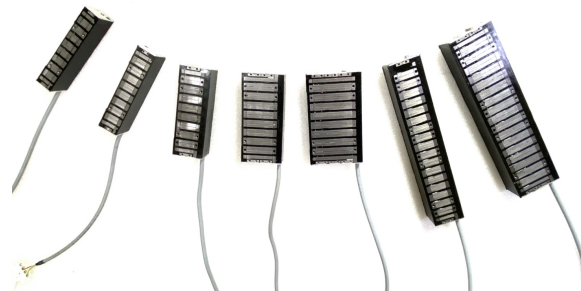




Extremely Low Cogging Force Iron-core Linear Motor (High-end version: YAN)



(Economical version: YAE)



Version: 3.0

Date: 2023. 01. 01



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●Technology Background

Magtronics Technology Inc. started in 2006. The team members are mainly from ITRI and very experienced in the field of precision mechanics and control. It is also worthy to mention that some members have participated the technology transfer with NSK and Toshiba, some have worked for ARM as the seeded instructor in Asia, and some were the consultants of many electrical machine company.

The main expertise of our team includes

1. design and installation of ultra-precision stage
2. design and manufacturing of DDL, DDR, and VCM
3. firmware and hardware design of motor drive
4. research and design of novel sensors

●History

From 2006 to 2013, we had focused on the development of linear-motor-based precision subsystem for high-end application such as wafer probe card, IC tester, TFT/LCD manufacturing equipment (4.5G ~ 8.5G), LED manufacturing equipment (die bonder, wire bonder, chip sorter), PCB machine (SMT, PCB router, steel plate laser cutting), and many more ... (Please see reference for detail)

From 2014 to 2016, we started to serialize and automatically produce the **zero-cogging force iron core linear motor**, which we invented for our high-end application. Since the iron-core linear motor has the highest efficiency and lowest temperature rise, these two features are very important for the application of high precision positioning. However, the iron-core linear motor has the drawback of cogging force which is a considerable disadvantage from the viewpoint of fast settling and low speed stability. Hence, we spent two years of R&D effort to reduce the cogging force. Now, the cogging force of our motor is only one eighth as compared to that of Japanese first brand. In addition, the attractive force between mover and stator is another disadvantage of the iron-core linear motor from the viewpoint of easiness of installation. But, from the viewpoint of precision motion, it is worthy to mention that the attractive force between mover and stator is a good feature to preload the linear guide for smoothness and higher rigidity. Our ambition is to replace ironless linear motor with this zero-cogging iron-core linear motor.

From 2017 to 2019, we proposed the first **scaleless position encoder head** for extremely long stroke or highly polluted application, which achieves the resolution of 1 um and maximal speed of 24 m/s. This new technology not only lower the overall cost, but also enhance the reliability and easiness of installation. In 2018, we also developed a series of **miniature nano-precision positioning stages** to provide the complete solution of six DOF motion for extremely high precision



manufacturing, such as the assembly of camera module, optical fiber connector, probe card pin insertion. These miniaturized stages using linear motor as the forcer together with the high performance optical encoder can achieve the repeatability of +/-0.1 um and +/- 1 arcsec.

Since 2020, we have developed a **vacuum-compatible stage** for electrical beam inspection equipment which is critically important for nowadays semiconductor industry (< 7nm). The feature of the stage solves the heat dissipation in a vacuum chamber ($10e-7$ Torr). In addition, a decoupled mechanism is employed to achieve equal moving mass of both axes such that the heat generated by the linear motors are minimal.



●Features

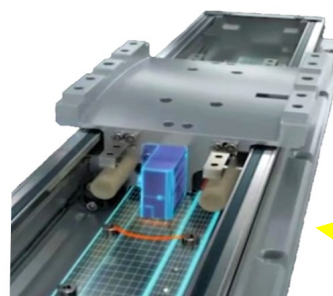
- Nearly zero cogging force to enhance low-speed stability, settling time, and following error.
- Built-in aluminum mounting plate for excellent heat dissipation and lighter weight (YAN)
- Fully covered by metal shielding for eliminating EMI to nearby encoder head (YAN)
- Forced cooling accessories to achieve smaller size and better heat dissipation (suffix A or B)
- Dedicated scaleless position sensor with 1 um resolution ease long stroke application and lower cost

●Applications

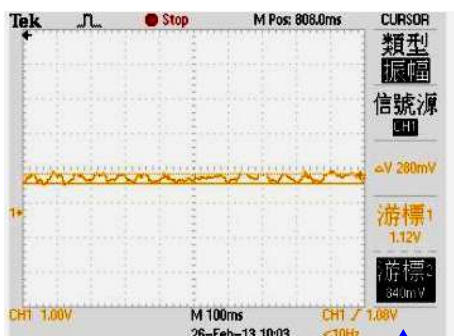
- Semiconductor Equipment
- TFT/LCD/LED Manufacturing Equipment
- Automatic Material Handling Equipment
- Wire cut / Electric Discharge Machine
- Laser Cutting & Engraving Machines
- CNC Machining Center
- etc.,.....



