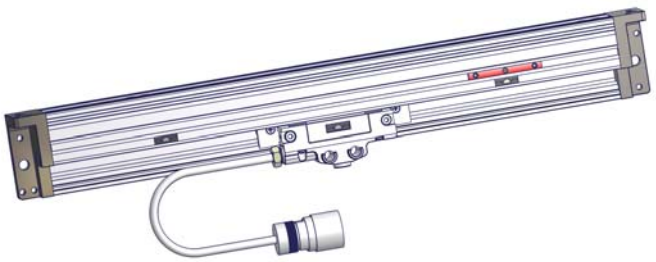
GIVI MISURE s.r.l.
Via Assunta 57 - 20054 NOVA MILANESE (MI) ITALY
TEL.+39 0362.36.61.26 FAX +39 0362.36.68.76
www.givimisure.it sales@givimisure.it

Code	Project	Release	Title
ST04	***A01-C***	***B***	***TECHNICAL DATASHEET***

OPTICAL SCALE PBS-HR

GENERAL FEATURES

- Incremental optical scale with stainless steel grating (grating pitch 20 μm or 40 μm), for applications on synchronized Press brakes.
- Reader head guided by self-aligned translation carriage.
- Resolutions up to 0.5 μm, accuracy ± 2.5 μm.
- Linear thermal expansion coefficient $\lambda = 10.6 \times 10^{-6}\ °C^{-1}$ suitable to the application.
- Predefined orientation of direction of grating linear expansion.
- Reference indexes in required positions, selectable by Magneto Set device. The swinging cable output and the selectable zero references make the scale symmetric and applicable, in the same version, both to the right column and to the left column of the Press brake.
- Protected against inversion of power supply polarity and short circuit on output ports.



MECHANICAL AND ELECTRICAL FEATURES

MECHANICAL

- Rugged and heavy PROFILE: anodized aluminium, dimensions 57x40 mm.
- Elastic COUPLING to compensate misalignments and self-correction of mechanic hysteresis. Backlash error <0.2 μm. Error on the point of maximum travel < 1.5 μm.
- Double level LIP SEALS (internal and external) along the sliding side of the reader head.
- READER HEAD, consisting of tie rod and reading block, with fully protected place for electronic boards.
- CARRIAGE guided by ball bearings with gothic arc profile sliding on tempered and straightened tracks, to guarantee accuracy and lack of wear.
- READING BLOCK sliding through ball bearings.
- Die-cast TIE ROD.
- Stainless steel GRATING placed in the aluminium profile.
- Elastomeric GASKETS which allow to reproduce the full protection in mechanical joints (in case of disassembly).
- Full possibility to disassemble and reassemble it.
- Possibility of direct service.

ELECTRICAL

- Reading device with an infra-red light emitter and receiving photodiodes.
- A and B output signals with phase displacement of 90° (electrical).
- CABLE:
  - 8-wire shielded cable ∅ = 6.1 mm, PUR external sheath, with cable gland.
  - Conductor section: supply 0.35 mm^2, signals 0.14 mm^2.

Do not exceed the minimum cable bending radius of 40 mm.

The cable is suitable for continuous movements.

LINE DRIVER	PUSH-PULL	WIRE COLOUR
A	B	Green
$\overline{A}$	NC	Orange
B	A	White
$\overline{B}$	NC	Light blue
I_O	I_O	Brown
$\overline{I_O}$	NC	Yellow
SCH	SCH	Shield
VS = 5V	VS = 5V	Red
VS0 = 0V	VS0 = 0V	Blue

