BISHOPWISECARVER

A FAMILY OF SOLUTIONS

MONORACE

LINEAR RAIL RANGE

RACE

TELERACE

TELESCOPIC SLIDES RANGE

GENERAL CATALOGUE

The writing of this catalogue was done with diligence, but it does not accept liability for any errors or omissions. We also reserve the right to make technical changes, recommend that you verify the update of the information here confronted with our engineering department.

Product Safety

The products must be used following the instructions below. Given the variety of applications where the product can be used we are not able to assess whether a malfunction can cause damage to property or persons. The designer and the buyer are responsible for defining and implementing the safety instructions to enforce the end user.

T RACE SpA , September 2012

T RACE

T RACE is a young and dynamic company, specialized in the design, manufacture and sales of new and innovative linear guides and telescopic slides. Although a newly established society, **T RACE** is composed of highly qualified people with comprehensive experience in the field of linear motion. **T RACE** has its own facilities in Italy and Germany, and a network of distributors in all major industrialized countries in the world, to ensure the presence of its products internationally.

T RACE has the honour to present this new catalogue, in which the range of products has been further expanded with solutions, that are more responsive to the needs of its customers by pursuing the principles of continuous innovation of its product range, as a function of gained applied experience.
The **T RACE** products are characterized by a strong originality for both the dimensions and geometric shapes and for the innovative production process. The C-shaped rails with internal raceways coupled with their roller sliders or ball cage sliders offer the best performance / size, available on the market. The innovative heat treatment of surface hardening, provides a high levels of wear resistance and excellent protection against corrosion due to post-treatment chemical oxidation, which also gives the original black color, the unique characteristics of the **T RACE** products.

The linear rails and telescopic slides from **T RACE**, with their own design features, are particularly suitable in all applications, where the environmental conditions of use are critical and where the request is easily adaptable to mounting structures and ease of installation. The application areas are very diverse, ranging from CNC-machines and general-automation to civilian and military transport vehicles, medical equipment, civil construction, High-Tech furniture and countless other applications, where traditional re-circulating ball slides are not an adequate linear solution.

The added value offered by **T RACE**, is the availability to adapt their standard products to specific applications, by developing customized versions for their clients, by providing its engineering service for the study, analysis and research of the optimal solution,- thanks also to its multidisciplinary experience gained in various sectors.
The contents of the catalog are available online at **www.t-race.com**.
Thanks to the collaboration with the company Traceparts, on the portal **www.traceparts.com**, all 3D models of products of this catalog are available for download in the native CAD format used by the designer.

MONORACE

LINEAR RAIL RANGE

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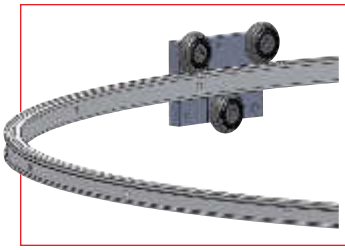

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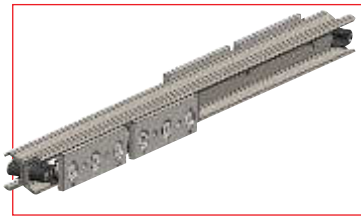

Telescopic slides with variable stroke, and ball-bearings, INOX (s/s) version also

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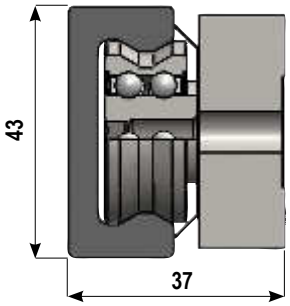
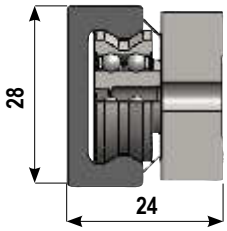
LINEAR ROLLER SYSTEM

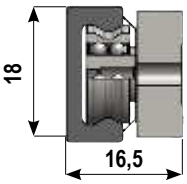
T RACE's range of linear bearings are setting new standards due to its innovative design and technical concepts.
The family MONORACE, based on different C-shaped rails with a wide range of sliders, is offering unique linear solutions for all kinds of automation applications for many industries.
T RACE's system with roller sliders and internal raceways, offer the markets highest performing system, along with being size wise the most compact system.
The rails series MR – ML are high precision cold-drawn profiles, made from a specific Casehardening steel alloy, to assure optimal surface hardening by nitrogen diffusion. In addition the treatment too provides a strong resistance against corrosion, meanwhile reducing the friction and wear, to assure a long life of the rail.

The rails of series LA, are rolled steel profiles for simple applications. INOX version also available for severe conditions.

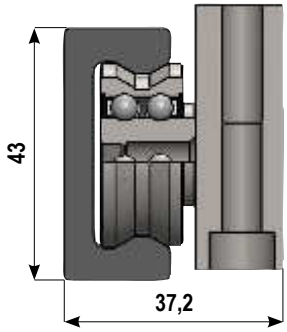
The unique design of T RACE's linear bearings, along with the products capability to fit non precise installation constructions, assures an optimal linear solution for the wide range of applications outside the typical machine tool market as: handling equipment, transport/military vehicles, office furniture, etc.

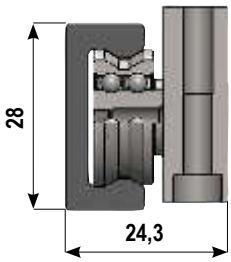




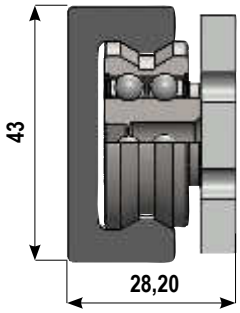


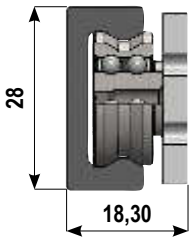
MR rails with
R. series sliders.

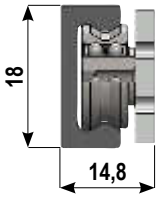




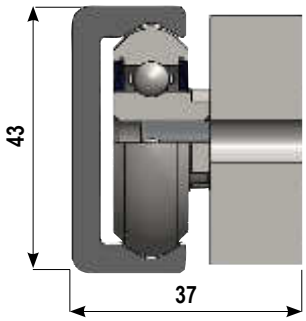
MR rails with
R.T series sliders.



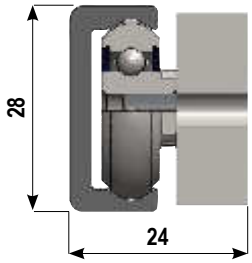


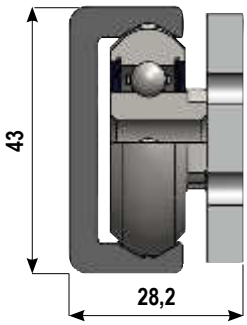


MR rails with
R.S series sliders.

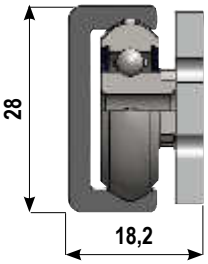


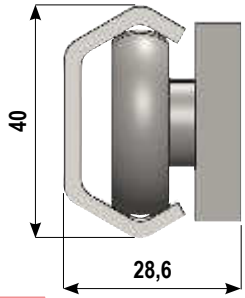
ML rails with
RL series sliders.

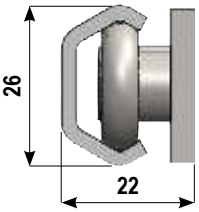




ML rails with
R.S series sliders.







LA rails with
PA. series sliders.

LINEAR ROLLER SYSTEM with MR rail and R, R.T, R.S sliders

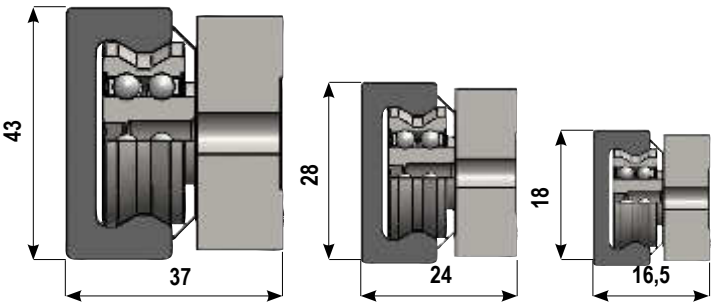
The MR Series Linear Rail System consists of a C-section steel rail with internal convex raceways, where robust double row ball bearing rollers travel. The high precision rollers are lubricated for life and protected with 2RS seals. Sliders are available with three or five rollers, including eccentrics to adjust the bearing preload. Both ends of the sliders are equipped with polyamide wipers to remove debris from the raceway and grease impregnated felt wipers to lubricate the raceways for long life with minimal maintenance.

The MR rail system is especially equiped for harsh environments where contamination is a problem. Most bearing systems utilize a groove that a roller or ball travel within. These grooves capture and hold debris that eventually cause the bearing to fail. The convex raceway of the MR Series provides a place for debris and other contaminates to be pushed aside by the rollers. This feature enables the MR Series to function in environments where other bearings quickly fail.

Sliders Series: RV, RP, RA

R Sliders Series are made of zinc plated steel with mounting holes parallel to the roller axis and perpendicular to the direction of preferred loading.The sliders have sealed rollers, axial wipers, and longitudinal seals for optimal protection of the internal parts and a sealing strip to prevent accidental tampering of the fixed rollers.
The R Series Sliders are available in 3 sizes and with either 3 or 5 rollers.

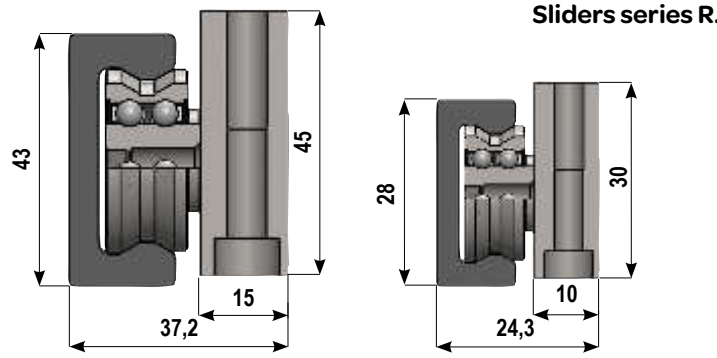
Sliders series R.



Sliders Series: RVT, RAT, RPT, RFT

R.T Sliders Series are made of zinc plated steel with mounting holes perpendicular to the roller axis and parallel with the direction of preferred loading.
The sliders have sealed rollers and axial wipers for protection of the internal parts. The R.T Series Sliders are available in 2 sizes and with either 3 or 5 rollers

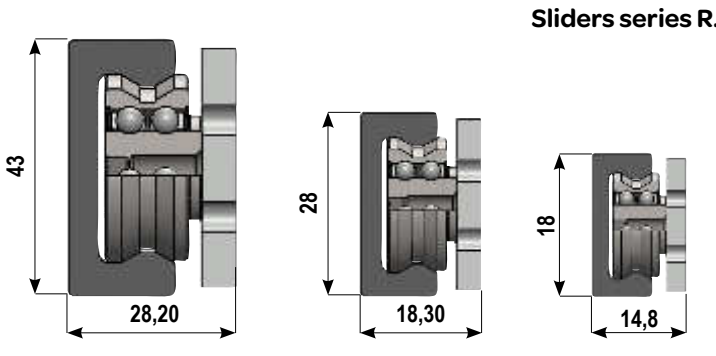
Sliders series R.T



Sliders Series: RVS, RAS, RPS, RFS

The R.S Sliders Series have a very slim body to obtain the most compact slider possible, without sacrificing performance. They also offer both threaded and through hole mounting options.
The standard slider body is made from zinc plated steel but is also available in all Stainless Steel construction for higher corrosion resistance.
The R.S Series Sliders are available in 2 sizes, 2 materials, and with either 3, 4 or 5 rollers.

Sliders series R.S



Sliders are available with either 3 or 5 rollers. For the 3 roller version, the first and third roller are fixed, concentric rollers that run on the same raceway. The second roller is eccentric and runs on the opposite raceway.
The eccentric feature is used to adjust the slider preload in the rail.
For the 5 roller version, the two lateral and the central roller are fixed, and run on the same raceway.
The second and fourth roller are eccentric and run on the opposite raceway. The eccentric feature is used to adjust the slider preload in the rail. Because one raceway contacts more rollers than the other raceway, the sliders have a preferred loading direction.
The slider is marked with two small circular notches indicating the direction with the most rollers and direction of preferred loading. Care during assembly is required to ensure the maximum load capacity of the system is achieved.

The rollers used in the sliders consist of two different geometries to achieve different levels of constraint within the linear rails Guiding Rollers (RCV, REV) contact the raceway at two points creating a well constrained rollers on the raceway. Floating Rollers (RCP, REP) engage only the peak of the raceway which constrains it radially but allows it to float in the axial direction between the two shoulders.
By using different combinations of guiding and floating rollers, sliders with different performance characteristics are obtained. These combinations can be used to avoid the binding that can occur because of alignment problems when mounting two linear bearings in parallel.

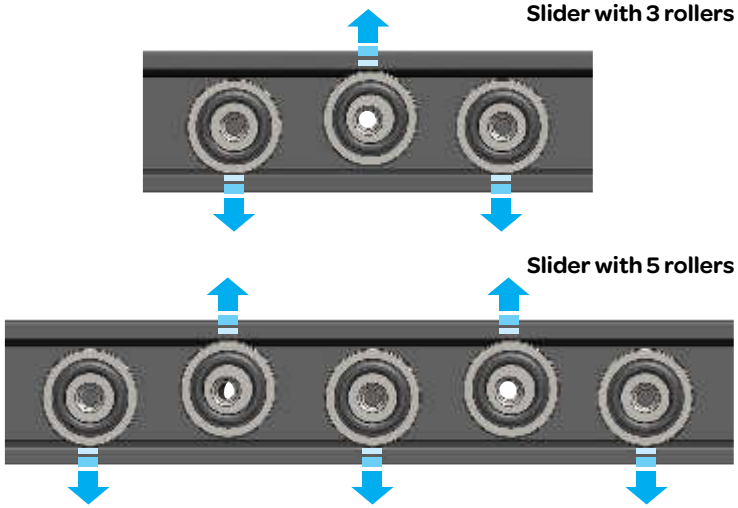
Guiding Sliders: By utilizing all guiding rollers RV, RTV, and RSV sliders are obtained, they are fully constrained and will support loads and moments in all directions with the greatest capacity in the radial direction.

Floating Sliders: By utilizing all floating rollers to construct RP, RSP, and RTP sliders are obtained, these sliders are able to carry full load in the radial direction and also float and rotate a small amount in the rail without affecting the preload or quality of the movement and without binding. Floating sliders are used in 2 rail systems to absorb parallelism errors in the mounting surfaces. For size 43 sliders, RF, RFT, and RFS sliders are available which allow even greater axial displacement.

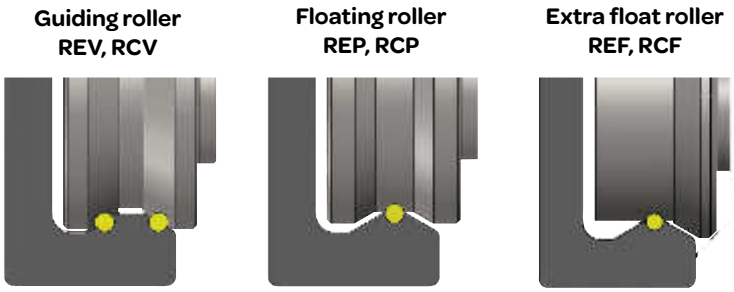
Rotating Sliders: By mixing guiding and floating rollers to construct RA, RSA, and RTA sliders are obtained, these sliders are able to carry full load in the radial direction and also rotate slightly without affecting the preload or quality of movement. These sliders also retain the ability to guide the payload as it travels. Rotating sliders are used in 2 rail systems to absorb angular errors in the mounting surfaces, that cause traditional bearings to bind.

Combination: By combining a floating and rotating slider together in a 2 rail system, the MR rail system can carry and guide a full payload while compensating for parallelism and angular errors in the rail mounting surfaces. These types of errors are often found when mounting to welded frames, structural Aluminum frames, sheet metal structures, etc. The self alignment capability can eliminate the need to machine the rail mounting surfaces.

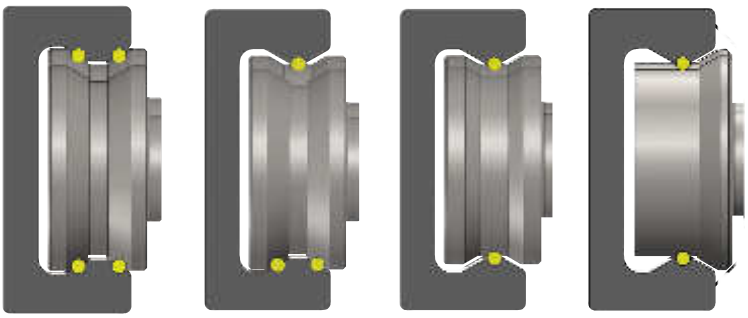
Roller loading position



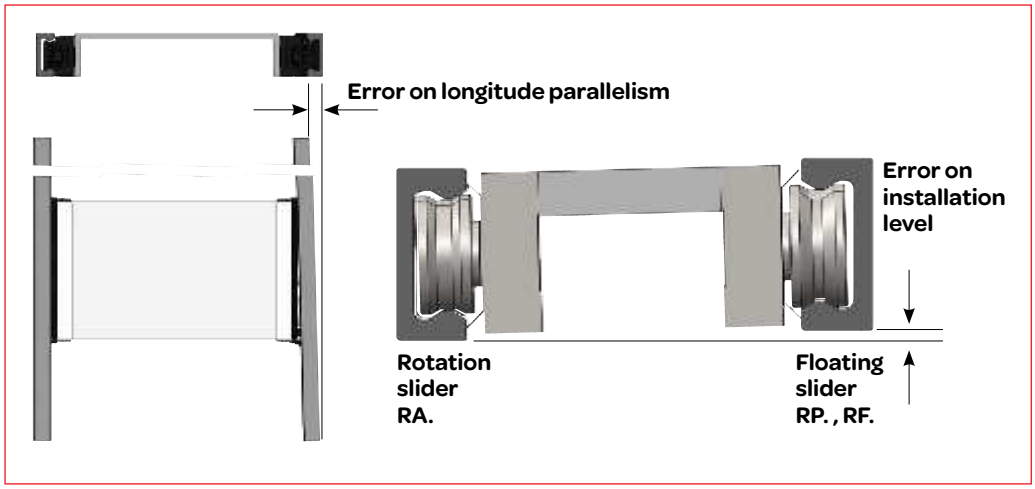
Roller contact points

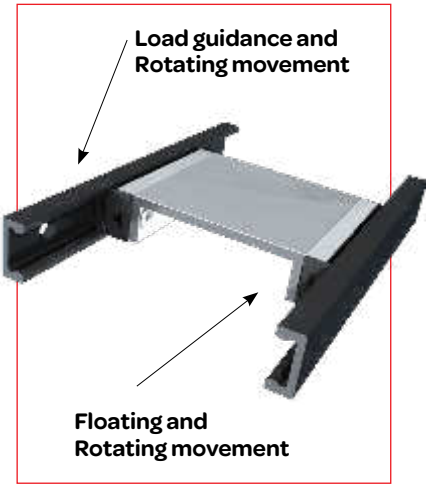


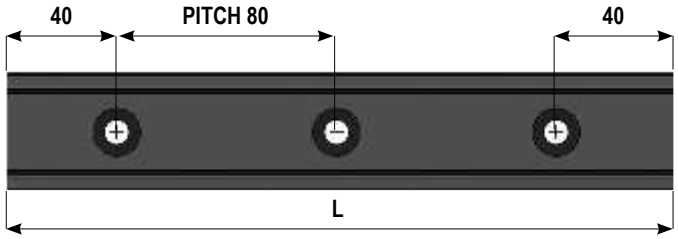
Slider contact points

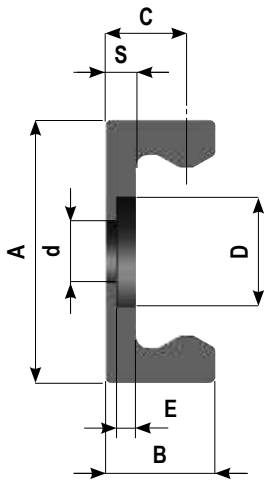


Selfaligning combination

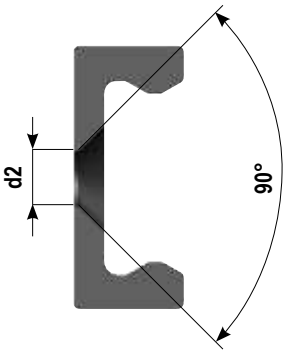








MR..L Counterbored holes



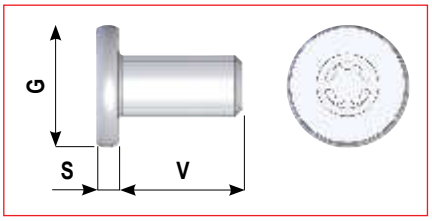
MR..S Countersunk holes

(Example od order code: MR28L - 640)

Code	A (mm)	B (mm)	C (mm)	S (mm)	D (mm)	d (mm)	E (mm)	d2 (mm)	Screw type	Weight (Kg/m)
MRG18S	18	9,5	7,1	2,8				4,5	M4 DIN7991	0,68
MRG18L					9	5	1,9		M4 TORX *	
MR28S	28	12	8	3				5,5	M5 DIN7991	1,25
MR28L					11	6	2		M5 TORX *	
MR43S	43	18	13,2	5				8,5	M8 DIN7991	3,04
MR43L					18	10	3,2		M8 TORX *	

*** Special flat-head TORX screws supplied with rails.**

Screw type		G (mm)	S (mm)	V (mm)		Tightening Torque
M4 TORX	M4	8	1,9	8	T20	3,5 Nm
M5 TORX	M5	10	2	10	T25	10Nm
M8 TORX	M8	16	3	16	T40	20Nm

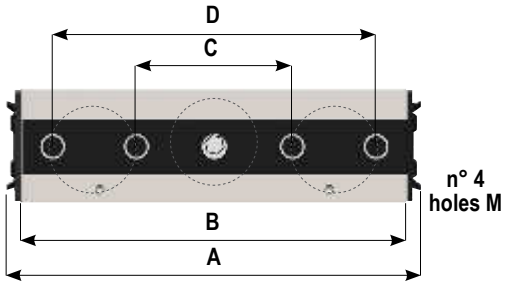


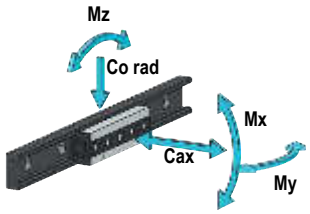
TECHNICAL DATA

MR Series Rails are made in 3 sizes 18mm, 28mm and 43mm with two types of mounting holes: MR .. L with counterbored mounting holes for special low head TORX mounting screws that are provided with the rail. MR .. S with countersunk mounting holes for UNI-standard ISO5933 fasteners.
The rail has a "C" shaped cross-section with interior, convex raceways. The convex raceways are polished for smooth, low noise motion. The interior raceways are protected from accidental bumps and other damages, that can spoil the surface. The shape also protects the rollers from similar types of damages. MR Series Rails are made from carbon steel that is hardened through high depth nitriding. The rails are then treated with the innovative TRACE-NOX process, which delivers excellent corrosion resistance. This treatment is not a plating which can flake off but instead penetrates and alters the material surface. The result is a very hard and durable, corrosion resistance linear rail, that is black in color, due to the microimpregnation of oil and antioxidants.

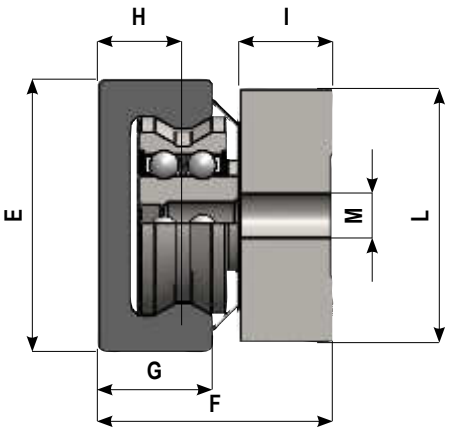
Lenght L (mm)		
MRG18	MR28	MR43
160		
240	240	
320	320	
400	400	400
480	480	480
560	560	560
640	640	640
720	720	720
800	800	800
880	880	880
960	960	960
1040	1040	1040
1120	1120	1120
1200	1200	1200
1280	1280	1280
1360	1360	1360
1440	1440	1440
1520	1520	1520
1600	1600	1600
1680	1680	1680
1760	1760	1760
1840	1840	1840
1920	1920	1920
2000	2000	2000
2080	2080	2080
2160	2160	2160
2240	2240	2240
2320	2320	2320
2400	2400	2400
2480	2480	2480
2560	2560	2560
2640	2640	2640
2720	2720	2720
2800	2800	2800
2880	2880	2880
2960	2960	2960
	3040	3040
	3120	3120
	3200	3200
	3280	3280
	3360	3360
	3440	3440
	3520	3520
	3600	3600
	3680	3680
	3760	3760
	3840	3840
	3920	3920
	4000	4000

3 Rollers slider for R. series

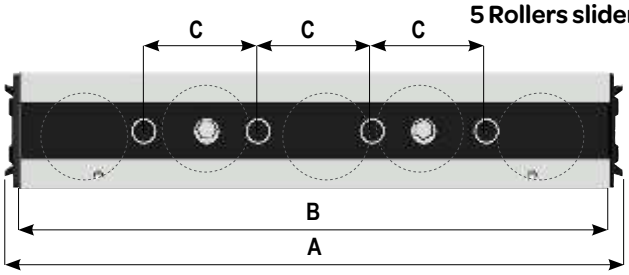




RV Guiding slider dimensions



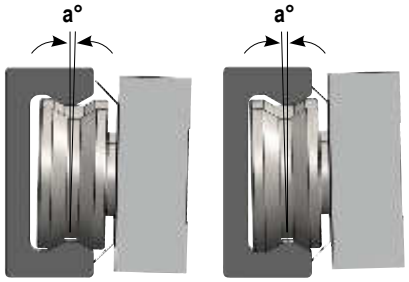
5 Rollers slider for R. series



Code	Rail type	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)	L (mm)	M (mm)	A (mm)	B (mm)	C (mm)	D (mm)	Weight (g)	Dynamic coeff. C (N)	Load capacity				
															Co rad (N)	Co ax (N)	Mx (Nm)	My (Nm)	Mz (Nm)
RVG18-3	MRG18	18	16,5	9,5	7,1	4,8	16	M5	78	70	20	52	75	3300	1600	690	3	9	15
RPG18-3														3300	1600	0	0	0	15
RAG18-3														3300	1600	460	3	9	15
RVG18-5									120	112	20		120	4455	2160	1150	6	18	48
RPG18-5														4455	2160	0	0	0	48
RAG18-5														4455	2160	690	6	18	48
RV28-3	MR28	28	24	12	8	9,7	25	M5	102	94	35	78	240	6000	3200	1380	9	27	46
RP28-3														6000	3200	0	0	0	46
RA28-3														6000	3200	920	9	27	46
RV28-5									148	140	25		360	8100	4320	2300	18	46	120
RP28-5														8100	4320	0	0	0	120
RA28-5														8100	4320	1380	18	46	120
RV43-3	MR43	43	37	18	13,2	14,8	40	M8	147	136	55	114	730	14200	7200	3210	32	92	155
RP43-3														14200	7200	0	0	0	155
RA43-3														14200	7200	2080	32	92	155
RF43-3														14200	7200	0	0	0	155
RV43-5									218	207	40		1130	19170	9720	5350	64	165	418
RP43-5														19170	9720	0	0	0	418
RA43-5														19170	9720	3560	64	165	418
RF43-5														19170	9720	0	0	0	418

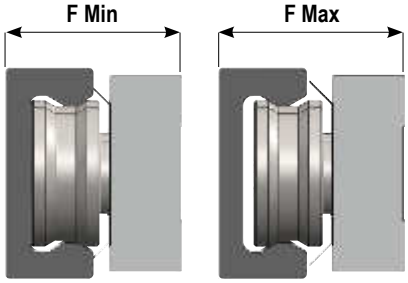
RA series – Rotating slider

Series	(+/-) a°
RA18	1,5
RA28	1,5
RA43	1,5



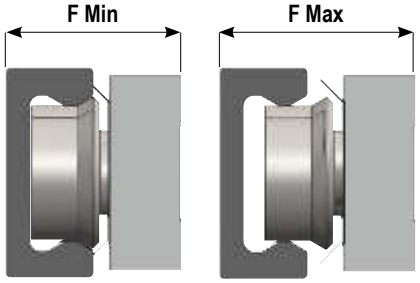
RP series – Floating slider

Series	(+/-) a°	F Min	F Max
RP18	1,5	16	17
RP28	1,5	23,4	24,6
RP43	1,5	36	38



RF series – Extra floating slider

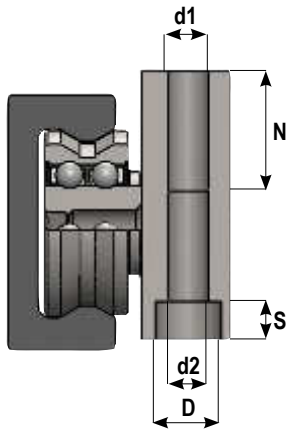
Series	(+/-) a°	F Min	F Max
RF43	1,5	36	40



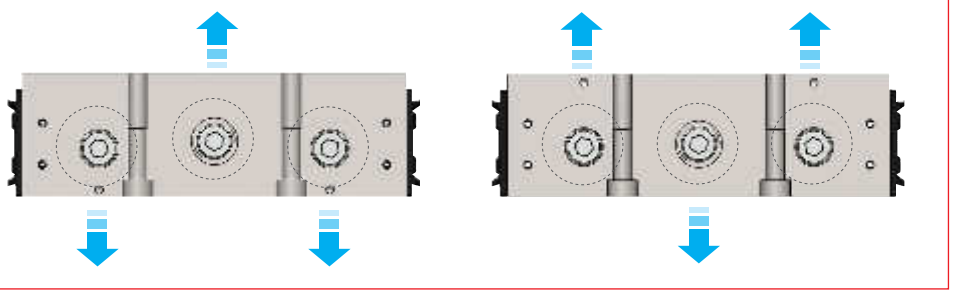
Sliders of series RVT, RAT, RPT , RFT, provide fixing holes parallel to the preferable radial load direction. As the slider body protrudes from rail level, the moving part can be resting on top of the linear system, while being fixed from above with threaded holes or from below with through passing holes.

Slider type	Threaded holes for top mounting		Passing holes for bottom mounting, screw UNI 5931			
	d1 (mm)	N (mm)	Tipo vite	d2 (mm)	S (mm)	D (mm)
R.T28-3	M6	15	M5	Ø 5,5	5	Ø 9
R.T28-5						
R.T43-3	M8	20	M6	Ø 6,5	6,5	Ø 11
R.T43-5						

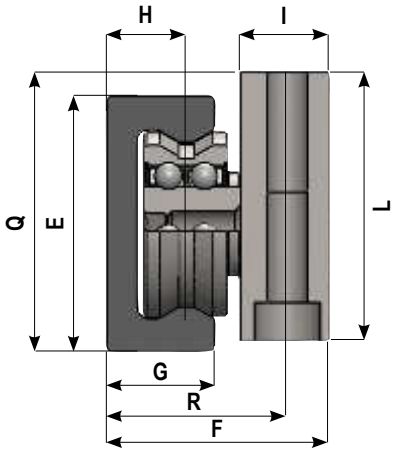
RVT Guiding slider dimensions



The A and B versions differ only in the arrangement of the rollers providing maximum radial load capacity either toward or against the mounting surface. The preferential loading direction is marked by two circular notches. (Ordering code example: RVT28-3A or RVT28-3B) The slider body allows two methods of mounting. One method is to pass a fastener through the counterbored hole into the payload or to pass a fastener through the payload into the tapped hole at M.

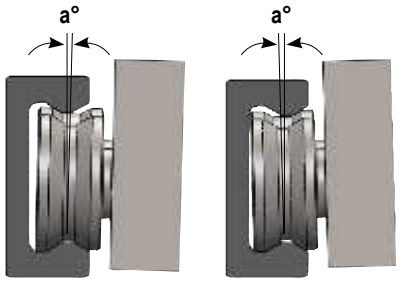


RVT Guiding slider dimensions



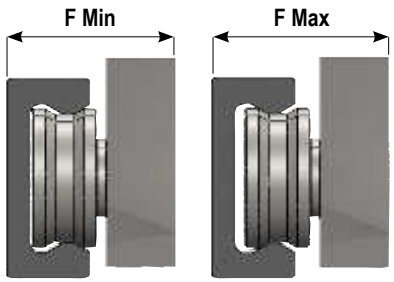
Rotation slider series RAT

Series	(+/-) a°
RAT28	1,5
RAT43	1,5



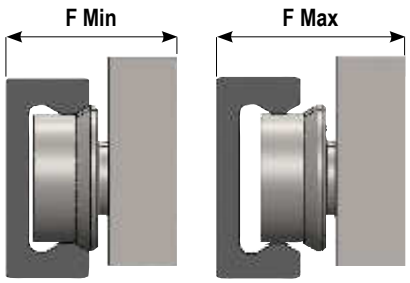
Floating slider series RPT

Series	(+/-) a°	F Min	F Max
RPT28	1,5	23,7	24,9
RPT43	1,5	36,2	38,2

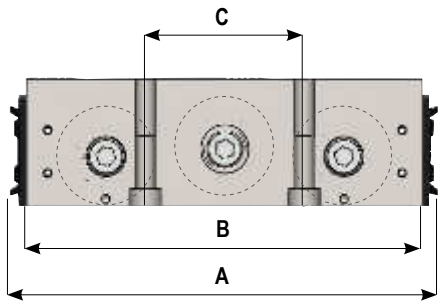


Extra floating slider series RFT

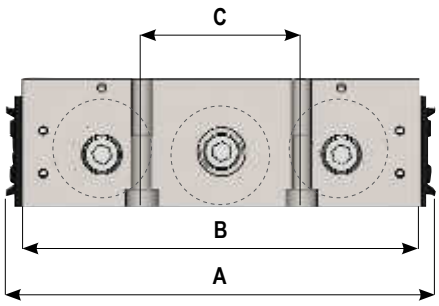
Series	(+/-) a°	F Min	F Max
RFT43	1,5	36,2	40,2



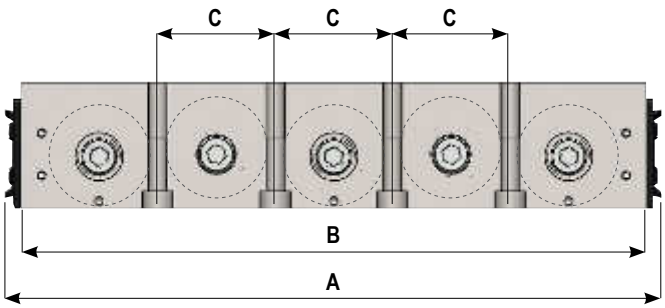
3 Rollers slider for R.T series – Version A



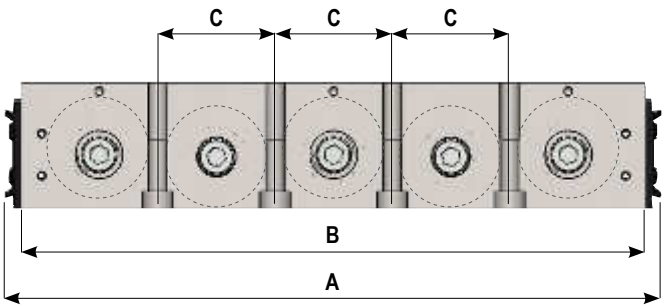
3 Rollers slider for R.T series – Version B



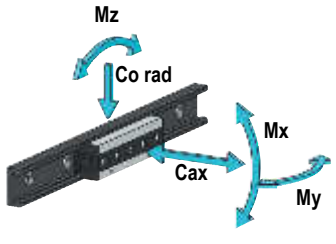
5 Rollers slider for R.T series – Version A



5 Rollers slider for R.T series – Version A



Code	Rail	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)	L (mm)	N (mm)	Q (mm)	R (mm)	A (mm)	B (mm)	C (mm)	Weight (g)	Dynamic coeff. C (N)	Load capacity				
																Co rad (N)	Co ax (N)	Mx (Nm)	My (Nm)	Mz (Nm)
RVT28-3.	MR28	28	24,3	12	8	10	30	15	32	19,5	102	94	36	280	6000	3200	1380	9	27	46
RPT28-3.															6000	3200	0	0	0	46
RAT28-3.															6000	3200	920	9	27	46
RVT28-5.											148	140	27	430	8100	4320	2300	18	46	120
RPT28-5.															8100	4320	0	0	0	120
RAT28-5.															8100	4320	1380	18	46	120
RVT43-3.	MR43	43	37,2	18	13,2	15	45	20	47	30	151	140	56	860	14200	7200	3210	32	92	155
RPT43-3.															14200	7200	0	0	0	155
RAT43-3.															14200	7200	2140	32	92	155
RFT43-3.															14200	7200	0	0	0	155
RVT43-5.											235	224	42	1200	19170	9720	5350	64	165	418
RPT43-5.															19170	9720	0	0	0	418
RAT43-5.															19170	9720	3210	64	165	418
RFT43-5.															19170	9720	0	0	0	418

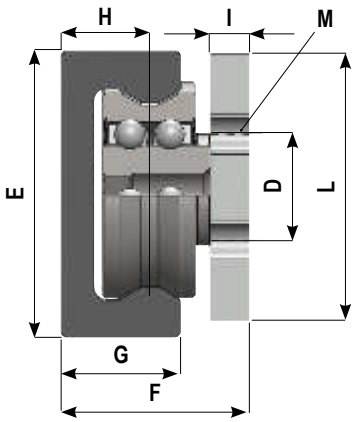


Example of order code.
RVT28-3B : Guiding slider with 3 roller, version B

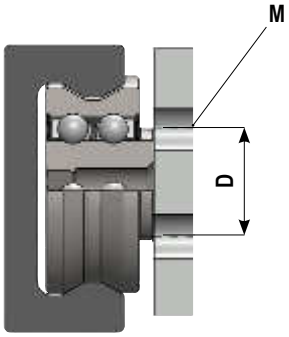
Very compact slider, with slim strong slider body, for application with limited space. Performance like standard R-sliders including self aligning concept. Featuring extra long 4-roller version to optimize performance with only 1 slider, instead of 2 sliders.

