100 mm after compensation)					
Straightness (μm)	±0.4	±0.5	±0.6	±0.75	±1	±1.5
Flatness (μm)	±0.4	±0.6	±0.6	±1	±1	±1.5
Max. speed	2m/s					
Max. acceleration(no load)	2G					
Horizontal load (Kg)	35kg					
Side load (Kg)	20kg					



# Nanometer-level air-floating precision motion stage

# Nanometer-level air-floating precision motion stage

## Air-floating gantry dual-drive precision motion stage

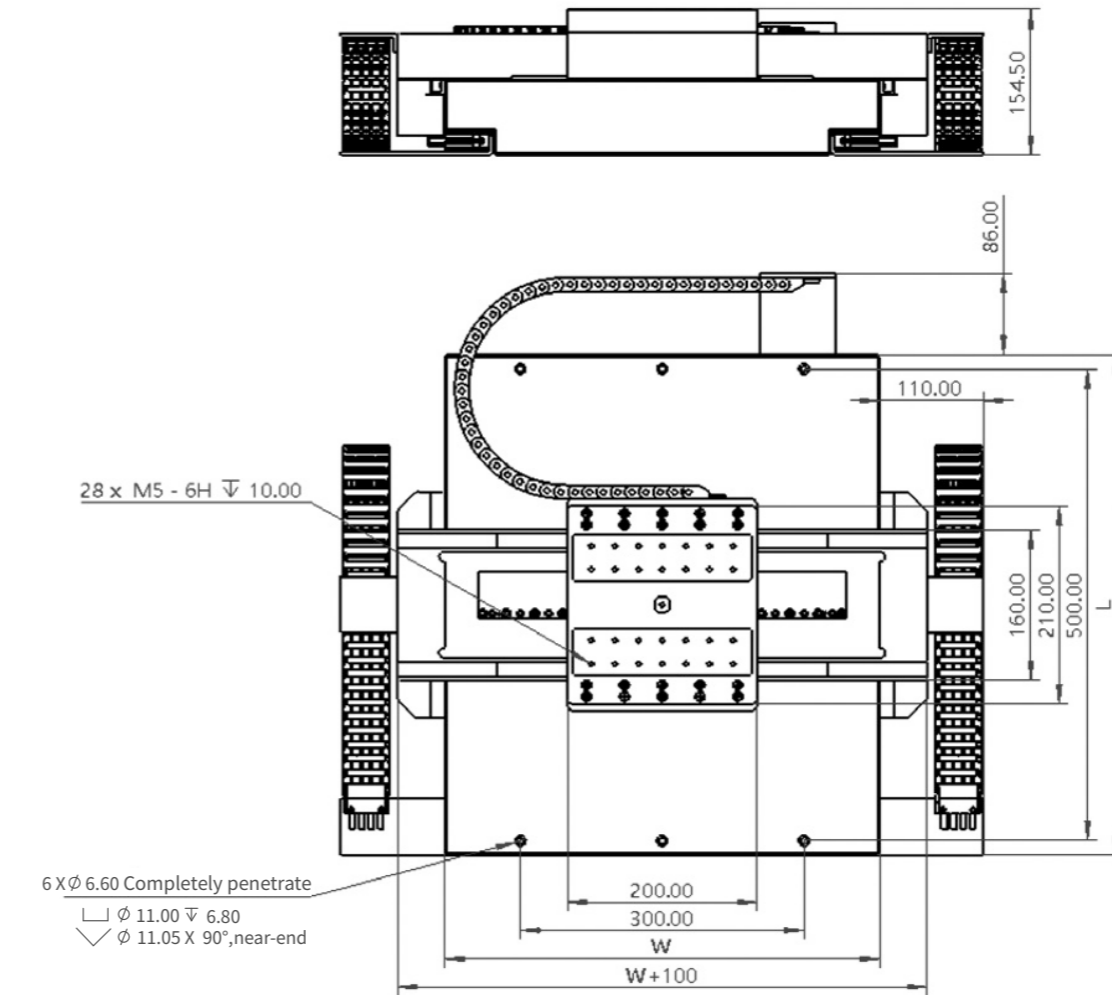


### Basic parameter

Model Parameter	STAM-062-100*100	STAM-062-150*150	STAM-062-200*200	STAM-053-250*250	STAM-053-300*300	STAM-053-400*400	STAM-053-500*500
Guide rail type	Planar common-rail air floating guide rail						
X motor specification	Three-phase ironless motor, continuous force 60N, peak force 210N						
Y axis	60N/210N(Single-drive)	60N/210N(Single-drive)	60N/210N(Single-drive)	120N/420N(Double-drive)	120N/420N(Double-drive)	120N/420N(Double-drive)	120N/420N(Double-drive)
Travel stroke (mm)	100	150	200	250	300	400	500
Optical grating resolution	5nm (simulated quantity) Other optical grating resolutions can also be selected						
Repeatability positioning precision (μm)	±0.1						
Positioning precision (μm)(before compensation)*1)	±1	±1.5	±2	±2	±2.5	±3	±4
Positioning precision (μm)(after compensation)*1)	±0.5						
Straightness (μm)	±0.4	±0.5	±0.6	±0.75	±1	±1.5	±1.5
Flatness (μm)	±0.4	±0.6	±0.6	±1	±1	±1.5	±1.5
Max. speed*2	2m/s						
Speed stability*3	≤1%						
X-axis (upper axis) max. acceleration (no load)	4G						
Y-axis (lower axis) max. acceleration (no load)	2G	1.7G	1.5G	2G	2G	1.6G	1.4G
Max. load (Kg)	15						
Air source working pressure	0.3-0.48MPa						
Technical description	<p>Note 1: This data is the upper limit of the measured data in the laboratory and the calibrated parameter. If there are higher requirements, consult the manufacturer.</p> <p>Note 2: The maximum speed of the stage depends on the valid travel stroke, the grating resolution, and the clock frequency of the grating and driver. Different configurations will lead to the change of the upper limit of this parameter. For details, consult the manufacturer.</p> <p>Note 3: Speed uniformity, also known as speed error, is closely related to the interval of speed. A slower speed results in a greater proportion of the speed error. Regarding the applications in which the speed is lower than 1 mm/s, linear motors are recommended.</p>						

## Air-floating gantry dual-drive precision motion stage

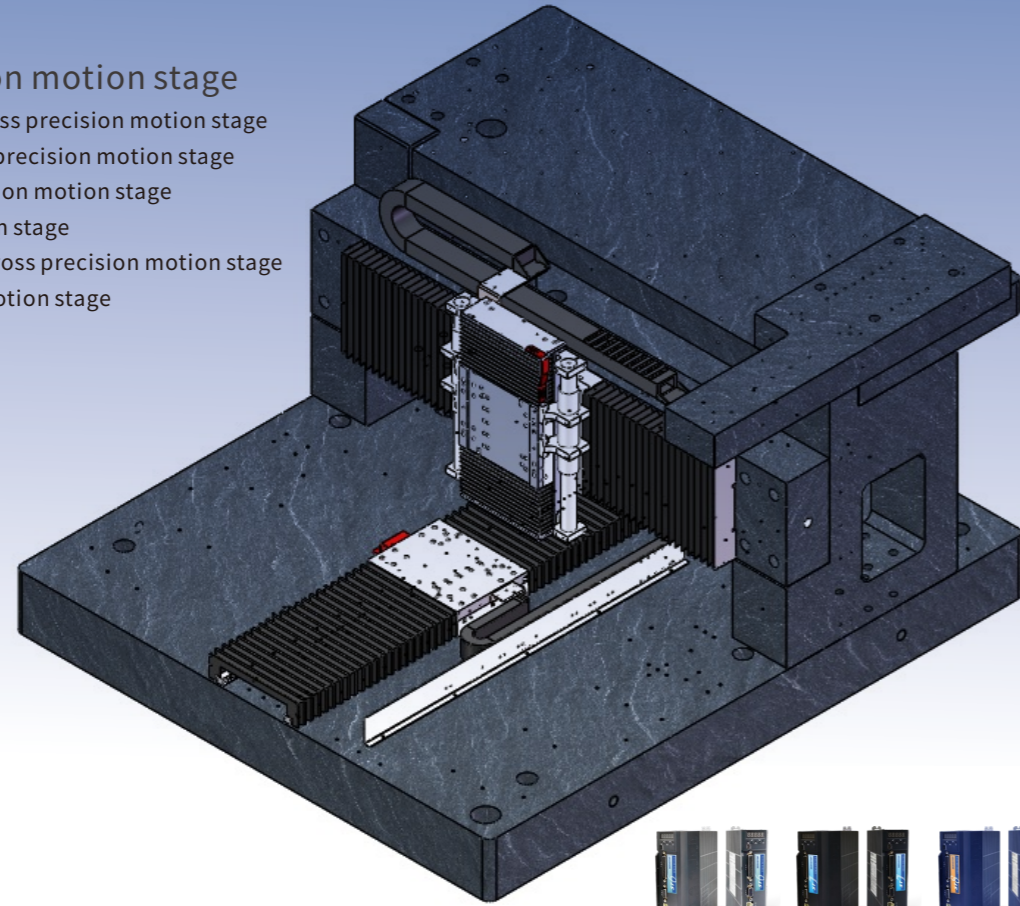
### Dimensions



Dimension\Model	100×100	150×150	200×200	250×250	300×300	400×400	500×500
W (mm)	310	360	410	460	510	610	710
L (mm)	380	430	480	530	580	680	780

# Stacking precision motion stage

- Stacking precision motion stage
- Marble superimposed cross precision motion stage
- Marble fixed-beam cross precision motion stage
- Fixed-beam dual-Y precision motion stage
- Five-axis precision motion stage
- Modular superimposed cross precision motion stage
- Hollow cross precision motion stage



## ■ Stacking precision motion stage

### ● Product features

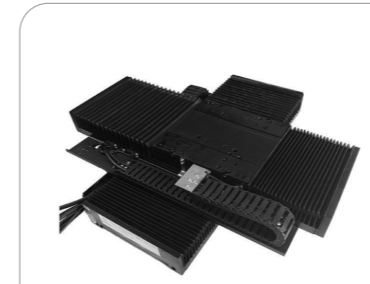
- Driven by the direct drive linear motor
- Stability of the marble stage system
- Nanometer-level positioning accuracy can be achieved
- Optimized cable management and oil line management system
- Customized on demand

### ● Product usage

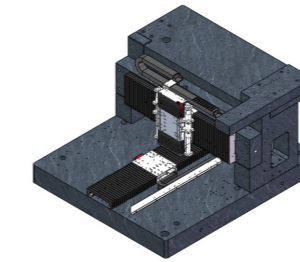
- Semiconductor processing and testing equipment
- Glass testing industry
- Laser industry
- Precision CNC machine tool
- High-end medical apparatus and instruments
- Mobile phone testing industry and other fields

## ■ Stacking precision motion stage

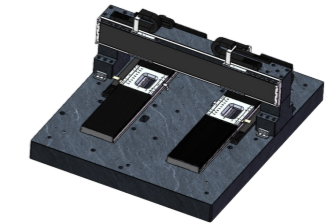
### · Micrometer-level precision motion stage



Superimposed cross module



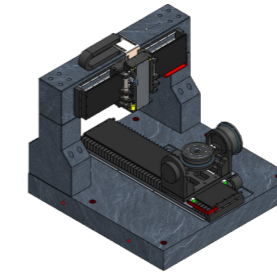
Fixed-beam XYZ stage



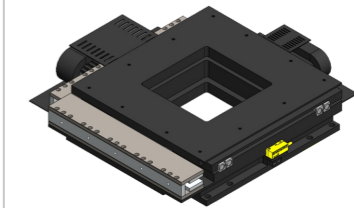
Fixed-beam dual-Y stage



Modular superimposed cross



Five-axis stage

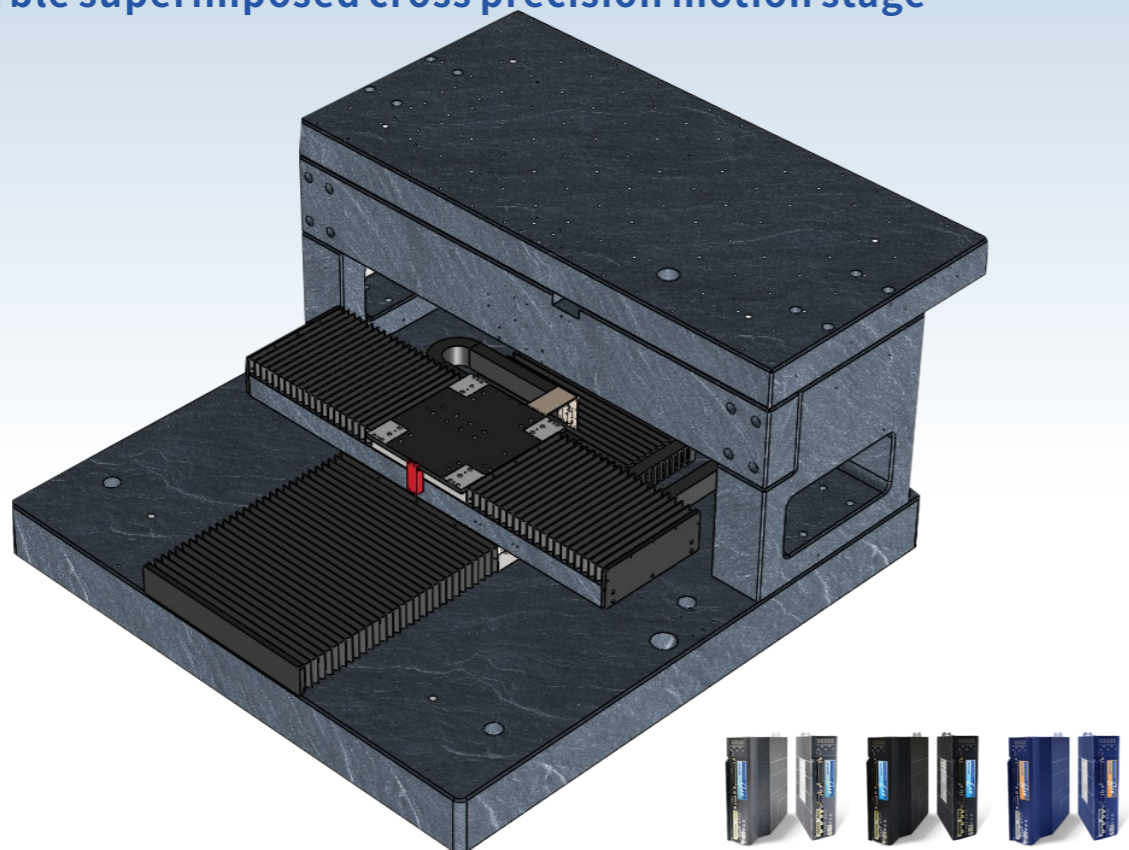


Hollow cross stage

Stacking precision motion stage

Stacking precision motion stage

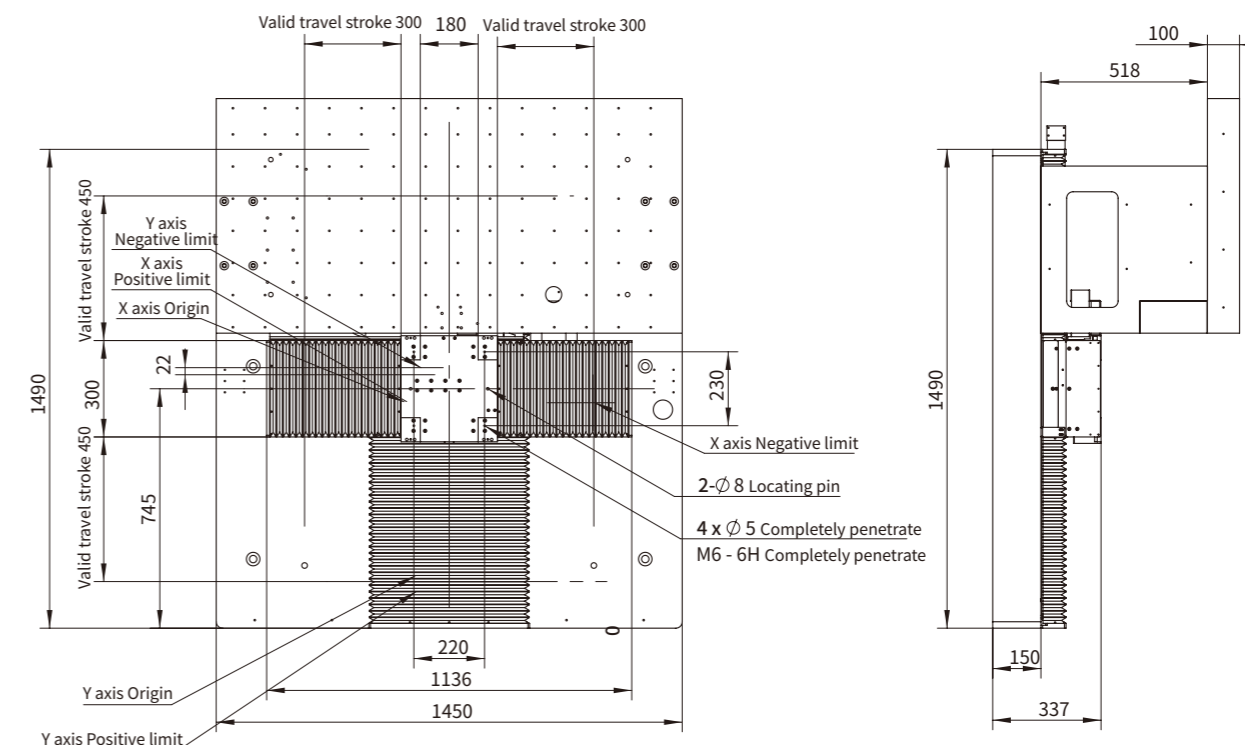
Marble superimposed cross precision motion stage



- The superimposed cross stage structure and the marble crossbeam can increase the Z axis driven by linear motor to conduct vertical motion, and match the magnetic spring to perform gravity balance and prevent objects from falling in case of power outage, forming a 3-axis precision positioning stage;
- Micrometer-level ( $\mu\text{m}$ ) repeatability positioning precision;
- Linear motor drive, optical grating ruler feedback;
- The marble stage with low expansion coefficient and low water absorption features high rigidity, strong stability, and excellent vibration absorption performance;
- Used for high precision equipment, such as high-precision laser cutting equipment, testing equipment (AOI), and laser marking equipment;
- Customized according to customer requirements.

Marble superimposed cross precision motion stage

Dimensions



Basic parameter

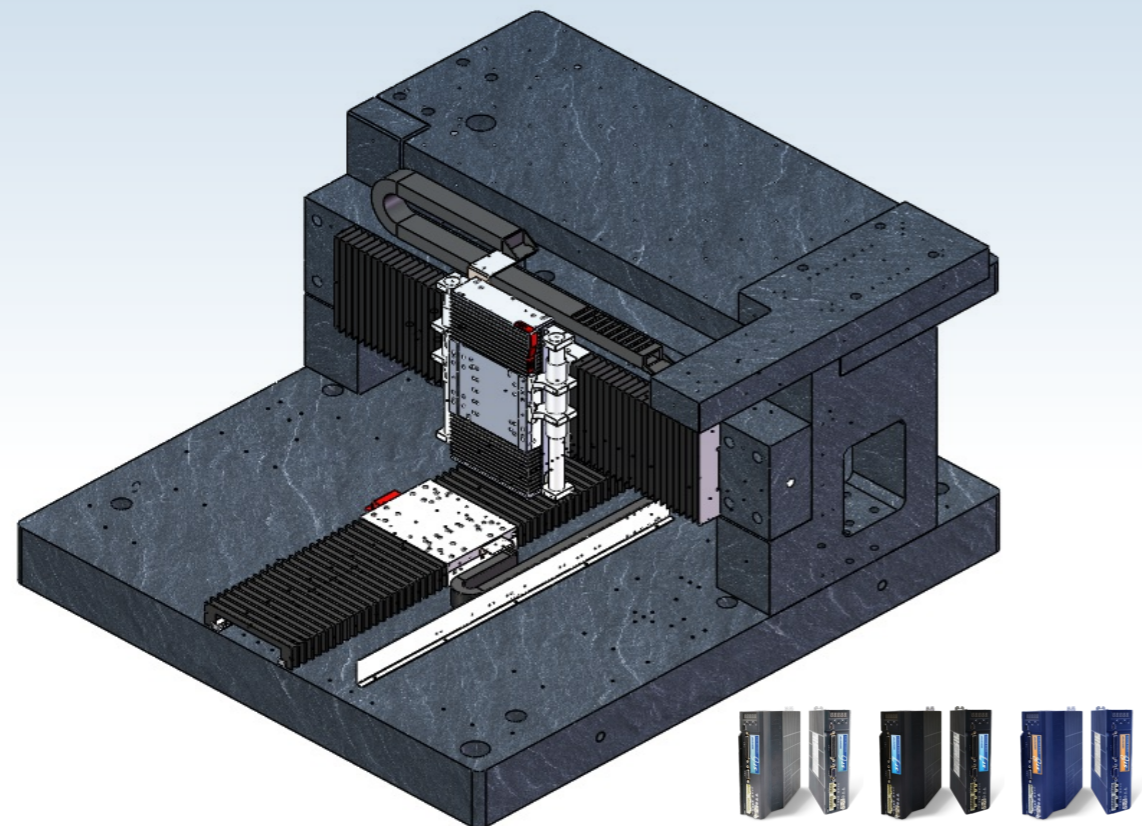
Basic parameter	X-axis (upper axis)	Y-axis (lower axis)
Load (Kg)	On demand	/
Travel stroke (mm)	Customized on demand	Customized on demand
Speed (mm/s)	<1.5m/s	<1.5m/s
Acceleration	<1G	<1G
Positioning precision ( $\mu\text{m}$ (after compensation))	< $\pm 1.5$	< $\pm 1.5$
Repeatability positioning precision ( $\mu\text{m}$ )	< $\pm 1$	< $\pm 1$
Straightness( $\mu\text{m}$ )	< $\pm 2/300\text{mm}$	< $\pm 2/300\text{mm}$
Orthogonality ( $\mu\text{m}$ )	< $\pm 3/300\text{mm}@Y$	< $\pm 3/300\text{mm}@X$
Material	Marble	Marble
Optical grating resolution ( $\mu\text{m}$ )	0.1, 0.5, and 1 for selection	0.1, 0.5, and 1 for selection

■ Stacking precision motion stage

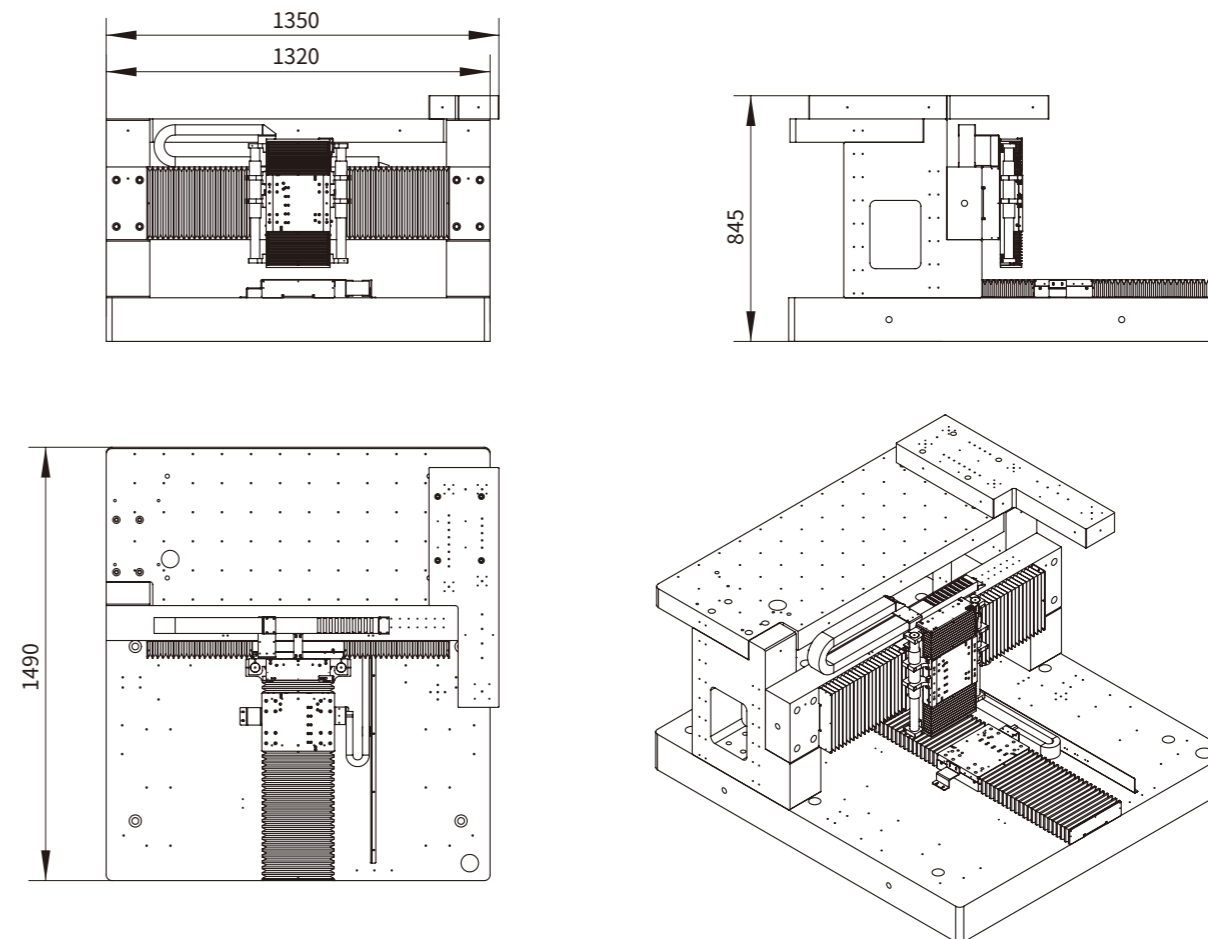
■ Stacking precision motion stage

■ Marble fixed-beam cross precision motion stage

■ Marble fixed-beam cross precision motion stage



● Dimensions



- The structure of the fixed-beam cross stage is adopted, the Z axis driven by the linear motor is disposed on the X axis, and the magnetic spring is matched to perform gravity balance and prevent objects from falling in case of power outage, forming a precision three-axis positioning stage;
- Micrometer-level ( $\mu\text{m}$ ) repeatability positioning precision;
- Linear motor drive, optical grating ruler feedback;
- The marble stage with low expansion coefficient and low water absorption features high rigidity, strong stability, and excellent vibration absorption performance;
- Used for high precision equipment, such as high-precision laser cutting equipment, testing equipment (AOI), and laser marking equipment;
- Customized according to customer requirements.

