



台達 MSR 線性編碼器系統 (絕對型)

安裝說明書

(1) 注意事項

- 此包裝中之內容物包含：0.5 mm 墊片一片、M3 螺絲兩個、讀頭一個，以及本說明書。
- 請勿使用易刮傷光學尺及讀頭的工具進行安裝。
- 請勿在具爆炸性、易燃性或具其他危險的區域使用本產品。
- 請勿以手指直接觸碰讀頭及線材。
- 請使用清潔劑 (正庚烷、丙二醇或乙醇) 清潔光學尺與讀頭光學視窗，並保持乾燥，無殘留水漬。
- 請勿讓清潔劑浸透讀頭，否則會使內部構造產生無法清洗的汙染物。
- 請勿用清潔劑擦拭讀頭標籤貼紙，避免產品資訊被模糊。
- 此線性編碼器系統不適用於線性切割等高汙染的應用環境。
- 安裝治具為選配，型號為 MSR-LEH-KSAS1。

如果您在使用上仍有問題，請洽詢經銷商或者本公司客服中心。

(2) 型號說明

MSR - LEH - SD A 4N 3 D 5 S1

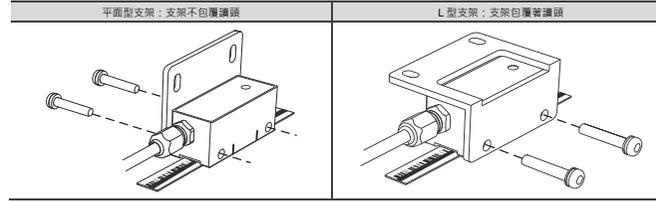
代碼	項目	說明
(1)	產品名稱	MSR = 運動控制測器
(2)	產品種類	LE = 線性編碼器
(3)	產品類別	H = 讀頭
(4)	產品系列	SD = 標準品系列
(5)	應用型態	A = 絕對型
(6)	解析度	4N = 4 nm
(7)	輸出訊號	3 = 台達通訊協議 B = BiSS C 通訊
(8)	接頭型式	D = D-Sub
(9)	電纜長度	5 = 0.5 m
(10)	特別碼	S1 = 標準品

(3) 產品規格

電氣規格	
輸入電壓	5 V _{DC} (-5% / +10%)
輸入電流	≤ 200 mA (Max.)
輸出訊號格式	台達通訊、BiSS C 通訊
機械規格	
讀頭尺寸 (長 x 寬 x 高)	36 x 16.5 x 16.5 mm
重量	讀頭: 12.6 g 線材: 26.7 g/m
最高速度	10 m/s
加速度	500 m/s ² · 3 軸
環境規格	
防護等級	IP64
工作溫度	0 ~ 80°C
儲存溫度	-20 ~ +80°C
濕度	95% RH (不結露及不結冰)
耐震動	≤ 100 m/s ² (55 Hz to 2 kHz · 3 軸)
耐衝擊	≤ 500 m/s ² (11 ms · ½ 正弦 · 3 軸)
安規認證	

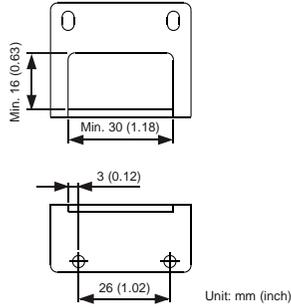
(4) 可調式支架安裝說明

請將支架安裝孔設計為長孔型式，方便安裝螺絲時調整讀頭與光學尺之間的距離。



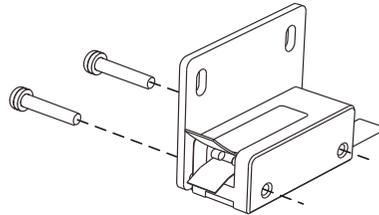
注意：請支架設計時，保留周邊空間，以利安裝治具可直接拆卸替換讀頭，避免支架也須同時做拆卸。

注意：支架須預留開孔，以利於辨識讀頭的型號與 LED 燈號，開孔規格建議如下圖。

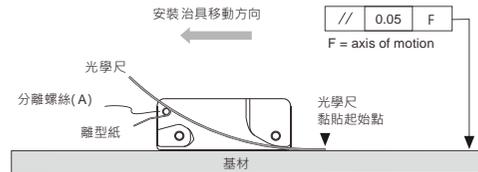


(5) 光學尺安裝步驟與注意事項

1. 在黏貼光學尺前，需先確認支架與基材的表面是否平整，建議在基材上標示光學尺的安裝起始點。
2. 使用清潔劑 (正庚烷、丙二醇或乙醇) 去除基材表面髒汙並保持乾燥，無殘留水漬。
3. 使用 M3 螺絲將安裝治具安裝在欲安裝讀頭的支架上 (安裝治具側邊 M3 螺絲孔的間距與讀頭相同)，安裝治具與基材之間，請保留足夠間隙 (例：≥ 2 mm) 以能順地將光學尺插入。



