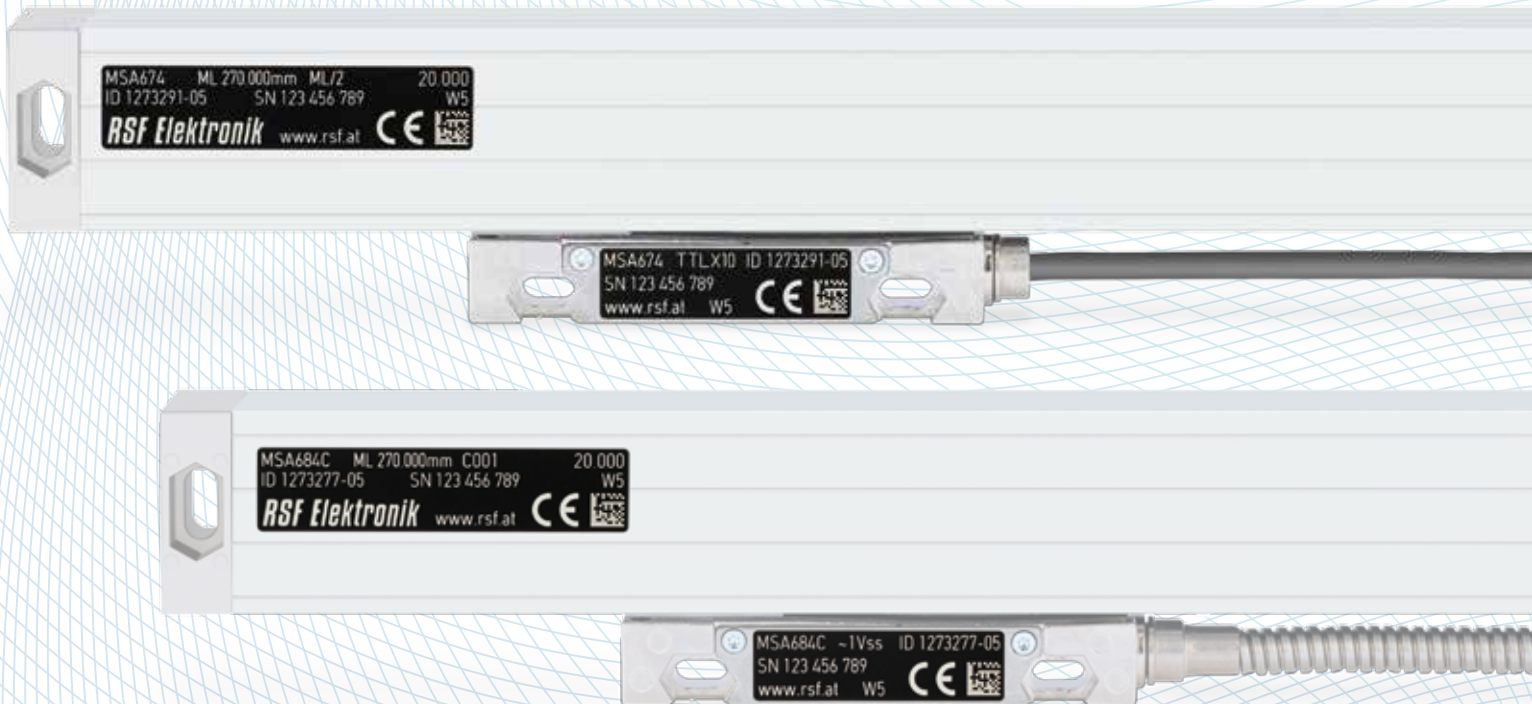




RSF Elektronik

www.rsf.at

INCREMENTAL LINEAR ENCODERS MSA 674, MSA 684



INCREMENTAL LINEAR MEASURING DEVICES AND PRECISION GRADUATIONS

RSF Elektronik is one of the world's leading companies in the field of electronic linear measuring devices and it offers an extensive portfolio which includes almost all designs which are required by the market. The typical resolutions or measuring steps range from a few micrometres down to the nanometre range.



