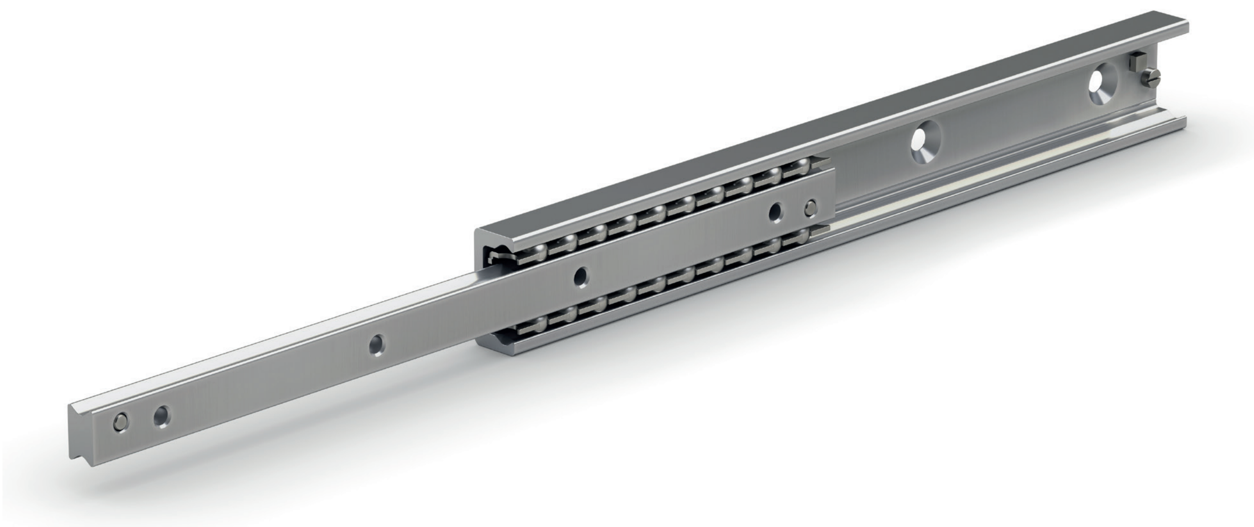
ASN

Data sheet - rev. 1.0



LINEAR COMPONENTS

myRollon

MyRollon is **your digital working platform** for linear guides, telescopic rails, actuators and actuator systems.

With myRollon, it is possible to determine the best linear motion solution according to your application specifications.

SCAN ME!

Index

ORDERING KEY

■ ASN

ASN	35	1490	759	N
Series	Size	Rail lenght [mm]	**Stroke,** if deviating from standard stroke (data sheet data)	**Surface treatments** if deviation from standard (ISO 2081)

Ordering example: **ASN35-0770**

Notes on ordering: Information for expanded surface streatments is only necessary if required.

Rail lengths and stroke lengths are always stated with four digits. Please pad with zeros to fill in lengths with less than four digits, e.g. 530mm lenght is a "0530"

FEATURES AND ADVANTAGES

Fig.1

ASN rails are partially extending telescopic rails in cold-drawn steel with induction-hardened raceways.

With its compact and straightforward design, ASN provides an exceptionally stiff, easy-to-install solution capable of handling extremely high payloads. When mounted to a supporting structure, it forms a highly rigid system. Available in five sizes, it features a double-sided stroke.

Designed for demanding applications involving high loads and cycles, as well as shocks and crash tests, it ensures durability and smooth movement even under heavy loads - thanks to its hardened raceways.

ASN is particularly suitable for construction and machine technology, automotive and railcars, logistics, and the beverage industry.

Performance characteristics

- Available sizes: 22, 28, 35, 43, 63
- Available rail lengths: from 130 mm up to 1970 mm (from 5.1 in to 77.6 in)
- Max. operating speed: 0.8 m/s (31.5 in/s) Depending on application
- Max. acceleration: 1.2 m/s² (47.2 in/s²) Depending on application
  Temperature range: -20 °C to +170 °C (-4 °F to +338 °F)

Materials and treatment:

- Rails and sliders: cold drawn carbon steel, also available with zinc plating, zinc-nickel plating, e-coating, and nickel plating surface treatments.
- Raceways: induction-hardened.
- Balls material: carbon steel, stainless steel combined with optional surface treatment.
- Ball cage: Steel.
- Surface treatments: zinc plating (ISO 2081 standard) in standard, also available in zinc-nickel, e-coating and nickel plating for increased protection.

MAIN ADVANTAGES

High load capacity	Compact design	Single or double stroke	High hardness of the raceways	Flexibility
Thanks to their hardened raceways and reduced ball spacing within the cage, ASN guides facilitate the handling of heavy loads.	ASN's extremely compact design also makes it ideal for applications with limited space constraints.	By simply removing an end screw, the guide enables stroke movement in both directions.	The hardened raceways make ASN suitable for high-cycle applications, even under challenging shock and vibration conditions, ensuring extended service life.	ASN telescopic guides are compatible with various mounting configurations, thanks to their load capacity in both radial and axial directions.

