



HEIDENHAIN



Product Information

LC 481

LC 491

Absolute Linear Encoders

September 2005

LC 481/LC 491

- Absolute linear encoder
- High positioning accuracy and traversing speed through single-field scanning
- For limited installation space

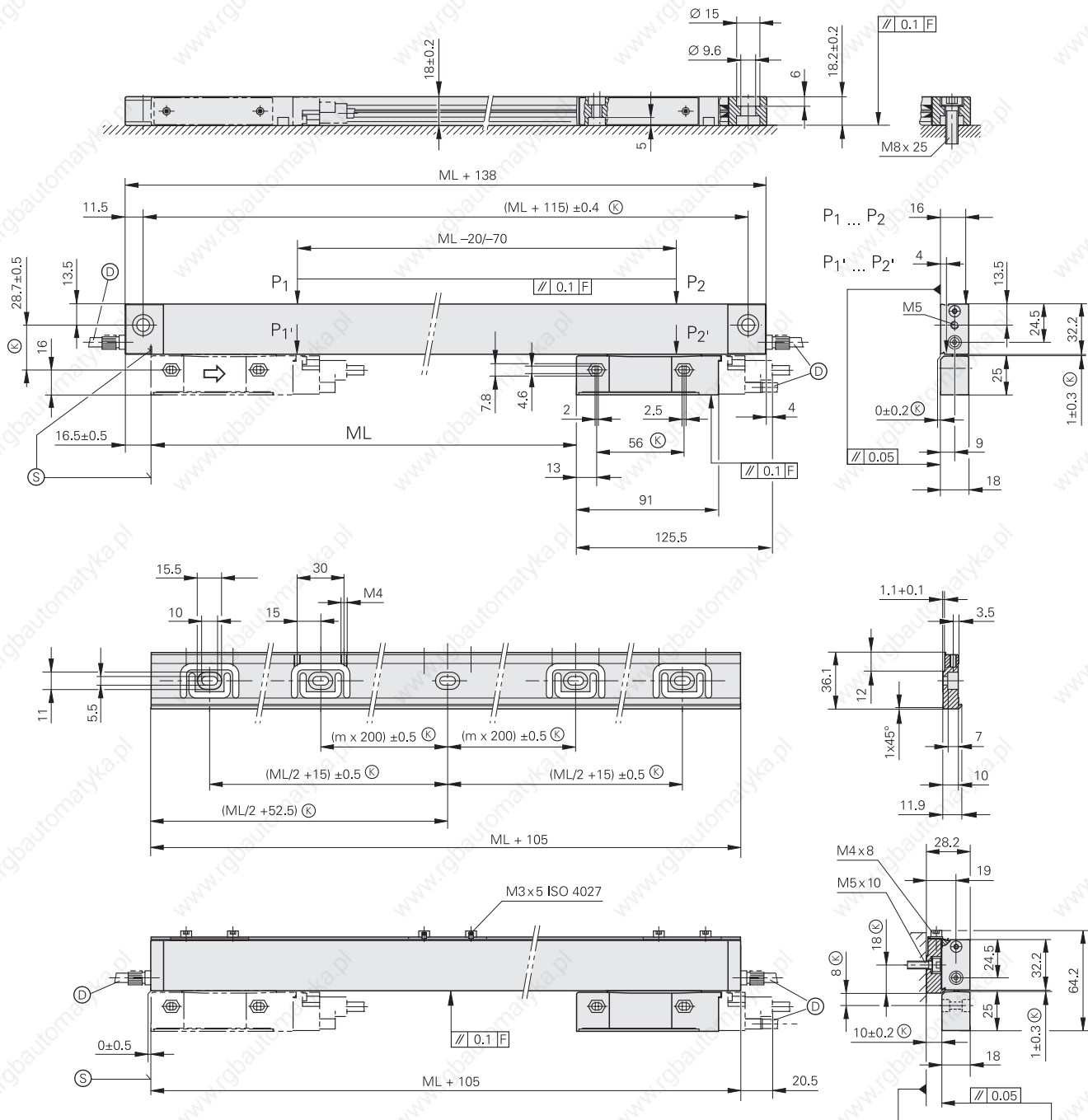
Dimensions in mm



Tolerancing ISO 8015

ISO 2768 - m H

< 6 mm: ± 0.2 mm



- ① = Without mounting spar
- ② = With mounting spar
- F = Machine guideway
- P = Gauging points for alignment
- ⊗ = Required mating dimensions
- ⊙ = Compressed air inlet
- Ⓜ = Beginning of measuring length (ML)
- ⇒ = Direction of scanning unit motion for output signals in accordance with interface description

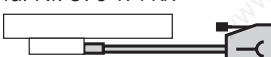
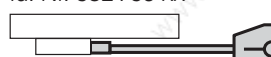
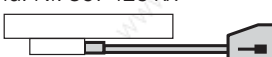
Mounting spar

