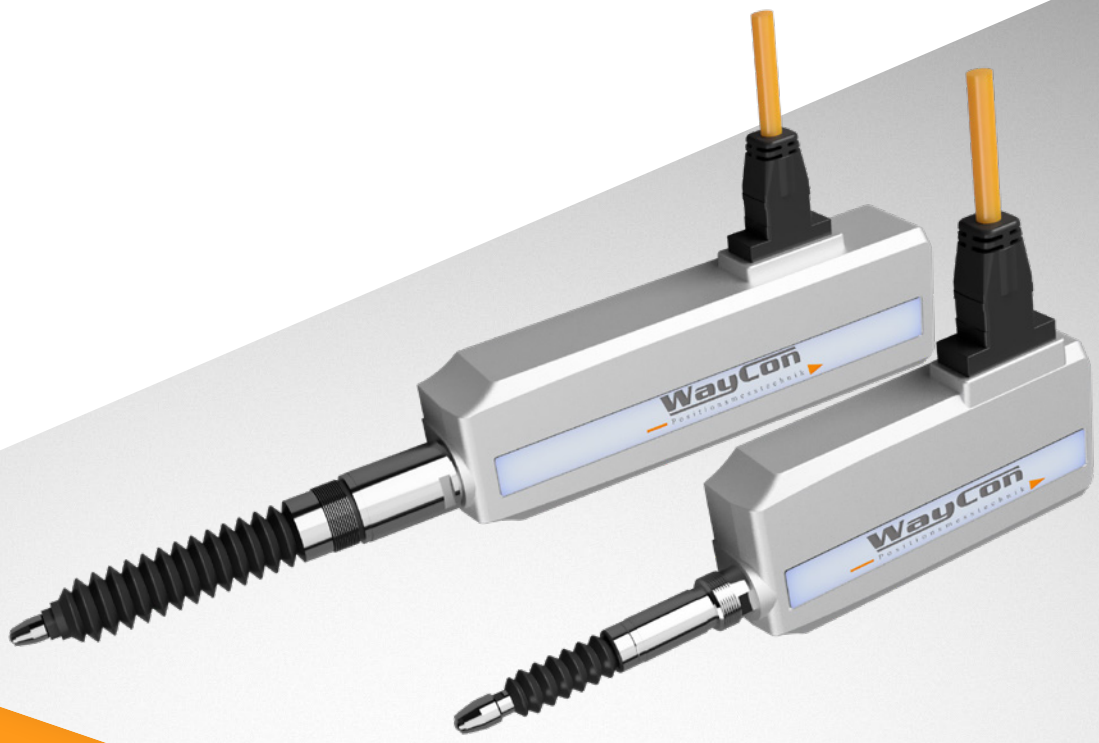
DIGITAL LENGTH GAUGES



GMR SERIES

Key-Features:

- *High precision length gauges with photoelectric linear encoder*
- *Measurement ranges up to 50 mm*
- *Small range linearity up to 0.5 µm*
- *Repeatability up to 0.3 µm*
- *Resolution up to 0.1 µm*
- *Incremental output RS-422*
- *Protection class IP67*

