User's guide

MT, MTS, MTA, MTAX, MTAZ, MTLA

Incremental and absolute magnetic tapes

lika

Smart encoders & actuators

lika

General contents

Typographic and iconographic conventions

In this guide, to make it easier to understand and read the text the following typographic and iconographic conventions are used:

- parameters and objects both of Lika device and interface are coloured in GREEN;
- alarms are coloured in RED;
- states are coloured in FUCSIA.

When scrolling through the text some icons can be found on the side of the page: they are expressly designed to highlight the parts of the text which are of great interest and significance for the user. Sometimes they are used to warn against dangers or potential sources of danger arising from the use of the device. You are advised to follow strictly the instructions given in this guide in order to guarantee the safety of the user and ensure the performance of the device. In this guide the following symbols are used:

	This icon, followed by the word **WARNING**, is meant to highlight the parts of the text where information of great significance for the user can be found: user must pay the greatest attention to them! Instructions must be followed strictly in order to guarantee the safety of the user and a correct use of the device. Failure to heed a warning or comply with instructions could lead to personal injury and/or damage to the unit or other equipment.
	This icon, followed by the word **NOTE**, is meant to highlight the parts of the text where important notes needful for a correct and reliable use of the device can be found. User must pay attention to them! Failure to comply with instructions could cause the equipment to be set wrongly: hence a faulty and improper working of the device could be the consequence.
	This icon is meant to highlight the parts of the text where suggestions useful for making it easier to set the device and optimize performance and reliability can be found. Sometimes this symbol is followed by the word **EXAMPLE** when instructions for setting parameters are accompanied by examples to clarify the explanation.

Preliminary information

This guide is designed to provide the most complete and exhaustive information the operator needs to correctly and safely install and use the **MTx magnetic tapes** for incremental and absolute linear encoders.

Lika Electronic's range includes the following models of magnetic tapes:

- MTx: magnetic tape designed for use with quadrature incremental and sine-cosine linear encoders, available in several versions having pole pitch ranging between 1.0 mm / 0.039" and 5.0 mm / 0.197";

- MTSx: magnetic tape designed for use with quadrature incremental and sine-cosine linear encoders, available in several versions having pole pitch ranging between 2.0 mm / 0.079" and 5.0 mm / 0.197";

- MTAx: magnetic tape designed for use with absolute linear encoders, available in 1.0 mm / 0.039", 2.0 mm / 0.079" and 5.0 mm / 0.197" pole pitch versions;

- MTAX: magnetic tape specifically aimed at use with SMAX absolute linear encoder;

- MTAZ: magnetic tape specifically aimed at use with SMAZ absolute linear encoder;

- MTLA: magnetic tape specifically aimed at use with SMLA absolute encoder.

WARNING
Always refer also to the user's guide of the matched sensor before installing the magnetic tape.

1 Safety summary

1.1 Safety

- Always adhere to the professional safety and accident prevention regulations applicable to your country during device installation and operation;
- installation and maintenance operations have to be carried out by qualified personnel only, with power supply disconnected and stationary mechanical parts;
- device must be used only for the purpose appropriate to its design: use for purposes other than those for which it has been designed could result in serious personal and/or the environment damage;
- failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the equipment;
- Lika Electronic assumes no liability for the customer's failure to comply with these requirements.

1.2 Warnings

Equipment that produces strong magnetic fields must be kept as far from the tape as possible. Do not bring magnets close to the tape.

- Install the magnetic tape following strictly the information in the "Mechanical installation" section;
- mechanical installation has to be carried out with stationary mechanical parts;
- respect the environmental characteristics of the product;
- do not tool or machine the unit unless otherwise indicated;
- do not twist or bend the magnetic tape;
- always comply with the tape's bending radius values indicated in this manual;
- we suggest installing the tape and the sensor providing protection means against waste, especially swarf as turnings, chips, or filings; should this not be possible, please make sure that adequate cleaning measures such as brushes, wipers or compressed air jets are in place in order to prevent the sensor and the tape from jamming;

- protect the tape from acid solutions and chemicals that may damage it.

2   Identification

The tape can be identified through the **order code** quoted in the delivery documents and the **identification code** printed every 50 cm on the magnetic surface of the tape. Useful information on the tape model and production are available in the identification code, as shown, for example, in the following figure:

lika MT10 L 151430-1
(a) (b) (c) (d) (e) (f) (g)
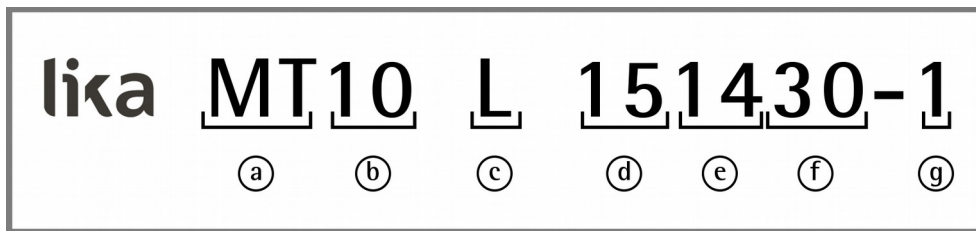
where:

(a)   tape model

(b)   pole pitch (e.g. "10" = 1.0 mm / 0.039" pole pitch)

(c)   manufacturing plant

(d)   year of production

(e)   week of production

(f)   day of production

(g)   daily production batch

Please always quote the order code and the identification code when reaching Lika Electronic for needing support on the magnetic tape. For any information on the technical characteristics of the product refer to the technical catalogue.

⚠️   **Warning**: units having order code ending with "/Sxxx" may have characteristics different from standard and be supplied with specific additional documentation (Technical Info).

3   Mechanical installation

WARNING
Installation has to be carried out by qualified personnel only, with power supply disconnected and mechanical parts compulsorily in stop. Do not tool or machine the unit unless otherwise indicated.

