TLN - TQN

Data sheet - rev. 1.0

LINEAR COMPONENTS

myRollon

myRollon is Rollon's **digital working platform** designed to simplify the selection and configuration of linear and rotary motion solutions. It enables users to identify the most suitable motion system based on their specific application requirements, enhancing design precision and efficiency.

By centralizing essential tools and resources in a unified environment, myRollon empowers users to access all necessary services and information — saving time and boosting productivity in search of high-performance motion solutions.

SCAN ME!

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ORDERING KEY

▪ **TLN...P**

TLN	30P	-1490	K	R
Series	Size	Length	Surface coating (if different from standard)	Right (R) or left (L)

Ordering examples: **TLN40P-1010R; TLN30P-1010L.**

Note on ordering: please pad with zeroes to fill in for lengths with less than 4 digits, e.g. 550 mm length is “0550”.

▪ **TQN...P**

TQN	30P	-1490	K
Series	Size	Length	Surface coating (if different from standard)

Ordering examples: **TQN30P-1010K.**

Note on ordering: please pad with zeroes to fill in for lengths with less than 4 digits, e.g. 550 mm length is “0550”.

FEATURES AND ADVANTAGES

Fig.1

TLN and TQN are full-extension telescopic rails combining very compact dimensions with high flexural rigidity. The use of steel rollers without ball cages reduces sensitivity to high dynamics and variable duty cycles, making them ideal for automated, vertical, or variable-stroke applications, even in the presence of dirt or debris.

TLN rails feature a fully extending design with single-row ball bearings and a rigid S-shaped intermediate element. This configuration provides smooth movement, high load capacity, and low deflection while maintaining a cost-effective structure. TLN rails are hardened using the Rollon-Nox nitriding and black oxidation process.

TQN rails adopt a compact square cross-section with single-row ball bearings, offering high load capacity and low deflection in a space-efficient design. They are particularly suitable for vertical applications, and their stroke/load capacity ratio can be customized by modifying the distance between the sliders. TQN rails are also hardened with the Rollon-Nox nitriding and black oxidation process.

The TLN and TQN series are particularly suitable for automation systems, material handling equipment, and industrial and packaging machinery, especially in high-cycle environments where durability, reliability, and minimal maintenance are essential.

Performance characteristics

- Available sizes: 30, 40
- Max. operating speed: 1 m/s (39 in/s)*
- Temperature range: -20 °C + 80 °C (-4 °F + 176 °F)
- Surface treatments: see Pg.16

* depending on application and stroke

Rails

- Materials: Rollon-Nox hardened raceways.
- Available rail lengths: from 450 mm up to 1970 mm (from 17.7 in to 77.6 in)

Rollers

- Materials: Carbon steel 2Z shield.
- Rollers lubricated for life

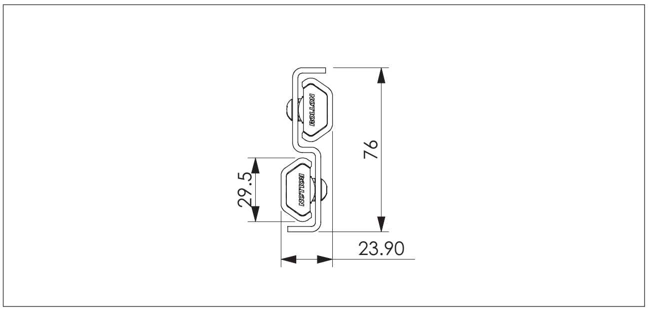
MAIN ADVANTAGES

High dynamics	Versatility	High load capacity with low deflection	Durability	Low maintenance
The use of single-row ball bearings with rolling elements makes the rails less sensitive to rapid accelerations, shifting duty cycles, and high-speed operation typical of automated systems.	The absence of a ball cage allows TLN and TQN rails to operate reliably in vertical and variable-stroke applications.	The rigid intermediate elements (S-shaped for TLN and square cross-section for TQN) provide excellent flexural rigidity, helping ensure stable extension and minimal deflection under load.	The Rollon-Nox nitriding combined with black oxidation enhances wear resistance and contributes to long service life, even in demanding industrial environments.	The roller-based design and absence of a ball cage reduce the risk of contamination-related failures and minimize servicing needs in high-cycle applications.