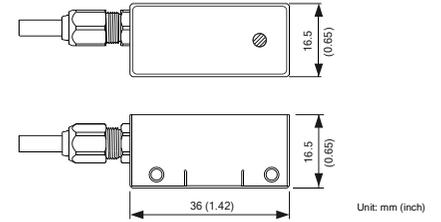
4. 離型紙撕開約 50 mm 後，將光學尺插入安裝治具內，並確認離型紙從分離螺絲(A)下方穿過，以手指按壓乾淨無塵的擦拭布，以將光學尺的前端貼附在基材上所標示的起始點，如下圖。



5. 一手壓住光學尺，一手拉住離型紙，並沿著上圖箭頭方向，平穩地移動安裝治具，直到撕除全部的離型紙。
 6. 將光學尺完整貼附在基材上，若須進一步固定光學尺兩端，可使用 Loctite 435 瞬間膠。
 7. 光學尺安裝完成；請待讀頭安裝完成再撕除光學尺保護膜。
- 註：勿拆卸支架，以繼續用於讀頭安裝。

(6) 讀頭安裝說明

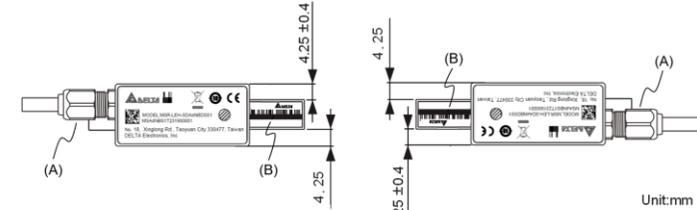
■ 讀頭尺寸圖



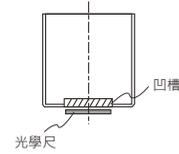
■ 讀頭安裝步驟

1. 安裝前，請先確認欲安裝讀頭的支架表面是否平整。
2. 確認讀頭與光學尺的安裝方向，如下圖所示，增量軌道的圖紋(B)朝下時，讀頭的訊號線(A)應位於左方；增量軌道的圖紋(B)朝上時，讀頭的訊號線(A)應位於右方。

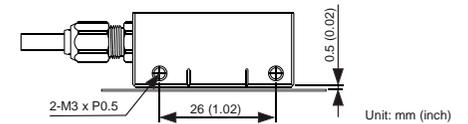
註：使用▲Delta Logo 輔助方向確認，讀頭的▲朝上，即尺的▲朝上。



3. 確認讀頭底部凹槽的中心線對齊光學尺的中心線。



4. 請將 0.5 mm 的墊片放置於光學尺和讀頭之間，以調整兩者之間的距離。
 5. 使用 M3 螺絲將讀頭固定於支架上，微調讀頭與墊片之間的距離，使讀頭與墊片的接觸力適中。
- 注意：M3 螺絲長度必須大於 8 mm。

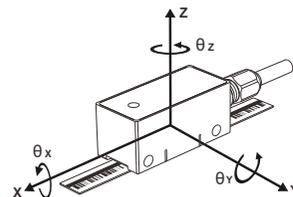


6. 移除墊片，並撕除光學尺保護膜。
7. 供電並確認 LED 燈號。當讀頭位於絕對軌道有圖紋的區域時，LED 應顯示綠燈。

LED 燈號定義如下；若燈號異常，請見 (9) 故障排除。

LED 燈號	定義	LED 燈號	定義
綠燈	訊號正常	紅燈	訊號過弱或過強
黃燈	訊號偏弱或偏強	白燈	上電時通訊輸出失敗

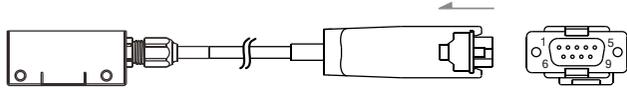
■ 讀頭與光學尺的組裝公差



代碼	組裝公差
Y	± 0.4 mm
Z	± 0.2 mm
Theta_x	± 1.5 度
Theta_y	± 0.5 度
Theta_z	± 2.0 度

(7) 配線說明

請根據下表為編碼器訊號線配線，並搭配 Shielding 與差動訊號對絞之線材以確保輸出訊號的品質。此 D-Sub 接頭並不能防止油或水的侵入，請勿在可能接觸油或水的場所使用本產品。



