"中文版"請參閱背面

Installation and Safety Guide
LMT Series Linear Motor

Thank you for choosing HIWIN linear motor product. Read and understand the motor specification, the user manual, and the Safety/Warning Notice statements before installing and using the product.

Safety symbols

Caution	Risk of electric shock	Caution, strong magnetic field	Caution, hot surface	Don't Touch
				

★ Precautions and Warning

1. Before using this product, be sure to read and understand the user manual. Strictly adhere to the statements given in the manual. HIWIN is not responsible for any damage, accident, or injury caused by incorrect handling.
2. Before installing and operating this product, perform cosmetic inspection. If any signs of damaged, please contact HIWIN customer service or local agent.
3. The product designs are based on structural calculations, computer simulations and experimental testing. Do not disassemble or modify product by oneself without permission from HIWIN.
4. Do not install forcer assembly, before you ensure that the power has been disconnected, otherwise there is risk of electrical shock.
5. The magnetic attraction between the magnet and other magnetic or ferrous materials is extremely high. Keep fingers and other body parts away that are wearing magnetic objects (steel objects) from the stators to avoid injury by the magnetic attraction.
6. Keep out of reach of children from handling this product.
7. Anyone with a pacemaker or A.I.C.D. is prohibited to use this product.

★ User Guide Criteria

1. Stator assembly has strong magnet field, be sure to handle with care.
2. Put warning labels on the top surface of stator assembly for reminder of magnetic dangers.
3. Keep magnetic storage media or precision instrument away from the product to avoid damage caused by magnetic fields. (i.e. magnet scale, watch, credit card and magnetic response device).
4. During assembly of stator to system structure, keep any magnetic material at a distance.
5. During assembly, avoid using magnetic tools and screws.
6. Do not bend or damage the cables of forcer assembly.
7. Do not run the continuous current of forcer higher than specified in datasheet.
8. Be sure to confirm that there is no interference with other components in operation. And confirm that the cable bending radius is large enough to prevent reducing the life of the cables.
9. When abnormal smell, noise, smoke and vibration is detected, press emergency stop button and turn off power.
10. The product can only be repaired by HIWIN engineers. Please send the product back to HIWIN if there is any unusual phenomenon.
11. A one year guarantee is provided from the date of delivery. HIWIN will not be held responsible for replacing or maintaing product which has been incorrectly handled (please refer to the notes and instructions in the operation manual) or damage from natural disasters.
12. Do not touch the forcer or stator during operation.
13. Operate within specified temperature range.
14. After finishing operation, allow forcer to cool down sufficiently (in a 25℃ room temperature) before working around the product, to avoid getting burned.

1- Mechanism interface accuracy

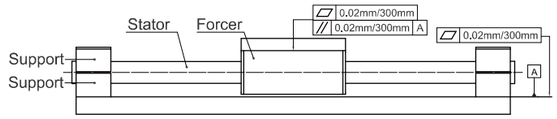


Fig1. Installation interface geometric tolerance

1-1 Flatness on datum plane A, beneath the clamp stator plate, is recommended to be within 0.02mm/300mm. (Reference Fig1)

1-2 Flatness on the forcer installation interface is recommended to be within 0.02mm/300mm ; Also, it is recommended that forcer installation interface is parallel within 0.02mm/300mm relative to datum plane A. (Reference Fig 1)

1-3 It is highly recommended to design the shaft support as a V-shape clamp. (Reference Fig 2)

Fig2. Support design

1-4 The length L1 of the shaft support used to clamp stator will vary depending on stroke length. (Please refer to Appendix A)

