

## MSA 650 Technical data

Scale model	System resolution	Accuracy grades*	Grating pitch*	Max. velocity (Edge distance) continuous momentary	
<b>• Sinusoidal micro-current signals</b>					
<b>MSA 650.13</b>	depending on external Subdividing	±5, ±10 µm/m	20 µm	1 m/s	2 m/s
<b>• Square wave Line Driver signals with integrated Subdividing</b>					
<b>MSA 650.24</b>	10 µm	±10 µm/m	40 µm	1 m/s (> 5 µs)	2 m/s (> 2,5 µs)
<b>MSA 650.23</b>	5 µm	±5, ±10 µm/m	20 µm	1 m/s (> 2,5 µs)	2 m/s (> 1,2 µs)
<b>MSA 650.33</b>	2,5 µm	±5, ±10 µm/m	20 µm	1 m/s (> 1,2 µs)	1 m/s (> 1,2 µs)
<b>MSA 650.64</b>	2 µm	±5, ±10 µm/m	40 µm	1 m/s (> 800 ns)	2 m/s (> 400 ns)
<b>MSA 650.63</b>	1 µm	±5, ±10 µm/m	20 µm	1 m/s (> 400 ns)	1 m/s (> 400 ns)
<b>MSA 650.73</b>	0,5 µm	±5, ±10 µm/m	20 µm	1 m/s (> 200 ns)	1 m/s (> 200 ns)

\* Other accuracy grades or grating pitches (e.g. Inch) upon request

Standard measuring lengths: (mm)

170, 220, 270, 320, 370, 420, 470, 520, 620, 720, 770, 820, 920, 1040, 1140, 1240, 1340, 1440, 1540, 1640, 1740

Measuring type: glass scale

Reference mark (RI): selectable

MSA 650.xx **K:**

Distance coded Reference marks (**K**): after travelling 20 mm the absolute position will be shown on the display.

MSA 650.xx:

Up to measuring length 920 mm one Reference mark in the middle of the measuring length or 35 mm from both ends of measuring length, measuring length 1040 mm and longer, 45 mm from both ends of measuring length.

Option:

One Reference mark at any location, or two or more RI's separated by distances of n x 50 mm

Required moving force:

with standard sealing lips < 3 N

with low drag sealing lips < 0,2 N

Environmental sealing DIN 40050:

IP 53 (with standard sealing lips)

Permissible vibration: 80 m/s<sup>2</sup> (40 to 2000 Hz)

Permissible shock: 200 m/s<sup>2</sup> (8 ms)

Permissible temperature:

-20°C to +70°C (storage), 0°C to +50°C (operation)

Weight (approx.):

0,8 kg/m (scale spar) + 85 g (scanning head without cable)

Signal-outputs (optional):

**• sinusoidal micro-current signals  
MSA 650.13**

Power supply:

+5 V ±5%, max. 90 mA

Output signals:

Encoder signals: 7 to 16 µApp, typical 11,5 µApp at 1 KΩ

Reference pulse: 2 to 8 µA,

typical 5 µA (useable component) at 1 KΩ

Max. output frequency:

100 kHz (with 3 m cable)

**• square wave signals (single ended)  
with integrated Subdividing Electronics**

**• square wave signals (differential)  
via Line Driver RS 422 standard  
with integrated Subdividing Electronics**

**MSA 650.23** = times 1

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**MSA 650.33** = times 2

**MSA 650.63** = times 5

**MSA 650.64** = times 5

**MSA 650.73** = times 10

Power supply:

+5 V ±5%, < 150 mA (with interpolation, unloaded)

< 200 mA (without interpolation, unloaded)