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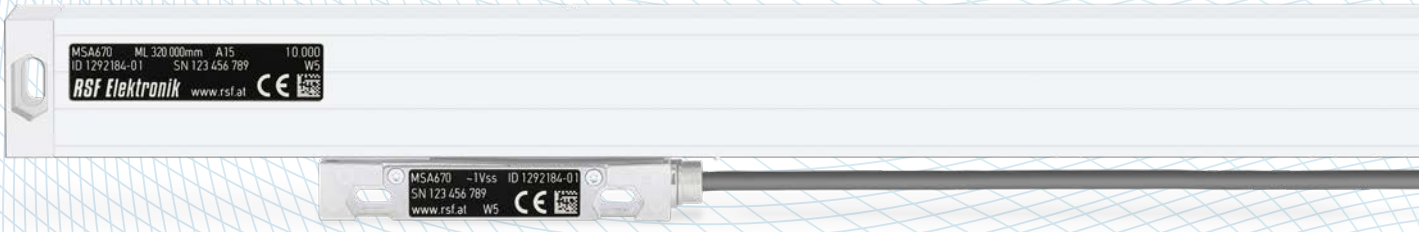
MSA 670
SEALED LINEAR ENCODERS



MSA 670 - TECHNICAL DATA

READING HEAD AE MSA 670

Model	MSA 670 $1V_{PP}$	MSA 670 $1V_{PP}$	MSA 670 $\sim 11\mu A_{PP}$	MSA 670 TTLx1	MSA 670 TTLx1	MSA 670 TTLx5	MSA 670 TTLx5	MSA 670 TTLx10	MSA 670 TTLx10	MSA 670 TTLx25
Interface	∿ 1 V_{PP}	∿ 1 V_{PP}	∿ 11 μA_{PP}	⎍ TTLx1	⎍ TTLx1	⎍ TTLx5	⎍ TTLx5	⎍ TTLx10	⎍ TTLx10	⎍ TTLx25
Measuring step	Depending on external interpolation	Depending on external interpolation	Depending on external interpolation	10 µm	5 µm	2 µm	1 µm	0.5 µm	0.25 µm	0.1 µm
Signal period	20 µm	10 µm	20 µm	40 µm	20 µm	40 µm	20 µm	20 µm	10 µm	10 µm
Integrated interpolation	--	--	--	Times 1	Times 1	Times 5	Times 5	Times 10	Times 10	Times 25
Max. traversing speed	1 m/s	1 m/s	1 m/s	1 m/s	1 m/s	1 m/s	1 m/s	1 m/s	1 m/s	0.96 m/s
Max. output frequency	100 kHz	100 kHz	100 kHz	--	--	--	--	--	--	--
Edge separation a_{min}	--	--	--	6.6 µs	3.3 µs	0.8 µs	0.8 µs	0.3 µs	0.3 µs	0.2 µs
Electrical connection	Cable: 3 m with D-sub connector 15-pin (TTL, 1 V_{PP}) or M23 connector 9-pin (11 μA_{PP})									
Voltage supply	▪ 1 V_{PP}: +5 V ±10 % ▪ ~11,5 μA_{PP}: +5 V ±5 % ▪ TTL: +5 V ±5 %									
Power consumption max.	▪ 1 V_{PP}: 825 mW (without load) ▪ ~11,5 μA_{PP}: 660 mW (without load) ▪ TTL: 825 mW (without load)									
Current consumption max.	▪ 1 V_{PP}: 150 mA (without load) ▪ ~11,5 μA_{PP}: 120 mA (without load) ▪ TTL: 150 mA (without load)									
Vibration 40 Hz – 2000 Hz	150 m/s^2									
Shock 8 ms	3000 m/s^2									
Operating temperature	0 °C to 50 °C									
Storage temperature	-20 °C to 70 °C									
Mass	▪ Reading head: 75 g (without cable) ▪ Cable: 30 g/m, D-sub connector: 28 g, M23 connector: 75 g									

SCALE UNIT

Model	MSA 670
Mounting version	Fixed end blocks left and right
Standard measuring lengths (ML): [mm]	70, 120, 170, 220, 270, 320, 370, 420, 470, 520, 620, 720, 820, 920, 1040, 1140, 1240, 1340, 1440, 1540, 1640, 1740, 1840, 2040, 2240
Graduation carrier	Glass scale ($\alpha_{therm} \approx 8.5 \times 10^{-6}\ K^{-1}$), grating period: 40, µm, 20 µm, 10 µm
Accuracy grades (at 20 °C)	Dependent on interface and grating period ▪ ±5 µm/m ▪ ±10 µm/m

