

EXT linear encoder / Encoder lineal EXT

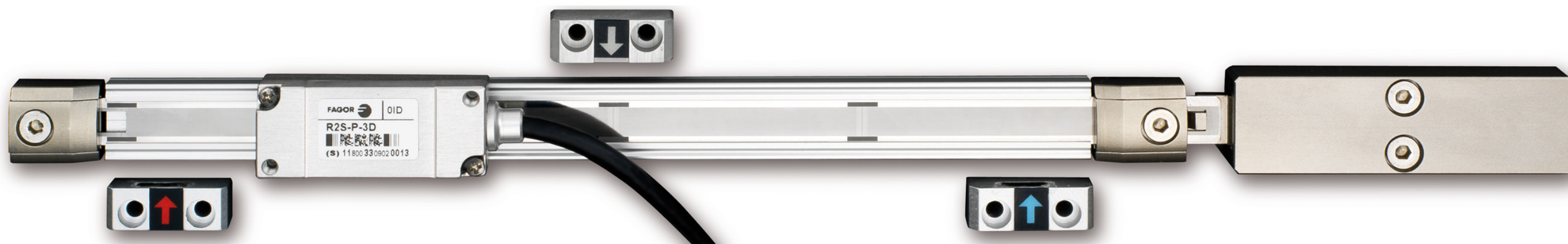
Installation manual / Manual de instalación

Manual code: 14460093

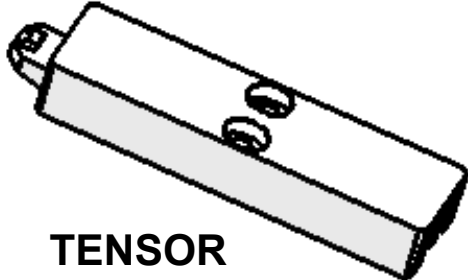
Manual version: 1503



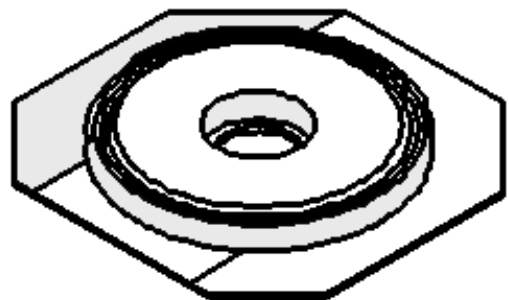
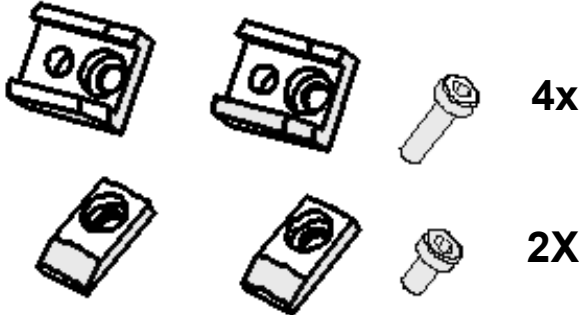
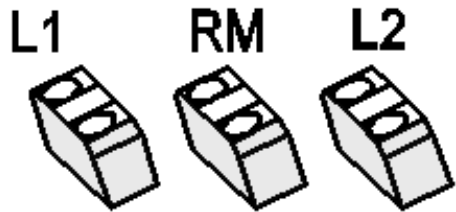
Fagor Automation S. Coop.



CONTENIDO DEL EMBALAJE PACKAGE CONTENTS



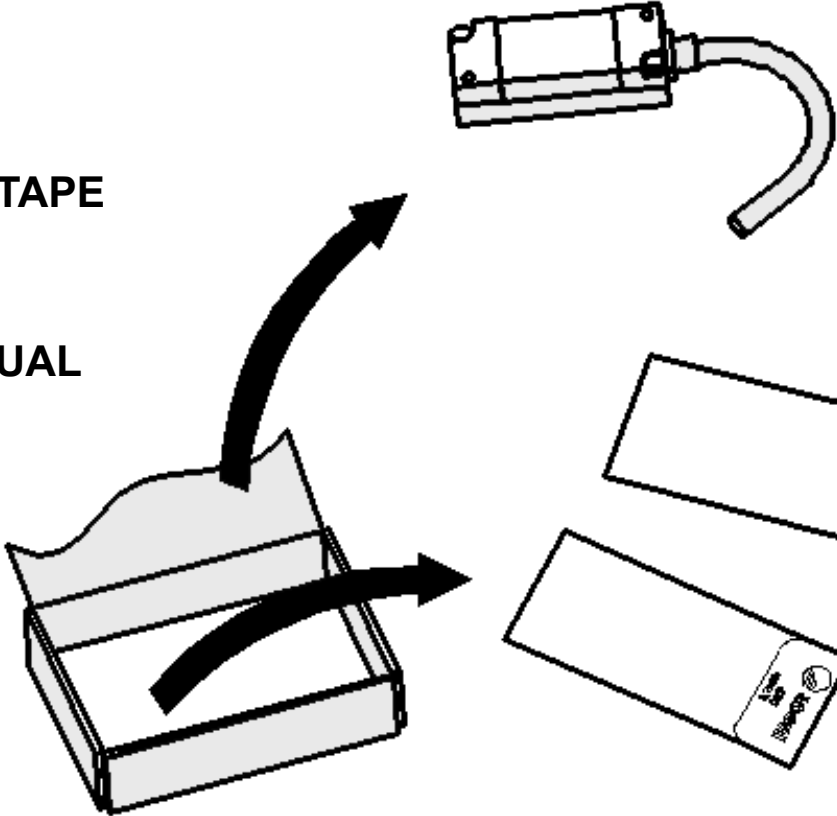
TENSOR
TENSIONER



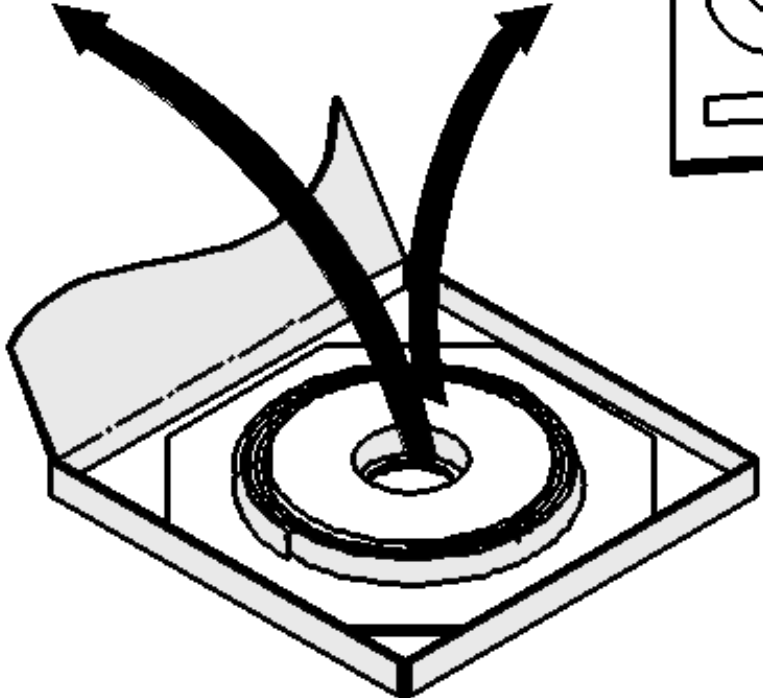
FLEJE
STEEL TAPE



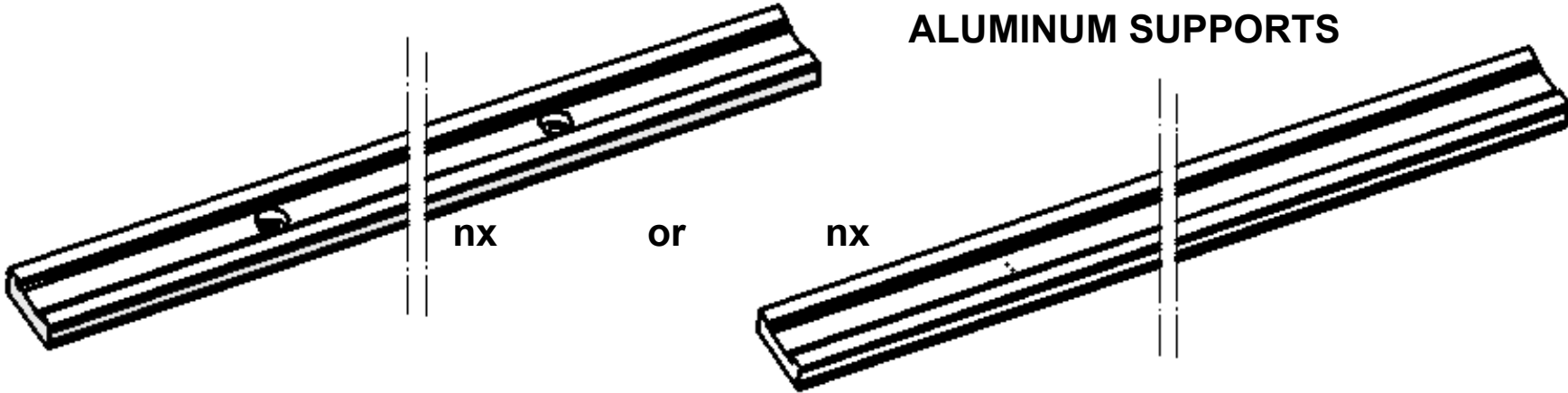
MANUAL



CALAS DE MONTAJE
MOUNTING SHIMS

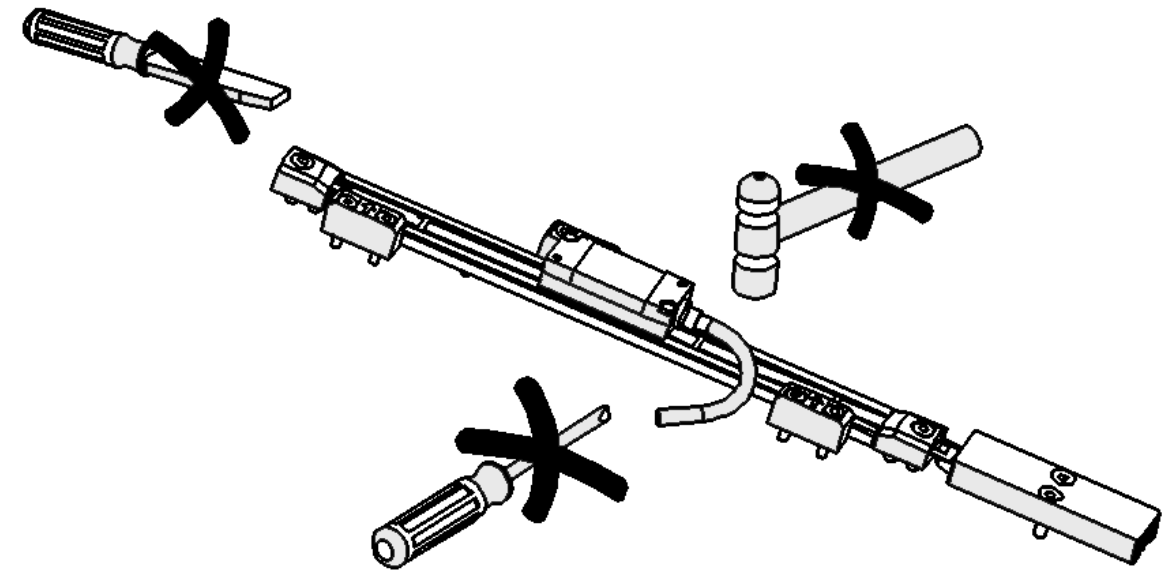
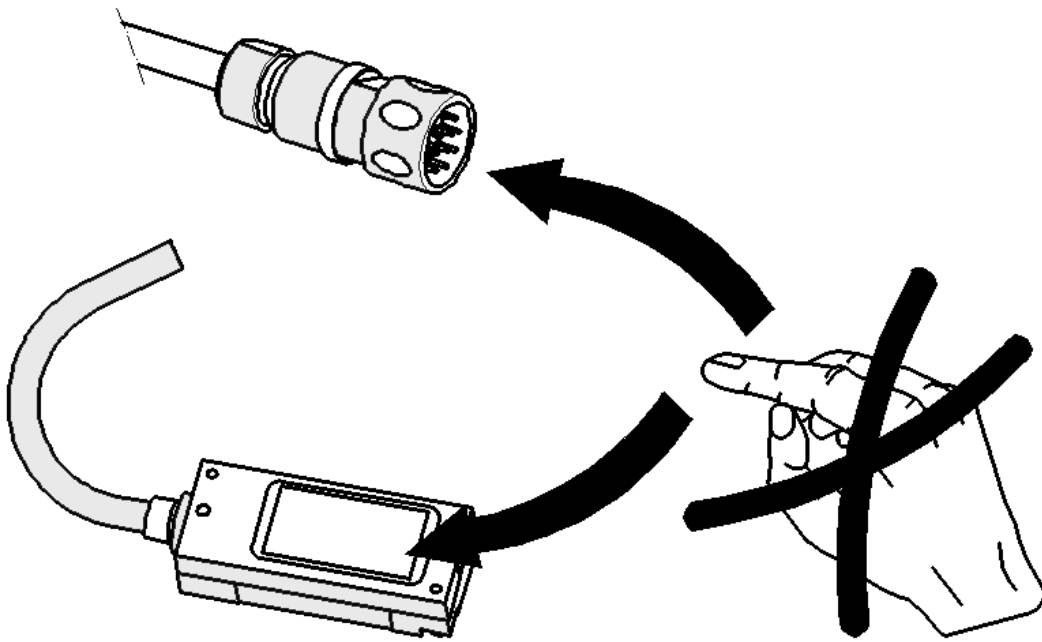
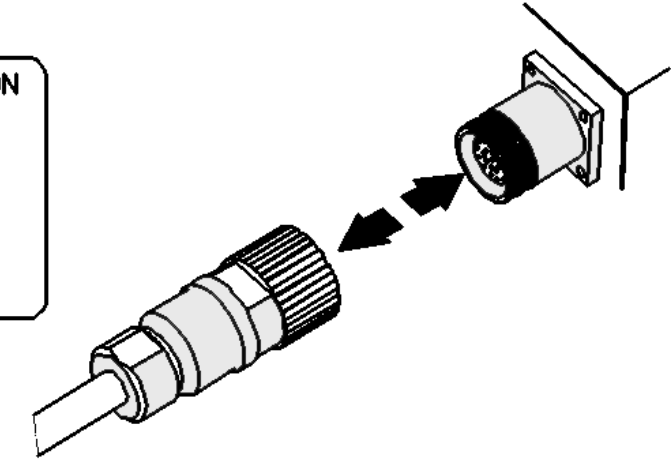
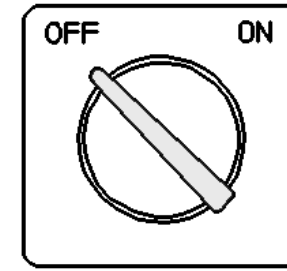
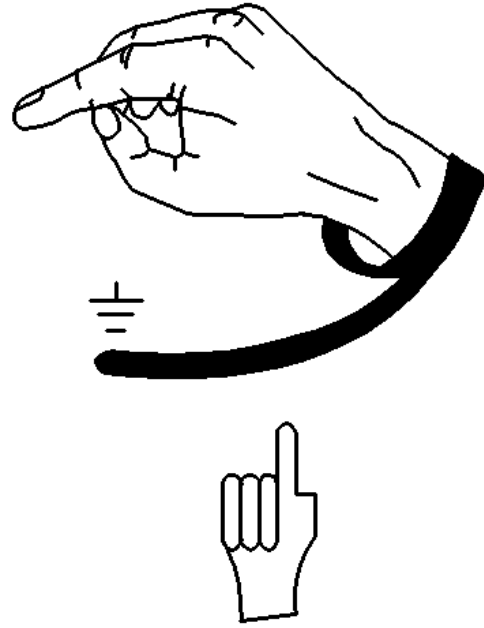