Guiding slider series RVS.

Version R.S.-.. standard with threaded holes



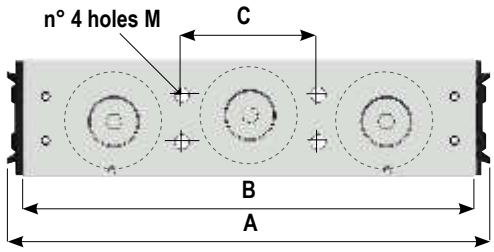
Version R.S.-..C version with cylindrical holes



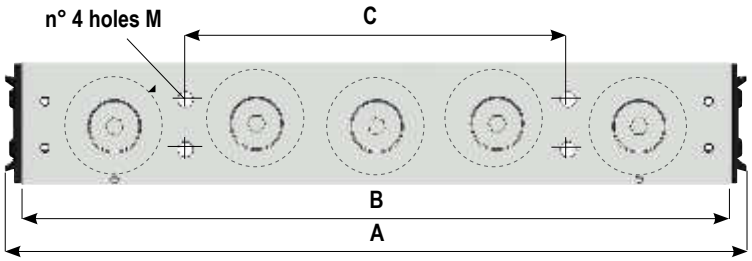
The sliders are available in standard version with threaded fixing holes R.S-.. and in version ...C with through passing holes for inside fixing with standard cylindrical screws DIN912, with no interference with the rollers.

Slider type	M	Type of fixing screws
R.GS18-..	M4	
R.GS18-..C	Ø 4,5	M4 DIN912
R.S.28-..	M5	
R.S.28-..C	Ø 5,5	M5 DIN912
R.S.43-..	M6	
R.S.43-..C	Ø 6,5	M6 DIN912

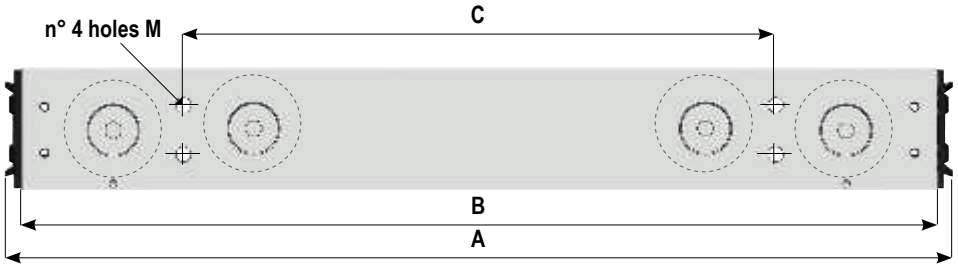
3 Rollers slider for R.S series



5 Rollers slider for R.S series

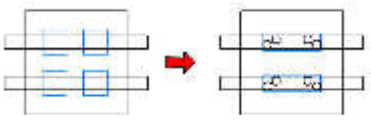


Long slider with 4 rollers R.S series

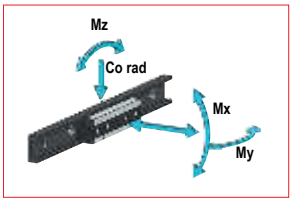


INOX Versions

The sliders in dimensions 28 and 43 are also available in INOX for version RVSX, RASX and RPSX. The rollers are hardened AISI 440C, while slider body AISI 304.
The load capacities are identical to the standard version of RVS and RPS.



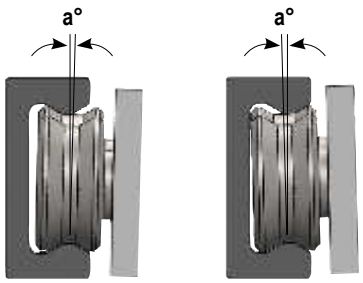
The extra long slider body for 4-roller sliders R.S..-4L are made to offer an economical alternative for the many cases where 2 sliders are used, merely for proportional reasoning, rather than for load capacities.
Also, option for very economical sliders for high Mz and My moment capacities.



Example of order codes.
RVS28-3 : Guiding Slim-slider with 3 roller
RPS43-4LC : Extra long rotation Slim-slider with 4 rollers and cylindrical fixing holes
RVSX28-5: INOX guiding Slim-slider with 5 rollers

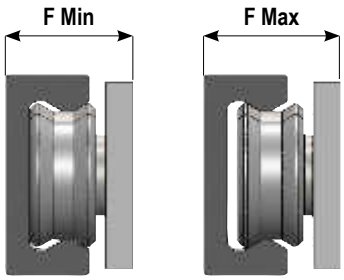
Rotating slider RAS series

Series	(+/-) a°
RAS18	1,5
RAS28	1,5
RAS43	1,5



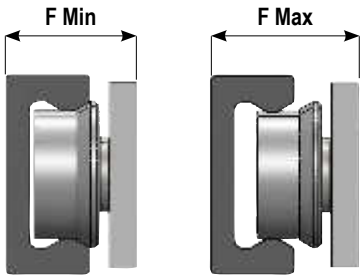
Floating slider RPS series

Series	(+/-) a°	F Min	F Max
RPS18	1,5	14,3	15,3
RPS28	1,5	17,6	18,8
RPS43	1,5	27,2	29,2



Extra floating slider RFS series

Series	(+/-) a°	F Min	F Max
RFS43	1,5	27,2	31,2



Code	Rail Type	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)	L (mm)	A (mm)	B (mm)	C (mm)	D (mm)	Weight (g)	Dynamic coeff. C (N)	Load capacity				
														Co rad (N)	Co ax (N)	Mx (Nm)	My (Nm)	Mz (Nm)
RVGS18-3	MRG18	18	14,7	9,5	7,1	3	15	81	73	21	8	75	3300	1600	690	3	9	16
RPGS18-3													3300	1600	0	0	0	16
RAGS18-3													3300	1600	460	3	9	16
RVGS18-5								110	102	50	8	120	4455	2160	1150	6	19	49
RPGS18-5													4455	2160	0	0	0	49
RAGS18-5													4455	2160	690	6	19	49
RVGS18-4L								158	150	98	8	125	3300	1600	920	6	27	78
RPGS18-4L													3300	1600	0	0	0	78
RAGS18-4L													3300	1600	460	6	27	78
RVS.28-3.	MR28	28	18,2	12	8	4	25	114	106	32	10	140	6000	3200	1380	9	30	52
RPS.28-3.													6000	3200	0	0	0	52
RAS.28-3.													6000	3200	920	9	30	52
RVS.28-5.								164	156	82	10	210	8100	4320	2300	18	52	130
RPS.28-5.													8100	4320	0	0	0	130
RAS.28-5.													8100	4320	1380	18	52	130
RVS.28-4L.								208	200	126	10	230	6000	3200	1840	18	73	202
RPS.28-4L.													6000	3200	0	0	0	202
RAS.28-4L.													6000	3200	920	18	73	202
RVS.43-3.	MR43	43	28,2	18	13,2	6	40	164	153	46	16	440	14200	7200	3210	32	98	165
RPS.43-3.													14200	7200	0	0	0	165
RAS.43-3.													14200	7200	1240	32	98	165
RFS.43-3.													14200	7200	0	0	0	165
RVS.43-5.								241	230	124	16	670	19170	9720	5350	64	180	440
RPS.43-5.													19170	9720	0	0	0	440
RAS.43-5.													19170	9720	3210	64	180	440
RFS.43-5.													19170	9720	0	0	0	440
RVS.43-4L.								311	300	194	16	750	14200	7200	4280	64	257	698
RPS.43-4L.													14200	7200	0	0	0	698
RAS.43-4L.													14200	7200	2140	64	257	698
RFS.43-4L.													14200	7200	0	0	0	698

LINEAR ROLLER SYSTEM with ML rail and RL, RLS sliders

The ML Series Linear Roller System consists of a C shaped steel rail with internal concave raceways where robust ball bearing rollers travel. The high precision rollers are lubricated for life and protected with 2Z seals. Sliders are available with three or five rollers including eccentrics to adjust the slider's preload. Both ends of the sliders are equipped with polyamide wipers to remove debris from the raceway and grease impregnated felt wipers to lubricate the raceways for long life with minimal maintenance.

Sliders include a mix of concentric and eccentric rollers. The eccentric rollers are used to preload the system and eliminate any play. The preload can be adjusted to suit the particular application. Sliders are able to carry load and moment loads in all direction. Because one of the rail raceways contacts more rollers than the other, this direction is the prefered direction of radial loading. Two small circular marks indicate the direction of preferred slider loading.

The ML Systems's C shaped steel rail has internal raceways that are protected from accidental damage. Similarly, the rollers are protected inside the rail and under the slider body.

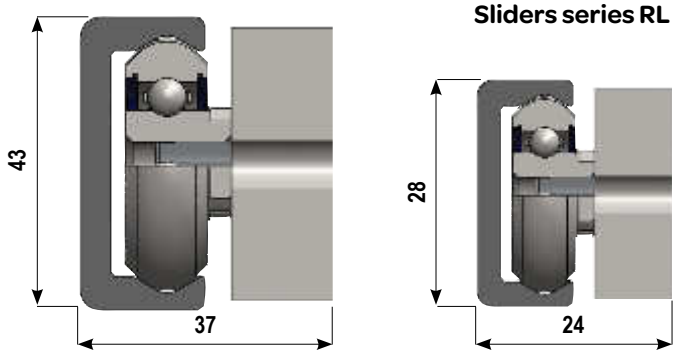
Overall, the ML Series Linear Rail Systems is easy to assembly and extremely compact.

RL Series Sliders

are made of strong zinc plated steel body, with mounting holes parallel to the roller axis and perpendicular to the direction of preferred loading. The sliders have wipers which incorporate preoiled felt for lubrication of raceways.

The RL Series Sliders are available in 2 sizes and with either 3 or 5 rollers.

Sliders series RL



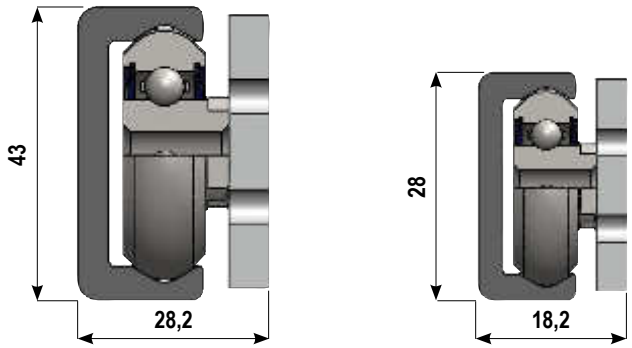
RLS Series Sliders

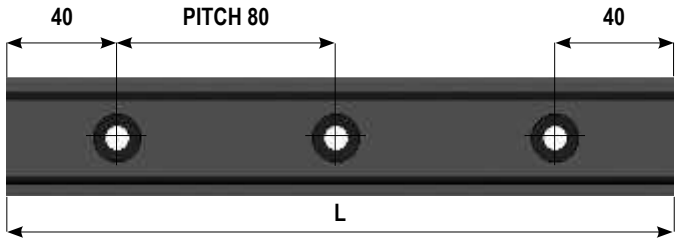
The RLS Series Sliders have a very slim body, as the most compact slider, without sacrificing performance.

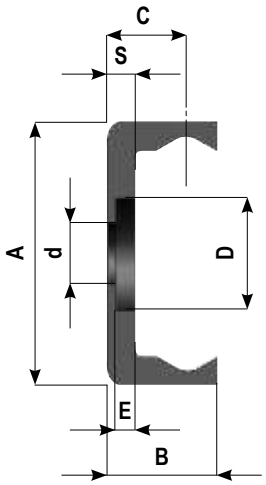
They also offer both threaded and through hole mounting options (RLS and RLS..C).

The standard slider body is made from zinc plated steel but is also available in complete inox. The RLS Series Sliders are available in 2 sizes, 2 materials, and with either 3, 4 or 5 rollers.

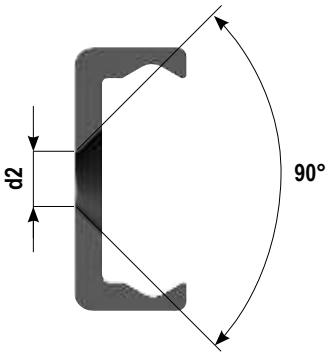
Sliders series RLS







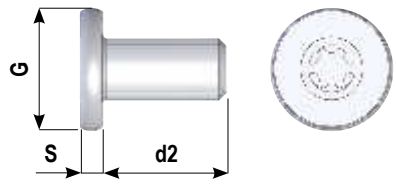
Counterbored holes ML..L



Countersunk holes ML..S

(Code example: ML28L - 640)

Code	A (mm)	B (mm)	C (mm)	S (mm)	D (mm)	d (mm)	E (mm)	d2 (mm)	Screw type	Weight (kg/m)
ML28S	28	11	8,2	3				5,5	M5 DIN7991	1
ML28L					11	6	2		M5 TORX*	
ML43S	43	18,3	12,65	4,5				8,5	M8 DIN7991	2,3
ML43L					18	10	3,2		M8 TORX*	



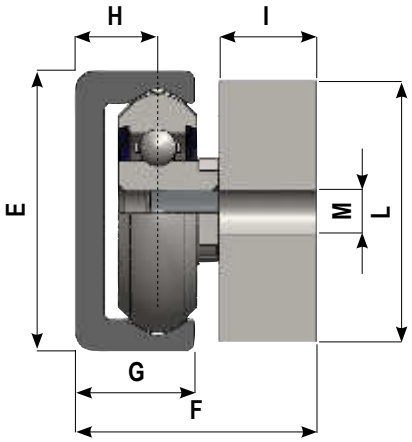
Screw type		G (mm)	S (mm)	V (mm)		Tightening Torque
M5 TORX	M5	10	2	10	T25	10Nm
M8 TORX	M6	16	3	16	T40	20Nm

TECHNICAL DATA

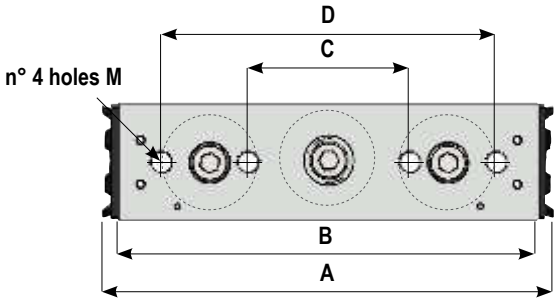
ML Series Rails are made in two sizes 28mm and 43mm with two types of mounting holes: ML .. L with counterbored mounting holes for special low head TORX mounting screws that are provided with the rail. ML .. S with countersunk mounting holes for UNI-standard ISO5933 fasteners. The rail has a "C" shaped cross-section with interior, concave raceways.
The concave raceways are polished for smooth, low noise motion. The interior raceways are protected from accidental bumps and other damage that can spoil the surface. The shape also protects the rollers from similar types of damage.
ML Series Rails are made from carbon steel, that is hardened through high depth nitiriding.The rails are then treated with the innovative TRACE-NOX process which delivers excellent corrosion resistance. This treatment is not a plating which can flake off, but instead penetrates and alters the material surface.
The result is a very hard and durable, corrosion resistant linear rail that is black in color, due to the microimpregnation of oil and antioxidants.

Lenght L (mm)	
ML28	ML43
240	
320	
400	400
480	480
560	560
640	640
720	720
800	800
880	880
960	960
1040	1040
1120	1120
1200	1200
1280	1280
1360	1360
1440	1440
1520	1520
1600	1600
1680	1680
1760	1760
1840	1840
1920	1920
2000	2000
2080	2080
2160	2160
2240	2240
2320	2320
2400	2400
2480	2480
2560	2560
2640	2640
2720	2720
2800	2800
2880	2880
2960	2960
3040	3040
3120	3120
3200	3200
3280	3280
3360	3360
3440	3440
3520	3520
3600	3600
3680	3680
3760	3760
3840	3840
3920	3920
4000	4000

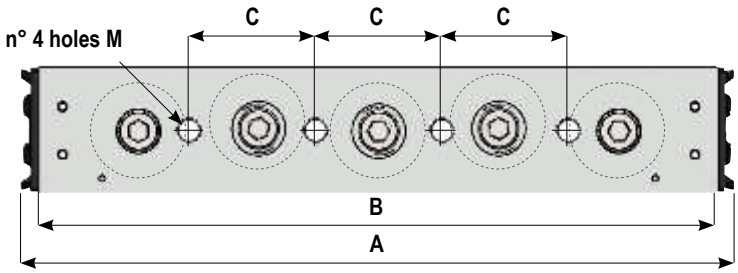
The sliders of series RL offer a strong body with 4 fixing holes.



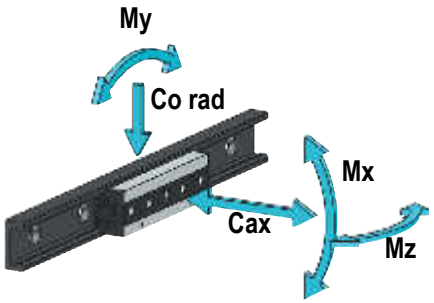
3 Rollers slider RL



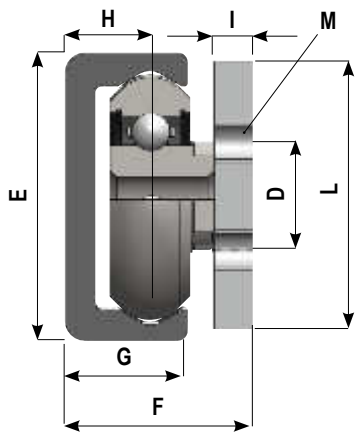
5 Rollers slider RL



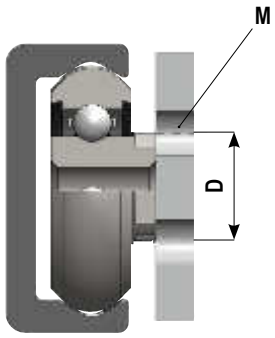
Code	Rail type	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)	L (mm)	M (mm)	A (mm)	B (mm)	C (mm)	D (mm)	Weight (g)	Dynamic coeff. C (N)	Load capacity				
															Co rad (N)	Co ax (N)	Mx (Nm)	My (Nm)	Mz (Nm)
RL28-3	ML28	28	24	11	8,2	10	25	M5	105	97	35	78	220	4800	2000	750	5	13	27
RL28-5									151	143	25		330	6480	2700	1250	10	25	75
RL43-3	ML43	43	37	18,3	12,65	15	40	M8	152	143	55	114	700	11600	5000	1875	21	54	107
RL43-5									226	215	40		1070	15660	6750	3125	41	95	285



Guiding slider series RLS.



Version RLS-.. standard with threaded holes



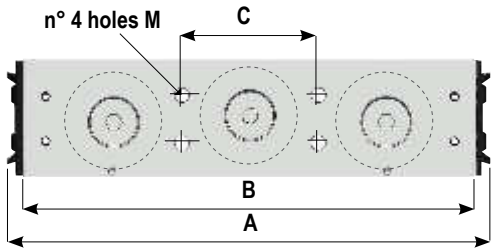
Version RLS-..C version with cylindrical holes

Very compact slider, with thin strong slider body, for application with limited space. Performance like standard RL-sliders. Featuring extra long 4-roller version to optimize performance with only 1 slider, instead of 2 sliders.

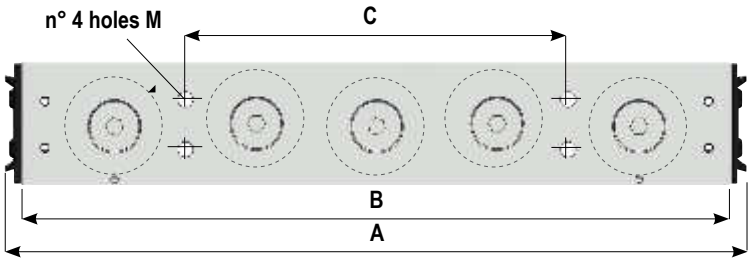
The sliders are available in standard version with threaded fixing holes RL.S-.. and in version ...C with through passing holes for inside fixing with standard cylindrical screws DIN912, with no interference with the rollers.

Slider type	M	Type of fixing screws
RLS28-..	M5	
RLS28-..C	Ø 5,5	M5 DIN912
RLS43-..	M6	
RLS43-..C	Ø 6,5	M6 DIN912

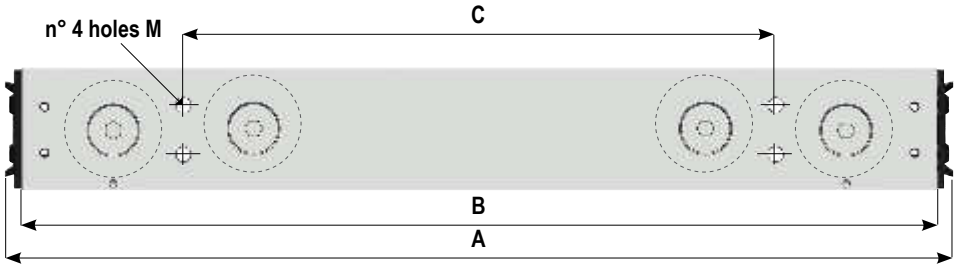
3 Rollers slider RLS.



5 Rollers slider RLS.



Long slider with 4 rollers RL.S series



Code	Rail type	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)	L (mm)	A (mm)	B (mm)	C (mm)	D (mm)	Weight (g)	Dynamic coeff. C (N)	Load capacity				
														Co rad (N)	Co ax (N)	Mx (Nm)	My (Nm)	Mz (Nm)
RLS28-3	ML28	28	18,2	11	8,2	4	25	114	106	32	10	140	4800	2000	750	5	16	32
RLS28-5								164	156	82	10	210	6480	2700	1250	10	28	82
RLS28-4L								208	200	126	10	230	4800	2000	1000	10	39	126
RLS43-3	ML43	43	28,2	18,3	12,65	6	40	164	153	46	16	440	11600	5000	1875	19	57	115
RLS43-5								241	230	124	16	670	15660	6750	3125	37	106	310
RLS43-4L								311	300	194	16	750	11600	5000	2500	37	150	485

ROLLER LINEAR SYSTEM Sheet iron LAZ, LAX rails and PAZ, PAX sliders

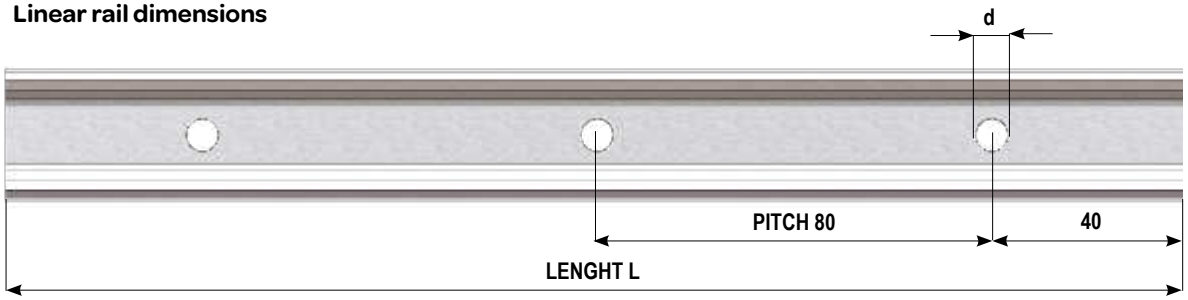
LAZ series rails
LAZ series rails and PAZ series sliders are dimensionally identical to the LAX and PAX Series but are much lower in cost because they are made of Zinc plated steel.

The LA series is a simple and functional solution for linear motion. The minimum space requirements, internal protected raceways, ease of assembly, and good load capacity makes this linear bearing system an excellent choice compared to other solutions available on the market.

LAX series rails
LAX series rails and PAX series sliders are constructed entirely of stainless steel and are a simple and functional solution for applications that require high corrosion resistance,.
The rails and sliders bodies are made from 300 Series stainless with rollers made from 440C.
These are particularly suitable for food processing, pharmaceutical, and medical applications or in difficult environments such as marine environments where there is exposure to highly corrosive agents.
The slider is equipped with 3 rollers. The middle roller is eccentric and is used to adjust the slider preload.

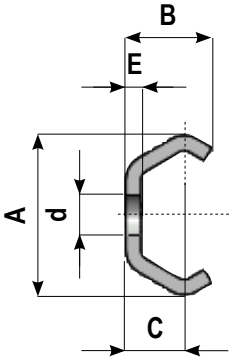
LAZ and LAX sheet iron rails

Linear rail dimensions

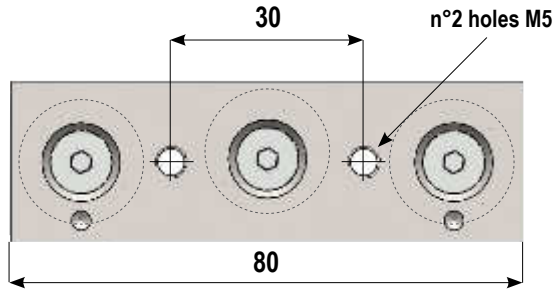


Rail code	A (mm)	B (mm)	C (mm)	d (mm)	E (mm)	Fixing screws	Weight (kg)
LAZ 26	26	14	9,5	6,5	2,5	M5 - ISO 7380	0,67
LAX 26							
LAZ 40	40	21,3	13,3	9	3	M8 - ISO 7380	1,55
LAX 40							

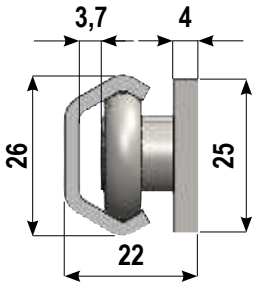
Suitable fixing screws of type ISO 7380



Lenght L (mm)	
LAZ 26 LAX 26	LAZ 40 LAX 40
160	
240	
320	320
400	400
480	480
560	560
640	640
720	720
800	800
880	880
960	960
1040	1040
1120	1120
1200	1200
1280	1280
1360	1360
1440	1440
1520	1520
1600	1600
1680	1680
1760	1760
1840	1840
1920	1920
2000	2000
2080	2080
2160	2160
2240	2240
2320	2320
2400	2400
2480	2480
2560	2560
2640	2640
2720	2720
2800	2800
2880	2880
2960	2960
3040	3040
3120	3120
3200	3200
3280	3280
3360	3360
3440	3440
3520	3520
3600	3600
3680	3680
3760	3760
3840	3840
3920	3920
4000	4000

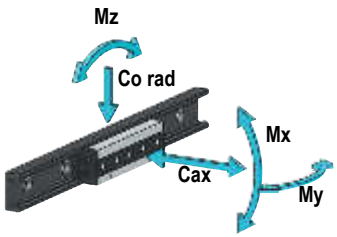


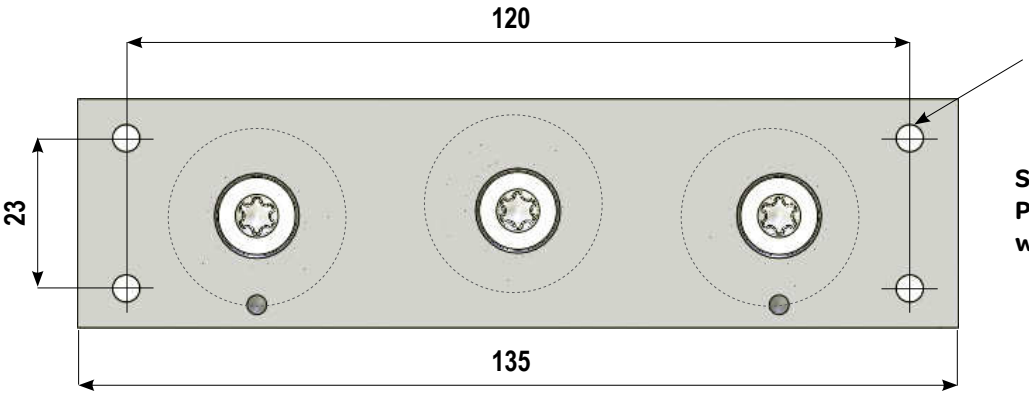
Sliders series
PAZ26, PAX26
with 3 rollers



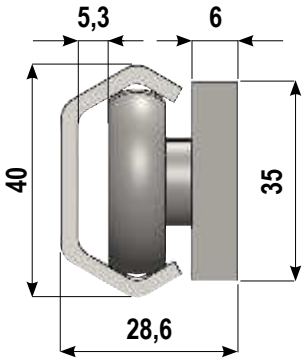
With LAZ
and LAX rail

Code	Co rad (N)	Co ax (N)	Mx (Nm)	My (Nm)	Mz (Nm)	Weight (g)
PAZ26 PAX26	800	400	3	9	12	100





Sliders series
PAZ40, PAX40
with 3 rollers

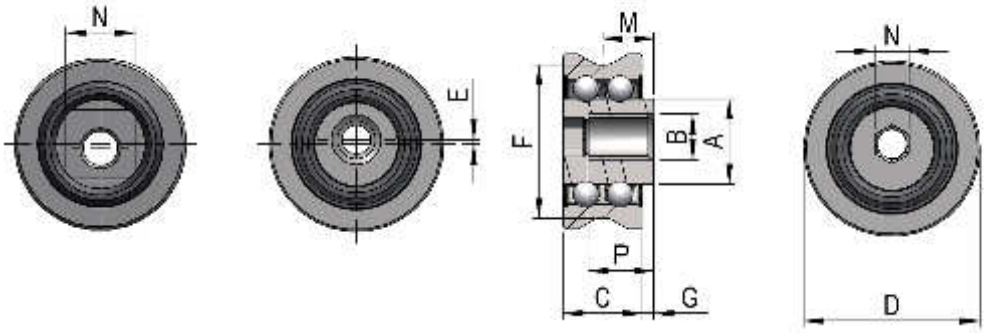


with LAZ
and LAX rail

Code	Co rad (N)	Co ax (N)	Mx (Nm)	My (Nm)	Mz (Nm)	Weight (g)
PAZ40 PAX40	1600	800	9	23	32	430

The ROLLERACE rollers are designed around a double-row precision ball bearing to guarantee both high radial and axial load capacities. The rollers are protected by a double lip sealing system (2RS) to assure long lifetime, even in difficult environments. The integrated roller pivot has concentric or eccentric shape, to allow for preload setting in the different systems.
The bearings are made to precision class DIN620 of core-hardened carbon steel. The rollers are available in series R.V with 2 contact points on the protruding raceways to obtain, a rigid guiding movement.
The R.P has the rollers with some limited floating/compensation capacity, as only having one contact point at the central part of the raceways.
The R.F rollers offer much more floating capacity, as one side is completly flat (only rollers in size 43/63) .
The rollers of size 28 and 43 are also available in INOX stainless steel series R..X. All made from AISI440 steel, core hardened and ground, for applications in corrosive ambients.

Only size 63

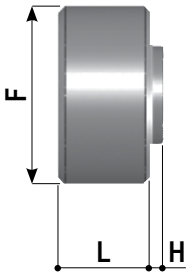


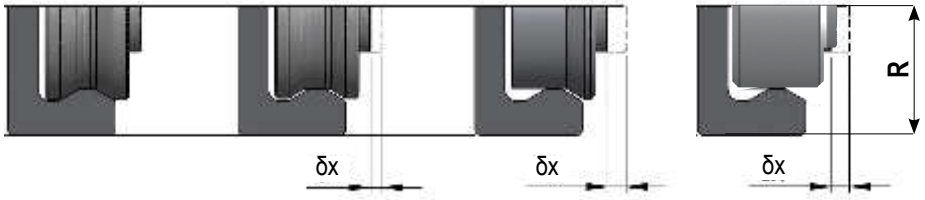
Guiding roller R.V

Floating roller R.P

Freely floating roller R.F

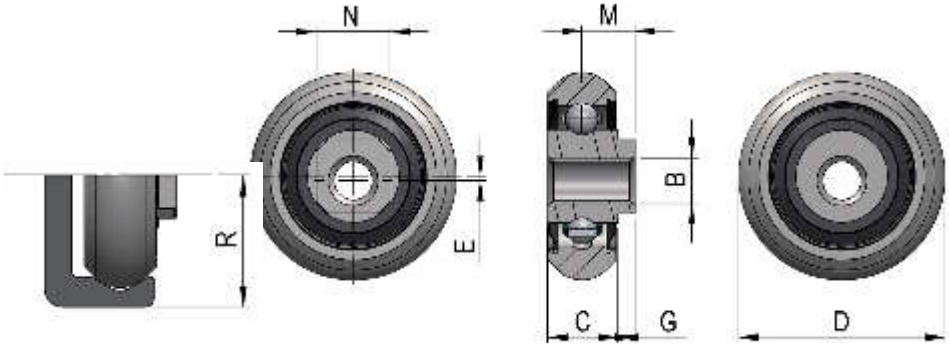
Plain roller R.P





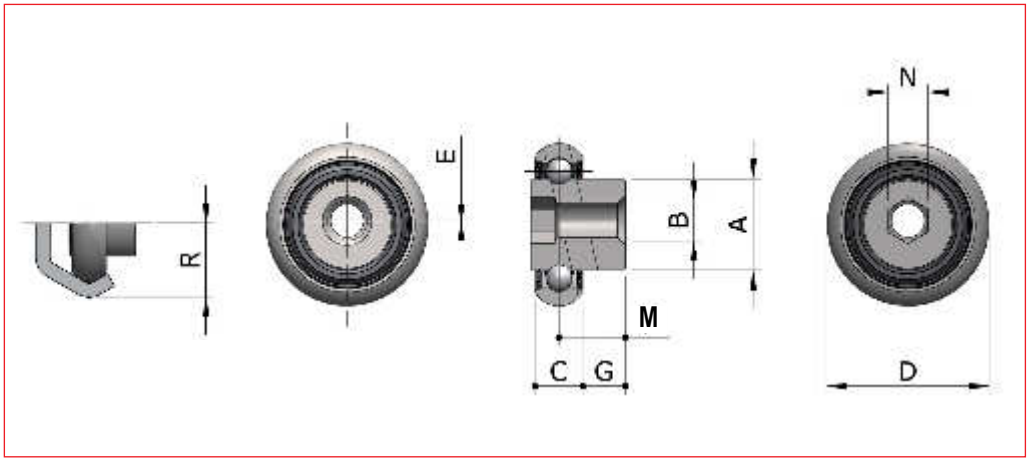
Roller code	Type	E (mm)	D (mm)	C (mm)	M (mm)	G (mm)	N Flat key	A (mm)	B (mm)	P (mm)	R (mm)	F (mm)	L (mm)	H (mm)	Version	Lateral floating δx	For rail	Dynamic coeff. C (N)	Load capacity (N)		Weight (g)
																			Co rad	Co ax	
RCV18G	concentric	0	13,2	7,0	4,6	1,1	Allen key 3	6,8	M4	5,4	8,8				guiding		MRG18	1650	800	230	10
REV18G	eccentric	0,4																			
RCP18G	concentric	0										11,9	2,5	3,4	floating	1 (+/-0,5)					
REP18G	eccentric	0,4																			
RCV28	concentric	0	20,0	9,0	6,3	1,75	Allen key 4	10,8	M5	7,0	13,9	17,6			guiding		MR28	3000	1600	460	20
RCV28X																					
REV28	eccentric	0,6																			
REV28X																					
RCP28	concentric	0											3,0	4,8	floating	1,2 (+/-0,6)					
RCP28X																					
REP28	eccentric	0,6																			
REP28X																					
REU28	eccentric	0,6	17,7									17,7	9	1,8	plain	2 (+/- 1)					
RCV43	concentric	0	30,8	14,0	9,0	2,0	Allen key 6	15,0	M8	10,5	21,3	27,2			guiding		MR43 FXR	7100	3600	1070	50
RCV43X																					
REV43	eccentric	0,8																			
REV43X																					
RCP43	concentric	0	30,4										4,0	7,0	floating	2 (+/-1)					
RCP43X																					
REP43	eccentric	0,8																			
REP43X																					
RCF43	concentric	0											9,0	7,0	freely floating	4 (+3/-1)					
REF43	eccentric	0,8																			
RCU43	concentric	0	27,2									27,2	14	2	plain	4,5 (+3/-1,5)					
REU43	eccentric	0,8																			
RCV63	concentric	0	42,4	15,7	10,95	3,1	Flat key 17 Outer dim. for KMR 63	22,1	M10	18,8		38,4			guiding		FXR	11200	6400	2000	80
REV63	eccentric	1,2																			

Position R refered to FXR rail is indicated at page 26



The rollers of series L.V and P.Z are single row bearings with 2Z steel seals.
The integrated roller pivot has concentric or eccentric shape, to allow for preload setting in the different systems.
The bearings are made to precision class DIN620 of core-hardened carbon steel.
The inner ball-retainer is too made of steel for high temperature applications to withstand high temperature.

