



HEIDENHAIN



Product Information

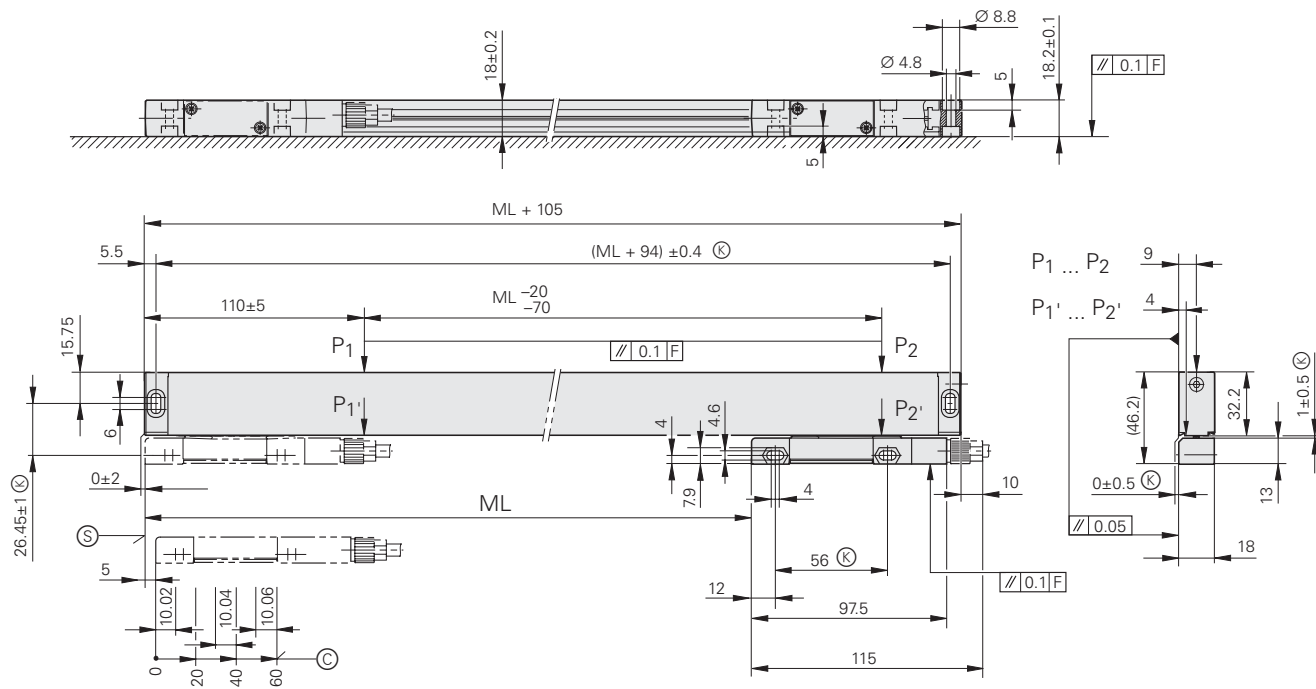
LS 378C

Incremental Linear Encoder

February 2007

LS 378C

Incremental Linear Encoder for Measuring Steps to 0.25 μm



Dimensions in mm



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

- P = Gauging points for alignment
- Ⓢ = Begin. of meas. length ML
- Ⓢ = Reference mark
- Ⓢ = Required mating dimensions
- Ⓢ = Machine guideway
- Ⓢ = Compressed air inlet