SOPORTES DE ALUMINIO
ALUMINUM SUPPORTS



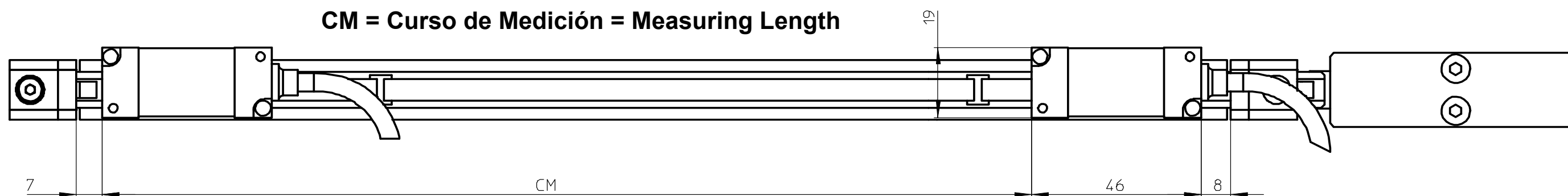


DIN EN 100

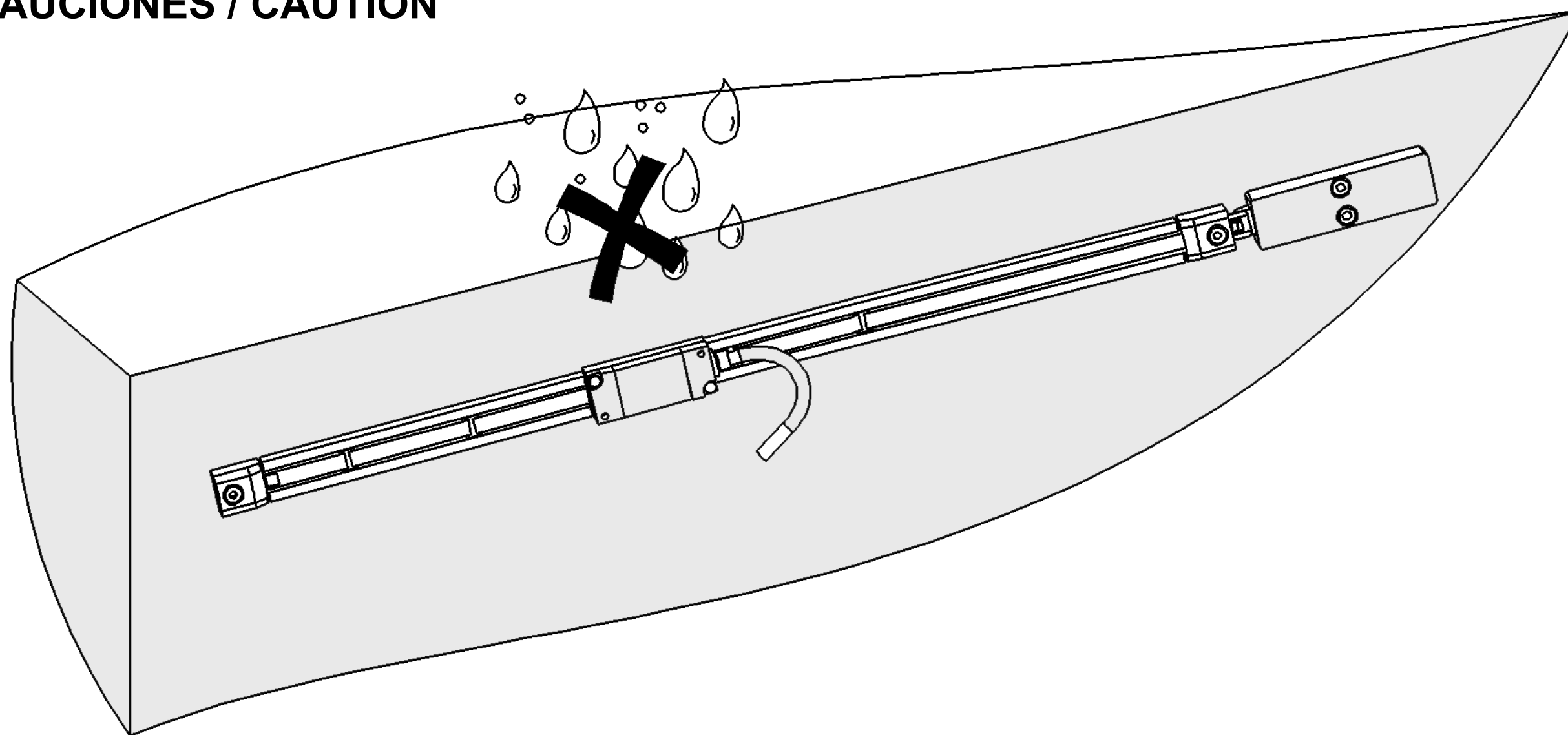


DIMENSIONES GENERALES (mm) / OVERALL DIMENSIONS (mm)

CM = Curso de Medición = Measuring Length

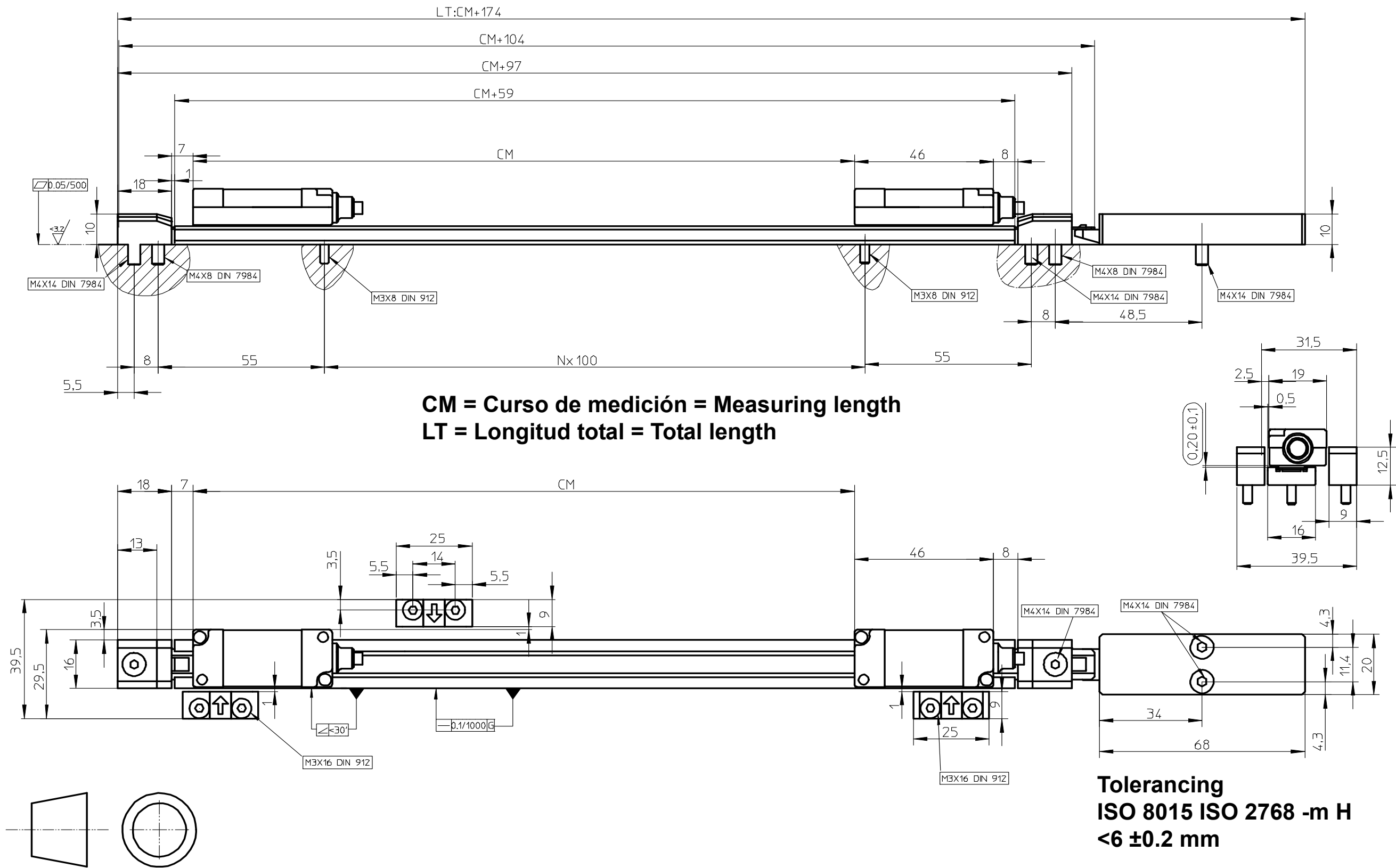


PRECAUCIONES / CAUTION



DIMENSIONES (mm). Curso de medición (CM) < 2040 mm
DIMENSIONS (mm). Measuring length (CM) < 2040 mm

Fijación con tornillos
Screw mounting

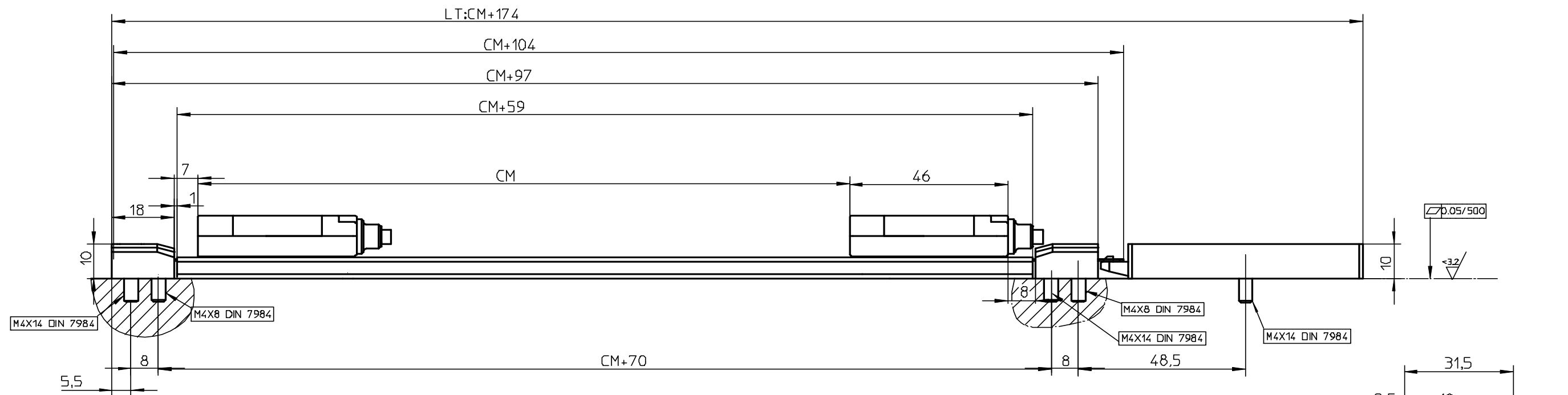


CM = Curso de medición = Measuring length
LT = Longitud total = Total length

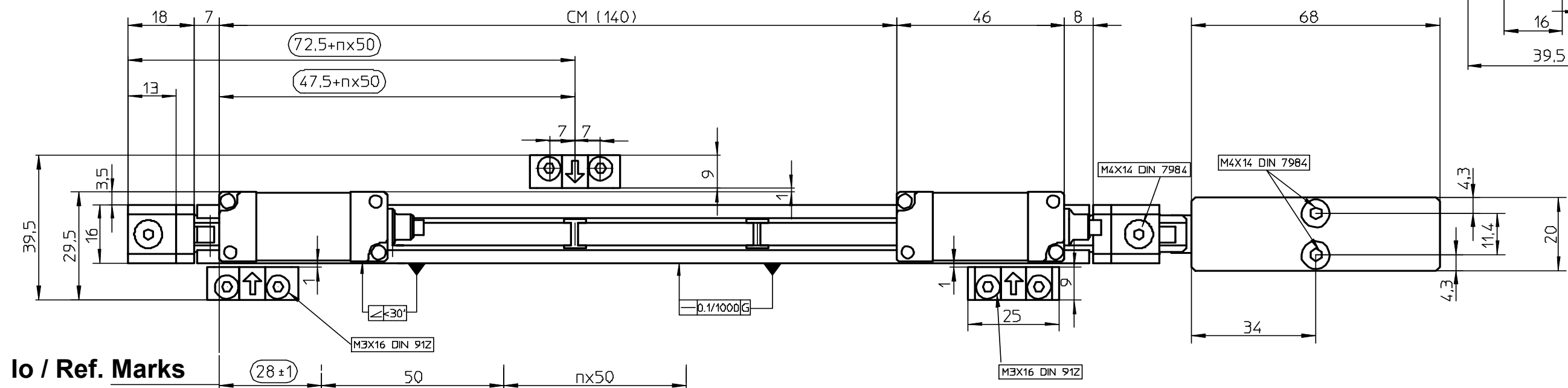
Tolerancing
ISO 8015 ISO 2768 -m H
$6 \pm 0.2 \text{ mm}$

DIMENSIONES (mm). Curso de medición (CM) < 2040 mm Fijación por adhesivo

DIMENSIONS (mm). Measuring length (CM) < 2040 mm Sticker mounting



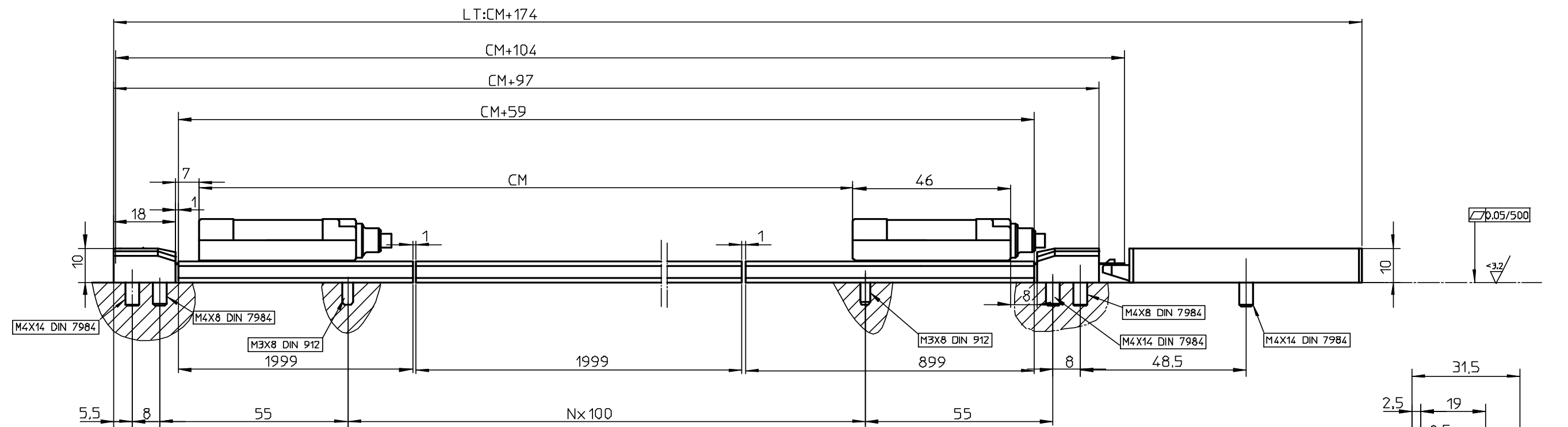
CM = Curso de medición = Measuring length
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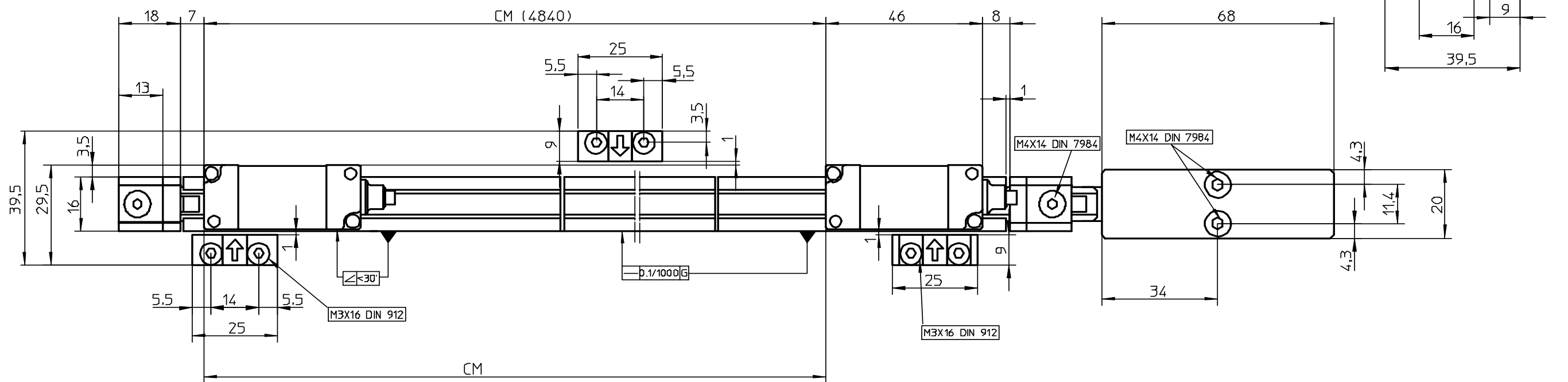
lo / Ref. Marks

DIMENSIONES (mm). Curso de medición (CM) > 2040 mm
DIMENSIONS (mm). Measuring length (CM) > 2040 mm