COMPONENTS AND DIMENSIONS

- Partial extension guide sections

- **ASN22**

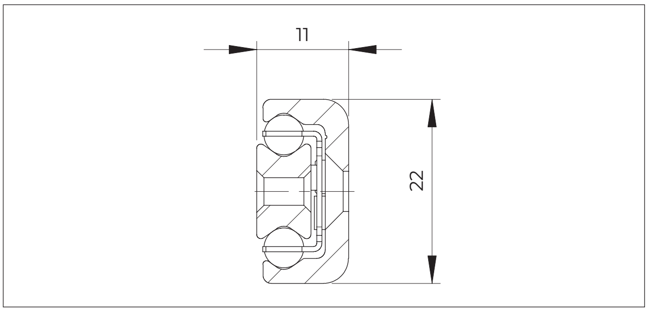


Fig.2

- **ASN28**

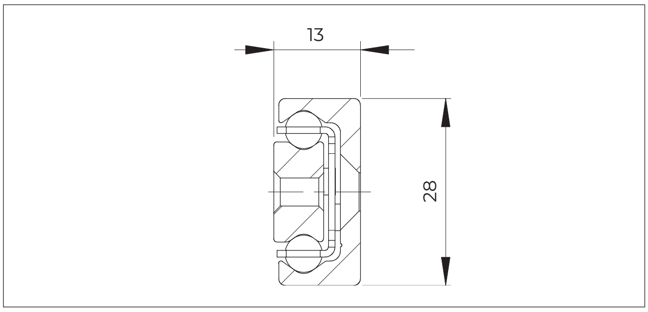


Fig.3

- **ASN35**

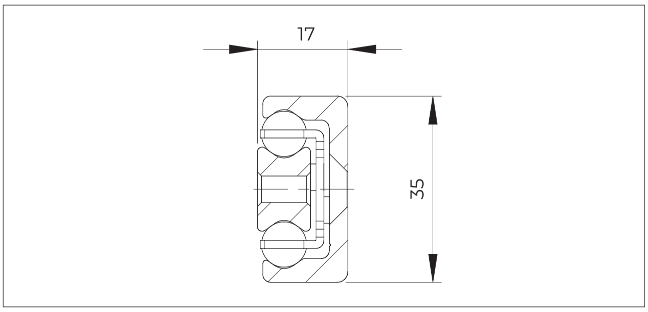


Fig.4

- **ASN43**

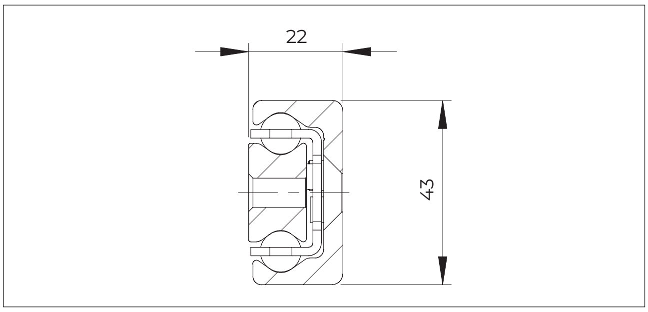


Fig.5

- **ASN 63**

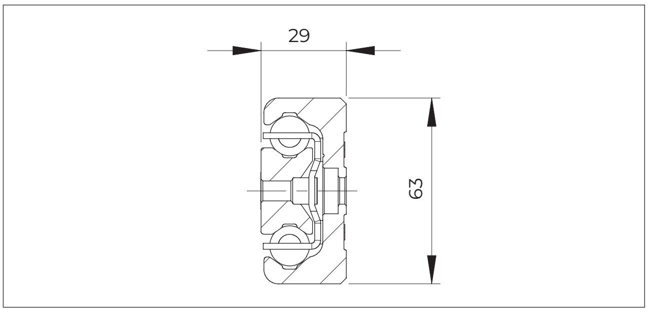
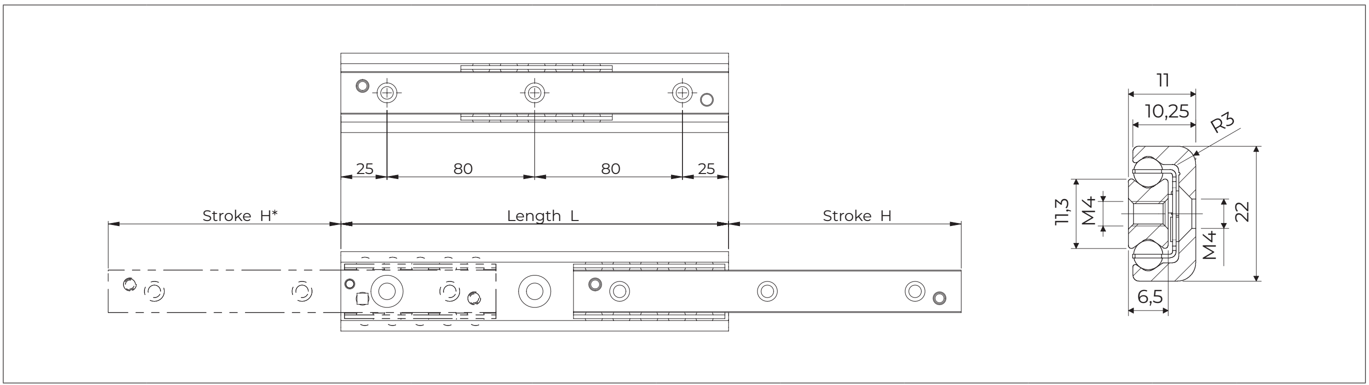