3.1 Magnetic tape structure
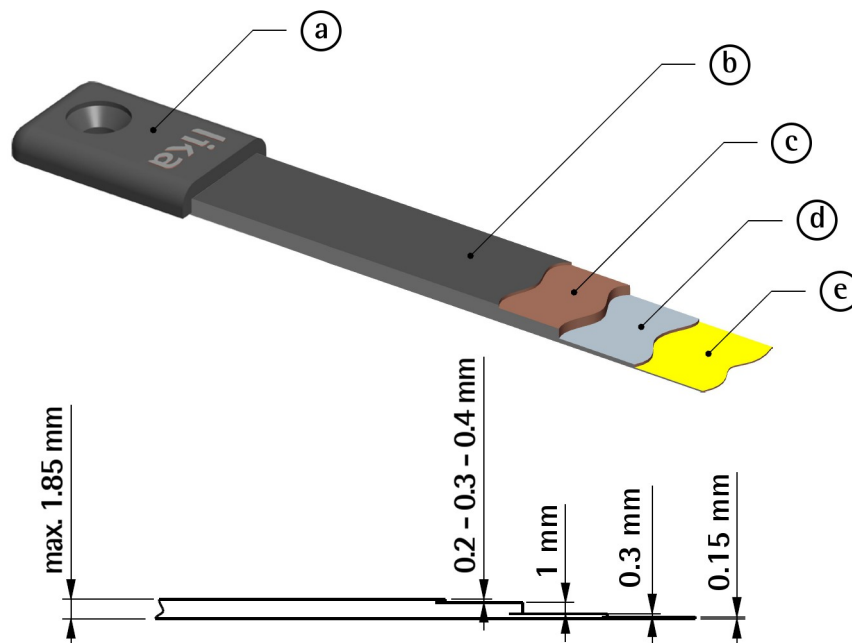
Label

Ⓐ	Tape terminal (optional)	ⓓ	Ferromagnetic stainless steel strip
ⓑ	Stainless steel cover strip (optional)	ⓔ	Adhesive backing
ⓒ	Polymer-ferrite composite strip		

NOTE
Parts ⓒ, ⓓ and ⓔ are delivered already stuck together. The stainless steel cover strip ⓑ is optional and delivered separately, thus it must be applied by the customer. The tape terminal ⓐ is optional and delivered separately, thus it must be applied by the customer.

3.1.1 MT, MTA2 tapes overall dimensions
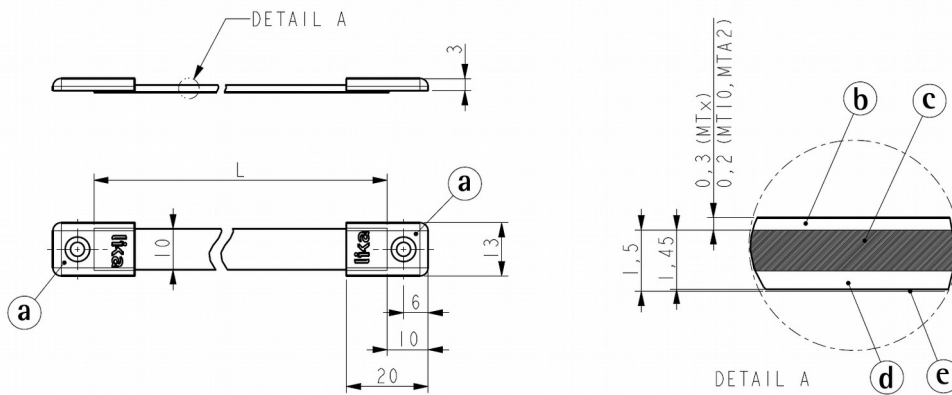
NOTE

Thickness of the ⓑ cover strip:

MT10, MTA2 = 0.2 mm / 0.0079";
MTx = 0.3 mm / 0.012".

3.1.2 MTS tape overall dimensions
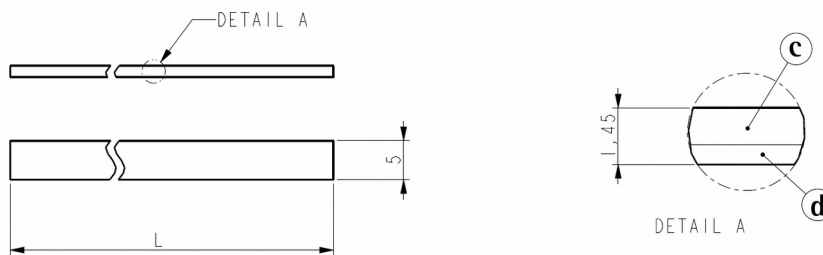
NOTE

The cover strip and the tape terminals are not available for MTS type tape.

3.1.3 MTA1, MTA5, MTAX, MTAZ, MTLA tapes overall dimensions
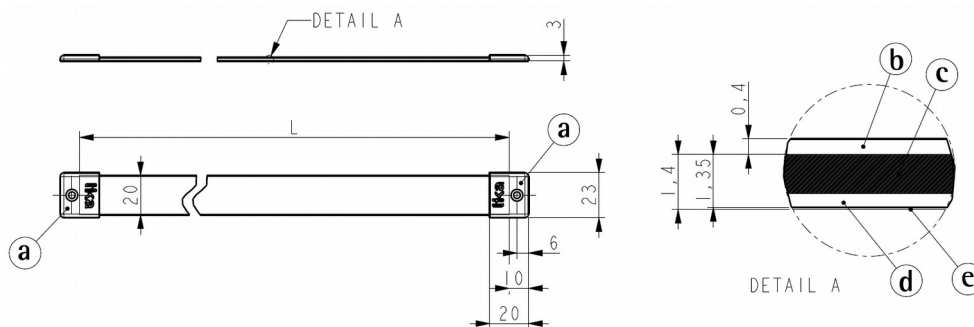
NOTE

Thickness of the ⓑ cover strip: 0.4 mm / 0.016".

ⓑ cover strip not available for MTA1 type tape.