Fijación con tornillos
Screw mounting

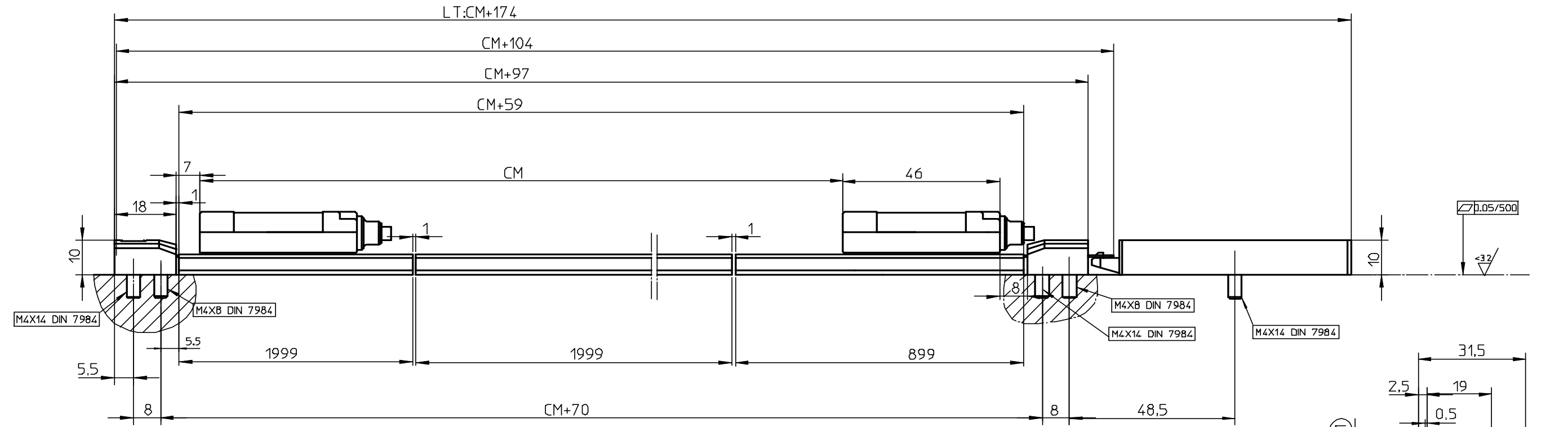


CM = 4840 Curso de medición = Measuring length
CARRIER = 2x1999 + 1x899
LT = Longitud total = Total length

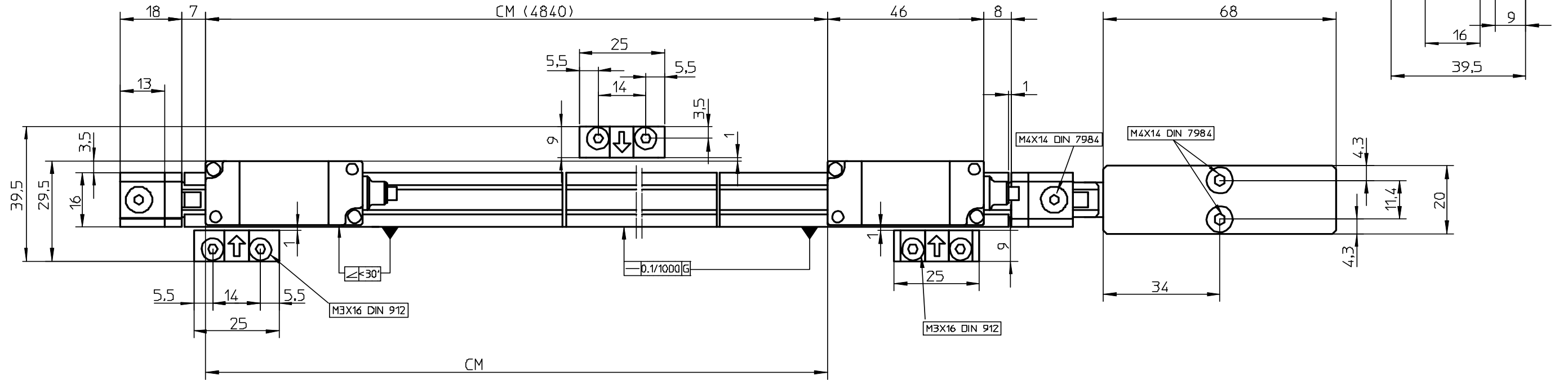


DIMENSIONES (mm). Curso de medición (CM) > 2040 mm Fijación por adhesivo

DIMENSIONS (mm). Measuring length (CM) > 2040 mm Sticker mounting

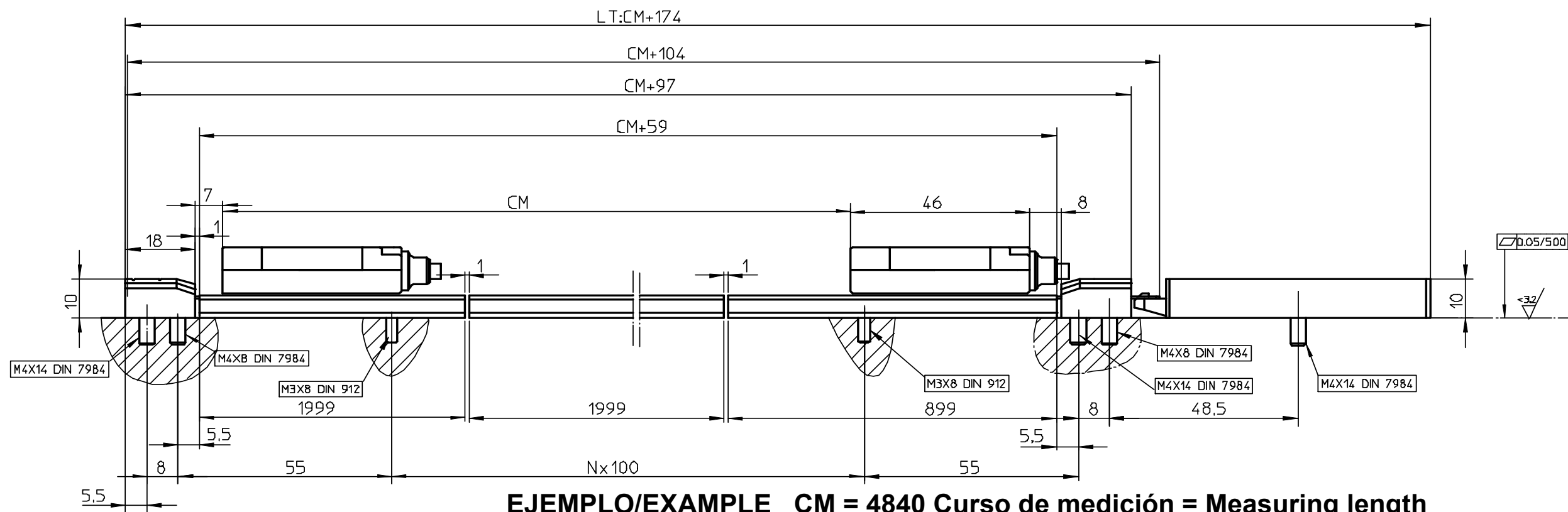


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LT = Longitud total = Total length

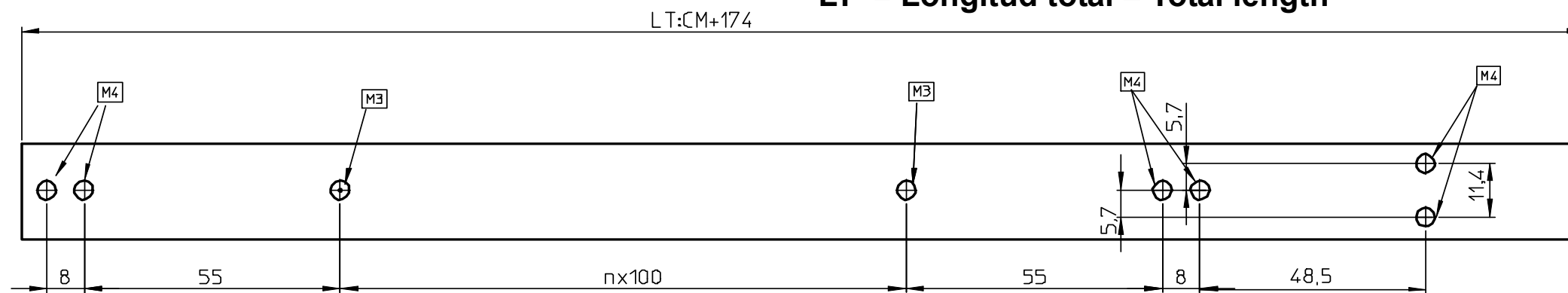


PREPARACIÓN DE SUPERFICIE DE MONTAJE / MOUNTING SURFACE PREPARATION

PERFILES ATORNILLADOS / SCREW MOUNTING



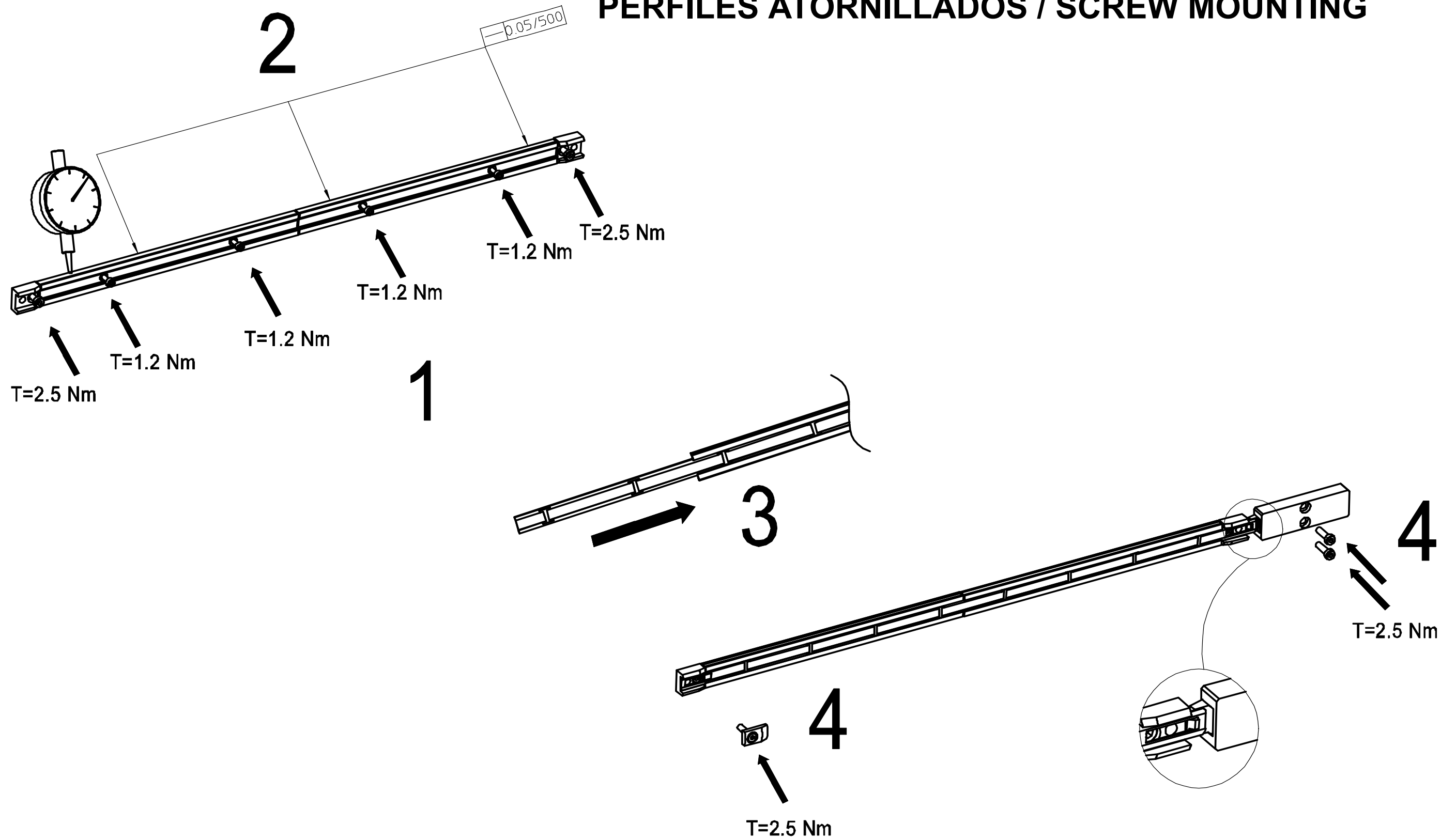
EJEMPLO/EXAMPLE CM = 4840 Curso de medición = Measuring length
PERFILES / PROFILES = 2x1999 + 1x899
LT = Longitud total = Total length



CM = Curso de medición = Measuring length
LT = Longitud total = Total length

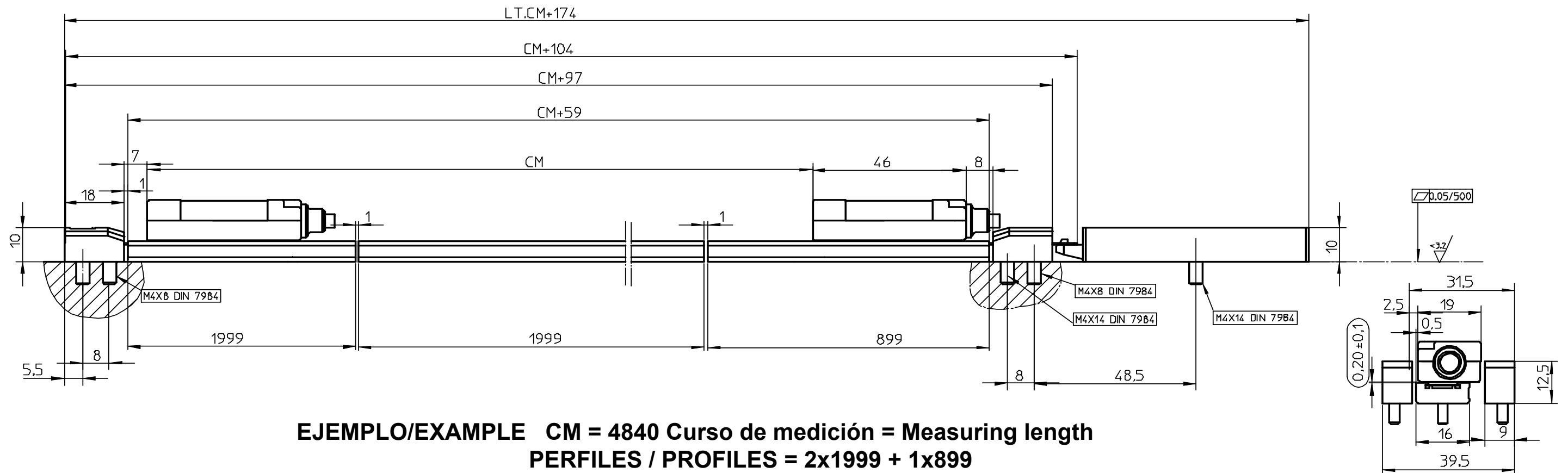


MONTAJE PERFILES-FLEJE / GUIDE-TAPE MOUNTING PERFILES ATORNILLADOS / SCREW MOUNTING

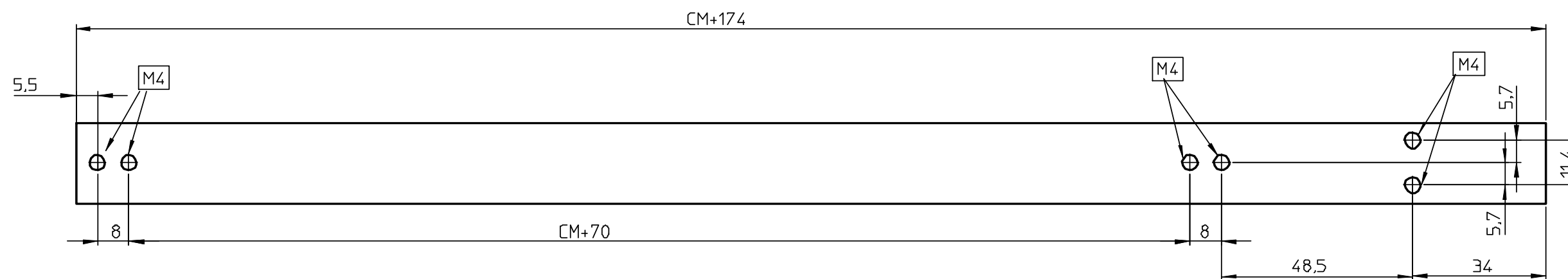


PREPARACIÓN DE SUPERFICIE DE MONTAJE / MOUNTING SURFACE PREPARATION

PERFILES ADHESIVADOS / STICKER MOUNTING



EJEMPLO/EXAMPLE CM = 4840 Curso de medición = Measuring length
PERFILES / PROFILES = 2x1999 + 1x899
LT = Longitud total = Total length