COMPONENTS AND DIMENSIONS

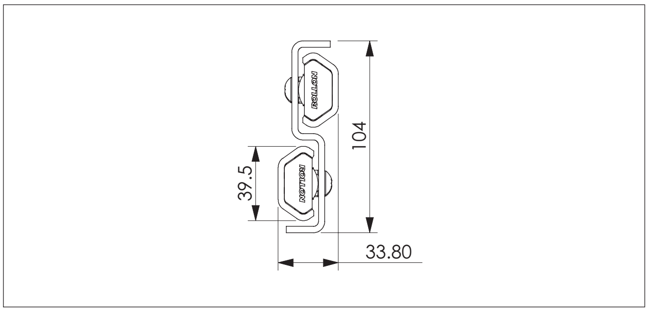
- **TLN...P - TQN...P series**

- **TLN30P...R - TLN30P...L**



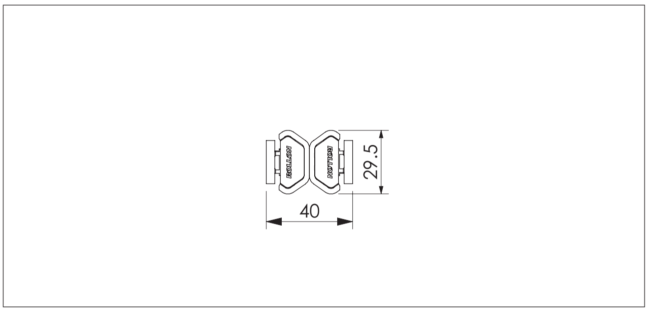
Load capacity Pg.8 **Fig.2**

- **TLN40P...R - TLN40P...L**



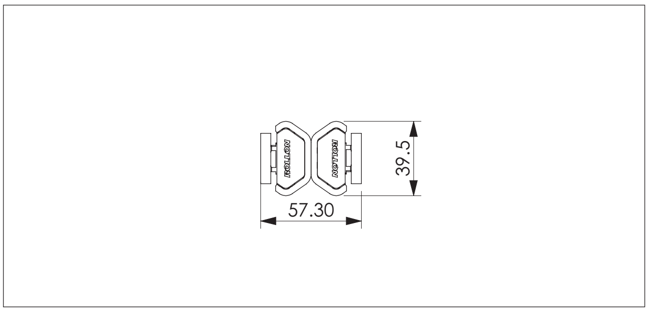
Load capacity Pg.9 **Fig.3**

- **TQN30P**



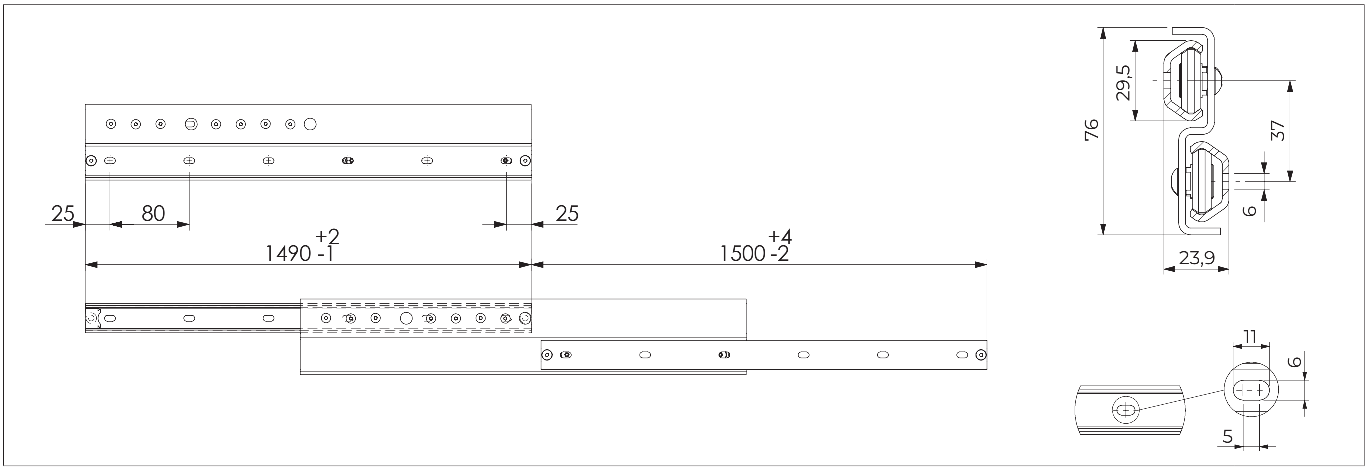
Load capacity Pg.10 **Fig.4**

- **TQN40P**



Load capacity Pg.11 **Fig.5**

■ **TLN30P**



Fixing holes are through passing holes for standard button-head screws ISO 7380. Alternatively, very flat-head Rollon Torx screws can be used.

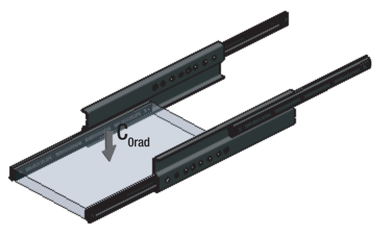
Fig.6

Type	Size	Length L [mm]	Stroke H [mm]	Load capacity for a pair of rails		N° of holes	Weight [Kg]
				Dynamic load coefficient C* [N]	C_{0rad} [N]		
TLN...P	30	450	460	1287	1843	6	1.9
		530	540	1421	2090	7	2.2
		610	620	1517	2231	8	2.5
		690	700	1589	2337	9	2.8
		770	780	1645	2420	10	3.1
		850	860	1690	2486	11	3.4
		930	940	1727	2540	12	3.7
		1010	1020	1758	2439	13	4.0
		1090	1100	1784	2278	14	4.3
		1170	1180	1807	2137	15	4.6
		1250	1260	1826	2013	16	4.9
		1330	1340	1843	1902	17	5.2
		1410	1420	1858	1802	18	5.6
		1490	1500	1871	1713	19	5.9

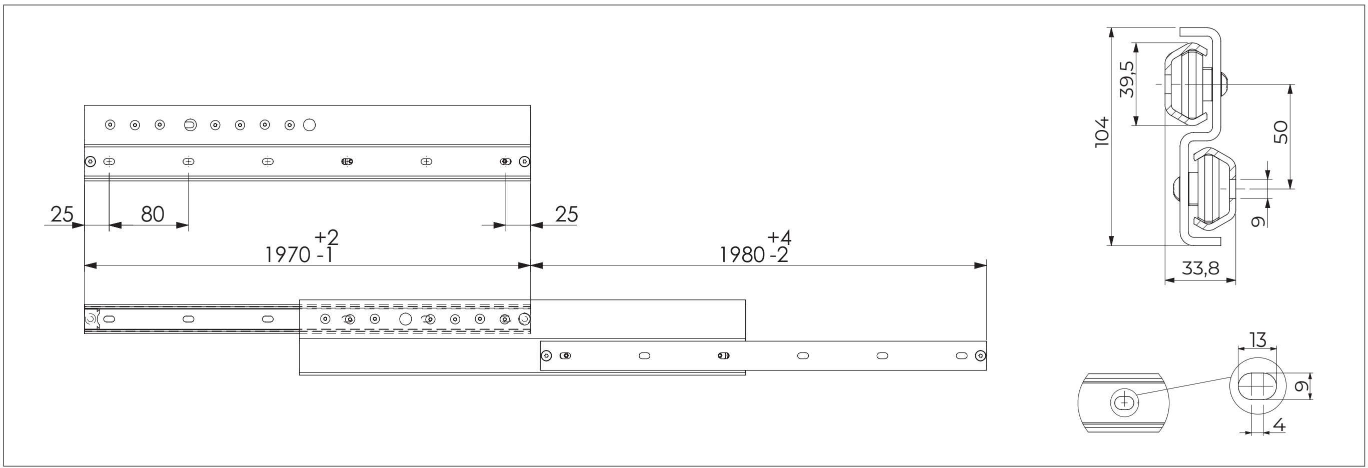
*Only for lifetime calculation, see pg. 16
Rails in left and right version when used in pair:
TLN30P...L left version
TLN30P...R right version

Tab.1

Loads



■ **TLN40P**



Fixing holes are through passing holes for standard button-head screws ISO 7380. Alternatively, very flat-head Rollon Torx screws can be used.