• 台達通訊協議 (型號代碼(7) = 3), 請用下列輸出 PIN 位:

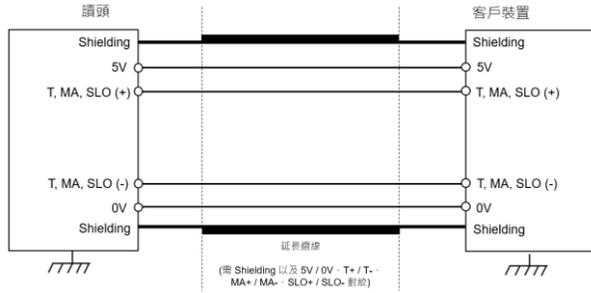
Pin No.	訊號名稱	說明	Pin No.	訊號名稱	說明
1	-	-	6	-	-
2	-	-	7	-	-
3	-	-	8	0V	電源 0V
4	5V	電源 5V	9	T-	T-串列通訊
5	T+	T+串列通訊	Case	Shielding	-

• BiSS C 通訊 (型號代碼(7) = B), 請用下列輸出 PIN 位:

Pin No.	訊號名稱	說明	Pin No.	訊號名稱	說明
1	-	-	6	SLO+	SLO+串列通訊
2	MA+	MA+串列通訊	7	SLO-	SLO-串列通訊
3	MA-	MA-串列通訊	8	0V	電源 0V
4	5V	電源 5V	9	-	-
5	-	-	Case	Shielding	-

(8) 線材建議接法

- 若需延長編碼器訊號線，請使用 Shielding 及 5V / 0V、T+ / T-、MA+ / MA-、SLO+ / SLO- 對絞之延長纜線。若延長纜線較長，需選用較粗的線徑 (例：30 m 的纜線建議使用至少 20 AWG 的線徑)，以確保訊號無衰減或干擾。
- Shielding 端子需連接至所有連接設備的接地端。



(9) 故障排除

故障情形	建議處理方式
LED 燈號不亮	檢查編碼器訊號線 電源 的配線是否正確。
LED 燈號顯示 紅燈	<ol style="list-style-type: none"> 1. 檢查讀頭與光學尺的安裝方向是否正確。 2. 檢查讀頭光學視窗或光學尺是否有油污或刮傷。 3. 檢查讀頭與光學尺是否符合組裝公差。
LED 燈號顯示 白燈	檢查編碼器訊號線 通訊輸出 的配線是否正確。



2024-06-17



5014165700-E003

台达 MSR 光栅尺 (绝对型)

安装说明书

(1) 注意事项

- 此包装中之内容物包含：0.5 mm 垫片一片、M3 螺丝两个、读头一个，以及本说明书。
- 请勿使用易刮伤光栅尺及读头的工具进行安装。
- 请勿在具爆炸性、易燃性或具其他危险的区域使用本产品。
- 请勿以手指直接接触读头及线材。
- 请使用清洁剂（正庚烷、丙二醇或乙醇）清洁光栅尺与读头光学窗口，并保持干燥，无残留水渍。
- 请勿让清洁剂渗透读头，否则会使内部构造产生无法清洗的污染物。
- 请勿用清洁剂擦拭读头标签贴纸，避免产品资讯被模糊。
- 此产品不适用于线性切割等高污染的应用环境。
- 安装治具为选配，型号为 MSR-LEH-KSAS1。

如果您在使用上仍有问题，请洽询经销商或者本公司客服中心。

(2) 型号说明

MSR - LEH - SD A 4N 3 D 5 S1

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10)

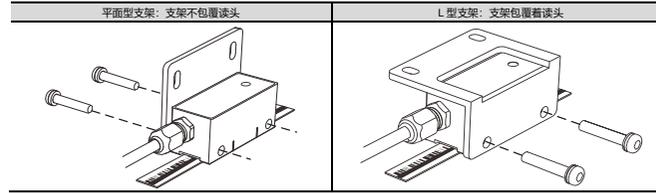
代码	项目	说明
(1)	产品名称	MSR = 运动控制传感器
(2)	产品种类	LE = 线性编码器
(3)	产品类别	H = 读头
(4)	产品系列	SD = 标准品系列
(5)	应用形态	A = 绝对型
(6)	分辨率	4N = 4 nm
(7)	输出讯号	3 = 台达通讯协议 B = BiSS C 通讯
(8)	接头型式	D = D-Sub
(9)	电缆长度	5 = 0.5 m
(10)	特别码	S1 = 标准品