Forced cooling



**Scaleless
Position
Sensor**

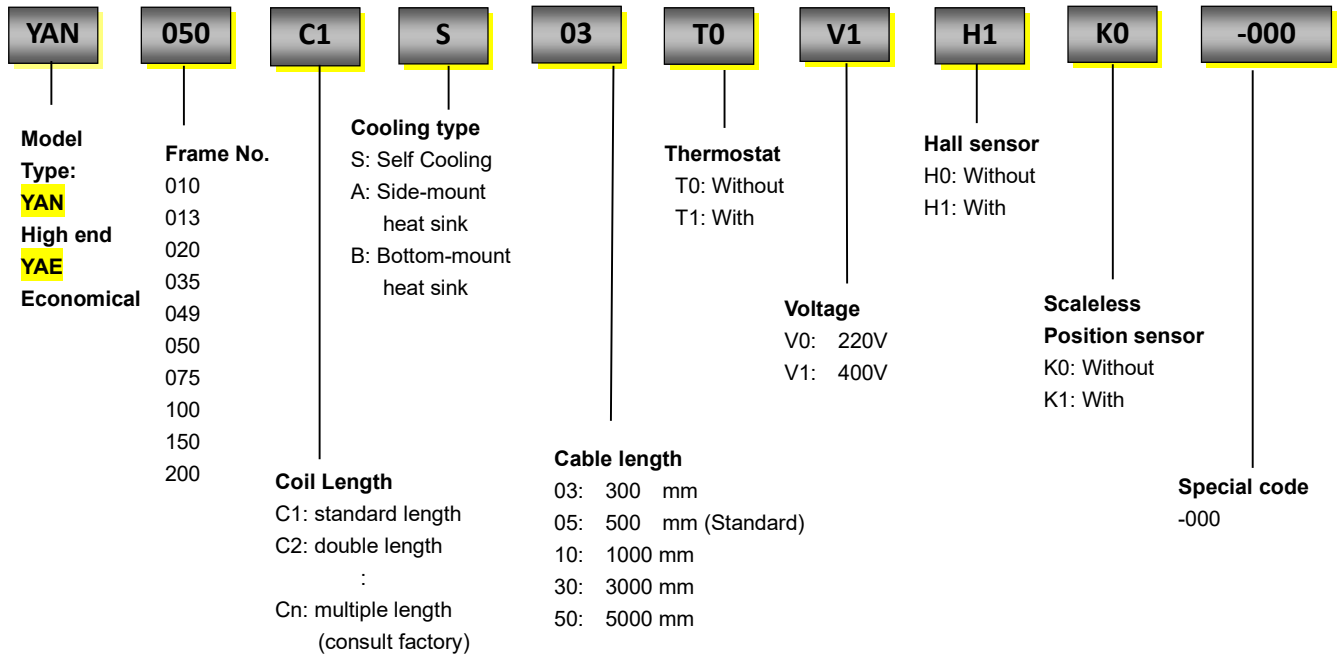


**Extremely low
cogging force**

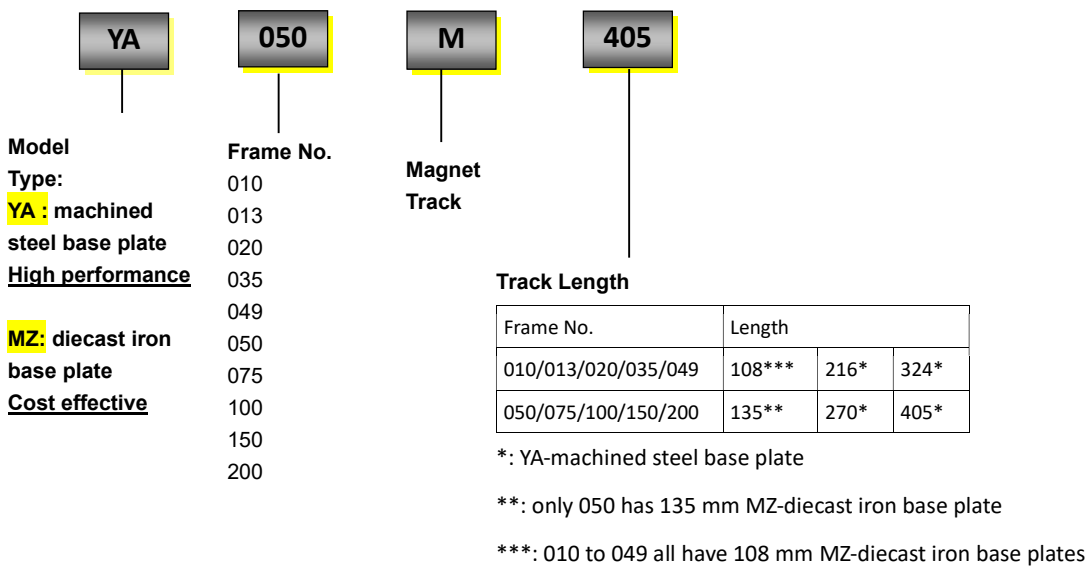


● Model Designation

1. Moving Coil :



2. Magnet Track :

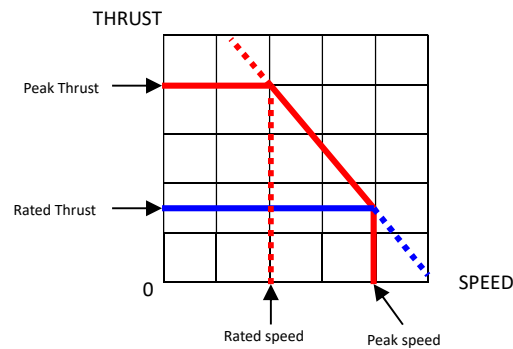




● Specification

Coil model no.		Rated thrust (N)	Peak thrust (N)	Rated Current (Arms)	Peak Current (Arms)	Rated speed*2 (m/s)	Peak speed*1 (m/s)	Resistance L to L (ohm)	Inductance L to L (mH)	Force Const. (N/Arms)	Attractive Force (N)	Install Height (mm)	Coil mass (kg)
YAN010	C1S	22	66	0.5	1.5	3.1	5.4	37.8	128	45.6	157	43	0.51
YAE010	C1S	22	66	0.5	1.5	3.1	5.4	37.8	128	45.6	157	39	0.3
YAE013	C1S	36	108	0.5	1.5	1.7	3.3	53.6	224	73.8	226	45	0.4
	C2S	72	216	1	3	1.7	3.3	26.8	112	73.8	452	39	0.7
YAN020	C1S	55	165	0.95	2.85	2.3	4.1	19.9	92	57.3	315	45	0.75
	C2S	110	330	1.9	5.7	2.3	4.1	10	46	57.3	460	45	1.45
YAE020	C1S	55	165	0.95	2.85	2.3	4.1	19.9	92	57.3	315	39	0.59
	C2S	110	330	1.9	5.7	2.3	4.1	10	46	57.3	460	39	1.18
YAN035	C1S	100	300	1.6	4.8	1.95	3.6	11.7	67.8	63.4	810	45	1.1
	C2S	200	600	3.2	9.6	1.95	3.6	5.8	33.9	63.4	1600	45	2
YAE035	C1S	100	300	1.6	4.8	1.95	3.6	11.7	67.8	63.4	810	39	0.92
	C2S	200	600	3.2	9.6	1.95	3.6	5.8	33.9	63.4	1600	39	1.77
YAN049	C1S	120	360	2.8	8.4	3.6	6	4.2	19.1	42.5	1055	45	1.35
	C2S	240	720	5.6	16.8	3.6	6	2.1	9.5	42.5	2040	45	2.6
YAE049	C1S	120	360	2.8	8.4	3.6	6	4.2	19.1	42.5	1055	39	1.16
YAN 050	C1S	280	840	4.2	12.6	2.6	4.1	3.2	31.3	67.6	1700	58	3
	C2S	560	1680	8.4	25.2	2.6	4.1	1.6	15.6	67.6	3300	58	5.7
	C3S	840	2520	12.6	37.8	2.6	4.1	1.05	10.4	67.6	5000	58	8.4
	C4S	1120	3360	16.8	50	2.6	4.1	0.8	7.8	67.6	6600	58	11
	C1A ³	500	840	7.5	12.6	2.6	3.4	3.2	31.3	67.6	1700	58	3.8
	C1B ³	500	840	7.5	12.6	2.6	3.4	3.2	31.3	67.6	1700	75	4.4
	C2A ³	1000	1680	15	25.2	2.6	3.4	1.6	15.6	67.6	3300	58	7.4
	C2B ³	1000	1680	15	25.2	2.6	3.4	1.6	15.6	67.6	3300	75	8.6
YAN 075	C1S	440	1320	5.8	17.4	2.6	3.7	2.2	19.9	77.2	2320	58	3.95
	C2S	880	2640	11.6	34.8	2.6	3.7	1.1	9.9	77.2	4300	58	7.8
	C1A ³	780	1320	10.3	17.4	2.6	3.2	2.2	19.9	77.2	2320	58	5.7
	C2A ³	1560	2640	20.6	34.8	2.6	3.2	1.1	9.9	77.2	4300	58	11.2
YAN 100	C1S	560	1680	11.8	35.4	3.9	5.9	0.72	7.8	47.7	3310	58	5.1
	C2S	1120	3360	23.6	70.8	3.9	5.9	0.36	3.9	47.7	6520	58	9.8
	C3S	1680	5040	35.4	106	3.9	5.9	0.24	2.6	47.7	9830	58	14.5
	C4S	2240	6720	47.2	141	3.9	5.9	0.18	1.9	47.7	13100	58	19.2
	C1A ³	995	1680	21	35.4	3.9	5	0.72	7.8	47.7	3310	58	7.2
	C1B ³	995	1680	21	35.4	3.9	5	0.72	7.8	47.7	3310	75	7.5
	C2A ³	1990	3360	42	70.8	3.9	5	0.36	3.9	47.7	6520	58	12
	C2B ³	1990	3360	42	70.8	3.9	5	0.36	3.9	47.7	6520	75	14.3
	C3B ^{3/4}	2985	5040	63	106	3.9	5	0.24	2.6	47.7	9830	75	16.7
	C4B ^{3/4}	3980	5040	84	141	3.9	5	0.18	1.9	47.7	13100	75	19.1
YAN150	C1S	840	2520	11.8	35.4	2.7	4	0.49	11.6	71.2	4640	60	8.2
	C2S	1680	5040	23.6	70.8	2.7	4	0.25	5.8	71.2	8600	60	15.8
	C3S	2520	7560	35.4	106	2.7	4	0.16	3.9	71.2	13320	60	23.4
	C1B ^{3/4}	1495	2520	21	35.4	2.7	3.5	0.49	11.6	71.2	4640	77	10
	C2B ^{3/4}	2990	5040	42	70.8	2.7	3.5	0.25	5.8	71.2	8600	77	20
	C3B ^{3/4}	4485	7560	63	106	2.7	3.5	0.16	3.9	71.2	13320	77	30
YAN200	C1S	1120	3360	11.8	35.4	2	3.1	0.38	15.5	94.5	6620	62	10.1
	C2S	2240	6720	23.6	70.8	2	3.1	0.19	7.7	94.5	13040	62	20.7
	C3S	3360	10080	35.4	106	2	3.1	0.13	5.1	94.5	19260	62	30.4
	C1B ^{3/4}	1990	3360	21	35.4	2	2.7	0.38	15.5	94.5	6620	79	12.9
	C2B ^{3/4}	3980	6720	42	70.8	2	2.7	0.19	7.7	94.5	13040	79	23.6
	C3B ^{3/4}	5970	10080	63	106	2	2.7	0.13	5.1	94.5	19260	79	33

註* : 1. Peak speed is defined as the maximal speed at which the motor can produce the rated thrust.
 2. Rated speed is defined as the maximal speed at which the motor can produce the maximal thrust.
 3. Rated thrust can be increased by using the piped heat sink. The increased rated thrust is defined using water cool method.
 4. This model has not the side-mount heat sink (A)



Definition diagram of thrust-speed curve

Caution: Strong attraction force between moving winding and magnet stator may cause injury. Please install carefully!

Special order requirement

- 1. Thrust more than 10080 Nt**
- 2. Specific thrust-speed curve arrangement**
- 3. Customized length of magnet track**

Please Contact factory

www.magtronics.com.tw



Magnet Track model no.		Pole pair Pitch (mm)	Magnet track mass (kg)	Size			
				Width (mm)	L2 (mm)	L3 (mm)	M
MZ 010	M108	27	0.12	22	108	110	1
YA 010	M108		0.12	22	108	110	1
	M216		0.24	22	216	218	3
MZ 013	M108	27	0.14	26	108	110	1
MZ 020	M108	27	0.23	44	108	115.7	1
YA 020	M216		0.46	44	216	223.7	3
	M324		0.69	44	324	331.7	5
MZ 035	M108	27	0.34	60	108	118.5	1
YA 035	M216		0.68	60	216	226.5	3
	M324		1.02	60	324	334.5	5
YA 049	M108	27	0.45	75	108	121.1	1
YA 049	M216		0.9	75	216	229.1	3
	M324		1.35	75	324	337.1	5
MZ 050	M135	45	0.79	75	135	146.3	1
YA 050	M270		1.58	75	270	281.3	3
	M405		2.37	75	405	416.3	5
YA 075	M135	45	1.24	100	135	150.1	1
	M270		2.48	100	270	285.1	3
	M405		3.72	100	405	420.1	5
YA 100	M135	45	1.58	125	135	153.9	1
	M270		3.16	125	270	288.9	3
	M405		4.74	125	405	423.9	5
YA150	M135	45	3	175	135	150.1	1
	M270		6	175	270	285.1	3
	M405		9	175	405	420.1	5
YA200	M135	45	4	225	135	153.9	1
	M270		8	225	270	288.9	3
	M405		12	225	405	423.9	5

Test Standard and Application Environment	
Thermal Endurance Class of winding	H (180°C, UL)
DC Insulation Resistance test	DC1000V, > 500Mohm
AC Dielectric Voltage Withstand test	AC 1800V, 1 minute
Layer Short Impulse test	< 2%
Production structure	IP65
Operation Temp.	0~40
Operation humidity	20%RH~80%RH(no condense)
Operation environment	Under 1000 m above sea level No corrosion and no explosion



• Dimensions

Model: YA 010

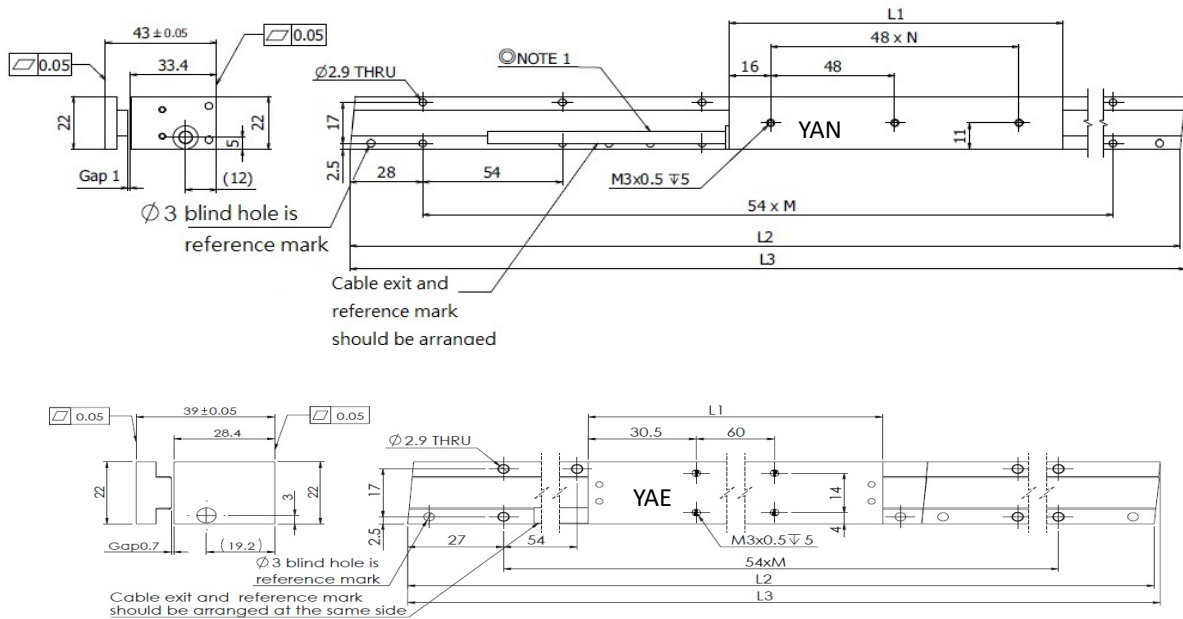
Coil model no.		Size	
		L1 (mm)	N
YAN010	C1S	129	2
YAE010	C1S	121	-

YAN: High end, YAE :Economical

Magnet Track model no.		Size		
		L2 (mm)	L3 (mm)	M
MZ010	M108	108	110	1
YA010	M108	108	110	1
	M216	216	218	3

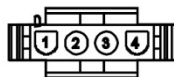
YA : machined steel base plate, High performance

MZ: diecast iron base plate, Cost effective



©Note 1 Specification of motor cable

- Outer diameter : 5.5 mm
- Min. bending radius
- Conti. Flexing: 10 x outer diameter
- occasional flexing: 7,5 x outer diameter
- fixed installation: 4 x outer diameter



Pin no.	Signal	Wire no.
1	Phase U	1
2	Phase V	2
3	Phase W	3
4	FG	Green

The Mating Connector
Cap : 350780-1
Socket : 350536-3

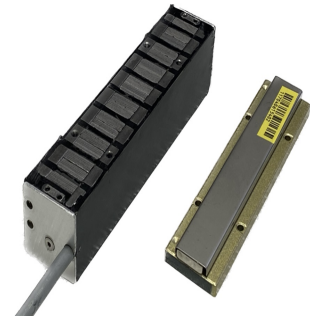
Plug : 350779-1
Pin : 350218-3
by Tyco Electronics AMP K.K.