RSF Elektronik, corporate head quarters, Leoben, Austria



RSF Elektronik, manufacturing subsidiary Střibro, Czech Republic

Another core element of the product range are high-precision and resistant graduations which are manufactured in thin-layer technology on glass or other carrier substrates. RSF Elektronik also develops customized cable devices for the widest range of sectors and areas of application, and these are manufactured by the Střibro subsidiary. In order to safeguard the company's high quality standard, a comprehensive quality assurance and environmental management system – certified according to DIN EN ISO 9001 and DIN EN ISO 14001 – has been put in place. Thanks to the company's extensive distribution network, optimum customer service is guaranteed in practically all regions.

DESIGN AND OPERATION

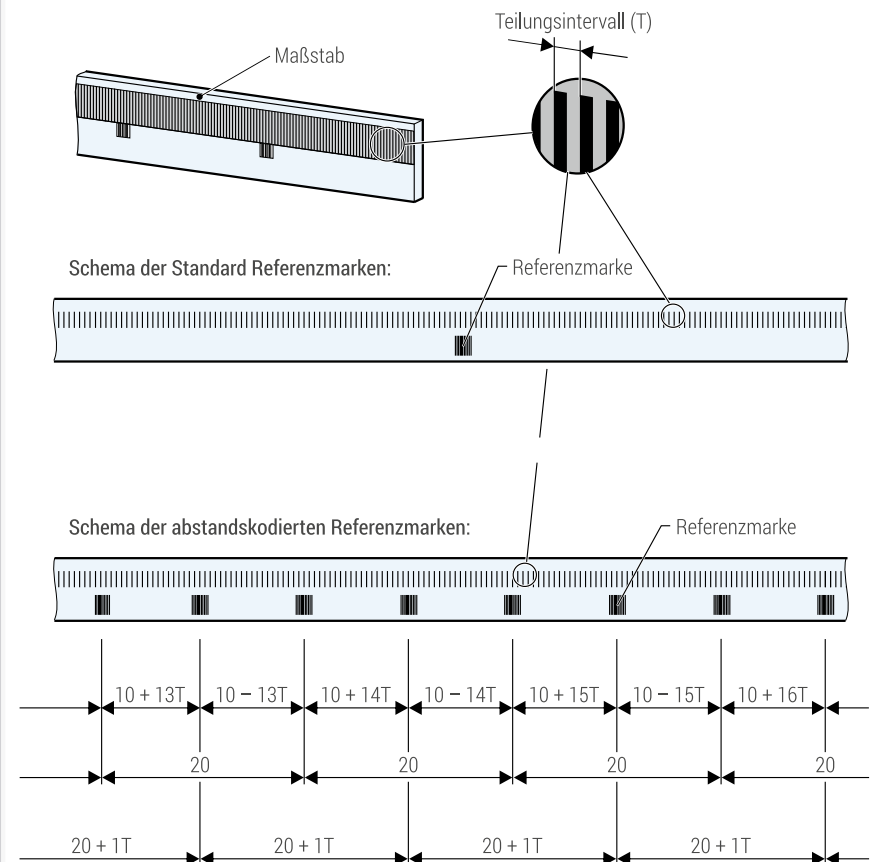
As scale graduation a high accuracy grating is in use. The base is a glass substrate ($\alpha \approx 8,5 \times 10^{-6}/K$).

The grating is the consistent series of lines and spaces. The width of one line and one space is called a grating pitch (T).

Parallel to the grating, there is one reference mark, centered of the measuring length, on a second track.

Linear encoders with a suffix „C“ in the model designation are equipped with distance-coded reference marks. After traveling a distance of 20 mm at maximum, the absolute tool position is available with these models. By dint of the optical scanning, a position-accurate evaluation of the reference marks is ensured.

Scale unit



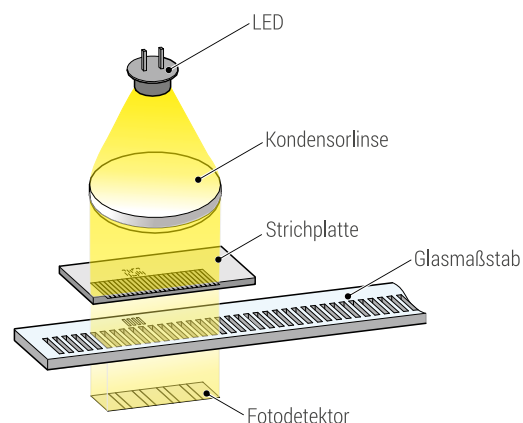
The reading head of the sealed linear encoders MSA 674 respectively MSA 684 runs on roller bearings, self-guided scanning carriage. Reticle and optoelectronics for scanning the graduation pattern of the scale are implemented into the reading head.

