



HEIDENHAIN



Product Information

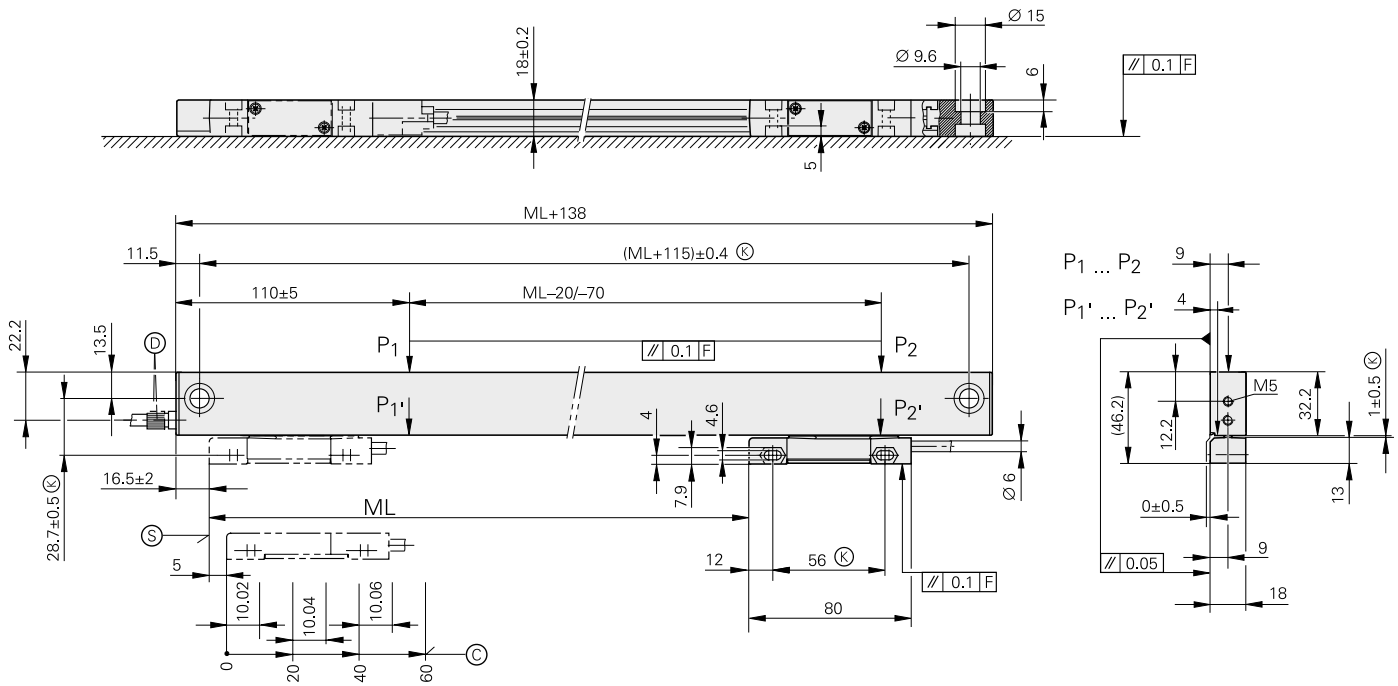
LS 1378

Incremental Linear Encoder

March 2013

LS 1378

Incremental Linear Encoder for Measuring Steps to 0.25 μm



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 1378
Measuring standard Expansion coefficient	Glass scale with DIADUR graduation $\alpha_{\text{therm}} \approx (8 \pm 1) \times 10^{-6} \text{ K}^{-1}$
Accuracy grade	$\pm 5 \mu\text{m}$
Measuring length ML* in mm	70 120 170 220 270 320 370 420 470 520 570 620 670 720 770 820 870 920 970 1020 1140 1240
Reference marks	<i>LS 1378</i> : Every 50 mm <i>LS 1378C</i> : Distance-coded
Interface ¹⁾	\square TTL
Grating period	20 μm
Integrated interpolation Signal period Measuring step ²⁾	20-fold 1 μm 0.25 μm (after 4-fold evaluation in the subsequent electronics)
Scanning frequency Edge separation	$\geq 50 \text{ kHz}$ $\leq 0.2 \mu\text{s}$
Power supply without load	5 V \pm 0.25 V / < 140 mA
Electrical connection	Separate adapter cable (1 m/3 m/6 m/9 m) connectable to mounting block
Cable length ³⁾	$\leq 50 \text{ m}$
Traversing speed	$\leq 60 \text{ m/min}$
Required moving force	$\leq 5 \text{ N}$
Vibration 55 to 2000 Hz Shock 11 ms Acceleration	$\leq 100 \text{ m/s}^2$ (IEC 60068-2-6) $\leq 300 \text{ m/s}^2$ (IEC 60068-2-27) $\leq 100 \text{ m/s}^2$ in measuring direction
Operating temperature	0 °C to 50 °C
Protection IEC 60529	IP 53 when installed according to mounting instructions IP 64 with use of compressed air from DA 400
Weight without cable	0.28 kg + 0.65 kg/m measuring length