3.1.4 KIT LKM-1439 and KIT LKM-1440 tape terminals overall dimensions
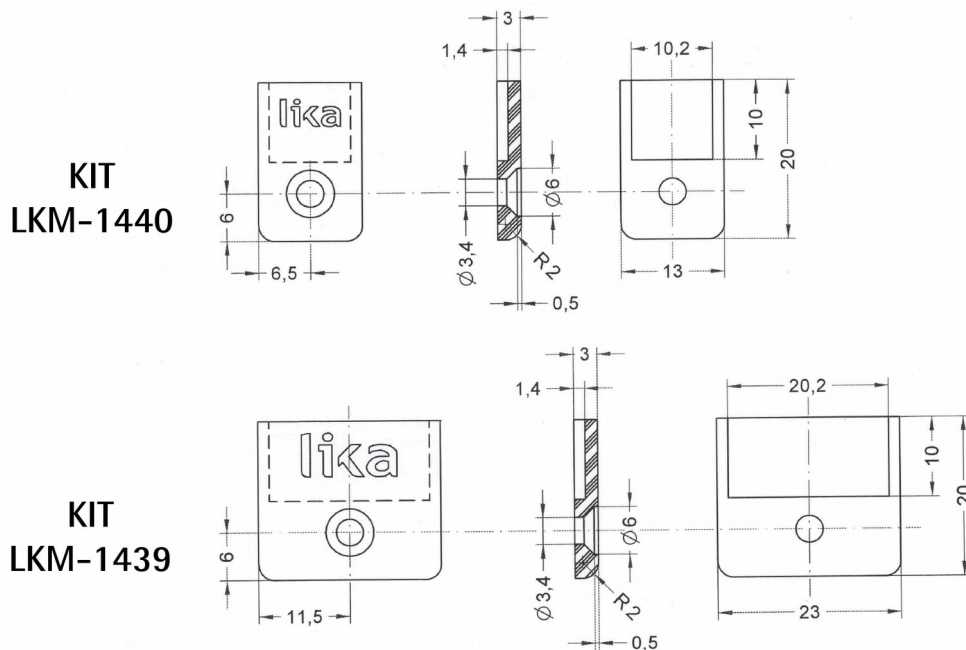
To install the tape terminals please refer to the "3.9 Mounting the KIT LKM-1439 and KIT LKM-1440 tape terminals" section on page 27.

NOTE

The tape terminals are not available for MTS type tape.

3.1.5 PS1 optional aluminium profile overall dimensions
For SMK and SME5 models only
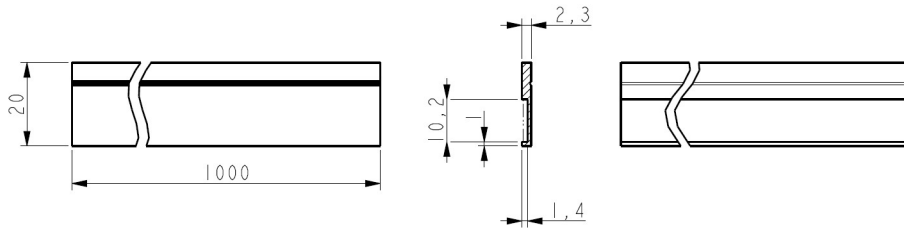
To install the PS1 profile please refer to the "3.7.2 Mounting the tape with optional PS1 aluminium profile (Figure 3)" section on page 20.

3.2 Transport and handling

The tape is delivered wound on coils, the magnetized side facing inwards. If supplied, the stainless steel cover strip is delivered separately; it must be applied to the magnetic tape by the customer as described in this manual (refer to the "3.8 Applying the cover strip" section on page 25).

Do not wind the tape with the magnetized side facing outwards.
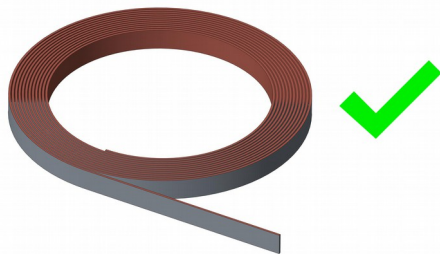
Magnetized surface facing inwards   **Magnetized surface facing outwards**
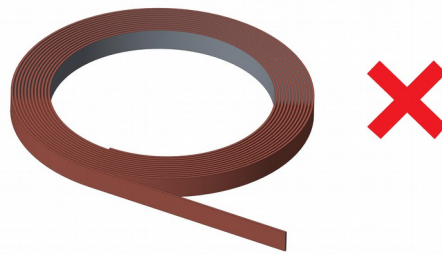
Do not twist or bend the magnetic tape.

Always comply with the minimum bending radius values shown in the following Figure:
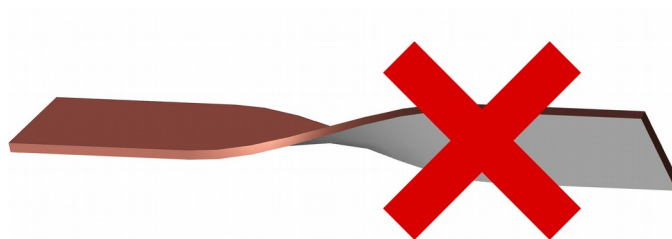
Always comply with the minimum bending radius values shown in the following Figure:
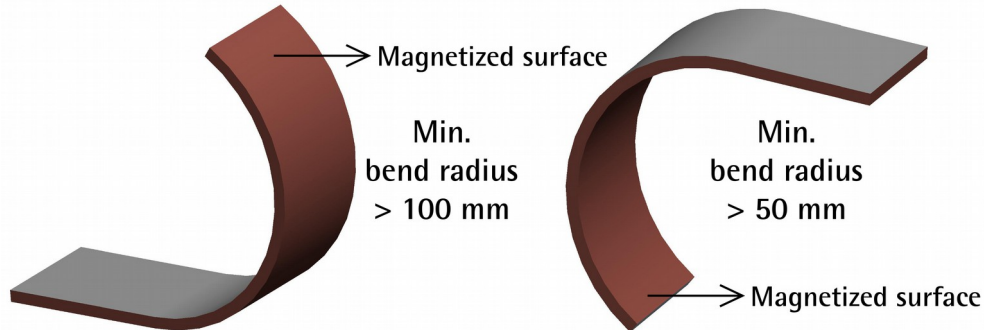
3.3 Preliminary information before installation

WARNING
Always refer also to the user's guide of the matched sensor before installing the magnetic tape.