Roller code	Type	E (mm)	D (mm)	C (mm)	M (mm)	G (mm)	N Flat key	B (mm)	R (mm)	For rail	Dynamic coeff. C (N)	Load capacity (N)		Weight (g)
												Co rad	Co ax	
LCV28	concentric	0	23,25	7,0	5,9	2,4	Flat key Outer dim. 10 for KML 28	M5	14	ML28	2.400	1.000	250	20
LEV28	eccentric	0,6												
LCV43	concentric	0	35,7	11,0	9,4	3,85	Flat key Outer dim. 13 for KML 43	M8	22	ML43	5800	2500	625	50
LEV43	eccentric	0,8												



The rollers series P.. Are also available in stainless steel INOX AISI440 hardened steel for corrosive ambients.
The INOX rollers comes with 2RS seals and lubricated for life with mineral oil for alimentary application or low temperature applications.

Roller code	Type	E (mm)	D (mm)	C (mm)	M (mm)	G (mm)	N Flat key	A (mm)	B (mm)	R (mm)	For rail	Dynamic coeff. C (N)	Load capacity (N)		Weight (g)
													Co rad	Co ax	
PCZ26	concentric	0	20,3	6	8,5	5,5	Allen key 3	11,2	M5	13	LAZ26	900	400	148	10
PEZ26	eccentric	0,6													
PCX26	concentric	0									LAX26				
PEX26	eccentric	0,6													
PCZ40	concentric	0	32	10	9,65	4,65	Allen key 5	15,0	M6	19,6	LAZ40	1800	800	296	40
PEZ40	eccentric	0,8													
PCX40	concentric	0									LAX40				
PEX40	eccentric	0,8													

FLEXIBLE LINEAR SYSTEM

FLEXRACE a very flexible linear system with unique assembly possibilities.
The FLEXRACE system provides an extremely versatile linear system, with great variety of rail / roller configurations for a wide range of applications. FLEXRACE is designed to be a strong and simple multitask linear system for larger handling and automation applications. It is a Low -cost, easy to assemble system, that offers smooth motion even on inaccurate surfaces.

FXR rail with rollers

Depending on space and capacity requirements, two dimensions of rollers are available, size 43 - 63. The standard rollers are guiding of type R.V, but with use of the floating-rollers R.P43 o r R.F43 and R.F63 a Selfaligning system is easily obtained.
For corrosive ambients INOX rollers are also available in size 43.

Fig. 1

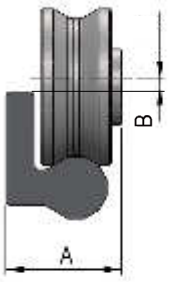


Fig. 2

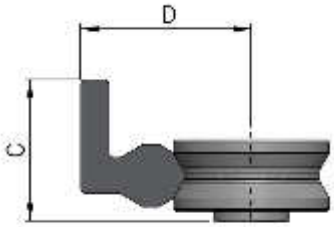
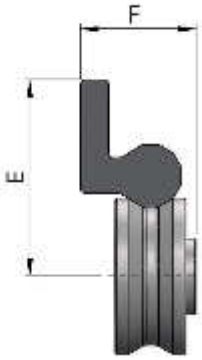
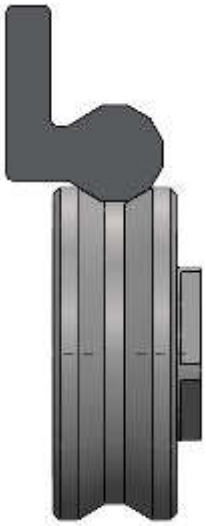


Fig. 3



Rail with roller R.V63



Possible roller positioning with FXR rail

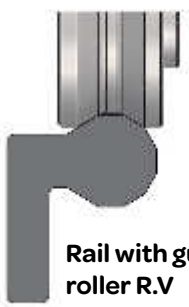
Roller type	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)
R.V43	22,85	0,8	27,9	33,73	38,78	22,85
R.V63	24,8	1	29,85	39,41	44,46	24,8

For complete data and dimensions for rollers, please refer to page 23.

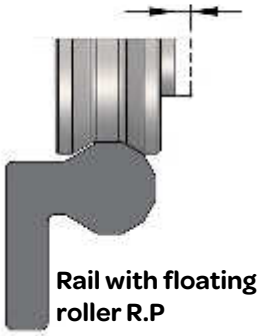
For R.F43=4mm

Lateral floating 1mm (+/-0,5) only for R.P43

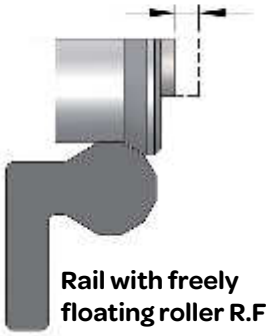
Lateral floating



Rail with guiding roller R.V

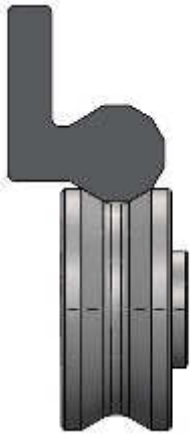


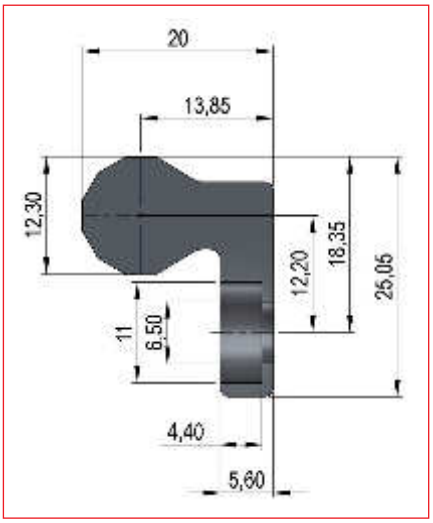
Rail with floating roller R.P



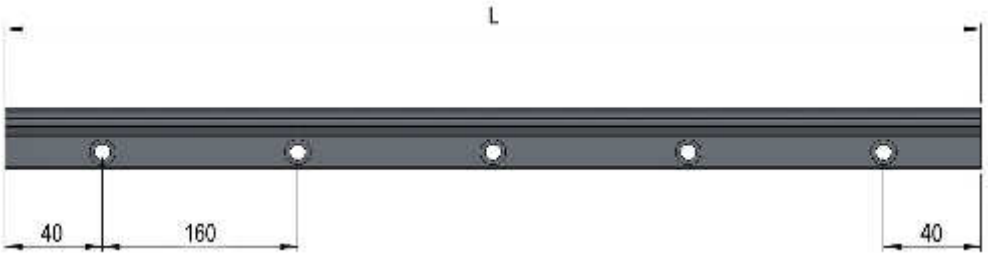
Rail with freely floating roller R.F

Rail with roller R.V43



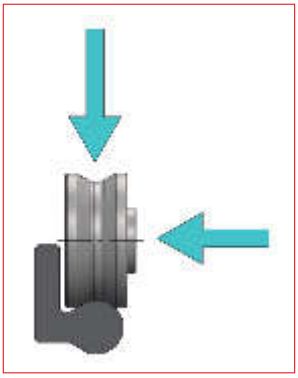


The rail is made from special carbon steel alloy to assure a good nitride hardening with our T RACE-NOX treatment. An innovative hardening technology applied to the linear rail products able to increase the hardness on the surface and in depth, enough to guarantee to support the typical Hertz's stress in the point of contacts with the rollers, and to grant a strong resistance against corrosion, reducing the friction and the wear, for a long life of the rail.
After nitride hardening the rails are processed with an oxidation treatment and subsequently a hot-oil impregnation to assure a nice black color and a high corrosion resistance. Now is also available the version FXR-P80 with holes pitches 80 mm, reccomended for high load application.



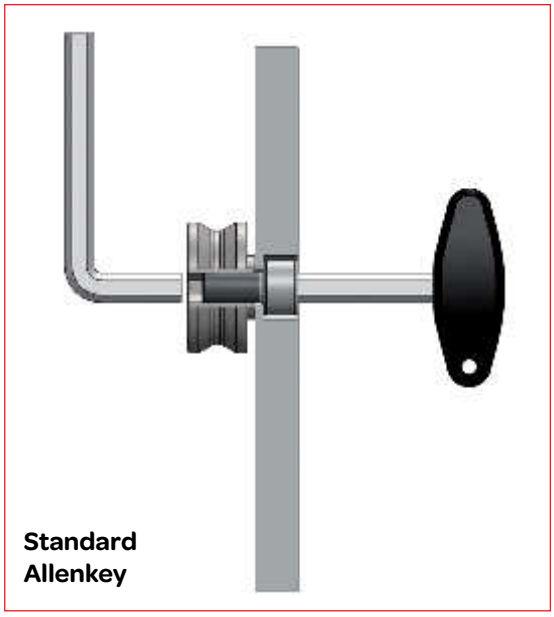
L (mm)												Weight (kg/m)
400	560	720	880	1040	1200	1360	1520	1680	1840	2000	2160	2,09
2320	2480	2640	2800	2960	3120	3280	3440	3600	3760	3920		

Roller positioning



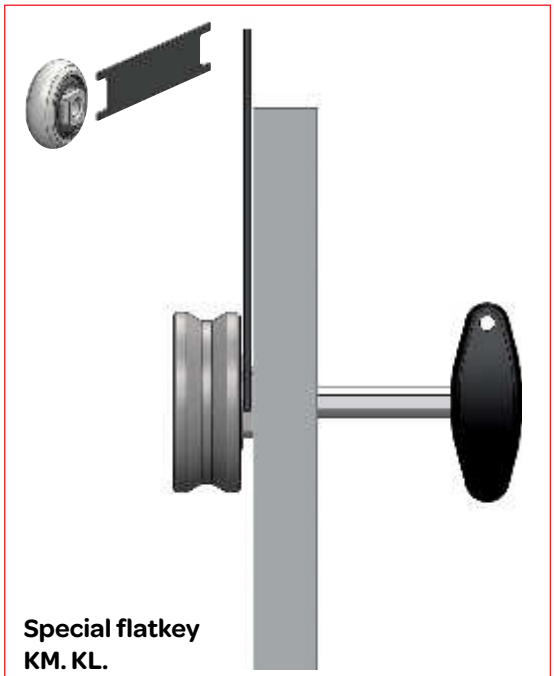
The roller must be correctly positioned with regards to load direction and also with sufficient number of rollers to assure requested load capacity and life-time.
The load capacities are listed on page 23. Generally it is always preferable to position the rollers so the main loads are acting radially on the rollers, as highest load capacity for the rollers, i.e. Co rad. Load capacity is higher than axial load capacity Co ax, as the axial load is only acting on one raceway, compared to two raceways for radial loads.
The rollers must be fixed to complete rigid and plan steel support and fixed with the below indicated tigthning torques for each type of rollers.

While fixing screw of the rollers is maintained blocked with the key on the rear-end, each type of rollers has its own key/tool.
When use of eccentric rollers, it is suggested to use a spring-washer, between screw and roller, to facilitate the preload regulation before final tightening of roller.
The preloading of the eccentric rollers are done, like explained for the sliders on page 32.



Standard Allenkey

Roller type	Roller key	Screw type	Tightening torgue (Nm)
R..18	Allenkey 3	M4	3
R..28	Allenkey 4	M5	7
R..43	Allenkey 6	M8	23
R..63	KMR63	M10	38
L..28	KLM28	M5	7
L..43	KLM43	M8	23
P..26	Allenkey 3	M5	7
P..40	Allenkey 5	M8	23



Special flatkey KM. KL.

Lubrication of rails and rollers

The correct lubrication of rails and rollers is very important to assure long life of the products, in case of high frequency applications. In such cases it is suggested to clean raceways and rollers and re-lubricate every approx. 100.000 cycles, in normal operation conditions.
We suggest to use grease for high precision of type "Classe NLGI2 (ISO2137) .

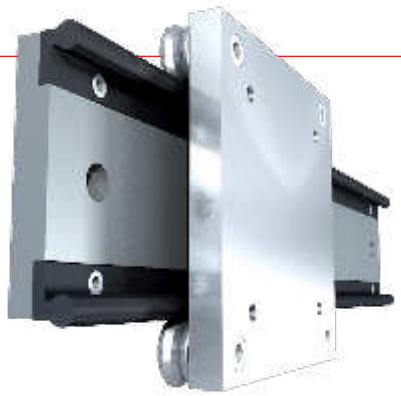
Possible configurations with FXR rails

FLEXRACE
FLEXIBLE RAIL RANGE

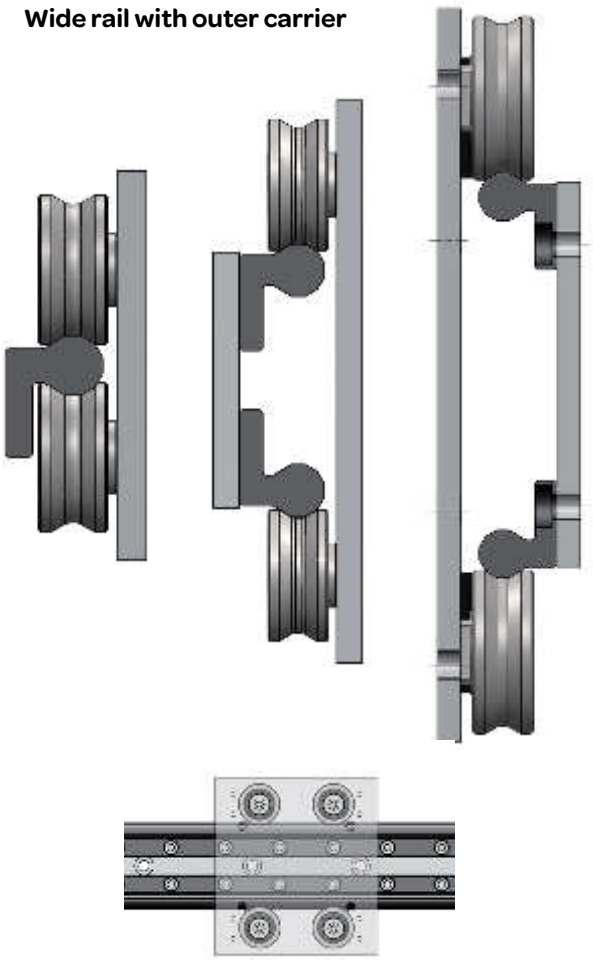
The FXR rail allows for many different rail configurations for linear moments with 2 or more parallel rails fixed to plan or tubolar supports, on which rollers or carriers are running. With its unique 3-raceways, compact and space saving linear solutions can be obtained.
The below illustrated configurations are all customized solutions T RACE have been offering its customers and are made to order. Naturally these solutions can also be made locally by end user, just buying the components, FXR rails and rollers.
If requested T RACE's Technical office can assist to assure correct dimensioning according to requested load/moment capacities.
Main advantages are that linear solutions with high Mx moment capacities can easily be assembled. Solutions which too can substitute a monorail solution with parallel rails.

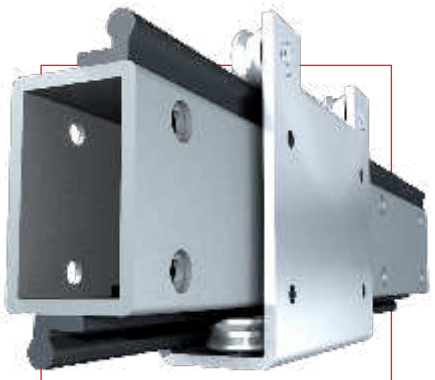
Wide rail with inner carrier

Telescopic slide with rollers. Two elements moving to assure 100% extension.

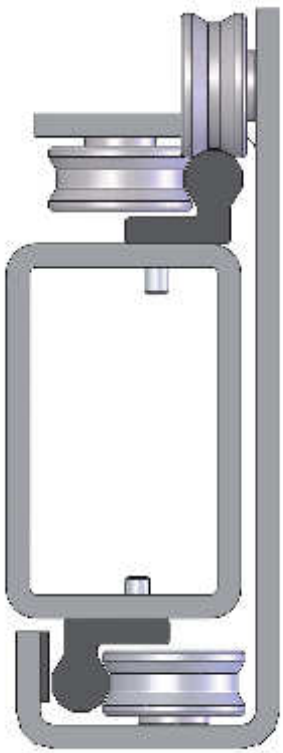


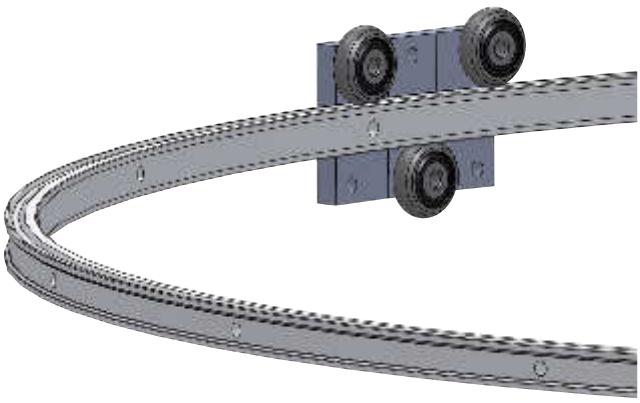
Wide rail with outer carrier





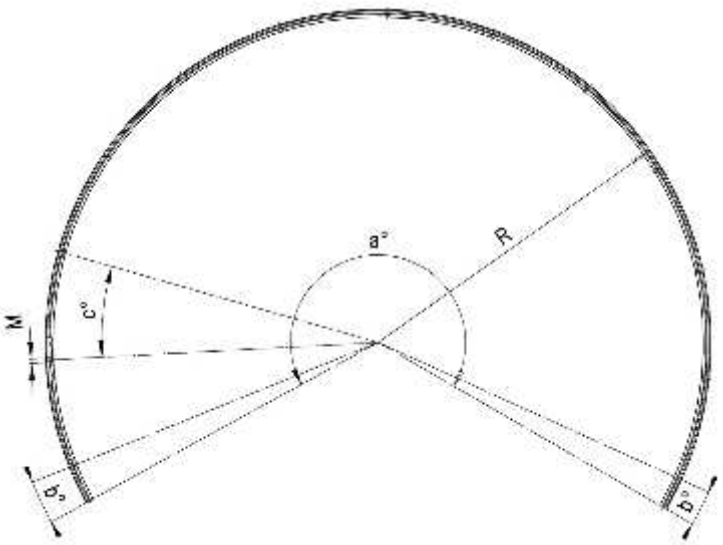
Tubolar rail with external carrier for heavy loads/ moments.





The curve rails of series BSC are made to customers request, based on required radius, not inferior of 500mm, see below table.
The curves radius is according to the requested angle a° with the limitation of lengths of one single rail-length. The rail is made from cold-drawn steel profiles with bright zinc-plating. The rails radial fixing points are also customized according to the below table.
On the rail is running 3-roller sliders, which also is ordered on request, based on the radius. The rollers are single row bearings with 2Z seals.
To assure a good lifetime of the system, we propose to grease regulary, based on the frequency, with grease of type "Class NLGI2" (ISO2137).

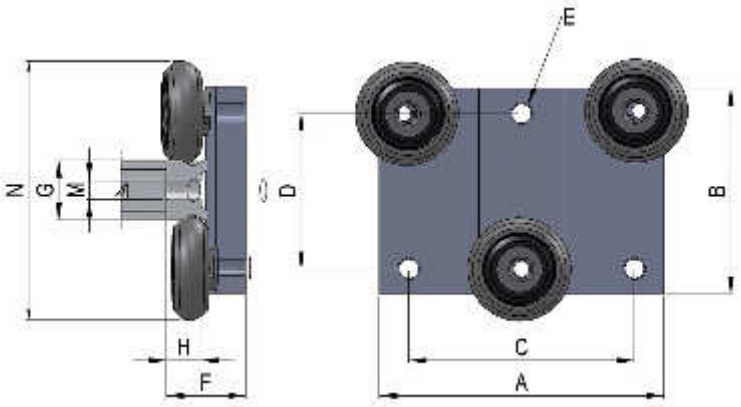
Rail of series BSC

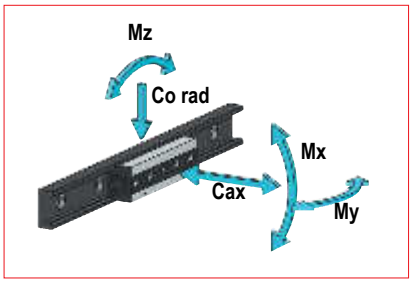


Rail code	Radius of curve R (mm)	Lengths of rails (mm)	Arch of curve a°	Rails fixing holes		
				position b°	pitch c°	M (mm)
BSC28	500 min	3000 max.	on request			Ø 5,5
BSC43	600 min	4000 max.	on request			Ø 6,5

The fixing holes are for screws with cylindrical heads DIN.

Slider series RBS





Rail code	A (mm)	B (mm)	C (mm)	D (mm)	F (mm)	N (mm)	H (mm)	G (mm)	E (mm)	Load capacity (N)				
										Co rad	Co ax	Mx	My	Mz
RBS28-3	60	50	40	35	17,3	53,7	6,4	14,4	M5	800	400	2	6	8
RBS43-3	90	80	60	58	24,7	90,7	12,2	21	M6	1600	800	6	18	24

Linear Rail Mounting

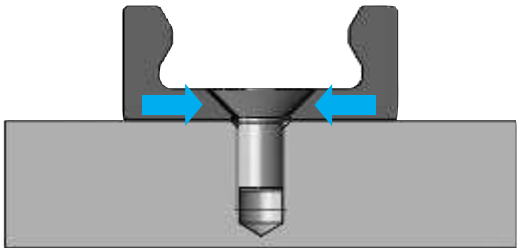
The availability of both countersunk (S-type) and counterbored (L-type) rail mounting holes allows optimization of alignment and orientation of the rails, depending on load direction and geometry.

Generally the countersunk S-type rail is mounted with flathead screws and does not require special alignment, because the taper of the fastener and rail mounting hole, forces a rail into a specific position. Such rail mounting holes, allow for easy and fast rail installation, however the precision of the tapped hole placement in the mounting surface will affect the position of the rail.
The counterbored holes in L-type rails allows for a small amount of lateral movement during installation.
This type of mounting is preferred when the tapped holes in the mounting surface are not precisely placed. This type of mounting holes are necessary, when aligning the rail with an external reference surface, as the holes will allow the rail to move slightly, to sit against the reference surface.
The rail must be secured to a structure sufficiently rigid to support the full load. The surface mounting holes should include a chamfer as shown in the table.

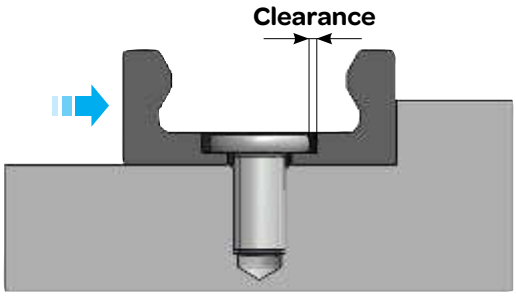
Slider Assembly

R sliders for MR and ML rails, have threaded holes parallel with the holes of the rail and aligned within the tolerance shown on page 36. In case of more sliders in same rail, the misalignment of the fixing holes of various sliders is compensated by making a bit larger holes on the fixing structure.
It is recommended to only fully tighten the sliders mounting screws after installing all sliders in all the rails.
This allows the sliders to align to the rail, avoiding creating additional stress on the sliders.R_S and RLS sliders have a slim slider body and allow for double slider fixing, with either threaded holes (standard) or a through hole, by adding a "C" designation to the part number (i.e. RLS28C-3).
In case of through holes, it is advisable to drill some holes in the rail for access to the screws, for tightening after the sliders with screws are inserted into the rail. The RT sliders have mounting holes perpendicular to the rail mounting holes and offer the options of mounting from above or from below.
In case where two sliders in respective version A and B, are installed in same rail, it might be necessary to shim the slider body thicknessupport, as eventual presence of minor misalignement (see tolerance on page 36) of slider body thickness.

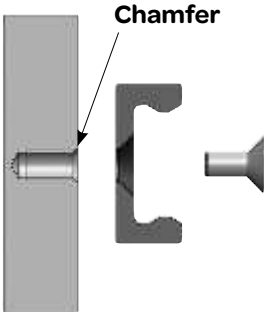
Rail with Countersunk holes – Type-"S"



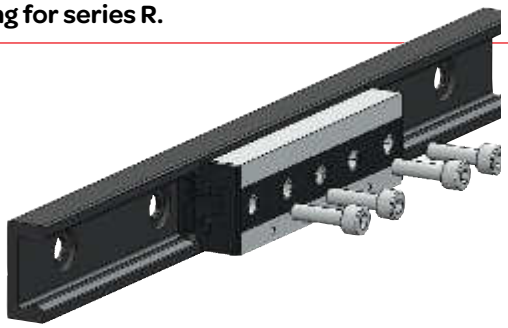
Rail with Counterbored holes – Type –"L"



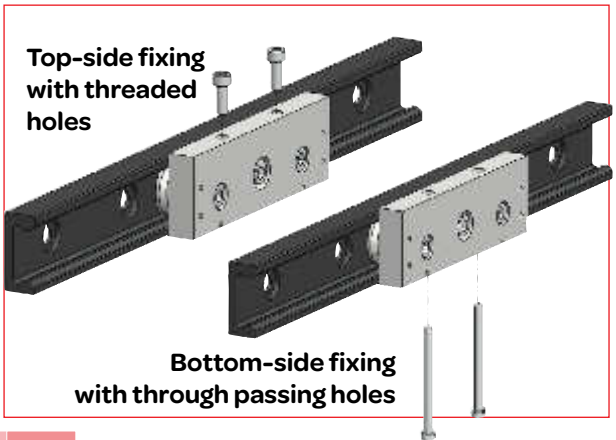
Rail type	Chamfer (mm)
MRG18	0.5x45°
MR28	1x45°
MR43	1.5x45°
ML28	1x45°
ML43	1.5x45°



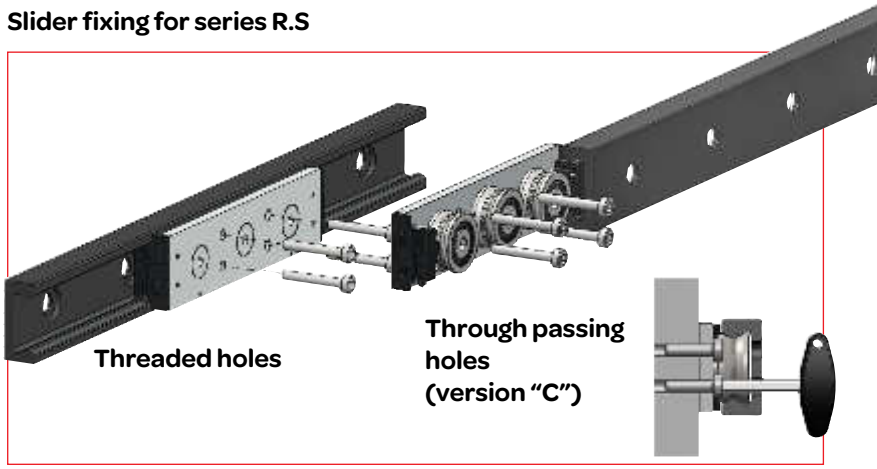
Slider fixing for series R.



Slider fixing for series R.T



Slider fixing for series R.S



Examples of Mounting Arrangements

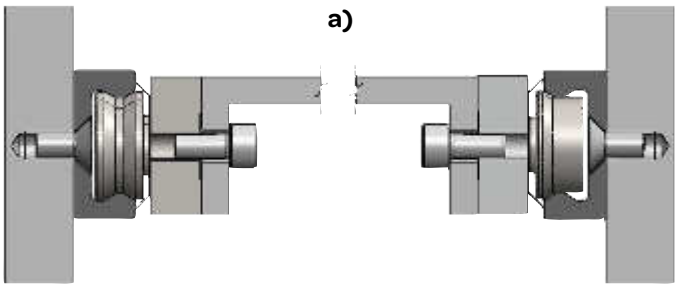
a) A pair of rails mounted on facing walls with S-type mounting holes, for fast installation. Combined with self-aligning RA sliders (rotating) and RP or RF sliders (floating), such linear system is capable of self adjusting for some mm of parallelism errors between the two walls, see also page 37 for further info.

b) A pair of rails mounted to the same horizontal surface with "L" brackets to rotate the rails so they are loaded radially. The "L" type rails with counterbored holes are used to ensure full support of the rail on the horizontal surface. RVT sliders are fixed to a plate from above. Use of "L" type rails provides maximum rigidity of parallel rails.

c) Rails are mounted on perpendicullar surfaces. The upper rail is of type S with countersunk holes for quick mounting and combined with a RAT slider to support the weight, but also for allowing some rotational movement. The lower rail is with counterbored holes to allow rail adjustment against the vertical surface and is combinded with an RFS slider to allow for unlimited vertical compensation. The system simplifies installation and allows alignment of the rails on both the vertical plane and horizontal plane.

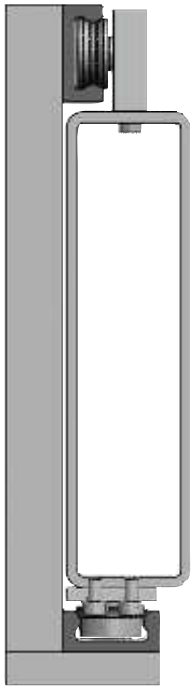
d) Rails are mounted flat on a horizontal surface and loaded axially.
The two rails are "L" type with counterbored mounting holes to allow proper rail alignment. One of the two rails should be pushed against a lateral support for precise alignment of the movement's linearity. The sliders are fixed to a carriage plate and the second rail is fastened in place while moving the carriage assembly along the full travel to ensure parallelism of the rails. The RV-sliders offer maximum stiffness and load capacity in the axial direction

a)



MR43S/RA43-3 MR43S/RF43-3

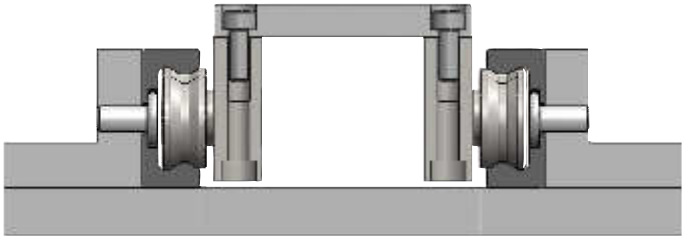
MR43S/RAT43-3



MR43L/RFS43-3

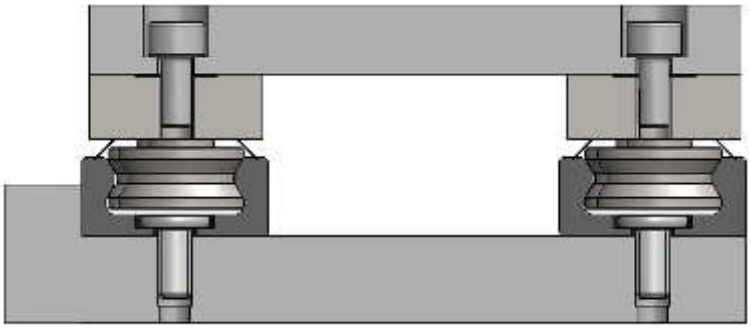
c)

b)



MR43L/RVT43-3 MR43L/RVT43-3

d)

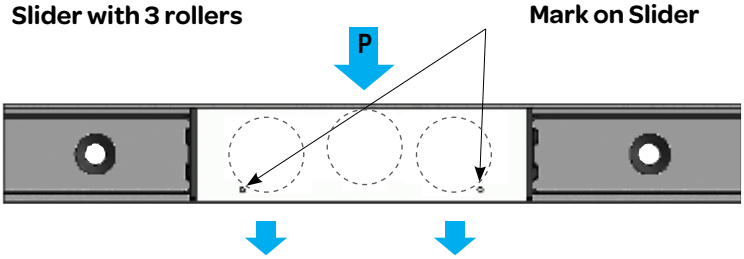


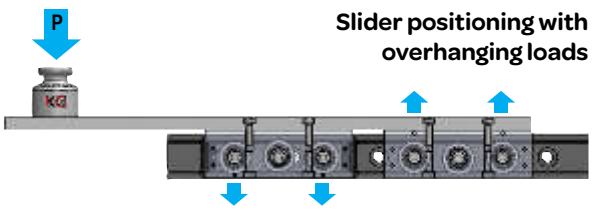
MR43L/RV43-3 MR43L/RV43-3

Slider orientation

Sliders with 3 and 5 rollers provide maximum load capacity in the radial direction with the greater number of rollers on the same raceway of the rail. The side is marked with two circular impressions on the slider body.
For example, sliders carrying a load as shown in the picture below should be oriented with the marks opposite the load direction.
The marks indicate where the maximum reaction force is available.

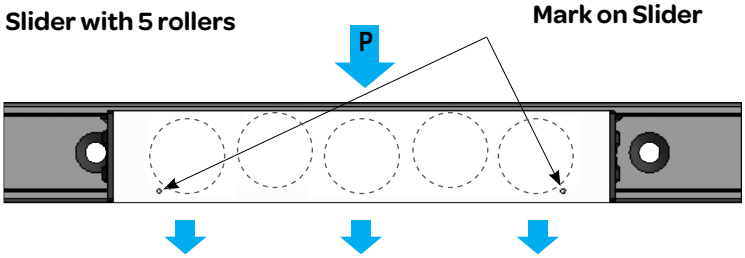
Slider with 3 rollers Mark on Slider





Slider positioning with overhanging loads

Slider with 5 rollers Mark on Slider



When the sliders are ordered mounted in rail, the preload setting is done in factory, with our regolation instruments to assure a standard light preload P1, to assure no play and with optimal smooth running.
As there might be minor differences of internal raceway distance, between same type of rails, already preload set sliders should not be used for other rails. I.e. each slider must be preload set to each rail.
When sliders are purchased separately from the rail, the preload setting is done according to below procedure, depending on whether the slider is type R_ or RL or LA.Preload setting is permitted for all sliders by the eccentric roller; one for 3 roller-sliders or two eccentric rollers in case of 5 roller-sliders. The adjustable eccentric rollers should be in contact with the opposite raceway of the fixed-rollers, which are all concentric rollers :

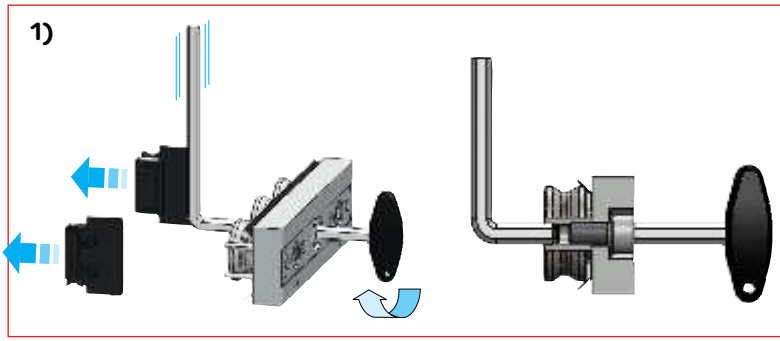
Procedure for preload setting of sliders serie R.

