

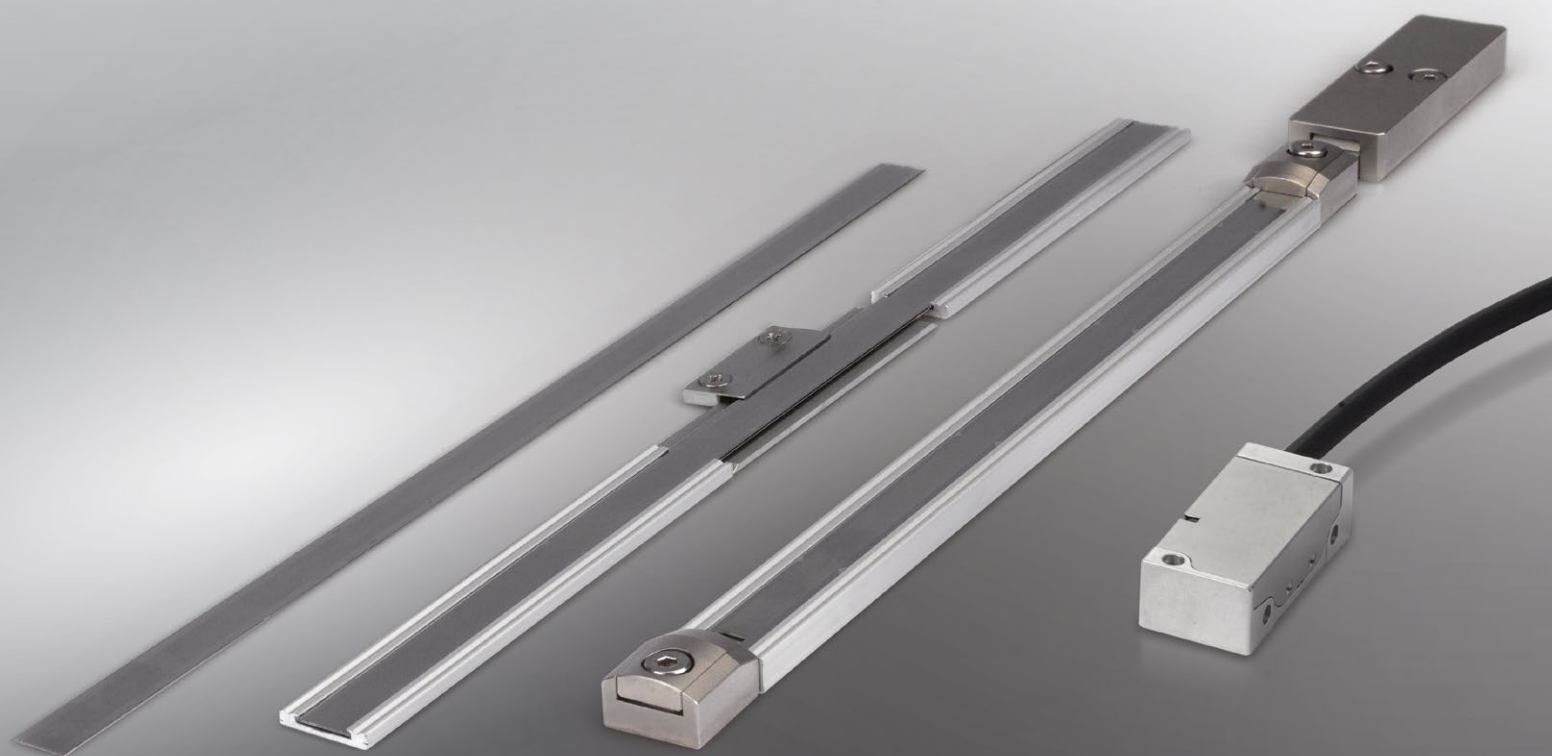
Non-contact IT MINI

INCREMENTAL OPTICAL LINEAR ENCODERS

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AUTOMATION



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NON-CONTACT IT MINI

INCREMENTAL OPTICAL LINEAR ENCODERS

FOR CONTROLLING AND POSITIONING OF LINEAR AXES

The IT MINI optical encoder is engineered for highly dynamic precision motion applications. Designed to provide high-speed position measurement, exceptional accuracy and superior repeatability.

The IT MINI encoder series is the ideal solution for space-limited applications. Whether in semiconductor manufacturing, stages, factory automation, metrology, or other advanced industrial sectors, the IT MINI ensures performance, reliability and high immunity to contamination.

