


Code ST02	Project A62-A	Release B	TECHNICAL DATASHEET
OPTICAL SCALE GVS 300			

GENERAL FEATURES

- Small-size incremental scale, for applications with limited installation space.
- Possibility of registration which simplifies alignment and allows the use on rough surfaces (retrofitting and machines for which application was not foreseen).
- Resolutions up to 0.1 μm . Accuracy grade $\pm 5 \mu\text{m}$.
- Two 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.
- High stability of LINE DRIVER signals.



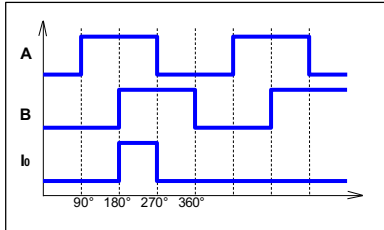
MECHANICAL AND ELECTRICAL CHARACTERISTICS

MECHANICAL	Cod. GVS 300	T																														
<ul style="list-style-type: none"> • PROFILE made of anodized aluminium. Dimensions 23x18 mm. • RAIL for the sliding of the intermediate fixing blocks, positionable along the entire measuring length, necessary for the intermediate fixing of scales with measuring length over 700 mm. • Elastic COUPLING for misalignment compensation and self-correction of mechanical hysteresis. Backlash error $<0.2 \mu\text{m}$. • 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 15x0.203 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. 	Measuring support stainless steel grating Linear thermal expansion coefficient $10.6 \times 10^{-6} \text{ } ^\circ\text{C}^{-1}$	No cod. = without reference indexes P = constant step (every 30 mm) Z = in required positions																														
ELECTRICAL <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> - 8-wires armored cable $\varnothing = 6.1 \text{ mm}$. - Conductors section: power supply 0.35 mm^2; signals 0.14 mm^2. GVS 300 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.	Reference indexes (I_0) Resolution (μm) 100 50 10 5 2 1 0.5 0.2 0.1 Max. traversing speed (m/min) LINE DRIVER (VL) output 80 60 30 Max. traversing speed (m/min) TRANSISTOR (VQ) output 80 40 16 8 4 NA NA Accuracy grade $\pm 5 \mu\text{m}^*$ Measuring length ML in mm up to 700 mm (for longer measuring lengths it is necessary to use the intermediate fixing blocks) Max. acceleration 10 m/s^2 Required moving force $\leq 4 \text{ N}$ Vibration resistance (EN 60068-2-6) 50 m/s^2 [55 ÷ 2000 Hz] Shock resistance (EN 60068-2-27) 150 m/s^2 [11 ms] Protection class (EN 60529) IP 53 standard IP 64 pressurized Operating temperature $0 \text{ } ^\circ\text{C} \div 50 \text{ } ^\circ\text{C}$ Storage temperature $-20 \text{ } ^\circ\text{C} \div 70 \text{ } ^\circ\text{C}$ Relative humidity $20\% \div 80\%$ (not condensed) Reading block sliding by ball bearings \odot Power supply $5 \text{ Vdc} \pm 5\%$ or $10 \div 28 \text{ Vdc} \pm 5\%$ Current consumption $140 \text{ mA}_{\text{MAX}}$ (with 5 V and $R = 120 \Omega$) 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 $250 \text{ g} + 420 \text{ g/m}$																															
<table border="1"> <thead> <tr> <th>LINE DRIVER</th> <th>TRANSISTOR</th> <th>CONDUCTOR COLOR</th> </tr> </thead> <tbody> <tr> <td>+ V</td> <td>+ V</td> <td>Red</td> </tr> <tr> <td>0 V</td> <td>0 V</td> <td>Blue</td> </tr> <tr> <td>A</td> <td>B</td> <td>Green</td> </tr> <tr> <td>\bar{A}</td> <td>NC</td> <td>Orange</td> </tr> <tr> <td>B</td> <td>A</td> <td>White</td> </tr> <tr> <td>\bar{B}</td> <td>NC</td> <td>Light-blue</td> </tr> <tr> <td>I_0</td> <td>I_0</td> <td>Brown</td> </tr> <tr> <td>I_0</td> <td>NC</td> <td>Yellow</td> </tr> <tr> <td>SCH</td> <td>SCH</td> <td>Shield</td> </tr> </tbody> </table>	LINE DRIVER	TRANSISTOR	CONDUCTOR COLOR	+ V	+ V	Red	0 V	0 V	Blue	A	B	Green	\bar{A}	NC	Orange	B	A	White	\bar{B}	NC	Light-blue	I_0	I_0	Brown	I_0	NC	Yellow	SCH	SCH	Shield		
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* The declared accuracy grade of $\pm X \mu\text{m}$ 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	$R = 120 \Omega$ $I_L = \pm 20 mA_{MAX}$
A and B phase displacement	$90^\circ \pm 5^\circ$ electrical
Signal amplitude is referred to a differential measurement made with 120Ω impedance and power supply voltage to the transducer of $5 V \pm 5\%$.	

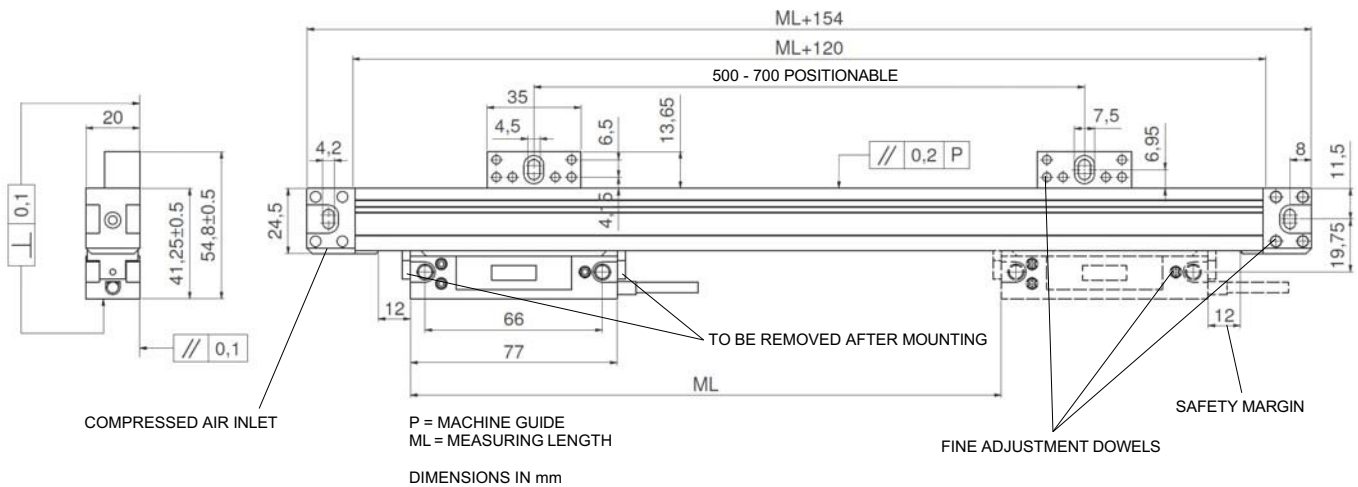
CABLE



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



ORDERING CODE

MODEL	SCALE TYPE, RESOLUTION, REFERENCE INDEXES	MEASURING LENGTH	POWER SUPPLY, OUTPUT SIGNALS	CABLE LENGTH, CABLE TYPE	CONNECTOR, WIRING	SPECIAL, PRESSURIZATION
GVS 300	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 300 T10Z 00500 05VL M04/A C58 PR**