To make the preload setting, one must act on the top screw, tightening the eccentric wheel (only accessible screw left on the top cover band) and the pivot of the eccentric roller, - on the other side. 2 Allen keys are needed.
1 - Verify that the raceways are clean, take the wipers off, to obtain a more sensitive feeling for correct preload setting and smooth running.
2 - Tighten the top-screw, but not too much, to allow a firm turning of the eccentric bottom-pivot, maintaining the roller tight to slider body.
3 - Turn the eccentric pivot so that the roller is roughly aligned with the concentric rollers or slightly in the opposite direction of the concentric rollers.
4 - Block the rail on a stable support, so hands are free. Insert the slider into the rail. Insert the Allen key into the pivot, through the rail fixing hole. Turn the Allen key slightly, so that the eccentric roller is coming in light contact with the raceways, opposite the fixed rollers. During the rotation, accompany the top-screw while rotating in the same direction with second Allen key, in order to avoid any loosening or change in preload setting.
5 - Move the slider along the whole rail length to find the part/point, where the slider moves with less friction/most oscillations. By pressing/pulling the slider ends, any oscillation is detected. If any oscillation/play is noted, the eccentric roller must be re-adjusted. Perfect preload setting is achieved, when the slider moves very smoothly and with no play at this point, with "widest" raceway distance.
The checking for oscilation is not possible for type: RA rotation slider or floating sliders RP, RF.
6 - Holding firm against the Allen key, engaged in eccentric pivot with one hand, while with other Allen key rotate and tighten the top-screw fastening the roller. WARNING! Do not lock or unlock the eccentric roller by turning the pivot, always only act on the top-screw for blocking/loosening the roller.
7 - It's possible to verify the amount of preload by slowly inserting the slider at the end. The inserting force Fi is proportional to the preload. In general a good setting correspond to the following min/max. forces shown in Table 6b.
8 - Then make final roller/screw blocking using a torque wrench, to assure right closing torque (Mt) according to the values in Table 7b, while maintaining the Allen key in pivot, to prevent any change of preload setting.

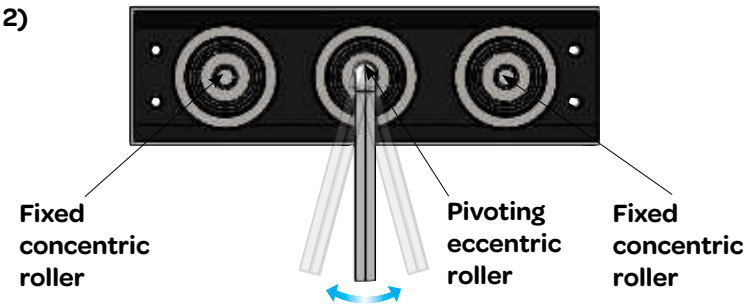
For 5-roller sliders, the above steps are repeated for each of the two eccentric rollers. When adjusting the second eccentric roller, it is necessary to visually assure, that the roller has got in contact with the raceway, to hereby rotate in opposite direction, compared to the fixed rollers, when moving the slider. This can be seen through the rails fixing holes. The homogeneity of preload setting, between the two eccentric rollers, can be verified by simply inserting the slider with the other end, i.e. after turning the slider 180 degrees.
WARNING! After preload setting, assure that slider is inserted with fixed rollers positioned in direction of applied load.
In case the rail is already installed, so no longer accessable from behind, the preload is set outside the rail, by tentatively positioning of the eccentric roller in more steps, to finally obtain a smooth movement with no slider oscillation in the installed rail.

Preload setting of sliders series R.

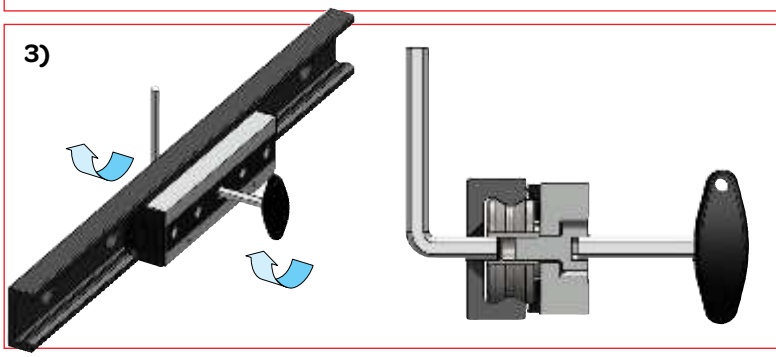
1)



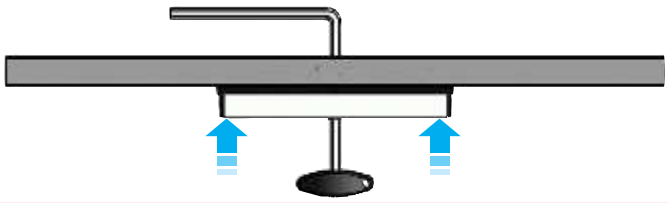
2)



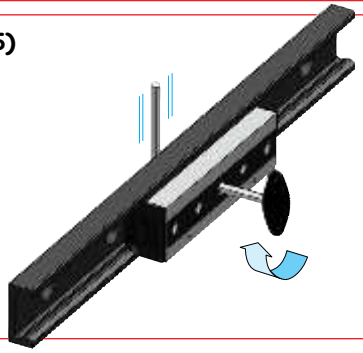
3)



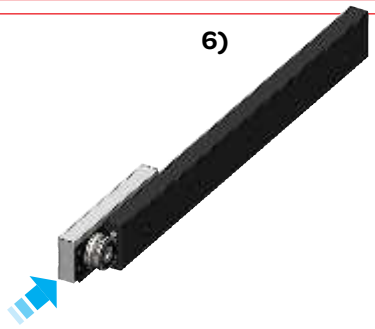
4)



5)



6)



7)

Slider type	Fi - Inserting force	
	min	max
R.18	0,5 N	2 N
R.28	1 N	5 N
R.43	2 N	10 N

Slider type	Mt - Tightning torque
R.18	3 Nm
R.28	9 Nm
R.43	22 Nm

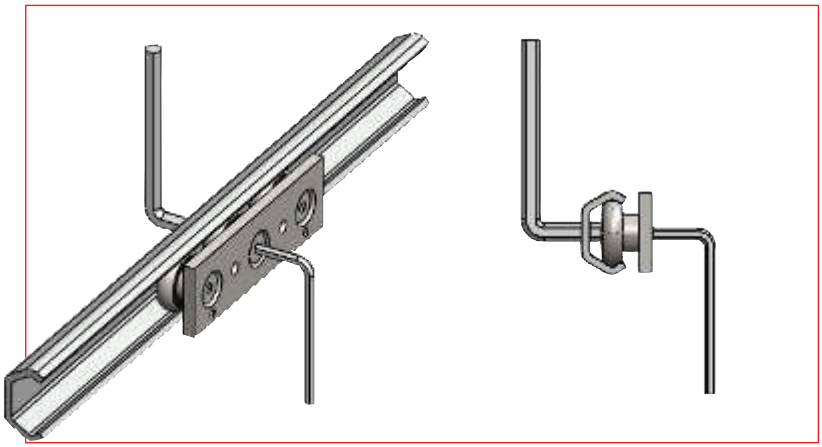
Procedure for preload setting of sliders serie PAZ, PAX .

The PAZ/PAX sliders, like the R-sliders, have the preload setting done by adjustments of the central roller with eccentric pivot.
The preload setting is done with 2 Allen keys and is similar to R-sliders, described on page 32.
The closing torque Mt and inserting force for these sliders are shown in below tables.

Slider type	Mt - Tightning torque
PAZ/PAX 26	7 Nm
PAZ/PAX 40	23 Nm

Slider type	Fi - Inserting force	
	min	max
PAZ/PAX 26	1 N	5 N
PAZ/PAX 40	1 N	5 N

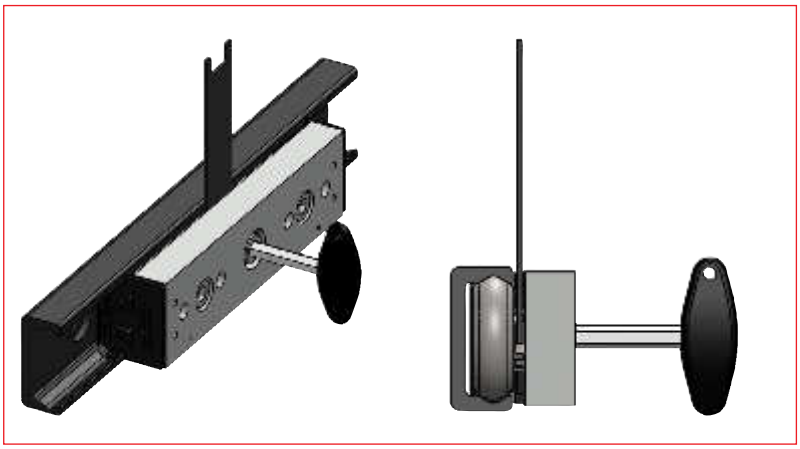
Preload setting of slider series PA.



Procedure for preload setting of sliders series RL.

The RL sliders have unlike the R series, a special central square pivot accessable with a flat key inserted between slider body and eccentric roller.
With this flat key, provided by TRACE, the correct preload setting is done following the concepts of adjustments described in page 32.
While having the slider already inserted in rail.
With this pivot concept, slider preload setting is too possible, while having both rail and slider already been installed.

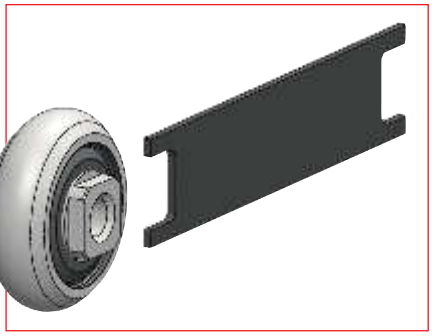
Preload setting of slider series RL.



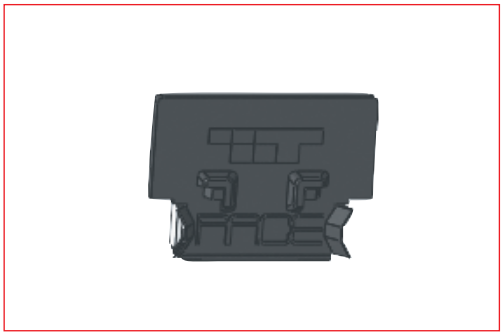
Slider type	Mt - Tightning torque
RL28	7 Nm
RL43	23 Nm

Slider type	Fi - Inserting force	
	min	max
RL28	1 N	5 N
RL43	2 N	10 N

Regulation key KML



Wipers for replacement series KT.



The flat key for preload setting of RL-sliders is supplied free of charge, on request. NB two type of keys, ref. below table.

Slider type	Code for flat key
RL28	KML28
RL43	KML43

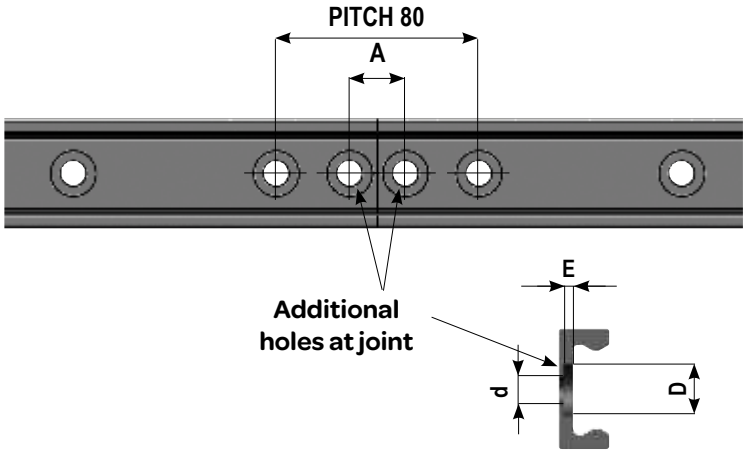
Wiper codes	Slider type
KT- 18	R.18
KT-28	R.28, R. T28
KT-43	R.43, R. T43
KTL-28	RL28
KTL-43	RL43
KTS-28	R. S28
KTS-43	R. S43
KTLS-28	RLS28
KTLS-43	RLS43

Lubrication of raceways

All sliders, except PAZ and PAX series, are supplied with strong wipers with incorporated pre-oiled sponge, to provide a good greasing for a long period of operation. See table a right side for wiper codes for all sliders. The duration of this self-lubrication dependents on the employmental conditions and the level of environmental pollution. Usually under normal conditions, the self-lubricant wipers can last about 700 km, however they can easily be replaced with a kit of new wipers with sponge.
The rollers are all, lubricated for life with grease of lithium type soap. The R_sliders have 2RS seals, while RL-sliders have metal 2Z seals.
Lubrication is very important to assure a long operation life. For applications with high frequency and continuous movement, it is advisable to regularly clean the raceways and relubricate the sliders for every 100,000 cycles, depending on the operation environment. Grease of class NLGI2 (ISO 2137) is then recommended.

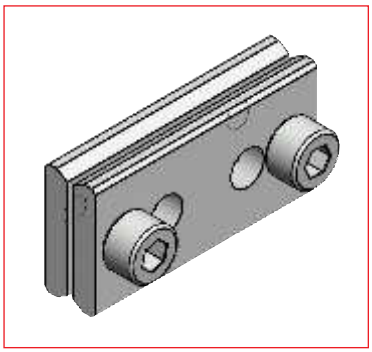
MR and ML rails can be supplied in longer lengths than offered in catalog, by splicing multiple rail segments together. These spliced rails must be ordered from the factory, while specifying the total length and the lengths of individual segments : "Example: MR43-6000 (4000 + 2000)" The spliced rail will be delivered in preselected segments length and with additional counterbored mounting holes added to the joining locations, in addtion to ground ends.
The customer must add additional mounting holes in his structure for these additional holes at the joining location. End-screws for joining is too supplied free, same type as the standard screws for rails with cylindrical fixing holes.

Joining area for spliced rails

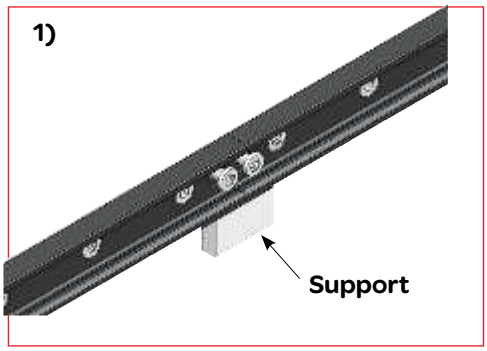


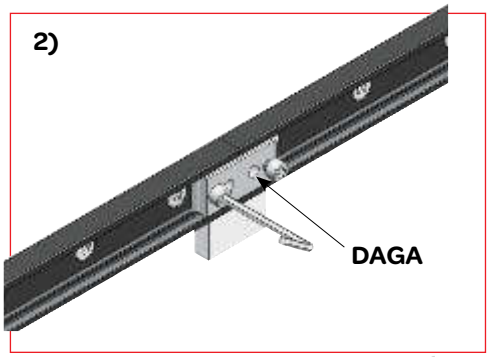
Alignment tool for spliced rails DAGA.

To assure a correct alignment of the rail ends, an appropriate alignment tool can be purchased as a separate item. See drawing/table for product describtion and codes, at right side.



Rail type	Joining screws	Alignment tool	A	D	d	E
MRG18	M4-TORX SP	DAGA-MR18	16	9	5	1,9
MR28	M5-TORX SP	DAGA-MR28	16	11	6	2
MR43	M8-TORX SP	DAGA-MR43	22	18	10	3,2
ML28	M5-TORX SP	DAGA-ML28	16	11	6	2
ML43	M8-TORX SP	DAGA-ML43	22	18	10	3,2
FXR	M6-DIN 7984	DAGA-FXR	20	10,5	6,5	4,4





Installation instructions for rails composed of more lengths

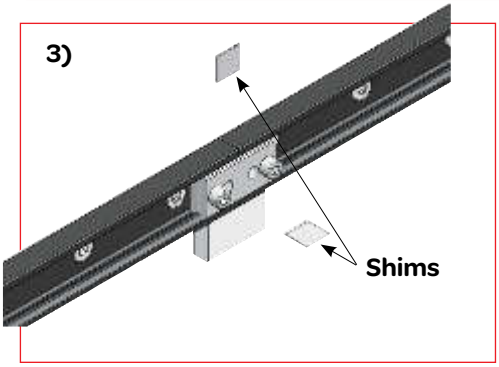
1) Begin by supporting the two rail segments at the splice location. Develop a support guide in the area of joining lengths. Insert the alignment tool DAGA from one end of the rail. Install the mounting screws including the two at the splice location, but do not fully tighten them, to allow for small rail movements.

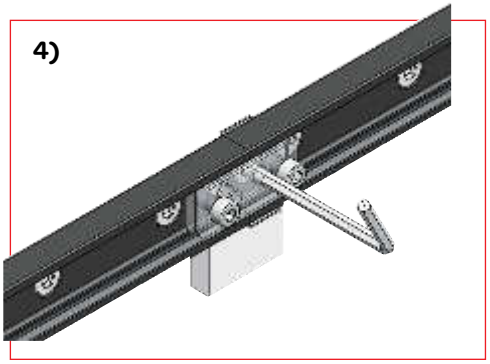
2) Place the alignment tool over the splice. Tighten the alignment tool screws to align the rail segments.

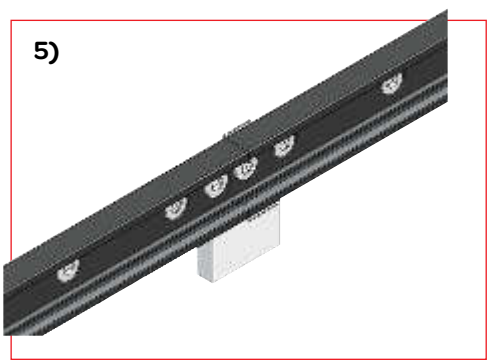
3) Verify that rail mounting surfaces (back side and lateral side of the rail) are aligned. If not, it may be neccessary by use of shims, to maintain aligment after the mounting bolts are tightened and the alignment tool is removed.

4) Tighten the bolts at the splice location by passing the Allen key through the holes in the alignment tool. Tighten the other mounting bolts in the rails.

5) Loosen the alignment tool and remove it from one end.

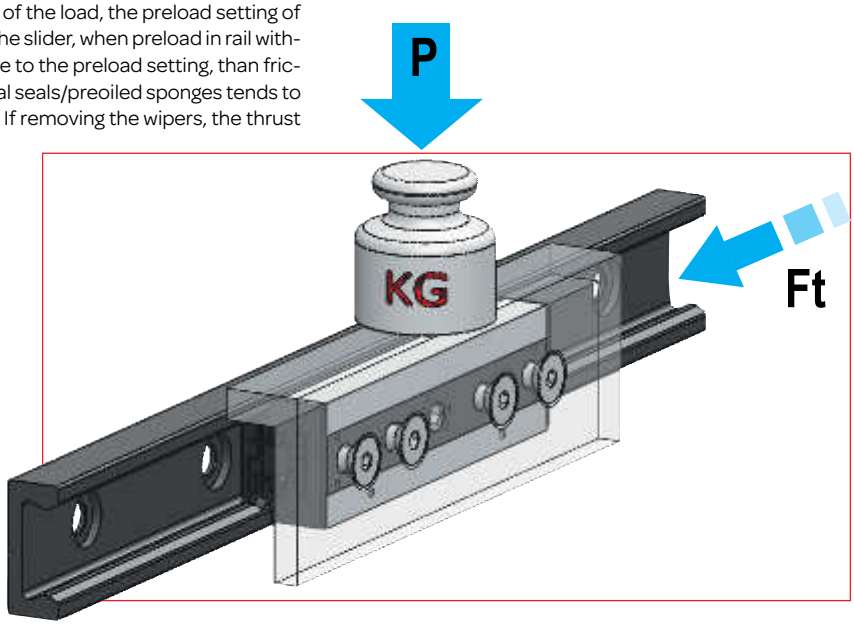






Thrust force

The force required to move a slider is contingent on several factors, which are summarized to each other in releation to the application. I.e. the actual load applied, the direction of the load, the preload setting of the slider, friction of wipers/lateral seals and bearing seals. In principle the slider, when preload in rail without a load applied, may require a thrust force of Fw, which is mainly due to the preload setting, than friction caused by wipers. Especially the friction generated by wipers/lateral seals/preoiled sponges tends to decrease after an initial period, as adapting their shapes the raceways. If removing the wipers, the thrust force Fo is then only based on the slider preload setting. The thrust force from slider preload setting may varie along the rail, due to minor parallellism tolerance of the rails internal raceways.
The thrust force Ft of the slider with a radial load P applied, is approximately proportional to the load as a coefficient function of friction of the wheels, increased by the thrust force Fw from wipers and preload setting.



Ft =(P x μ)+Fw

In case that slider is without wipers the value Ft results by:

Ft =(P x μ)+Fo

The below table shows the indicative values of Fw and Fo of a minimum value and a maximum value, depending on the preload setting of the slider. The result of Ft simplified formula is reasonably valid for applied loads greater than 10% of the maximum permissible load. For lower loads the coefficient of friction is increased up to twice the original value.

Slider type	Fo Static friction of slider without load and without wipers	Fw Static friction of slider without load and with wipers	μ Friction coefficient of rollers
R.18	from 0,2 N to 0,5 N	from 1 N to 1,5 N	0,005
R.28	from 0,5 N to 1,5 N	from 2,5 N to 3,5 N	0,005
R.43	from 1 N to 3,5 N	from 6 N to 10 N	0,005
RL/RLS/R.S28	from 0,5 N to 1,5 N	from 2,5 N to 3,5 N	0,005
RL/RLS/R.S43	from 1 N to 3,5 N	from 6 N to 10 N	0,005
PAZ-PAX	from 0,1 N to 0,6 N		0,008

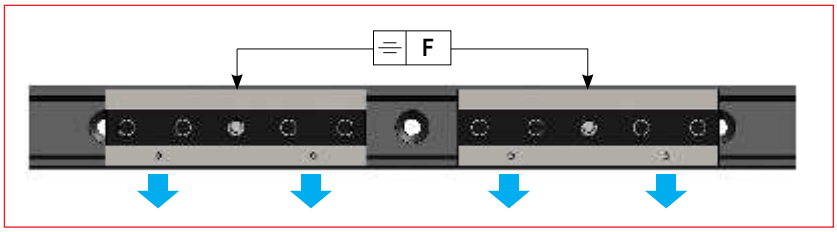
Noise and speed

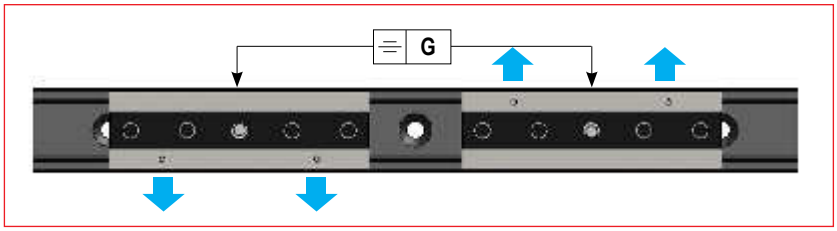
T RACE's roller sliders offer high operating speed up to 10m/s, with almost no noise, when compared to recirculating ball-sliders. The table on right side, shows the max. speed for different slider types. The R sliders with wipers and lateral seals, may emit a minor friction noise at no applied load, which however tends to decrease during use, as the parts adapt to the shapes of the raceways

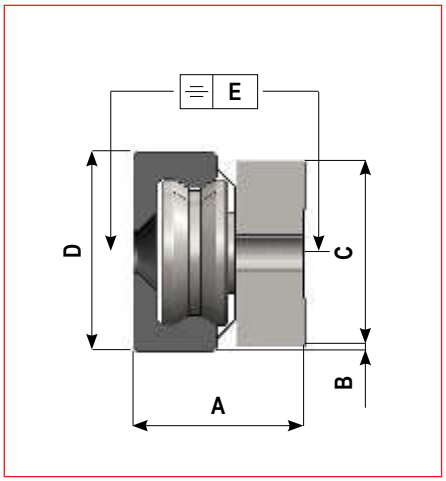
Slider type	Max. speed
R.18	5 m/s
R.28	7 m/s
R.43	10 m/s
RL/RLS/R.S28	7 m/s
RL/RLS/R.S43	10 m/s
PAZ-PAX	5 m/s

Construction tolerances

The construction tolerances for the assembled dimensions of rails with their relative sliders are shown in below table. This too in relation to the rail mounting hole tolerances and mounting holes of the sliders.
In particular, it is necessary to take into account the possibility that the axis of slider symmetry, may be slightly misaligned with the axis of symmetry of the rails. This mismatch may be larger in case of use of two sliders in same rail, of which one is postioned with load direction in opporsite load directions.
This misalignments can be compensated while making the fixing holes sligthly larger on both fixed and mobile parts.



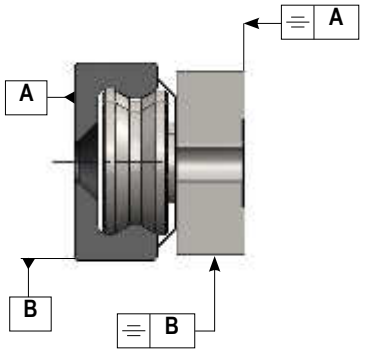


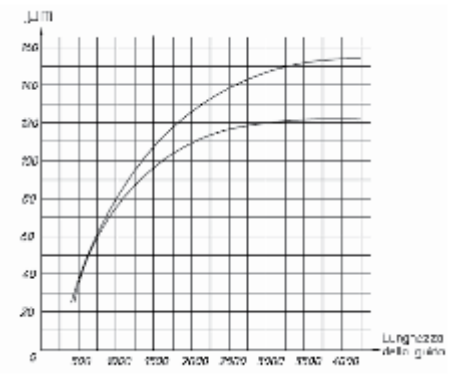


Rail type	Slider type	Tolerance						
		A	B	C	D	E	F	G
MRG18	R.G18	+0,15/-0,1	+0,2/-0,25	+0,05/-0,05	+0,2/-0,2	+0,3/-0,35	0,2	0,8
MR28	R.28	+0,15/-0,1	+0,2/-0,25	+0,05/-0,05	+0,2/-0,2	+0,3/-0,35	0,2	0,8
	R.S28	+0,1/-0,15	+0,25/-0,25	0/-0,1	+0,2/-0,2	+0,35/-0,35	0,3	1,0
	R.T28	+0,1/-0,15	+0,25/-0,25	0/-0,1	+0,2/-0,2		0,2	0,8
MR43	R.43	+0,15/-0,1	+0,2/-0,25	+0,05/-0,05	+0,2/-0,2	+0,3/-0,35	0,2	0,8
	R.S43	+0,1/-0,15	+0,25/-0,25	0/-0,1	+0,2/-0,2	+0,3/-0,35	0,3	1,0
	R.T43	+0,1/-0,15	+0,25/-0,25	0/-0,1	+0,2/-0,2		0,2	0,8
ML28	RL28	+0,1/-0,15	+0,25/-0,25	0/-0,1	+0,2/-0,2	+0,35/-0,35	0,2	1,0
	RLS28	+0,1/-0,15	+0,25/-0,25	0/-0,1	+0,2/-0,2	+0,35/-0,35	0,2	1,0
ML43	RL43	+0,1/-0,15	+0,25/-0,25	0/-0,1	+0,2/-0,2	+0,35/-0,35	0,2	1,0
	RLS43	+0,1/-0,15	+0,25/-0,25	0/-0,1	+0,2/-0,2	+0,35/-0,35	0,2	1,0
LAZ26, LAX26	PAZ26, PAX26	+0,25/-0,25	+0,4/-0,4	0/-0,1	+0,3/-0,3	+0,5/-0,5	0,3	1,0
LAZ40, LAX40	PAZ40, PAX40	+0,25/-0,25	+0,4/-0,4	0/-0,1	+0,3/-0,3	+0,5/-0,5	0,3	1,0

Linear Precision

The linear precision as the deviation of the sliders actual trajectory in relation to a theoretical straight line, is determined by the straightness of the surface in which the rail is fixed and the intrinsic precision of the rail. In reference to the linear precision of the sole rail, it is determined by the parallelism of the slider movement with respect to the two longitudinal planes of the rail, plan A and B.
The values of A and B are shown in the below chart, as a function of the rail length = actual slider movement.
The linear accuracy indicated in relation to plane A, is only achievable if the rail is fixed onto a perfectly straight/flat surfaces, using all mounting holes. The linear accuracy indicated in relation to the side B is achievable only for rails with counterbored mounting holes, of series "L" , after having aligned the rail against a perfectly straight reference side. In case rails with c'sunk mounting holes is used, the linear precision is related to the straightness of the structures mounting holes.
The guide does not set free may not be perfectly straight (slightly arched on plan A) with no problem once clamped to a rigid structure.

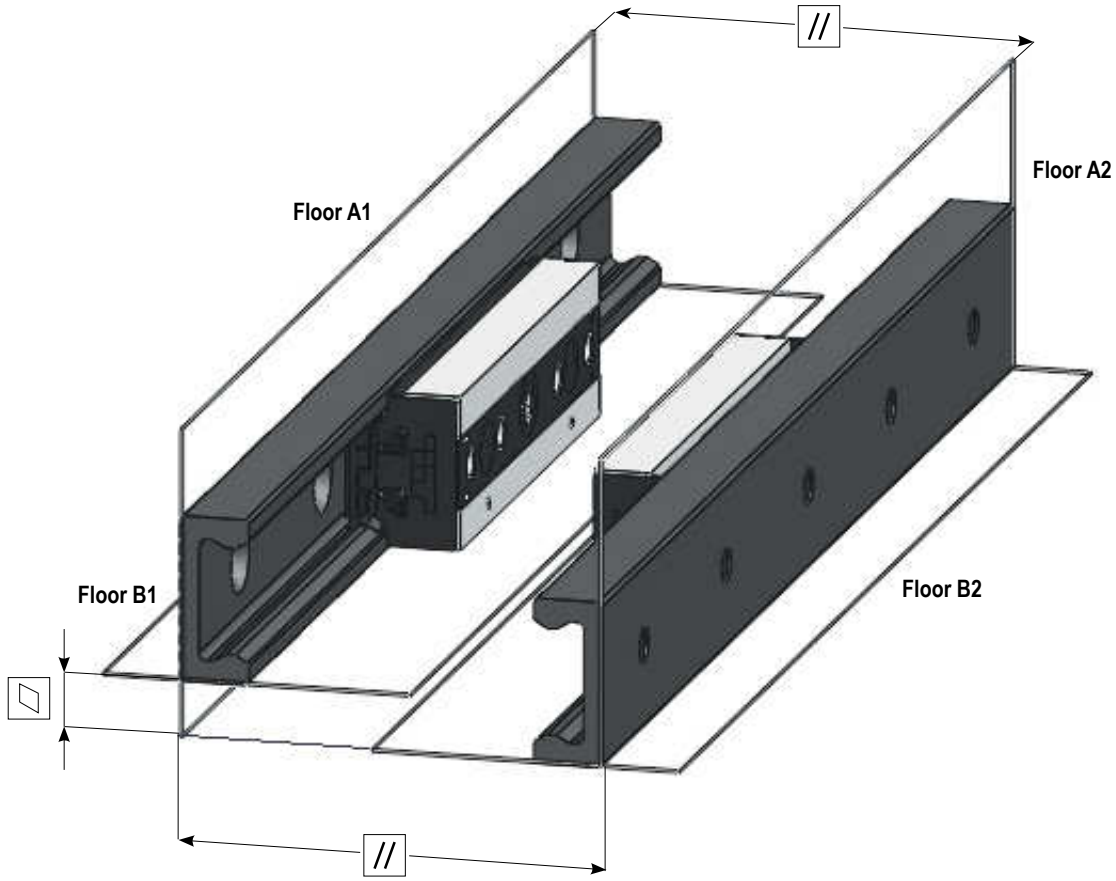




Assembly tolerances for two parallel rails

When two rails are used in parallel, it is necessary that the structure surfaces on which the rails are fixed, are parallel on different levels, with tolerance values within the figures given in below chart.
Errors of parallelism greater than the values listed may cause additional load on rollers and rails, which hereby reduce the nominal load capacity and expected life-time (see coefficient of use page 38).
In case of particularly high error values, it may also compromise the functionality movement.
The MR rails combined with sliders of type RA, RP or RF can compensate larger mounting errors, due to the rollers contact geometry (see page 9).

Hereby such Selfaligning system, can within certain limits, avoid additional load on rollers, which otherwise could compromise correct function of the linear system.
The rails of series ML and LA do not provide such geometry Selfaligning compensation, but they are structurally more flexible (bearings with single row of balls, rails with less rigid raceways as thinner) and hereby able to accept a reasonable error of parallelism, corresponding to an additional internal load, when the errors are within the values listed in below chart.



	Slider combination		Acceptable parallelism error (mm)		
Pair of parallel rails	**Sliders in rail A**	**Sliders in rail B**	**Between level A**	**Between level A**	**Between level B***
MRG18	RVG18	RVG18	0,03	0,02	0,5
	RAG18	RPG18	1	0,4	8
MR28	RV28, RVS28	RV28, RVS28	0,04	0,02	0,6
	RA28, RAS28	RP28, RPS28	1,2	0,5	9
	RA28, RAS28	RF28, RFS28	3	0,5	8
MR43	RV43, RVS43	RV43, RVS43	0,05	0,04	0,7
	RA43, RAS43	RP43, RPS43	2	0,6	10
	RA43, RAS43	RF43, RFS43	4	0,6	10
ML28	RL28, RLS28	RL28, RLS28	0,07	0,04	0,8
ML43	RL43, RLS43	RL43, RLS43	0,09	0,06	0,8
LAZ,LAX	PAZ, PAX	PAZ, PAX	0,2	0,2	1

*** Value related at a distance between the two rails of about 500 mm..**

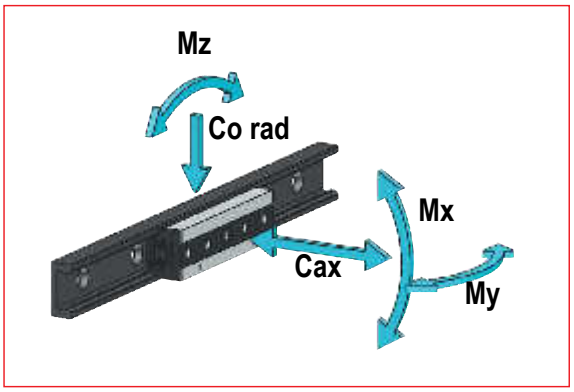
After identifying the most appropriate positioning of rails and sliders, or eventually the single rollers, it is necessary to verify the proper sizing of the linear components.
This both from a static point of view and in accordance to the expected life-time.
For the static verification it is necessary to determine the load on each slider or roller, and then identify the most stressed one. Then verify the values of the safety coefficients, while comparing with the max. nominal load capacities. When the applied load is a combination of loads; radial and/or axial loads and moments, it is necessary to determine the value of each factor and verify that:

$$\frac{Pax}{Co\ ax} \quad \frac{Prad}{Co\ rad} + \frac{Mex}{Mx} + \frac{Mey}{My} \quad \frac{Mez}{Mz} <= \frac{1}{Z}$$

- **Pax** = axial load component
- **Prad** = radial load component
- **Mex, Mey, Mez** = applied moments
- **Co ax** = axial load capacity
- **Co rad** = radial load capacity
- **Mx, My, Mz** = resistance capacity to moments
- **Z** = safety coefficient > = 1

The radial load capacity for all sliders is the side with 2 engraved marks, ref. page 31.

Load direction



It is recommended to apply the following values to safety coefficient Z:

Z	Application conditions
1 - 1,5	Accurate determination of static and dynamic loads. Precise assembly, tight structure.
1,5 - 2	Avarage conditions
2 - 3,5	Insufficient determination of applied loads. Vibrations, loose structure. Imprecise assembly. Unfavourable einvironmental conditions.

Theoretical lifetime calculation

The theoretical life of the rollers and raceways of rail should be determined by the conventional formula as indicated below in km of running, however, should keep in mind that the value thus calculated must be taken with caution just for orientation, in fact, the real service life achieved can be very different from that calculated value, because the phenomena of wear and fatigue are caused by factors not easy to predetermine, for example:

- Inaccuracy in the estimation of the real loading condition
- Overloading for inaccuracies assembly
- Vibration, shock and dynamic pulse stress
- Raceways status of lubrication
- Thermal excursions
- Environmental pollution and dust
- Damage mounting
- Stroke length and frequency of movement

$$L\ (Km) = 100 \cdot \left(\frac{C}{P}\right)^3 \cdot \frac{fc}{n} \cdot fa$$

Where:
- **C** = Dynamic load coefficient of slider
- **P** = The equivalent load applied on the most stressed slider

Verified for each single slider

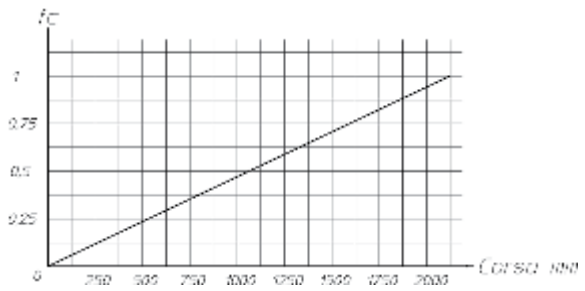
$$-P = P\,rad + \left(\frac{Pax}{Co\ ax} + \frac{Mex}{Mx} + \frac{Mey}{My} + \frac{Mez}{Mz}\right) \cdot Co\ rad$$

- **fc** = Coefficient depending on the actual stroke length. This factor takes into account applications with short stroke. With value 1 the stroke is superior to 2m, with shorter stroke the value is less, ref "Graph Coefficient Fc"

- **n** = Number of sliders in same rail passing same raceway point

- **fa** = Coefficient taking into account operational ambient and level of correct lubrication of raceways

Coefficient fc



fa	Application conditions
0,7 - 1	Good lubrication and wipers mounted – No impurities on raceways – Correct installation
0,2 - 0,5	Normal dusty factory ambient, some vibrations, temperature changes, no wipers
0,05 - 0,1	Poor Lubrication, dusty ambient, vibrations, high temperature changes, no wipers

The correction factors fc and fa applied to the theoretical calculation formula have the sole purpose of guiding the designer qualitatively on the influence in the lifetime estimation of the real application conditions without any pretense of precision. For more details please contact the Technical Service T RACE.