- It consists of two components, the reader head and a steel tape with engraved measuring graduation.
- Small reader head for integration within applications with limited space available.
- LED signal integrity indicator for easy installation.
- With reference markings integrated in the incremental track to reduce the size. Reference marks selectable via magnets.
- 1 Vpp analogue or TTL digital output signals with resolution down to 2.5 nanometres.
- High precision and excellent repeatability together with the motion control provide smooth and reliable control.
- Three different systems for securing the engraved tape (adhesive, guided or tensioned) to suit a variety of working conditions.
- 0.3 mm thick adhesive tape for easier assembly (cut to length).
- Two options: with or without limit switches.

Table of maximum speed for the models

MHz Customer Clock Frequency	Edge Separation (ns)	Resolution: 5 µm (m/s)	Resolution: 1 µm (m/s)	Resolution: 0.5 µm (m/s)	Resolution: 0.1 µm (m/s)	Resolution: 0.05 µm (m/s)	Resolution: 0.025 µm (m/s)	Resolution: 0.01 µm (m/s)	Resolution: 0.005 µm (m/s)	Resolution: 0.0025 µm (m/s)
40	25	12	12	12	2.48	1.24	0.62	0.25	0.12	0.06
25	40	12	12	9.30	1.86	0.93	0.47	0.19	0.09	0.05
20	50	12	12	7.44	1.49	0.74	0.37	0.15	0.07	0.04
12	83	12	9.30	4.65	0.93	0.47	0.23	0.09	0.05	0.02
10	100	12	8.27	4.13	0.83	0.41	0.21	0.08	0.04	0.02
8	125	12	6.76	3.38	0.68	0.34	0.17	0.07	0.03	0.02
6	166	12	5.31	2.66	0.53	0.27	0.13	0.05	0.03	0.01
4	250	12	3.54	1.77	0.35	0.18	0.09	0.04	0.02	0.01
2	500	8.86	1.77	0.89	0.18	0.09	0.04	0.02	0.01	0.004



Specifications

	ITMRD	ITMRX	ITMRY	ITMRW	ITMRZ	ITMRV	ITMRL	ITMRJ	ITMRQ	ITMRP
Measurement	Incremental: by means of a 20 µm pitch graduated steel tape									
Steel thermal expansion coefficient	$\alpha_{\text{therm}} \approx 11 \text{ ppm/K}$									
Measuring resolution	5 µm	1 µm	0.5 µm	0.1 µm	0.05 µm	0.025 µm	0.01 µm	0.005 µm	0.0025 µm	
Output signals	□ Differential TTL									~ 1 Vpp
Incremental signal period	20 µm	4 µm	2 µm	0.4 µm	0.2 µm	0.1 µm	0.04 µm	0.02 µm	0.01 µm	20 µm
Sub-divisional error (SDE)	< ± 10 nm									
Reference marks I ₀	every 50 mm ITMSD, ITMSX, ITMSY, ITMSW, ITMSZ, ITMSV, ITMSL, ITMSJ, ITMSQ, ITMSP: selectable via magnet									
Travel limits	Open collector, active low. Activation by magnets									
Maximum cable length	Up to 30 m (1)									
Supply voltage	5V ± 10%; < 250 mA (without load)									
Connection	1 or 3 metre cable included									
Reader head protection	IP 40									
Accuracy	± 5 µm/m									
Maximum speed	see table previous page									10 m/s
Maximum vibration	200 m/s ² (55 ... 2000 Hz) IEC 60068-2-6									
Maximum shock	1000 m/s ² (11 ms) IEC 60068-2-27									
Ambient operating temperature	0 °C ... 70 °C									
Storage temperature	-20 °C ... 70 °C									
Relative humidity	20 °C ... 80 %									

(1) Dependent on cable type, readhead cable length and clocked output option.
Contact Fagor Automation for more information.



Order identification

Example: ITMSW08-1C1 + ITA-270

Reader head

ITM	S	W	08	1	C1	
Small incremental reader head	Type of reference mark: - R: incremental every 50 mm - S: selectable via magnet	Type of signal: - D: 5 µm resolution differential TTL - X: 1 µm resolution differential TTL - Y: 0.5 µm resolution differential TTL - W: 0.1 µm resolution differential TTL - Z: 0.05 µm resolution differential TTL - V: 0.025 µm resolution differential TTL - L: 0.010 µm resolution differential TTL - J: 0.005 µm resolution differential TTL - Q: 0.0025 µm resolution differential TTL - P: 1 Vpp sinewave	Frequency: 02: 2 MHz 04: 4 MHz 06: 6 MHz 08: 8 MHz 10: 10 MHz 12: 12 MHz 20: 20 MHz 25: 25 MHz 40: 40 MHz	Length of cable: 1: 1 metre 3: 3 metres	Connector: - D: Sub D HD 15 M - H2: YASKAWA® - C1: 12-pin M23 connector M-F thread - C5: 12-pin M23 connector M-M thread - D15: Sub D 15 M - O: without connector	Limit switches: - Blank: with limit switches - N: no limit switches