Model: YA 013

Coil model no.		Size	
		L1 (mm)	N
YAE013	C1S	121	-

YAN: High end, YAE: Economical

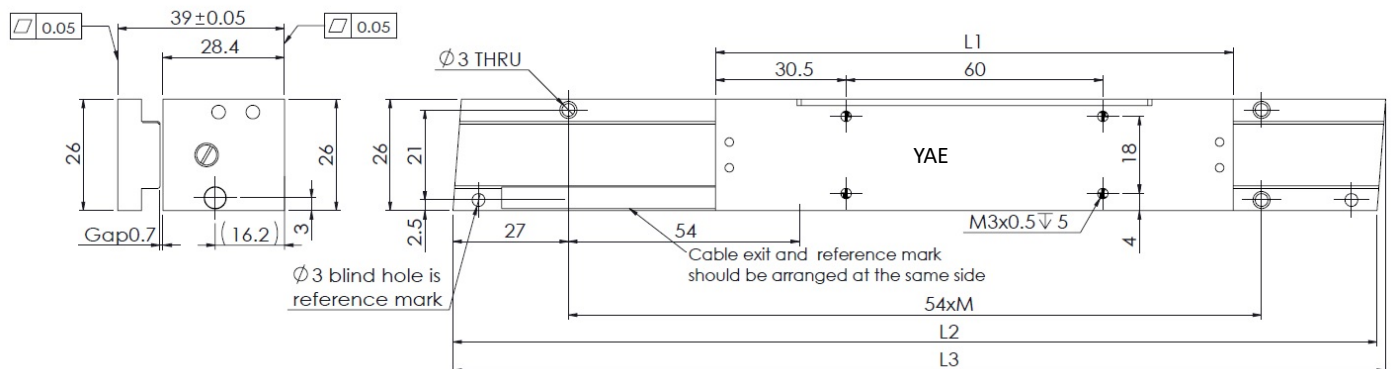


Magnet Track model no.		Size		
		L2 (mm)	L3 (mm)	M
MZ013	M108	108	110	1

YA : machined steel base plate, High performance

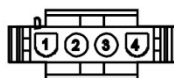
MZ: diecast iron base plate, Cost effective

YAE013C1
MZ013M108



©Note 1 Specification of motor cable

- Outer diameter : 5.5 mm
- Min. bending radius
- Conti. Flexing: 10 x outer diameter
- occasional flexing: 7,5 x outer diameter
- fixed installation: 4 x outer diameter



Pin no.	Signal	Wire no.
1	Phase U	1
2	Phase V	2
3	Phase W	3
4	FG	Green

The Mating Connector
Cap : 350780-1
Socket : 350536-3

Plug : 350779-1
Pin : 350218-3
by Tyco Electronics AMP K.K.



Model: YA 020

Coil model no.		Size	
		L1 (mm)	N
YAN020	C1S	127	2
	C2S	235	5
YAE020	C1S	121	-
	C2S	229	-

YAN: High end, YAE: Economical



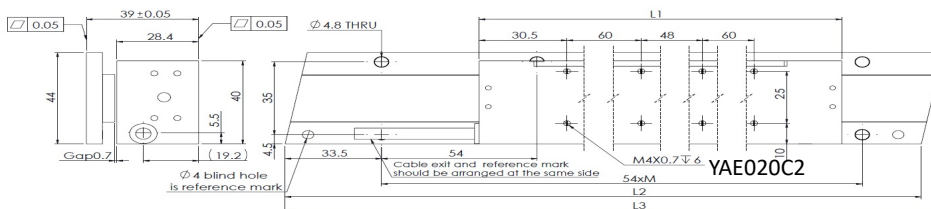
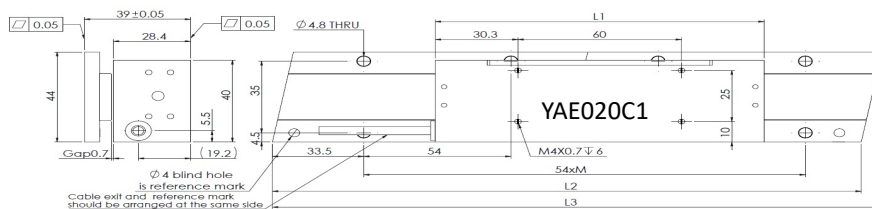
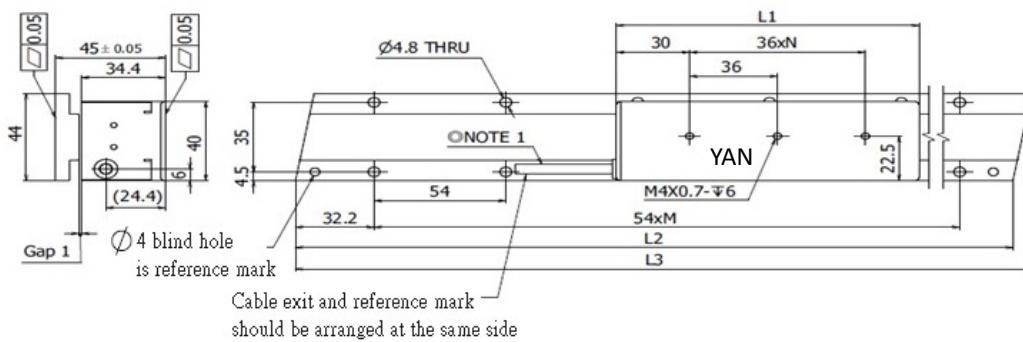
YAN020C1
YAO20M216

Magnet Track model no.		Size		
		L2 (mm)	L3 (mm)	M
MZ020	M108	108	115.7	1
YA020	M216	216	223.7	3
	M324	324	331.7	5

YA : machined steel base plate, High performance
MZ: diecast iron base plate, Cost effective

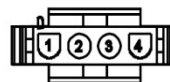


YAE020C1
MZ020M108



◎Note 1 Specification of motor cable

- Outer diameter : 5.5 mm
- Min. bending radius
- Conti. Flexing: 10 x outer diameter
- occasional flexing: 7,5 x outer diameter
- fixed installation: 4 x outer diameter



Pin no.	Signal	Wire
1	Phase	1
2	Phase	2
3	Phase	3
4	FG	Green

The Mating Connector
Cap : 350780-1
Socket : 350536-3

Plug : 350779-1
Pin : 350218-3
by Tyco Electronics AMP K.K.



Model: YA 049

Coil model no.		Size	
		L1 (mm)	N
YAN049	C1S	127	2
	C2S	235	5
YAE049	C1S	121	-

YAN: High end, YAE: Economical

Magnet Track model no.		Size		
		L2 (mm)	L3 (mm)	M
MZ049	M108	108	121.1	1
YA049	M216	216	229.1	3
	M324	324	337.1	5

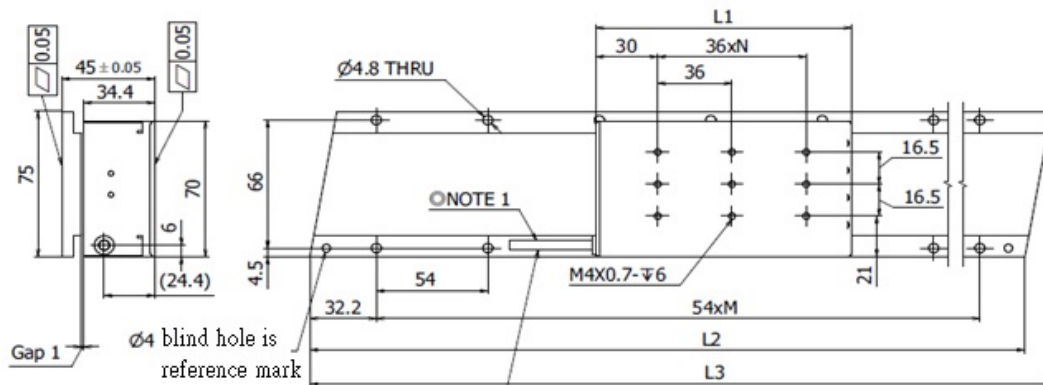
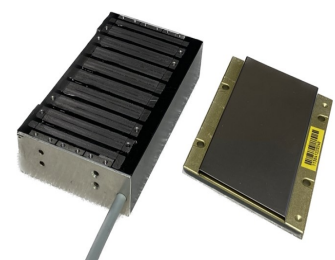
YA : machined steel base plate, High performance

MZ: diecast iron base plate, Cost effective

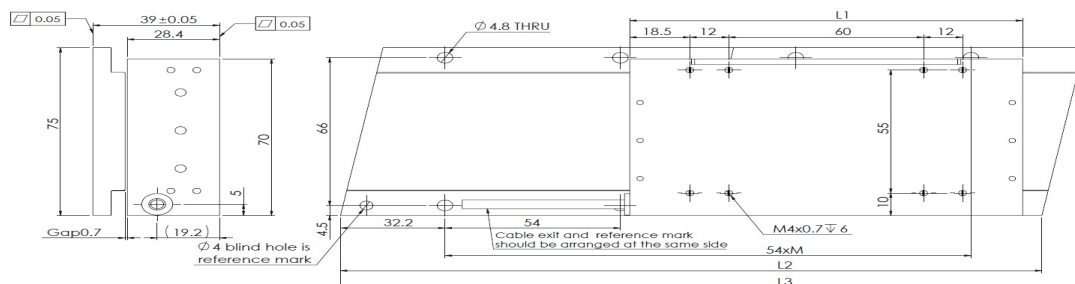


YAN049C1
YA049M216

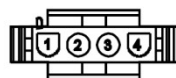
YAE049C1
MZ049M108



Cable exit and reference mark should be arranged at the same side



©Note 1 Specification of motor cable
 Outer diameter : 5.5 mm
 Min. bending radius
 Conti. Flexing: 10 x outer diameter
 occasional flexing: 7,5 x outer diameter
 fixed installation: 4 x outer diameter



The Mating Connector
 Cap : 350780-1
 Socket : 350536-3

Pin no.	Signal	Wire no.
1	Phase U	1
2	Phase V	2
3	Phase W	3
4	FG	Green

Plug : 350779-1
 Pin : 350218-3
 by Tyco Electronics AMP K.K.



Model: YA 050(S) (Self cooling)

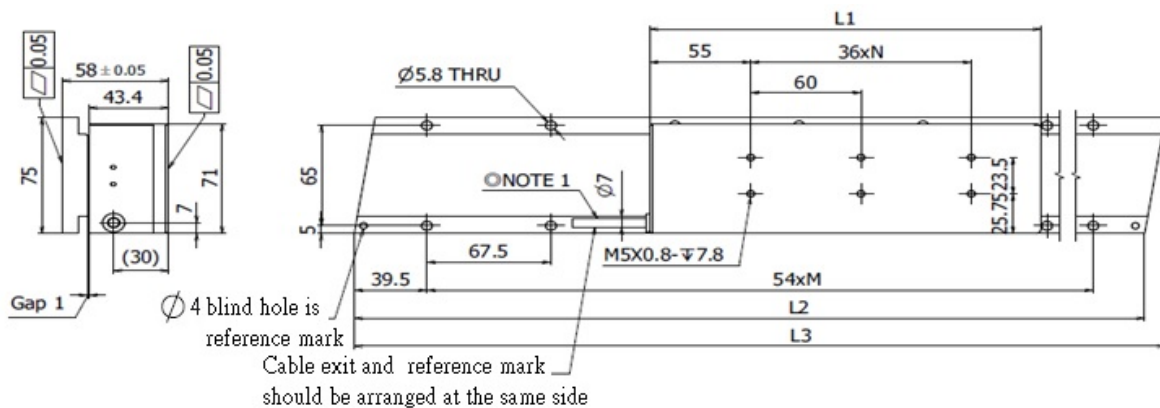
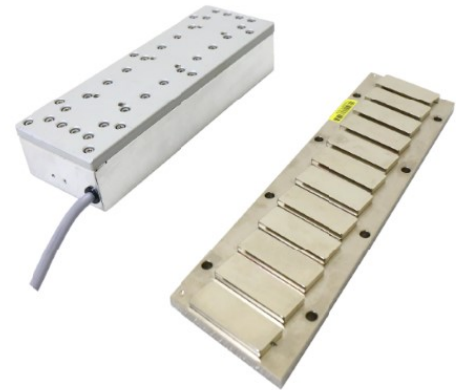
Coil model no.		Size	
		L1 (mm)	N
YAN050	C1S	213	2
	C2S	393	5
	C3S	573	8
	C4S	753	11

YAN: High end, YAE: Economical

Magnet Track model no.		Size		
		L2 (mm)	L3 (mm)	M
MZ050	M135	135	146.3	1
YA050	M270	270	281.3	3
	M405	405	416.3	5

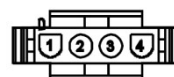
YA : machined steel base plate, **High performance**

MZ: diecast iron base plate, **Cost effective**



©Note 1 Specification of motor cable

- Outer diameter : 6.5 mm
- Min. bending radius
- Conti. Flexing: 10 x outer diameter
- occasional flexing: 7,5 x outer diameter
- fixed installation: 4 x outer diameter



Pin no.	Signal	Wire no.
1	Phase U	1
2	Phase V	2
3	Phase W	3
4	FG	Green

The Mating Connector
Cap : 350780-1
Socket : 350536-3

Plug : 350779-1
Pin : 350218-3
by Tyco Electronics AMP K.K.