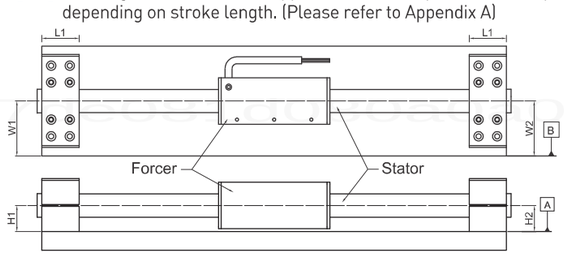


Fig3. Stator assembly dimension

1-5 Both dimensions H1 and H2 are the height from datum plane A to stator center axis. After stator is assembled, it is recommended that the height difference between H1 and H2 must be less than 0.2mm. Both the dimensions W1 and W2 are the width that is from datum plane B to stator center axis. After stator is assembled, it is recommended that the width difference between W1 and W2 must be less than 0.2mm. $|H1-H2| \leqq 0.2mm$; $|W1-W2| \leqq 0.2mm$. (Reference Fig 3)

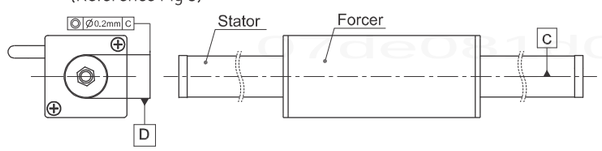


Fig4. Geometric tolerance of stator and forcer installation height

1-6 Datum axis C and D are stator center and forcer center axis respectively. After installing stator and forcer, datum axis D must be concentric within 0.2mm relative to datum axis C. (Reference Fig 4)

1-7 Please keep in mind the gap (G) between stator and forcer during assembly because dimension G could directly affects motor performance and reliability. (Regarding dimension G and D1, please refer to Appendix B and Fig 5)

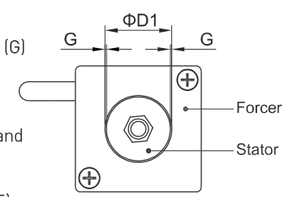
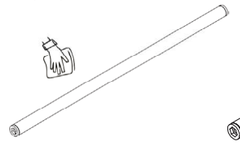


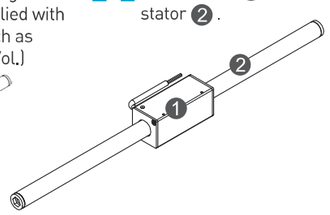
Fig5. Forcer and stator assembly dimensions

2- Installation step

2-1 Clean stator surface by using disposable cotton rags applied with allowed cleaning liquid such as isopropanol alcohol (95% Vol.)

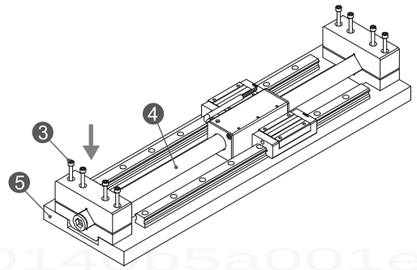


2-2 Insert forcer ❶ into stator ❷.



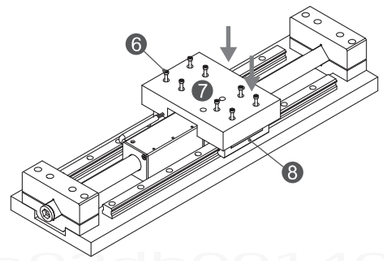
2-3 Mount stator ❹ onto shaft support ❺ with screws ❸, and measure height difference to make sure that it is less than 0.2mm after installing stator to shaft support.

⚠ Please refer to **1-5**. After installation, height and width difference must be less than 0.2mm.
Regarding screw torque to assemble forcer and stator, please refer to Appendix C.



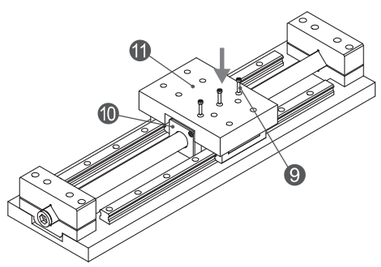
2-4 Mount forcer plate ❼ onto guide block ❽ with screws ❻.

⚠ Regarding screw torque to assemble forcer and stator, please refer to Appendix C.

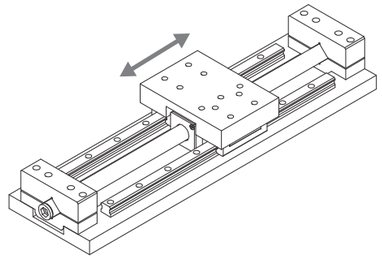


2-5 Use screws ❾ to install forcer ❿ onto forcer plate ⓫.