Before mounting the tape and the cover strip, you must:
- ascertain that the encoder and the magnetic tape match together; the sensor has to be compulsorily paired with its specific tape type. Please check the order code of both the sensor and the tape (an identification code is also printed on the polymer-ferrite surface of the tape). For example: SME12 incremental encoder must be paired with the MT10 incremental magnetic tape; SMA5 absolute encoder must be paired with the MTA5 absolute magnetic tape;
- clean carefully the bonding surface as detailed in the "3.4 Information on sticking the tape" on page 14 and in the "3.5 Information on applying the cover strip" section on page 15;
- cut the tape and the cover strip at the required length as explained in the "3.6 Shortening and cutting the tape and the cover strip" section on page 16;
- do not apply the cover strip to the magnetic tape before they are both cut at the required length;
- do not cut the tape and the cover strip if they are already bonded together;
- stick the magnetic tape first, then apply the cover strip to the tape;

- check carefully the mounting direction of the tape; please refer also to the "User's manual" of the encoder; mounting direction is crucial and binding upon the absolute encoders;
- check carefully the counting direction and the information printed on the surface of the absolute code tapes as well; please refer also to the "User's manual" of the encoder; please note down the information on the print and the arrow direction before applying the cover strip.

WARNING

The measuring system cannot work if the encoder and the magnetic tape are mounted otherwise than indicated in the manuals.

3.4 Information on sticking the tape

The adhesion of the tape to the bonding surface depends on a variety of factors such as the cleaning, the temperature at application, the roughness of the materials and the smoothness of the bonding surface. To obtain optimum and safe adhesion, the bonding surfaces must be well unified, clean and dry. The ideal application temperature range is +21°C to +38°C (+70°F to +100°F).

3.4.1 Cleaning the bonding surfaces

Most substrates are best prepared by cleaning with a soft and clean cloth and one of the following solvent-based cleaners (alcoholic solvents or hydrocarbon solvents): isopropyl alcohol (IPA), heptane, trichloroethylene (please do not use on aluminium surfaces not to provoke a reaction generating chlorine acids), toluene, acetone and methyl ethyl ketone (MEK). Typical surface cleaning solvent is 50:50 mixture of isopropyl alcohol (IPA) and water (rubbing alcohol). In case of oxidation, Scotch-Brite hand pads or similar products, followed by cleaning with IPA/water, allow to abrade the surface and can increase surface area to improve adhesion.

3.4.2 Application temperature
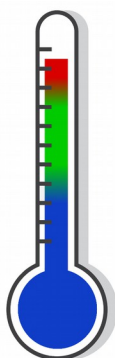
Ideal application temperature range is +21°C to +38°C (+70°F to +100°F). The minimum suggested application temperature is +10°C (+50°F). Initial tape application to surfaces at temperatures below the suggested minimum +10°C (+50°F) is not recommended because the adhesive becomes too firm to adhere readily. However, once properly applied, low temperature holding is generally satisfactory. After application, the bond strength will increase as the

adhesive flows onto the surface. At room temperature 100% of ultimate bond strength will be achieved after approximately 72 hours.

3.4.3 Bonding surface finish
As a general rule, we suggest sticking the tape on bonding surfaces that are as much smooth as possible. The surface roughness parameter (surface finish) should be Ra $\leq$ 3.2 (Class N8).

3.4.4 Pressure
Bond strength is dependent upon the amount of adhesive-to-surface contact developed. Firm application pressure develops better adhesive contact and helps improve bond strength. Typically, good surface contact can be attained by applying enough pressure to insure that the tape experiences approximately 15 psi (100 kPa) pressure. Either roller or platen pressure can be used. Note that rigid surfaces may require 2 or 3 times that much pressure to make the tape experience 15 psi.

3.5 Information on applying the cover strip
To obtain optimum and safe adhesion of the cover strip, the polymer-ferrite surface must be well clean and dry; the ideal application temperature range is +21°C to +38°C (+70°F to +100°F). Should the polymer-ferrite material require additional surface cleaning, we suggest using a soft and clean cloth with 50:50 mixture of isopropyl alcohol (IPA) and water (rubbing alcohol), then wait for the surface to dry.

WARNING
Protect the tape from acid solutions and chemicals that may damage it.
Please check in the following table the chemicals that have no or low impact, the chemicals that have low to medium impact and the chemicals that have high impact on the magnetic material of the tape.

No or low impact chemicals		
Acetic acid 20%	Acetic acid 30%	Cotton seed oil
Formaldehyde 40%	Formic acid	Glacial acetic acid
Glycerine (93°C)	Hexane	Isooctane
Kerosene	Lactic acid	Linseed oil
Mineral oil	Oleic acid	Soy bean oil
Steam heat	Stearic acid	

Low to medium impact chemicals		
Acetone	Acetylene	Anhydrous ammonia
Isopropyl ether	Lacquer solvent	Petrol
Seawater	Turpentine	
High impact chemicals		
Benzene	Carbon tertrachloride	Hydrochloric acid 37% (93°C)
Nitric acid 70%	Nitrobenzene	Red fuming nitric acid
Tetrahydrofuran	Toluene	Trichloroethylene
Xylene		

NOTE
Tolerances also depend on temperature, air supply, duration of impact, liquid consistency and several other factors. Therefore it is always advisable to test the material under real conditions.

3.6 Shortening and cutting the tape and the cover strip

3.6.1 Shortening the tape and the cover strip
All the magnetic tapes both incremental and absolute can be shortened and cut at the desired length and according to needs. No limitations are imposed within the maximum length indicated in the datasheet.