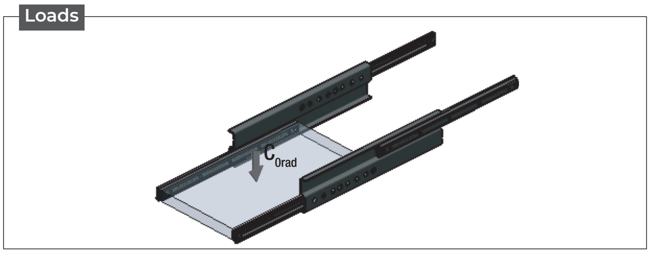
Fig.7

Type	Size	Length L [mm]	Stroke H [mm]	Load capacity for a pair of rails		N° of holes	Weight [Kg]
				Dynamic load coefficient C* [N]	C_{0rad} [N]		
TLN...P	40	610	620	2549	3633	8	5.1
		690	700	2754	4050	9	5.7
		770	780	2913	4284	10	6.3
		850	860	3040	4470	11	6.9
		930	940	3143	4622	12	7.5
		1010	1020	3229	4748	13	8.1
		1090	1100	3301	4855	14	8.7
		1170	1180	3363	4946	15	9.2
		1250	1260	3417	5025	16	9.8
		1330	1340	3464	5094	17	10.4
		1410	1420	3505	4936	18	11.0
		1490	1500	3542	4696	19	11.6
		1570	1580	3575	4478	20	12.2
		1650	1660	3604	4280	21	12.8
		1730	1740	3631	4098	22	13.4
		1810	1820	3655	3932	23	14.0
		1890	1900	3677	3778	24	14.6
		1970	1980	3698	3636	25	15.2

*Only for lifetime calculation, see pg. 16
Rails in left and right version when used in pair:
TLN40P...L left version
TLN40P...R right version

Tab.2

Loads



■ **TQN30P**

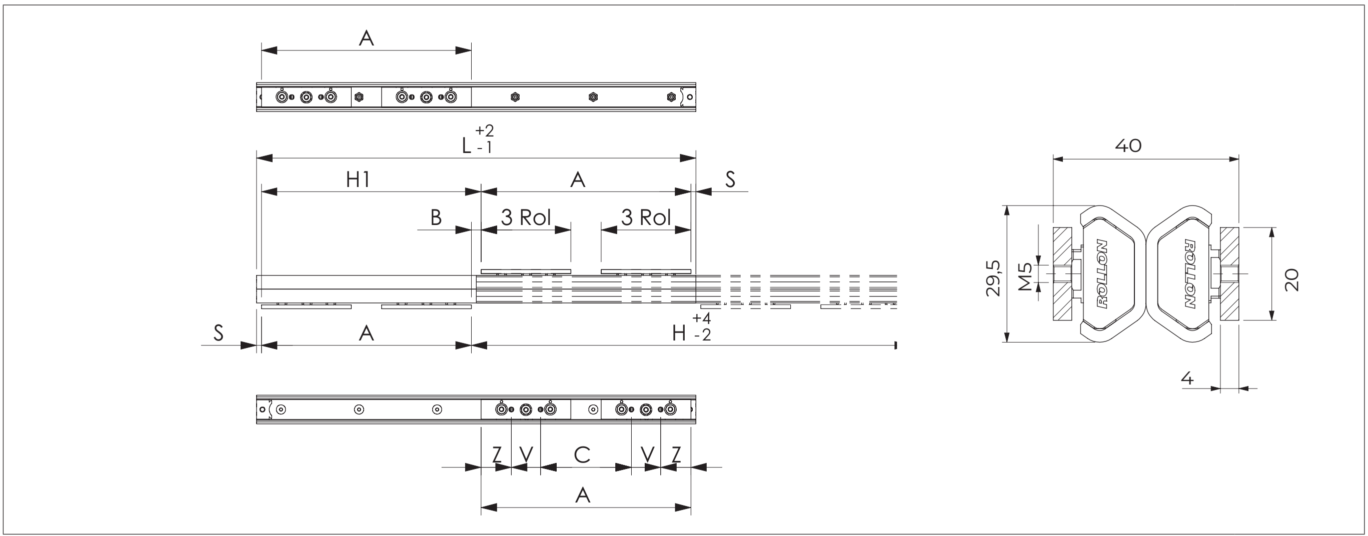
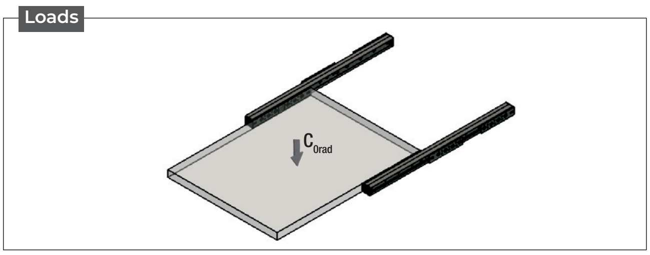