ML	m
70 ... 520	0
570 ... 920	1
1020 ... 1340	2
1440 ... 1740	3
1840 ... 2040	4

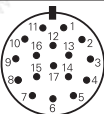
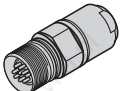
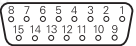
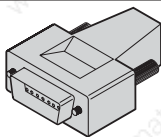
Specifications	LC 481				LC 491F				LC 491M			
Measuring standard Thermal expansion coefficient	DIADUR glass scale with absolute track and incremental track <i>Without mounting spar:</i> approx. $8 \cdot 10^{-6} \text{ K}^{-1}$, <i>with mounting spar:</i> approx. $9 \cdot 10^{-6} \text{ K}^{-1}$											
Accuracy grade*	$\pm 3 \text{ }\mu\text{m}$, $\pm 5 \text{ }\mu\text{m}$											
Measuring length ML* in mm Mounting spar recommended	70	120	170	220	270	320	370	420	470	520	570	620
Only with mounting spar	720	770	820	920	1020	1140	1240					
	1340	1440	1540	1640	1740	1840	2040					
Absolute position values	EnDat 2.1				Fanuc 01 serial interface				Mitsubishi High Speed Serial Interface			
Measuring step	Approx. $0.02 \text{ }\mu\text{m}^{1)}$				<i>Accuracy $\pm 3 \text{ }\mu\text{m}$:</i> $0.01 \text{ }\mu\text{m}$, <i>accuracy $\pm 5 \text{ }\mu\text{m}$:</i> $0.05 \text{ }\mu\text{m}$							
Calculation time t_{cal}	< 1 ms				–							
Incremental signals Grating period/signal period Cutoff frequency –3dB	$\sim 1 \text{ V}_{\text{PP}}$ $20 \text{ }\mu\text{m}$ $\geq 150 \text{ kHz}$				–							
Power supply	$5 \text{ V} \pm 5\%$ / $< 300 \text{ mA}$ without load. Remote sensing is possible											
Electrical connection Max. cable length	Separate adapter cable (1 m/3 m/6 m/9 m) connectable to mounting block Upon request											
Traversing speed	$\leq 180 \text{ m/min}$											
Required moving force	$\leq 5 \text{ N}$											
Vibration 55 to 2000 Hz Shock 11 ms Acceleration in measuring direction	<i>Without mounting spar:</i> $\leq 100 \text{ m/s}^2$ (IEC 60 068-2-6) <i>With mounting spar:</i> $\leq 200 \text{ m/s}^2$ (IEC 60 068-2-6) $\leq 300 \text{ m/s}^2$ (IEC 60 068-2-27) $\leq 100 \text{ m/s}^2$											
Operating temperature	0 to $50 \text{ }^{\circ}\text{C}$											
Protection IEC 60 529	IP 53 when installed acc. to mounting instructions, IP 64 with compressed air from DA 300											
Weight	<i>Encoder:</i> $0.2 \text{ kg} + 0.5 \text{ kg/m}$ measuring length, <i>mounting spar:</i> 0.9 kg/m											

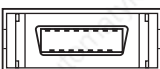
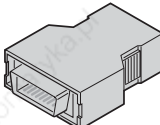
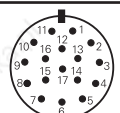
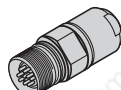
* Please indicate when ordering

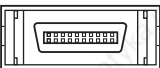
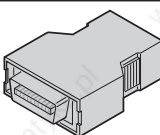
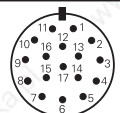
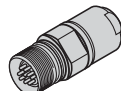
¹⁾ After 1024-fold interpolation of the incremental signals

Connecting Elements and Cables	LC 481	LC 491F	LC 491M
Adapter cable complete With M23 coupling (male), 17-pin Cable length 1 m/3 m/6 m/9 m Cable diameter 6 mm	Id. Nr. 369 129-xx 	Id. Nr. 337 439-xx 	
Connecting cable complete With M23 connector (female), 17-pin Cable diameter 8 mm	With D-sub connector (female) Id. Nr. 332 115-xx 	With Fanuc connector Id. Nr. 534 855-xx 	With Mitsubishi connector Id. Nr. 344 625-xx 
Connecting cable with one connector With M23 connector (female) Cable diameter 8 mm	Id. Nr. 309 778-xx 	–	
Adapter cable complete Cable diameter 6 mm	With D-sub connector (female) Id. Nr. 370 474-xx 	With Fanuc connector Id. Nr. 532 759-xx 	With Mitsubishi connector Id. Nr. 367 425-xx 

Electrical Connection

LC 481 17-pin coupling M23  15-pin D-sub connector, female, for HEIDENHAIN controls and IK 220 													
	Power supply					Incremental signals				Absolute position values			
	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
	Up	Sensor Up	0V	Sensor 0V	Inside 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

LC 491F 20-pin Fanuc connector  17-pin coupling M23 									
	Power supply					Absolute position values			
	9	18/20	12	14	16	1	2	5	6
	7	1	10	4	–	14	17	8	9
	Up	Sensor Up	0V	Sensor 0V	Shield	Serial Data	Serial Data	Request	Request
	Brown/Green	Blue	White/Green	White	–	Gray	Pink	Violet	Yellow

LC 491M 20-pin Mitsubishi connector  17-pin coupling M23 									
	Power supply					Absolute position values			
	20	19	1	11	6	16	7	17	
	7	1	10	4	14	17	8	9	
	Up	Sensor Up	0V	Sensor 0V	Serial Data	Serial Data	Request Frame	Request Frame	
	Brown/Green	Blue	White/Green	White	Gray	Pink	Violet	Yellow	

Shield on housing; Up = power supply voltage
Sensor: The sensor line is connected internally with the corresponding power line
Vacant pins or wires must not be used!

HEIDENHAIN

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- For more information
- Sealed Linear Encoders brochure
 - Technical Information: Single-Field Scanning