Fig.6

■ ASN22



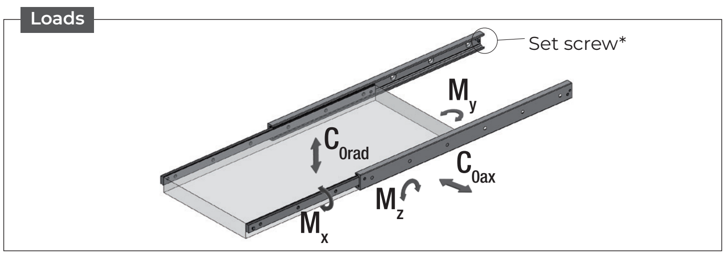
* Remove the set screw to reach all the fixing holes and enable double-sided stroke. See the installation instructions on page 16.
Fixing holes for countersunk head screws M4, according to DIN 7991.

Fig.7

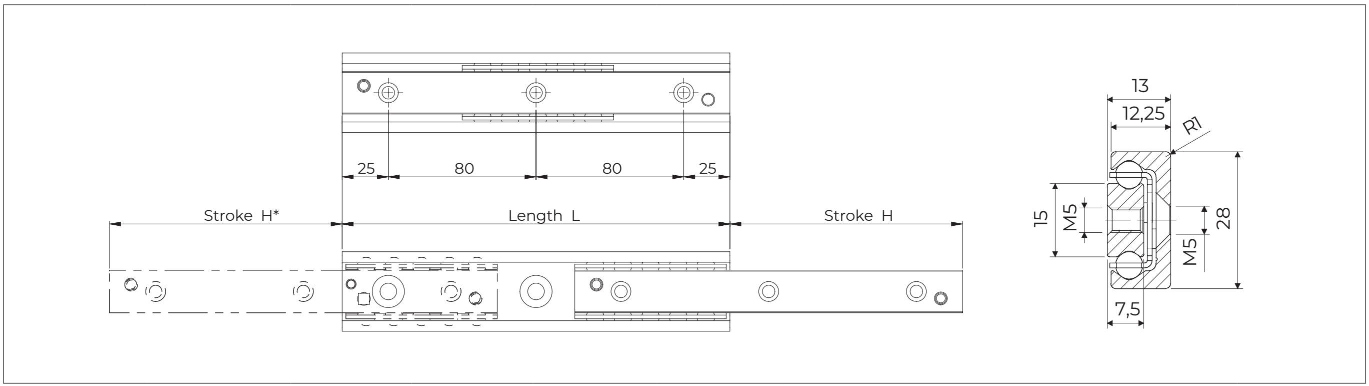
Type	Size	Length L [mm]	Stroke H [mm]	Load capacity and moments for a pair of rails					No. of holes	Weight per single guide
				C_{0rad} [N]	C_{0ax} [N]	M_x* [Nm]	M_y [Nm]	M_z [Nm]		kg
ASN	22	130	76	626	438	5.7	20	30	2	0.2
		210	111	1430	1002	10.7	72	102	3	0.3
		290	154	1988	1392	14.9	138	198	4	0.4
		370	196	2556	1790	19	226	324	5	0.5
		450	231	3402	2380	24	360	516	6	0.6
		530	274	3958	2770	28.2	496	710	7	0.7
		610	316	4524	3168	32.3	654	934	8	0.8
		690	351	5378	3764	37.3	872	1246	9	0.9
		770	394	5934	4154	41.5	1078	1538	10	1.0

* The value M_x refers to a single rail.