Model: YA 050(A) (with Side-mount heat sink)

Coil model no.		Size	
		L1 (mm)	N
YAN050	C1A	213	2
	C2A	393	5

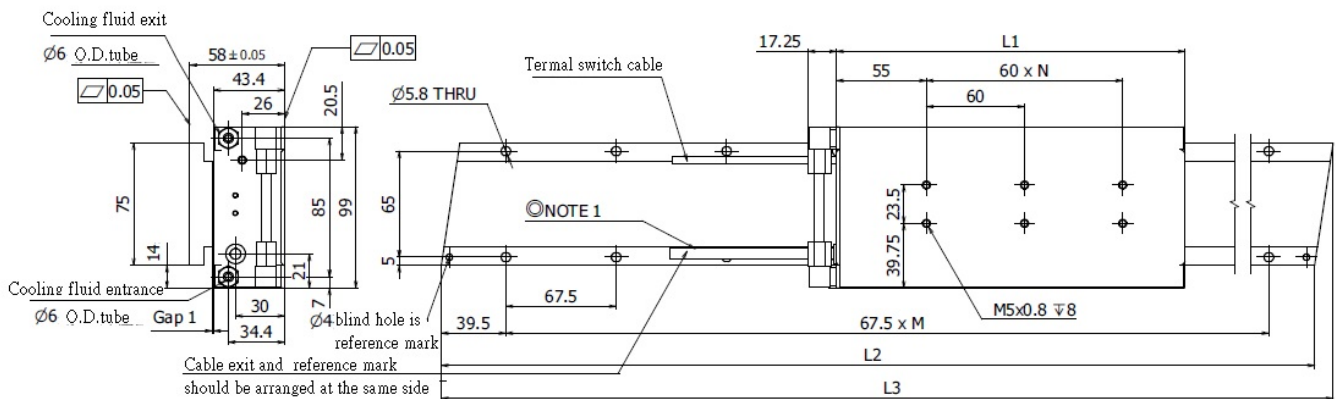
YAN: High end, YAE: Economical



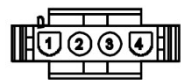
Magnet Track model no.		Size		
		L2 (mm)	L3 (mm)	M
MZ050	M135	135	146.3	1
YA050	M270	270	281.3	3
	M405	405	416.3	5

YA : machined steel base plate, High performance

MZ: diecast iron base plate, Cost effective



©Note 1 Specification of motor cable
 Outer diameter : 7.5 mm
 Min. bending radius
 Conti. Flexing: 10 x outer diameter
 occasional flexing: 7,5 x outer diameter
 fixed installation: 4 x outer diameter



Pin no.	Signal	Wire no.
1	Phase U	1
2	Phase V	2
3	Phase W	3
4	FG	Green

The Mating Connector
 Cap : 350780-1
 Socket : 350536-3

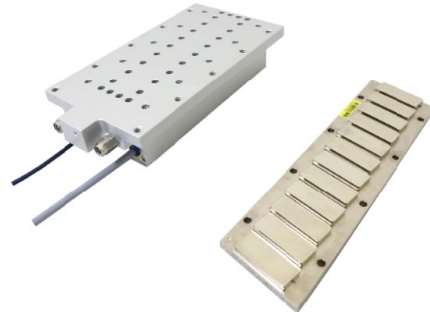
Plug : 350779-1
 Pin : 350218-3
 by Tyco Electronics AMP K.K.



Model: YA 050(B) (with Bottom-mount heat sink)

Coil model no.		Size	
		L1 (mm)	N
YAN050	C1B	227	4
	C2B	407	7

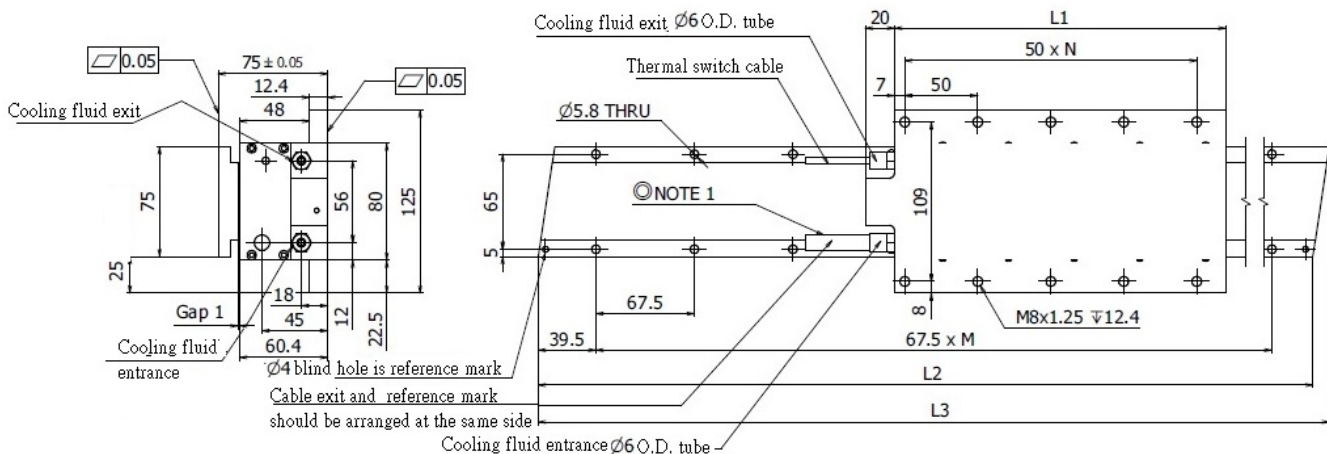
YAN: High end, YAE: Economical



Magnet Track model no.		Size		
		L2 (mm)	L3 (mm)	M
MZ050	M135	135	146.3	1
YA050	M270	270	281.3	3
	M405	405	416.3	5

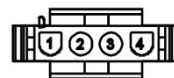
YA : machined steel base plate, High performance

MZ: diecast iron base plate, Cost effective



◎Note 1 Specification of motor cable

- Outer diameter : 7.5 mm
- Min. bending radius
- Conti. Flexing: 10 x outer diameter
- occasional flexing: 7.5 x outer diameter
- fixed installation: 4 x outer diameter



Pin no.	Signal	Wire no.
1	Phase U	1
2	Phase V	2
3	Phase W	3
4	FG	Green

The Mating Connector
Cap : 350780-1
Socket : 350536-3

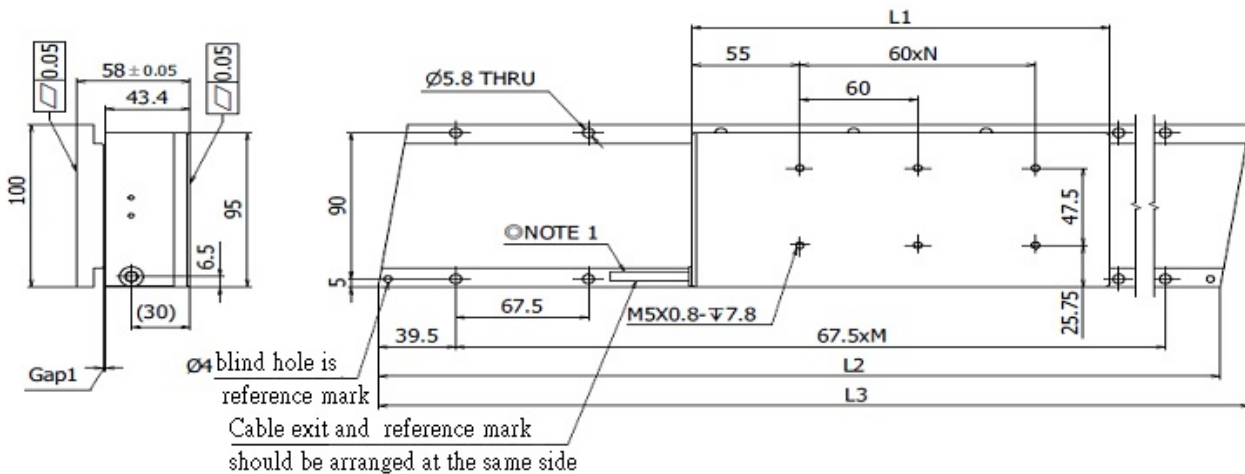
Plug : 350779-1
Pin : 350218-3
by Tyco Electronics AMP K.K.



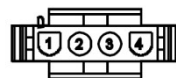
Model: YA 075(S) (Self cooling)

Coil model no.		Size	
		L1 (mm)	N
YAN075	C1S	213	2
	C2S	393	5

Magnet Track model no		Size		
		L2 (mm)	L3 (mm)	M
YA075	M135	135	150.1	1
	M270	270	285.1	3
	M405	405	420.1	5



◎Note 1 Specification of motor cable
 Outer diameter : 7 mm
 Min. bending radius
 Conti. Flexing: 10 x outer diameter
 occasional flexing: 7,5 x outer diameter
 fixed installation: 4 x outer diameter



The Mating Connector
 Cap : 350780-1
 Socket : 350536-3

Pin no.	Signal	Wire no.
1	Phase U	1
2	Phase V	2
3	Phase W	3
4	FG	Green

Plug : 350779-1
 Pin : 350218-3
 by Tyco Electronics AMP K.K.

