ROLLON®
BY TIMKEN

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 DSD version with double direction stroke. DS…S version available with reinforced and damped stainless steel end stops.

Fig. 3

DSE

Telescopic rail with a 150% extension of it's 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.

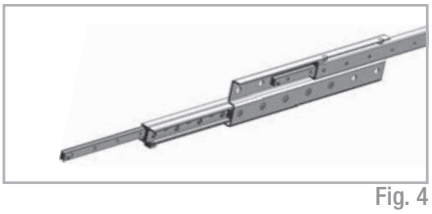


Fig. 4

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.
DE…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

Overview product cross sections

Partial extension guides

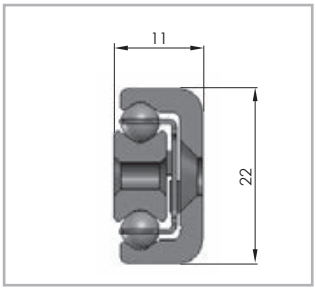


Fig. 9

ASN22

Load capacities p. TR-8

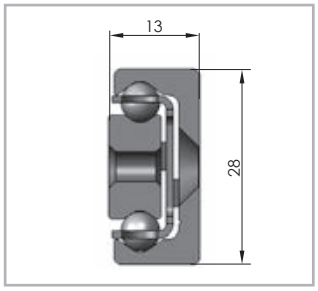


Fig. 10

ASN28

Load capacities p. TR-9

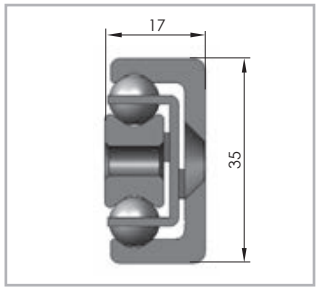


Fig. 11

ASN35

Load capacities p. TR-9

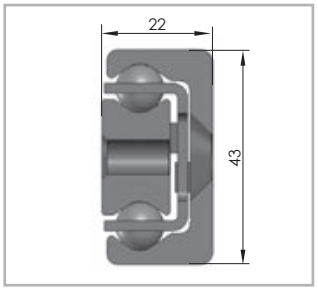


Fig. 12

ASN43

Load capacities p. TR-10

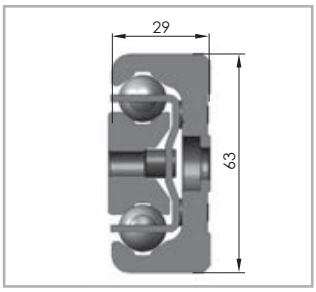


Fig. 13

ASN63

Load capacities p. TR-10

Full extension guides

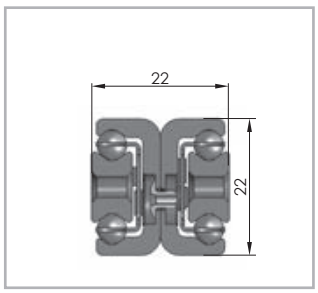


Fig. 14

DE22

Load capacities p. TR-23

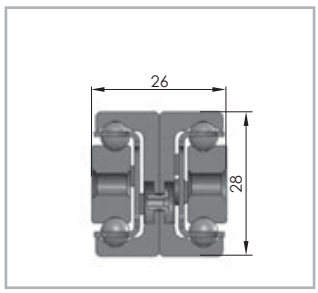


Fig. 15

DE28

Load capacities p. TR-23

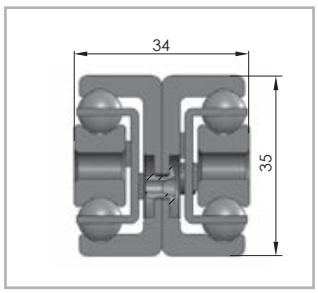


Fig. 16

DE35

Load capacities p. TR-24

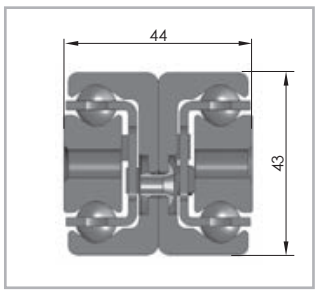


Fig. 17

DE43

Load capacities p. TR-24

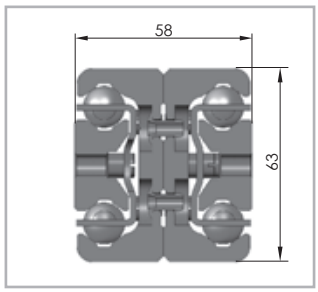


Fig. 18

DEF63

Load capacities p. TR-24

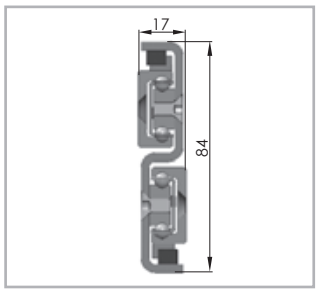


Fig. 19

DSS28

Load capacities p. TR-12

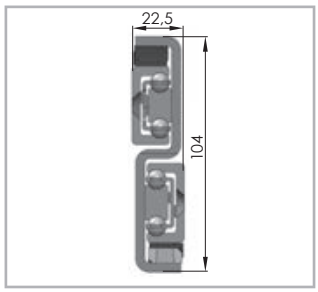


Fig. 20

DSS35

Load capacities p. TR-12

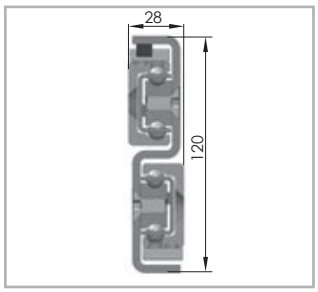


Fig. 21

DSS43

Load capacities p. TR-13

Full extension guides

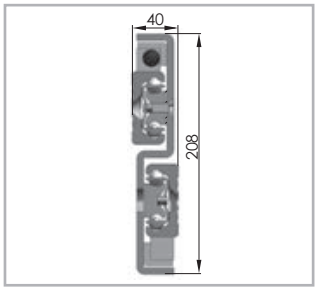


Fig. 22

DSS63

Load capacities p. TR-13

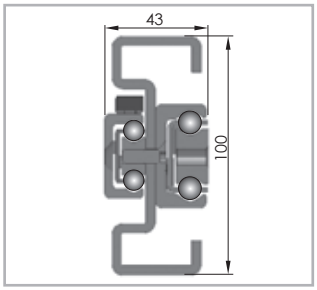


Fig. 23

DSC43

Load capacities p. TR-21

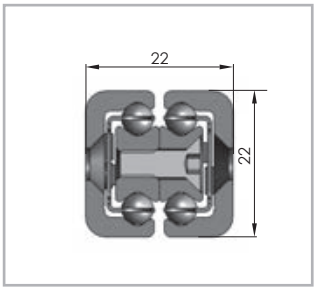


Fig. 24

DBN22

Load capacities p. TR-32

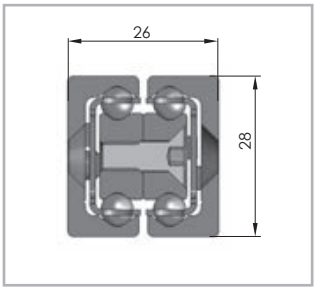


Fig. 25

DBN28

Load capacities p. TR-32

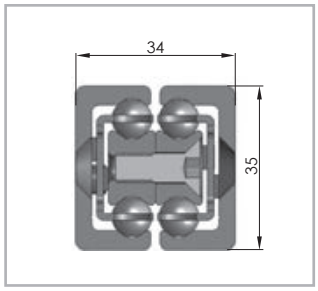


Fig. 26

DBN35

Load capacities p. TR-33

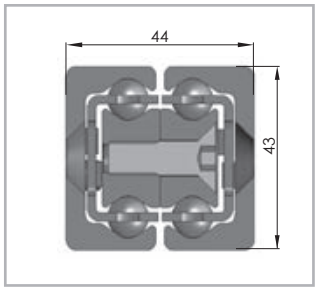


Fig. 27

DBN43

Load capacities p. TR-33

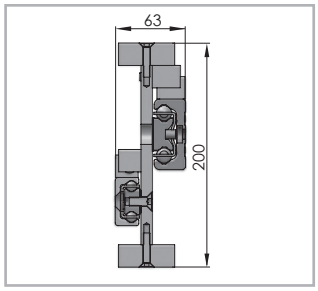


Fig. 28

DMS63

Load capacities p. TR-34

Overextending guides

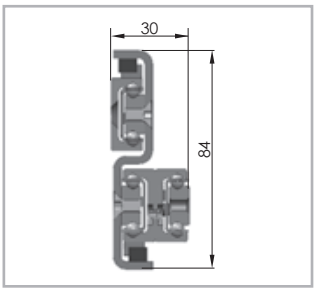


Fig. 29

DSE28

Load capacities p. TR-19

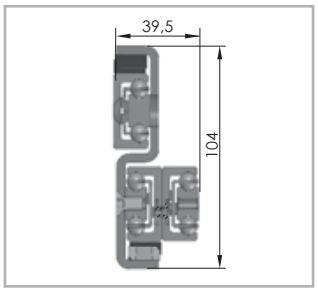


Fig. 30

DSE35

Load capacities p. TR-19

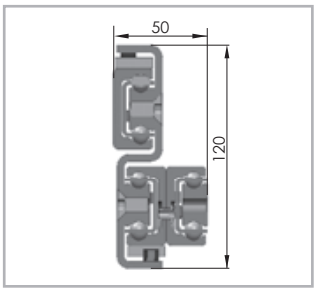


Fig. 31

DSE43

Load capacities p. TR-20

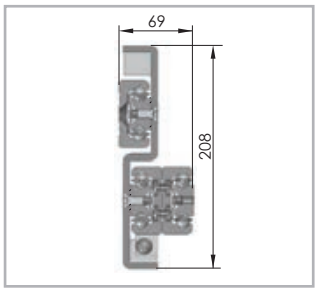


Fig. 32

DSE63

Load capacities p. TR-20

Technical data

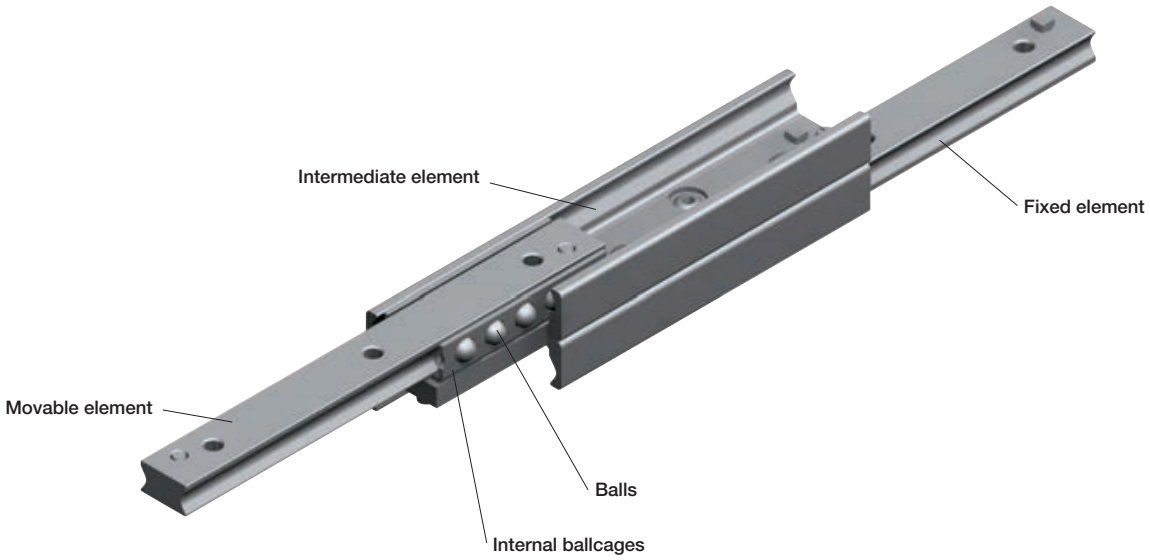


Fig. 33

Performance characteristics:

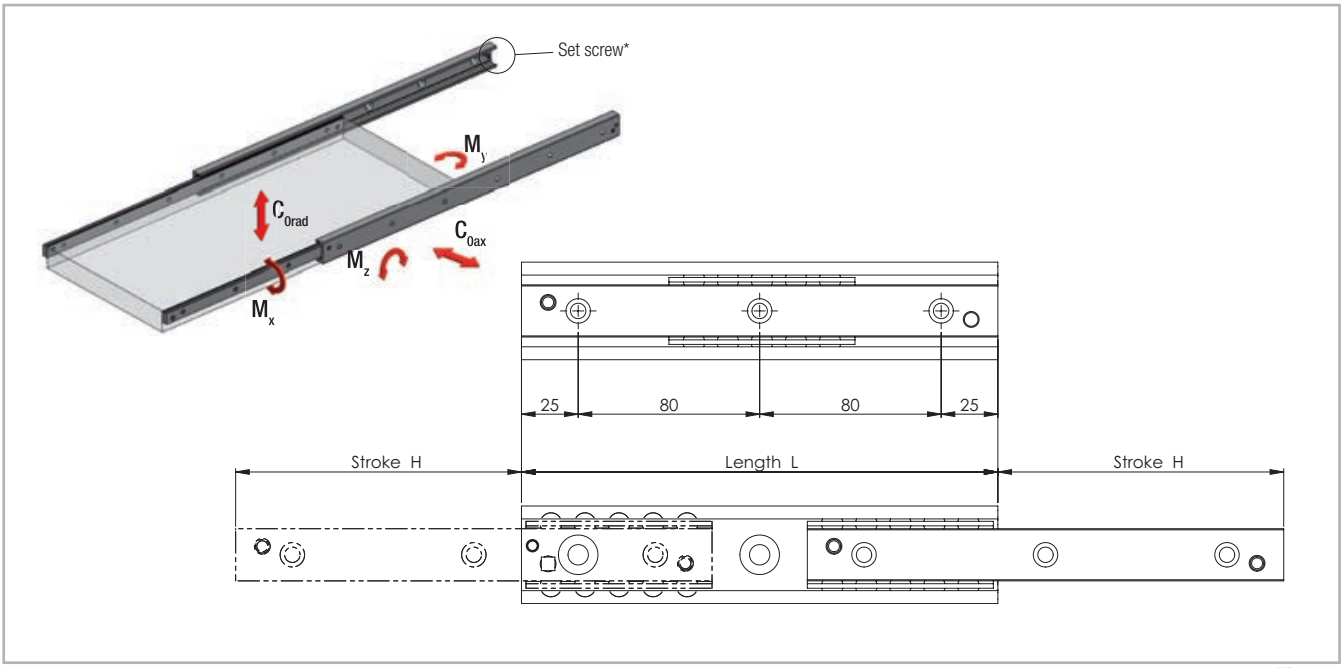
- Available sizes ASN / DE: 22, 28, 35, 43, 63
- Available sizes DS: 28, 35, 43, 63
- Available sizes DSE: 28, 35, 43, 63
- Available sizes DSC: 43
- Available sizes DBN: 22, 28, 35, 43
- Available size DMS: 63
- Induction hardened raceways
- Rails and sliders made of cold-drawn roller bearing carbon steel
- Balls made of hardened roller bearing carbon steel
- Max. operating speed: 0.8 m/s (31.5 in/s) (depending on application)
- DE...S and DSS...S temperature range: -20°C to +50°C (-4°F to +122° F)
- ASN, DE, DBN, temperature range: -20 °C to +170 °C (-4 °F to +338 °F), DS, DSE, DSC and DMS: -20 °C to +80 °C (-4 °F to +176 °F)
- Electrolytic galvanised as per ISO 2081, increased anticorrosive protection on request (see pg. TR-45 Anticorrosive protection)

Remarks:

- All load capacity data are based on a pair of telescopic rails except the value M_x of ASN series (see pag. TR-8, TR-9, TR-10)
- 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 continuous operation
- Calculation of the service life is based exclusively on the loaded rows of balls
- For models DMS, DSB, and DSE, please observe right or left side use
- 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. 34