⚠ Please refer to **1-6** after assembling forcer and stator, forcer center axis must be concentric with stator center axis.
Please refer to **1-7** after assembling forcer and stator, please note air gap between forcer and stator.
Regarding screw torque to assemble forcer and stator, please refer to Appendix C



2-6 After finishing installation, please make sure there's no interference issue between forcer and stator.



Regarding screws depth and pitch, please refer to Catalog.

★ APPENDIX A

Model	LMT2D/LMT2T/LMT2Q		
Stroke S (mm)	50~350	400~800	850~1050
L1 (mm)	25	40	60
Model	**LMT6D/LMT6T/LMT6Q**		
Stroke S (mm)	100~350	400~800	850~1050
L1 (mm)	25	40	60
Model	**LMTA2/LMTA3/LMTA4**		
Stroke S (mm)	100~300	350~700	750~1550
L1 (mm)	25	40	60
Model	**LMTB2/LMTB3/LMTB4**		
Stroke S (mm)	100~700	750~1300	1350~1550
L1 (mm)	50	70	100
Model	**LMTC2/LMTC3/LMTC4**		
Stroke S (mm)	100~750	800~1500	1550~2000
L1 (mm)	50	70	100
Model	**LMTD2/LMTD3/LMTD4**		
Stroke S (mm)	100~550	600~1000	1050~3000
L1 (mm)	60	80	100

★ APPENDIX B

Model	Size (mm)	
	ΦD1	G
LMT2	13	0.25~0.50
LMT6	16	0.25~0.50
LMTA	21.5	0.375~0.75
LMTB	26.5	0.375~0.75
LMTC	37	0.50~1.00
LMTD	45.6	0.725~1.45

★ APPENDIX C

Table of screw torques for forcer and stator assembly (Refer DIN912) Bolt strength class12.9

Screw size	Torque(kgf-cm)
M3x0.5P	15.3
M4x0.7P	36.7
M5x0.8P	70.6
M6x1.0P	124
M8x1.25P	301

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Please refer to the other side for English version

無鐵心式LMT線性馬達安全注意事項

特別感謝您選購本公司無鐵心式線性馬達，請您於操作線性馬達前須對馬達規格及操作使用手冊充分了解，並詳細閱讀本安全預防措施。

安全符號				
				
注意	小心觸電	強磁	表面高溫	請勿觸摸

★ 使用前注意事項

1. 使用本產品前，請務必詳閱本使用手冊，未遵照本注意事項之規定安裝方式者，本公司不負任何可能造成之損壞、意外或傷害之責任。
2. 請於安裝或使用本產品前，先確實檢查外觀是否有破損或毀壞，若有任何破損情形，請立即與本公司人員或經銷商聯絡。
3. 請勿自行拆解或改裝本產品。本公司產品均經過結構運算、電腦模擬及實體測試，故請勿在未徵求專業人員同意之前，自行拆解或改裝本產品。

4. 安裝動子組合禁止連接電源裝置，導致觸電受衝擊。

5. 強磁吸力危險，避免手持或身上導磁材料接觸定子組合造成受傷。

6. 兒童需被管理者監督以避免接觸本產品。
7. 裝有心臟節律器，禁止使用本產品。

★ 安全使用規範

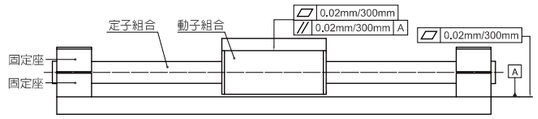
1. 定子組合具有強大的磁場，使用上必須小心。
2. 定子組合強磁標籤朝上。
3. 磁性資料存取裝置和精密機械儀器等，請勿靠近本產品，以免導致物件損壞。(如攜帶手錶、信用卡、敏感物….請不要靠近。)
4. 定子組合拆裝作業時，須避免導磁性元件靠近。
5. 組裝時，避免使用鐵磁性工具及螺絲。