When there is relative movement between the reading head and the linear scale, LED light is modulated by the scale grating pitch and converted into electrical signals by the photo elements.

A signal period (360°) corresponds to one interval of the grating pitch.

The regulation of the LED ensures a constant signal amplitude, guaranteeing stability in the case of temperature fluctuations as well as with long-run operation.




Transmissive scanning principle





TECHNICAL DATA MSA 674(C), MSA 684(C)

APPLICATION: METROLOGY

ACCURACY GRADE: $\pm 5 \mu\text{m}$




Model Electronic version	Output signal	System resolution [μm]	Grating period [μm]	Integrated interpolation	Max. velocity [m/s]
MSA 684 1Vpp		Depending on external interpolation	20	--	1.0
MSA 674 TTLx10		0.5	20	Times 10	1.0
MSA 674 TTLx20		0.25	20	Times 20	1.0


Standard measuring lengths (ML): [mm]	70, 120, 170, 220, 270, 320, 370, 420, 470, 520, 570, 620, 670, 720, 770, 820, 870, 920, 970, 1020, 1140, 1240
Scale unit:	<ul style="list-style-type: none"> Glass scale ($\alpha \approx 8.5 \times 10^{-6}/\text{K}$)
Location of reference mark (RI):	<ul style="list-style-type: none"> Distance-coded reference mark (C) after travelling max. 20 mm the absolute position is available. The position of the reference mark is centered within the measuring length.
Required moving force:	< 3.0 N
Environmental sealing acc. EN 60529:	IP 53
Permissible vibration:	100 m/s ² (55 to 2000 Hz)
Permissible shock:	200 m/s ² (8 ms)
Permissible temperature:	<ul style="list-style-type: none"> -20 °C to +70 °C (storage) 0 °C to +50 °C (operation)
Mass linear encoder (approx.):	<ul style="list-style-type: none"> 106 g + 0.57 g/mm (ML) + 200 g (reading head with cable)
Cable:	PUR, cable length 3 m
Power supply:	<ul style="list-style-type: none"> Sinusoidal voltage signals  1 Vpp: +5 V $\pm 10\%$, max. 150 mA (unloaded) Square-wave signals via line driver  : +5 V $\pm 10\%$, max. 150 mA (unloaded)
RoHS-conformity:	The MSA 674 and MSA 684 linear encoders comply with the guideline of the RoHS-directive 2011/65/EU and also the delegated directive 2015/863/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

TECHNICAL DATA MSA 674(C), MSA 684(C)