Type	Size	Length L [mm]	Stroke H [mm]	Load capacity and moments for a pair of rails					No. of holes
				C_{0rad} [N]	C_{0ax} [N]	M_x* [Nm]	M_y [Nm]	M_z [Nm]	
ASN	22	130	76	626	438	5.7	20	30	2
		210	111	1430	1002	10.7	72	102	3
		290	154	1988	1392	14.9	138	198	4
		370	196	2556	1790	19	226	324	5
		450	231	3402	2380	24	360	516	6
		530	274	3958	2770	28.2	496	710	7
		610	316	4524	3168	32.3	654	934	8
		690	351	5378	3764	37.3	872	1246	9
		770	394	5934	4154	41.5	1078	1538	10

* The value M_x refers to a single rail

Tab. 1

Type	Size	Length L [mm]	Stroke H [mm]	Load capacity and moments for a pair of rails					No. of holes
				C_{0rad} [N]	C_{0ax} [N]	M_x* [Nm]	M_y [Nm]	M_z [Nm]	
ASN	28	130	74	1226	858	15.3	40	56	2
		210	116	2232	1562	26.1	114	164	3
		290	148	3868	2708	39.6	264	376	4
		370	190	4890	3422	50.4	426	610	5
		450	232	5910	4138	61.2	628	898	6
		530	274	6932	4852	72	870	1242	7
		610	316	7952	5566	82.8	1150	1642	8
		690	358	8974	6282	93.6	1470	2100	9
		770	400	9994	6996	104.4	1828	2612	10
		850	433	11656	8160	117.9	2330	3330	11
		930	475	12676	8872	128.7	2778	3968	12
		1010	517	13696	9586	139.5	3262	4660	13
		1090	559	14716	10300	150.3	3788	5410	14
		1170	601	15736	11014	161.1	4350	6216	15
ASN	35	210	127	2130	1492	29.4	114	164	3
		290	159	4120	2884	46.9	292	416	4
		370	203	5276	3694	59.9	476	680	5
		450	247	6434	4504	73	708	1010	6
		530	279	8564	5994	90.4	1086	1550	7
		610	323	9716	6802	103.5	1422	2030	8
		690	367	10870	7608	116.6	1804	2576	9
		770	399	13042	9130	134	2382	3404	10
		850	443	14190	9932	147.1	2870	4100	11
		930	487	15338	10736	160.2	3404	4862	12
		1010	519	17530	12272	177.6	4184	5978	13
		1090	563	18674	13072	190.7	4824	6890	14
		1170	607	19818	13874	203.8	5508	7868	15
		1250	639	22024	15416	221.2	6490	9272	16
		1330	683	23164	16214	234.3	7280	10400	17
		1410	727	24306	17014	247.4	8116	11594	18
		1490	759	26520	18564	264.8	9300	13286	19

* The value M_x refers to a single rail

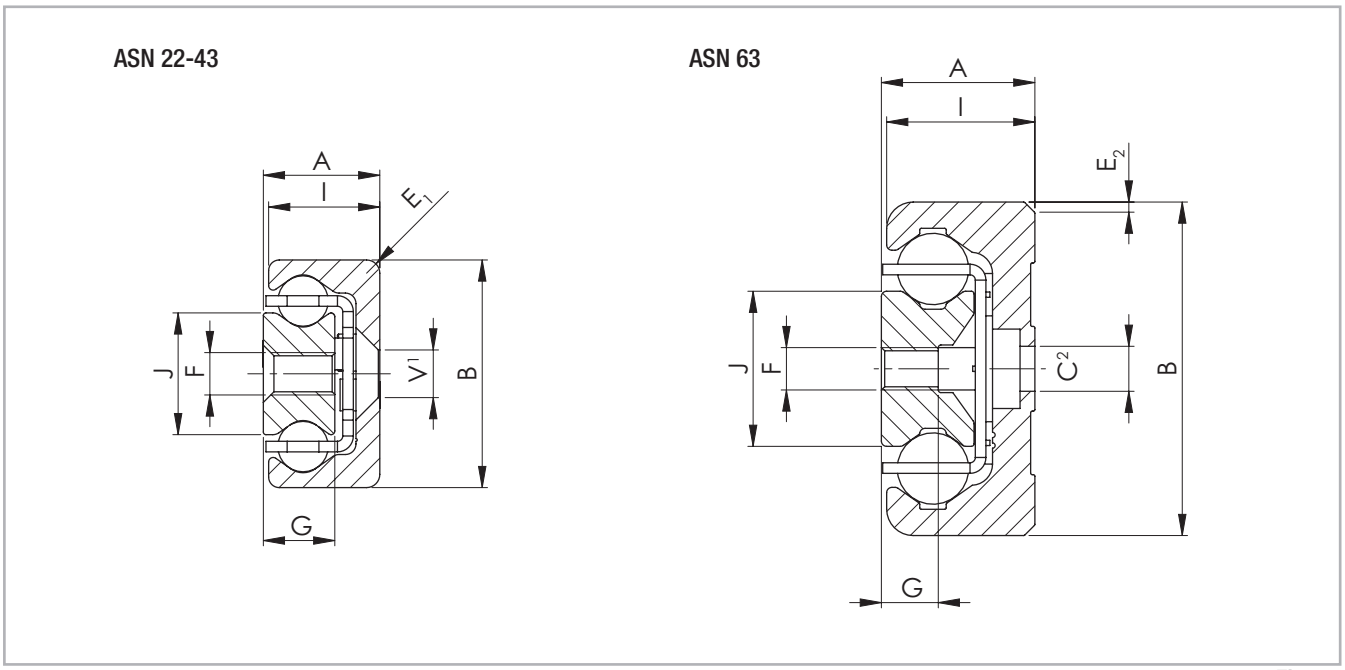
Tab. 2

Type	Size	Length L [mm]	Stroke H [mm]	Load capacity and moments for a pair of rails					No. of holes
				C_{0rad} [N]	C_{0ax} [N]	M_x* [Nm]	M_y [Nm]	M_z [Nm]	
ASN	43	210	123	3190	2234	60.6	168	240	3
		290	158	5744	4020	93.8	402	576	4
		370	208	6754	4728	115.9	616	880	5
		450	243	9380	6566	149.2	1018	1456	6
		530	278	12078	8454	182.4	1524	2176	7
		610	313	14822	10376	215.6	2128	3042	8
		690	363	15726	11008	237.8	2588	3698	9
		770	398	18464	12926	271	3362	4804	10
		850	433	21230	14862	304.2	4238	6054	11
		930	483	22108	15476	326.4	4878	6968	12
		1010	518	24868	17408	359.6	5922	8460	13
		1090	568	25754	18028	381.8	6674	9534	14
		1170	603	28508	19956	415	7886	11266	15
		1250	638	31276	21894	448.2	9198	13142	16
		1330	688	32150	22504	470.4	10130	14472	17
		1410	723	34912	24438	503.6	11612	16590	18
		1490	758	37690	26382	536.8	13196	18850	19
		1570	793	40476	28334	570.1	14880	21256	20
		1650	843	41322	28926	592.2	16058	22940	21
		1730	878	44104	30872	625.5	17912	25588	22
		1810	928	44958	31472	647.6	19202	27432	23
		1890	963	47734	33414	680.8	21224	30320	24
		1970	1013	48596	34018	703	22628	32324	25
ASN	63	610	333	21182	14828	474	3106	4438	8
		690	373	25068	17548	547.5	4144	5920	9
		770	413	28978	20284	621	5332	7616	10
		850	453	32904	23032	694.5	6668	9526	11
		930	493	36842	25790	768	8154	11648	12
		1010	533	40790	28554	841.4	9788	13984	13
		1090	573	44746	31322	914.9	11574	16534	14
		1170	613	48708	34096	988.4	13508	19296	15
		1250	653	52674	36872	1061.9	15590	22272	16
		1330	693	56644	39650	1135.4	17824	25462	17
		1410	733	60618	42432	1208.9	20204	28864	18
		1490	773	64594	45216	1282.4	22736	32480	19
		1570	813	68574	48002	1355.9	25416	36310	20
		1650	853	72554	50788	1429.4	28246	40352	21
		1730	893	76536	53576	1502.8	31226	44608	22
		1810	933	80522	56364	1576.3	34354	49078	23
		1890	973	84506	59154	1649.8	37632	53760	24
		1970	1013	88494	61946	1723.3	41060	58656	25

Tab. 3

* The value M_x refers to a single rail

ASN



[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)

Fig. 35

Type	Size	Cross-section										Weight per single guide [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)

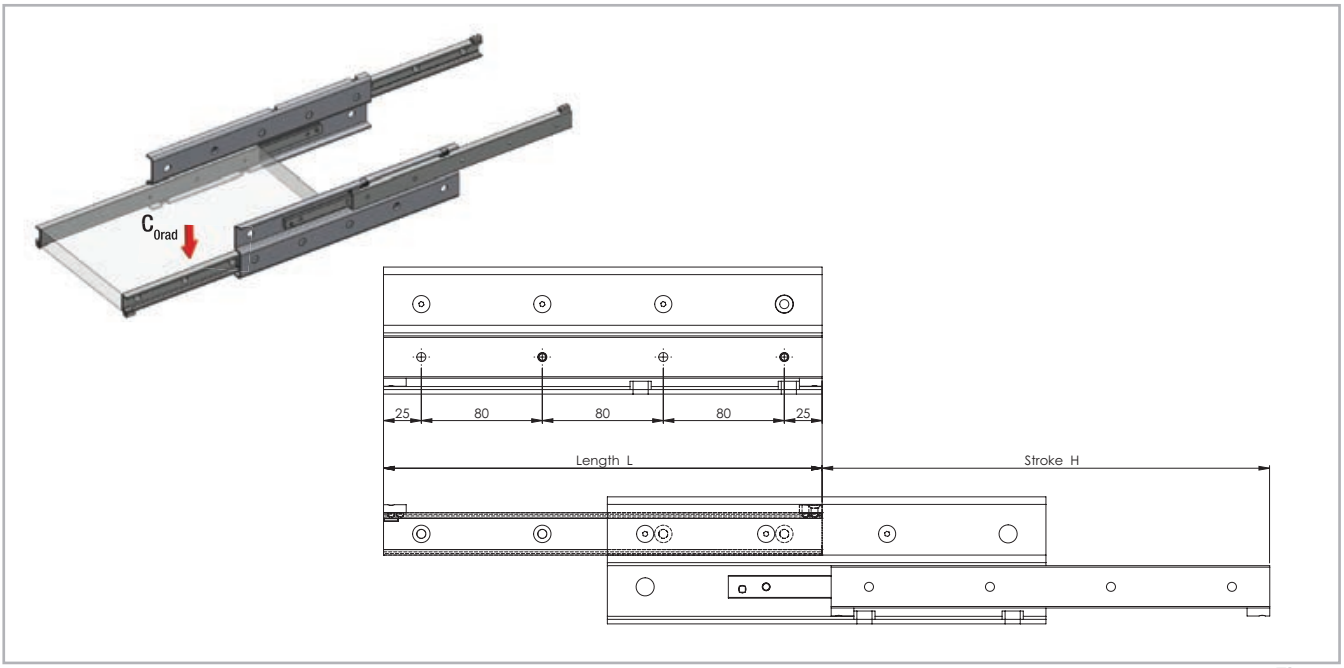


Fig. 36

Type	Size	Length L [mm]	Stroke H [mm]	Load capacity for a pair of rails C_{0rad} [N]	Accessible holes / total
DSS	28	290	296	1140	3 / 4
		370	380	1538	4 / 5
		450	464	1938	4 / 6
		530	548	2340	6 / 7
		610	630	2752	6 / 8
		690	714	3154	7 / 9
		770	798	3556	7 / 10
		850	864	4222	9 / 11
		930	950	4480	9 / 12
		1010	1034	4108	10 / 13
		1090	1118	3792	10 / 14
		1170	1202	3522	12 / 15
		1250	1266	3390	12 / 16
		1330	1350	3172	13 / 17
		1410	1434	2980	13 / 18
		1490	1518	2810	15 / 19

Tab. 5

Type	Size	Length L [mm]	Stroke H [mm]	Load capacity for a pair of rails C_{0rad} [N]	Accessible holes / total
DSS	35	450	494	2500	5 / 6
		530	558	3370	6 / 7
		610	646	3816	6 / 8
		690	734	4264	7 / 9
		770	798	5158	8 / 10
		850	886	5602	9 / 11
		930	974	6048	9 / 12
		1010	1038	6952	10 / 13
		1090	1126	7016	11 / 14
		1170	1214	6480	12 / 15
		1250	1278	6242	12 / 16
		1330	1366	5814	13 / 17
		1410	1454	5442	14 / 18
		1490	1518	5272	15 / 19
		1570	1606	4964	15 / 20
		1650	1694	4690	16 / 21
		1730	1758	4564	17 / 22

Tab. 6

Type	Size	Length L [mm]	Stroke H [mm]	Load capacity for a pair of rails C_{0rad} [N]	Accessible holes / total
DSS	43	530	556	4122	6 / 7
		610	626	5206	6 / 8
		690	726	5550	7 / 9
		770	796	6638	7 / 10
		850	866	7746	9 / 11
		930	966	8072	9 / 12
		1010	1036	9180	10 / 13
		1090	1106	10208	10 / 14
		1170	1206	9220	12 / 15
		1250	1276	8796	12 / 16
		1330	1376	8054	13 / 17
		1410	1446	7728	14 / 18
		1490	1516	7426	15 / 19
		1570	1616	6890	15 / 20
		1650	1686	6650	16 / 21
		1730	1756	6426	17 / 22
		1810	1856	6022	18 / 23
		1890	1926	5838	18 / 24
		1970	2026	5500	19 / 25

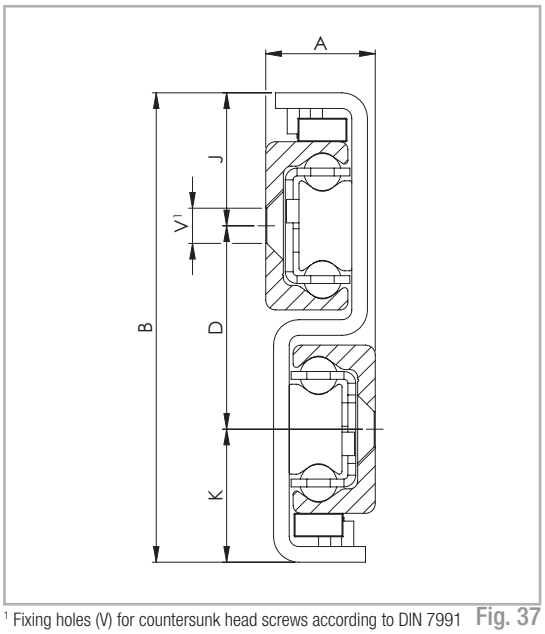
Tab. 7

Type	Size	Length L [mm]	Stroke H [mm]	Load capacity for a pair of rails C_{0rad} [N]	Accessible holes / total
DSS	63	610	666	7004	6 / 8
		690	746	8504	8 / 9
		770	826	10024	8 / 10
		850	906	11560	9 / 11
		930	986	13104	9 / 12
		1010	1066	14658	11 / 13
		1090	1146	16218	11 / 14
		1170	1226	17784	12 / 15
		1250	1306	19354	12 / 16
		1330	1386	20928	14 / 17
		1410	1466	22504	14 / 18
		1490	1546	24082	15 / 19
		1570	1626	25664	15 / 20
		1650	1706	24728	17 / 21
		1730	1786	23654	17 / 22
		1810	1866	22668	18 / 23
		1890	1946	21762	18 / 24
		1970	2026	20926	20 / 25

Tab. 8

DSS

DSS with one-sided extension (single stroke)



[1] Fixing holes (V) for countersunk head screws according to DIN 7991 Fig. 37

Type	Size	Cross-section						Weight per single guide [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 limit blocks

