ELEKTRA MAGNETIC SCALE

(S2 Double Rail Jointed Guided)

Technical Specifications:

Pole Pitch	1mm/2mm/5mm
Resolutions (X4 edge)	1µm , 5µm, 10µm, 20µm
Accuracy (µ/m)	±10µ, ±20µ, ±50µ
Repeat accuracy	± 1 count
Standard Measuring Lengths	3000, 3250, 3500, 3750, 4000, 4250, 4500, 4750, 5000, 5250, 5500, 5750, 6000, 6250, 6500, 6750, 7000, 7250, 7500, 7750, 8000, 8250, 8500, 8750, 9000, 9250, 9500, 9750, 10000, 10500, 11000, 12000, 12500, 13000, 13500, 14000, 15000, 20000
Current consumption	Typ. 150mA (250mA max)
Power supply	+ 5 VDC (± 5%)
Output signal	Differential Line driver as per EIA RS422 standards. 1Vp-p Sine wave output. (0.6Vp-p – 1.2Vp-p)
Reference mark	Every 50mm
Operating Temperature	0ºC to 50ºC
Storage Temperature	-20ºC to 70ºC
Relative Humidity	20% to 80% Non-condensing
Standard Cable length	5 meters armoured
Max. cable length	20 meters
Measurement Speed 1Vpp	2MHz (10m/s @ 5µm) 1Vp-p – 10KHz
Protection class	IP-67

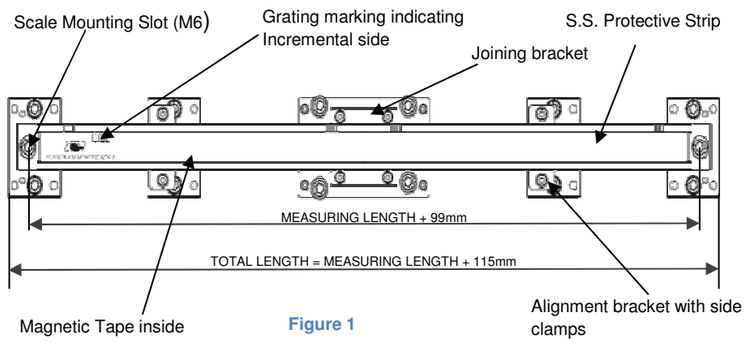
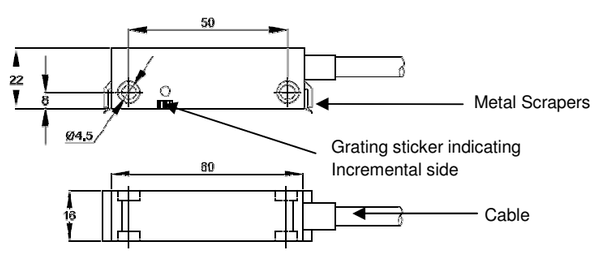
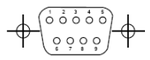


Figure 1



Pin Connection Details:



9 Pin 'D' type Plug connector

STATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

RS422

Pin	1	2	3	4	5	6	7	8	9
Signal	+ Z	- Z	VCC	Shield	GND	+ A	- A	- B	+ B
Colour	Grey	Brown	Black	Violet	White	Pink	Red	Green	Yellow

1Vpp

Pin	1	2	3	4	5	6	7	8	9
Signal	V0+	V0-	VCC	Shield	GND	V1+	V1-	V2-	V2+
Colour	Grey	Brown	Black	Violet	White	Pink	Red	Green	Yellow

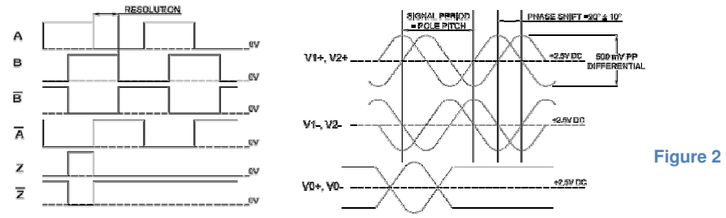


Figure 2

EMRA – for 1mm Pole Pitch
EMRB – for 2mm Pole Pitch
EMRD – for 5mm Pole Pitch

Definitions:

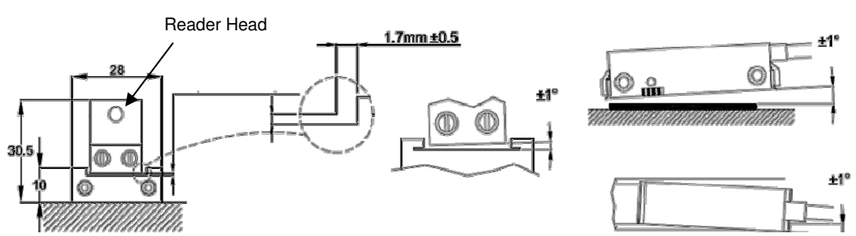
Resolution: Resolution of a linear encoder is defined as the smallest measureable positional step. The resolution depends on the grating pitch of the scale and the interpolation factor set in the reader head. The quoted resolution (See table) is after x4 edge multiplication. For 1Vp-p resolution is determined by the interpolation of the user processing system.

Accuracy: The accuracy of the system is such that all positional data-points about the mean error fall within the specified limits for any 1m travel. The reference temperature for the accuracy class is considered as 20º C.

Mounting Tolerances:

Scale: Scale should be aligned with in 0.1mm/m from front side and top side.

Reader head: Standard gap between reader head and scale should be as per given in table in Figure 2. A plastic shim is provided to maintain this gap between reader head and scale during installation. Refer Figure 2 for further alignment data.



Gap
EMRA – 0.2mm (±0.1)
EMRB – 0.5mm (±0.2)
EMRD – 2.0mm (±0.5)

Figure 3

Safety:

- During handling and installation of the encoder, avoid making any sharp bends to the magnetic tape. Doing so may result in permanently damage.
- Avoid contact of acetone, propane, petrol, diesel or any aggressive cleaning agent during the handling of the magnetic tape.
- Avoid using a magnetic stand or any permanent magnet close to the magnetic scale at any time during installation, operation or maintenance as this may result in permanent damage to the magnetic encoding of the scale.
- Avoid putting excessive pressure on the magnetic tape. such as clamping, during handling and installation.

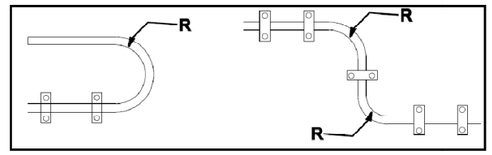


Figure 4

Inspection of Mounting:
Move the slide over the full range of motion to make sure that full machine travel can be obtained without the reader head contacting the scale end brackets. Otherwise the reader head may become damaged.
Make sure that the plastic shim is removed after installation.

Cable Routing:

- The cables should be routed such that they do do not come in between the machine moving parts.
- The bending radius should not be less than 60mm as shown in the Figure 4.
- The encoder cables should not be routed close to high power or high voltage switching sources.
- Where extension leads are used the connectors should be mounted clear of any source of liquid contamination.

Carriage Mounting:

- Carriage assembly contains M4X6 mounting holes on either side. Machine slides can be directly mounted on carriage assembly.
- Alternately carriage assembly can be mounted using "flexible bracket" (Part No: 162-01-0730) as shown in diagram below.