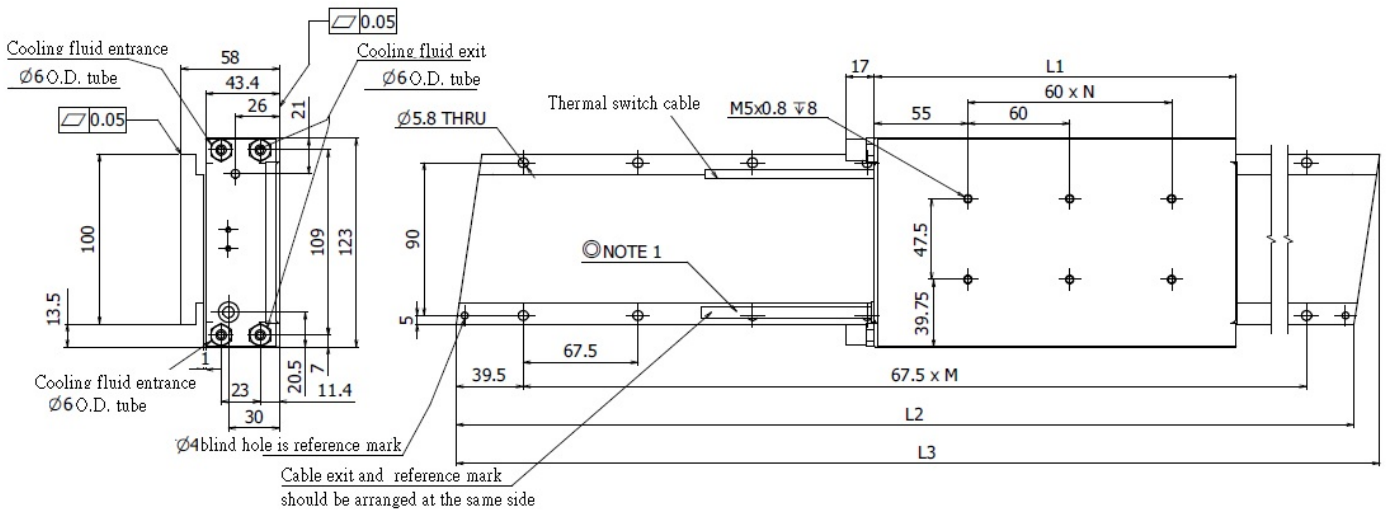


Model: YA 075(A) (with side-mount heat sink)

Coil model no.		Size	
		L1 (mm)	N
YAN075	C1A	213	2
	C2A	393	5

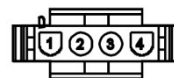


Magnet Track model no		Size		
		L2 (mm)	L3 (mm)	M
YA075	M135	135	150.1	1
	M270	270	285.1	3
	M405	405	420.1	5



◎Note 1 Specification of motor cable

Outer diameter : 8.5 mm
 Min. bending radius
 Conti. Flexing: 10 x outer diameter
 occasional flexing: 7,5 x outer diameter
 fixed installation: 4 x outer diameter



Pin no.	Signal	Wire no.
1	Phase U	1
2	Phase V	2
3	Phase W	3
4	FG	Green

The Mating Connector
 Cap : 350780-1
 Socket : 350536-3

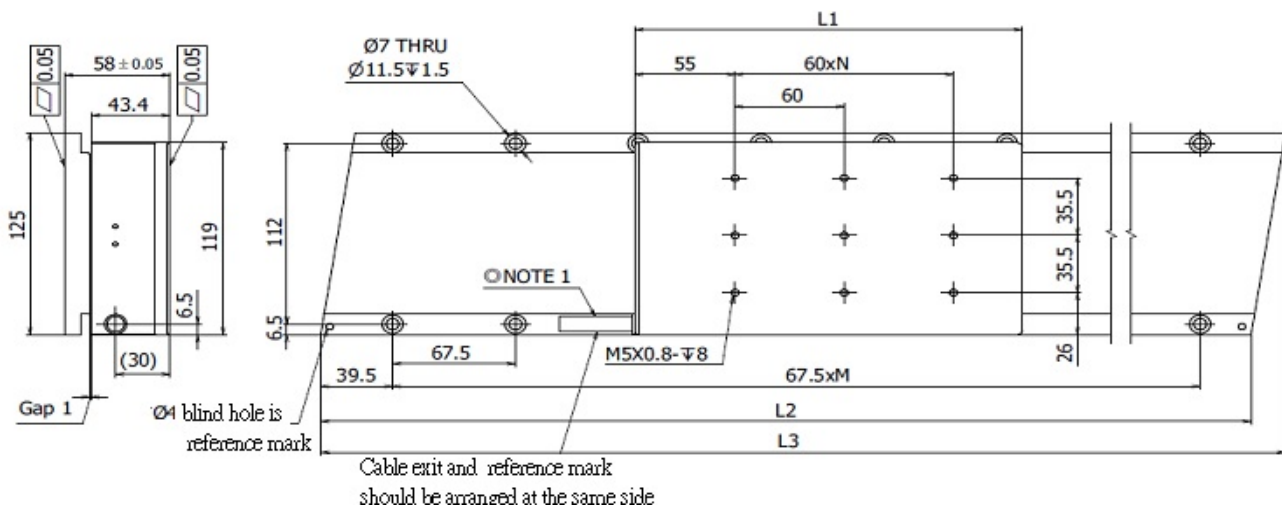
Plug : 350779-1
 Pin : 350218-3
 by Tyco Electronics AMP K.K.



Model: YA 100 (S) (Self cooling)

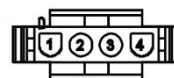
Coil model no.	Size		
	L1 (mm)	N	
YAN100	C1S	213	2
	C2S	393	5
	C3S	573	8
	C4S	753	11

Magnet Track model no	Size			
	L2 (mm)	L3 (mm)	M	
YA100	M135	135	153.9	1
	M270	270	288.9	3
	M405	405	423.9	5



◎Note 1 Specification of motor cable

Outer diameter : 8.5 mm
 Min. bending radius
 Conti. Flexing: 10 x outer diameter
 occasional flexing: 7,5 x outer diameter
 fixed installation: 4 x outer diameter



Pin no.	Signal	Wire no.
1	Phase U	1
2	Phase V	2
3	Phase W	3
4	FG	Green

The Mating Connector
 Cap : 350780-1
 Socket : 350536-3

Plug : 350779-1
 Pin : 350218-3
 by Tyco Electronics AMP K.K.

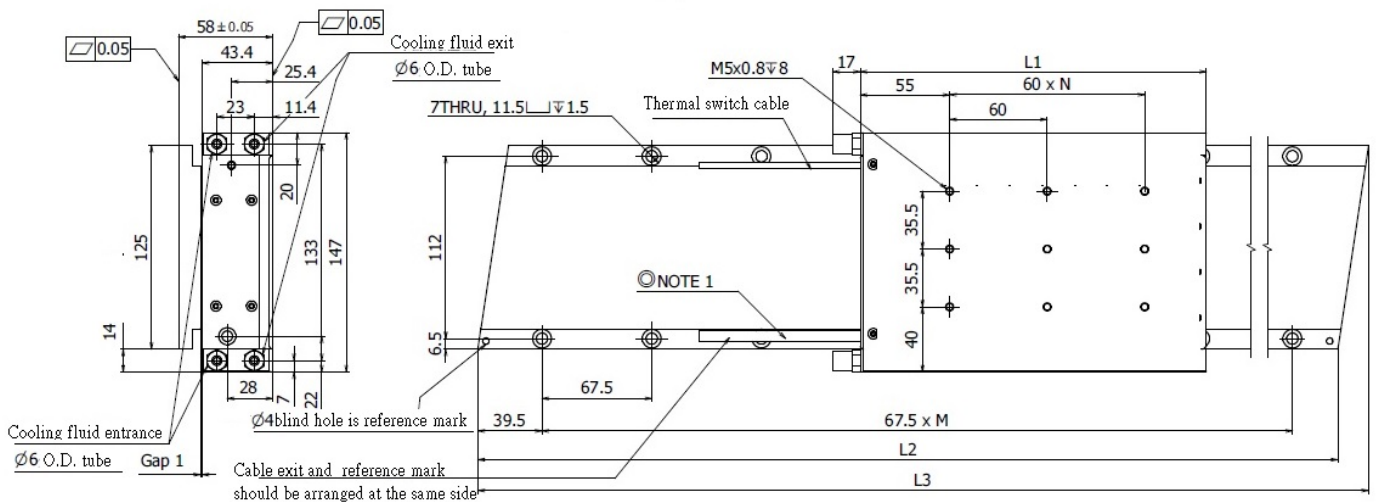


Model: YA 100 (A) (with side-mount heat sink)

Coil model no.	Size		
	L1 (mm)	N	
YAN100	C1A	213	2
	C2A	393	5

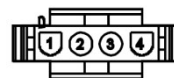


Magnet Track model no	Size			
	L2 (mm)	L3 (mm)	M	
YA 100	M135	135	153.9	1
	M270	270	288.9	3
	M405	405	423.9	5



⊙Note 1 Specification of motor cable

Outer diameter : 9 mm
 Min. bending radius
 Conti. Flexing: 10 x outer diameter
 occasional flexing: 7,5 x outer diameter
 fixed installation: 4 x outer diameter



Pin no.	Signal	Wire no.
1	Phase U	1
2	Phase V	2
3	Phase W	3
4	FG	Green

The Mating Connector
 Cap : 350780-1
 Socket : 350536-3

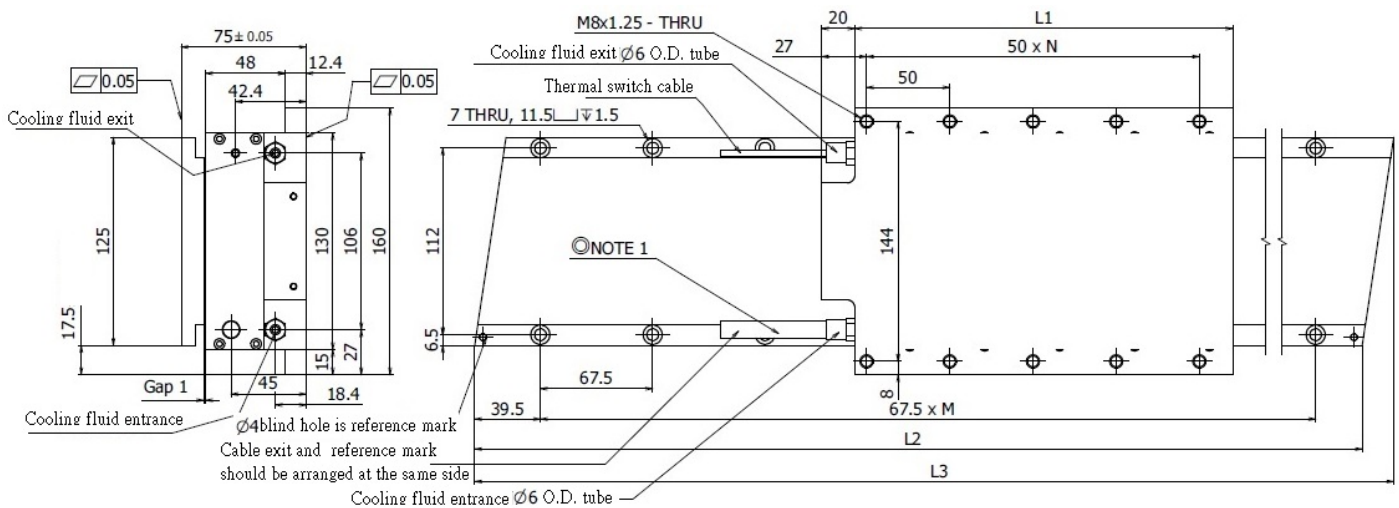
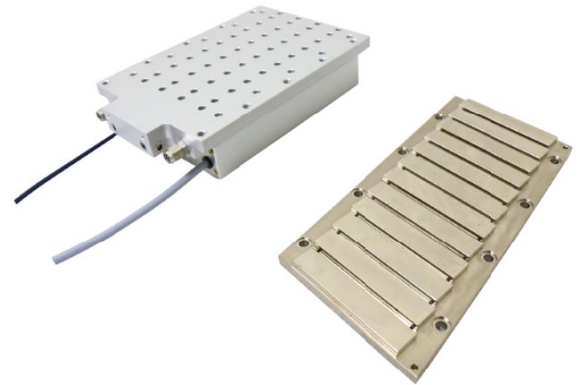
Plug : 350779-1
 Pin : 350218-3
 by Tyco Electronics AMP K.K.