Tab.1



■ ASN28



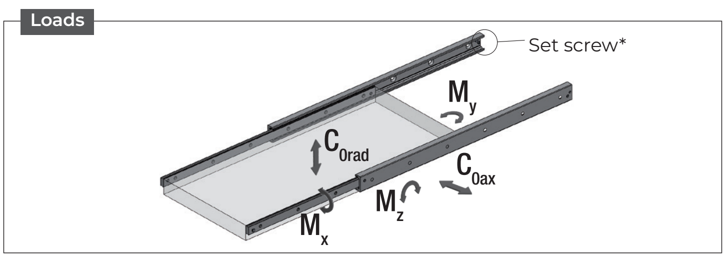
* Remove the set screw to reach all the fixing and enable double-sided stroke. See the installation instructions on page 16.
Fixing holes for countersunk head screws M5, according to DIN 7991.

Fig.8

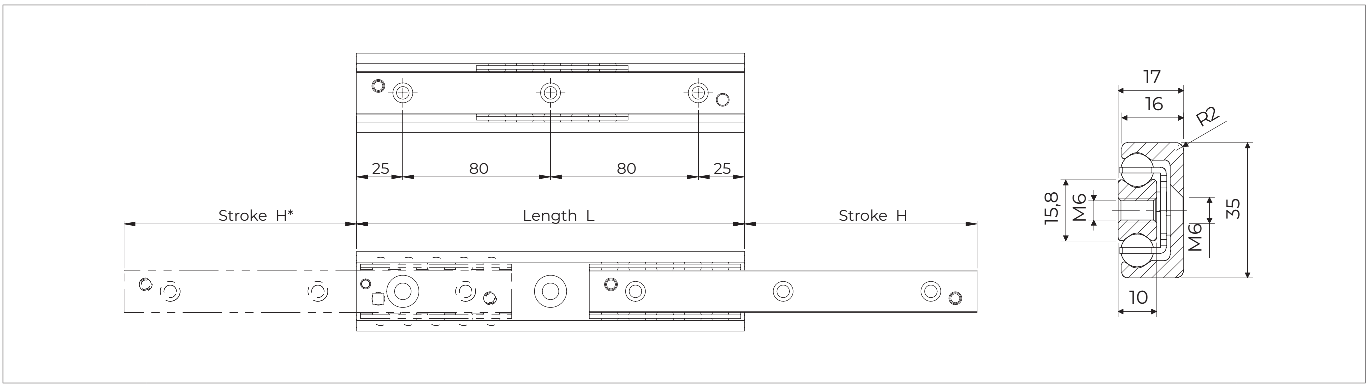
Type	Size	Length L [mm]	Stroke H [mm]	Load capacity and moments for a pair of rails					No. of holes	Weight per single guide
				C_{0rad} [N]	C_{0ax} [N]	M_x* [Nm]	M_y [Nm]	M_z [Nm]		kg
ASN	28	130	74	1226	858	15.3	40	56	2	0.3
		210	116	2232	1562	26.1	114	164	3	0.4
		290	148	3868	2708	39.6	264	376	4	0.6
		370	190	4890	3422	50.4	426	610	5	0.7
		450	232	5910	4138	61.2	628	898	6	0.9
		530	274	6932	4852	72	870	1242	7	1.1
		610	316	7952	5566	82.8	1150	1642	8	1.2
		690	358	8974	6282	93.6	1470	2100	9	1.4
		770	400	9994	6996	104.4	1828	2612	10	1.6
		850	433	11656	8160	117.9	2330	3330	11	1.7
		930	475	12676	8872	128.7	2778	3968	12	1.9
		1010	517	13696	9586	139.5	3262	4660	13	2.0
		1090	559	14716	10300	150.3	3788	5410	14	2.2
		1170	601	15736	11014	161.1	4350	6216	15	2.4

* The value M_x refers to a single rail.

Tab.2



▪ ASN35



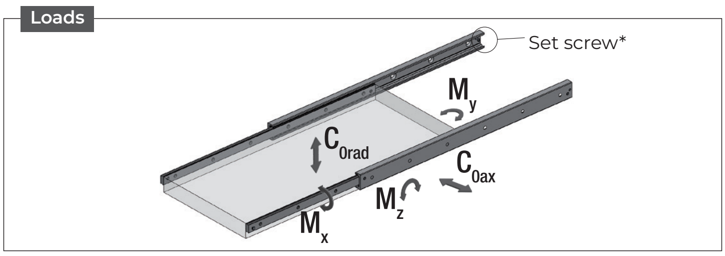
* Remove the set screw to reach all the fixing and enable double-sided stroke. See the installation instructions on page 16.
Fixing holes for countersunk head screws M6, according to DIN 7991.

