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HEIDENHAIN



Product Information

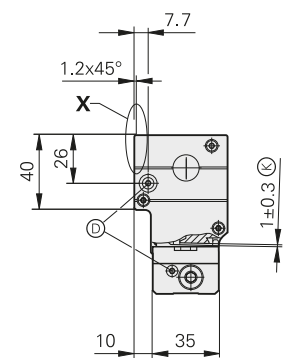
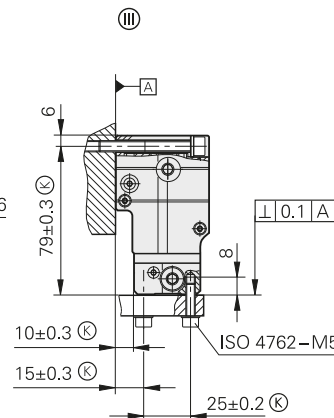
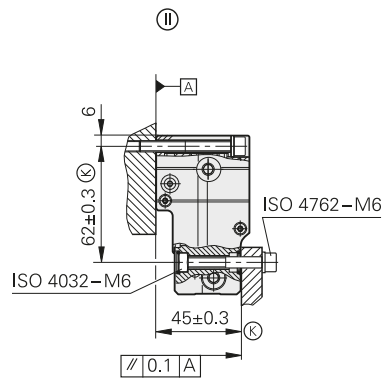
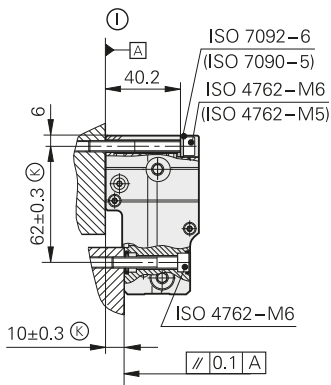
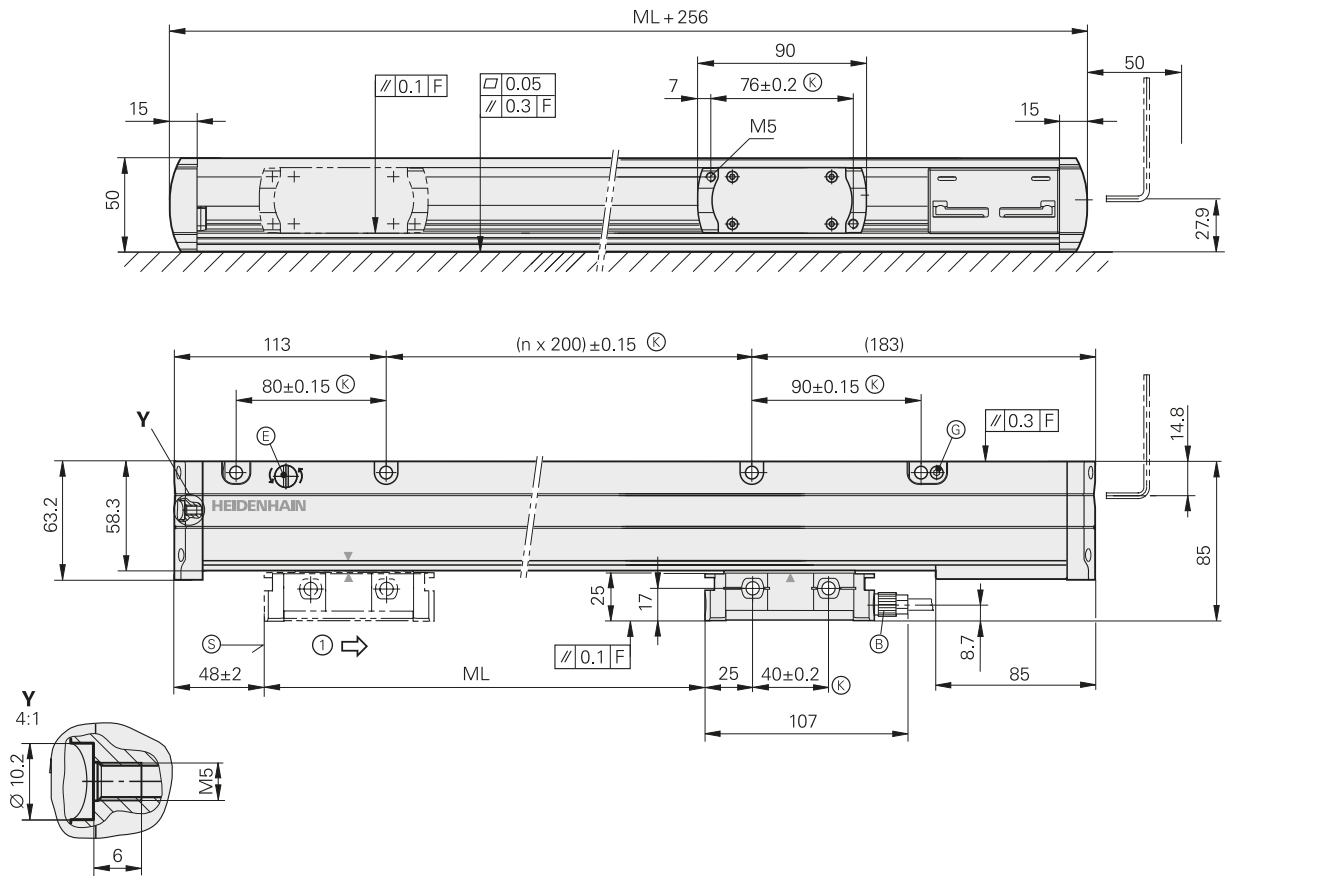
LC 201