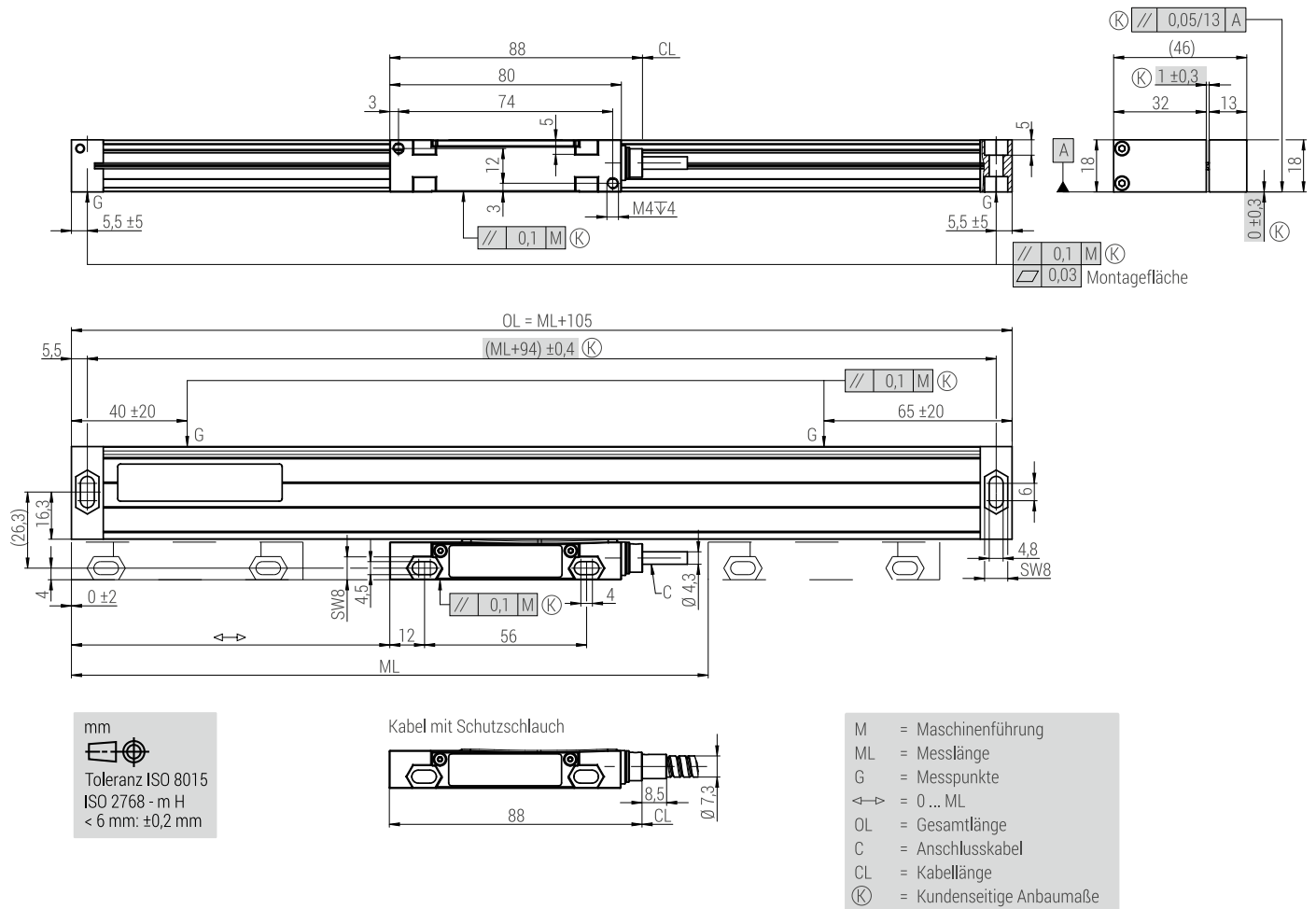
APPLICATION: MANUALLY OPERATED MACHINE TOOLS

ACCURACY GRADE: $\pm 10 \mu\text{m}$

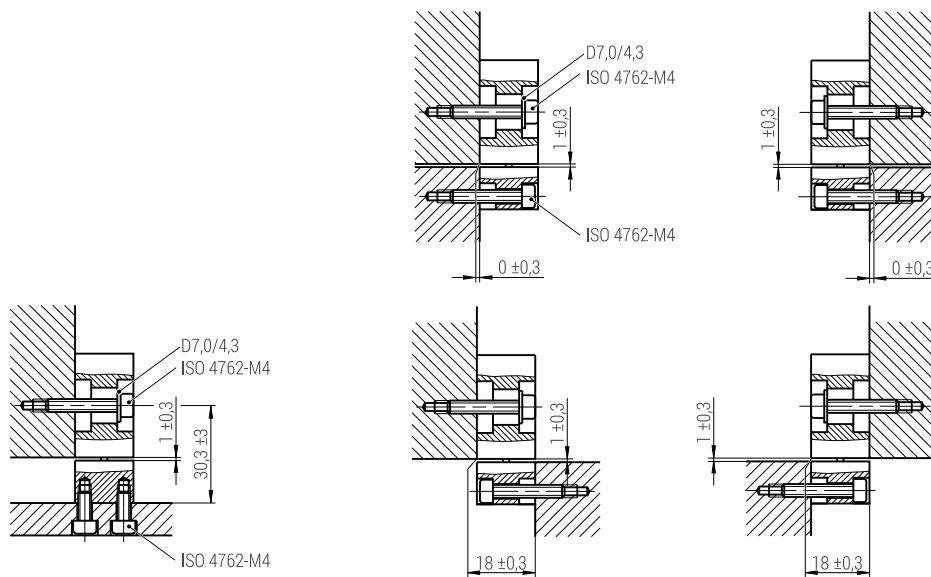
Model Electronic version	Output signal	System resolution [μm]	Grating period [μm]	Integrated interpolation	Max. velocity [m/s]
MSA 684 1Vss		Depending on external interpolation	20	--	1,0
MSA 674 TTLx5		1.0	20	Times 5	1.0
MSA 674 TTLx10		0.5	20	Times 10	1.0