Fig.9

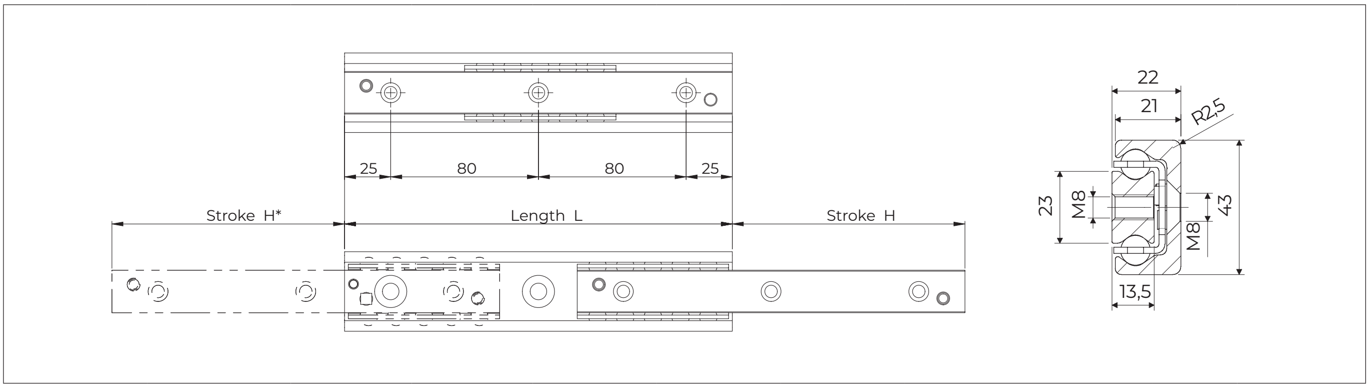
Type	Size	Length L [mm]	Stroke H [mm]	Load capacity and moments for a pair of rails					No. of holes	Weight per single guide
				C_{0rad} [N]	C_{0ax} [N]	M_x* [Nm]	M_y [Nm]	M_z [Nm]		kg
ASN	35	210	127	2130	1492	29.4	114	164	3	0.6
		290	159	4120	2884	46.9	292	416	4	0.9
		370	203	5276	3694	59.9	476	680	5	1.1
		450	247	6434	4504	73	708	1010	6	1.4
		530	279	8564	5994	90.4	1086	1550	7	1.6
		610	323	9716	6802	103.5	1422	2030	8	1.9
		690	367	10870	7608	116.6	1804	2576	9	2.1
		770	399	13042	9130	134	2382	3404	10	2.3
		850	443	14190	9932	147.1	2870	4100	11	2.6
		930	487	15338	10736	160.2	3404	4862	12	2.8
		1010	519	17530	12272	177.6	4184	5978	13	3.1
		1090	563	18674	13072	190.7	4824	6890	14	3.3
		1170	607	19818	13874	203.8	5508	7868	15	3.6
		1250	639	22024	15416	221.2	6490	9272	16	3.8
		1330	683	23164	16214	234.3	7280	10400	17	4.1
		1410	727	24306	17014	247.4	8116	11594	18	4.3
		1490	759	26520	18564	264.8	9300	13286	19	4.5

* The value M_x refers to a single rail.

Tab.3



▪ ASN43



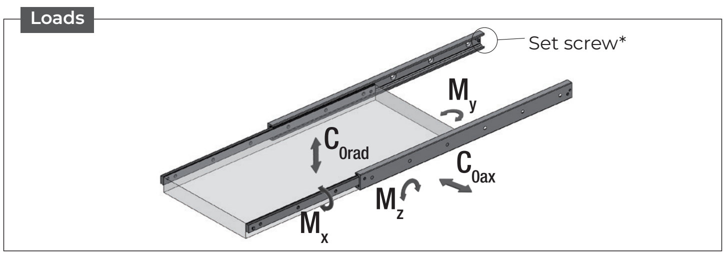
* Remove the set screw to reach all the fixing and enable double-sided stroke. See the installation instructions on page 16.
Fixing holes for countersunk head screws M8, according to DIN 7991.