The <u>minimum</u> length of the magnetic tape must be calculated as follows (see the Figure):

measuring length ⓓ + sensing head bottom side length ⓒ + the dimension of 1 pole pitch at least ⓑ + 1 cm (0.4") ⓐ if you install the optional tape terminals. The sum of ⓐ + ⓑ values must be doubled as it is intended for each end of the tape.
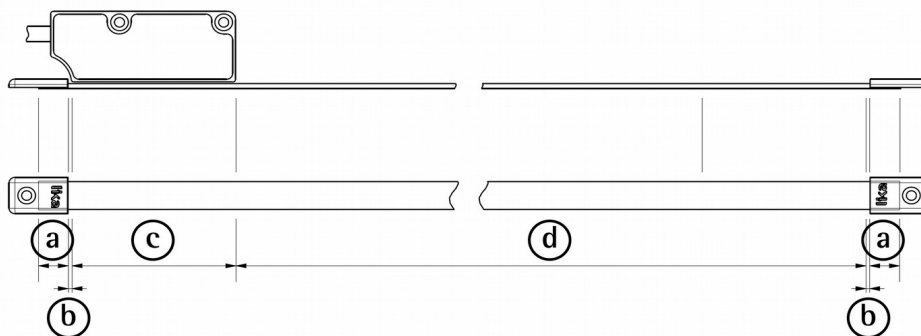
NOTE
Should you install both the optional tape terminals and the cover strip, please take care to cut the cover strip 2 cm / 0.79" shorter than the tape as it cannot be fixed under the terminals.

EXAMPLE
Let's suppose we need to measure a 5,000 mm (197") long travel by means of a SMA2 absolute encoder; furthermore we want to apply the optional cover strip to the MTA2 tape and mount the KIT LKM-1440 optional tape terminals. The maximum length of the MTA2 magnetic tape is 8.1 m (319").

ⓐ   10 mm / 0.39" (x 2)
ⓑ   2 mm / 0.079" (x 2)
ⓒ   55 mm / 2.165"
ⓓ   5000 mm / 197"

Thus the minimum length of the tape will be 5,079 mm (200").
As we want to install also the tape terminals, the cover strip will be 5,079 mm – 20 mm = 5,059 mm (200" - 0.78" = 199.22").

3.6.2 Cutting the tape and the cover strip
Use shears or a metal cutting chop saw to cut the tape and the cover strip. Please consider that the shears' blades will make a clear cut in one side and a warped cut in the other side.
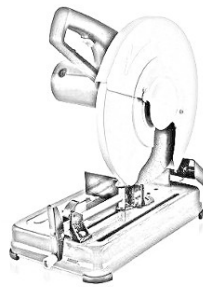
WARNING
Please always cut the tape and the cover strip separately. Do not cut the tape and the cover strip if they are already bonded together.

3.7 Mounting the magnetic tape

WARNING

The active side of the magnetic tape (polymer-ferrite composite dark side) must always face the active side of the linear encoder (sensor's location in the enclosure).

WARNING

We suggest installing the tape and the sensor providing protection means against waste, especially swarf as turnings, chips, or filings; should this not be possible, please make sure that adequate cleaning measures such as brushes, wipers or compressed air jets are in place in order to prevent the sensor and the tape from jamming.

WARNING

Please ensure that the tape is kept in a straight line!

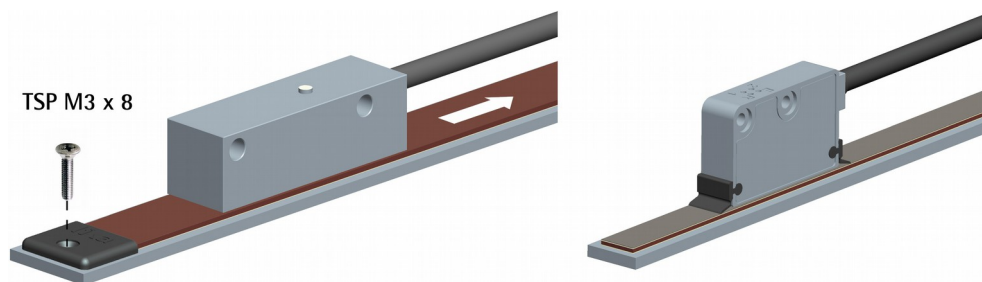### 3.7.1 Mounting the scale with adhesive tape (Figure 1 and Figure 2)

Figure 1 – Mounting the scale with adhesive tape

To prevent the ends of the tape from peeling off, we suggest always mounting the optional tape terminals (refer to the "3.9 Mounting the KIT LKM-1439 and KIT LKM-1440 tape terminals" section on page 27).

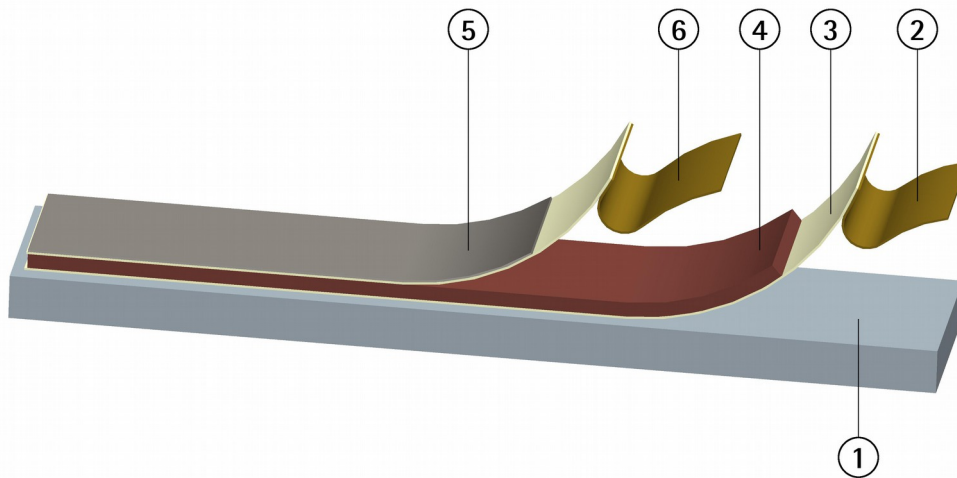**Step by step procedure for mounting the scale with adhesive tape**

Figure 2 – Mounting the magnetic tape

- Cut the magnetic tape **4** at the required length as described in the "3.6 Shortening and cutting the tape and the cover strip" section on page 16;
- clean carefully the bonding surface **1** as described in the "3.4 Information on sticking the tape" section on page 14;
- stick on the magnetic tape **4** first: peel away just a short part of the protection backing (liner) **2** from the adhesive tape **3** and stick on the first part of the tape; go on sticking short sections until bonding the whole length; apply enough pressure to insure that the tape experiences approximately 15 psi (100 kPa) pressure. Either roller or platen pressure can be used; for more information refer to the "3.4.4 Pressure" section on page 15;

WARNING
Make sure that the tape is always kept in a straight line. We suggest sticking on the tape inside a groove or against an edge.

