GIVI MISURE

MEGATRON AG
FERROXCUBE DISTRIBUTOR FOR MAGNETIC COMPONENTS

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Code	Project	Release	
ST02	***A63-A***	***A***	***TECHNICAL DATASHEET***

OPTICAL SCALE GVS 400

GENERAL FEATURES

- Incremental optical scale for various applications.
- Resolutions up to 0.1 µm. Accuracy grade up to ± 5 µm.
- Four sealing lips made of special elastomer resistant to oil and wearing, for an excellent protection of the grating.
- Reference indexes at constant step, in central position or in different positions at request.
- Wide alignment tolerances.
- In modular version for measuring lengths over 6500 mm, or for lower measuring lengths on request.
- High stability of LINE DRIVER signals.
- Small overall dimensions, to allow installation in narrow spaces.

MECHANICAL AND ELECTRICAL CHARACTERISTICS

MECHANICAL

- Rugged and heavy PROFILE made of anodized aluminium. Dimensions 39x23 mm.
- Elastic COUPLING for misalignment compensation and self-correction of mechanical hysteresis. Backlash error <0.2 µm.
- SEALING LIPS for the protection of the grating, made of special elastomer resistant to oil and wearing.
- 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.
- Stainless steel GRATING dimensions 18x0.305 mm in a single piece. The support maintains the grating in its position leaving it free to expand.
- Elastomeric GASKETS which allow to reproduce the full protection in mechanical joints (in case of disassembling).
- Full possibility to disassemble and reassemble it.
- Possibility of direct service.

ELECTRICAL

- Reading device with high-efficiency light emitter and single-field photodiode.
- A and B output signals with phase displacement of 90° (electrical).
- Reference indexes at constant step, in central position or in different positions at request.
- CABLE:
  - 8-wires shielded armored cable ∅ = 6.1 mm.
  - Conductors section: power supply 0.35 mm^2; signals 0.14 mm^2.

  GVS 400 scale is normally supplied with armored cable.
  PVC, PUR, ultraflex or tuboflex cables available on request.

  PUR cable is suitable for continuous movements, respecting a minimum bending radius of 80 mm.

LINE DRIVER	TRANSISTOR	CONDUCTOR COLOR
+ V	+ V	Red
0 V	0 V	Blue
A	B	Green
$\overline{A}$	NC	Orange
B	A	White
$\overline{B}$	NC	Light-blue
I_0	I_0	Brown
$\overline{I_0}$	NC	Yellow
SCH	SCH	Shield

Cod. GVS 400	**T**								
Measuring support	stainless steel grating								
Linear thermal expansion coefficient	10.6×10^{-6} °C^{-1}								
Reference indexes (I_0)	**No cod.** = without reference indexes **P** = constant step (every 30 mm) **Z** = in required positions								
Resolution (µm)	100	50	10	5	2	1	0.5	0.2	0.1
Max. traversing speed (m/min) LINE DRIVER (VL) output	120							60	30
Max. traversing speed (m/min) TRANSISTOR (VQ) output	120		80	40	16	8	4	NA	NA
Accuracy grade	± 5 µm *								
Measuring length ML in mm	in modular version for measuring lengths over 6500 mm or for lower measuring lengths on request								
Max. acceleration	30 m/s^2								
Required moving force	≤ 4 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 ± 5% or 10 ÷ 28 Vdc ± 5%								
Current consumption	140 mA_{MAX} (with 5 V and R = 120 Ω)								
A, B and I_0 output signals	LINE DRIVER TRANSISTOR								
Max. cable length	100 m (LINE DRIVER) 50 m (TRANSISTOR)								
Electrical connections	see related table								
Electrical protections	inversion of polarity and short circuits								
Weight	400 g + 1300 g/m								

* The declared accuracy grade of ± X µm is referred to a measuring length of 1 m.

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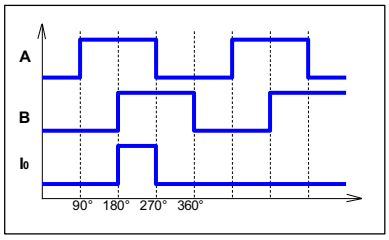
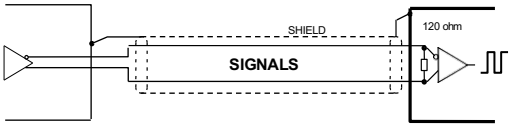
OUTPUT SIGNALS



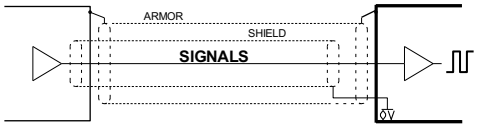
Signals amplitude	LINE DRIVER ($V_{OH} \geq 2.5$ V $V_{OL} \leq 0.5$ V) TTL
Load per channel	R = 120 Ω $I_L = \pm 20$ mA$_{MAX}$
A and B phase displacement	90° ± 5° electrical
Signal amplitude is referred to a differential measurement made with 120 Ω impedance and power supply voltage to the transducer of 5 V ± 5%.	