Fig.10

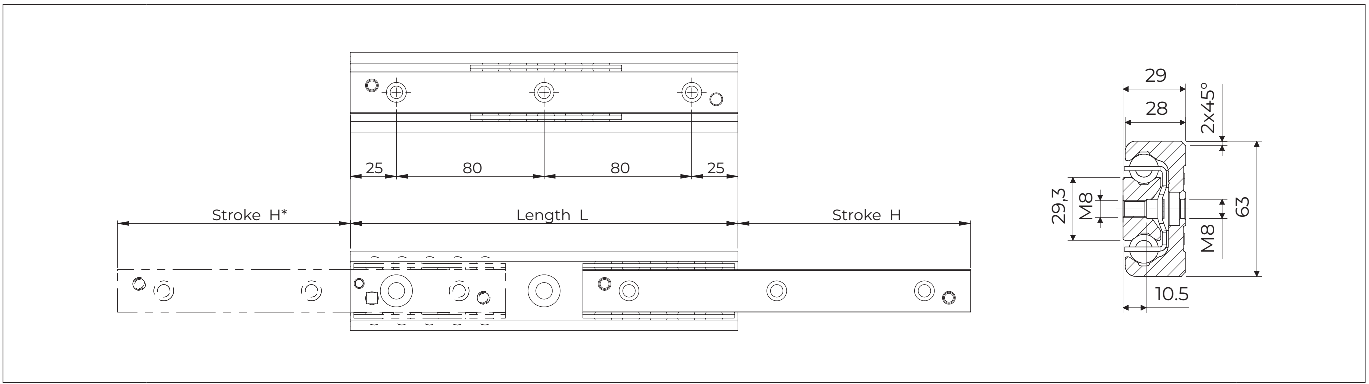
Type	Size	Length L [mm]	Stroke H [mm]	Load capacity and moments for a pair of rails					No. of holes	Weight per single guide
				C_{0rad} [N]	C_{0ax} [N]	M_x* [Nm]	M_y [Nm]	M_z [Nm]		kg
		210	123	3190	2234	60.6	168	240	3	1.1
		290	158	5744	4020	93.8	402	576	4	1.5
		370	208	6754	4728	115.9	616	880	5	1.9
		450	243	9380	6566	149.2	1018	1456	6	2.4
		530	278	12078	8454	182.4	1524	2176	7	2.8
		610	313	14822	10376	215.6	2128	3042	8	3.2
		690	363	15726	11008	237.8	2588	3698	9	3.6
		770	398	18464	12926	271	3362	4804	10	4.0
		850	433	21230	14862	304.2	4238	6054	11	4.5
		930	483	22108	15476	326.4	4878	6968	12	4.9
		1010	518	24868	17408	359.6	5922	8460	13	5.3
ASN	43	1090	568	25754	18028	381.8	6674	9534	14	5.7
		1170	603	28508	19956	415	7886	11266	15	6.1
		1250	638	31276	21894	448.2	9198	13142	16	6.6
		1330	688	32150	22504	470.4	10130	14472	17	7.0
		1410	723	34912	24438	503.6	11612	16590	18	7.4
		1490	758	37690	26382	536.8	13196	18850	19	7.8
		1570	793	40476	28334	570.1	14880	21256	20	8.2
		1650	843	41322	28926	592.2	16058	22940	21	8.7
		1730	878	44104	30872	625.5	17912	25588	22	9.1
		1810	928	44958	31472	647.6	19202	27432	23	9.5
		1890	963	47734	33414	680.8	21224	30320	24	9.9
		1970	1013	48596	34018	703	22628	32324	25	10.3

* The value M_x refers to a single rail.

Tab.4



▪ ASN63



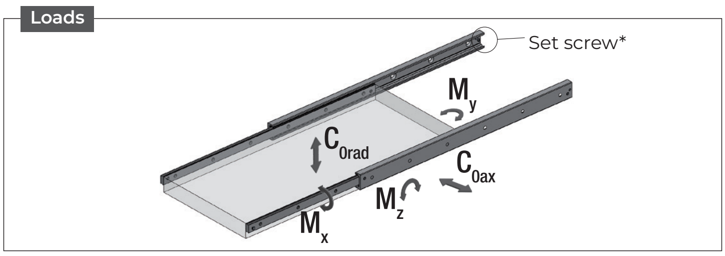
* Remove the set screw to reach all the fixing holes and enable double-sided stroke. See the installation instructions on page 16.
**Fixing holes for countersunk head screws M8, according to DIN 7991.
***Fixing holes for M8 socket cap screws, according to DIN 7984. Alternative fixing with Torx® screws in a special design with a low head (on request).

Fig.11

Type	Size	Length L [mm]	Stroke H [mm]	Load capacity and moments for a pair of rails					No. of holes	Weight per single guide
				C_{0rad} [N]	C_{0ax} [N]	M_x* [Nm]	M_y [Nm]	M_z [Nm]		kg
ASN	63	610	333	21182	14828	474	3106	4438	8	6.3
		690	373	25068	17548	547.5	4144	5920	9	7.1
		770	413	28978	20284	621	5332	7616	10	7.9
		850	453	32904	23032	694.5	6668	9526	11	8.8
		930	493	36842	25790	768	8154	11648	12	9.6
		1010	533	40790	28554	841.4	9788	13984	13	10.4
		1090	573	44746	31322	914.9	11574	16534	14	11.2
		1170	613	48708	34096	988.4	13508	19296	15	12.1
		1250	653	52674	36872	1061.9	15590	22272	16	12.9
		1330	693	56644	39650	1135.4	17824	25462	17	13.7
		1410	733	60618	42432	1208.9	20204	28864	18	14.5
		1490	773	64594	45216	1282.4	22736	32480	19	15.3
		1570	813	68574	48002	1355.9	25416	36310	20	16.2
		1650	853	72554	50788	1429.4	28246	40352	21	17.0
		1730	893	76536	53576	1502.8	31226	44608	22	17.8
		1810	933	80522	56364	1576.3	34354	49078	23	18.6
		1890	973	84506	59154	1649.8	37632	53760	24	19.5
		1970	1013	88494	61946	1723.3	41060	58656	25	20.3

* The value M_x refers to a single rail.

