



# RSF Elektronik

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广州中联伟德自控技术有限公司提供  
020-31151996

MC 15  
ABSOLUTE EXPOSED  
LINEAR ENCODERS





- Absolute Position valuation
- Large mounting tolerances
- Serial interfaces
- Status display directly at the scanning head via LED function

## ABSOLUTE MEASUREMENT PRINCIPLE

This means the position valuation from evaluating one unique code information at any point over the entire measuring length. For this the scanning head needs not to be moved relative to the graduation carrier, so that the position value is available immediately after power-on. Reference points and reference drives are thus not required. The subsequent electronics may access this position value at any time.

## REQUIREMENTS ON AN ABSOLUTE LINEAR ENCODER

- AVOIDING REFERENCING
- ADVANCED OPERATIONAL SAFETY
- HIGH TRAVERSING SPEED
- SMALL DIMENSIONS
- NO MECHANICAL BACKLASH
- ZERO FRICTIONAL FORCE
- WEAR-FREE OPERATION

## TERM EXPLANATIONS

### Absolute position indexing

Serial encoding of a line sequence as a highly precise graduation.

### Scanning head

Opto-electronic scanning device of a graduation.

### Yaw angle, pitch angle, roll angle, displacement, gap tolerance

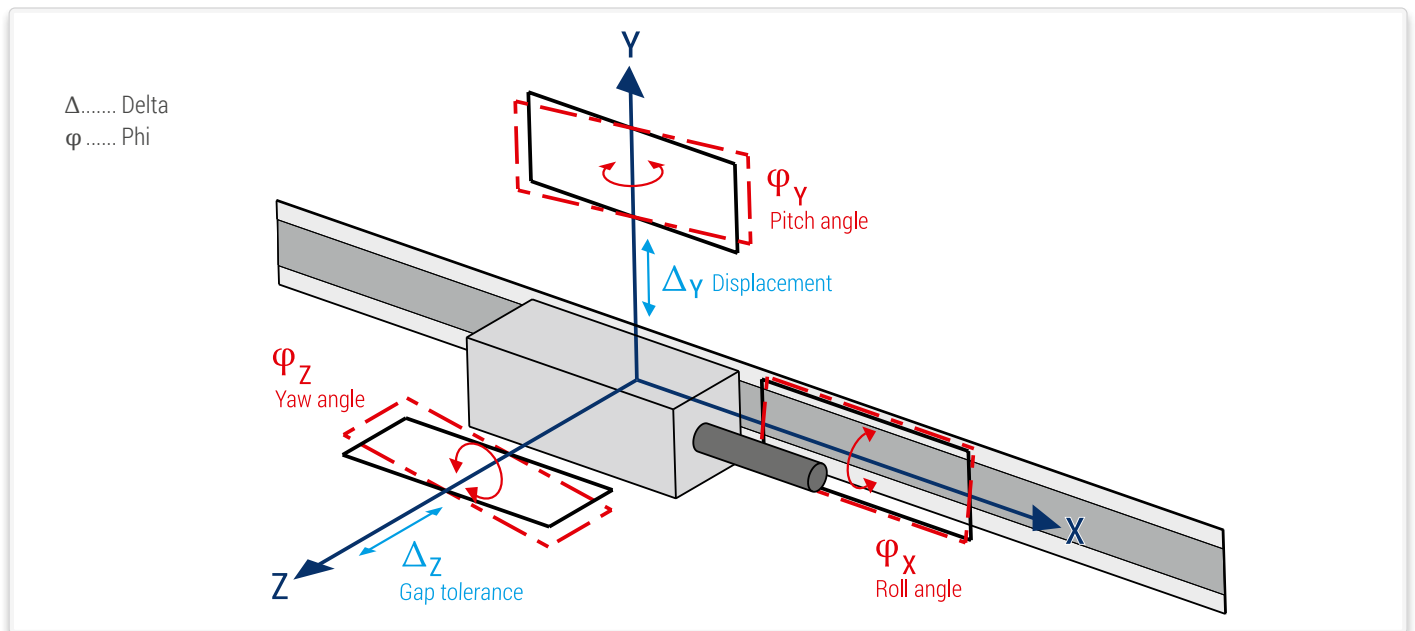
Mounting tolerances of the scanning head relative to the graduation carrier.

### Accuracy

This is a fundamental characteristic, which is specified with an accuracy grade (e.g.  $\pm 5 \mu\text{m}/\text{m}$ ).

