

ROLLON[®]
Linear Evolution

Telescopic Line



General catalogue
English

www.rollon.com

When you move. We move.

Rollon S.p.A. was founded in 1975 as a manufacturer of linear motion components. Today Rollon group is a leading name in the design, production and sale of linear rails, telescopic rails and actuators, with headquarters based in Italy and offices and distributors located throughout the world. Rollon products are used in many industries with creative and efficient solutions in a wide range of applications used on a daily basis.

Solutions for linear motion



Linear Rails

- Rails with roller bearings
- Rails with caged ball bearings
- Rails with recirculating ball bearing

Telescopic Rails

- Rails with partial/total extension
- Heavy duty rails
- Rails for and automated/manual applications

Actuators

- Belt driven actuators
- Ball screw driven actuators
- Rack and pinion actuators

Core Competencies

- > Full range of linear rails, telescopic rails and actuators
- > Worldwide presence with branches and distributors
- > Fast delivery all over the world
- > Large technical know-how for applications



> Standard solutions

Wide range of products and sizes
Linear rails with roller and caged ball bearings
Heavy duty telescopic rails
Belt or ball screw driven linear actuators
Multi-axis systems



> Collaboration

International know-how in several industries
Project consultancy
Maximizing performance and cost optimization



> Customization

Special products
Research and development of new solutions
Technologies dedicated to different sectors
Optimal surface treatment

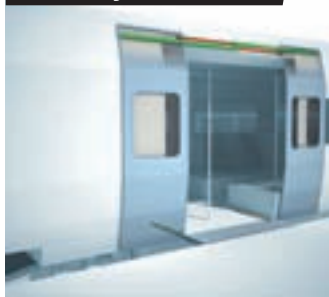


Applications

Aerospace



Railway



Logistics



Industrial Machines



Medical



Specialty Vehicles



Robotics



Packaging



> **Telescopic Rail**



Technical features overview

1 Product explanation

Telescopic Rail: Seven models with full and partial extension

TR-2

2 Technical data

Performance characteristics and notes

TR-5

3 Dimensions and load capacity

ASN

TR-6

DSS

TR-10

DSS...S

TR-12

DSB

TR-14

DSD

TR-15

DSE

TR-18

DSC

TR-20

DE

TR-22

DE...S

TR-25

DE...D

TR-27

DBN

TR-29

DMS

TR-32

DRT

TR-34

4 Technical instructions

Telescopic rail selection, Static load check

TR-36

Deflection

TR-37

Static load

TR-38

Service life

TR-39

Speed, Extension and extraction force,

Double-sided stroke, Temperature

TR-42

Anticorrosive protection, Lubrication, Clearance and preload

TR-43

Fixing screws

TR-44

Installation instructions

TR-45

Ordering key

Ordering key with explanations

TR-47

► Opti Rail



1 Product explanation

Fully extending telescopic rails for manual movement

OR-2

2 Technical data

Performance characteristics and notes

OR-4

3 Dimensions and load capacity

LTH30 RF

OR-5

LTH30 KF

OR-6

LTH30...S

OR-7

LTH45 RF

OR-8

LTH45 KF

OR-9

LTH45...S

OR-10

LTF44

OR-11

4 Technical instructions

Load capacity, Extension and extraction force

OR-12

Anticorrosive protection, Temperature,

Lubrication, Installation instructions

OR-13

Ordering key

Ordering key with explanations

OR-14

► Light Rail



1 Product explanation

Light telescopic rails, with full or partial extension

LR-2

2 Technical data

Performance characteristics and notes

LR-4

3 Dimensions and load capacity

LPS 38

LR-5

LFS 46

LR-6

LFS 57

LR-7

LFS 58 SC

LR-8

LFS 70

LR-9

LFX 27

LR-10

DRX/DRS, Fixing screws

LR-11

4 Technical instructions

Load capacities

LR-12

Speed, Temperature, Lubrication, Corrosion protection

LR-13

Installation instructions, DRX/DRS installation

LR-14

Ordering key

Ordering key with explanations

LR-15

Guides suitable for all applications

Technical features overview



| Reference | | Section | Profile | | Self alignment | Extension | Slider | | Anticorrosion | |
|-----------------|-----------|---------|---------|-------------------|----------------|-----------|--------|---------|---------------|---|
| Family | Product | | Type | Hardened raceways | | | Balls | Rollers | | |
| Telescopic Rail | | ASN | | Cold Drawn | √ | + | 50% | | | |
| | | DE | | Cold Drawn | √ | ++ | 100% | | | |
| | | DS | | Cold Drawn | √ | ++ | 100% | | | |
| | | DSE | | Cold Drawn | √ | ++ | 150% | | | |
| | | DSC | | Cold Drawn | √ | ++ | 100% | | | |
| | | DBN | | Cold Drawn | √ | ++ | 100% | | | |
| | | DMS | | Cold Drawn | √ | ++ | 100% | | | |
| | | DRT | | Cold Drawn | √ | + | 100% | | | |
| | Opti Rail | | LTH | | Cold Drawn | | ++ | 100% | | |
| | | LTF | | Cold Drawn | | ++ | 100% | | | |
| Light Rail | | LPS | | Formed Sheetmetal | | ++ | 50% | | | |
| | | LFS | | Formed Sheetmetal | | ++ | 100% | | | |
| | | LFX | | Formed Sheetmetal | | ++ | 100% | | | <i>Available in stainless steel</i> |
| | | DRX/DRS | | Formed Sheetmetal | | ++ | 100% | | | <i>Available in stainless steel</i> |

The information shown must be verified for the specific application.
For a complete view of technical data, please consult our catalogs on www.rollon.com

* The maximum value is defined by the application.

** Different anti-corrosion treatments are available. For more information, please contact Rollon.

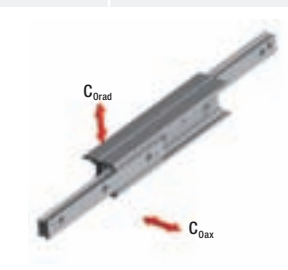
*** For more information, please contact Rollon.

| Size | Max. load capacity per slider [N] | | Max. dynamic load capacity [N] C 100 | Max. stroke [mm] | Max. rail length [mm] | Max. extension speed [m/s] | Rigidity (deflection) | Operating temperature |
|----------------|-----------------------------------|-------------------|--------------------------------------|------------------|-----------------------|----------------------------|-----------------------|-----------------------|
| | C ₀ rad | C ₀ ax | | | | | | |
| 22-28-35-43-63 | 44247 | 30973 | 61688 | 1013 | 1970 | 0,8 | +++ | -20°C/+170°C |
| 22-28-35-43-63 | 7198 | 3062 | 26338 | 2026 | 1970 | 0,8 | +++ | -20°C/+170°C |
| 28-35-43-63 | 12832 | | 14483 | 2026 | 1970 | 0,8 | ++++ | -20°C/+110°C |
| 28-35-43-63 | 5672 | | 16063 | 3039 | 1970 | 0,8 | ++++ | -20°C/+110°C |
| 43 | 5529 | 2075 | 14885 | 2028 | 1970 | 0,8 | +++ | -20°C/+110°C |
| 22-28-35-43 | 1331 | 1279 | 14483 | 2026 | 1970 | 0,8 | + | -20°C/+170°C |
| 63 | 19812 | | 30595 | 2266 | 2210 | 0,8 | ++++ | -20°C/+110°C |
| 43 | 2860 | | 6053 | 1980 | 1970 | 0,8 | +++ | -20°C/+110°C |
| 30-45 | 1673 | | *** | 1522 | 1500 | 0,3 | ++ | -20°C/+170°C |
| 44 | 648 | | 1000 | 1010 | 1000 | 0,3 | + | -20°C/+170°C |
| 38 | 175 | 50 | *** | 373 | 473 | 0,5 | + | +10°C/+40°C |
| 46-57-58-70 | 650 | 115 | *** | 1100 | 1100 | 0,5 | + | +10°C/+40°C |
| 27 | 350 | 50 | *** | 576 | 550 | 0,5 | + | -30°C/+200°C |
| 30 | 360 | | *** | 1120 | 1040 | 0,8 | + | -20°C/+100°C |

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ROLLON[®]
Linear Evolution

Telescopic Rail



Product explanation



> Telescopic Rail: Seven models with full and partial extension



Fig. 1

The Telescopic Rail product line is made up of seven models with full and partial extension and various cross-sections and intermediate elements in S-shape, I-beam or square. High loads in combination with cost-efficiency and free movement have long been the outstanding properties of the Telescopic Rail product line.

The most important characteristics:

- High load capacity with low deflection
- Rigid intermediate elements
- Standardized hole locations
- Zero-play running even with maximum load
- Space saving design
- High reliability

Preferred areas of application of the Telescopic Rail product family:

- Railcars (e. g. maintenance and battery extensions, doors)
- Construction and machine technology (e.g., housings and doors)
- Logistics (e.g., extensions for containers or gripper movements)
- Automotive technology
- Packaging machines
- Beverage industry
- Special machines

ASN

Partially extending telescopic rail consisting of a guide rail and a slider. This compact and simple design allows for very high load capacities. When the guide rail is mounted to a structure a very high rigidity system is created.



Fig. 2

DS

Fully extending telescopic rail consisting of a fixed guide rail, an identical moving guide rail, and an S-shaped intermediate element. This has a high moment of inertia and high rigidity in a slim size. This results in a high loading capacity with low deflection in the extended state.

The DS series is available in three different designs: DSS version with single direction stroke. DSB version with single direction stroke, and locking capability in the extended state, and the DSD version with double direction stroke.

...S version available with reinforced and damped stainless steel end stops.



Fig. 3

DSE

Telescopic rail with a 150% extension of its length, made by four elements. It has a high rigidity, thanks to the intermediate elements with a high moment of inertia, in a streamlined shape.

This results in a high load capacity, with reduced bending even when the telescopic guide is fully extended.



Fig. 4

DSC

Fully extending telescopic rail consisting of a compact and flexurally rigid intermediate element that connects two different sized guide rails with each other as a fixed and moving element.

This design makes it possible to reduce all components to the necessary size and length for achieving the full stroke. The DSC series features high rigidity and a high load capacity in a compact size. This results in an optimal combination of performance and weight reduction.



Fig. 5

DE

Fully extending telescopic rail consisting of two guide rails, which are mounted on an I-beam profile to form the intermediate element, one moveable slider and one fixed slider which mounts onto the structure. The square cross-section allows a compact size with high load capacities and low deflection, especially with radial loading. Also available with a double stroke design, which includes an eccentrically located driving disc for simultaneous movement. For double sided extensions, a dedicated DE...D version is available with a driving disc.

...S version available with reinforced and damped stainless steel end stops.



Fig. 6

DBN

Fully extending telescopic rail consisting of two guide rails, one which is fixed to a structure, and one which is moveable, and two sliders which are mounted together and form the intermediate element. The size is similar to the DE series and offers good protection from contamination of the ballcage.



Fig. 7

DMS

Heavy load telescopic consisting of elements from the ASN series and an extremely rigid I-beam profile as the intermediate element. This fully extending telescopic rail is used to accept very heavy loads with low deflection.



Fig. 8

DRT

Fully extending telescopic rail on a roller slide base consisting of the S-shaped intermediate element from the DS series, and elements of the proven Compact Rail roller slider system. The use of roller sliders instead of a linear bearing as the load accepting element, enables a large resistance to contamination and an extremely quiet motion.



Fig. 9

Technical data

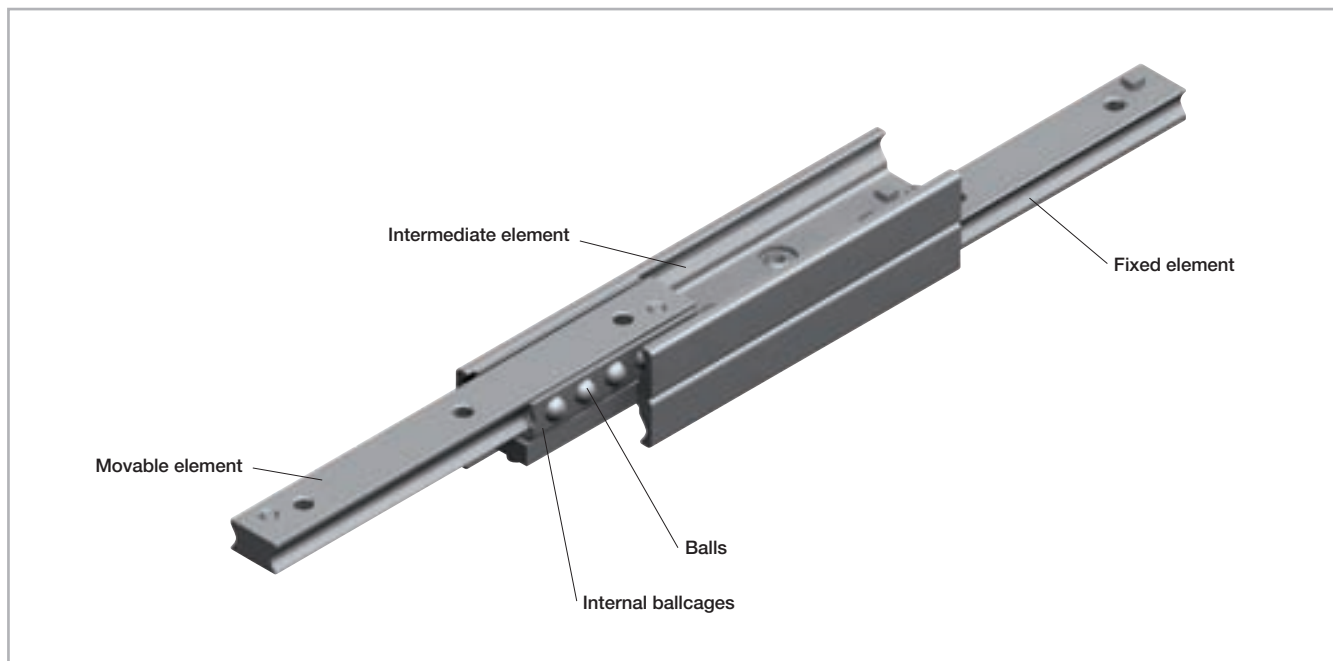


Fig. 10

Performance characteristics:

- Available sizes ASN / DE: 22, 28, 35, 43, 63
- Available sizes DS: 28, 35, 43, 63
- Available sizes DSE: 28, 35, 43, 63
- Available sizes DSC: 43
- Available sizes DBN: 22, 28, 35, 43
- Available size DMS: 63
- Available size DRT: 43
- Induction hardened raceways
- Rails and sliders made of cold-drawn roller bearing carbon steel
- Balls made of hardened roller bearing carbon steel
- Max. operating speed: 0.8 m/s (31.5 in/s)
(depending on application)
- ASN, DE, DBN, temperature range: -20 °C to +170 °C (-4 °F to +338 °F), DS, DSE, DSC, DRT: -20 °C to +110 °C (-4 °F to +230 °F)
- Electrolytic galvanised as per ISO 2081, increased anticorrosive protection on request (see pg. TR-43 Anticorrosive protection)

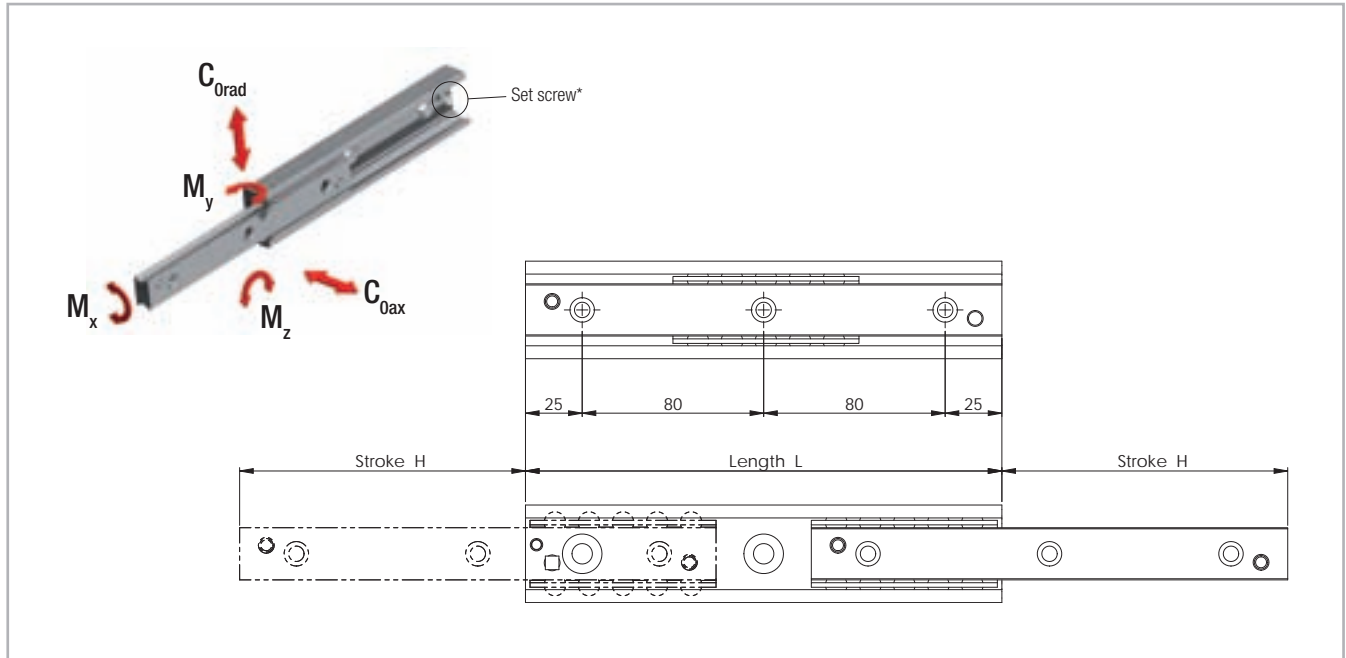
Remarks:

- Horizontal movement installation is recommended
- Vertical movement installation on request
- External end stops are recommended
- Double-sided stroke in ASN, DSD, DE, DBN series (DMS on request)
- Custom strokes on request
- All load capacity data is based on one telescopic rail
- All load capacity data is based on continuous operation
- Calculation of the service life is based exclusively on the loaded rows of balls
- For models DMS, DRT, DSB, and DSE, please observe right or left side use
- DRT 43 must be fixed with Torx® screws (custom design, included in delivery) ASN 63 and DMS 63 can be fixed with Torx® screws as an alternative
- Fixing screws of property class 10.9 must be used for all telescopic rails
- Internal stops are used to stop the unloaded slider and the ball cage. Please use external stops as end stops for a loaded system

Dimensions and load capacity



> ASN



* Remove the set screw to reach all the fixing holes. See also assembly instructions on page TR-45f.

Fig. 11

| Type | Size | Length L [mm] | Stroke H [mm] | Load capacities and moments* | | | | | No. of holes |
|------|------|---------------|---------------|------------------------------|---------------|------------|------------|------------|--------------|
| | | | | C_{0rad} [N] | C_{0ax} [N] | M_x [Nm] | M_y [Nm] | M_z [Nm] | |
| ASN | 22 | 130 | 76 | 313 | 219 | 5,7 | 10 | 15 | 2 |
| | | 210 | 111 | 715 | 501 | 10,7 | 36 | 51 | 3 |
| | | 290 | 154 | 994 | 696 | 14,9 | 69 | 99 | 4 |
| | | 370 | 196 | 1278 | 895 | 19 | 113 | 162 | 5 |
| | | 450 | 231 | 1701 | 1190 | 24 | 180 | 258 | 6 |
| | | 530 | 274 | 1979 | 1385 | 28,2 | 248 | 355 | 7 |
| | | 610 | 316 | 2262 | 1584 | 32,3 | 327 | 467 | 8 |
| | | 690 | 351 | 2689 | 1882 | 37,3 | 436 | 623 | 9 |
| | | 770 | 394 | 2967 | 2077 | 41,5 | 539 | 769 | 10 |

* The given load capacities and weights apply for a single extension

Tab. 1

| Type | Size | Length L [mm] | Stroke H [mm] | Load capacities and moments* | | | | | No. of holes |
|------|------|---------------|---------------|------------------------------|---------------|------------|------------|------------|--------------|
| | | | | C_{0rad} [N] | C_{0ax} [N] | M_x [Nm] | M_y [Nm] | M_z [Nm] | |
| ASN | 28 | 130 | 74 | 613 | 429 | 15,3 | 20 | 28 | 2 |
| | | 210 | 116 | 1116 | 781 | 26,1 | 57 | 82 | 3 |
| | | 290 | 148 | 1934 | 1354 | 39,6 | 132 | 188 | 4 |
| | | 370 | 190 | 2445 | 1711 | 50,4 | 213 | 305 | 5 |
| | | 450 | 232 | 2955 | 2069 | 61,2 | 314 | 449 | 6 |
| | | 530 | 274 | 3466 | 2426 | 72 | 435 | 621 | 7 |
| | | 610 | 316 | 3976 | 2783 | 82,8 | 575 | 821 | 8 |
| | | 690 | 358 | 4487 | 3141 | 93,6 | 735 | 1050 | 9 |
| | | 770 | 400 | 4997 | 3498 | 104,4 | 914 | 1306 | 10 |
| | | 850 | 433 | 5828 | 4080 | 117,9 | 1165 | 1665 | 11 |
| | | 930 | 475 | 6338 | 4436 | 128,7 | 1389 | 1984 | 12 |
| | | 1010 | 517 | 6848 | 4793 | 139,5 | 1631 | 2330 | 13 |
| | | 1090 | 559 | 7358 | 5150 | 150,3 | 1894 | 2705 | 14 |
| 1170 | 601 | 7868 | 5507 | 161,1 | 2175 | 3108 | 15 | | |
| | | | | | | | | | |
| ASN | 35 | 210 | 127 | 1065 | 746 | 29,4 | 57 | 82 | 3 |
| | | 290 | 159 | 2060 | 1442 | 46,9 | 146 | 208 | 4 |
| | | 370 | 203 | 2638 | 1847 | 59,9 | 238 | 340 | 5 |
| | | 450 | 247 | 3217 | 2252 | 73 | 354 | 505 | 6 |
| | | 530 | 279 | 4282 | 2997 | 90,4 | 543 | 775 | 7 |
| | | 610 | 323 | 4858 | 3401 | 103,5 | 711 | 1015 | 8 |
| | | 690 | 367 | 5435 | 3804 | 116,6 | 902 | 1288 | 9 |
| | | 770 | 399 | 6521 | 4565 | 134 | 1191 | 1702 | 10 |
| | | 850 | 443 | 7095 | 4966 | 147,1 | 1435 | 2050 | 11 |
| | | 930 | 487 | 7669 | 5368 | 160,2 | 1702 | 2431 | 12 |
| | | 1010 | 519 | 8765 | 6136 | 177,6 | 2092 | 2989 | 13 |
| | | 1090 | 563 | 9337 | 6536 | 190,7 | 2412 | 3445 | 14 |
| | | 1170 | 607 | 9909 | 6937 | 203,8 | 2754 | 3934 | 15 |
| | | 1250 | 639 | 11012 | 7708 | 221,2 | 3245 | 4636 | 16 |
| | | 1330 | 683 | 11582 | 8107 | 234,3 | 3640 | 5200 | 17 |
| 1410 | 727 | 12153 | 8507 | 247,4 | 4058 | 5797 | 18 | | |
| 1490 | 759 | 13260 | 9282 | 264,8 | 4650 | 6643 | 19 | | |

* The given load capacities and weights apply for a single extension

Tab. 2

3 Dimensions and load capacity

| Type | Size | Length L [mm] | Stroke H [mm] | Load capacities and moments* | | | | | No. of holes | |
|------|------|---------------|---------------|------------------------------|----------------------|------------|------------|------------|--------------|------|
| | | | | C_{grad} [N] | C_{Oax} [N] | M_x [Nm] | M_y [Nm] | M_z [Nm] | | |
| ASN | 43 | 210 | 123 | 1595 | 1117 | 60.6 | 84 | 120 | 3 | |
| | | 290 | 158 | 2872 | 2010 | 93.8 | 201 | 288 | 4 | |
| | | 370 | 208 | 3377 | 2364 | 115.9 | 308 | 440 | 5 | |
| | | 450 | 243 | 4690 | 3283 | 149.2 | 509 | 728 | 6 | |
| | | 530 | 278 | 6039 | 4227 | 182.4 | 762 | 1088 | 7 | |
| | | 610 | 313 | 7411 | 5188 | 215.6 | 1064 | 1521 | 8 | |
| | | 690 | 363 | 7863 | 5504 | 237.8 | 1294 | 1849 | 9 | |
| | | 770 | 398 | 9232 | 6463 | 271 | 1681 | 2402 | 10 | |
| | | 850 | 433 | 10615 | 7431 | 304.2 | 2119 | 3027 | 11 | |
| | | 930 | 483 | 11054 | 7738 | 326.4 | 2439 | 3484 | 12 | |
| | | 1010 | 518 | 12434 | 8704 | 359.6 | 2961 | 4230 | 13 | |
| | | 1090 | 568 | 12877 | 9014 | 381.8 | 3337 | 4767 | 14 | |
| | | 1170 | 603 | 14254 | 9978 | 415 | 3943 | 5633 | 15 | |
| | | 1250 | 638 | 15638 | 10947 | 448.2 | 4599 | 6571 | 16 | |
| | | 1330 | 688 | 16075 | 11252 | 470.4 | 5065 | 7236 | 17 | |
| | | 1410 | 723 | 17456 | 12219 | 503.6 | 5806 | 8295 | 18 | |
| | | 1490 | 758 | 18845 | 13191 | 536.8 | 6598 | 9425 | 19 | |
| | | 1570 | 793 | 20238 | 14167 | 570.1 | 7440 | 10628 | 20 | |
| | | 1650 | 843 | 20661 | 14463 | 592.2 | 8029 | 11470 | 21 | |
| | | 1730 | 878 | 22052 | 15436 | 625.5 | 8956 | 12794 | 22 | |
| | | 1810 | 928 | 22479 | 15736 | 647.6 | 9601 | 13716 | 23 | |
| | | 1890 | 963 | 23867 | 16707 | 680.8 | 10612 | 15160 | 24 | |
| | | 1970 | 1013 | 24298 | 17009 | 703 | 11314 | 16162 | 25 | |
| | | | | | | | | | | |
| | | ASN | 63 | 610 | 333 | 10591 | 7414 | 474 | 1553 | 2219 |
| 690 | 373 | | | 12534 | 8774 | 547.5 | 2072 | 2960 | 9 | |
| 770 | 413 | | | 14489 | 10142 | 621 | 2666 | 3808 | 10 | |
| 850 | 453 | | | 16452 | 11516 | 694.5 | 3334 | 4763 | 11 | |
| 930 | 493 | | | 18421 | 12895 | 768 | 4077 | 5824 | 12 | |
| 1010 | 533 | | | 20395 | 14277 | 841.4 | 4894 | 6992 | 13 | |
| 1090 | 573 | | | 22373 | 15661 | 914.9 | 5787 | 8267 | 14 | |
| 1170 | 613 | | | 24354 | 17048 | 988.4 | 6754 | 9648 | 15 | |
| 1250 | 653 | | | 26337 | 18436 | 1061.9 | 7795 | 11136 | 16 | |
| 1330 | 693 | | | 28322 | 19825 | 1135.4 | 8912 | 12731 | 17 | |
| 1410 | 733 | | | 30309 | 21216 | 1208.9 | 10102 | 14432 | 18 | |
| 1490 | 773 | | | 32297 | 22608 | 1282.4 | 11368 | 16240 | 19 | |
| 1570 | 813 | | | 34287 | 24001 | 1355.9 | 12708 | 18155 | 20 | |
| 1650 | 853 | | | 36277 | 25394 | 1429.4 | 14123 | 20176 | 21 | |
| 1730 | 893 | | | 38268 | 26788 | 1502.8 | 15613 | 22304 | 22 | |
| 1810 | 933 | | | 40261 | 28182 | 1576.3 | 17177 | 24539 | 23 | |
| 1890 | 973 | | | 42253 | 29577 | 1649.8 | 18816 | 26880 | 24 | |
| 1970 | 1013 | 44247 | 30973 | 1723.3 | 20530 | 29328 | 25 | | | |

Tab. 3

* The given load capacities and weights apply for a single extension

> ASN

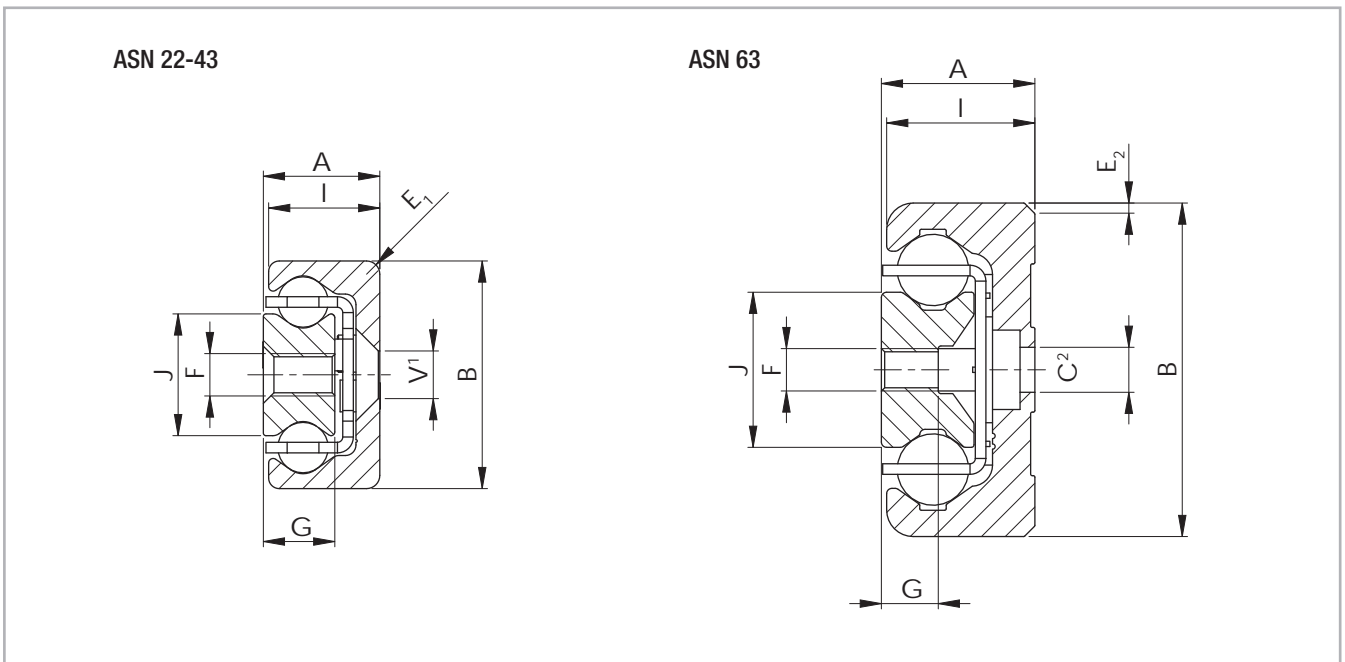


Fig. 12

¹ Fixing holes (V) for countersunk head screws according to DIN 7991

² Fixing holes (C) for socket cap screws according to DIN 7984. Alternative fixing with Torx® screws in special design with low head (on request)

| Type | Size | Cross-section | | | | | | | | | | Weight [kg/m] |
|------|------|---------------|--------|--------|--------|--------|---------------------|--------------------|----|----|----|---------------|
| | | A [mm] | B [mm] | I [mm] | J [mm] | G [mm] | E ₁ [mm] | E ₂ [°] | V | C | F | |
| ASN | 22 | 11 | 22 | 10.25 | 11.3 | 6.5 | 3 | - | M4 | - | M4 | 1.32 |
| | 28 | 13 | 28 | 12.25 | 15 | 7.5 | 1 | - | M5 | - | M5 | 2.02 |
| | 35 | 17 | 35 | 16 | 15.8 | 10 | 2 | - | M6 | - | M6 | 3.05 |
| | 43 | 22 | 43 | 21 | 23 | 13.5 | 2.5 | - | M8 | - | M8 | 5.25 |
| | 63 | 29 | 63 | 28 | 29.3 | 10.5 | - | 2 x 45 | - | M8 | M8 | 10.30 |

Tab. 4

> DSS

DSS with one-sided extension (single stroke)