The MR and ML rails are both made from high precision cold drawn profiles, produced from specific carbon steel to provide high dept hardness, by nitriding hardening treatment. This innovative process is called T-NOX, and is developed by T RACE to assure high hardness, low wear and a high resistance to corrosion. This chemical heat treatment is conducted in three phases:

1) High depth nitriding
2) Black oxidation
3) Impregnation with corrosion inhibitors and mineral oil.

The T NOX treatment is done on the complete rail surfaces, to also provide high corrosion protection on the raceways.

Rails	Material	Treatments
MR Series	Steel for nitriding	nitriding
ML Series	Steel for nitriding	nitriding
LAZ Series	Steel	Zinc plating
LAX Series	Stainless steel inox AISI 303	no

The sliders use different materials according to below table

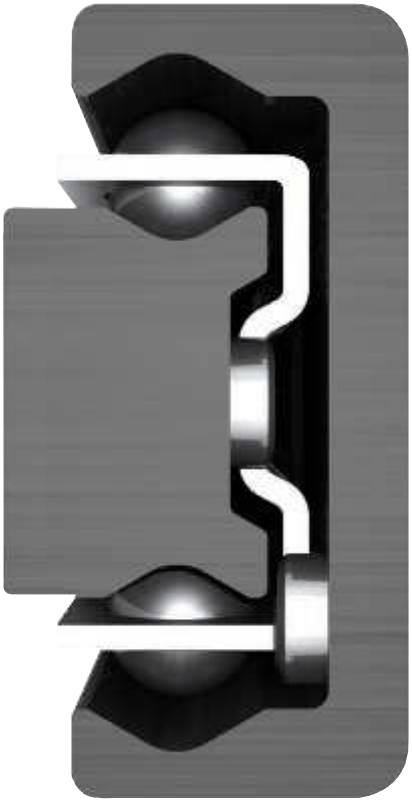
Material	Slider					
	R. Series	R.T, R.S Series	RL, RLS Series	PAZ Series	R.SX Series	PAX Series
Slider body	Zinc plated steel	Zinc plated steel	Zinc plated steel	Zinc plated steel	Stainless steel inox AISI 304	
Lateral seals	Polycarbonate	no	no	no	no	no
Wipers	Polycarbonate elastomer	Polycarbonate elastomer	Polycarbonate elastomer	no	Polycarbonate elastomer	no
Pre-oiled sponge	Sintetic fibre with bearing oil			no	Sintetic fibre with bearing oil	no
Screws	Bright zinc plated steel				Stainless steel inox	
Pins and spring washer	Spring steel			no	Stainless steel inox	no
Washer	Hardened steel				Stainless steel inox AISI 440C	
Bearing seals	Neopren		Zinc plated steel		Neopren	
Bearing cage	Polyamide		Zinc plated steel		Polyamide	

Working temperature

The operation temperature for sliders are -30° / +130° Celsius, for which max, temperature is limited by the 2RS seals. For the sliders RL. and PAZ, with 2Z seals the max operation temperature is 170° . On request special greased rollers can be supplied for higher/lower temperature.

BALL-CAGE LINEAR RAIL

The SF ball-cage series are a very simple linear rail formed by one or more sliders moving in a ball-cage inside a longer rail.
The components are the same of the SR series with the same excellent characteristics.



Main innovations

- Constant smooth movement
- Complete overall nitritiding hardened profiles with high resistance to wear
- Constant preload, unlike zinc plated slides
- Smooth black finish

Main load capacity

- Large ball diameter
- Increased number of balls per ball-cage
- Nitriding hardened raceways for increased load capacity

Main resistance to impacts

- Shaped ball-cage to offer more rigid ball-cage
- Improved stoppers
- Reduced ball-cage creeping problems

Main corrosion resistance

- T NOX treatment to provide high standard corrosion resistance, much superior to traditional zinc plated slides
- Version with INOX components available

SF standard

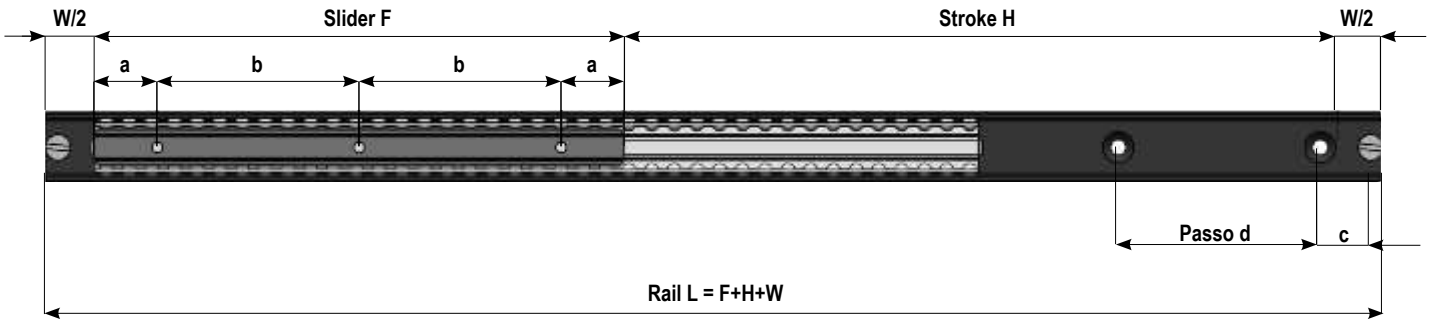
The series SF is conposed of a slider, moving inside the outer rail and ball-cage. The stroke is limited by the ball-cage and length of outer rail.
Many standard versions are available.

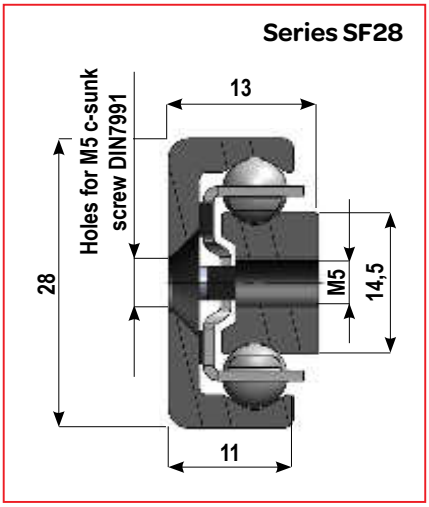
SF with double sliders in same ball-cage

On request is provided 2 sliders moving along the same rail and ball-cage. Version dedicated for applications with a long mobile part.
The slider and rail versions are selected among the standard versions.

SF with double slider in indipendent ball-cages

On request is provided version with 2 sliders, each moving in its own independent ball-cage, to allow opposite movement direction, hence a 2 door sliding system.
The slider and rail versions are selected among the standard versions.





Order code ex.:
SF28-80-250-370

Slider lenght F — Stroke H — Rail lenght L

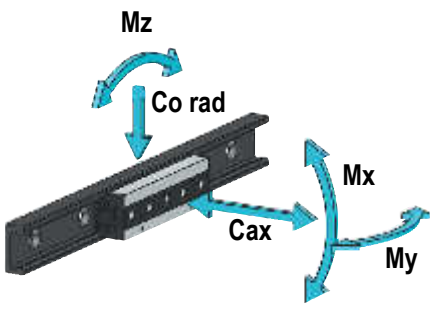
The SF ball-cage series are a linear rail with one or more sliders moving in a ball-cage, inside a longer rail. The components are the same as SR.
The product code is obtained, by first selecting the slider length, then based on required stroke, is selected the rail length, according to : L = F+H+W.

Where W is a constant of 40 mm for series SF28.

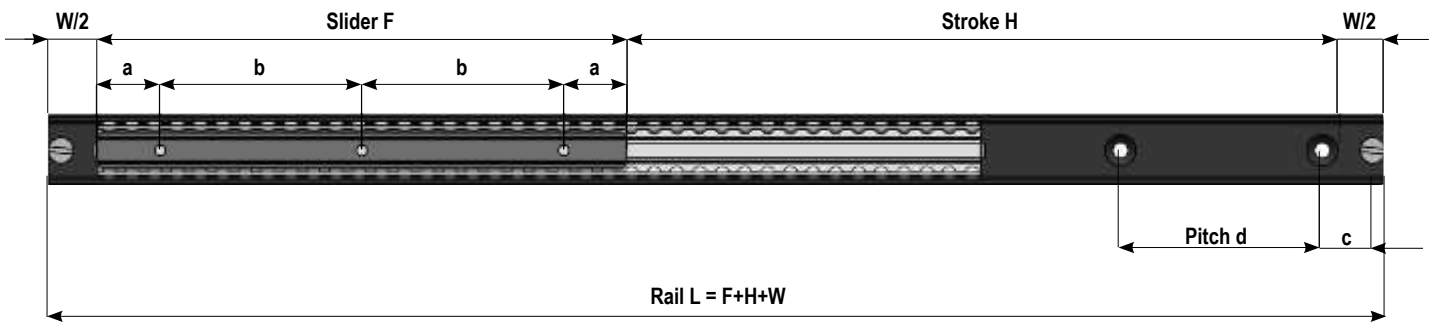
The version SRX28 for high corrosion resistance, have all components in INOX, except the profiles. SXR28 has same dimensions and performance as SR28.

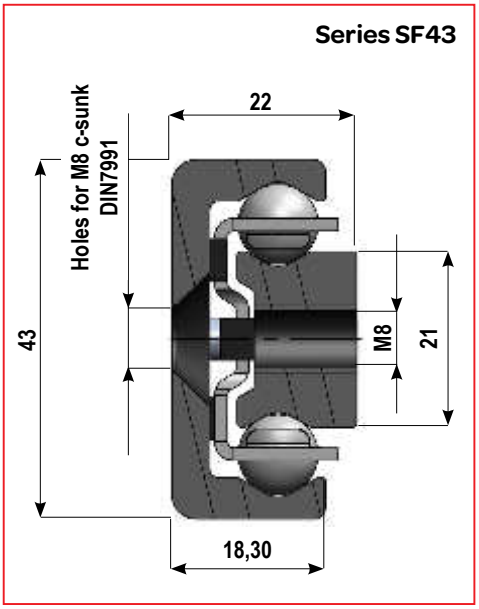
Slider									Weight: 0,7 kg/m
F (mm)	a (mm)	b (mm)	n° holes	C Dynamic	Load capacity				
					Co rad (N)	Co ax (N)	Mx (Nm)	My (Nm)	Mz (Nm)
60	10	20	3	3672	3600	2280	26	23	36
80	10	20	4	4896	4800	3040	35	41	64
130	25	80	2	7956	7800	4940	57	107	169
210	25	80	3	12852	12600	7980	93	279	441
290	25	80	4	17748	17400	11020	128	533	841
370	25	80	5	22644	22200	14060	163	867	1369
450	25	80	6	27540	27000	17100	198	1283	2025

Can be produced on request solutions with more sliders within the same ball-cage or with more sliders inside separate ball-cages. The sliders (F) and the rails (L) length could be selected among the standard versions.



Rail				Weight: 1 kg/m
L (mm)	c (mm)	d (mm)	n° holes	W (mm)
130	25	80	2	40
210	25	80	3	40
290	25	80	4	40
370	25	80	5	40
450	25	80	6	40
530	25	80	7	40
610	25	80	8	40
690	25	80	9	40
770	25	80	10	40
850	25	80	11	40
930	25	80	12	40
1010	25	80	13	40
1170	25	80	15	40
1330	25	80	17	40
1490	25	80	19	40
1650	25	80	21	40





Order code ex.:
SF43-210-350-610

Slider lenght F — Stroke H — Rail lenght L

The SF ball-cage series are a linear rail with one or more sliders moving in a ball-cage, inside a longer rail. The components are the same as SR.
The product code is obtained, by first selecting the slider length, then based on required stroke, is selected the rail length, according to : L = F+H+W.

Where W is a constant of 50 mm for series SF43.

The version SRX43 for high corrosion resistance, have all components in INOX, except the profiles. SXR43 has same dimensions and performance as SR43.

Slider									Weight:1,8 kg/m
F (mm)	a (mm)	b (mm)	n° holes	C Dynamic	Load capacity				
					Co rad (N)	Co ax (N)	Mx (Nm)	My (Nm)	Mz (Nm)
130	25	80	2	15587	14300	9230	162	200	310
210	25	80	3	25179	23100	14910	262	522	809
290	25	80	4	34771	31900	20590	361	995	1542
370	25	80	5	44363	40700	26270	461	1620	2510
450	25	80	6	53955	49500	31950	561	2396	3713
530	25	80	7	63547	58300	37630	660	3324	5150
610	25	80	8	73139	67100	43310	760	4403	6822

Can be produced on request solutions with more sliders within the same ball-cage or with more sliders inside separate ball-cages. The sliders (F) and the rails (L) length could be selected among the standard versions.

Rail				Weight: 2,4 kg/m
L (mm)	c (mm)	d (mm)	n° holes	W (mm)
290	25	80	4	50
370	25	80	5	50
450	25	80	6	50
530	25	80	7	50
610	25	80	8	50
690	25	80	9	50
770	25	80	10	50
850	25	80	11	50
930	25	80	12	50
1010	25	80	13	50
1170	25	80	15	50
1330	25	80	17	50
1490	25	80	19	50
1650	25	80	21	50
1810	25	80	23	50
1970	25	80	25	50

ROLLER TELESCOPIC SLIDES

The roller telescopic slides of series TLR and TLQ are designed for continous movements and for variable stroke, for both horizontal and vertical applications.
The TLR series allow for unique compensation of misalignment, when mounted in pair, to hereby much reduce binding from minor installation error.
These telescopic slides have incorporated wipers and pregreased sponge, to provide clean and lubricated raceways.
The versions TLRX and TQAX offer high corrosion resistance, as all parts are made in INOX, except the rails, which come with T RACE-NOX innovative anti-corrosion treatment .
Three section-dimensions are available : 18, 28 and 43mm .

The roller telescopic slides of series TLA and TQA are available in two versions of material : The TLAZ and TQAZ with rolled zinkplated rails and rollers in hardened steel. The TLAZ and TQAX are fully made of INOX AISI 304 and the rollers in AISI440 for high corrosion resistance and for applications requiring only INOX components.
This series are designed for applications with medium load capacity, requiring smooth and silent movement, at a lower price level.
Two section-dimensions are available : 26 and 40mm.

BALL-CAGE TELESCOPIC SLIDES

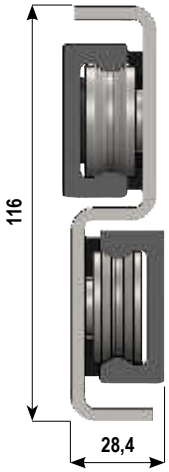
The ball-cage telescopic slides of series TLS, TSQ and TSH are designed high load applications, requiring min. flexion.

The semi-telescopic slides of series SR is the base component for mentioned telescopic slides .

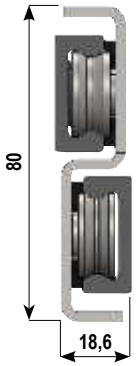
The optimized design and nitriding hardened raceways provide superior performance compared to traditional induction hardened and subsequent zinc plated raceways, which soon become un-stable as the zinc plating is consumed after short usage.

The versions TLSX, TSQX, TSHX and SRX offer high corrosion resistance, as all parts are made in stainless steel INOX, except the rails, which come with T RACE-NOX innovative anti-corrosion treatment .
Two section-dimensions are available : 28 and 43mm .

TLR.43

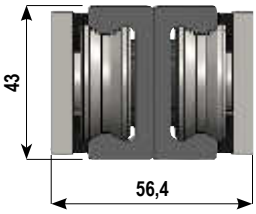


TLR.28

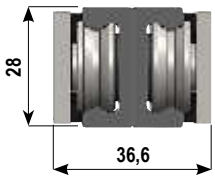


TLR.18

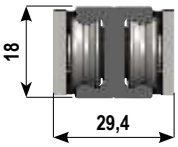
TLQ.43



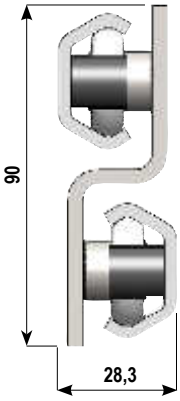
TLQ.28



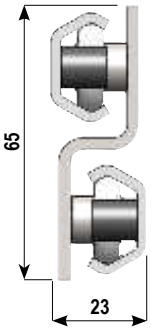
TLQ.18



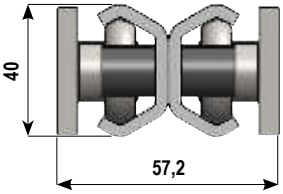
TLA.40



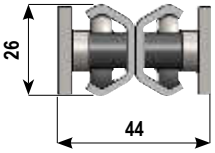
TLA.26



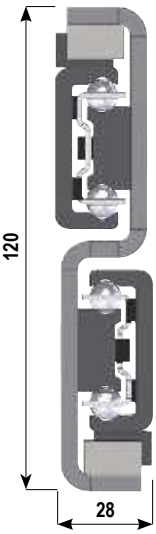
TQA.40



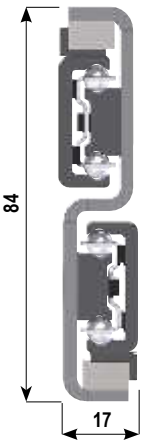
TQA.26



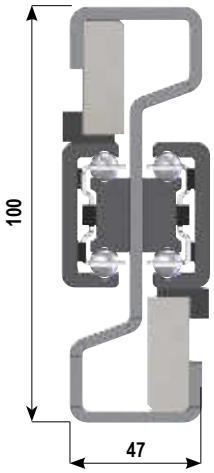
TLS.43



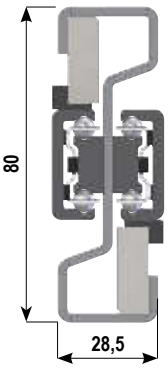
TLS.28



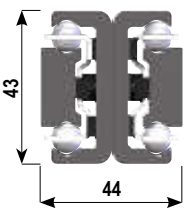
TSH.43



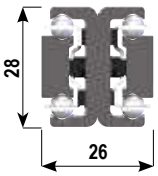
TSH.28



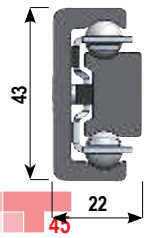
TSQ.43



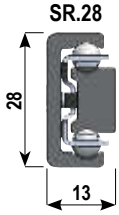
TSQ.28



SR.43

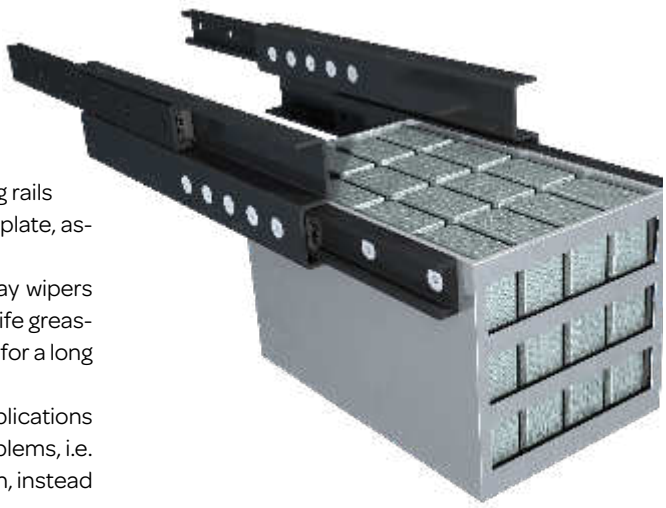


SR.28



TELESCOPIC SLIDES RANGE

The TLR slides are the world's only telescopic slides system which incorporated self-aligning feature to absorb parallelism errors of the mounting surfaces, when used in pairs.
The TLR slides are designed for heavy duty High-Tech telescopic applications, with precise motorized movement, requiring constant smooth sliding performance with no play. Recommended for high frequency applications.
The high performance is provide by use of double-row precision bearings, strong rails with hardened and honed raceways, fixed to a rigid intermediate S-shaped steel plate, assuring high load capacities and low flexion at even fully extended position.
The TLR slides guarantee maintenance free operation, thanks to strong raceway wipers and longitudinal seals for dust and impurity protection. An integrated lubed for-life greasing system, assuring a constant thin layer of lubrication on the raceway surfaces, for a long operation period.
TLR system offers unique possibilities and benefits for all kind of automation applications with variable strokes, for which a ball-cage slide often has ball-cage creeping problems, i.e. friction problems to reach full extension, as ball-cage is forced out to end position, instead of rolling.

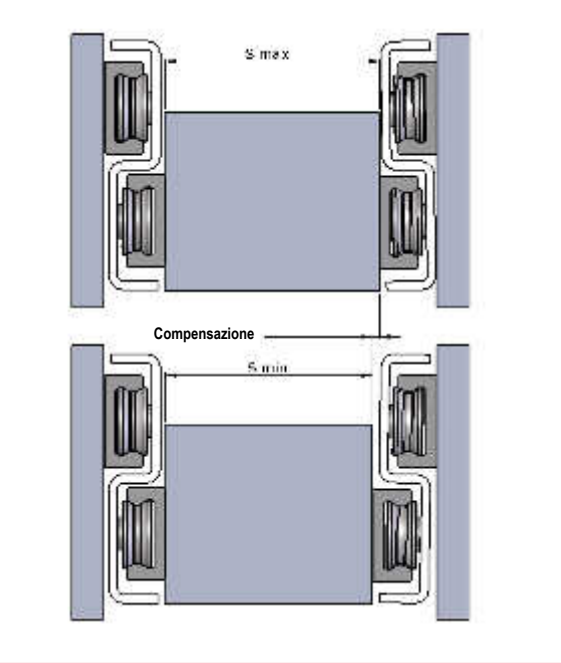


TLRX slides for corrosive ambients

For corrosive ambients is available TLRX, with all components and intermediate element in stainless steel INOX, except the rails, which have T RACE-NOX anti-corrosion treatment; a oxidation treatment and impregnation in hot oil, to offer a good corrosion resistance.

Extension

The TLR slides allow for an extension equal to the closed slide plus a small constant.
The extension is obtained by movement of the intermediate element and the lower rail, while the upper rail is fixed to structure.
As it can be seen on left figure, the movement of the lower rail is more than the upper rail, due to optimizing of load capacity and the fact that the rollers are positioned on the intermediate element to offer max load capacity in this position. Hereby the TLR slides are asymmetric, so the slides must be ordered as left side slide TLRS and right side slide TLRD and when installed the product code must be on top side.
The load capacities are all indicated per single rail, with centered load position, equal to half the rail in extended position.



Self-aligning capacity

When TLR slides are used in pairs, they offer the possibility to absorb minor structural errors or non-precise installation, which otherwise would much increase the required force for moving the mobile part, in both extending and closing direction. A typical problem for ball-cage telescopic slides.
Using a pair of self-aligning TLR slides, smooth low friction movement is assured, along with a more easy installation and/or less precise workings of structure, i.e. cost savings. The self-aligning feature is obtained by having a combination of floating rollers and guiding rollers in the TLR..A. i.e. allowing for a minor rotation of the rails, maintaining the preload in both upper and lower rails of the TLR..A slide.
The suffix A in TLR..A, indicates "Aligning" The concept is well illustrated in the catalogue section MONORACE , for which the base components have their origin.
To be noted that the rotation of the TLR..A slide hereby changes the nominal value of 18,6mm to 17,2mmm (S min) – 19,0mm (S max) while compensating dimensional errors on mobile structure or distance errors between the two lateral sides of fixed structure, for which the upper rails are fixed to. Herewith avoiding binding-problems, with would much increase friction force, with consequent reduced load capacity and expected life-time.

The TLR..A is in general always used in pair with a standard TLR, to assure good lateral stability. However good self-aligning can also be obtained for movement of vertical panels, with use of TLR..A at top to absorb some mis-alignment, and with some retainer guidance at lower part. Please refer to page 70, for further information.

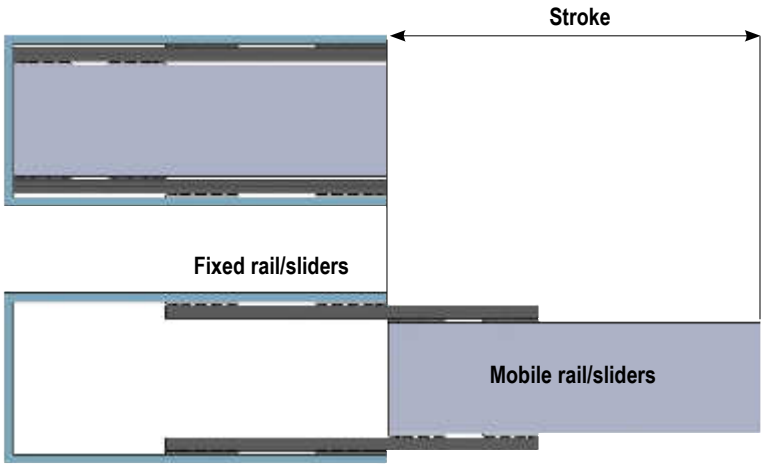
The very compact TLQ telescopic slides are designed for High-Tech telescopic applications with precise motorized movement, requiring constant smooth sliding performance with no play.
The unique concept for TLQ, is that it allows customer, to set the desired stroke precisely as wanted, based on complete standard product.
The TLQ telescopic slides offer both high radial load capacities, and good axial load capacities. The rail/slider configuration allows the TLQ slides to be mounted not only at the side, but also underneath the moving part, when there are space limitations at the sides. Outstanding linear solution for all vertical applications, for both manual or motorized movement. The squared designed is obtained by using two MR-rails with hardened honed raceways, as the rigid intermediate element, into which the sliders are assembled. In each rail run 2 independent roller sliders, with a certain distance in between them, to obtain a stroke of H1 for fixed rail/sliders and H2 for mobile rail/sliders. Total stroke H = H1 + H2 is ,equal to the total length of the slide.
The sliders to be fixed at structure are longer and positioned with more space in between them. The in general shorter sliders, positioned with less distance in between them are to be fixed at mobile part. For horizontal applications, the product marking must always be on top, to assure max. radial load capacity.
Unlike TLR slides, for TLQ there is no Right-side / Left side version, just by turning the slide horizontally the slide becomes symmetric.

The components for TLQ slides are the same as for TLR slides and MONORACE MR series: High depth nitriding hardened rails, honed raceways, double row bearings, strong wipers with incorporated pre-oiled felt for long lasting lubrication of raceways.
TLQ slides are designed for high frequency applications which require min. friction, smooth and stable movement with no play.

The material and its treatment offer a good resistance against corrosion, to allow for installation in outdoor ambients.

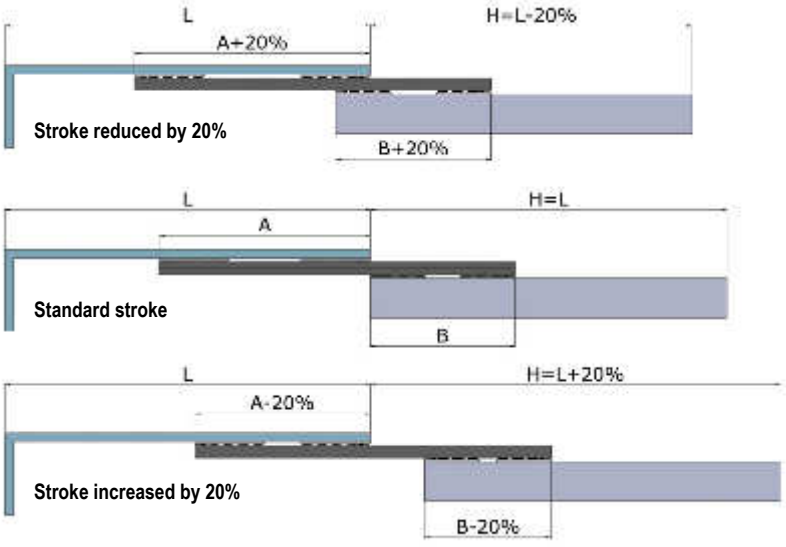
TLQX slides for corrosive ambients

For corrosive ambients is available TLRX, with all components in INOX, except the rail, which have T RACE NOX anti-corrosion treatment; a oxidation treatment and impregnation in hot oil, to offer a good corrosion resistance.



Modified stroke

The standard stroke H for TLQ slides can easily be modified to obtain different stroke, shorter or longer than standard, just by fixing the sliders in a position different than standard A and B indicated in table.
As shown in the table, by increasing the distance A / B 20% stroke decreases by 20%, but load capacity increases by 80%.
Otherwise reducing the distance A / B by 20%, the stroke increase by 20%, while load capacity decrease by 40%

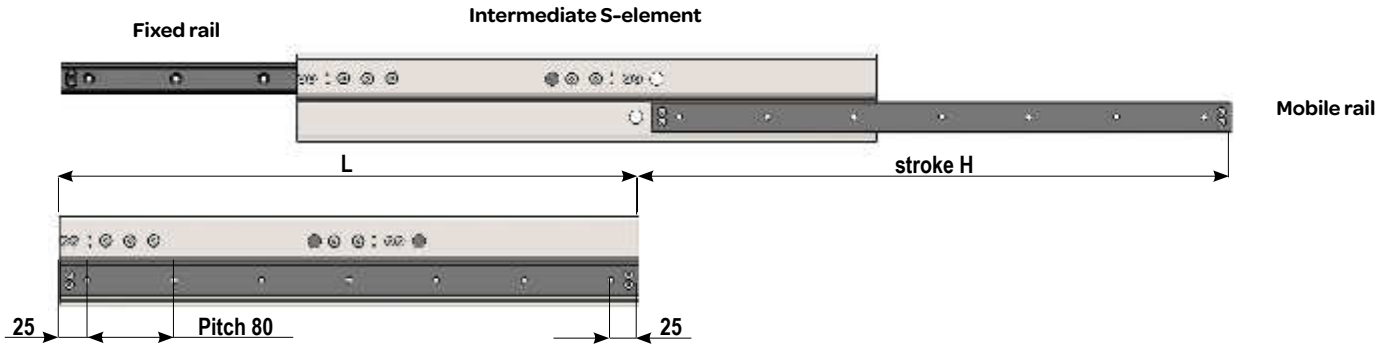


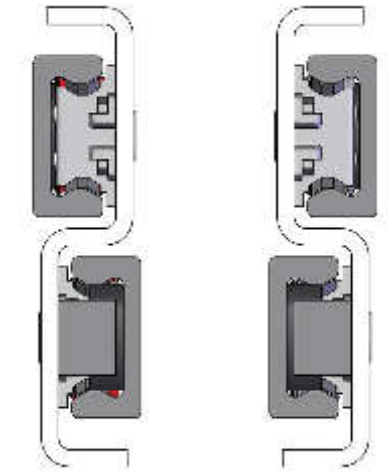
Load capacity increased by 80% *

Standard/ nominal load capacity Co rad

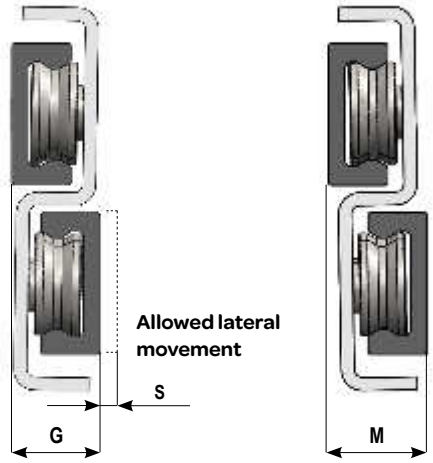
Load capacity reduced by 40% *

***Indicative values related to individual lengths**

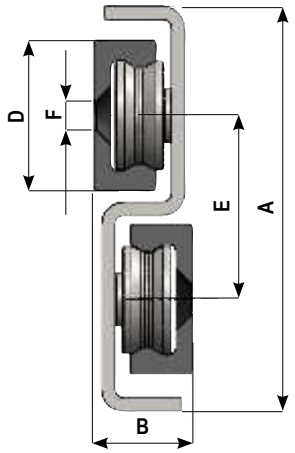




Left version TLRS. **Right version TLRD.**



Self-aligning version with floating rollers to allow rotation TLR.. A



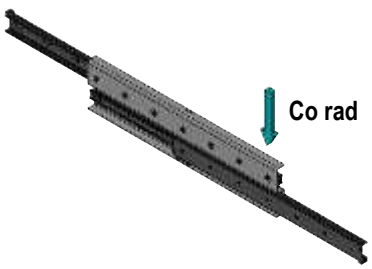
Standard version with rigid/guiding rollers TLR..

Code	A (mm)	B (mm)	D (mm)	E (mm)	F (mm)	G (mm)	M (mm)	S (mm)
TLR18	52	15,2	18	25	Ø 4,5 for screw M4 DIN7991	14,7	15,7	1
TLR.28	80	18,6	28	35	Ø 5,5 for screw M5 DIN7991	17,2	19	1,8
TLR.43	116	28	43	52	Ø 8,5 for screw M8 DIN7991	26,8	30	3,2

For corrosive ambients is available TLRX., with all components and intermediate element in INOX, except the rail, which have T RACE NOX anti-corrosion treatment; a oxidation treatment and impregnation in hot oil, to offer a good corrosion resistance. Same dimension and performance as standard version TLR .

Order code ex.:
TLRD28-370 = standard rigid right slide, length 370mm
TLRS28A-370 = self-aligning left slide, length 370mm
TLRDX28A-370 = self-aligning INOX right slide, length 370mm

The listed load capacities Co rad, are per single slide, with the load centered, i.e. in the middle of the extended lower rail, P. In case the load is not centered, ex. The load is more towards tip, the load capacity is reduced, please refer to page 74. For further info and flexion "f" indications.
TLR slides must be installed with the code mark and upper rail at top-side, while mobile part is fixed to lower rail.

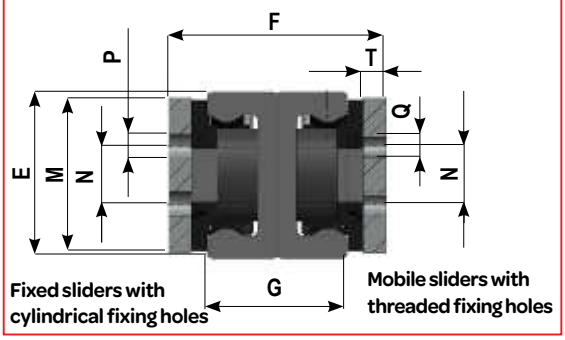


Code	Lenght L (mm)	Stroke H (mm)	Dynamic coefficient C (N)	Loead capacity Co rad (N)	Weight (kg)
TLR18-290	290	290	731	355	0,9
TLR18-370	370	370	969	470	1,2
TLR18-450	450	450	1.115	541	1,4
TLR18-530	530	530	1.214	589	1,6
TLR18-610	610	610	1.286	623	1,9
TLR18-690	690	690	1.324	642	2,1
TLR18-770	770	770	1.344	652	2,3

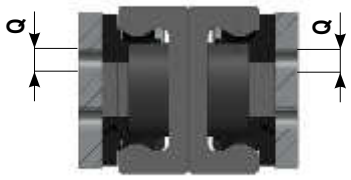
Code	Lenght L (mm)	Stroke H (mm)	Dynamic coefficient C (N)	Loead capacity Co rad (N)	Weight (kg)
TLR.28-370	370	380	1578	798	2,1
TLR.28-450	450	460	1859	940	2,5
TLR.28-530	530	540	2044	1034	2,9
TLR.28-610	610	620	2711	1371	3,3
TLR.28-690	690	700	2933	1483	3,7
TLR.28-770	770	780	3083	1560	4,1
TLR.28-850	850	860	3180	1608	4,5
TLR.28-930	930	940	3259	1631	4,9
TLR.28-1010	1010	1020	3325	1519	5,3
TLR.28-1090	1090	1100	3380	1421	5,7
TLR.28-1170	1170	1180	3428	1334	6,1
TLR.28-1250	1250	1260	3469	1258	6,5
TLR.28-1330	1330	1340	3505	1190	6,9
TLR.28-1410	1410	1420	3537	1129	7,3
TLR.28-1490	1490	1500	3565	1073	7,7

Code	Lenght L (mm)	Stroke H (mm)	Dynamic coefficient C (N)	Loead capacity Co rad (N)	Weight (kg)
TLR.43-530	530	540	4074	2078	6,4
TLR.43-610	610	620	4241	2163	7,3
TLR.43-690	690	700	6154	3139	8,2
TLR.43-770	770	780	6553	3342	9,1
TLR.43-850	850	860	6869	3504	10
TLR.43-930	930	940	7127	3635	10,9
TLR.43-1010	1010	1020	7340	3744	11,8
TLR.43-1090	1090	1100	7520	3835	12,7
TLR.43-1170	1170	1180	7673	3784	13,6
TLR.43-1250	1250	1260	7806	3574	14,5
TLR.43-1330	1330	1340	7922	3386	15,4
TLR.43-1410	1410	1420	8024	3217	16,3
TLR.43-1490	1490	1500	8114	3064	17,2
TLR.43-1570	1570	1580	8195	2925	18,1
TLR.43-1650	1650	1660	8267	2798	19
TLR.43-1730	1730	1740	8333	2682	19,9
TLR.43-1810	1810	1820	8392	2574	20,8
TLR.43-1890	1890	1900	8447	2476	21,7
TLR.43-1970	1970	1980	8496	2384	22,6

Version TLQ.