● Basic parameter

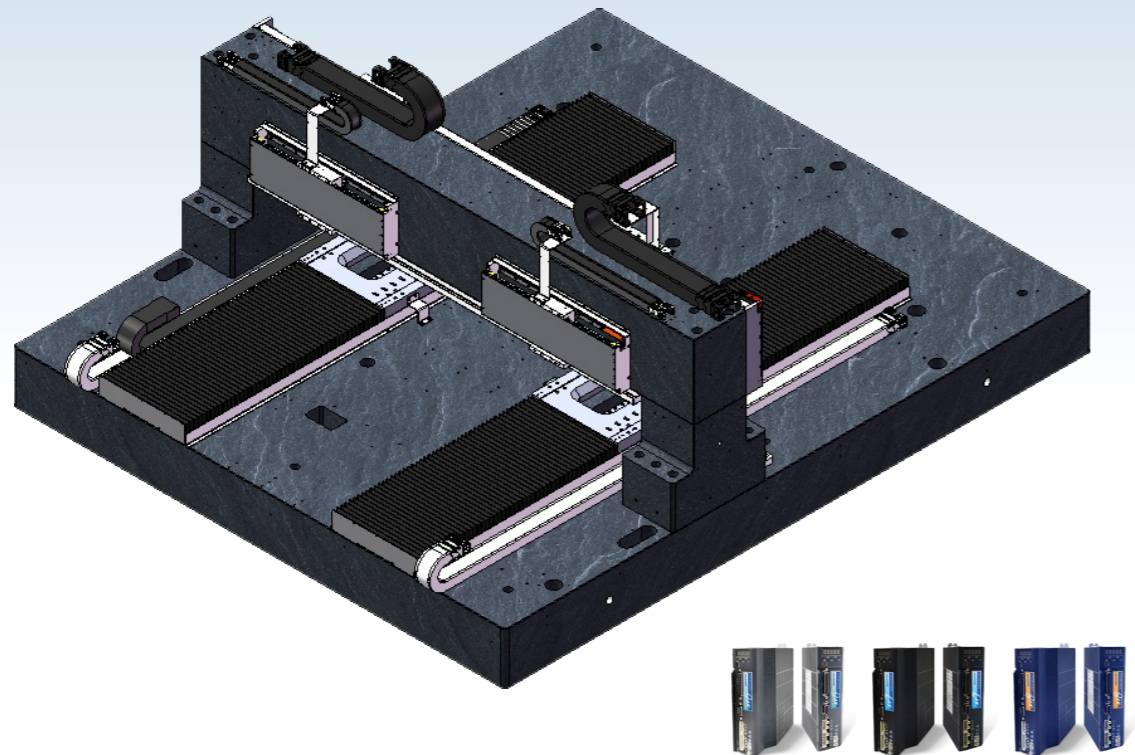
Basic parameter	X-axis (upper axis)	Y-axis (lower axis)
Load (Kg)	On demand	/
Travel stroke (mm)	Customized on demand	Customized on demand
Max. speed (mm/s)	<1.5m/s	<1.5m/s
Max. acceleration	<1G	<1G
Positioning precision ( $\mu\text{m}$ (after compensation) )	< $\pm 1.5$	< $\pm 1.5$
Repeatability positioning precision ( $\mu\text{m}$ )	< $\pm 1$	< $\pm 1$
Straightness( $\mu\text{m}$ )	< $\pm 2/300\text{mm}$	< $\pm 2/300\text{mm}$
Orthogonality ( $\mu\text{m}$ )	< $\pm 3/300\text{mm}@Y$	< $\pm 3/300\text{mm}@X$
Material	Marble	Marble
Optical grating resolution ( $\mu\text{m}$ )	0.1, 0.5, and 1 for selection	0.1, 0.5, and 1 for selection

■ Stacking precision motion stage

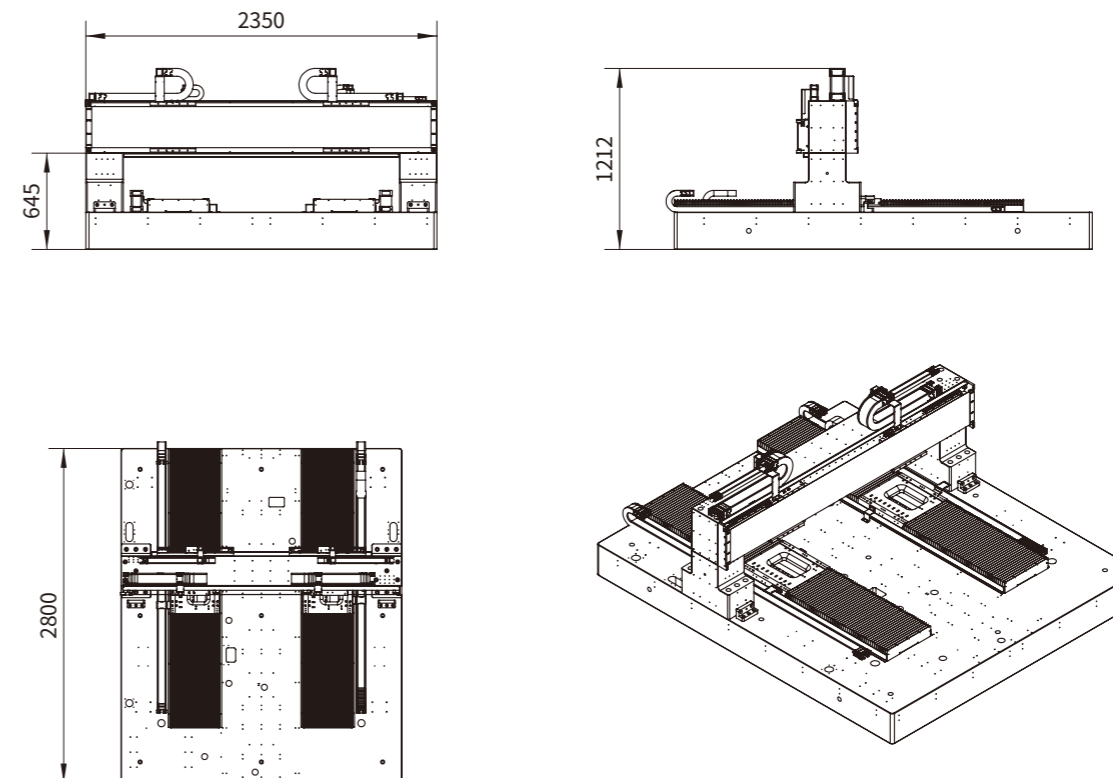
■ Stacking precision motion stage

■ Fixed-beam dual-Y precision motion stage

■ Fixed-beam dual-Y precision motion stage



● Dimensions



- The fixed-beam double-cross stage structure is adopted, and the crossbeam can accommodate the X axis on one side or both sides to form a three-axis or four-axis precision positioning stage;
- Micrometer-level ( $\mu\text{m}$ ) repeatability positioning precision;
- Linear motor drive, optical grating ruler feedback;
- The marble stage with low expansion coefficient and low water absorption features high rigidity, strong stability, and excellent vibration absorption performance;
- Used for high precision equipment, such as high-precision laser cutting equipment, testing equipment (AOI), and laser marking equipment;
- Customized according to customer requirements.

● Basic parameter

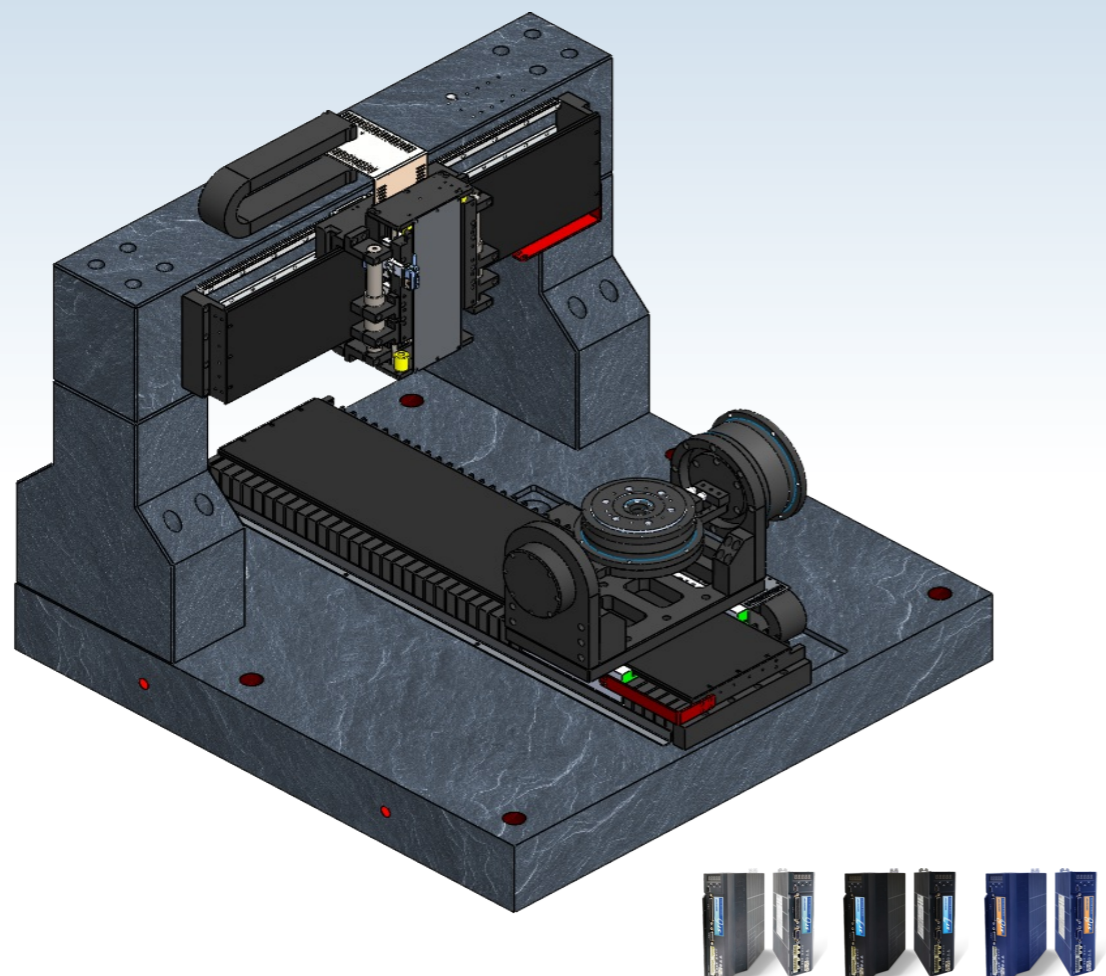
Basic parameter	X-axis (upper axis)	Y-axis (lower axis)
Load (Kg)	On demand	/
Travel stroke (mm)	Customized on demand	Customized on demand
Speed (mm/s)	<1.5m/s	<1.5m/s
Acceleration	<1G	<1G
Positioning precision ( $\mu\text{m}$ (after compensation) )	< $\pm 1.5$	< $\pm 1.5$
Repeatability positioning precision ( $\mu\text{m}$ )	< $\pm 1$	< $\pm 1$
Straightness( $\mu\text{m}$ )	< $\pm 2/300\text{mm}$	< $\pm 2/300\text{mm}$
Orthogonality ( $\mu\text{m}$ )	< $\pm 3/300\text{mm}@Y$	< $\pm 3/300\text{mm}@X$
Material	Marble	Marble
Optical grating resolution ( $\mu\text{m}$ )	0.1, 0.5, and 1 for selection	0.1, 0.5, and 1 for selection

■ Stacking precision motion stage

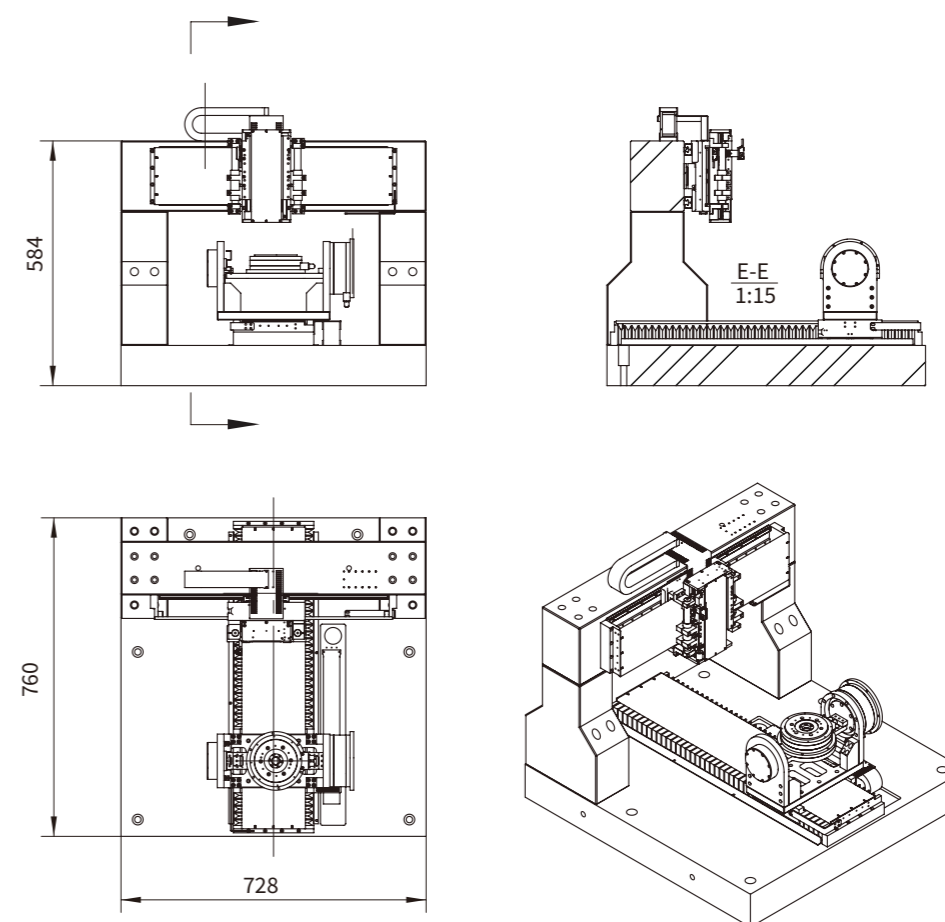
■ Stacking precision motion stage

■ Five-axis precision motion stage

■ Five-axis precision motion stage



● Dimensions



● Basic parameter

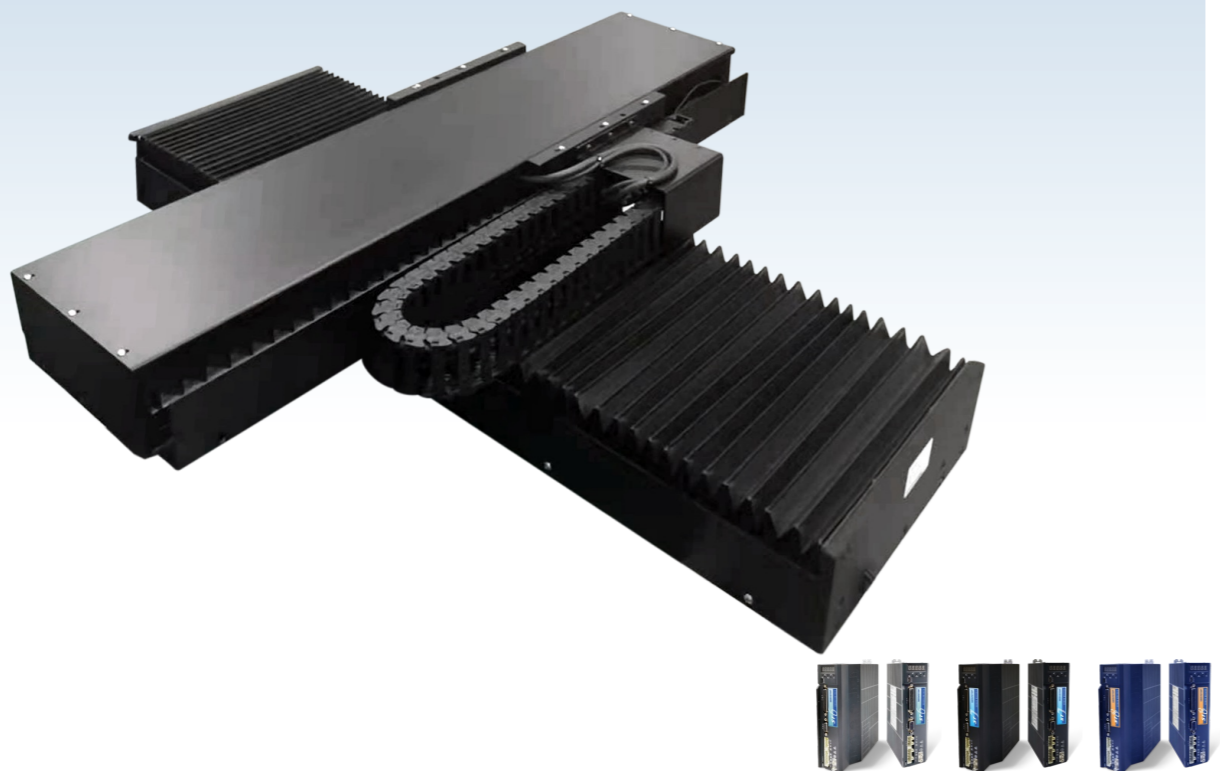
Parameter	Y axis (lower axis)	X axis (upper axis)	Z axis	DD1 axis	DD2 axis
Load (Kg)	On demand	/	On demand	On demand	3-10kg (Customized on demand)
Travel stroke (mm)	Customized on demand (<1.5m)	Customized on demand (<1.5m)	Customized on demand (<20mm)	±90°	360°
Max. speed (mm/s)	<1.5m/s	<1.5m/s	<0.15m/s	Customized on demand	Customized on demand
Max. acceleration	<2G	<2G	<1G	Customized on demand	Customized on demand
Positioning precision (μm (after compensation))	<±2	<±2	<±2	±25arcsec	±25arcsec
Repeatability positioning precision (μm)	<±1	<±1	<±1	±3arcsec	±3arcsec
Straightness(μm)	<±3/300mm	<±3/300mm	<±2/50mm	/	/
Orthogonality (μm)	<±3/300mm@X	<±3/300mm@Y	<±4/300mm	/	/
Material	Aluminum alloy/Marble	Aluminum alloy/Marble	Aluminum alloy	Steel (body)	Steel (body)
Optical grating resolution (μm)	0.1, 0.5, and 1 for selection	0.1, 0.5, and 1 for selection	/	Customized on demand	Customized on demand

■ Stacking precision motion stage

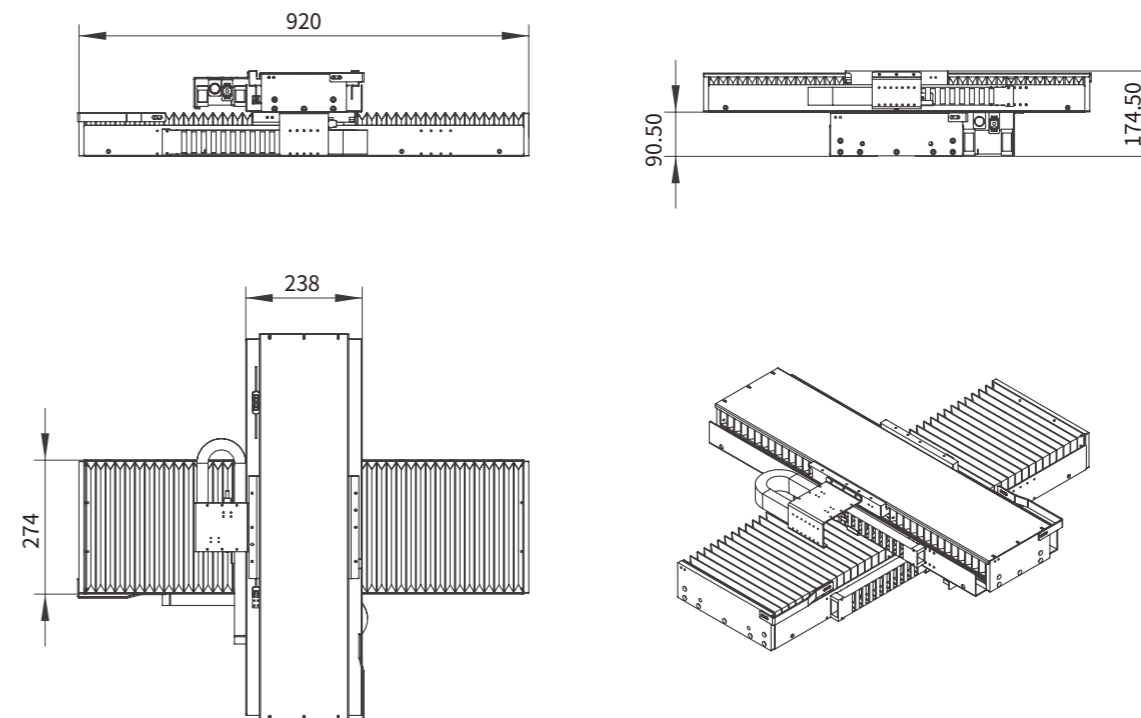
■ Stacking precision motion stage

■ Modular superimposed cross precision motion stage

■ Modular superimposed cross precision motion stage



● Dimensions



● Product features

- XY worktable, which can achieve the micrometer-level repeatability positioning precision;
- Max. speed 1000 mm/s, max. acceleration 1G;
- Linear motor drive, optical grating ruler or magnetic grating ruler code feedback;
- Customized according to customer requirements;
- The dual dustproof modes of sheet metal and organ cover are adopted to avoid the damage to the interior of the linear motor caused by the dust produced by glass cutting and prevent the direct laser from burning the module surface.

● Product usage

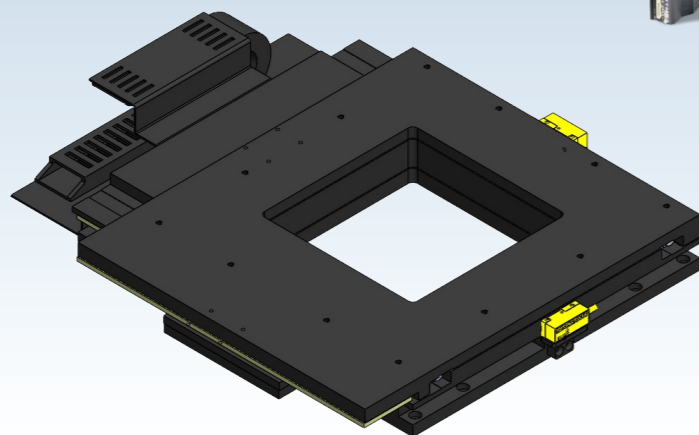
- The superimposed cross precision stage meets the requirements of high-speed, high-acceleration, high-precision product customization, which is suitable for high-end manufacturing industries, such as laser-based glass cutting, OLED processing, and screen inspection.