Fig.8

Type	Size	L [mm]	H [mm]	Fixed & Mobile sliders*2			Load capacity and moments for a pair of rails					
				A [mm]	C [mm]	H1 [mm]	Dynamic load coefficient C*3 [N]	C_{0rad} [N]	C_{0ax} [N]	M_x*1 [Nm]	M_y [Nm]	M_z [Nm]
TQN...P	30	450	450	215	93	225	606	891	371	8	174	246
		530	530	255	133	265	702	1032	430	8	228	326
		610	610	295	173	305	776	1140	472	8	228	406
		690	690	335	213	345	835	1190	503	8	228	472
		770	770	375	253	385	883	1081	521	8	228	472
		850	850	415	293	425	923	990	477	8	228	472
		930	930	455	333	465	957	913	440	8	228	472
		1010	1010	495	373	505	986	847	409	8	228	472
		1090	1090	535	413	545	1011	790	381	8	228	472
		1170	1170	575	453	585	1033	741	357	8	228	472
		1250	1250	615	493	625	1052	697	336	8	228	472
		1330	1330	655	533	665	1069	658	317	8	228	472
		1410	1410	695	573	705	1085	623	300	8	228	472
		1490	1490	735	613	745	1099	592	285	8	228	472

*1 The value Mx refers to a single rail
*2 All sliders are 3 rollers type
*3 Only for lifetime calculation, see pg. 16

Tab.3



▪ TQN40P

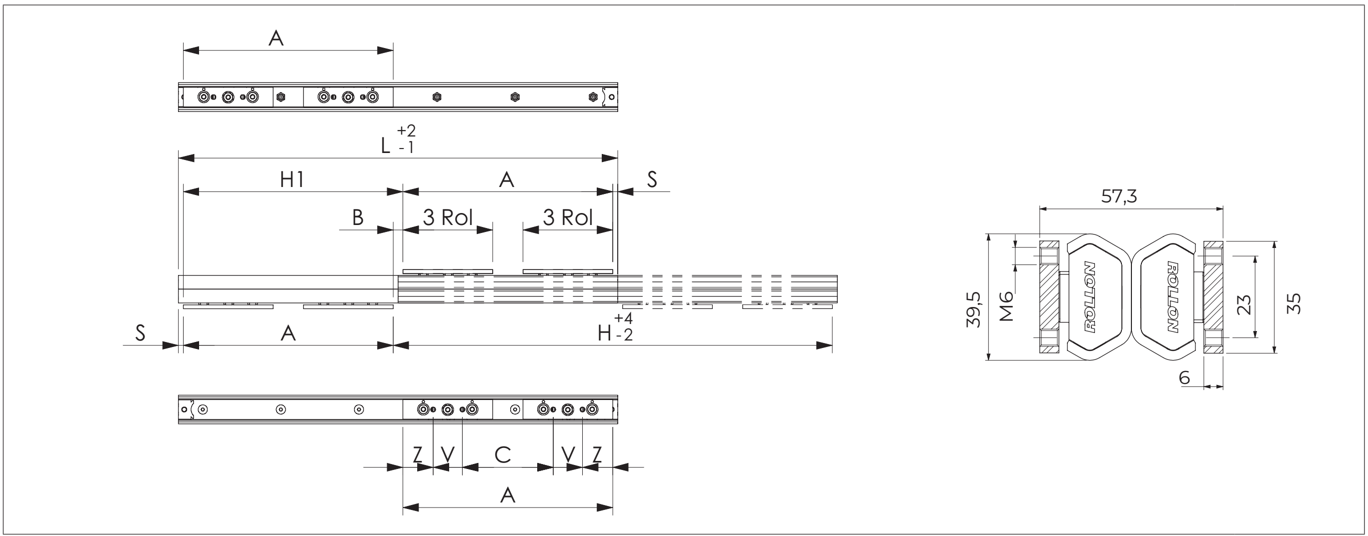
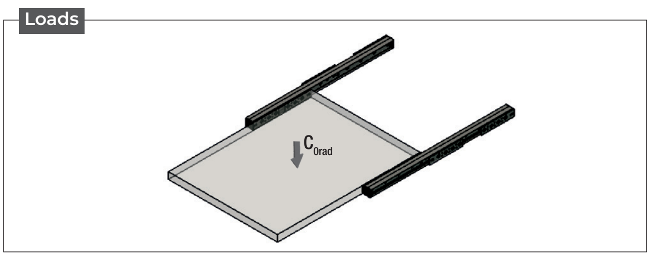


Fig.9

Type	Size	L [mm]	H [mm]	Fixed & Mobile sliders*2			Load capacity and moments for a pair of rails					
				A [mm]	C [mm]	H1 [mm]	Dynamic load coefficient C*3 [N]	C_{0rad} [N]	C_{0ax} [N]	M_x *1 [Nm]	M_y [Nm]	M_z [Nm]
TQN...P	40	610	610	295	40	305	1619	1695	1220	20	562	640
		690	690	335	80	345	1762	1916	1327	20	562	800
		770	770	375	120	385	1872	2098	1228	20	562	960
		850	850	415	160	425	1959	2251	1129	20	562	1120
		930	930	455	200	465	2030	2142	1045	20	562	1152
		1010	1010	495	240	505	2089	1994	972	20	562	1152
		1090	1090	535	280	545	2139	1864	909	20	562	1152
		1170	1170	575	320	585	2181	1751	854	20	562	1152
		1250	1250	615	360	625	2218	1651	805	20	562	1152
		1330	1330	655	400	665	2250	1561	761	20	562	1152
		1410	1410	695	440	705	2278	1481	722	20	562	1152
		1490	1490	735	480	745	2303	1408	687	20	562	1152
		1570	1570	775	520	785	2325	1343	655	20	562	1152
		1650	1650	815	560	825	2345	1283	626	20	562	1152
		1730	1730	855	600	865	2363	1228	599	20	562	1152
		1810	1810	895	640	905	2380	1178	575	20	562	1152
		1890	1890	935	680	945	2394	1131	552	20	562	1152
		1970	1970	975	720	985	2408	1089	531	20	562	1152

*1 The value Mx refers to a single rail
*2 All sliders are 3 rollers type
*3 Only for lifetime calculation, see pg. 16

Tab.4



ACCESSORIES

▪ **Fixing screws**

We recommend fixing screws according to ISO 7380 with low head height or TORX® screws (see Fig.10) on request.