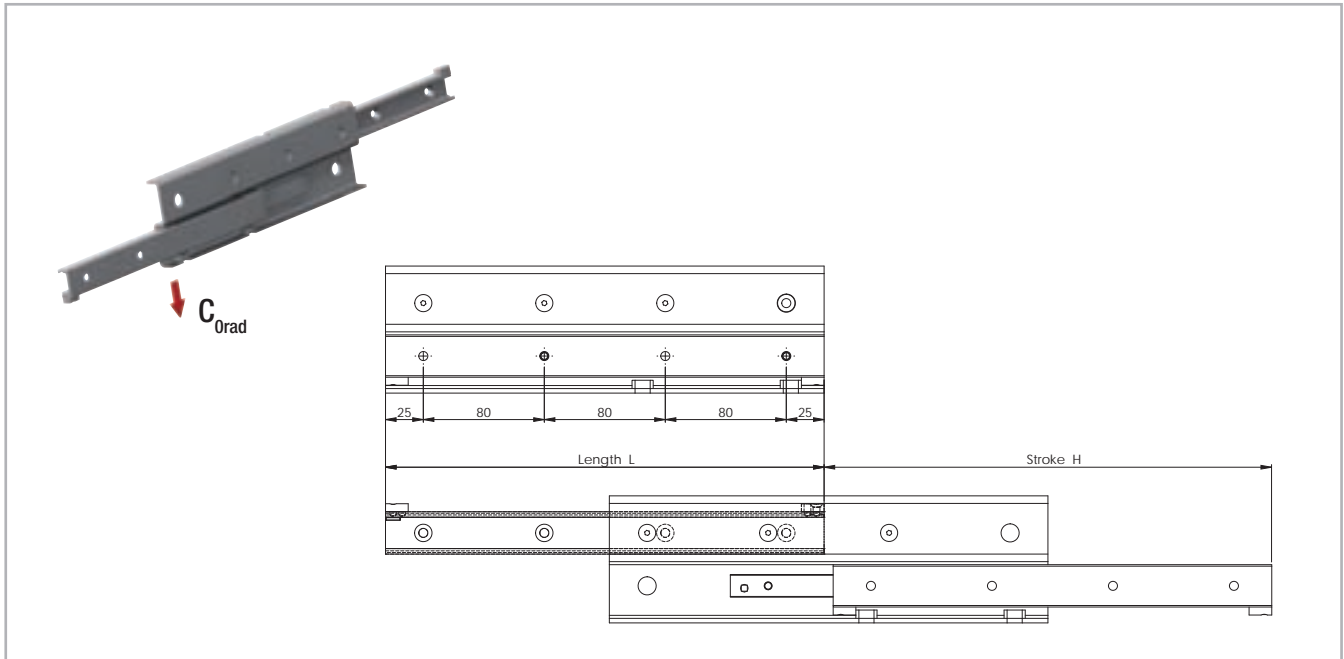


Fig. 13

| Type | Size | Length L [mm] | Stroke H [mm] | Load capacity* C_{Orad} [N] | Accessible holes / total |
|------|------|---------------|---------------|-------------------------------|--------------------------|
| DSS | 28 | 290 | 296 | 570 | 3 / 4 |
| | | 370 | 380 | 769 | 4 / 5 |
| | | 450 | 464 | 969 | 4 / 6 |
| | | 530 | 548 | 1170 | 6 / 7 |
| | | 610 | 630 | 1376 | 6 / 8 |
| | | 690 | 714 | 1577 | 7 / 9 |
| | | 770 | 798 | 1778 | 7 / 10 |
| | | 850 | 864 | 2111 | 9 / 11 |
| | | 930 | 950 | 2240 | 9 / 12 |
| | | 1010 | 1034 | 2054 | 10 / 13 |
| | | 1090 | 1118 | 1896 | 10 / 14 |
| | | 1170 | 1202 | 1761 | 12 / 15 |
| | | 1250 | 1266 | 1695 | 12 / 16 |

* The given load capacities and weights apply for a single extension

Tab. 5

| Type | Size | Length L [mm] | Stroke H [mm] | Load capacity* C_{Orad} [N] | Accessible holes / total |
|------|------|---------------|---------------|-------------------------------|--------------------------|
| DSS | 35 | 450 | 494 | 1250 | 5 / 6 |
| | | 530 | 558 | 1685 | 6 / 7 |
| | | 610 | 646 | 1908 | 6 / 8 |
| | | 690 | 734 | 2132 | 7 / 9 |
| | | 770 | 798 | 2579 | 8 / 10 |
| | | 850 | 886 | 2801 | 9 / 11 |
| | | 930 | 974 | 3024 | 9 / 12 |
| | | 1010 | 1038 | 3476 | 10 / 13 |
| | | 1090 | 1126 | 3508 | 11 / 14 |
| | | 1170 | 1214 | 3240 | 12 / 15 |
| | | 1250 | 1278 | 3121 | 12 / 16 |
| | | 1330 | 1366 | 2907 | 13 / 17 |
| | | 1410 | 1454 | 2721 | 14 / 18 |
| | | 1490 | 1518 | 2636 | 15 / 19 |
| | | 1570 | 1606 | 2482 | 15 / 20 |
| | | 1650 | 1694 | 2345 | 16 / 21 |
| | | 1730 | 1758 | 2282 | 17 / 22 |

* The given load capacities and weights apply for a single extension

Tab. 6

| Type | Size | Length L [mm] | Stroke H [mm] | Load capacity* C_{Orad} [N] | Accessible holes / total |
|------|------|---------------|---------------|-------------------------------|--------------------------|
| DSS | 43 | 530 | 556 | 2061 | 6 / 7 |
| | | 610 | 626 | 2603 | 6 / 8 |
| | | 690 | 726 | 2775 | 7 / 9 |
| | | 770 | 796 | 3319 | 7 / 10 |
| | | 850 | 866 | 3873 | 9 / 11 |
| | | 930 | 966 | 4036 | 9 / 12 |
| | | 1010 | 1036 | 4590 | 10 / 13 |
| | | 1090 | 1106 | 4908 | 10 / 14 |
| | | 1170 | 1206 | 4610 | 12 / 15 |
| | | 1250 | 1276 | 4398 | 12 / 16 |
| | | 1330 | 1376 | 4027 | 13 / 17 |
| | | 1410 | 1446 | 3864 | 14 / 18 |
| | | 1490 | 1516 | 3713 | 15 / 19 |
| | | 1570 | 1616 | 3445 | 15 / 20 |
| | | 1650 | 1686 | 3325 | 16 / 21 |
| | | 1730 | 1756 | 3213 | 17 / 22 |
| | | 1810 | 1856 | 3011 | 18 / 23 |
| 1890 | 1926 | 2919 | 18 / 24 | | |
| 1970 | 2026 | 2750 | 19 / 25 | | |

* The given load capacities and weights apply for a single extension

Tab. 7

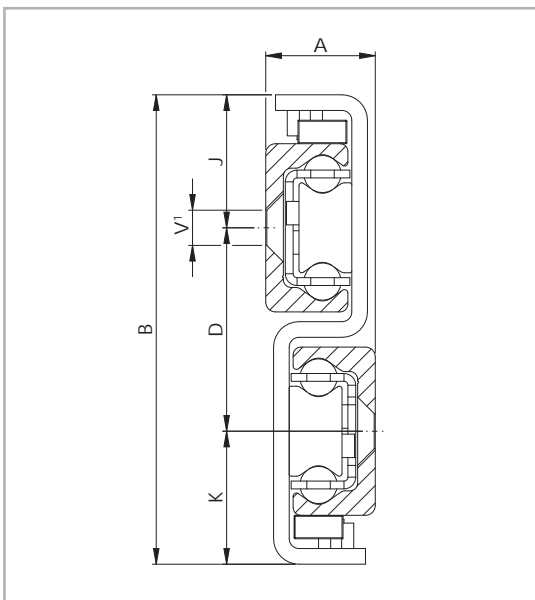
| Type | Size | Length L [mm] | Stroke H [mm] | Load capacity* C_{Orad} [N] | Accessible holes / total |
|------|------|---------------|---------------|-------------------------------|--------------------------|
| DSS | 63 | 610 | 666 | 3502 | 6 / 8 |
| | | 690 | 746 | 4252 | 8 / 9 |
| | | 770 | 826 | 5012 | 8 / 10 |
| | | 850 | 906 | 5780 | 9 / 11 |
| | | 930 | 986 | 6552 | 9 / 12 |
| | | 1010 | 1066 | 7329 | 11 / 13 |
| | | 1090 | 1146 | 8109 | 11 / 14 |
| | | 1170 | 1226 | 8892 | 12 / 15 |
| | | 1250 | 1306 | 9677 | 12 / 16 |
| | | 1330 | 1386 | 10464 | 14 / 17 |
| | | 1410 | 1466 | 11252 | 14 / 18 |
| | | 1490 | 1546 | 12041 | 15 / 19 |
| | | 1570 | 1626 | 12832 | 15 / 20 |
| | | 1650 | 1706 | 12364 | 17 / 21 |
| | | 1730 | 1786 | 11827 | 17 / 22 |
| | | 1810 | 1866 | 11334 | 18 / 23 |
| | | 1890 | 1946 | 10881 | 18 / 24 |
| 1970 | 2026 | 10463 | 20 / 25 | | |

* The given load capacities and weights apply for a single extension

Tab. 8

> DSS

DSS with one-sided extension (single stroke)



¹ Fixing holes (V) for countersunk head screws according to DIN 7991 Fig. 14

| Type | Size | Cross-section | | | | | | Weight [kg/m] |
|------|------|---------------|--------|--------|--------|--------|-----|---------------|
| | | A [mm] | B [mm] | K [mm] | D [mm] | J [mm] | V | |
| DSS | 28 | 17 | 84 | 24,5 | 35 | 24,5 | M5 | 6,40 |
| | 35 | 22,5 | 104 | 30,5 | 43 | 30,5 | M6 | 10,10 |
| | 43 | 28 | 120 | 34 | 52 | 34 | M8 | 14,60 |
| | 63 | 40 | 208 | 64 | 80 | 64 | M10 | 32,60 |

Tab. 9

> DSS...S

...S version with reinforced and damped stainless steel end stops

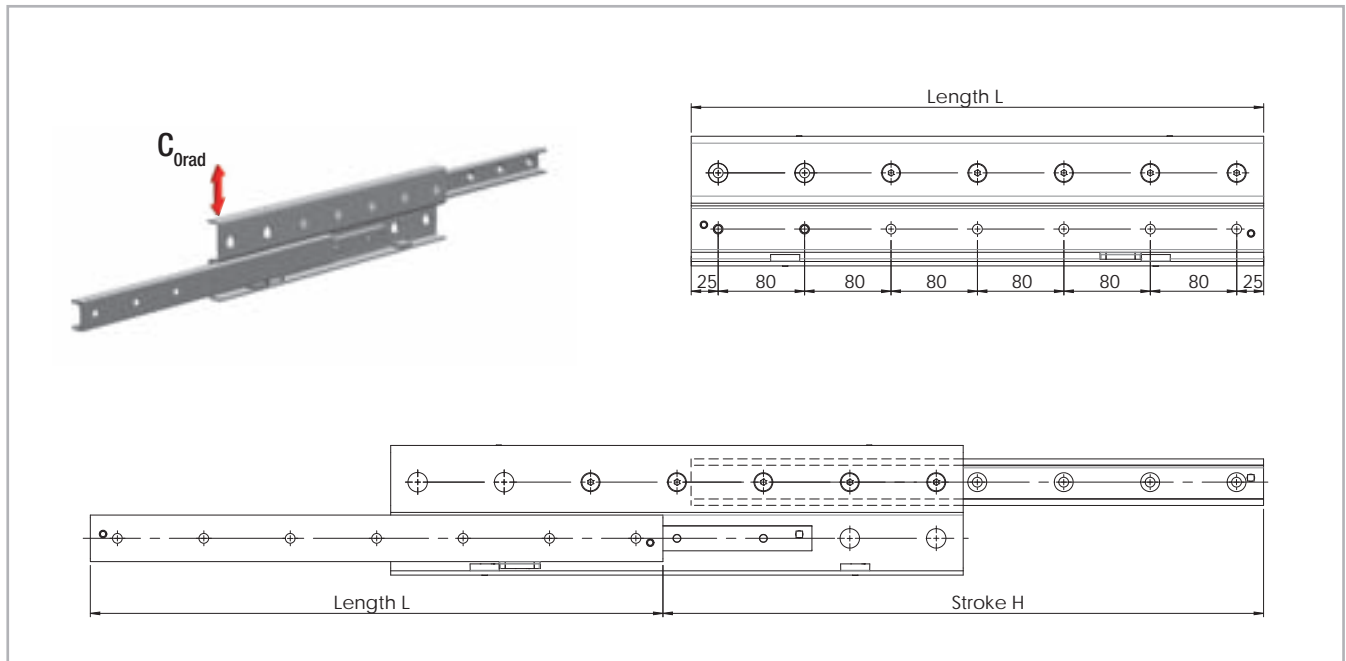


Fig. 15

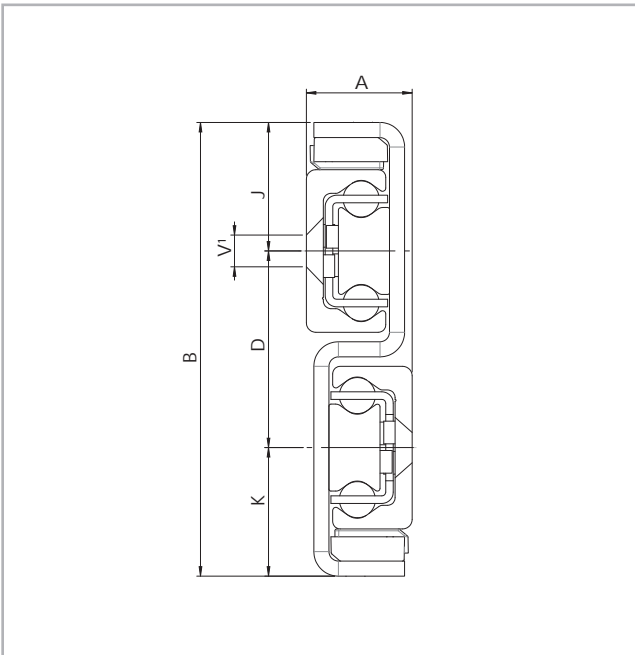
| Type | Size | Length L [mm] | Stroke H [mm] | Load capacity* C_{Orad} [N] | Accessible holes / total |
|---------|------|---------------|---------------|-------------------------------|--------------------------|
| DSS...S | 43 | 530 | 556 | 2061 | 6 / 7 |
| | | 610 | 626 | 2603 | 6 / 8 |
| | | 690 | 726 | 2775 | 7 / 9 |
| | | 770 | 796 | 3319 | 7 / 10 |
| | | 850 | 866 | 3873 | 9 / 11 |
| | | 930 | 966 | 4036 | 9 / 12 |
| | | 1010 | 1036 | 4590 | 10 / 13 |
| | | 1090 | 1106 | 5104 | 10 / 14 |
| | | 1170 | 1206 | 4610 | 12 / 15 |
| | | 1250 | 1276 | 4398 | 12 / 16 |
| | | 1330 | 1376 | 4027 | 13 / 17 |
| | | 1410 | 1446 | 3864 | 14 / 18 |
| | | 1490 | 1516 | 3713 | 15 / 19 |
| | | 1570 | 1616 | 3445 | 15 / 20 |
| | | 1650 | 1686 | 3325 | 16 / 21 |
| | | 1730 | 1756 | 3213 | 17 / 22 |
| | | 1810 | 1856 | 3011 | 18 / 23 |
| 1890 | 1926 | 2919 | 18 / 24 | | |
| 1970 | 2026 | 2750 | 19 / 25 | | |

* The given load capacities and weights apply for a single extension

Tab. 10

> DSS...S

...S version with reinforced and damped stainless steel end stops



¹ Fixing holes (V) for countersunk head screws according to DIN 7991

Fig. 16

| Type | Size | Cross-section | | | | | | Weight [kg/m] |
|---------|------|---------------|--------|--------|--------|--------|----|---------------|
| | | A [mm] | B [mm] | K [mm] | D [mm] | J [mm] | V | |
| DSS...S | 43 | 28 | 120 | 34 | 52 | 34 | M8 | 14.60 |

Tab. 11

> DSB

B version with locking system for closed position

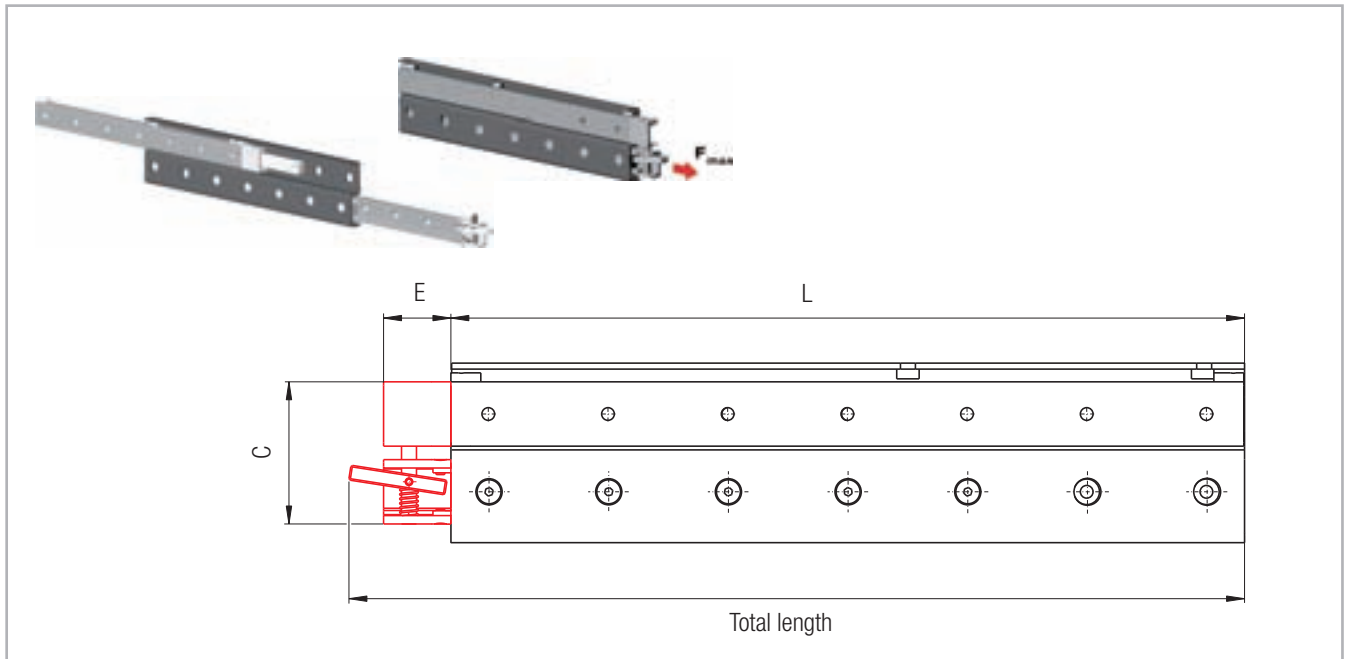


Fig. 17

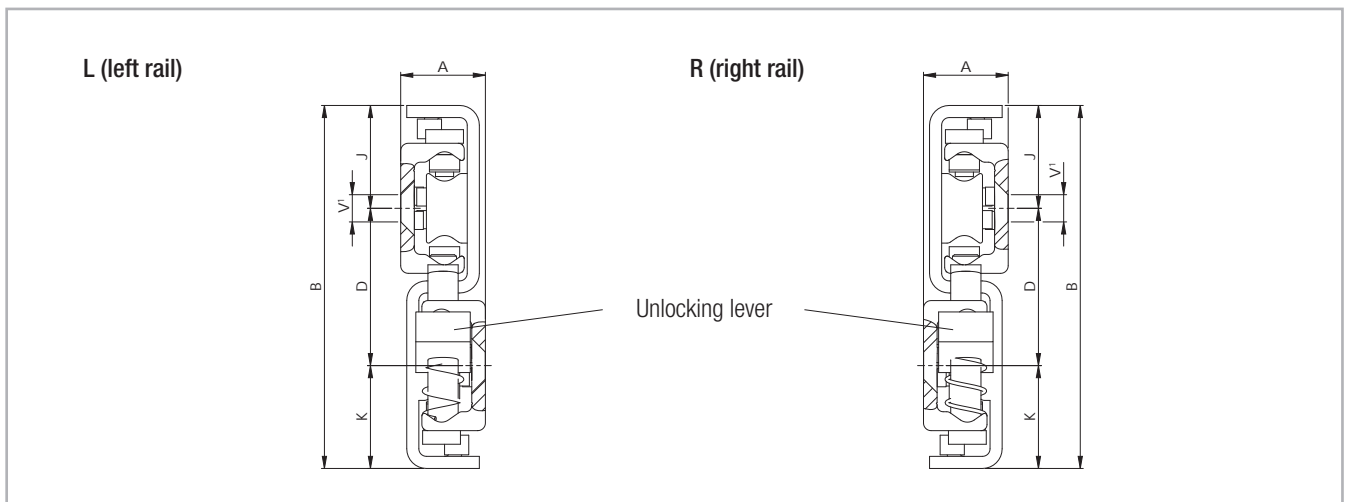


Fig. 18

¹ Fixing holes (V) for countersunk head screws according to DIN 7991

The DSB is built on the DSS design. The same load capacities, cross-sections and available rail lengths apply (see pg. TR-10ff). Data in Table 10 are based on the special features of the locking mechanism.

Please observe right or left installation for version DSB. The maximum load on the locking in the extension direction is indicated by F_{max} .

| Type | Size | L [mm] | Total length [mm] | C [mm] | E [mm] | F_{max} [N] | Weight [kg/m] |
|------|------|-------------------|-------------------|--------|--------|---------------|---------------|
| DSB | 28 | from 290 to 1490* | L + 52 | 63 | 35 | 2460 | 6.51 |
| | 35 | from 450 to 1730* | L + 53 | 78 | 33 | 3000 | 10.4 |
| | 43 | from 530 to 1970* | L + 69 | 95 | 45 | 5630 | 14.98 |

* for available lengths, see pg. TR-10, tab. 5 and 7 (DSS)

Tab. 12

> DSD

DSD with double direction stroke (double stroke)

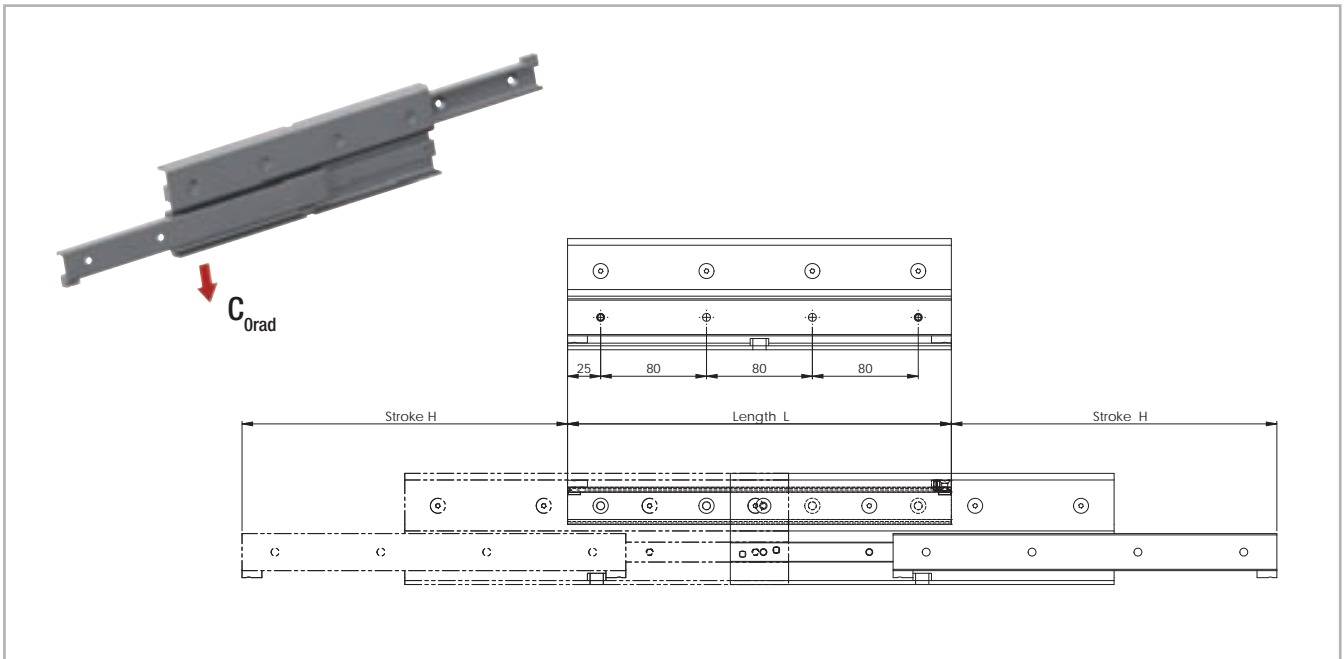


Fig. 19

| Type | Size | Length L [mm] | Stroke H [mm] | Load capacity* C _{0rad} [N] | Accessible holes / total |
|------|------|---------------|---------------|--------------------------------------|--------------------------|
| DSD | 28 | 290 | 246 | 895 | 4 / 4 |
| | | 370 | 326 | 1105 | 4 / 5 |
| | | 450 | 406 | 1317 | 6 / 6 |
| | | 530 | 486 | 1626 | 6 / 7 |
| | | 610 | 566 | 1837 | 8 / 8 |
| | | 690 | 646 | 2050 | 8 / 9 |
| | | 770 | 726 | 2262 | 10 / 10 |
| | | 850 | 806 | 2475 | 10 / 11 |
| | | 930 | 886 | 2581 | 12 / 12 |
| | | 1010 | 966 | 2357 | 12 / 13 |
| | | 1090 | 1046 | 2168 | 14 / 14 |
| | | 1170 | 1126 | 2008 | 14 / 15 |
| | | 1250 | 1206 | 1870 | 16 / 16 |
| | | 1330 | 1286 | 1749 | 16 / 17 |
| 1410 | 1366 | 1644 | 18 / 18 | | |
| 1490 | 1446 | 1550 | 18 / 19 | | |

* The given load capacities and weights apply for a single extension

Tab. 13

| Type | Size | Length L [mm] | Stroke H [mm] | Load capacity* C _{0rad} [N] | Accessible holes / total |
|------|------|---------------|---------------|--------------------------------------|--------------------------|
| DSD | 35 | 450 | 350 | 3025 | 4 / 6 |
| | | 530 | 430 | 3191 | 6 / 7 |
| | | 610 | 510 | 3381 | 6 / 8 |
| | | 690 | 590 | 3800 | 8 / 9 |
| | | 770 | 670 | 4008 | 8 / 10 |
| | | 850 | 750 | 4223 | 10 / 11 |
| | | 930 | 830 | 4646 | 10 / 12 |
| | | 1010 | 910 | 4868 | 12 / 13 |
| | | 1090 | 990 | 4580 | 12 / 14 |
| | | 1170 | 1070 | 4202 | 14 / 15 |
| | | 1250 | 1150 | 3882 | 14 / 16 |
| | | 1330 | 1230 | 3607 | 16 / 17 |
| | | 1410 | 1310 | 3369 | 16 / 18 |
| | | 1490 | 1390 | 3160 | 18 / 19 |
| | | 1570 | 1470 | 2975 | 18 / 20 |
| | | 1650 | 1550 | 2811 | 20 / 21 |
| | | 1730 | 1630 | 2664 | 20 / 22 |

* The given load capacities and weights apply for a single extension

Tab. 14

| Type | Size | Length L [mm] | Stroke H [mm] | Load capacity* C_{0rad} [N] | Accessi-ble holes / total |
|------|------|---------------|---------------|----------------------------------|---------------------------|
| DSD | 43 | 530 | 476 | 3018 | 6 / 7 |
| | | 610 | 556 | 3265 | 8 / 8 |
| | | 690 | 636 | 3781 | 8 / 9 |
| | | 770 | 716 | 4297 | 10 / 10 |
| | | 850 | 796 | 4547 | 10 / 11 |
| | | 930 | 876 | 5063 | 12 / 12 |
| | | 1010 | 956 | 5578 | 12 / 13 |
| | | 1090 | 1036 | 5830 | 14 / 14 |
| | | 1170 | 1116 | 5392 | 14 / 15 |
| | | 1250 | 1196 | 5014 | 16 / 16 |
| | | 1330 | 1276 | 4686 | 16 / 17 |
| | | 1410 | 1356 | 4398 | 18 / 18 |
| | | 1490 | 1436 | 4143 | 18 / 19 |
| | | 1570 | 1516 | 3917 | 20 / 20 |
| | | 1650 | 1596 | 3713 | 20 / 21 |
| | | 1730 | 1676 | 3530 | 22 / 22 |
| | | 1810 | 1756 | 3364 | 22 / 23 |
| 1890 | 1836 | 3213 | 24 / 24 | | |
| 1970 | 1916 | 3075 | 24 / 25 | | |

* The given load capacities and weights apply for a single extension

Tab. 15

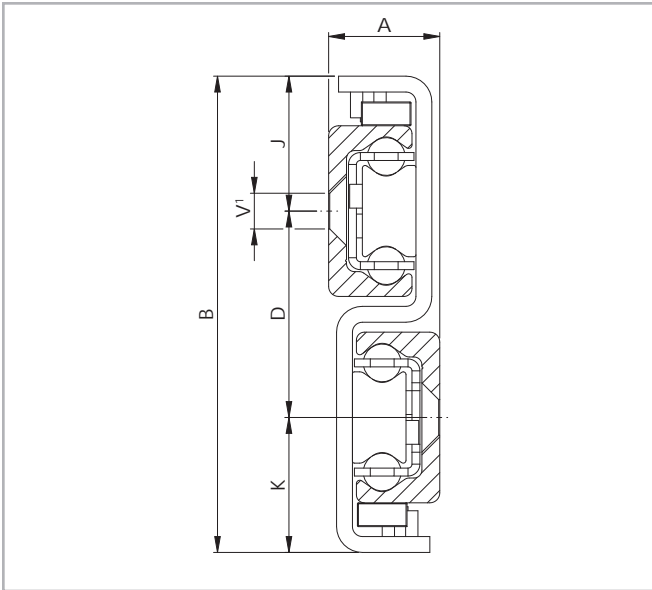
| Type | Size | Length L [mm] | Stroke H [mm] | Load capacity* C_{0rad} [N] | Accessi-ble holes / total |
|------|------|---------------|---------------|----------------------------------|---------------------------|
| DSD | 63 | 610 | 398 | 11858 | 6 / 8 |
| | | 690 | 478 | 12242 | 6 / 9 |
| | | 770 | 558 | 12717 | 8 / 10 |
| | | 850 | 638 | 13250 | 8 / 11 |
| | | 930 | 718 | 13823 | 10 / 12 |
| | | 1010 | 798 | 14424 | 10 / 13 |
| | | 1090 | 878 | 15046 | 12 / 14 |
| | | 1170 | 958 | 15684 | 12 / 15 |
| | | 1250 | 1038 | 16334 | 14 / 16 |
| | | 1330 | 1118 | 16994 | 14 / 17 |
| | | 1410 | 1198 | 17661 | 16 / 18 |
| | | 1490 | 1278 | 18335 | 16 / 19 |
| | | 1570 | 1358 | 19009 | 18 / 20 |
| | | 1650 | 1438 | 17769 | 18 / 21 |
| | | 1730 | 1518 | 16680 | 20 / 22 |
| | | 1810 | 1598 | 15718 | 20 / 23 |
| | | 1890 | 1678 | 14860 | 22 / 24 |
| 1970 | 1758 | 14091 | 22 / 25 | | |

* The given load capacities and weights apply for a single extension

Tab. 16

> DSD

DSD with double direction stroke (double stroke)



¹ Fixing holes (V) for countersunk head screws according to DIN 7991

Fig. 20

| Type | Size | Cross-section | | | | | | Weight [kg/m] |
|------|------|---------------|--------|--------|--------|--------|-----|---------------|
| | | A [mm] | B [mm] | K [mm] | D [mm] | J [mm] | V | |
| DSD | 28 | 17 | 84 | 24,5 | 35 | 24,5 | M5 | 6.40 |
| | 35 | 22,5 | 104 | 30,5 | 43 | 30,5 | M6 | 10.10 |
| | 43 | 28 | 120 | 34 | 52 | 34 | M8 | 14.60 |
| | 63 | 40 | 208 | 64 | 80 | 64 | M10 | 32.60 |