● Basic parameter

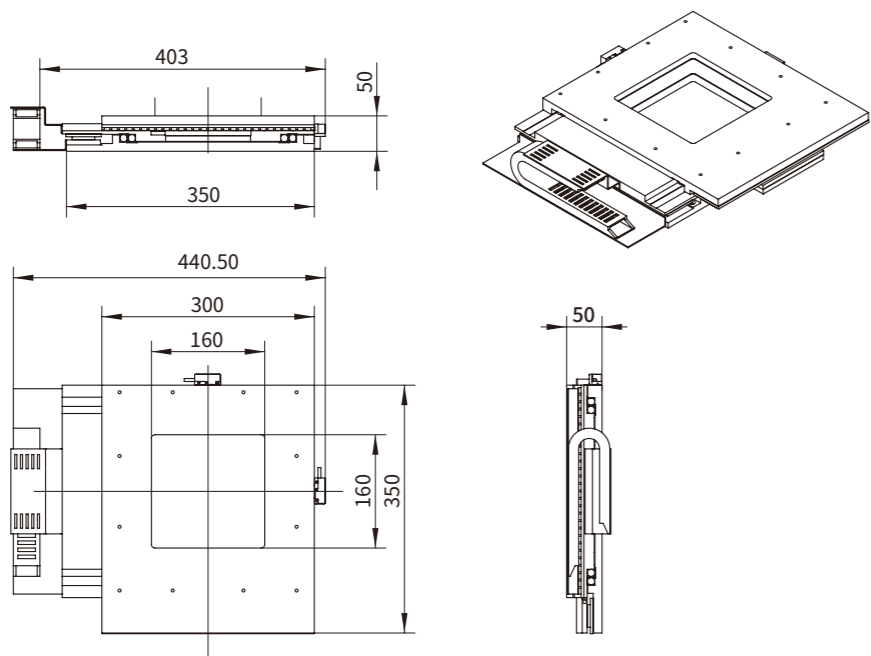
Parameter	X axis (upper axis)	Y axis (lower axis)
Load (Kg)	On demand	/
Valid travel stroke (mm)	100-600 (Customized on demand)	100-600 (Customized on demand)
Max. speed (m/s)	1.5m/s	1.5m/s
Max. Acceleration (G)	2G	2G
Repeatability (um)	±1um	±1um
Absolute positioning precision (um)	3um (after compensation)	3um (after compensation)
Resolution (um)	0.5um、1um	0.5um、1um
Straightness (um)	±5um/1000mm	±5um/1000mm
Orthogonality (um)	±5um/1000mm	±5um/1000mm
Dustproof	Sheet metal and organ cover	Sheet metal and organ cover
Material	Marble and aluminum profiles are optional	Marble and aluminum profiles are optional

Stacking precision motion stage

Hollow cross precision motion stage STM-HXY-160



Dimensions

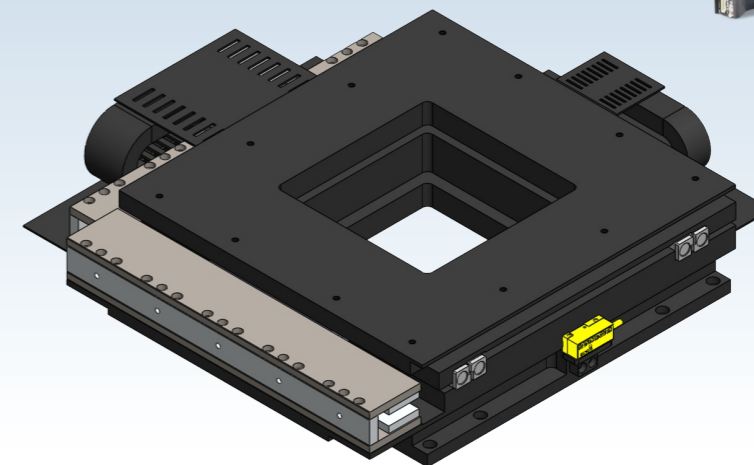


Basic parameter

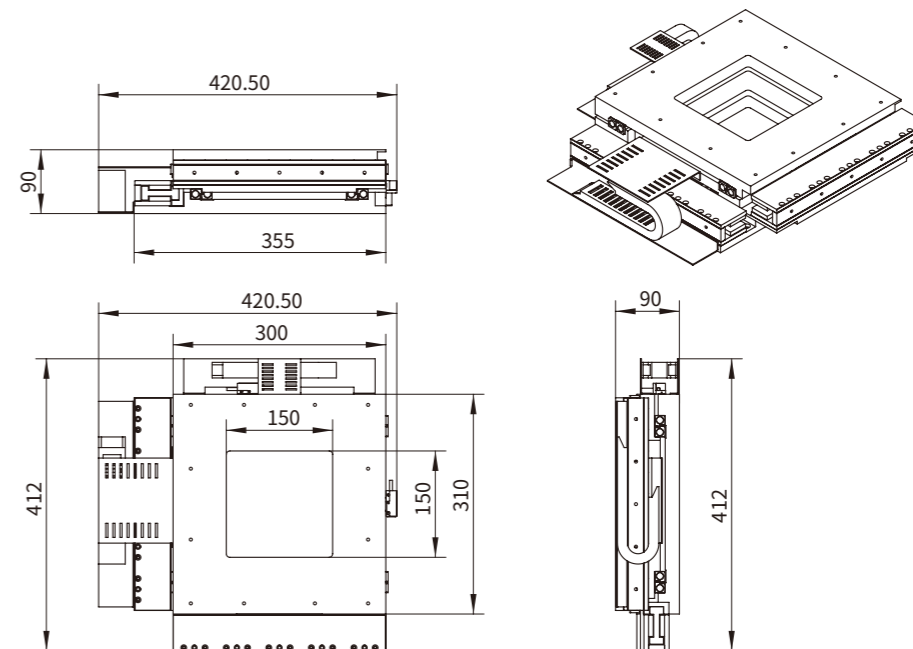
Parameter	X axis (upper axis)	Y axis (lower axis)
Load (Kg)	≤5	/
Travel stroke (mm)	Customized on demand (<160mm)	Customized on demand (<160mm)
Max. speed (mm/s)	<0.5m/s	<0.5m/s
Max. Acceleration	<0.5G	<0.5G
Positioning precision (μm (after compensation))	<±2	<±2
Repeatability positioning precision (μm)	<±1	<±1
Straightness (μm)	<±2/100mm	<±2/100mm
Orthogonality (μm)	<±3/100mm	<±3/100mm
Material	Aluminum alloy/Marble	Aluminum alloy/Marble
Optical grating resolution (μm)	0.1, 0.5, and 1 for selection	0.1, 0.5, and 1 for selection

Stacking precision motion stage

Hollow cross precision motion stage STM-HXY-150



Dimensions



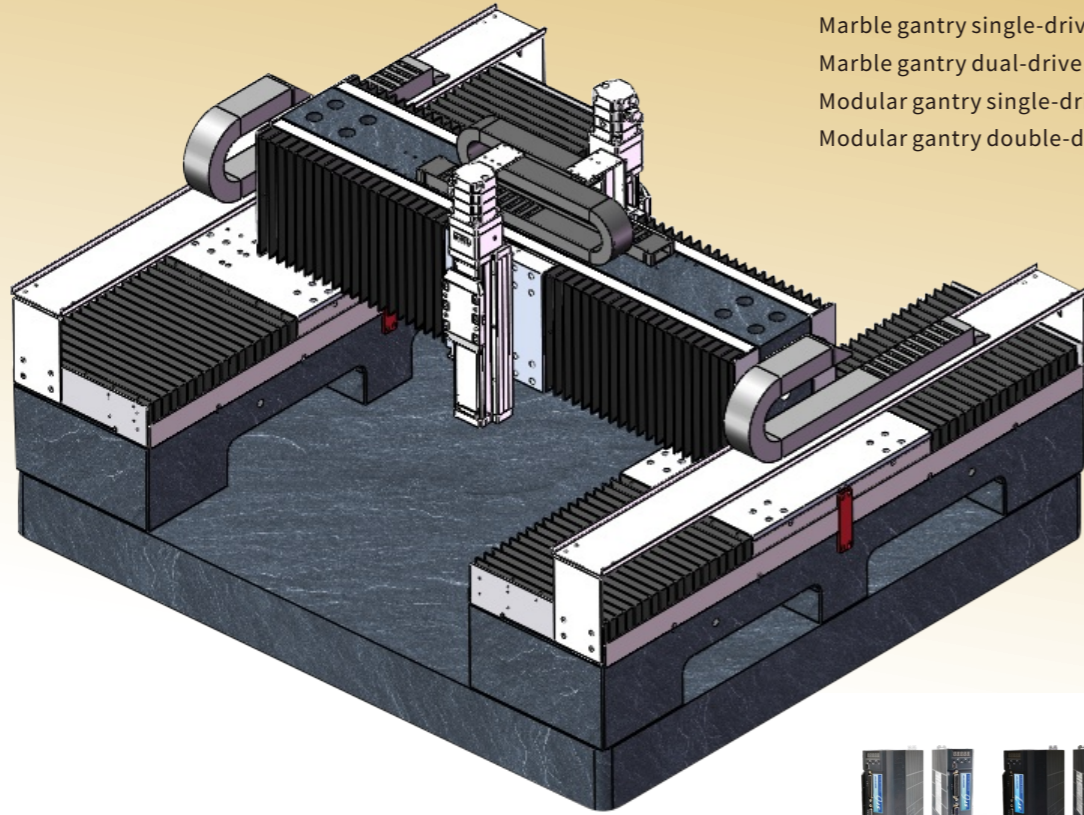
Basic parameter

Parameter	X axis (upper axis)	Y axis (lower axis)
Load (Kg)	≤10	/
Travel stroke (mm)	Customized on demand (<150mm)	Customized on demand (<150mm)
Max. speed (mm/s)	<0.5m/s	<0.5m/s
Max. Acceleration	<0.5G	<0.5G
Positioning precision (μm (after compensation))	<±2	<±2
Repeatability positioning precision (μm)	<±1	<±1
Straightness (μm)	<±2/100mm	<±2/100mm
Orthogonality (μm)	<±3/100mm	<±3/100mm
Material	Aluminum alloy/Marble	Aluminum alloy/Marble
Optical grating resolution (μm)	0.1, 0.5, and 1 for selection	0.1, 0.5, and 1 for selection



# Gantry precision motion stage

- Gantry precision motion stage
  - Marble gantry single-drive precision motion stage
  - Marble gantry dual-drive precision motion stage
  - Modular gantry single-drive precision motion stage
  - Modular gantry double-drive precision motion stage



## ■ Gantry precision motion stage

### ● Product features

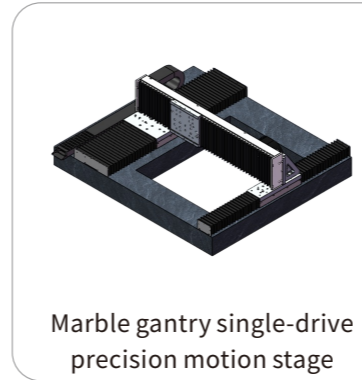
- Driven by the direct drive linear motor
- Stability of the marble stage system
- Nanometer-level positioning accuracy can be achieved
- Optimized cable management and oil line management system
- Customized on demand

### ● Product usage

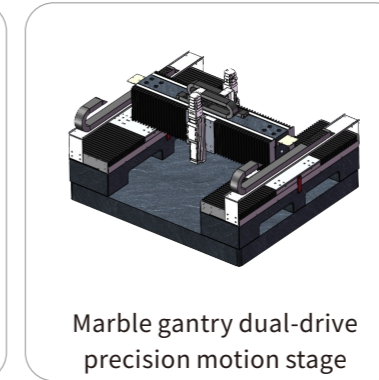
- Semiconductor processing and testing equipment
- Glass testing industry
- Laser industry
- Precision CNC machine tool
- High-end medical apparatus and instruments
- Mobile phone testing industry and other fields

## ■ Gantry precision motion stage

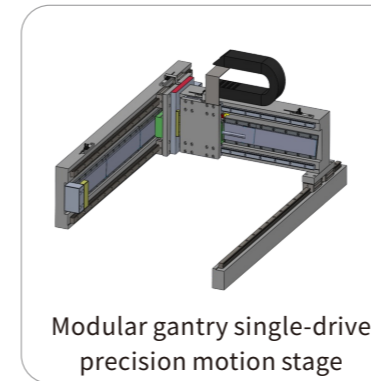
### · Gantry precision motion stage



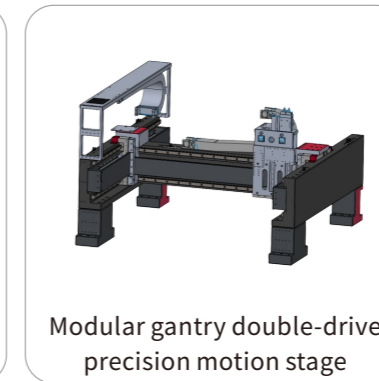
Marble gantry single-drive precision motion stage



Marble gantry dual-drive precision motion stage



Modular gantry single-drive precision motion stage

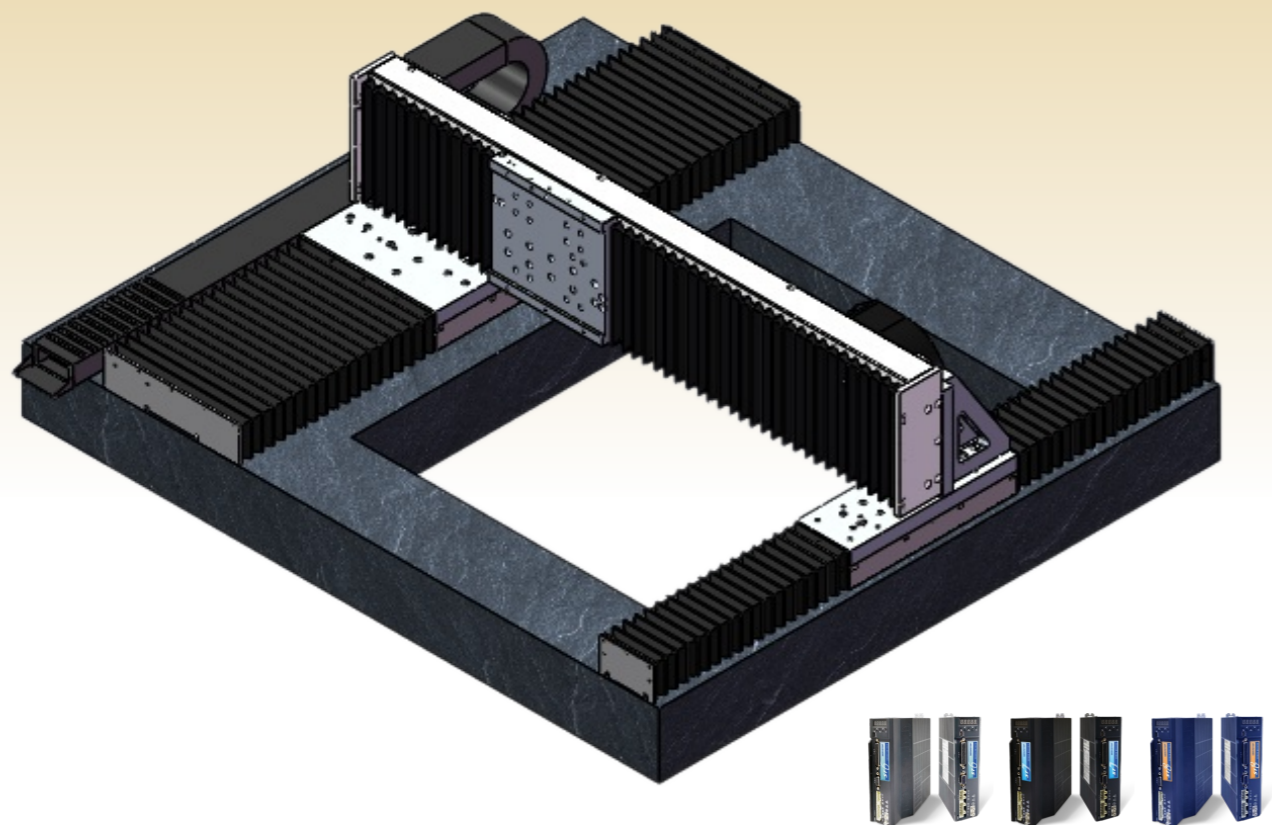


Modular gantry double-drive precision motion stage

■ Gantry precision motion stage

■ Gantry precision motion stage

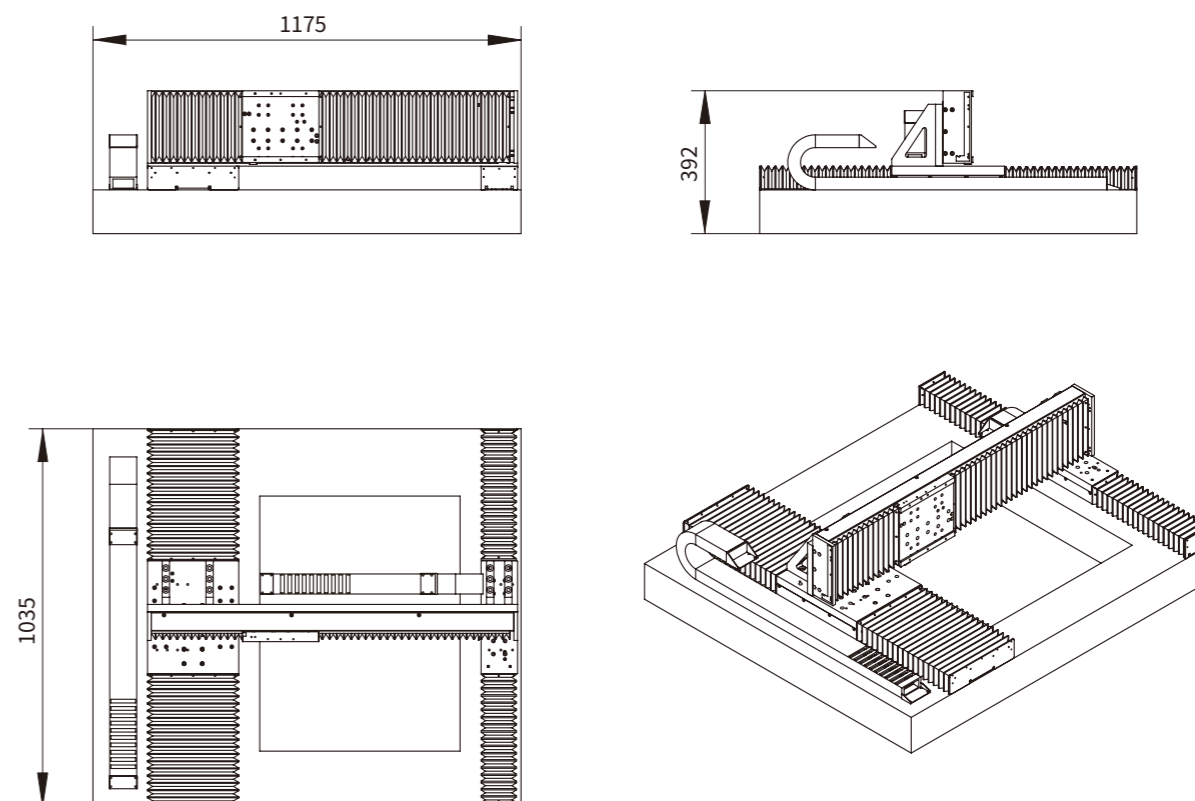
■ Marble gantry single-drive precision motion stage



- On the XY worktable, the X-axis base is a marble crossbeam, and the Z-axis can be added to the X-axis load plate to form a three-axis precision stage;
- The gantry structure and the crossbeam move along with the dual-Y axis, and only one axis of the dual-Y axis is equipped with a linear motor and a driver, which is a single-drive structure;
- Micrometer-level ( $\mu\text{m}$ ) reCustomized according to customer requirements.peatability positioning precision;
- Linear motor drive, optical grating ruler feedback;
- Used for high precision equipment, such as high-precision laser cutting equipment, testing equipment (AOI), and laser marking equipment;
- Customized according to customer requirements.

■ Marble gantry single-drive precision motion stage

● Dimensions



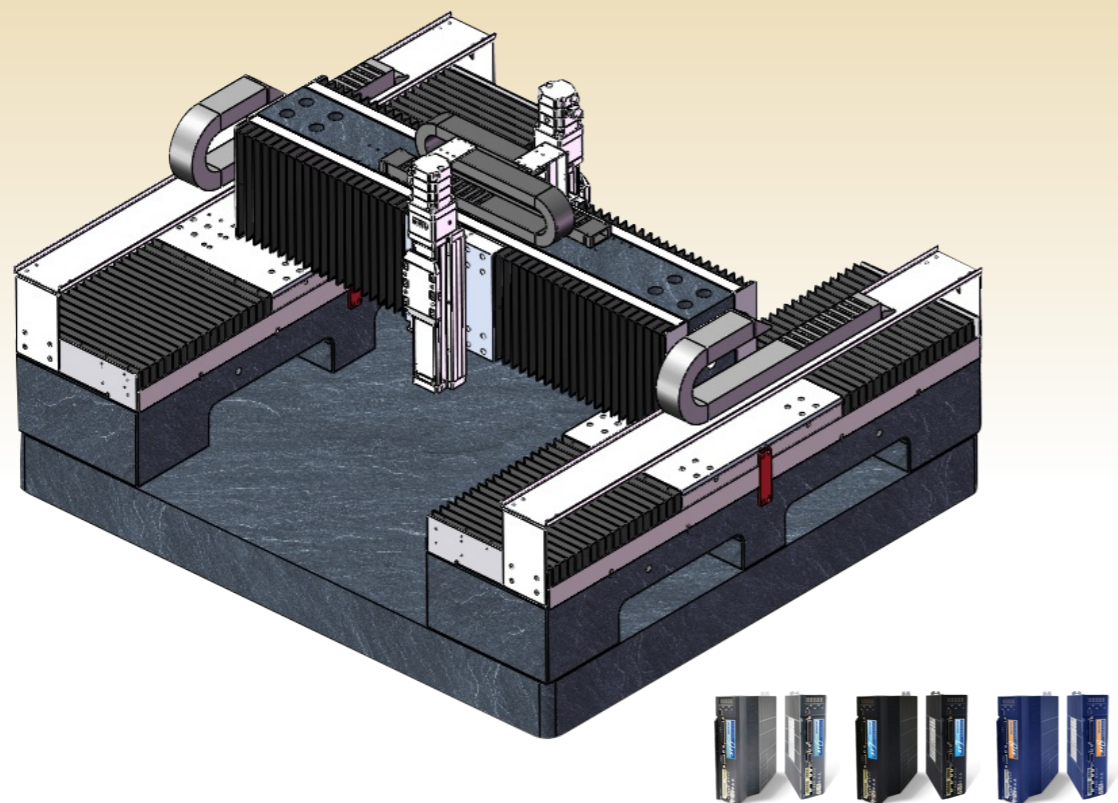
● Basic parameter

Parameter	X axis (upper axis)	Y1 axis (lower axis)
Load (Kg)	On demand	/
Travel stroke (mm)	Customized on demand	Customized on demand
Max. speed (mm/s)	<1.5m/s	<1.5m/s
Max. Acceleration	<1G	<1G
Positioning precision ( $\mu\text{m}$ (after compensation))	< $\pm 1.5$	< $\pm 1.5$
Repeatability positioning precision ( $\mu\text{m}$ )	< $\pm 1$	< $\pm 1$
Straightness ( $\mu\text{m}$ )	< $\pm 2/300\text{mm}$	< $\pm 2/300\text{mm}$
Orthogonality ( $\mu\text{m}$ )	< $\pm 3/300\text{mm}@Y$	< $\pm 3/300\text{mm}@X$
Material	Marble	Marble
Optical grating resolution ( $\mu\text{m}$ )	0.1, 0.5, and 1 for selection	0.1, 0.5, and 1 for selection

■ Gantry precision motion stage

■ Gantry precision motion stage

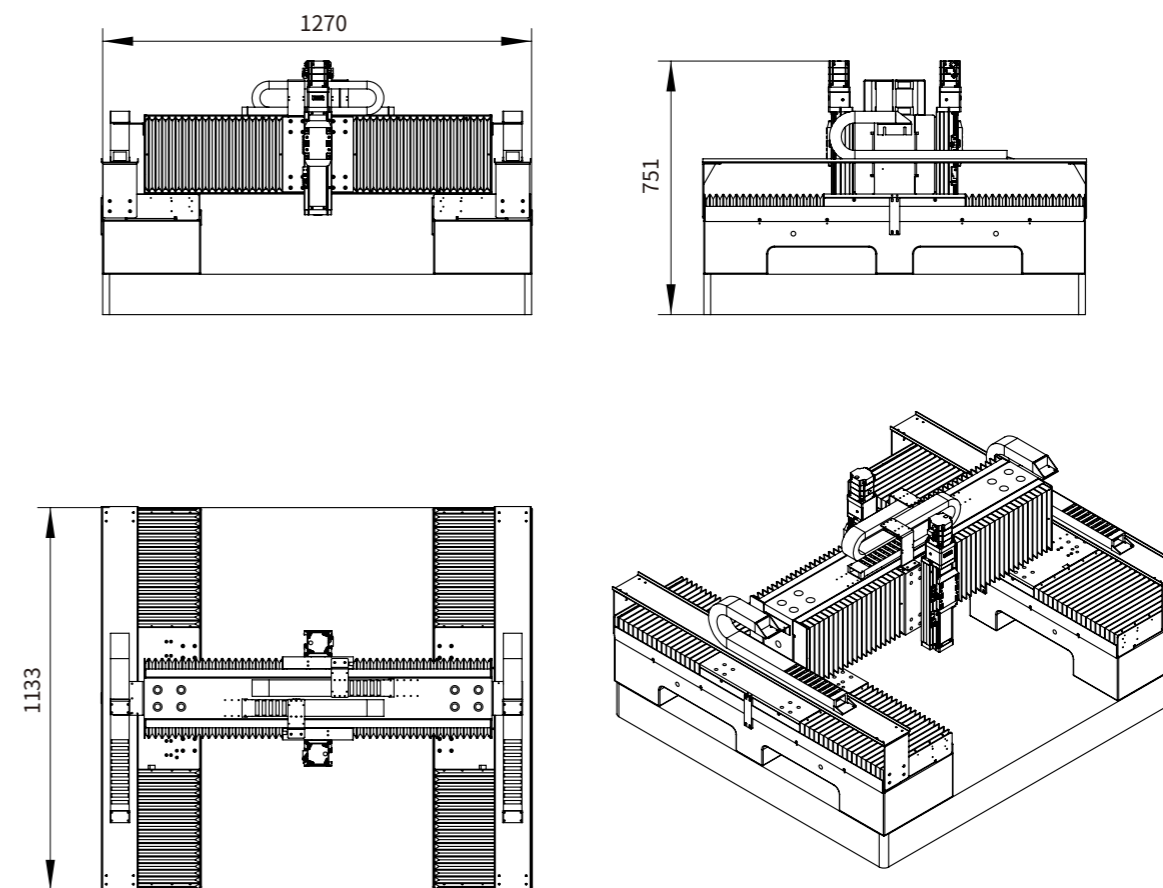
■ Marble gantry dual-drive precision motion stage



- On the XYZ worktable, the X-axis base is a marble crossbeam, which is a three-axis precision positioning stage;
- The gantry structure and the crossbeam move along with the dual-Y axis, and each axis of the dual-Y axis is driven by one driver;
- Micrometer-level ( $\mu\text{m}$ ) repeatability positioning precision;
- Micrometer-level ( $\mu\text{m}$ ) repeatability positioning precision;
- Used for high precision equipment, such as high-precision laser cutting equipment, testing equipment (AOI), wafer inspection, and LED packaging testing;
- Customized according to customer requirements.