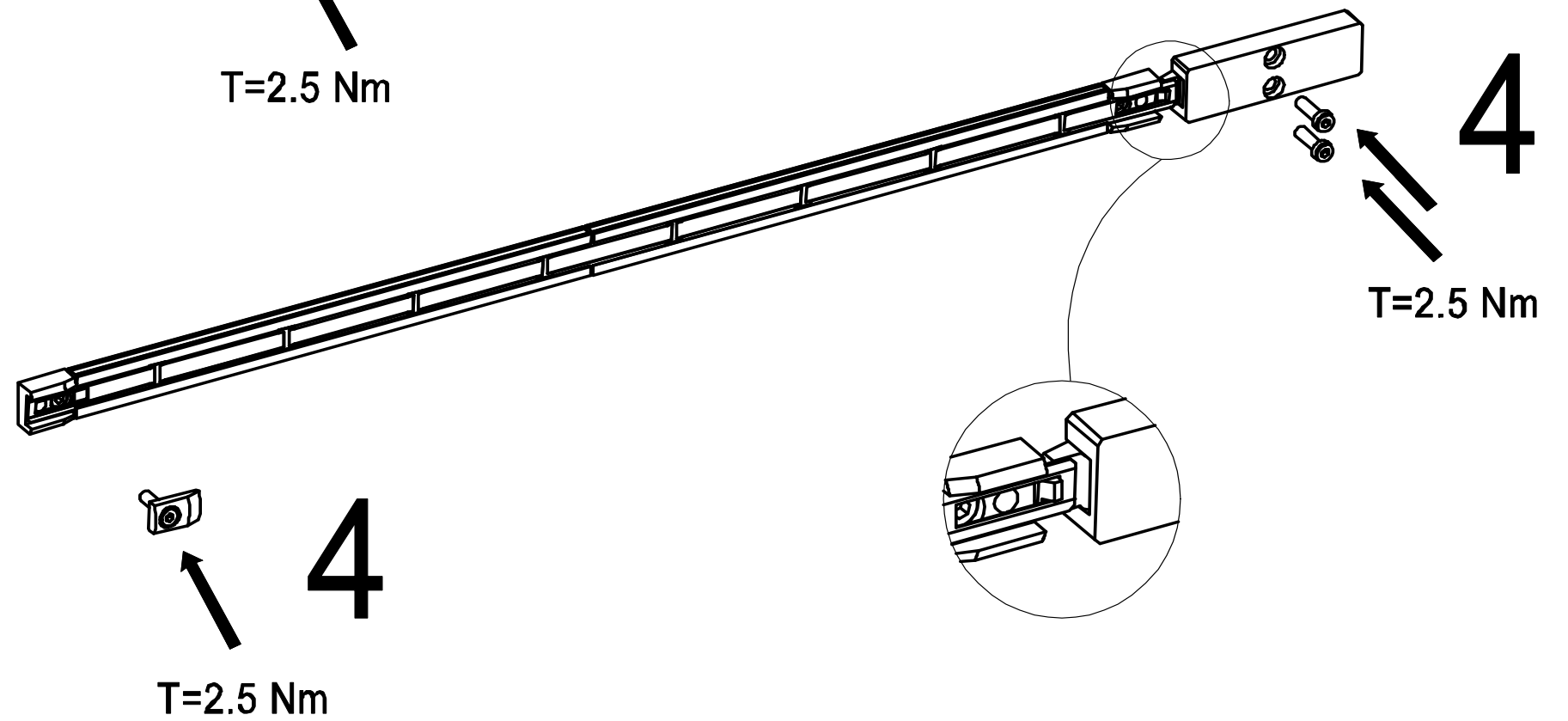
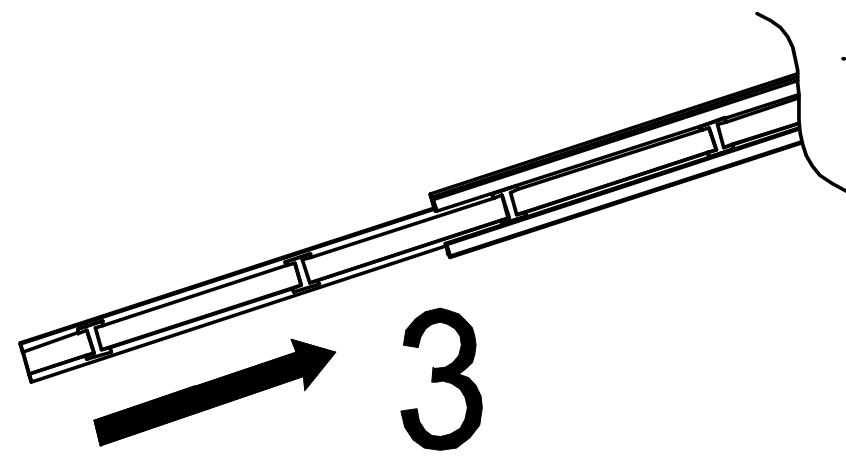
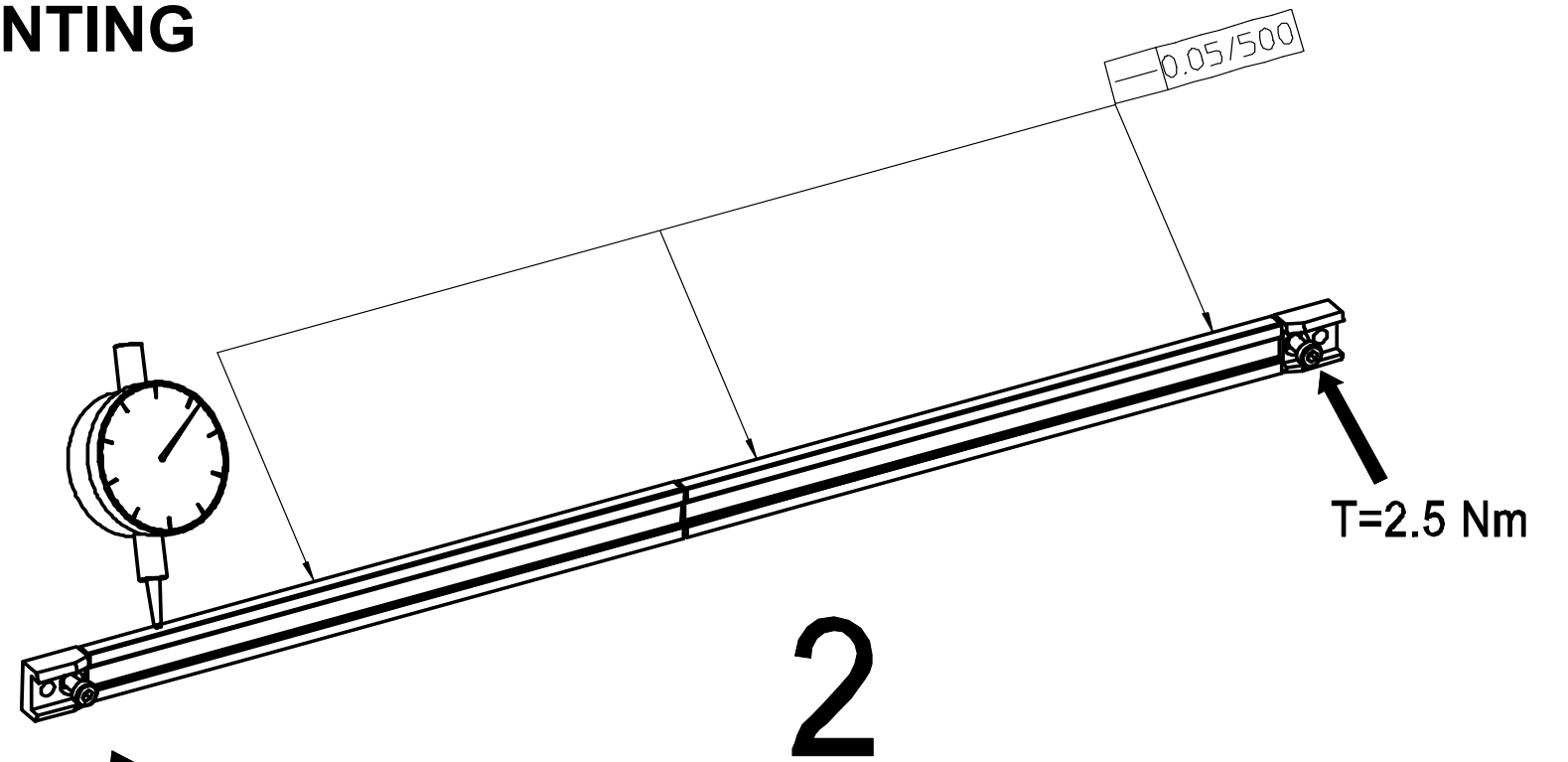
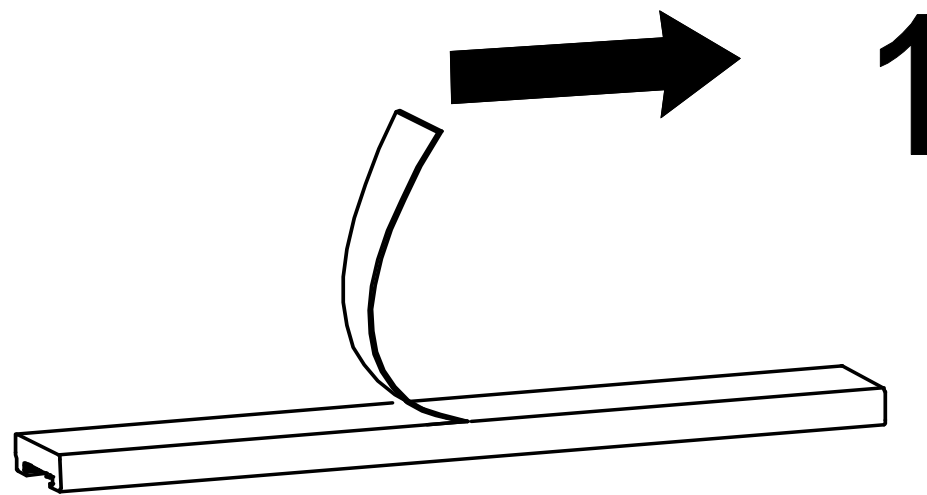


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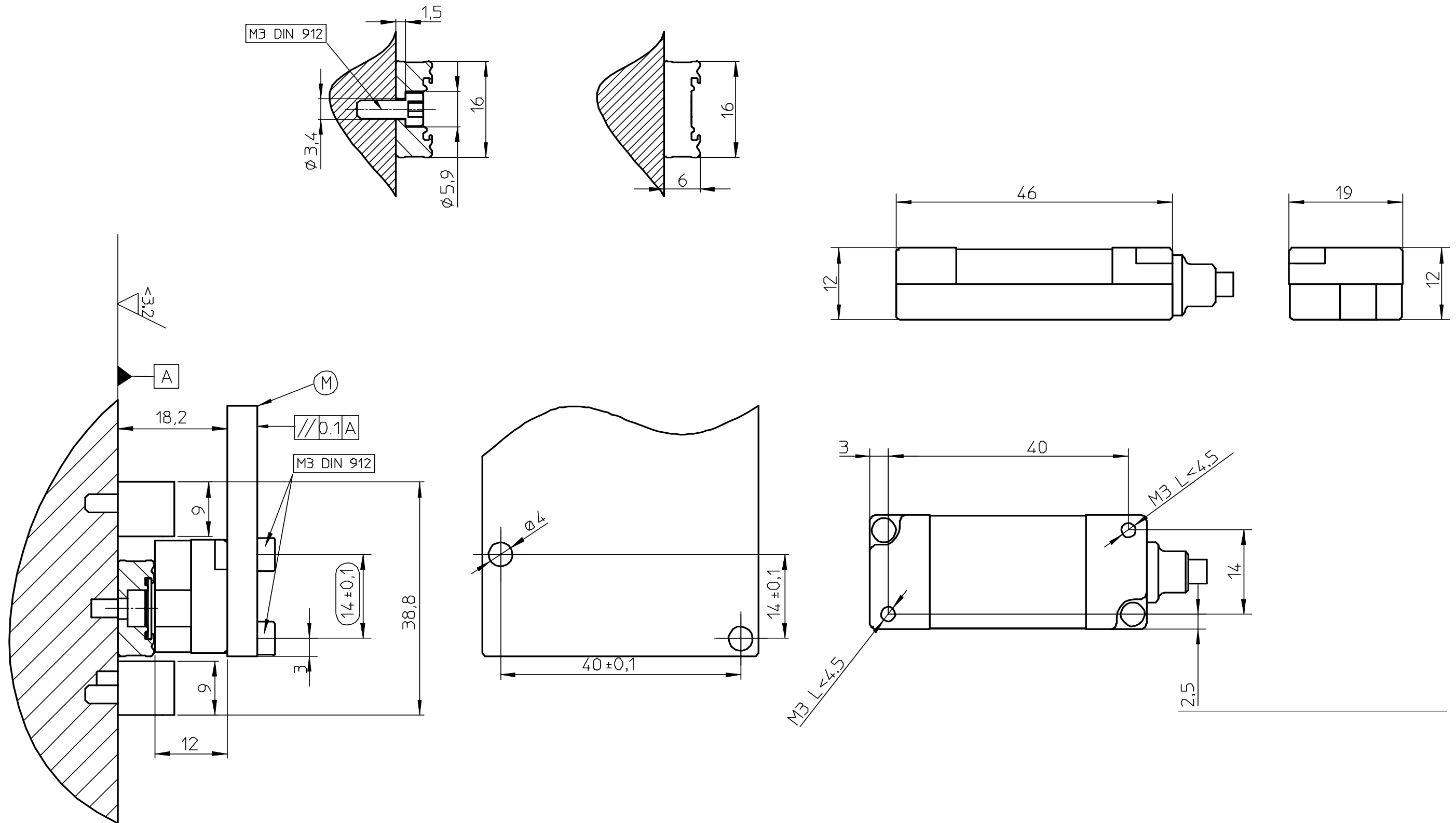
MONTAJE PERFILES-FLEJE / GUIDE-TAPE MOUNTING

PERFILES ADHESIVADOS / STICKER MOUNTING



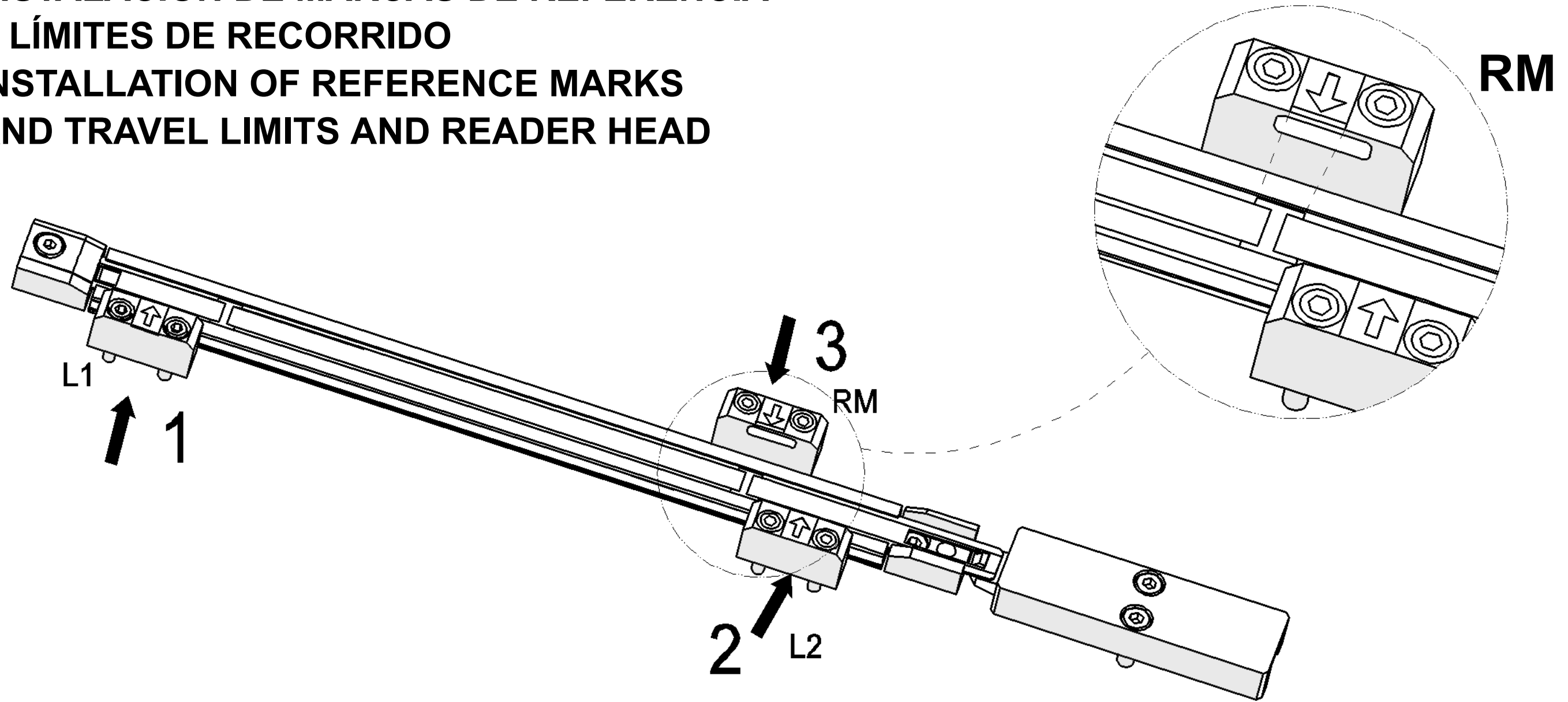
DIMENSIONES GENERALES DE LA CABEZA

OVERALL DIMENSIONS OF THE READER HEAD



INSTALACIÓN DE MARCAS DE REFERENCIA Y LÍMITES DE RECORRIDO

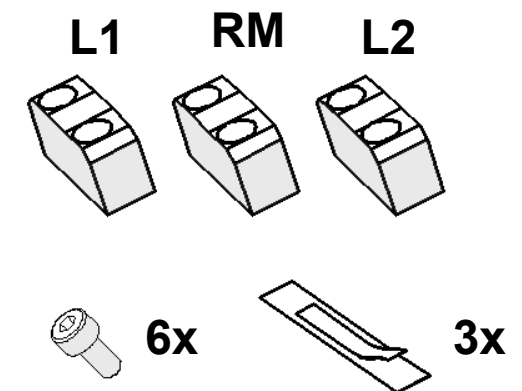
INSTALLATION OF REFERENCE MARKS AND TRAVEL LIMITS AND READER HEAD



L1 = Flecha roja / Red arrow
 L2 = Flecha azul / Blue arrow
 RM = Flecha gris* / Grey arrow*

