ABSOLUTE LINEAR ENCODER GVS 808 M

code **ST02** | project **A85** | release **B**

MITSUBISHI ELECTRIC
Changes for the Better

GENERAL FEATURES

- Absolute optical encoder with glass measuring support, MITSUBISHI High Speed serial interface.
- Resolutions up to 10 nm. Accuracy grade up to ± 2 µm.
- Fixed expansion point (**FEP**) in the middle, positionable on the right (**RT**) or on the left (**LT**), for a linear expansion consistent with the type of application.
- Direct reading of the absolute measure.
- Rugged and heavy profile of considerable section.
- Adjustable cable output, through double connector.
- Pressurization from both sides of the scale or from the transducer.

Cod. GVS 808	M
Measuring support - Grating pitch - Linear thermal expansion coefficient	glass scale 20 µm 8 x 10^{-6} °C^{-1}
Serial interface	MITSUBISHI High Speed (2.5 Mbps – Full-Duplex)
Resolution absolute measure	1 - 0.1 - 0.01 µm
Accuracy grade	± 5 µm * standard version ± 3 µm * high-accuracy version (± 2 µm for ML up to 640 mm)
Interpolation error (SDE)	± 70 nm **
Hysteresis	90 nm **
Measuring length ML in mm	140, 240, 340, 440, 540, 640, 740, 840, 940, 1040, 1140, 1240, 1340, 1440, 1540, 1640, 1740, 1840, 2040, 2240, 2440, 2640, 2840, 3040, 3240_{MAX}
Fixed expansion point (FEP)	central or positionable on the right (RT) or on the left (LT)
Max. traversing speed	180 m/min
Max. acceleration	50 m/s^2 in measuring direction
Required moving force	≤ 2.5 N
Vibration resistance (EN 60068-2-6)	100 m/s^2 [55 ÷ 2000 Hz]
Shock resistance (EN 60068-2-27)	150 m/s^2 [11 ms]
Protection class (EN 60529)	IP 54 standard IP 64 pressurized
Operating temperature	0 °C ÷ 50 °C
Storage temperature	-20 °C ÷ 70 °C
Relative humidity	20% ÷ 80% (not condensed)
Reading block sliding	by ball bearings
Power supply	5 Vdc ± 10%
Current consumption	255 mA_{MAX} (with R = 120 Ω)
Max. cable length	50 m ***
Connector	on the transducer, with adjustable output
Electrical protections	inversion of polarity and short circuits
Weight	0.55 kg + 2.8 kg/m

* The declared accuracy grade of ± X µm is referred to a measuring length of 1 m.
** The error declared is subject to the respect of the alignment tolerances.
*** Ensuring a minimum power supply voltage of 5 V to the transducer.

MECHANICAL CHARACTERISTICS

- Rugged and heavy **PROFILE** of considerable section, made of anodized aluminum. Dimensions 36.7x58.5 mm.
- **SPRING SYSTEM** for misalignment compensation and self-correction of mechanical hysteresis.
- Double pair of linear **SEALING LIPS** for a very high protection of the grating.
- Pressurizable **READER HEAD**, consisting of tie rod and reading block, with fully-protected place for electronic boards.
- **READING BLOCK** sliding through ball bearings.
- Die-cast **TIE ROD**, with nickel surface treatment.
- Absolute glass **GRATING**, placed in the scale housing.
- Elastomeric **GASKETS** which allow to reproduce the full protection in mechanical joints (in case of disassembling).
- **FULL POSSIBILITY** to disassemble and reassemble it.

ELECTRICAL CHARACTERISTICS

- Connector on the transducer, easily disconnectable in case of need.
- Reading device with an infra-red light emitter and receiving photodiodes.
- Serial protocol MITSUBISHI High Speed.
- CABLE:
  - 6-wire shielded cable ø = 6.2 mm, PUR external sheath.
  - Conductors section: power supply 0.35 mm^2; signals 0.25 mm^2.
  - Connector CY3 MITSUBISHI Full-Duplex.