Tab. 17

> DSE

E version with extra stroke

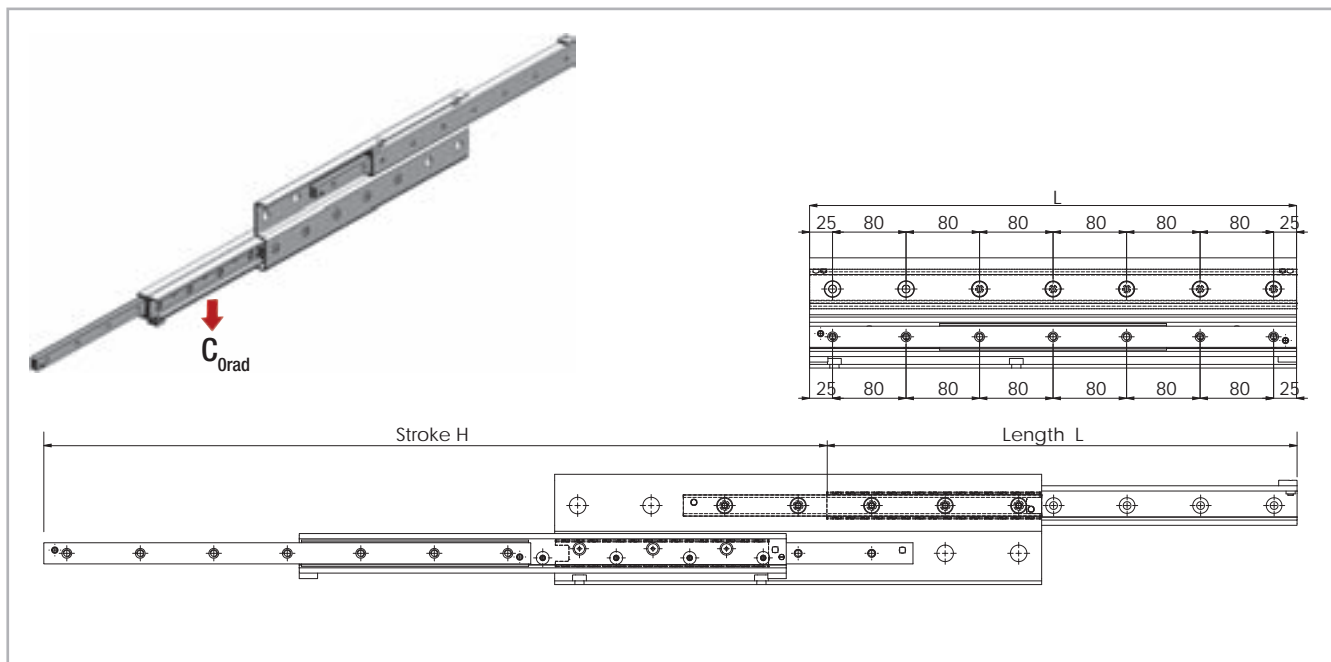


Fig. 21

| Type | Size | Length L [mm] | Stroke H [mm] | Load capacity* C _{Orad} [N] | No. of holes fixed part | No. of holes mobile part |
|------|------|---------------|---------------|--------------------------------------|-------------------------|--------------------------|
| DSE | 28 | 290 | 444 | 351 | 3 / 4 | 4 |
| | | 370 | 570 | 476 | 4 / 5 | 5 |
| | | 450 | 696 | 600 | 4 / 6 | 6 |
| | | 530 | 822 | 725 | 6 / 7 | 7 |
| | | 610 | 946 | 851 | 6 / 8 | 8 |
| | | 690 | 1072 | 842 | 7 / 9 | 9 |
| | | 770 | 1198 | 753 | 7 / 10 | 10 |
| | | 850 | 1297 | 710 | 9 / 11 | 11 |
| | | 930 | 1425 | 646 | 9 / 12 | 12 |
| | | 1010 | 1551 | 592 | 10 / 13 | 13 |
| | | 1090 | 1677 | 547 | 10 / 14 | 14 |
| | | 1170 | 1803 | 508 | 12 / 15 | 15 |

* The given load capacities and weights apply for a single extension

Tab. 18

| Type | Size | Length L [mm] | Stroke H [mm] | Load capacity* C _{Orad} [N] | No. of holes fixed part | No. of holes mobile part |
|------|------|---------------|---------------|--------------------------------------|-------------------------|--------------------------|
| DSE | 35 | 450 | 741 | 776 | 5 / 6 | 6 |
| | | 530 | 837 | 1049 | 6 / 7 | 7 |
| | | 610 | 969 | 1188 | 6 / 8 | 8 |
| | | 690 | 1101 | 1326 | 7 / 9 | 9 |
| | | 770 | 1197 | 1591 | 8 / 10 | 10 |
| | | 850 | 1329 | 1425 | 9 / 11 | 11 |
| | | 930 | 1461 | 1291 | 9 / 12 | 12 |
| | | 1010 | 1557 | 1233 | 10 / 13 | 13 |
| | | 1090 | 1689 | 1131 | 11 / 14 | 14 |
| | | 1170 | 1821 | 1045 | 12 / 15 | 15 |
| | | 1250 | 1917 | 1006 | 12 / 16 | 16 |
| | | 1330 | 2049 | 937 | 13 / 17 | 17 |
| | | 1410 | 2181 | 877 | 14 / 18 | 18 |
| | | 1490 | 2277 | 850 | 15 / 19 | 19 |

* The given load capacities and weights apply for a single extension

Tab. 19

| Type | Size | Length L [mm] | Stroke H [mm] | Load capacity* C _{Orad} [N] | No. of holes fixed part | No. of holes mobile part |
|------|------|---------------|---------------|--------------------------------------|-------------------------|--------------------------|
| DSE | 43 | 530 | 834 | 1291 | 6 / 7 | 7 |
| | | 610 | 939 | 1632 | 6 / 8 | 8 |
| | | 690 | 1089 | 1735 | 7 / 9 | 9 |
| | | 770 | 1194 | 2077 | 7 / 10 | 10 |
| | | 850 | 1299 | 2426 | 9 / 11 | 11 |
| | | 930 | 1449 | 2506 | 9 / 12 | 12 |
| | | 1010 | 1554 | 2364 | 10 / 13 | 13 |
| | | 1090 | 1674 | 2180 | 11 / 14 | 14 |
| | | 1170 | 1809 | 2022 | 12 / 15 | 15 |
| | | 1250 | 1914 | 1928 | 12 / 16 | 16 |
| | | 1330 | 2064 | 1766 | 13 / 17 | 17 |
| | | 1410 | 2169 | 1694 | 13 / 18 | 18 |
| | | 1490 | 2274 | 1628 | 15 / 19 | 19 |
| | | 1570 | 2409 | 1539 | 15 / 20 | 20 |
| | | 1650 | 2529 | 1458 | 16 / 21 | 21 |
| | | 1730 | 2634 | 1409 | 16 / 22 | 22 |
| | | 1810 | 2784 | 1320 | 18 / 23 | 23 |
| 1890 | 2889 | 1280 | 18 / 24 | 24 | | |
| 1970 | 3039 | 1206 | 19 / 25 | 25 | | |

* The given load capacities and weights apply for a single extension

Tab. 20

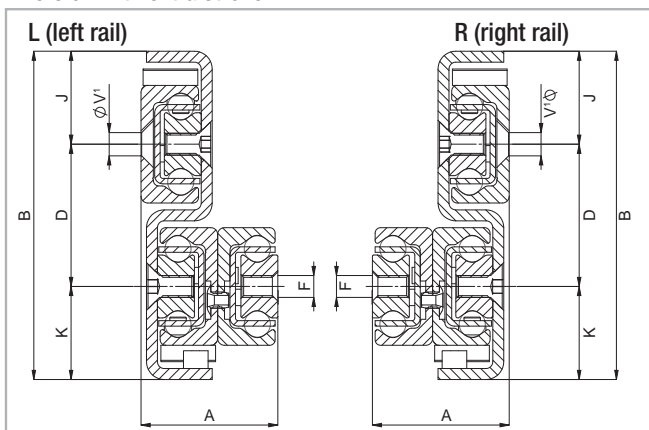
| Type | Size | Length L [mm] | Stroke H [mm] | Load capacity* C _{Orad} [N] | No. of holes fixed part | No. of holes mobile part |
|------|------|---------------|---------------|--------------------------------------|-------------------------|--------------------------|
| DSE | 63 | 610 | 999 | 2164 | 6 / 8 | 8 |
| | | 690 | 1119 | 2630 | 8 / 9 | 9 |
| | | 770 | 1239 | 3104 | 8 / 10 | 10 |
| | | 850 | 1359 | 3582 | 9 / 11 | 11 |
| | | 930 | 1479 | 4064 | 9 / 12 | 12 |
| | | 1010 | 1599 | 4548 | 11 / 13 | 13 |
| | | 1090 | 1719 | 5035 | 11 / 14 | 14 |
| | | 1170 | 1839 | 5523 | 12 / 15 | 15 |
| | | 1250 | 1959 | 5672 | 12 / 16 | 16 |
| | | 1330 | 2079 | 5357 | 14 / 17 | 17 |
| | | 1410 | 2199 | 5076 | 14 / 18 | 18 |
| | | 1490 | 2319 | 4822 | 15 / 19 | 19 |
| | | 1570 | 2439 | 4593 | 15 / 20 | 20 |
| | | 1650 | 2559 | 4384 | 17 / 21 | 21 |
| | | 1730 | 2679 | 4194 | 17 / 22 | 22 |
| | | 1810 | 2799 | 4019 | 18 / 23 | 23 |
| | | 1890 | 2919 | 3859 | 18 / 24 | 24 |
| 1970 | 3039 | 3710 | 20 / 25 | 25 | | |

* The given load capacities and weights apply for a single extension

Tab. 21

> DSE

E version with extra stroke



¹ Fixing holes (V) for countersunk head screws according to DIN 7991
Please observe right or left installation for version DSE.

Fig. 22

| Type | Size | Cross-section | | | | | | | Weight [kg/m] |
|------|------|---------------|--------|--------|--------|--------|----|-----|---------------|
| | | A [mm] | B [mm] | K [mm] | D [mm] | J [mm] | F | V' | |
| DSE | 28 | 30 | 84 | 24,5 | 35 | 24,5 | M5 | M5 | 8,4 |
| | 35 | 39,5 | 104 | 30,5 | 43 | 30,5 | M6 | M6 | 13,2 |
| | 43 | 50 | 120 | 34 | 52 | 34 | M8 | M8 | 19,9 |
| | 63 | 69 | 208 | 64 | 80 | 64 | M8 | M10 | 42,9 |

Tab. 22

> DSC

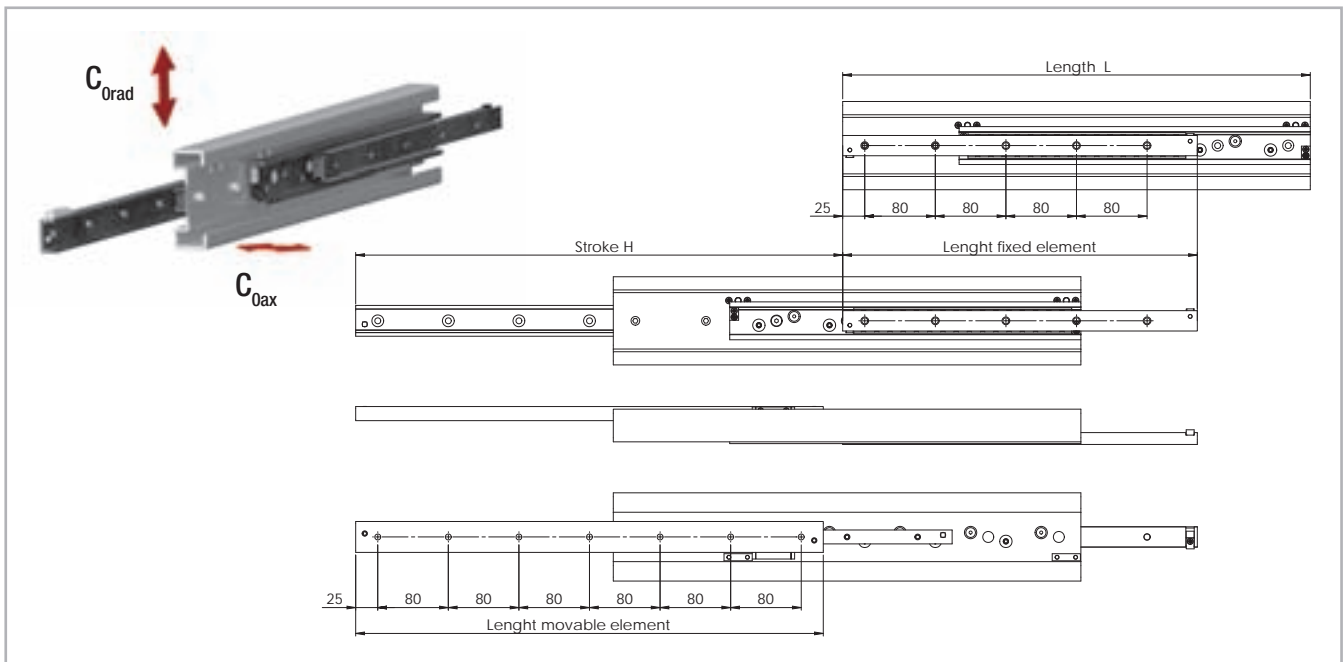


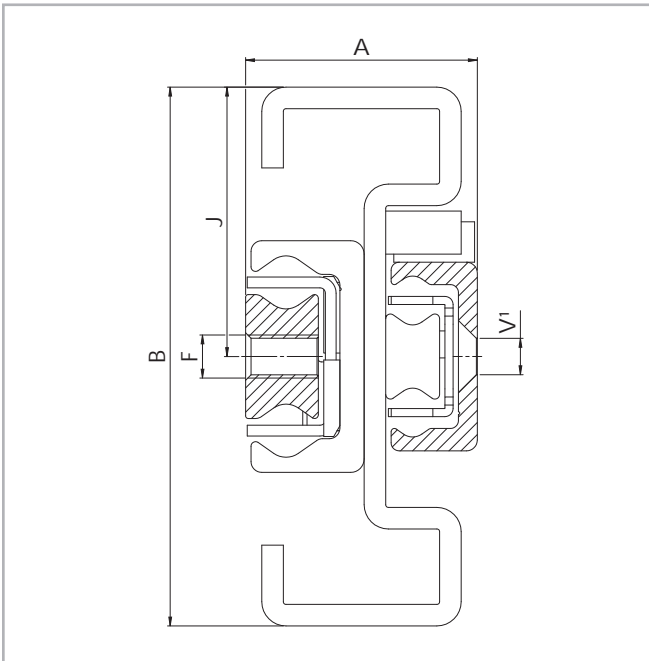
Fig. 23

| Type | Size | Length L [mm] | Stroke H [mm] | Load capacities* | | Fixed element | | Movable element | |
|------|------|---------------|---------------|-----------------------|----------------------|--------------------------|-------------|--------------------------|-------------|
| | | | | C _{Orad} [N] | C _{Oax} [N] | Accessible holes / total | Length [mm] | Accessible holes / total | Length [mm] |
| DSC | 43 | 530 | 552 | 2390 | 1673 | 5 / 5 | 402 | 6 / 7 | 530 |
| | | 610 | 619 | 2964 | 2075 | 6 / 6 | 465 | 6 / 8 | 610 |
| | | 690 | 725 | 3095 | 1920 | 6 / 6 | 520 | 8 / 9 | 690 |
| | | 770 | 792 | 3666 | 1792 | 7 / 7 | 582 | 8 / 10 | 770 |
| | | 850 | 859 | 4246 | 1681 | 8 / 8 | 644 | 9 / 11 | 850 |
| | | 930 | 965 | 4369 | 1459 | 9 / 9 | 700 | 9 / 12 | 930 |
| | | 1010 | 1029 | 5254 | 1392 | 10 / 10 | 770 | 11 / 13 | 1010 |
| | | 1090 | 1099 | 5529 | 1317 | 10 / 10 | 825 | 11 / 14 | 1090 |
| | | 1170 | 1202 | 5177 | 1182 | 11 / 11 | 887 | 12 / 15 | 1170 |
| | | 1250 | 1272 | 4937 | 1127 | 12 / 12 | 942 | 12 / 16 | 1250 |
| | | 1330 | 1375 | 4499 | 1027 | 13 / 13 | 1005 | 14 / 17 | 1330 |
| | | 1410 | 1445 | 4317 | 986 | 14 / 14 | 1060 | 14 / 18 | 1410 |
| | | 1490 | 1509 | 4181 | 955 | 14 / 14 | 1130 | 15 / 19 | 1490 |
| | | 1570 | 1615 | 3849 | 879 | 15 / 15 | 1185 | 16 / 20 | 1570 |
| | | 1650 | 1685 | 3714 | 848 | 15 / 15 | 1240 | 16 / 21 | 1650 |
| | | 1730 | 1752 | 3601 | 822 | 16 / 16 | 1302 | 17 / 22 | 1730 |
| | | 1810 | 1843 | 3406 | 778 | 17 / 17 | 1365 | 18 / 23 | 1810 |
| 1890 | 1922 | 3270 | 747 | 18 / 18 | 1427 | 19 / 24 | 1890 | | |
| 1970 | 2028 | 3063 | 699 | 19 / 19 | 1482 | 20 / 25 | 1970 | | |

* The given load capacities and weights apply for a single extension

Tab. 23

> DSC



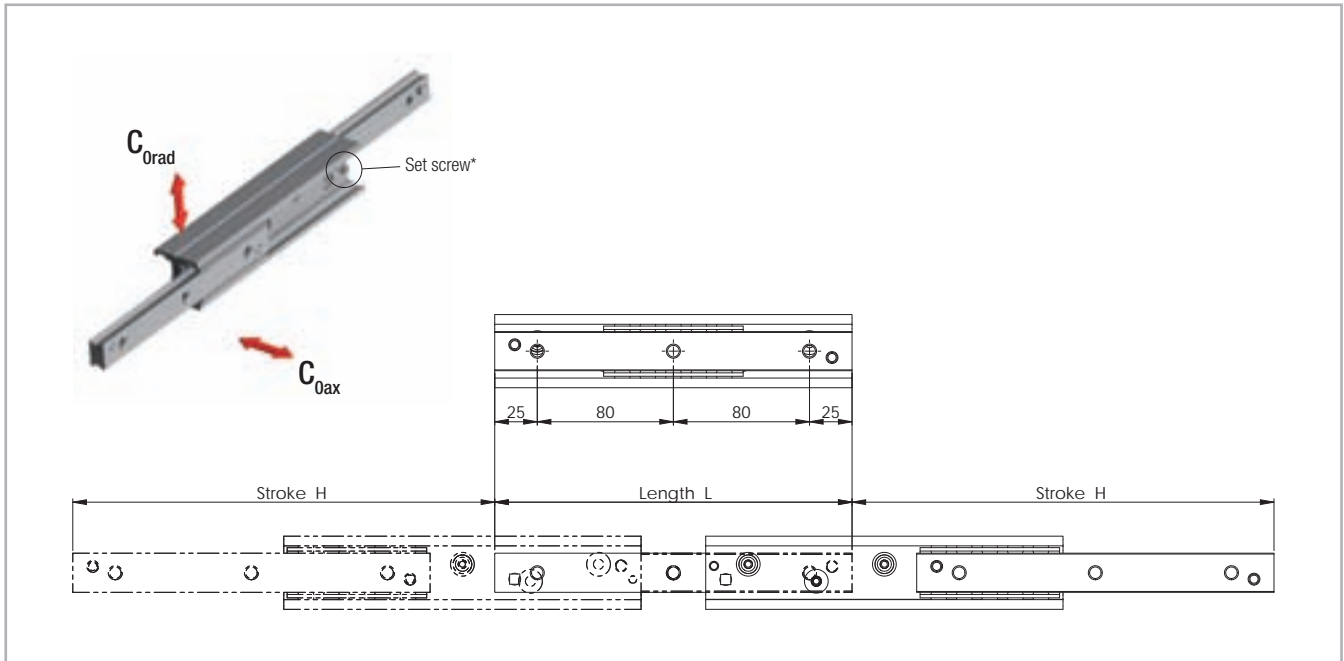
¹ Fixing holes (V) for countersunk head screws according to DIN 7991

Fig. 24

| Type | Size | Cross-section | | | | | Weight [kg/m] |
|------|------|---------------|-----------|-----------|-----------|------------|------------------|
| | | A [mm] | B [mm] | J [mm] | F [mm] | V' [mm] | |
| DSC | 43 | 43 | 100 | 50 | M8 | M6 | 13.4 |

Tab. 24

> DE



* Remove the set screw to reach all the fixing holes. See also assembly instructions on page TR-45f.

Fig. 25

| Type | Size | Length L [mm] | Stroke H [mm] | Load capacities* | | No. of holes |
|-------------------|------|---------------|---------------|-----------------------|----------------------|--------------|
| | | | | C _{Orad} [N] | C _{Oax} [N] | |
| DEF DEV DEM | 22 | 130 | 152 | 119 | 83 | 2 |
| | | 210 | 222 | 281 | 196 | 3 |
| | | 290 | 308 | 390 | 273 | 4 |
| | | 370 | 392 | 501 | 263 | 5 |
| | | 450 | 462 | 674 | 230 | 6 |
| | | 530 | 548 | 571 | 193 | 7 |
| | | 610 | 632 | 494 | 167 | 8 |
| | | 690 | 702 | 453 | 153 | 9 |
| | | 770 | 788 | 401 | 135 | 10 |

Tab. 25

* The given load capacities and weights apply for a single extension

| Type | Size | Length L [mm] | Stroke H [mm] | Load capacities* | | No. of holes |
|-------------------|------|---------------|---------------|-----------------------|----------------------|--------------|
| | | | | C _{Orad} [N] | C _{Oax} [N] | |
| DEF DEV DEM | 28 | 130 | 148 | 235 | 164 | 2 |
| | | 210 | 232 | 432 | 302 | 3 |
| | | 290 | 296 | 767 | 537 | 4 |
| | | 370 | 380 | 968 | 471 | 5 |
| | | 450 | 464 | 1169 | 385 | 6 |
| | | 530 | 548 | 1107 | 325 | 7 |
| | | 610 | 633 | 955 | 280 | 8 |
| | | 690 | 717 | 842 | 247 | 9 |
| | | 770 | 801 | 753 | 221 | 10 |
| | | 850 | 866 | 710 | 208 | 11 |
| | | 930 | 950 | 646 | 189 | 12 |
| | | 1010 | 1034 | 592 | 174 | 13 |
| | | 1090 | 1118 | 547 | 160 | 14 |
| | | 1170 | 1202 | 508 | 149 | 15 |

Tab. 26

* The given load capacities and weights apply for a single extension

| Type | Size | Length L [mm] | Stroke H [mm] | Load capacities* | | No. of holes |
|-------------------|------|---------------|---------------|-----------------------|----------------------|--------------|
| | | | | C _{0rad} [N] | C _{0ax} [N] | |
| DEF DEV DEM | 35 | 210 | 254 | 402 | 281 | 3 |
| | | 290 | 318 | 800 | 560 | 4 |
| | | 370 | 406 | 1025 | 718 | 5 |
| | | 450 | 494 | 1250 | 793 | 6 |
| | | 530 | 558 | 1685 | 728 | 7 |
| | | 610 | 646 | 1908 | 626 | 8 |
| | | 690 | 734 | 1689 | 548 | 9 |
| | | 770 | 798 | 1591 | 516 | 10 |
| | | 850 | 886 | 1425 | 463 | 11 |
| | | 930 | 974 | 1291 | 419 | 12 |
| | | 1010 | 1038 | 1233 | 400 | 13 |
| | | 1090 | 1126 | 1131 | 367 | 14 |
| | | 1170 | 1214 | 1045 | 339 | 15 |
| | | 1250 | 1278 | 1006 | 327 | 16 |
| | | 1330 | 1366 | 937 | 304 | 17 |
| | | 1410 | 1454 | 877 | 285 | 18 |
| | | 1490 | 1518 | 850 | 276 | 19 |

* The given load capacities and weights apply for a single extension

Tab. 27

| Type | Size | Length L [mm] | Stroke H [mm] | Load capacities* | | No. of holes |
|------|------|---------------|---------------|-----------------------|----------------------|--------------|
| | | | | C _{0rad} [N] | C _{0ax} [N] | |
| DEF | 63 | 610 | 666 | 4090 | 2863 | 8 |
| | | 690 | 746 | 4859 | 3062 | 9 |
| | | 770 | 826 | 5635 | 2784 | 10 |
| | | 850 | 906 | 6415 | 2553 | 11 |
| | | 930 | 986 | 7198 | 2357 | 12 |
| | | 1010 | 1066 | 6885 | 2189 | 13 |
| | | 1090 | 1146 | 6427 | 2043 | 14 |
| | | 1170 | 1226 | 6026 | 1916 | 15 |
| | | 1250 | 1306 | 5672 | 1803 | 16 |
| | | 1330 | 1386 | 5357 | 1703 | 17 |
| | | 1410 | 1466 | 5076 | 1614 | 18 |
| | | 1490 | 1546 | 4822 | 1533 | 19 |
| | | 1570 | 1626 | 4593 | 1460 | 20 |
| | | 1650 | 1706 | 4384 | 1394 | 21 |
| | | 1730 | 1786 | 4194 | 1333 | 22 |
| | | 1810 | 1866 | 4019 | 1278 | 23 |
| | | 1890 | 1946 | 3859 | 1227 | 24 |
| | | 1970 | 2026 | 3710 | 1180 | 25 |

* The given load capacities and weights apply for a single extension

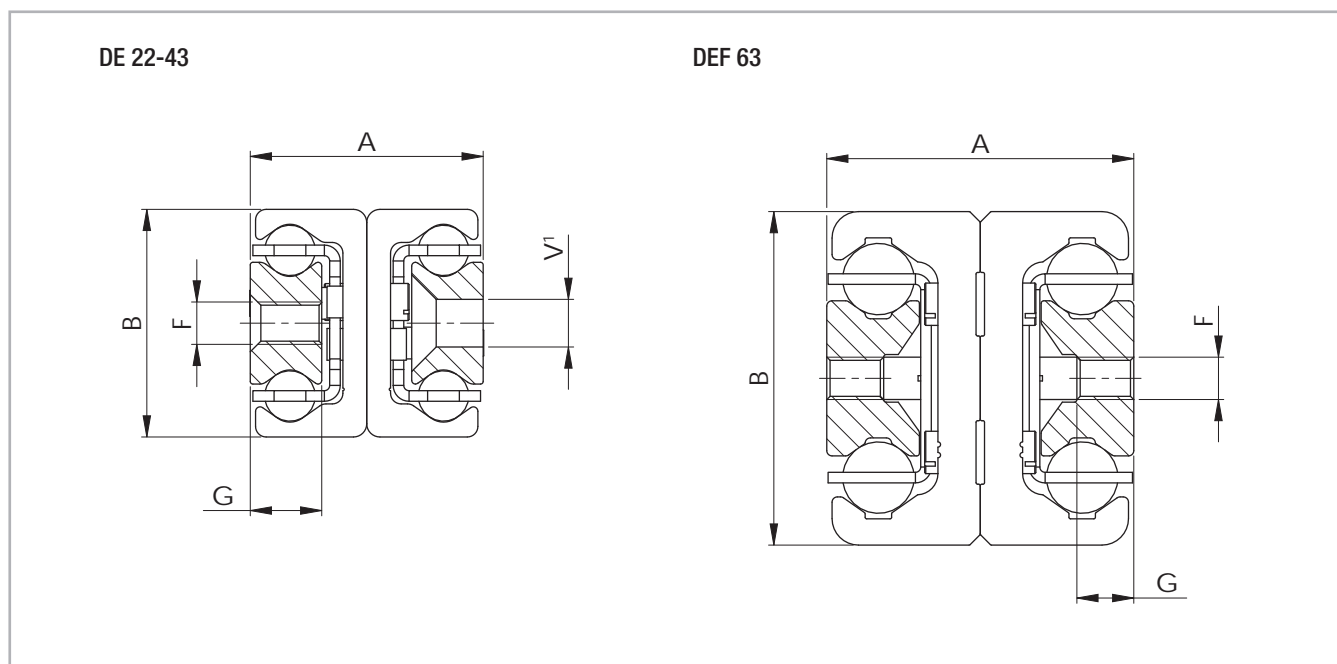
Tab. 29

| Type | Size | Length L [mm] | Stroke H [mm] | Load capacities* | | No. of holes |
|-------------------|------|---------------|---------------|-----------------------|----------------------|--------------|
| | | | | C _{0rad} [N] | C _{0ax} [N] | |
| DEF DEV DEM | 43 | 210 | 246 | 605 | 424 | 3 |
| | | 290 | 316 | 1114 | 780 | 4 |
| | | 370 | 416 | 1300 | 910 | 5 |
| | | 450 | 486 | 1828 | 1279 | 6 |
| | | 530 | 556 | 2375 | 1434 | 7 |
| | | 610 | 626 | 2934 | 1300 | 8 |
| | | 690 | 726 | 3091 | 1096 | 9 |
| | | 770 | 796 | 3055 | 1016 | 10 |
| | | 850 | 866 | 2847 | 946 | 11 |
| | | 930 | 966 | 2506 | 833 | 12 |
| | | 1010 | 1036 | 2364 | 786 | 13 |
| | | 1090 | 1106 | 2238 | 744 | 14 |
| | | 1170 | 1206 | 2022 | 672 | 15 |
| | | 1250 | 1276 | 1928 | 641 | 16 |
| | | 1330 | 1376 | 1766 | 587 | 17 |
| | | 1410 | 1446 | 1694 | 563 | 18 |
| | | 1490 | 1516 | 1628 | 541 | 19 |
| | | 1570 | 1586 | 1567 | 521 | 20 |
| | | 1650 | 1686 | 1458 | 485 | 21 |
| | | 1730 | 1756 | 1409 | 468 | 22 |
| | | 1810 | 1856 | 1320 | 439 | 23 |
| | | 1890 | 1926 | 1280 | 425 | 24 |
| | | 1970 | 2026 | 1206 | 401 | 25 |

* The given load capacities and weights apply for a single extension

Tab. 28

> DE



¹ Fixing holes (V) for countersunk head screws according to DIN 7991

Fig. 26

| Type | Size | Cross-section | | | | | Weight [kg/m] |
|-------------------|------|---------------|--------|--------|----|----|---------------|
| | | A [mm] | B [mm] | G [mm] | F | V | |
| DEF DEV DEM | 22 | 22 | 22 | 6.5 | M4 | M4 | 2.64 |
| | 28 | 26 | 28 | 7.5 | M5 | M5 | 4.04 |
| | 35 | 34 | 35 | 10 | M6 | M6 | 6.10 |
| | 43 | 44 | 43 | 13.5 | M8 | M8 | 10.50 |
| | 63 | 58 | 63 | 10.5 | M8 | - | 20.60 |

Tab. 30

There are three options for mounting holes available for the DE series in sizes 22 to 43:

Version DEF with threaded holes,

Version DEV with counter-sunk holes,

Version DEM, both variants (mixed) (see fig. 26).

Size 63 is only available with threaded holes.