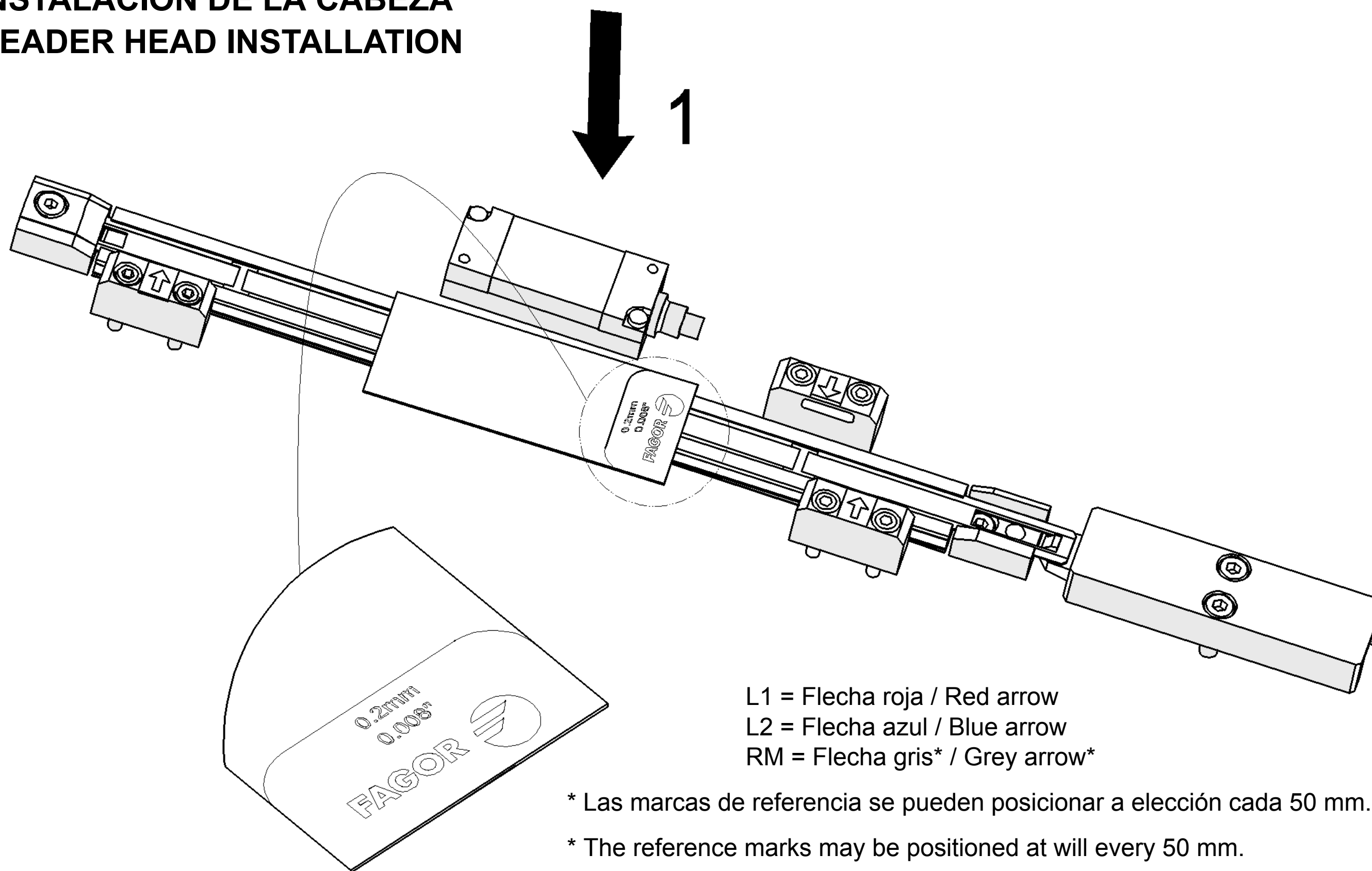
* Las marcas de referencia se pueden posicionar a elección cada 50 mm.

* The reference marks may be positioned at will every 50 mm.

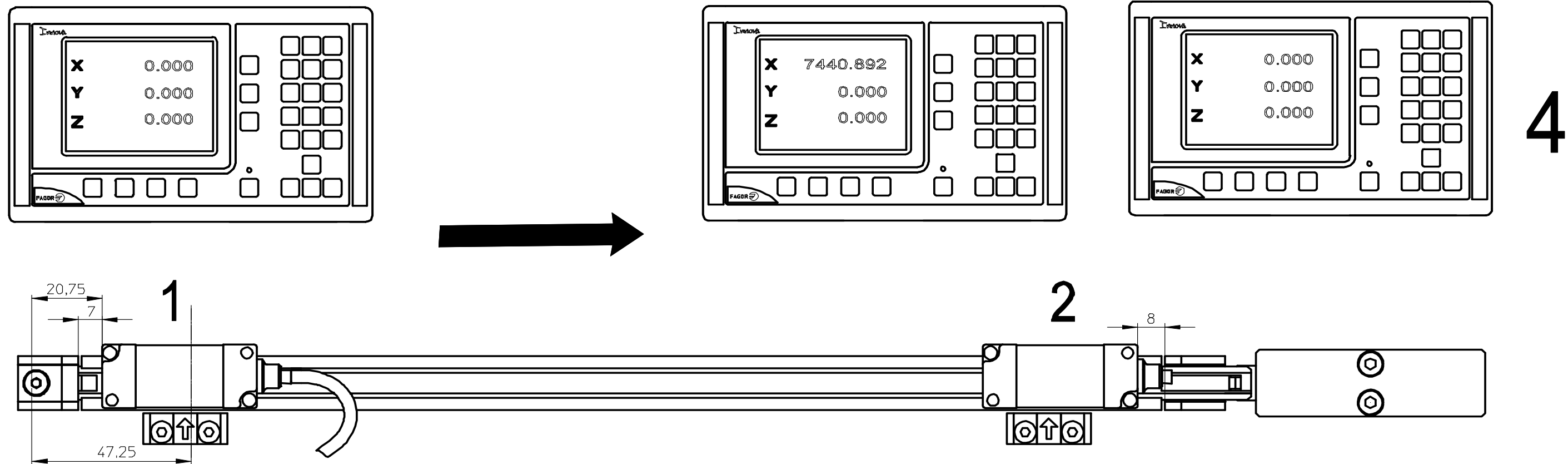


Utilizar adhesivos o tornillos
 Use stickers or screws

INSTALACIÓN DE LA CABEZA READER HEAD INSTALLATION



PROCESO DE TENSADO (1/2) / TENSIONING PROCEDURE (1/2)



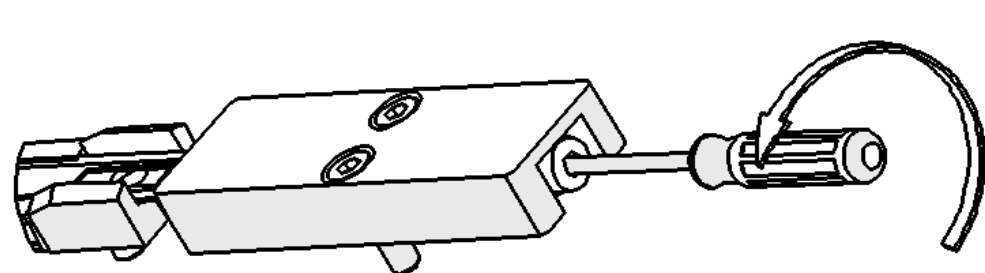
PROCESO DE TENSADO (1/2)

1. SITUAR LA CABEZA A 7mm DEL TOPE IZQUIERDO, Y PONER EL VISUALIZADOR A 0.
2. MOVER LA CABEZA AL OTRO EXTREMO DEL CURSO DE MEDICION (MINIMO A 8 mm DEL TOPE DERECHO).
3. APUNTAR LA MEDIDA QUE NOS DA EL VISUALIZADOR (EJEMPLO L=7440,892 mm PARA UN CURSO DE MEDICIÓN = 7440).
4. PONER EL VISUALIZADOR A 0.
5. CALCULAR EL VALOR A TENSAR SEGUN LA SIGUIENTE FORMULA $T=(L+47.25)\times 0.120$ DONDE T ES EL VALOR EN MICRAS QUE DEBE MOSTRAR EL VISUALIZADOR DESPUES DE TENSAR, EN ESTE EJEMPLO:
 $T=(L+47.25)\times 0.120=(7440.8928+47.25)\times 0.120=896$ MICRAS.

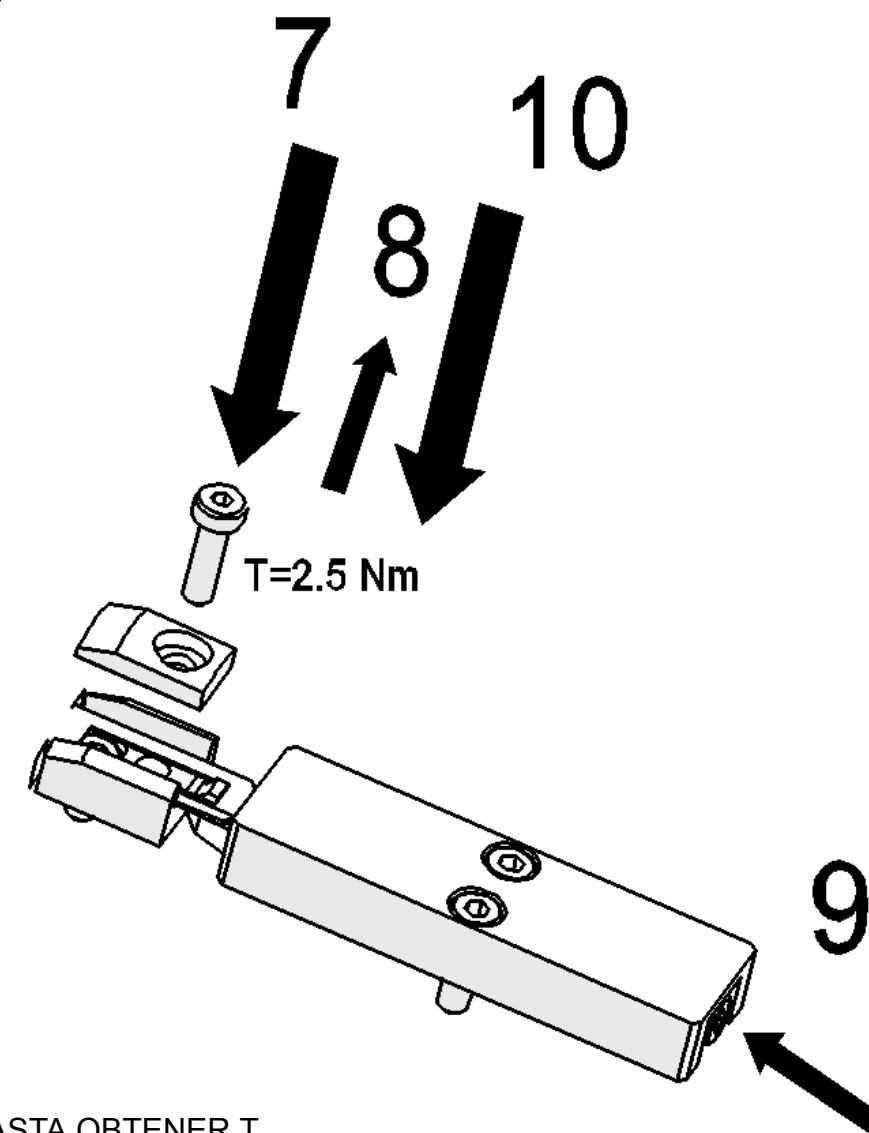
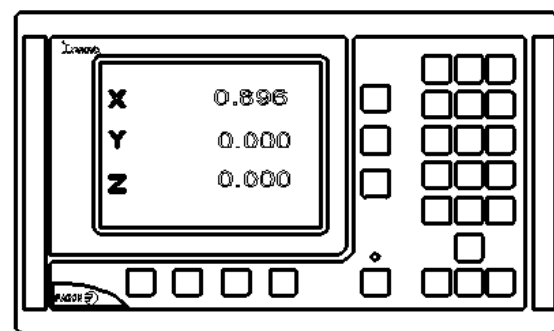
TENSIONING PROCEDURE (1/2)

1. POSITION THE READER HEAD 7mm FROM THE LEFT END AND SET THE DRO TO 0.
2. MOVE THE READER HEAD TO THE OTHER END OF THE MEASURING LENGTH (AT LEAST 8 mm FROM THE RIGHT END).
3. JOT DOWN THE MEASUREMENT DISPLAYED BY THE DRO (FOR EXAMPLE L=7440,892 mm FOR A MEASURING LENGTH = 7440).
4. SET THE DRO TO 0.
5. CALCULATE THE TENSION VALUE WITH THE FORMULA $T=(L+47.25)\times 0.120$ WHERE T IS THE VALUE IN MICRONS THAT THE DRO MUST DISPLAY AFTER THE BAND HAS BEEN TENSIONED, IN THIS EXAMPLE:
 $T=(L+47.25)\times 0.120=(7440.8928+47.25)\times 0.120=896$ MICRONS.

PROCESO DE TENSADO (2/2) / TENSIONING PROCEDURE (2/2)



6



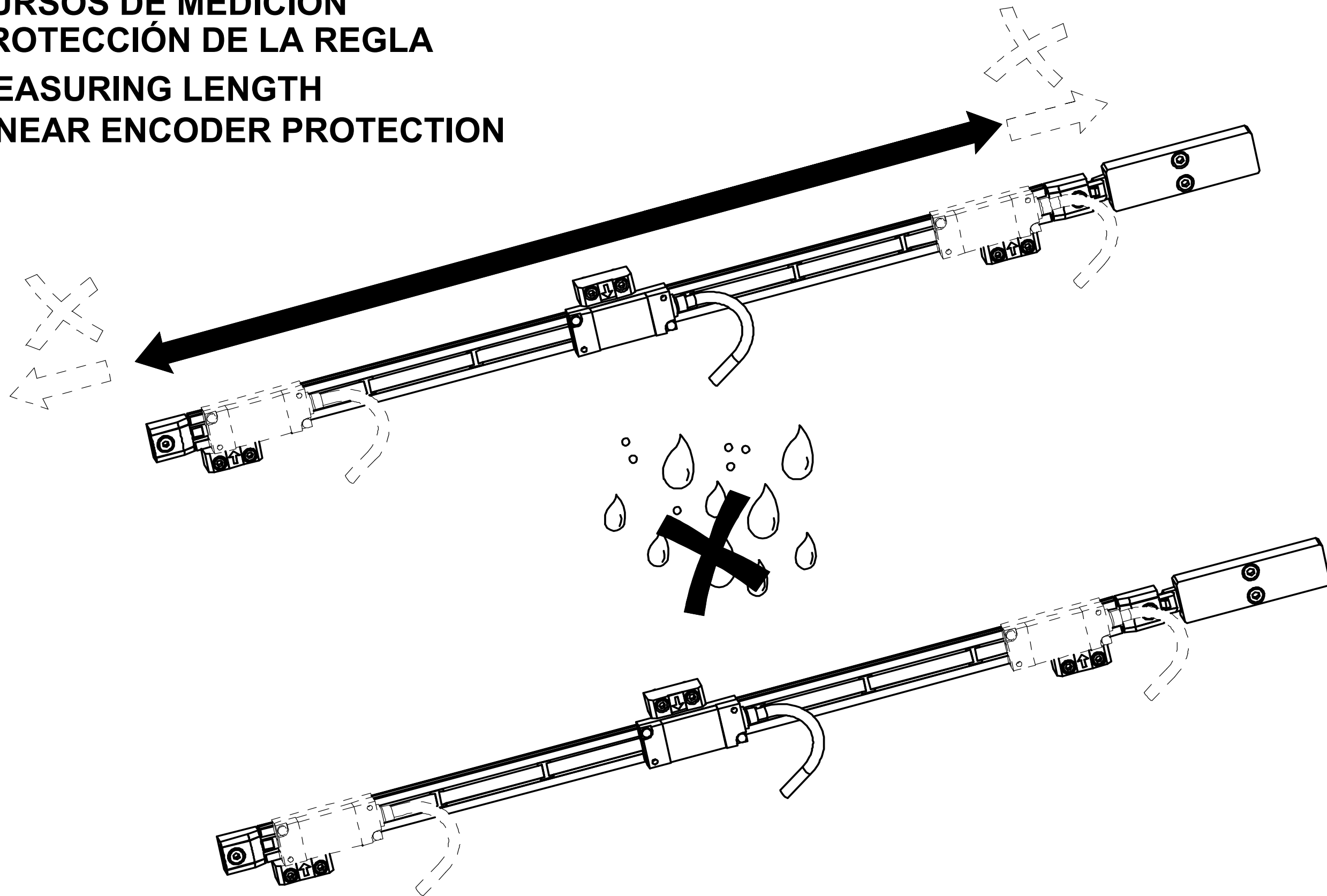
PROCESO DE TENSADO (2/2)

6. TENSAR HASTA QUE EL VISUALIZADOR MUESTRE EL VALOR T.
7. APRETAR TORNILLO BLOQUEO.
8. VOLVER A SOLTAR EL TORNILLO DE BLOQUEO.
9. EN CASO DE QUE HAYA VARIADO EL VALOR DE T EN EL VISUALIZADOR, AJUSTARLO TENSANDO O DESTENSANDO HASTA OBTENER T.
10. BLOQUEAR EL FLEJE MEDIANTE TORNILLO BLOQUEO.