The cable is suitable for continuous movements.
The cable's bending radius should not be lower than 70 mm.

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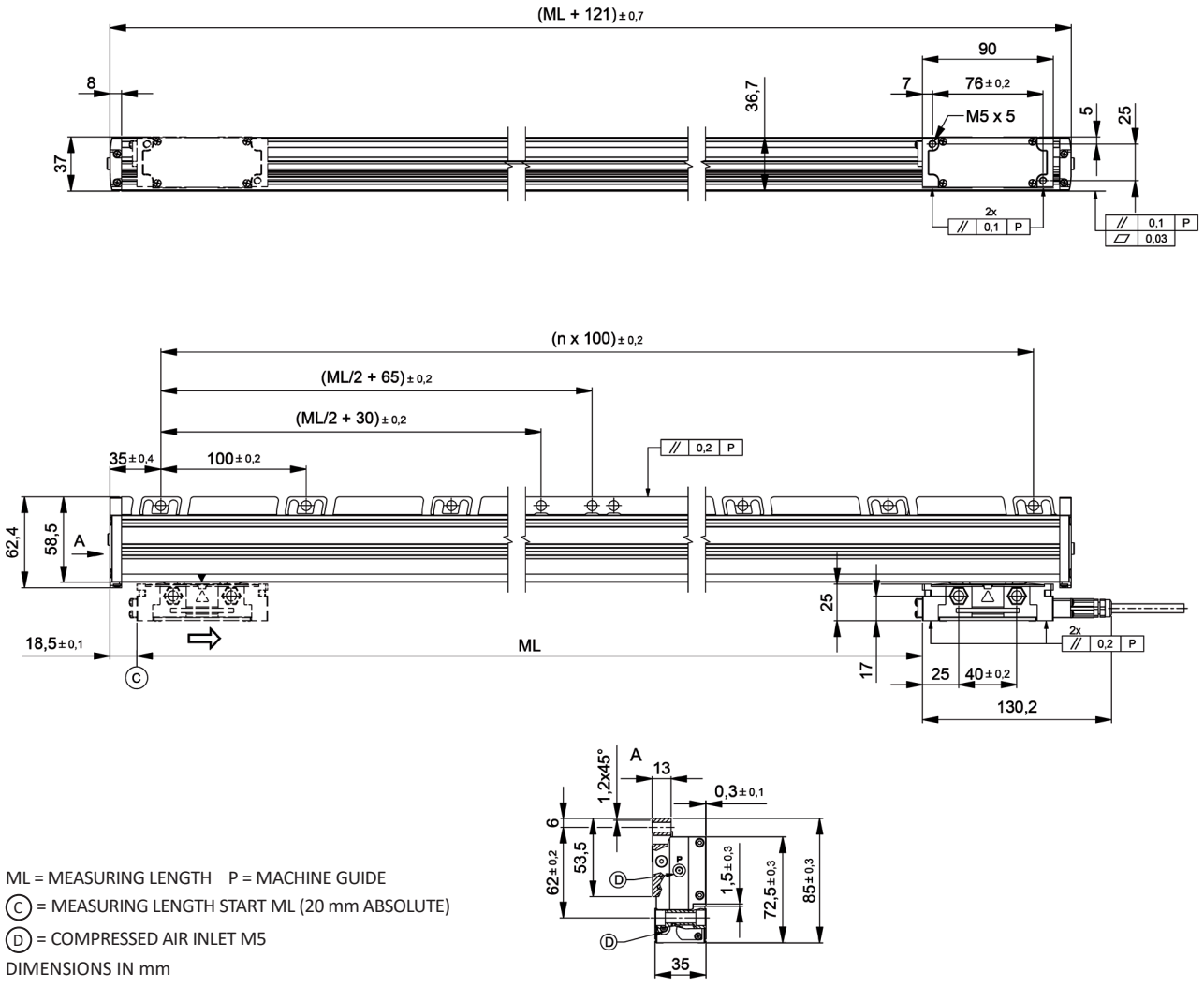
DIMENSIONS