Specifications	LS 378C		
Measuring standard Expansion coefficient	Glass scale with DIADUR graduation $\alpha_{\text{therm}} (8 \pm 1) \times 10^{-6} \text{ K}^{-1}$		
Accuracy grade	$\pm 5 \mu\text{m}$		
Measuring length ML* in mm	70 770	120 820	170 920
Reference marks	Distance-coded		
Incremental signals	□ □ TTL		
Grating period	20 μm		
Integrated interpolation Signal period	5-fold 4 μm	10-fold 2 μm	20-fold 1 μm
Measuring step (after 4-fold evaluation in the subsequent electronics)	1 μm	0.5 μm	0.25 μm
Scanning frequency	$\leq 100 \text{ kHz}$ $\leq 50 \text{ kHz}$	$\leq 100 \text{ kHz}$ $\leq 50 \text{ kHz}$ $\leq 25 \text{ kHz}$	$\leq 50 \text{ kHz}$
Edge separation (nominal) ³⁾	$\geq 0.5 \mu\text{s}$ $\geq 1 \mu\text{s}$	$\geq 0.25 \mu\text{s}$ $\geq 0.5 \mu\text{s}$ $\geq 1 \mu\text{s}$	$\geq 0.2 \mu\text{s}$
Traversing speed	$\leq 60 \text{ m/min}^{2)}$ $\leq 60 \text{ m/min}$	$\leq 60 \text{ m/min}^{2)}$ $\leq 60 \text{ m/min}$ $\leq 30 \text{ m/min}$	$\leq 60 \text{ m/min}$
Power supply without load	$5 \text{ V} \pm 5 \% / < 200 \text{ mA}$		
Electrical connection*	Cable 3 m/6 m/9 m with M23 coupling, male, 12-pin		
Cable length ¹⁾	$\leq 50 \text{ m}$		
Required moving force	$\leq 5 \text{ N}$		
Vibration 55 to 2000 Hz Shock 11 ms Acceleration	$\leq 100 \text{ m/s}^2$ (IEC 60 068-2-6) $\leq 300 \text{ m/s}^2$ (IEC 60 068-2-27) $\leq 100 \text{ m/s}^2$ in measuring direction		
Operating temperature	0 to 50 °C		
Protection IEC 60 529	IP 53 when installed according to mounting instructions		
Weight without cable	0.28 kg + 0.65 kg/m measuring length		

* Please select when ordering

¹⁾ With HEIDENHAIN cable

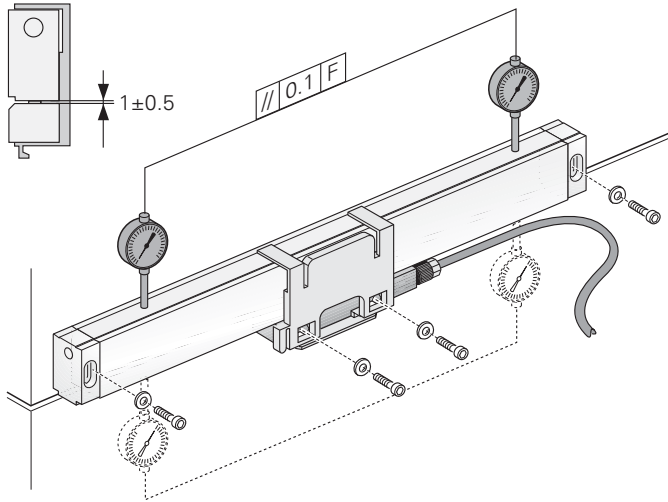
²⁾ Mechanical Limit

³⁾ Tolerance: $\pm (0.02 \mu\text{s} + 2 \% \text{ of nominal value})$

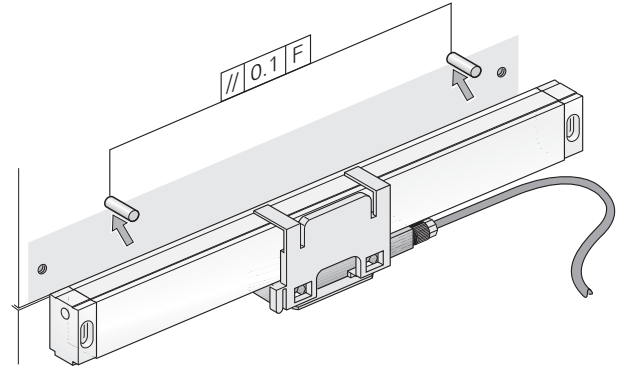
Mounting

1st step: Align the scale housing to the machine guideway (F)

