

Solid design meets smooth running

The new miniature profile rail guide series for laboratory automation



Miniature profile rail guides are the ideal solution for applications requiring compact dimensions, high running accuracy, long service life and low noise as for example in laboratory machinery.

With the new miniature profile rail guide series LLS, SKF has coupled its practical experience gained in the Medical industry with the latest findings from its own reasearch and development into the new design.

The demands placed on modern linear guidance technology have risen significantly in recent years - especially in terms of service life, precise motion combined with a high robustness of the product. At the same time, users expect installation and maintenance outlay to be as low as possible, and this is particularly true in the field of medical applications.



**Lower noise level
suitable for medical,
lab and office
environments**



**Self lubrication for long
service life**



**Smooth running
and low friction for
position accuracy**

Optimized for your application

Minimal service requirements combined with low friction and silent running, the new LLS series provides high performance for medical applications.

Typical applications

- Robotic analyzer
- Sample processor
- Dental laboratory equipment
- Chemical analyzer

Benefits

- Low noise for medical, lab and office environments
- Self-lubrication for long service life
- Smooth running for position accuracy
- Safe and quick mounting due to innovative ball retention system
- Robust and compact design
- Interchangeability of carriages and rails
- More clean with threads from the bottom
- Customized designs for better integrations
- Stainless steel components
- RoHs and REACH conform

Dental milling machine



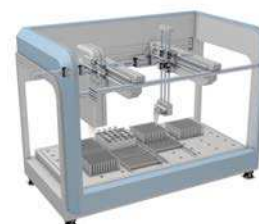
Chemical analyzer



Sample processor



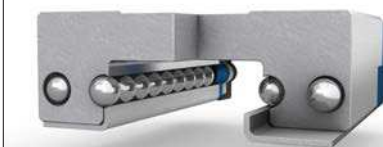
Robotic analyzer for laboratories



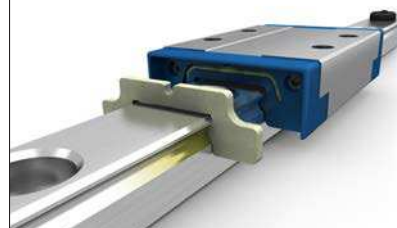
Optimized design features

- New optimized ball recirculation
- To maximize the maintenance-free operation, all LLS carriages are factory pre-lubricated and equipped with a lubrication reservoir which secures the lubrication condition in the complete guiding system
- Robust ball retention system
- New and optimized seal design
- Reduced friction
- High dynamic values: speed $v = 3 \text{ m/s}$, acceleration $a = 80 \text{ m/s}^2$
- Extended temperature range -20 $+100 \text{ }^\circ\text{C}$ (sealed version $+80 \text{ }^\circ\text{C}$)
- Interchangeable according to ISO 12090-2
- High stiffness due to optimized number of balls