> DE...S

...S version with reinforced and damped stainless steel end stops

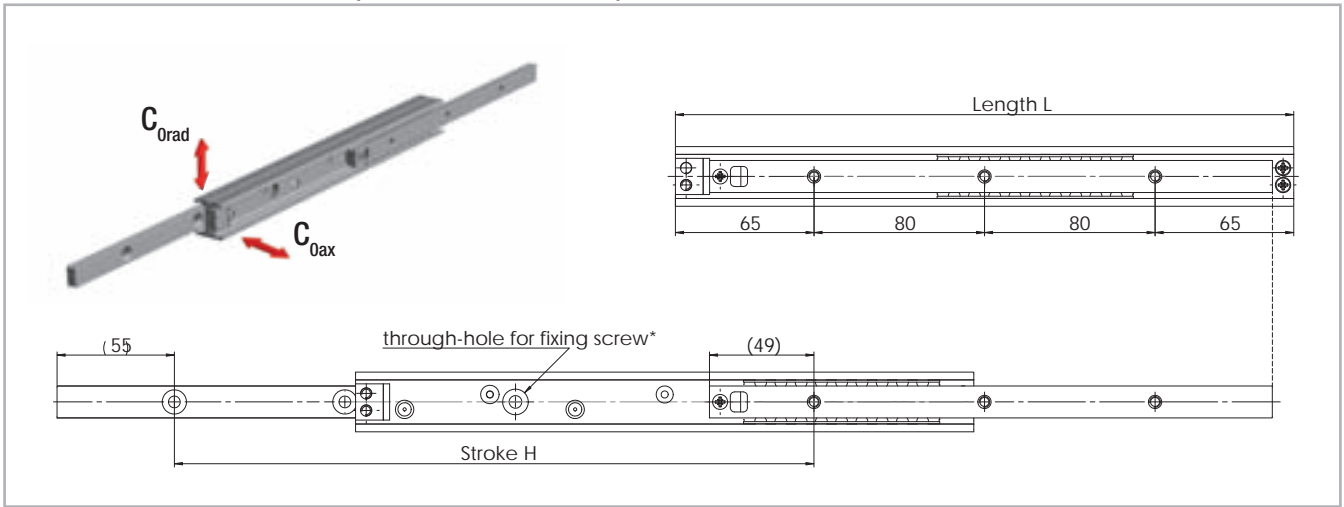


Fig. 27

| Type | Size | Length L [mm] | Stroke H [mm] | Load capacity* | | Slider [mm] | B [mm] | No of holes |
|--------|------|---------------|---------------|-----------------------|----------------------|-------------|--------|-------------|
| | | | | C _{Orad} [N] | C _{Oax} [N] | | | |
| DE...S | 28 | 290 | 300 | 352 | 247 | 264 | 49 | 3 |
| | | 370 | 384 | 542 | 379 | 344 | 49 | 4 |
| | | 450 | 468 | 735 | 378 | 424 | 49 | 5 |
| | | 530 | 533 | 1050 | 343 | 504 | 49 | 6 |
| | | 610 | 636 | 946 | 278 | 584 | 49 | 7 |
| | | 690 | 701 | 880 | 258 | 664 | 49 | 8 |
| | | 770 | 804 | 747 | 219 | 744 | 49 | 9 |
| | | 850 | 850 | 737 | 216 | 824 | 49 | 10 |
| | | 930 | 953 | 642 | 188 | 904 | 49 | 11 |
| | | 1010 | 1018 | 611 | 179 | 984 | 49 | 12 |
| | | 1090 | 1102 | 562 | 165 | 1064 | 49 | 13 |
| | | 1170 | 1186 | 521 | 153 | 1144 | 49 | 14 |

* The given load capacities and weights apply for a single extension

Tab. 31

| Type | Size | Length L [mm] | Stroke H [mm] | Load capacity* | | Slider [mm] | B [mm] | No of holes |
|--------|------|---------------|---------------|-----------------------|----------------------|-------------|--------|-------------|
| | | | | C _{Orad} [N] | C _{Oax} [N] | | | |
| DE...S | 35 | 370 | 370 | 715 | 500 | 338 | 45 | 4 |
| | | 450 | 464 | 894 | 626 | 418 | 45 | 5 |
| | | 530 | 536 | 1238 | 787 | 498 | 45 | 6 |
| | | 610 | 630 | 1416 | 656 | 578 | 45 | 7 |
| | | 690 | 702 | 1770 | 597 | 658 | 45 | 8 |
| | | 770 | 796 | 1599 | 519 | 738 | 45 | 9 |
| | | 850 | 868 | 1483 | 481 | 818 | 45 | 10 |
| | | 930 | 962 | 1322 | 429 | 898 | 45 | 11 |
| | | 1010 | 1012 | 1296 | 421 | 978 | 45 | 12 |
| | | 1090 | 1128 | 1127 | 366 | 1058 | 45 | 13 |
| | | 1170 | 1178 | 1108 | 360 | 1138 | 45 | 14 |
| | | 1250 | 1272 | 1015 | 330 | 1218 | 45 | 15 |
| | | 1330 | 1344 | 968 | 314 | 1298 | 45 | 16 |
| | | 1410 | 1438 | 896 | 291 | 1378 | 45 | 17 |
| | | 1490 | 1510 | 859 | 279 | 1458 | 45 | 18 |

* The given load capacities and weights apply for a single extension

Tab. 32

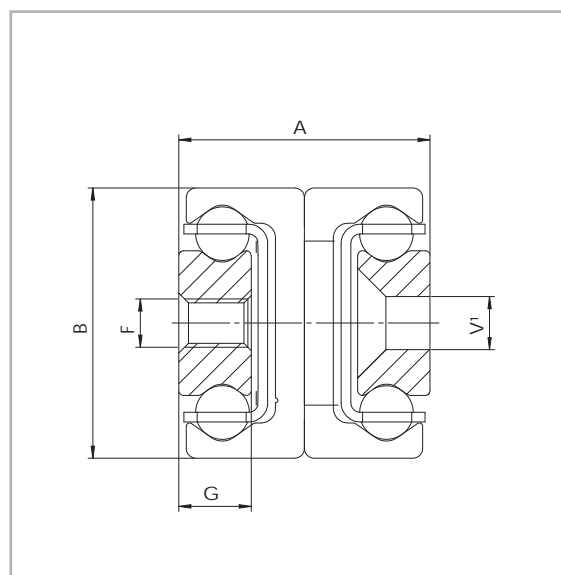
| Type | Size | Length L [mm] | Stroke H [mm] | Load capacities* | | Slider [mm] | B [mm] | No of holes |
|--------|------|---------------|---------------|-----------------------|----------------------|-------------|--------|-------------|
| | | | | C _{0rad} [N] | C _{0ax} [N] | | | |
| DE...S | 43 | 370 | 366 | 1007 | 705 | 338 | 45 | 4 |
| | | 450 | 496 | 932 | 653 | 418 | 45 | 5 |
| | | 530 | 536 | 1709 | 1197 | 498 | 45 | 6 |
| | | 610 | 636 | 1898 | 1261 | 578 | 45 | 7 |
| | | 690 | 706 | 2419 | 1156 | 658 | 45 | 8 |
| | | 770 | 806 | 2603 | 991 | 738 | 45 | 9 |
| | | 850 | 846 | 2982 | 991 | 818 | 45 | 10 |
| | | 930 | 976 | 2457 | 817 | 898 | 45 | 11 |
| | | 1010 | 1016 | 2457 | 817 | 978 | 45 | 12 |
| | | 1090 | 1116 | 2199 | 731 | 1058 | 45 | 13 |
| | | 1170 | 1186 | 2089 | 695 | 1138 | 45 | 14 |
| | | 1250 | 1286 | 1899 | 631 | 1218 | 45 | 15 |
| | | 1330 | 1326 | 1899 | 631 | 1298 | 45 | 16 |
| | | 1410 | 1456 | 1672 | 556 | 1378 | 45 | 17 |
| | | 1490 | 1496 | 1672 | 556 | 1458 | 45 | 18 |
| | | 1570 | 1596 | 1548 | 515 | 1538 | 45 | 19 |
| | | 1650 | 1666 | 1493 | 496 | 1618 | 45 | 20 |
| | | 1730 | 1766 | 1393 | 463 | 1698 | 45 | 21 |
| | | 1810 | 1806 | 1393 | 463 | 1778 | 45 | 22 |
| 1890 | 1936 | 1267 | 421 | 1858 | 45 | 23 | | |
| 1970 | 2066 | 1161 | 386 | 1938 | 45 | 24 | | |

* The given load capacities and weights apply for a single extension

Tab. 33

> DE...S

...S version with reinforced and damped stainless steel end stops



¹ Fixing holes (V) for countersunk head screws according to DIN 7991 Fig. 28

| Type | Size | Cross-section | | | | | Weight [kg/m] |
|--------|------|---------------|--------|--------|----|----|---------------|
| | | A [mm] | B [mm] | G [mm] | F | V | |
| DE...S | 28 | 26 | 28 | 7.5 | M5 | M5 | 4.04 |
| | 35 | 34 | 35 | 10 | M6 | M6 | 6.10 |
| | 43 | 44 | 43 | 13.5 | M8 | M8 | 10.50 |

Tab. 34

> DE...D

DED with double direction stroke (double stroke)

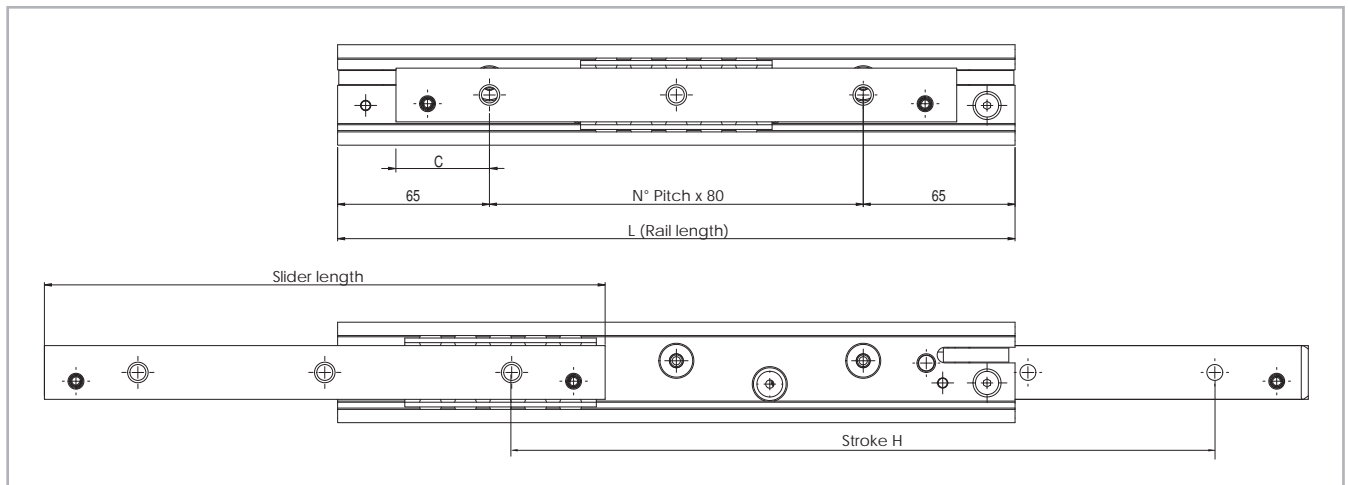


Fig. 29

D version (with a driving disc)

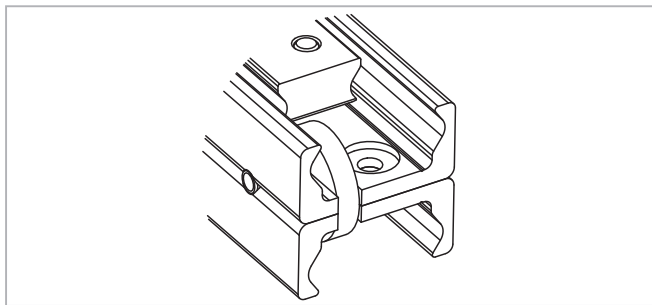


Fig. 30

The driving disc in the intermediate element in the DE...D versions acts to make sure that in bilateral strokes (double strokes) the intermediate element always returns to the correct position and does not remain in an undefined position. This design is available in sizes 28, 35, 43 and 63 with all three versions of the fixing holes. This version is based on the standard DE series version, but differs in the technical characteristics for the construction methods. Please contact our technical service department for more information.

| Type | Size | Length L [mm] | Stroke H [mm] | Load capacities* | | Slider [mm] | C [mm] | No. of holes |
|-------------------------------|------|---------------|---------------|-----------------------|----------------------|-------------|--------|--------------|
| | | | | C _{Orad} [N] | C _{Oax} [N] | | | |
| DEF...D DEV...D DEM...D | 28 | 290 | 292 | 418 | 293 | 250 | 45 | 3 |
| | | 370 | 376 | 612 | 428 | 330 | 45 | 4 |
| | | 450 | 460 | 809 | 391 | 410 | 45 | 5 |
| | | 530 | 544 | 1007 | 329 | 490 | 45 | 6 |
| | | 610 | 628 | 970 | 285 | 570 | 45 | 7 |
| | | 690 | 712 | 853 | 250 | 650 | 45 | 8 |
| | | 770 | 796 | 762 | 224 | 730 | 45 | 9 |
| | | 850 | 880 | 688 | 202 | 810 | 45 | 10 |
| | | 930 | 964 | 628 | 184 | 890 | 45 | 11 |
| | | 1010 | 1048 | 577 | 169 | 970 | 45 | 12 |
| | | 1090 | 1132 | 534 | 157 | 1050 | 45 | 13 |
| 1170 | 1216 | 496 | 146 | 1130 | 45 | 14 | | |

* The given load capacities and weights apply for a single extension

Tab. 35

| Type | Size | Length L [mm] | Stroke H [mm] | Load capacities* | | Slider [mm] | C [mm] | No. of holes |
|-------------------------------|------|---------------|---------------|-----------------------|----------------------|-------------|--------|--------------|
| | | | | C _{Orad} [N] | C _{Oax} [N] | | | |
| DEF...D DEV...D DEM...D | 35 | 290 | 303 | 445 | 312 | 250 | 45 | 3 |
| | | 370 | 391 | 661 | 463 | 330 | 45 | 4 |
| | | 450 | 479 | 880 | 616 | 410 | 45 | 5 |
| | | 530 | 543 | 1281 | 767 | 490 | 45 | 6 |
| | | 610 | 631 | 1506 | 654 | 570 | 45 | 7 |
| | | 690 | 719 | 1730 | 570 | 650 | 45 | 8 |
| | | 770 | 783 | 1651 | 536 | 730 | 45 | 9 |
| | | 850 | 871 | 1473 | 478 | 810 | 45 | 10 |
| | | 930 | 959 | 1330 | 432 | 890 | 45 | 11 |
| | | 1010 | 1023 | 1268 | 412 | 970 | 45 | 12 |
| | | 1090 | 1111 | 1161 | 377 | 1050 | 45 | 13 |
| | | 1170 | 1199 | 1070 | 347 | 1130 | 45 | 14 |
| | | 1250 | 1263 | 1030 | 334 | 1210 | 45 | 15 |
| | | 1330 | 1351 | 958 | 311 | 1290 | 45 | 16 |
| | | 1410 | 1439 | 895 | 291 | 1370 | 45 | 17 |
| | | 1490 | 1503 | 867 | 281 | 1450 | 45 | 18 |

* The given load capacities and weights apply for a single extension

Tab. 36

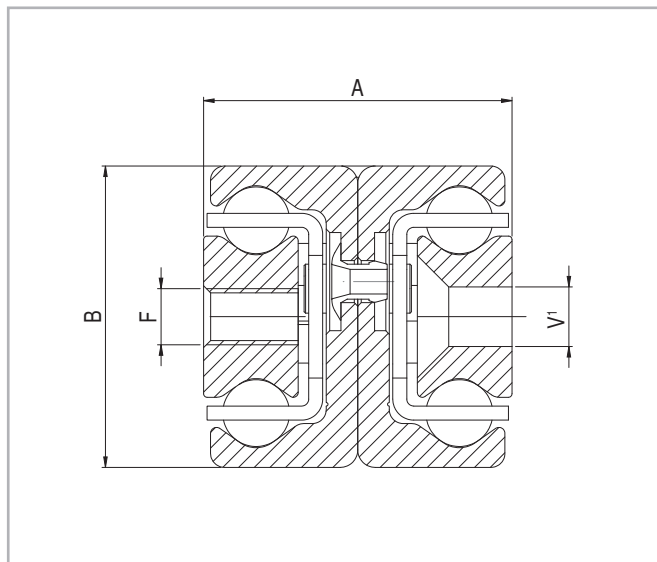
| Type | Size | Length L [mm] | Stroke H [mm] | Load capacities* | | Slider [mm] | C [mm] | No. of holes |
|-------------------------------|------|---------------|---------------|-----------------------|----------------------|-------------|--------|--------------|
| | | | | C _{0rad} [N] | C _{0ax} [N] | | | |
| DED...D DEV...D DEN...D | 43 | 290 | 301 | 501 | 351 | 240 | 40 | 3 |
| | | 370 | 401 | 700 | 490 | 320 | 40 | 4 |
| | | 450 | 471 | 1159 | 811 | 400 | 40 | 5 |
| | | 530 | 541 | 1656 | 1159 | 480 | 40 | 6 |
| | | 610 | 641 | 1848 | 1242 | 560 | 40 | 7 |
| | | 690 | 711 | 2362 | 1140 | 640 | 40 | 8 |
| | | 770 | 781 | 2892 | 1054 | 720 | 40 | 9 |
| | | 850 | 881 | 2753 | 915 | 800 | 40 | 10 |
| | | 930 | 951 | 2583 | 859 | 880 | 40 | 11 |
| | | 1010 | 1021 | 2433 | 809 | 960 | 40 | 12 |
| | | 1090 | 1121 | 2180 | 725 | 1040 | 40 | 13 |
| | | 1170 | 1191 | 2072 | 689 | 1120 | 40 | 14 |
| | | 1250 | 1261 | 1974 | 656 | 1200 | 40 | 15 |
| | | 1330 | 1361 | 1804 | 600 | 1280 | 40 | 16 |
| | | 1410 | 1431 | 1729 | 575 | 1360 | 40 | 17 |
| | | 1490 | 1501 | 1661 | 552 | 1440 | 40 | 18 |
| | | 1570 | 1601 | 1538 | 512 | 1520 | 40 | 19 |
| | | 1650 | 1671 | 1484 | 493 | 1600 | 40 | 20 |
| | | 1730 | 1741 | 1433 | 476 | 1680 | 40 | 21 |
| | | 1810 | 1841 | 1341 | 446 | 1760 | 40 | 22 |
| 1890 | 1911 | 1300 | 432 | 1840 | 40 | 23 | | |
| 1970 | 2011 | 1224 | 407 | 1920 | 40 | 24 | | |

* The given load capacities and weights apply for a single extension

Tab. 37

> DED version D

DED with double direction stroke (double stroke)



¹ Fixing holes (V) for countersunk head screws according to DIN 7991

Fig. 31

| Type | Size | Length L [mm] | Stroke H [mm] | Load capacities* | | Slider [mm] | C [mm] | No. of holes |
|---------|------|---------------|---------------|-----------------------|----------------------|-------------|--------|--------------|
| | | | | C _{0rad} [N] | C _{0ax} [N] | | | |
| DEF...D | 63 | 610 | 602 | 3844 | 2691 | 558 | 39 | 7 |
| | | 690 | 682 | 4618 | 3233 | 638 | 39 | 8 |
| | | 770 | 762 | 5398 | 3257 | 718 | 39 | 9 |
| | | 850 | 842 | 6181 | 2945 | 798 | 39 | 10 |
| | | 930 | 922 | 6967 | 2687 | 878 | 39 | 11 |
| | | 1010 | 1002 | 7756 | 2471 | 958 | 39 | 12 |
| | | 1090 | 1082 | 7193 | 2287 | 1038 | 39 | 13 |
| | | 1170 | 1162 | 6694 | 2128 | 1118 | 39 | 14 |
| | | 1250 | 1242 | 6260 | 1990 | 1198 | 39 | 15 |
| | | 1330 | 1322 | 5879 | 1869 | 1278 | 39 | 16 |
| | | 1410 | 1402 | 5542 | 1762 | 1358 | 39 | 17 |
| | | 1490 | 1482 | 5241 | 1666 | 1438 | 39 | 18 |
| | | 1570 | 1562 | 4971 | 1580 | 1518 | 39 | 19 |
| | | 1650 | 1642 | 4728 | 1503 | 1598 | 39 | 20 |
| | | 1730 | 1722 | 4507 | 1433 | 1678 | 39 | 21 |
| | | 1810 | 1802 | 4306 | 1369 | 1758 | 39 | 22 |
| | | 1890 | 1882 | 4122 | 1310 | 1838 | 39 | 23 |
| | | 1970 | 1962 | 3953 | 1257 | 1918 | 39 | 24 |

* The given load capacities and weights apply for a single extension

Tab. 38

| Type | Size | Cross-section | | | | Weight [kg/m] |
|--------|------|---------------|--------|----|----------------|---------------|
| | | A [mm] | B [mm] | F | V ¹ | |
| DE...D | 28 | 26 | 28 | M5 | M5 | 4,04 |
| | 35 | 34 | 35 | M6 | M6 | 6,10 |
| | 43 | 44 | 43 | M8 | M8 | 10,50 |
| | 63 | 58 | 63 | M8 | - | 20,60 |

Tab. 39

There are three options for mounting holes available for the

DE...D series in sizes 28 to 43:

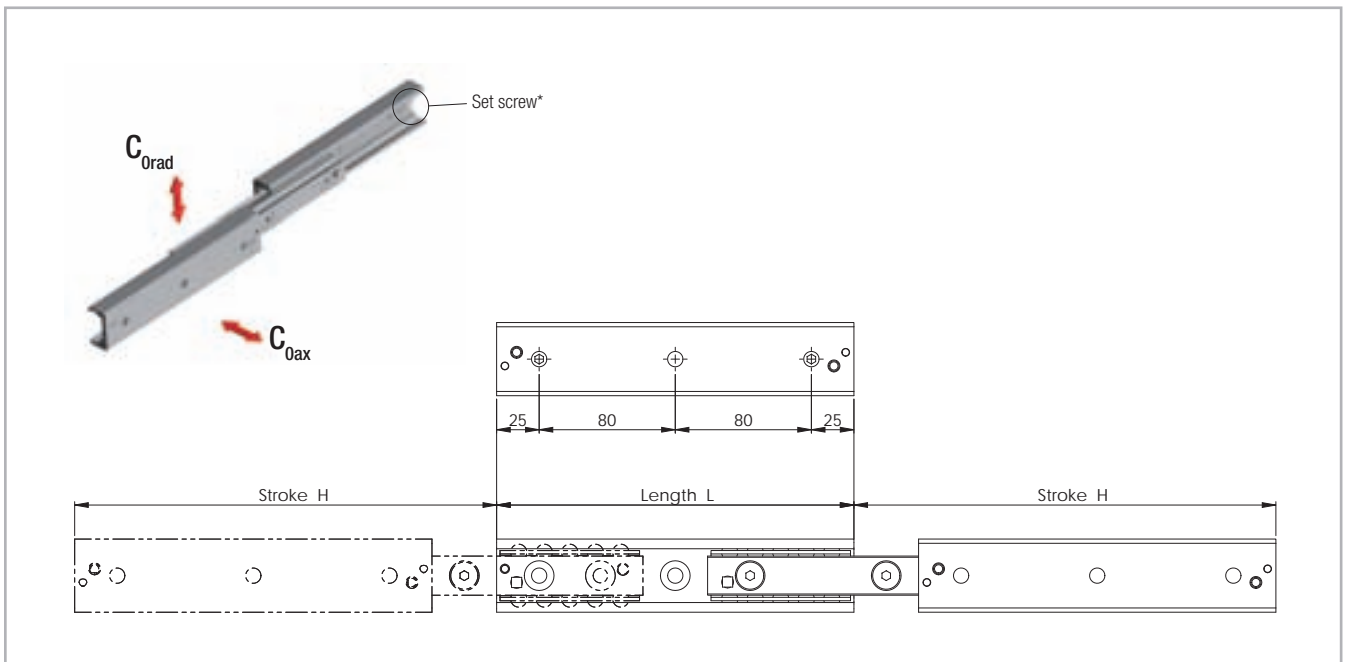
Version DEF with threaded holes,

Version DEV with counter-sunk holes,

Version DEM, both variants (mixed).

Size 63 is only available with threaded holes.

> DBN



* Remove the set screw to reach all the fixing holes. See also assembly instructions on page TR-45f.

Fig. 32

| Type | Size | Length L [mm] | Stroke H [mm] | Load capacities* | | No. of holes |
|------|------|---------------|---------------|-----------------------|----------------------|--------------|
| | | | | C _{Orad} [N] | C _{Oax} [N] | |
| DBN | 22 | 130 | 152 | 119 | 83 | 2 |
| | | 210 | 222 | 281 | 196 | 3 |
| | | 290 | 308 | 236 | 236 | 4 |
| | | 370 | 392 | 186 | 186 | 5 |
| | | 450 | 462 | 162 | 162 | 6 |
| | | 530 | 548 | 136 | 136 | 7 |
| | | 610 | 632 | 117 | 117 | 8 |
| | | 690 | 702 | 108 | 108 | 9 |
| | | 770 | 788 | 95 | 95 | 10 |

Tab. 40

* The given load capacities and weights apply for a single extension

| Type | Size | Length L [mm] | Stroke H [mm] | Load capacities* | | No. of holes |
|------|------|---------------|---------------|-----------------------|----------------------|--------------|
| | | | | C _{Orad} [N] | C _{Oax} [N] | |
| DBN | 28 | 130 | 148 | 235 | 164 | 2 |
| | | 210 | 232 | 432 | 302 | 3 |
| | | 290 | 296 | 622 | 537 | 4 |
| | | 370 | 380 | 482 | 482 | 5 |
| | | 450 | 464 | 393 | 393 | 6 |
| | | 530 | 548 | 332 | 332 | 7 |
| | | 610 | 633 | 286 | 286 | 8 |
| | | 690 | 717 | 252 | 252 | 9 |
| | | 770 | 801 | 226 | 226 | 10 |
| | | 850 | 866 | 213 | 213 | 11 |
| | | 930 | 950 | 194 | 194 | 12 |
| | | 1010 | 1034 | 178 | 178 | 13 |
| | | 1090 | 1118 | 164 | 164 | 14 |
| | | 1170 | 1202 | 152 | 152 | 15 |

Tab. 41

* The given load capacities and weights apply for a single extension

| Type | Size | Length L [mm] | Stroke H [mm] | Load capacities* | | No. of holes |
|------|------|---------------|---------------|-----------------------|----------------------|--------------|
| | | | | C _{Grad} [N] | C _{Oax} [N] | |
| DBN | 35 | 210 | 254 | 402 | 281 | 3 |
| | | 290 | 318 | 667 | 560 | 4 |
| | | 370 | 406 | 522 | 522 | 5 |
| | | 450 | 494 | 429 | 429 | 6 |
| | | 530 | 558 | 394 | 394 | 7 |
| | | 610 | 646 | 338 | 338 | 8 |
| | | 690 | 734 | 297 | 297 | 9 |
| | | 770 | 798 | 279 | 279 | 10 |
| | | 850 | 886 | 250 | 250 | 11 |
| | | 930 | 974 | 227 | 227 | 12 |
| | | 1010 | 1038 | 217 | 217 | 13 |
| | | 1090 | 1126 | 199 | 199 | 14 |
| | | 1170 | 1214 | 183 | 183 | 15 |
| | | 1250 | 1278 | 177 | 177 | 16 |
| | | 1330 | 1366 | 165 | 165 | 17 |
| | | 1410 | 1454 | 154 | 154 | 18 |
| | | 1490 | 1518 | 149 | 149 | 19 |

* The given load capacities and weights apply for a single extension

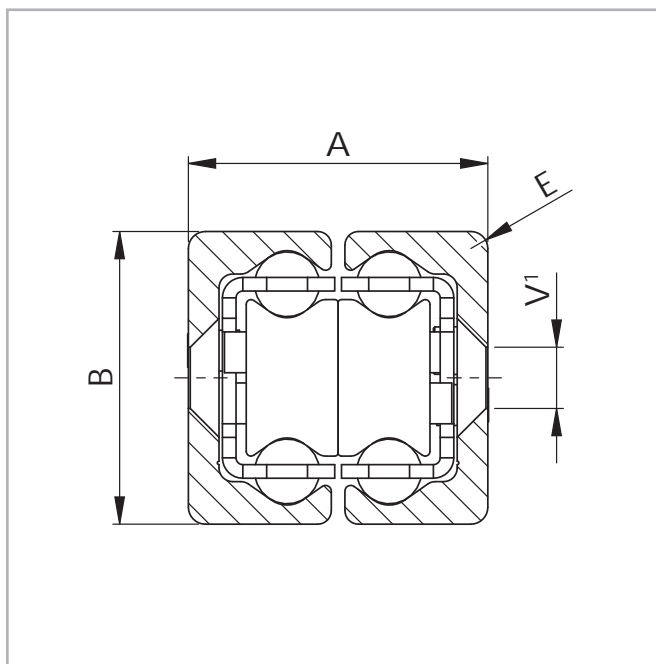
Tab. 42

| Type | Size | Length L [mm] | Stroke H [mm] | Load capacities* | | No. of holes |
|------|------|---------------|---------------|-----------------------|----------------------|--------------|
| | | | | C _{Grad} [N] | C _{Oax} [N] | |
| DBN | 43 | 210 | 246 | 605 | 424 | 3 |
| | | 290 | 316 | 1114 | 780 | 4 |
| | | 370 | 416 | 1300 | 910 | 5 |
| | | 450 | 486 | 1331 | 1279 | 6 |
| | | 530 | 556 | 1193 | 1193 | 7 |
| | | 610 | 626 | 1082 | 1082 | 8 |
| | | 690 | 726 | 912 | 912 | 9 |
| | | 770 | 796 | 845 | 845 | 10 |
| | | 850 | 866 | 788 | 788 | 11 |
| | | 930 | 966 | 693 | 693 | 12 |
| | | 1010 | 1036 | 654 | 654 | 13 |
| | | 1090 | 1106 | 619 | 619 | 14 |
| | | 1170 | 1206 | 559 | 559 | 15 |
| | | 1250 | 1276 | 533 | 533 | 16 |
| | | 1330 | 1376 | 488 | 488 | 17 |
| | | 1410 | 1446 | 469 | 469 | 18 |
| | | 1490 | 1516 | 450 | 450 | 19 |
| | | 1570 | 1586 | 434 | 434 | 20 |
| | | 1650 | 1686 | 403 | 403 | 21 |
| | | 1730 | 1756 | 390 | 390 | 22 |
| | | 1810 | 1856 | 365 | 365 | 23 |
| | | 1890 | 1926 | 354 | 354 | 24 |
| | | 1970 | 2026 | 334 | 334 | 25 |

* The given load capacities and weights apply for a single extension

Tab. 43

> DBN



¹ Fixing holes (V) for countersunk head screws according to DIN 7991

Fig. 33

| Type | Size | Cross-section | | | | Weight [kg/m] |
|------|------|---------------|--------|--------|----|---------------|
| | | A [mm] | B [mm] | E [mm] | V | |
| DBN | 22 | 22 | 22 | 3 | M4 | 2.64 |
| | 28 | 26 | 28 | 1 | M5 | 4.04 |
| | 35 | 34 | 35 | 2 | M6 | 6.10 |
| | 43 | 44 | 43 | 2.5 | M8 | 10.50 |

Tab. 44

> DMS

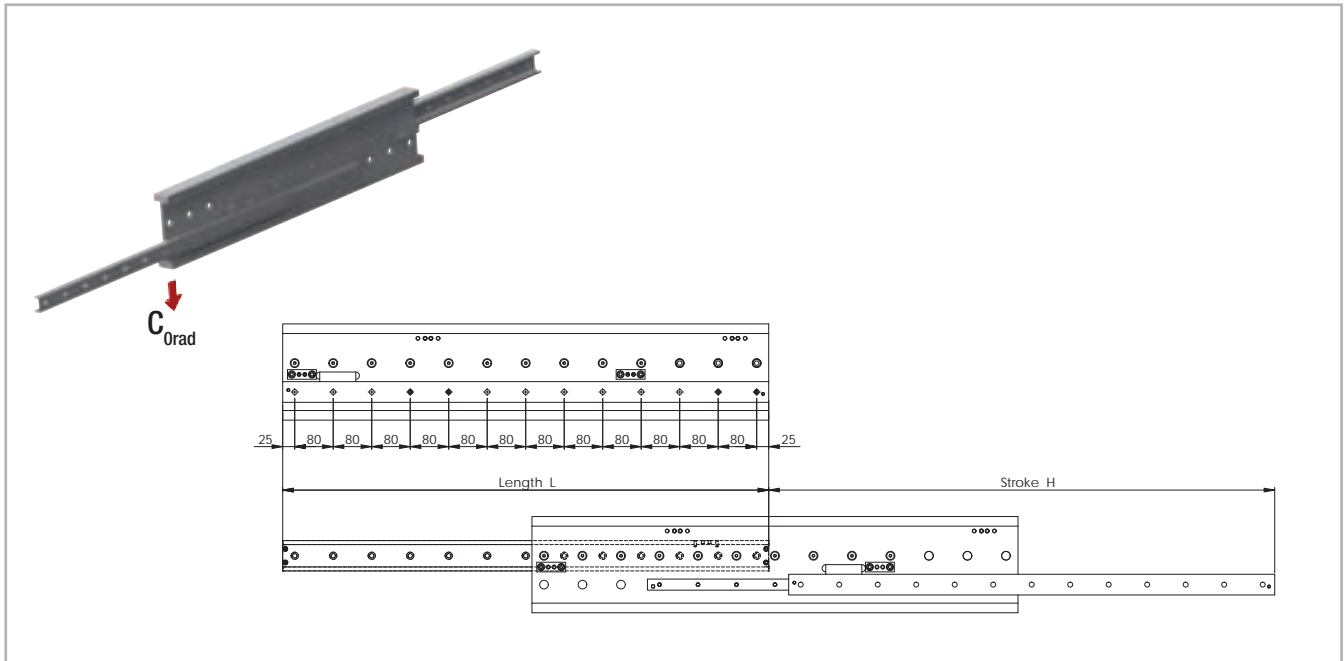


Fig. 34

| Type | Size | Length L [mm] | Stroke H [mm] | Load capacity* C_{Orad} [N] | Fixed element Accessible holes / total | Movable element Accessible holes / total |
|------|------|---------------|---------------|-------------------------------|---|---|
| DMS | 63 | 1010 | 1051 | 8052 | 10 / 13 | 10 / 13 |
| | | 1090 | 1141 | 8748 | 10 / 14 | 11 / 14 |
| | | 1170 | 1216 | 9584 | 11 / 15 | 11 / 15 |
| | | 1250 | 1291 | 10424 | 12 / 16 | 13 / 16 |
| | | 1330 | 1381 | 11119 | 13 / 17 | 13 / 17 |
| | | 1410 | 1456 | 11960 | 13 / 18 | 14 / 18 |
| | | 1490 | 1531 | 12804 | 14 / 19 | 14 / 19 |
| | | 1570 | 1621 | 13498 | 14 / 20 | 15 / 20 |
| | | 1650 | 1696 | 14343 | 16 / 21 | 16 / 21 |
| | | 1730 | 1771 | 15190 | 16 / 22 | 17 / 22 |
| | | 1810 | 1861 | 15883 | 17 / 23 | 17 / 23 |
| | | 1890 | 1936 | 16730 | 18 / 24 | 19 / 24 |
| | | 1970 | 2026 | 17423 | 19 / 25 | 19 / 25 |
| | | 2050 | 2101 | 18271 | 19 / 26 | 20 / 26 |
| 2130 | 2176 | 19120 | 20 / 27 | 20 / 27 | | |
| 2210 | 2266 | 19812 | 21 / 28 | 22 / 28 | | |