- if supplied, mount the optional tape terminals **7** at both ends of the tape as described in the "3.9 Mounting the KIT LKM-1439 and KIT LKM-1440 tape terminals" section on page 27;
- if supplied, apply the cover strip **5** as described in the "3.8 Applying the cover strip" section on page 25.

WARNING

While mounting the magnetic tape, the minimum bending radius cannot be lower than 350 mm (14").

3.7.2 Mounting the tape with optional PS1 aluminium profile (Figure 3) For SMK and SME5 models only

For the overall dimensions of the PS1 aluminium profile refer to the "3.1.5 PS1 optional aluminium profile overall dimensions" section on page 12.
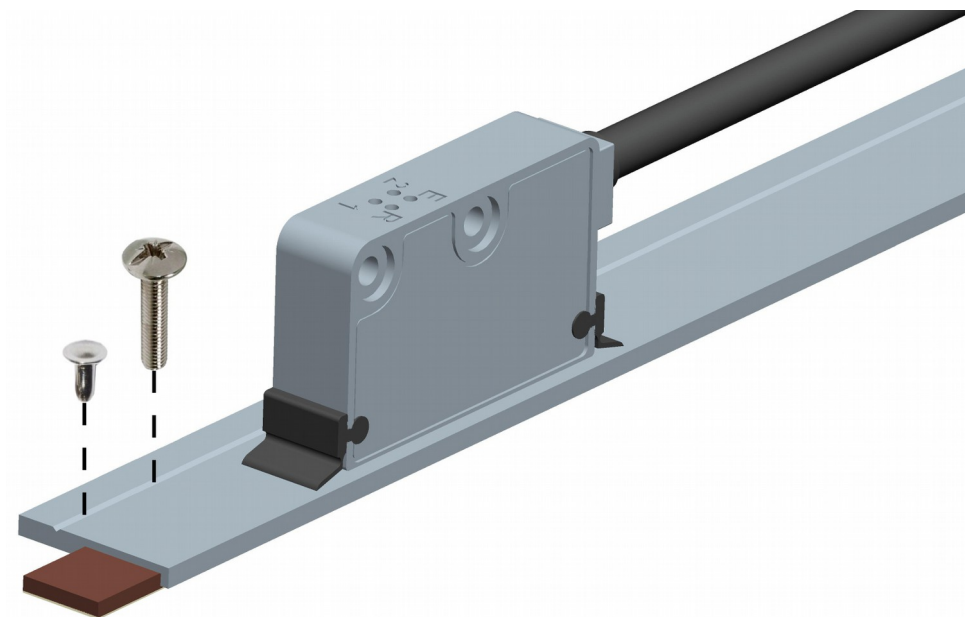
Figure 3 – Mounting the tape with PS1 profile

Step by step procedure for mounting the tape with PS1 profile

WARNING

The stainless steel cover strip is not necessary when you mount the PS1 profile, thus it must <u>NOT</u> be applied.

- Stick on the magnetic tape as explained in the "3.7.1 Mounting the scale with adhesive tape (Figure 1 and Figure 2)" section on page 18;
- place the PS1 profile on the tape and fasten it by means of screws or rivets; the fixing holes have to be drilled along the groove in the lateral section of the profile; pay the utmost attention not to damage the tape. Carefully remove the scrap material after drilling.

WARNING
When you install the profile please consider that the maximum sensor gap must be calculated from the magnetized surface of the tape, not from the aluminium profile.

3.7.3 Mounting the tape on arcs and round surfaces (Figure 4)
For MTx and MTLA tapes only

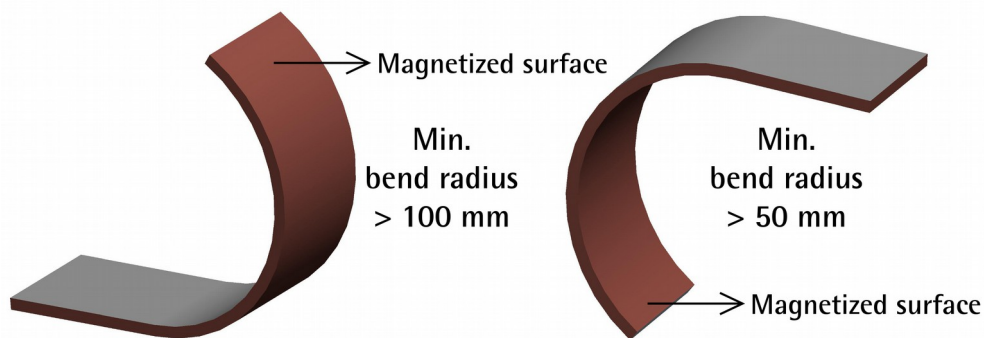**Figure 4 – Minimum bend radius**

MT tapes for incremental encoders and MTLA tape for SMLA absolute encoder can be installed in curved structures, in arcs and even -MT tape only- in circular surfaces (for such applications we suggest always considering the installation of MRI type rings).

If you need to read the outer surface of the arc / circumference, the minimum bend radius must be greater than 100 mm / 3.94" for MT type tape; greater than 75 mm / 2.95" for MTLA type tape. If you need to read the inner surface of the arc / circumference, the minimum bend radius must be greater than 50 mm / 1.97" (MT type tape only).
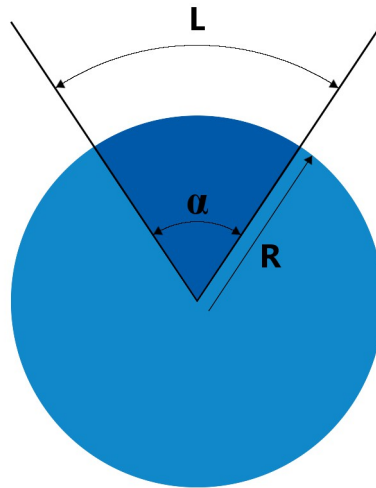
The mounting procedure for circular / angular applications is the same as for linear applications, refer to the "3.7.1 Mounting the scale with adhesive tape (Figure 1 and Figure 2)" section on page 18.