Absolute Linear Encoders
with Full-Size Scale Housing

LC 201 series single-section housing

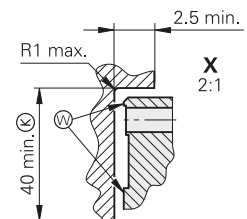
Absolute linear encoders with full-size scale housing

- Measuring length up to 4240 mm
- Horizontal mounting possible
- Also available in mirrored version (mating dimensions upon request)
- Thermal behavior can be influenced by different mounting possibilities



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

- ⊙, ⊖, ⊕ = Mounting options
- F = Machine guideway
- Ⓚ = Required mating dimensions
- Ⓟ = Cable connection usable at either end
- Ⓢ = Compressed-air connection usable at either end
- Ⓣ = fixed stop
- Ⓠ = Clamping screw for scale tape
- Ⓡ = Beginning of measuring length ML (= 100 mm absolute)
- Ⓜ = Mating surfaces
- ⇒ = Direction of scanning unit motion for output signals in accordance with interface description





Specifications	LC 211	LC 281	LC 291F	LC 291M										
Measuring standard Coefficient of linear expansion	METALLUR steel scale tape with absolute track and incremental track, grating period 40 µm $\alpha_{\text{therm}} \approx 10 \times 10^{-6} \text{ K}^{-1}$													
Accuracy grade	± 5 µm													
Measuring length ML* in mm	440 3240	640 3440	840 3640	1040 3840	1240 4040	1440 4240	1640	1840	2040	2240	2440	2640	2840	3040
Interface	EnDat 2.2		Fanuc Serial Interface α interface		Mitsubishi high speed interface									
Ordering designation	EnDat22		EnDat02		Fanuc05					Mit03-04				
Measuring step	0.010 µm				α interface/ α interface 0.0125 µm/0.050 µm					0.010 µm				
Diagnostics interface	Digital													
Clock frequency Calculation time t_{cal}	≤ 16 MHz ≤ 5 µs		≤ 2 MHz ≤ 5 µs		–		–			–				
Incremental signals	–		~ 1 V _{PP}		–									
Signal period	–		40 µm		–									
Cutoff frequency –3 dB	–		≥ 250 kHz		–									
Electrical connection	Separate adapter cable (1 m/3 m/6 m/9 m) connectable at either end of mounting block													
Cable length ¹⁾	≤ 100 m (at clock frequency ≤ 8 MHz)		≤ 150 m		≤ 50 m					≤ 30 m				
Voltage supply	DC 3.6 V to 14 V													
Power consumption (max.)	At 14 V: ≤ 1.3 W At 3.6 V: ≤ 1.1 W													
Current consumption (typical)	At 5 V: 225 mA (without load)													
Traversing speed	≤ 180 m/min (max. acceleration in measuring direction ≤ 100 m/s ²)													
Required moving force	≤ 15 N													
Vibration 55 Hz to 2000 Hz effecting the Shock 11 ms	Housing: 200 m/s ² (EN 60068-2-6) Scanning unit: 300 m/s ² (EN 60068-2-6) ≤ 300 m/s ² (EN 60068-2-27)													
Operating temperature	0 °C to 50 °C													
Protection EN 60529	IP 53 when installed according to mounting instructions, IP 64 with sealing air from DA 400													
Mass	1.3 kg + 3.6 kg/m measuring length													


