

Code ST06	Project A50-A	Release C	TECHNICAL DATASHEET
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ABSOLUTE OPTICAL SCALE GVS 204

GENERAL FEATURES

- Optical scale with glass measuring support and direct reading of the absolute position. Particularly suitable for synchronized press brakes.
- High-speed serial interface.
- Reader head guided by a self-aligned and self-cleaning sliding carriage with spring system.
- Resolutions up to 0.1 μm . Accuracy grade up to $\pm 1 \mu\text{m}$.
- Adjustable cable output.
- **SYMMETRIC** mechanical mounting.
- Various possibilities of application, with double-effect joint or steel wire.
- Option: 1 Vpp analog signal.



MECHANICAL AND ELECTRICAL CHARACTERISTICS

MECHANICAL	Cod. GVS	204
<ul style="list-style-type: none"> • Rugged and heavy PROFILE, made of anodized aluminium. Dimensions 55x28 mm. • Elastic COUPLING for misalignment compensation and self-correction of mechanical hysteresis. Backlash error <math>< 0.2 \mu\text{m}</math>. • SEALING LIPS for the protection of the grating, made of special elastomer resistant to oil and wearing. Special self-blocking profile. • READER HEAD, consisting of tie rod and reading block, with fully protected place for electronic boards. • CARRIAGE guided by ball bearings with gothic arch profile sliding on tempered and grinded guides, to guarantee the system accuracy and the absence of wearing. • Die-cast TIE ROD, with nickel-plating surface treatment. • Absolute GLASS SCALE placed in the scale housing. • Elastomeric GASKETS which allow to reproduce the full protection in mechanical joints (in case of disassembling). • Adjustable CABLE output. • Various possibilities of application, with double-effect joint or steel wire. GV-PB adapter guarantees the compatibility with scale mod. PBS-HR. • Full possibility to disassemble and reassemble the scale. • Possibility of direct service. 	Measuring support Grating pitch Thermal expansion coefficient	glass scale 20 μm  $8 \times 10^{-6} \text{ } ^\circ\text{C}^{-1}$
	Incremental signal	sine wave 1 Vpp (optional)
	Resolution 1 Vpp	up to 0.1 μm *
	Signal period	20 μm
	Serial interface	SSI - BiSS
	Resolution absolute measure	1 μm - 0.1 μm
	Accuracy grade	$\pm 2.5 \mu\text{m}$ standard version $\pm 1 \mu\text{m}$ high-accuracy version
	Measuring length ML in mm	170, 220, 270, 320, 370, 420, 470, 520, 570, 620, 720, ...
	Max. traversing speed	120 m/min **
	Max. acceleration	20 m/s ²
	Required moving force	$\leq 1.5 \text{ N}$
	Vibration resistance (EN 60068-2-6)	80 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 $^\circ\text{C}$ ÷ 50 $^\circ\text{C}$
	Storage temperature	-20 $^\circ\text{C}$ ÷ 70 $^\circ\text{C}$
	Relative humidity	20% ÷ 80% (not condensed)
	Carriage sliding	by ball bearings @
	Power supply	5 Vdc $\pm 5\%$
	Current consumption	350 mA _{MAX} 180 mA _{TYP} (with R = 120 Ω)
	Max. cable length	20 m ****
	Electrical connections	see related table
	Electrical protections	inversion of polarity and short circuits
	Weight	900 g + 1850 g/m

ELECTRICAL

- Reading device with an infra-red light emitter and receiving photodiodes.
- Option: A and B 1 Vpp output signals with phase displacement of 90° (electrical).
- Serial protocol SSI - BiSS.
- CABLE:
 - Shielded twisted pair for digital signals (SIN - COS).
 - The cable is suitable for continuous movements.

SERIAL OUTPUT VERSION

- 6-wire shielded cable $\varnothing = 5.8 \text{ mm}$, PVC external sheath, with low friction coefficient, oil resistant.
- Conductors section: power supply 0.14 mm²; signals 0.14 mm².

The cable's bending radius should not be lower than 90 mm.

ANALOG + SERIAL OUTPUT VERSION

- 10-wire shielded cable $\varnothing = 6.2 \text{ mm}$, PUR external sheath.
- Conductors section: power supply 0.29 mm²; signals 0.10 mm².

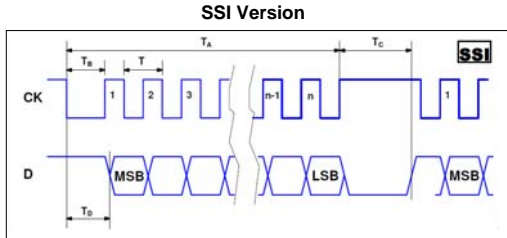
The cable's bending radius should not be lower than 90 mm.