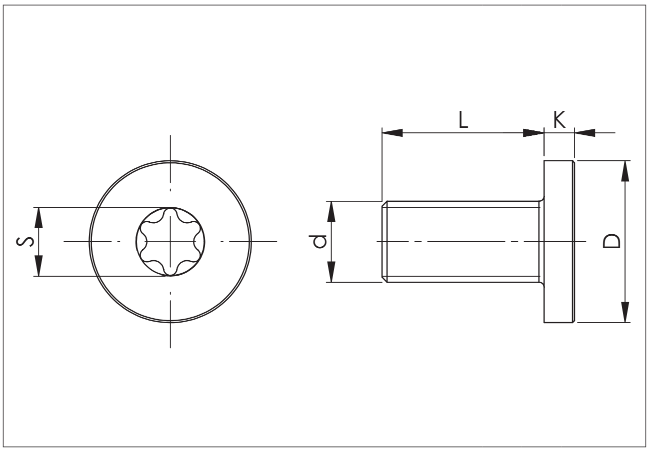


Fig.10

Rail size	Screw type	d	D [mm]	L [mm]	K [mm]	S	Tightening torque [Nm]
30	M5 x 10	M5 x 0.8	10	10	2	T25	9
40	M8 x 16	M8 x 1.25	16	16	3	T40	20

Tab.5

USE AND MAINTENANCE

▪ 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 Telerace telescopic rail depends on two factors: the load capacity of the rollers and the rigidity of the intermediate element. For mainly short strokes the load capacity is determined by the load-bearing capacity of the rollers; for average and long strokes it is determined by the rigidity of the intermediate element.

▪ Deflection

If the load P acts vertically on the pair of rails (see Fig.12), the expected elastic deflection in the extended state can be determined as follows:

$$f = \frac{q}{t} \cdot P$$

Fig.11

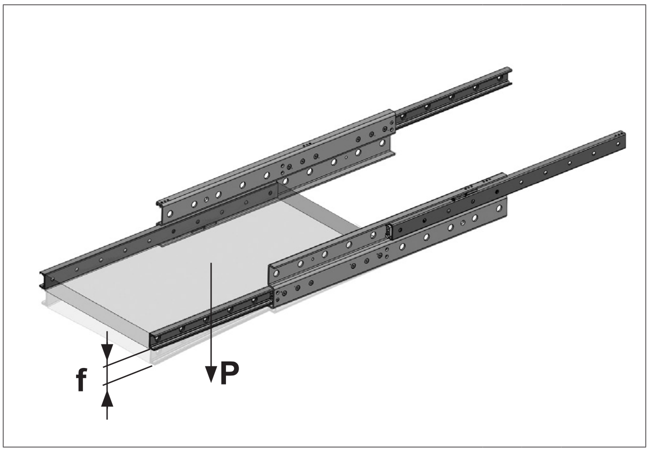


Fig.12

Whereby:

f is the expected elastic deflection [mm]

q is a stroke coefficient (see fig. 14)

t is a factor depending on the model of the telescopic rail (see fig. 13)

P is the actual load acting on the center of a pair of rails [N].

The value resulting from the formula above is an estimation and also assumes an absolutely rigid adjacent construction. If this rigidity is not present, or in case the deflection is a key application requirement, please contact our Technical Department for a precise calculation.

TLN30P t=400	TQN30P t=120
TLN40P t=900	TQN40P t=420

Fig.13

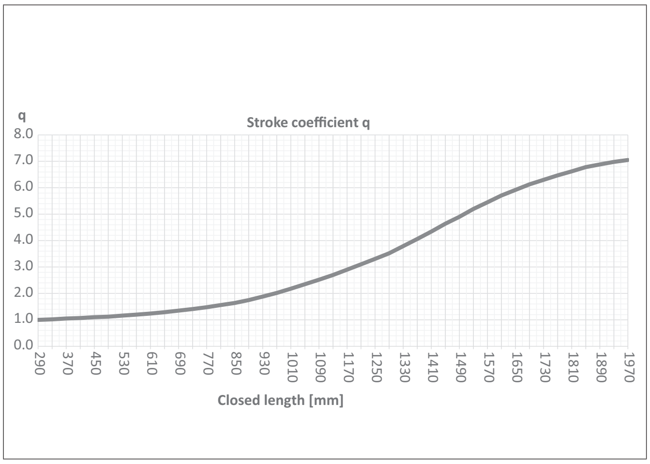


Fig.14

▪ Lubrication

TLN...P, TQN...P feature rollers lubricated for life. The raceways must therefore be lubricated every 100.000 cycles if they are used in indoor, clean, environments. If used in harsh environments (eg. dirt, temperature, humidity) the lubrication interval must be reduced and it is necessary to periodically clean the raceways.

Raceways 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 more details please contact our technical department.

▪ Anticorrosion treatments

TLN...P / TQN...P

Treatment	Characteristics
Rollon-Nox	Patented high depth nitride hardening and black oxidation treatment that provides good durability under high loads or frequencies and good corrosion resistance. It is standard for all sizes.
Rollon E-coating (K)	Electro painting that provides a fine black finishing to the entire rail. It can be partially removed from the raceways on the running contact point of the rollers after a period of use. Telescopic rails with Rollon E-Coating are supplied with stainless steel rollers to further increase the corrosion resistance.

Tab.6

▪ Speed

The speed of the rails is limited by the strength of the stoppers that take on the intermediate element with each opening/closing. At the same speed, the impact force increase proportionally to the length of the rail and the weight of the intermediate element.

All Telerace telescopic rails feature robust end-stoppers capable of sus taining high speeds. Besides highest speed, the telescopic rails with ball bearing rollers are also less sensitive to frequent and intense accelerations and decelerations due to absence of the ball cage.