Tab.5



ACCESSORIES

Fixing screws

All rails are fixed with countersunk screws as per DIN 7991, except for size 63 where cap head screws as per DIN 7984 are also needed. For size 63, Torx® screws with low-head cap screws are available on request (see fig. 12) for the cylindrical hole.

Size	Screw type	d	D [mm]	L [mm]	K [mm]	S
63	M8 x 20	M8 x 1.25	13	20	5	T40

Tab.6

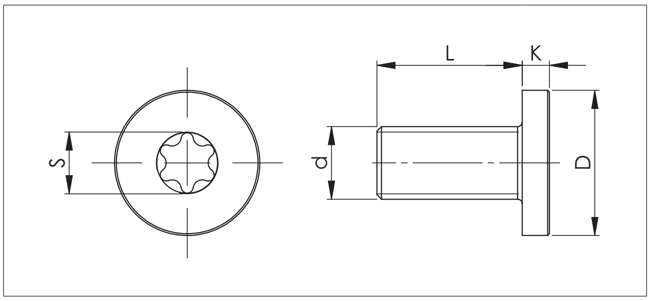


Fig.12

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.7

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.8

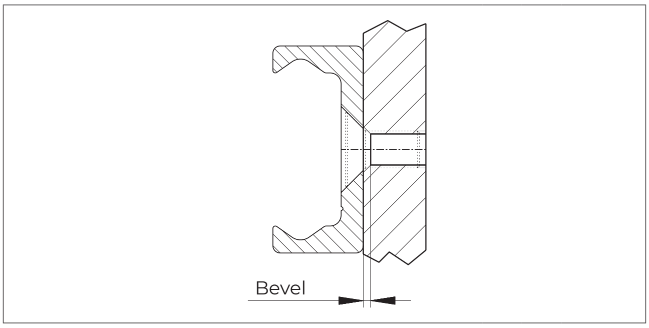


Fig.13

USE AND MAINTENANCE

ASN selection

Selecting the suitable telescopic rail should be done based on the load and the maximum permissible deflection in the extended state. For ASN rails, the load capacity depends on the load-bearing capacity of the ball cage, while the deflection depends mostly on the rigidity of the structures to which the elements of the rail are fixed.

Static load check

The values in the load capacity tables of the corresponding series (see Components and Dimensions, pg.6) indicate the maximum permissible load of a pair of rails at the middle of the two rails and along the centerline of the moving element, with the rails in the completely extended state.

Using a pair of rails, the load acts in the center on rails (see fig.15, P). The load capacity of a rail pair is:

$$C_{0rad}$$

Fig.14

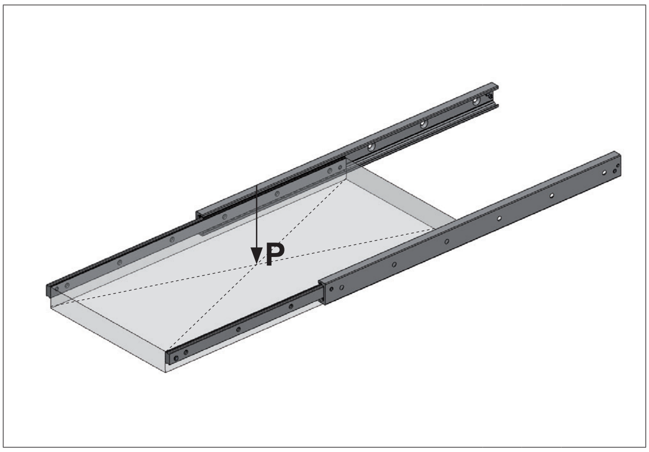


Fig.15

Deflection:

With the partial extensions of the ASN series, the deflection is almost completely determined by the stiffness of the structures to which the ASN is connected. We cannot calculate the deflection of the ASN itself, but it can be considered negligible.

Static load

The telescopic extension of the various series allows different forces and moments (see components and dimensions, from pg.6). 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 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 reversals, high assembly accuracy, no elastic deformations.	1.5
Normal installation conditions, moderate frequency of use.	1.5 - 2
Shocks and vibrations, high-frequency reversals, significant elastic deformation.	2 - 3.5

Fig.16

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 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.17

The above formulas are valid for a single load case. If two or more of the described forces act simultaneously, the following calculation 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} = applied radial load
C_{0rad} = radial load capacity
P_{0ax} = applied axial load
C_{0ax} = axial load capacity
M_1 = applied moment in the x-direction
M_x = capacity moment in the x-direction
M_2 = applied moment in the y-direction
M_y = capacity moment in the y-direction
M_3 = applied moment in the z-direction
M_z = capacity moment in the z-direction

Fig.18

▪ Speed

Max. operating speed: 0.8 m/s (31.5 in/s) depending on the application.