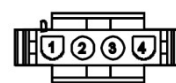
Model: YA 100 (B) (with Bottom-mount heat sink)

Coil model no.		Size	
		L1 (mm)	N
YA 100	C1B	227	3
	C2B	407	7
	C3B	587	11
	C4B	767	15

Magnet Track model no		Size		
		L2 (mm)	L3 (mm)	M
YA 100	M135	135	153.9	1
	M270	270	288.9	3
	M405	405	423.9	5



◎Note 1 Specification of motor cable
 Outer diameter : 9 mm
 Min. bending radius
 Conti. Flexing: 10 x outer diameter
 occasional flexing: 7,5 x outer diameter
 fixed installation: 4 x outer diameter



Pin no.	Signal	Wire no.
1	Phase U	1
2	Phase V	2
3	Phase W	3
4	FG	Green

The Mating Connector
 Cap : 350780-1
 Socket : 350536-3

Plug : 350779-1
 Pin : 350218-3
 by Tyco Electronics AMP K.K.

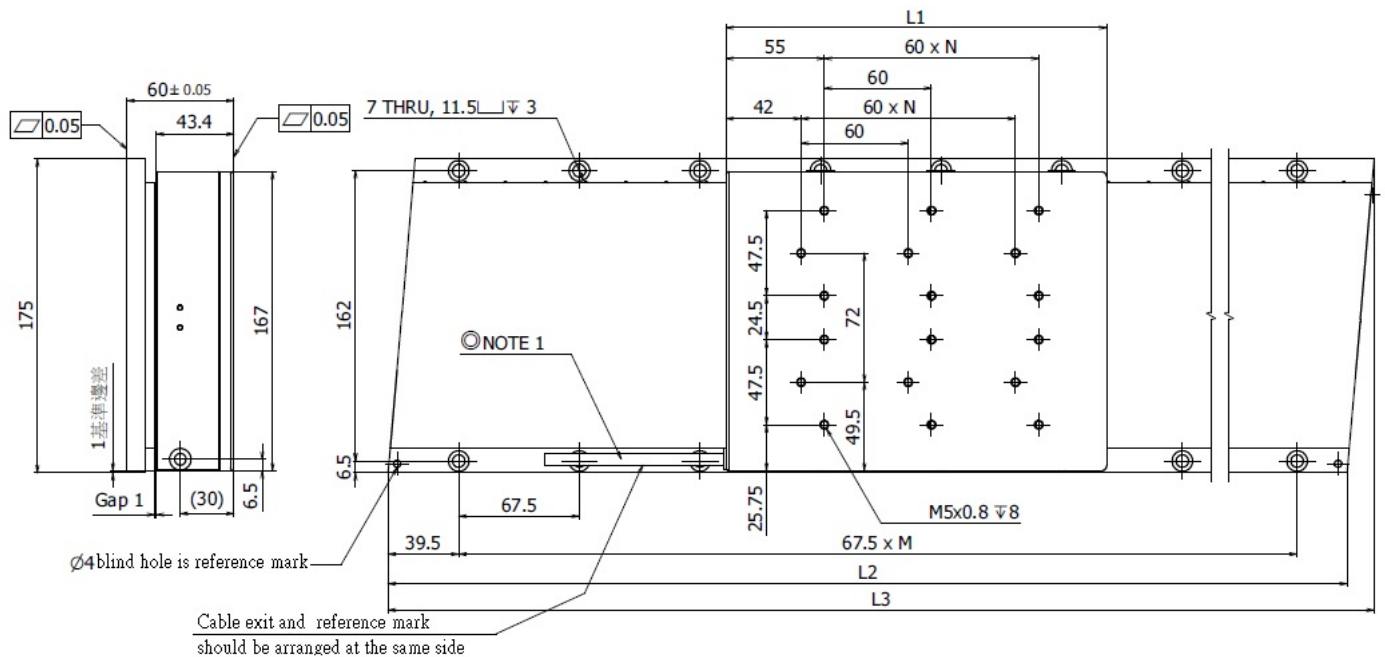


Model: YA 150 (S) (Self cooling)

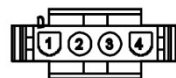
Coil model no.		Size	
		L1 (mm)	N
YA 150	C1S	213	2
	C2S	393	5
	C3S	573	8



Magnet Track model no		Size		
		L2 (mm)	L3 (mm)	M
YA 150	M135	135	150.1	1
	M270	270	285.1	3
	M405	405	420.1	5



◎Note 1 Specification of motor cable
 Outer diameter : 9 mm
 Min. bending radius
 Conti. Flexing: 10 x outer diameter
 occasional flexing: 7,5 x outer diameter
 fixed installation: 4 x outer diameter



Pin no.	Signal	Wire no.
1	Phase U	1
2	Phase V	2
3	Phase W	3
4	FG	Green

The Mating Connector
 Cap : 350780-1
 Socket : 350536-3

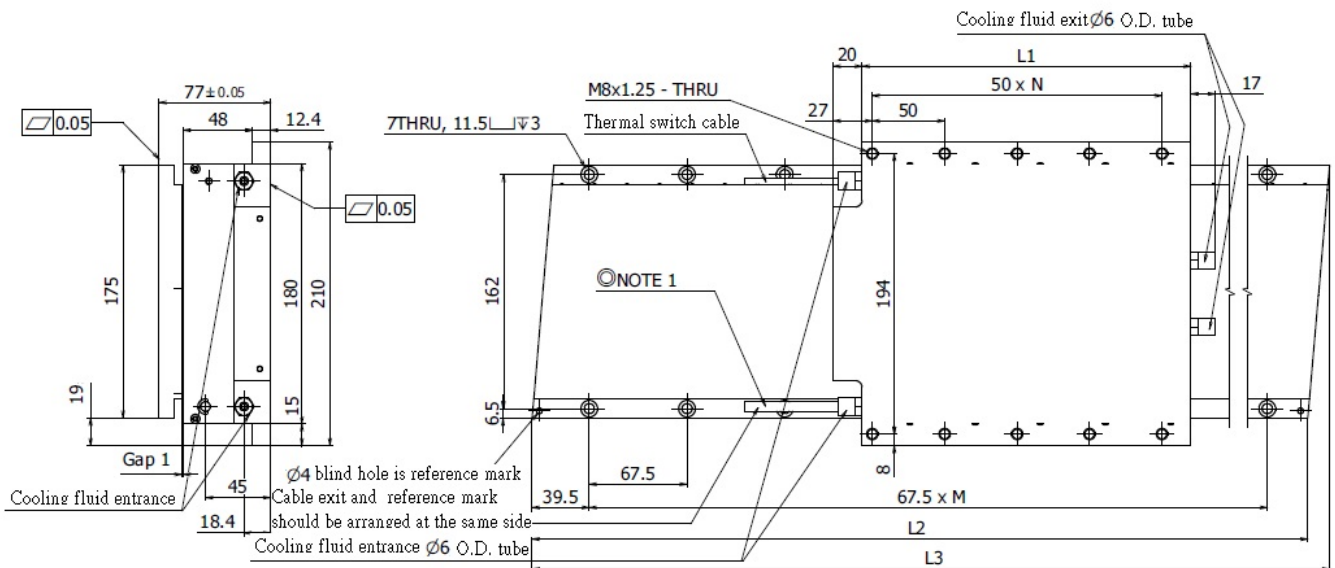
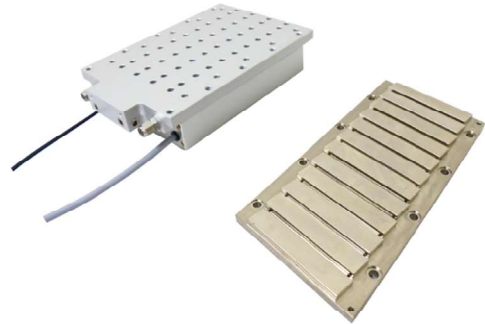
Plug : 350779-1
 Pin : 350218-3
 by Tyco Electronics AMP K.K.



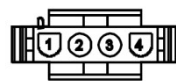
Model: YA 150 (B) (with Bottom-mount heat sink)

Coil model no.		Size	
		L1 (mm)	N
YA 150	C1B	227	3
	C2B	407	7
	C3B	587	11

Magnet Track model no		Size		
		L2 (mm)	L3 (mm)	M
YA 150	M135	135	150.1	1
	M270	270	285.1	3
	M405	405	420.1	5



©Note 1 Specification of motor cable
 Outer diameter : 9 mm
 Min. bending radius
 Conti. Flexing: 10 x outer diameter
 occasional flexing: 7,5 x outer diameter
 fixed installation: 4 x outer diameter



The Mating Connector
 Cap : 350780-1
 Socket : 350536-3

Pin no.	Signal	Wire no.
1	Phase U	1
2	Phase V	2
3	Phase W	3
4	FG	Green

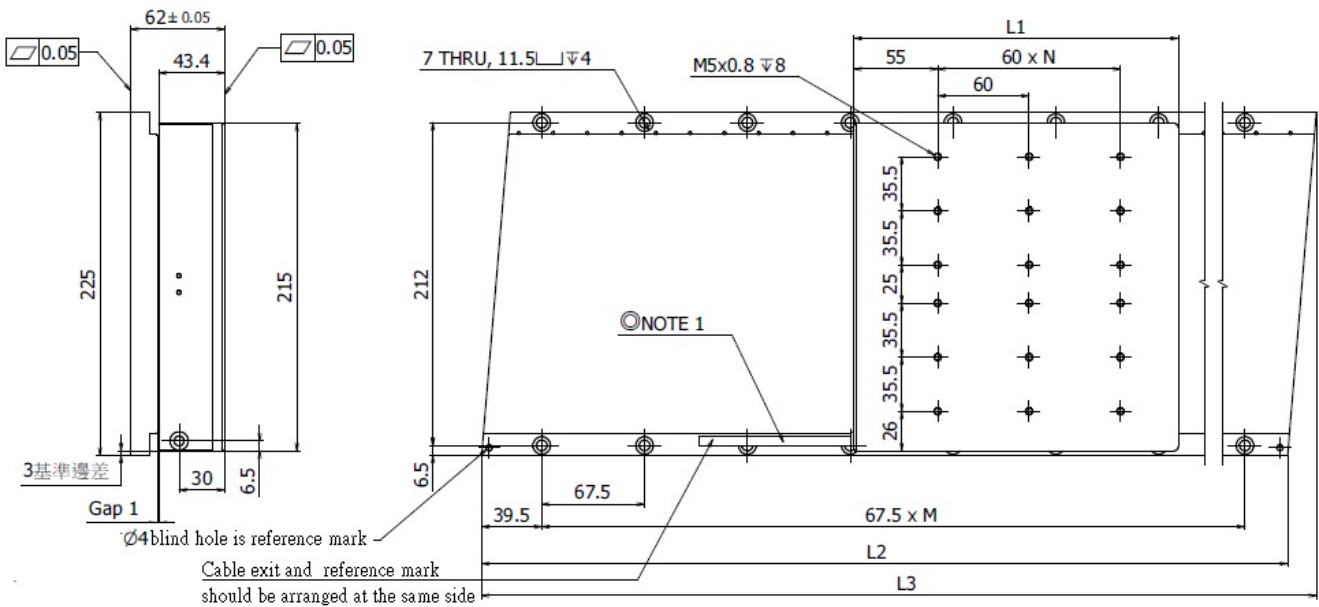
Plug : 350779-1
 Pin : 350218-3
 by Tyco Electronics AMP K.K.



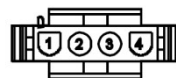
Model: YA 200 (S) (Self cooling)

Coil model no.		Size	
		L1 mm	N
YA 200	C1S	213	2
	C2S	393	5
	C3S	573	8

Magnet Track model no.		Size		
		L2 mm	L3 mm	M
YA 200	M135	135	288.9	1
	M270	270	423.9	3
	M405	405	693.9	5



◎Note 1 Specification of motor cable
 Outer diameter : 9 mm
 Min. bending radius
 Conti. Flexing: 10 x outer diameter
 occasional flexing: 7,5 x outer diameter
 fixed installation: 4 x outer diameter



Pin no.	Signal	Wire no.
1	Phase U	1
2	Phase V	2
3	Phase W	3
4	FG	Green

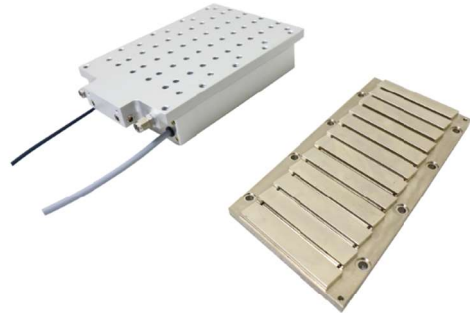
The Mating Connector
 Cap : 350780-1
 Socket : 350536-3

Plug : 350779-1
 Pin : 350218-3
 by Tyco Electronics AMP K.K.