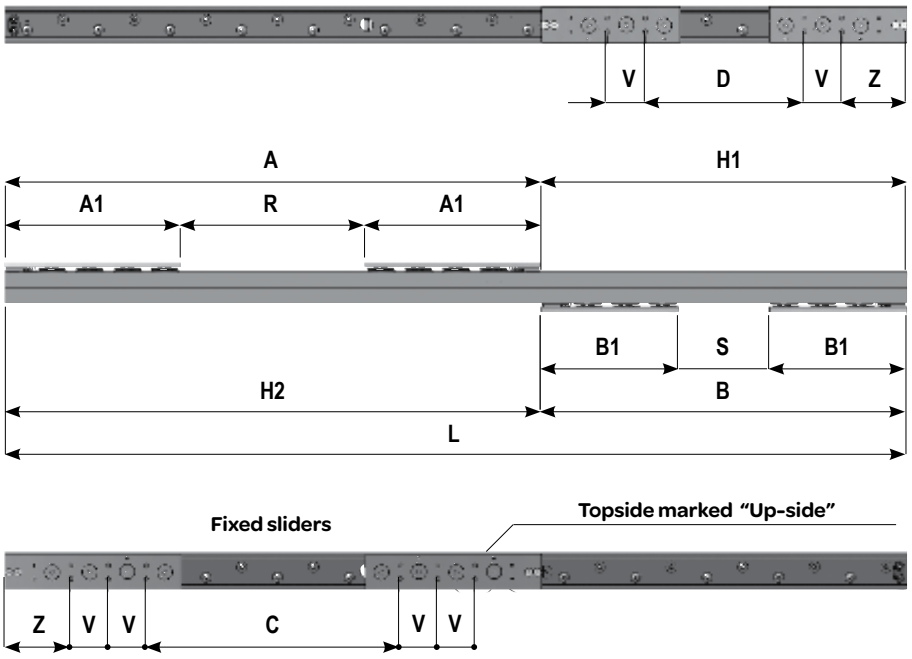
Version TLQ. FF



All sliders with threaded fixing holes

Version TLQ. CC

All sliders with cylindrical fixing holes



The fixed sliders are marked "Fix slider" while the mobile sliders are marked "Mobile slider" .

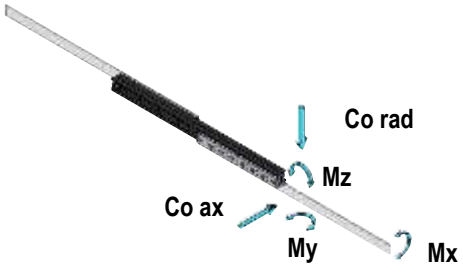
4 sliders weight: 1,5 kg
Rail weight: 2,5 kg/m

Code	E (mm)	F (mm)	G (mm)	M (mm)	N (mm)	P (mm)	Q (mm)	T (mm)	V (mm)	Z (mm)	Weight (Kg)
TLQ18	18	29,4	19	15	8	Ø 4,5 for screw M4 DIN912	M4	3	21	48	Sliders: 0,4 kg Rail: 1,4 kg/m
TLQ.28	28	36,6	23,9	25	10	Ø 5,5 for screw M5 DIN912	M5	4	29	58	Sliders: 1,5 kg Rail: 2,5 kg/m
TLQ.43	43	56,4	36	40	15	Ø 6,5 for screw M6 DIN912	M6	6	42	74	Sliders: 2,4 kg Rail: 6 kg/m

The TLQX version has same dimensions and performance as standard TLQ .
Order code ex.:
TLQ28-770 = standard version with length 770
TLQX28CC-770 = Inox version, with cylindrical fixing holes for all sliders, length 770mm

The listed load capacities Co rad, are per single slide, with the load centered, i.e. in the middle of the extended lower rail, P. In case the load is not centered, ex. The load is more towards tip, the load capacity is reduced, please refer to page 74. For further info and flexion "f" indications.
TLQ slides must be installed with the code mark and upper rail at top-side.

The size TLQ18 is not available in high corrosion resistance version.



Code	Lenght L (mm)	total stroke H (mm)	Fixed sliders (mm)					Mobile sliders (mm)					Dyn. coeff. C (N)	Load capacity				
			A	A1	C	R	Stroke H1	B	B1	D	S	Stroke H2		Co rad (N)	Co ax (N)	Mx [Nm]	My [Nm]	Mz [Nm]
TLQ18-370	370	241	185	87	47	11	185	314	155	82	4	56	725	351	175	6	109	47
TLQ18-450	450	284	270	87	132	96	180	346	155	114	36	104	1159	473	213	6	101	43
TLQ18-530	530	364	318	87	180	144	212	378	155	146	68	152	1267	414	187	6	134	60
TLQ18-610	610	444	366	87	228	192	244	410	155	178	100	200	1343	369	166	6	134	60
TLQ18-690	690	524	414	87	276	240	276	442	155	210	132	248	1400	332	150	6	134	60
TLQ18-770	770	604	462	87	324	288	308	474	155	242	164	296	1445	302	136	6	134	60

Code	Lenght L (mm)	total stroke H (mm)	Fixed sliders (mm)					Mobile sliders (mm)					Dyn. coeff. C (N)	Load capacity				
			A	A1	C	R	Stroke H1	B	B1	D	S	Stroke H2		Co rad (N)	Co ax (N)	Mx [Nm]	My [Nm]	Mz [Nm]
TLQ.28-450	450	450	227	111,5	53	4	223	223	111,5	49	0	227	602	464	232	18	96	128
TLQ.28-530	530	530	307	111,5	133	84	223	223	111,5	49	0	307	1138	877	438	18	96	128
TLQ.28-610	610	610	360	140,5	128	79	250	250	111,5	76	27	360	1335	1029	404	18	128	171
TLQ.28-690	690	690	408	140,5	176	127	282	282	111,5	108	59	408	1458	958	366	18	158	222
TLQ.28-770	770	770	456	140,5	224	175	314	314	111,5	140	91	456	1552	877	335	18	158	273
TLQ.28-850	850	850	504	140,5	272	223	346	346	111,5	172	123	504	1626	808	309	18	158	288
TLQ.28-930	930	930	552	140,5	320	271	378	378	111,5	204	155	552	1687	750	286	18	158	288
TLQ.28-1010	1010	1010	600	140,5	368	319	410	410	111,5	236	187	600	1737	699	267	18	158	288
TLQ.28-1090	1090	1090	648	140,5	416	367	442	442	111,5	268	219	648	1779	655	250	18	158	288
TLQ.28-1170	1170	1170	696	140,5	464	415	474	474	111,5	300	251	696	1814	616	235	18	158	288
TLQ.28-1250	1250	1250	744	140,5	512	463	506	506	111,5	332	283	744	1845	581	222	18	158	288
TLQ.28-1330	1330	1330	792	140,5	560	511	538	538	111,5	364	315	792	1872	550	210	18	158	288
TLQ.28-1410	1410	1410	840	140,5	608	559	570	570	111,5	396	347	840	1896	522	200	18	158	288
TLQ.28-1490	1490	1490	888	140,5	656	607	602	602	111,5	428	379	888	1917	497	190	18	158	288

Code	Lenght L (mm)	total stroke H (mm)	Fixed sliders (mm)					Mobile sliders (mm)					Dyn. coeff. C (N)	Load capacity				
			A	A1	C	R	Stroke H1	B	B1	D	S	Stroke H2		Co rad (N)	Co ax (N)	Mx [Nm]	My [Nm]	Mz [Nm]
TLQ.43-610	610	600	310	155	78	0	300	310	155	78	0	300	1529	1114	557	64	324	432
TLQ.43-690	690	690	374	155	142	64	316	316	155	84	6	374	2326	1695	847	64	340	453
TLQ.43-770	770	770	456	197	140	62	314	314	155	82	4	456	3052	2224	1034	64	334	446
TLQ.43-850	850	850	504	197	188	110	346	346	155	114	36	504	3305	2408	958	64	421	561
TLQ.43-930	930	930	552	197	236	158	378	378	155	146	68	552	3509	2489	892	64	507	676
TLQ.43-1010	1010	1010	600	197	284	206	410	410	155	178	100	600	3676	2328	834	64	518	792
TLQ.43-1090	1090	1090	648	197	332	254	442	442	155	210	132	648	3816	2187	784	64	518	907
TLQ.43-1170	1170	1170	696	197	380	302	474	474	155	242	164	696	3935	2063	739	64	518	1022
TLQ.43-1250	1250	1250	744	197	428	350	506	506	155	274	196	744	4037	1951	699	64	518	1137
TLQ.43-1330	1330	1330	792	197	476	398	538	538	155	306	228	792	4126	1851	663	64	518	1252
TLQ.43-1410	1410	1410	840	197	524	446	570	570	155	338	260	840	4204	1761	631	64	518	1368
TLQ.43-1490	1490	1490	888	197	572	494	602	602	155	370	292	888	4272	1679	602	64	518	1446
TLQ.43-1570	1570	1570	936	197	620	542	634	634	155	402	324	936	4334	1605	575	64	518	1446
TLQ.43-1650	1650	1650	984	197	668	590	666	666	155	434	356	984	4389	1536	551	64	518	1446
TLQ.43-1730	1730	1730	1032	197	716	638	698	698	155	466	388	1032	4438	1474	528	64	518	1446
TLQ.43-1810	1810	1810	1080	197	764	686	730	730	155	498	420	1080	4483	1416	507	64	518	1446
TLQ.43-1890	1890	1890	1128	197	812	734	762	762	155	530	452	1128	4524	1363	488	64	518	1446
TLQ.43-1970	1970	1970	1176	197	860	782	794	794	155	562	484	1176	4561	1313	470	64	518	1446

Steel/inox roller telescopic slides TLAZ, TLAX, TQAZ,TQAX

The TLAZ and TQAZ slides are made from robust rolled steel profiles and precision bearings, for smooth and precise moment along with interesting load capacities. The TLAZ comes with an intermediate element to offer higher load capacities than the TQAZ for the medium/longer stroke versions.
These slides represent T RACE's most economical telescopic slides, but nothing compared with cheap furniture drawer-slides, based on ball-cage movement. The slides are for application where TLS/TSQ/TLR/TQL28 can't meet the target price or where commercial drawer slides can't meet the requested quality and smooth movement.
The slides are available in standard steel version and complete INOX versions: TLAX, TQAX. The INOX versions offer same performance as standard and with same dimensions.

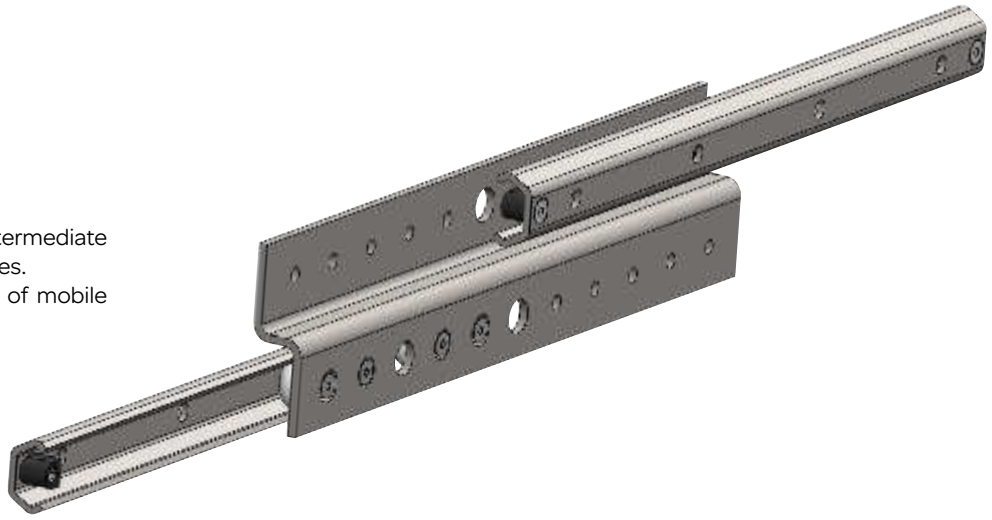
The slides offer a stroke equal to the length of the slide. The roller bearings are with 2Z seals and lubed for life. Thanks to high temperature grease, the TLAZ and TQAZ are also suitable for application with constant temperature of 170° celcius
The slides comes all with strong damping rubber end-stops , which together with the rolling movement assure very silent function.

Roller telescopic slides TLAX, TQAX
Same dimensions and performance as standard version. All components is INOX. The roller bearings have 2RS seal and lubed for life with grease for alimentary and low temperature applications. Ideal slides for use in medical, chemical, alimentary industries, or in high corrosive ambients as marine equipment also for clean room usage, as very low emission of particles.

The slides can easily be washed, due to its open construction.

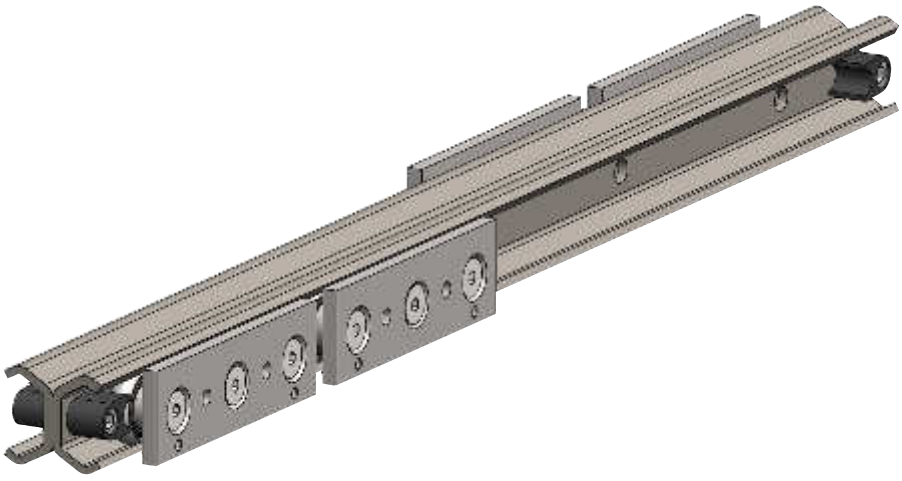
TLAZ, TLAX

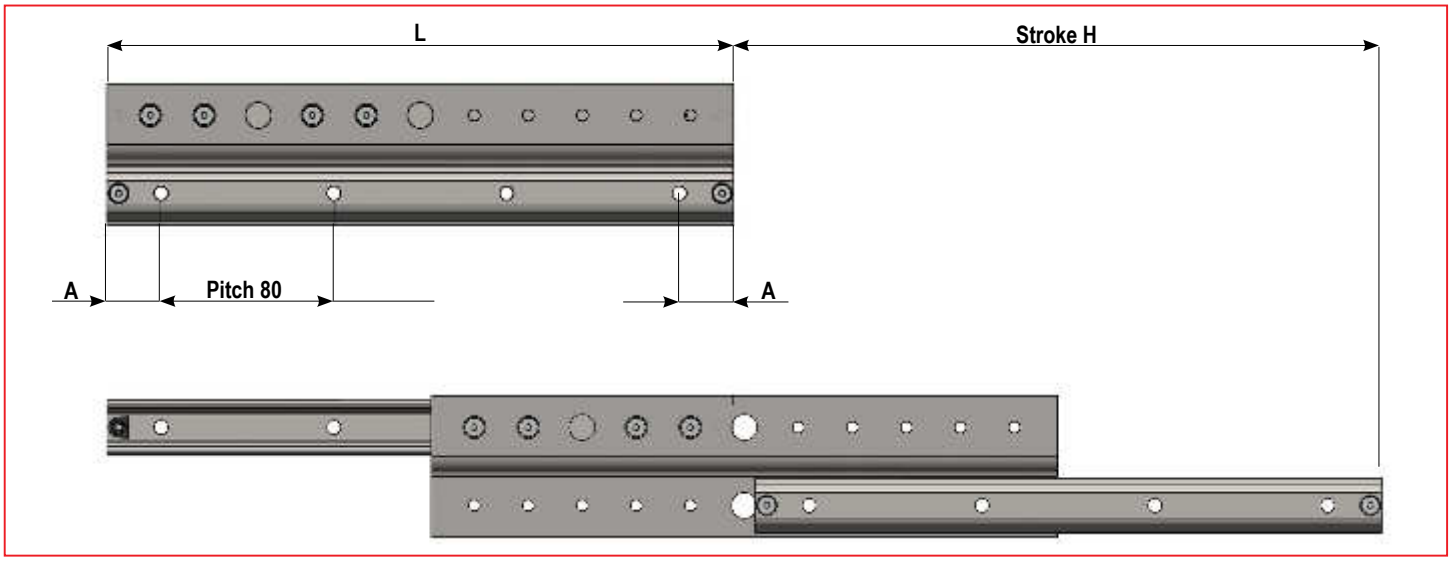
The TLAZ, TLAX slides have vertical intermediate element to provide good load capacities.
Designed for installation at the sides of mobile part for horizontal extension.



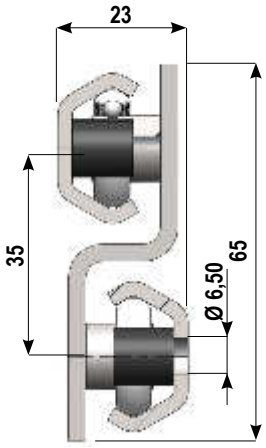
TQAZ,TQAX

The TQAZ, TQAX slides have a very compact and squared design, obtained by welding the two rails together, in which are running a pair of 3-roller sliders on each side. Fixed structure and mobile part are fixed to the sliders. The slide offer a stroke equal to its length. Suitable also for vertical applications.
Due to its independent sliders, the TQAZ slide allows to optimize the stroke for each version. Just by positioning the slides more close together, for longer stroke, but reducing load capacity, or further apart for shorter stroke and higher load capacity. Similar to TLQ page 47, kindly check for further info.





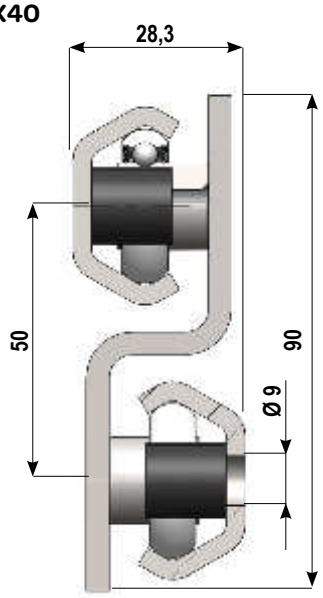
TLAZ26, TLAX26



Weight: 3,5 kg/m

Code	Lenght L (mm)	Stroke H (mm)	A (mm)	N° holes fixing	Load capacity Co rad (N)
TLA.26-300	300	300	30	4	320
TLA.26-350	350	350	55	4	400
TLA.26-400	400	400	40	5	457
TLA.26-450	450	450	25	6	500
TLA.26-500	500	500	50	6	533
TLA.26-550	550	550	35	7	560
TLA.26-600	600	600	20	8	581
TLA.26-650	650	650	45	8	600
TLA.26-700	700	700	30	9	615
TLA.26-750	750	750	55	9	628
TLA.26-800	800	800	40	10	640
TLA.26-850	850	850	25	11	650
TLA.26-900	900	900	50	11	658
TLA.26-1000	1000	1000	20	13	664
TLA.26-1100	1100	1100	30	14	609
TLA.26-1200	1200	1200	40	15	562

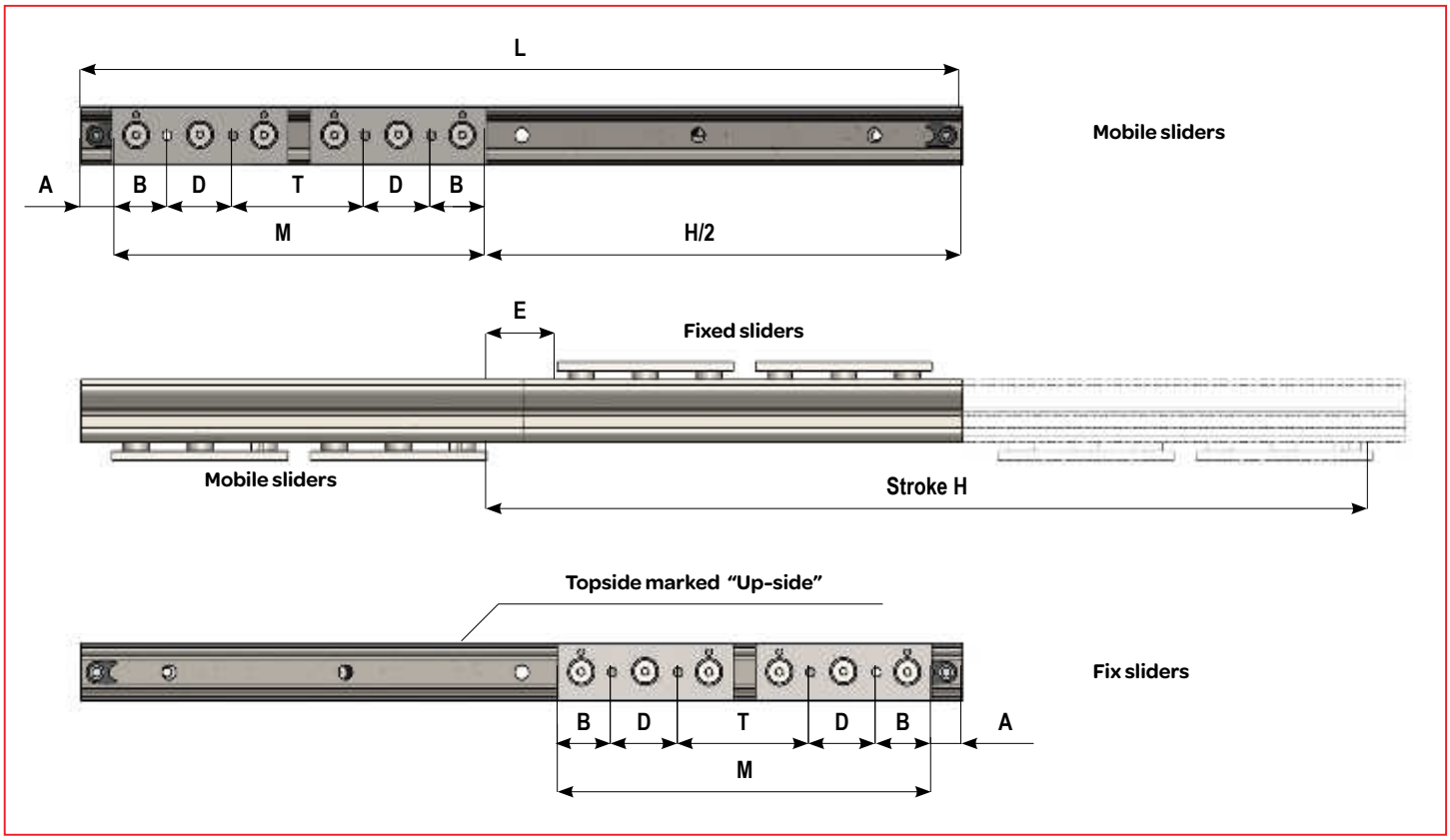
TLAZ40, TLAX40



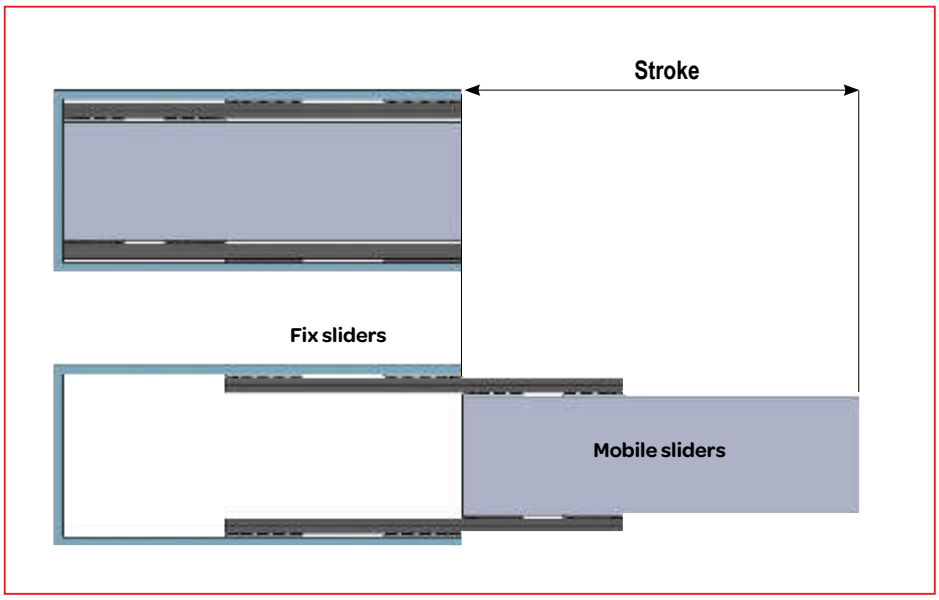
Weight: 7 kg/m

Code	Lenght L (mm)	Stroke H (mm)	A (mm)	N° holes fixing	Load capacity Co rad (N)
TLA.40-500	500	500	50	6	752
TLA.40-550	550	550	35	7	842
TLA.40-600	600	600	20	8	914
TLA.40-650	650	650	45	8	973
TLA.40-700	700	700	30	9	1024
TLA.40-750	750	750	55	9	1066
TLA.40-800	800	800	40	10	1103
TLA.40-850	850	850	25	11	1135
TLA.40-900	900	900	50	11	1163
TLA.40-1000	1000	1000	20	13	1210
TLA.40-1100	1100	1100	30	14	1158
TLA.40-1200	1200	1200	40	15	1072
TLA.40-1300	1300	1300	50	16	998
TLA.40-1400	1400	1400	20	18	934
TLA.40-1500	1500	1500	30	19	877
TLA.40-1600	1600	1600	40	20	827

The TQAX are complete INOX slides, same dimensions and performances as standard steel version TQAZ . Load capacity indicated for single slide.

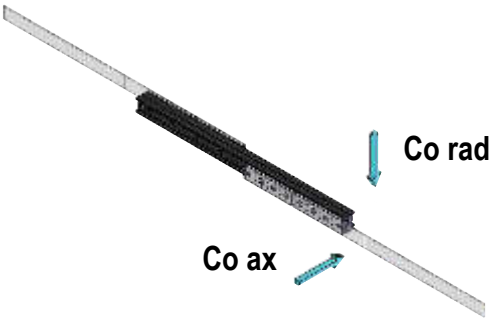


The nominal stroke H is obtained by placing the fixed and mobile sliders spacing them at the distance T.

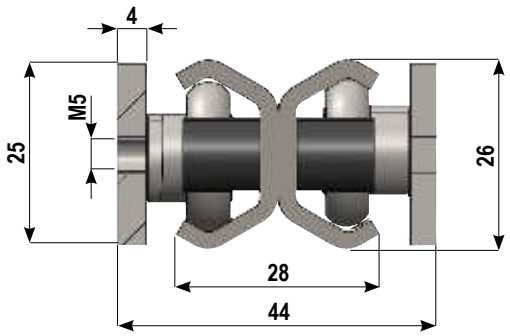


The slide must be installed with the mark "Up-side" facing upwards.
The sliders fixed to structure are marked "Fix-sliders" while when once fixed to mobile part are marked "Mobile sliders". When used in pair, the same slide can be installed left or right, just by rotating the slide 180° degrees horizontally, keeping the mark "Up-side" facing upwards.

Fixing hole position of sliders				
Type	A	B	D	E
TQA.26	14	25	30	28
TQA.40	0	7,5	120	0



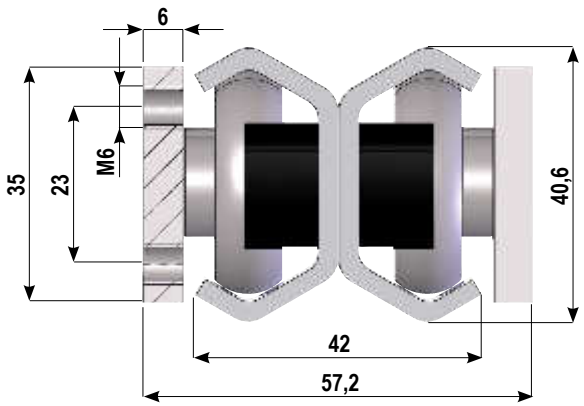
TQAZ26, TQAX26



Weight of the 4 sliders: 0,4 kg
Weight of the rail: 1,5 kg/m

Code	Lenght L (mm)	Stroke H (mm)	Distance sliders M (mm)	T (mm)	Load capacity Co rad (N)	Load capacity Co ax (N)
TQA.26-400	400	400	172	62	417	208
TQA.26-450	450	450	197	87	465	232
TQA.26-500	500	500	222	112	503	251
TQA.26-550	550	550	247	137	533	262
TQA.26-600	600	600	272	162	513	243
TQA.26-650	650	650	297	187	479	227
TQA.26-700	700	700	322	212	450	213
TQA.26-750	750	750	347	237	424	201
TQA.26-800	800	800	372	262	400	190
TQA.26-850	850	850	397	287	379	180
TQA.26-900	900	900	422	312	361	171
TQA.26-1000	1000	1000	472	362	328	156
TQA.26-1100	1100	1100	522	412	301	143
TQA.26-1200	1200	1200	572	462	278	132

TQAZ40, TQAX40



Weight of the 4 sliders: 1,6 kg
Weight of the rail: 3,2 kg/m

Code	Lenght L (mm)	Stroke H (mm)	Distance sliders M (mm)	T (mm)	Load capacity Co rad (N)	Load capacity Co ax (N)
TQA.40-600	600	600	300	45	991	495
TQA.40-650	650	650	325	70	1043	521
TQA.40-700	700	700	350	95	1087	543
TQA.40-750	750	750	375	120	1125	525
TQA.40-800	800	800	400	145	1157	497
TQA.40-850	850	850	425	170	1113	471
TQA.40-900	900	900	450	195	1059	449
TQA.40-1000	1000	1000	500	245	966	409
TQA.40-1100	1100	1100	550	295	888	376
TQA.40-1200	1200	1200	600	345	821	348
TQA.40-1300	1300	1300	650	395	764	323
TQA.40-1400	1400	1400	700	445	714	302
TQA.40-1500	1500	1500	750	495	670	284
TQA.40-1600	1600	1600	800	545	632	267

The TQAX are complete INOX slides, same dimensions and performances as standard steel version TQAZ . Load capacity indicated for single slide.

BALL-CAGE TELESCOPIC SLIDES

The Ball-cage T RACE telescopic slides range are the most advanced ball-cage slides. They offer the best ratio "capacity load / size" available on the market with the Superior smooth performance, thanks to its nitriding hardened raceways, assuring constant preload during full lifetime. The black oxidation guarantees a high corrosion resistance unlike traditional zinc plated slides, which soon loose their preload, once soft zinc is consumed at ball contact points.
All the Series are available in the version "X" with high corrosion resistance. For this version the balls the cages and the screws are made in stainless steel (INOX) and also the intermediate plate (when foreseen) for high corrosion resistance. The rails are standard with T RACE-NOX treatment.
All ball-cage telescopic are supplied with a standard preload that is between a light play to a light preload, obtained by selecting the right ball diameter from a large range of balls, with diameter differences of hundreds of mm. As both the rail and inner rail have minor tolerances also the preload has subsequently a small range of preload setting, i.e. between minor play to minor preload. Typically suitable for all standard applications. For special application could provide the versions:

Version with light play G1
"G1"version with light play over total stroke for minor friction and/or to allow some minor compensation of assembly error.

Version with light play P1
"P1" version with light preload over total stroke, to provide a complete stable and more rigid movement with some higher friction when slide is without load.

Version with superfinished raceways
It is possible also to have a "F" version with better finished raceways for optimal smooth movement. When combined with a light preload P1 version the telescopic offer an un-comparable smooth and stable movement, for High-Tech application, for which others standard ball-cage linear bearing offer too poor sliding performance. As this version has its raceways honed after T RACE-NOX treatment, the hardened raceways are no longer black, so corrosion resistance at the raceways is comparable with standard hardened linear bearings.

Version with customized stroke
All ball-cage telescopic slides can be requested with stroke customized to meet the applications specific request for stroke. In general additional stroke of 5-30% can be obtained, with some load capacity reduction. Each such request must be verified by T RACE's Tech. Depart. and eventual extra cost will then be communicated along with technical revised data.

Two section-dimensions are available : 28 and 43mm

TLS

The TLS are full telescopic slides, composed of 2 semi-telescopic slides fixed to a robust S-shaped intermediate element, to provide high load capacities with min. flexion.
Double full stroke versions are also available.
The optimized design and hardened raceways provide superior performance at competitive prices, compared to traditional zinc plated slides.

TSQ

TSQ sildes are obtained by rivetting 2 semi-telescopic SR slides together, forming a H-shaped intermediate element, in which the inner rails are fixed to mobile and fixed structure.
The TSQ slides offer very compact dimensions, with good radial and axial load capacities. Full double stroke is possible for all versions.

TSQR

The telescopic slides of the series TSQR are equipped with robust stoppers with rubber shock absorber for dragging of the intermediate element during the extraction stage and in the phase of recovery and re-closing, significantly reducing the shock and noise derived from the impact and allowing a longer life.
These telescopic allow the complete extraction in only one side.

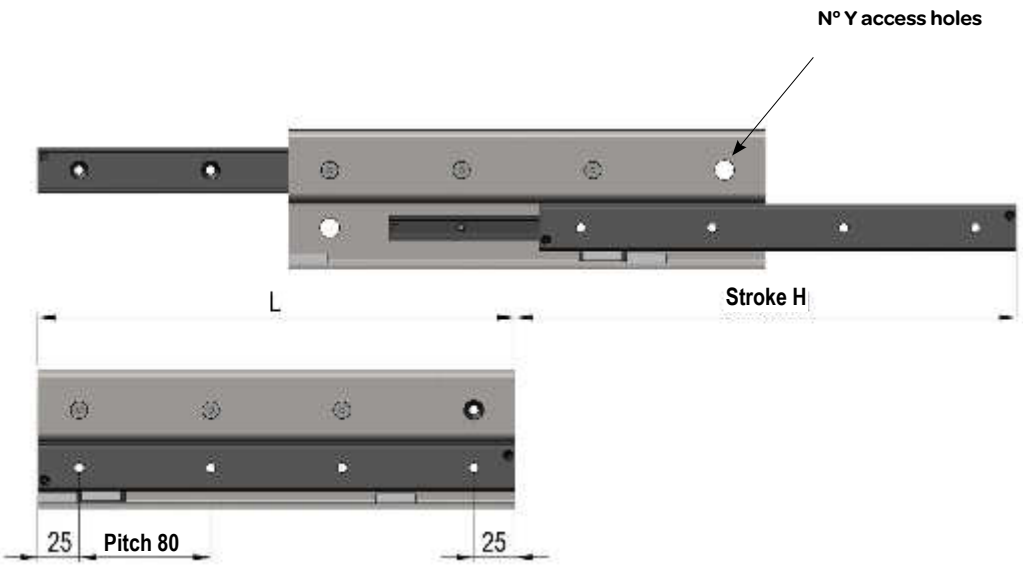
TSH

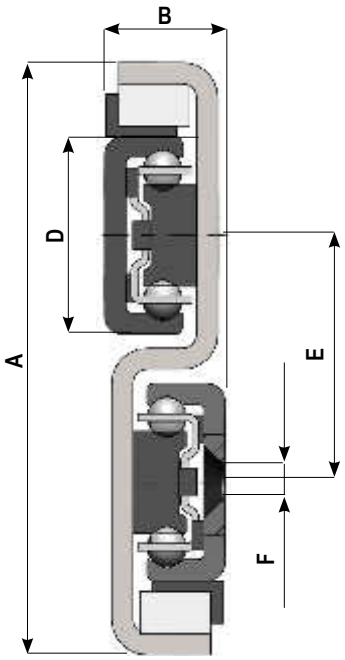
The TSH telescopic slides are composed of two SR semi-telescopic slides fixed to a rectangular rigid element, providing high load capacities both radial and axial, at very compact overall dimensions. Compared to TLS versions, the TSH provide a much more stable assembly and with less oscilations, in extended position.
The TSH also comes with syncronized movement for both single and double stroke. TSH..DSY - i.e. the two semi-telescopic slides SR move together, as connected by a integrated rack & pinion system. Hereby moving the intermediate element 500mm the mobile part extends 1000mm.
System particularly usefull for High-speed telescopic applications and double side telescopic slides movements, as the intermediate element automatically follows smoothly the movement, without any strong impact, as the element is dragged along with the movement all the time

SR

The SR semi-telescopic slides, allows for half stroke on each side.
They are the base component for TLS and TSQ slides.
Unique solution for partial extensions of heavy loads, at economical prices.
With double stroke, space saving linear solutions can be obtained.

