



# HEIDENHAIN



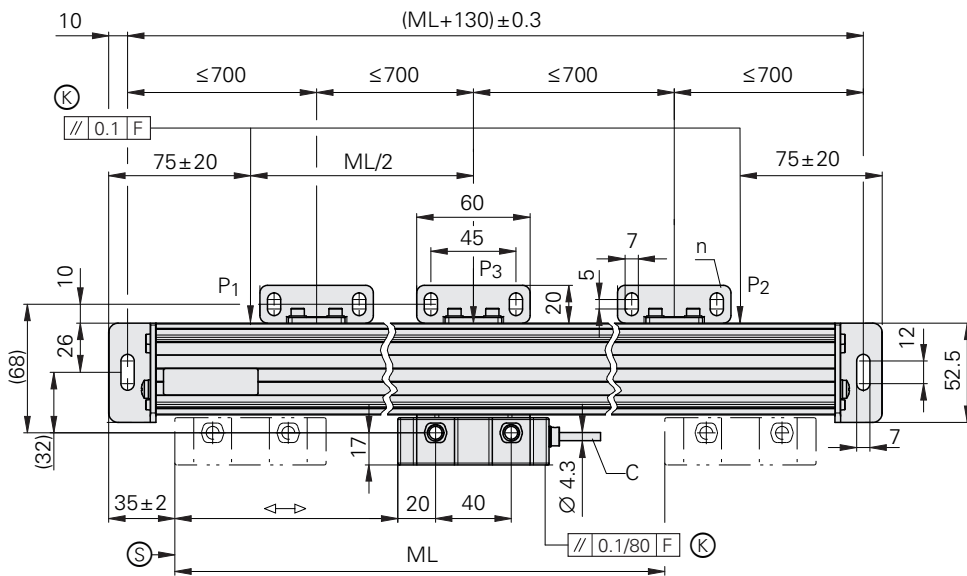
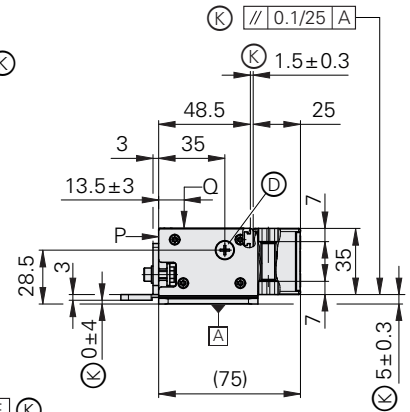
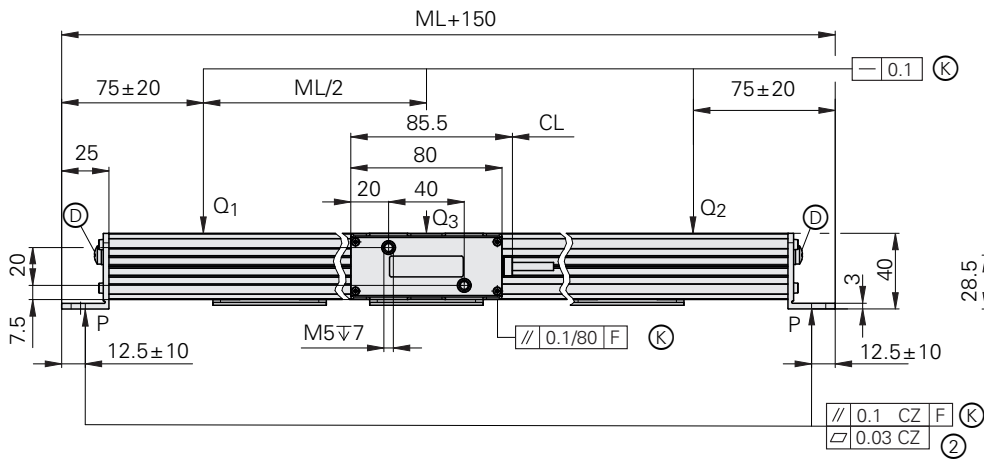
Product Information

**LS 683 C**

**LS 673 C**

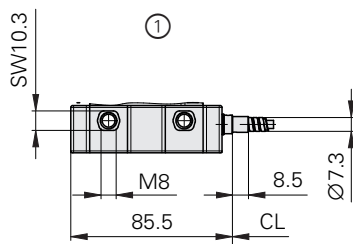
Incremental Linear Encoders

# LS 600 series



ML	n
≥ 620	1 x
≥ 1140	2 x
≥ 2040	3 x
≥ 2840	4 x

mm  
  
 Tolerancing ISO 8015  
 ISO 2768:1989-mH  
 ≤ 6 mm: ±0.2 mm



- F = Machine guideway
- ML = Measuring length
- P, Q = Measuring points
- C = PUR connecting cable
- CL = Cable length
- ↔ = 0 ... ML
- K = Required mating dimensions
- S = Beginning of measuring length ML
- D = Compressed-air inlet
- 1 = PUR cable in metal armor
- 2 = Mounting surface

LS 6x3(C)  
 Starting value for version with distance-coded reference marks between 0 mm and 3200 mm




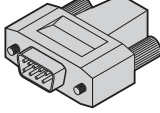
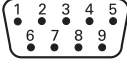

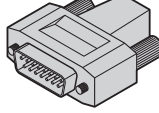
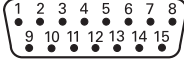

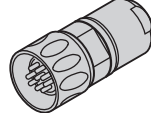
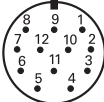

