NUMERIK JENA

Product Information METRO

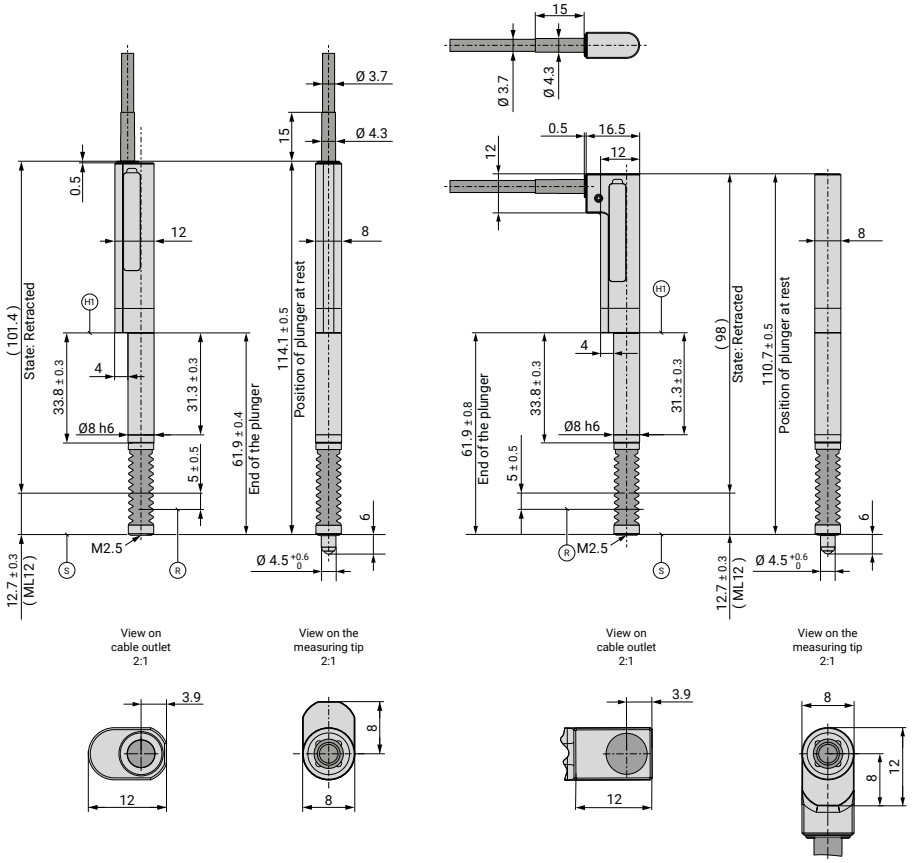
English (en)
03/2025

METRO

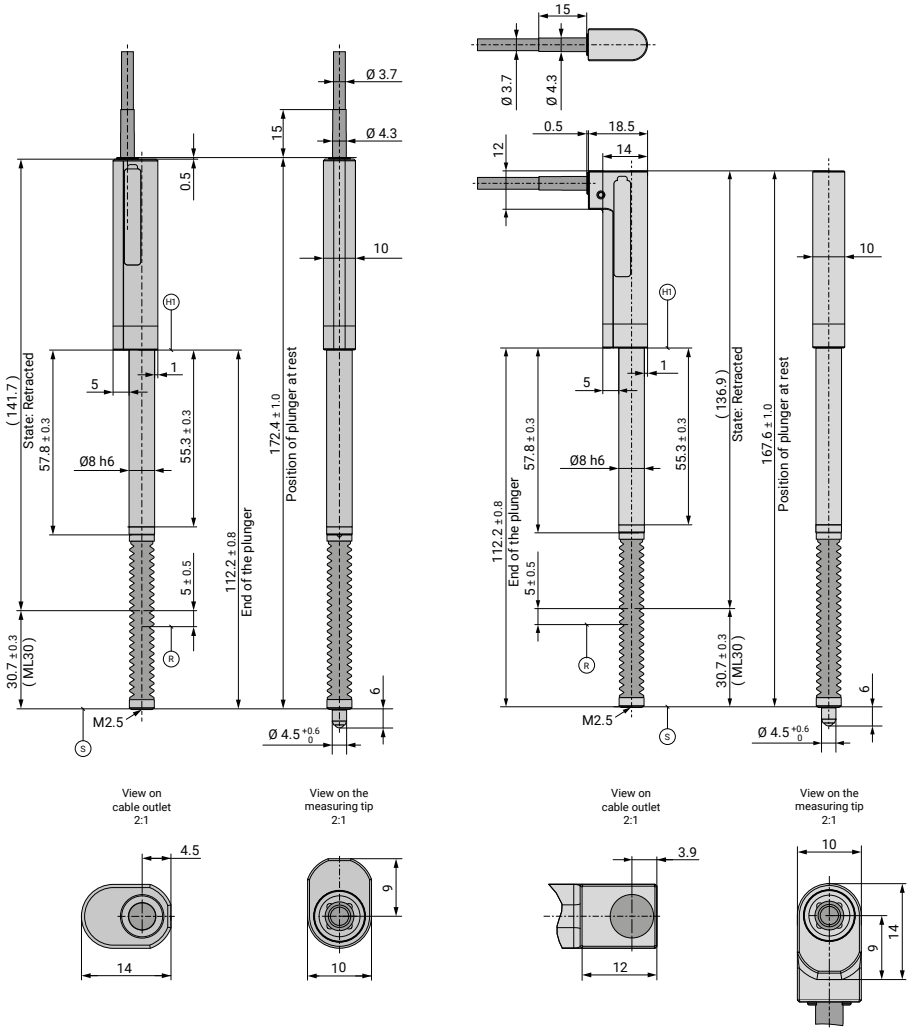
Incremental length gauges with ±0.5 µm accuracy