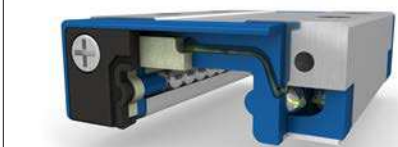
Robust ball retention system



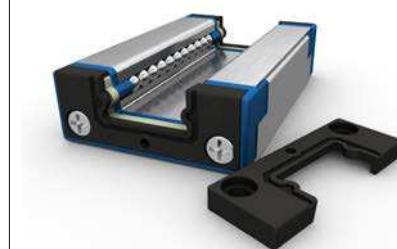
Lubrication reservoir



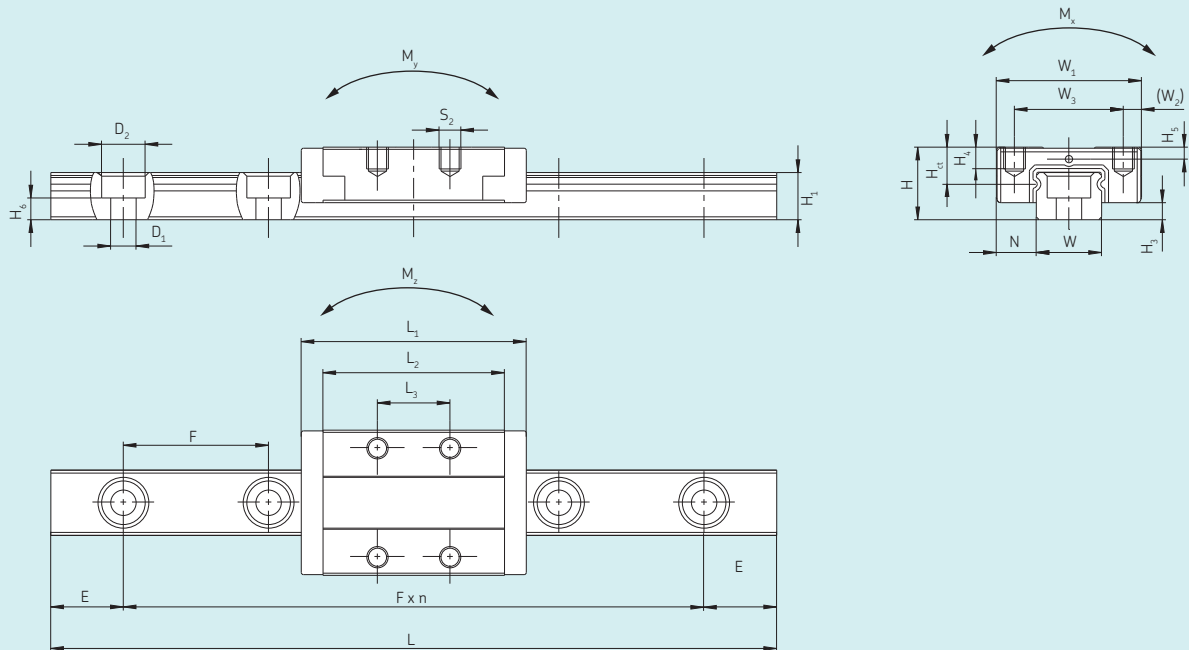
Lubrication channel



Optimized seal design



Technical data



| Designation | Size | | | | | | | | | | | | | | | | | | | | | |
|-------------|------|----|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|----|-----|---------|---------------------------------|--------------------------|--------------------------|----|
| | | H | W ₁ | W ₂ | W ₃ | L ₁ | L ₂ | L ₃ | S ₂ | H ₁ | H ₃ | H ₄ | H ₅ | H ₆ | H _{ct} | W | N | L ±1 | D ₁ x D ₂ | E _{min} ±0,5 | E _{max} ±0,5 | F |
| mm | | | | | | | | | | | | | | | | | | | | | | |
| LLSHS 7 TA | 7 | 8 | 17 | 2,5 | 12 | 23,5 | 18 | 8 | M2 | 4,8 | 1,5 | 2,5 | 1,7 | 2,3 | 4,6 | 7 | 5 | 1000 | 2,5x4,5 | 5 | 12 | 15 |
| LLSHS 7 LA | 7 | 8 | 17 | 2,5 | 12 | 31,5 | 26 | 12 | M2 | 4,8 | 1,5 | 2,5 | 1,7 | 2,3 | 4,6 | 7 | 5 | 1000 | 2,5x4,5 | 5 | 12 | 15 |
| LLSHS 9 TA | 9 | 10 | 20 | 2,5 | 15 | 31 | 25 | 10 | M3 | 6,5 | 2,35 | 3 | 1,65 | 3 | 5,1 | 9 | 5,5 | 1000 | 3,5x6 | 5 | 16 | 20 |
| LLSHS 9 LA | 9 | 10 | 20 | 2,5 | 15 | 40,5 | 34,5 | 15 | M3 | 6,5 | 2,35 | 3 | 1,65 | 3 | 5,1 | 9 | 5,5 | 1000 | 3,5x6 | 5 | 16 | 20 |
| LLSHS 12 TA | 12 | 13 | 27 | 3,5 | 20 | 35 | 29 | 15 | M3 | 8,8 | 3,35 | 4,5 | 2,65 | 4,3 | 6,5 | 12 | 7,5 | 1000 | 3,5x6 | 5 | 21 | 25 |
| LLSHS 12 LA | 12 | 13 | 27 | 3,5 | 20 | 46,5 | 40,5 | 20 | M3 | 8,8 | 3,35 | 4,5 | 2,65 | 4,3 | 6,5 | 12 | 7,5 | 1000 | 3,5x6 | 5 | 21 | 25 |