(3) 产品规格

电气规格	
输入电压	5 V _{DC} (-5% / +10%) 滤波: 200 mVpp (Max.)
输入电流	250 mA (Max.)
输出讯号格式	台达通讯、BiSS C 通讯
机械规格	
读头尺寸 (长 x 宽 x 高)	36 x 16.5 x 16.5 mm
重量	读头: 12.6 g 线材: 26.7 g/m
最高速度	10 m/s
加速度	500 m/s ² , 3 轴
环境规格	
防护等级	IP64
工作温度	0 ~ 80°C
储存温度	-20 ~ +80°C
湿度	95% RH (不结露及不结冰)
耐震动	≤ 100 m/s ² (55 Hz to 2 kHz, 3 轴)
耐冲击	≤ 500 m/s ² (11 ms, 1/2 正弦, 3 轴)
安规认证	

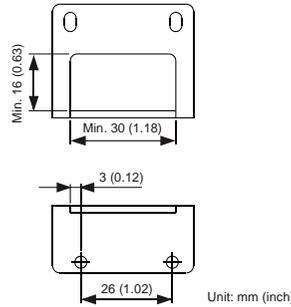
(4) 可调式支架安装说明

请将支架安装孔设计为长孔型式，方便安装螺丝时调整读头与光栅尺之间的距离。



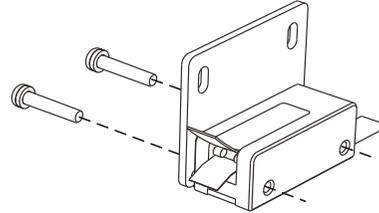
注意：请支架设计时，保留周遭空间，以利安装治具可直接拆卸替换成读头，避免支架也须同时做拆卸。

注意：支架须预留开孔，以利于辨识读头的型号与 LED 灯号，开孔规格建议如下图。

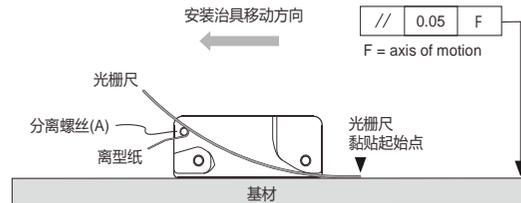


(5) 光栅尺安装步骤与注意事项

1. 在黏贴光栅尺前，需先确认支架与基材的表面是否平整，建议在基材上标示光栅尺的安装起始点。
2. 使用清洁剂（正庚烷、丙二醇或乙醇）去除基材表面脏污并保持干燥，无残留水渍。
3. 使用 M3 螺丝将安装治具安装在欲安装读头的支架上（安装治具侧 M3 螺丝孔的间距与读头相同）。安装治具与基材之间，请保留足够间隙（例：≥ 2mm）以能平顺地将光栅尺插入。



4. 离型纸撕开约 50 mm 后，将光栅尺插入安装治具内，并确认离型纸从分离螺丝(A)下方穿过。以手指按压干净无尘的擦拭布，以将光栅尺的前端贴附在基材上所标示的起始点。如下图。

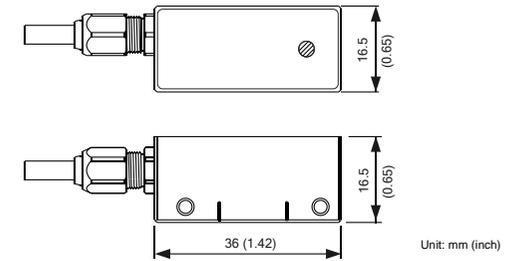


5. 一手压住光栅尺、一手拉住离型纸，并沿着上图箭头方向，平稳地移动安装治具，直到撕除全部的离型纸。
6. 将光栅尺完整贴附在基材上。若须进一步固定光栅尺两端，可使用 Loctite 435 瞬间胶。
7. 光栅尺安装完成，请待读头安装完成再撕除光栅尺保护膜。

注：勿拆卸支架，以继续用于读头安装。

(6) 读头安装说明

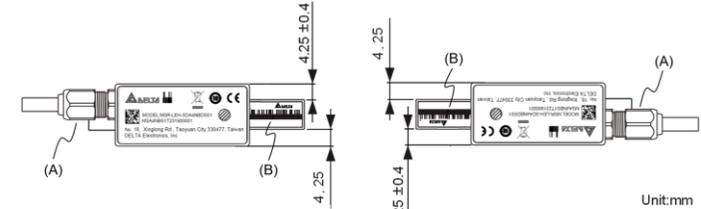
■ 读头尺寸图



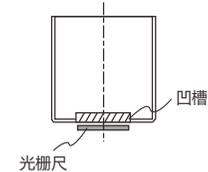
■ 读头安装步骤

1. 安装前，请先确认欲安装读头的支架表面是否平整。
2. 确认读头与光栅尺的安装方向。如下图所示，增量轨道的图纹(B)朝下时，读头的讯号线(A)应位于左方；增量轨道的图纹(B)朝上时，读头的讯号线(A)应位于右方。