Use a dial gauge to align the housing

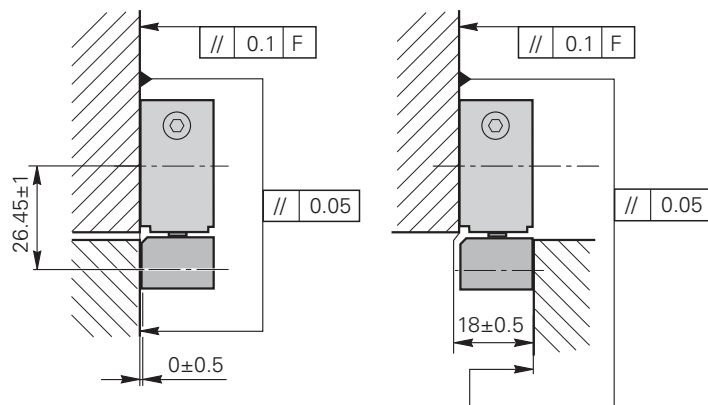


Orient against pins or edges



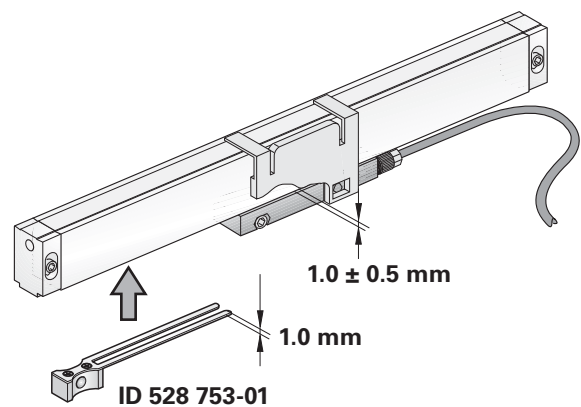
2nd step: Adjust the scanning unit

Tolerance between mounting base and machine chassis:
± 0.5 mm




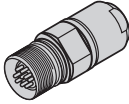
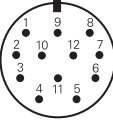


Tolerance between mounting base and scale housing:
± 0.5 mm

Aid: Mounting aid 528753-01



Electrical Connection





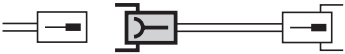
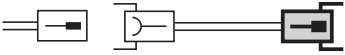
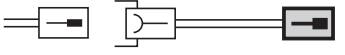

Pin layout TTL

12-pin coupling M23															
															
	Power supply				Incremental signals						Other signals				
	12	2	10	11	5	6	8	1	3	4	7	9	/	/	
	U_P	Sensor U _P	0V	Sensor 0V	U_{a1}	U_{a1}	U_{a2}	U_{a2}	U_{a0}	U_{a0}	U_{aS}¹⁾	Vacant	Vacant	Shield	
	Brown/ Green	Blue	White/ Green	White	Brown	Green	Gray	Pink	Red	Black	Violet	/	Yellow	–	

Shield on housing; **U_P** = power supply


Sensor: The sensor line is connected internally to the respective the power supply.


¹⁾ **Fanuc Connector:** vacant

PUR connecting cable Ø 8 mm		12-pin: [4(2 x 0.14 mm ²) + (4 x 0.5 mm ²)]	
Complete with M23 connector (female) and M23 coupling (male)		298401-xx	
Complete with M23 connector (female) and D-sub connector (female) for IK 220		310199-xx	
With one M23 connector (female)		309777-xx	
Cable only , Ø 8 mm		244957-01	
Mating element on connecting cable for connecting element on encoder	M23 connector (female) for cable Ø 8 mm 	291697-26	
Connector on cable for connection to subsequent electronics	M23 connector (male) for cable Ø 8 mm Ø 6 mm 	291697-08 291697-07	
Coupling on connecting cable	M23 coupling (male) for cable Ø 4.5 mm Ø 6 mm Ø 8 mm 	291698-14 291698-03 291698-04	
Flange socket for mounting on the subsequent electronics	M23 flange socket (female) 	315892-08	

HEIDENHAIN

DR. JOHANNES HEIDENHAIN GmbH
Dr.-Johannes-Heidenhain-Straße 5
83301 Traunreut, Germany

 +49 (8669) 31-0

 +49 (8669) 5061

E-Mail: info@heidenhain.de

www.heidenhain.de

For more information

- Brochure: *Sealed Linear Encoders*