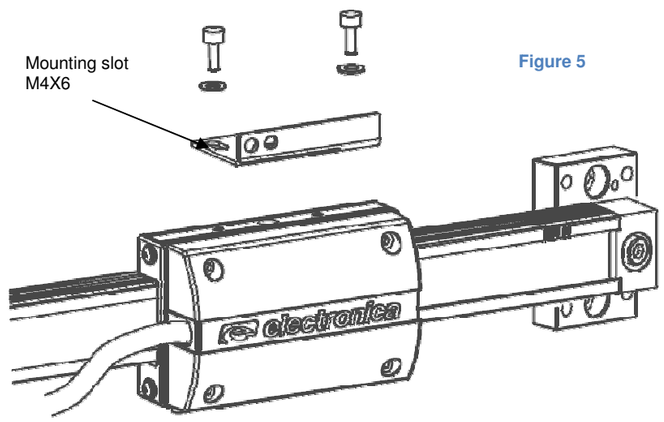


Figure 5

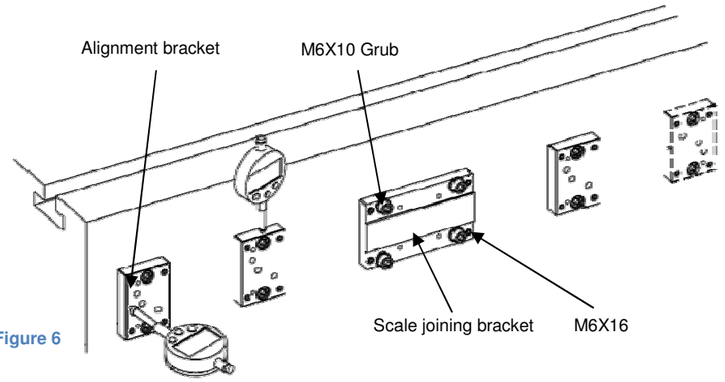


Figure 6

- The best location for mounting the scale is as near to the centreline of the slide, or as close to the guide-ways of the machine as possible.
- Every bracket should be installed using reference of all previous brackets as shown by dotted bracket

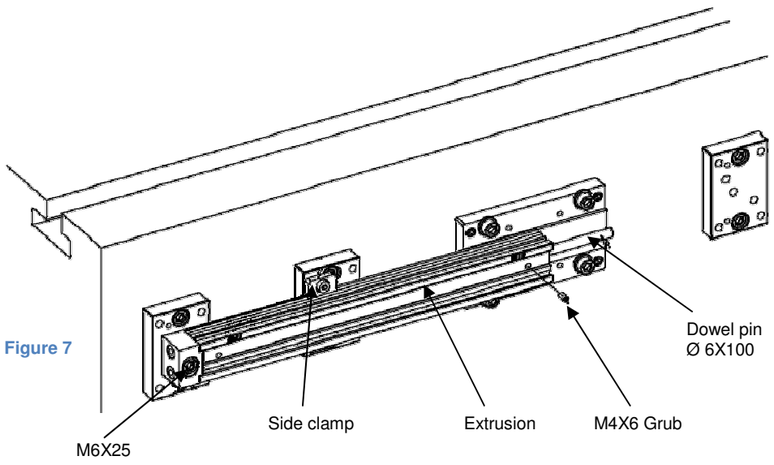


Figure 7

- A mounting bracket should be installed at both ends and joining bracket should be installed at the point of joining of two extrusions.
- At approximately every 500mm side clamps should be installed as shown in Figure 7.
- After mounting the extrusion, insert the provided dowel pin at the open end to its half length and secure it by the grub screw.

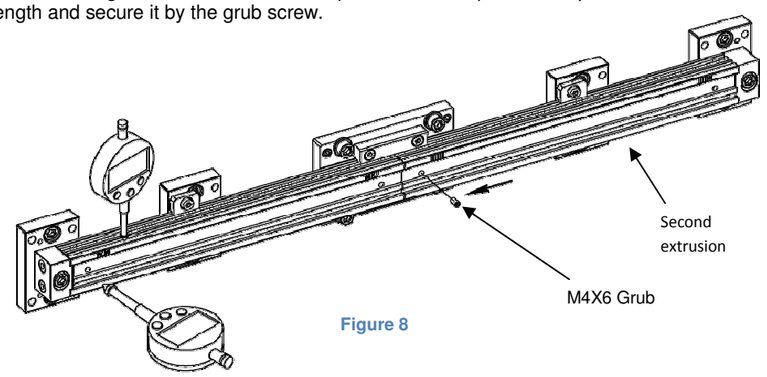


Figure 8

- Attach the next section of extrusion by sliding it into dowel pin and secure. Using grub screws secure another end of dowel pin as shown in Figure 8.
- Attach the joining clamps provided at the joint of the scale.
- In case more than two extrusions are available then repeat the above steps for all sections.
- Using a dial gauge check scale alignment is within 0.3mm over entire length. Adjust the alignment as required using the grub-screws on the mounting brackets.