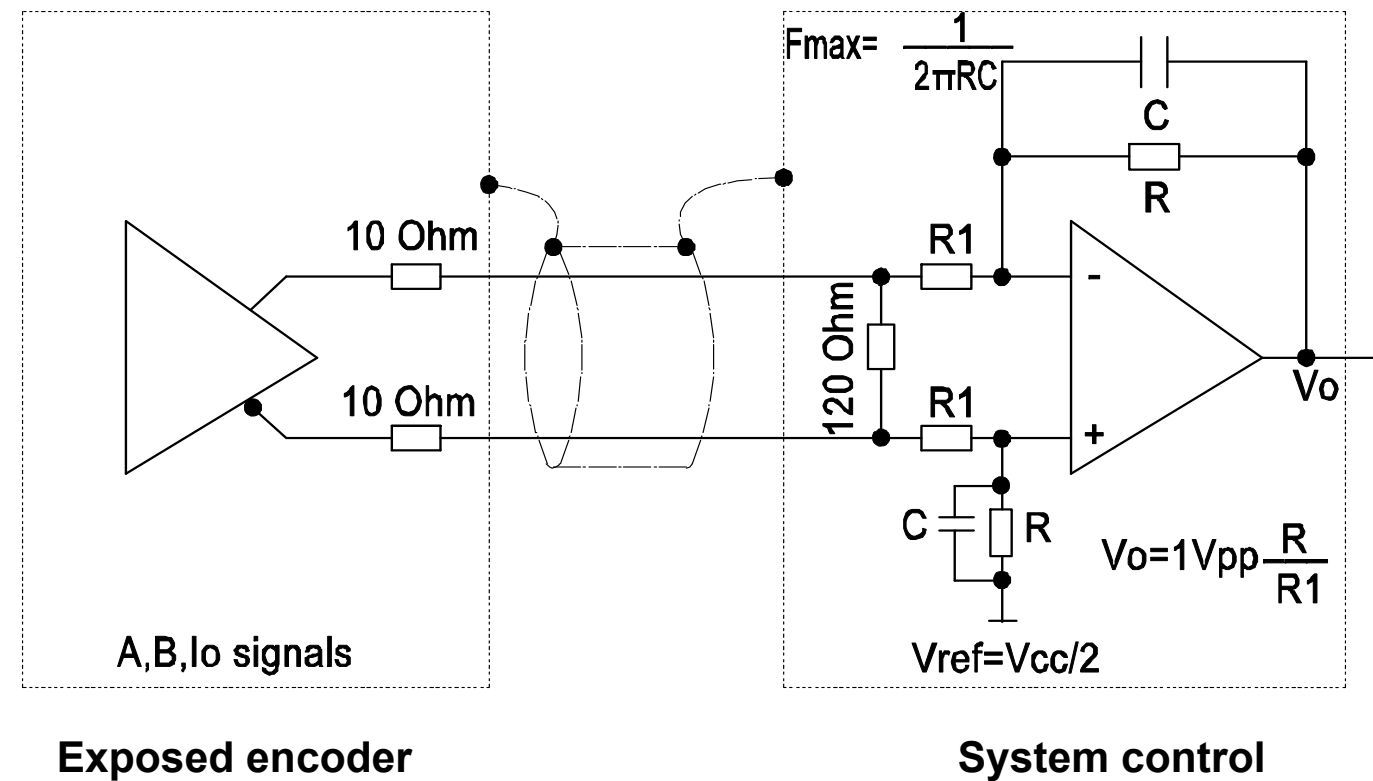
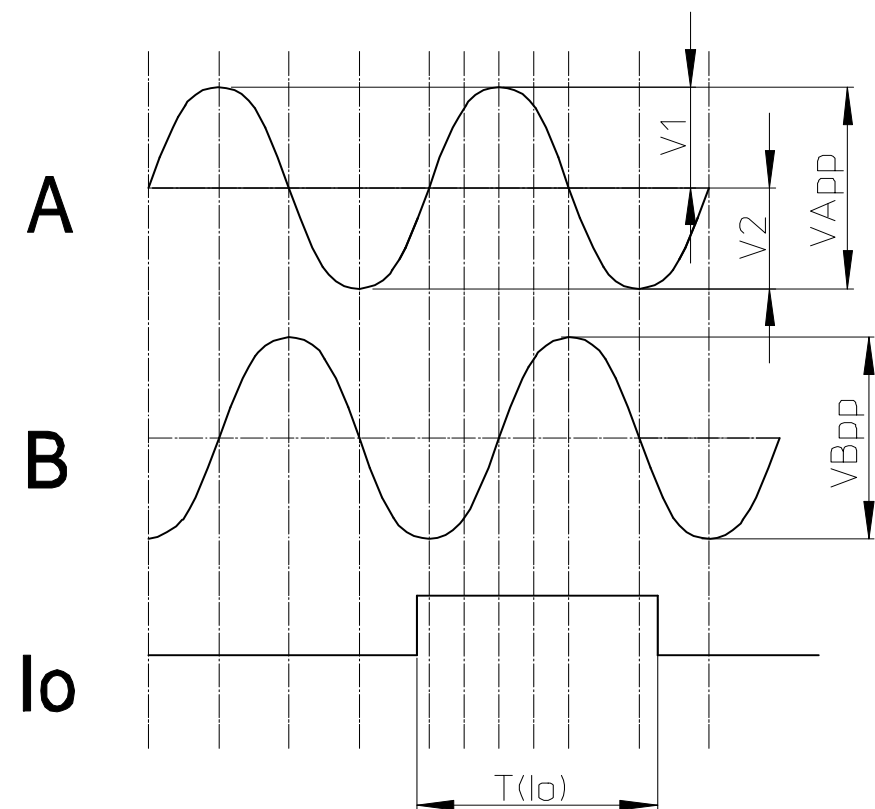
TENSIONING PROCEDURE (2/2)

6. TENSION UNTIL THE DRO DISPLAYS THE T VALUE.
7. TIGHTEN THE LOCKING SCREW.
8. LOOSEN THE LOCKING SCREW AGAIN.
9. IF THE T VALUE DISPLAYED BY THE DRO HAS CHANGED, ADJUST IT BY TENSIONING AND LOOSENING UNTIL OBTAINING THE T VALUE.
10. LOCK THE BAND USING THE LOCKING SCREW.

**CURSOS DE MEDICIÓN
PROTECCIÓN DE LA REGLA
MEASURING LENGTH
LINEAR ENCODER PROTECTION**

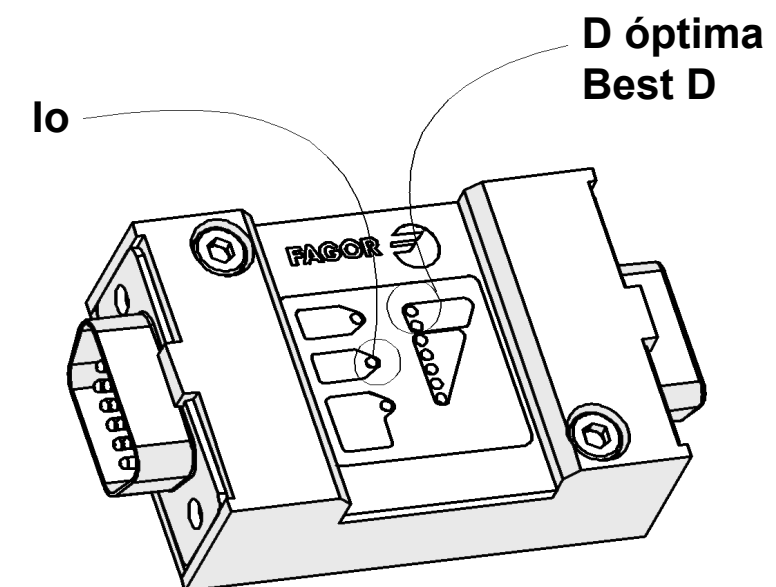


INTERFACE SEÑALES 1 Vpp / 1 Vpp SIGNAL INTERFACE



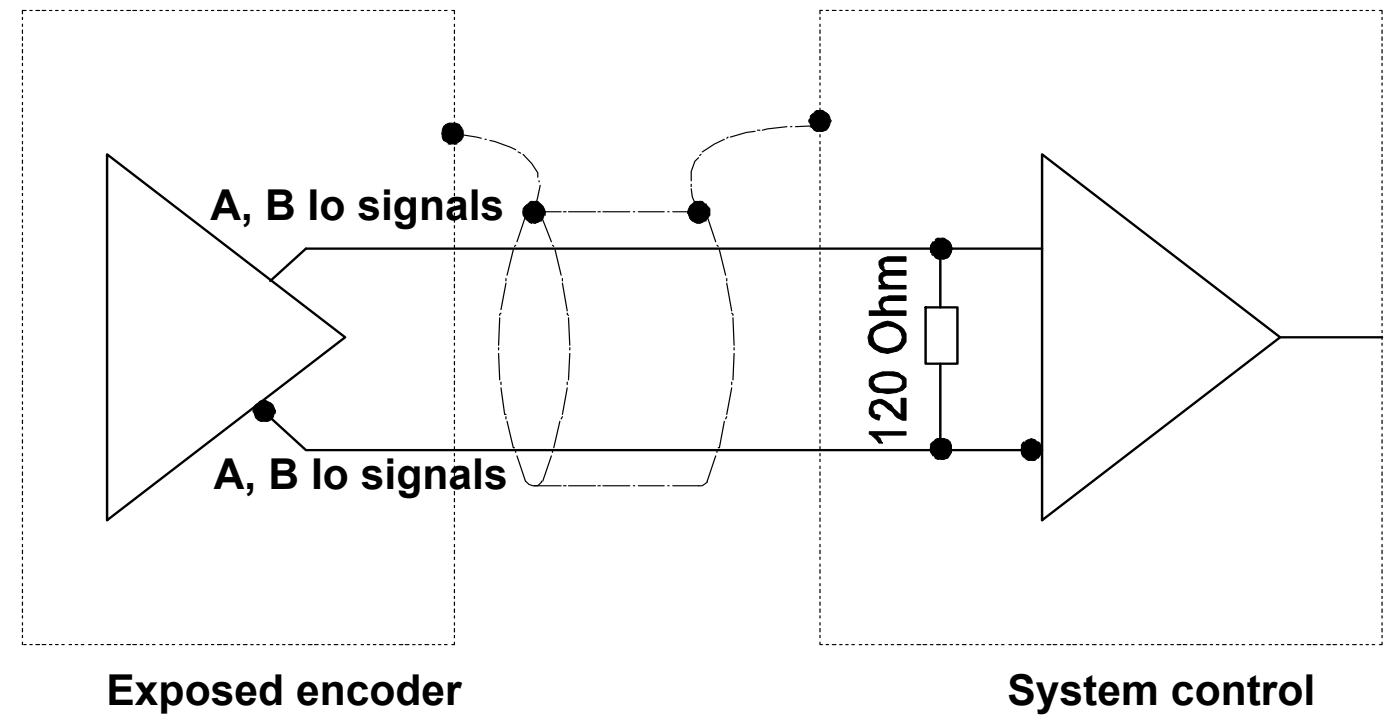
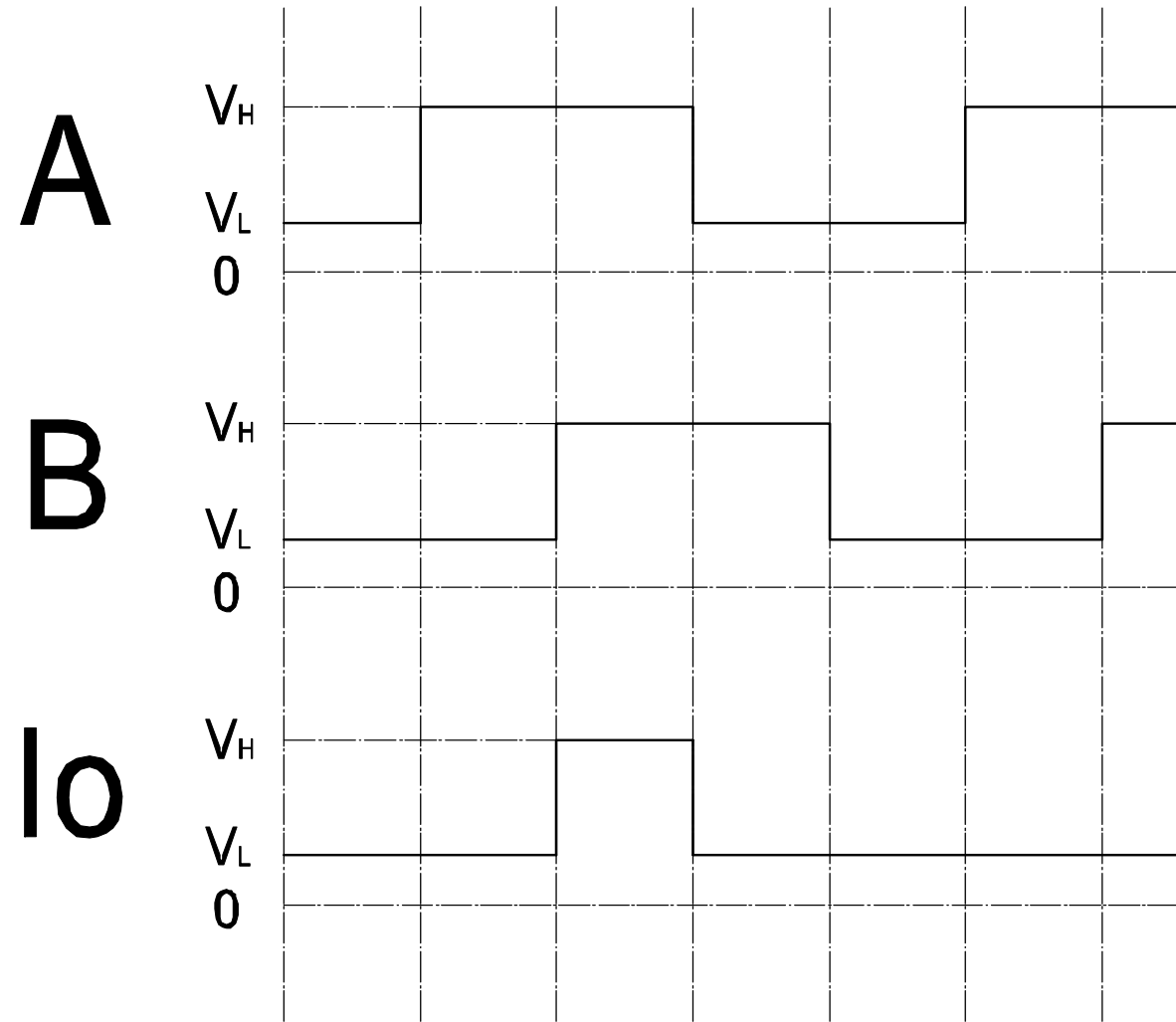
Señales A, B A, B signals	Amplitud Amplitude	0.6 / 1.2 Vpp
	Centrado Centered	$ V_1 - V_2 / 2 V_{pp} < 0.065$
	Relación Ratio	$V_{App} / V_{Bpp} = 0.8 / 1.25$
	Desfase Phase shift	$90^\circ \pm 10^\circ$
Señal Io Io signal	Amplitud Amplitude	0.6 / 1.2 Vpp
	Anchura Width	$180^\circ / 540^\circ$
	Sincronismo Synchronism	Depende del cabeceo de la cabeza Depends on the pitch of the reader head