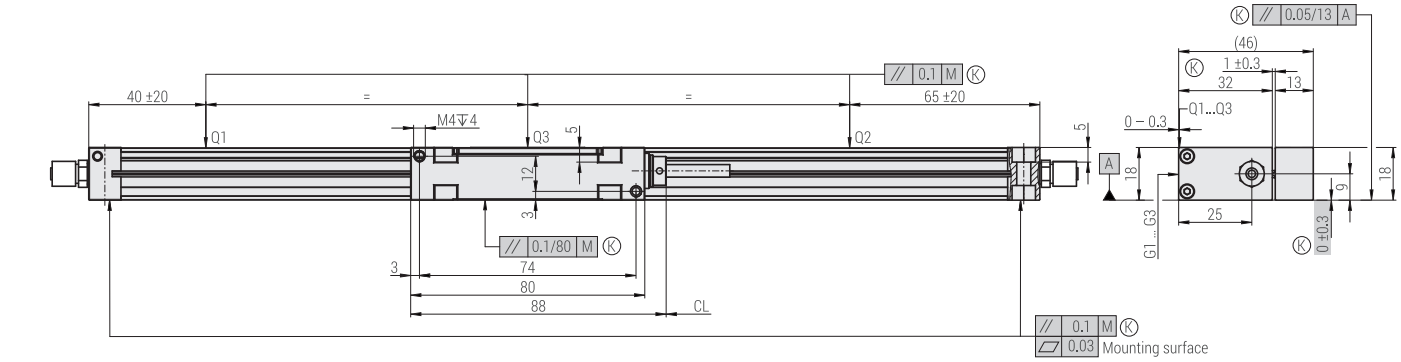
Location of the reference mark (RI):	▪ Distance-coded reference marks (K): After travelling max. 20 mm the absolute position is available
	▪ One reference mark in the middle of measuring length
	  ▪ Up to measuring length 920 mm, 35 mm from both ends of measuring length
	  ▪ From measuring length 1040 mm, 45 mm from both ends of measuring length
	▪ Optional:
	  ▪ One reference mark at any location
	  ▪ Additional reference marks can be selected by distances of n x 50 mm

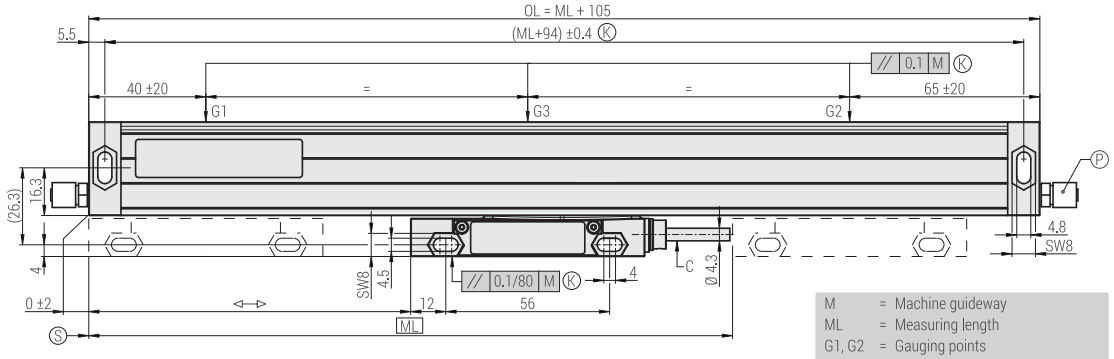
Reqired moving force	▪ With standard sealing lips:< 3.0 N ▪ With low drag sealing lips:< 0.2 N
Protection EN 60529	IP 53 (with standard sealing lips)
Mass	Scale spar (approx.): 0.8 kg/m (ML)

CONFORMITIES AND CERTIFICATIONS

CE	▪ RoHS: 2011/65/EU, 2015/863/EU ▪ EMV: 2014/30/EU
UKCA	▪ SI 2012/3032 RoHS Regulations ▪ SI 2016/1091 EMC Regulations
Product-Certifications	UL, CSA, EN, IEC 61010-1

MSA 670 DIMENSIONS, MOUNTING POSSIBILITIES



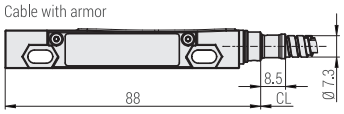


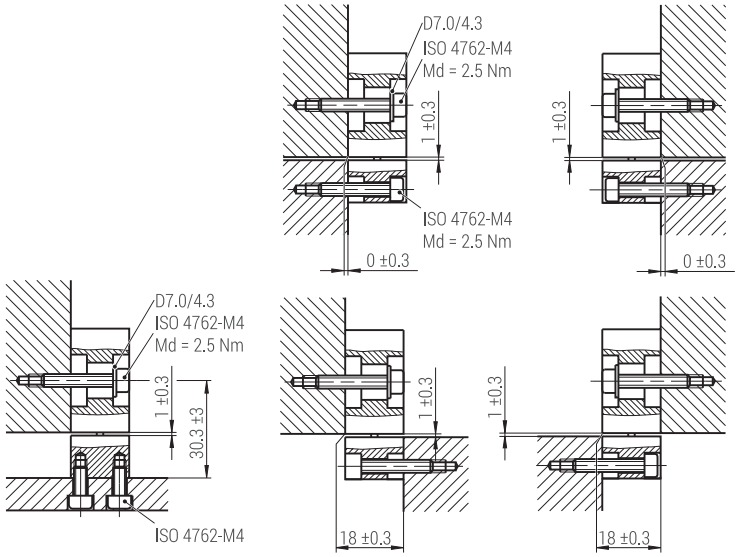
M	=	Machine guideway
ML	=	Measuring length
G1, G2	=	Gauging points
G3	=	Gauging point at ML ≥ 620 mm
Q1 ... Q3	=	Gauging points at ML ≥ 620 mm
◁▷	=	0 ... ML
OL	=	Overall length
C	=	Cable
CL	=	Cable length
K	=	Required mating dimensions
S	=	Beginning of the measuring length
P	=	Compressed air inlet M5 optional

