

Installation and Safety Guide

LMC 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

	<ol style="list-style-type: none"> 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. Before installing and operating this product, perform cosmetic inspection. If any signs of damaged, please contact HIWIN customer service or local agent. 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.
	<ol style="list-style-type: none"> Do not install forcer assembly, before you ensure that the power has been disconnected, otherwise there is risk of electrical shock.
	<ol style="list-style-type: none"> 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.
	<ol style="list-style-type: none"> Keep out of reach of children from handling this product. Anyone with a pacemaker or A.I.C.D. is prohibited to use this product.

★ User Guide Criteria

	<ol style="list-style-type: none"> Stator assembly has strong magnet field, be sure to handle with care. Put warning labels on the top surface of stator assembly for reminder of magnetic dangers. 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). During assembly of stator to system structure, keep any magnetic material at a distance During assembly, avoid using magnetic tools and screws.
	<ol style="list-style-type: none"> Do not bend or damage the cables of forcer assembly. Do not run the continuous current of forcer higher than specified in datasheet. 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. When abnormal smell, noise, smoke and vibration is detected, press emergency stop button and turn off power. The product can only be repaired by HIWIN engineers. Please send the product back to HIWIN if there is any unusual phenomenon. A one year guarantee is provided from the date of delivery. HIWIN will not be held responsible for replacing or maintaining product which has been incorrectly handled (please refer to the notes and instructions in the operation manual) or damage from natural disasters.
	<ol style="list-style-type: none"> Do not touch the forcer or stator during operation.
	<ol style="list-style-type: none"> Operate within specified temperature range. After finishing operation, allow forcer to cool down sufficiently (in a 25°C room temperature) before working around the product, to avoid getting burned.

1- Mechanism interface accuracy

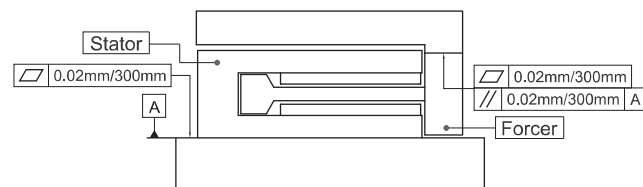


Fig1. Installation Interface geometric accuracy

1-1 Installation interface with stator should have flatness of 0.02mm per 300mm, as shown in Fig1.

1-2 Installation interface with forcer should have flatness of 0.02mm per 300mm and accuracy of 0.02mm per 300mm with reference to datum A as shown in Fig1.

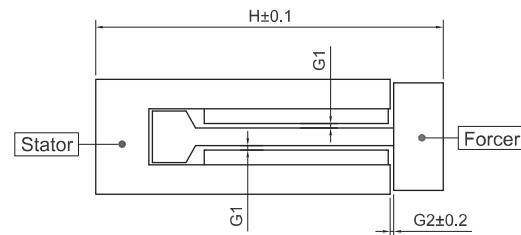
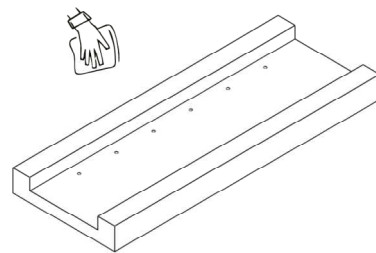


Fig2. Forcer and stator assembled dimension

1-3 Notice H, G1 and G2 dimensions between forcer and stator after assembly, they will impact linear motor performance and reliability, please refer to Appendix A and Fig2.