注：使用 ▲ Delta Logo 辅助方向确认，读头的 ▲ 朝上，即尺的 ▲ 朝上。

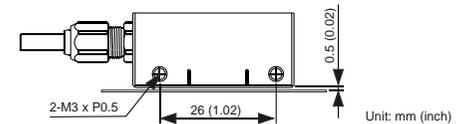


3. 确认读头底部凹槽的中心线对齐光栅尺的中心线。



4. 请将 0.5 mm 的垫片放置于光栅尺和读头之间，以调整两者之间的距离。
5. 使用 M3 螺丝将读头固定于支架上，微调读头与垫片之间的距离，使读头与垫片的接触力适中。

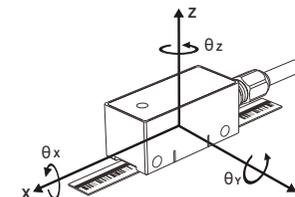
注意：M3 螺丝长度必须大于 8 mm。



6. 移除垫片，并撕除光栅尺保护膜。
7. 供电并确认 LED 灯号。当读头位于绝对轨道有图纹的区域时，LED 应显示绿灯。LED 灯号定义如下；若灯号异常，请见 (9) 故障排除。

LED 灯号	定义	LED 灯号	定义
绿灯	讯号正常	红灯	讯号过弱或过强
黄灯	讯号偏弱或偏强	白灯	上电时通讯输出失败

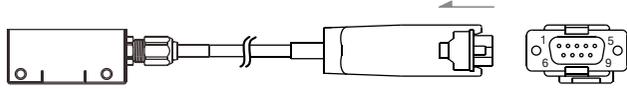
■ 读头与光栅尺的组装公差



代码	组装公差
Y	± 0.4 mm
Z	± 0.2 mm
θ _x	± 1.5 度
θ _y	± 0.5 度
θ _z	± 2.0 度

(7) 配线说明

请根据下表为编码器讯号线配线，并搭配 Shielding 与差动讯号对绞之线材以确保输出讯号的质量。此 D-Sub 接头并不能防止油或水的侵入，请勿在可能接触油或水的场所使用本产品。



• 台達通訊协议 (型号代码(7) = 3), 请用下列输出 PIN 位:

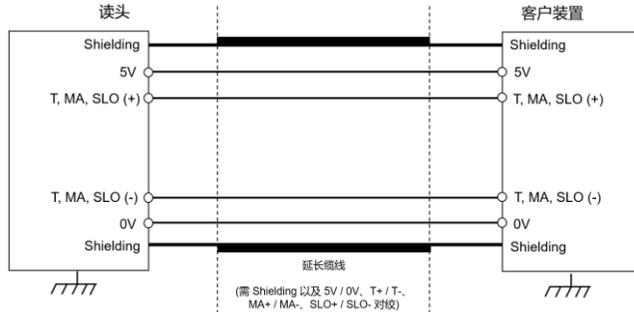
Pin No.	讯号名称	说明	Pin No.	讯号名称	说明
1	-	-	6	-	-
2	-	-	7	-	-
3	-	-	8	0V	电源 0V
4	5V	电源 5V	9	T-	T-串列通讯
5	T+	T+串列通讯	Case	Shielding	-

• BISS C 通讯 (型号代码(7) = B), 请用下列输出 PIN 位:

Pin No.	讯号名称	说明	Pin No.	讯号名称	说明
1	-	-	6	SLO+	SLO+串列通讯
2	MA+	MA+串列通讯	7	SLO-	SLO-串列通讯
3	MA-	MA-串列通讯	8	0V	电源 0V
4	5V	电源 5V	9	-	-
5	-	-	Case	Shielding	-

(8) 线材建议接法

- 若需延长编码器讯号线，请使用 Shielding 及 5V / 0V、T+ / T-、MA+ / MA-、SLO+ / SLO- 对绞之延长缆线。若延长缆线较长，需选用较粗的线径 (例：30 m 的缆线建议使用至少 20 AWG 的线径)，以确保讯号无衰减或干扰。
- Shielding 端子需连接至所有连接设备的接地端。



(9) 故障排除

故障情形	建议处置方式
LED 灯号不亮	检查编码器讯号线 电源 的配线是否正确。
LED 显示 红灯	1. 检查读头与光栅尺的安装方向是否正确。 2. 检查读头光学窗口或光栅尺是否有脏污或刮伤。 3. 检查读头与光栅尺是否符合组装公差。
LED 显示 白灯	检查编码器讯号线 通讯输出 的配线是否正确。