EXPOSED TESTER

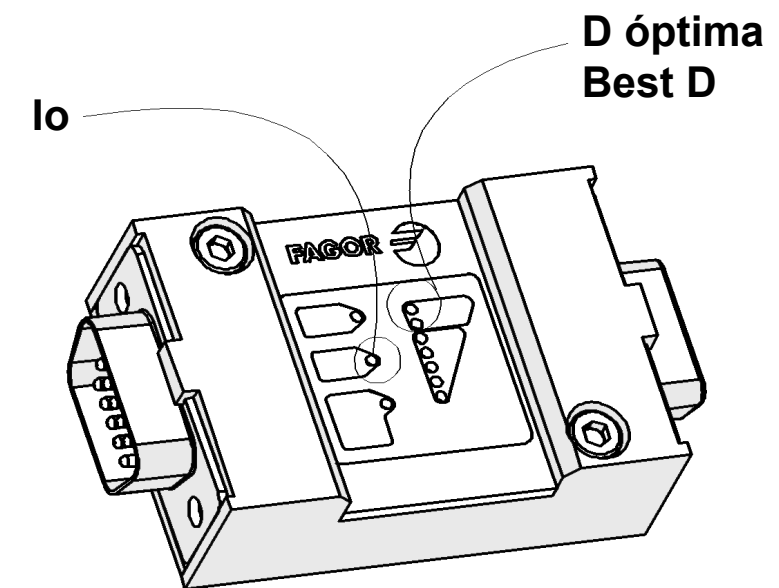


Módulo de ayuda al montaje
Mounting assistance module

INTERFACE DIFERENCIAL RS-422 / DIFFERENTIAL INTERFACE RS-422 (EIA STANDARD)

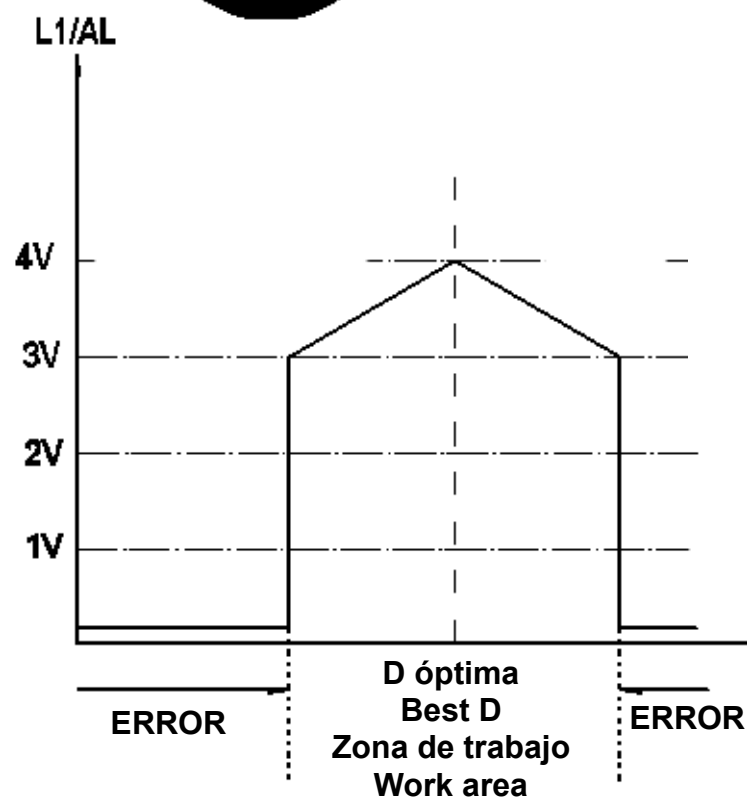
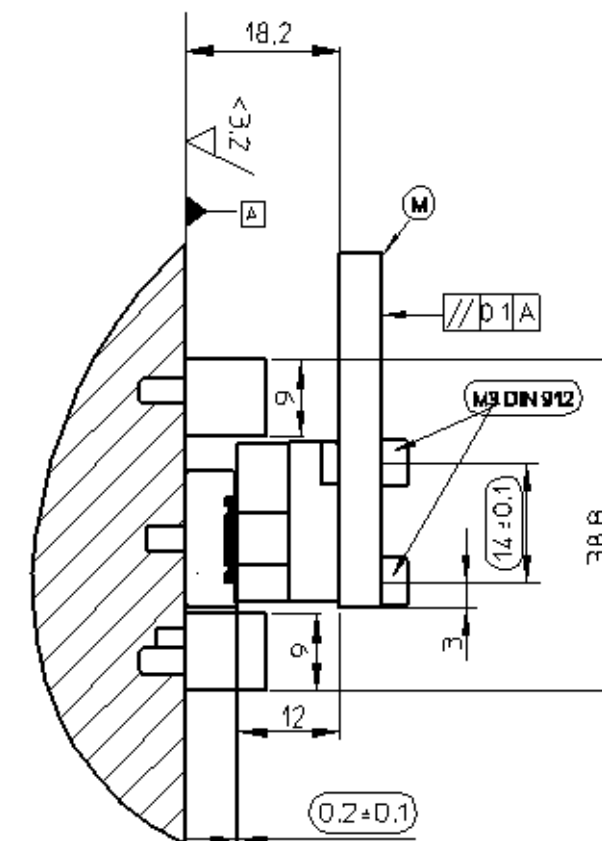
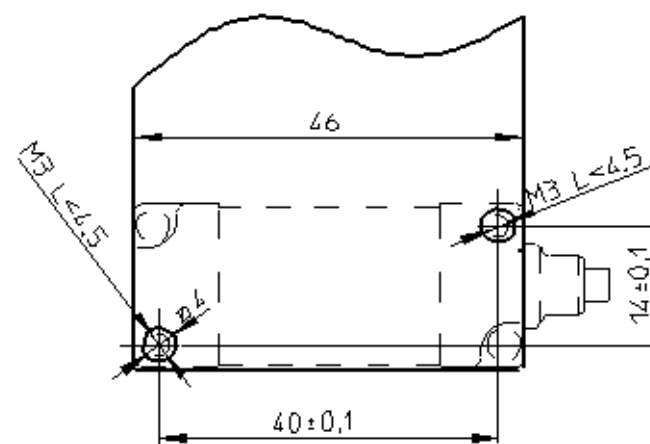
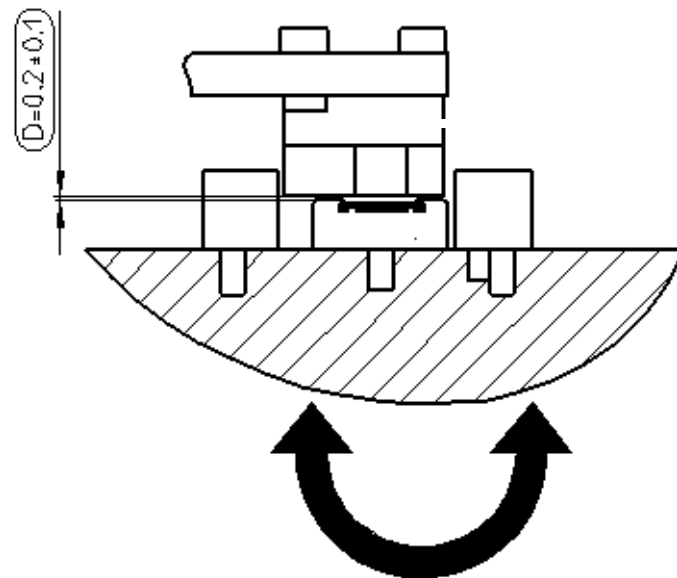
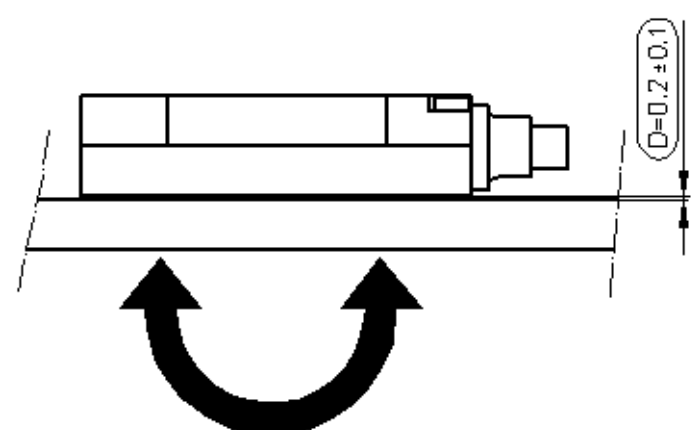


EXPOSED TESTER



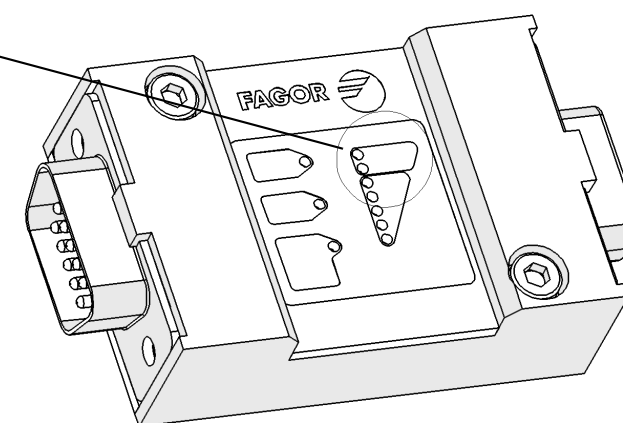
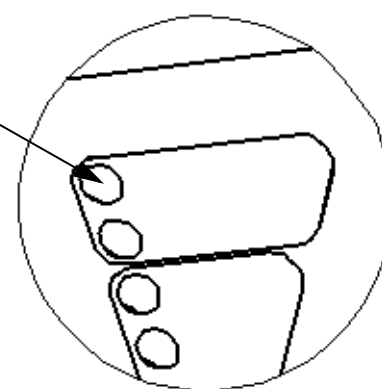
Módulo de ayuda al montaje
Mounting assistance module

Señales A, B, Io A, B, Io signals	Niveles lógicos Logic levels	$V_L \leq 0.5V / V_H \geq 2.5V \quad I_L=20mA$
	Impedancia de carga Load impedance	$Z \leq 120 \text{ Ohm}$
	Switching time	$t_{\pm} \leq 30ns$
Sincronismo Io Io synchronism	90° Respecto al periodo A,B 90° with respect to A, B period	
	Sincronizado respecto a AxB Synchronized with AxB	



LED VERDE : ZONA ÓPTIMA DE SEÑAL
GREEN LED : BEST SIGNAL AREA

DISTANCIA DE TRABAJO
WORK DISTANCE



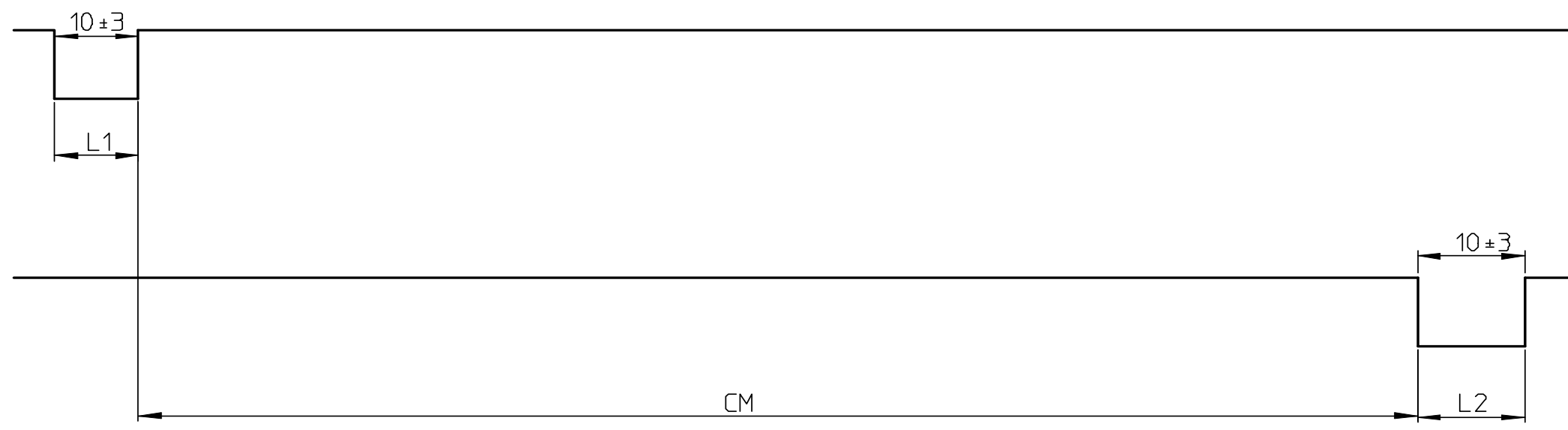
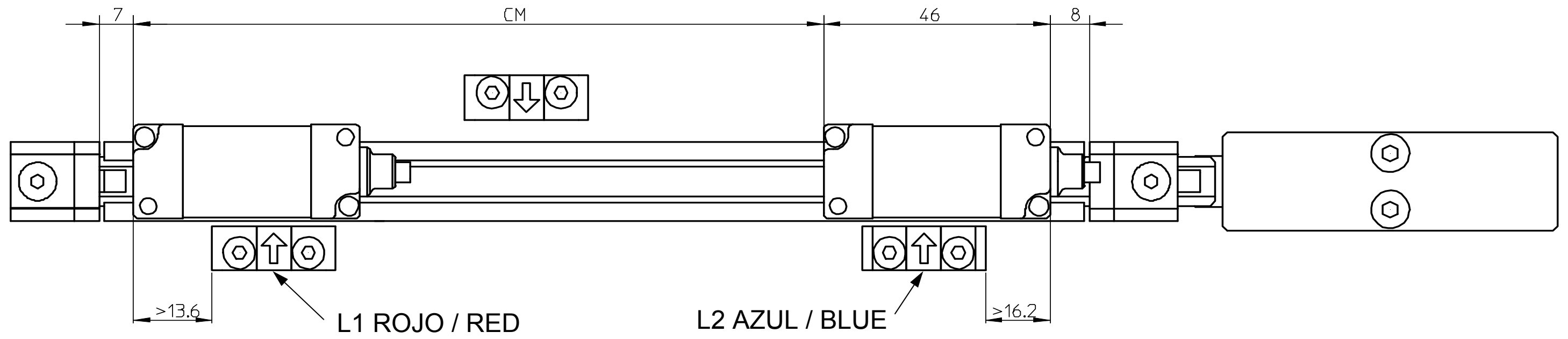
NOTA DE AYUDA AL MONTAJE

Para ajustar la separación óptima del conjunto fleje-cabeza, utilice el pin L1/AL y el accesorio EXPOSED-TESTER. Este dispositivo indicará mediante unos LEDs cuál es la posición óptima de la cabeza. También podrá realizar el ajuste mediante un voltímetro visualizando la tensión del pin L1/AL.

NOTE FOR MOUNTING ASSISTANCE

To adjust the best gap of the band-head set, use pin L1/AL and the EXPOSED-TESTER. The LED's of this device will indicate the best position of the reader head. You can also make this adjustment using a volt meter displaying the voltage at pin L1/AL.