SIGNALS	CONDUCTOR COLOR
+ V	Brown
0 V	White
CK	Green
$\overline{\text{CK}}$	Yellow
D	Pink
$\overline{\text{D}}$	Grey
SCH	Shield

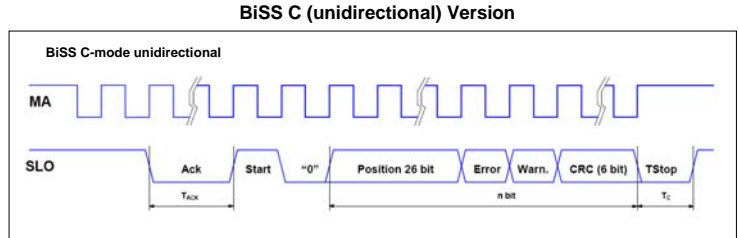
* Depending on CNC division factor.
 ** With a 0.1 μm resolution, the maximum traversing speed becomes 25 m/min.
 *** Pressurization set up on request.
 **** Ensuring the required power supply voltage to the transducer, the maximum cable length can be extended to 50 m.

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OUTPUT SIGNALS



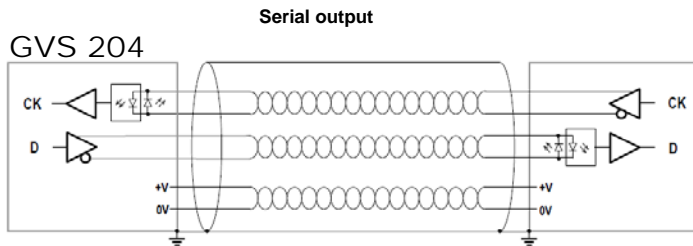
Interface	SSI Binary - Gray
Signals level	EIA RS 485
Clock frequency	0.1 ÷ 1.2 MHz *
n	Position bit
Tc	10 ÷ 20 µs



Interface	BiSS C unidirectional
Signals level	EIA RS 485
Clock frequency	0.1 ÷ 2 MHz *
n	26 + 2 + 6 bit
Tc	10 ÷ 20 µs

* The maximum frequency is guaranteed with a cable length up to 2 m.

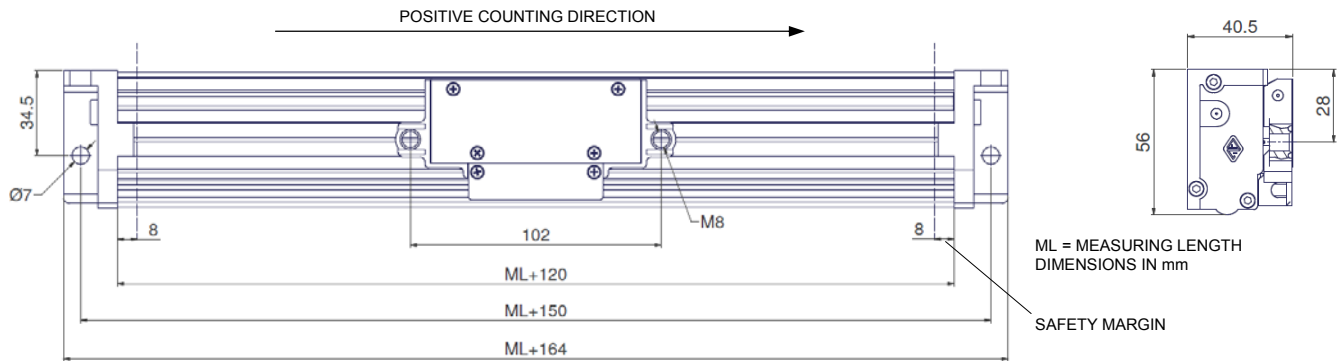
CABLE



In case of cable extension, it is necessary to guarantee:

- the electrical connection between the body of the connectors and the cables shield;
- the required power supply to the transducer.

DIMENSIONS



GV-PB adapter provided for the interchangeability with scale mod. PBS-HR.

ORDERING CODE

MODEL	RESOLUTION	MEASURING LENGTH	POWER SUPPLY	OUTPUT SIGNALS	INCREMENTAL SIGNAL	CABLE LENGTH, CABLE TYPE	CONNECTOR	SPECIAL, PRESSURIZATION
GVS 204	T1	0270	05V	S0	V	M0.5 / S	SC	PR

T1 = 1 µm
T0.1 = 0.1 µm
Length in mm
0270 = 270 mm
05V = 5 Vdc
S0 = SSI programmable
S1 = SSI binary
S2 = SSI binary+even parity
S3 = SSI binary+odd parity
S4 = SSI binary+error
S5 = SSI binary+even parity+error
S6 = SSI binary+odd parity+error
S7 = SSI Gray
B1 = BiSS binary
V = +1 Vpp
No cod. = no incremental signal
Mnn = length in m
M0.5 = 0.5 m (standard)
50 = 50 m
R = 6 wires (only serial)
S = 10 wires (serial+analog)
Cnn = progressive
SC = without connector
No cod. = standard
SPnn = special nn
PR = pressurized

Example **ABSOLUTE OPTICAL SCALE GVS204 T1 0270 05V S0 V M0.5/S SC PR**