* The given load capacities and weights apply for a single extension

Tab. 45

> DMS

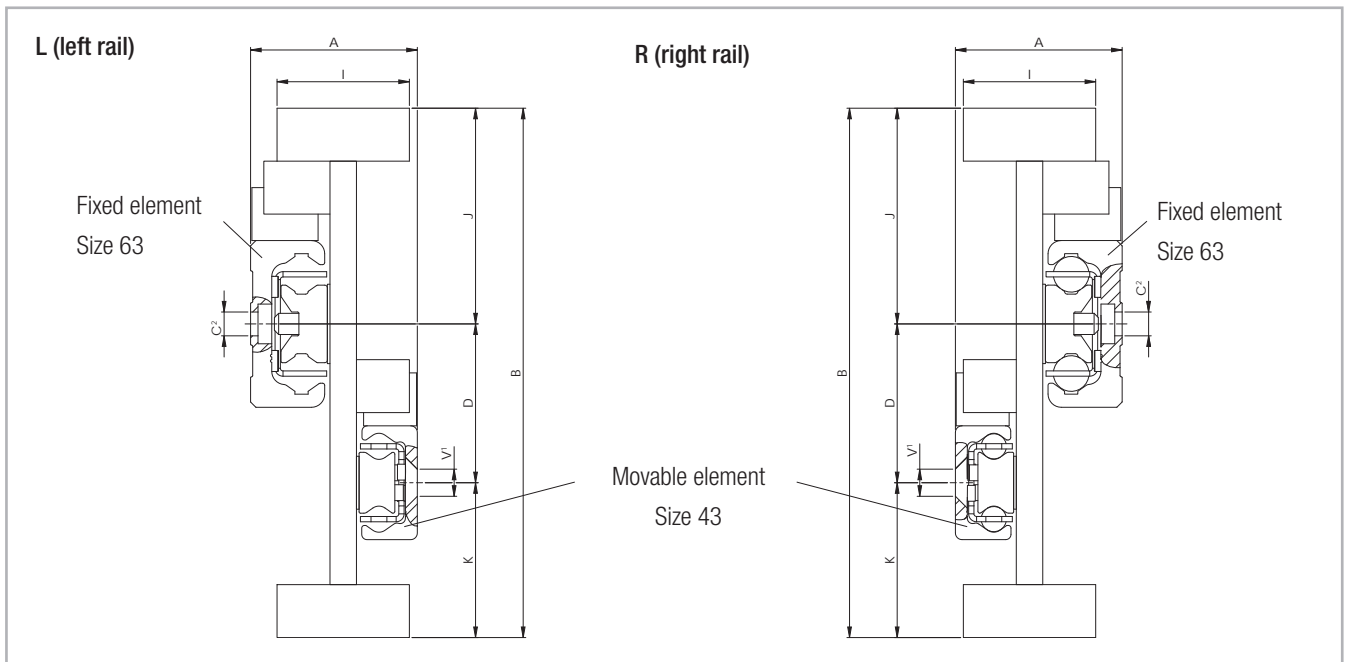


Fig. 35

¹ Fixing holes (V) for countersunk head screws according to DIN 7991

² Fixing holes (C) for socket cap screws according to DIN 7984. Alternative fixing with Torx® screws in special design with low head (on request)
Please observe right or left installation for version DMS.

| Type | Size | Cross-section | | | | | | | | Weight [kg/m] |
|------|------|---------------|--------|--------|--------|--------|--------|----|----|---------------|
| | | A [mm] | B [mm] | I [mm] | K [mm] | D [mm] | J [mm] | C | V | |
| DMS | 63 | 63 | 200 | 50 | 58.5 | 60 | 81.5 | M8 | M8 | 43 |

Tab. 46

> DRT

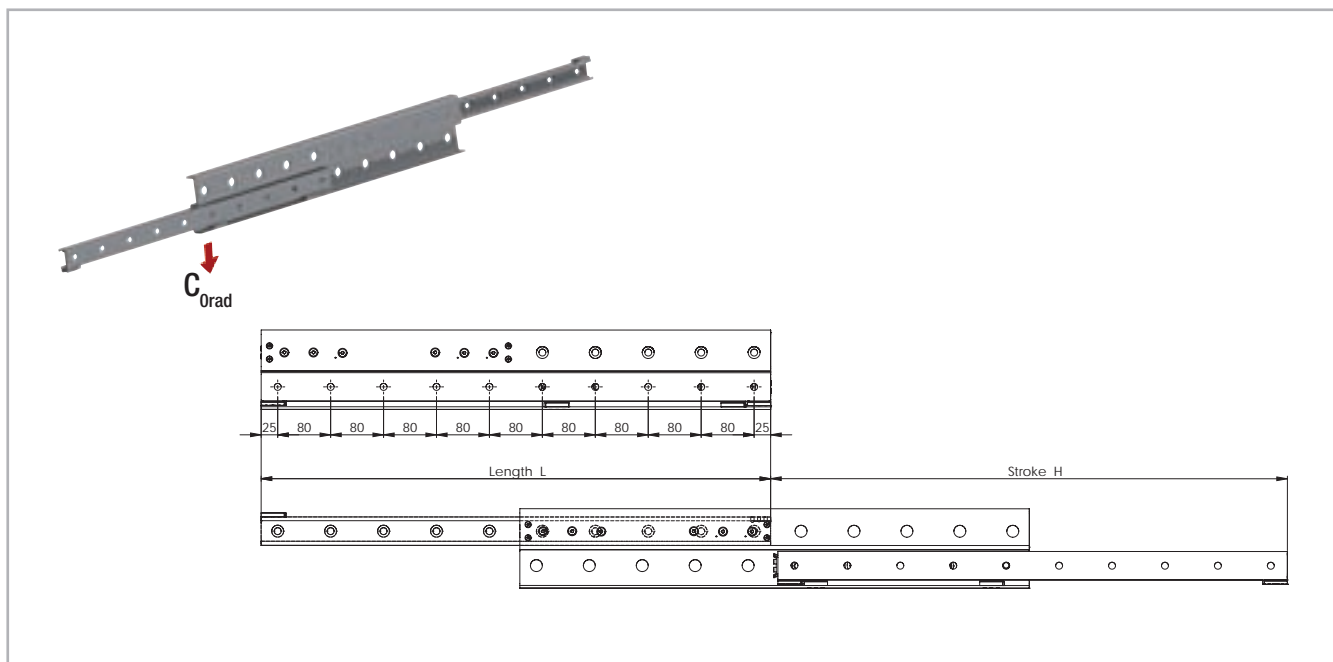


Fig. 36

| Type | Size | Length L [mm] | Stroke H [mm] | Load capacity* C_{Orad} [N] | Accessible holes / total |
|------|------|---------------|---------------|-------------------------------|--------------------------|
| DRT | 43 | 770 | 780 | 2385 | 10 / 10 |
| | | 850 | 860 | 2460 | 10 / 11 |
| | | 930 | 940 | 2520 | 12 / 12 |
| | | 1010 | 1020 | 2575 | 12 / 13 |
| | | 1090 | 1100 | 2620 | 14 / 14 |
| | | 1170 | 1180 | 2660 | 14 / 15 |
| | | 1250 | 1260 | 2690 | 16 / 16 |
| | | 1330 | 1340 | 2720 | 16 / 17 |
| | | 1410 | 1420 | 2745 | 18 / 18 |
| | | 1490 | 1500 | 2770 | 18 / 19 |
| | | 1570 | 1580 | 2790 | 20 / 20 |
| | | 1650 | 1660 | 2805 | 20 / 21 |
| | | 1730 | 1740 | 2825 | 22 / 22 |
| | | 1810 | 1820 | 2840 | 22 / 23 |
| 1890 | 1900 | 2850 | 24 / 24 | | |
| 1970 | 1980 | 2860 | 24 / 25 | | |

* The given load capacities and weights apply for a single extension

Tab. 47

> DRT

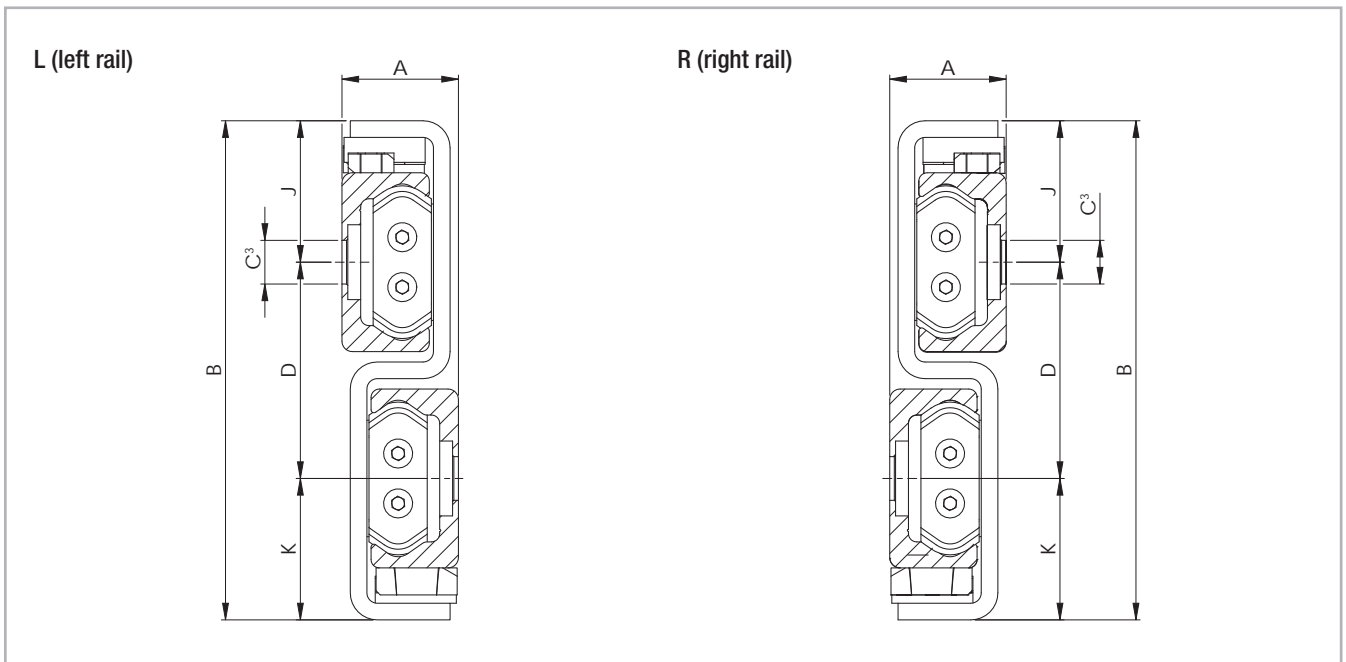


Fig. 37

³ Fixing holes for Torx® screws in custom design with load head (included in scope of supply)
Please observe right or left installation for version DRT.

| Type | Size | Cross-section | | | | | | Weight [kg/m] |
|------|------|---------------|--------|--------|--------|--------|----|---------------|
| | | A [mm] | B [mm] | K [mm] | D [mm] | J [mm] | C | |
| DRT | 43 | 29 | 120 | 34 | 52 | 34 | M8 | 11.20 |

Tab. 48

Technical instructions



> Telescopic rail selection

Selecting the suitable telescopic rail should be done based on the load and the maximum permissible deflection in the extended state. The load capacity of a telescopic rail depends on two factors: the loading capacity of the ballcage and the rigidity of the intermediate element. For mainly short strokes the load capacity is determined by the load-bearing capacity of the ballcage; for average and long strokes it is determined by the rigidity of the intermediate element. Therefore series, which otherwise contain comparable components, are also suited for differing load capacities.

> Static load check

The values in the load capacity tables of the corresponding series (see Sect. 3, Product Dimensions, pg. TR-6ff) give the maximum permissible loading of a telescopic rail in the centre of the movable rail in the completely extended state.

All load capacity data is based on a telescopic rail.

Typically, a pair of rails is used and the loading acts in the centre on both rails (see fig. 39, P_1).

In this case, the load capacity of a rail pair is:

$$P_1 = 2 \cdot C_{Orad}$$

Fig. 38

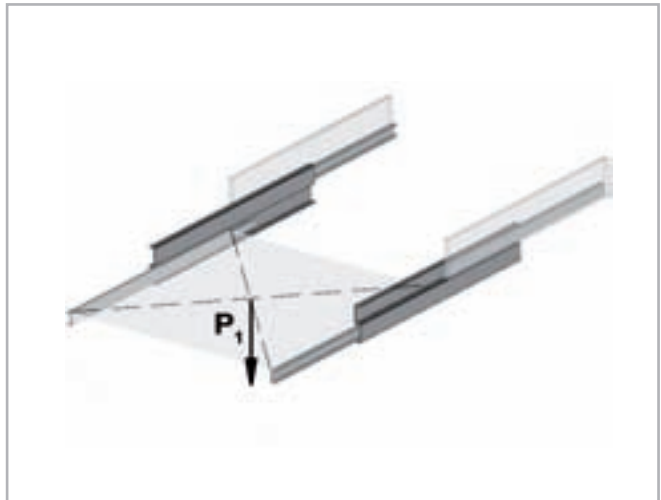


Fig. 39

> Deflection

If the load P acts vertically on the rail (see fig. 42), the expected elastic deflection of the individual telescopic rail in the extended state can be determined as follows:

$$f = \frac{q}{t} \cdot P \quad (\text{mm})$$

Fig. 40

Whereby:

f is the expected elastic deflection in mm

q is a stroke coefficient (see fig. 43)

t is a factor depending on the model of the telescopic rail (see fig. 41)

P is the actual load acting on the centre of a rail, in N

Also refer to page TR-38 for checking the static load

| | | | |
|------|------------|-------|------------|
| DS28 | $t = 180$ | DBN22 | $t = 3$ |
| DS35 | $t = 470$ | DBN28 | $t = 8$ |
| DS43 | $t = 800$ | DBN35 | $t = 13$ |
| DS63 | $t = 4000$ | DBN43 | $t = 56$ |
| DE22 | $t = 8$ | DMS63 | $t = 3500$ |
| DE28 | $t = 17$ | DRT43 | $t = 800$ |
| DE35 | $t = 54$ | DSC43 | $t = 800$ |
| DE43 | $t = 120$ | | |
| DE63 | $t = 540$ | | |

Fig. 41

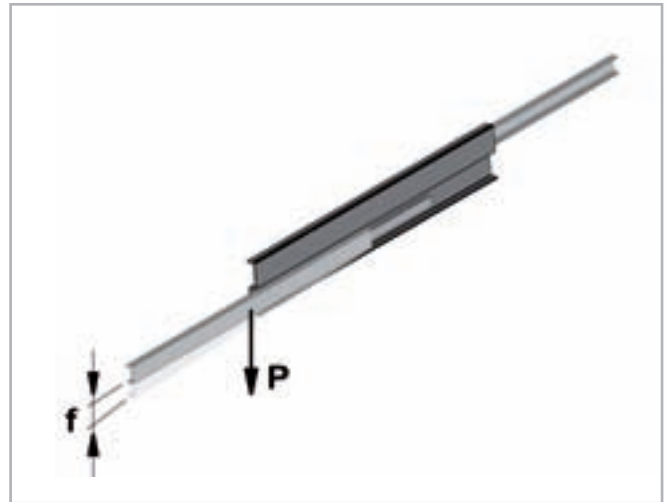


Fig. 42

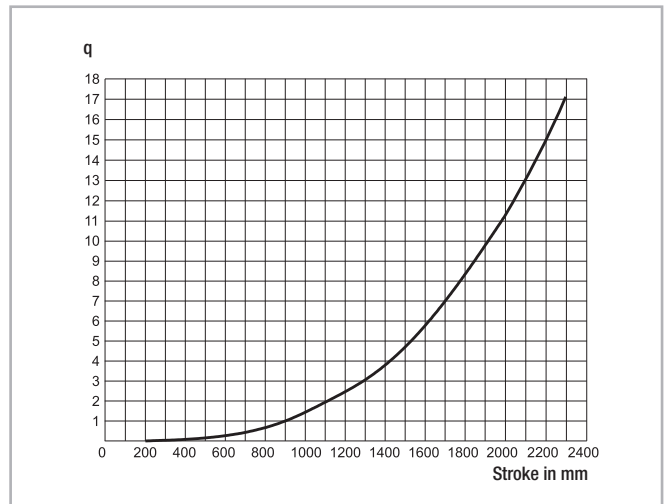


Fig. 43

Note: The above formula (see fig. 40) applies to a single rail. When using a rail pair, the load of the single rail is $P = P_i/2$ (see pg. TR-36, fig. 39). This estimated value assumes an absolutely rigid adjacent construction. If this rigidity is not present, the actual deflection will deviate from the calculation.

Important:

With the partial extensions of the ASN series, the deflection is almost completely determined by the rigidity, i.e. by the moment of inertia of the adjacent construction.

For guides Series DSE please contact Rollon technical support.

> Static load

The telescopic extension of the various series allow different forces and moments (see Sect. 3, Product dimensions, pg. TR-6ff).

During the static tests the radial load capacity, C_{Orad} , the axial load capacity, C_{Oax} , and moments M_x , M_y and M_z indicate the maximum permissible values of the loads; higher loads negatively effect the running properties

and the mechanical strength. A safety factor, S_0 , is used to check the static load, which takes into account the basic parameters of the application and is defined in more detail in the following table:

Safety factor S_0

| | |
|--|---------|
| Neither shocks nor vibrations, smooth and low-frequency reverse, high assembly accuracy, no elastic deformations | 1.5 |
| Normal installation conditions | 1.5 - 2 |
| Shocks and vibrations, high-frequency reverse, significant elastic deformation | 2 - 3.5 |

Tab. 49

The ratio of the actual load to maximum permissible load may be as large as the reciprocal of the accepted safety factor, S_0 , at the most.

| | | | | |
|--|--|--------------------------------------|--------------------------------------|--------------------------------------|
| $\frac{P_{Orad}}{C_{Orad}} \leq \frac{1}{S_0}$ | $\frac{P_{Oax}}{C_{Oax}} \leq \frac{1}{S_0}$ | $\frac{M_1}{M_x} \leq \frac{1}{S_0}$ | $\frac{M_2}{M_y} \leq \frac{1}{S_0}$ | $\frac{M_3}{M_z} \leq \frac{1}{S_0}$ |
|--|--|--------------------------------------|--------------------------------------|--------------------------------------|

Fig. 44

The above formulas are valid for a single load case. If two or more of the described forces act simultaneously, the following check must be made:

| | |
|--|---|
| $\frac{P_{Orad}}{C_{Orad}} + \frac{P_{Oax}}{C_{Oax}} + \frac{M_1}{M_x} + \frac{M_2}{M_y} + \frac{M_3}{M_z} \leq \frac{1}{S_0}$ | <p>P_{Orad} = effective radial load C_{Orad} = permissible radial load P_{Oax} = effective axial load C_{Oax} = permissible axial load M_1 = effective moment in the x-direction M_x = permissible moment in the x-direction M_2 = effective moment in the y-direction M_y = permissible moment in the y-direction M_3 = effective moment in the z-direction M_z = permissible moment in the z-direction</p> |
|--|---|

Fig. 45

> Service life

The service life is defined as the time span between commissioning and the first sign of fatigue or wear indications on the raceways. The service life of a telescopic rail is dependent on several factors, such as the effective load, the installation precision, occurring shocks and vibrations, the operating temperature, the ambient conditions and the lubrication. Calculation of the service life is based exclusively on the loaded rows of balls.

In practice, the decommissioning of the bearing, due to its destruction or extreme wear of a component, represents the end of service life.

This is taken into account by an application coefficient (f_i in the formula below), so the service life consists of:

$$L_{km} = 100 \cdot \left(\frac{\delta}{W} \cdot \frac{1}{f_i} \right)^3$$

L_{km} = calculated service life in km
 δ = load capacity factor in N
 W = equivalent load in N
 f_i = application coefficient

Fig. 46

Application coefficient f_i

| | ASN, DS, DE, DBN, DRT, DSC |
|---|----------------------------|
| Neither shocks nor vibrations, smooth and low-frequency direction change, clean environment | 1.3 - 1.8 |
| Light vibrations and average direction change | 1.8 - 2.3 |
| Shocks and vibrations, high-frequency direction change, very dirty environment | 2.3 - 3.5 |

Tab. 50

If the external load, P, is the same as the dynamic load capacity, C_{0rad} , (which of course must never be exceeded), the service life at ideal operating conditions ($f_i = 1$) amounts to 100 km.

Naturally, for a single load P, the following applies: $W = P$. If several external loads occur simultaneously, the equivalent load is calculated as follows:

$$W = P_{rad} + \left(\frac{P_{ax}}{C_{0ax}} + \frac{M_1}{M_x} + \frac{M_2}{M_y} + \frac{M_3}{M_z} \right) \cdot C_{0rad}$$

Fig. 47

Load capacity factor δ

| Length [mm] | ASN | | | | |
|----------------|-----------------|-------|-------|-------|-------|
| | 22 | 28 | 35 | 43 | 63 |
| | δ [N] | | | | |
| 130 | 415 | 872 | | | |
| 210 | 932 | 1577 | 1533 | 2288 | |
| 290 | 1295 | 2692 | 2906 | 4055 | |
| 370 | 1665 | 3405 | 3721 | 4794 | |
| 450 | 2205 | 4119 | 4537 | 6602 | |
| 530 | 2567 | 4832 | 5990 | 8451 | |
| 610 | 2936 | 5557 | 6803 | 10325 | 15003 |
| 690 | 3480 | 6271 | 7617 | 11005 | 17708 |
| 770 | 3842 | 6984 | 9093 | 12877 | 20427 |
| 850 | | 8111 | 9903 | 14762 | 23155 |
| 930 | | 8811 | 10714 | 15429 | 25889 |
| 1010 | | 9524 | 12201 | 17310 | 28629 |
| 1090 | | 10237 | 13009 | 17981 | 31374 |
| 1170 | | 10950 | 13818 | 19860 | 34121 |
| 1250 | | | 15311 | 21747 | 36871 |
| 1330 | | | 16118 | 22411 | 39623 |
| 1410 | | | 16925 | 24295 | 42377 |
| 1490 | | | 18423 | 26186 | 45133 |
| 1570 | | | | 28083 | 47890 |
| 1650 | | | | 28733 | 50648 |
| 1730 | | | | 30626 | 53407 |
| 1810 | | | | 31281 | 56166 |
| 1890 | | | | 33172 | 58927 |
| 1970 | | | | 33829 | 61688 |

Tab. 51

| Length [mm] | DS... | | | | DSE | | | | DSC |
|----------------|-----------------|------|-------|-------|------|------|------|-------|-------|
| | 28 | 35 | 43 | 63 | 28 | 35 | 43 | 63 | 43 |
| | δ [N] | | | | | | | | |
| 290 | 863 | | | | 542 | | | | |
| 370 | 1164 | | | | 733 | | | | |
| 450 | 1466 | 1892 | | | 924 | 1195 | | | |
| 530 | 1768 | 2540 | 3120 | | 1116 | 1612 | 1988 | | 3597 |
| 610 | 2078 | 2878 | 3929 | 5328 | 1310 | 1825 | 2509 | 3345 | 4451 |
| 690 | 2381 | 3217 | 4197 | 6459 | 1502 | 2040 | 2396 | 4063 | 4661 |
| 770 | 2684 | 3881 | 5010 | 7604 | 1694 | 2467 | 3194 | 4789 | 5511 |
| 850 | 3180 | 4218 | 5836 | 8759 | 2014 | 2679 | 3726 | 5523 | 6373 |
| 930 | 3474 | 4555 | 6090 | 9921 | 2203 | 2892 | 3879 | 6263 | 6572 |
| 1010 | 3778 | 5226 | 6916 | 11089 | 2396 | 3325 | 4410 | 7006 | 7880 |
| 1090 | 4081 | 5561 | 7750 | 12261 | 2706 | 3536 | 4948 | 7752 | 8296 |
| 1170 | 4384 | 5897 | 7646 | 13437 | 2781 | 3748 | 5095 | 8501 | 8934 |
| 1250 | 4896 | 6573 | 8829 | 14616 | | 4184 | 5632 | 9252 | 9351 |
| 1330 | 5193 | 6907 | 9077 | 15798 | | 4395 | 5781 | 10005 | 9990 |
| 1410 | 5496 | 7242 | 9909 | 16981 | | 4606 | 6316 | 7957 | 10409 |
| 1490 | 5806 | 7920 | 10746 | 18166 | | 5044 | 6855 | 11514 | 11728 |
| 1570 | | 8253 | 10988 | 19353 | | | 7048 | 12270 | 11913 |
| 1650 | | 8588 | 11825 | 20540 | | | 7539 | 13028 | 12330 |
| 1730 | | 9268 | 12665 | 21729 | | | 8080 | 13786 | 13197 |
| 1810 | | | 12904 | 22919 | | | 8222 | 14544 | 13912 |
| 1890 | | | 13743 | 24109 | | | 8763 | 15303 | 14704 |
| 1970 | | | 13983 | 25301 | | | 8907 | 16063 | 14885 |

Tab. 52

| Length [mm] | DRT | DMS |
|----------------|-----------------|-------|
| | 43 | 63 |
| | δ [N] | |
| 770 | 5160 | |
| 850 | 5306 | |
| 930 | 5424 | |
| 1010 | 5522 | 12154 |
| 1090 | 5605 | 14987 |
| 1170 | 5675 | 14457 |
| 1250 | 5736 | 16486 |
| 1330 | 5789 | 16763 |
| 1410 | 5836 | 19842 |
| 1490 | 5878 | 19285 |
| 1570 | 5915 | 22158 |
| 1650 | 5948 | 21598 |
| 1730 | 5978 | 24707 |
| 1810 | 6005 | 23911 |
| 1890 | 6030 | 25963 |
| 1970 | 6053 | 26225 |
| 2050 | | 29341 |
| 2130 | | 28763 |
| 2210 | | 30595 |

Tab. 53

| Length [mm] | DE... / DBN | | | | DE |
|----------------|-----------------|------|------|-------|-------|
| | 22 | 28 | 35 | 43 | 63 |
| | δ [N] | | | | |
| 130 | 165 | 357 | | | |
| 210 | 386 | 655 | 614 | 923 | |
| 290 | 537 | 1153 | 1211 | 1687 | |
| 370 | 690 | 1456 | 1552 | 1974 | |
| 450 | 925 | 1759 | 1892 | 2764 | |
| 530 | 1075 | 2063 | 2540 | 3580 | |
| 610 | 1229 | 2372 | 2878 | 4414 | 6203 |
| 690 | 1467 | 2675 | 3217 | 4661 | 7361 |
| 770 | 1616 | 2979 | 3881 | 5493 | 8527 |
| 850 | | 3487 | 4218 | 6335 | 9699 |
| 930 | | 3783 | 4555 | 6572 | 10875 |
| 1010 | | 4086 | 5226 | 7411 | 12055 |
| 1090 | | 4388 | 5561 | 8257 | 13238 |
| 1170 | | 4691 | 5897 | 8489 | 14423 |
| 1250 | | | 6573 | 9332 | 15610 |
| 1330 | | | 6907 | 9568 | 16798 |
| 1410 | | | 7242 | 10409 | 17987 |
| 1490 | | | 7920 | 11255 | 19178 |
| 1570 | | | | 12105 | 20369 |
| 1650 | | | | 12330 | 21561 |
| 1730 | | | | 13178 | 22754 |
| 1810 | | | | 13406 | 23948 |
| 1890 | | | | 14252 | 25142 |
| 1970 | | | | 14483 | 26336 |

Tab. 54

> Speed

The maximum operating speed is determined by the mass of the intermediate element, which moves with the movable rail. This reduces the maximum permissible operating speed with increasing length (see fig. 48).

Maximum acceleration: 1.2 m/s²

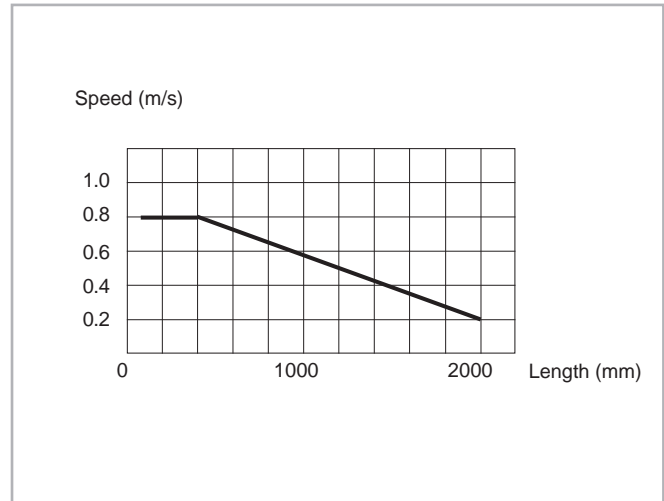


Fig. 48

> Opening and closing force

The required actuation forces of a telescopic rail depend on the acting load and the deflection in the extended state. The force required for opening is principally determined by the coefficient of friction of the linear bearing. With correct assembly and lubrication, this is 0.01. During the extension, the force is reduced with the elastic deflection of the loaded

telescopic rail. A higher force is required to close a telescopic extension, since, based on the elastic deflection, even if it is minimal, the movable rail must move against an inclined plane.

> Double-sided stroke

For all designs allowing double-sided stroke, it must be noted that the position of the intermediate element is defined only in the extended state. In the extended state, the intermediate element can protrude by half of its length on each side. Exception is the ASN series, which comes out as a partial extension without an intermediate element and the custom design of series DE with driving disc.

The double-sided stroke in the ASN, DE and DBN series is achieved by removing the set screw. For the DSD series, the double-sided stroke is implemented by design adaptation. Double-sided stroke for series DMS on request. The DSB and DRT series are not available with double-sided stroke.

> Temperature

- Series ASN, DE, DBN can be used up to an ambient temperature of +170 °C (+338 °F). A lithium lubricant for high operating temperatures is recommended for temperatures above +130 °C (+266 °F).
- The DS, DSC, and DRT series have a useable range of -20 °C to +110 °C (-4 °F to +230 °F) due to of the rubber stop.

> Anticorrosive protection

- All of our Telescopic Rail series have a standard anticorrosive protection by electrolytic galvanisation according to ISO 2081. If a higher resistance to corrosion is required, the guides are available with Rollon Alloy or chemical nickel treatment. For both versions stainless steel balls are provided.
- Numerous application-specific surface treatments are available upon request, e.g., FDA approved nickel plating for use in the food industry. For more information please contact Rollon technical support.

> Lubrication

Recommended lubrication intervals are heavily dependent upon the ambient conditions, speed and temperature. Under normal conditions, lubrication is recommended after 100 km operational performance or after an operating period of six months. In critical application cases the interval should be shorter. Please clean the raceways carefully before lubricating. Raceways and spaces of the ball cage are lubricated with a lithium lubricant of average consistency (roller bearing lubricant).

Different lubricants are available on request for special applications:

- FDA-approved lubricant for use in the food industry
- specific lubricant for clean rooms
- specific lubricant for the marine technology sector
- specific lubricant for high and low temperatures

For specific information, contact Rollon technical support.

> Clearance and preload

Telescopic Rail guides are mounted as standard with no play. For more information, please contact Rollon technical support.

| Preload classes | | |
|---------------------|--------------|-------------------|
| Increased clearance | No clearance | Increased preload |
| G ₁ | Standard | K ₁ |

Tab. 55

* for higher preload, contact Rollon technical support.