* Please select when ordering

¹⁾ 1 V_{PP} on request

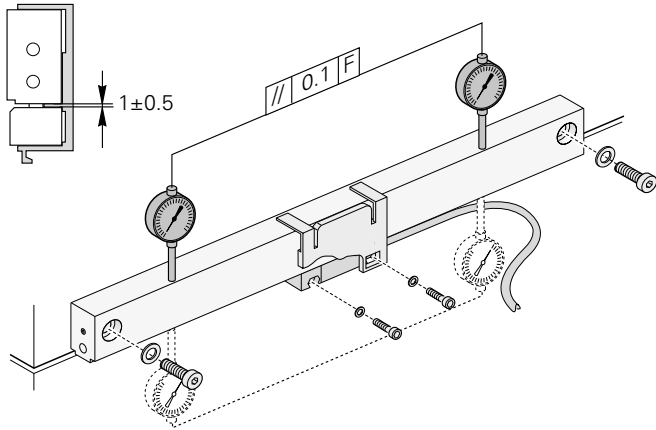
²⁾ 0.05 μm (after 4-fold evaluation in subsequent electronics) on request. Traversing speed 30 m /min.

³⁾ With HEIDENHAIN cable

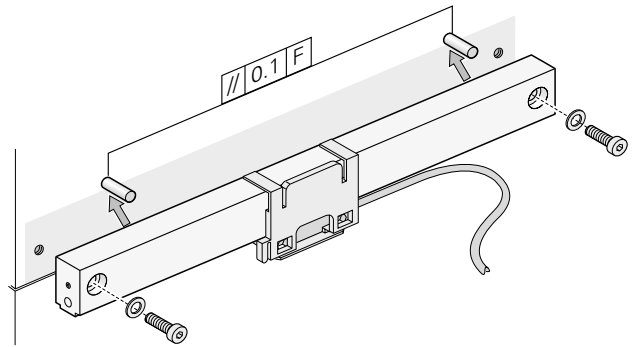
Mounting

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

Use a dial gauge to align the housing

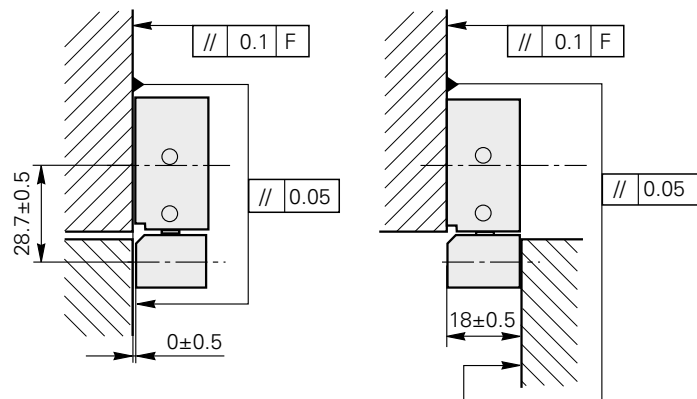


Orient against pins or edges



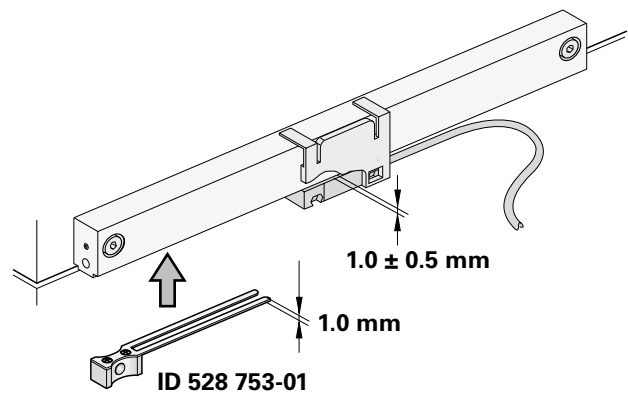
2nd step: Adjust the scanning unit

Tolerance between mounting base and machine chassis: ± 0.5 mm



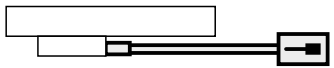
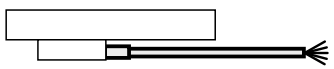
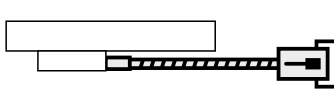
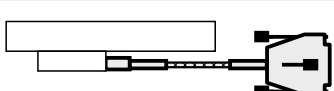
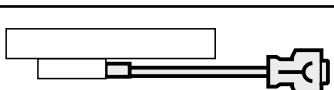
Tolerance between mounting base and scale housing: ± 0.5 mm