### Measuring step

The smallest digital counting step produced by an encoder.



## MC 15 TECHNICAL DATA

### SCANNING HEAD

Model	AK MC 15	AK MC 15 B	AK MC 15 F	AK MC 15 M		AK MC 15 P	AK MC 15 Y
Interface	EnDat 2.2	BiSS C unidirectional	Fanuc serial interface $\alpha$ i Interface	Mitsubishi high speed interface		Panasonic serial interface	Yaskawa serial interface
Version	EnDat 2.2	BiSS/Cu	Fanuc05	Mit03-4	Mit03-2	Pana02	YEC07
Measuring step	0,1 $\mu$ m (100 nm) 0,05 $\mu$ m (50 nm) <b>测量步距</b>						
Calculation time $t_{cal}$ Clock frequency	$\leq 5 \mu$ s $\leq 16$ MHz	--	--	--	--	--	--
Traversing speed	$\leq 600$ m/min						
Interpolation error	Approx. $\pm 1 \mu$ m <b>细分误差</b>						
Electrical connection	Cable, 1 m or 3 m with M12-connector 8-pin or D-sub connector 15-pin						
Voltage supply	DC 3.6 V to 14 V (3.6 V at least required in the scanning head)						
Power consumption	At 3.6 V: $\leq 950$ mW At 14 V: $\leq 1050$ mW						
Current consumption typ.	At 5 V: 100 mA (without load)						
Vibration 55 Hz to 2000 Hz Shock 6 ms	$\leq 500$ m/s <sup>2</sup> (EN 60 068-2-6) $\leq 1000$ m/s <sup>2</sup> (EN 60 068-2-27)						
Operating temperature Storage temperature	-10 °C to 70 °C -20 °C to 70 °C						
Mass	Scanning head: 12 g (without cable), connecting cable: 22 g/m, connector: M12-connector: 15 g; D-sub connector: 28 g						

### GRADUATION CARRIER

Model	MB MC 15 MK	MC 15 MP	MC 15 GK	MC 15 BK
Graduation carrier	Steel tape scale with adhesive tape <b>背胶固定的钢带</b>	Steel tape scale in aluminum carrier with clamping element <b>带底座的钢带</b>	Glass scale with adhesive tape	Glass ceramic scale with adhesive tape
Coefficient of linear expansion	$\alpha \approx 10 \times 10^{-6}/K$	$\alpha \approx 10 \times 10^{-6}/K$	$\alpha \approx 8.5 \times 10^{-6}/K$	$\alpha \approx 0 \times 10^{-6}/K$
Accuracy grade (at 20 °C)	$\pm 15 \mu$ m/m <b>精度等级</b>	$\pm 15 \mu$ m/m	$\pm 5 \mu$ m/m	$\pm 5 \mu$ m/m
Measuring length ML	Up to 10 000 mm *	Up to 10 000 mm *	Up to 3140 mm	Up to 1920 mm
Mass	17 g/m	92 g/m + 2 g clamping	55 g/m	57 g/m

\* longer lengths on request.

### CONFORMITIES AND CERTIFICATIONS

RoHS	2011/65/EU, 2015/863/EU
EMV	2014/30/EU
Product-Certifications	UL, CSA, EN, IEC 61010-1