> Fixing screws

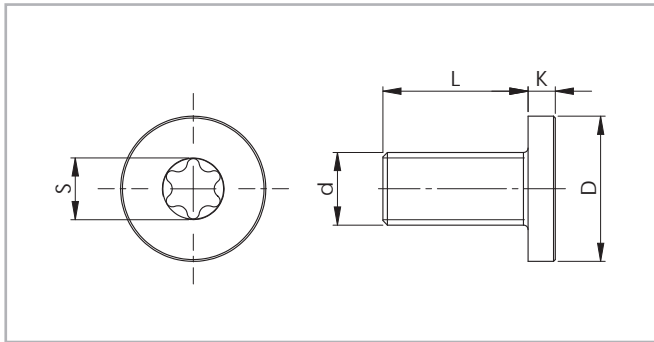


Fig. 49

The DRT 43 telescopic rail must be fixed with a custom designed Torx® screws with low cap head. The screws are included in the scope of supply. All other rails are fixed with counter-sunk or cap head screws as per DIN 7991 or 7984. In size 63 of the ASN and DMS series, Torx® screws with low head cap screws are available on request (see fig. 49).

| Size | Screw type | d | D [mm] | L [mm] | K [mm] | S |
|------|------------|-----------|--------|--------|--------|-----|
| 63 | M8 x 20 | M8 x 1.25 | 13 | 20 | 5 | T40 |
| 43 | M8 x 16 | M8 x 1.25 | 16 | 16 | 3 | |

Tab. 56

Recommended Standard fixing screw tightening torques

| Property class | Size | Tightening torque [Nm] |
|----------------|------|------------------------|
| 10.9 | 22 | 3 |
| | 28 | 6 |
| | 35 | 10 |
| | 43 | 25 |
| | 63 | 30 |

Tab. 57

Prepare a sufficient bevel on the threaded fixing holes, according to the following table:

| Size | Bevel (mm) |
|------|------------|
| 22 | 0,5 x 45° |
| 28 | 1 x 45° |
| 35 | 1 x 45° |
| 43 | 1 x 45° |
| 63 | 1 x 45° |

Tab. 58

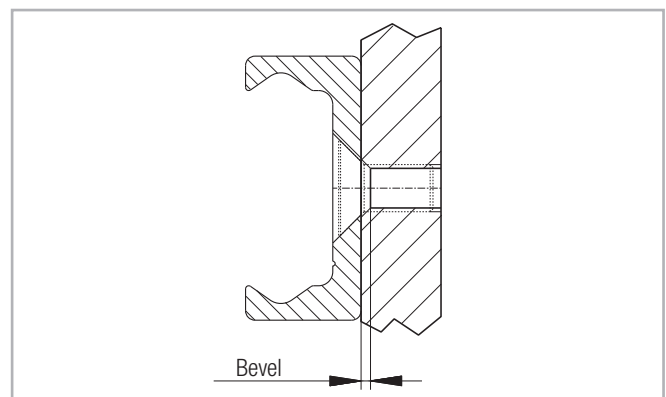
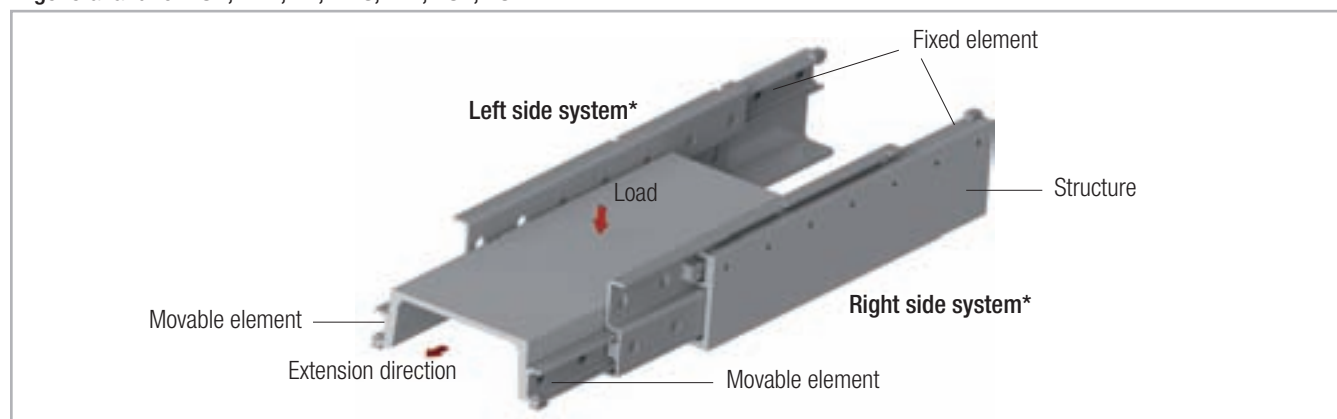


Fig. 50

> Installation instructions

In general and for ASN, DBN, DE, DMS, DRT, DSB, DSE



* For models DMS, DRT, DSB, and DSE, please observe right or left side use

Fig. 51

General

- Internal stops are used to stop the unloaded slider and the ball cage. Please use external stops as end stops for a loaded system.
- To achieve optimum running properties, high service life and rigidity, it is necessary to fix the telescopic rails with all accessible holes on a rigid and level surface.
- In order to reach all mounting holes for the ASN, DEV, DEM and DBN series it is necessary to remove the locking screw in the rail during assembly and then to reinsert it afterwards.
- When using two telescopic rails, please observe the parallelism of the installation surfaces. The fixed and movable rails fit to the rigid assembly construction.
- Telescopic Rail guides are suitable for continuous use in automatic systems. For this, the stroke should remain constant in all moving cycles and the operating speed must be checked (see pg. TR-42, fig. 48). The movement of the telescopic rails is enabled by internal ballcages, which could experience an offset from the original position with differing strokes. This phase offset can have a negative effect on the running properties or limit the stroke. If differing strokes occur in an application, the drive force must be sufficiently dimensioned in order to appropriately synchronise the ballcage offset. Otherwise, an additional maximum stroke must be planned regularly to ensure the correct position of the ballcage.

ASN

- Series ASN accepts radial and axial loads and moments in all principle directions.
- Horizontal and vertical application is possible. Prior to vertical installation, we recommend contacting Rollon technical support.
- The installation of two partial extensions on a profile provides a load capable full extension. For individual solutions, please contact Rollon technical support.

DE / DBN

- Series DE and DBN accept radial and axial loads.
- Horizontal and vertical application is possible. Prior to vertical installation, we recommend you contact Rollon technical support.
- The functionality of custom design DE...D is only guaranteed if the stroke available is completely used.

DS / DSE / DMS / DRT

- Series DS, DES, DMS and DRT accept radial loads. This should act in the vertical cross-sectional axis on the movable rails.
- Horizontal and vertical application is possible. Prior to vertical installation, we recommend you contact Rollon technical support.
- When installing make sure that the load is placed on the movable element (the lower rail) (see fig. 51).
The opposite assembly negatively affects the function.
- Installation must be done on a rigid structure using all accessible fixing holes.
- Pay attention to the parallel alignment during assembly with paired application.

> Installation instructions

For DSC

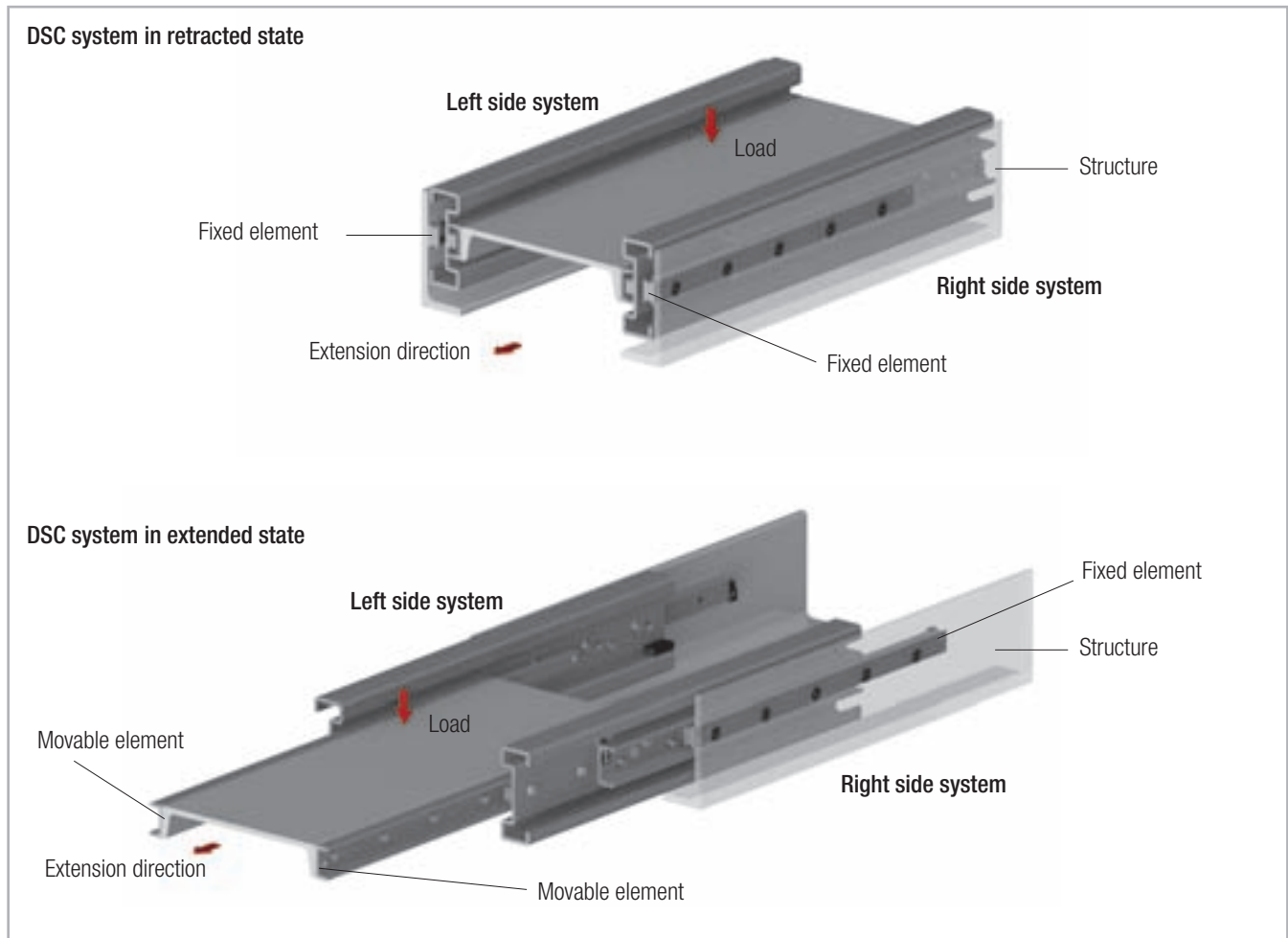


Fig. 52

DSC

- The DSC series absorbs radial and axial loads, in which case radial load directions are preferable.
- Horizontal and vertical use is possible. Prior to vertical installation we recommend inspection by the application engineers.
- During installation make sure that the load is mounted on the movable element (see Fig. 52). Reverse installation will impair proper functioning.
- The installation must be performed on a rigid structure, using all accessible mounting holes.
- Important: The length of the slider (fixed element) is different from the system length. See Table 23 on page TR-20 for DSC load ratings. The table also provides information on the accessible mounting holes.
- Important: The slide (fixed element) must be mounted in the front position when the system is retracted in order to achieve the entire stroke.
- If used in pairs, make sure the elements are aligned parallel during mounting.

Ordering key

> Telescopic rails

| | | | | | |
|--------------|-----------|------------|------------|----------|---|
| DSB | 28 | 690 | 885 | L | NIC |
| | | | | | Expanded surface protection is deviation from standard (ISO 2081) <i>see pg. TR-43, Anticorrosive protection</i> |
| | | | | | Right (R) or left (L) version (only for series DMS, DRT, DSB, DSE) <i>see pg. TR-5 Remarks</i> |
| | | | | | Stroke, if deviating from standard stroke (catalogue data) <i>see pg. TR-6ff Product dimensions and Ordering key for special strokes</i> |
| | | Length | | | <i>see pg. TR-6ff Product dimensions</i> |
| | Size | | | | <i>see pg. TR-6ff Product dimensions</i> |
| Product type | | | | | <i>see pg. TR-6ff Product dimensions</i> |

Ordering example 1: ASN35-0770

Ordering example 2: DSB28-0690-0885-L-NIC

Ordering example 3 (rail DE...D): DEF28D-0690

Notes on ordering: Information for right and left side installation and for expanded surface protection is only necessary if required.

Rail lengths and stroke lengths are always stated with 4 digits. Please pad with zeroes to fill in for lengths with less than 4 digits, e.g. 515mm length is "0515"

> Special strokes

Special strokes are defined as deviations from standard stroke H. They are each available as multiples of the values in tab. 59 and 60.

These values are dependent on the spacing of the ballage.

| Type | Size | Stroke modification [mm] |
|------|------|--------------------------|
| ASN | 22 | 7.5 |
| | 28 | 9.5 |
| | 35 | 12 |
| | 43 | 15 |
| | 63 | 20 |

Tab. 59

Stroke modification of series DMS on request.

No stroke modification is possible for the DSD, DSC and DRT series. Each stroke modification influences the load capacities stated in the catalogue. It is possible that after a stroke modification important fastening holes might no longer be accessible. For more information please contact Rollon technical support.

| Type | Size | Stroke modification [mm] |
|------------------|------|--------------------------|
| DSS DE DBN | 22 | 15 |
| | 28 | 19 |
| | 35 | 24 |
| | 43 | 30 |
| | 63 | 40 |
| DSE | 28 | 28,5 |
| | 35 | 36 |
| | 43 | 45 |
| | 63 | 60 |

Tab. 60

ROLLON[®]

Linear Evolution

Opti Rail



Product explanation



> Fully extending telescopic rails for manual movement



Fig. 1

Range of fully extending telescopic rails, extremely compact and highly rigid, with reduced deflection even when the telescopic rail is fully extended. The steel ball bearings ensure a high load capacity.

The most important characteristics:

- Full extension
- Compact construction
- Quiet and smooth operation
- Long life
- Reliable operation
- 2 types of hole pitch

Preferred areas of application:

- Railway (e. g. maintenance and battery extensions)
- Special Vehicles (e.g. fireworks, ambulance, mobile shops)
- Professional furniture
- Special machines
- Industrial drawers

LTH

Fully extending telescopic rail made of cold drawn steel, consisting of two rails, one fixed and one moveable, and of a central I-beam profile element. This element has high inertia and a very rigid construction, while boasting a very compact design. This ensures a high load capacity and reduced deflection even when the telescopic rail is fully extended.

...S version available with reinforced and damped stainless steel end stops.



Fig. 2

LTF

Fully extending telescopic rail consisting of two guide rails as fixed and movable elements and an S-shaped intermediate element. This special shape allows an extremely slim and compact design for movements that are only occasionally executed.



Fig. 3

Technical data

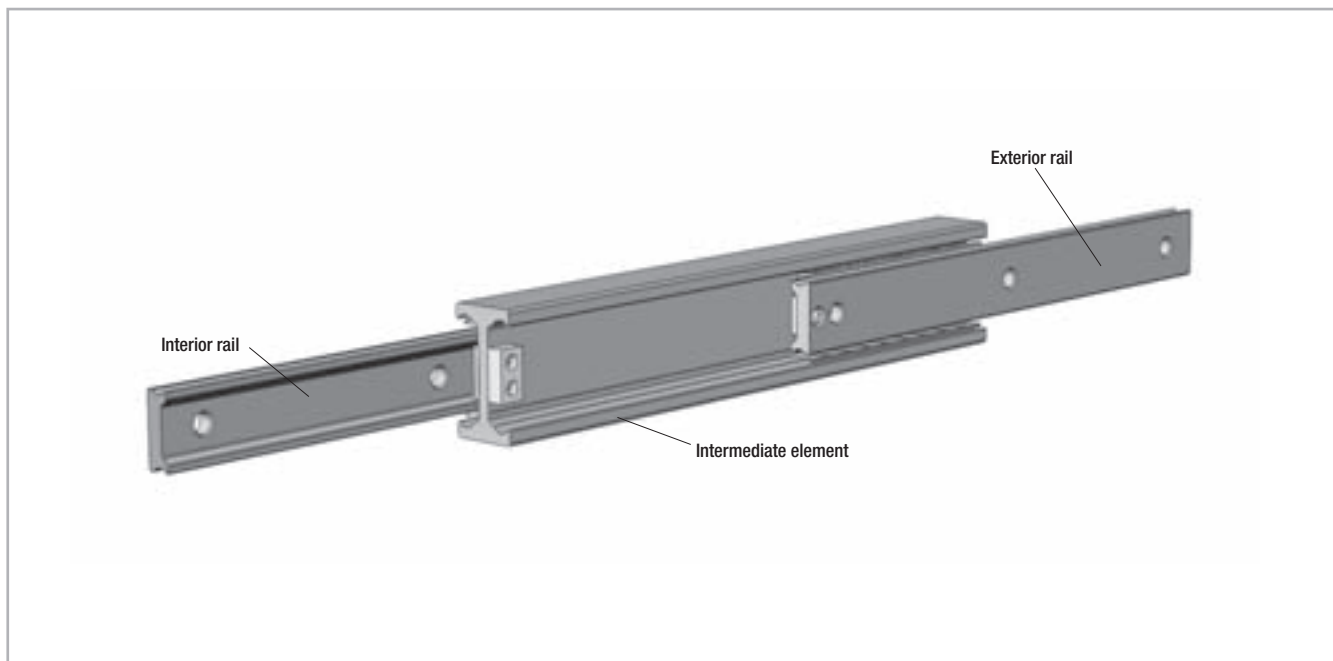


Fig. 4

Performance characteristics

- Temperature range: -20 °C to +170 °C (-4 °F to +338 °F)
- Max. operating speed: 0.3 m/s (depending on application)
- Available sizes LTH: 30 and 45
- Available sizes LTF: 44
- Sliders and LTH central element made of steel Cf53
- Sliders and LTF central element made of steel C43

Note:

- Horizontal movement installation is recommended
- Vertical movement installation on request
- Custom strokes on request
- All load capacity data are based on one telescopic rail
- Fixing screws of property class 10.9 must be used for all telescopic rails
- Internal stops are used to stop the unloaded slider and the ball cage.
Please use external stops as end stops for a loaded system.

Dimensions and load capacity

LTH30 RF

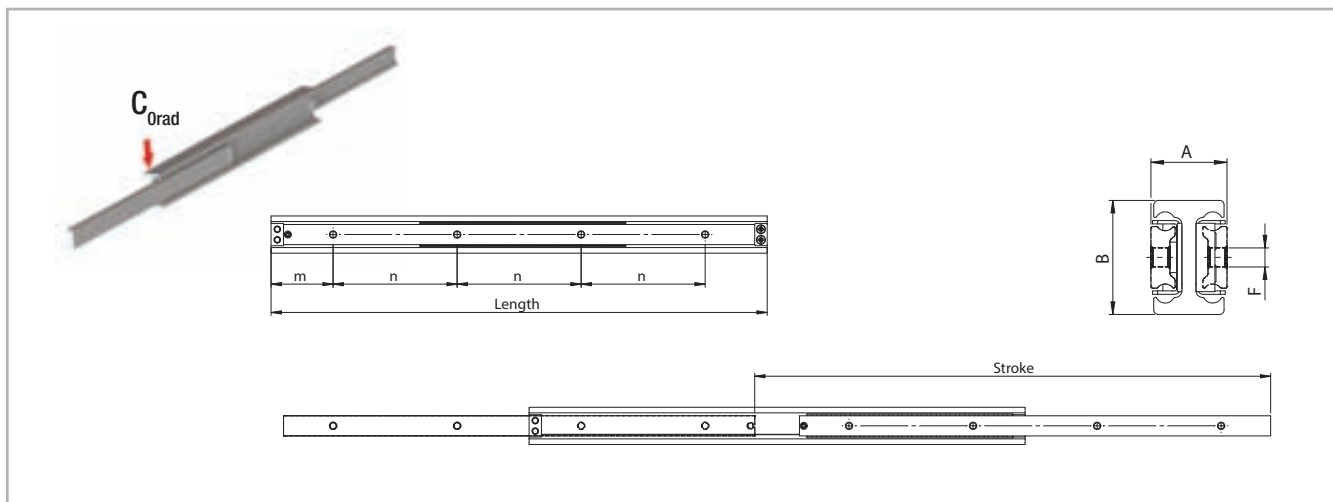


Fig. 5

| Type | Size | Length | Stroke | A | B | m | n | F | Load capacity* | No. of holes | Weight* |
|------|------|--------|--------|------|------|------|------|----|----------------|--------------|---------|
| | | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | | C_{Orad} [N] | | [kg] |
| LTH | 30 | 250 | 285 | 20 | 30 | 25 | 100 | M6 | 202 | 3 | 0.88 |
| | | 300 | 323 | | | 50 | | | 504 | | |
| | | 350 | 377 | | | 25 | | | 4 | 1.23 | |
| | | 400 | 416 | | | 50 | | | | | 568 |
| | | 450 | 485 | | | 25 | | | 5 | 1.58 | |
| | | 500 | 523 | | | 50 | | | | | 735 |
| | | 550 | 577 | | | 25 | | | 6 | 1.93 | |
| | | 600 | 615 | | | 50 | | | | | 701 |
| | | 650 | 685 | | | 25 | | | 7 | 2.28 | |
| | | 700 | 723 | | | 50 | | | | | 593 |
| | | 750 | 777 | | | 25 | | | 8 | 2.63 | |
| | | 800 | 815 | | | 50 | | | | | 533 |
| | | 850 | 884 | | | 25 | | | 9 | 2.98 | |
| | | 900 | 923 | | | 50 | | | | | 468 |
| | | 950 | 977 | | | 25 | | | 10 | 3.33 | |
| | | 1000 | 1015 | | | 50 | | | | | 429 |
| 1050 | 1084 | 25 | 11 | 3.68 | | | | | | | |
| 1100 | 1123 | 50 | | | 396 | | | | | | |
| 1150 | 1176 | 25 | 12 | 4.03 | | | | | | | |
| 1200 | 1215 | 50 | | | 368 | 4.20 | | | | | |

* The given load capacities and weights apply for a single extension

Tab. 1

> LTH30 KF

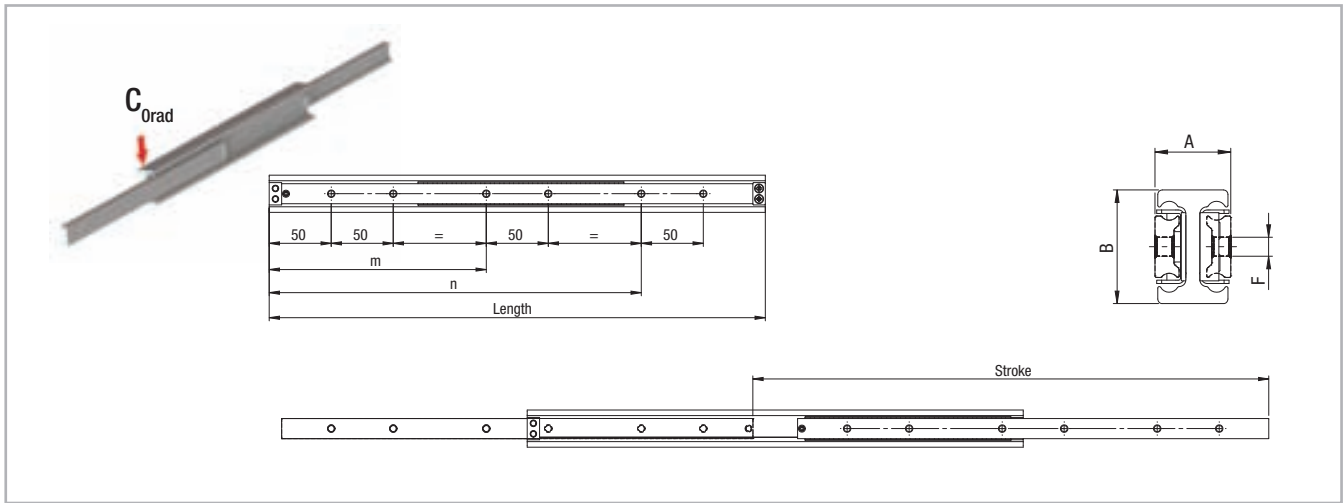


Fig. 6

| Type | Size | Length | Stroke | A | B | m | n | F | Load capacity* | No. of holes | Weight* |
|------|------|--------|--------|------|------|------|------|----|----------------|--------------|---------|
| | | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | | C_{Orad} [N] | | [kg] |
| LTH | 30 | 250 | 285 | 20 | 30 | - | 150 | M6 | 202 | 4 | 0.88 |
| | | 300 | 323 | | | - | 200 | | 504 | | 1.05 |
| | | 350 | 377 | | | - | 250 | | 521 | | 1.23 |
| | | 400 | 416 | | | 175 | 300 | | 568 | | 1.40 |
| | | 450 | 485 | | | 200 | 350 | | 582 | 1.58 | |
| | | 500 | 523 | | | 225 | 400 | | 735 | 1.75 | |
| | | 550 | 577 | | | 250 | 450 | | 732 | 1.93 | |
| | | 600 | 615 | | | 275 | 500 | | 701 | 2.10 | |
| | | 650 | 685 | | | 300 | 550 | | 615 | 2.28 | |
| | | 700 | 723 | | | 325 | 600 | | 593 | 2.45 | |
| | | 750 | 777 | | | 350 | 650 | | 550 | 2.63 | |
| | | 800 | 815 | | | 375 | 700 | | 533 | 2.80 | |
| | | 850 | 884 | | | 400 | 750 | | 481 | 2.98 | |
| | | 900 | 923 | | | 425 | 800 | | 468 | 3.15 | |
| | | 950 | 977 | | | 450 | 850 | | 441 | 3.33 | |
| | | 1000 | 1015 | | | 475 | 900 | | 429 | 3.50 | |
| 1050 | 1084 | 500 | 950 | 396 | 3.68 | | | | | | |
| 1100 | 1123 | 525 | 1000 | 386 | 3.85 | | | | | | |
| 1150 | 1176 | 550 | 1050 | 368 | 4.03 | | | | | | |
| 1200 | 1215 | 575 | 1100 | 360 | 4.20 | | | | | | |

* The given load capacities and weights apply for a single extension

Tab. 2

> LTH30...S

...S version with reinforced and damped stainless steel end stops

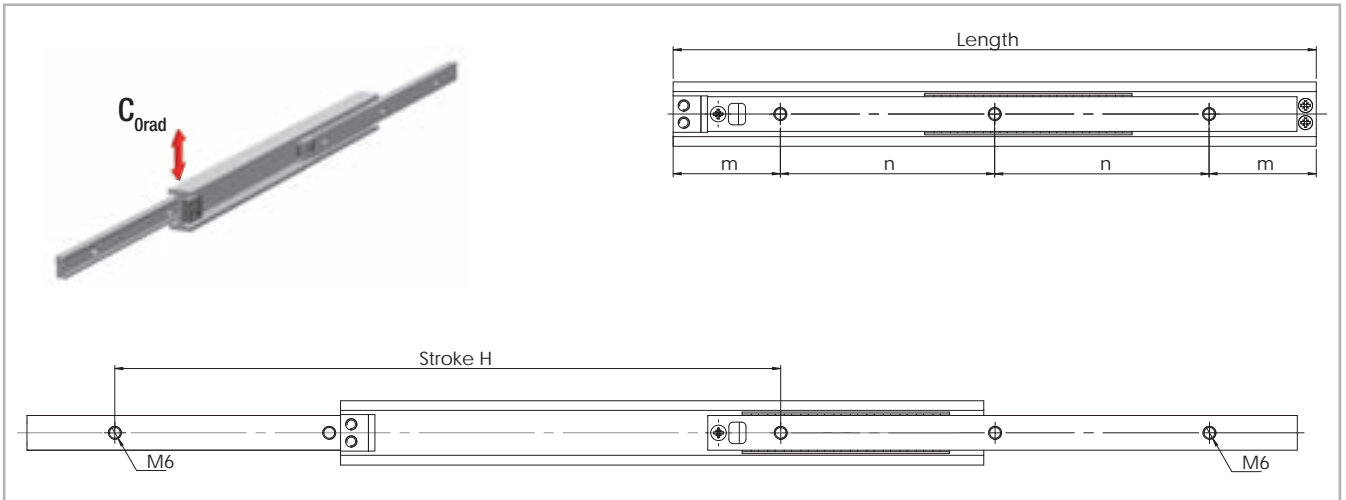


Fig. 7

| Type | Size | Length [mm] | Stroke [mm] | A [mm] | B [mm] | m [mm] | n [mm] | F | Load capacity* C_{Orad} [N] | No. of holes |
|---------|------|----------------|----------------|-----------|-----------|-----------|-----------|----|----------------------------------|--------------|
| LTH...S | 30 | 300 | 310 | 20 | 30 | 50 | 100 | M6 | 408 | 3 |
| | | 350 | 364 | | | 75 | | | 440 | |
| | | 400 | 402 | | | 50 | | | 497 | 4 |
| | | 450 | 472 | | | 75 | | | 516 | |
| | | 500 | 510 | | | 50 | | | 665 | 5 |
| | | 550 | 564 | | | 75 | | | 749 | |
| | | 600 | 618 | | | 50 | | | 696 | 6 |
| | | 650 | 671 | | | 75 | | | 638 | |
| | | 700 | 725 | | | 50 | | | 589 | 7 |
| | | 750 | 764 | | | 75 | | | 569 | |
| | | 800 | 817 | | | 50 | | | 530 | 8 |
| | | 850 | 871 | | | 75 | | | 496 | |
| | | 900 | 925 | | | 50 | | | 466 | 9 |
| | | 950 | 979 | | | 75 | | | 439 | |
| | | 1000 | 1017 | | | 50 | | | 428 | 10 |
| 1050 | 1071 | 75 | 405 | | | | | | | |
| 1100 | 1109 | 50 | 395 | 11 | | | | | | |
| 1150 | 1179 | 75 | 366 | | | | | | | |
| 1200 | 1217 | 50 | 359 | 12 | | | | | | |

* The given load capacities and weights apply for a single extension

Tab. 3

OR

> LTH45 RF

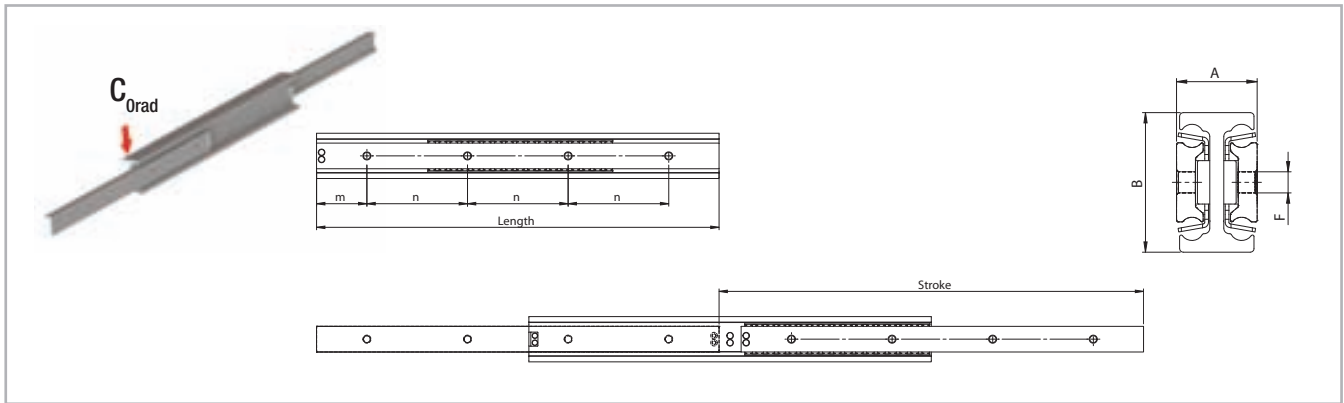


Fig. 8

| Type | Size | Length | Stroke | A | B | m | n | F | Load capacity* | No. of holes | Weight* |
|------|------|--------|--------|------|------|------|------|----|----------------|--------------|---------|
| | | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | | C_{Orad} [N] | | [kg] |
| LTH | 45 | 250 | 276 | 26 | 45 | 25 | 100 | M8 | 1305 | 3 | 1.50 |
| | | 300 | 310 | | | 50 | | | 1412 | | 1.80 |
| | | 350 | 388 | | | 25 | | | 1410 | 4 | 2.10 |
| | | 400 | 422 | | | 50 | | | 1421 | | 2.40 |
| | | 450 | 478 | | | 25 | | | 1432 | 5 | 2.70 |
| | | 500 | 512 | | | 50 | | | 1450 | | 3.00 |
| | | 550 | 590 | | | 25 | | | 1382 | 6 | 3.30 |
| | | 600 | 624 | | | 50 | | | 1516 | | 3.60 |
| | | 650 | 680 | | | 25 | | | 1626 | 7 | 3.90 |
| | | 700 | 714 | | | 50 | | | 1673 | | 4.20 |
| | | 750 | 770 | | | 25 | | | 1542 | 8 | 4.50 |
| | | 800 | 826 | | | 50 | | | 1430 | | 4.80 |
| | | 850 | 882 | | | 25 | | | 1333 | 9 | 5.10 |
| | | 900 | 916 | | | 50 | | | 1307 | | 5.40 |
| | | 950 | 972 | | | 25 | | | 1225 | 10 | 5.70 |
| | | 1000 | 1028 | | | 50 | | | 1153 | | 6.00 |
| | | 1050 | 1084 | | | 25 | | | 1089 | 11 | 6.30 |
| | | 1100 | 1118 | | | 50 | | | 1072 | | 6.60 |
| | | 1150 | 1174 | | | 25 | | | 1017 | 12 | 6.90 |
| | | 1200 | 1230 | | | 50 | | | 967 | | 7.20 |
| 1250 | 1286 | 25 | 921 | 13 | 7.50 | | | | | | |
| 1300 | 1320 | 50 | 909 | | 7.80 | | | | | | |
| 1350 | 1376 | 25 | 869 | 14 | 8.10 | | | | | | |
| 1400 | 1410 | 50 | 858 | | 8.40 | | | | | | |
| 1450 | 1488 | 25 | 798 | 15 | 8.70 | | | | | | |
| 1500 | 1522 | 50 | 789 | | 9.00 | | | | | | |