有毒物质表

部件名称 Part Name	有毒物质-Hazardous Substances					
	铅(Pb)	汞(Hg)	镉(Cd)	六价铬 (Cr VI)	多溴联苯 (PBB)	多溴联苯醚 (PBDE)
金属部件 Metal Part	×	○	○	○	○	○
塑料部件 Plastic Part	○	○	○	○	○	○
电子件 Electronic	×	○	○	○	○	○
触点 Contacts	○	○	×	○	○	○
线缆和线缆附件 Cable & Cabling accessories	×	○	○	○	○	○
电池 Battery	○	○	○	○	○	○

本表格依据 SJ/T 11364 的规定编制。
 ○: 表示该有害物质在该部件所有均质材料中的含量均在 GB/T 26572 规定的限量要求以下。
 ×: 表示该有害物质至少在该部件的某一均质材料中的含量超出 GB/T 26572 规定的限量要求。

This table is made according to SJ/T 11364.
 ○: indicates that the concentration of hazardous substance in all of the homogeneous materials for this part is below the limit as stipulated in GB/T 26572.
 ×: indicates that the concentration of hazardous substance in at least one of the homogeneous materials used for this part is above the limit as stipulated in GB/T 26572.



Delta MSR Series Linear Encoder System (Absolute Type) Instruction Sheet

(1) Precautions

- The product package includes: one spacer (thickness: 0.5 mm or 0.02 inches), two M3 screws, one read head, and this instruction sheet.
- Do not use tools which are likely to scratch the linear scale or read head during installation.
- Do not use this product in an environment which involves risks of explosion, combustion, or other dangers.
- Do not touch the read head or cable with your bare fingers.
- Clean the linear scale and the optical window of the read head with cleaning fluid (heptane, propylene glycol, or ethanol). Keep the linear scale and read head dry without water stains.
- Prevent the cleaning fluid from entering the read head, or it may cause unremovable stains inside.
- Prevent the cleaning fluid to wipe the label of read head, which is risky for blurring the product information.
- This linear encoder system is not applicable in highly polluted environment such as linear cutting applications.
- The scale applicator is sold separately. The model number is MSR-LEH-KSAS1.

If you encounter any problems when using this product, contact the distributor or Delta Customer Service Center.

(2) Model explanation

MSR - LEH - SD A 4N 3 D 5 S1

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10)

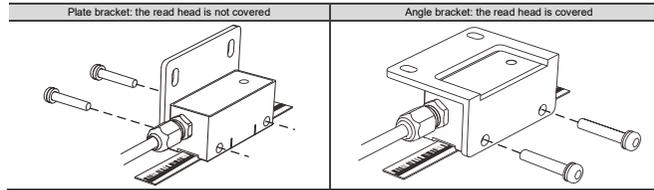
Code	Item	Description
(1)	Product name	MSR = motion sensor
(2)	Product type	LE = linear encoder
(3)	Product category	H = read head
(4)	Product series	SD = standard
(5)	Application type	A = absolute
(6)	Resolution	4N = 4 nm
(7)	Signal output	3 = Delta protocol B = BiSS C protocol
(8)	Connector type	D = D-Sub
(9)	Cable length	5 = 0.5 m
(10)	Special code	S1 = standard product

(3) Product specification

Electrical specification	
Input voltage	5 V _{CC} (-5% / +10%) Ripple 200 mVpp (Max.)
Input current	250 mA (Max.)
Output signal type	Delta protocol, BiSS C protocol
Mechanical specification	
Read head dimensions (L x W x H)	36 x 16.5 x 16.5 mm (1.42 x 0.65 x 0.65 inches)
Weight	Read head: 12.6 g (0.44 oz) Cable: 26.7 g/m
Max. speed	10 m/s
Acceleration	500 m/s ² , 3-axis
Environment specification	
IP rating	IP64
Ambient temperature	0 to 80°C (32 to 176°F)
Storage temperature	-20 to +80°C (-4 to +176°F)
Humidity	95% RH (non-condensing / non-freezing)
Vibration resistance	≤ 100 m/s ² (55 Hz to 2 kHz, 3-axis)
Shock resistance	≤ 500 m/s ² (11 ms, ½ sine, 3-axis)
Approvals	

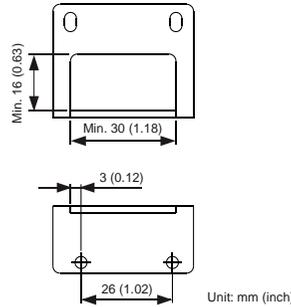
(4) Instructions for installing the adjustable bracket

Cut slotted holes in the installation bracket, which allow you to adjust the distance between the read head and linear scale when you tighten the screws.



