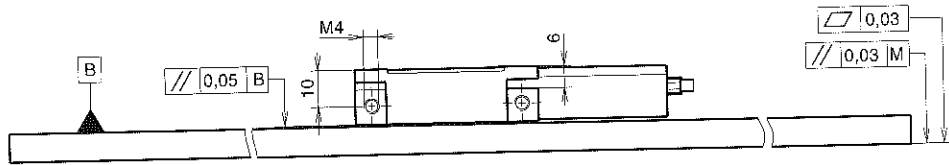


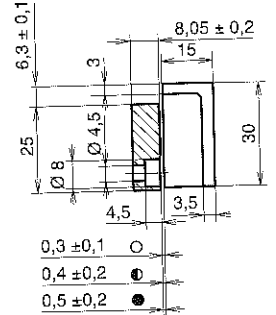
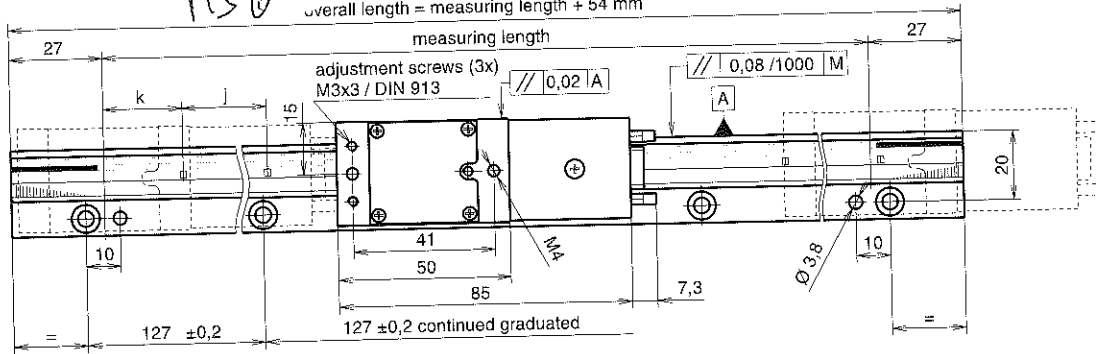


Version: **MS 6x-xx MA** = steel tape scale on aluminium carrier, **MS 6x-xx MS** = steel tape scale on steel carrier



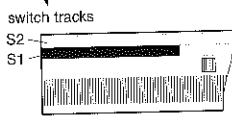
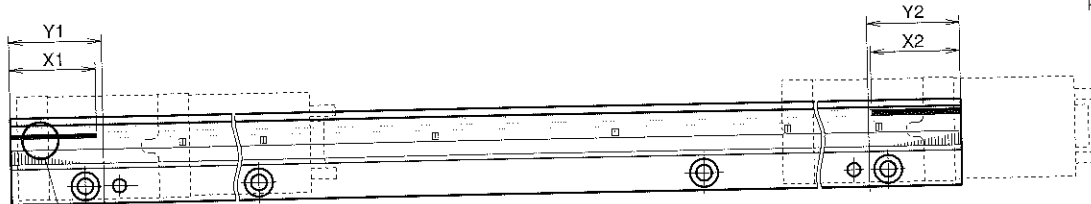
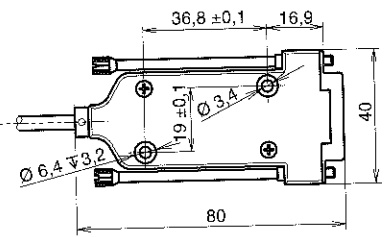
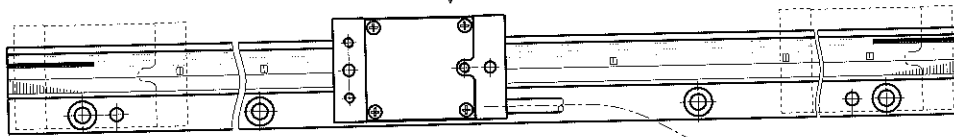
MS60

Overall length = measuring length + 54 mm



MS61

version with male connector (optional)



legend for all versions!