- High repeatability
- Minimized add-on dimension
- Plunger actuation with spring force

METRO-12x8



METRO-30x8



Mechanical data	METRO-12x8	METRO-30x8
Plunger actuation	By spring force	
Position of plunger at rest	Extended	
Measuring standard	Grating period 20 µm	
System accuracy	±0.5 µm	
Position error per signal period	≤ ±0.1 µm	
Short-range accuracy typically	0.3 µm	
Reference mark	≈ 5.0 mm below upper stop	
Measuring range	12 mm	30 mm
Radial force	≤ 0.8 N (mechanically permissible)	
Fastening	Clamping shank Ø8 h6	
Operating orientation	Any	
Vibration 55 Hz to 2000 Hz	≤ 100 m/s² (EN 60068-2-6)	
Shock 11 ms	≤1,000 m/s² (EN 60068-2-27)	
Operating temperature	10 °C to 40 °C; reference temperature 20 °C	
Humidity level	≤93%	
Protection EN 60529	IP67	
Contamination level	3	
Mass without cable	40 g	50 g

Electrical data	METRO-1278 METRO-3078				METRO-1288 METRO-3088
Interface	TTL				1 V_{PP}
Integrated interpolation*	5-fold	10-fold	25-fold	50-fold	–
Signal period	4 µm	2 µm	0.8 µm	0.4 µm	20 µm
Edge separation a at scanning frequency*/traverse speed[2)]					
100 kHz ≤ 72 m/min[1)]	≥ 0.45 µs	≥ 0.23 µs	≥ 0.09 µs	≥ 0.05 µs	–
50 kHz ≤ 60 m/min	≥ 0.90 µs	≥ 0.45 µs	≥ 0.18 µs	≥ 0.09 µs	
25 kHz ≤ 30 m/min	≥ 1.80 µs	≥ 0.90 µs	≥ 0.36 µs	≥ 0.18 µs	
Electrical connection	15-pin D-sub connector, male, cable outlet straight, 1.5 m, integrated interface electronics (HEIDENHAIN-Pin layout)				
Cable outlet*	Axial or Radial				
Cable length	≤ 30 m with HEIDENHAIN cable				
Supply voltage	DC 5 V ±10%				
Current consumption	< 120 mA (without load)				< 110 mA (without load)

* Please select when ordering

[1)] Mechanically limited

[2)] At a corresponding cutoff or scanning frequency

Ⓡ = Position of the reference mark
Ⓢ = Beginning of the measuring length
Ⓗ1 = Clamping area
Ⓗ2 = Air connection 2 mm tube