TLS..single stroke version





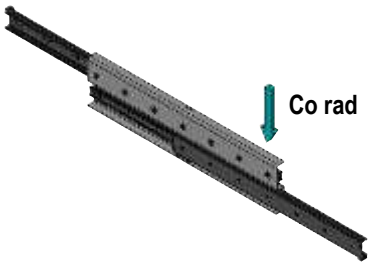
** In closed position most fixing holes are accessible throng the access-holes Y on the intermediate element.*

Code	A (mm)	B (mm)	D (mm)	E (mm)	F (mm)
TLS.28	84	17	28	35	Hole for screw M5 DIN7991
TLS.43	120	28	43	52	Hole for screw M8 DIN7991

The slide TLSX offers high corrosion resistance, with all components and intermediate element in INOX, except the rails. The TLSX have the same dimensions and performance as standard version TLS. Could be provided the versions G1 with light play and the version P1 with light preload.

Order code ex. :
TLS28-610 standard slide with single stroke
TLSX28-610-P1 slide with high corrosion resistance and preload P1
TLSX28-610 slide with high corrosion resistance

The nominal load capacities **Co rad** are all based for load related to centered load position **P**, in the middle of the single slide. For applications with load in other positions, please refer to page 74.
Load capacities are indicated per single slide.
The TLS slide is installed with upper rail fixed to structure and lower rail fixed to mobile part, having the product code at top.
For flexion f in relation to applied load and its position, please refer to page 76 .

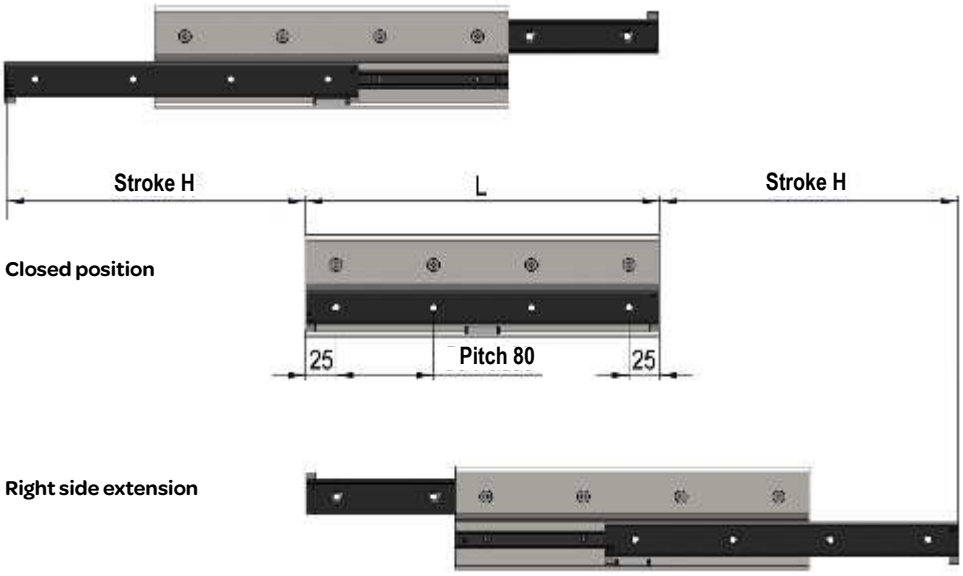


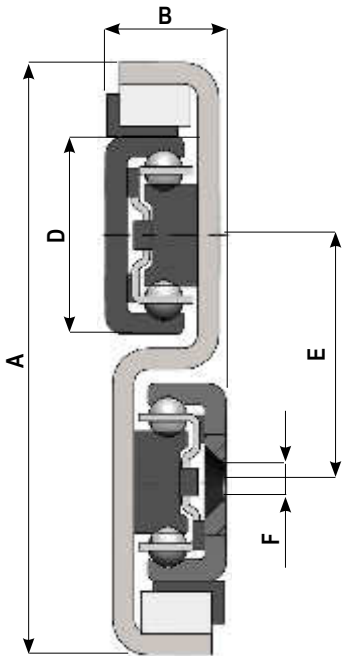
Code	Lenght L (mm)	Stroke H (mm)	n°Y access holes*	Dynamic coefficient C (N)	Load capacity Co rad (N)	Weight (kg)
TLS.28-290	290	295	1	867	577	1,7
TLS.28-370	370	380	1	1143	761	2,2
TLS.28-450	450	460	1	1525	1020	2,6
TLS.28-530	530	540	2	1802	1205	3,1
TLS.28-610	610	620	2	2187	1465	3,6
TLS.28-690	690	700	2	2464	1651	4,1
TLS.28-770	770	780	2	2850	1913	4,5
TLS.28-850	850	860	3	3127	2098	5
TLS.28-930	930	940	3	3514	2222	5,5
TLS.28-1010	1010	1020	3	3791	2053	5,9
TLS.28-1090	1090	1100	3	4068	1907	6,4
TLS.28-1170	1170	1180	4	4455	1781	6,9
TLS.28-1250	1250	1260	4	4732	1671	7,4
TLS.28-1330	1330	1340	4	5120	1573	7,7
TLS.28-1410	1410	1420	4	5397	1486	8,2
TLS.28-1490	1490	1500	5	5785	1409	8,7

Code	Lenght L (mm)	Stroke H (mm)	n°Y access holes*	Dynamic coefficient C (N)	Load capacity Co rad (N)	Weight (kg)
TLS.43-530	530	545	2	3489	2186	7,1
TLS.43-610	610	625	2	3824	2393	8,5
TLS.43-690	690	705	2	4467	2799	9,7
TLS.43-770	770	785	2	5112	3206	10,7
TLS.43-850	850	865	3	5757	3614	11,9
TLS.43-930	930	945	3	6404	4022	13
TLS.43-1010	1010	1025	3	7050	4431	14,1
TLS.43-1090	1090	1105	3	7698	4840	15,2
TLS.43-1170	1170	1185	4	8027	4715	16,4
TLS.43-1250	1250	1265	4	8674	4427	17,5
TLS.43-1330	1330	1345	4	9321	4172	18,6
TLS.43-1410	1410	1425	4	9969	3945	19,7
TLS.43-1490	1490	1505	5	10616	3741	20,9
TLS.43-1570	1570	1585	5	11264	3558	22
TLS.43-1650	1650	1665	5	11912	3391	23,1
TLS.43-1730	1730	1745	5	12240	3240	24,2
TLS.43-1810	1810	1825	6	12887	3101	25,4
TLS.43-1890	1890	1905	6	13535	2974	26,4
TLS.43-1970	1970	1985	6	14183	2857	27,6

TLS..D double stroke version

Left side extension





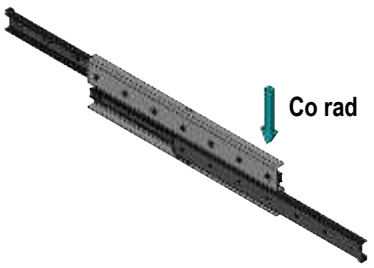
** The rail central fixing hole, with odd fixing holes are not accessible, and therefore not to be used for fixing.*
NB. In closed position the intermediate element might be protruding at one of the sides, as movement not synchronized with the rails.

Code	A (mm)	B (mm)	D (mm)	E (mm)	F (mm)
TLS.28D	84	17	28	35	Holes for screw M5 DIN7991
TLS.43D	120	28	43	52	Holes for screw M8 DIN7991

The slide TLS..D offers high corrosion resistance, with all components and intermediate element in INOX, except the rails. The TLS..D have the same dimensions and performance as standard version TLS..D. Could be provided the versions G1 with light play and the version P1 with light preload.

Order code ex. :
TLS28D-610 standard slide with double stroke
TLSX28D-610-P1 slide with high corrosion resistance and preload P1
TLSX28D-610 slide with high corrosion resistance

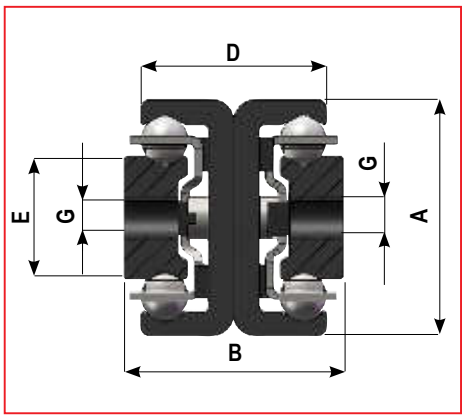
The nominal load capacities **Co rad** are all based for load related to centered load position **P**, in the middle of the single slide. For applications with load in other positions, please refer to page 74.
Load capacities are indicated per single slide.
The TLS slide is installed with upper rail fixed to structure and lower rail fixed to mobile part, having the product code at top.
For flexion f in relation to applied load and its position, please refer to page 76.



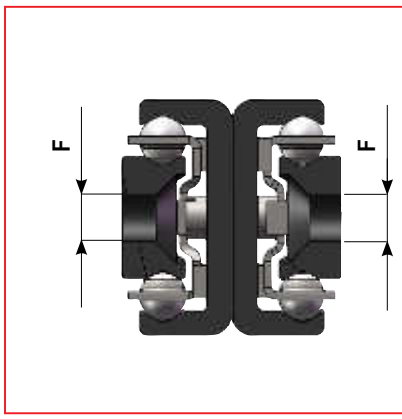
Code	Lenght L (mm)	Stroke H (mm)	Dynamic coefficient C (N)	Load capacity Co rad (N)	Weight (kg)
TLS.28D-290	290	245	1481	1020	1,8
TLS.28D-370	370	325	1866	1280	2,3
TLS.28D-450	450	405	2129	1454	2,8
TLS.28D-530	530	485	2518	1718	3,3
TLS.28D-610	610	565	2787	1897	3,8
TLS.28D-690	690	645	3057	2077	4,3
TLS.28D-770	770	725	3448	2342	4,8
TLS.28D-850	850	805	3720	2523	5,3
TLS.28D-930	930	885	4110	2566	5,8
TLS.28D-1010	1010	965	4383	2343	6,3
TLS.28D-1090	1090	1045	4774	2155	6,8
TLS.28D-1170	1170	1125	5047	1996	7,3
TLS.28D-1250	1250	1205	5438	1858	7,8
TLS.28D-1330	1330	1285	5712	1738	8,2
TLS.28D-1410	1410	1365	5986	1633	8,7
TLS.28D-1490	1490	1445	6376	1539	9,2

Code	Lenght L (mm)	Stroke H (mm)	Dynamic coefficient C (N)	Load capacity Co rad (N)	Weight (kg)
TLS.43D-530	530	480	4726	3022	7,6
TLS.43D-610	610	560	5020	3197	8,7
TLS.43D-690	690	640	5667	3605	9,9
TLS.43D-770	770	720	6314	4015	11
TLS.43D-850	850	800	6962	4424	12,2
TLS.43D-930	930	880	7610	4834	13,3
TLS.43D-1010	1010	960	8258	5244	14,5
TLS.43D-1090	1090	1040	8907	5654	15,6
TLS.43D-1170	1170	1120	9217	5272	16,8
TLS.43D-1250	1250	1200	9867	4915	17,9
TLS.43D-1330	1330	1280	10516	4603	19,1
TLS.43D-1410	1410	1360	11165	4328	20,2
TLS.43D-1490	1490	1440	11814	4084	21,4
TLS.43D-1570	1570	1520	12464	3866	22,5
TLS.43D-1650	1650	1600	13113	3670	23,7
TLS.43D-1730	1730	1680	13428	3493	24,8
TLS.43D-1810	1810	1760	14078	3333	26
TLS.43D-1890	1890	1840	14727	3186	27,1
TLS.43D-1970	1970	1920	15377	3052	28,3

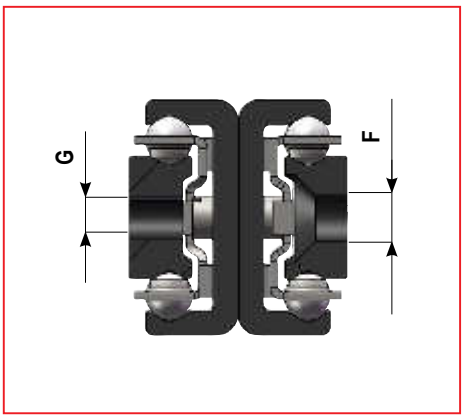
TSQ. standard
Threaded holes both sides.

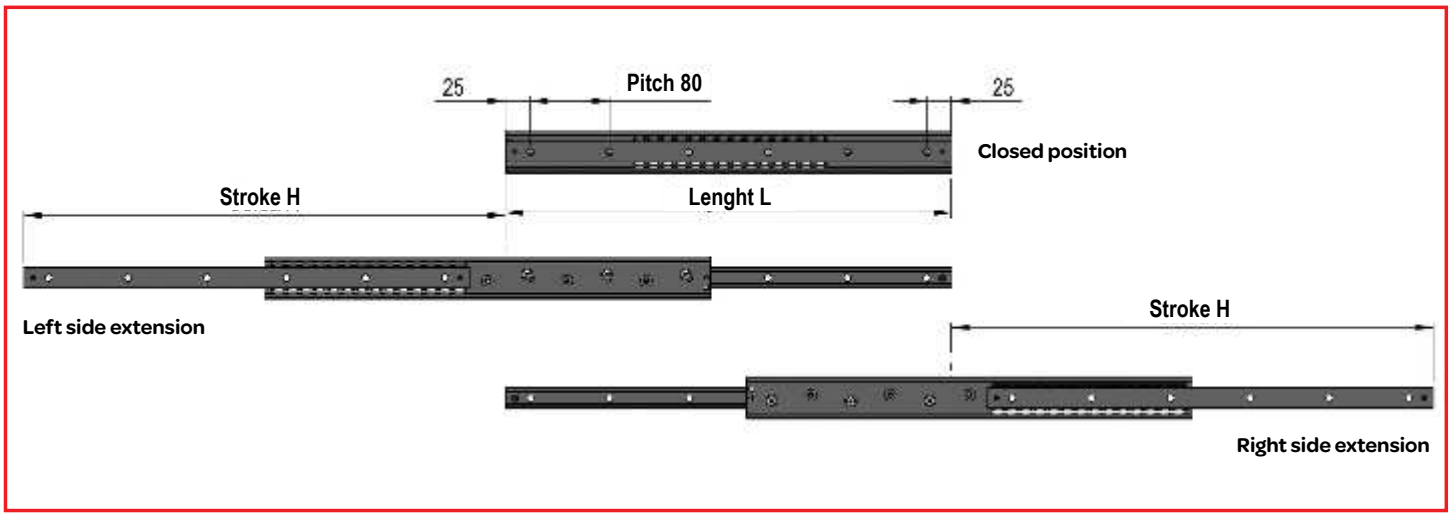


TSQ.S version
C'sunk fixing holes both sides.



TSQ.M version
C'sunk fixing holes and other side with threaded fixing holes.





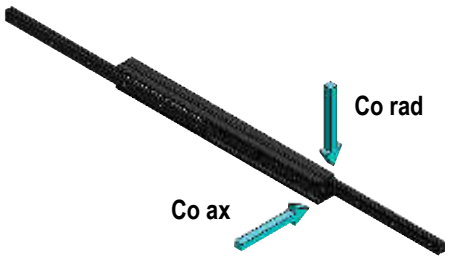
Note: *The slide is provided with a set screw which limits the stroke of the movable sliders in one direction for a stroke equal to H, by removing the screw it is possible to move the sliders in the opposite direction to obtain a double stroke equal to 2H.*

Code	A (mm)	B (mm)	D (mm)	E (mm)	G (mm)	F (mm)
TSQ.28.	28	26	22	14,5	M5	Hole for screw M5 DIN7991
TSQ.43.	43	44	36,6	21	M8	Hole for screw M8 DIN7991

The slide TSQX offers high corrosion resistance, with all components and intermediate element in INOX, except the rails. The TSQX have the same dimensions and performance as standard version TSQ. Could be provided the versions G1 with light play and the version P1 with light preload.

Order code ex. :
TSQ28-610 standard slide
TSQX28-610-P1 slide with high corrosion resistance and preload P1
TSQX28-610 slide with high corrosion resistance

The nominal load capacities **Co rad** are all based for load related to centered load position **P**, in the middle of the single slide. For applications with load in other positions, please refer to page 74.
Load capacities are indicated per single slide.
For flexion f in relation to applied load and its position, please refer to page 76.



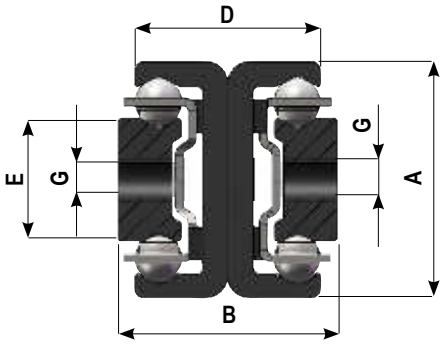
Code	Lenght L (mm)	Stroke H (mm)	Dynamic coefficient C (N)	Load capacity Co rad (N)	Load capacity Co ax (N)	Weight (kg)
TSQ.28.-130	130	136	392	259	151	0,4
TSQ.28.-210	210	224	685	454	265	0,7
TSQ.28.-290	290	312	979	649	379	1,1
TSQ.28.-370	370	400	1273	844	358	1,4
TSQ.28.-450	450	470	1759	1173	316	1,7
TSQ.28.-530	530	558	2051	1037	266	2
TSQ.28.-610	610	628	2547	944	242	2,3
TSQ.28.-690	690	716	2839	825	211	2,6
TSQ.28.-770	770	786	3340	765	196	2,9
TSQ.28.-850	850	874	3630	685	175	3,2
TSQ.28.-930	930	944	4134	643	165	3,5
TSQ.28.-1010	1010	1032	4422	585	150	3,8
TSQ.28.-1090	1090	1120	4712	537	138	4,1
TSQ.28.-1170	1170	1190	5217	511	131	4,4

Code	Lenght L (mm)	Stroke H (mm)	Dynamic coefficient C (N)	Load capacity Co rad (N)	Load capacity Co ax (N)	Weight (kg)
TSQ.43.-210	210	232	968	636	410	1,9
TSQ.43.-290	290	308	1657	1098	709	2,7
TSQ.43.-370	370	412	1891	1246	804	3,4
TSQ.43.-450	450	488	2583	1710	1104	4,2
TSQ.43.-530	530	564	3289	2187	1105	4,9
TSQ.43.-610	610	640	4005	2670	992	5,7
TSQ.43.-690	690	716	4727	3158	901	6,4
TSQ.43.-770	770	820	4924	2733	774	7,2
TSQ.43.-850	850	896	5642	2532	717	7,9
TSQ.43.-930	930	972	6363	2359	668	8,7
TSQ.43.-1010	1010	1048	7088	2208	625	9,4
TSQ.43.-1090	1090	1124	7816	2075	587	10,2
TSQ.43.-1170	1170	1200	8545	1957	554	10,9
TSQ.43.-1250	1250	1276	9277	1852	524	11,7
TSQ.43.-1330	1330	1380	9450	1690	478	12,4
TSQ.43.-1410	1410	1456	10178	1611	456	13,2
TSQ.43.-1490	1490	1532	10908	1539	436	13,9
TSQ.43.-1570	1570	1608	11639	1473	417	14,7
TSQ.43.-1650	1650	1684	12371	1413	400	15,4
TSQ.43.-1730	1730	1760	13104	1357	384	16,2
TSQ.43.-1810	1810	1836	13838	1306	370	16,9
TSQ.43.-1890	1890	1940	14001	1223	346	17,7
TSQ.43.-1970	1970	2016	14733	1181	334	18,4

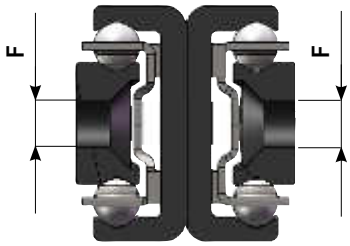
Ball-cage telescopic slides TSQR.., TSQRX..

The telescopic slides of the series TSQR are equipped with robust stoppers with rubber shock absorber for dragging of the intermediate element during the extraction stage and in the phase of recovery and re-closing, significantly reducing the shock and noise derived from the impact and allowing a longer life.
This telescopic slide allow the complete extraction in only one side.

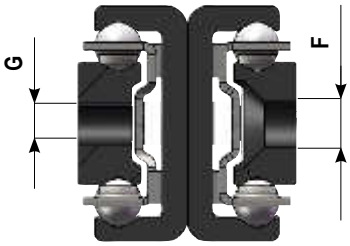
TSQR. standard
Threaded holes both sides.



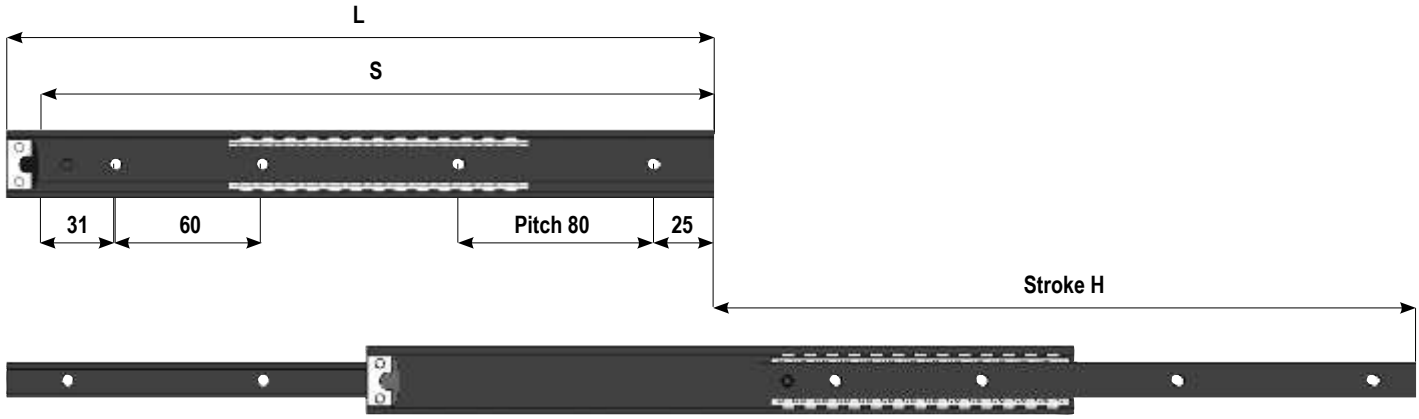
TSQR.S version
C'sunk fixing holes both sides.



TSQR.M version
C'sunk fixing holes and other side with threaded fixing holes.



Note: *The fixed and mobile sliders, are equal to each other and slightly shorter (S) of the length of the closed telescopic slide (L). To gain access to the fixing holes for the version with countersunk holes is necessary to remove the stoppers on both sides and reassemble them again after fixing.*

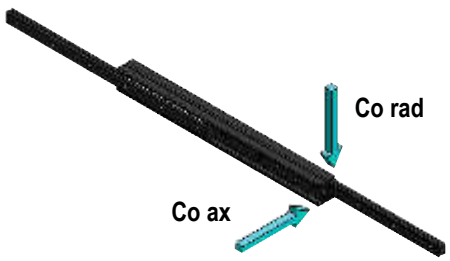


Code	A (mm)	B (mm)	D (mm)	E (mm)	G (mm)	F (mm)
TSQR.28.	28	26	22	14,5	M5	Holes for screw M5 DIN7991
TSQR.43.	43	44	36,6	21	M8	Holes for screw M8 DIN7991

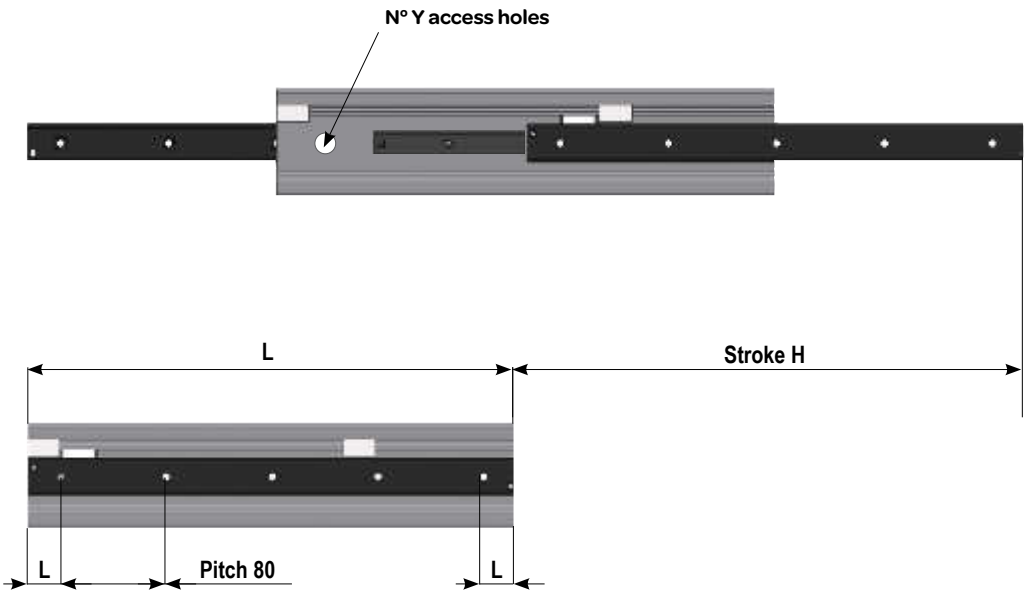
The slide TSQRX offers high corrosion resistance, with all components and intermediate element in INOX, except the rails. The TSQRX have the same dimensions and performance as standard version TSQR. Could be provided the versions G1 with light play and the version P1 with light preload.
Order code ex. :
TSQR28-610 standard slide with single stroke
TSQRX28-610-P1 slide with high corrosion resistance and preload P1
TSQRX28-610 slide with high corrosion resistance
The nominal load capacities **Co rad** are all based for load related to centered load position **P**, in the middle of the single slide. For applications with load in other positions, please refer to page 74. Load capacities are indicated per single slide. For flexion f in relation to applied load and its position, please refer to page 76.

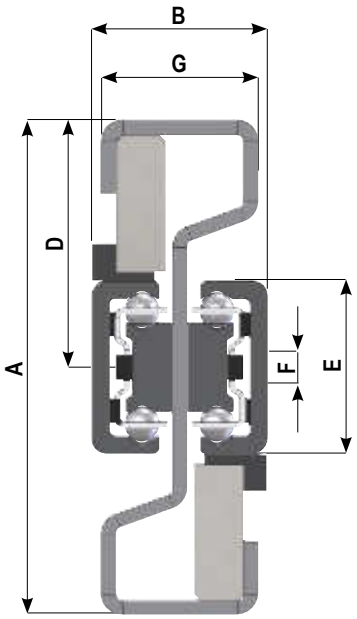
Code	Lenght L (mm)	Lenght S (mm)	Stroke H (mm)	Dynamic coefficient C (N)	Load capacity Co rad (N)	Load capacity Co ax (N)	Weight (kg)
TSQR.28.-130	130	116	130	392	259	151	0,4
TSQR.28.-210	210	196	220	685	454	265	0,7
TSQR.28.-290	290	276	290	979	649	379	1,1
TSQR.28.-370	370	356	380	1273	844	358	1,4
TSQR.28.-450	450	436	450	1759	1173	316	1,7
TSQR.28.-530	530	516	540	2051	1037	266	2
TSQR.28.-610	610	596	610	2547	944	242	2,3
TSQR.28.-690	690	676	700	2839	825	211	2,6
TSQR.28.-770	770	756	770	3340	765	196	2,9
TSQR.28.-850	850	836	860	3630	685	175	3,2
TSQR.28.-930	930	916	930	4134	643	165	3,5
TSQR.28.-1010	1010	996	1020	4422	585	150	3,8
TSQR.28.-1090	1090	1076	1090	4712	537	138	4,1
TSQR.28.-1170	1170	1156	1180	5217	511	131	4,4

Code	Lenght L (mm)	Lenght S (mm)	Stroke H (mm)	Dynamic coefficient C (N)	Load capacity Co rad (N)	Load capacity Co ax (N)	Weight (kg)
TSQR.43.-210	210	196	225	968	636	410	1,9
TSQR.43.-290	290	276	290	1657	1098	709	2,7
TSQR.43.-370	370	356	385	1891	1246	804	3,4
TSQR.43.-450	450	436	450	2583	1710	1104	4,2
TSQR.43.-530	530	516	545	3289	2187	1105	4,9
TSQR.43.-610	610	596	610	4005	2670	992	5,7
TSQR.43.-690	690	676	705	4727	3158	901	6,4
TSQR.43.-770	770	756	770	4924	2733	774	7,2
TSQR.43.-850	850	836	865	5642	2532	717	7,9
TSQR.43.-930	930	916	930	6363	2359	668	8,7
TSQR.43.-1010	1010	996	1025	7088	2208	625	9,4
TSQR.43.-1090	1090	1076	1090	7816	2075	587	10,2
TSQR.43.-1170	1170	1156	1185	8545	1957	554	10,9
TSQR.43.-1250	1250	1236	1250	9277	1852	524	11,7
TSQR.43.-1330	1330	1316	1345	9450	1690	478	12,4
TSQR.43.-1410	1410	1396	1410	10178	1611	456	13,2
TSQR.43.-1490	1490	1476	1505	10908	1539	436	13,9
TSQR.43.-1570	1570	1556	1570	11639	1473	417	14,7
TSQR.43.-1650	1650	1636	1665	12371	1413	400	15,4
TSQR.43.-1730	1730	1716	1730	13104	1357	384	16,2
TSQR.43.-1810	1810	1796	1825	13838	1306	370	16,9
TSQR.43.-1890	1890	1876	1890	14001	1223	346	17,7
TSQR.43.-1970	1970	1956	1985	14733	1181	334	18,4



TSH.X single stroke version



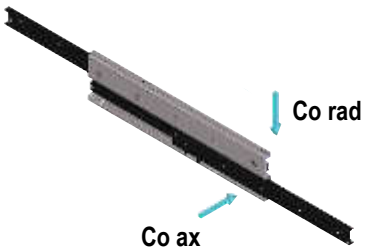


Code	A (mm)	B (mm)	D (mm)	E (mm)	F (mm)	G (mm)
TSH.28	80	28,5	40	28	Hole for screw M5 DIN7991	25,5
TSH.43	100	47	50	43	Hole for screw M8 DIN7991	42

The slide TSHX offers high corrosion resistance, with all components and intermediate element in INOX, except the rails. The TSHX have the same dimensions and performance as standard version TSH. Could be provided the versions G1 with light play and the version P1 with light preload.

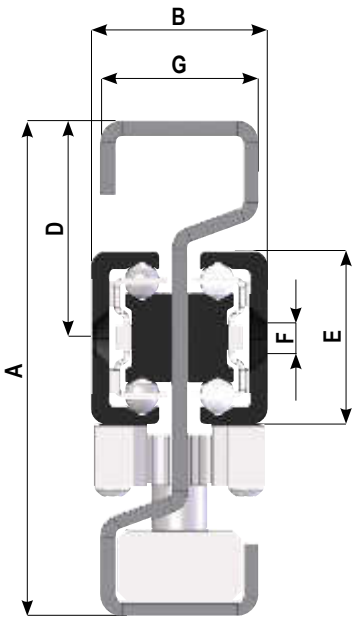
Order code ex. :
TSH28-610 standard slide with single stroke
TSHX28-610-P1 slide with high corrosion resistance and preload P1
TSHX28-610 slide with high corrosion resistance

The nominal load capacities **Co rad** are all based for load related to centered load position **P**, in the middle of the single slide. For applications with load in other positions, please refer to page 74.
Load capacities are indicated per single slide.
For flexion f in relation to applied load and its position, please refer to page 76.

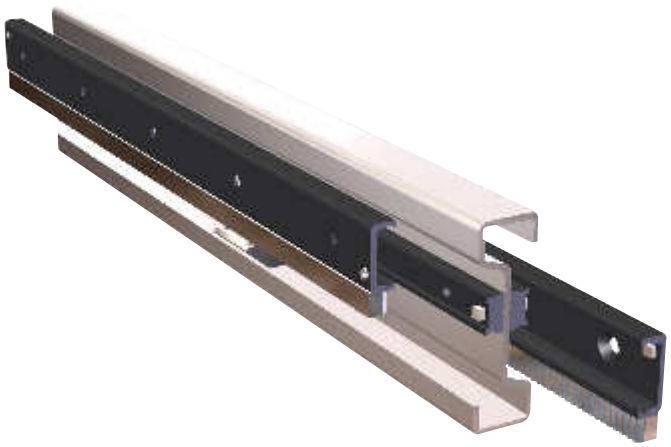


Code	Lenght L (mm)	Stroke H (mm)	n°Y access holes*	Dynamic coefficient C (N)	Load capacity Co rad (N)	Load capacity Co ax (N)	Weight (kg)
TSH.28-290	290	295	1	868	577	336	1,8
TSH.28-370	370	380	1	1143	762	443	2,3
TSH.28-450	450	460	1	1525	1020	593	2,8
TSH.28-530	530	540	2	1802	1206	701	3,3
TSH.28-610	610	620	2	2187	1466	853	3,8
TSH.28-690	690	700	2	2464	1652	961	4,3
TSH.28-770	770	780	2	2851	1913	1113	4,8
TSH.28-850	850	860	3	3128	2099	1221	5,3
TSH.28-930	930	940	3	3515	2361	1374	5,8
TSH.28-1010	1010	1020	3	3792	2546	1423	6,3
TSH.28-1090	1090	1100	3	4068	2370	1322	6,8
TSH.28-1170	1170	1180	4	4456	2213	1235	7,3
TSH.28-1250	1250	1260	4	4733	2076	1158	7,8
TSH.28-1330	1330	1340	4	5121	1955	1091	8,2
TSH.28-1410	1410	1420	4	5397	1847	1031	8,7
TSH.28-1490	1490	1500	5	5785	1750	977	9,2

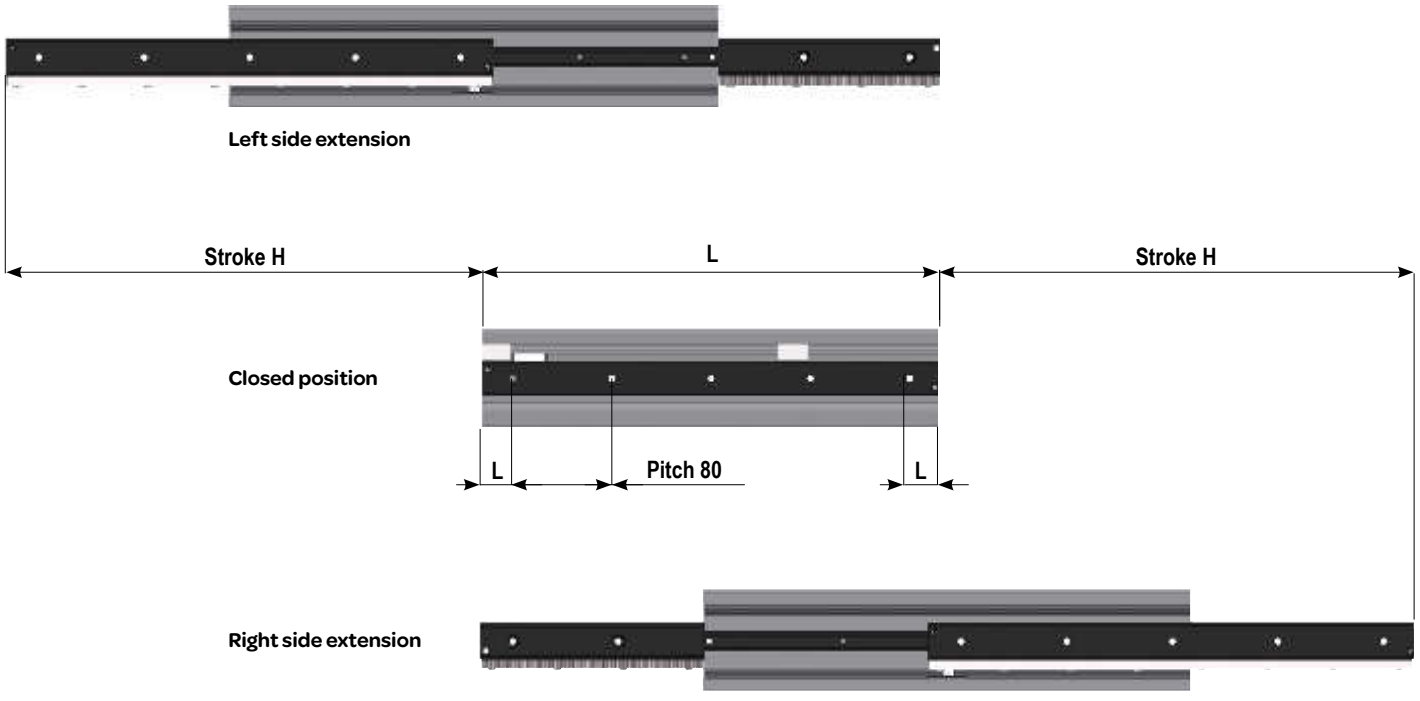
Code	Lenght L (mm)	Stroke H (mm)	n°Y access holes*	Dynamic coefficient C (N)	Load capacity Co rad (N)	Load capacity Co ax (N)	Weight (kg)
TSH.43-530	530	545	2	3490	2187	1266	7,3
TSH.43-610	610	625	2	3824	2393	1385	8,3
TSH.43-690	690	705	2	4468	2799	1621	9,5
TSH.43-770	770	785	2	5112	3206	1856	10,5
TSH.43-850	850	865	3	5758	3614	2092	11,7
TSH.43-930	930	945	3	6404	4022	2329	12,7
TSH.43-1010	1010	1025	3	7051	4431	2565	13,9
TSH.43-1090	1090	1105	3	7698	4808	2802	15,0
TSH.43-1170	1170	1185	4	8028	4495	2919	16,1
TSH.43-1250	1250	1265	4	8675	4220	2903	17,2
TSH.43-1330	1330	1345	4	9322	3977	2736	18,3
TSH.43-1410	1410	1425	4	9969	3761	2587	19,4
TSH.43-1490	1490	1505	5	10617	3567	2453	20,5
TSH.43-1570	1570	1585	5	11265	3392	2333	21,6
TSH.43-1650	1650	1665	5	11913	3233	2224	22,7
TSH.43-1730	1730	1745	5	12240	3089	2124	23,8
TSH.43-1810	1810	1825	6	12888	2956	2033	24,9
TSH.43-1890	1890	1905	6	13536	2835	1950	26,0
TSH.43-1970	1970	1985	6	14184	2723	1873	27,1



The TSH..DSY with syncronized movement for both single and double stroke, is composed of two semi-telescopic slides SR that move together, as connected by an integrated rack & pinion system. Hereby moving the intermediate element 500mm the mobile part extends 1000mm.
System particularly usefull for High-speed telescopic slide applications and double side telescopic slides movements, as the intermediate element automatically follows smoothly the movement, without any strong impact, as the element is dragged along with the movement all the time.