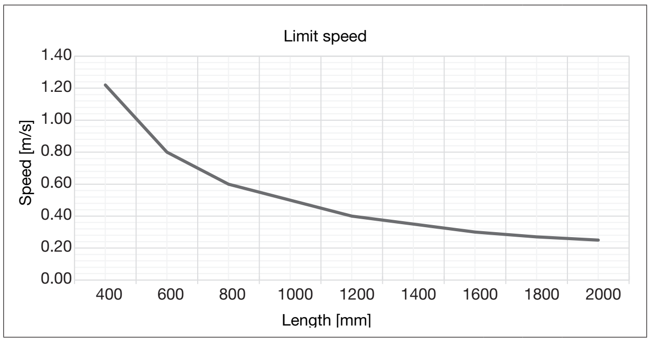


Fig.15

▪ Stroke customization for TQN...P

TQN...P series offer the unique possibility to easily customize the actual stroke H to individual needs. This is obtained by repositioning the slider distance “A” for “Fixed sliders” and distance “B” for “Mobile sliders” , with different distances than standard. Please consider that distance A should always be longer than distance B to maximize the load capacity. If the distance between fixed sliders "A" and mobile sliders "B" is reduced the total stroke increases and the load capacity decreases. Vice versa, the total stroke decreases and the load capacity is improved. Please contact our technical department for load capacities according to customized stroke.

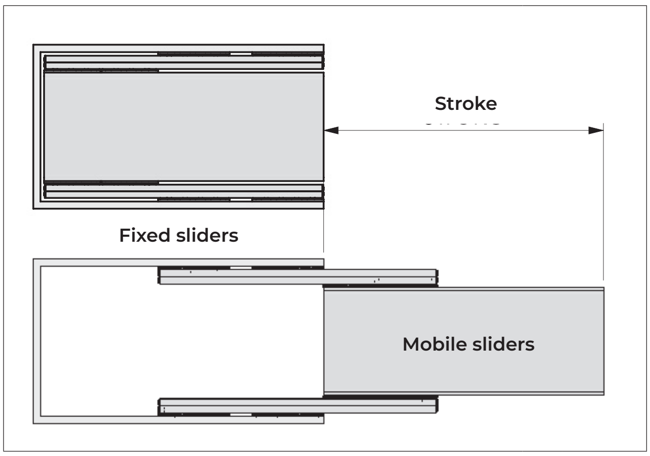


Fig.16

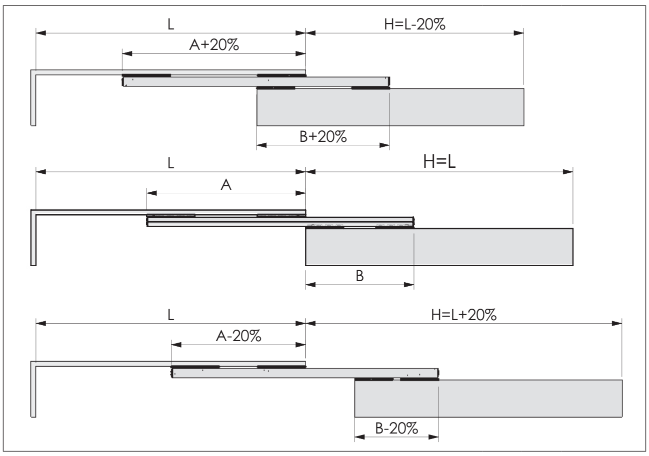
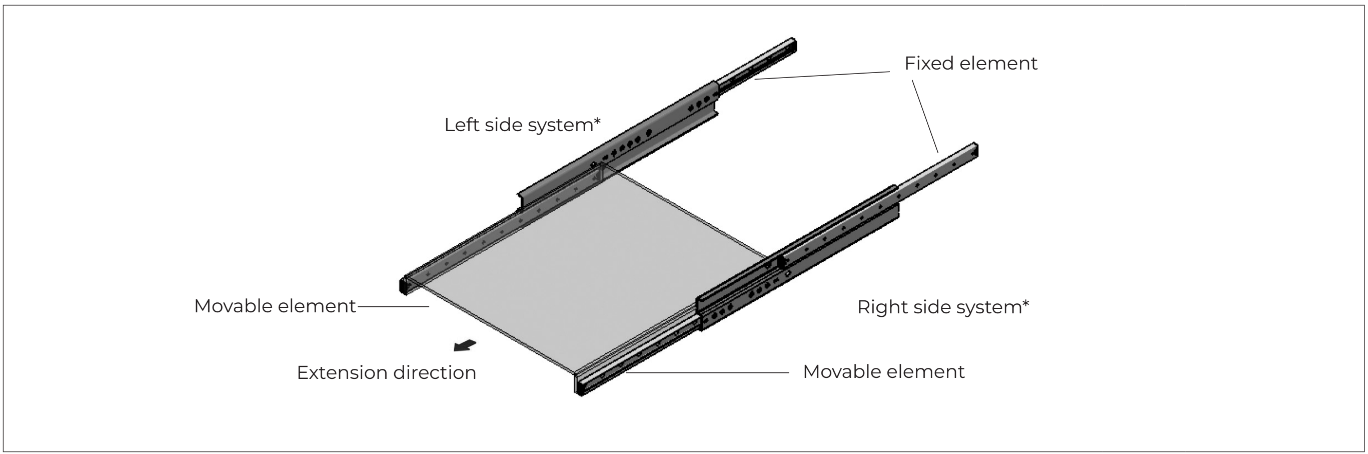


Fig.17

Installation instructions

In general and for specific product series



* For model TLN...P please observe right or left side use.

Fig.18

General

- 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.
- Telerace rails are suitable for continuous use in automatic systems, even when the stroke is not constant. The operating speed must be checked (see Pg.13).

TLN...P

- This series accepts 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, please contact our technical department.
- When installing make sure that the load is placed on the movable element (the lower rail) (see Fig.18). 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.