mm
Tolerancing ISO 8015
ISO 2768 -mK
≤ 6 mm: ±0.2 mm

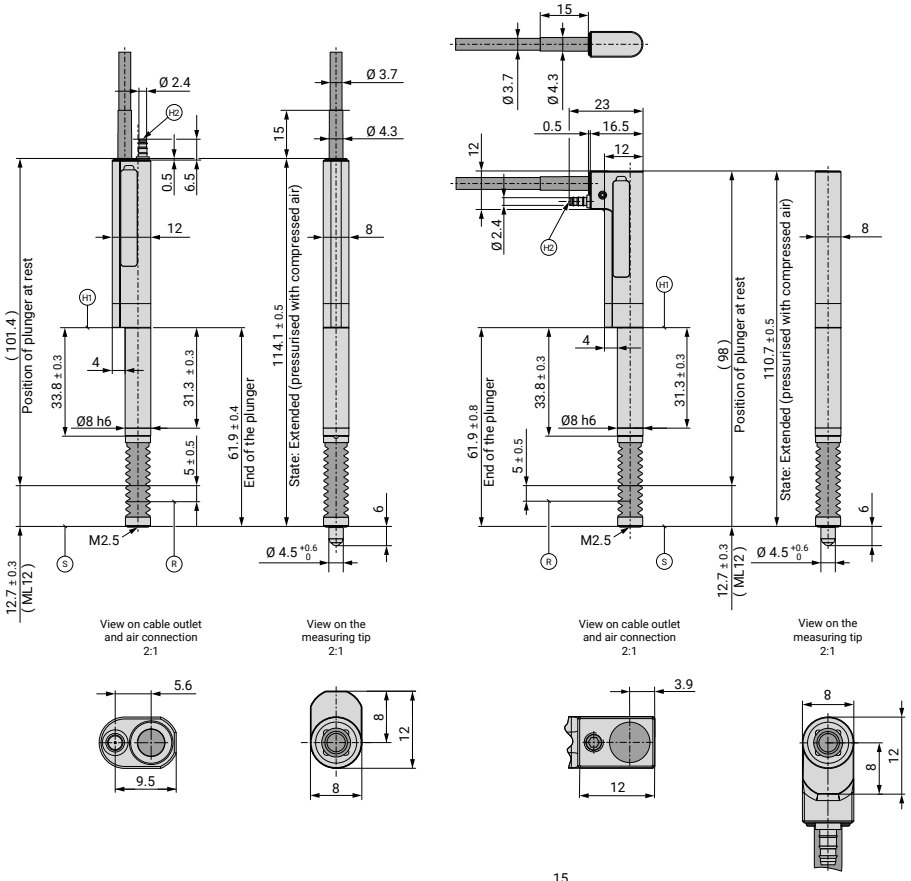
Use above sea level: **down to 5,000 m**

METRO

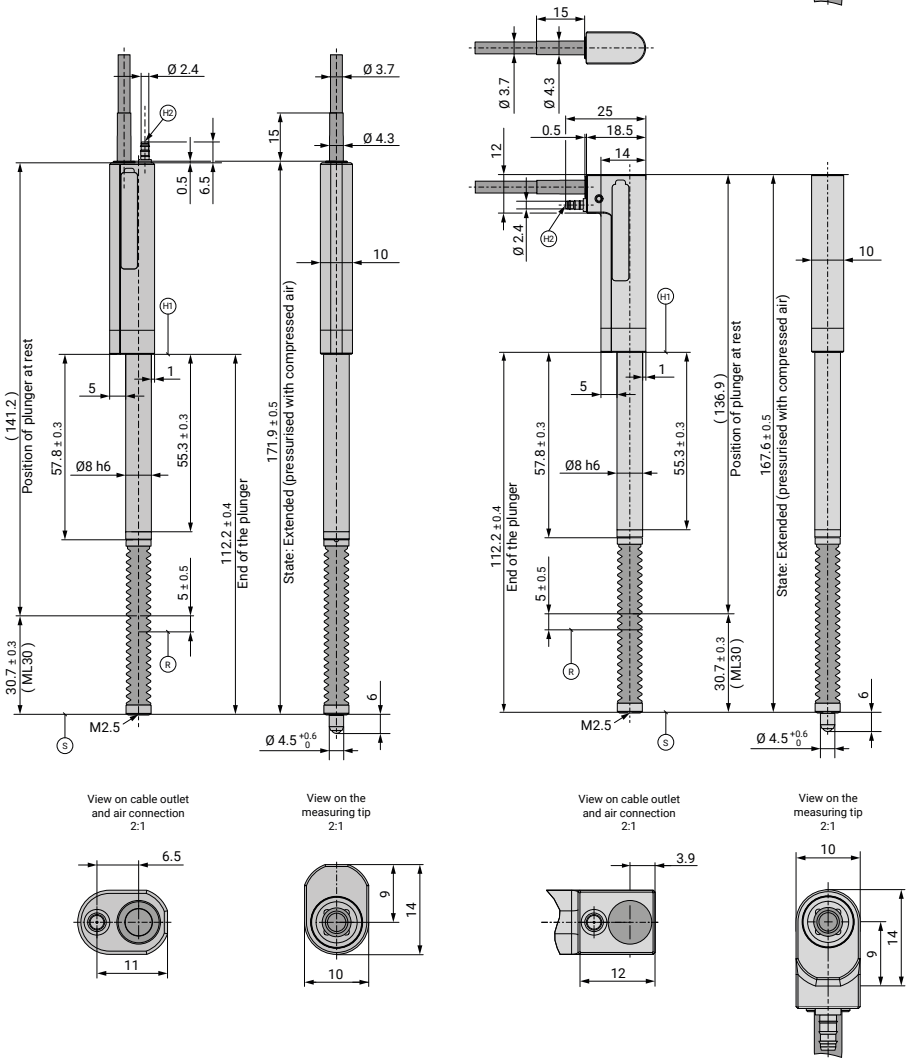
Incremental length gauges with ±0.5 µm accuracy