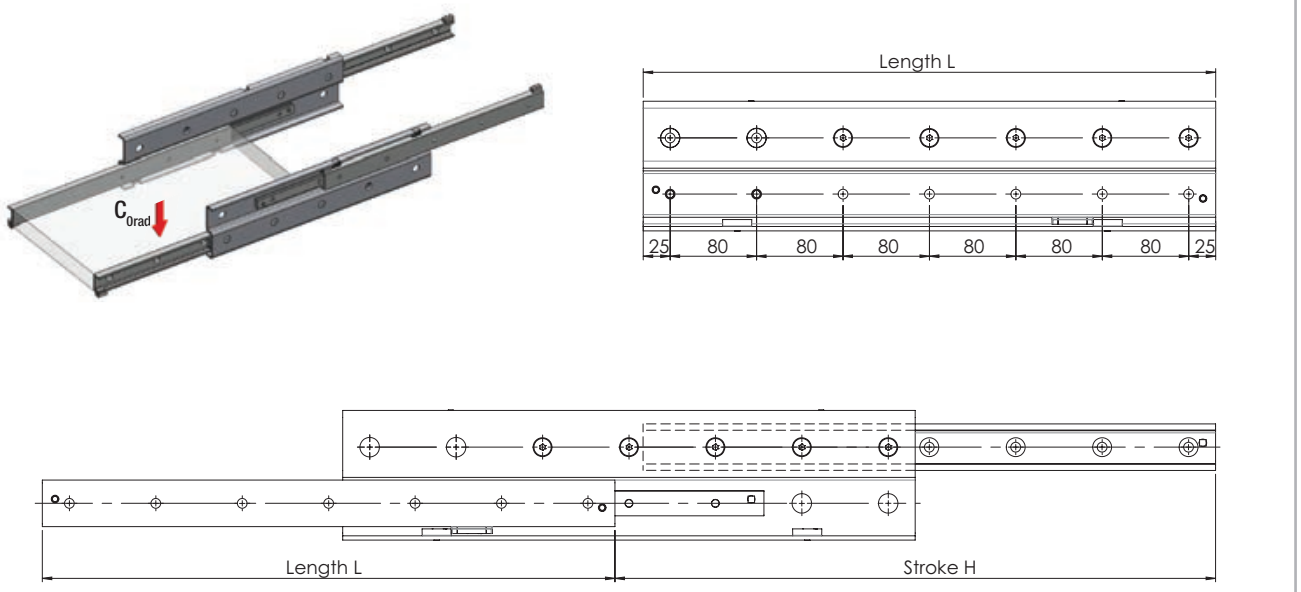


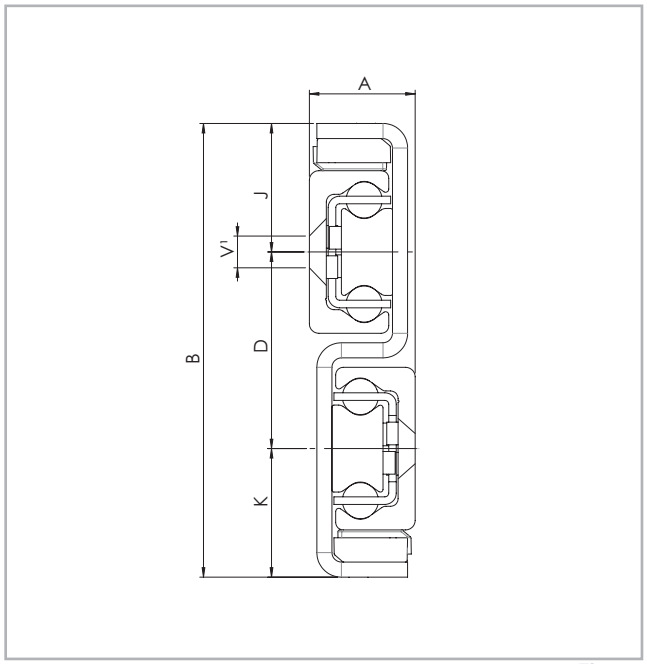
Fig. 38

Type	Size	Length L [mm]	Stroke H [mm]	Load capacity for a pair of rails C_{0rad} [N]	Accessible holes / total
DSS...S	43	530	556	4122	6 / 7
		610	626	5206	6 / 8
		690	726	5550	7 / 9
		770	796	6638	7 / 10
		850	866	7746	9 / 11
		930	966	8072	9 / 12
		1010	1036	9180	10 / 13
		1090	1106	10208	10 / 14
		1170	1206	9220	12 / 15
		1250	1276	8796	12 / 16
		1330	1376	8054	13 / 17
		1410	1446	7728	14 / 18
		1490	1516	7426	15 / 19
		1570	1616	6890	15 / 20
		1650	1686	6650	16 / 21
		1730	1756	6426	17 / 22
		1810	1856	6022	18 / 23
		1890	1926	5838	18 / 24
		1970	2026	5500	19 / 25

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. 39

Type	Size	Cross-section						Weight per single guide [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

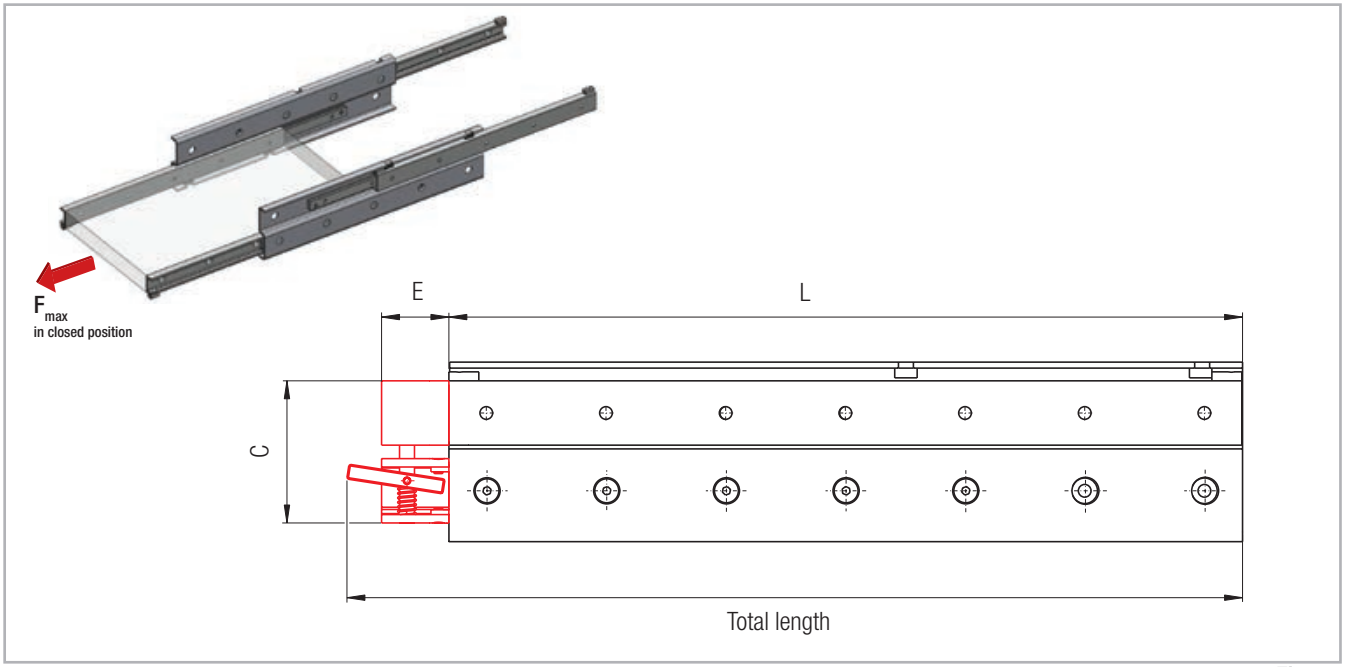
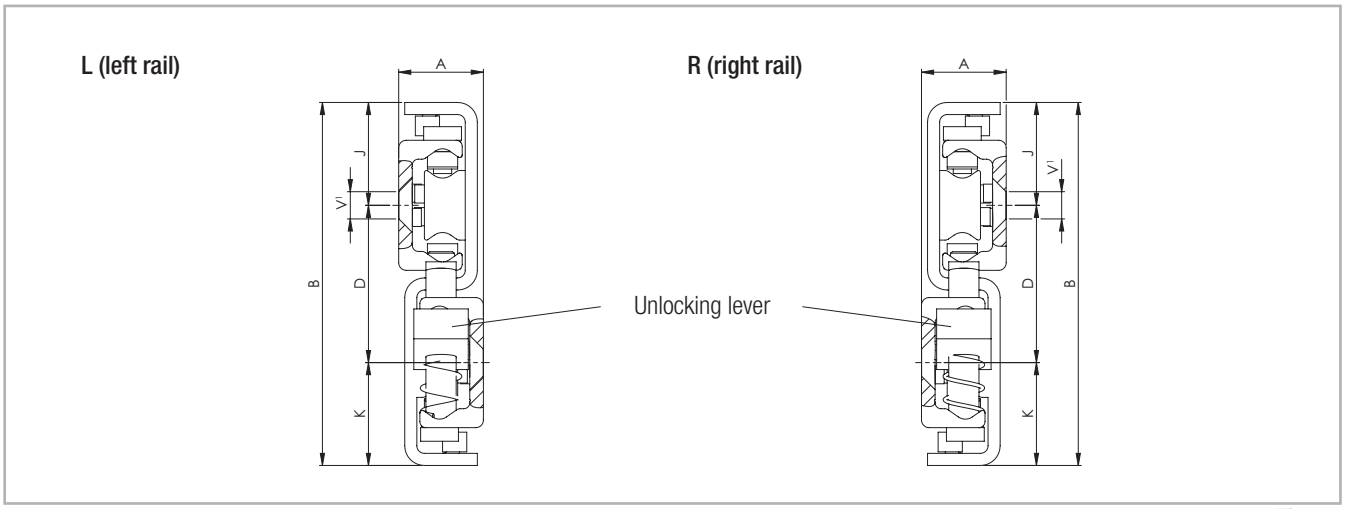


Fig. 40



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

Fig. 41

The DSB is built on the DSS design. The same load capacities, cross-sections and available rail lengths apply (see pg. TR-12ff). 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 when closed is indicated by F_{max}.

Type	Size	L [mm]	Total length [mm]	C [mm]	E [mm]	F_{max*2} [N]	Weight per single guide [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-12, tab. 5 and 7 (DSS)
*2 When using one lock

Tab. 12

DSD

DSD with double direction stroke (double stroke)

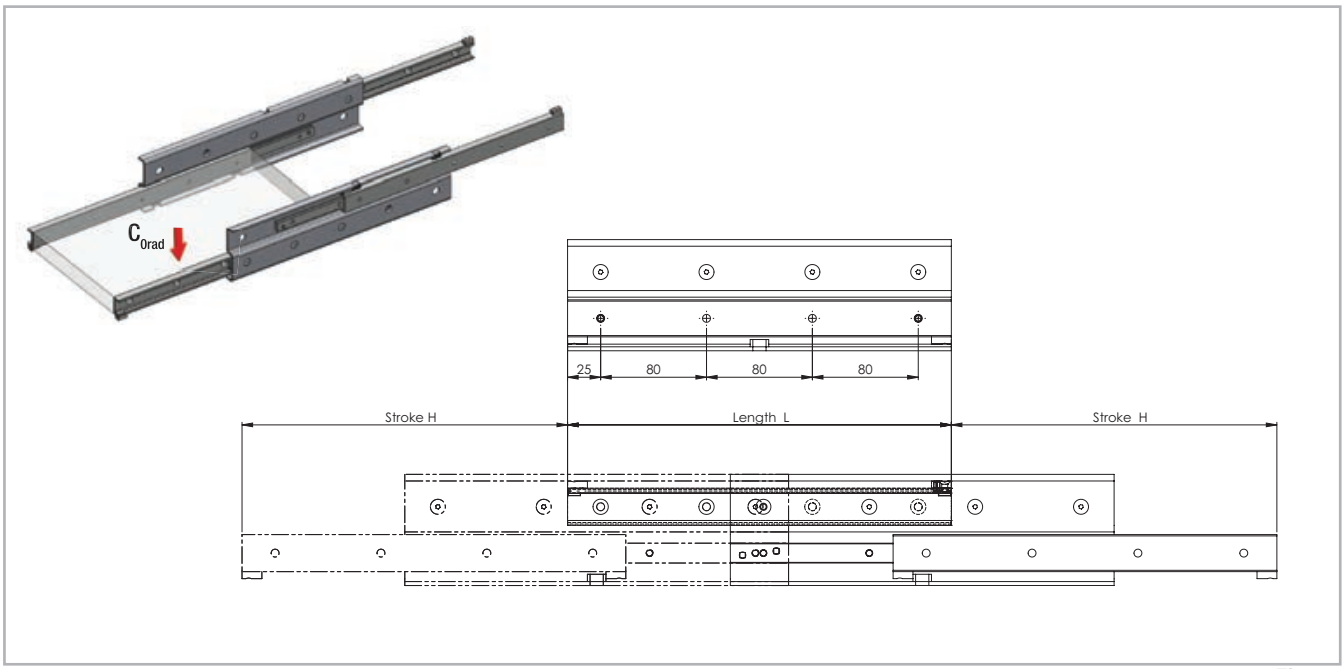


Fig. 42

Type	Size	Length L [mm]	Stroke H [mm]	Load capacity for a pair of rails C_{0rad} [N]	Accessible holes / total
DSD	28	290	246	1790	4 / 4
		370	326	2210	4 / 5
		450	406	2634	6 / 6
		530	486	3252	6 / 7
		610	566	3674	8 / 8
		690	646	4100	8 / 9
		770	726	4524	10 / 10
		850	806	4950	10 / 11
		930	886	5162	12 / 12
		1010	966	4714	12 / 13
		1090	1046	4336	14 / 14
		1170	1126	4016	14 / 15
		1250	1206	3740	16 / 16
		1330	1286	3498	16 / 17
		1410	1366	3288	18 / 18
		1490	1446	3100	18 / 19

Tab. 13

Type	Size	Length L [mm]	Stroke H [mm]	Load capacity for a pair of rails C_{0rad} [N]	Accessible holes / total
DSD	35	450	350	6050	4 / 6
		530	430	6382	6 / 7
		610	510	6762	6 / 8
		690	590	7600	8 / 9
		770	670	8016	8 / 10
		850	750	8446	10 / 11
		930	830	9292	10 / 12
		1010	910	9736	12 / 13
		1090	990	9160	12 / 14
		1170	1070	8404	14 / 15
		1250	1150	7764	14 / 16
		1330	1230	7214	16 / 17
		1410	1310	6738	16 / 18
		1490	1390	6320	18 / 19
		1570	1470	5950	18 / 20
		1650	1550	5622	20 / 21
		1730	1630	5328	20 / 22

Tab. 14

Type	Size	Length L [mm]	Stroke H [mm]	Load capacity for a pair of rails C_{0rad} [N]	Accessible holes / total
DSD	43	530	476	6036	6 / 7
		610	556	6530	8 / 8
		690	636	7562	8 / 9
		770	716	8594	10 / 10
		850	796	9094	10 / 11
		930	876	10126	12 / 12
		1010	956	11156	12 / 13
		1090	1036	11660	14 / 14
		1170	1116	10784	14 / 15
		1250	1196	10028	16 / 16
		1330	1276	9372	16 / 17
		1410	1356	8796	18 / 18
		1490	1436	8286	18 / 19
		1570	1516	7834	20 / 20
		1650	1596	7426	20 / 21
		1730	1676	7060	22 / 22
		1810	1756	6728	22 / 23
		1890	1836	6426	24 / 24
		1970	1916	6150	24 / 25