mm

Tolerancing ISO 8015
ISO 2768:1989 - m H
< 6 mm: ±0.2 mm

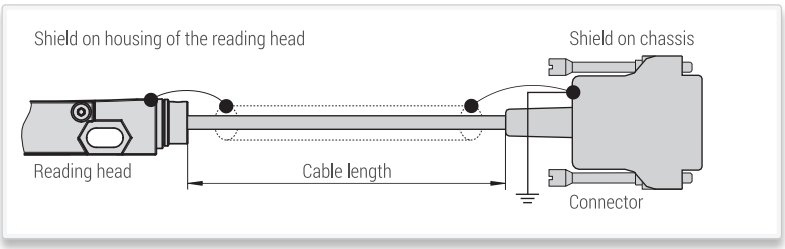
Cable with armor

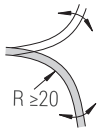
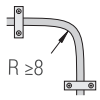
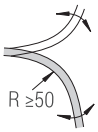




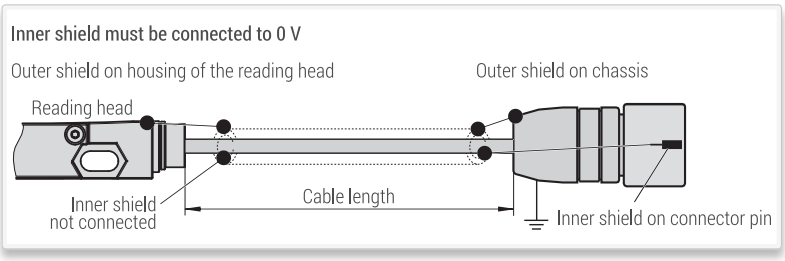
SHIELDING

SIGNALS: TTL, 1 V_{PP}



Cable	Material	Cycles	Bending radius	
Ø 4.3 mm	Shielded PUR cable	Drag chain: > 5.000.000 Torsion: > 300.000	 R ≥20	 R ≥8
Ø 7.3 mm	Shielded PUR cable with metal armor		 R ≥50	 R ≥20

SIGNALS: 11 μA_{PP}

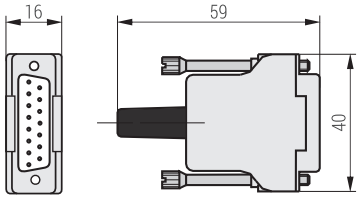


Cable	Material	Cycles	Bending radius	
Ø 4.4 mm	Double-shielded high flexible cable		 R ≥70	 R ≥35

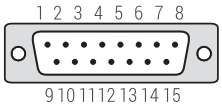
MALE CONNECTORS, PIN ASSIGNMENTS

D-sub connector, 15-pin

Dimensions (male, 15-pin, mass: 28 g)



Pin assignment (View on pins)

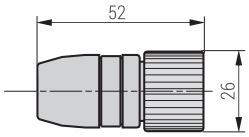


Pin	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Sinusoidal voltage signals 1 V_{PP}	Occupied	0 V Sensor	Occupied	RI–	A2–	A1–	V+ Sensor	V+	0 V	nc	nc	RI+	A2+	A1+	nc
TTL-signals	Occupied	0 V Sensor	$\overline{US}$	$\overline{RI}$	$\overline{T2}$	$\overline{T1}$	V+ Sensor	V+	0 V	nc	nc	RI	T2	T1	nc

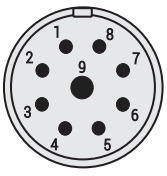
- Sensor: the sensor pins are bridged in the chassis with the particular power supply.
- Shield is connected with the chassis.
- Pins or wires marked “occupied” or “nc” must not be used by the customer.

M23 connector, 9-pin

Dimensions (male, 9-pin, mass: 75 g)



Pin assignment (View on pins)



Pin	1	2	3	4	5	6	7	8	9	
Sinusoidal micro-current signals 11 μA_{PP}	0°+	0°–	V+	0 V	90°+	90°–	RI+	RI–	Inner shield	Outer shield on chassis

Date 01/2025 ■ Doc.No. D1400385-00-A-01 ■ Technical adjustments in reserve!

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