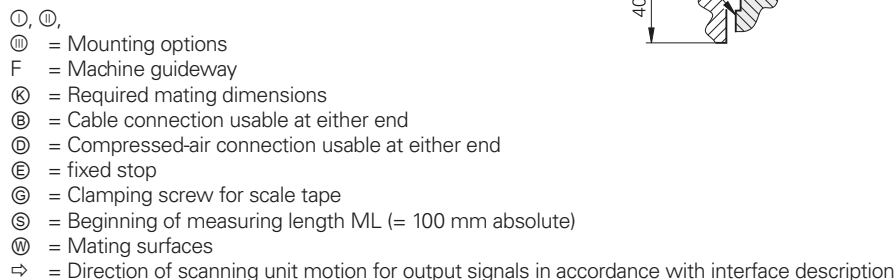




- Measuring length up to 4240 mm
- Horizontal mounting possible
- Also available in mirrored version (mating dimensions upon request)
- Thermal behavior can be influenced by different mounting possibilities





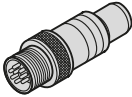
Specifications	LC 211			LC 281			LC 291 F			LC 291 M					
Measuring standard Coefficient of linear expansion	METALLUR steel scale tape with absolute track and incremental track, grating period 40 µm $\alpha_{\text{therm}} \approx 10 \times 10^{-6} \text{ K}^{-1}$														
Accuracy grade	± 5 µm														
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 αi interface			Mitsubishi high speed interface				
Ordering designation	EnDat22				EnDat02			Fanuc05			Mit03-04				
Measuring step	0.010 µm							αi 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														

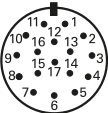
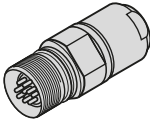
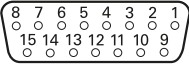
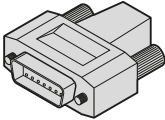
* Please select when ordering
¹⁾ With HEIDENHAIN cable

Electrical connection

Pin layout

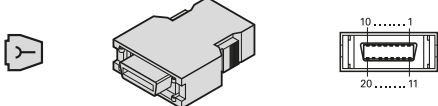
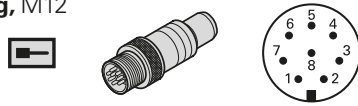
EnDat pin layout

8-pin coupling, M12								
								
	Power supply				Serial data transfer			
	8	2	5	1	3	4	7	6
	U _P	Sensor U _P	0 V	Sensor 0 V	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	0 V	Sensor 0 V	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

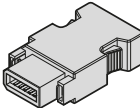
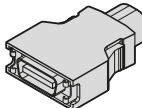
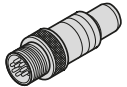
Cable shield connected to housing; **U_P** = Power supply voltage
Sensor: The sensor line is connected in the encoder with the corresponding power line
Vacant pins or wires must not be used!
¹⁾ Only with ordering designations EnDat01 and EnDat02

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
	Up	Sensor Up	0 V	Sensor 0 V	Shield	Serial Data	Serial Data	Request	Request
	Brown/ Green	Blue	White/ Green	White	–	Gray	Pink	Violet	Yellow

Cable shield connected to housing; Up = 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			
	Up	Sensor Up	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; Up = 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.

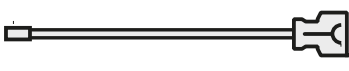
Adapter cables

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 signals ¹⁾		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 291F
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 With Mitsubishi connector (male), 20-pin	 	6 mm 4.5 mm 6 mm 4.5 mm	1036781-xx 1036775-xx 1036781-xx 1036775-xx
Armored adapter cable With Mitsubishi connector (female), 10-pin With Mitsubishi connector (male), 20-pin	 	10 mm 10 mm	1127827-xx 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