Self-aligned incremental optical scale

PBS-HR

Datasheet

Characteristics

- 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 characteristics

Mechanical

- Rugged and heavy PROFILE, made of anodized aluminium.
  Dimensions 57x40 mm.
- Elastic COUPLING for misalignment compensation and self-correction of mechanical hysteresis. Backlash error <0.2 µm. Error on the point of maximum travel <1,5 µm.
- Double level SEALING LIPS (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 arch profile sliding on tempered and straightened tracks, to guarantee the system accuracy and the absence of wearing.
- 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 disassembling).
- Full possibility to disassemble and reassemble the scale.
- 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 Ø= 6.1 mm, PUR external sheath, with cable gland.
  - Conductors section: power supply 0.35 mm²; signals 0.14 mm².

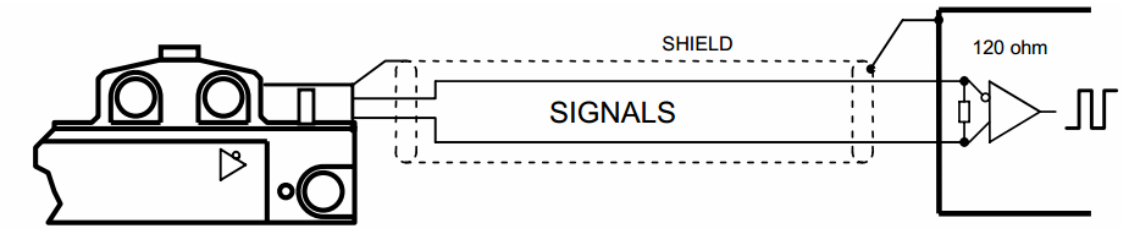
Do not exceed the minimum cable bending radius of 40 mm.
The cable is suitable for continuous movements.

line driver	push-pull	Wire colour
A	B	green
$\overline{A}$	NC	orange
B	A	white
$\overline{B}$	NC	light blue
I_0	I_0	brown
$\overline{Io}$	NC	yellow
SCH	SCH	shield
VS=5 V	VS=5 V	red
VS0=0 V	VS0=0 V	dark blue

Willtec Messtechnik ek, Eschenweg 4, 79232 March-Hugstetten, Fon:07665/93465-0 Fax:07665/93465-22
info@willtec.de www.willtec.de

PBS-HR	100Z	5Z	W1Z
Measuring support	stainless steel		
Grating pitch P	40 µm	20 µm	40 µm
Thermal expansion coefficient	$10,6 \times 10^{-6}$ °C^{-1}		
Reference index (I_0)	in required position		
Resolution	10 µm	5 µm	1 µm
Accuracy	± 2,5 µm/m		
Measuring length ML [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 (EN60068-2-27)	150 m/s2 [11 ms]		
Protection class (EN60529)	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		
Max. cable length	40 m		
Electrical connections	see related table		
Electrical protections	inversion of power supply polarity and short circuit on output port		
Weight	720 g + 2300 g/m		

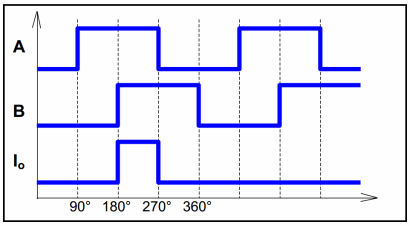
Cable



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

- the electrical connection between the body of the connectors and the cabled shield

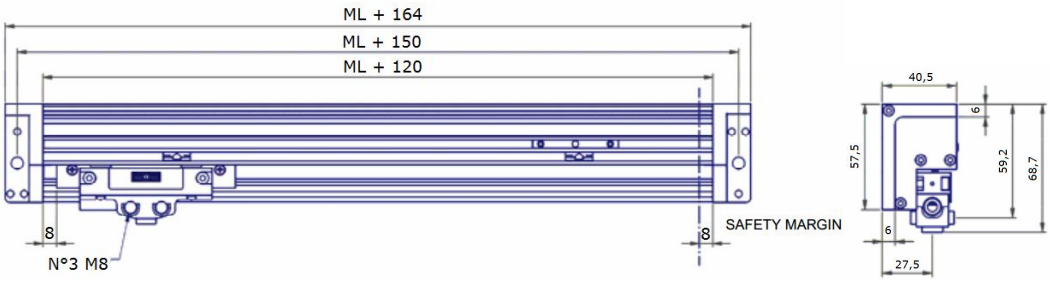
Output signals



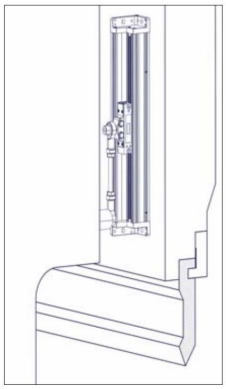
Signal amplitude	LINE DRIVER (V_{OH} ≥ 2.5 V V_{OL} ≤ 0.5 V) TTL
Load per channel	R = 120 Ω I_L = ± 20 mA_{MAX}
A and B phase displacement	90° ± 5° electrical

Willtec Messtechnik ek, Eschenweg 4, 79232 March-Hugstetten, Fon:07665/93465-0 Fax:07665/93465-22
info@willtec.de www.willtec.de

Dimensions



ML= Measuring length
Dimensions in mm



Recommended joint orientation

Ordering example

PBS-HR - 5 Z - 0270 - 05V L - M01/S - CV - SP10

Type
PBS-HR

Resolution, index (options)
100= 10 µm
5= 5 µm
W1= 1 µm
Z= with index

Measuring length
Length in mm
0270= 270 mm

Power supply, output signals
05V= 5 V
12V= 12 V
L= Line Driver
Q= Push-Pull

Cable length, cable type
Mnn= length in m
M01= 1 m (standard)
M40= 40 m
S= standard cable (for continuous movements)

Connector, wiring
Cnn= progressive

Special, pressurized
No cod. = standard
SPnn= special nn

Willtec Messtechnik ek, Eschenweg 4, 79232 March-Hugstetten, Fon:07665/93465-0 Fax:07665/93465-22
info@willtec.de www.willtec.de