Important: to keep the sufficient space around the bracket under designing, which helps that scale applicator can be changed into the read head directly. Prevent that bracket should be removed at the same moment.

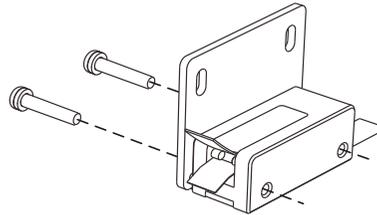
Important: allow an opening in the bracket for identifying the model number and LED indicator light on the read head. The suggested dimensions are as follows.



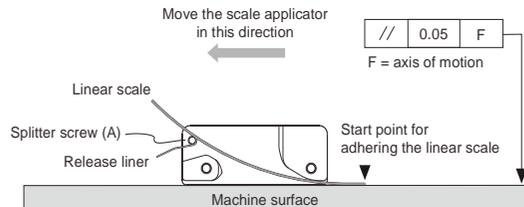
Unit: mm (inch)

(5) Steps and precautions for installing the linear scale

1. Check if the surfaces of the bracket and machine are flat before adhering the linear scale. Marking the start point for installation on the machine surface is recommended.
2. Clean the dirt on the machine surface with cleaning fluid (heptane, propylene glycol, or ethanol), and keep the surface dry without water stains.
3. Use M3 screws to install the scale applicator on the bracket where the read head is to be mounted. The distance between the mounting holes for M3 screws on the sides of the applicator is the same as that on the read head. Leave enough gap (e.g. ≥ 2 mm or 0.08 inches) between the applicator and machine surface to insert the scale smoothly.



4. Remove about 50 mm (1.97 inches) of the release liner from the linear scale. Insert the linear scale through the scale applicator, and then pull out the release liner and make sure it is routed under the splitter screw (A). Using a clean lint-free cloth, apply finger pressure to adhere the front side of the linear scale to the start point marked on the machine surface. Refer to the following figure.

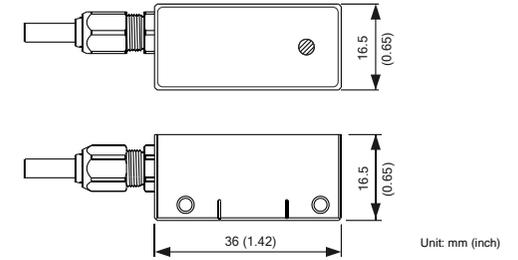


5. Press the linear scale with one hand, pull the release liner with the other hand, and then move the scale applicator smoothly in the direction shown in the preceding figure until the release liner is completely removed.
6. Fully adhere the linear scale to the machine surface. If you want to further fix both sides of the linear scale, it is advisable to apply the Loctite 435 instant adhesive.
7. The installation for linear scale is now complete. However, do not remove the protective film from the linear scale until the read head is installed.

Important: leave the installation bracket in place for the read head installation.

(6) Instructions for installing the read head

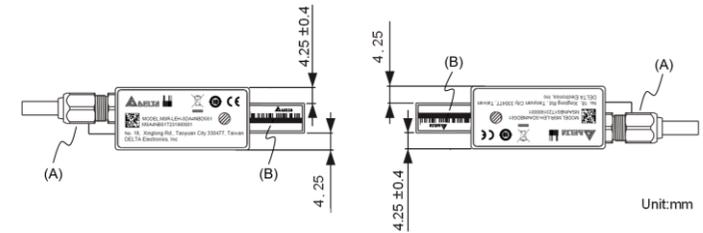
■ Dimensions of the read head



Unit: mm (inch)

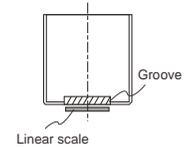
■ Steps for installing the read head

1. Before installation, ensure the surface of the bracket for installing the read head is flat.
 2. Check the installation orientation of the read head and linear scale. As shown in the following figure, the signal cable (A) of the read head should be on the left side when the incremental track (B) faces downward, and vice versa.
- Important:** Use ▲ Delta Logo for the orientation verification. ▲ of read head faces up and ▲ of scale faces up.

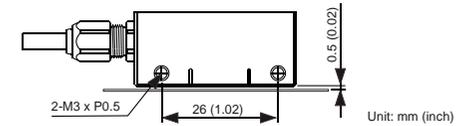


Unit: mm

3. Make sure the centerline of the groove at the bottom of the read head aligns with the centerline of the linear scale.



4. Insert a spacer with a thickness of 0.5 mm (0.02 inches) between the linear scale and read head to adjust the gap in between.
 5. Secure the read head to the bracket with M3 screws. Fine-adjust the gap between the read head and spacer to moderate the contact force in between.
- Important:** the length of M3 screws must be longer than 8 mm (0.31 inches).