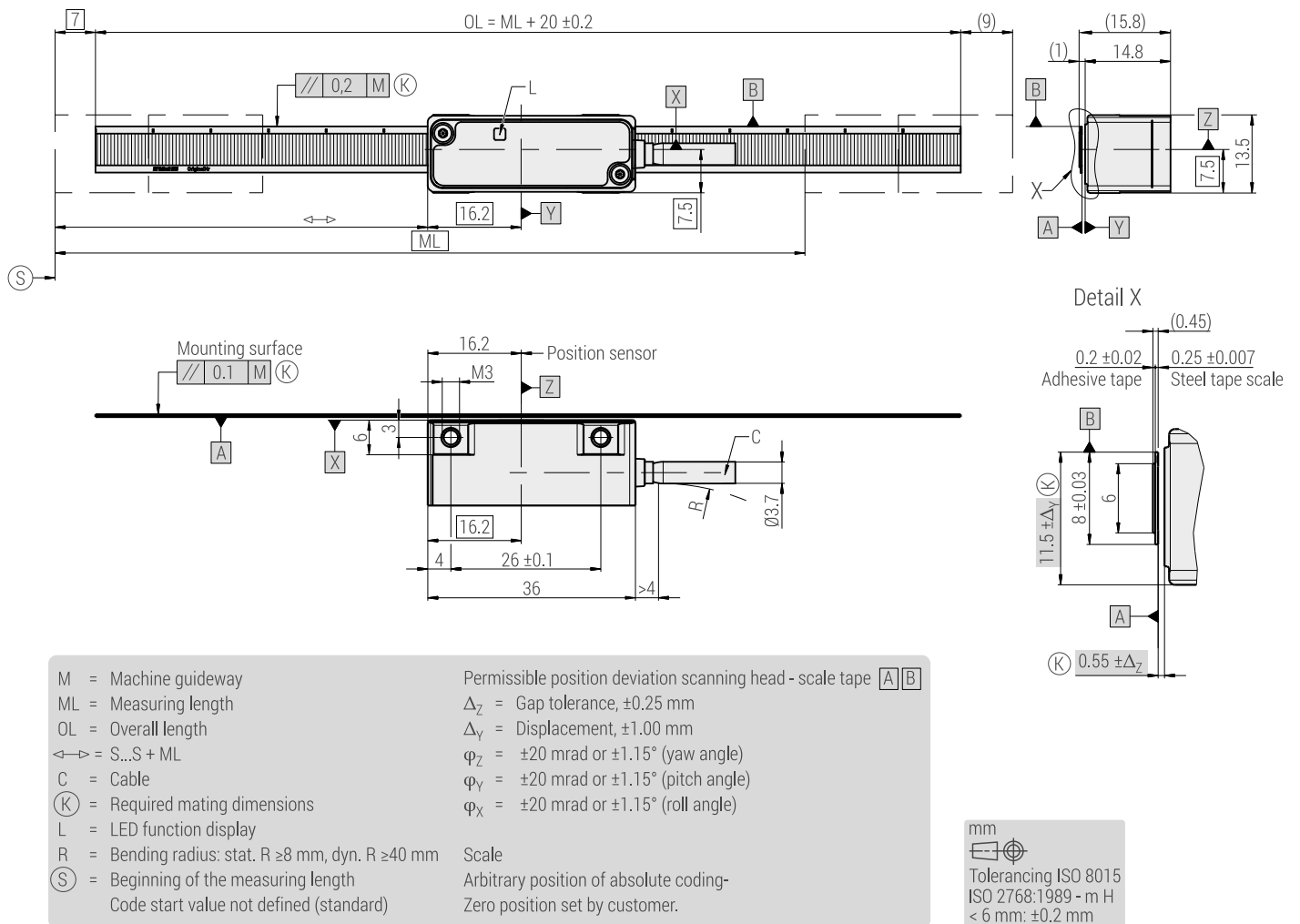
## MC 15 MK

### 背胶固定的光栅尺

- Steel tape scale with absolute track and adhesive tape



Dimensions, mounting tolerances:



Tape mounting tool **TMT MS 15 MK** (optional)

For safe and precise mounting of the steel tape scale.

- Mount TMT MS 15 MK instead of the MC 15 scanning head.
- Thread steel tape scale (version MK) and move along the scale length.
- Remove TMT MS 15 MK, mount MC 15 scanning head.