Content

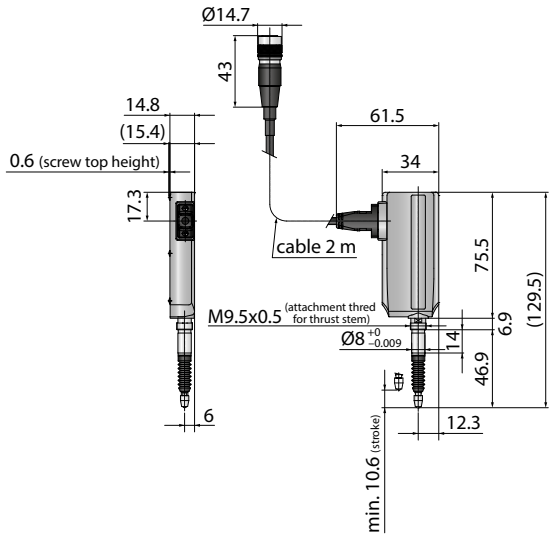
TECHNICAL DATA

Measurement range	[mm]	10		25		50
Linearity [1]	[µm]	0.8+L/50	1.5+L/50	0.8+L/50	1.5+L/50	1.5+L/50
Linearity at small range [2]	[µm]	0.5				
Repeatability	[µm]	0.3				
Resolution	[µm]	0.1	1	0.1	1	1
Response speed max.	[mm/s]	400	1500	400	1500	1500
Measurement force max.	[N]	probe tip points down: 1.4 probe tip points horizontal: 1.3 probe tip points up: 1.2		probe tip points down: 4.6 probe tip points horizontal: 4.3 probe tip points up: 4		probe tip points down: 5.7 probe tip points horizontal: 5.3 probe tip points up: 4.9
Output signal		90° phase difference, differential square wave (RS-422 equivalent)				
Signal pitch	[µm]	0,4	4	0,4	4	4
Edge distance min.		250 ns (4 MHz)	500 ns (2 MHz)	250 ns (4 MHz)	500 ns (2 MHz)	500 ns (2 MHz)
Reference signal (Z phase) [3]	[mm]	approx. 3		approx. 5		
Repeatability reference signal	[µm]	≤0.5 µm (at a constant reference point passing speed less than 300 mm/s in the same direction)				
Supply		5 ± 0.2 VDC (ripple voltage max. 200 mV_{PP})				
Connection		cable, 2 m with Hirose connector, 10 pins				
Protection class		IP67				
Operating temperature	[°C]	0...+50				
Storage temperature	[°C]	-10...+60				
Humidity	[%]	20...80 (relative, no condensation)				
Probe tip		carbide ball ø3 mm				
Weight	[g]	260		300		400

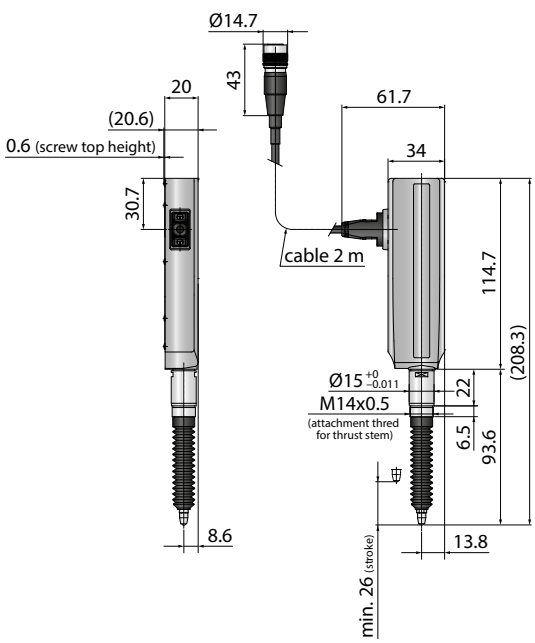
[1] L = actual measured length in mm
Example for linearity 0.8+L/50: For a actual measured length of 5 mm the linearity is 0.9 µm.
[2] within a measured length of 20 µm
[3] from lowest resting point

TECHNICAL DRAWING

GMR-10: measurement range 10 mm

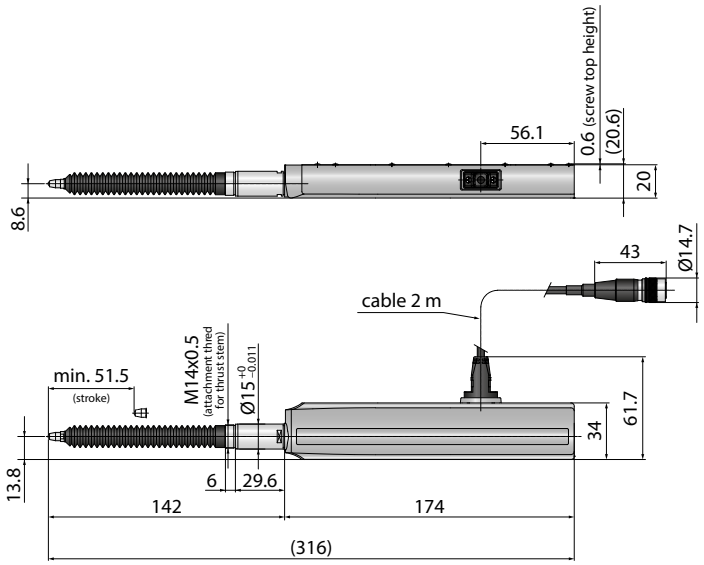


GMR-25: measurement range 25 mm



TECHNICAL DRAWING

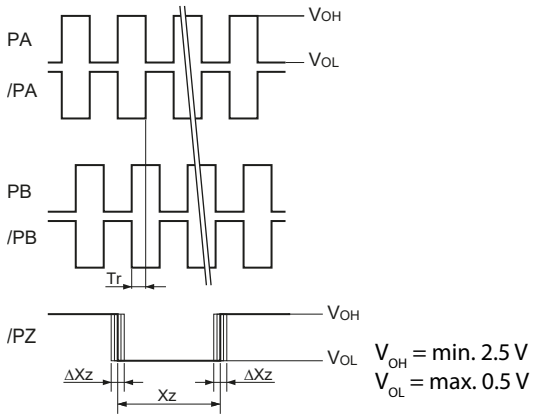
GMR-50: measurement range 50 mm



SIGNAL DESCRIPTION

Digital length gauges of the GMR series provide the following two output signal:

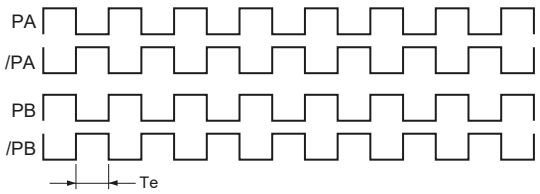
Normal output signal:



V_{OH} = min. 2.5 V
V_{OL} = max. 0.5 V

- Output condition: Speed of rod movement ≤ Sensor response speed
- Tr = Edge distance (see table below)
- Output delay time: Not more than 1 µs
- ΔXz = Repeatability of reference signal ≤0.5 µm
- Xz = Reference signal pulse width approx. 40...60 µm

Error output signal:
If an error occurs, PA, /PA, PB and /PB are put out in phase.



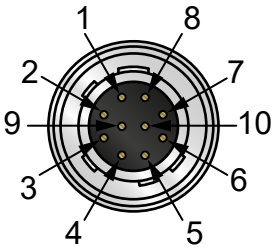
- Output conditions: The sensor enters the error state and the special pattern indicated in the figure above is output under the following conditions:
  Speed of rod movement > Sensor response speed
- Te = Edge distance (see table below)

Resolution	Tr	Te
1 µm	500 ns	500 ns
0.1 µm	250 ns	500 ns

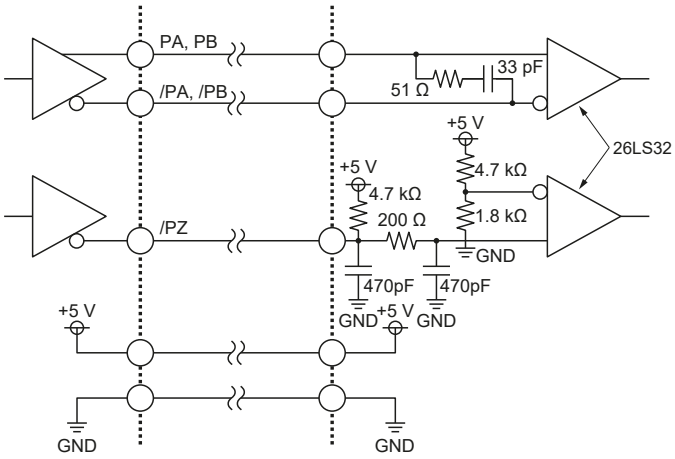
ELECTRICAL CONNECTION

Connector type: Hirose HR10A-10P-10P, male

Function	Pin	Connection cable K10P2M-F-HR
PA	1	GN
/PA	2	YE
n. c.	3	-
PB	4	PK
/PB	5	GY
n. c.	6	-
n. c.	7	-
/PZ	8	RD
+V	9	BN
GND	10	WH
Shield	Housing	Housing



Circuit diagram



ORDER CODE

GMR – □ – □

Measurement range	
0...10 mm	10
0...25 mm	25
0...50 mm [1]	50

	Resolution
1	1 µm
01	0.1 µm [1]

[1] Measurement range 50 mm not in combination with resolution 0.1 µm

MODELS

GMR-10-1	Measurement range 0...10 mm, resolution 1 µm
GMR-25-1	Measurement range 0...25 mm, resolution 1 µm
GMR-50-1	Measurement range 0...50 mm, resolution 1 µm
GMR-10-01	Measurement range 0...10 mm, resolution 0.1 µm
GMR-25-01	Measurement range 0...25 mm, resolution 0.1 µm

ACCESSORIES

Cable with Hirose connector (female), 10 poles, shielded	
K10P2M-F-HR	2 m, straight connector

Digital displays for sensors with HTL or TTL output, 2 channel	
WAY-DXM-S	touch screen, supply: 18...30 VDC
WAY-DXM-AC	touch screen, supply: 115...230 VAC

For more information and options please refer to the WAY-DXM data sheet.

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