■ Marble gantry dual-drive precision motion stage

● Dimensions



● Basic parameter

Parameter	X axis (upper axis)	Y1/Y2 axis (lower axis)
Load (Kg)	On demand	/
Travel Stroke (mm)	Customized on demand	Customized on demand
Max. speed (mm/s)	<1.5m/s	<1.5m/s
Max. Acceleration	<1G	<1G
Positioning precision ( $\mu\text{m}$ (after compensation))	< $\pm 1.5$	< $\pm 1.5$
Repeatability positioning precision ( $\mu\text{m}$ )	< $\pm 1$	< $\pm 1$
Straightness ( $\mu\text{m}$ )	< $\pm 2/300\text{mm}$	< $\pm 2/300\text{mm}$
Orthogonality ( $\mu\text{m}$ )	< $\pm 3/300\text{mm}@Y$	< $\pm 3/300\text{mm}@X$
Material	Marble	Marble
Optical grating resolution ( $\mu\text{m}$ )	0.1, 0.5, and 1 for selection	0.1, 0.5, and 1 for selection

■ Gantry precision motion stage

■ Gantry precision motion stage

■ Modular gantry single-drive precision motion stage

■ Modular gantry single-drive precision motion stage

● Product features

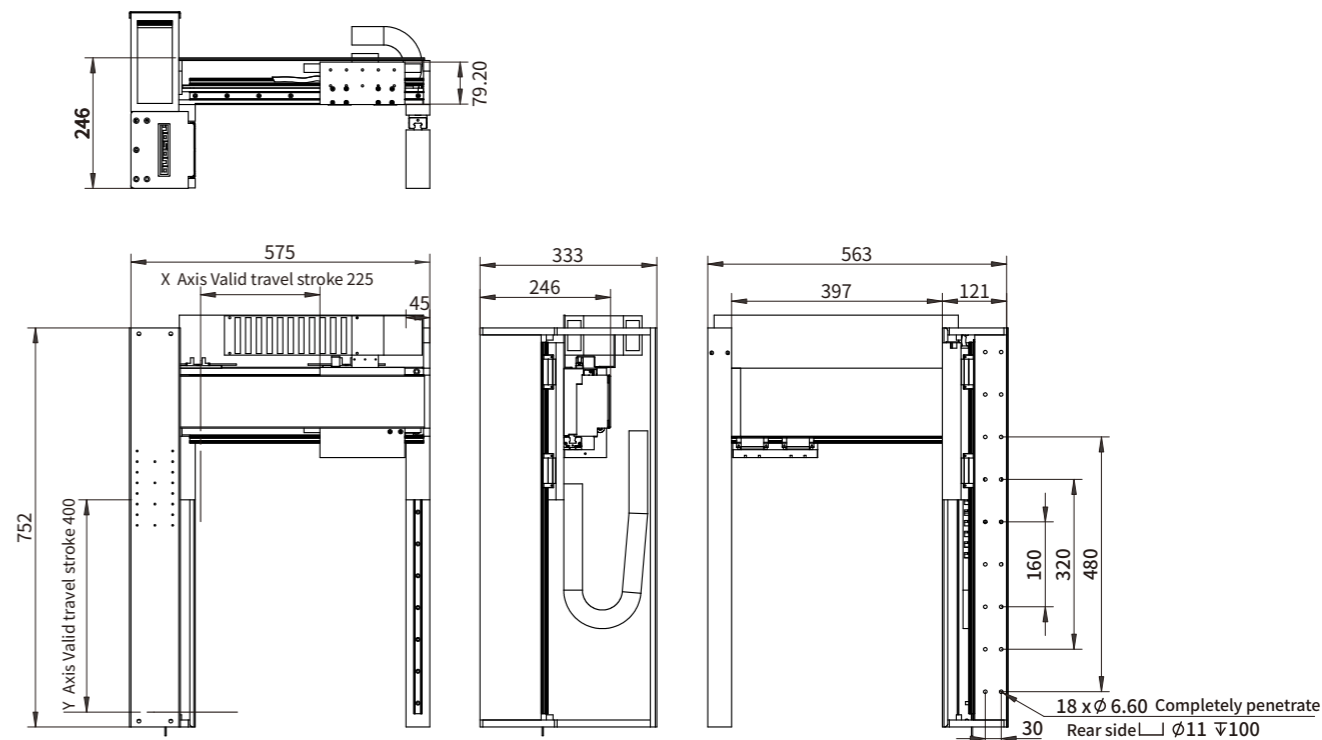
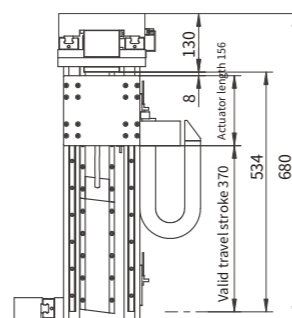
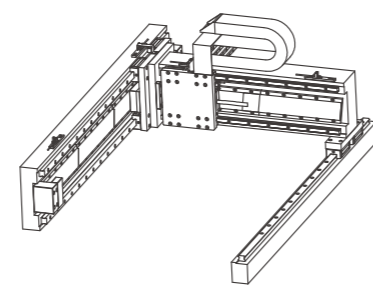
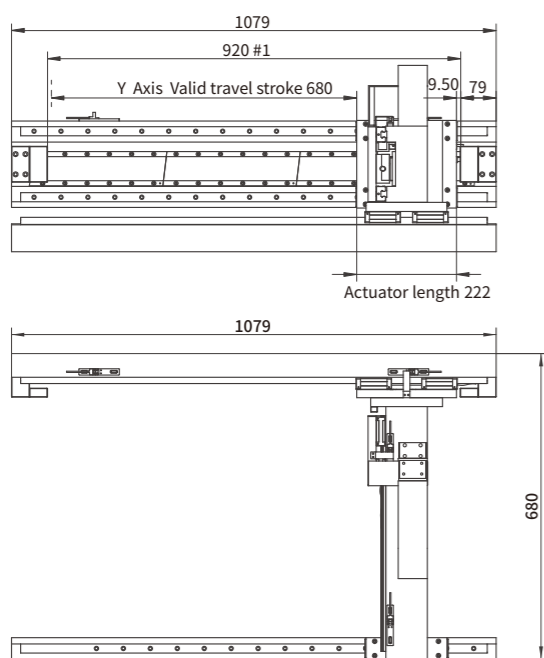
- Single-drive gantry structure;
- The positioning accuracy can reach  $\pm 3 \mu\text{m}$ , and the repeatability positioning accuracy can reach  $\pm 2 \mu\text{m}$ ;
- Customized according to customer requirements.

● Product usage

- Laser-based sheet metal cutting;
- COG, FOG, and LED dispensing in semiconductor industries;
- Used for various automation equipment in industries, such as 3C and photovoltaic power.

● Dimensions

● Dimensions



● Basic parameter

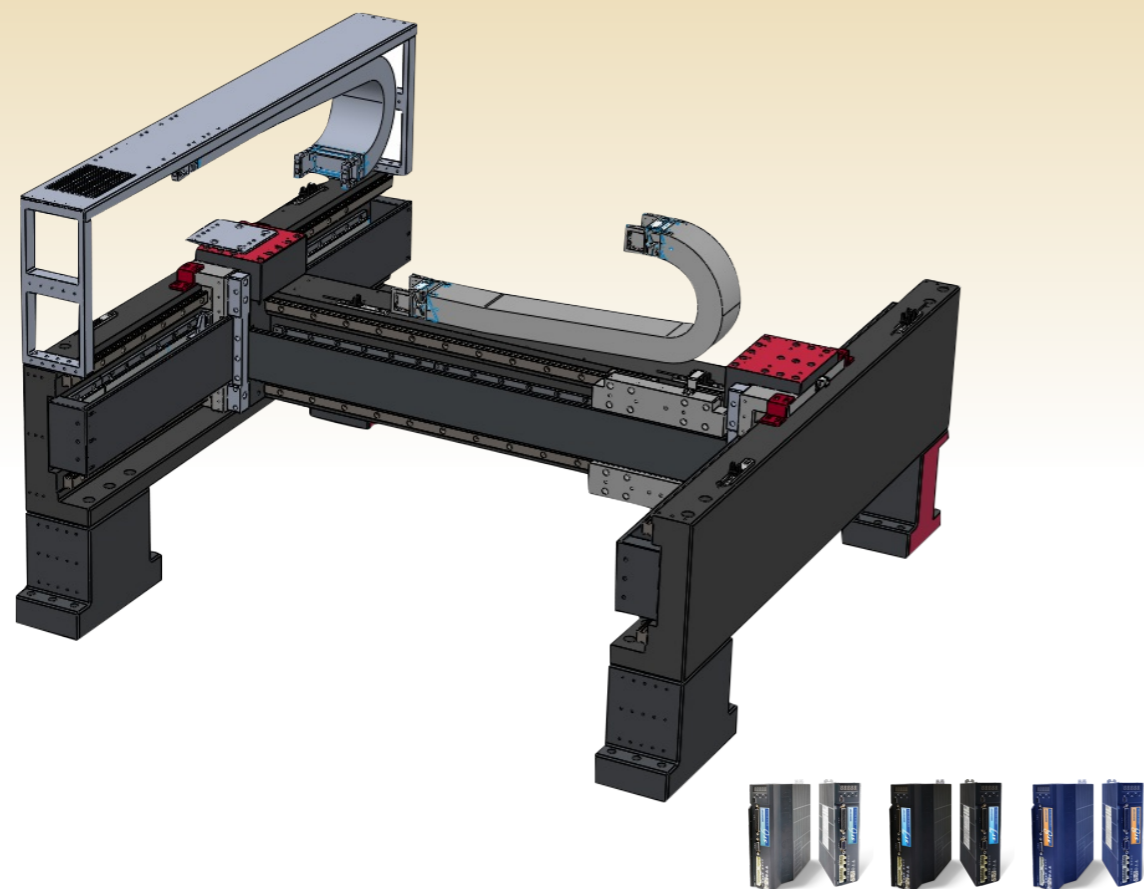
Parameter	X Axis (Crossbeam Axis)	Y axis (lower axis)
Load (Kg)	On demand	/
Travel stroke (mm)	Customized on demand (<2m)	Customized on demand
Max. speed (mm/s)	<1.5m/s	<1.5m/s
Max. Acceleration	<1.5G	<1.5G
Positioning precision ( $\mu\text{m}$ (after compensation))	< $\pm 3$	< $\pm 3$
Repeatability positioning precision ( $\mu\text{m}$ )	< $\pm 2$	< $\pm 2$
Straightness ( $\mu\text{m}$ )	< $\pm 4/300\text{mm}$	> $\pm 4/300\text{mm}$
Orthogonality ( $\mu\text{m}$ )	< $\pm 5/300\text{mm}@Y$	< $\pm 5/300\text{mm}@X$
Material	Aluminum alloy/Marble	Aluminum alloy/Marble/Cast iron
Optical grating resolution ( $\mu\text{m}$ )	0.1, 0.5, and 1 for selection	0.1, 0.5, and 1 for selection

■ Gantry precision motion stage

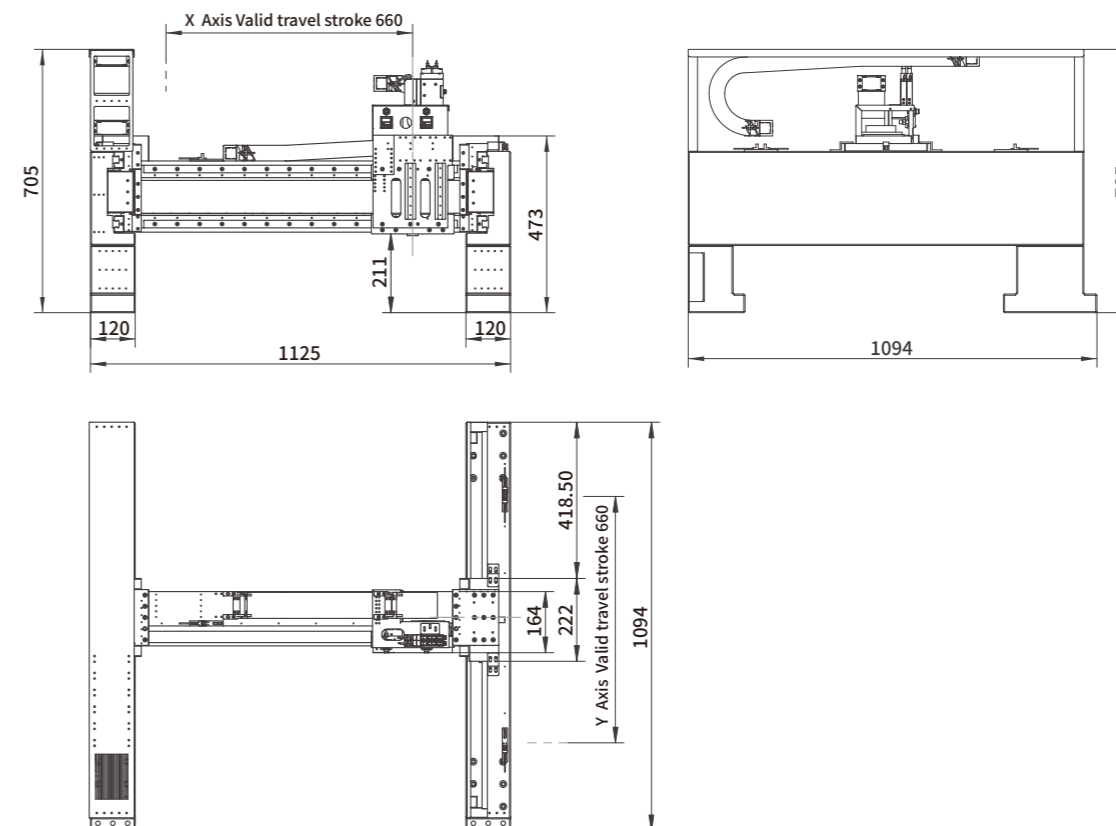
■ Gantry precision motion stage

■ Modular gantry double-drive precision motion stage

■ Modular gantry double-drive precision motion stage



● Dimensions



● Product features

- Dual-drive gantry + Z-axis structure;
- The positioning accuracy can reach up to  $\pm 3 \mu\text{m}$ , and the repeatability positioning accuracy can reach up to  $\pm 2 \mu\text{m}$ ;
- Customized according to customer requirements.

● Product usage

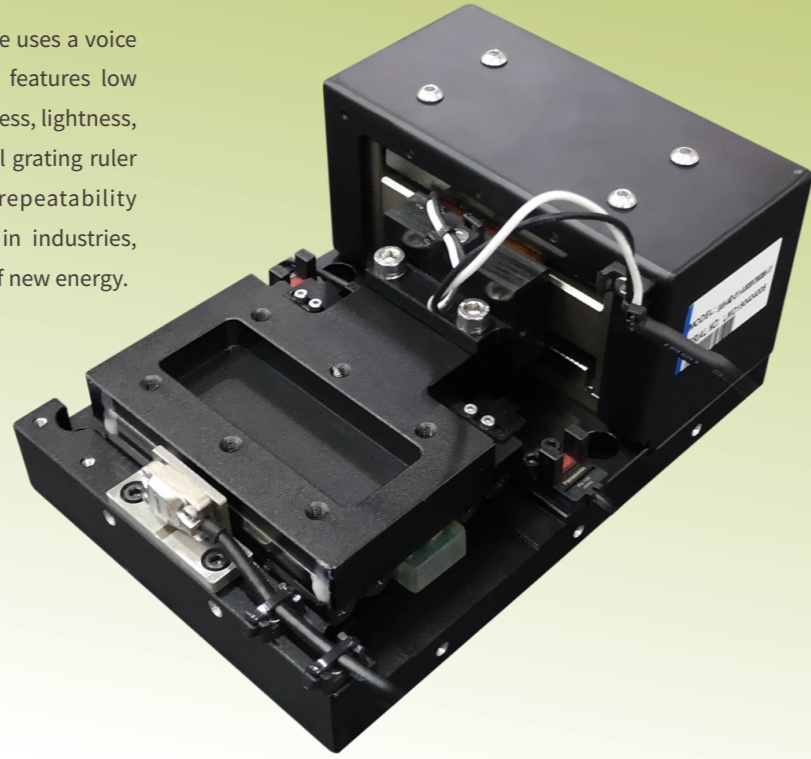
- Glass cutting;
- Used for high precision laser cutting equipment;
- Testing equipment (AOI);
- High precision equipment such as laser direct imaging (LDI) equipment.

● Basic parameter

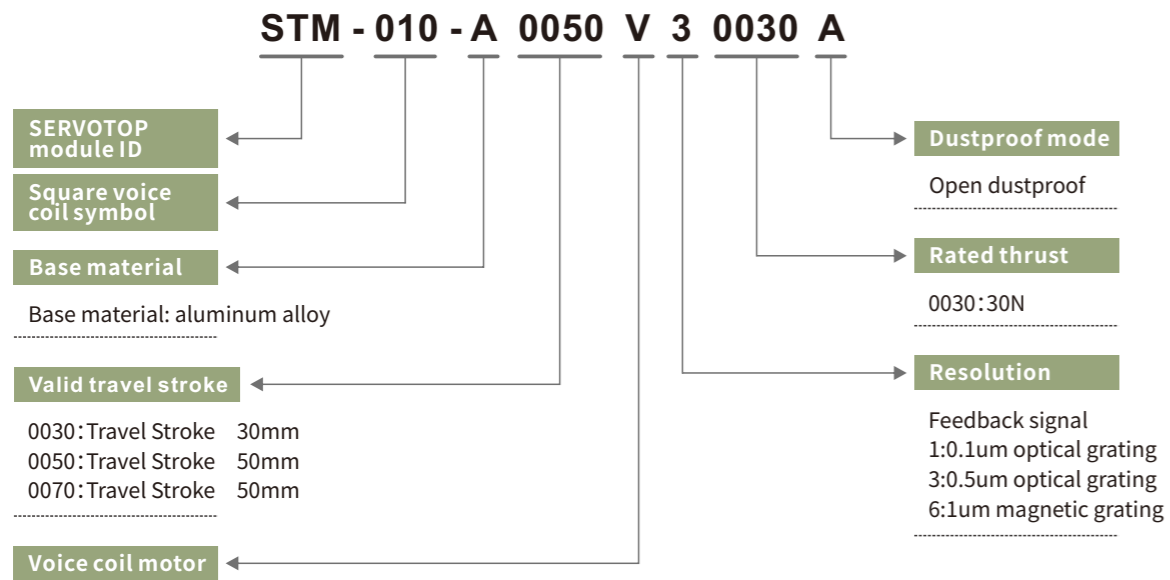
Parameter	X Axis (Crossbeam Axis)	Y Axis (Dual-drive Axis)	Z Axis (Vertical Axis)
Load (Kg)	/	/	On demand
Travel stroke (mm)	Customized on demand (<2m)	Customized on demand (<4m)	Customized on demand (<0.3m)
Max. speed (mm/s)	<1.5m/s	<1.5m/s	<0.3m/s
Max. Acceleration	<1.5G	<1.5G	<0.5G
Positioning precision ( $\mu\text{m}$ (after compensation))	< $\pm 2$	< $\pm 2$	< $\pm 5$
Repeatability positioning precision ( $\mu\text{m}$ )	< $\pm 1.5$	< $\pm 1.5$	< $\pm 3$
Straightness ( $\mu\text{m}$ )	< $\pm 4/300\text{mm}$	> $\pm 4/300\text{mm}$	> $\pm 5$
Orthogonality ( $\mu\text{m}$ )	< $\pm 5/300\text{mm}@Y$	< $5/300\text{mm}@X$	< $\pm 3/300\text{mm}$
Material	Aluminum alloy/Marble	Aluminum alloy/Marble	Aluminum alloy
Optical grating resolution ( $\mu\text{m}$ )	0.1, 0.5, and 1 for selection	0.1, 0.5, and 1 for selection	0.1, 0.5, and 1 for selection

# Mini motion stage of voice coil motor

The STM-010-A series square voice coil motor module uses a voice coil motor as power and a cross roller guide and features low friction and high rigidity, ensuring excellent smoothness, lightness, and convenience of motion. By using a linear optical grating ruler for feedback, it can achieve the sub-micron repeatability positioning precision. Currently, it is widely used in industries, such as high-precision testing, and battery winding of new energy.



## Naming Convention of the Square Voice Coil Module



Example: STM-010-A0050V10030A-V0, indicating: square voice coil module, travel stroke 50 mm, feedback signal from optical grating with resolution 0.1 um, rated thrust 30 N, and open dustproof mode.

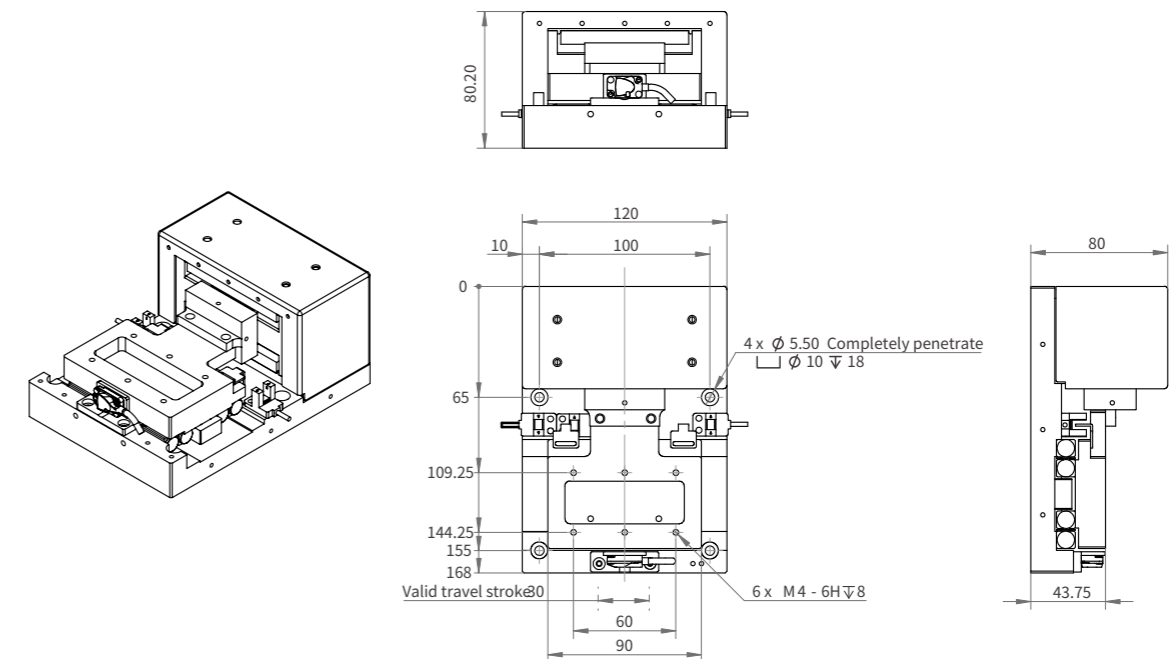
## Mini motion stage of voice coil motor

### Specifications

Model Parameter	STM-010-A0030V	STM-010-A0050V	STM-010-A0070V
Rated thrust	31N		
Peak thrust	93N		
Continuous current	4.5Arms		
Peak current	13.5Arms		
Max. load	5kg		
Valid travel stroke	30mm	50mm	70mm
Max. travel stroke	40mm	60mm	80mm
Guide rail	Cross roller guide	Cross roller guide	Cross roller guide
Horizontal straightness	3um		
Reference origin	External origin + Z phase		
Motor resistor	0.9Ω		
Motor inductance	1.3mH		
Resolution	Optical grating: 0.1um/0.5um Magnetic grating: 1um		
Repeatability positioning precision	±0.5 (0.1/0.5um optical grating) ±1 (1um magnetic grating)		
Dimensions	120*168*80 mm	140*168*80 mm	210*168*80 mm

Note: The maximum load is a theoretical value in horizontal placement when the acceleration is 1G, the pause interval is 0.5s, and the speed is 1000 mm/s, which is used for reference only. The actual load is affected by various factors, such as the motion speed, acceleration, thrust, and load installation mode.