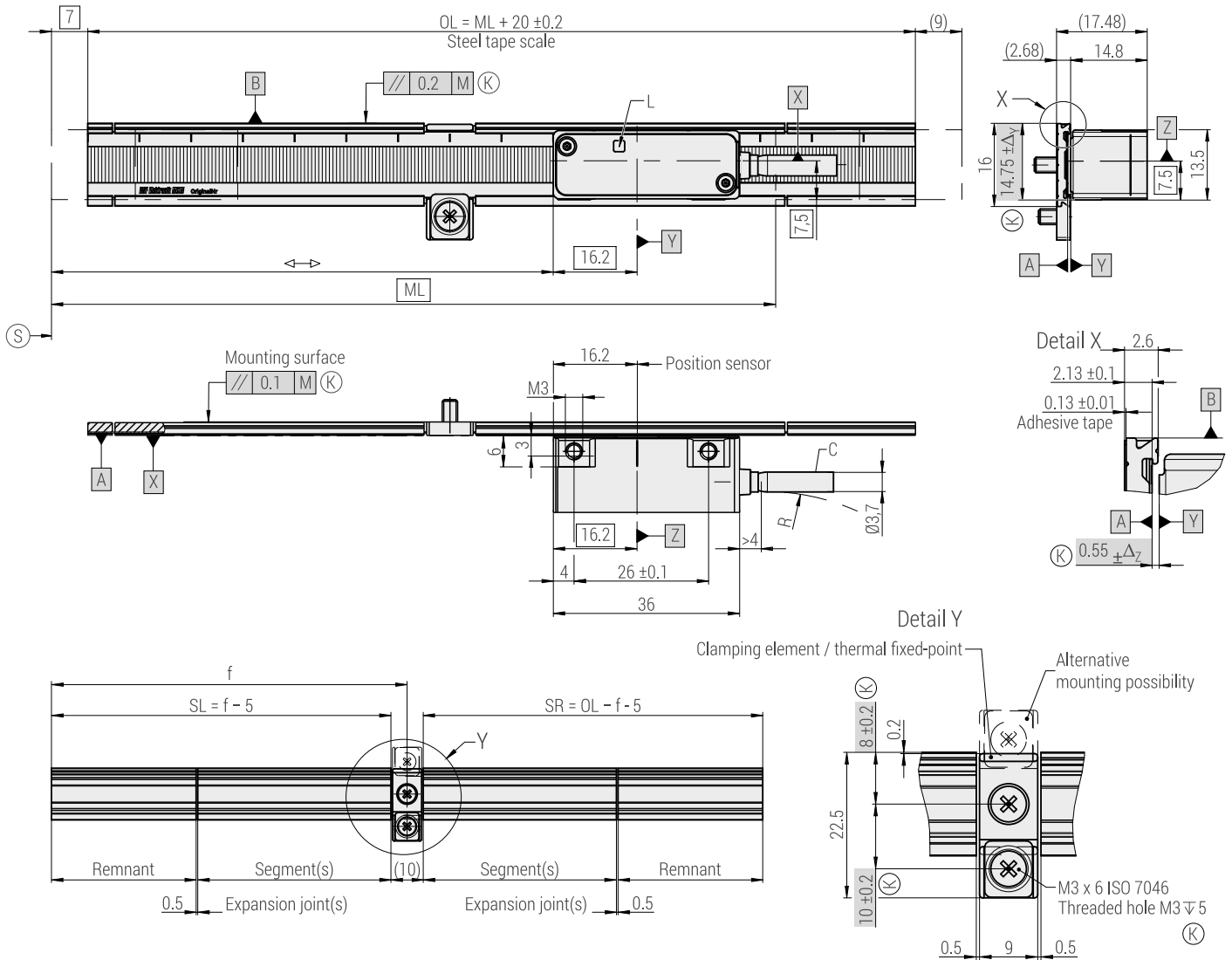
## MC 15 MP

### 带铝壳底座的光栅尺

- Steel tape scale with absolute track in aluminum carrier with clamping element
- Clamping element bolted
- Carrier with adhesive tape



Dimensions, mounting tolerances:



M = Machine guideway

ML = Measuring length

OL = Overall length

↔ = S...S + ML

f = Position of the clamping element

Standard: f = OL/2

Optional: f =  $\begin{cases} 4.5 \\ \geq 25 \dots \leq OL - 25 \\ OL - 4.5 \end{cases}$

C = Cable

(K) = Required mating dimensions

L = LED function display

R = Bending radius: stat. R ≥ 8 mm, dyn. R ≥ 40 mm

(S) = Beginning of the measuring length

Code start value not defined

Permissible position deviation of the scanning head - scale tape (A) (B)

Δ<sub>Z</sub> = Gap tolerance, +0.25 mm / -0.2 mm

Δ<sub>Y</sub> = Displacement, ±0.5 mm

φ<sub>Z</sub> = ±20 mrad or ±1.15° (yaw angle)

φ<sub>Y</sub> = ±20 mrad or ±1.15° (pitch angle)

φ<sub>X</sub> = ±20 mrad or ±1.15° (roll angle)

Scale

Arbitrary position of absolute coding-zero position set by customer.

mm



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

# DISTRIBUTION CONTACTS

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## RSF Elektronik

Ges.m.b.H.

Linear and Angle Encoders  
Precision Graduations

Certified acc. to  
ISO 9001  
ISO 14001