TQN...P

- This series accepts radial and axial loads and moments in all principal directions.
- Horizontal and vertical applications are possible. Prior to vertical installation, please contact our technical department.
- The rail must be installed with the label facing upward. The fixed sliders have the circular engraving mark facing upward, while on the mobile sliders the same mark is facing downward.
- When used in pairs, the same rail can be used as left or right rail, always keeping the mark facing upwards.

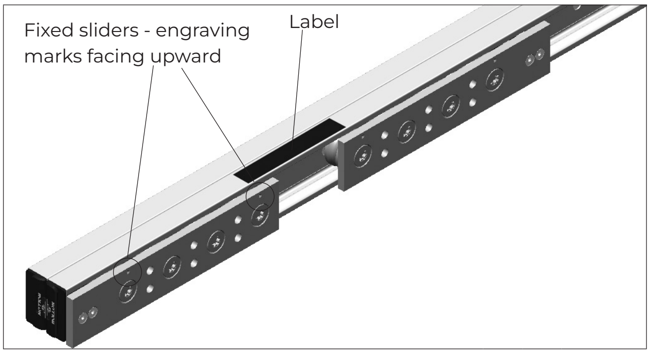


Fig.19

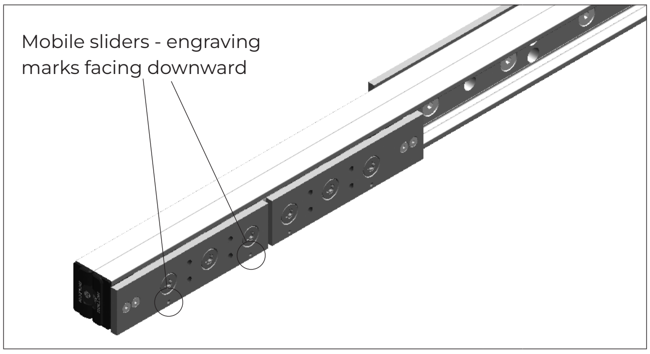


Fig.20

STATIC LOAD AND SERVICE LIFE

Sizing of telescopic applications

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 Telerace telescopic rail depends on two factors: the load capacity of the rollers and the rigidity of the intermediate element. For mainly short strokes, the load capacity is determined by the load-bearing capacity of the rollers; for average and long strokes it is determined by the rigidity of the intermediate element.

The main factors to consider while sizing the rail for a telescopic movement are:

- Weight of the mobile part and other appliable loads
- Presence of dynamic forces / eventual abuse
- Max. acceptable deflection
- Max. acceptable extraction/closing force of mobile part
- Environment, frequency and speed
- Expected lifetime

All load capacities C_{0rad} are indicated per pair of rails and with the load perfectly centered. Hereby the load P is acting as a radial point load, at half the extension and in the middle between the two rails. The load capacity for a single rail is obtained dividing the value C_{0rad} by half.

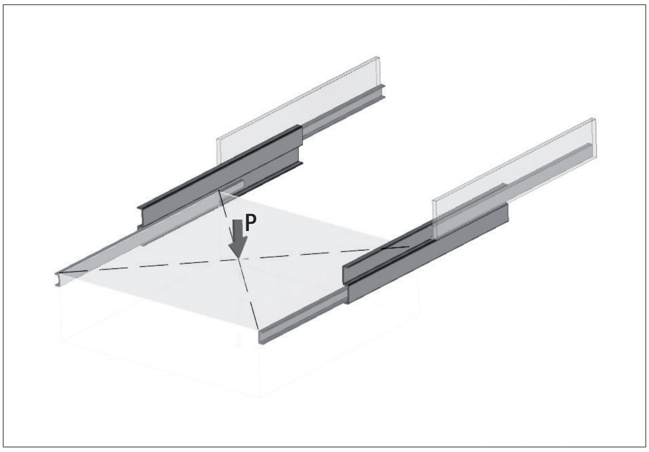


Fig.22

When sizing a telescopic application, consider the center of mass of the load and any external dynamic forces acting on the rails.

In case the actual load P isn't centered, the equivalent load Pe must be calculated for the verification of load capacity explained on Pg.17.

$$Pe = 2 \cdot \frac{P \cdot d}{a + b}$$

Fig.21

Where :

P = Weight/load of mobile part [N]

a, b = distances of the load center with respect to left and right rail [mm].

d = the largest between "a" and "b", according to the load position [N].

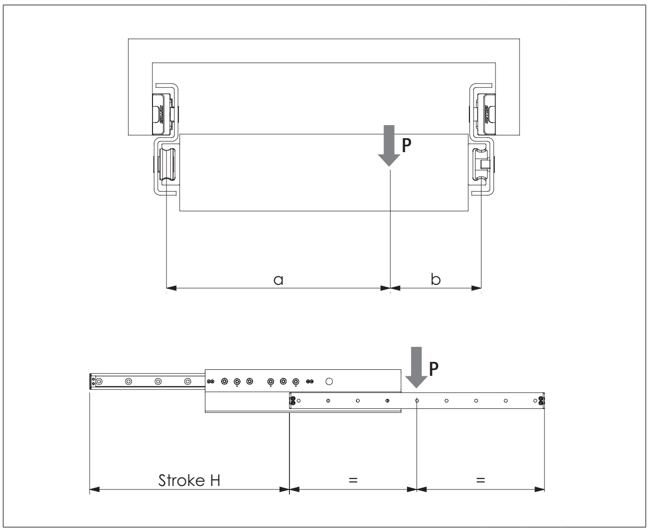


Fig.23

If the load is not positioned halfway on the mobile slider but with a deviation c from its center, contact the technical department.