CABLE

LINE DRIVER OUTPUT

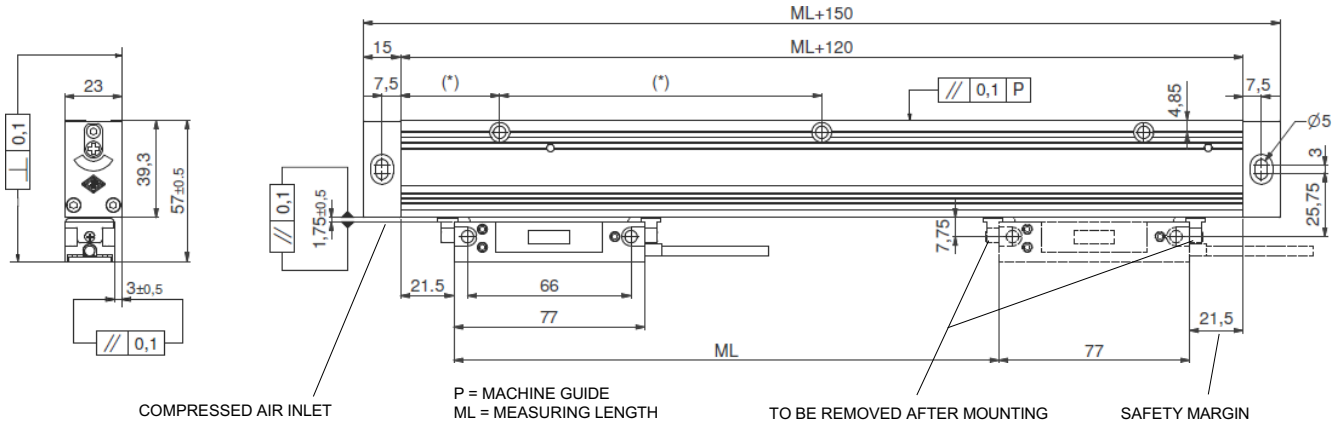


TRANSISTOR OUTPUT

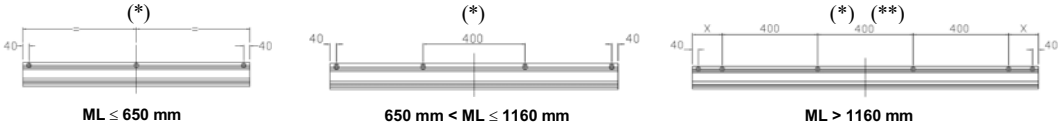


In case of cable extension, it is necessary to guarantee:
- **the electrical connection between the body of the connectors and the cables shield;**
- **a minimum power supply voltage of 5 V to the transducer.**

DIMENSIONS



DIMENSIONS IN mm



ML ≤ 650 mm | **650 mm < ML ≤ 1160 mm** | **ML > 1160 mm**

(**) Add holes at 40 mm from the cut heads, when the first hole at constant step is at a distance X > 175 mm.

ORDERING CODE

MODEL	SCALE TYPE, RESOLUTION, REFERENCE INDEXES	MEASURING LENGTH	POWER SUPPLY, OUTPUT SIGNALS	CABLE LENGTH, CABLE TYPE	CONNECTOR, WIRING	SPECIAL, PRESSURIZATION
GVS 400	**T 10 Z**	**00500**	**05VL**	**M04 / A**	**Cnn**	**PR**

T = TTL **100** = 100 µm **10** = 10 µm **1** = 1 µm **01** = 0.1 µm **No cod.** = without indexes **P** = indexes at constant step **Z** = indexes in required positions	Length in mm **00500** = 500 mm	**05V** = 5 Vdc **1028V** = 10 ÷ 28 Vdc **L** = LINE DRIVER **Q** = TRANSISTOR	**Mnn** = length in m **M04** = 4 m (standard) **100** = 100 m **A** = armored cable **N** = PVC cable **S** = PUR cable **U** = ultraflex cable **T** = tuboflex cable	**Cnn** = progressive	**No cod.** = standard **SPnn** = special nn **PR** = pressurized

Example 👉 **OPTICAL SCALE GVS 400 T10Z 00500 05VL M04/A C58 PR**