Code PBS-HR	100Z	5Z	W1Z
Measuring support	stainless steel		
Grating pitch P	40 μm	20 μm	40 μm
Linear thermal expansion	$10.6 \times 10^{-6}\ °C^{-1}$		
Reference index (I_0)	in required position		
Resolution	10 μm	5 μm	1 μm
Accuracy	± 2.5 μm/m		
Measuring length ML in mm	170, 220, 270, 320, 370 420, 470, 520, 570, 620,…….		
Max. traversing speed	80 m/min	60 m/min	25 m/min
Max. acceleration	30 m/s^2		
Required moving force	≤ 4 N ≤ 2.5 N on request		
Vibration resistance (EN 60068-2-6)	100 m/s^2 [10 ÷ 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)		
Block sliding	by ball bearings		
Power supply	5 V ± 5% or 12 V ± 5%		
Current consumption	65 mA_{MAX} or 55 mA_{MAX}		
A and B output signals	LINE DRIVER PUSH-PULL		
Maximum cable length	40 m		
Electrical connection	see the rel. table		
Electrical protections	inversion of power supply polarity and short circuit on output port		
Weight	720 g + 2300 g/m		

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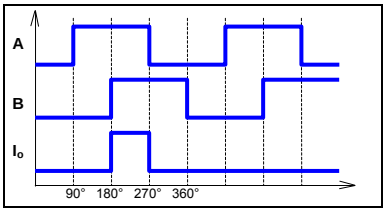
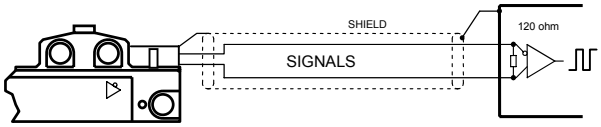
OUTPUT SIGNALS



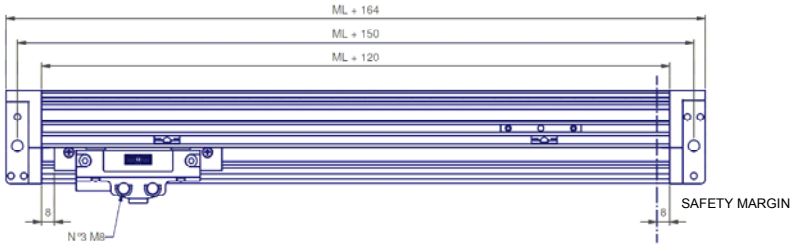
Signal amplitude	LINE DRIVER ($V_{OH} \geq 2.5$ V $V_{OL} \leq 0.5$ V) TTL
Load per channel	R = 120 Ω $I_L = \pm 20$ mA_{MAX}
A and B phase displacement	90° ± 5° electrical

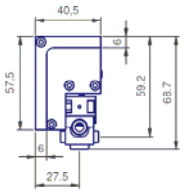
CABLE



In case of cable extension, the electrical connection between the body of the connectors must be ensured.

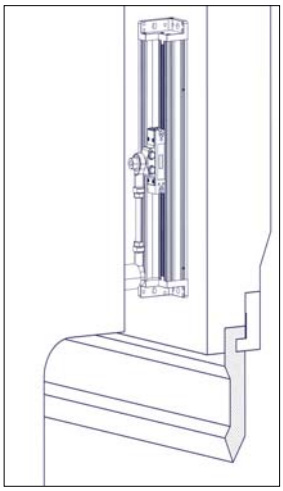
DIMENSIONS





ML = MEASURING LENGTH

DIMENSIONS IN mm



RECOMMENDED JOINT ORIENTATION

ORDERING CODE

MODEL	RESOLUTION, INDEX (OPTIONS)	MEASURING LENGTH	POWER SUPPLY, OUTPUT SIGNAL	CABLE LENGTH, CABLE TYPE	CONNECTOR, WIRING	SPECIAL, PRESSURIZED
PBS-HR	**5 Z**	**00270**	**05V L**	**M01 / S**	**CV**	**SP10**
	100 = 10µm **5** = 5µm **W1** = 1µm **Z** = with index	Length in mm **00270** = 270mm	**05V** = 5V **12V** = 12V **L** = LINE DRIVER **Q** = PUSH-PULL	**Mnn** = length in m **M03** = 3m **M04** = 4m **M40** = 40m **S** = standard cable (for continuous movements)	**Cnn** = progressive	**No code** = standard **SPnn** = special nn

Example ☞ **OPTICAL SCALE PBS-HR 5Z 00270 05VL M01/S CV**