Standard measuring lengths (ML): [mm]	70, 120, 170, 220, 270, 320, 370, 420, 470, 520, 570, 620, 670, 720, 770, 820, 870, 920, 970, 1020, 1140, 1240
Scale unit:	<ul style="list-style-type: none"> Glass scale ($\alpha \approx 8.5 \times 10^{-6}/\text{K}$)
Location of reference mark (RI):	<ul style="list-style-type: none"> Distance-coded reference mark (C) after travelling max. 20 mm the absolute position is available. The position of the reference mark is centered within the measuring length.
Required moving force:	< 3.0 N
Environmental sealing acc. EN 60529:	IP 53
Permissible vibration:	100 m/s ² (55 to 2000 Hz)
Permissible shock:	200 m/s ² (8 ms)
Permissible temperature:	<ul style="list-style-type: none"> -20 °C to +70 °C (storage) 0 °C to +50 °C (operation)
Mass linear encoder (approx.):	<ul style="list-style-type: none"> 106 g + 0.57 g/mm (ML) + 350 g (reading head with cable)
Cable:	PUR with metal armor, cable length 3 m
Power supply:	<ul style="list-style-type: none"> Sinusoidal voltage signals $\sim 1 \text{ V}_{\text{pp}}$: +5 V $\pm 10 \%$, max. 150 mA (unloaded) Square-wave signals via line driver  : +5 V $\pm 10 \%$, max. 150 mA (unloaded)
RoHS-conformity:	The MSA 674 and MSA 684 linear encoders comply with the guideline of the RoHS-directive 2011/65/EU and also the delegated directive 2015/863/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

DIMENSIONS, MOUNTING TOLERANCES

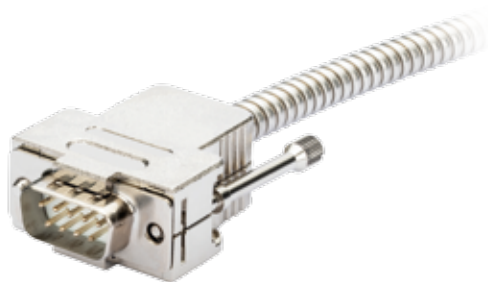


MOUNTING POSSIBILITIES



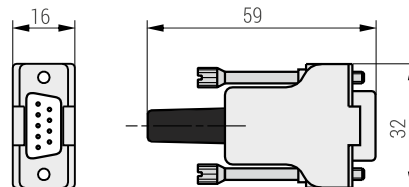
CONNECTORS, PIN ASSIGNMENTS

9-pin D-sub



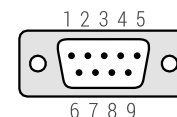
Dimensions

(Male, 9-pin, mass: 22 g)



Pin assignment

View on pins



Pin	1	2	3	4	5	6	7	8	9
Square-wave signals via line driver	Nc	T1	$\bar{T}1$	T2	$\bar{T}2$	0 V	V+	$\bar{R}I$	RI

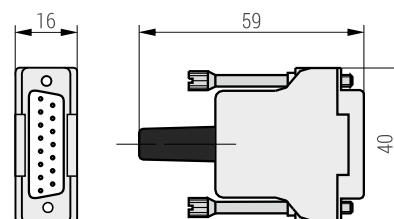
- Shield is connected with the chassis.
- Pins or wires marked "occupied" or "nc" must not be used by the customer.

15-pin D-sub



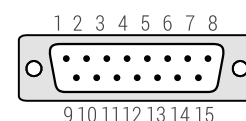
Dimensions

(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 Vpp	A1+	0 V	A2+	V+	Nc	Nc	RI-	Nc	A1-	0 V Sensor	A2-	V+ Sensor	Occupied	RI+	Test*
Square-wave signals via line driver	T1	0 V	T2	V+	Nc	Nc	$\bar{R}I$	Nc	$\bar{T}1$	0 V Sensor	$\bar{T}2$	V+ Sensor	$\bar{U}S$	RI	Test**

- * Test = Analog signal switch-over for signal control.
By applying +5 V to the test pin, the NOT corrected test signals (1 Vpp) are switched to the output connector.
- ** Test = Analog signal switch-over for signal control.
By applying +5 V to the test pin, the test signals (sinusoidal micro-current signals 11 μ App) are switched to the output connector.
- 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.

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