| Designation | Size | | | | | | | | | Weight | |
|-------------|------|--------|----------------|-----------------|------------------|----------------------------------|------------------------------------|----------|------|--------|--|
| | | C | C ₀ | M _{xC} | M _{xCO} | M _{yC} /M _{zC} | M _{yCO} /M _{zCO} | Carriage | Rail | | |
| | | 100 km | | dyn | stat | dyn | stat | | | | |
| | | N | | Nm | | | | kg | kg/m | | |
| LLSHS 7 TA | 7 | 915 | 1460 | 3,0 | 4,6 | 1,7 | 2,6 | 0,01 | 0,23 | | |
| LLSHS 7 LA | 7 | 1270 | 2400 | 4,1 | 7,6 | 3,9 | 7,4 | 0,02 | 0,23 | | |
| LLSHS 9 TA | 9 | 1700 | 2800 | 7,1 | 11,5 | 4,6 | 7,5 | 0,02 | 0,4 | | |
| LLSHS 9 LA | 9 | 2280 | 4300 | 9,6 | 17,7 | 9,6 | 18,0 | 0,03 | 0,4 | | |
| LLSHS 12 TA | 12 | 2500 | 3900 | 14,0 | 21,5 | 7,5 | 11,7 | 0,04 | 0,75 | | |
| LLSHS 12 LA | 12 | 3550 | 6300 | 19,9 | 34,8 | 17,1 | 30,4 | 0,06 | 0,75 | | |

Ordering key

| | LLS | H | S | 9 | TA | R | 1 | T0 | -300 | P5 | W2 | D | E=0 | MC |
|--|---|---|---|---|----|---|---|----|------|----|----|---|-----|----|
| Miniature profile rail guide | _____ | | | | | | | | | | | | | |
| System type | _____ | | | | | | | | | | | | | |
| H | Standard system | | | | | | | | | | | | | |
| Type code | _____ | | | | | | | | | | | | | |
| C | Carriage (Carriage only) ¹⁾ | | | | | | | | | | | | | |
| R | Rail (Rail only) ¹⁾ | | | | | | | | | | | | | |
| S | System (Carriage and rail) | | | | | | | | | | | | | |
| Z | Accessories ¹⁾ | | | | | | | | | | | | | |
| Size | _____ | | | | | | | | | | | | | |
| 7, 9, 12 | | | | | | | | | | | | | | |
| Carriage type | _____ | | | | | | | | | | | | | |
| TA | Standard carriage, standard length, standard height | | | | | | | | | | | | | |
| LA | Standard carriage, extended length, standard height | | | | | | | | | | | | | |
| Sealing | _____ | | | | | | | | | | | | | |
| . | Carriage with cover plates ³⁾ | | | | | | | | | | | | | |
| R | Carriage with front seals | | | | | | | | | | | | | |
| Number of carriages per rail | _____ | | | | | | | | | | | | | |
| 1, 2, 4, 6 | | | | | | | | | | | | | | |
| Preload class | _____ | | | | | | | | | | | | | |
| T0 | Clearance | | | | | | | | | | | | | |
| T1 | Light preload | | | | | | | | | | | | | |
| T2 | Medium preload (on request) | | | | | | | | | | | | | |
| Rail length | _____ | | | | | | | | | | | | | |
| - xxxx | up to 1.000mm length (longer rails are available on request) | | | | | | | | | | | | | |
| Precision class | _____ | | | | | | | | | | | | | |
| P5 | Standard | | | | | | | | | | | | | |
| P1 | High ²⁾ | | | | | | | | | | | | | |
| Rail arrangement | _____ | | | | | | | | | | | | | |
| . | Single rail system ³⁾ | | | | | | | | | | | | | |
| W2 | Two rails mounted parallel | | | | | | | | | | | | | |
| Wx | x rails mounted parallel | | | | | | | | | | | | | |
| Rail | _____ | | | | | | | | | | | | | |
| . | Standard rail ³⁾ | | | | | | | | | | | | | |
| Dx | Customized rail | | | | | | | | | | | | | |
| Distance between end face and center of the first mounting hole of the rail | _____ | | | | | | | | | | | | | |
| E0 | If no "E" specified, the holes at both rail ends will be positioned equidistantly from either end of the rail (shortest possible "E" dimension) | | | | | | | | | | | | | |
| Exx | "E" dimensions to be specified ($E_{\min} = 5\text{mm}$) | | | | | | | | | | | | | |
| Rail end stops | _____ | | | | | | | | | | | | | |
| . | Plastic plugs ³⁾ | | | | | | | | | | | | | |
| PP | Plastic plugs ¹⁾ | | | | | | | | | | | | | |
| MC | Metal clamps | | | | | | | | | | | | | |

¹⁾ Delivered seperately
²⁾ Available as system
³⁾ No code for standard

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