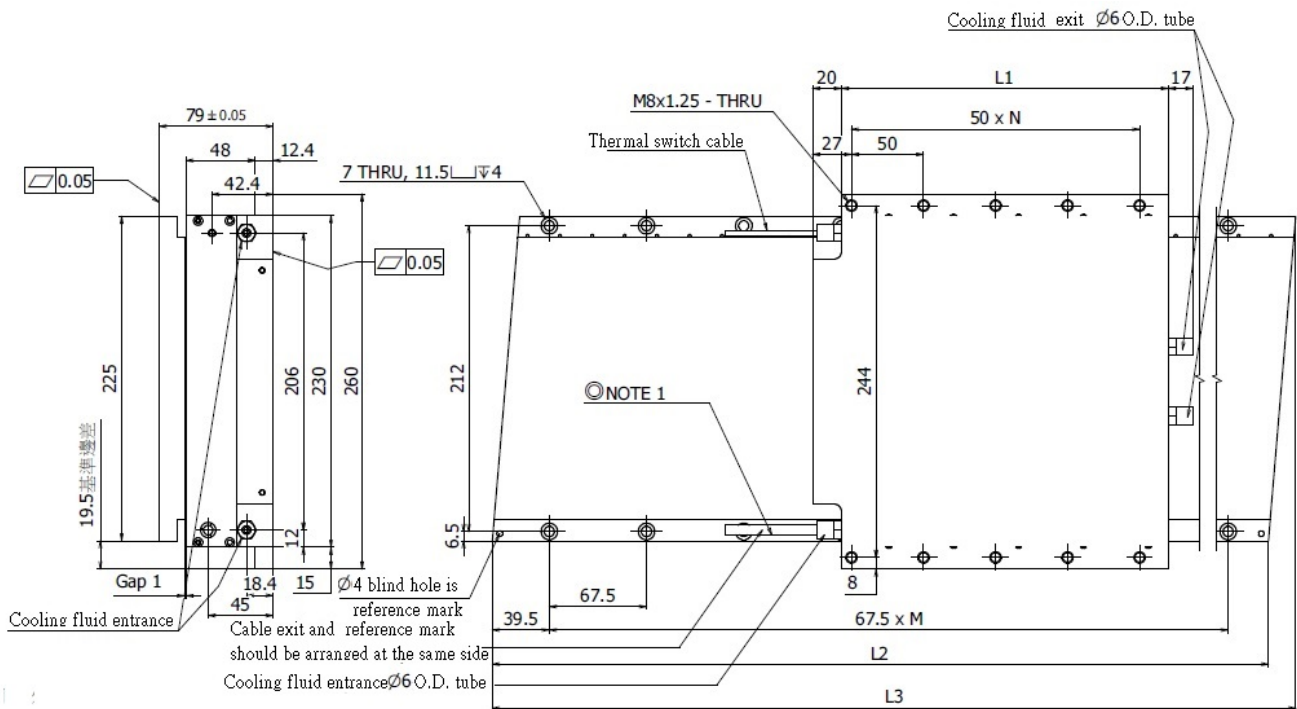


Model: YA 200 (B) (with Bottom-mount heat sink)

Coil model no.		Size	
		L1 mm	N
YA 200	C1B	227	3
	C2B	407	7
	C3B	587	11

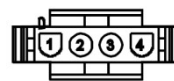


Magnet Track model no.		Size		
		L2 mm	L3 mm	M
YA 200	M135	135	288.9	1
	M270	270	423.9	3
	M405	405	693.9	5



◎Note 1 Specification of motor cable

Outer diameter : 10 mm
 Min. bending radius
 Conti. Flexing: 10 x outer diameter
 occasional flexing: 7,5 x outer diameter
 fixed installation: 4 x outer diameter



Pin no.	Signal	Wire no.
1	Phase U	1
2	Phase V	2
3	Phase W	3
4	FG	Green

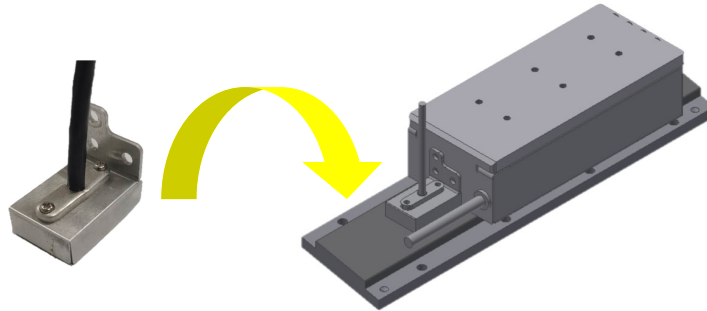
The Mating Connector
 Cap : 350780-1
 Socket : 350536-3

Plug : 350779-1
 Pin : 350218-3
 by Tyco Electronics AMP K.K.

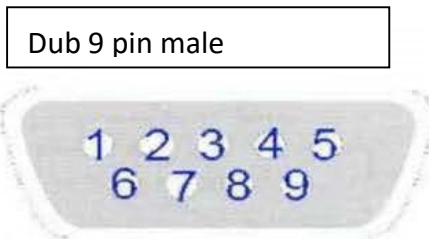


● HALL SENSOR

YAN and YAE series of motor can be equipped with hall sensor for commutation. YA013 to YA049 use UVW27, and YA050 to YA200 use UVW45. Those hall sensor can be mounted to the front of the moving coil by two M3x5 screws without additional fixing parts.



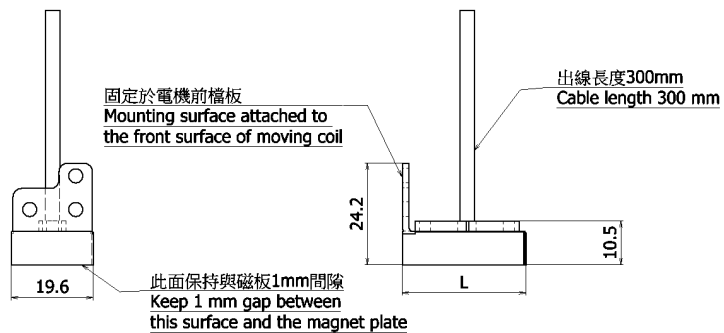
Pin definition



Pin No.	Function
1	5V
2	U
3	V
4	W
5	0V

Dimensions

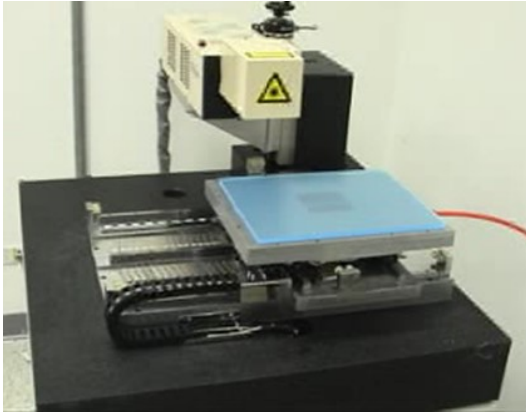
L	mm
UVW27	30
UVW45	37





●Reference

1.Laser drill stage for back light module

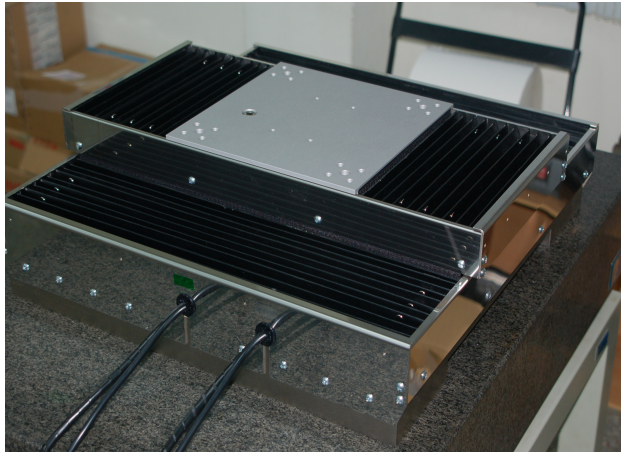


ITEM		X axis (up)	Yaxis(down)	Z axis
Stroke	Effective (mm)	310	310	
	Maximal (mm)	320	320	
Resolution (um)		0.1	0.1	
Straightness (um)		<1	<1	
Flatness (um)		<5	<5	
XYZ squareness (um)		<3		
Repeatability (um)		+/- 0.2	+/- 0.2	
Accuracy (um) (after laser calibration)		< 1	< 1	
Maximal speed (m/sec)		1.8	1.8	
Maximal Acc. (G)		2	2	

- The up axis and down axis are stacked with a very low profile design. The distance between working surface of up axis and linear guide mounting surface of down axis is only 100 mm.
- Wide span design of down axis together with driven by dual linear motors eliminates resonance in yaw direction due to gravity center change of up axis.
- The stage employs a bottom base made of cast iron to absorb vibration.
- Ultra-low cogging force linear motors are employed.



2. Ultra-precision Laser drill stage for Wafer Probe Card



高分子材料雷射鑽孔 Polymer Laser Drilling

雷射加工於 Probe Card 的另一項運用，係在 高分子材料上以紫外光雷射鑽孔，利用紫外光雷射剝離 (laser ablation) 的特性，具備高解析度及低熱效應的加工製程，製作更細微的孔徑、更小的孔徑間距，目前也已穩定量產。

適用材料：PI、Mylar、Kapton、Polyimide 等材料

鑽切厚度：0.15mm 以下

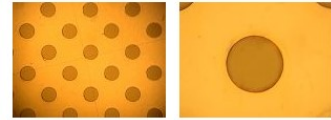
加工孔徑：10 μ m 以上

錐度：5 度

加工精度：孔徑 $\pm 1\mu$ m

位置精度：5 μ m 以內

加工面積：150mm*150mm

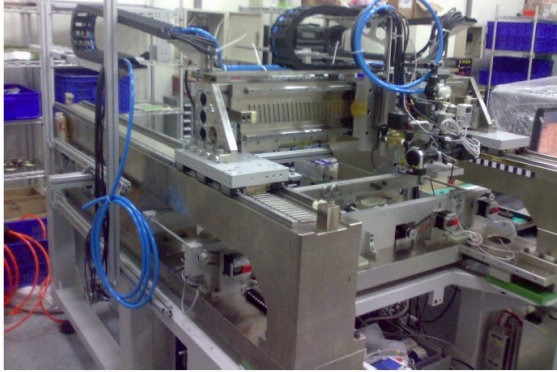


ITEM		X axis (up)	Y axis (down)	Z axis
Stroke	Effective (mm)	150	150	
	Maximal (mm)	160	160	
Resolution (um)		0.05	0.05	
Straightness (um)		<1	<1	
Flatness (um)		<5	<5	
XYZ squareness (um)		<2		
Repeatability (um)		+/- 0.1	+/- 0.1	
Accuracy (um) (with laser calibration)		< 1	< 1	
Maximal speed (m/sec)		0.8	0.8	
Maximal Acc. (G)		2	2	

- The up axis and down axis are stacked with a very low profile design. The distance between working surface of up axis and linear guide mounting surface of down axis is only 100 mm.
- Wide span design of down axis together with driven by dual linear motors eliminates resonance in yaw direction due to gravity center change of up axis.
- The stage employs a bottom base made of cast iron to absorb vibration.
- Built-in cable chain and fully covered bellow to improve protection grade.
- Ultra-low cogging force linear motors are employed.