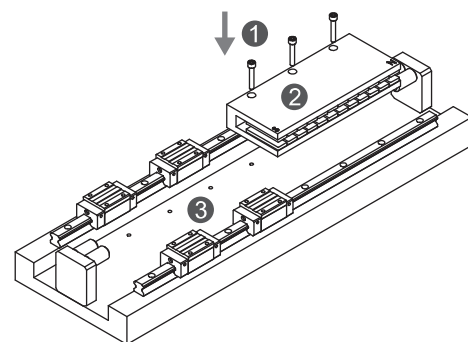
2- Installation step

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



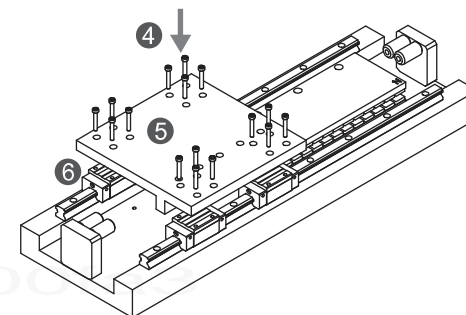
2-2 Install right side of stator ② to base frame ③ by screw ①.

Warning signs label of stator is required to be placed on the top surface of stator.
Refer to Appendix B for table of screw torques to assemble stator and forcer.

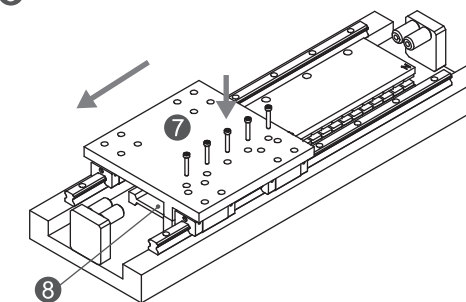


2-3 Use screw ④ to install forcer plate ⑤ on guide block ⑥.

Refer to Appendix B for table of screw torques to assemble stator and forcer.

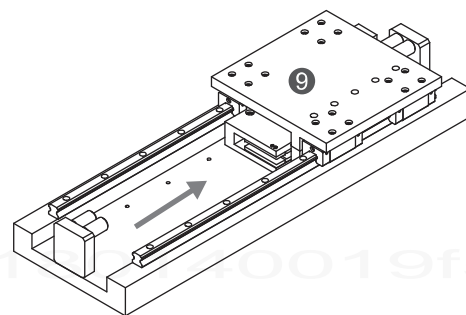


2-4 Move forcer plate ⑦ to the left side to ease installation of forcer ⑧.



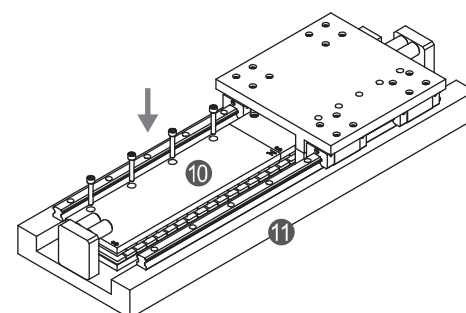
2-5 Check that the forcer ⑨ can move freely over the entire stroke and stop on right side for another stator assembly.

Please reference 1-3 after assembling forcer and stator, please note air gap between forcer and stator. Refer to Appendix B for table of screw torques to assemble stator and forcer.

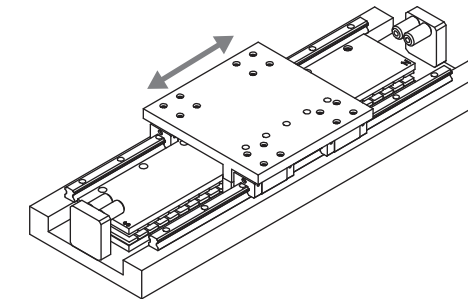


2-6 Assemble every stator ⑩ by fixing on base frame ⑪.

Please be careful when handling the stator assembly to avoid getting clamped.



2-7 Check that the forcer can move freely over the entire stroke after assembly is finished.



Regarding screws depth and pitch, please refer to Catalog.

