GIVI MISURE
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Code	Project	Release	
ST06	***A50-A***	***E***	***TECHNICAL DATASHEET***

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 SSI - BiSS C (unidirectional) 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 ± 1 µm.
- Adjustable cable output.
- SYMMETRIC mechanical mounting.
- Various possibilities of application, with double-effect joint or steel wire.
- Option: 1 Vpp analog signal or Line Driver digital signal.

MECHANICAL AND ELECTRICAL CHARACTERISTICS

MECHANICAL

- Rugged and heavy PROFILE, made of anodized aluminium. Dimensions 55x28 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. 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 GRATING 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.

ELECTRICAL

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

SERIAL OUTPUT VERSION
- 6-wire shielded cable ∅ = 7 mm, PVC external sheath, with low friction coefficient, oil resistant.
- Conductors section: power supply 0.25 mm^2; signals 0.25 mm^2.

The cable's bending radius should not be lower than 70 mm.

ANALOG or DIGITAL + SERIAL OUTPUT VERSION
- 10-wire shielded cable ∅ = 7.1 mm, PUR external sheath.
- Conductors section: power supply 0.35 mm^2; signals 0.10 mm^2.

The cable's bending radius should not be lower than 80 mm.

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

Cod. GVS	204
Measuring support	glass scale
Grating pitch	20 µm P
Linear thermal expansion coefficient	8 x 10^{-6} °C^{-1}
Incremental signal (optional)	sine wave 1 Vpp or TTL Line Driver
Resolution 1 Vpp	up to 0.1 µm *
Resolution Line Driver	5 µm
Signal period	20 µm
Serial interface	SSI - BiSS C (unidirectional)
Resolution absolute measure	1 µm - 0.1 µm
Accuracy grade	± 2.5 µm ** standard version ± 1 µm ** high-accuracy version
Measuring length ML in mm	170, 220, 270, 320, 370, 420, 470, 520, 570, 620, 720, …
Max. traversing speed	60 m/min
Max. acceleration	20 m/s^2
Required moving force	≤ 1.5 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 °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
Current consumption (with R = 120 Ω)	350 mA_{MAX} 180 mA_{TYP} 5 Vdc 70 mA_{MAX} 35 mA_{TYP} 10 ÷ 28 Vdc
Max. cable length	20 m ***
Electrical connections	see related table
Electrical protections	inversion of polarity and short circuits
Weight	900 g + 1850 g/m

* Depending on CNC division factor.
** The declared accuracy grade of ± X µm is referred to a measuring length of 1 m.
*** Ensuring the required power supply voltage to the transducer, the maximum cable length can be extended to 50 m.

GIVI MISURE S.R.L. A SOCIO UNICO
C.F. e Iscrizione al Reg. Imprese di Monza e Brianza n° 04355540156 - Cap. Soc. € 51.480,00 I.V.

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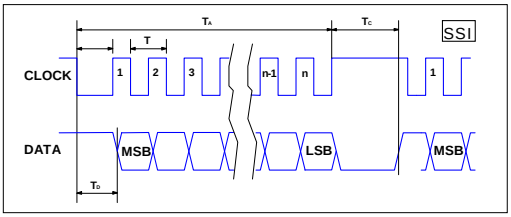
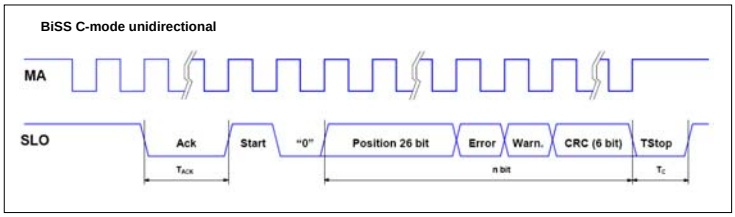
OUTPUT SIGNALS

SSI Version



Interface	SSI Binary – Gray
Signals level	EIA RS 422
Clock frequency	0.1 ÷ 1.2 MHz
n	26 bit
T_C	max. 25 µs
T_D	max. 7 µs

BiSS C (unidirectional) Version

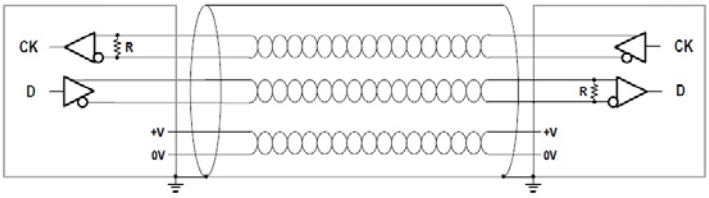


Interface	BiSS C unidirectional
Signals level	EIA RS 485 / RS 422
Clock frequency	0.1 ÷ 8 MHz
n	26 + 2 + 6 bit
T_C	8 µs
T_{ACK}	max. 22 µs

CABLE

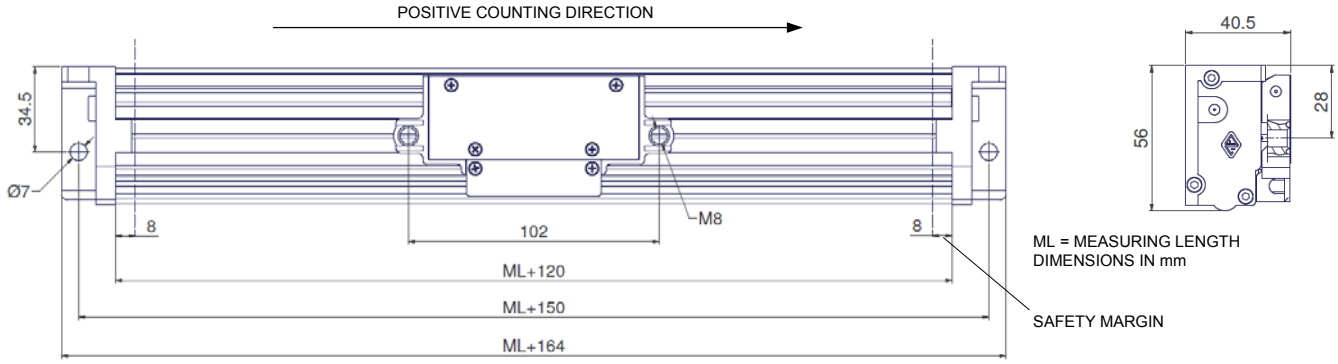
Serial output

GVS 204



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	RESOLUT.	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 **T01** = 0.1 µm	Length in mm **0270** = 270 mm	**05V** = 5 Vdc **1028V** = 10 ÷ 28 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 **T** = Line Driver **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 or digital)	**Cnn** = progressive **SC** = without connector	**No cod.** = standard **SPnn** = special nn **PR** = pressurized

Example ☞ **ABSOLUTE OPTICAL SCALE GVS 204 T1 0270 05V S0 V M0.5/S SC PR**