WARNING
Please consider that the angular resolution depends on the radius of the curved support.

3.7.3.1 Calculating the angular resolution

The **angular resolution** can be defined as the spacing expressed in degrees (°) between two consecutive discrete points, i.e. the sequence of information provided by the encoder.

The angular resolution of a tape applied on either a curved or a circular surface results from the following calculation:

$$\text{Angular resolution} = \frac{\alpha}{\text{Number of information}}$$

where:

$$\alpha = \frac{L \times 360}{2\pi R}$$

L is the length of the tape; and R is the radius of the curved or circular surface.

The number of information is the number of pulses/counts provided by the measuring system for the whole tape length L.

As you can easily see in the Figure above, α is the magnitude of the angle corresponding to the length of the tape applied on the circular surface. The formula for calculating the magnitude of the angle α (i.e. the size of the arc) can be argued considering that, if the magnitude of the circumference ($2\pi R$) is 360°, then the magnitude of the tape angle will be 360° (circumference) or a fraction of 360° (arc).

The number of information depends on the length of the tape and the technical characteristics of the installed sensor.

As far as the incremental sensors and the MT incremental tapes are concerned, we need to calculate the number of information provided by the measuring unit for the tape length as it is not available in the order code. We must consider the length of the tape, the pole pitch of the tape and the interpolation factor used by the installed sensor.

The incremental tape can be long as you need and up to 100 m (MT tape). The pole pitch is the distance between two consecutive poles. Several pole pitches from 1.0 mm (MT10 tape) up to 5.0 mm (MT50 tape) can be supplied. We must pair each tape type with its own sensor type which is designed to detect the specific pole pitch; for example, MT50 tape must be compulsorily paired with a sensor which is able to read to 5.0 mm pole pitch, such as the SME52 model sensor. Finally we must consider the interpolation factor. If you need to know the interpolation factor, then you have to **divide the pole pitch value by the resolution** indicated in the order code.

$$\text{Interpolation factor} = \frac{\text{Pole pitch}}{\text{resolution}}$$

For example: as above, let's suppose we are using a SME**5**2-xx-x-**50**-… linear encoder paired with the MT50 magnetic tape; as the pole pitch of the MT50 tape is 5 mm long and the resolution of the sensor is 0.05 mm (order code = 50), then the interpolation factor is 100x (5 mm / 0.05 mm).

As far as the SMLA absolute encoder is concerned, since the maximum length of the MTLA tape is 400 mm (15.75"), the measuring unit will provide **4096** information when the SMLA-xx-x-**06**-… is installed, **8192** information when the SMLA-xx-x-**07**-… is installed and **16384** information when the SMLA-xx-x-**08**-… is installed. If you mount only half the tape (200 mm / 7.87"), then the number of information provided, for example, by the SMLA-xx-x-06-… encoder will be down to half (2048 cpr). For the absolute encoder resolution please refer to the order code.

There follows a couple of examples to better understand how to calculate the angular resolution.

EXAMPLE 1
Incremental encoder system: SME52-xx-x-50-… sensor paired with MT50 incremental tape
Let's suppose you mount a 600 mm long MT50 incremental tape on an arc having a size of R = 150 mm. The MT50 tape is paired with a SME52-xx-x-**50**-… sensor. As the pole pitch of the MT50 tape is 5 mm long and the resolution of the sensor is 0.05 mm (order code = 50), then the interpolation factor is 100x (5 mm / 0.05 mm).

As stated, the angular resolution results from the following calculation:

$$\text{Angular resolution} = \frac{\alpha}{\text{Number of information}}$$

First of all let's calculate the magnitude of the angle α.

$$\alpha = \frac{L \ \times \ 360}{2\pi R} = \frac{600 \ \times \ 360}{2\pi \ \times \ 150} = \frac{216{,}000}{942.48} = 229.18$$

Now let's calculate the number of information provided for the whole tape length.
The MT50 tape being 600 mm long has the number of poles as follows:

$$\text{Number of poles} = \frac{\text{Length of the tape}}{\text{Pole pitch}} = \frac{600}{5} = 120$$

Since the interpolation factor is x100 (see above), the measuring system will provided the number of information as follows:

Number of information = number of poles x interpolation = 120 x 100 = 12.000

Thus it will be:

$$\text{Angular resolution} = \frac{\alpha}{\text{Number of information}} = \frac{229.18}{12{,}000} = \textbf{0.019°}$$

EXAMPLE 2
Absolute encoder system: SMLA-xx-x-07-… encoder paired with MTLA absolute tape
Let's suppose you mount a 400 mm long MTLA absolute tape on an arc having a size of R = 100 mm. The MTLA tape is paired with a SMLA-xx-x-**07**-… sensor. The resolution of the encoder is 8192 cpr, as you can read in the order code.

As previously stated, the angular resolution is calculated as follows:

$$\text{Angular resolution} = \frac{\alpha}{\text{Number of information}}$$

First of all let's calculate the magnitude of the angle α.

$$\alpha = \frac{L \times 360}{2\pi R} = \frac{400 \times 360}{2\pi \times 100} = \frac{144{,}000}{628.3} = 229.18$$

The number of information can be read in the order code: SMLA-xx-x-**07**-… = 8192 cpr.