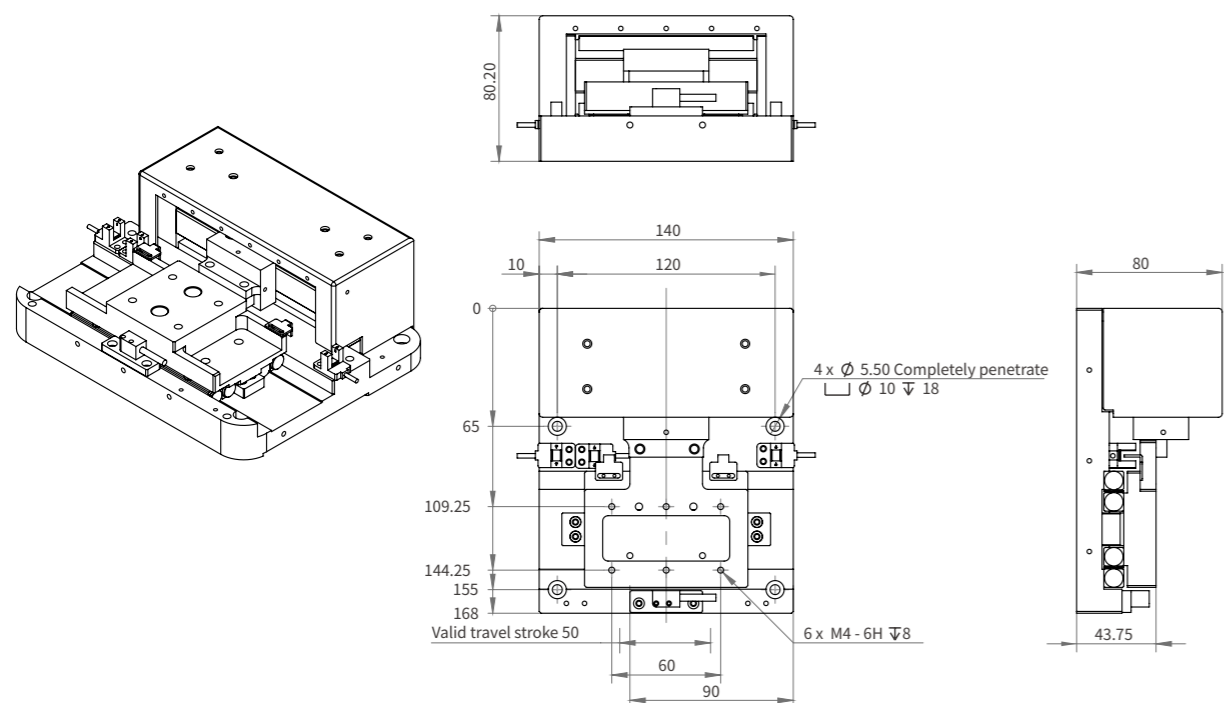
### STM-010-A0030V Dimensions



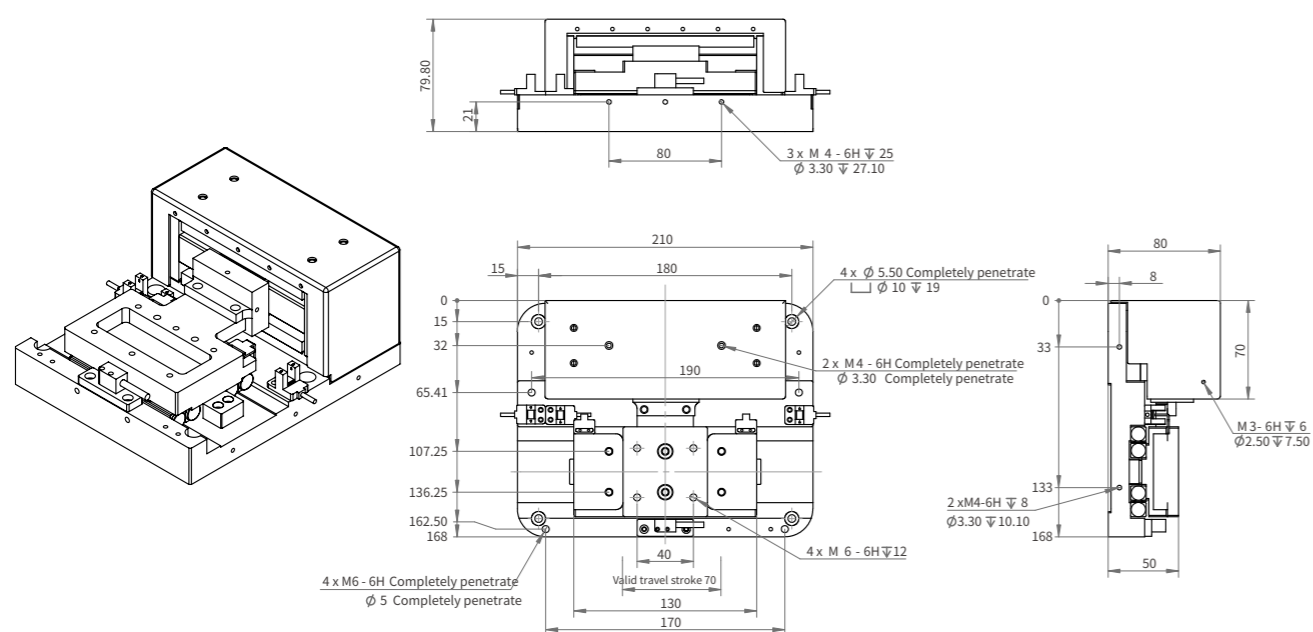
Linear motor stage  
Mini alignment stage  
Air-floating motion stage  
Stacking motion stage  
Gantry motion stage  
voice coil motor motion stage  
2-DOF module  
Drive and Control

# Mini motion stage of voice coil motor

## ● STM-010-A0050V Dimensions



## ● STM-010-A0070V Dimensions



Technical requirements:  
 The rated thrust of the motor is 30 N, and the thrust fluctuation is less than 0.2 N;  
 The sliding friction force of the stage is less than 0.5 N;  
 Black anodizing for aluminum alloy, black plastic spraying for sheet metal.

MEMO

# 2-DOF module

A 2-DOF motion structural component that combines the vertically applied linear Z axis and the rotational  $\theta$  axis.

The motion shaft adopts hollow design, and the component structure is equipped with vacuum tubes for absorbing and transporting parts (such as chip and wafer) (in vertical and rotating directions).

The Z-axis power uses a voice coil motor to do the vertical linear motion, and the  $\theta$  axis uses the stepper motor to control rotation at a small angle in case of frequent acceleration and deceleration.



## ZLR 2-DOF module

### Product features

- Integrated design, where internal PCB adopts unified wiring and the component is integrated into one DB26 interface for output.
- The shaft adopts hollow design and is equipped with vacuum tubes for easy absorption.

### Product usage

- Semiconductor processing and testing equipment
- Glass testing industry
- Laser industry
- Precision CNC machine tool
- High-end medical apparatus and instruments
- Mobile phone testing industry and other fields

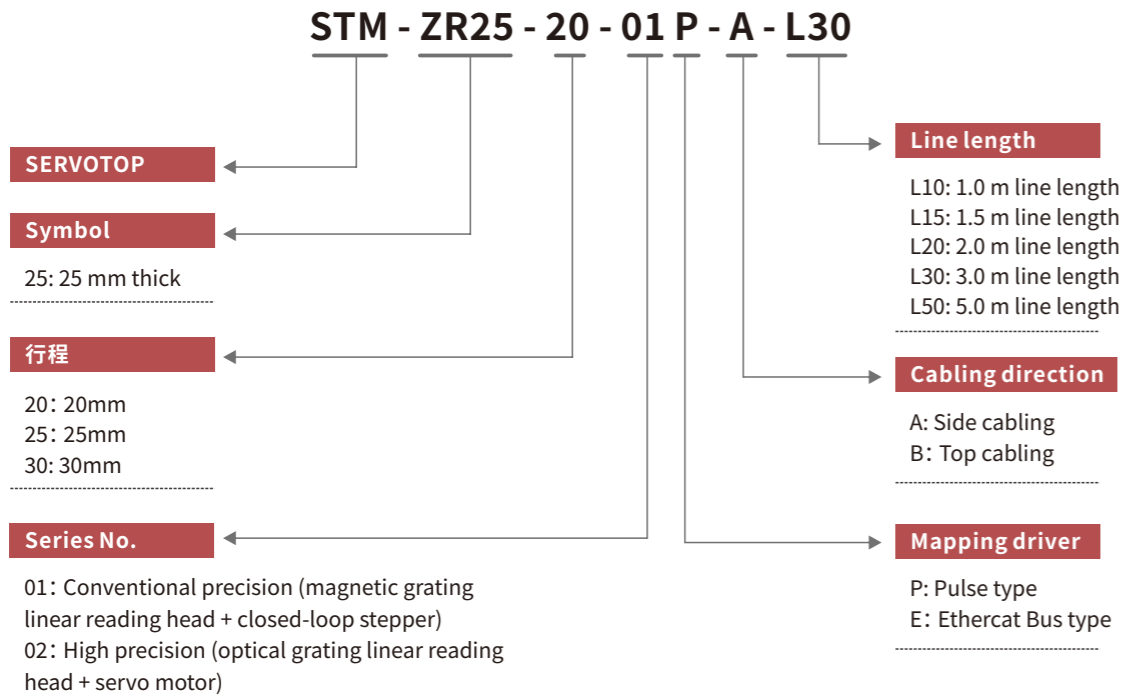
# 2-DOF module

## Technical Parameters

Structure	Item	Model	Model
		STM-ZLR25-30-01-B	STM-ZLR25-30-02-B
Body	Dimensions (H×D×W) (mm)	210*100*25	210*100*25
	Weight	1080g	1100g
	Weight of motion part	480g	480g
	Power voltage	DC24V/DC48V	DC24V/DC48V
	Z axis	Voice coil motor	Voice coil motor
	Front-end axis error	±10um	±10um
	Vacuum port	Φ4mm	Φ4mm
Linear motion part	Travel Stroke	30mm	30mm
	Reading head	Magnetic grating reading head	Optical grating reading head
	Reading head resolution	1um	0.1um
	Reading head resolution	±3um	±1um
	Continuous thrust	6N	6N
	Peak Thrust	24N	24N
	Rated current	1A	1A
	Peak current	4A	4A
	Acceleration	4G	4G
	Max. speed	1.5m/s	1.5m/s
Rotational motion part	Phase quantity	2	
	Basic step angle	1.8°	
	Basic step angle error	±0.09°	
	Rated current	0.8A	
	Resistor	5.5Ω±10%	
	Inductance	1.75mH±20%	
	Holding torque	36mM.m	
	Rotor inertia	≈3.5g.cm <sup>3</sup>	
	Motor mass	≈80g	
	Insulation level	B	
	Dielectric voltage withstand	500V A.C	
	Resolution	2000 lines	
Max. rotating speed	2000rpm		



● Naming convention

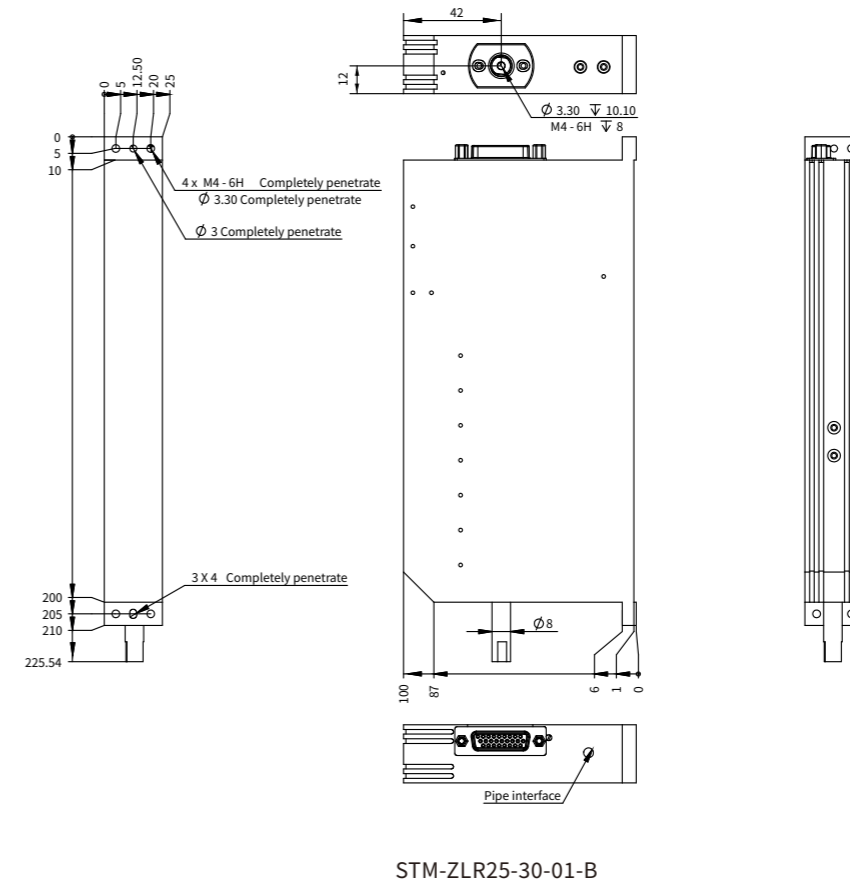


● Definition of top DB26 interface CN (receptacle) pins (See the DB26 three-row female electrical control interface in the "Mechanical Dimensions" figure)

Pin No.	Signal Name	Definition
1	A+	Phase line A of the rotating motor
2	A-	Phase line /A of the rotating motor
3	B+	Phase line B of the rotating motor
4	B-	Phase line /B of the rotating motor
5	U	Voice coil motor U
6	U	Voice coil motor U
7	CHI+	Rotation encoder Z+
8	CHI-	Rotation encoder Z-
9	L_GND	Linear encoder power supply GND
10	Z-	Linear unique origin signal Z-
11	Z+	Linear unique origin signal Z+
12	H	Upper limit signal of the reading head
13	T	Lower limit signal of the reading head
14	L_Vcc	Linear encoder power supply Vcc

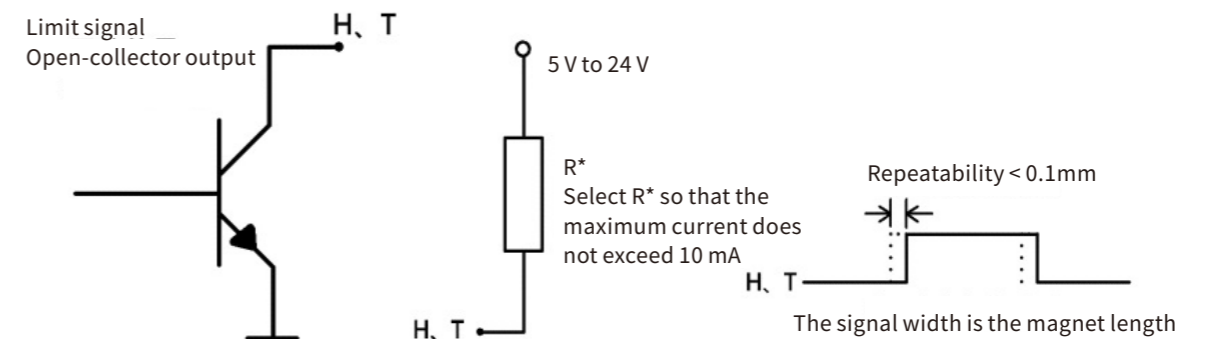
Pin No.	Signal Name	Definition
15	R_Vcc	Rotation encoder power supply Vcc
16	CHB+	Rotation encoder B+
17	CHB-	Rotation encoder B-
18	CHA-	Rotation encoder power supply GND
19	B-	Linear encoder B-
20	B+	Linear encoder B+
21	A-	Linear encoder A-
22	A+	Linear encoder A+
23	V	Voice coil motor V
24	V	Voice coil motor V
25	CHA+	Rotation encoder A+
26	CHA-	Rotation encoder A-
Shell	Shielding	

● Mechanical dimensions



● Output circuit diagram of a limit signal in linear direction

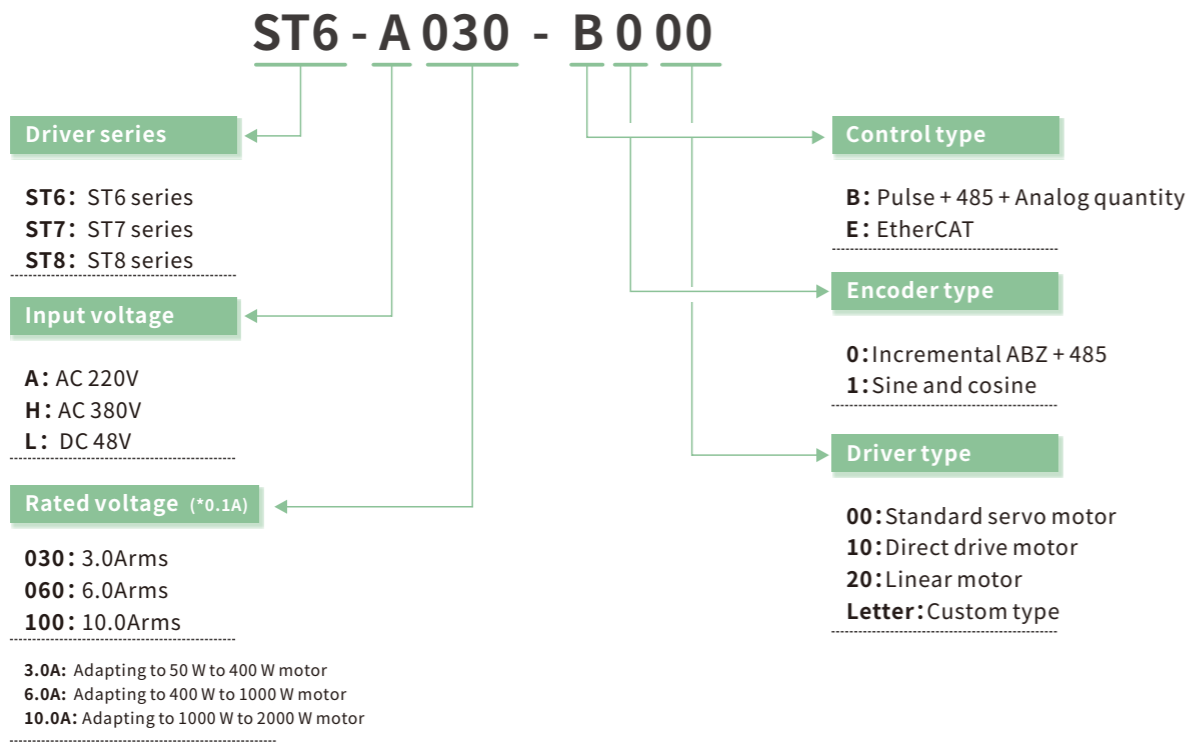
❖ Limit signal



# Driver model selection

# Driver model selection

## Driver Naming Convention



## Specification table of the driver

Series	Specification Model	Voltage (V)	Rated Current (A)	Control Type	Encoder Type	Driver Type
ST6	ST6-A030-B000	220	3	Pulse/Modbus/Analog quantity	Incremental ABZ/Absolute value	Standard servo motor
	ST6-A030-E000	220	3	EtherCAT	Incremental ABZ/Absolute value	Standard servo motor
	ST6-A060-B000	220	6	Pulse/Modbus/Analog quantity	Incremental ABZ/Absolute value	Standard servo motor
	ST6-A060-E000	220	6	EtherCAT	Incremental ABZ/Absolute value	Standard servo motor
	ST6-A100-B000	220	10	Pulse/Modbus/Analog quantity	Incremental ABZ/Absolute value	Standard servo motor
	ST6-A100-E000	220	10	EtherCAT	Incremental ABZ/Absolute value	Standard servo motor
	ST6-A030-B010	220	3	Pulse/Modbus/Analog quantity	Incremental ABZ/Absolute value	Direct drive motor
	ST6-A030-E010	220	3	EtherCAT	Incremental ABZ/Absolute value	Direct drive motor
	ST6-A060-B010	220	6	Pulse/Modbus/Analog quantity	Incremental ABZ/Absolute value	Direct drive motor
	ST6-A060-E010	220	6	EtherCAT	Incremental ABZ/Absolute value	Direct drive motor
	ST6-A100-B010	220	10	Pulse/Modbus/Analog quantity	Incremental ABZ/Absolute value	Direct drive motor
	ST6-A100-E010	220	10	EtherCAT	Incremental ABZ/Absolute value	Direct drive motor
	ST6-A030-B020	220	3	Pulse/Modbus/Analog quantity	Incremental ABZ/Absolute value	Linear Motors
	ST6-A030-E020	220	3	EtherCAT	Incremental ABZ/Absolute value	Linear Motors
	ST6-A060-B020	220	6	Pulse/Modbus/Analog quantity	Incremental ABZ/Absolute value	Linear Motors
	ST6-A060-E020	220	6	EtherCAT	Incremental ABZ/Absolute value	Linear Motors
ST6-A100-B020	220	10	Pulse/Modbus/Analog quantity	Incremental ABZ/Absolute value	Linear Motors	
ST6-A100-E020	220	10	EtherCAT	Incremental ABZ/Absolute value	Linear Motors	
ST7	ST7-A030-B000	220	3	Pulse/Modbus/Analog quantity	Incremental ABZ/Absolute value	Standard servo motor
	ST7-A060-B000	220	6	Pulse/Modbus/Analog quantity	Incremental ABZ/Absolute value	Standard servo motor
	ST7-A100-B000	220	10	Pulse/Modbus/Analog quantity	Incremental ABZ/Absolute value	Standard servo motor
	ST7-A030-B010	220	3	Pulse/Modbus/Analog quantity	Incremental ABZ/Absolute value	Direct drive motor
	ST7-A060-B010	220	6	Pulse/Modbus/Analog quantity	Incremental ABZ/Absolute value	Direct drive motor
	ST7-A100-B010	220	10	Pulse/Modbus/Analog quantity	Incremental ABZ/Absolute value	Direct drive motor
	ST7-A030-B020	220	3	Pulse/Modbus/Analog quantity	Incremental ABZ/Absolute value	Linear Motors
	ST7-A060-B020	220	6	Pulse/Modbus/Analog quantity	Incremental ABZ/Absolute value	Linear Motors
ST7-A100-B020	220	10	Pulse/Modbus/Analog quantity	Incremental ABZ/Absolute value	Linear Motors	

## Driver model selection

## Driver model selection

### Specification table of the driver(continued)

Series	Specification Model	Voltage (V)	Rated Current (A)	Control Type	Encoder Type	Driver Type
ST8	ST8-A030-B000	220	3	Pulse/Modbus/Analog quantity	Incremental ABZ/Absolute value	Standard servo motor
	ST8-A030-E000	220	3	EtherCAT	Incremental ABZ/Absolute value	Standard servo motor
	ST8-A060-B000	220	6	Pulse/Modbus/Analog quantity	Incremental ABZ/Absolute value	Standard servo motor
	ST8-A060-E000	220	6	EtherCAT	Incremental ABZ/Absolute value	Standard servo motor
	ST8-A100-B000	220	10	Pulse/Modbus/Analog quantity	Incremental ABZ/Absolute value	Standard servo motor
	ST8-A100-E000	220	10	EtherCAT	Incremental ABZ/Absolute value	Standard servo motor
	ST8-A030-B010	220	3	Pulse/Modbus/Analog quantity	Incremental ABZ/Absolute value	Direct drive motor
	ST8-A030-E010	220	3	EtherCAT	Incremental ABZ/Absolute value	Direct drive motor
	ST8-A060-B010	220	6	Pulse/Modbus/Analog quantity	Incremental ABZ/Absolute value	Direct drive motor
	ST8-A060-E010	220	6	EtherCAT	Incremental ABZ/Absolute value	Direct drive motor
	ST8-A100-B010	220	10	Pulse/Modbus/Analog quantity	Incremental ABZ/Absolute value	Direct drive motor
	ST8-A100-E010	220	10	EtherCAT	Incremental ABZ/Absolute value	Direct drive motor
	ST8-A030-B020	220	3	Pulse/Modbus/Analog quantity	Incremental ABZ/Absolute value	Linear Motors
	ST8-A030-E020	220	3	EtherCAT	Incremental ABZ/Absolute value	Linear Motors
	ST8-A060-B020	220	6	Pulse/Modbus/Analog quantity	Incremental ABZ/Absolute value	Linear Motors
	ST8-A060-E020	220	6	EtherCAT	Incremental ABZ/Absolute value	Linear Motors
	ST8-A100-B020	220	10	Pulse/Modbus/Analog quantity	Incremental ABZ/Absolute value	Linear Motors
	ST8-A100-E020	220	10	EtherCAT	Incremental ABZ/Absolute value	Linear Motors