Tape

IT	A	270
Incremental tape with integrated reference marks	Type of tape: - A: 0.3 mm thick tape with adhesive - G: 0.5 mm thick tape guided model - T: 0.5 mm thick tape tensioned model	Measuring length: (1) In the example: 270: 270 mm

Guides

PG	PT	PTS
Adhesive guide for guided tape	Adhesive guide for tensioned tape	Bolted guide for tensioned tape
Length: For example: 30 = 300 mm		

- (1) Adhesive tape: available from 70 mm to 16,020 mm in 50 mm increments.
 Guided tape: available from 240 mm to 6,040 mm in 100 mm increments.
 Tensioned tape: available from 140 mm to 30,040 mm in 100 mm increments.

ITMA, ITMG, ITMT

ITMA ADHESIVE MODEL



ITMG GUIDED MODEL



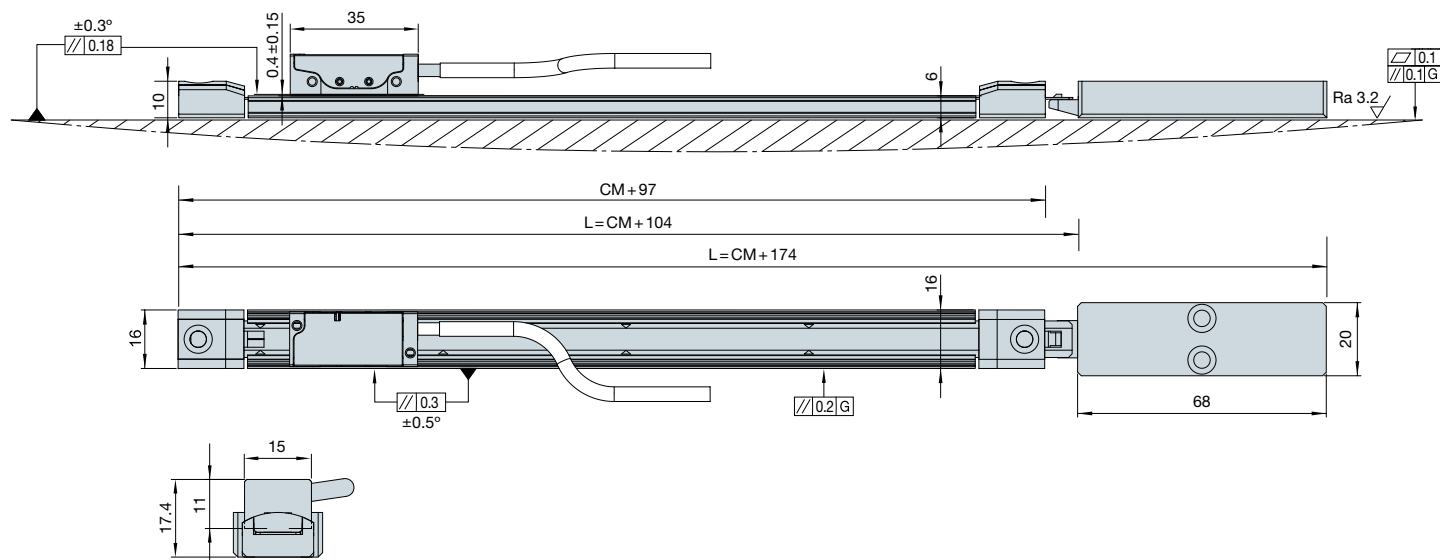
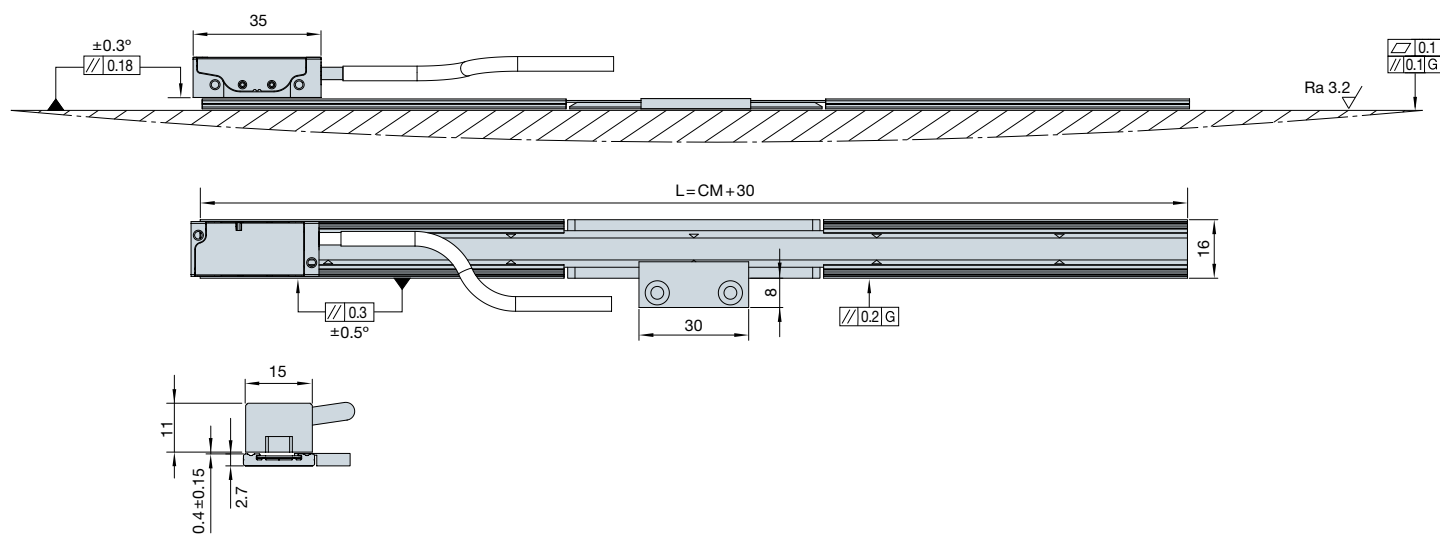
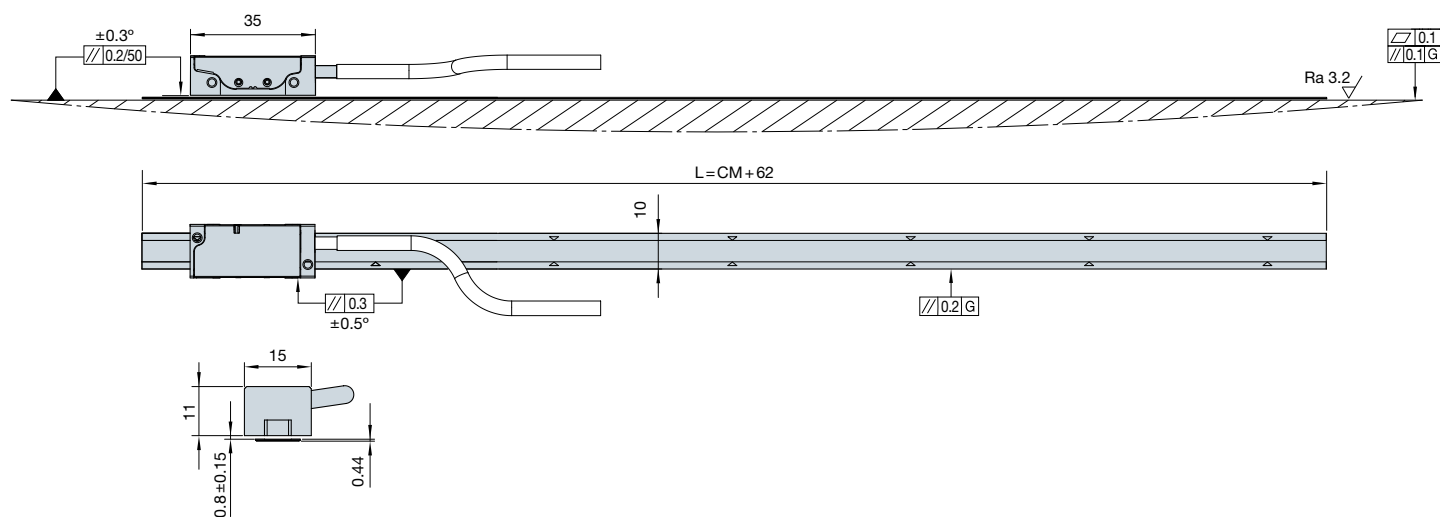
ITMT TENSIONED MODEL



G Machine guideway

CM Measuring length

Dimensions in mm



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