* The given load capacities and weights apply for a single extension

Tab. 4

> LTH45 KF

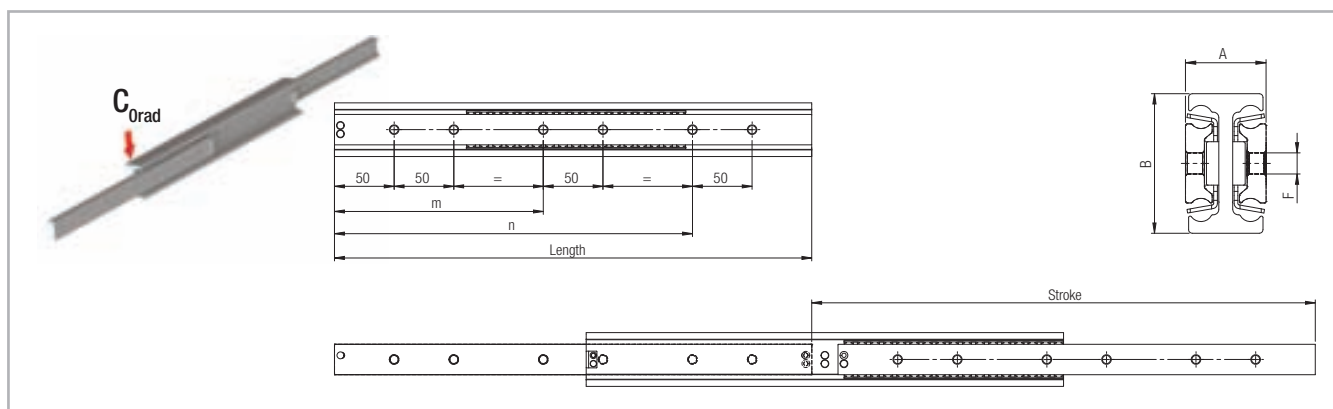


Fig. 9

| Type | Size | Length [mm] | Stroke [mm] | A [mm] | B [mm] | m [mm] | n [mm] | F | Load capacity* C_{Orad} [N] | No. of holes | Weight* [kg] |
|------|------|----------------|----------------|-----------|-----------|-----------|-----------|----|----------------------------------|--------------|-----------------|
| LTH | 45 | 250 | 276 | 26 | 45 | - | 150 | M8 | 1305 | 4 | 1.50 |
| | | 300 | 310 | | | - | 200 | | 1412 | | 1.80 |
| | | 350 | 388 | | | - | 250 | | 1410 | | 2.10 |
| | | 400 | 422 | | | 175 | 300 | | 1421 | | 2.40 |
| | | 450 | 478 | | | 200 | 350 | | 1432 | 2.70 | |
| | | 500 | 512 | | | 225 | 400 | | 1450 | 3.00 | |
| | | 550 | 590 | | | 250 | 450 | | 1382 | 3.30 | |
| | | 600 | 624 | | | 275 | 500 | | 1516 | 3.60 | |
| | | 650 | 680 | | | 300 | 550 | | 1626 | 3.90 | |
| | | 700 | 714 | | | 325 | 600 | | 1673 | 4.20 | |
| | | 750 | 770 | | | 350 | 650 | | 1542 | 4.50 | |
| | | 800 | 826 | | | 375 | 700 | | 1430 | 4.80 | |
| | | 850 | 882 | | | 400 | 750 | | 1333 | 5.10 | |
| | | 900 | 916 | | | 425 | 800 | | 1307 | 5.40 | |
| | | 950 | 972 | | | 450 | 850 | | 1225 | 5.70 | |
| | | 1000 | 1028 | | | 475 | 900 | | 1153 | 6.00 | |
| | | 1050 | 1084 | | | 500 | 950 | | 1089 | 6.30 | |
| | | 1100 | 1118 | | | 525 | 1000 | | 1072 | 6.60 | |
| | | 1150 | 1174 | | | 550 | 1050 | | 1017 | 6.90 | |
| | | 1200 | 1230 | | | 575 | 1100 | | 967 | 7.20 | |
| 1250 | 1286 | 600 | 1150 | 921 | 7.50 | | | | | | |
| 1300 | 1320 | 625 | 1200 | 909 | 7.80 | | | | | | |
| 1350 | 1376 | 650 | 1250 | 869 | 8.10 | | | | | | |
| 1400 | 1410 | 675 | 1300 | 858 | 8.40 | | | | | | |
| 1450 | 1488 | 700 | 1350 | 798 | 8.70 | | | | | | |
| 1500 | 1522 | 725 | 1400 | 789 | 9.00 | | | | | | |

* The given load capacities and weights apply for a single extension

Tab. 5

> LTH45...S

...S version with reinforced and damped stainless steel end stops

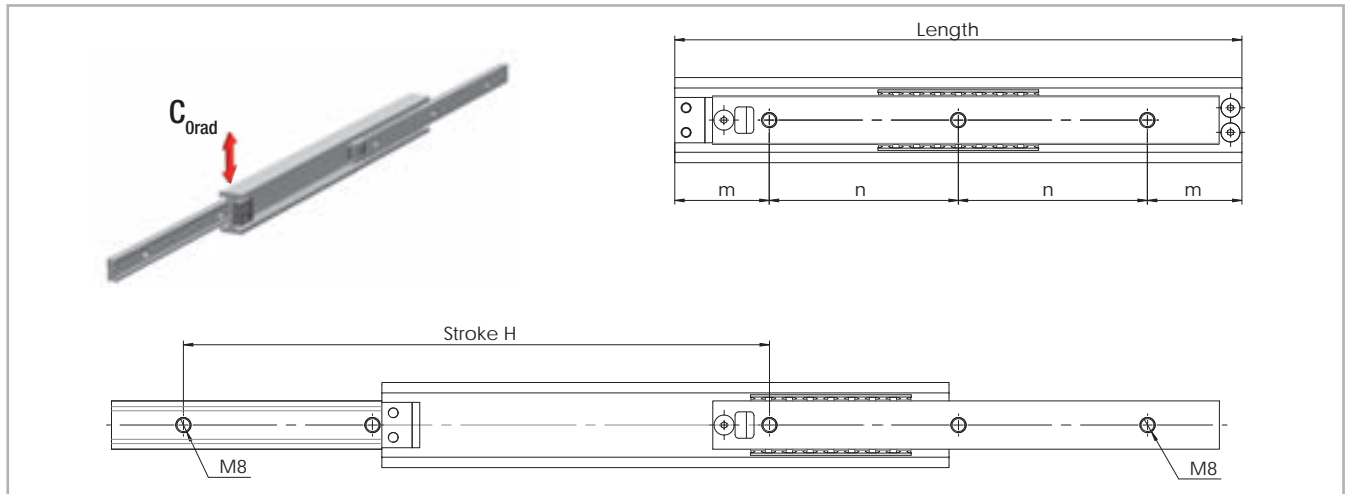


Fig. 10

| Type | Size | Length L [mm] | Stroke H [mm] | A [mm] | B [mm] | m [mm] | n [mm] | F | Load capacity* C_{Orad} [N] | No. of holes |
|---------|------|---------------|---------------|--------|--------|--------|--------|----|-------------------------------|--------------|
| LTH...S | 45 | 300 | 310 | 26 | 45 | 50 | 100 | M8 | 658 | 3 |
| | | 350 | 366 | | | 75 | | | 916 | |
| | | 400 | 422 | | | 50 | | | 833 | |
| | | 450 | 456 | | | 75 | | | 1077 | 4 |
| | | 500 | 512 | | | 50 | | | 986 | |
| | | 550 | 568 | | | 75 | | | 1100 | 5 |
| | | 600 | 624 | | | 50 | | | 1102 | |
| | | 650 | 680 | | | 75 | | | 1213 | 6 |
| | | 700 | 714 | | | 50 | | | 1471 | |
| | | 750 | 770 | | | 75 | | | 1542 | 7 |
| | | 800 | 826 | | | 50 | | | 1430 | |
| | | 850 | 882 | | | 75 | | | 1333 | 8 |
| | | 900 | 916 | | | 50 | | | 1307 | |
| | | 950 | 972 | | | 75 | | | 1225 | 9 |
| | | 1000 | 1028 | | | 50 | | | 1153 | |
| | | 1050 | 1084 | | | 75 | | | 1089 | 10 |
| | | 1100 | 1118 | | | 50 | | | 1072 | |
| | | 1150 | 1174 | | | 75 | | | 1017 | 11 |
| 1200 | 1230 | 50 | 967 | | | | | | | |
| 1250 | 1286 | 75 | 921 | 12 | | | | | | |
| 1300 | 1320 | 50 | 909 | | | | | | | |
| 1350 | 1376 | 75 | 869 | 13 | | | | | | |
| 1400 | 1410 | 50 | 858 | | | | | | | |
| 1450 | 1488 | 75 | 798 | 14 | | | | | | |
| 1500 | 1522 | 50 | 789 | | | | | | | |

* The given load capacities and weights apply for a single extension

Tab. 6

> LTF44

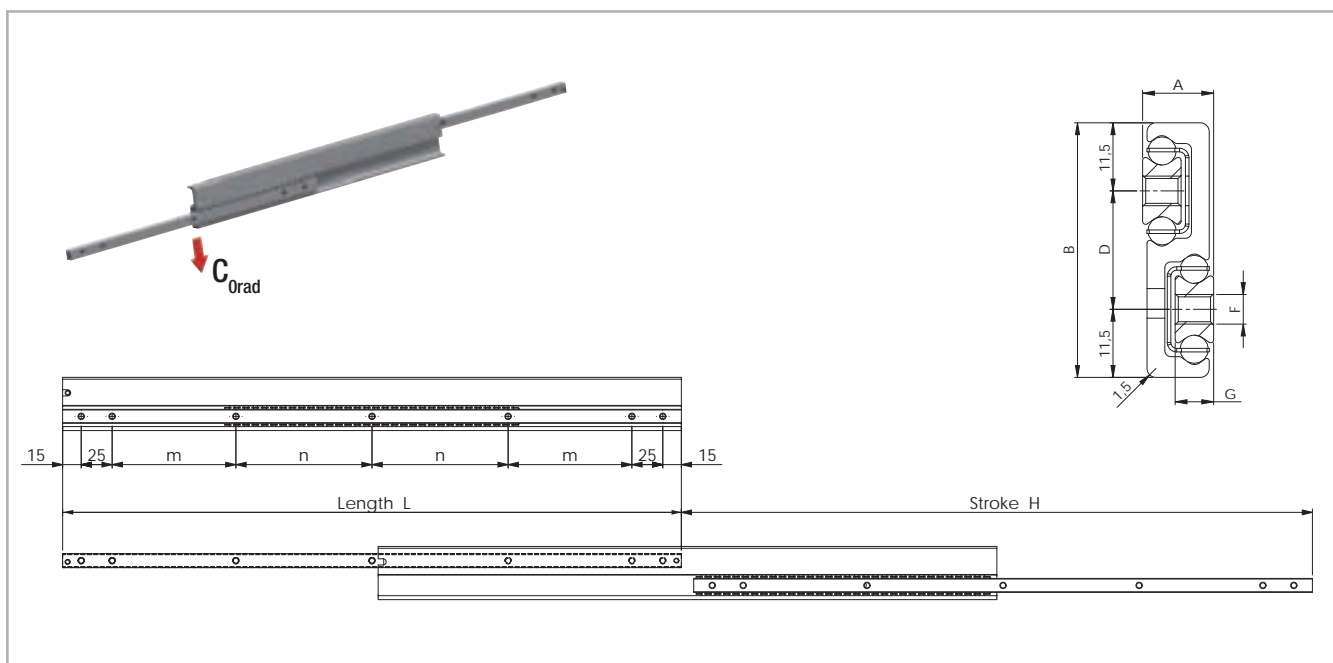


Fig. 11

| Type | Size | Length L [mm] | Stroke H [mm] | Load capacity C_{Orad} [N] | Cross-section | | | | | Fixed and movable rail | | | Weight [kg/m] | |
|------|------|---------------|---------------|------------------------------|---------------|--------|--------|--------|----|------------------------|--------|--------------|---------------|-----|
| | | | | | A [mm] | B [mm] | D [mm] | G [mm] | F | m [mm] | n [mm] | No. of holes | | |
| LTF | 44 | 200 | 210 | 114 | 12 | 43 | 20 | 6,5 | M5 | 60 | 0 | 5 | 2,70 | |
| | | 225 | 235 | 130 | | | | | | 72,5 | | | | |
| | | 250 | 260 | 144 | | | | | | 85 | | | | |
| | | 275 | 285 | 162 | | | | | | 97,5 | | | | |
| | | 300 | 310 | 180 | | | | | | 110 | | | | |
| | | 325 | 335 | 196 | | | | | | 122,5 | | | | |
| | | 350 | 360 | 210 | | | | | | 135 | | | | |
| | | 375 | 385 | 226 | | | | | | 147,5 | | | | |
| | | 400 | 410 | 246 | | | | | | 160 | | | | |
| | | 425 | 435 | 262 | | | | | | 172,5 | | | | |
| | | 450 | 460 | 276 | | | | | | 185 | | | | |
| | | 500 | 510 | 312 | | | | | | 100 | 110 | 7 | | |
| | | 550 | 560 | 342 | | | | | | | | | | 135 |
| | | 600 | 610 | 384 | | | | | | | | | | 160 |
| | | 650 | 660 | 408 | | | | | | | | | | 185 |
| | | 700 | 710 | 444 | | | | | | | | | | 160 |
| | | 750 | 760 | 474 | | | | | | | | | | 185 |
| | | 800 | 810 | 510 | | | | | | | | | | 210 |
| | | 850 | 860 | 540 | | | | | | | | | | 235 |
| | | 900 | 910 | 576 | | | | | | 150 | 260 | 7 | | |
| 950 | 960 | 612 | 285 | | | | | | | | | | | |
| 1000 | 1010 | 648 | 310 | | | | | | | | | | | |

Tab. 7

Technical instructions



> Load capacity

- The given load capacities are guidelines for one extension slide mounted vertically with uniform load distribution (area load) when using all mounting holes. The load values must be reduced in unfavorable conditions.

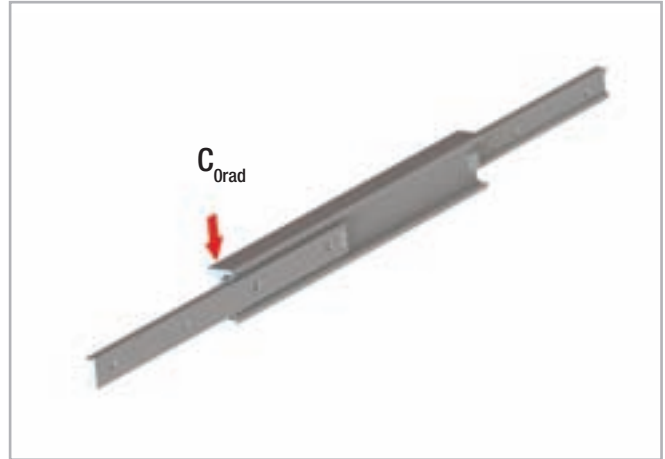


Fig. 12

> Opening and closing force

- The required actuation forces of a telescopic rail depend on the acting load and the deflection in the extended state. The force required for opening is principally determined by the coefficient of friction of the linear bearing. With correct assembly and lubrication, this is 0.01. During the extension, the force is reduced with the elastic deflection of the loaded telescopic rail. A higher force is required to close a telescopic extension, since, based on the elastic deflection, even if it is minimal, the movable rail must move against an inclined plane.

> Anticorrosive protection

- All of the OPTI RAIL series have a standard anticorrosive protection by electrolytic galvanisation according to ISO 2081. If a higher resistance to corrosion is required, the guides are available with Rollon Alloy or chemical nickel treatment. For both versions stainless steel balls are provided.
- Numerous application-specific surface treatments are available upon request, e.g., FDA approved nickel plating for use in the food industry. For more information please contact Rollon technical support.

> Temperature

- The OPTI RAIL series can be used up to an ambient temperature of +170 °C (+338 °F). A lithium lubricant for high operating temperatures is recommended for temperatures above +130 °C (+266 °F). Minimum temperature with standard grease is -20°C.

> Lubrication

Recommended lubrication intervals are heavily dependent upon the ambient conditions, speed and temperature. Under normal conditions, lubrication is recommended after 100 km operational performance or after an operating period of six months. In critical application cases the interval should be shorter. Please clean the raceways carefully before relubrication. Raceways and spaces of the ball cage are lubricated with a lithium lubricant of average consistency (roller bearing lubricant).

Different lubricants are available on request for special applications:

- FDA-approved lubricant for use in the food industry
- specific lubricant for clean rooms
- specific lubricant for the marine technology sector
- specific lubricant for high and low temperatures

For specific information, contact Rollon technical support.

> Installation instructions

- The internal stops are not designed to stop a moving load. They are only supposed to retain the ball-cage and prevent the internal parts from sliding out of the assembly. An external end-stop must always be installed to stop the moving load.
- To achieve optimum running properties, high service life and rigidity, it is necessary to fix the OPTI RAIL rails with all accessible holes on a rigid and level surface.
- Double-sided stroke available on request.
- When using an extension pair, please observe the parallelism of the installation surfaces. The fixed rail and the movable one will assume the rigidity of the mounting structure.
- The movement of the extensions is enabled by internal ball cages, which could experience an offset from the original position with differing strokes. This phase offset can have a negative effect on the running properties or limit the stroke. If differing strokes occur in an application, the drive force must be sufficiently dimensioned in order to appropriately synchronize the ball cage offset. As an alternative, an extra full stroke cycle can be performed after a number of cycles, in order to re-phase the ball cage in its correct position.

Ordering key OPTI RAIL



> LTH

| | | | | | | |
|------------|-----------|------------|------------|-----------|------------|---|
| LTH | 45 | 850 | 904 | KF | NIC | |
| | | | | | | Expanded surface protection is deviation from standard (ISO 2081) <i>see pg. OR-13 Anticorrosive protection</i> |
| | | | | | | Hole pattern <i>see pg. OR-5ff</i> |
| | | | | | | Stroke, if deviating from standard stroke (catalogue data) <i>see pg. OR-5ff Product dimensions and Ordering key for special strokes</i> |
| | | | | | | Length <i>see pg. OR-5ff Product dimensions</i> |
| | | | | | | Size <i>see pg. OR-5ff Product dimensions</i> |
| | | | | | | Product type <i>see pg. OR-5ff Product dimensions</i> |

Ordering example 1: LTH45-0850-KF

Ordering example 2: LTH45-0850-0904-KF-NIC

Notes on ordering: Rail lengths and strokes are always stated with 4 digits. Please use zeroes to fill in for lengths with less than 4 digits

> LTH Special strokes

Special strokes are defined as deviations from standard stroke.

They are each available as multiples of the values in tab. 8.

These values are dependent on the spacing of the ballcage.

| Type | Size | Stroke modification [mm] |
|------|------|--------------------------|
| LTH | 30 | 15,4 |
| | 45 | 22 |

Tab. 8

Each stroke modification influences the load capacities stated in the catalogue. For more information please contact Rollon technical support.

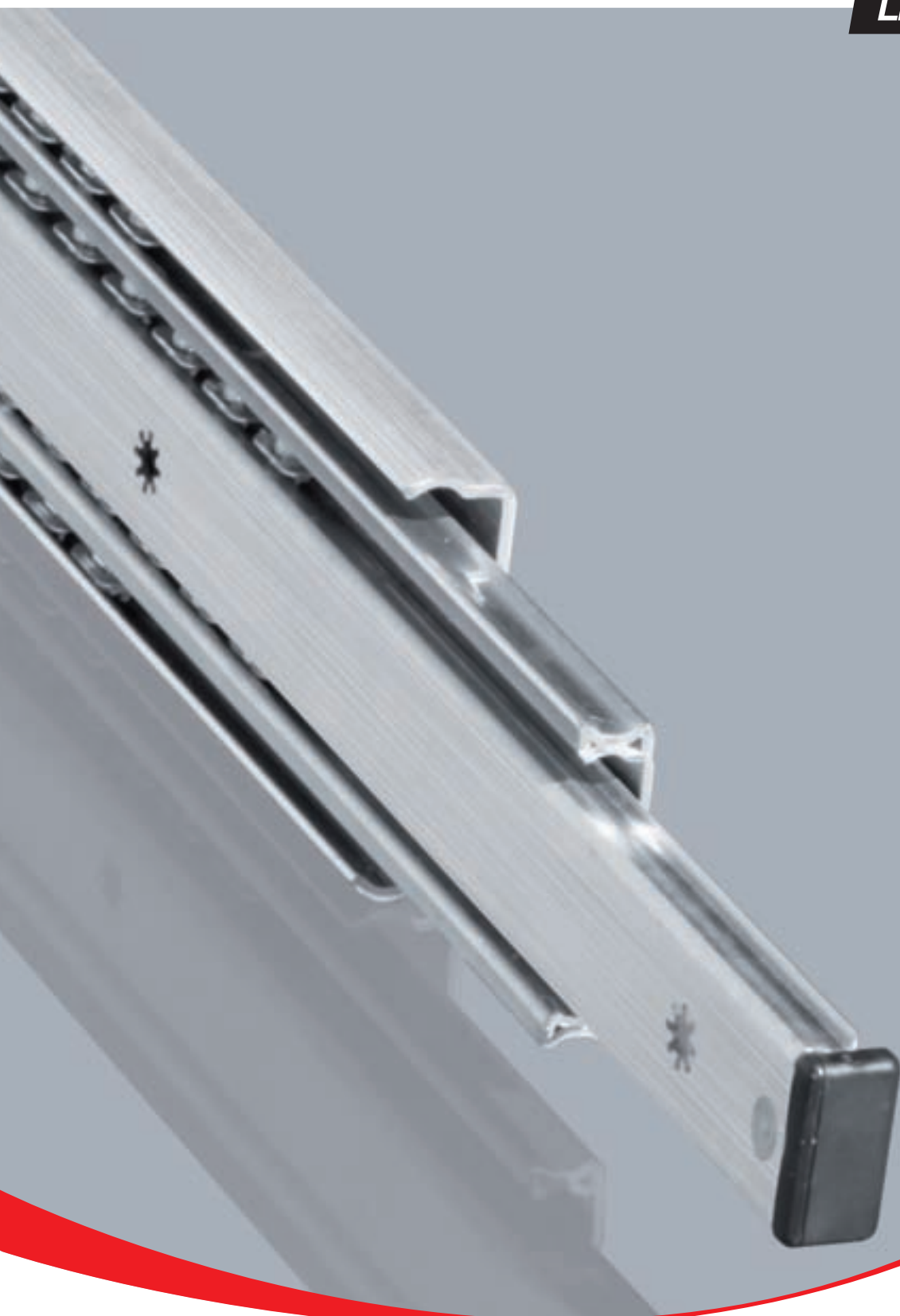
> LTF

| | | | | |
|------------|-----------|------------|------------|--|
| LTF | 44 | 690 | NIC | |
| | | | | Expanded surface protection is deviation from standard (ISO 2081) <i>see pg. OR-13 Anticorrosive protection</i> |
| | | | | Length <i>see pg. OR-11ff</i> |
| | | | | Size <i>see pg. OR-11ff</i> |
| | | | | Product type <i>see pg. OR-11ff</i> |

ROLLON[®]

Linear Evolution

Light Rail



Product explanation



> Light telescopic rails, with full or partial extension



Fig. 1

The Light Rail product family consists of five series with full and partial extensions in a lightweight design. It is ideal for applications in which the mass of the rail is just as important as the bending rigidity.

The most important characteristics:

- Light and quiet running with heavy loads
- Long service life without maintenance
- Effective self-cleaning of the ball track
- High functional reliability
- Structural elasticity capable of absorbing minor impacts and absence of permanent deformation
- Not sensitive to side impacts

Preferred areas of application:

- Beverage industry
- Automotive
- Construction and machine technology (e.g., housing)
- Packaging machines
- Railcars (e. g., maintenance and battery extensions)
- Special machines

LPS 38

Partial extension with rails made of hot-dipped galvanized steel and plastic ball cages.



Fig. 2

LFS 46

Detachable internal rail which can be released with a latch. Rails are made of bright chrome-plated steel, the ball cages of steel and plastic. Roll back protection in closed position.



Fig. 3

LFS 57

Full extension with rails made of hot-dipped galvanized steel and zinc-plated steel ball cages. Roll back protection in closed position.



Fig. 4

LFS 58 SC

Full extension with automatic retraction and damping. The automatic retraction system is assisted by a spring-loaded mechanism that allows the rail to get back to a complete retraction before reaching the closed position.



Fig. 5

LFS 70

Full extension with rails made of zinc-plated galvanized and blue passivated steel. The ball cages are made of zinc-plated steel. Heavy load end stop in opened and closed position. Roll back protection in closed position.



Fig. 6

LFX 27

The stainless steel full extension consists of two inner guide rails that, connected to a double-T profile, form the intermediate element and two outer rails that form the connection to the connecting construction as fixed and moving element. The square cross-section allows a compact design of high load ratings and low deflection.



Fig. 7

DRX-DRS

Roller type telescopic rail made of stainless or galvanized steel. Corrosion resistant even if scratched, exposed to solvents or to shocks.



Fig. 8

Technical data

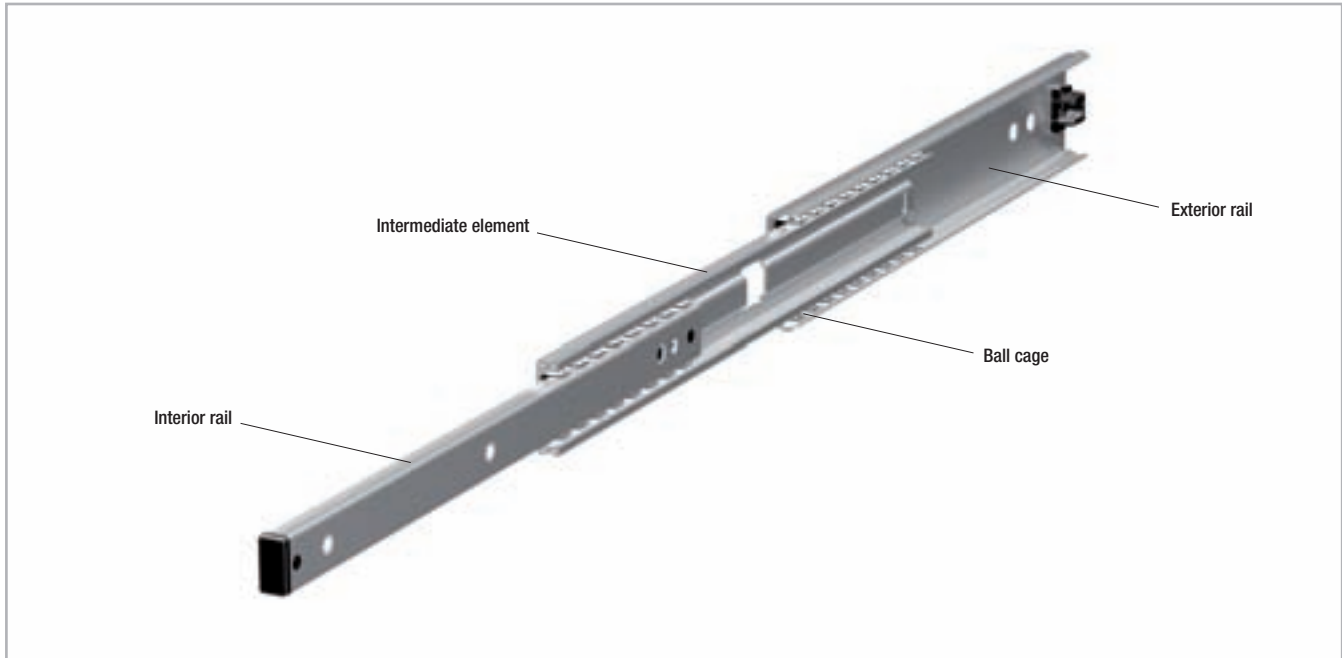


Fig. 9

Performance characteristics:

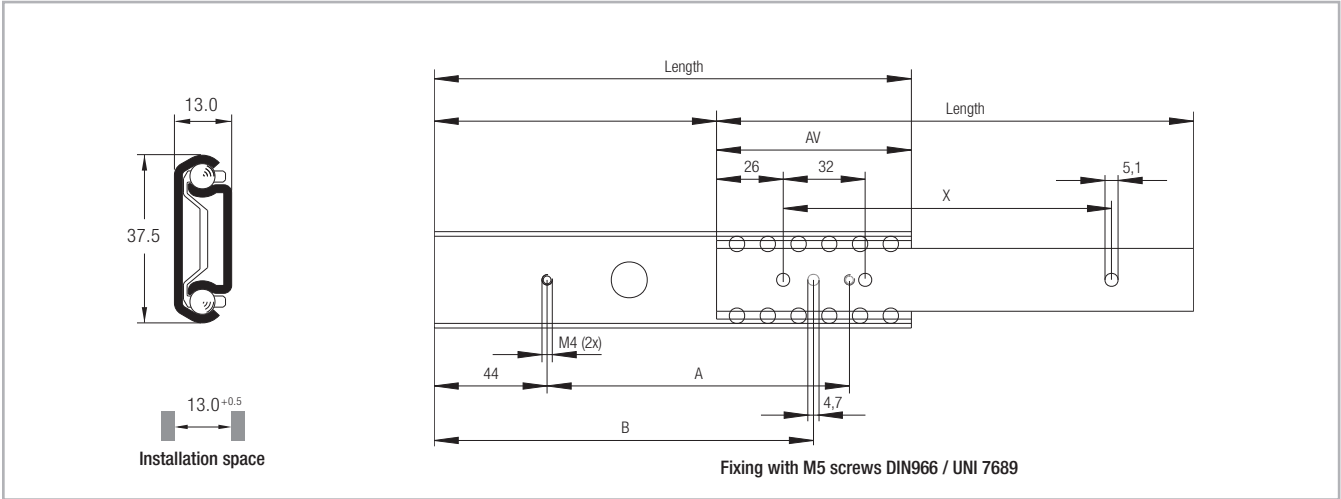
- Extension speed (depending on application):
 Extension distance 100 - 500 mm: max. 0.5 m/s (19.69 in/s)
 Extension distance 600 mm: max. 0.4 m/s (15.75 in/s)
 Extension distance 700 mm: max. 0.3 m/s (11.81 in/s)
- LFS 58 SC series with automatic retraction
- Temperature range: from +10 °C to +40 °C,
 for DRX/DRS from -20° to + 100° C, for LFX from -30° to +200° C.
 Temporary storage and transport temperature: -20 °C to max. +80 °C (-4 °F to +176 °F)
- All systems are lubricated for life
- LFS/LPS rail material: hot galvanized or chromed steel
- LFS/LPS ball bearing cage material: galvanized steel or plastic
- LFS/LPS ball bearing material: hardened carbon steel
- LFX rail, balls and cage material: stainless steel 1.4301
- DRX rail material: stainless steel AISI 316L
- DRS rail material: galvanized steel ISO 2081 compliant

Remarks:

- Assembly in cross-sectional width, here a positive tolerance of +0.5 mm is recommended (mounted under tension). If the extensions are installed with too small a tolerance, the service life is decreased
- Load capacity is per single rail (not per pair)
- Cycle data applies to the use of an extension pair (recommended)
- Vertical use of extensions (radial load) is recommended
- If mounted in a horizontal position, the load capacity will be reduced (see p. LR-12)
- Cathodic edge protection, additional corrosion protection with powder coating on request
- Roll back protection in closed position is friction locked (except LPS 38)
- Not suitable for moments – must be used as extension pair

Dimensions and load capacity

> LPS 38



All dimensions given in mm

Fig. 10

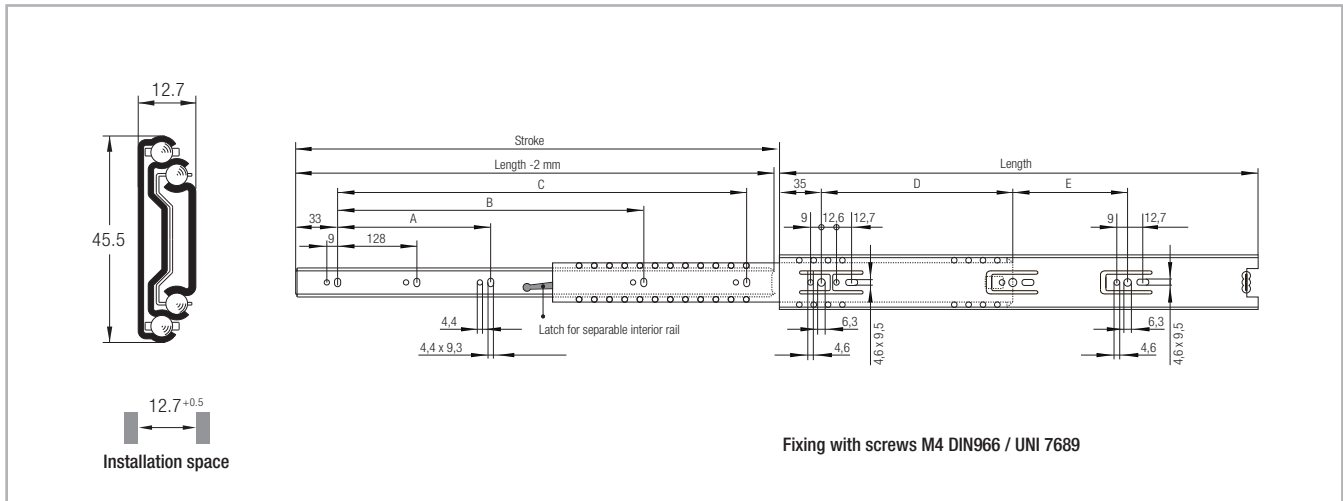
| Type | Size | Length [mm] | Extension loss AV [mm] | Stroke* [mm] | A [mm] | B [mm] | X [mm] | Load capacity** C_{0rad} [N] | Load capacity** C_{0ax} [N] | Weight** [kg] |
|------|------|----------------|------------------------------|-----------------|-----------|-----------|-----------|--------------------------------------|-------------------------------------|------------------|
| LPS | 38 | 242 | 88 | 154 | 166 | 202 | 192 | 175 | 50 | 0.30 |
| | | 317 | | 229 | 241 | 277 | 256 | | | 0.40 |
| | | 398 | 100 | 298 | 322 | 358 | 352 | | | 0.50 |
| | | 473 | | 373 | 397 | 433 | 416 | | | 0.60 |

* The stroke is the difference of the length and the extension loss AV
 ** The given load capacities and weights apply for a single extension

Tab. 1

Note: The given load capacities are guidelines with 100,000 cycles and uniform load distribution (area load) when using all mounting holes. The load values must be reduced in unfavorable conditions.