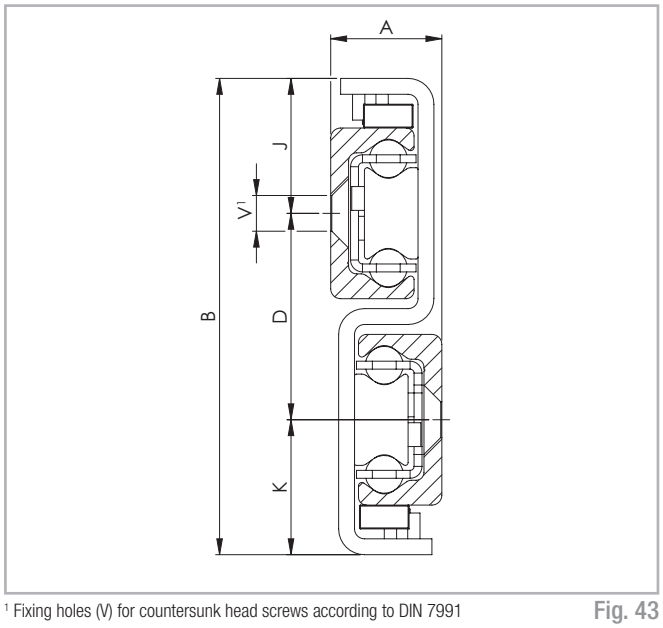
Tab. 15

Type	Size	Length L [mm]	Stroke H [mm]	Load capacity for a pair of rails C_{0rad} [N]	Accessible holes / total
DSD	63	610	398	23716	6 / 8
		690	478	24484	6 / 9
		770	558	25434	8 / 10
		850	638	26500	8 / 11
		930	718	27646	10 / 12
		1010	798	28848	10 / 13
		1090	878	30092	12 / 14
		1170	958	31368	12 / 15
		1250	1038	32668	14 / 16
		1330	1118	33988	14 / 17
		1410	1198	35322	16 / 18
		1490	1278	36670	16 / 19
		1570	1358	38018	18 / 20
		1650	1438	35538	18 / 21
		1730	1518	33360	20 / 22
		1810	1598	31436	20 / 23
		1890	1678	29720	22 / 24
		1970	1758	28182	22 / 25

Tab. 16

DSD

DSD with double direction stroke (double stroke)



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

Fig. 43

Type	Size	Cross-section						Weight per single guide [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

Please note the technical information “Double-sided stroke” on page TR-42

DSE

E version with extra stroke

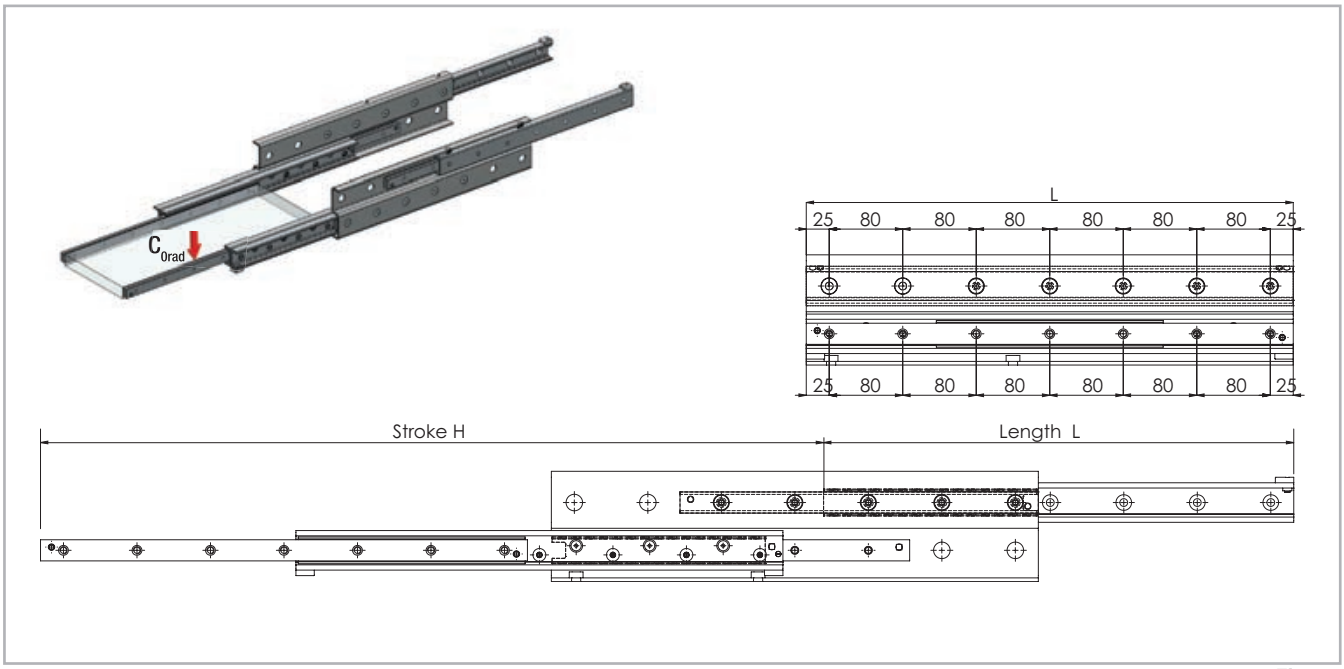


Fig. 44

Type	Size	Length L [mm]	Stroke H [mm]	Load capacity for a pair of rails C_{0rad} [N]	No. of holes fixed part	No. of holes mobile part
DSE	28	290	444	702	3 / 4	4
		370	570	952	4 / 5	5
		450	696	1200	4 / 6	6
		530	822	1450	6 / 7	7
		610	946	1702	6 / 8	8
		690	1072	1684	7 / 9	9
		770	1198	1506	7 / 10	10
		850	1297	1420	9 / 11	11
		930	1425	1292	9 / 12	12
		1010	1551	1184	10 / 13	13
		1090	1677	1094	10 / 14	14
		1170	1803	1016	12 / 15	15

Tab. 18

Type	Size	Length L [mm]	Stroke H [mm]	Load capacity for a pair of rails C_{0rad} [N]	No. of holes fixed part	No. of holes mobile part
DSE	35	450	741	1552	5 / 6	6
		530	837	2098	6 / 7	7
		610	969	2376	6 / 8	8
		690	1101	2652	7 / 9	9
		770	1197	3182	8 / 10	10
		850	1329	2850	9 / 11	11
		930	1461	2582	9 / 12	12
		1010	1557	2466	10 / 13	13
		1090	1689	2262	11 / 14	14
		1170	1821	2090	12 / 15	15
		1250	1917	2012	12 / 16	16
		1330	2049	1874	13 / 17	17
		1410	2181	1754	14 / 18	18
		1490	2277	1700	15 / 19	19

Tab. 19

Type	Size	Length L [mm]	Stroke H [mm]	Load capacity for a pair of rails C_{0rad} [N]	No. of holes fixed part	No. of holes mobile part
DSE	43	530	834	2582	6 / 7	7
		610	939	3264	6 / 8	8
		690	1089	3470	7 / 9	9
		770	1194	4154	7 / 10	10
		850	1299	4852	9 / 11	11
		930	1449	5012	9 / 12	12
		1010	1554	4728	10 / 13	13
		1090	1659	4476	11 / 14	14
		1170	1809	4044	12 / 15	15
		1250	1914	3856	12 / 16	16
		1330	2064	3532	13 / 17	17
		1410	2169	3388	13 / 18	18
		1490	2274	3256	15 / 19	19
		1570	2409	3078	15 / 20	20
		1650	2529	2916	16 / 21	21
		1730	2634	2818	16 / 22	22
		1810	2784	2640	18 / 23	23
		1890	2889	2560	18 / 24	24
		1970	3039	2412	19 / 25	25

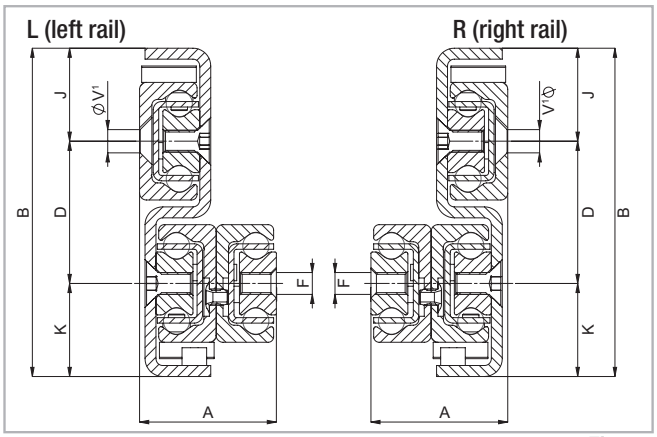
Tab. 20

Type	Size	Length L [mm]	Stroke H [mm]	Load capacity for a pair of rails C_{0rad} [N]	No. of holes fixed part	No. of holes mobile part
DSE	63	610	999	4328	6 / 8	8
		690	1119	5260	8 / 9	9
		770	1239	6208	8 / 10	10
		850	1359	7164	9 / 11	11
		930	1479	8128	9 / 12	12
		1010	1599	9096	11 / 13	13
		1090	1719	10070	11 / 14	14
		1170	1839	11046	12 / 15	15
		1250	1959	11344	12 / 16	16
		1330	2079	10714	14 / 17	17
		1410	2199	10152	14 / 18	18
		1490	2319	9644	15 / 19	19
		1570	2439	9186	15 / 20	20
		1650	2559	8768	17 / 21	21
		1730	2679	8388	17 / 22	22
		1810	2799	8038	18 / 23	23
		1890	2919	7718	18 / 24	24
		1970	3039	7420	20 / 25	25

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. 45

Type	Size	Cross-section							Weight per single guide [kg/m]
		A [mm]	B [mm]	K [mm]	D [mm]	J [mm]	F	V¹	
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

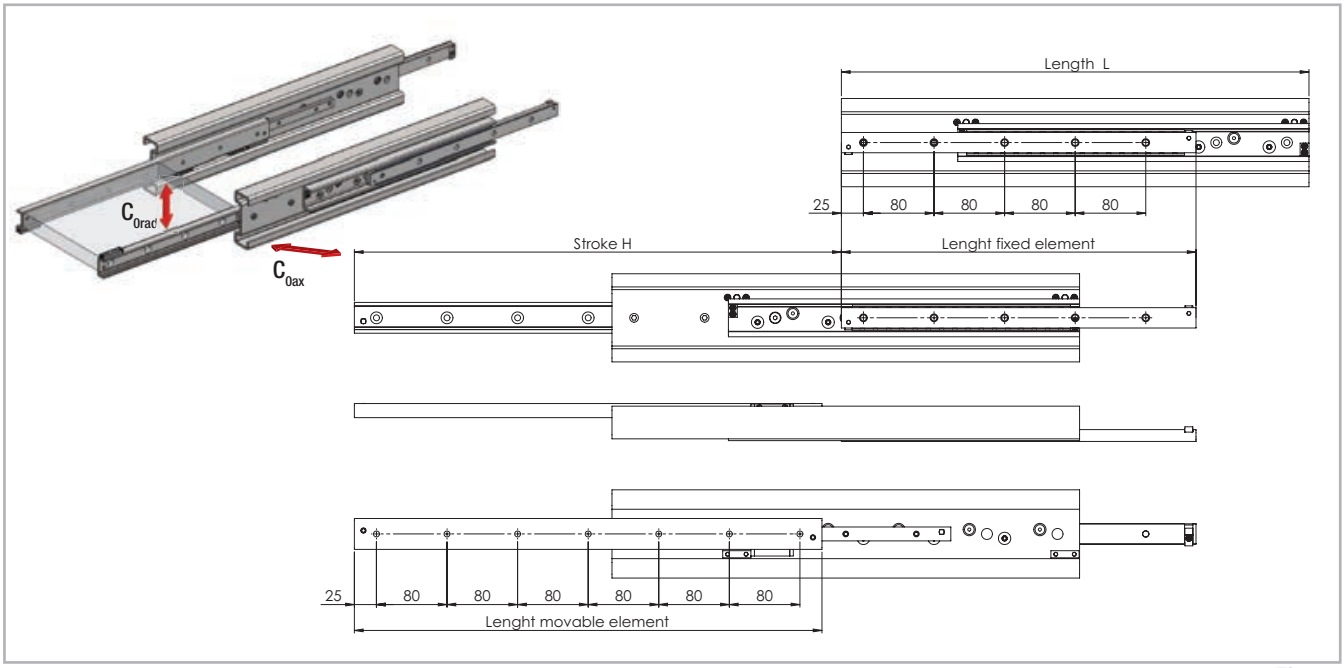
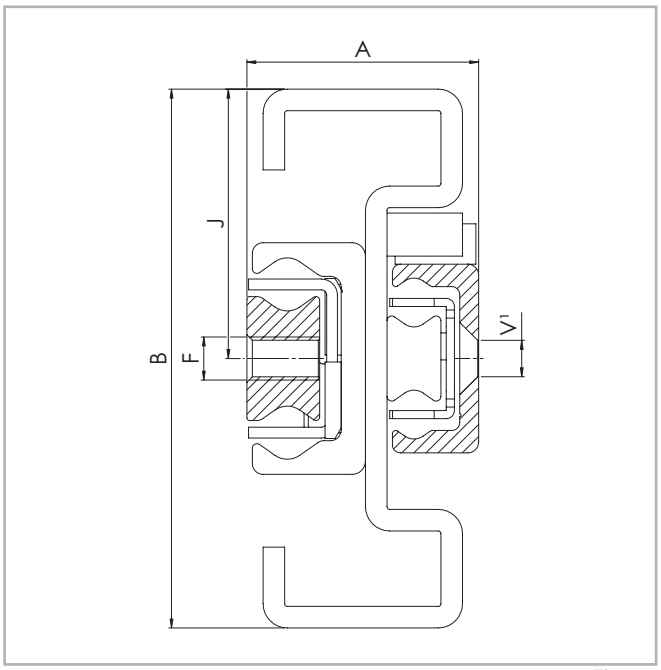


Fig. 46

Type	Size	Length L [mm]	Stroke H [mm]	Load capacity for a pair of rails		Fixed element		Movable element	
				C_{0rad} [N]	C_{0ax} [N]	Accessible holes / total	Length [mm]	Accessible holes / total	Length [mm]
DSC	43	530	552	4780	3346	5 / 5	402	6 / 7	530
		610	619	5928	4150	6 / 6	465	6 / 8	610
		690	725	6190	3840	6 / 6	520	8 / 9	690
		770	792	7332	3584	7 / 7	582	8 / 10	770
		850	859	8492	3362	8 / 8	644	9 / 11	850
		930	965	8738	2918	9 / 9	700	9 / 12	930
		1010	1029	10508	2784	10 / 10	770	11 / 13	1010
		1090	1099	11058	2634	10 / 10	825	11 / 14	1090
		1170	1202	10354	2364	11 / 11	887	12 / 15	1170
		1250	1272	9874	2254	12 / 12	942	12 / 16	1250
		1330	1375	8998	2054	13 / 13	1005	14 / 17	1330
		1410	1445	8634	1972	14 / 14	1060	14 / 18	1410
		1490	1509	8362	1910	14 / 14	1130	15 / 19	1490
		1570	1615	7698	1758	15 / 15	1185	16 / 20	1570
		1650	1685	7428	1696	15 / 15	1240	16 / 21	1650
		1730	1752	7202	1644	16 / 16	1302	17 / 22	1730
		1810	1843	6812	1556	17 / 17	1365	18 / 23	1810
		1890	1922	6540	1494	18 / 18	1427	19 / 24	1890
		1970	2028	6126	1390	19 / 19	1482	20 / 25	1970