Specifications	LS 683 C	LS 673 C																																										
<b>Measuring standard</b> Coefficient of linear expansion	Glass scale $\alpha_{\text{therm}} \approx 8 \cdot 10^{-6} \text{ K}^{-1}$																																											
<b>Accuracy grade</b>	$\pm 5 \mu\text{m}$																																											
<b>Measuring length (ML)*</b> in mm	<table border="1"> <tr> <td>170</td><td>220</td><td>270</td><td>320</td><td>370</td><td>420</td><td>470</td><td>520</td><td>570</td><td>620</td><td>670</td><td>720</td><td>770</td><td>820</td> </tr> <tr> <td>870</td><td>920</td><td>970</td><td>1020</td><td>1140</td><td>1240</td><td>1340</td><td>1440</td><td>1540</td><td>1640</td><td>1740</td><td>1840</td><td>2040</td><td>2240</td> </tr> <tr> <td>2440</td><td>2640</td><td>2840</td><td>3040</td><td colspan="10"></td> </tr> </table>		170	220	270	320	370	420	470	520	570	620	670	720	770	820	870	920	970	1020	1140	1240	1340	1440	1540	1640	1740	1840	2040	2240	2440	2640	2840	3040										
170	220	270	320	370	420	470	520	570	620	670	720	770	820																															
870	920	970	1020	1140	1240	1340	1440	1540	1640	1740	1840	2040	2240																															
2440	2640	2840	3040																																									
Reference mark	Distance-coded <sup>1)</sup>																																											
<b>Interface</b>	$\sim 1 \text{ V}_{\text{PP}}$	$\square$ TTL																																										
Signal period	20 $\mu\text{s}$																																											
Integrated interpolation	–	1-fold																																										
Measuring step	–	5 $\mu\text{m}$																																										
<b>Supply voltage</b> Without load	5 V $\pm 0.25 \text{ V}$ / < 150 mA																																											
<b>Electrical connection</b>	PUR cable and PUR cable with metal armor; cable outlet to the right on the mounting block																																											
<b>Cable length</b>	3 m, 6 m																																											
<b>Connecting element</b>	15-pin D-sub connector (male) 15-pin D-sub connector (female) 12-pin M23 connector (male)	15-pin D-sub connector (male) 9-pin D-sub connector (male) 12-pin M23 connector (male)																																										
<b>Traversing speed</b>	$\leq 60 \text{ m/min}$																																											
<b>Required moving force</b>	$\leq 5 \text{ N}$																																											
<b>Vibration</b> 55 Hz to 2000 Hz <b>Shock</b> 6 ms	$\leq 100 \text{ m/s}^2$ $\leq 200 \text{ m/s}^2$																																											
<b>Operating temperature</b>	0 °C to 50 °C																																											
<b>Protection</b> IEC 60529	IP53 (IP64 with sealing air via DA 400)																																											
<b>Mass</b> without cable	0.45 kg + 2.24 kg/m of measuring length																																											

\* Please select when ordering

<sup>1)</sup> Starting value for version with distance-coded reference marks between 0 mm and 3200 mm

# Pin layout

## TTL

① 9-pin D-sub connector (male)					② 15-pin D-sub connector (male)						③ 12-pin M23 connector (male)				
															
	Power supply				Incremental signals						Other signals				
①	7	7 <sup>1)</sup>	6	6 <sup>1)</sup>	2	3	4	5	9	8	/	/	/		
②	4	12	2	10	1	9	3	11	14	7	13	5/6/8	15 <sup>2)</sup>		
③	12	2	10	11	5	6	8	1	3	4	7	/	9		
	$U_P$	Sensor $U_P$	0V	Sensor 0V	$U_{a1}$	$\overline{U}_{a1}$	$U_{a2}$	$\overline{U}_{a2}$	$U_{a0}$	$\overline{U}_{a0}$	$\overline{U}_{aS}$	Vacant	Reserved, do not assign <sup>3)</sup>		
	Black		White		Green	Yellow	Pink	Red	Brown	Gray	Blue	/	Ecu		

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

**Sensor:** The sense line is connected in the encoder with the corresponding power supply line.


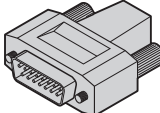
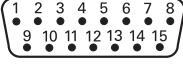

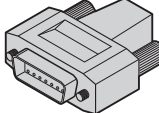
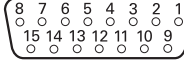

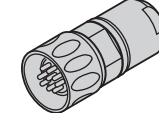
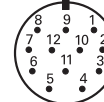

Vacant pins or wires must not be used!

<sup>1)</sup> Only ID 617513-xx, ID 626015-xx

<sup>2)</sup> No connection: ID 309783-xx, ID 309784-xx, ID 310196-xx, ID 310199-xx

<sup>3)</sup> Conversion from TTL to 11  $\mu A_{PP}$  for PWT; otherwise not assigned

## 1 V<sub>PP</sub>

① 15-pin D-sub connector (male)					② 15-pin D-sub connector (female)						③ 12-pin M23 connector (male)				
															
	Power supply				Incremental signals						Other signals				
①	4	12	2	10	1	9	3	11	14	7	5/6/8	13	15 <sup>1)</sup>		
②	1	9	2	11	3	4	6	7	10	12	13/14/15	8	5		
③	12	2	10	11	5	6	8	1	3	4	/	7	9		
	$U_P$	Sensor $U_P$	0V	Sensor 0V	A+	A-	B+	B-	R+	R-	Vacant	Reserved, do not assign <sup>2)</sup>	Reserved, do not assign <sup>3)</sup>		
	Black		White		Green	Yellow	Pink	Red	Brown	Gray	/	Blue	Ecu		

<sup>1)</sup> No connection: ID 310196-xx

<sup>2)</sup> Serial interface (clock)

<sup>3)</sup> Serial interface (data)


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This Product Information document 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 placed.



## More information:

To ensure proper and intended use, comply with the specifications in the following document:

- Brochure *Digital Readouts / Linear Encoders*

208864-xx