### Driver application environment

Item	Specifications	
Temperature	Working temperature	0~55°C
	Storage temperature	-20~65°C
Humidity	Working humidity	20% to 85% RH or below (no condensation)
	Storage humidity	20% to 85% RH or below (no condensation)
Air in storage environment	Indoor (no direct sunlight), no corrosive gas, no flammable gas, no oil mist, no dust	
Altitude	Below 1000 m altitude	
Vibration	10 to 60 Hz below 5.8 m/s <sup>2</sup> (0.6 G) (cannot be used continuously at the resonance frequency)	
Dielectric voltage withstand	AC 1500 V for 1 minute between the primary stage and FG	

### Driver Function Parameters

Function	ST6	ST7	ST8
1M low-speed pulse input	√	√	√
4M high-speed pulse input	√	√	√
Analog quantity control input	√	√	√
Modbus communication	√	√	√
Modbus control	Developing	Developing	√
EtherCAT control	√	×	√
Position control mode	√	√	√
Speed control mode	√	√	√
Torque control mode	√	√	√
Assignable I/O	√	√	√
Pulse frequency-division output	×	√ Hardware-level	√ Software-level
Self-tuning	×	Developing	√
Disturbance torque compensation	Developing	Developing	√
Notch filter	√	√	√
Oscillation suppression	Developing	Developing	√
Dynamic braking function	√	√	√
Inertia identification	√	√	√
Rigidity ranking list	√	√	√
Bode diagram analysis	√	√	√
Absolute position compensation	Developing	Developing	√
FFT analysis	√	√	√

Item	Model		
	ST6	ST7	ST8
Carrier frequency	16KHZ	8KHZ	20KHZ
Current loop sampling	16KHZ	16KHZ	40KHZ
Speed loop sampling	8KHZ	8KHZ	20KHZ
Position loop sampling	8KHZ	8KHZ	20KHZ
Maximum speed loop bandwidth	3.2KHZ	2.3KHZ	6.4KHZ
Current range	3A/6A/10A		
Adaptable motor	Absolute-value feedback rotary servo motor, absolute-value feedback torque motor, communication feedback linear motor, ABZ incremental feedback linear motor	Absolute-value feedback rotary servo motor, absolute-value feedback torque motor, communication feedback linear motor	Absolute-value feedback rotary servo motor, ABZ incremental feedback torque motor, absolute-value feedback torque motor, communication feedback linear motor, ABZ incremental feedback linear motor

# Driver model selection

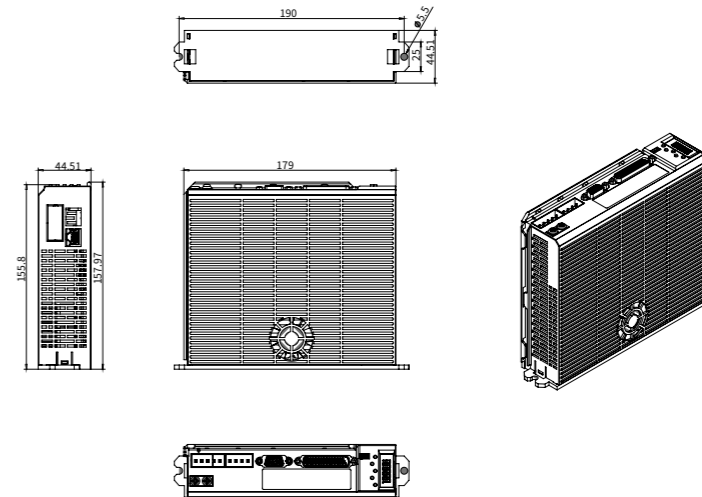
# Driver model selection

## Performance Parameter Table

Item		Specification			
		ST6	ST7	ST8	
Position control	Pulse input	Open-collector pulse input: frequency not more than 900 KHz, pulse width not less than 2.5 us			
		Differential normal pulse input: frequency not more than 1000 KHz, pulse width not less than 1 us			
		Differential high-speed pulse input: frequency not more than 4000 KHz, pulse width not less than 1 us			
	Input pulse logic mode	Pulse + direction, A phase + B phase, CW + CCW			
	Electronic gear ratio setting	Electronic gear ratio: A/B times, qualification condition (encoder resolution/1000000 < A/B < encoder resolution/2.5)			
	Instruction filter	FIR filter	Smoothing filter, FIR filter, mean filter		
Pulse output	Output pulse function	Developing	Available		
	Frequency division ratio	Developing	Arbitrary even frequency division ratio	Arbitrary frequency division ratio	
	Output pulse shape	Developing	ABZ quadrature encoder pulse signal		
Internal position mode function		Internal path planning of sections 1 to 16			
Speed control	Control mode	External analog instruction control/DI terminal signal combination to achieve internal speed selection in sections 1 to 16/Communication specified			
	Analog quantity input voltage range	DC ± 10 V [corresponding to rated speed at ±10 V] (full-function model)			
	Torque limit function	Internal parameter setting or analog input (full-function model)			
Torque control	Control mode	External analog instruction control (full-function model)/Internal parameters/DI terminal switching (analog quantity/internal parameters)/Communication specified			
	Analog quantity input voltage range	DC ± 10 V [corresponding to rated torque at ±10 V] (full-function model)			
	Speed limit function	Internal parameter setting or analog input (full-function model)			
Common functions	Control signal	Input/Output	5IN/OUT	5IN/OUT	(5IN/5OUT)/9IN/8OUT
	Analog quantity signal	Input/Output	2IN ± 10V		
	STO		N/A		
	Speed observer function		Available		
	Damping control function		Available		
	Adaptive notch filter		Available		
	Automatic adjustment function		Available		
	Encoder output frequency division		N/A	Available	Available
	Dynamic braking		Available		
	Regeneration function		External regenerative resistor (30 Ω to 50 Ω, 100 W to 300 W)		
	Protection function		Overvoltage, power supply anomaly, overcurrent, overtemperature anomaly, overload, encoder anomaly, overspeed, excessive position deviation, and abnormal parameters		
	Communication function	USB	Used for PC communication (for "Servostudio" connection)		
		Machine type	RS485/EtherCAT	RS485	RS485/EtherCAT

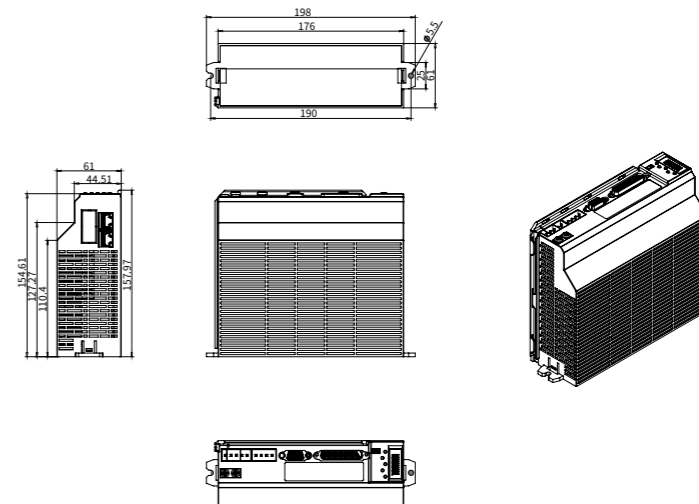
## Dimensions of Drivers (Unit:mm)

ST5/6/7/8-A030/A060-BXXX series & ST6/8-A030/A060-EXXX series



Driver series	Specification Model	Length (mm)	Width (mm)	Height (mm)	Installation Hole Spacing (mm)	Installation Hole Diameter (mm)
ST6/7/8	A030-BXXX	179	44.51	157.97	190	5.5
	A060-BXXX					
ST6/8	A030-EXXX	179	44.51	157.97	190	5.5
	A060-EXXX					

ST6/7/8-A100-BXXX series & ST6/8-A100-EXXX series



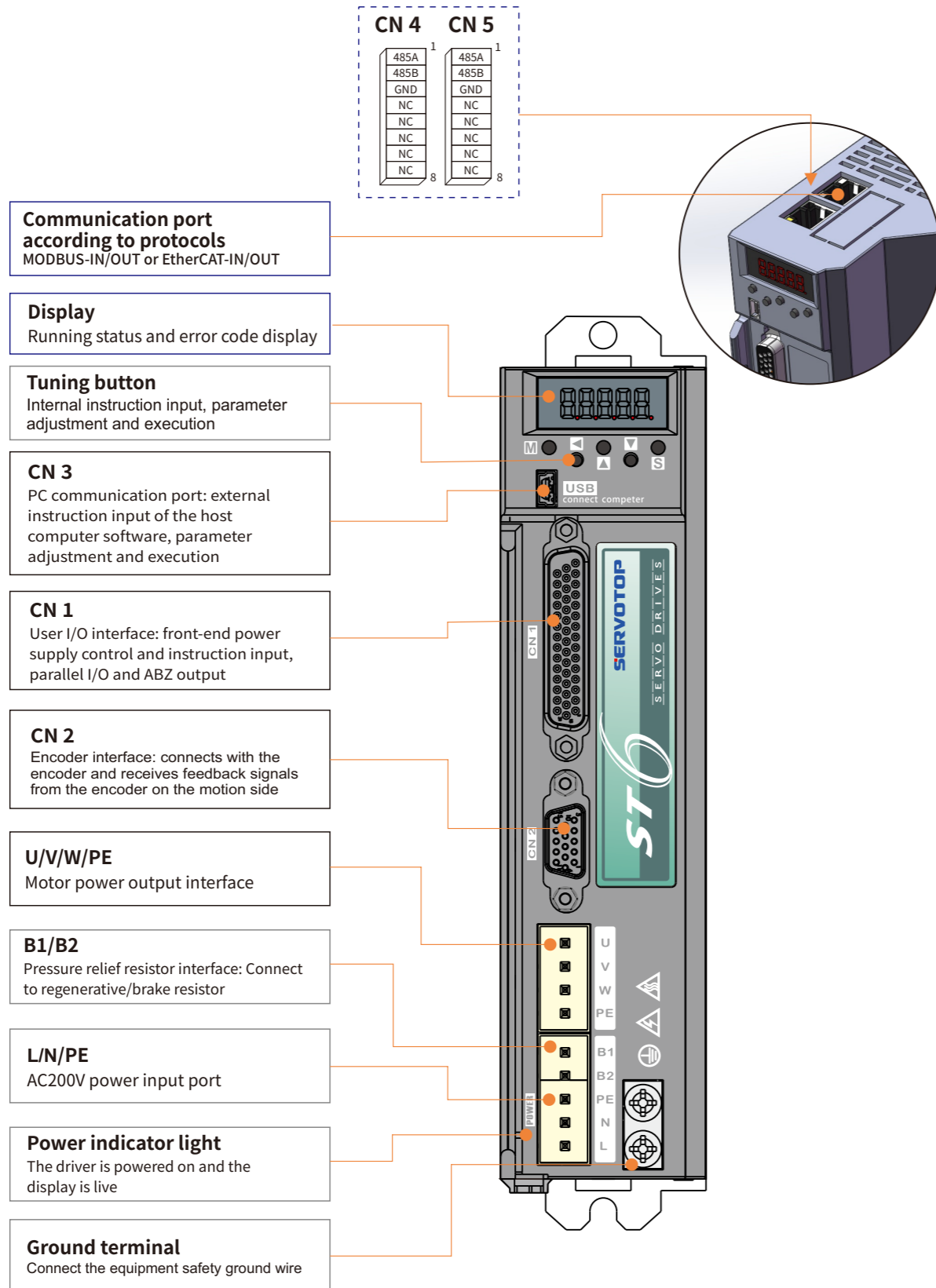
Driver series	Specification Model	Length (mm)	Width (mm)	Height (mm)	Installation Hole Spacing (mm)	Installation Hole Diameter (mm)
ST6/7/8	A100-BXXX	176	61	157.97	190	5.5
ST6/8	A100-EXXX					

# Driver model selection

# Driver model selection

## Driver panel interface description

## Driver connector terminal arrangement

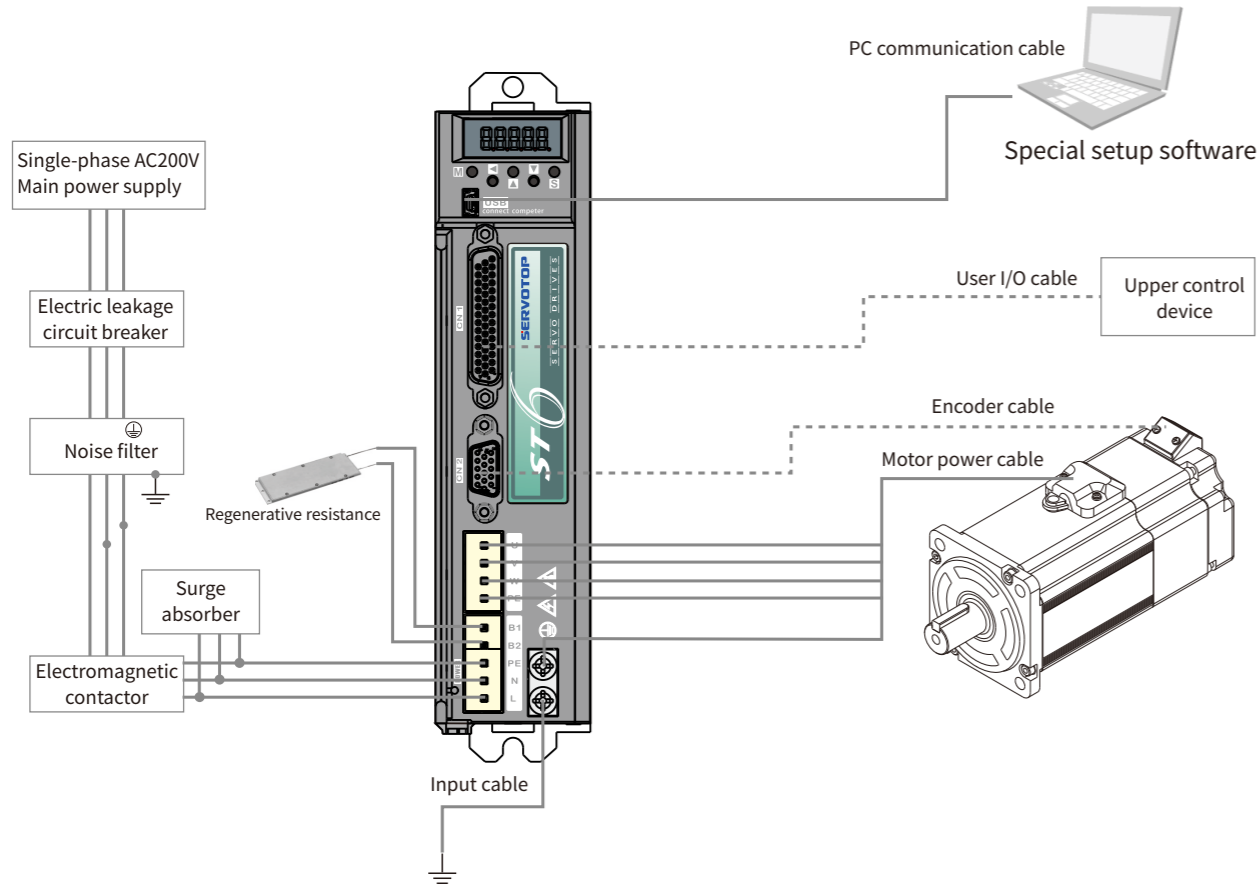


Name	Mark	Terminal number	Signal Name	Content
Regenerative resistor connection	B1/B2	1	B1	B1 interface for regenerative resistor connection
		2	B2	B2 interface for regenerative resistor connection
Unidirectional AC 200 V inputon	PE	3	PE	Grounding
	L/N	4	Power	L/N
	5			
Electric power input	U/V/W	1	U	Motor power U-phase output
		2	V	Motor power V-phase output
		3	W	Motor power W-phase output
Encoder	CN2	1	B+	Incremental encoder phase B +
		2	B-	Incremental encoder phase B -
		3	PS+(485+)	Absolute-value encoder +
		4	PS-(485-)	Absolute-value encoder -
		5	MA-	
		6	MA+	
		7	GND	Internal power supply GND
		8	A+	Incremental encoder phase A +
		9	A-	Incremental encoder phase A -
		10	Z+	Incremental encoder phase Z +
		11	Z-	Incremental encoder phase Z -
		12	SL+	
		13	SL-	
		14	+5V	Internal power supply +5 V (max. load current 500 mA)
		15	GND	Internal power supply GND
PC communication	CN3	1	VBUS	USB power supply
		2	D-	USB data -
		3	D+	USB data +
		4	NC	—
		5	GND	USB signal grounding
User I/O	CN1	For details, see "Cabling Instructions for User Control Terminal (CN1)" (P157-158)		
Communication port according to protocols	CN4/CN5	1	485A	485 communication port
		2	485B	
		3	GND	Internal power supply GND

# Driver model selection

# Driver model selection

## System cabling diagram



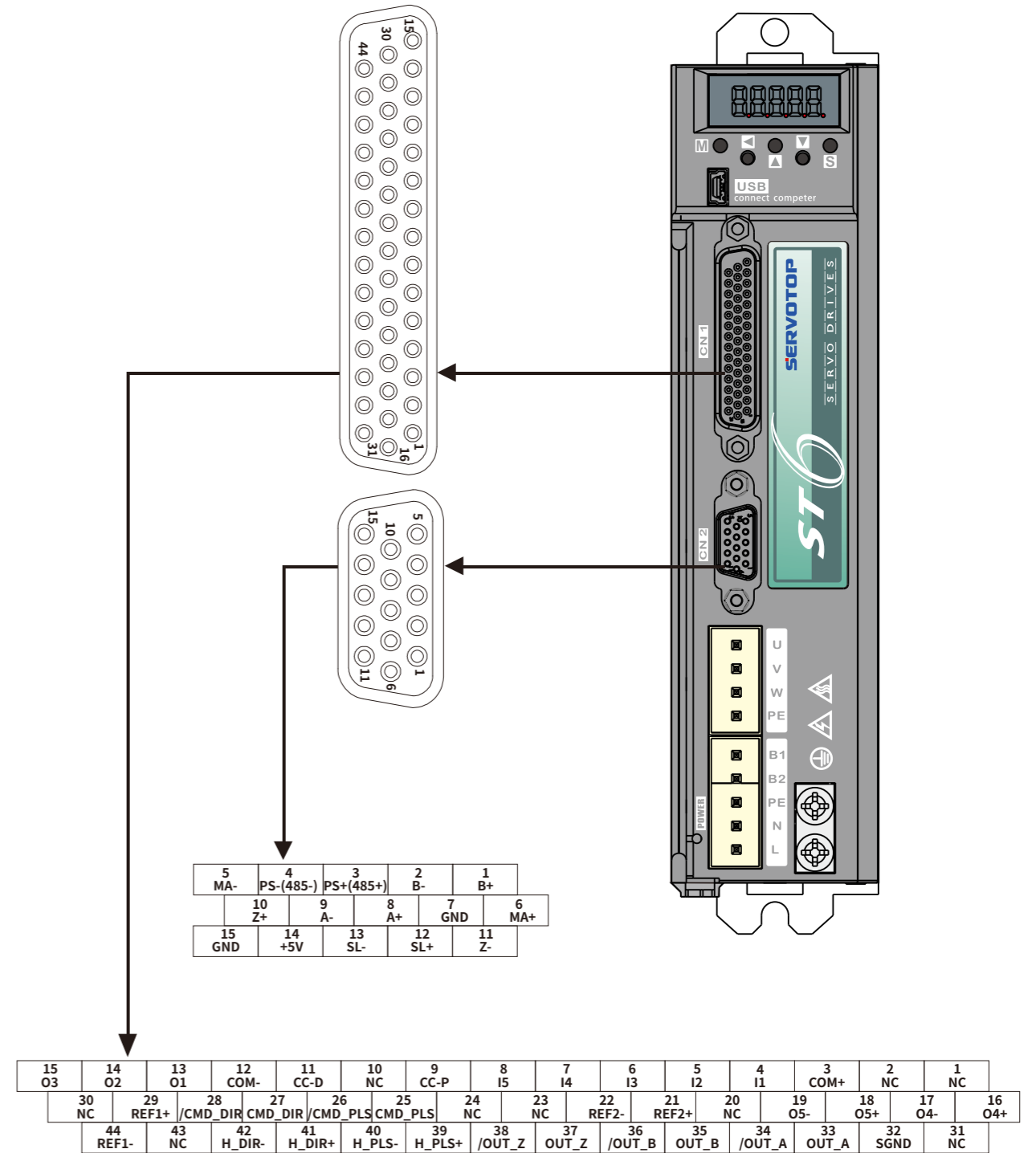
### 【Key points of correct cabling】

- ※ Use a twisted pair with shielded wire when a user's I/O cable is longer than 50 cm.
- ※ The encoder cable shall be shorter than 15 m.

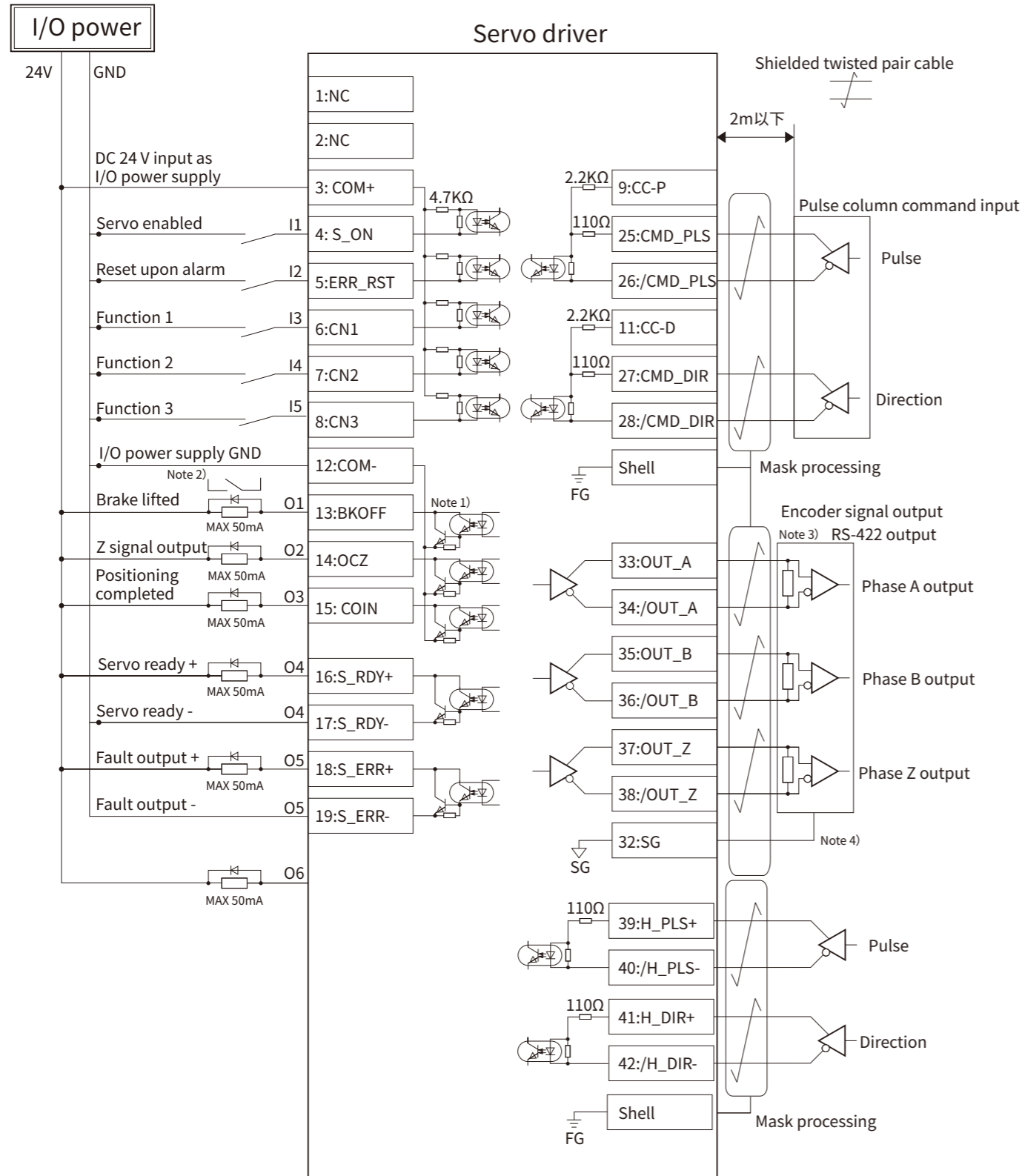


1. There is a high voltage in the circuit in the solid part of the cabling diagram. Exercise caution when performing cabling operations or using the system.
2. The dotted part of the cabling diagram indicates a non-hazardous voltage circuit.