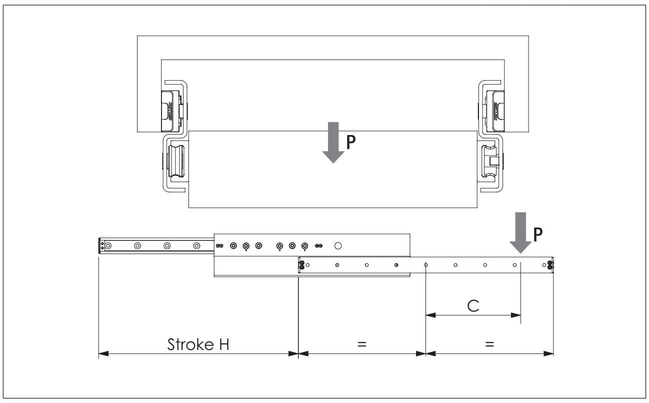


Fig.24

▪ Verification of load capacity

Verification of the load capacity assumes the knowledge of the forces acting on the rails in the different directions, divided into principal components correspondent to the values indicated in the tables of the product pages: radial loads, axial loads and moments.

For the telescopic rails TLN...P the verification is mainly down to comparing the load capacity C_{0rad} to Pe, including a safety factor S_0.

$$Pe <= C_{0rad} / S_0$$

Fig.25

Where S_0 is the safety coefficient as per below table

Safety coefficient - S_0	Application conditions
1 - 1.5	Neither shocks nor vibrations, smooth and low-frequency reverse, high assembly accuracy, no elastic deformations
1.5 - 2	Normal installation conditions
2 - 3.5	Shocks and vibrations, high-frequency reverse, significant elastic deformation

Tab.7

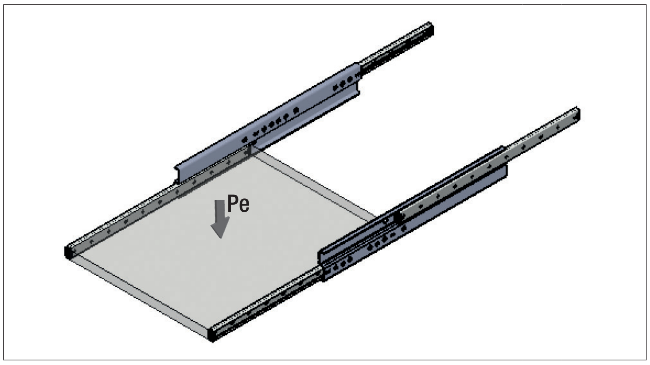


Fig.27

For telescopic rails TQN...P the calculation might also includes moments and axial load.

$$\left(\frac{Pe_{ax}}{C_{0ax}} + \frac{Pe_{rad}}{C_{0rad}} + \frac{Me_x}{M_x} + \frac{Me_y}{M_y} + \frac{Me_z}{M_z} <= \frac{1}{S_0} \right)$$

Fig.26

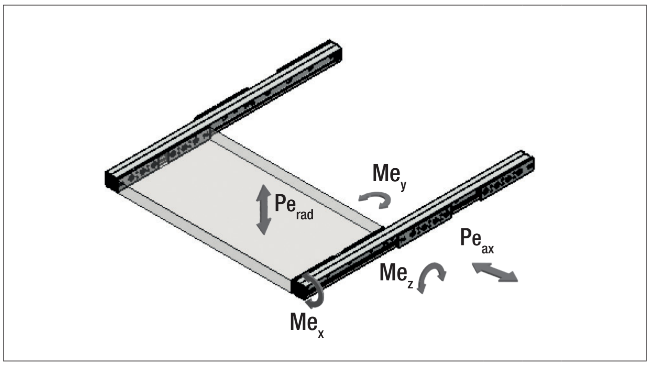


Fig.28

Where:

Pe_{rad} = applied radial load

Pe_{ax} = applied axial load

Me_x*, Me_y, Me_z = applied moments

C_{0rad} = radial load capacity

C_{0ax} = axial load capacity

M_x, M_y, M_z = moment capacities

*Me_x moment exist only in case of use a single telescopic rail

If using a single telescopic rail, the values C_{0rad}, C_{0ax}, M_y and M_z in the formula Fig.26 must be divided by 2 (M_x is always and only referred to a single rail).

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 ball bearings. 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 (fi in the formula below), so the service life consists of:

$$Lcy = 50 \cdot \left(\frac{C}{Pe} \cdot \frac{1}{fi} \right)^3 \cdot \frac{1}{H} \cdot 10^6$$

$$Lkm = 100 \cdot \left(\frac{C}{Pe} \cdot \frac{1}{fi} \right)^3$$

Lcy = calculated service life [num. of cycles]
Lkm = calculated service life [Km]
C = Dynamic load coefficient
Pe = Equivalent load applied [N]
H = Stroke [mm]
fi = Application coefficient

Fig.29

Application coefficient fi

The correction factor fi applied to the theoretical calculation formula has the sole purpose of guiding the designer quantitatively on the influence in the lifetime estimation of the real application conditions without any pretense of precision. For more details please contact our technical department.

Coefficient fi	Operating conditions
1 - 1.5	Correct load sizing, rigid structures, routine lubrication, clean surroundings.
1.5 - 2	Intermediate conditions
2 - 3.5	Approximative load sizing, unprecise non rigid structures, dusty not clear surroundings.

Tab.8

Equivalent load applied Pe

When the load P is not perfectly centered, the equivalent load Pe must be calculated as shown in Fig.30, otherwise, with the load perfecty centered:

$$Pe = P_{rad}$$

Fig.30

When using a pair of telescopic rails series TQN in presence of simultaneous load P_{rad}, P_{ax} and moments M_y, M_z (M_x only in case of single rail) :

$$Pe = Co_{rad} \cdot \left(\frac{Pe_{rad}}{C_{0rad}} + \frac{Pe_{ax}}{C_{0ax}} + \frac{Me_x}{M_x} + \frac{Me_y}{M_y} + \frac{Me_z}{M_z} \right)$$

Fig.31

If using a single telescopic rail, the values C_{0rad}, C_{0ax}, M_y and M_z in the formula Fig.31 must be divided by 2 (M_x is always and only referred to a single rail).

beyond motion