Maximum acceleration: 1.2 m/s² (47.2 in/s²)

▪ Opening and closing force

The required actuation forces of the ASN 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 value is 0.01.

During the extension, the force is reduced due to the elastic deflection of the loaded ASN rail. A higher force is required to close a telescopic extension since, due to the elastic deflection, even if it is minimal, the movable rail must move against an inclined plane.

▪ Double-sided stroke

The double-sided stroke of the ASN series is achieved by removing the set screw.

Fig.19

▪ Temperature

The ASN 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). The minimum temperature with standard grease is -20 °C (-4 °F).

▪ Anticorrosive protection

Treatment	Characteristics
Zinc Plating ISO 2081	Standard treatment for rail is ideal for indoor applications. Zinc-plated telescopic rails are supplied with steel balls.
Zinc-nickel ISO19598 (Z)	Ideal for outdoor applications. Telescopic rails with this treatment are supplied with stainless steel balls to further increase corrosion resistance.
Rollon e-coating (K)	Electro painting provides a fine black finish to the entire rail. It can be partially removed from the raceways at the running contact point of the balls after a period of use. Telescopic rails with Rollon E-Coating are supplied with stainless steel balls to further increase corrosion resistance.
Nickel-plating (N)	Provides high resistance to chemical corrosion and is ideal for applications in medical or food-related environments. Telescopic rails with nickel plating are supplied with stainless steel balls to further increase corrosion resistance.

Fig.20

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 of operational performance or after an operating period of six months. In critical applications, the interval should be shorter. Please clean the raceways carefully before lubricating. Raceways and spaces of the ball cage spaces 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

* for higher preload, contact Rollon technical support.

Tab.9

▪ Installation instructions

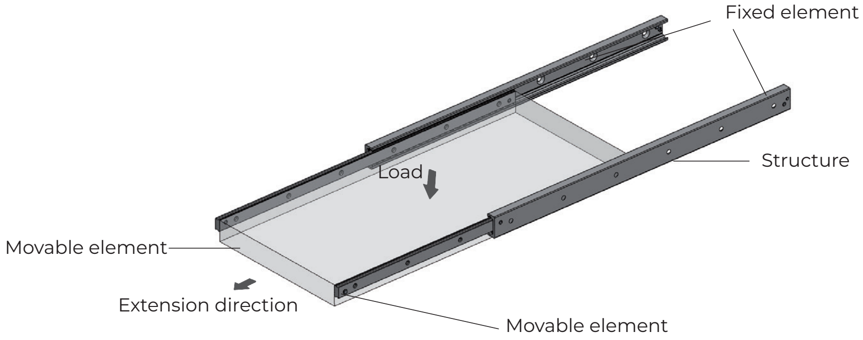


Fig.21

- 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, long 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 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 must fit into the rigid assemblyconstruction.
- Telescopic rail guides are suitable for continuous use in automatic systems. For this purpose, the stroke should remain constant in all moving cycles and the operating speed must be checked (see pg.14).
- Fixing screws of property class 10.9 must be used.
- The movement of the telescopic rails is enabled by internal ball cages, which may 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 to appropriately synchronize the ball cage offset. Otherwise, an additional maximum stroke must be planned regularly to ensure the correct position of the ball cage.
- Series ASN accepts radial and axial loads and moments in all principal directions.
- The installation of two partial extensions on a profile provides a load-capable full extension. For individual solutions, please contact Rollon technical support.
- Vertical movement installation is available upon request.

▪ Special strokes

Special strokes are defined as deviations from the standard stroke H. They are each available as multiples of the values in tab.10.

These values are depend 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.10

LIFE CALCULATION

▪ Service life

The service life is defined as the time span between commissioning and the first sign of fatigue or wear 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 guide, due to destruction or extreme wear of a component, represents the end of its 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.22

▪ Application coefficient f_i

	ASN
Neither shocks nor vibrations, smooth and low-frequency direction changes, clean environment.	1.3 - 1.8
Light vibrations and moderate direction changes.	1.8 - 2.3
Shocks and vibrations, high-frequency direction changes, very dirty environment	2.3 - 3.5

Fig.23

If the external load, P, is the same as the load capacity, C_{0rad}, (which of course must never be exceeded), the service life under 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.24

P_{0rad} = applied radial load
C_{0rad} = radial load capacity
P_{0ax} = applied axial load
C_{0ax} = axial load capacity
M_1 = applied moment in the x-direction
M_x = capacity moment in the x-direction
M_2 = applied moment in the y-direction
M_y = capacity moment in the y-direction
M_3 = applied moment in the z-direction
M_z = capacity moment in the z-direction

Fig.25

▪ 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.11

beyond motion