Tab. 23

DSC



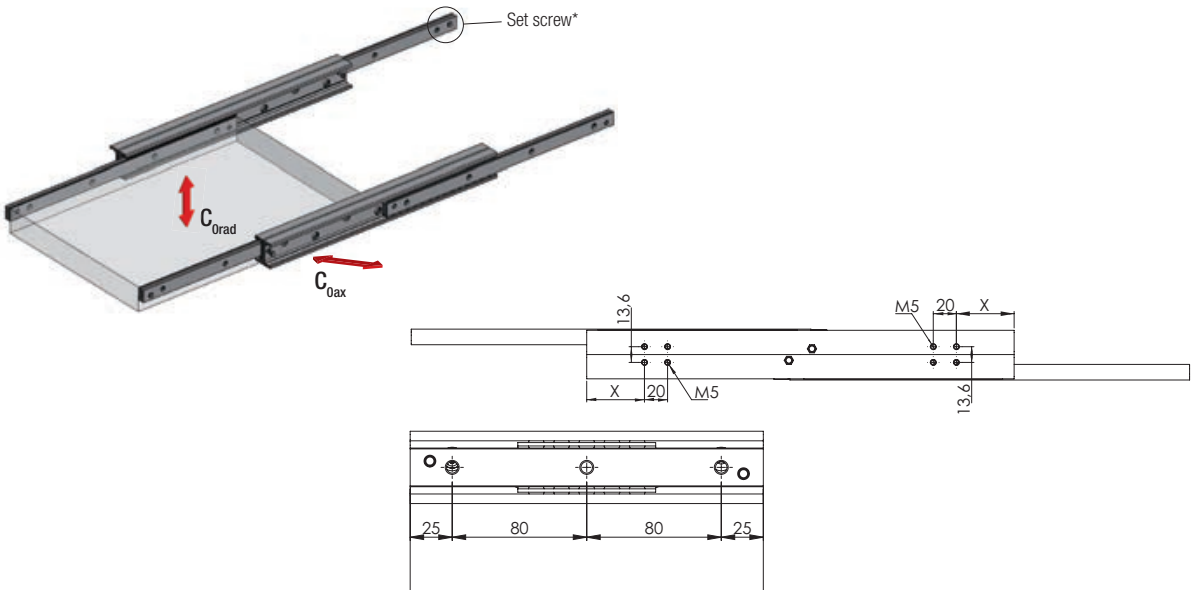
¹ Fixing holes (V) for countersunk head screws according to DIN 7991

Fig. 47

Type	Size	Cross-section					Weight per single guide [kg/m]
		A [mm]	B [mm]	J [mm]	F [mm]	V¹ [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. 48

Type	Size	Length L [mm]	Stroke H [mm]	Load capacity for a pair of rails		No. of holes
				C_{0rad} [N]	C_{0ax} [N]	
DEF DEV DEM	22	130	152	238	166	2
		210	222	562	392	3
		290	308	780	546	4
		370	392	1002	526	5
		450	462	1348	460	6
		530	548	1142	386	7
		610	632	988	334	8
		690	702	906	306	9
		770	788	802	270	10

Tab. 25

Type	Size	Length L [mm]	Stroke H [mm]	Load capacity for a pair of rails		No. of holes
				C_{0rad} [N]	C_{0ax} [N]	
DEF DEV DEM	28	130	148	470	328	2
		210	232	864	604	3
		290	296	1534	1074	4
		370	380	1936	942	5
		450	464	2338	770	6
		530	548	2214	650	7
		610	633	1910	560	8
		690	717	1684	494	9
		770	801	1506	442	10
		850	866	1420	416	11
		930	950	1292	378	12
		1010	1034	1184	348	13
		1090	1118	1094	320	14
		1170	1202	1016	298	15

Tab. 26

Type	Size	Length L [mm]	Stroke H [mm]	Load capacity for a pair of rails		No. of holes
				C_{0rad} [N]	C_{0ax} [N]	
DEF DEV DEM	35	210	254	804	562	3
		290	318	1600	1120	4
		370	406	2050	1436	5
		450	494	2500	1586	6
		530	558	3370	1456	7
		610	646	3816	1252	8
		690	734	3378	1096	9
		770	798	3182	1032	10
		850	886	2850	926	11
		930	974	2582	838	12
		1010	1038	2466	800	13
		1090	1126	2262	734	14
		1170	1214	2090	678	15
		1250	1278	2012	654	16
		1330	1366	1874	608	17
		1410	1454	1754	570	18
		1490	1518	1700	552	19

Tab. 27

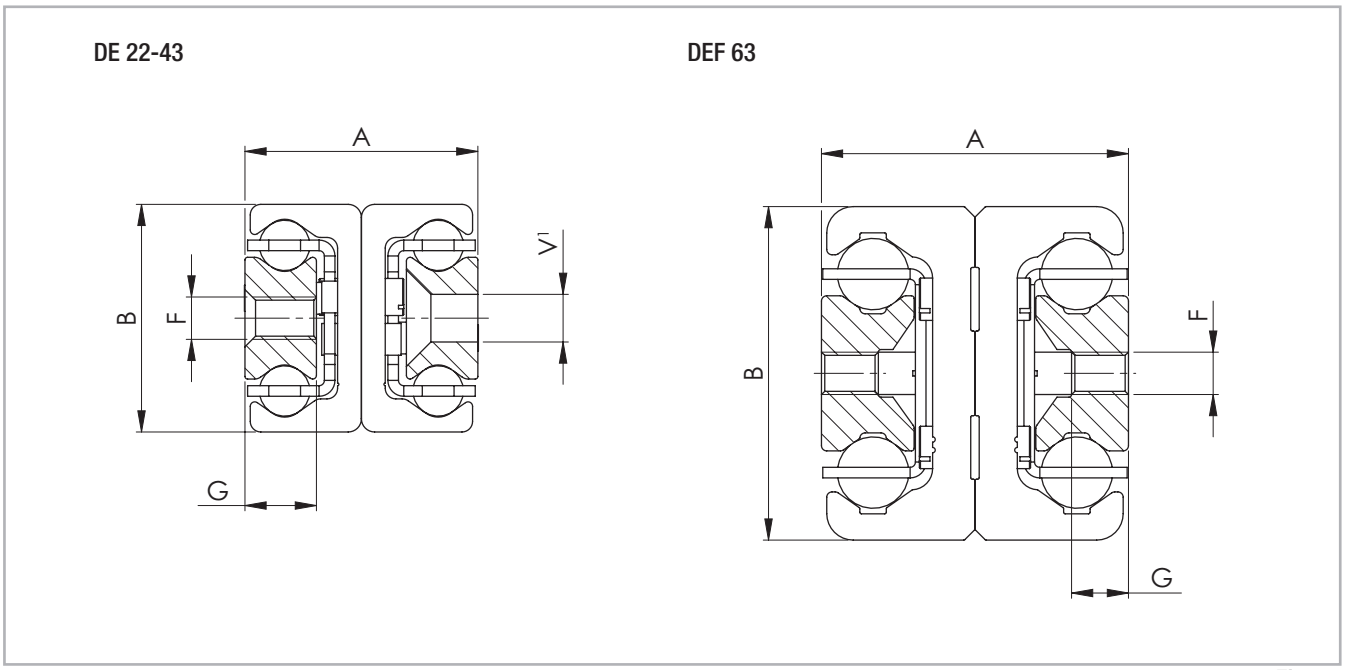
Type	Size	Length L [mm]	Stroke H [mm]	Load capacity for a pair of rails		No. of holes
				C_{0rad} [N]	C_{0ax} [N]	
DEF	63	610	666	8180	5726	8
		690	746	9718	6124	9
		770	826	11270	5568	10
		850	906	12830	5106	11
		930	986	14396	4714	12
		1010	1066	13770	4378	13
		1090	1146	12854	4086	14
		1170	1226	12052	3832	15
		1250	1306	11344	3606	16
		1330	1386	10714	3406	17
		1410	1466	10152	3228	18
		1490	1546	9644	3066	19
		1570	1626	9186	2920	20
		1650	1706	8768	2788	21
		1730	1786	8388	2666	22
		1810	1866	8038	2556	23
		1890	1946	7718	2454	24
		1970	2026	7420	2360	25

Tab. 29

Type	Size	Length L [mm]	Stroke H [mm]	Load capacity for a pair of rails		No. of holes
				C_{0rad} [N]	C_{0ax} [N]	
DEF DEV DEM	43	210	246	1210	848	3
		290	316	2228	1560	4
		370	416	2600	1820	5
		450	486	3656	2558	6
		530	556	4750	2868	7
		610	626	5868	2600	8
		690	726	6182	2192	9
		770	796	6110	2032	10
		850	866	5694	1892	11
		930	966	5012	1666	12
		1010	1036	4728	1572	13
		1090	1106	4476	1488	14
		1170	1206	4044	1344	15
		1250	1276	3856	1282	16
		1330	1376	3532	1174	17
		1410	1446	3388	1126	18
		1490	1516	3256	1082	19
		1570	1586	3134	1042	20
		1650	1686	2916	970	21
		1730	1756	2818	936	22
		1810	1856	2640	878	23
		1890	1926	2560	850	24
		1970	2026	2412	802	25

Tab. 28

DE



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

Fig. 49

Type	Size	Cross-section					Weight per single guide [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

Please note the technical information “Double-sided stroke” on page TR-42

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. 52).
Size 63 is only available with threaded holes.

DE...S

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

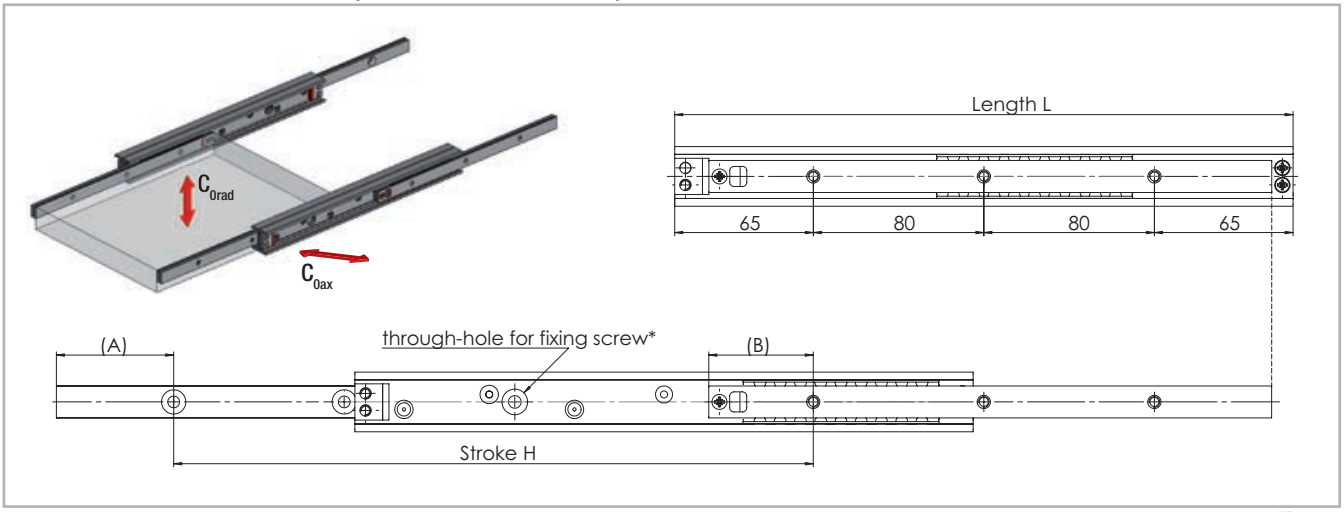


Fig. 50

Type	Size	Length L [mm]	Stroke H [mm]	Load capacity for a pair of rails C_{0rad} [N]	Load capacity for a pair of rails C_{0ax} [N]	Slider [mm]	A [mm]	B [mm]	No of holes
DE...S	28	290	300	704	494	264	55	49	3
		370	384	1084	758	344			4
		450	468	1470	756	424			5
		530	533	2100	686	504			6
		610	636	1892	556	584			7
		690	701	1760	516	664			8
		770	804	1494	438	744			9
		850	850	1474	432	824			10
		930	953	1284	376	904			11
		1010	1018	1222	358	984			12
		1090	1102	1124	330	1064			13
		1170	1186	1042	306	1144			14

Tab. 31

Type	Size	Length L [mm]	Stroke H [mm]	Load capacity for a pair of rails C_{0rad} [N]	Load capacity for a pair of rails C_{0ax} [N]	Slider [mm]	A [mm]	B [mm]	No of holes
DE...S	35	370	370	1430	1000	338	53	45	4
		450	464	1788	1252	418			5
		530	536	2476	1574	498			6
		610	630	2832	1312	578			7
		690	702	3540	1194	658			8
		770	796	3198	1038	738			9
		850	868	2966	962	818			10
		930	962	2644	858	898			11
		1010	1012	2592	842	978			12
		1090	1128	2254	732	1058			13
		1170	1178	2216	720	1138			14
		1250	1272	2030	660	1218			15
		1330	1344	1936	628	1298			16
		1410	1438	1792	582	1378			17
		1490	1510	1718	558	1458			18

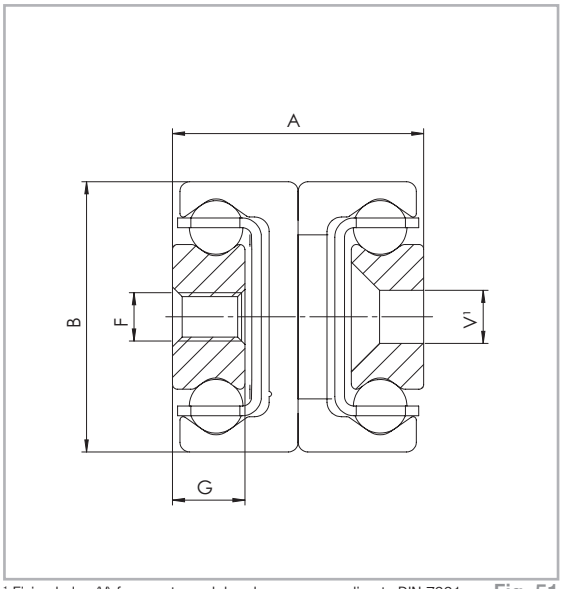
Tab. 32

Type	Size	Length L [mm]	Stroke H [mm]	Load capacity for a pair of rails		Slider [mm]	A [mm]	B [mm]	No of holes
				C_{0rad} [N]	C_{0ax} [N]				
DE...S	43	370	366	2014	1410	338	53	45	4
		450	496	1864	1306	418			5
		530	536	3418	2394	498			6
		610	636	3796	2522	578			7
		690	706	4838	2312	658			8
		770	806	5206	1982	738			9
		850	846	5964	1982	818			10
		930	976	4914	1634	898			11
		1010	1016	4914	1634	978			12
		1090	1116	4398	1462	1058			13
		1170	1186	4178	1390	1138			14
		1250	1286	3798	1262	1218			15
		1330	1326	3798	1262	1298			16
		1410	1456	3344	1112	1378			17
		1490	1496	3344	1112	1458			18
		1570	1596	3096	1030	1538			19
		1650	1666	2986	992	1618			20
		1730	1766	2786	926	1698			21
		1810	1806	2786	926	1778			22
		1890	1936	2534	842	1858			23
		1970	2066	2322	772	1938			24

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. 51

Type	Size	Cross-section					Weight per single guide [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)

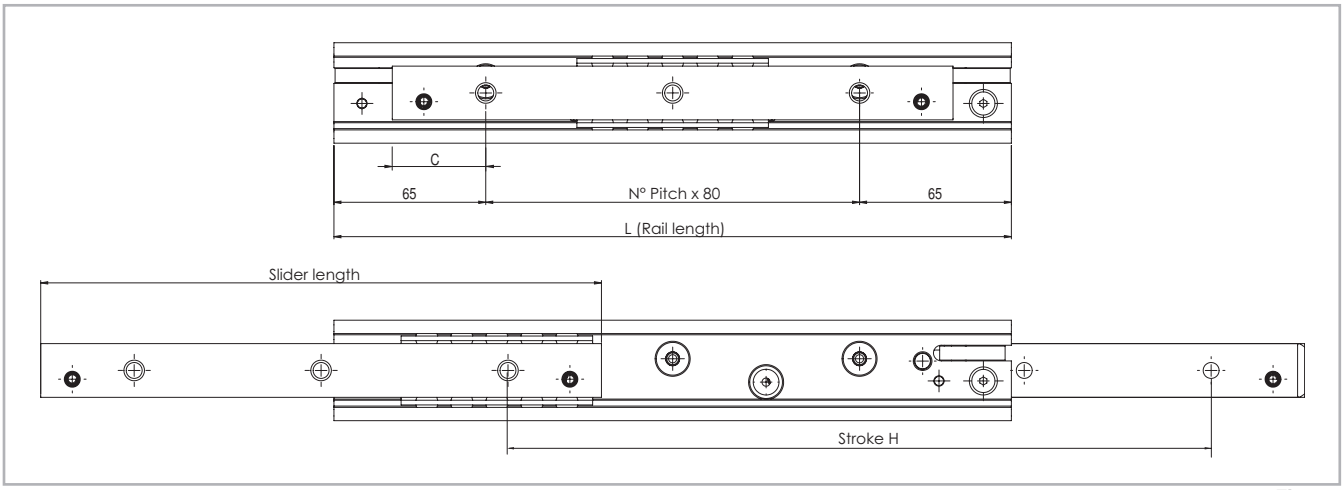


Fig. 52

D version (with a driving disc)