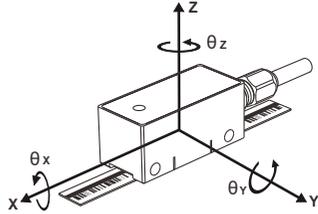


Unit: mm (inch)

6. Remove the spacer, and then remove the protective film from the linear scale.
 7. Apply power to the read head and check the LED indicator light. When the read head is over the marks of the absolute track, the LED indicator light should be green.
- The definitions of LED indicator lights are as follows. If there is an issue, refer to (9) Troubleshooting

LED Indicator	Definition	LED Indicator	Definition
Green	Signal is normal	Red	Signal is too weak or too strong
Yellow	Signal is slightly weak or slightly strong	White	Communication output fails when power-on

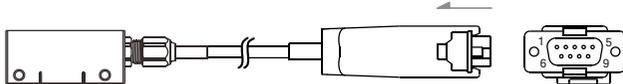
■ Assembly tolerance for the read head and linear scale



Code	Assembly tolerance
Y	± 0.4 mm (0.016 inches)
Z	± 0.2 mm (0.01 inches)
θ _x	± 1.5 degrees
θ _y	± 0.5 degrees
θ _z	± 2.0 degree

(7) Wiring

Wire the encoder signal cable according to the following table. Use shielded differential pair cables to ensure the quality of signal output. The D-Sub connector is neither waterproof nor oil-resistant; do not use this product in an environment containing oil or water.



• Delta protocol (Model Code(7) = 3), please with the following output pins:

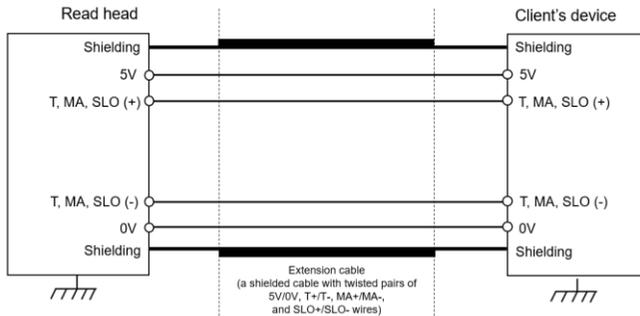
Pin No.	Signal	Description	Pin No.	Signal	Description
1	-	-	6	-	-
2	-	-	7	-	-
3	-	-	8	0V	Power 0V
4	5V	Power 5V	9	T-	T- signal
5	T+	T+ signal	Case	Shielding	-

• BISS C protocol (Model Code(7) = B), please with the following output pins:

Pin No.	Signal	Description	Pin No.	Signal	Description
1	-	-	6	SLO+	SLO+ signal
2	MA+	MA+ signal	7	SLO-	SLO- signal
3	MA-	MA- signal	8	0V	Power 0V
4	5V	Power 5V	9	-	-
5	-	-	Case	Shielding	-

(8) Wiring suggestions

- If you need to extend the encoder signal cable, use a shielded cable with twisted pairs of 5V/0V, T+/T-, MA+/MA-, and SLO+/SLO- wires. For longer extension cables, the wire gauge should be wider (e.g. the diameter should be at least 20 AWG for a 30 m cable) to prevent signal attenuation or interference.
- The shielding terminals must be connected to the ground terminals of all connecting devices.



(9) Troubleshooting

Issue	Suggested corrective action
LED indicator light is off	Check if Power of the encoder signal cable is correctly wired.
LED indicator light is red	1. Check if the installation orientation of the read head and linear scale is correct. 2. Check if the read head optical window and the linear scale are clean without stains. 3. Check if the read head and linear scale conform with the assembly tolerance.
LED indicator light is white	Check if Communication output of the encoder signal cable is correctly wired.

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<p>长春</p> <p>电话：(0431)8892-5060</p>	<p>郑州</p> <p>电话：(0371)6384-2772</p>	<p>武汉</p> <p>电话：(027)8544-8475</p>	<p>广州</p> <p>电话：(020)3879-2175</p>	<p>西安</p> <p>电话：(029)8836-0780</p>
<p>呼和浩特</p> <p>电话：(0471)6297-808</p>	<p>石家庄</p> <p>电话：(0311)8666-7337</p>	<p>南昌</p> <p>电话：(0791)8625-5010</p>	<p>厦门</p> <p>电话：(0592)5313-601</p>	<p>贵阳</p> <p>电话：(0851)8690-1374</p>
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