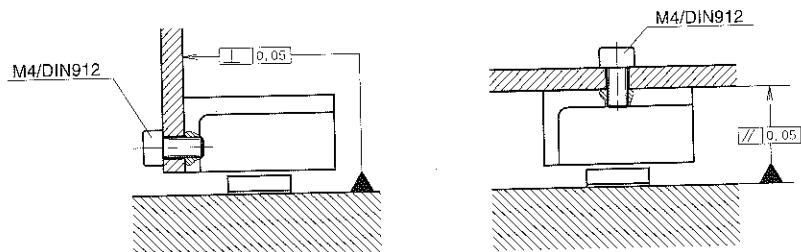
reference-marks:
k = any position of reference-mark
j = additional reference-marks separated by n x 50 mm

switch tracks:
x1, x2 = length of cover tapes
switch position left y1 = x1 + 2 mm
switch position right y2 = x2 + 0,5 mm

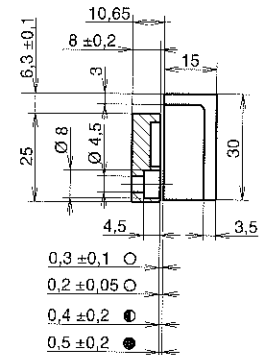
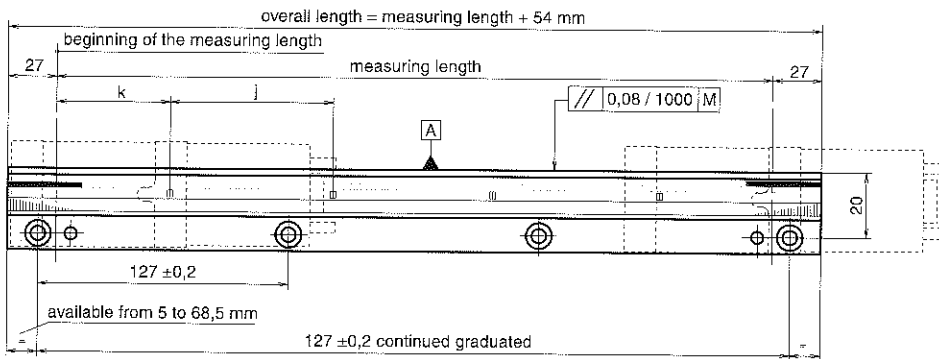
M = machine guideway

grating pitch	
○	40 μm
○	50 μm
●	100 μm
●	200 μm

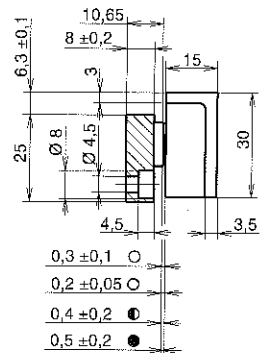
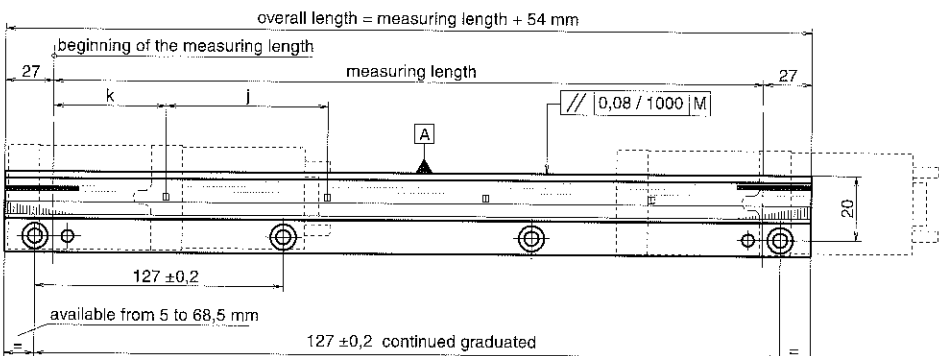
Mounting possibilities:



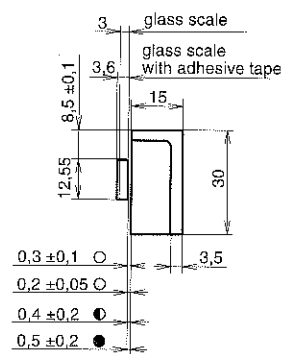
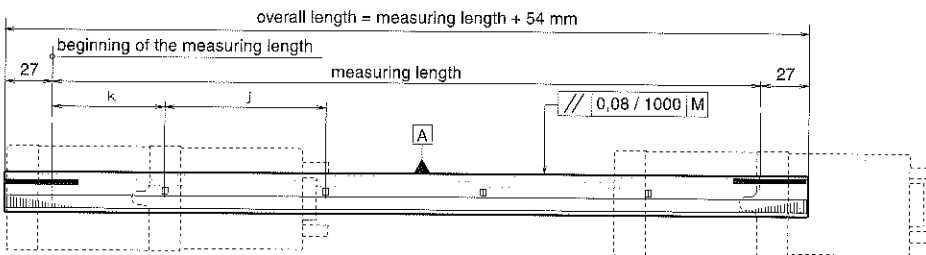
Version: MS 6x-xx GA = glass scale on aluminium carrier



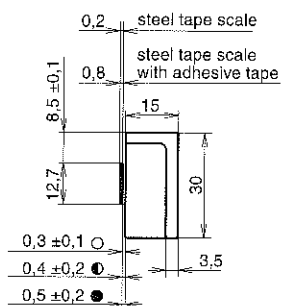
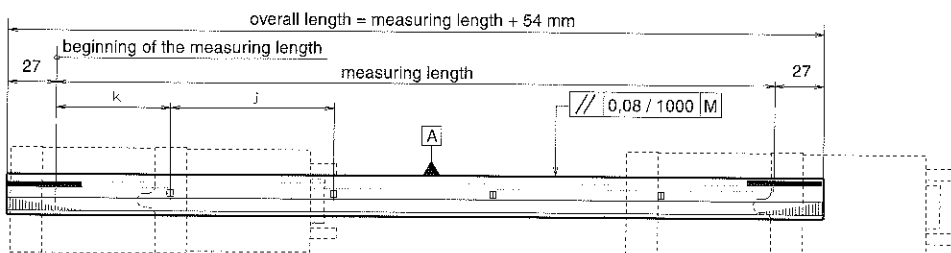
Version: MS 6x-xx GS = glass scale on steel carrier



Version: MS 6x-xx GO = glass scale, **MS 6x-xx GK** = glass scale with adhesive tape



Version: MS 6x-xx MO = steel tape scale, **MS 6x-xx MK** = steel tape scale with adhesive tape



**Technical data:**

Encoder type Scale version xx ²	System resolution	Accuracy grades ¹	Grating pitch	Maximum velocity
Sinusoidal voltage signals				
MS 60-20 XX	dependent on external Subdividing	±3, ±5, ±10 µm/m	40 µm	3,2 m/s
MS 60-30 XX	dependent on external Subdividing	±3, ±5, ±10 µm/m	100 µm	8 m/s
MS 60-40 XX	dependent on external Subdividing	±3, ±5, ±10 µm/m	200 µm	16 m/s
Sinusoidal micro-current signals				
MS 64-21 XX	dependent on external Subdividing	±3, ±5, ±10 µm/m	40 µm	3,2 m/s
MS 64-31 XX	dependent on external Subdividing	±3, ±5, ±10 µm/m	100 µm	8 m/s
MS 64-41 XX	dependent on external Subdividing	±3, ±5, ±10 µm/m	200 µm	16 m/s

Encoder type Scale version xx ²	System resolution	Accuracy grades ¹	Grating pitch	Edge distance at max. velocity
Square wave signals via Line Driver with integrated Subdividing				
MS 61-26 xx	2 µm	±3, ±5, ±10 µm/m	40 µm	> 500 ns 2 m/s
MS 61-36 xx	5 µm	±3, ±5, ±10 µm/m	100 µm	> 500 ns 5 m/s
MS 61-46 xx	10 µm	±3, ±5, ±10 µm/m	200 µm	> 500 ns 10 m/s
MS 61-56 xx	2,5 µm	±3, ±5, ±10 µm/m	50 µm	> 500 ns 2,5 m/s
MS 62-27 xx	1 µm	±3, ±5, ±10 µm/m	40 µm	> 250 ns 2 m/s
MS 62-37 xx	2,5 µm	±3, ±5, ±10 µm/m	100 µm	> 250 ns 5 m/s
MS 62-47 xx	5 µm	±3, ±5, ±10 µm/m	200 µm	> 250 ns 10 m/s
MS 62-57 xx	1,25 µm	±3, ±5, ±10 µm/m	50 µm	> 250 ns 2,5 m/s
MS 63-35 xx	1 µm	±3, ±5, ±10 µm/m	100 µm	> 100 ns 3 m/s
MS 63-45 xx	2 µm	±3, ±5, ±10 µm/m	200 µm	> 100 ns 6 m/s
MS 63-55 xx	0,5 µm	±3, ±5, ±10 µm/m	50 µm	> 100 ns 1,5 m/s
MS 65-55 xx	0,25 µm	±3, ±5, ±10 µm/m	50 µm	> 100 ns 0,5 m/s
MS 68-28 xx	10 µm	±3, ±5, ±10 µm/m	40 µm	> 1,6 µs 4 m/s