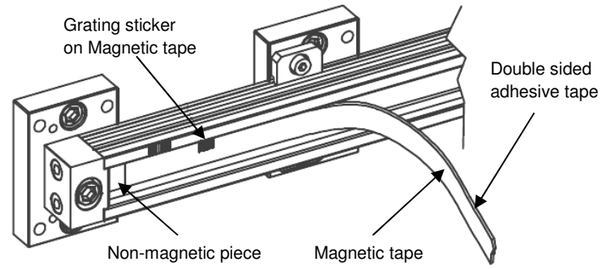


Figure 9

- Fix the provided non-magnetic pieces to each end of the scale followed by the magnetic tape by the double sided adhesive tape at the rear of the magnetic tape.
- Make sure that grating sticker on magnetic tape matches with grating sticker on extrusion.
- Make sure that magnetic tape is firmly fitted to extrusion.
- Make sure there is no uneven pressure on magnetic tape during handling and installation.

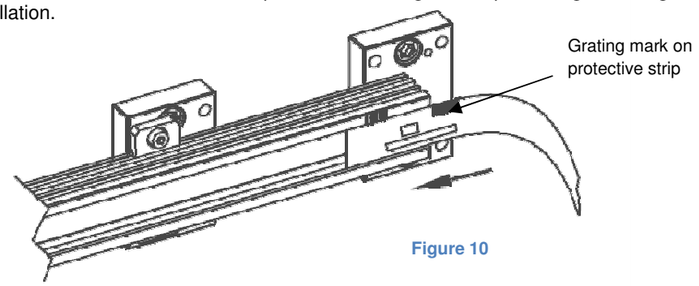


Figure 10

- From the open end insert the provided protective cover strip making sure that the grating marks on protective strip match with grating sticker on extrusion

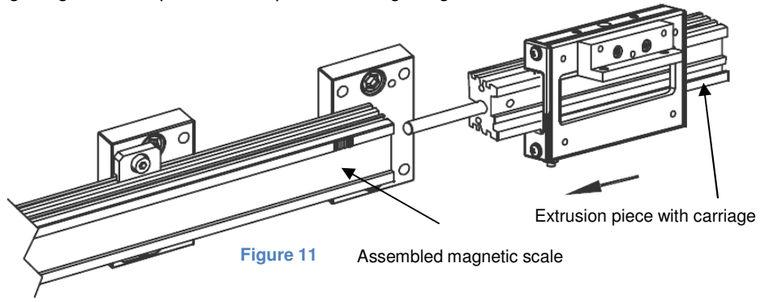


Figure 11 Assembled magnetic scale

- From the open end insert the provided extrusion piece with the mounted carriage assembly. Figure 11.
- While inserting use a dial gauge to align two extrusions with each other.
- After transferring the carriage assembly, remove extrusion piece and dowel pin.

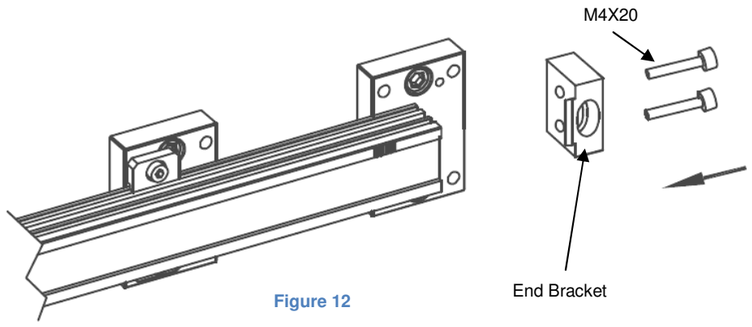


Figure 12

- Attach the scale end block as per Figure 12.
- After fitment of end bracket, mount the scale one support bracket using allen screws.