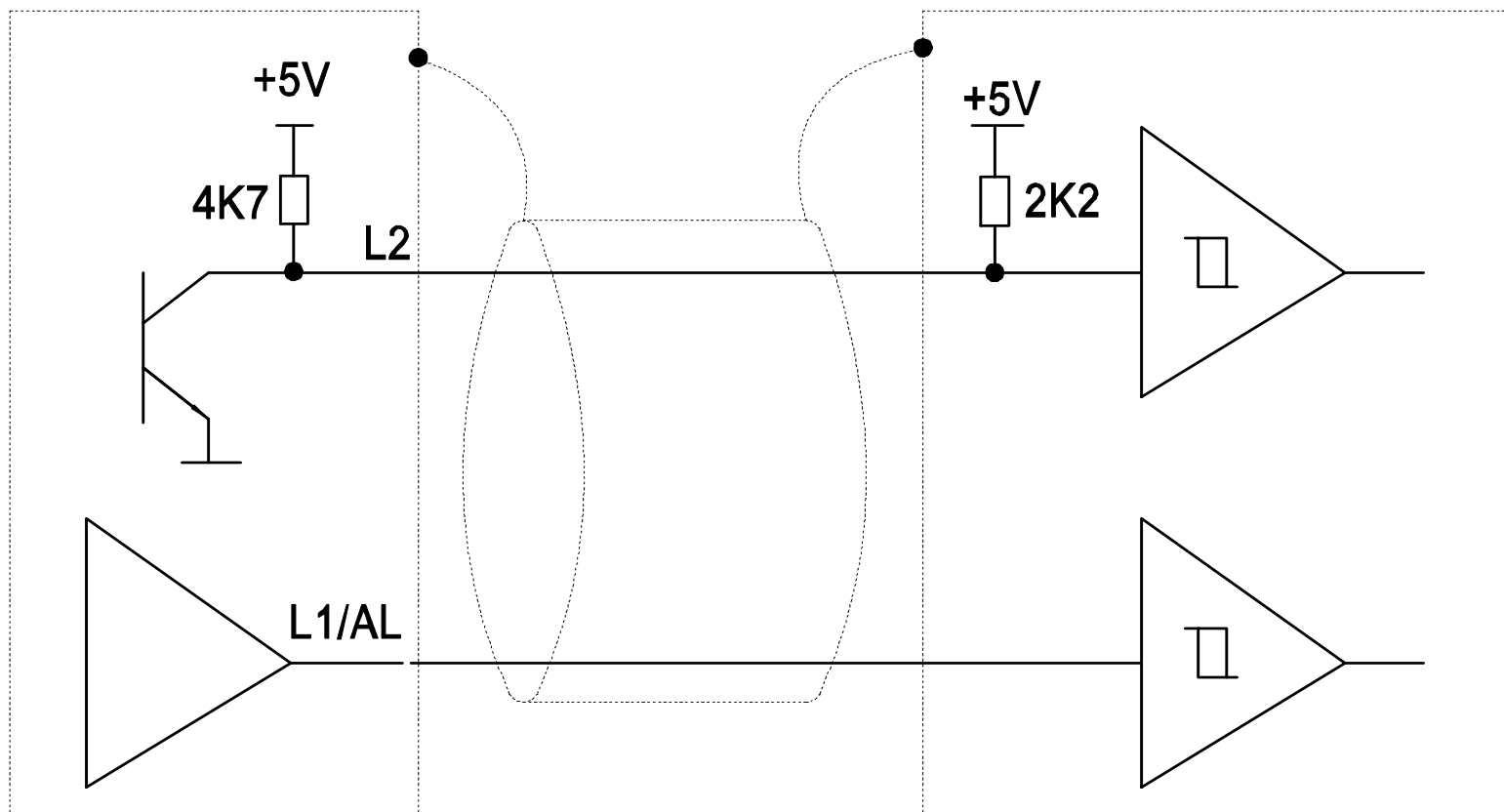
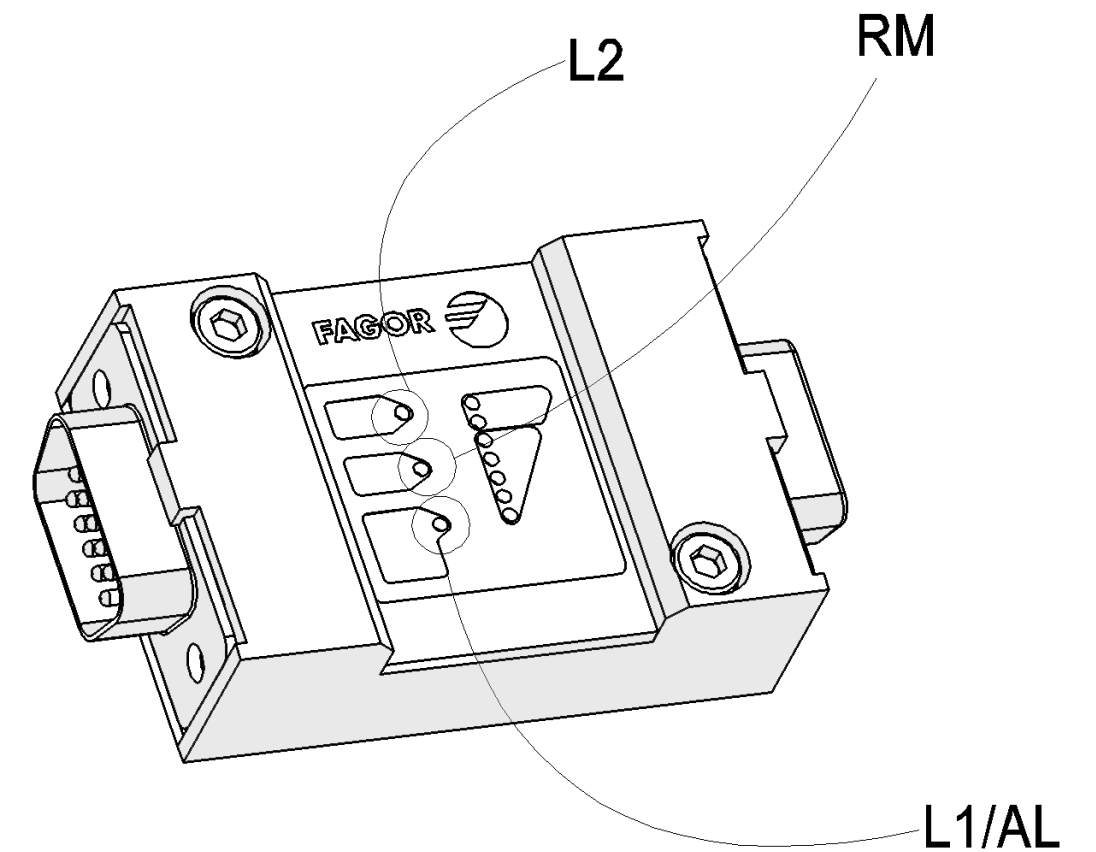
LÍMITES DE RECORRIDO L1-L2 / TRAVEL LIMITS L1-L2 (mm)

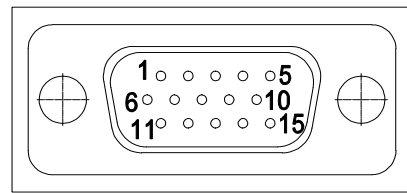
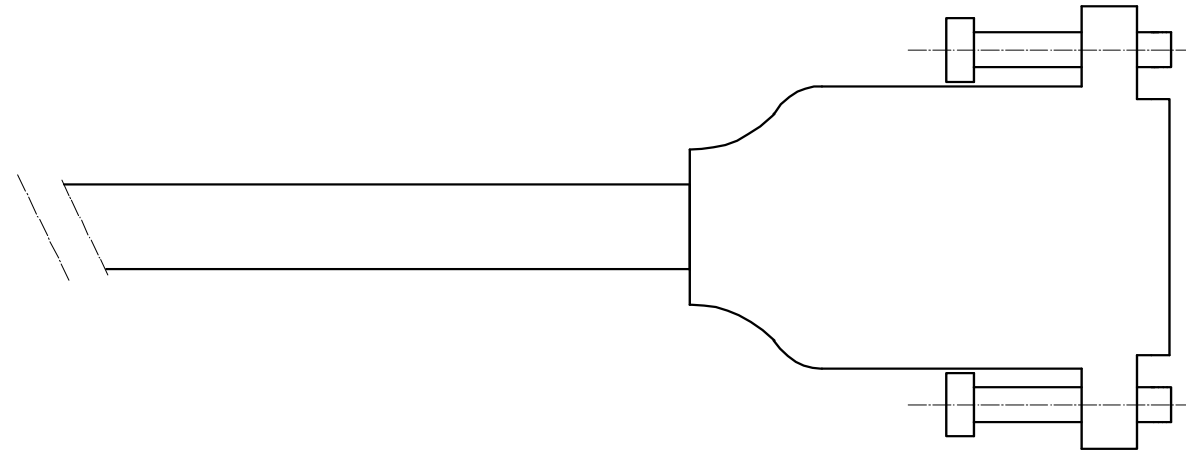


CM = Curso de medición = Measuring length

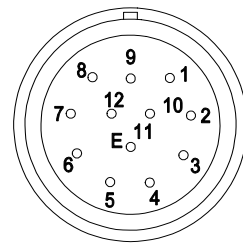
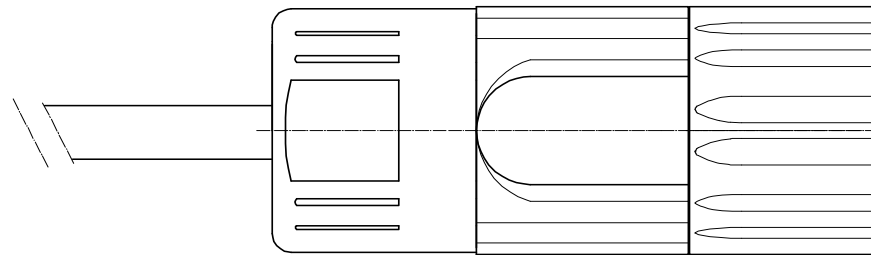
LÍMITES DE RECORRIDO L1-L2 / TRAVEL LIMITS L1-L2

Señal L1/AL L1/AL signal	Activación Activation	Imán rojo / Red magnet (L1)
	Salida Output	Push-pull (4 mA), activo bajo / active low
	V_L	< 0.5 V
	V_H	> 2.5 V
	Switching time	< 1 ms
Señal L2 L2 signal	Activación Activation	Imán azul / blue magnet (L2)
	Salida Output	TTL con 4.7 K a +5V en colector abierto, activo bajo TTL with 4.7 K at +5V in open collector, active low
	Switching time	< 1 ms





SUB-D15 HD
Vista frontal / Front view



CONEI-12 MACHO / MALE
Vista frontal / Front view

Pin	Señal Signal	Color
1	A	Verde / Green
2	/A	Amarillo / Yellow
3	B	Azul / Blue
4	/B	Rojo / Red
5	Io	Gris / Grey
6	/Io	Rosa / Pink
7	L2	Negro / Black
8	L1/AL	Violeta / Purple
9	+5V	Marrón / Brown
10	+5V sense	Azul-Rojo / Blue-Red (Naranja/Orange)
11	0V	Blanco / White
12	0V sense	Gris-Rosa / Grey-Pink (Incoloro/Clear)
13	-	
14	-	
15	-	
Chasis Chassis	Tierra Ground	Malla Shield

Pin	Señal Signal	Color
1	/B	Rojo / Red
2	+5V sense	Azul-Rojo / Blue-Red (Naranja/Orange)
3	Io	Gris / Grey
4	/Io	Rosa / Pink
5	A	Verde / Green
6	/A	Amarillo / Yellow
7	L1/AL	Violeta / Purple
8	B	Azul / Blue
9	L2	Negro / Black
10	0V	Blanco / White
11	0V sense	Gris-Rosa / Grey-Pink (Incoloro/Clear)
12	+5V	Marrón / Brown
Chasis Chassis	Tierra Ground	Malla Shield

Características eléctricas generales	
Alimentación	5V ± 5% Consumo < 150 mA (sin carga)
Velocidad máxima	480 m/min -3db a > 400 kHz con 1 Vpp 240 m/min a 200 kHz con TTL interpolación. x1 240 m/min a 1MHz con TTL interpolación. x5 120 m/min a 1 MHz con TTL interpolación x10 24m/min a 1Mhz con TTL Interpolación x50
Frecuencia máxima	400 kHz con 1 Vpp 1 MHz con TTL
Señales incrementales	1 Vpp 20 µm/período TTL interp. x1 20 µm/período Resol.: 5 µm Interpolación x5 4 µm/período Resol.: 1 µm Interpolación x10 2 µm/período Resol.: 0.5 µm Interpolación x50 0.4 µm / período Resol.: 0,1µm
Referencia lo	Seleccionable mediante imán
Temperatura de trabajo	0 / 50 °C
Límites de recorrido	Seleccionable mediante imanes N-S, salidas TTL
Conexión eléctrica	Cable de 1 ó 3 m con conector sub-D 15pin
Longitud de cable	1 Vpp: Hasta 100 m, con cable 1 m + alargadera Fagor TTL: Hasta 50 m, con cable 1 m + alargadera Fagor

Características mecánicas generales	
Precisión	± 5µm/m
Regla	Fleje período 20 µm
Vibración (55-2000 Hz)	200 m/s ²
Impacto (11 ms)	1000 m/s ²
Temperatura ambiente	0 °C / 50 °C
Temperatura almacenamiento	-20 °C / +70 °C
Señales	1 Vpp / TTL
Marcas de referencia	Una cada 50 mm, seleccionable magnéticamente
Límites	L1/L2 con dos imanes diferentes, señales TTL
Longitud de cable	3 m (otras longitudes bajo pedido)
Rmin de curvatura dinámico	8xD
Rmin de curvatura estático	4xD
Peso cabeza	19.5 gr
Peso cable	142.5 gr
Peso perfil + fleje	259 gr/m
Peso tensor + bridas	110 gr
Peso Exposed Tester	58 gr

General electrical characteristics	
Power supply	5V ± 5% Consumption < 150 mA (without load)
Maximum feed rate	480 m/min -3db at > 400 kHz with 1 Vpp 240 m/min at 200 kHz with TTL and x1 interpolation 240 m/min at 1MHz with TTL x5 interpolation 120 m/min at 1 MHz with TTL x10 interpolation 24m/min at 1Mhz with TTL x50 interpolation
Maximum frequency	400 kHz with 1 Vpp 1 MHz with TTL
Incremental signals	1 Vpp 20 µm/period TTL x1 interp. 20 µm/period Resol.: 5 µm x5 interpolation 4 µm/period Resol.: 1 µm x10 interpolation 2 µm/period Resol.: 0.5 µm x50 interpolation 0.4 µm / period Resol.: 0.1µm
Reference mark	Selected by magnet
Work temperature	0 / 50 °C
Travel limits	Selected by N-S magnets, TTL outputs
Electrical connection	1 or 3 m cable with 15-pin sub-D connector
Cable length	1 Vpp: Up to 100 m, with 1m cable + Fagor extension cable TTL: Up to 50 m, with 1m cable + Fagor extension cable

General mechanical characteristics	
Accuracy	± 5µm/m
Scale	Steel tape, 20 µm period
Vibration (55-2000 Hz)	200 m/s ²
Shock (11 ms)	1000 m/s ²
Ambient temperature	0 °C / 50 °C
Storage temperature	-20 °C / +70 °C
Signals	1 Vpp / TTL
Reference marks	One every 50 mm, may be selected with magnets
Limits	L1/L2 with two different magnets, TTL signals
Cable length	3 m (other lengths upon request)
Min. Dynamic bending radius	8xD
Min. static bending radius	4xD
Reader head weight	19.5 gr
Cable weight	142.5 gr
"Guide + tape" weight	259 gr/m
"Tensioner + fixtures" weight	110 gr
Exposed Tester weight	58 gr

CABLES Y ALARGADERAS DE CONEXIÓN / CONNECTION CABLES & EXTENSION CABLES

Señal encoder lineal Linear encoder signal	Composición cable / Cable composition	Longitud / Length
Exposed 1 Vpp	Cable Exposed Ø4mm (12 x 0.09mm ²)	Max: 12 m
	1m de Cable Exposed Ø4mm + Alargadera Ø8mm 1m cable Exposed Ø4mm + Ø8mm extension cable	Max: 100 m
	1m x (12 x 0.09mm ²) + N x (4x2x0.14mm ² + 4x0.5mm ²)	
Exposed TTL	Cable Exposed Ø4mm (12 x 0.09mm ²)	Max: 9 m
	1m de Cable Exposed Ø4mm + Alargadera Ø8mm 1m cable Exposed Ø4mm + Ø8mm extension cable	Max: 50 m
	1m x (12 x 0.09mm ²) + N x (4x2x0.14mm ² + 4x0.5mm ²)	

NOTA: En sistemas de control que no tengan señales de SENSE +5V y SENSE 0V, estas deben conectarse a sus respectivas alimentaciones +5V y 0V para conseguir las longitudes máximas indicadas en la tabla.

NOTE: On control systems lacking the SENSE +5V and SENSE 0V signals, they must be connected to their respective supply voltages +5V and 0V in order to be able to reach the cable lengths shown in the table.

GARANTIA

- *Plazo: 12 meses a partir de la fecha de expedición de fábrica.
- *Cubre gastos de Materiales y Mano de Obra de reparación en FAGOR AUTOMATION.
- *Los gastos de desplazamiento son a cargo del cliente.
- *No cubre averías por causas ajenas a FAGOR AUTOMATION, como: golpes, manipulación por personal no autorizado, etc.

DECLARACION DE CONFORMIDAD

Fabricante: Fagor Automation, S. Coop.
Barrio de San Andrés 19, C.P. 20500, Mondragón -Guipúzcoa- (ESPAÑA)

Declaramos bajo nuestra exclusiva responsabilidad la conformidad del producto al que hace referencia este manual

Nota. Algunos caracteres adicionales pueden seguir a las referencias de los modelos indicados en este manual. Todos ellos cumplen con las siguientes normas:


COMPATIBILIDAD ELECTROMAGNÉTICA:

EN 61000-6-2:2005 Norma de Inmunidad en entornos industriales
EN 61000-6-4:2007 Norma de Emisión en entornos industriales

De acuerdo con las disposiciones de la Directiva Comunitaria: 2004/108/CE de Compatibilidad Electromagnética.

Mondragón a 1 de Septiembre de 2009

Fagor Automation, S. Coop.


Director Gerente
Pedro Ruiz de Aguirre

WARRANTY

- *Term: 12 months from factory invoice date.
- *It covers parts and labor at FAGOR AUTOMATION.
- *Travel expenses are payable by the customer.
- *Damages due to causes external to FAGOR AUTOMATION, such as unauthorized handling, blows, etc. are not covered.

DECLARATION OF CONFORMITY

Manufacturer: Fagor Automation, S. Coop.
Barrio de San Andrés 19, C.P. 20500, Mondragón -Guipúzcoa- (SPAIN)

We declare under our exclusive responsibility the conformity of the product referred to in this manual.

Note. Some additional characters may follow the model references indicated in this manual. They all comply with the following regulations:

ELECTROMAGNETIC COMPATIBILITY:

EN 61000-6-2:2005 Standard on immunity in industrial environments
EN 61000-6-4:2007 Standard on emission in industrial environments

According to the European Directive: 2004/108/CE on electromagnetic compatibility.

Mondragón September 1st 2009

NOTAS DE USUARIO / USER NOTES

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FAGOR AUTOMATION S. COOP.

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Fagor Automation S. Coop.