¹ accuracy grades dependent on scale versions² scale versions see Pages 22 to 23**Output:**

- sinusoidal voltage signals
MS 60-20 xx, **MS 60-30** xx, **MS 60-40** xx

Power supply:

+5 V ±5%, max. 90 mA

Output signals (Vss):Encoder signals:0,6 to 1,2 Vss, typical 1 Vss
with terminating resistor Z₀ = 120 ΩReference pulse:0,2 to 0,85 Vss, typical 0,4 V
with terminating resistor Z₀ = 120 Ω**Connection options:**

CNC or Controll feedback

Max. output frequency:

80 kHz (with 3 m cable)

Output:

- sinusoidal micro-current signals
MS 64-21 xx, **MS 64-31** xx, **MS 64-41** xx

Power supply:

+5 V ±5%, max. 90 mA

Output signals (Iss):Encoder signals:

7 to 16 µA, typical 11,5 µA at 1 KΩ

Referenzimpuls:

2 to 8 µA, typical 5 µA at 1 KΩ

Connection options:any external ZE-V Subdividing Electronics or
Programmable Error Correction PKE or directly to suitable
NC o DRO**Max. Connection options:**

80 kHz (with 3 m cable)

Scale versions: different types are available. (Pages 22 to 23)

MS 6x-xx MS = steel tape scale glued onto steel carrier

MS 6x-xx MA = steel tape scale glued onto aluminium carrier

MS 6x-xx GA = glass scale glued onto aluminium carrier

MS 6x-xx GS = glass scale glued onto steel carrier

MS 6x-xx GO = glass scale without carrier

MS 6x-xx GK = glass scale with adhesive tape

MS 6x-xx MO = steel tape scale without carrier

MS 6x-xx MK = steel tape scale with adhesive tape

max. measuring length:

- **glass scale 2840 mm** (grating pitch: 40, 50, 100 or 200 μm)

- **steel tape scale 3000 mm** (grating pitch: 40, 100 or 200 μm)

- **steel tape scale 30 m** (grating pitch: 100 oder 200 μm)

Standard measuring length: (mm) 120, 170, 220, 270, 320, 370, 420, 470, 520, 620, 720, 820, 920, 1020, 1140, 1240, 1340, 1440, 1540, 1640, 1740, 1840, 2040, 2240, 2440, 2640, 2840

Reference mark (RI):

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

Special feature:

2 switch tracks (S1, S2) for individual special functions (reflection light barrier).

The desired switch positions (Y1, Y2) are determined by the customer with adhesive cover tapes (X1, Y2).

Permissible vibration: 150 m/s^2 (40 to 2000 Hz)

Permissible shock: 750 m/s^2 (8 ms)

Permissible temperature:

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

Weight (approx.)

100 g/m (glass scale) or 35 g/m (steel tape scale)

60 g (scanning head with 3 m cable)

Output:

- square wave signals via Line Driver RS 422 standard or single ended with integrated Subdividing Electronics

MS 61-26 xx = times 5

MS 61-36 xx = times 5

MS 61-46 xx = times 5

MS 61-56 xx = times 5

MS 62-27 xx = times 10

MS 62-37 xx = times 10

MS 62-47 xx = times 10

MS 62-57 xx = times 10

MS 63-35 xx = times 25

MS 63-45 xx = times 25

MS 63-55 xx = times 25

MS 65-55 xx = times 50

MS 68-28 xx = time 1

Power supply:

+5 V $\pm 5\%$, max. 200 mA

5 to 5,25 V, max. 200 mA (only for times 50)

Connection options:

directly to suitable NC or DRO

Moiré-adjustment:

with Analog-Signal-Control-Adapter MS-UAG (accessories Page 48)