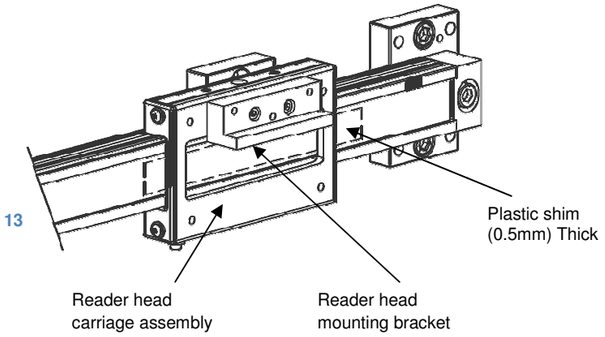


Figure 13

- Bring the carriage assembly to one end insert the 0.5mm plastic shim provided in guiding assembly under the reader-head. Figure 13.

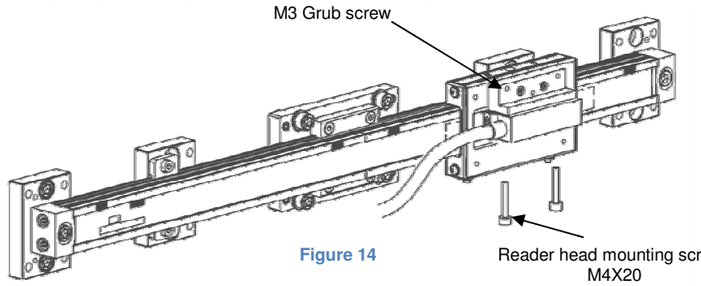


Figure 14

- Keeping the plastic shim on the scale secure the reader head on mounting bracket while pressing it onto plastic shim. This ensures gap between scale and reader head is as per table in Figure 3.
- Make sure that grating marks on reader head match with grating marks on extrusion.
- In case of misalignment M3 grub screw is provided on mounting bracket for plane adjustment.

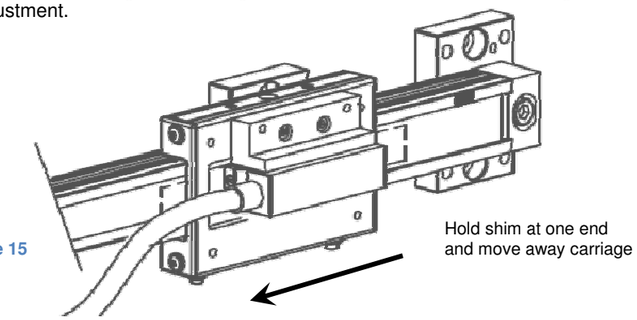


Figure 15

- After installation to remove plastic shim by moving the reader-head carriage.
- Once again check for movement of guiding assembly over entire length. If movement is not smooth then make sure that both reader head and carriage assembly are correctly aligned.

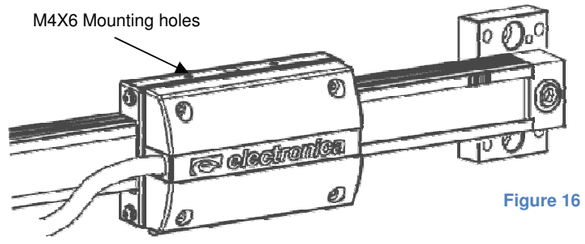


Figure 16

- Secure the provided cover over the reader-head so as to protect it in case of any falling objects.
- Secure the guiding assembly to moving part of machine. Mounting holes are provided on either sides of guiding assembly. Refer section **Carriage Mounting**.
- Ensure the supplied cover is properly mounted to protect the scale and reader head for the entire length to ensure the lifetime reliability and performance of the system.