- High repeatability
- Minimized add-on dimension
- Plunger actuation with compressed air

METRO-12x7



METRO-30x7



Mechanical data	METRO-12x7	METRO-30x7
Plunger actuation Position of plunger at rest	By compressed air Retracted	
Measuring standard	Grating period 20 µm	
System accuracy	±0.5 µm	
Position error per signal period	≤ ±0.1 µm	
Short-range accuracy typically	0.3 µm	
Reference mark	≈ 5.0 mm below upper stop	
Measuring range	12 mm	30 mm
Working pressure	1.0 bar to 2.5 bar	
Radial force	≤ 0.8 N (mechanically permissible)	
Fastening	Clamping shank Ø8 h6	
Operating orientation	Any	
Vibration 55 Hz to 2000 Hz **Shock** 11 ms	≤ 100 m/s² (EN 60068-2-6) ≤ 1000 m/s² (EN 60068-2-27)	
Operating temperature **Humidity level**	10 °C to 40 °C; reference temperature 20 °C ≤93%	
Protection EN 60529 **Contamination level**	IP64 (with sealing air ≥ 0.2 bar IP67) 3	
Mass without cable	40 g	50 g

Electrical data	METRO-1277 METRO-3077				METRO-1287 METRO-3087
Interface	TTL				1 V_{PP}
Integrated interpolation*	5-fold	10-fold	25-fold	50-fold	–
Signal period	4 µm	2 µm	0.8 µm	0.4 µm	20 µm
Edge separation a at scanning frequency*/traverse speed[2]					
100 kHz ≤ 72 m/min[1]	≥ 0.45 µs	≥ 0.23 µs	≥ 0.09 µs	≥ 0.05 µs	–
50 kHz ≤ 60 m/min	≥ 0.90 µs	≥ 0.45 µs	≥ 0.18 µs	≥ 0.09 µs	
25 kHz ≤ 30 m/min	≥ 1.80 µs	≥ 0.90 µs	≥ 0.36 µs	≥ 0.18 µs	
Electrical connection	15-pin D-sub connector, male, cable outlet straight, 1.5 m, integrated interface electronics (HEIDENHAIN-Pin layout)				
Cable outlet*	Axial or Radial				
Cable length	≤ 30 m with HEIDENHAIN cable				
Supply voltage	DC 5 V ±10%				
Current consumption	< 120 mA (without load)				< 110 mA (without load)

* Please select when ordering

[1] Mechanically limited

[2] At a corresponding cutoff or scanning frequency

Ⓡ = Position of the reference mark
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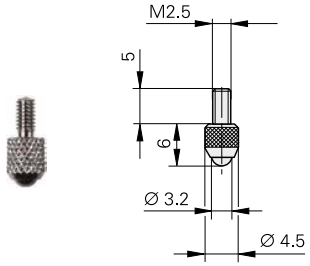
mm
Tolerancing ISO 8015
ISO 2768 -mK
≤ 6 mm: ±0.2 mm