Aid: Mounting aid 528 753-01




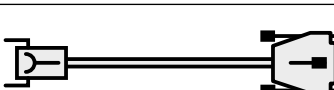
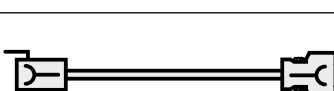
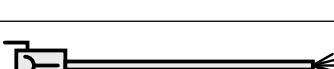
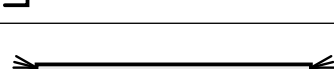
Electrical Connection

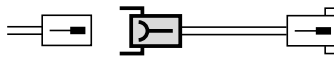
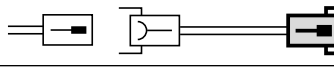
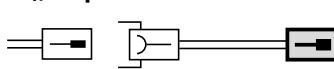

Adapter and Connecting Cables

Adapter cables $A_V = 0,19 \text{ mm}^2$		Cable Ø	
Adapter cable with 12-pin M23 coupling (male)		6 mm	360645-xx
Adapter cable without connector		6 mm	354319-xx
Armored adapter cable with M23 connector (male), 12-pin Extension cable		10 mm	344451-xx
Adapter cable with braiding With D-sub connector (male), 9-pin Cable for ND 52x		6 mm	617484-xx ¹⁾
Adapter cable With Fanuc connector, 20-pin		6 mm	745574-xx

Available cable lengths: 1 m/3 m/6 m/9 m


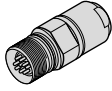


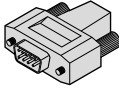


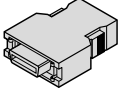
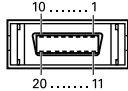




¹⁾ Max. cable length 6 m

PUR connecting cable Ø 8 mm	12-pin: $[4(2 \times 0.14 \text{ mm}^2) + (4 \times 0.5 \text{ mm}^2)]$; $A_V = 0,5 \text{ mm}^2$	
Complete with M23 connector (female) and M23 coupling (male), 12-pin		298401-xx
Complete with M23 connector (female) and D-sub connector (male), 9-pin for ND 52x		617513-xx
Complete with M23 connector (female), 12-pin and Fanuc connector, 20-pin		556558-xx
With one M23 connector (female), 12-pin		309777-xx
Cable only , Ø 8 mm		244957-01

Mating element on connecting cable for connecting element on encoder	M23 connector (female), 12-pin for cable Ø 8 mm 	291697-26
Connector on cable for connection to subsequent electronics	M23 connector (male), 12-pin for cable Ø 8 mm Ø 6 mm 	291697-08 291697-07
Coupling on connecting cable	M23 coupling (male), 12-pin 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), 12-pin 	315892-08

A_V : Cross section of power supply lines

Pin Layout

12-pin coupling M23					9-pin D-sub connector					20-pin Fanuc connector				
														
	Power supply				Incremental signals						Other signals			
	12	2	10	11	5	6	8	1	3	4	7	9	/	/
	7	/	6	/	2	3	4	5	9	8	1	/	/	/
	9	18/20	12	14	1	2	3	4	5	6	8	9	7	16
	U_P	Sensor U _P	0V	Sensor 0V	U_{a1}	\overline{U}_{a1}	U_{a2}	\overline{U}_{a2}	U_{a0}	\overline{U}_{a0}	$\overline{U}_{aS}^{1)}$	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

HEIDENHAIN

**DR. JOHANNES HEIDENHAIN
(CHINA) Co., Ltd.**

No. 6, TianWeiSanJie, Area A.
Beijing Tianzhu Airport Industrial Zone
Shunyi District, Beijing 101312, China

☎ +86 10 - 8042 0000

FAX +86 10 - 8042 00 10

E-Mail: sales@heidenhain.com.cn

www.heidenhain.com.cn

This Product Information supersedes all previous editions, which thereby become invalid. The basis for ordering from HEIDENHAIN is always the Product Information valid when the contract is made.

For more information

- Brochure: *Sealed Linear Encoders*