Thus it will be:

$$\text{Angular resolution} = \frac{\alpha}{\text{Number of information}} = \frac{229.18}{8{,}192} = \mathbf{0.028°}$$

3.8 Applying the cover strip
For the overall dimensions of the cover strip refer to the "3.1.1 MT, MTA2 tapes overall dimensions" section and following on page 10.
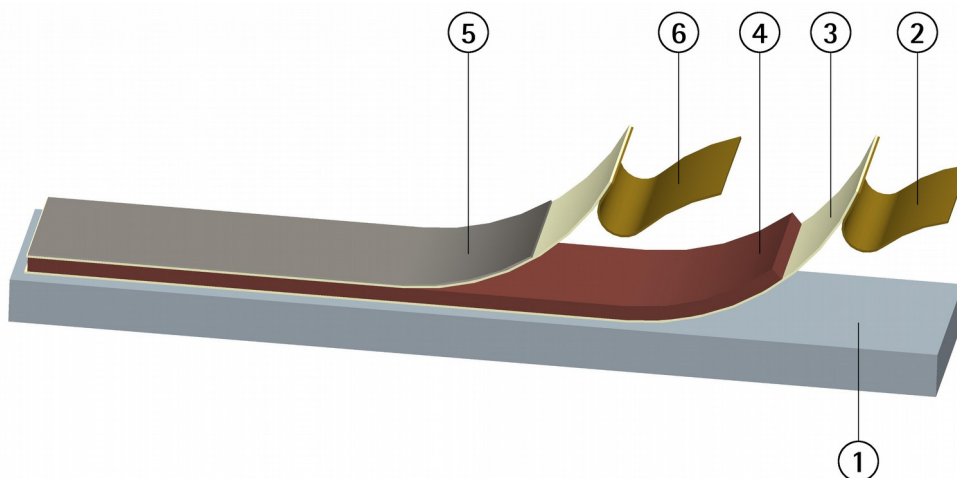

Figure 5 – Applying the cover strip

WARNING

Please ensure that the cover strip **5** is kept in a straight line!

WARNING

With absolute tape, please note down the direction of the arrow that indicates the counting direction before installing the cover strip **5**.

Proceed as follows when you need to apply the optional stainless steel cover strip:

- cut the cover strip **5** at the required length as described in the "3.6 Shortening and cutting the tape and the cover strip" section on page 16;
- clean carefully the magnetic tape surface **4** as described in the "3.5 Information on applying the cover strip" section on page 15;
- stick on the cover strip **5**: peel away just a short part of the protection backing (liner) **6** from the adhesive tape and stick on the first part of the cover strip; go on sticking short sections until bonding the whole length; apply enough pressure to insure that the tape experiences approximately 15 psi (100 kPa) pressure. Either roller or platen pressure can be used; for more information refer to the "3.4.4 Pressure" section on page 15.
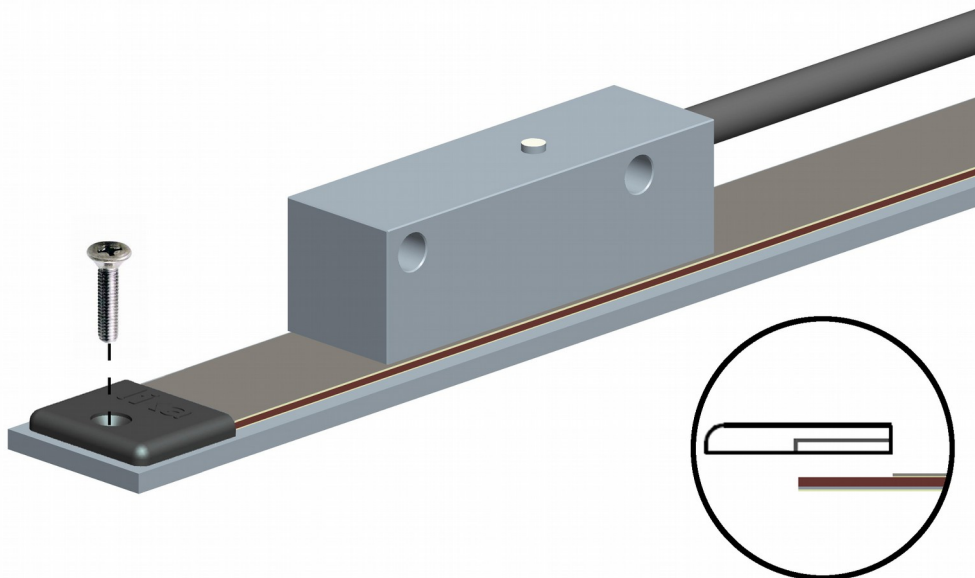
NOTE

Please note that the cover strip have different thickness in specific models:

- 0.2 mm / 0.0079"   for MT10 and MTA2 tapes;
- 0.3 mm / 0.012"   for MTx tapes;
- 0.4 mm / 0.016"   for MTA5, MTAX, MTAZ and MTLA tapes.

The cover strip is not available for MTS and MTA1 tapes.

3.9 Mounting the KIT LKM-1439 and KIT LKM-1440 tape terminals

For the overall dimensions of the tape terminals refer to the "3.1.4 KIT LKM-1439 and KIT LKM-1440 tape terminals overall dimensions" section on page 11.

Use the provided **TSP M3 x 8** type screws to fix the tape terminals.

WARNING

The terminals are designed to fix the ends of the magnetic tape (not both the tape and the cover strip). There is not enough space to put the cover strip under the terminals. Therefore take care to cut the cover strip 2 cm shorter than the tape and apply it to the tape section between the terminals.

For complete information please refer to the "3.6 Shortening and cutting the tape and the cover strip" section on page 16.
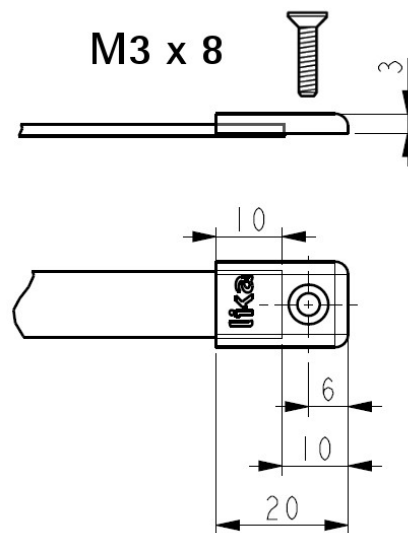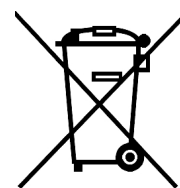
NOTE

The tape terminals are not available for MTS type tape.

Document release	Description
1.0	1st issue
1.1	Multilanguage version
1.2	Complete revision
1.3	Mounting the cover strip: dimensions updated

Dispose separately