> LFS 46



All dimensions given in mm

Fig. 11

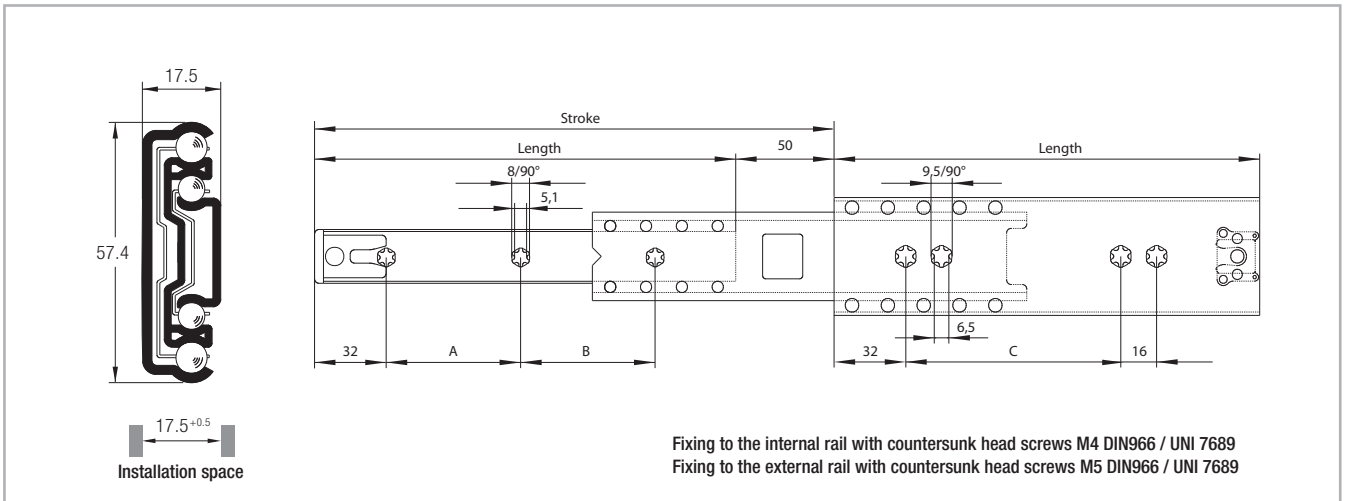
| Type | Size | Length | Stroke | A | B | C | D | E | Load capacity* | Load capacity* | Weight* |
|------|------|--------|--------|------|------|------|------|------|----------------|----------------|---------|
| | | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | C_{0rad} [N] | C_{0ax} [N] | [kg] |
| LFS | 46 | 300 | 305 | - | - | 242 | 192 | - | 150 | 50 | 0,48 |
| | | 350 | 356 | - | - | 292 | 256 | - | 150 | | 0,505 |
| | | 400 | 406 | - | - | 342 | 160 | 96 | 175 | | 0,64 |
| | | 450 | 457 | - | 256 | 392 | 224 | 160 | 200 | 0,71 | |
| | | 500 | 508 | - | 352 | 442 | | 128 | | 0,79 | |
| | | 550 | 559 | - | 416 | 492 | 224 | 192 | 0,88 | | |
| | | 600 | 610 | 224 | | 542 | | 224 | 0,95 | | |

* The given load capacities and weights apply for a single extension

Tab. 2

Note: The given load capacities are guidelines with 50,000 cycles and uniform load distribution (area load) when using all mounting holes. The load values must be reduced in unfavorable conditions.

> LFS 57



All dimensions given in mm

Fig. 12

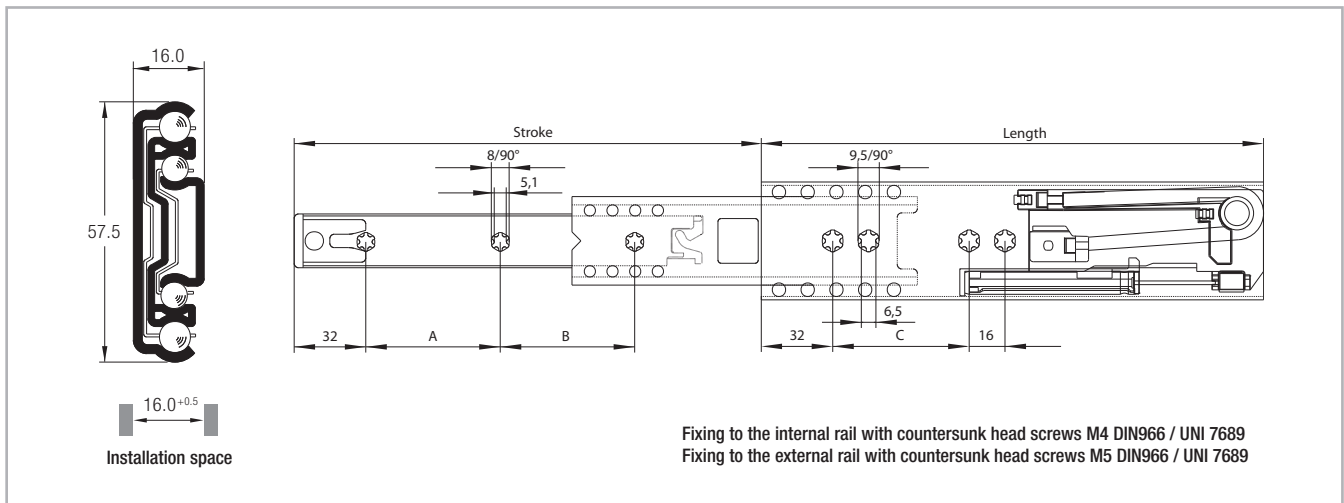
| Type | Size | Length | Stroke* | A | B | C | Load capacity** | Load capacity** | Weight** |
|------|------|--------|---------|------|------|------|-----------------|-----------------|----------|
| | | [mm] | [mm] | [mm] | [mm] | [mm] | C_{0rad} [N] | C_{0ax} [N] | |
| LFS | 57 | 300 | 350 | 128 | 104 | 160 | 250 | 80 | 0.84 |
| | | 350 | 400 | | 152 | | 300 | | 0.98 |
| | | 400 | 450 | 160 | 168 | 256 | 325 | | 1.13 |
| | | 450 | 500 | | 224 | | 350 | | 1.27 |
| | | 500 | 550 | 224 | 208 | 384 | 375 | | 1.42 |
| | | 550 | 600 | | 256 | | | | 1.57 |
| | | 600 | 650 | 288 | 240 | 400 | 400 | | 1.71 |
| | | 650 | 700 | | 288 | | | | 1.86 |
| | | 700 | 750 | 320 | 312 | 360 | 360 | | 2.01 |
| | | 750 | 800 | | 360 | | | | 2.16 |

Tab. 3

* The stroke is the sum of the length and the over extension
 ** The given load capacities and weights apply for a single extension

Note: The given load capacities are guidelines with 100,000 cycles and uniform load distribution (area load) when using all mounting holes. The load values must be reduced in unfavorable conditions.

> LFS 58 SC



All dimensions given in mm

Fig. 13

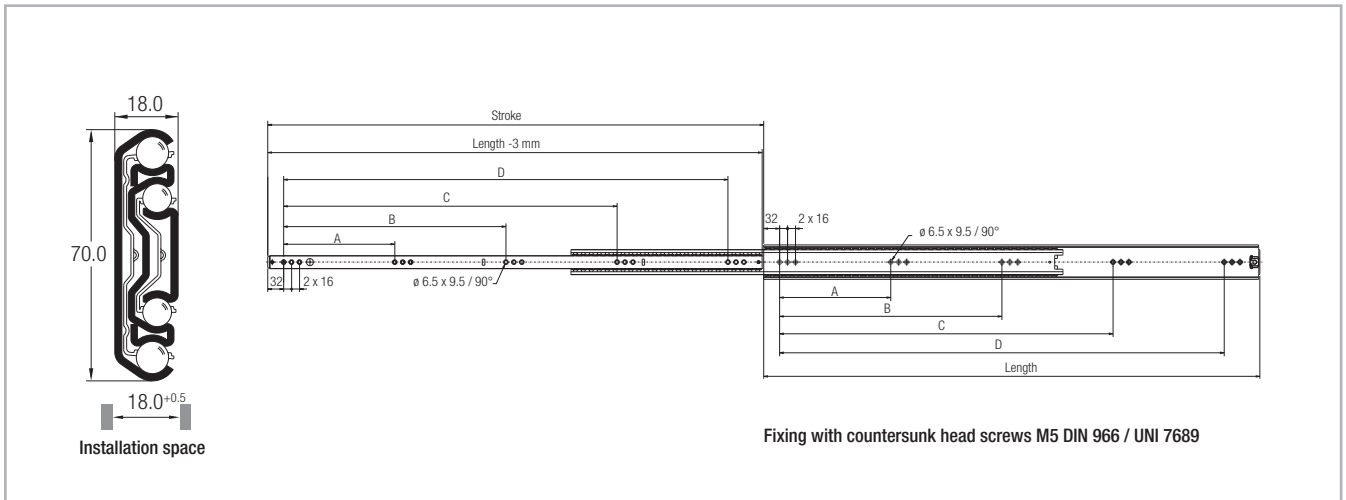
| Type | Size | Length [mm] | Stroke [mm] | A [mm] | B [mm] | C [mm] | Load capacity* C _{Grad} [N] | Weight* [kg] |
|------|------|----------------|----------------|-----------|-----------|-----------|---|-----------------|
| LFS | 58 | 400 | 434 | 128 | 128 | 224 | 200 | 1.10 |
| | | 450 | 484 | 160 | 160 | 256 | 250 | 1.25 |
| | | 500 | 534 | | | | 275 | 1.40 |
| | | 550 | 584 | 192 | 320 | 300 | 1.55 | |

* The given load capacities and weights apply for a single extension

Tab. 4

Note: The given load capacities are guidelines with 100,000 cycles and uniform load distribution (area load) when using all mounting holes. The load values must be reduced in unfavorable conditions. Horizontal installation is not possible due to the damping system. The damping effect is reduced for loads of 450 N and higher per extension pair.

> LFS 70



All dimensions given in mm

Fig. 14

| Type | Size | Length | Stroke | A | B | C | D | Load capacity* | | Weight* | |
|------|------|--------|--------|------|------|------|------|----------------|---------------|---------|------|
| | | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | C_{Orad} [N] | C_{Oax} [N] | | |
| LFS | 70 | 400 | 400 | - | - | - | 288 | 525 | 900** | 150 | 1,55 |
| | | 450 | 450 | - | - | 160 | 320 | 575 | 950** | | 1,74 |
| | | 500 | 500 | - | - | 192 | 384 | 650 | 975** | | 1,94 |
| | | 550 | 550 | - | - | 224 | 448 | | 1000** | | 2,13 |
| | | 600 | 600 | - | - | | | | 975** | | 2,32 |
| | | 700 | 700 | - | 192 | 384 | 576 | 875** | 2,70 | | |
| | | 800 | 800 | - | 224 | 448 | 672 | 600 | 725** | | 3,10 |
| | | 1100 | 1100 | 224 | 448 | 672 | 896 | 450 | 525** | | 100 |

* The given load capacities and weights apply for a single extension
 ** 10.000 cycles

Tab. 5

Note: The given load capacities are guidelines with 100.000 cycles and uniform load distribution (area load) when using all mounting holes. The load values must be reduced in unfavorable conditions.

> LFX 27

Guida telescopica in acciaio inox

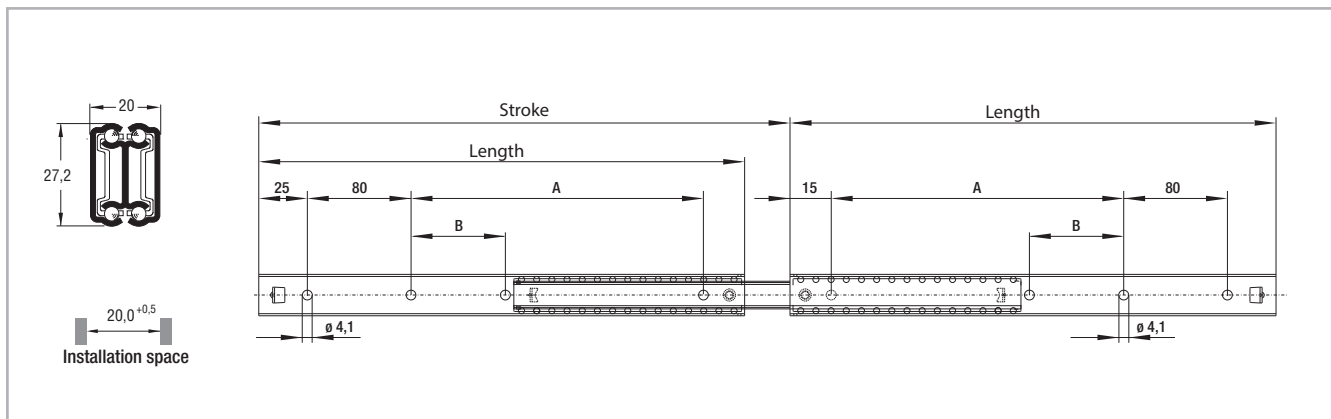


Fig. 15

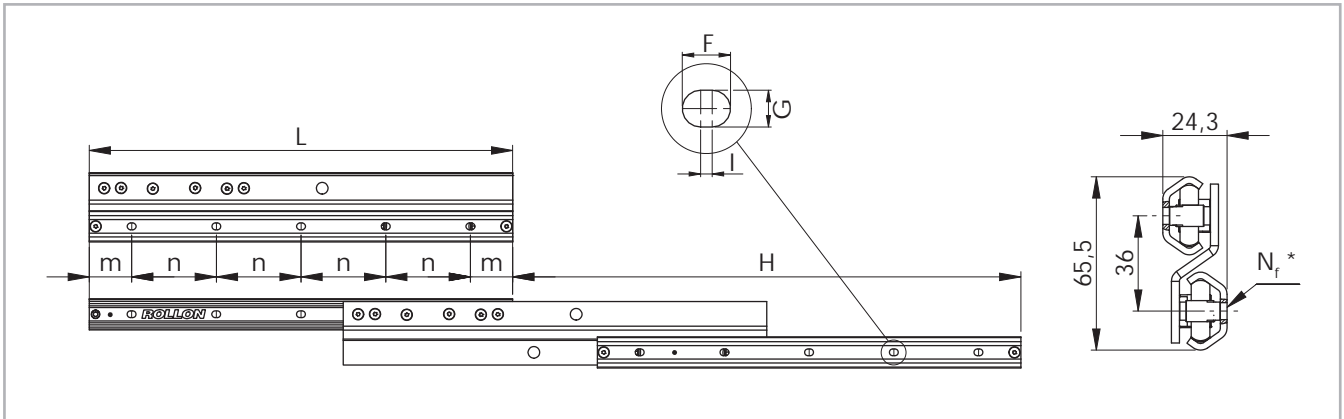
| Type | Size | Length [mm] | Stroke [mm] | A [mm] | B [mm] | Load capacity* [N] | | | | Weight* [kg] |
|------|------|----------------|----------------|-----------|-----------|-----------------------|-----------|-------------------|-----------|-----------------|
| | | | | | | to 10.000 cycles | | to 100.000 cycles | | |
| | | | | | | C_{0rad} | C_{0ax} | C_{0rad} | C_{0ax} | |
| LFX | 27 | 300 | 326 | 180 | - | 175 | 25 | 125 | 25 | 0,43 |
| | | 350 | 376 | 230 | 70 | | | | | 0,49 |
| | | 400 | 426 | 280 | 100 | | | | | 0,57 |
| | | 450 | 476 | 330 | 100 | | | | | 0,64 |
| | | 500 | 526 | 380 | 140 | | | | | 0,72 |
| | | 550 | 576 | 430 | 160 | | | | | 0,82 |

* The given load capacities and weights apply for a single extension

Tab. 6

> DRX/DRS

Versione DRX in acciaio inox



* Number of mounting holes

Fig. 16

| Type | Size | Length L [mm] | Stroke H [mm] | Load capacity* C _{0rad} [N] | Fixed and movable rail | | | | | | | |
|------------|------|---------------|---------------|--------------------------------------|------------------------|--------|--------------------------|------------------|---------------|--------|--------|--------|
| | | | | | m [mm] | n [mm] | N _f [2 rails] | Holes for screws | Weight [kg/m] | F [mm] | G [mm] | I [mm] |
| DRX DRS | 30 | 400 | 480 | 150 | 40 | 80 | 10 | M5 | 3.40 | 8,4 | 6,4 | 2 |
| | | 480 | 560 | 200 | | | 12 | | | | | |
| | | 560 | 640 | 240 | | | 14 | | | | | |
| | | 640 | 720 | 280 | | | 16 | | | | | |
| | | 720 | 800 | 320 | | | 18 | | | | | |
| | | 800 | 880 | 360 | | | 20 | | | | | |
| | | 880 | 960 | 350 | | | 22 | | | | | |
| | | 960 | 1040 | 310 | | | 24 | | | | | |
| | | 1040 | 1120 | 250 | | | 26 | | | | | |

* The given load capacities and weights apply for a single extension

Tab. 7

> Fixing screws

We recommend fixing screws according to ISO 7380 with low head height or TORX® screws (see fig. 17) on request.

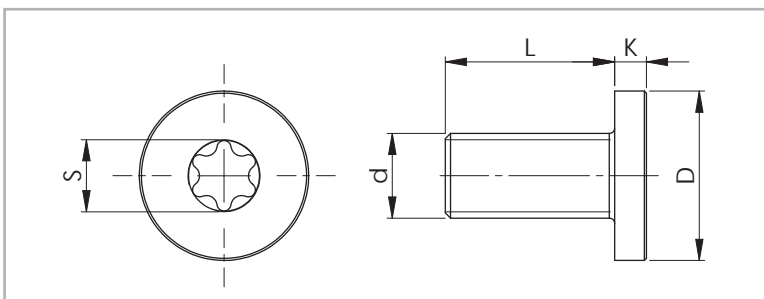


Fig. 17

| Rail size | Screw type | d | D [mm] | L [mm] | K [mm] | S | Tightening torque [Nm] |
|-----------|------------|-----------|--------|--------|--------|-----|------------------------|
| 20 | M4 x 8 | M4 x 0.7 | 8 | 8 | 2 | T20 | 3 |
| 30 | M5 x 10 | M5 x 0.8 | 10 | 10 | 2 | T25 | 9 |
| 45 | M8 x 16 | M8 x 1.25 | 16 | 16 | 3 | T40 | 22 |

Tab. 8

Technical instructions



> Load capacities

Vertical installation (radial load)

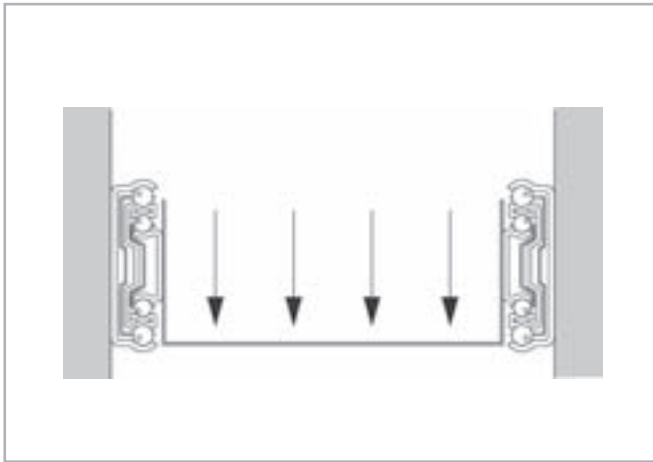


Fig. 18

The given loading capacities are guidelines for an extension rail vertically mounted with uniform load distribution using all mounting holes. The load values must be reduced in unfavorable conditions.

Horizontal installation (axial load)

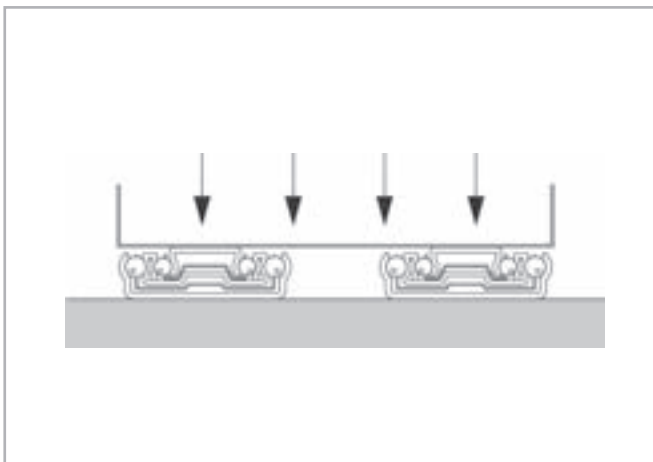


Fig. 19

For horizontal mounted extensions the load capacity is reduced (see pg. LR-5ff). The DRS/DRX series is not suitable for use on horizontal mounting (axial loads)

> Speed

The extension speed is determined by the size of the intermediate elements. Therefore, the maximum extension speed is inversely proportional to the overall extension of the rails (see fig. 20). The maximum extension speed is also directly related to the applied load and operating time. The indicated data refers to continuous operation at the maximum load capacity.

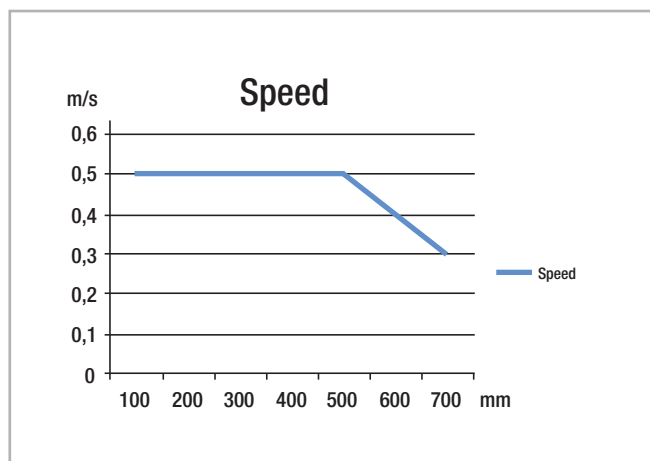


Fig. 20

> Temperature

Continual operating temperature of the Light Rail extensions is +10 °C to +40 °C. Temporary storage and transport temperature: -20 °C to max. +80 °C. The operating temperature for the DRX/DRS rails ranges from -20 °C to +100 °C. For more information please contact Rollon technical support.

> Lubrication

All extensions of the Light Rail product family are lubricated for life. Different lubricants for special applications are available upon request. Example: Lubricant with FDA approval for use in the food industry. For more information please contact Rollon technical support.

> Corrosion protection

Base material for the Light Rail product family is cold-rolled, hot-dipped galvanized steel. The cathodic edge protection offers a perfect combination of quality and cost-efficiency. The surface protection conforms to RoHS. The DRX/DRS series rails are also available in the stainless steel version for a high corrosion resistance. For more information please contact Rollon technical support.

> Installation instructions

- The existing internal stops are not designed to stop the moving load. They are only supposed to retain the ball-cage and prevent the internal parts to slide out of the assembly. An external end-stop must always be installed to stop the moving load.
- To achieve optimum running properties, high service life and rigidity, it is necessary to fix the Light Rail extensions with all accessible holes on a rigid and level surface. When using an extension pair, please observe the parallelism of the installation surfaces. The fixed and movable rails will assume the rigidity of the mounting structure.

Horizontally installed guides

Horizontally installed extensions can support tension or compression loads (see figs. 21 and 22).

For the horizontal mounting of extensions with compression loads, please take the following conditions into account: The Hertzian stress of the balls is no longer effective due to the expansion of the rail profile; the nominal tension tolerance of +0.5 mm is eliminated due to the installation confi-

guration. Both the above mentioned conditions contribute to a significant reduction of the axial load capacity.

Horizontally-mounted rails (axial load) also determine a considerably higher deflection of the extended tips if compared to traditionally vertically-mounted rails (radial load).

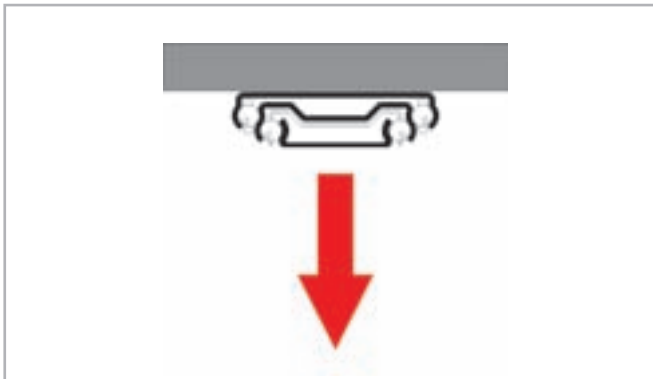


Fig. 21

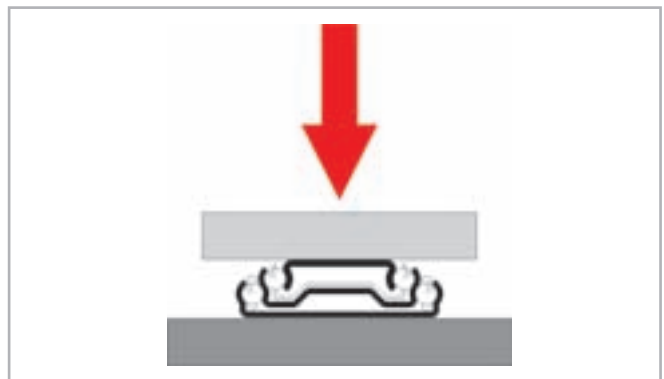


Fig. 22

> DRX/DRS installation

- During installation care must be taken that the movable elements are assembled as in the figure; i.e. as the lower rail. The opposite upside-down assembly negatively affects the function.
- Internal stops are used to stop the unloaded slider and the ball cage. Please use external stops as end stops for a loaded system.
- To achieve optimum running properties, high service life and rigidity, it is necessary to fix the telescopic rails with all accessible holes on a rigid and level surface.
- When using two telescopic rails, please observe the parallelism of the installation surfaces. The fixed and movable rails fit to the rigid assembly construction.

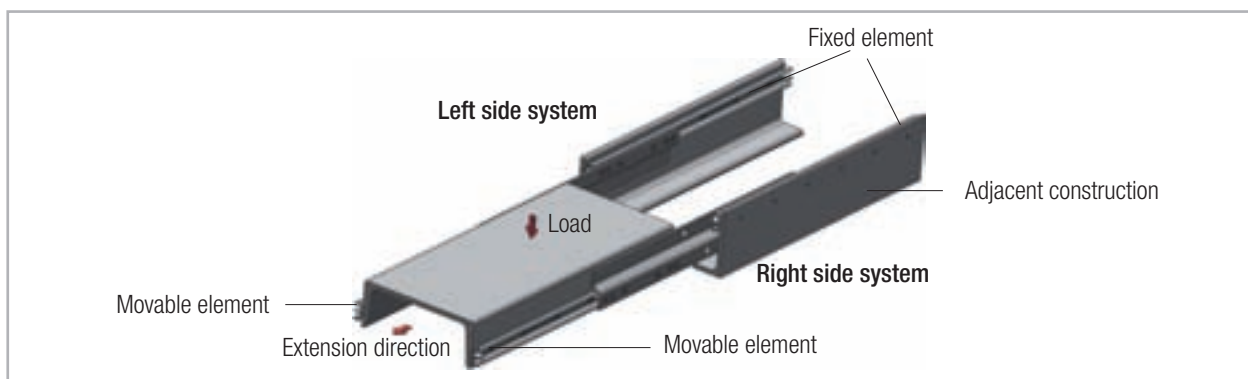


Fig. 23

Ordering key

> Light Rail

| | | | | |
|-----------|------|-------------------|--|--------------|
| LFS | 58- | 400 | SC | |
| | | | Automatic retraction only in LFS 58 SC | see pg. LR-8 |
| | | Rail length in mm | | see pg. LR-5 |
| | Size | | | see pg. LR-5 |
| Rail type | | | | see pg. LR-5 |

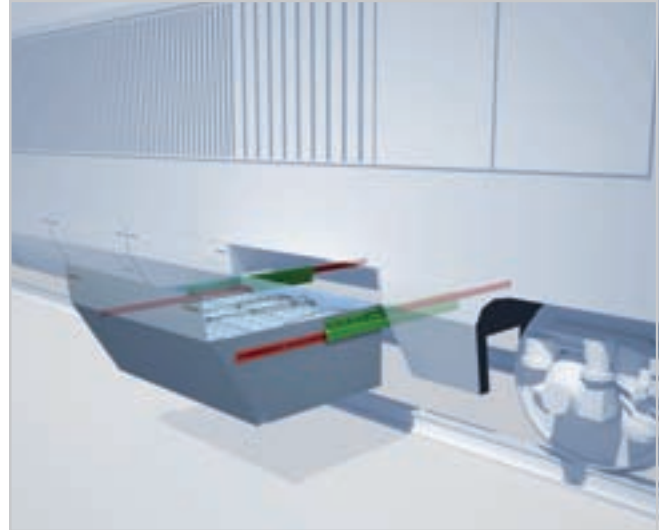
Ordering example: LFS58-0400SC

Notes on ordering: The rail lengths are always indicated as 4 digits with 0 prefixes

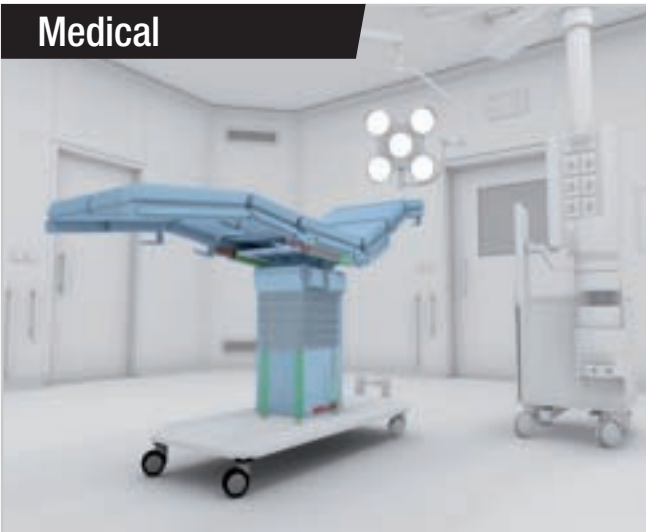
Guides suitable for all applications



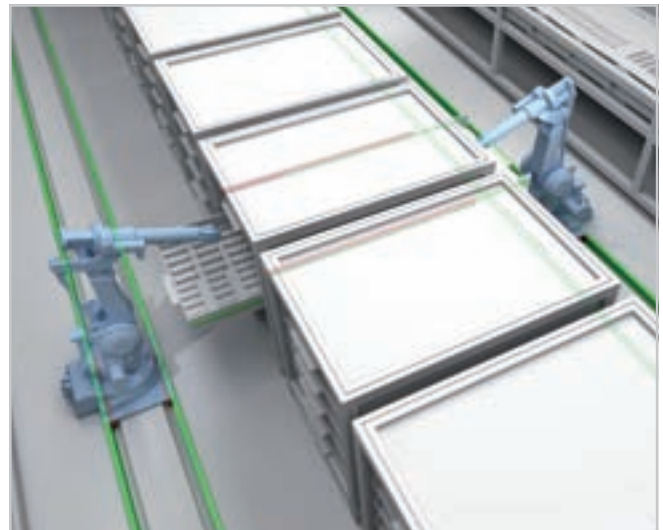
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Medical



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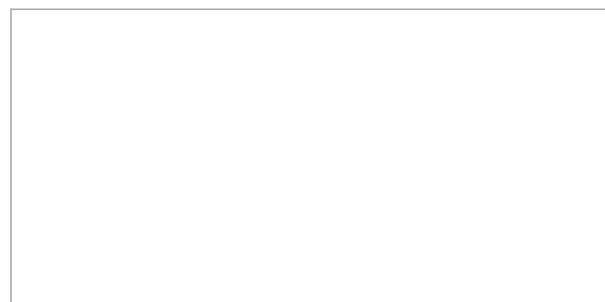


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