## Cabling for connecting panel terminals (CN1/CN2)



Differential input of pulse commands



Differential input of pulse commands

Note 1: When driving loads with inductive components such as relays, connect the protection circuit (diode).

Note 2: The output circuit adopts the Darlington transistor output mode of the open-collector, which is connected to the relay or optocoupler. When the transistor status is ON, the voltage between the open-collector and the emitter is about VCE (SAT) 1 V, which cannot meet the VIL voltage requirements of TTL level IC. Do not connect the output circuit directly.

Note 3: The differential pulse output and the differential signal connection terminal of the 485 communication circuit need to be connected to the terminal resistor.

Note 4: The signal ground wire of the upper control device that connects to the encoder output signal of the driver is connected. The signal grounding and the GND connection of the control power supply may cause misoperation.

※The DI function can be flexibly configured by a function code. DI is effective when it is turned on by default, and its positive-negative logic can be modified by using the function code.  
 ※The DO function can be flexibly configured by a function code. DO is turned on when it is effective by default, and its positive-negative logic can be modified by using the function code.

■ Cabling Instructions for User Control Terminal (CN1)

Name	Terminal number	Signal Name	Content
User control I/O	1	NC	Reserved
	2	NC	Reserved
	3	COM+	I/O power input 24 V+ (connected when using input signal)
	4	I1	Servo enabled S_ON (configurable)
	5	I2	Alarm reset ERR_RST (configurable)
	6	I3	Position torque switching (origin input signal, combination function 1) (configurable)
	7	I4	Combined function 2 (positive over-travel P_OT) (configurable)
	8	I5	Combined function 3 (negative over-travel N_OT) (configurable)
	9	CC-P	Collector pulse command input PLS power supply (24 V)
	10	NC	Reserved
	11	CC-D	Collector pulse command input DIR power supply (24 V)
	12	COM-	IO power input GND (connected when using output signal)
	13	O1	Brake lifting BKOFF (configurable)
	14	O2	OCZ encoder Z-phase signal output (open-collector) (configurable)
	15	O3	Positioning completed (configurable)
	16	O4+	Servo ready + S_RDY+ (configurable)
	17	O4-	Servo ready - S_RDY- (configurable)
	18	O5+	Fault output + S_ERR+ (configurable)
	19	O5-	Fault output - S_ERR- (configurable)
	20	NC	Reserved
	21	REF2+	Analog quantity input AI2+ (torque)
	22	REF2-	Analog quantity input AI2- (torque)
	23	NC	Reserved
	24	NC	Reserved
	25	CMD_PLS	Pulse command input 5V
	26	/CMD_PLS	Pulse command input PLS+ ( $\leq 1$ MHz)
	27	CMD_DIR	Direction command input 5V
	28	/CMD_DIR	Direction command input PLS- ( $\leq 1$ MHz)
	29	REF1+	Analog quantity input AI1+ (speed)
	30	NC	Reserved
	31	NC	Reserved
	32	SGND	Internal power supply GND
	33	OUT_A	Encoder signal pulse regenerative output A+
	34	/OUT_A	Encoder signal pulse regenerative output A-

■ Cabling Instructions for User Control Terminal (CN1)

Name	Terminal number	Signal Name	Content
User control I/O	35	OUT_B	Encoder signal pulse regenerative output B+
	36	/OUT_B	Encoder signal pulse regenerative output B-
	37	OUT_Z	Encoder signal pulse regenerative output Z+
	38	/OUT_Z	Encoder signal pulse regenerative output Z-
	39	H_PLS+	High-speed pulse signal input 5V
	40	H_PLS-	High-speed pulse signal input PLS- ( $\leq 4$ MHz)
	41	H_DIR+	High-speed direction signal input 5V
	42	H_DIR-	High-speed direction signal input DIR- ( $\leq 4$ MHz)
	43	NC	Reserved
	44	REF1-	Analog quantity input 1- (speed)

■ Driver connector terminal arrangement

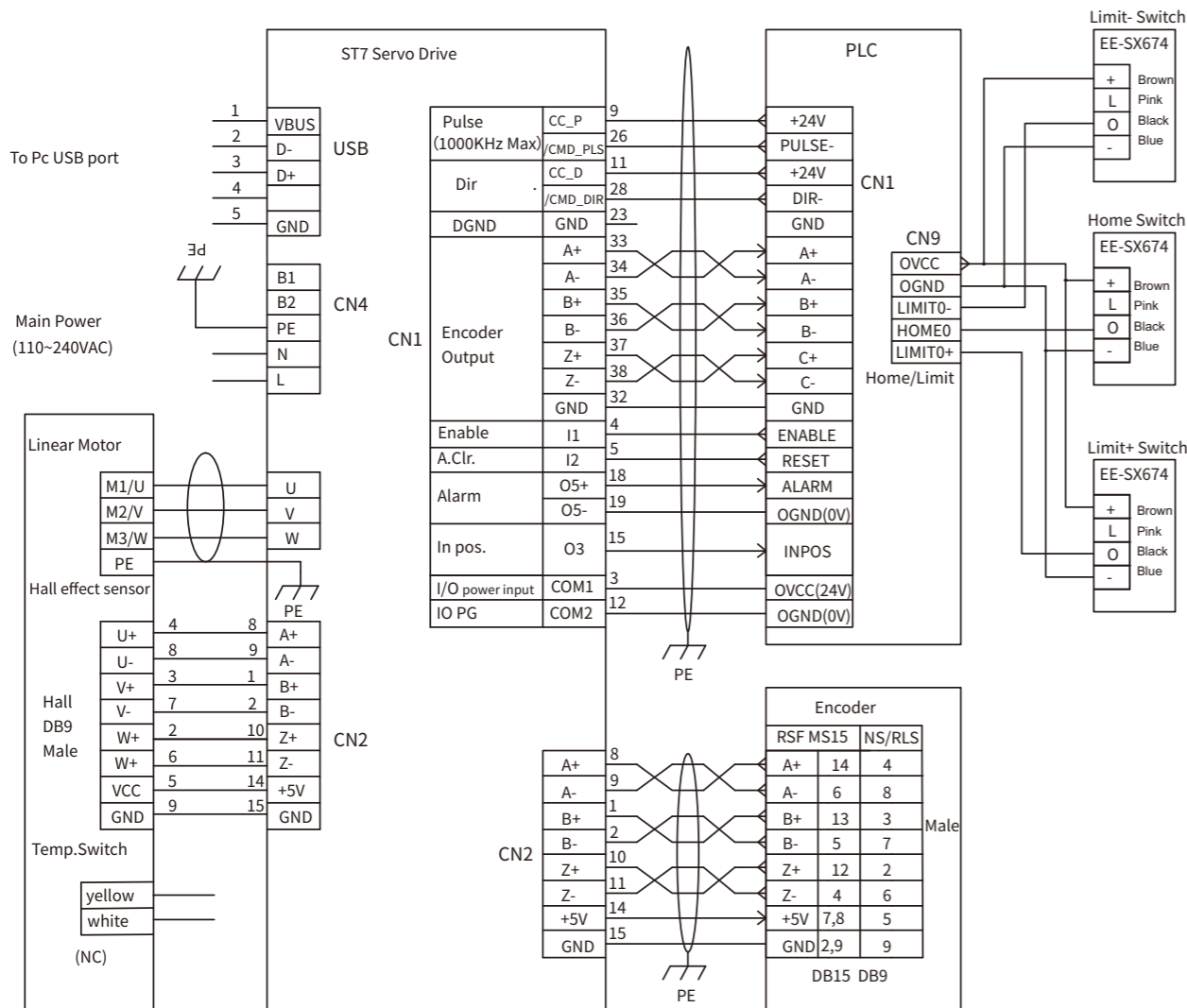
Name	Terminal number	Signal Name	Content
Encoder	1	B+	Incremental encoder phase B +
	2	B-	Incremental encoder phase B -
	3	PS+(485+)	Absolute-value encoder +
	4	PS-(485-)	Absolute-value encoder -
	5	MA-	
	6	MA+	
	7	GND	Internal power supply GND
	8	A+	Incremental encoder phase A +
	9	A-	Incremental encoder phase A -
	10	Z+	Incremental encoder phase Z +
	11	Z-	Incremental encoder phase Z -
	12	SL+	
	13	SL-	
	14	+5V	Internal power supply +5 V (max. load current 500 mA)
	15	GND	Internal power supply GND



## Linear motor driver : SERVOTOP-ST6/ST7/ST8 series

- Signal type: single-ended
- Pulse frequency: 4 MHz
- Control power: 110 V to 240 V AC
- Main power: 110 V to 240 V AC

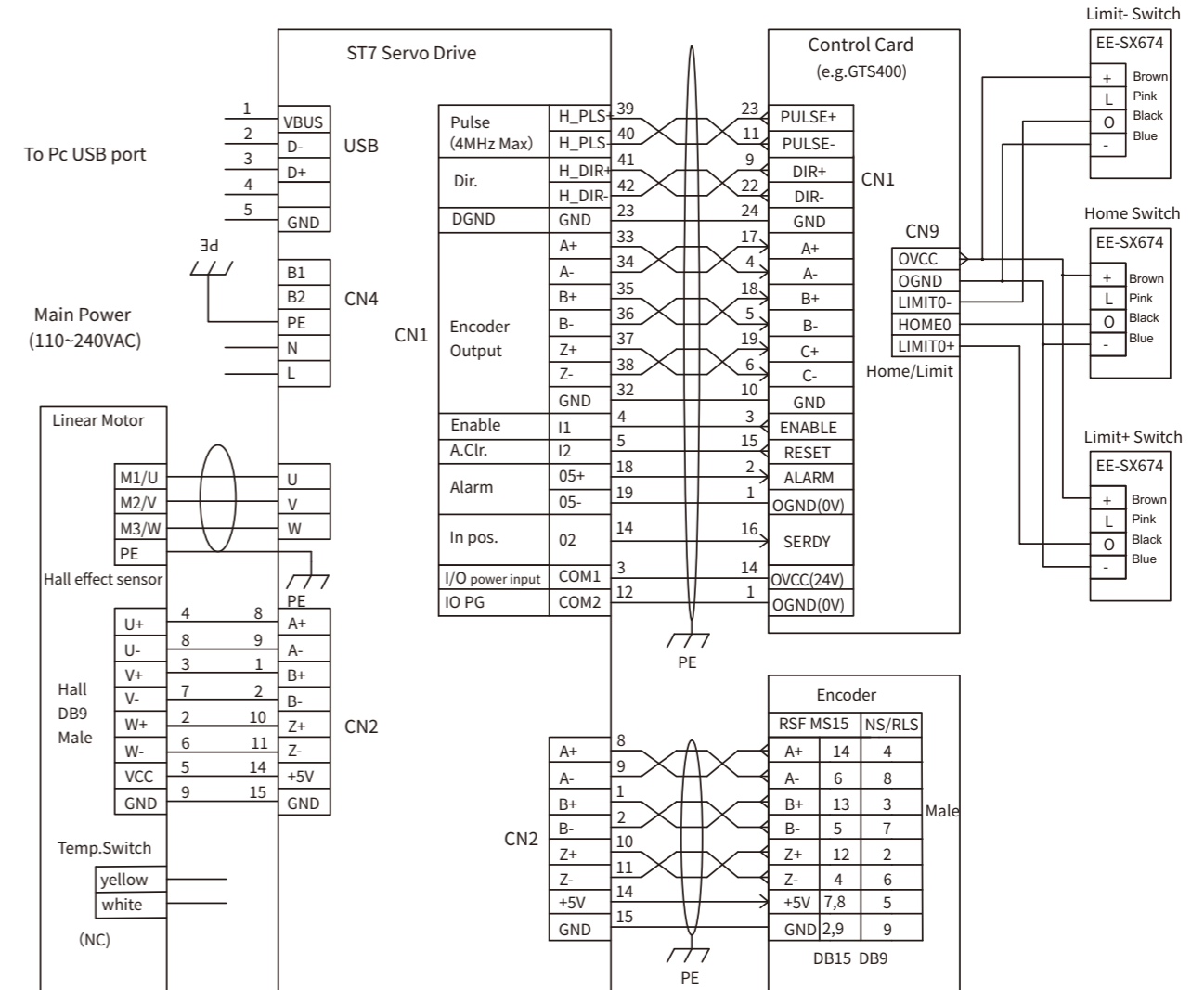
Signal connection diagram  
ST6/ST7/ST8 drivers: single-ended



## Linear motor motor driver: SERVOTOP-ST6/ST7/ST8 series

- Signal type: differential signal
- Pulse frequency: 4 MHz
- Control power: 110 V to 240 V AC
- Main power: 110 V to 240 V AC

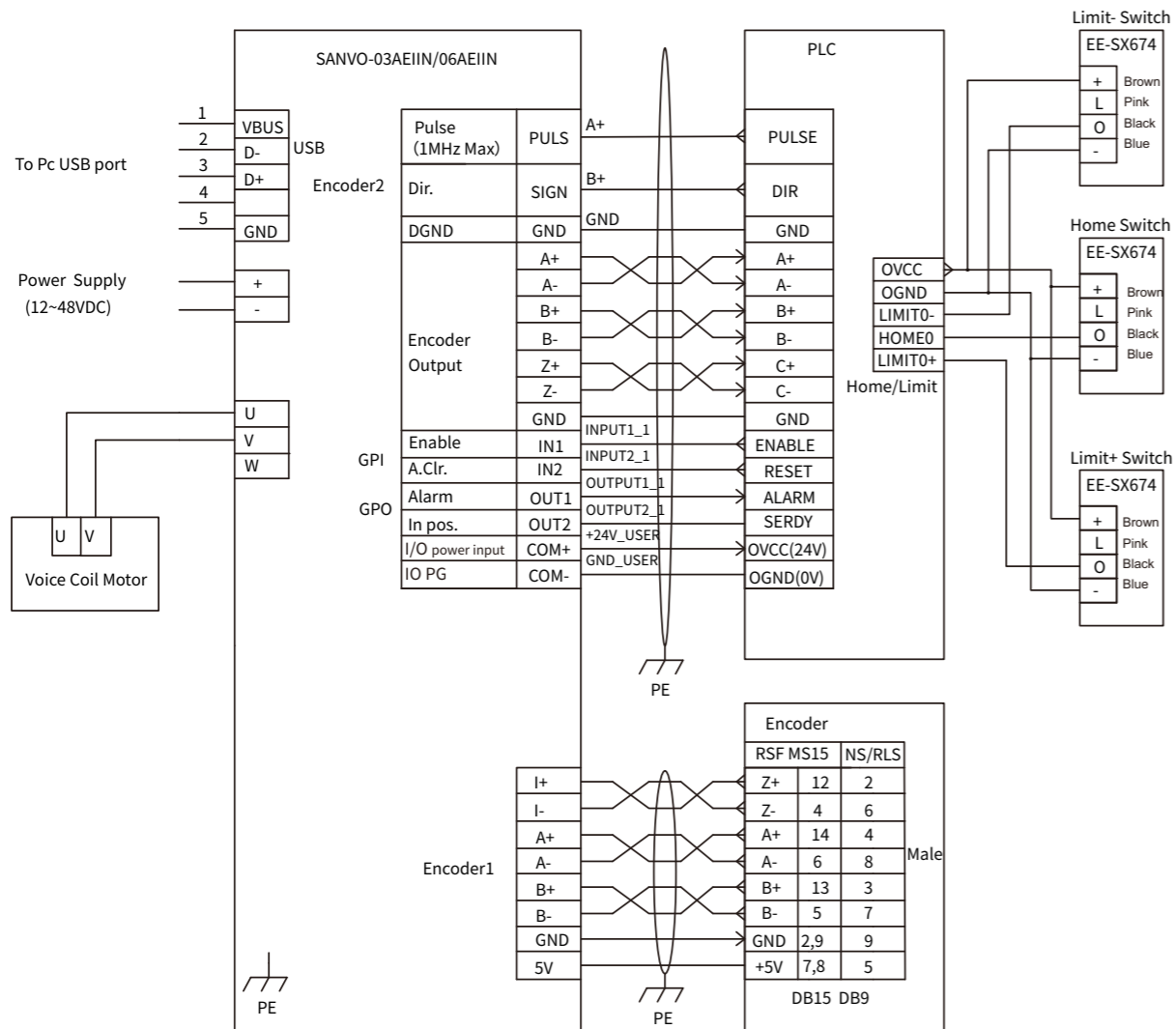
Signal connection diagram  
ST6/ST7/ST8 drivers: differential



## ● Voice coil motor driver: SANVO-03AEIIN/06AEIIN series

- Signal type: single-ended
- Pulse frequency: 4 MHz
- Main power: DC12-48V

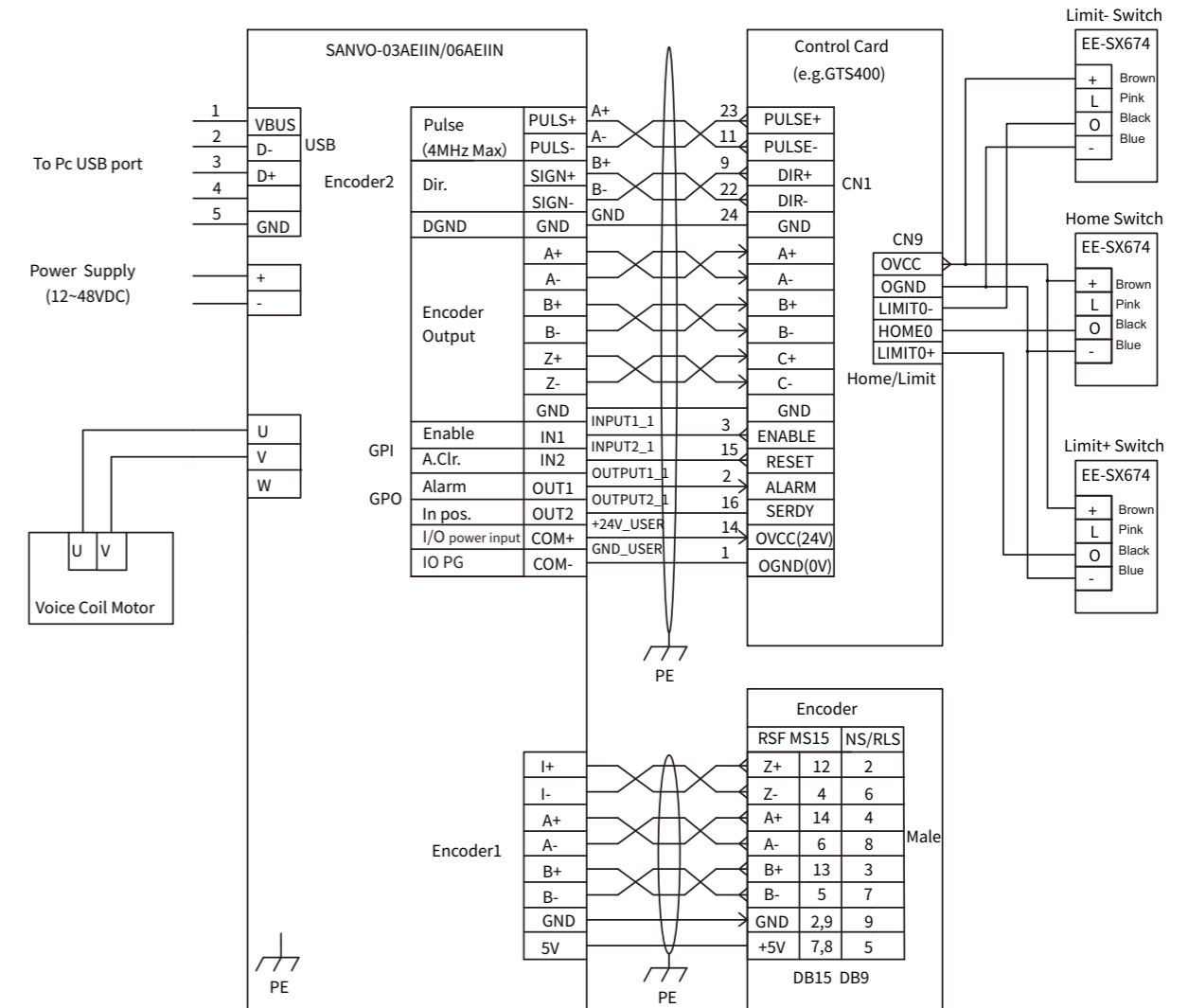
Signal connection diagram  
Voice coil motor drivers: single-ended



## ● Voice coil motor driver: SANVO-03AEIIN/06AEIIN series

- Signal type: differential signal
- Pulse frequency: 4MHz
- Main power: DC12-48V

Signal connection diagram  
Voice coil motor drivers: differential

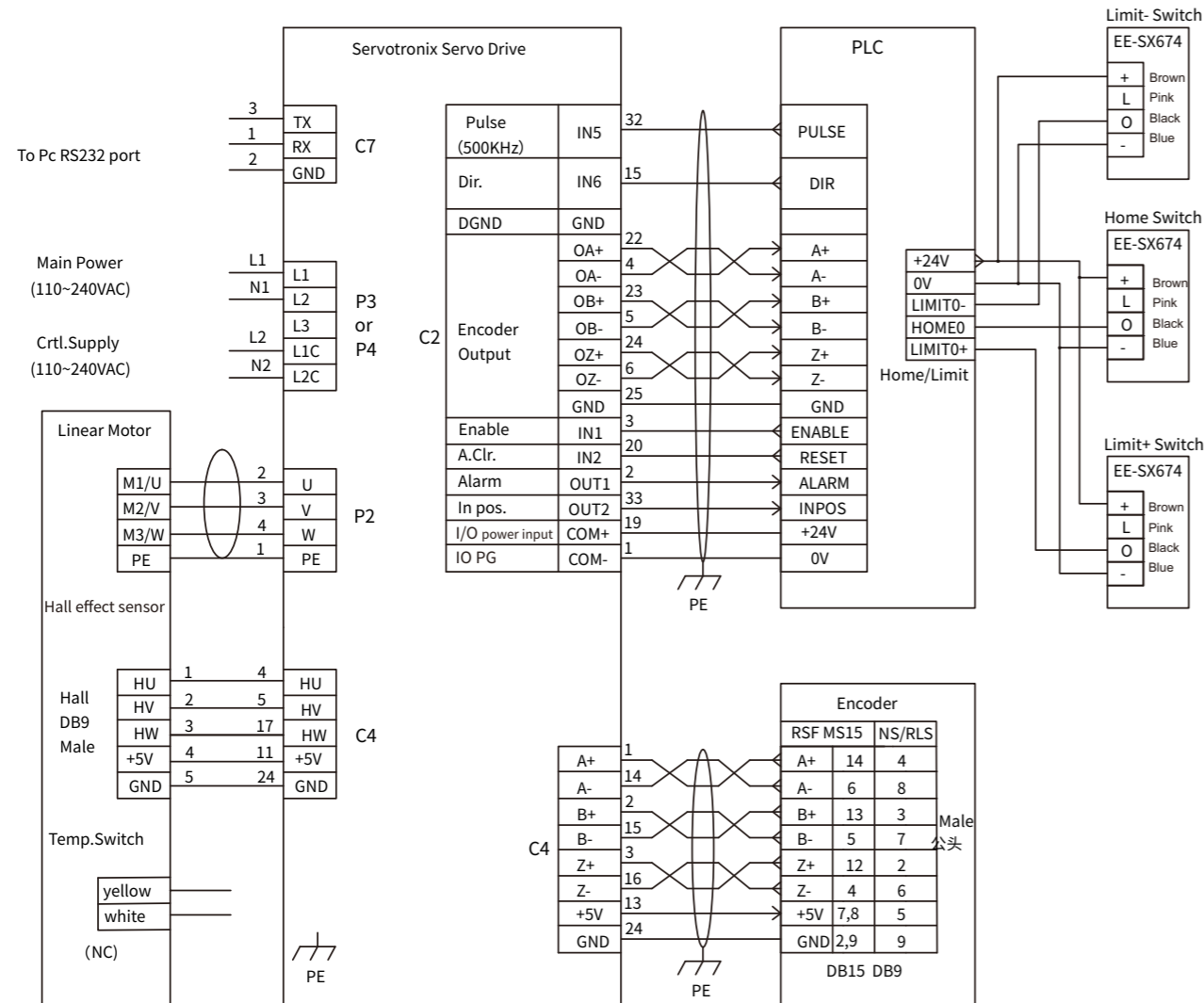


# Driver model selection

## Linear motor motor driver: Servotronic CDHD-0032/4D52/0062 series

- Signal type: single-ended
- Pulse frequency: 4MHz
- Control power: AC110-240VAC
- Main power: AC110-240VAC