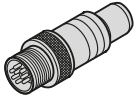



* Please select when ordering


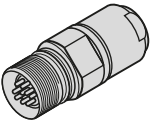
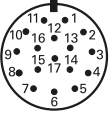

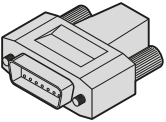
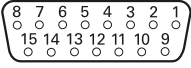



¹⁾ With HEIDENHAIN cable

Electrical connection

Pin layout

EnDat pin layout

8-pin coupling, M12								
								
	Power supply				Serial data transfer			
	8	2	5	1	3	4	7	6
	U_P	Sensor U_P	0V	Sensor 0V	DATA	DATA	CLOCK	CLOCK
	Brown/Green	Blue	White/Green	White	Gray	Pink	Violet	Yellow

17-pin coupling, M23						15-pin D-sub connector For HEIDENHAIN controls and IK 220										
																
	Power supply					Incremental signals ¹⁾				Serial data transfer						
	7	1	10	4	11	15	16	12	13	14	17	8	9			
	1	9	2	11	13	3	4	6	7	5	8	14	15			
	U_P	Sensor U_P	0V	Sensor 0V	Internal shield	A+	A-	B+	B-	DATA	DATA	CLOCK	CLOCK			
	Brown/ Green	Blue	White/ Green	White	/	Green/ Black	Yellow/ Black	Blue/ Black	Red/ Black	Gray	Pink	Violet	Yellow			


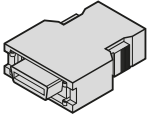
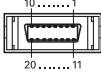

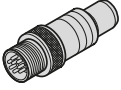




Cable shield connected to housing; **U_P** = Power supply voltage

Sensor: The sensor line is connected in the encoder with the corresponding power line

Vacant pins or wires must not be used!

¹⁾ Only with ordering designations EnDat01 and EnDat02

Fanuc pin layout


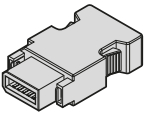


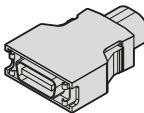
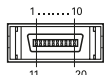

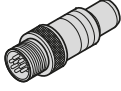
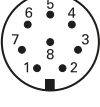




20-pin Fanuc connector					8-pin coupling, M12				
									
	Power supply					Serial data transfer			
	9	18/20	12	14	16	1	2	5	6
	8	2	5	1	–	3	4	7	6
	U_P	Sensor U _P	0V	Sensor 0V	Shield	Serial Data	Serial Data	Request	Request
	Brown/ Green	Blue	White/ Green	White	–	Gray	Pink	Violet	Yellow

Cable shield connected to housing; **U_P** = Power supply voltage

Sensor: The sensor line is connected in the encoder with the corresponding power line.

Vacant pins or wires must not be used.

Mitsubishi pin layout




10-pin Mitsubishi connector			20-pin Mitsubishi connector				8-pin coupling, M12					
												
	Power supply					Serial data transfer						
	10-pin	1	–	2	–	7	8	3	4			
	20-pin	20	19	1	11	6	16	7	17			
	8	2	5	1	3	4	7	6				
	U_P	Sensor U _P	0V	Sensor 0V	Serial Data	Serial Data	Request Frame	Request Frame				
	Brown/Green	Blue	White/Green	White	Gray	Pink	Violet	Yellow				

Cable shield connected to housing; **U_P** = Power supply voltage




Sensor: The sensor line is connected in the encoder with the corresponding power line.