Use above sea level: **down to 5,000 m**

Accessories for Length Gauges
Measuring contacts

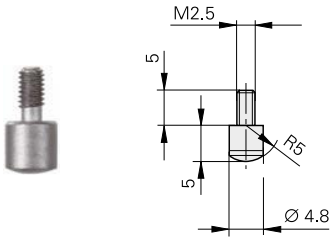
Ball-type contact

Steel	ID 202504-01
Carbide	ID 202504-02
Ruby	ID 202504-03



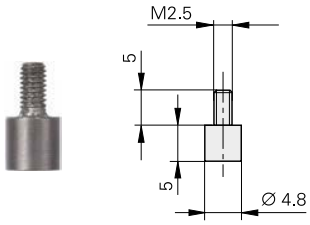
Domed contact

Carbide	ID 229232-01



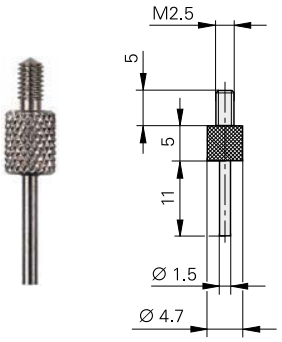
Flat contact

Steel	ID 270922-01
Carbide	ID 202506-01



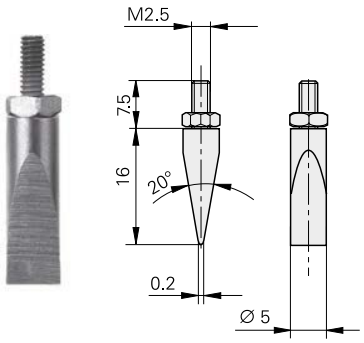
Pin-type contact

Steel	ID 202505-01



Knife-edge contact

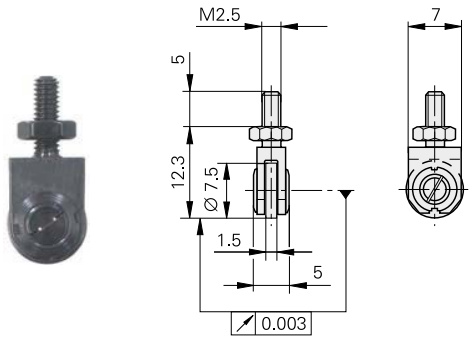
Steel	ID 202503-01



mm
Tolerancing ISO 8015
ISO 2768 - m H
≤ 6 mm: ±0.2 mm

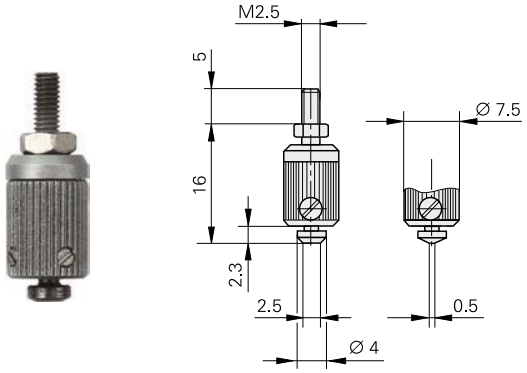
Roller contact, steel
For a low-friction contact with moving surfaces

Crowned	ID 202502-03
Cylindrical	ID 202502-04



Adjustable contact, carbide
For exact parallel alignment to the measuring plate surface

Flat	ID 202507-01
Knife-edged	ID 202508-01



METRO Nomenclature

Ordering key - example

METRO	–	12	7	8	A	–	L	1	P	Z13

Product name

METRO	Incremental length gauge METRO

Measuring length

12	12 mm
30	30 mm

Interface

7	Digital (TTL)
8	Analog (1 V_{PP})

Plunger actuation

7	Extended by compressed air
8	Extended by spring force

Cable outlet

A	Axial
R	Radial

Electrical connection

Z13	D-Sub connector male, 15-pin, cable outlet straight, electronics in connector, HEIDENHAIN pin layout

Cable (PUR Ø 3.7 mm) (single shielded)

P	1.5 m

Max. scanning frequency for digital interface selection

1	25 kHz
2	50 kHz
3	100 kHz

Max. scanning frequency for analog interface selection

0	100 kHz

Output signal for digital interface selection

L	Square-wave signal RS422 with 5-fold interpolation
M	Square-wave signal RS422 with 10-fold interpolation
I	Square-wave signal RS422 with 25-fold interpolation
N	Square-wave signal RS422 with 50-fold interpolation

Output signal for analog interface selection

C	Sinusoidal voltage signals (1 V_{PP})

Product notes

- The encoders as well as the accessories are guaranteed to function if the mounting and operating conditions are maintained as stated in the respective original instructions and installation notes.
- Connect NUMERIK JENA encoders only to subsequent electronics whose power supply is generated from PELV systems (EN 50178).
- NUMERIK JENA encoders fulfill the requirements of standard IEC 61010-1 only if the power is supplied from a secondary circuit with current limitation as per IEC 61010 (3rd Ed.), Section 9.4 or with power limitation as per IEC 60950-1 (2nd Ed.), Section 2.5 or from a Class 2 secondary circuit as specified in UL1310. In place of IEC 61010-1 (3rdEd.), Section 9.4, the corresponding sections of standards DIN EN 61010-1, EN61010-1, UL 61010-1 and CAN/CSA-C22.2 No. 61010-1 can be applied and in place of IEC 60950-1 (2nd Ed.), Section 2.5 the corresponding sections of standards DIN EN60950-1, EN60950-1, UL60950-1, CAN/CSA-C22.2 No. 60950-1 can be applied.

NUMERIK JENA

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Original documentation
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