3. Gantry stage for cell phone PCB remounting



ITEM		X axis (up)	Yaxis(down)	Z axis
Stroke	Effective (mm)	700	1500	
	Maximal (mm)	750	1550	
Resolution (um)		0.5	0.5	
Straightness (um)		<3	<3	
Flatness (um)		<9	<9	
XYZ squareness (um)		<5		
Repeatability (um)		+/- 1	+/- 1	
Accuracy (um) (with laser calibration)		< 5	< 5	
Maximal speed (m/sec)		2.5	2.5	
Maximal Acc. (G)		2.5	2.5	

- Dual linear motors, dual linear scales and dual drivers are employed to realize high speed/acceleration gantry system.
- X axis uses composite material to reduce weight and increase rigidity.
- M-shape bottom base made of cast iron is used to absorb vibration.
- Ultra-low cogging force linear motors are employed.



4. XY high-speed stage for SMD steel plate laser cutting machine



ITEM		X axis (up)	Yaxis(down)	Z axis
Stroke	Effective (mm)	600	600	
	Maximal (mm)	620	620	
Resolution (um)		0.5	0.5	
Straightness (um)		<2	<2	
Flatness (um)		<9	<9	
XYZ squareness (um)		<5		
Repeatability (um)		+/- 1.5	+/- 1.5	
Accuracy (um) (with laser calibration)		< 5	< 5	
Maximal speed (m/sec)		2	2	
Maximal Acc. (G)		2	2	

- The linear guides of X and Y axes are arranged on the same plane to enhance fast settling and trajectory tracking.
- The up axis and down axis are stacked with a very low profile design.
The distance between working surface of up axis and linear guide mounting surface of down axis is only 60 mm.
- The stage employs a bottom base made of cast iron to absorb vibration.
- Built-in cable chain and fully covered bellow to improve protection grade.
- ◆ Ultra-low cogging force linear motors are employed.



5. XYZ precision stage for optical lens dispenser on LED wafer

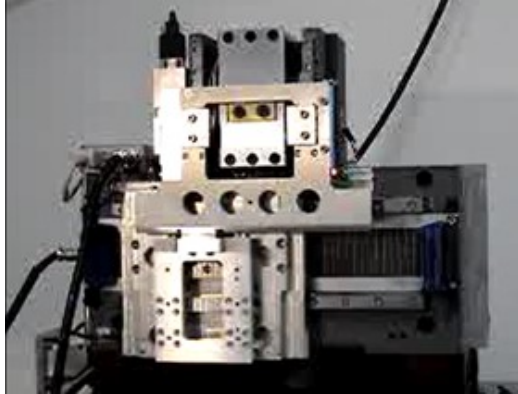


ITEM		X axis (up)	Yaxis(down)	Z axis
Stroke	Effective (mm)	150	150	50
	Maximal (mm)	158	158	58
Resolution (um)		0.05	0.05	0.05
Straightness (um)		<2	<1	<1
Flatness (um)		<1	<2	<2
XYZ squareness (um)		<2	<2	
Repeatability (um)		+/- 0.1	+/- 0.1	+/- 0.1
Accuracy (um) (with laser calibration)		< 1	< 1	< 1
Maximal speed (m/sec)		0.8	0.8	0.8
Maximal Acc. (G)		2	2	2

- X and Y axes are arranged to move separately, while the Z axis is stacked on the top X axis.
- Moving magnet is employed so that there is no moving cable for this system.
- Built-in cable chain and fully covered bellow to improve protection grade.
- ◆ Ultra-low cogging force linear motors are employed.



6. YZ high-speed stage for die bonder



ITEM	X axis (up)	Yaxis(down)	Z axis
Stroke	Effective (mm)	150	50
	Maximal (mm)	160	58
Resolution (um)		1	1
Straightness (um)		<2	<2
Flatness (um)		<5	<5
XYZ squareness (um)		<5	
Repeatability (um)		+/- 2	+/- 2
Accuracy (um) (with laser calibration)		< 1	< 1
Maximal speed (m/sec)		4	4
Maximal Acc. (G)		7	7

- Y and Z axes are decoupled to move so that the payload for both axes are the same to achieve the same bandwidth.
- Moving magnet is employed so that there is no moving cable for this system.
- The stage employees a bottom base made of cast iron to absorb vibration.
- ◆ Ultra-low cogging force linear motors are employed.



7. Precision stage for submicron EDM

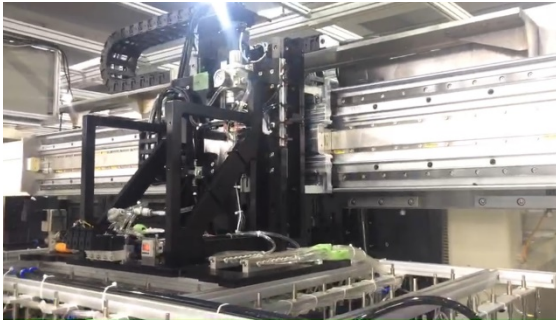


ITEM		X axis (up)	Yaxis(down)	Z axis
Stroke	Effective (mm)	150	150	
	Maximal (mm)	160	160	
Resolution (um)		0.02	0.02	
Straightness (um)		<1	<1	
Flatness (um)		<5	<5	
XYZ squareness (um)		<3		
Repeatability (um)		+/- 0.05	+/- 0.05	
Accuracy (um) (with laser calibration)		< 0.5	< 0.5	
Maximal speed (m/sec)		1	1	
Maximal Acc. (G)		3	3	

- The up axis and down axis are stacked with a very low profile design. The distance between working surface of up axis and linear guide mounting surface of down axis is only 100 mm.
- Wide span design of down axis together with driven by dual linear motors eliminates resonance in yaw direction due to gravity center change of up axis.
- Built-in cable chain and blind path cover to improve protection grade.
- Ultra-low cogging force linear motors are employed.



8. Long stroke positioning module for LCD panel handler



ITEM		X axis
Stroke	Effective (mm)	6000
	Maximal (mm)	6100
Resolution (um)		1
Straightness (um)		<15
Flatness (um)		<30
Repeatability (um)		+/- 3
Accuracy (um) (with laser calibration)		< 5
Maximal speed (m/sec)		5
Maximal Acc. (G)		2

- Scaleless position encoder is employed to ease installation.
- Extremely low cogging linear motor is used to minimize speed ripple.



9. Long stroke positioning module for outdoor banner printer

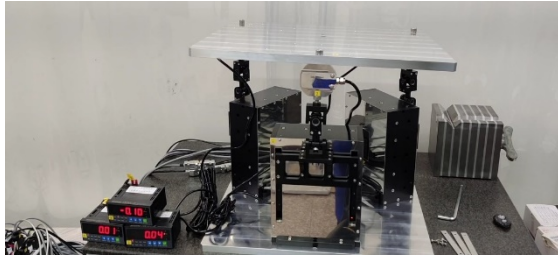


ITEM	X axis	
Stroke	Effective (mm)	5000
	Maximal (mm)	5100
Resolution (um)		1
Straightness (um)		<15
Flatness (um)		<30
Repeatability (um)		+/- 3
Accuracy (um) (with laser calibration)		< 5
Maximal speed (m/sec)		5
Maximal Acc. (G)		2

- Scaleless position encoder is employed to ease installation.
- Extremely low cogging linear motor is used to minimize speed ripple.



10. Z-Pitch-Roll positioning module with force feedback for wafer bonding



ITEM		Z axis
Stroke	Effective (mm)	25
	Maximal (mm)	20
Resolution (um)		0.02
Straightness (um)		<1
Flatness (um)		<2
Repeatability (um)		+/- 0.2
Accuracy (um) (with laser calibration)		< 2
Maximal speed (m/sec)		0.3
Maximal Acc. (G)		2

- Z-pitch-roll 3DOF motion is realized with 3 Z axis together with 3 universal bearing.
- Each axis equipped with load cell for real-time force feedback to equalize the pressure of the whole surface.
- Extremely low cogging linear motor is used to minimize speed ripple.



11. Air-bearing positioning stage for magnetic field measurement system of NSRRC

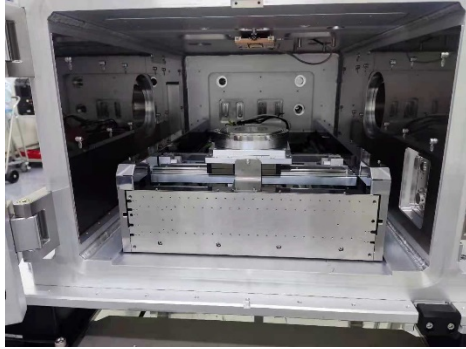


ITEM	Z axis	
Stroke	Effective (mm)	5000
	Maximal (mm)	5200
Resolution (um)	0.02	
Straightness (um)	<1	
Flatness (um)	<1	
Repeatability (um)	+/- 0.1	
Accuracy (um) (with laser calibration)	<0.5	
Maximal speed (m/sec)	0.5	
Maximal Acc. (G)	1	

- Air bearing is used to achieve long stroke precision motion.
- Extremely low cogging linear motor is used to minimize speed ripple.
- Symmetrical cable chains is designed to cancel out the bending force from cables.



12. Ultra precision positioning stage for E-beam inspector



ITEM		X axis	Y axis	R axis
Stroke	Effective (mm)	310	450	360 degree
	Maximal (mm)	320	460	360 degree
Resolution (um)		0.02	0.02	0.1 arcsec
Straightness (um)		<1	<1	<1 (同心度)
Flatness (um)		<3	<3	<1
Repeatability (um)		+/- 0.3	+/- 0.3	+/- 0.5 arcsec
Accuracy (um) (with laser calibration)		<0.5	<0.5	<2 arcsec
Maximal speed (m/sec)		0.4	0.4	15 rpm
Maximal Acc. (G)		1.5	1.5	1

- All motor windings are stationary so that the heat can be dissipated to the frame of vacuum chamber.
- Extremely low cogging linear motor is used to minimize speed ripple.
- High vacuum compatible to 10 e-7 Torr.



13. Ultra precision positioning stage for line-scan wafer inspector



ITEM		X axis	Y axis
Stroke	Effective (mm)	390	390
	Maximal (mm)	400	400
Resolution (um)		0.02	0.02
Straightness (um)		<1	<1
Flatness (um)		<3	<3
Repeatability (um)		+/- 0.1	+/- 0.1
Accuracy (um) (with laser calibration)		<0.5	<0.5
Maximal speed (m/sec)		0.4	0.4
Maximal Acc. (G)		1.5	1.5

- Special linear guide arrangement leads to excellent speed stability <math><0.2\text{mm/s}</math> @ 250 mm/s (0.08%)
- Extremely low cogging linear motor is used to minimize speed ripple.
- Black anodizing surface treatment to reduce reflection light interference.



14. Gantry stage with carbon fiber moving beam for laser cutting machine



ITEM		X axis	Y axis
Stroke	Effective (mm)	850	1600
	Maximal (mm)	900	1650
Resolution (um)		1	1
Straightness (um)		<3	<3
Flatness (um)		<10	<10
Repeatability (um)		+/- 3	+/- 3
Accuracy (um) (with laser calibration)		<5	<5
Maximal speed (m/sec)		5	5
Maximal Acc. (G)		6	6

- Carbon fiber low weight moving beam (1.2m / 42kg) is employed to achieve 6G acceleration gantry system.
- Extremely low cogging linear motor is used to minimize speed ripple.
- Black anodizing surface treatment to reduce reflection light interference.