Vacant pins or wires must not be used.

Adapter cables



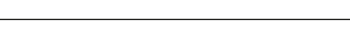



For absolute linear encoders – EnDat with incremental signals		Cable Ø	LC 281
PUR [6(2 x 0.19 mm ²); A _P = 0.19 mm ²]			
Adapter cable With M23 coupling (male, 17-pin)		6 mm	533631-xx
Armored adapter cable With M23 coupling (male, 17-pin)		10 mm	558362-xx
Adapter cable With 15-pin D-sub connector (female)		6 mm	558714-xx

Available cable lengths: 1 m/3 m/6 m/9 m
A_P = Cross section of power supply lines









For absolute linear encoders – EnDat without incremental signals¹⁾		Cable Ø	LC 211
PUR (2 x 0.14 mm ²); A _P = 0.28 mm ²			
Adapter cable With M12 coupling (male), 8-pin		6 mm, 4.5 mm	1036547-xx 1036537-xx
Armored adapter cable With M12 coupling (male), 8-pin		10 mm	1122897-xx
Adapter cable With 25-pin D-sub connector (female)		6 mm	1083369-xx

A_P = Cross section of power supply lines

¹⁾ **Note for safety-related applications:** Only completely assembled HEIDENHAIN cables are qualified.
Be sure to exchange connectors or modify cables only after consultation with HEIDENHAIN Traunreut.

For absolute linear encoders – Fanuc		Cable Ø	LC 291 F
PUR (2 x 0.14 mm ²); A _P = 0.28 mm ²			
Adapter cables With M23 coupling (male, 17-pin)		6 mm 4.5 mm	1036555-xx 1036549-xx
Armored adapter cable With M23 coupling (male, 17-pin)		10 mm	1126035-xx
Adapter cables With M12 coupling (male), 8-pin		6 mm 4.5 mm	1036547-xx 1036537-xx
Armored adapter cable With M12 coupling (male), 8-pin		10 mm	1122879-xx
Adapter cables With Fanuc connector (female), 20-pin		6 mm 4.5 mm	1036726-xx 1036724-xx
Armored adapter cable With Fanuc connector (male), 20-pin		10 mm	1126031-xx

Available cable lengths: 1 m/3 m/6 m/9 m
A_P = Cross section of power supply lines

For absolute linear encoders – Mitsubishi		Cable Ø	LC 291M
PUR (2 x 0.14 mm ²); A _P = 0.28 mm ²			
Adapter cable With M23 coupling (male, 17-pin)		6 mm 4.5 mm	1036555-xx 1036549-xx
Armored adapter cable With M23 coupling (male, 17-pin)		10 mm	1126035-xx
Adapter cables With M12 coupling (male), 8-pin		6 mm 4.5 mm	1036547-xx 1036537-xx
Armored adapter cable With M12 coupling (male), 8-pin		10 mm	1122879-xx
Adapter cable With Mitsubishi connector (female), 10-pin		6 mm 4.5 mm	1036781-xx 1036775-xx
With Mitsubishi connector (male), 20-pin		6 mm 4.5 mm	1036781-xx 1036775-xx
Armored adapter cable With Mitsubishi connector (female), 10-pin		10 mm	1127827-xx
With Mitsubishi connector (male), 20-pin		10 mm	1127794-xx

Available cable lengths: 1 m/3 m/6 m/9 m
A_P = Cross section of power supply lines

HEIDENHAIN

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



For more information:

Comply with the requirements described in the following documents to ensure the correct operation of the encoder:

- Brochure: *Linear Encoders for Numerically Controlled Machine Tools* 571470-xx
- Brochure *Interfaces of HEIDENHAIN Encoders* 1078628-xx
- *LC 2x1 Mounting Instructions* 1206635-xx