ML = MEASURING LENGTH P = MACHINE GUIDE

(C) = MEASURING LENGTH START ML (20 mm ABSOLUTE)

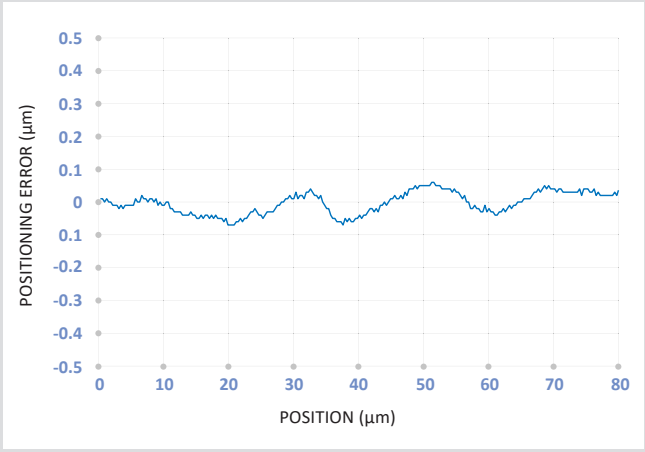
(D) = COMPRESSED AIR INLET M5

DIMENSIONS IN mm

ACCURACY

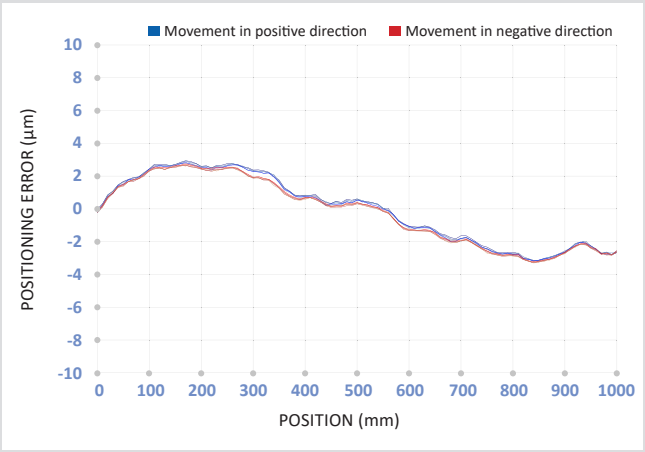
Accuracy graph: deviation between the value measured by the encoder and the value measured by the reference system.

INTERPOLATION - SDE



SDE (sub-division error) graph: accuracy of the interpolation device within the single grating pitch.

REPEATABILITY



Repeatability graph obtained by carrying out the measurements several times in both directions of advancement.

- Unidirectional repeatability: measurement error detected without inverting the movement direction of the encoder.
- Hysteresis: difference in the measure due to the inversion of the encoder movement direction.

The graphs show tests carried out in a metrological room under controlled climatic conditions: T= 20 °C ± 0.1 °C and R.H.= 45 ÷ 55%. The reference system for the comparison of position measurements is interferometric with 1 nm resolution and equipped with an environmental compensation device.

INNOVATIVE SYSTEM FEP
FixedExpansionPoint

GVS 808 is supplied with a Fixed Expansion Point (FEP) positioned in the middle (standard). On request it is possible to supply encoders with FEP positionable on the left (LT) or on the right (RT). Based on the application, the customer can determine the linear thermal expansion direction, so as to maximize the machining accuracy and repeatability even in the presence of significant temperature changes.