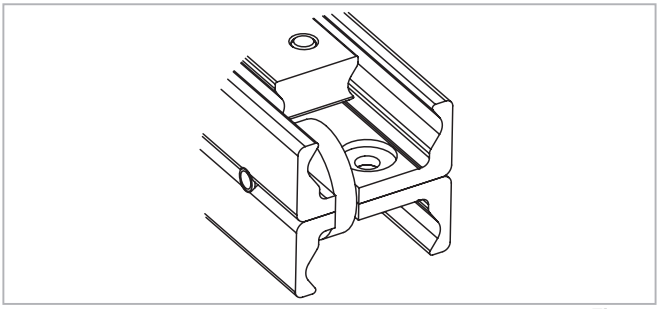


Fig. 53

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 capacity for a pair of rails C_{0rad} [N]	Load capacity for a pair of rails C_{0ax} [N]	Slider [mm]	C [mm]	No. of holes
DEF...D DEV...D DEM...D	28	290	292	836	586	250	45	3
		370	376	1224	856	330	45	4
		450	460	1618	782	410	45	5
		530	544	2014	658	490	45	6
		610	628	1940	570	570	45	7
		690	712	1706	500	650	45	8
		770	796	1524	448	730	45	9
		850	880	1376	404	810	45	10
		930	964	1256	368	890	45	11
		1010	1048	1154	338	970	45	12
		1090	1132	1068	314	1050	45	13
		1170	1216	992	292	1130	45	14

Tab. 35

Type	Size	Length L [mm]	Stroke H [mm]	Load capacity for a pair of rails C_{0rad} [N]	Load capacity for a pair of rails C_{0ax} [N]	Slider [mm]	C [mm]	No. of holes
DEF...D DEV...D DEM...D	35	290	303	890	624	250	45	3
		370	391	1322	926	330	45	4
		450	479	1760	1232	410	45	5
		530	543	2562	1534	490	45	6
		610	631	3012	1308	570	45	7
		690	719	3460	1140	650	45	8
		770	783	3302	1072	730	45	9
		850	871	2946	956	810	45	10
		930	959	2660	864	890	45	11
		1010	1023	2536	824	970	45	12
		1090	1111	2322	754	1050	45	13
		1170	1199	2140	694	1130	45	14
		1250	1263	2060	668	1210	45	15
		1330	1351	1916	622	1290	45	16
		1410	1439	1790	582	1370	45	17
		1490	1503	1734	562	1450	45	18

Tab. 36

Type	Size	Length L [mm]	Stroke H [mm]	Load capacity for a pair of rails C_{0rad} [N]	Load capacity for a pair of rails C_{0ax} [N]	Slider [mm]	C [mm]	No. of holes
DED...D DEV...D DEN...D	43	290	301	1002	702	240	40	3
		370	401	1400	980	320	40	4
		450	471	2318	1622	400	40	5
		530	541	3312	2318	480	40	6
		610	641	3696	2484	560	40	7
		690	711	4724	2280	640	40	8
		770	781	5784	2108	720	40	9
		850	881	5506	1830	800	40	10
		930	951	5166	1718	880	40	11
		1010	1021	4866	1618	960	40	12
		1090	1121	4360	1450	1040	40	13
		1170	1191	4144	1378	1120	40	14
		1250	1261	3948	1312	1200	40	15
		1330	1361	3608	1200	1280	40	16
		1410	1431	3458	1150	1360	40	17
		1490	1501	3322	1104	1440	40	18
		1570	1601	3076	1024	1520	40	19
		1650	1671	2968	986	1600	40	20
		1730	1741	2866	952	1680	40	21
		1810	1841	2682	892	1760	40	22
		1890	1911	2600	864	1840	40	23
		1970	2011	2448	814	1920	40	24

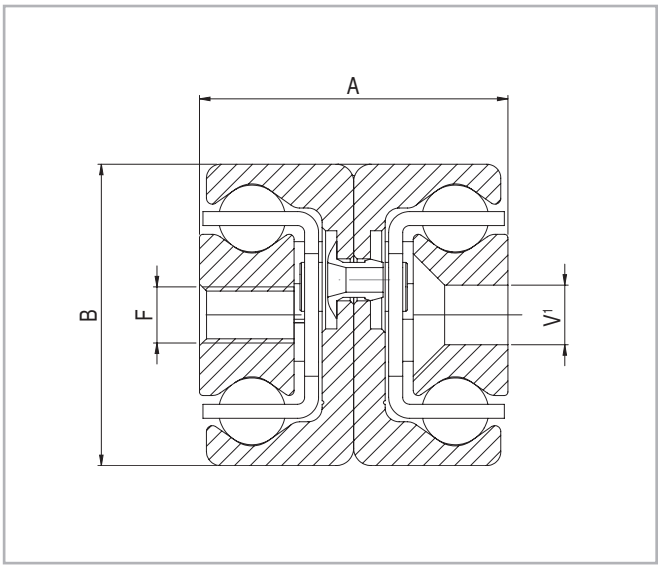
Tab. 37

Type	Size	Length L [mm]	Stroke H [mm]	Load capacity for a pair of rails C_{0rad} [N]	Load capacity for a pair of rails C_{0ax} [N]	Slider [mm]	C [mm]	No. of holes
DEF...D	63	610	602	7688	5382	558	39	7
		690	682	9236	6466	638	39	8
		770	762	10796	6514	718	39	9
		850	842	12362	5890	798	39	10
		930	922	13934	5374	878	39	11
		1010	1002	15512	4942	958	39	12
		1090	1082	14386	4574	1038	39	13
		1170	1162	13388	4256	1118	39	14
		1250	1242	12520	3980	1198	39	15
		1330	1322	11758	3738	1278	39	16
		1410	1402	11084	3524	1358	39	17
		1490	1482	10482	3332	1438	39	18
		1570	1562	9942	3160	1518	39	19
		1650	1642	9456	3006	1598	39	20
		1730	1722	9014	2866	1678	39	21
		1810	1802	8612	2738	1758	39	22
		1890	1882	8244	2620	1838	39	23
		1970	1962	7906	2514	1918	39	24

Tab. 38

DED version D

DED with double direction stroke (double stroke)



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

Fig. 54

Type	Size	Cross-section A [mm]	Cross-section B [mm]	Cross-section F	Cross-section V[1]	Weight per single guide [kg/m]
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.

DE...Z

Version Z with synchronized full extension

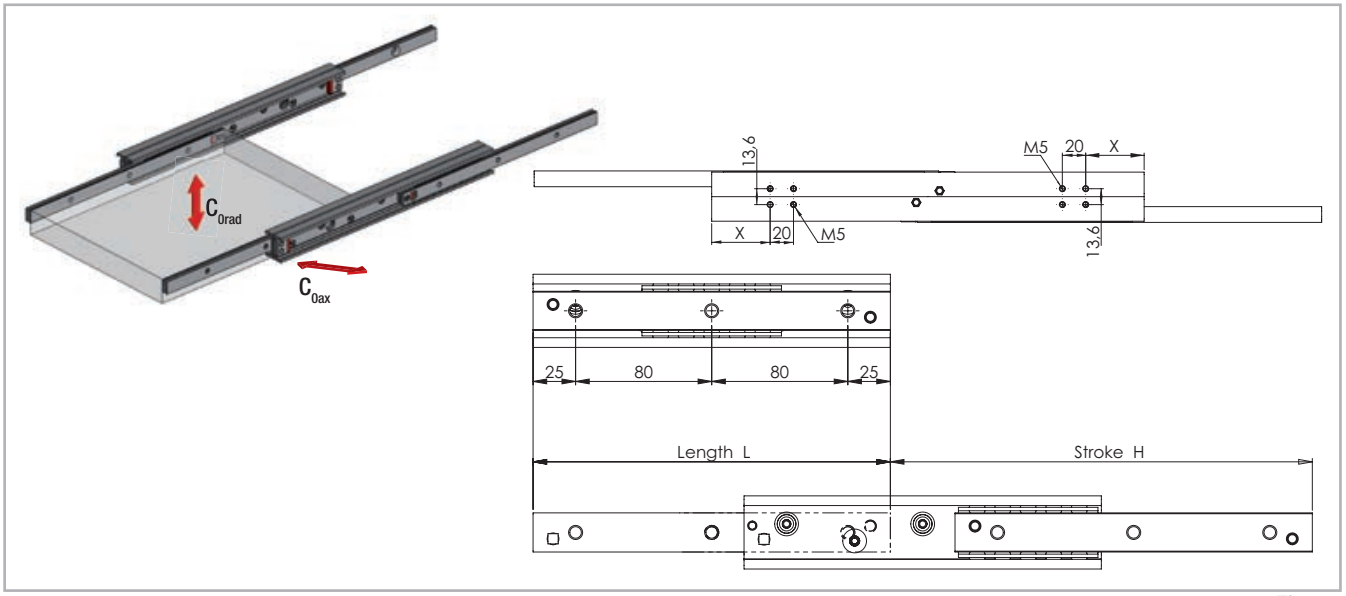


Fig. 55

Type[1]	Size	Length L [mm]	Stroke H [mm]	X	Load capacity for a pair of rails		No. of holes
					C_{0rad} [N]	C_{0ax} [N]	
DEF...Z	43	290	243	30	1746	1222	4
		370	323	50	1947	1363	5
		450	403	70	2481	1737	6
		530	483	90	3016	1915	7
		610	563	110	3229	1618	8
		690	643	130	3762	1401	9
		770	723	150	3714	1235	10
		850	803	170	3321	1104	11
		930	883	190	3004	999	12
		1010	963	210	2741	911	13
		1090	1043	230	2521	838	14
		1170	1123	250	2334	776	15
		1250	1203	270	2172	722	16
		1330	1283	290	2032	675	17
		1410	1363	310	1908	634	18
		1490	1443	330	1799	598	19
		1570	1523	350	1701	566	20
		1650	1603	370	1614	537	21
		1730	1683	390	1535	510	22
		1810	1763	410	1463	486	23
		1890	1843	430	1398	465	24
		1970	1923	450	1338	445	25

[1] The synchronized full extension is only available in version F with threaded mounting holes

Tab. 40

Z version (with rack and pinion)

The rack and pinion system allows the rail to open starting from the intermediate element, thus permitting a synchronized full extension and guaranteeing a multiplication of the drive (for equal lengths in rail stroke, the drive stroke is cut in half). 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.

DE...Z

DE...Z with double direction stroke (double stroke)

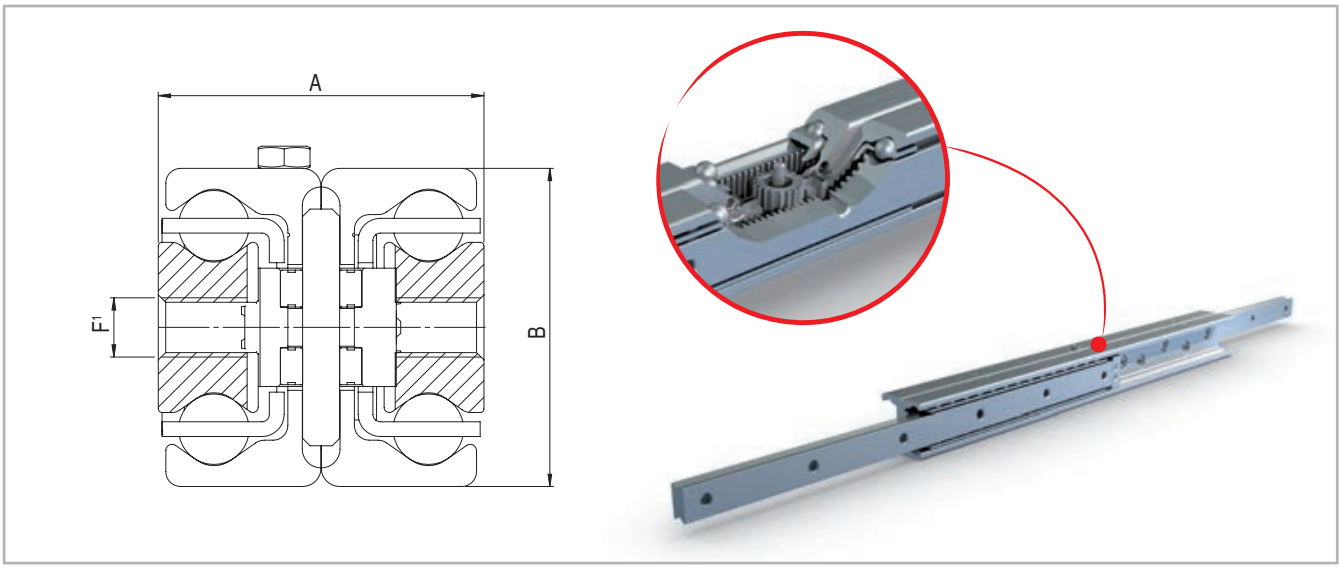


Fig. 56

¹ Fixing holes (V) for countersunk head screws according to DIN 7991
* Max shaft length 10mm

Type	Size	Cross-section			Weight per single guide [kg/m]
		A [mm]	B [mm]	F	
DEF...Z	43	44	43	M8	10.50

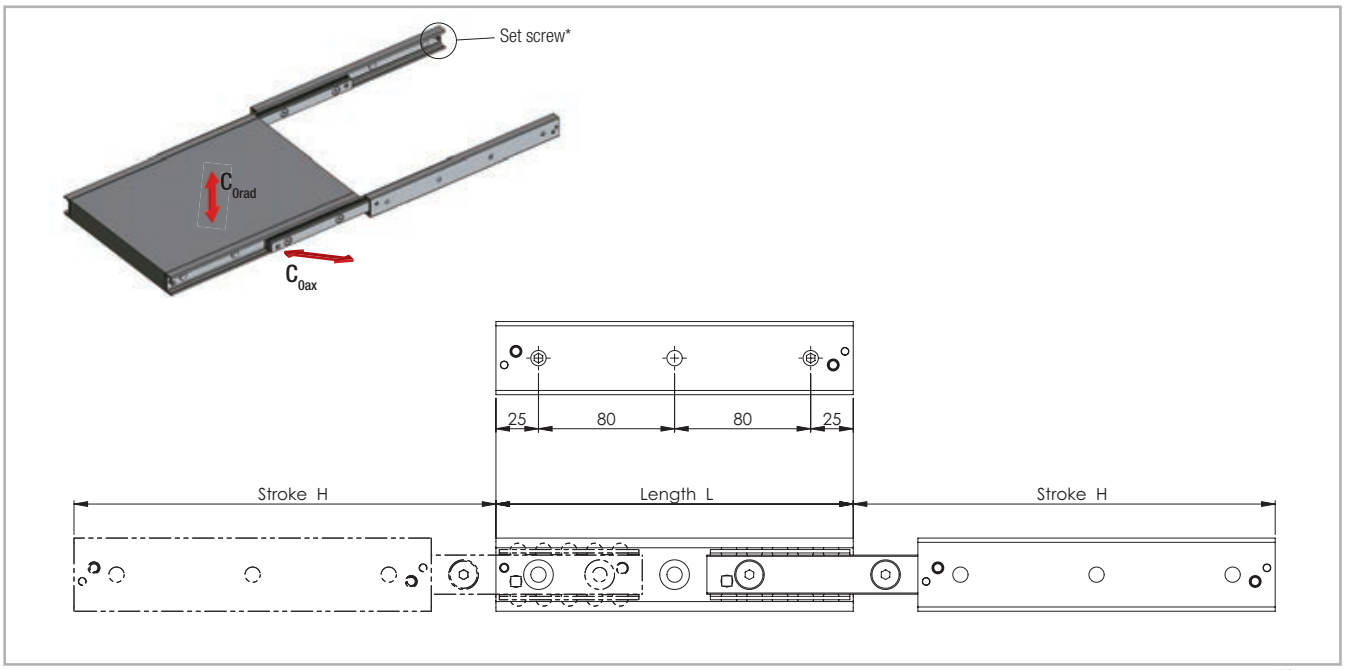
Tab. 41

DEF43Z with threaded holes is available in left and right version:

DEF43Z....L

DEF43Z....R

DBN



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

Fig. 57

Type	Size	Length L [mm]	Stroke H [mm]	Load capacity for a pair of rails		No. of holes
				C_{0rad} [N]	C_{0ax} [N]	
DBN	22	130	152	238	166	2
		210	222	562	392	3
		290	308	472	472	4
		370	392	372	372	5
		450	462	324	324	6
		530	548	272	272	7
		610	632	234	234	8
		690	702	216	216	9
		770	788	190	190	10

Tab. 42

Type	Size	Length L [mm]	Stroke H [mm]	Load capacity for a pair of rails		No. of holes
				C_{0rad} [N]	C_{0ax} [N]	
DBN	28	130	148	470	328	2
		210	232	864	604	3
		290	296	1244	1074	4
		370	380	964	964	5
		450	464	786	786	6
		530	548	664	664	7
		610	633	572	572	8
		690	717	504	504	9
		770	801	452	452	10
		850	866	426	426	11
		930	950	388	388	12
		1010	1034	356	356	13
		1090	1118	328	328	14
		1170	1202	304	304	15

Tab. 43

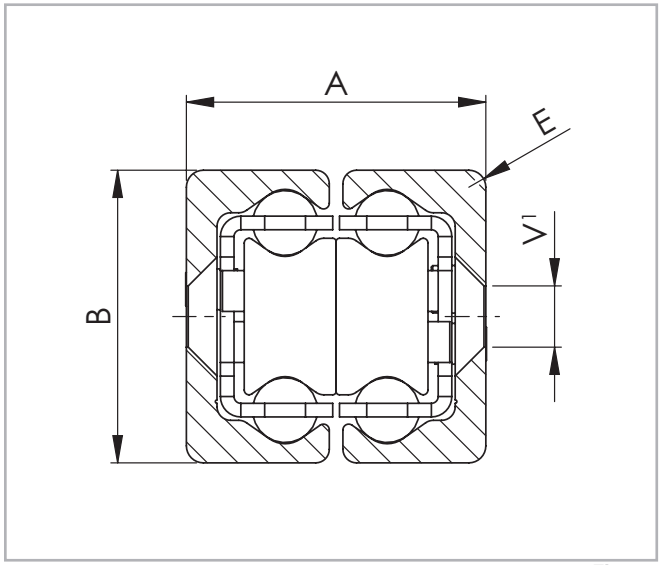
Type	Size	Length L [mm]	Stroke H [mm]	Load capacity for a pair of rails		No. of holes
				C_{0rad} [N]	C_{0ax} [N]	
DBN	35	210	254	804	562	3
		290	318	1334	1120	4
		370	406	1044	1044	5
		450	494	858	858	6
		530	558	788	788	7
		610	646	676	676	8
		690	734	594	594	9
		770	798	558	558	10
		850	886	500	500	11
		930	974	454	454	12
		1010	1038	434	434	13
		1090	1126	398	398	14
		1170	1214	366	366	15
		1250	1278	354	354	16
		1330	1366	330	330	17
		1410	1454	308	308	18
		1490	1518	298	298	19

Tab. 44

Type	Size	Length L [mm]	Stroke H [mm]	Load capacity for a pair of rails		No. of holes
				C_{0rad} [N]	C_{0ax} [N]	
DBN	43	210	246	1210	848	3
		290	316	2228	1560	4
		370	416	2600	1820	5
		450	486	2662	2558	6
		530	556	2386	2386	7
		610	626	2164	2164	8
		690	726	1824	1824	9
		770	796	1690	1690	10
		850	866	1576	1576	11
		930	966	1386	1386	12
		1010	1036	1308	1308	13
		1090	1106	1238	1238	14
		1170	1206	1118	1118	15
		1250	1276	1066	1066	16
		1330	1376	976	976	17
		1410	1446	938	938	18
		1490	1516	900	900	19
		1570	1586	868	868	20
		1650	1686	806	806	21
		1730	1756	780	780	22
		1810	1856	730	730	23
		1890	1926	708	708	24
		1970	2026	668	668	25

Tab. 45

DBN



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

Fig. 58

Type	Size	Cross-section				Weight per single guide [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. 46

Please note the technical information “Double-sided stroke” on page TR-42

DMS

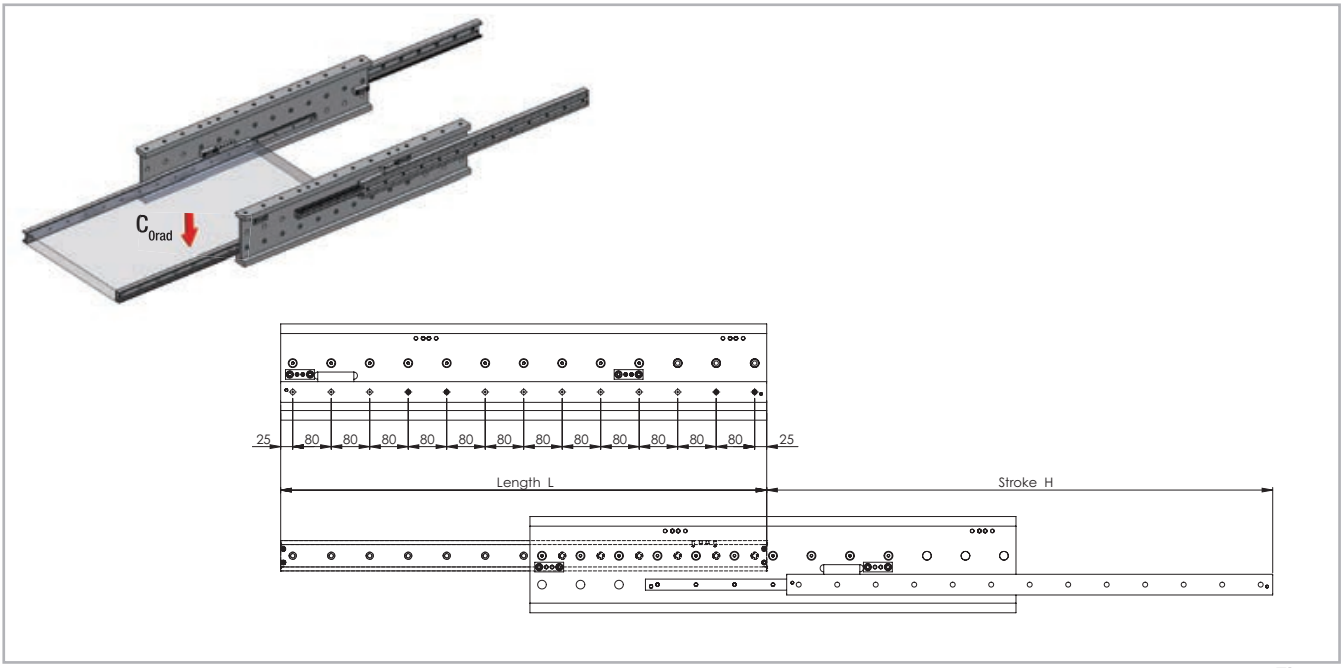
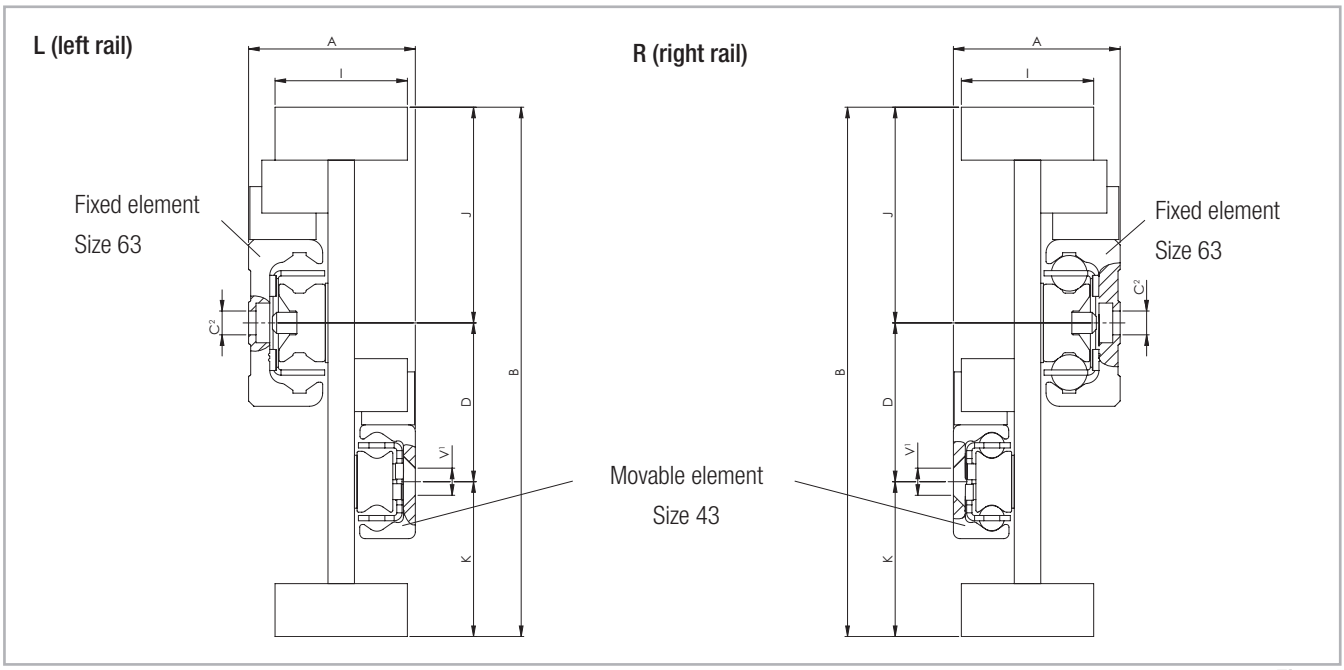


Fig. 59

Type	Size	Length L [mm]	Stroke H [mm]	Load capacity for a pair of rails C_{0rad} [N]	Fixed element Accessible holes / total	Movable element Accessible holes / total
DMS	63	1010	1051	16104	10 / 13	10 / 13
		1090	1141	17496	10 / 14	11 / 14
		1170	1216	19168	11 / 15	11 / 15
		1250	1291	20848	12 / 16	13 / 16
		1330	1381	22238	13 / 17	13 / 17
		1410	1456	23920	13 / 18	14 / 18
		1490	1531	25608	14 / 19	14 / 19
		1570	1621	26996	14 / 20	15 / 20
		1650	1696	28686	16 / 21	16 / 21
		1730	1771	30380	16 / 22	17 / 22
		1810	1861	31766	17 / 23	17 / 23
		1890	1936	33460	18 / 24	19 / 24
		1970	2026	34846	19 / 25	19 / 25
		2050	2101	36542	19 / 26	20 / 26
		2130	2176	38240	20 / 27	20 / 27
		2210	2266	39624	21 / 28	22 / 28

Tab. 47

DMS



[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.

Fig. 60

Type	Size	Cross-section								Weight per single guide [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. 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. 4, Product Dimensions, pg. TR-8ff) give the maximum permissible loading of a pair of rails in the middle of the two rails and in the center line of the moving element with the rails in the completely extended state.

Using a pair of rails, the loading acts in the centre on both rails (see fig. 62, P1).
The load capacity of a rail pair is:

$$P_1 = C_{0rad}$$

Fig. 61

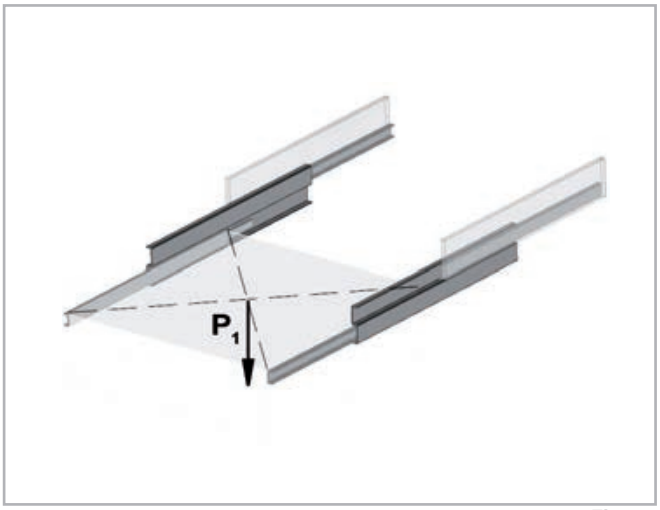


Fig. 62

Deflection

If the load P acts vertically on the pair of rails (see fig. 63), the expected elastic deflection in the extended state can be determined as follows:

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

Fig. 63

Whereby:

f is the expected elastic deflection in mm

q is a stroke coefficient (see fig. 66)

t is a factor depending on the model of the telescopic rail (see fig. 64)

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

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

DS28	t = 360	DBN22	t = 6
DS35	t = 940	DBN28	t = 16
DS43	t = 1600	DBN35	t = 26
DS63	t = 8000	DBN43	t = 112
DE22	t = 16	DMS63	t = 7000
DE28	t = 34	DSC43	t = 1600
DE35	t = 108		
DE43	t = 240		
DE63	t = 1080		

Fig. 64

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.

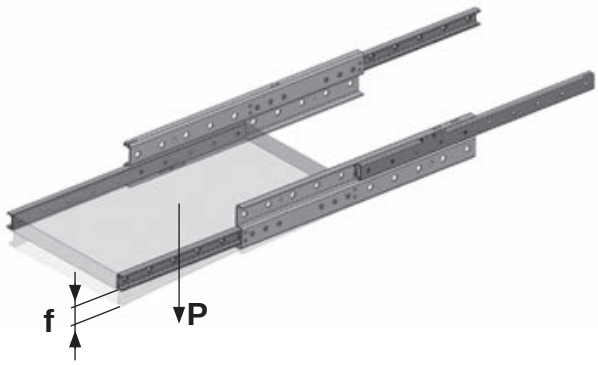


Fig. 65

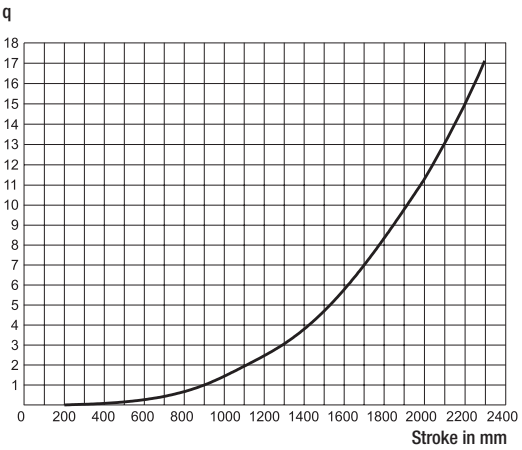


Fig. 66

Static load

The telescopic extension of the various series allow different forces and moments (see Sect. 4, Product dimensions, pg. TR-8ff).
During the static tests the radial load capacity, C_{0rad}, the axial load capacity, C_{0ax}, 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.

$$\frac{P_{0rad}}{C_{0rad}} \leq \frac{1}{S_0} \qquad \frac{P_{0ax}}{C_{0ax}} \leq \frac{1}{S_0} \qquad \frac{M_1}{M_x} \leq \frac{1}{S_0} \qquad \frac{M_2}{M_y} \leq \frac{1}{S_0} \qquad \frac{M_3}{M_z} \leq \frac{1}{S_0}$$

Fig. 67

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:

$$\frac{P_{0rad}}{C_{0rad}} + \frac{P_{0ax}}{C_{0ax}} + \frac{M_1}{M_x} + \frac{M_2}{M_y} + \frac{M_3}{M_z} \leq \frac{1}{S_0}$$

P_{0rad} = effective radial load
C_{0rad} = permissible radial load
P_{0ax} = effective axial load
C_{0ax} = 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