★ APPENDIX A

Model	Size (mm)		
	H	G1	G2
LMCA	74.5	≥0.4	1
LMCB	94.5	≥0.4	1
LMCC	117.5	≥0.4	1
LMCD	105	≥0.4	1.2
LMCE	125	≥0.4	1.2
LMCF	172	≥0.4	1.2
LMC-EFC	68.5	≥0.4	1.3
LMC-EFE	93	≥0.4	1.3

★ APPENDIX B

Table of screw torques for assembly of forcer and stator (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

Please refer to the other side for English version

無鐵心式LMC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

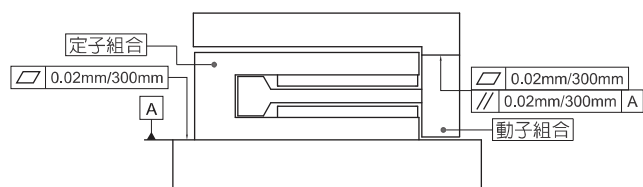
★ 使用前注意事項

	<ol style="list-style-type: none"> 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。
	<ol style="list-style-type: none"> 4. 安裝動子組合禁止連接電源裝置，導致觸電受衝擊。
	<ol style="list-style-type: none"> 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。
	<ol style="list-style-type: none"> 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

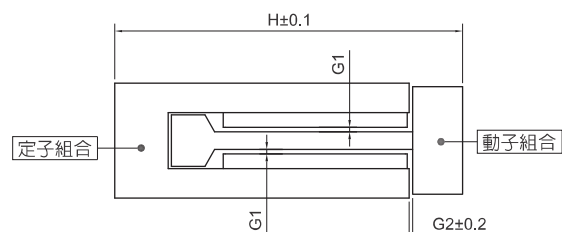
	<ol style="list-style-type: none"> 1. 定子組合具有強大的磁場，使用上必須小心。 2. 定子組合強磁標籤朝上。 3. 磁性資料存取裝置和精密機械儀器等，請勿靠近本產品，以免導致物件損壞。(如攜帶手錶、信用卡、敏感物... 請不要靠近。) 4. 定子組合拆裝作業時，須避免導磁性元件靠近。 5. 組裝時，避免使用鐵磁性工具及螺絲。
	<ol style="list-style-type: none"> 6. 動子組合電纜線部分不可損壞破皮或擠壓。 7. 請勿施加超過動子組合規定之最大連續電流。 8. 請確認動子組合運行過程中不會干涉到其他零件，並注意電纜線是否有足夠之彎曲半徑，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。
	<ol style="list-style-type: none"> 12. 機台運轉時，禁止觸摸動、定子組合。
	<ol style="list-style-type: none"> 13. 操作溫度需於規範內。 14. 機台停止運轉後請靜置室溫25°C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** 鎖附定子組合的安裝面(基準面A)，建議平面精度為 $0.02\text{mm}/300\text{mm}$ 。(如圖一)
- 1-2** 鎖附動子組合的安裝面，建議平面精度為 $0.02\text{mm}/300\text{mm}$ ，並平行於基準面A，平行精度為 $0.02\text{mm}/300\text{mm}$ 。(如圖一)

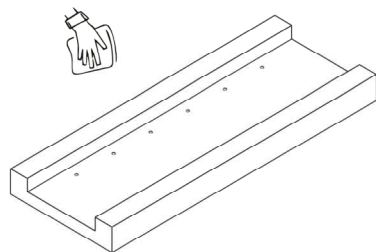


圖二 動定子組裝尺寸精度

- 1-3** 安裝動定子組合時，需特別注意動定子間之尺寸(H&G1&G2)，此尺寸值將會影響線性馬達之性能及可靠度。(H&G1&G2值請參照附錄A)(如圖二)