ORDERING CODE

Example LINEAR ENCODER **GVS 808 M1A 03240 05V M1 M04/S CY3 SLT PR**

Model	Encoder type, resolution	Measuring length	Power supply	Output signals	Cable length, cable type	Connector, wiring	FEP (Fixed Expansion Point)	Special, pressurization
GVS 808	M1 = 1 µm M01 = 0.1 µm M001 = 0.01 µm A = absolute	Measuring length in mm 03240 = ML_{MAX}	05V = 5 V	M1 = MITSUBISHI High Speed	Mnn = length in m M04 = 4 m (standard) M50 = 50 m S = PUR cable	CY3 = MITSUBISHI Full-Duplex connector	No cod. = central FEP (standard) SLT = selectable FEP	No cod. = standard SPnn = special nn PR = pressurized

Without prior notice, the products may be subject to modifications that the Manufacturer reserves to introduce as deemed necessary for their improvement.

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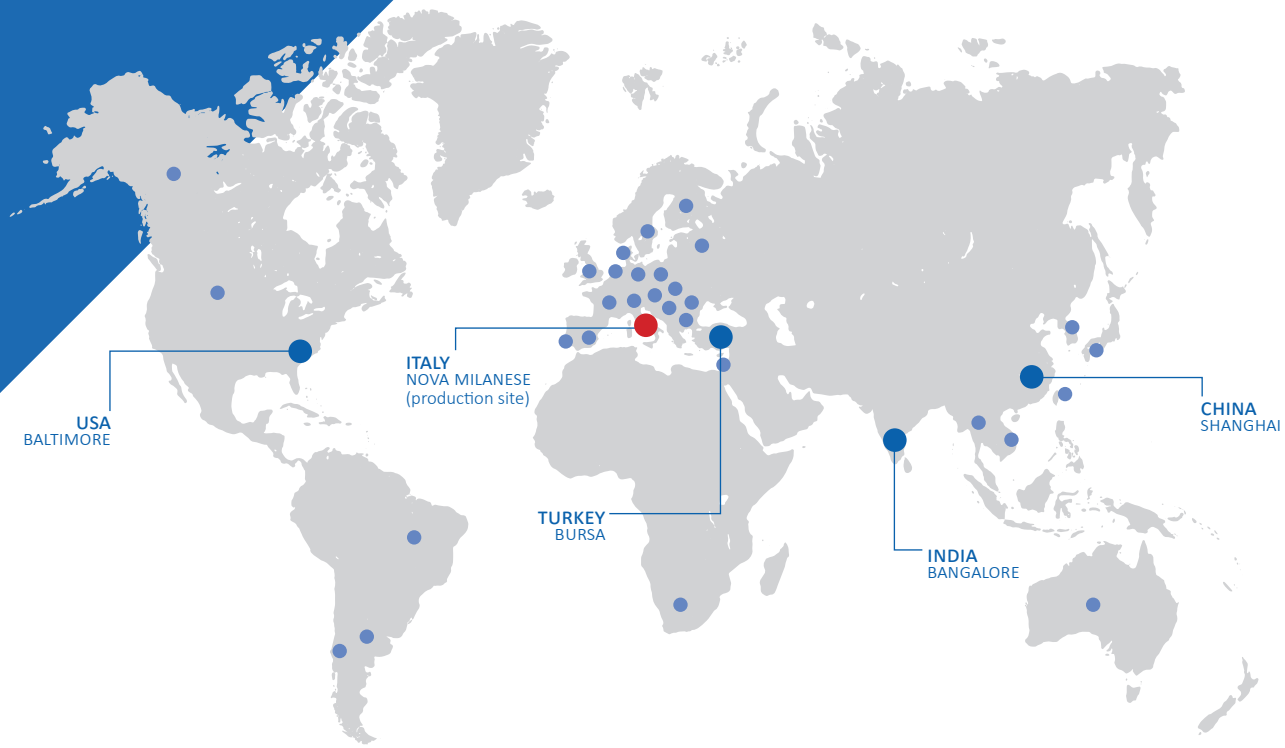

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