6. 動子組合電纜線部分不可損壞破皮或擠壓。
7. 請勿施加超過動子組合規定之最大連續電流。
8. 請確認動子組合運行過程中不會干涉到其他零件，並注意電纜線是否有足夠之彎曲半徑，以避免電纜線壽命降低。
9. 機台運轉時，當偵測到任何不正常的異味、噪音、煙霧、或是異常的振動，請立即停止運轉並關閉電源。
10. 產品發生異常狀況，請勿自行處理。請交由本公司合格技術人員維修或送回本公司處理。
11. 本產品自出廠日起一年內為有效的保固期，於此期間因不當使用(請參閱本說明書之注意與安裝事項)、或自然天災所造成的產品損壞，本公司不負責免費更換及維修產品之責任。

12. 機台運轉時，禁止觸摸動、定子組合。

13. 操作溫度需於規範內。
14. 機台停止運轉後請靜置室溫25℃後再進行作業，以避免燙傷。

1- 機構安裝精度

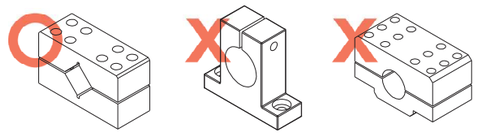


圖一 安裝介面幾何精度

1-1 夾持定子組合的下固定座安裝面(基準面A)，建議平面精度為 0.02mm/300mm 。(如圖一)

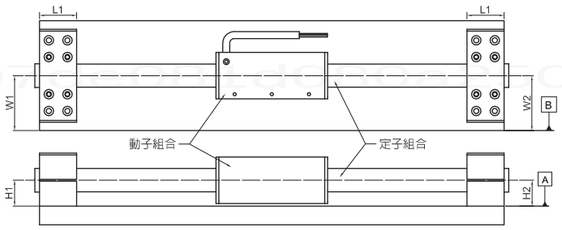
1-2 鎖附動子組合的安裝面，建議平面精度為 0.02mm/300mm ，並平行於基準面A，平行精度為 0.02mm/300mm 。(如圖一)

1-3 建議設計定子固定座採用V型枕塊。(如圖二)



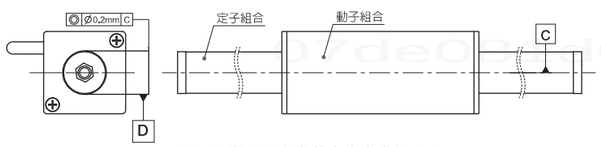
圖二 固定座設計

1-4 夾持定子的固定座長度(L1)會因行程不同而改變。(請參照附錄A)



圖三 定子組合安裝尺寸

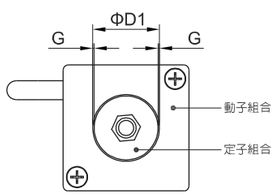
1-5 H1及H2皆為基準面A至定子組合中心高尺寸，建議定子組合組裝後，高度差不可大於0.2mm；W1及W2皆為基準面B至定子組合中心高尺寸，建議定子組合組裝後，高度差不可大於0.2mm；|H1-H2| ≦ 0.2mm ；|W1-W2| ≦ 0.2mm。(如圖三)



圖四 動定子組合安裝高度之幾何公差

1-6 基準C為定子組合之中心，基準D為動子組合之基準軸，建議動定子組合組裝後，基準C與基準D同心度不可大於0.2mm。(如圖四)

1-7 安裝動定子組合時，需特別注意動定子間之尺寸(G)，此尺寸值將會影響線性馬達之性能及可靠度。(G、ΦD1值請參照附錄B)。(如圖五)