Fig. 68

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 for a pair of rails
f_i = application coefficient

Fig. 69

Application coefficient f_i

	ASN, DS, DE, DBN, 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. 70

Load capacity factor δ

Length [mm]	ASN				
	22	28	35	43	63
	δ [N]				
130	830	1744			
210	1864	3154	3066	4576	
290	2590	5384	5812	8110	
370	3330	6810	7442	9588	
450	4410	8238	9074	13204	
530	5134	9664	11980	16902	
610	5872	11114	13606	20650	30006
690	6960	12542	15234	22010	35416
770	7684	13968	18186	25754	40854
850		16222	19806	29524	46310
930		17622	21428	30858	51778
1010		19048	24402	34620	57258
1090		20474	26018	35962	62748
1170		21900	27636	39720	68242
1250			30622	43494	73742
1330			32236	44822	79246
1410			33850	48590	84754
1490			36846	52372	90266
1570				56166	95780
1650				57466	101296
1730				61252	106814
1810				62562	112332
1890				66344	117854
1970				67658	123376

Tab. 51

Length [mm]	DS...				DSE				DSC
	28	35	43	63	28	35	43	63	43
	δ [N]								
290	1726				1084				
370	2328				1466				
450	2932	3784			1848	2390			
530	3536	5080	6240		2232	3224	3976		7194
610	4156	5756	7858	10656	2620	3650	5018	6690	8902
690	4762	6434	8394	12918	3004	4080	4792	8126	9322
770	5368	7762	10020	15208	3388	4934	6388	9578	11022
850	6360	8436	11672	17518	4028	5358	7452	11046	12746
930	6948	9110	12180	19842	4406	5784	7758	12526	13144
1010	7556	10452	13832	22178	4792	6650	8820	14012	15760
1090	8162	11122	15500	24522	5412	7072	9896	15504	16592
1170	8768	11794	15292	26874	5562	7496	10190	17002	17868
1250	9792	13146	17658	29232		8368	11264	18504	18702
1330	10386	13814	18154	31596		8790	11562	20010	19980
1410	10992	14484	19818	33962		9212	12632	15914	20818
1490	11612	15840	21492	36332		10088	13710	23028	23456
1570		16506	21976	38706			14096	24540	23826
1650		17176	23650	41080			15078	26056	24660
1730		18536	25330	43458			16160	27572	26394
1810			25808	45838			16444	29088	27824
1890			27486	48218			17526	30606	29408
1970			27966	50602			17814	32126	29770

Tab. 52

Length [mm]	DMS
	63
	δ [N]
770	
850	
930	
1010	24308
1090	29974
1170	28914
1250	32972
1330	33526
1410	39684
1490	38570
1570	44316
1650	43196
1730	49414
1810	47822
1890	51926
1970	52450
2050	58682
2130	57526
2210	61190

Tab. 53

Length [mm]	DE... / DBN				DE
	22	28	35	43	63
	δ [N]				
130	330	714			
210	772	1310	1228	1846	
290	1074	2306	2422	3374	
370	1380	2912	3104	3948	
450	1850	3518	3784	5528	
530	2150	4126	5080	7160	
610	2458	4744	5756	8828	12406
690	2934	5350	6434	9322	14722
770	3232	5958	7762	10986	17054
850		6974	8436	12670	19398
930		7566	9110	13144	21750
1010		8172	10452	14822	24110
1090		8776	11122	16514	26476
1170		9382	11794	16978	28846
1250			13146	18664	31220
1330			13814	19136	33596
1410			14484	20818	35974
1490			15840	22510	38356
1570				24210	40738
1650				24660	43122
1730				26356	45508
1810				26812	47896
1890				28504	50284
1970				28966	52672

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. 71).
Maximum acceleration: 1.2 m/s^2

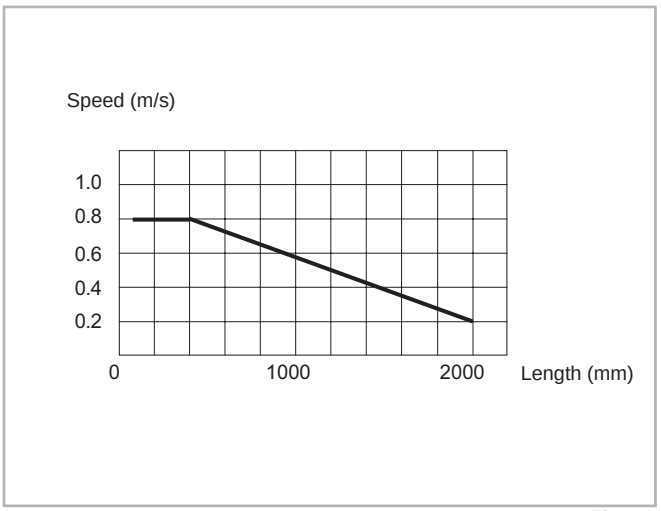


Fig. 71

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 series are not available with double-sided stroke.

Temperature

- ASN, DE, DBN 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 (-4 °F).
- The DS, DSE, DSC and DMS series have a useable range of -20 °C to +80 °C (-4 °F to +176 °F) due to of the rubber stop.
- The DSS43S and DE...S series have a temperature range of application from -20 ° C to + 50 ° C (-4 ° F to 122 ° F), due to the bumpers in special resin.

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 Aloy 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

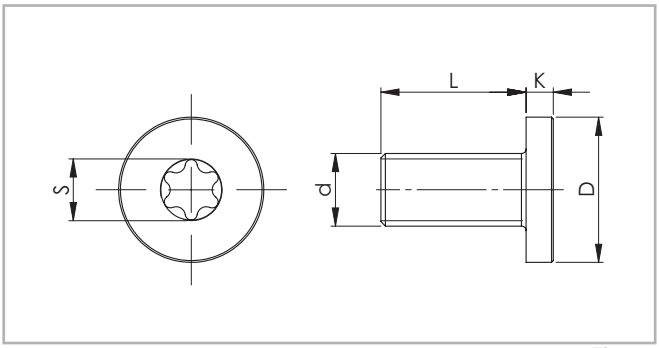


Fig. 72

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. 72).

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

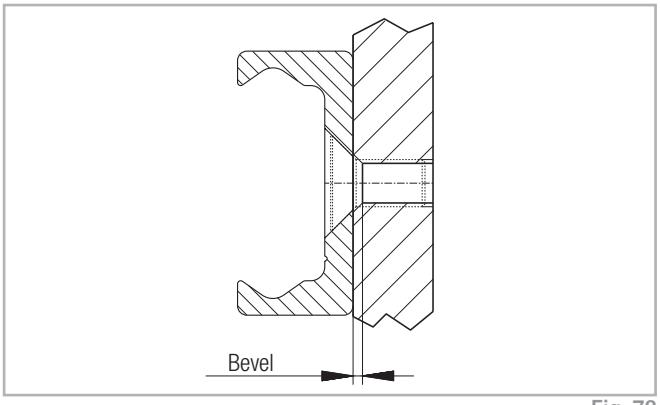
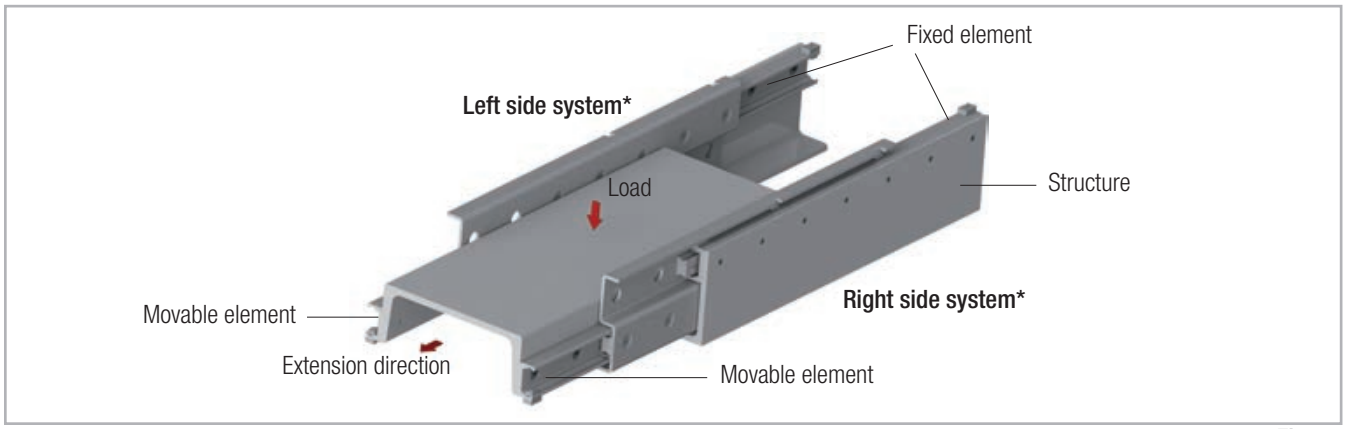


Fig. 73

Installation instructions

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



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

Fig. 74

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.
- 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-44, fig. 72). 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

- Series DS, DES, DMS 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. 74).
  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

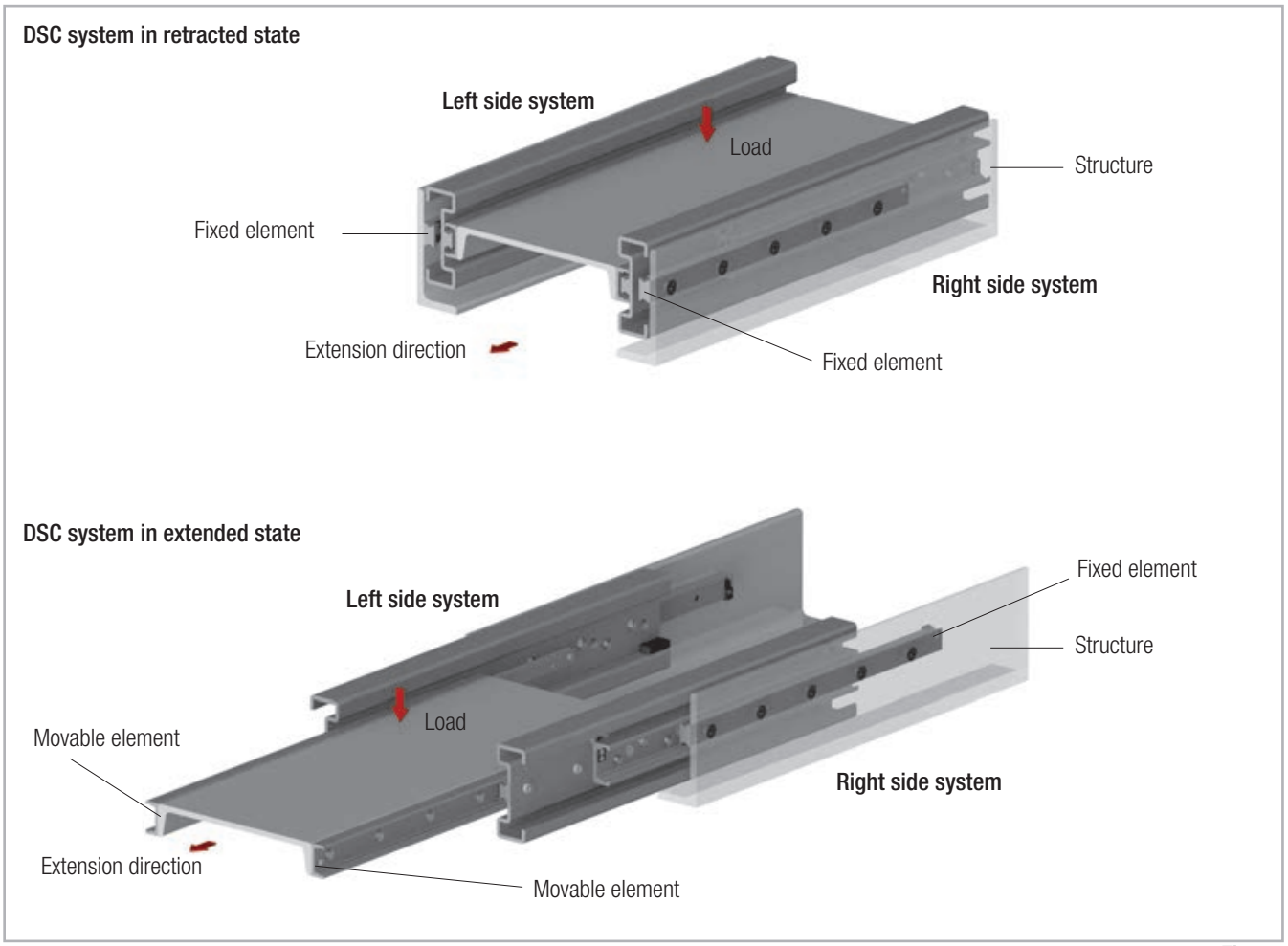


Fig. 75

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. 75). 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-21 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.
- 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) *see pg. TR-45, Anticorrosive protection*
				Right (R) or left (L) version (only for series DMS, DSB) *see pg. TR-7 Remarks*	
			Stroke, if deviating from standard stroke (catalogue data) *see pg. TR-8ff Product dimensions and Ordering key for special strokes*		
		Length	*see pg. TR-8ff Product dimensions*		
	Size	*see pg. TR-8ff Product dimensions*			
Product type	*see pg. TR-8ff Product dimensions*				

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 ballcage.

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 and DSC 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
DE...S	35	22
DSE	28	28.5
	35	36
	43	45
	63	60

Tab. 60

ROLLON®
BY TIMKEN

Follow us:

EUROPE

ROLLON S.p.A. - ITALY (Headquarters)

Via Trieste 26
I-20871 Vimercate (MB)
Phone: (+39) 039 62 59 1
www.rollon.it - infocom@rollon.it

ROLLON GmbH - GERMANY

Bonner Strasse 317-319
D-40589 Düsseldorf
Phone: (+49) 211 95 747 0
www.rollon.de - info@rollon.de

ROLLON S.A.R.L. - FRANCE

Les Jardins d'Eole, 2 allée des Séquoias
F-69760 Limonest
Phone: (+33) (0) 4 74 71 93 30
www.rollon.fr - infocom@rollon.fr

ROLLON B.V. - NETHERLANDS

Ringbaan Zuid 8
6905 DB Zevenaar
Phone: (+31) 316 581 999
www.rollon.nl - info@rollon.nl

ROLLON S.p.A. - RUSSIA (Rep. Office)

117105, Moscow, Varshavskoye
shosse 17, building 1
Phone: +7 (495) 508-10-70
www.rollon.ru - info@rollon.ru

ROLLON Ltd - UK (Rep. Office)

The Works 6 West Street Olney
Buckinghamshire, United Kingdom, MK46 5 HR
Phone: +44 (0) 1234964024
www.rollon.uk.com - info@rollon.uk.com

AMERICA

ROLLON Corporation - USA

101 Bilby Road. Suite B
Hackettstown, NJ 07840
Phone: (+1) 973 300 5492
www.rolloncorp.com - info@rolloncorp.com

ROLLON - SOUTH AMERICA (Rep. Office)

R. Joaquim Floriano, 397, 2o. andar
Itaim Bibi - 04534-011, São Paulo, BRASIL
Phone: +55 (11) 3198 3645
www.rollonbrasil.com.br - info@rollonbrasil.com

ASIA

ROLLON Ltd - CHINA

No. 1155 Pang Jin Road,
China, Suzhou, 215200
Phone: +86 0512 6392 1625
www.rollon.cn.com - info@rollon.cn.com

ROLLON India Pvt. Ltd. - INDIA

1st floor, Regus Gem Business Centre, 26/1
Hosur Road, Bommanahalli, Bangalore 560068
Phone: (+91) 80 67027066
www.rollonindia.in - info@rollonindia.in

ROLLON - JAPAN

3F Shiodome Building, 1-2-20 Kaigan, Minato-ku,
Tokyo 105-0022 Japan
Phone +81 3 6721 8487
www.rollon.jp - info@rollon.jp

Consult the other ranges of products

Distributor

All addresses of our global sales partners can also be found at www.rollon.com