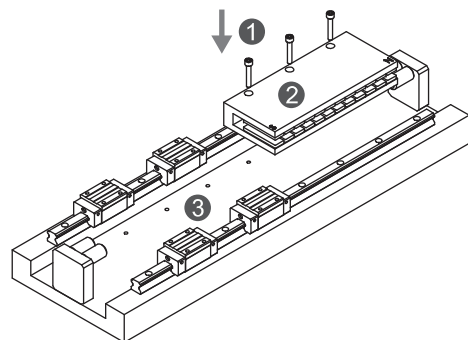
2- 安裝順序

- 2-1** 使用乾淨擦拭布沾酒精(95%工業用酒精)將安裝介面擦拭乾淨。



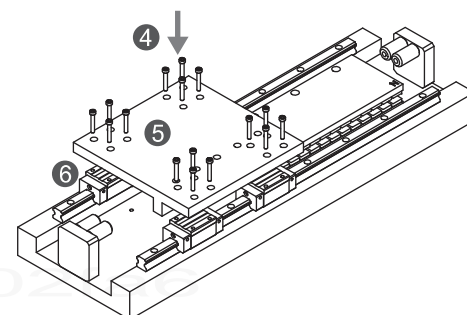
- 2-2** 使用螺絲 ① 將最右側定子組合 ② 與底板 ③ 結合。

定子警告標語需朝上。
鎖附動定子組合之螺絲扭力表請參照附錄B。

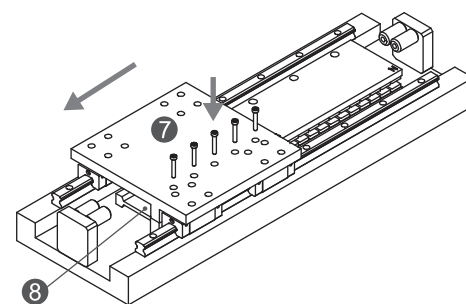


- 2-3** 使用螺絲 ④ 將動子座 ⑤ 安裝於線性元件 ⑥ 上。

鎖附動定子組合之螺絲扭力表請參照附錄B。

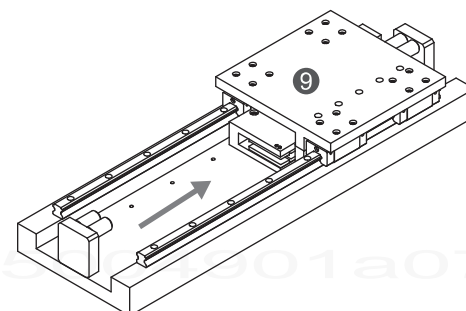


- 2-4** 將動子座 ⑦ 移至最左側，方便鎖附動子組合 ⑧。



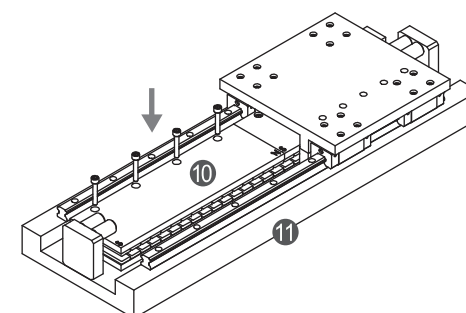
- 2-5** 將組裝好之動子組合 ⑨，推至右側確認動定子組合是否有干涉；並方便進行下一組定子組裝。

請參照 1-3 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B。

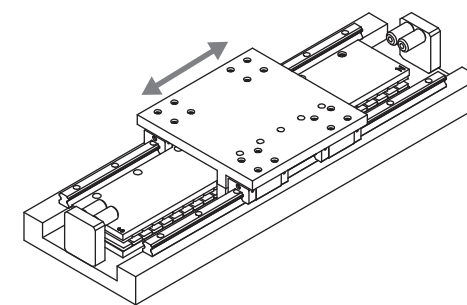


- 2-6** 將其餘定子組合 ⑩ 鎖附於底板 ⑪ 上。

定子組合請小心取放，避免手部夾傷。



- 2-7** 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	尺寸(mm)		
	H	G1	G2
LMCA	74.5	≥0.4	1
LMCB	94.5	≥0.4	1
LMCC	117.5	≥0.4	1
LMCD	105	≥0.4	1.2
LMCE	125	≥0.4	1.2
LMCF	172	≥0.4	1.2
LMC-EFC	68.5	≥0.4	1.3
LMC-EFE	93	≥0.4	1.3

★ 附錄B

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

HIWIN
Motion Control and System Technology

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