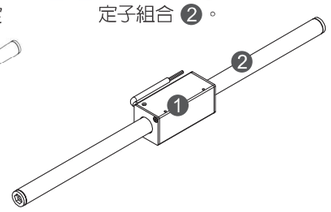


圖五 動定子組裝尺寸精度

2- 安裝順序

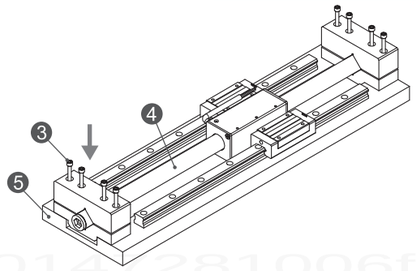
2-1 使用乾淨擦拭布沾酒精(95%工業用酒精)將定子組合擦拭乾淨。

2-2 將動子組合 ❶ 放置於定子組合 ❷ 。



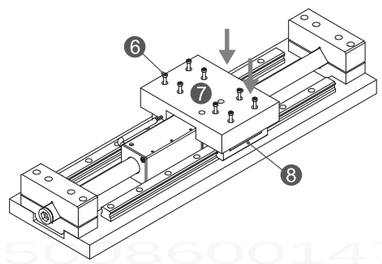
2-3 使用螺絲 ❸ 將定子組合 ❹ 安裝於固定座 ❺ 上，並量測高度差及左右差不可大於0.2mm。

> 請參照**1-5**定子組裝後，高度差與左右差不可大於0.2mm。
> 鎖附動定子組合之螺絲扭力表請參照附錄C。



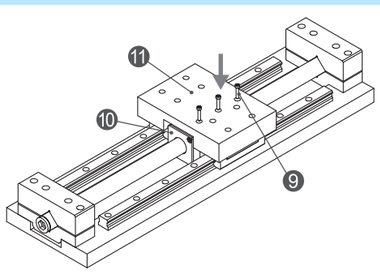
2-4 使用螺絲 ❻ 將動子座 ❼ 安裝於滑塊 ❽ 上。

> 鎖附動定子組合之螺絲扭力表請參照附錄C。

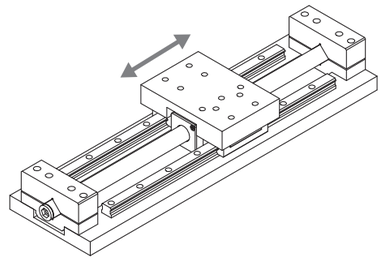


2-5 使用螺絲 ❾ 將動子組合 ❿ 鎖附於動子座 ⓫ 上。

> 請參照**1-6**動子組裝後，動定子組合組裝後，同心度不可大於0.2mm。
> 請參照**1-7**動定子組合組裝後，需特別注意動定子間之尺寸。
> 鎖附動定子組合之螺絲扭力表請參照附錄C。



2-6 組裝完成，滑動動子座確認無任何干涉現象。



以上，選用螺絲之長度與牙深請參考型錄。

★ 附錄A

型號	LMT2D/LMT2T/LMT2Q		
行程S (mm)	50~350	400~800	850~1050
L1 (mm)	25	40	60
型號	**LMT6D/LMT6T/LMT6Q**		
行程S (mm)	100~350	400~800	850~1050
L1 (mm)	25	40	60
型號	**LMTA2/LMTA3/LMTA4**		
行程S (mm)	100~300	350~700	750~1550
L1 (mm)	25	40	60
型號	**LMTB2/LMTB3/LMTB4**		
行程S (mm)	100~700	750~1300	1350~1550
L1 (mm)	50	70	100
型號	**LMTC2/LMTC3/LMTC4**		
行程S (mm)	100~750	800~1500	1550~2000
L1 (mm)	50	70	100
型號	**LMTD2/LMTD3/LMTD4**		
行程S (mm)	100~550	600~1000	1050~3000
L1 (mm)	60	80	100

★ 附錄B

型 號	尺 寸(mm)	
	ΦD1	G
LMT2	13	0.25~0.50
LMT6	16	0.25~0.50
LMTA	21.5	0.375~0.75
LMTB	26.5	0.375~0.75
LMTC	37	0.50~1.00
LMTD	45.6	0.725~1.45

★ 附錄C

鎖固動、定子螺絲扭力表(參照DIN912)，強度12.9之螺栓	
螺絲尺寸	扭力值(kgf-cm)
M3x0.5P	15.3
M4x0.7P	36.7
M5x0.8P	70.6
M6x1.0P	124
M8x1.25P	301

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