Signal connection diagram  
Servotronic Servo Driver : single-ended

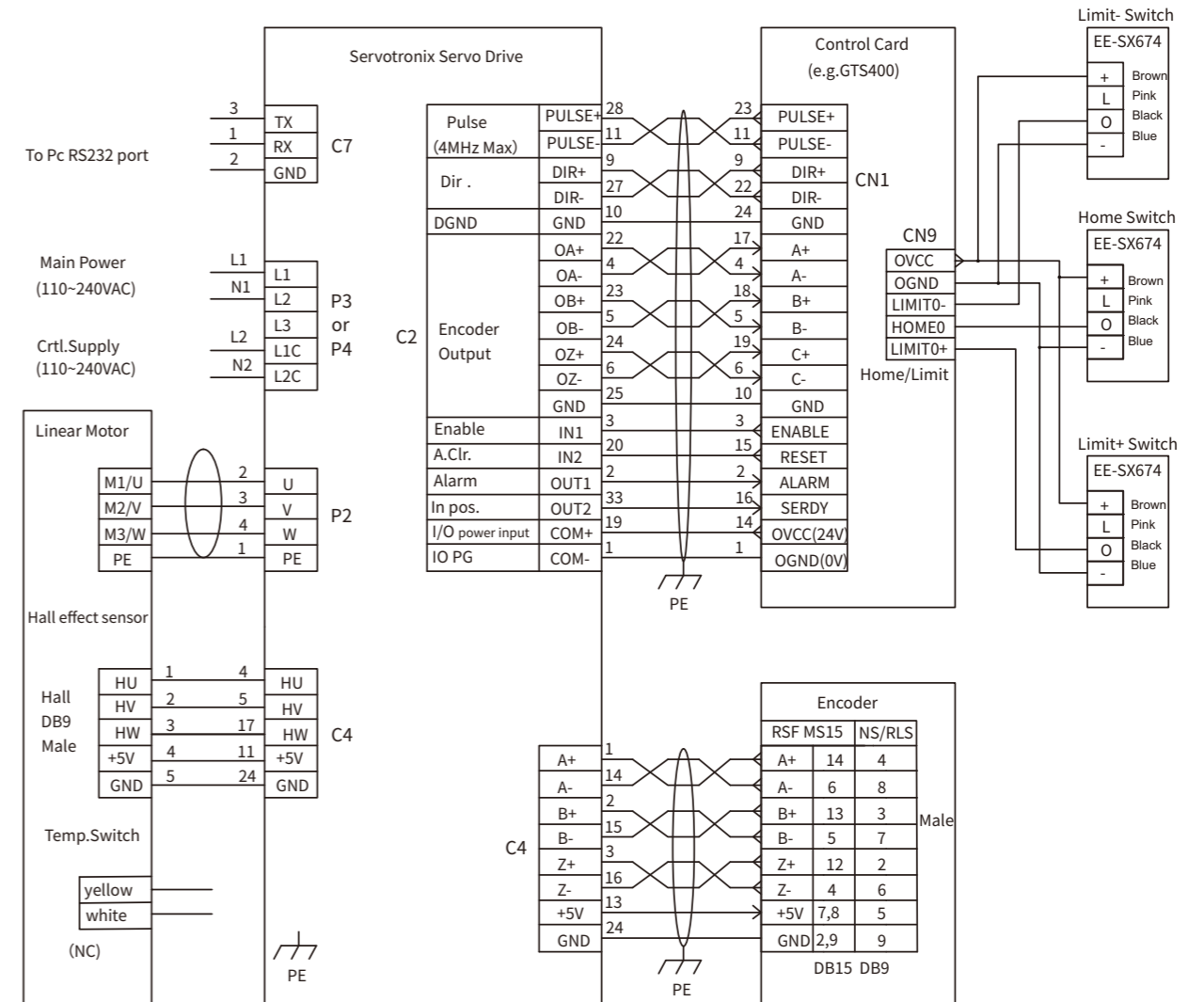


# Driver model selection

## Linear motor motor driver: Servotronic CDHD-0032/4D52/0062 series

- Signal type: differential signal
- Pulse frequency: 4MHz
- Control power: AC110-240VAC
- Main power: AC110-240VAC

Signal connection diagram  
Servotronic Servo Driver : differential



Linear motor selection. Based on the requirements of load, structure, and motion control, calculate the required continuous thrust and peak thrust, and select an appropriate motor type by referring to the motor specification table.

1. The peak thrust is determined by the mobility load mass and the maximum acceleration.

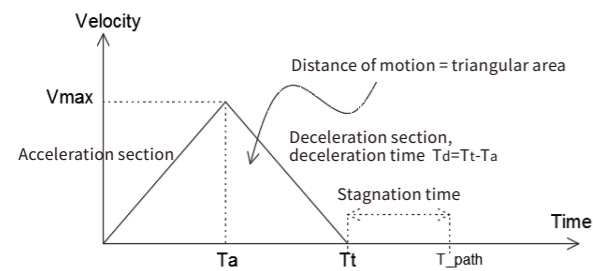
$$F_{thrust} = m_{mass} \cdot a_{acceleration} + F_{friction} + F_{external\ stress}$$

2. The formula for calculating continuous thrust is as follows:

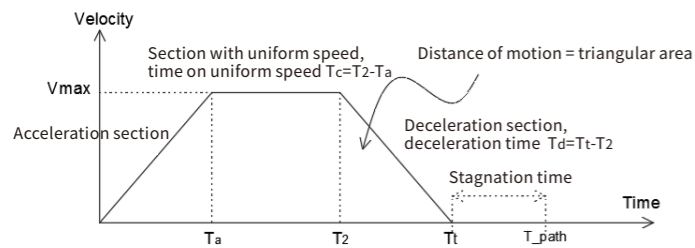
$$F_{RMS} = \sqrt{\frac{Fa^2 \cdot ta + Fc^2 \cdot tc + Fd^2 \cdot td + Fw^2 \cdot tw}{ta + tc + td + tw}}$$

- Fa = acceleration force      Ta = acceleration time
- Fc = force at uniform speed      Tc = time on uniform speed
- Fd = deceleration force      Td = deceleration time      Tt = motion time
- Fw = stagnation force      Tw = stagnation time

For short-distance movement, calculate by using the triangular velocity curve:



For long-distance movement, calculate by using the trapezoidal velocity curve:



Provide software for automatic calculation and selection of the linear motore:

Calculate by using a triangular velocity curve:

Calculate by using the trapezoidal velocity curve:

## Axis Working Mode

(In practical application, the velocity acceleration curve may be an S curve, but is simplified to linear acceleration here)

**Model 1**  
(Long-distance point motion, linear interpolation motion, etc.)

$\Delta T1 =$	$\Delta T2 =$	$\Delta T3 =$	
$\Delta T4 =$	$\Delta T5 =$	$\Delta T6 =$	
$\Delta T7 =$	Vmax =		

**Model 2**  
(Long-distance round-trip point motion, linear interpolation motion, etc.)

$\Delta T1 =$	$\Delta T2 =$	$\Delta T3 =$	
$\Delta T4 =$	$\Delta T5 =$	$\Delta T6 =$	
$\Delta T7 =$	Vmax =		

**Model 3**  
(Continuous short-distance step, CCD position correction, etc.)

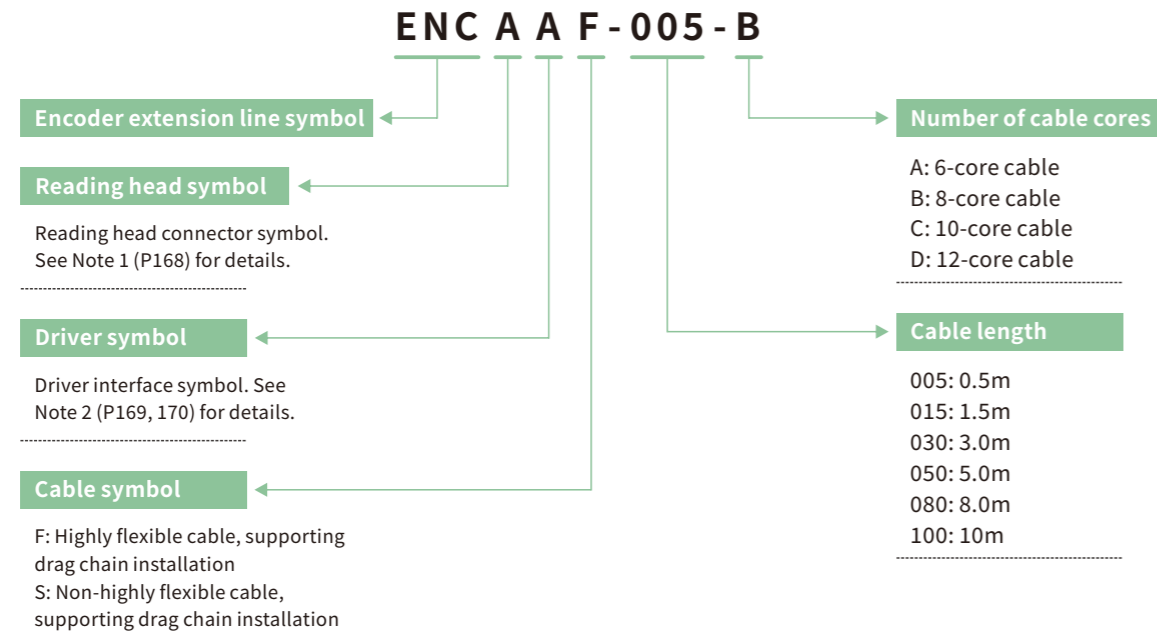
$\Delta T1 =$	$\Delta T2 =$	$\Delta T3 =$	
$\Delta T4 =$	$\Delta T5 =$	Vmax =	

**Mode 4**  
(Continuous repeated motion, arc interpolation, CCD position correction, etc.)

$\Delta T1 =$	$\Delta T2 =$	$\Delta T3 =$	
$\Delta T4 =$	$\Delta T5 =$	Vmax =	

## Encoder Extension Line Ordering Information

### Naming convention for encoder extension lines



### Note 1: Reading header interface definition

Symbol	Pin Quantity	Signal	Interface Type Diagram (DB15, Double-Row)	Adaptive Reading Head
A	7	5V		RSF MS15 DB15 TTL RSF MS15 DB15 1Vpp RGH41(RH100) DB15 Microe Veratus DB15
	2	0V		
	14	A		
	6	/A		
	13	B		
	5	/B		
	12	Z		
	4	/Z		
Shell	Shielding			

Symbol	Pin Quantity	Signal	Interface Type Diagram (DB9, Double-Row)	Adaptive Reading Head
B	1	VCC		SinCos® SEK90 SEK160 SEK260 HIPERFACE DB9
	6	0V		
	2	Sin+		
	3	Sin-		
	4	Cos+		
	5	Cos-		
	7	DATA+		
	8	DATA-		
Shell	Shielding			

Symbol	Pin Quantity	Signal	Interface Type Diagram (DB9, Double-Row)	Adaptive Reading Head
C	5	5V		RLS LM10 DB9 MicroE MTE DB9 NS MS-P20R10AB Magnetic encoder DB9
	9	0V		
	4	A		
	8	A-		
	3	B		
	7	B-		
	2	Z		
	6	Z-		
Shell	Shielding			

Symbol	Pin Quantity	Signal	Interface Type Diagram (DB9, Double-Row)	Adaptive Reading Head
F	5	5V		RLS RGH24(200)D, X, Z, W, Y, H, I, O DB9 DB9 LAMOTION RU2 TTL DB9 SANKYO PSLH055/ PSLH080 DB9
	1,9	0V		
	2	A		
	6	A-		
	4	B		
	8	B-		
	3	Z		
	7	Z-		
Shell	Shielding			

Symbol	Pin Quantity	Signal	Interface Type Diagram (DB9, Double-Row)	Adaptive Reading Head
H	1	5V		Reagle optical encoder DB9
	2	0V		
	6	485+		
	7	485-		
	9	Shielding		

Symbol	Pin Quantity	Signal	Interface Type Diagram (DB9, Double-Row)	Adaptive Reading Head
S	1	5V		SERVOTOP communication
	6	0V		
	2	D+		
	3	D-		
	4			
	5			
	7			
	8			
Shell	Shielding			

## ● Note 2: Driver interface definition

Symbol	Pin Quantity	Signal	Interface Type Diagram (SCSI 26pin)	Adaptive Driver
A	11	5V		Servotronic CDHD series C4 interface
	24	0V		
	1	A		
	14	/A		
	2	B		
	15	/B		
	3	Z		
	16	/Z		
	26	Shielding		

Symbol	Pin Quantity	Signal	Interface Type Diagram (SCSI 26pin)	Adaptive Driver
B	11	5V		Servotronic CDHD series C4 interface
	24	0V		
	9	Sine+		
	22	Sine-		
	10	Cosine+		
	23	Cosine-		
	3	Z+		
	16	Z-		
	26	Shielding		

Symbol	Pin Quantity	Signal	Interface Type Diagram (SCSI 26pin)	Adaptive Driver
C	11	5V		Servotronic CDHD series C4 interface
	24	0V		
	9	Sine+		
	22	Sine-		
	10	Cosine+		
	23	Cosine-		
	1	DATA+		
	14	DATA-		
	26	Shielding		

Symbol	Pin Quantity	Signal	Interface Type Diagram (SCSI MDR 14pin)	Adaptive Driver
D	14	5V		NS low-voltage servo driver J3 interface
	7	0V		
	4	A+		
	3	A-		
	6	B+		
	5	B-		
	12	Z+		
	13	Z-		
	Shell	Shielding		

Symbol	Pin Quantity	Signal	Interface Type Diagram (SCSI MDR 14pin)	Adaptive Driver
E	14	5V		NS linear servo driver CN2 interface
	7	0V		
	8	A+		
	9	A-		
	1	B+		
	2	B-		
	10	Z+		
	11	Z-		
Shell	Shielding			

Symbol	Pin Quantity	Signal	Interface Type Diagram (SCSI MDR 14pin)	Adaptive Driver
G	1	5V		Panasonic A5L A6L A6NL X5 (CN3) interface
	2	0V		
	5	A+		
	6	A-		
	7	B+		
	8	B-		
	9	Z+		
	10	Z-		
	Shell	Shielding		

## ● Note 2: Driver interface definition

Symbol	Pin Quantity	Signal	Interface Type Diagram (SCSI 26pin)	Adaptive Driver
I	1	P5		Mitsubishi direct drive MR-XX-XX-RJ series driver CN2L interface
	2, 10	LG, PSEL		
	3	PA		
	4	PAR		
	5	PB		
	6	PBR		
	7	PZ		
	8	PZR		
	Shell	SD		

Symbol	Pin Quantity	Signal	Interface Type Diagram (MUF-PK10K-X)	Adaptive Driver
K	1	5V		Servotronic LD series linear servo driver C5 interface
	2	0V		
	3	A+		
	4	A-		
	5	B+		
	6	B-		
	7	Z+		
	8	Z-		
	Shell	Shielding		

Symbol	Pin Quantity	Signal	Interface Type Diagram (DB15, Double-Row)	Adaptive Driver
L	1	5V		Kinco FD series linear servo driver X6 interface, using DB15 double-row male terminal
	9	0V		
	2	A+		
	10	A-		
	3	B+		
	11	B-		
	4	Z+		
	12	Z-		
	Shell	Shielding		

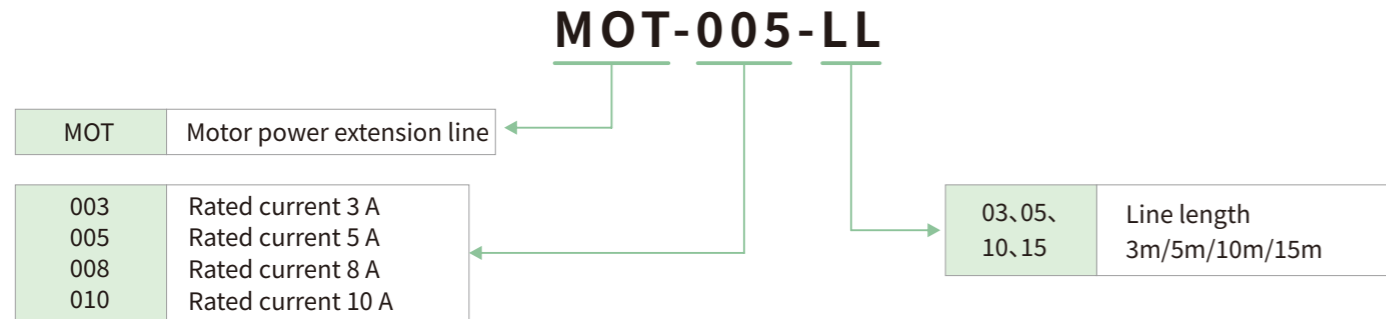
Symbol	Pin Quantity	Signal	Interface Type Diagram (DB15, Three-Row)	Adaptive Driver
N	5	5V		PARK linear driver DB15, three-row male terminal
	6	0V		
	8	A+		
	7	A-		
	12	B+		
	11	B-		
	1	Z+		
	2	Z-		
	Shell	Shielding		

Symbol	Pin Quantity	Signal	Interface Type Diagram (DB15, Three-Row)	Adaptive Driver
Q	14	5V		SERVOTOP direct drive DB15 CN2 interface
	15	0V		
	3	PS+(485+)		
	4	PS-(485-)		
	Shell	Shielding		

Symbol	Pin Quantity	Signal	Interface Type Diagram (DB15, Three-Row)	Adaptive Driver
R	14	5V		SERVOTOP direct drive DB15 CN2 interface
	15	0V		
	8	A+		
	9	A-		
	1	B+		
	2	B-		
	10	Z+		
	11	Z-		
Shell	Shielding			

## Power Extension Line Ordering Information

- Naming convention for power extension lines



## Warranty period and warranty scope

Warranty period: 12 months after delivery.

Warranty scope: Within the warranty period, the company provides free maintenance of product faults under normal use conditions, but does not include the following situations:

- The exterior paint peels off and fades naturally.
- Product faults or damage are caused by improper use or failure to install or use as required.
- The product is disassembled or reassembled without the prior consent of the company.
- The guide rail is not maintained regularly with lubricating oil or grease, or the guide rail is not maintained using the specified lubricating oil or grease, resulting in rail slider abrasion and bead shedding.
- Incorrect maintenance or inspection leads to product faults or damage.
- Product faults or damage are caused by force majeure, such as earthquake, storm, flood, lightning, and fire, or by human reasons.

Company name		Address:			
Mechanical engineer		Phone:			
Electrical engineer		Email:			
Recorded by:		Recorded on:			
Classification	No.	Item	Unit	Content	Comment
Basic requirements	1	Stage type		<input type="checkbox"/> Single-axis single-actuator <input type="checkbox"/> Single-axis multi-actuator <input type="checkbox"/> Cross <input type="checkbox"/> Fixed-beam gantry cross <input type="checkbox"/> Single-dri <input type="checkbox"/> Dual-drive <input type="checkbox"/> [   ]Mark here if not the above items	
	2	Stage installation base		<input type="checkbox"/> Marble <input type="checkbox"/> Cast iron <input type="checkbox"/> Steel <input type="checkbox"/> Aluminum plate <input type="checkbox"/> Others[   ]	
	3	Installation method		<input type="checkbox"/> Horizontal <input type="checkbox"/> Side-standing <input type="checkbox"/> Vertical <input type="checkbox"/> Inverted <input type="checkbox"/> Others	
	4	Dimension	mm	[   ]	H x W x D
	5	Actuator quantity	↑	[   ]	
	6	Actuator outgoing direction		[   ] <input type="checkbox"/> Not specified	
	7	Driver brand		[   ] <input type="checkbox"/> Not specified	
	8	Guide rail brand		[   ] <input type="checkbox"/> Not specified	
	9	Aluminum surface processing and color		<input type="checkbox"/> Natural anodizing <input type="checkbox"/> Black anodizing <input type="checkbox"/> Others[   ]	
	10	Sheet metal surface processing and color		<input type="checkbox"/> Blackening <input type="checkbox"/> Black painting <input type="checkbox"/> Black powder spraying <input type="checkbox"/> Others[   ]	Note: Detailed requirements shall be specified for blackening.
Driver power supply	1	Power supply voltage	V	<input type="checkbox"/> AC110 <input type="checkbox"/> AC220 <input type="checkbox"/> AC380 <input type="checkbox"/> Others[   ]	
	2	Single-phase/3-phase		<input type="checkbox"/> Single-phase <input type="checkbox"/> 3-phase	
	3	Power frequency	Hz	<input type="checkbox"/> 50Hz <input type="checkbox"/> 60Hz	
	4	Brand		[   ] <input type="checkbox"/> Not specified	
Static performance	1	Repeatability positioning precision	μm	[   ] <input type="checkbox"/> Not specified	
	2	Absolute positioning precision	μm	[   ] <input type="checkbox"/> Not specified	
	3	Straightness	μm		
	4	Flatness	μm		
	5	Parallelism between axes	μm	[   ] <input type="checkbox"/> Not specified	
	6	Perpendicularity between axes	μm	[   ] <input type="checkbox"/> Not specified	
Dynamic performance	1	Load weight	kg	[   ] kg	The data of each axis and each actuator shall be provided in detail.
	2	Valid travel stroke	mm		
	3	Total module length	mm		
	4	Max. speed	m/s	[   ] <input type="checkbox"/> Not specified	
	5	Max. acceleration	G	[   ] <input type="checkbox"/> Not specified	
	6	Speed stability	%	[   ] <input type="checkbox"/> Not specified	Speed fluctuation in the uniform speed section

# "Linear Motor Stage Selection Table"

Classification	No.	Item	Unit	Content	Comment
Dynamic performance	7	In-place stabilization time	ms	[ ] <input type="checkbox"/> Not specified	Time required to stabilize to 10 times the resolution of the feedback ruler
	8	Steady-state error	um	[ ] <input type="checkbox"/> Not specified	Enable the static state to control the error value
Action sequence diagram	1	Sports mode		<input type="checkbox"/> Model 1 <input type="checkbox"/> Model 2 <input type="checkbox"/> Model 3 <input type="checkbox"/> Model 4 <input type="checkbox"/> Others	See the "Axis working Mode" page. If different, provide it separately.
Control mode	1	Pulse mode		<input type="checkbox"/> CW/CCW <input type="checkbox"/> Pulse/DIR	
	2	Analog quantity mode		<input type="checkbox"/> Analog quantity control <input type="checkbox"/> No requirement	
	3	Communication mode		<input type="checkbox"/> Ethercat <input type="checkbox"/> Profibus <input type="checkbox"/> CANopen <input type="checkbox"/> RS485 <input type="checkbox"/> RS232 <input type="checkbox"/> Others[   ]	
Photoelectric sensor	1	Quantity	PCS		
	2	Quantity		[ ] <input type="checkbox"/> Not specified	
	3	Model			
	4	Location		<input type="checkbox"/> A sensor exists on each side and the origin is on the left <input type="checkbox"/> A sensor exists on each side and the origin is on the right <input type="checkbox"/> A sensor exists on each side and the origin is in the middle <input type="checkbox"/> Others[   ]	
	5	Communication mode		<input type="checkbox"/> Ethercat <input type="checkbox"/> Profibus <input type="checkbox"/> CANopen <input type="checkbox"/> RS485 <input type="checkbox"/> RS232 <input type="checkbox"/> Others[   ]	
Auxiliary materials	1	Provide the automatic oil injection line for guide rails		<input type="checkbox"/> Yes <input type="checkbox"/> No	
	2	Line length (between stage and driver)	m	Encoder wire length[   m] Motor wire length [   m]	By default, the body cable is 0.35 m long and the extension is 3 m long.
	3	Cabling method		<input type="checkbox"/> "Encoder/Actuator" body outgoing cable + extension cable <input type="checkbox"/> "Encoder/Actuator" body outgoing cable without extension cable	Note: The body outgoing cable of the encoder is only 3 m long. If the total length exceeds 3 m, the mode of "body outgoing cable + extension cable" must be adopted.
	4	Drag chain brand		[ ] <input type="checkbox"/> Not specified	
	5	Provide drag chain sheet metal		<input type="checkbox"/> Yes <input type="checkbox"/> No	
Dustproof requirement	1	Dustproof mode		<input type="checkbox"/> Dustproof organ cover <input type="checkbox"/> Dust cover <input type="checkbox"/> Fully sealed <input type="checkbox"/> No requirements <input type="checkbox"/> Others[   ]	
		Dust cover		<input type="checkbox"/> Mirror surface (SU304 only) <input type="checkbox"/> Drawing process (SU304 only)	
		Surface processing		<input type="checkbox"/> Painting <input type="checkbox"/> Powder spraying <input type="checkbox"/> Nickel plating <input type="checkbox"/> Others[   ]	
Working environment	1	Ambient temperature	°C		
	2	Relative humidity	%		
Other requirements	Note: if there are no specific requirements, SERVOTOP's factory standard shall prevail.				

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