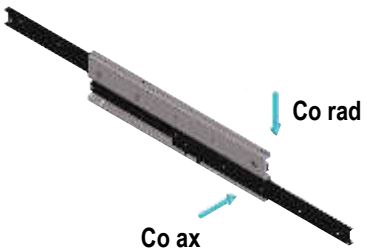
TSH..DSY double stroke version



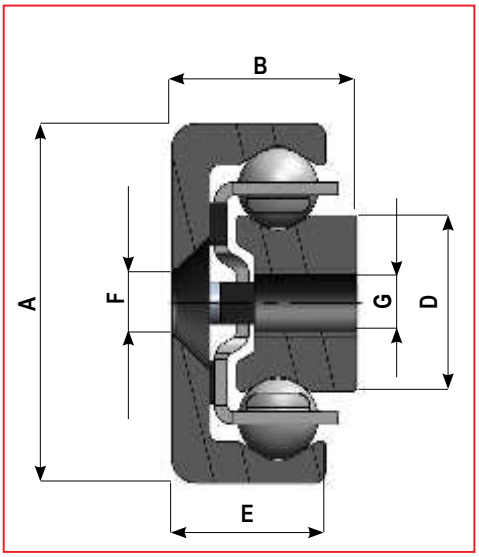
Code	A (mm)	B (mm)	D (mm)	E (mm)	F (mm)	G (mm)
TSH28DSY	80	28,5	35	28	Hole for screw M5 DIN7991	25,5
TSH43DSY	100	47	45	43	Hole for screw M8 DIN7991	42

Code	Lenght L (mm)	Stroke H (mm)	Dynamic coefficient C (N)	Load capacity Co rad (N)	Load capacity Co ax (N)	Weight (kg)
TSH28DSY-290	290	270	982	661	385	1,8
TSH28DSY-370	370	350	1259	846	493	2,3
TSH28DSY-450	450	430	1648	1110	646	2,8
TSH28DSY-530	530	510	1924	1295	753	3,3
TSH28DSY-610	610	590	2313	1559	907	3,8
TSH28DSY-690	690	670	2589	1744	1014	4,3
TSH28DSY-770	770	750	2978	2008	1168	4,8
TSH28DSY-850	850	830	3254	2192	1276	5,3
TSH28DSY-930	930	910	3644	2456	1429	5,8
TSH28DSY-1010	1010	990	3920	2641	1509	6,3
TSH28DSY-1090	1090	1070	4196	2503	1396	6,8
TSH28DSY-1170	1170	1150	4585	2328	1299	7,3
TSH28DSY-1250	1250	1230	4861	2177	1215	7,8
TSH28DSY-1330	1330	1310	5251	2044	1141	8,2
TSH28DSY-1410	1410	1390	5527	1926	1075	8,7
TSH28DSY-1490	1490	1470	5916	1822	1016	9,2

Code	Lenght L (mm)	Stroke H (mm)	Dynamic coefficient C (N)	Load capacity Co rad (N)	Load capacity Co ax (N)	Weight (kg)
TSH43DSY-530	530	500	4181	2.653	1.536	7,5
TSH43DSY-610	610	580	4830	3.063	1.774	8,6
TSH43DSY-690	690	660	5479	3.474	2.011	9,8
TSH43DSY-770	770	740	5794	3.665	2.122	10,8
TSH43DSY-850	850	820	6443	4.075	2.359	12,0
TSH43DSY-930	930	900	7093	4.486	2.597	13,1
TSH43DSY-1010	1010	980	7742	4.897	2.835	14,3
TSH43DSY-1090	1090	1060	8392	5.216	3.073	15,4
TSH43DSY-1170	1170	1140	9041	4.850	3.311	16,5
TSH43DSY-1250	1250	1220	9690	4.532	3.117	17,7
TSH43DSY-1330	1330	1300	10009	4.253	2.925	18,8
TSH43DSY-1410	1410	1380	10658	4.006	2.755	20,0
TSH43DSY-1490	1490	1460	11308	3.787	2.604	21,1
TSH43DSY-1570	1570	1540	11957	3.590	2.469	22,2
TSH43DSY-1650	1650	1620	12607	3.413	2.347	23,4
TSH43DSY-1730	1730	1700	13256	3.252	2.237	24,5
TSH43DSY-1810	1810	1780	13906	3.106	2.136	25,6
TSH43DSY-1890	1890	1860	14226	2.972	2.044	26,8
TSH43DSY-1970	1970	1940	14875	2.850	1.960	27,9



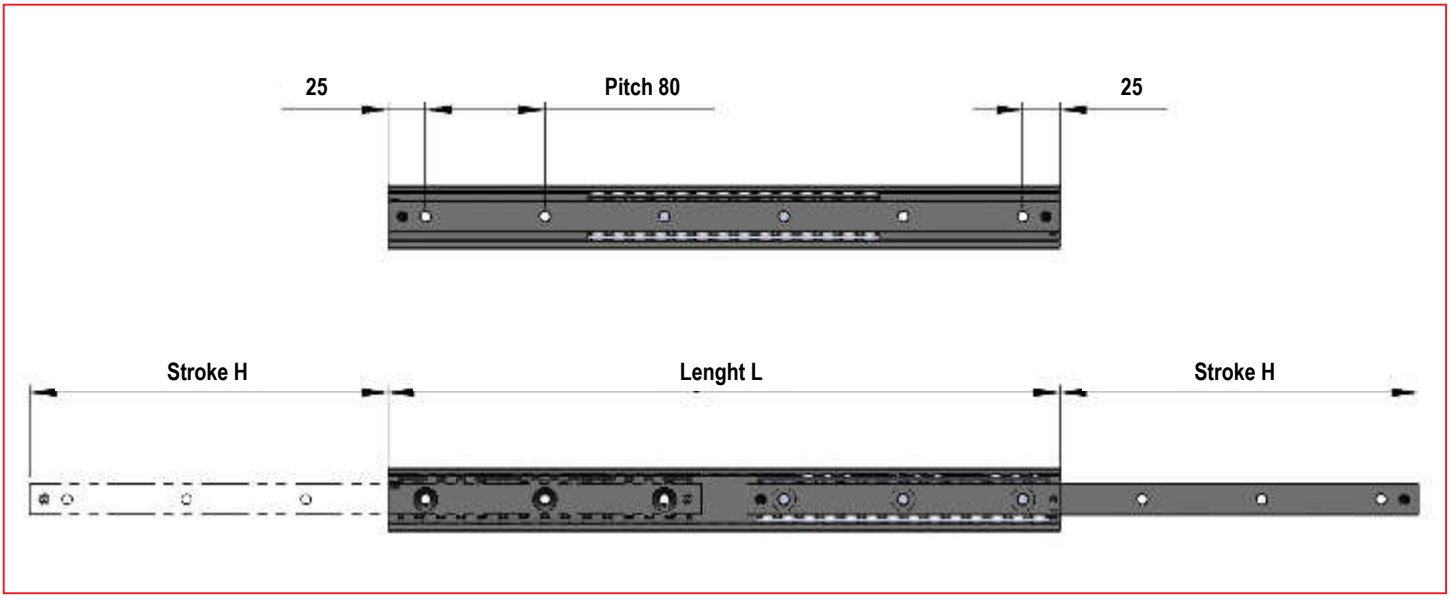
The nominal load capacities **Co rad** are all based for load related to centered load position **P**, in the middle of the single slide. For applications with load in other positions, please refer to page 74.
Load capacities are indicated per single slide.
For flexion f in relation to applied load and its position, please refer to page 76.



The semi-telescopic slides SR28 allow for a stroke H, equal to half the length of the slide, plus a minor stroke 10-25mm depending on type.
The slides can also perform an equal stroke to the other side, removing the small screw positioned at the left side.

The version SRX28 for high corrosion resistance, have all components in INOX, except the profiles.
SXR28 have same dimensions and performance as SR28.

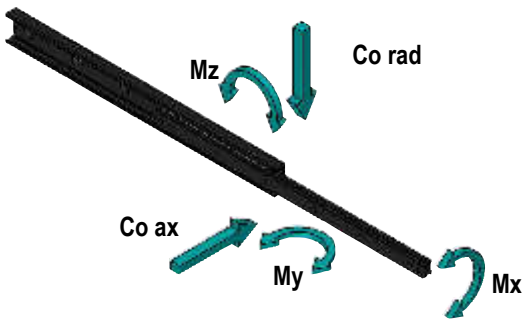
The load capacities are all referred to a single slide, with load at the centered position.



Code	A (mm)	B (mm)	D (mm)	E (mm)	G (mm)	F (mm)
SR.28	28	13	14,5	11	M5	Hole for screw M5 DIN7991
SR.43	43	22	21	18,30	M8	Hole for screw M8 DIN7991

The slide is provided with a screw which limits the stroke of the movable sliders in one direction for a stroke equal to H, by removing the screw it is possible to move the sliders in the opposite direction to obtain a double stroke equal to 2H.
The slide may be produced on request with stroke increased or diminished.
For example, with an extraction of 75% compared with the standard extraction of 50%, the load capacity is reduced to 20% of the load capacity Co rad indicated in the table.

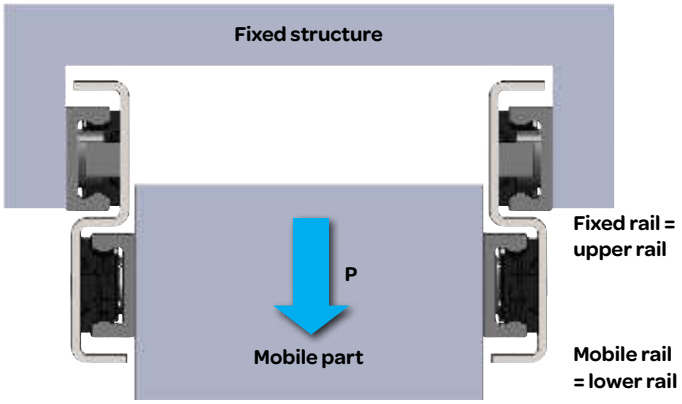
The slide SRX offers high corrosion resistance, with all components and intermediate element in INOX, except the rails. The SRX have the same dimensions and performance as standard version SR. Could be provided the versions G1 with light play and the version P1 with light preload.
Order code ex. :
SR28-610 standard slide with single stroke
SRX28-610-P1 slide with high corrosion resistance and preload P1
SRX28-610 slide with high corrosion resistance



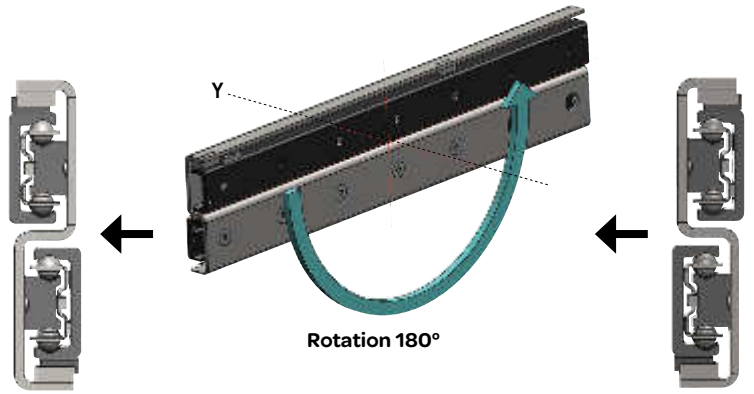
The nominal load capacities **Co rad** are all based for load related to centered load position **P**, in the middle of the single slide. For applications with load in other positions, please refer to page 74. Load capacities are indicated per single slide. For flexion f in relation to applied load and its position, please refer to page 76.

Code	Lenght L (mm)	Stroke H (mm)	Dyn coeff. C (N)	Load-moment capacities					Weight (kg)
				Co rad (N)	Co ax (N)	Mx (Nm)	My (Nm)	Mz (Nm)	
SR.28-130	130	68	872	639	374	13	15	27	0,25
SR.28-210	210	112	1544	1139	665	23	46	80	0,40
SR.28-290	290	156	2217	1639	958	33	94	161	0,55
SR.28-370	370	200	2891	2140	1251	43	158	270	0,70
SR.28-450	450	235	3934	2949	1724	55	260	446	0,86
SR.28-530	530	279	4607	3450	2017	65	361	618	1,01
SR.28-610	610	314	5666	4276	2499	78	510	873	1,16
SR.28-690	690	358	6337	4774	2791	88	648	1109	1,31
SR.28-770	770	393	7403	5608	3278	100	843	1443	1,46
SR.28-850	850	437	8072	6105	3569	110	1018	1742	1,62
SR.28-930	930	472	9142	6943	4059	122	1259	2154	1,77
SR.28-1010	1010	516	9810	7438	4348	132	1471	2516	1,92
SR.28-1090	1090	560	10480	7934	4638	142	1699	2906	2,07
SR.28-1170	1170	595	11550	8774	5129	155	2007	3433	2,22

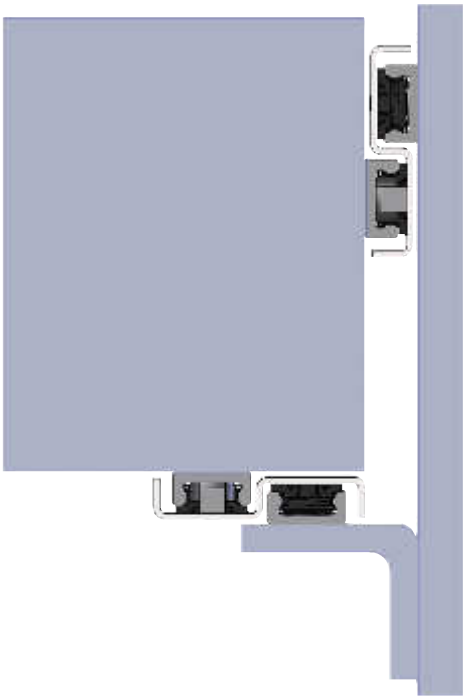
Code	Lenght L (mm)	Stroke H (mm)	Dyn coeff. C (N)	Load-moment capacities					Weight (kg)
				Co rad (N)	Co ax (N)	Mx (Nm)	My (Nm)	Mz (Nm)	
SR.43-210	210	116	2232	1497	966	99	75	117	1,0
SR.43-290	290	154	3817	2615	1688	152	176	272	1,4
SR.43-370	370	206	4496	3055	1972	187	266	412	1,7
SR.43-450	450	244	6107	4197	2709	239	436	675	2,1
SR.43-530	530	282	7746	5368	3464	292	647	1003	2,5
SR.43-610	610	320	9403	6556	4232	344	901	1396	2,9
SR.43-690	690	358	11072	7757	5006	397	1196	1853	3,2
SR.43-770	770	410	11693	8138	5253	432	1416	2194	3,6
SR.43-850	850	448	13358	9334	6025	484	1781	2759	4,0
SR.43-930	930	486	15030	10538	6802	537	2187	3389	4,4
SR.43-1010	1010	524	16707	11747	7582	589	2636	4084	4,7
SR.43-1090	1090	562	18390	12962	8366	642	3126	4843	5,1
SR.43-1170	1170	600	20076	14180	9152	694	3658	5667	5,5
SR.43-1250	1250	638	21764	15401	9941	747	4231	6556	5,9
SR.43-1330	1330	690	22347	15743	10161	782	4637	7184	6,3
SR.43-1410	1410	728	24032	16960	10947	834	5280	8180	6,6
SR.43-1490	1490	766	25719	18180	11734	887	5965	9241	7,0
SR.43-1570	1570	804	27409	19402	12523	939	6691	10367	7,4
SR.43-1650	1650	842	29100	20626	13313	992	7460	11557	7,8
SR.43-1730	1730	880	30793	21852	14105	1044	8270	12813	8,1
SR.43-1810	1810	918	32488	23080	14897	1097	9122	14132	8,5
SR.43-1890	1890	970	33053	23403	15106	1132	9713	15048	8,9
SR.43-1970	1970	1008	34745	24628	15896	1184	10634	16476	9,3



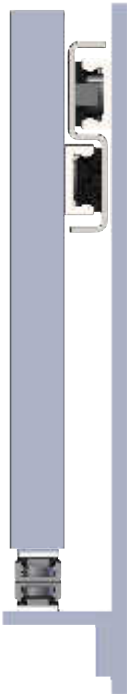
The slides can be mounted in different way, however in general as a configuration "drawer-slides" for horizontal complete extension of a mobile part, compared to a fixed structure.
Except for type TLR, which must be bought as Left-side TLRS and right-side TLRD, all other slides are symmetric, i.e. same version for both left and right side, just by rotating the slides 180degrees.
For all slides of series TLR, TLS, TLA with a vertical intermediate element, the mobile part must always be fixed to the lower rail. The upper rail is identified by the code marking at upper rail (TLR/TLS) or upper part (TLA).

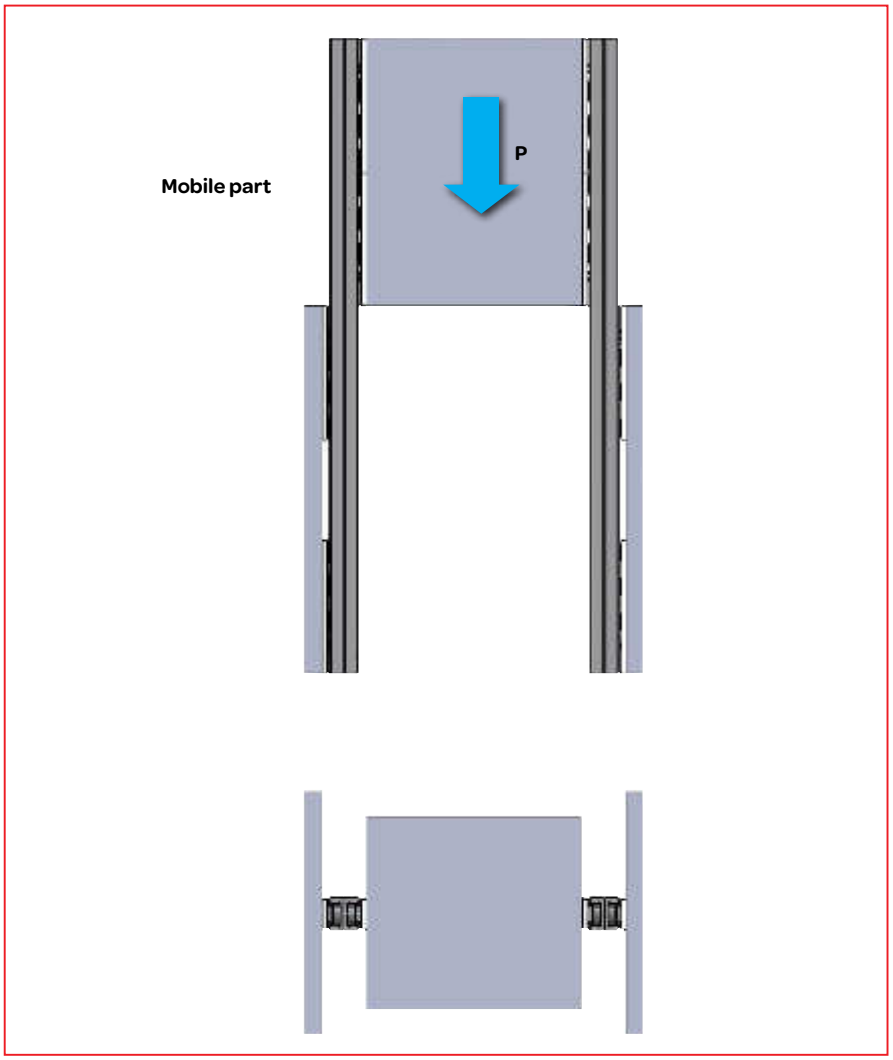


When the mobile part creates a cantilever load and only fixed with 1 slide at its side, it is suggested to use a pair of TLR, TLS, TLA as shown in below figure to better support the overhanging load.



For extensions of mobile parts, like doors or panels, it is suggested to us a TLR, TLS, TLA for upper part, to take the full load. The to cope with lateral oscillation a compact TLQ,TSQ o TQA slide at inferior part.

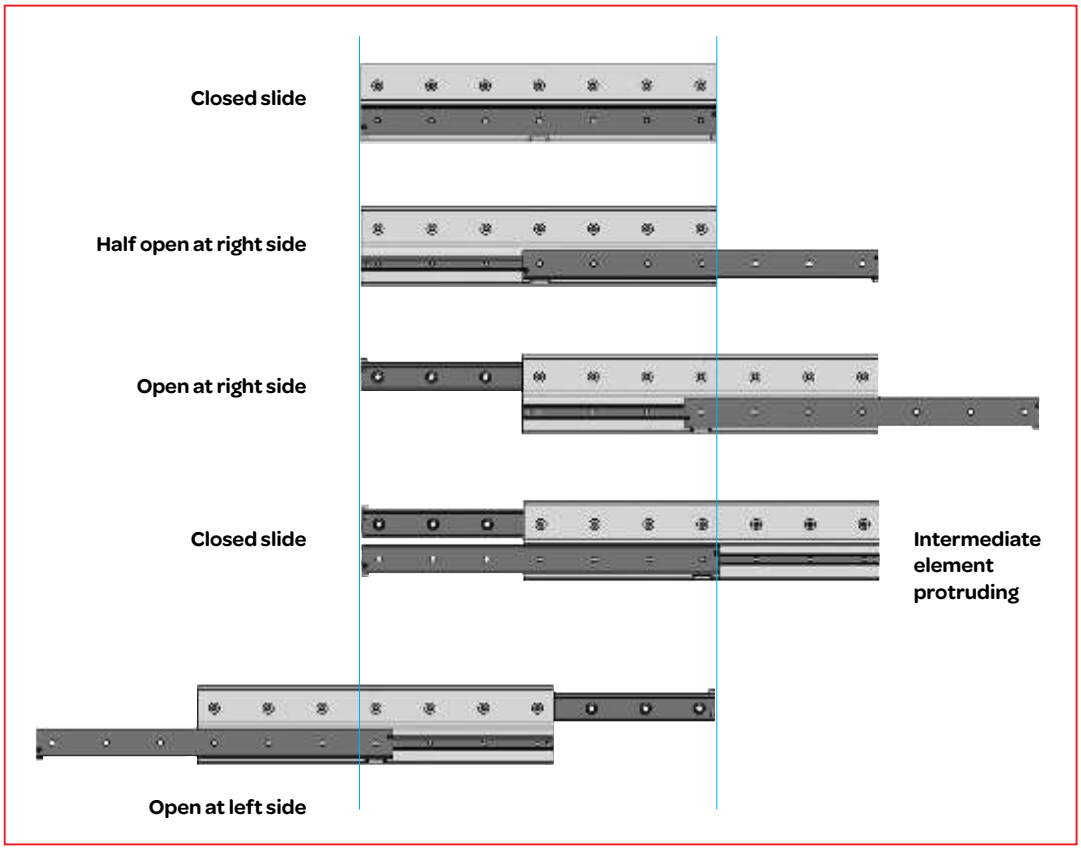




Vertical movement

For vertical movement is proposed TLQ or TQA slides, with compact dimensions. As the slides in such application generally do not take the load, but only some lateral oscillation, these slides are to be preferred.

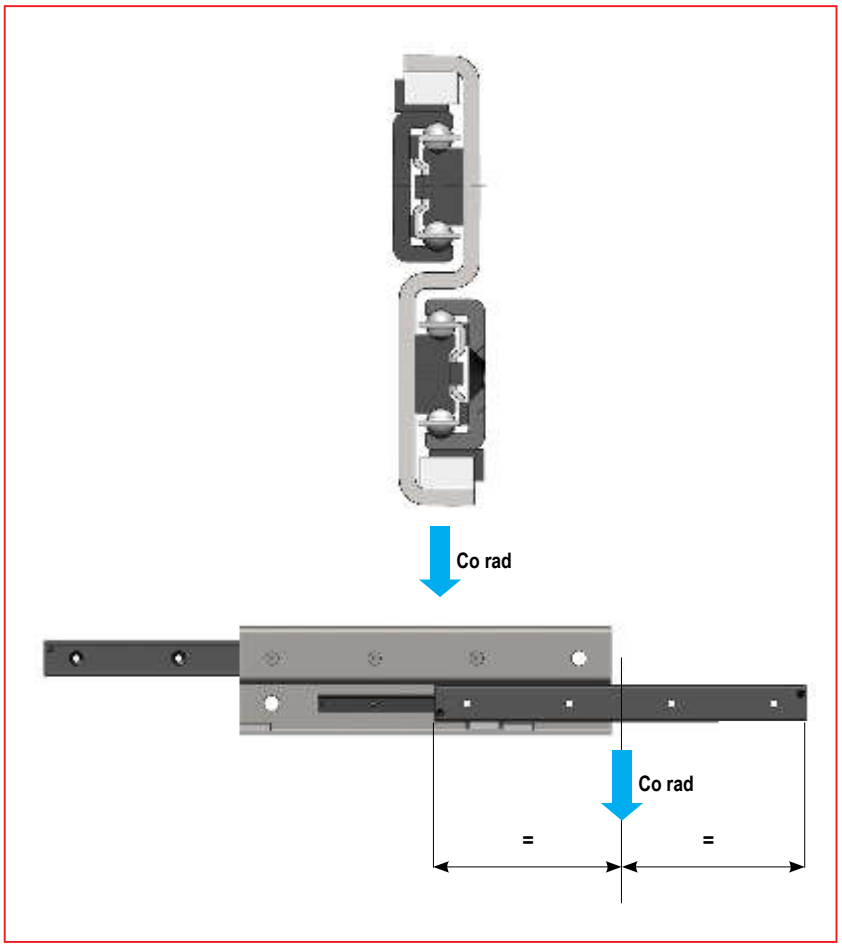
For vertical movement are recommended roller slides, while ball-cage slides (TLS, TQS, SR) likely will have some ball-cage creeping-problem, as the ball-cage tends to move downwards by gravity, creating some minor binding, during upwards extension.

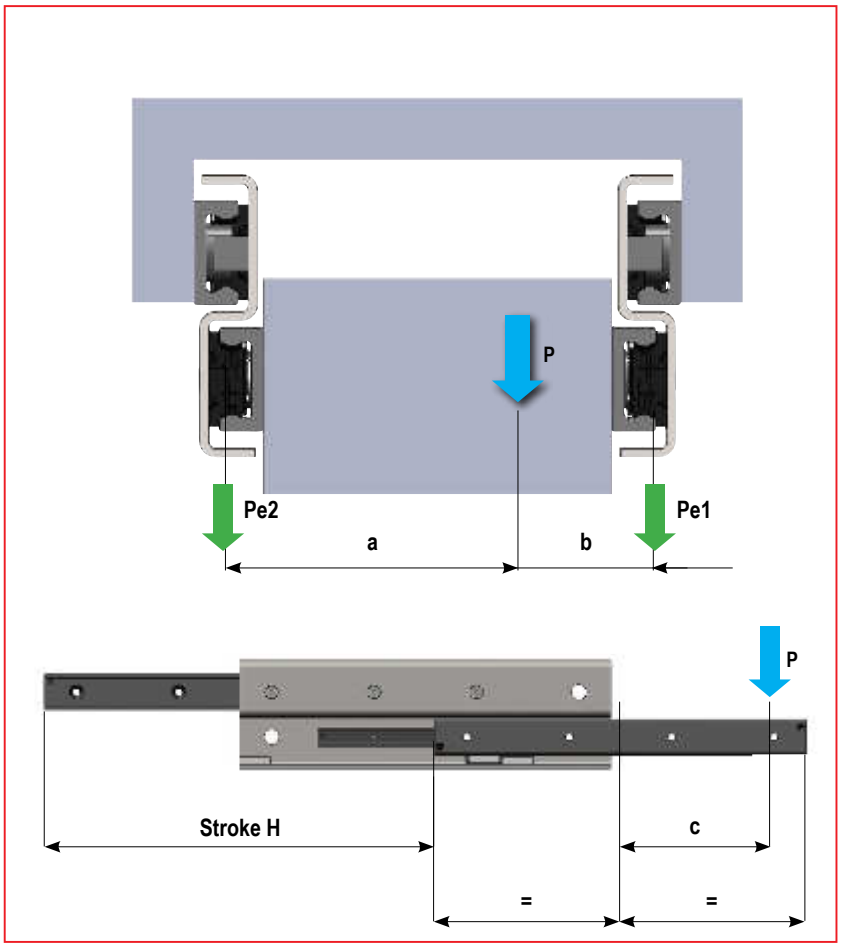


Double side movement

Slides for double side extension (TLS..D / TSQ) allow for extension of the mobile part to both left and right side, the stroke each side equals the length of the slide, less a small constant.

As the movement of the 3 parts, i.e. the two rails and intermediate element is not synvcronized, the intermediate element tends to protrude when closing the slide.
If this is a problem, synchronized slides can be offered, for which the intermediate element precisely follows the movement, as moved by a belt, fixed to upper and lower rail. See page 77.





The main factors for sizing the slides for a telescopic movement:

- The weight/forces of mobile part and their position compared to slides.
- Presence of dynamic forces / eventual abuse
- Max. acceptable flexion
- Max. acceptable extraction/closing force of mobile part
- Ambients, frequency, speed
- Expected lifetime

All load capacities Co rad, are indicated per single slide and with the load perfectly centered. I.e an homogeneous load placed between 2 slides. Hereby the load P is acting as a radial point load, at half the extension and in the middle between the 2 slides. The load capacity for a pair is then :

P = 2 • Co rad

When sizing a telescopic application, it must be carefully evaluated if the load is centered. Also it must be considered if any external dynamic forces, or possible abuse could further increase the load forces acting on the slides.

In case the load isn't centered. i.e. load center Pe1 more towards one of the slides, and/or more towards the tip of the load, the center weighted load must be calculated for the must slides = Pe1 , to be inserted in formula on next page.

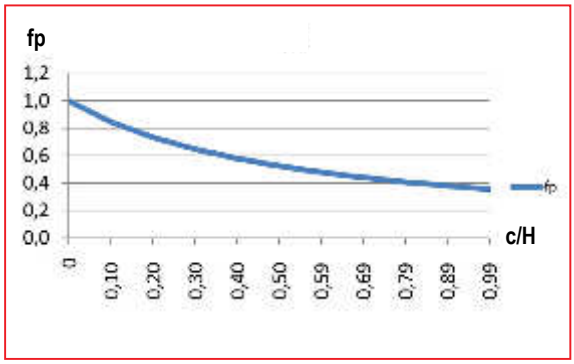
$$Pe1 = \frac{(P \cdot a)}{(a + b)} \cdot fp$$

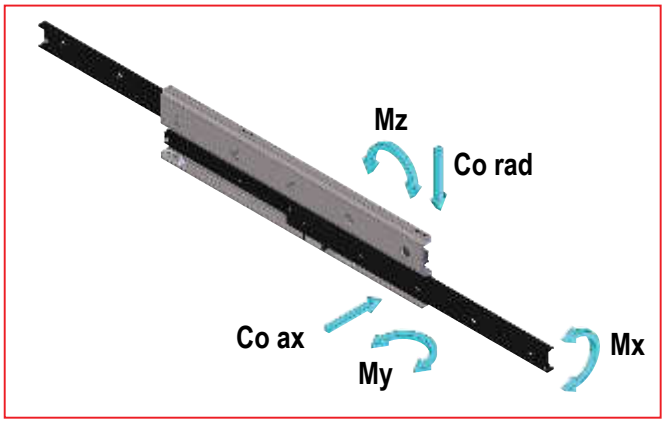
Where :
P = Weight/load of mobile part
a, b = distances from centered load to left/right slide
fp = load position coefficient, based on relation of "c" distance between actual load P and load Co rad position, compared stroke H .

The coefficient fp is obtained from below diagram. as the ratio between "c/H" .

When only 1 slide the formula is **Pe = P • fp**

Capacity load reduction according to the position of the load P.





Where :
Pe rad = applied radial load
Pe ax = applied axial load
Mex, Mey, Mez = applied moments
Co rad = radial load capacity
Co ax = axial load capacity
Mx, My, Mz = moment capacities

SR and full telescopic slides TLQ, the calculation might also includes moments.

$$\left(\frac{Pe\ ax}{Co\ ax} + \frac{Pe\ rad}{Co\ rad} + \frac{Mex}{Mx} + \frac{Mey}{My} + \frac{Mez}{Mz}\right) <= \frac{1}{Z}$$

To assure a correct selection of the slides according to the slide's load capacity, it is assumed the known different forces acting on the slides, which then must be decomposed in : radial, axial or moment forces. Then again compared to load/moment capacities indicated for each single product in previous pages.
For the slides with intermediate element TLS, TLR, TLA the verification is mainly down to comparing the load capacity Co Rad. to Pe as calculated on previous page, including a safety factor Z .
Pe <= Co rad • Z

Where Z is the safety coefficient as per below table.

Safety coefficient - Z	Application conditions
1 - 1,5	Precise calculation of load/forces, precise assembly and rigid structures
1,5 - 2	Intermediate conditions
2 - 3,5	Roughly estimation of load/forces, not precise and not rigid structures

For slides TSQ and TQA might too include axial loads. The verification includes therefore both axial and radial loads.
Once having found Pe axial and radial the formula is :

$$\left(\frac{Pe\ ax}{Co\ ax} + \frac{Pe\ rad}{Co\ rad}\right) <= \frac{1}{Z}$$

Lifetime calculation

Theoretical lifetime calculation

The theoretical life of the rollers and raceways of rail should be determined by the conventional formula as indicated below in km of running, however, should keep in mind that the value thus calculated must be taken with caution just for orientation, in fact, the real service life achieved can be very different from that calculated value, because the phenomena of wear and fatigue are caused by factors not easy to predetermine, for example:

- Inaccuracy in the estimation of the real loading condition
- Overloading for inaccuracies in assembling
- Vibration, shock and dynamic pulse stress
- Raceways status of lubrication
- Thermal excursions
- Environmental pollution and dust
- Damage mounting
- Stroke length and frequency of movement

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

Where :
Pe rad = applied radial load
Pe ax = applied axial load
Mex, Mey, Mez = applied moments
Co rad = radial load capacity
Co ax = axial load capacity
Mx, My, Mz = moment capacities

The correction factors **fa** applied to the theoretical calculation formula have the sole purpose of guiding the designer qualitatively on the influence in the lifetime estimation of the real application conditions without any pretense of precision. For more details please contact the Technical Service T RACE.
The slides TQA/X and TLA/X is expected to reach approx. 100.000 cycles, with a load of 70% of max load capacity.

Coefficient fa	Operating condistions
0,7-1	Correct load sizing, rigid structures, constantgood lubrication, clean ambient
0,3-0,7	Intermediate conditions
0,05-0,3	Approximative load sizing, unprecise non rigid structures, dusty not clear ambient

The actual lifetime very much depends on constant good lubrication of the raceways. Without good constant librucation and/or in very dusty ambients the actual lifetime expectations can be much reduced.

Calculation of load P to be used for Lifetime calculation

The load P to be used in below formular is referred to single slide, with load in the centre. If used in pair, load on each single slide must be calculated, see page 74 for further info.

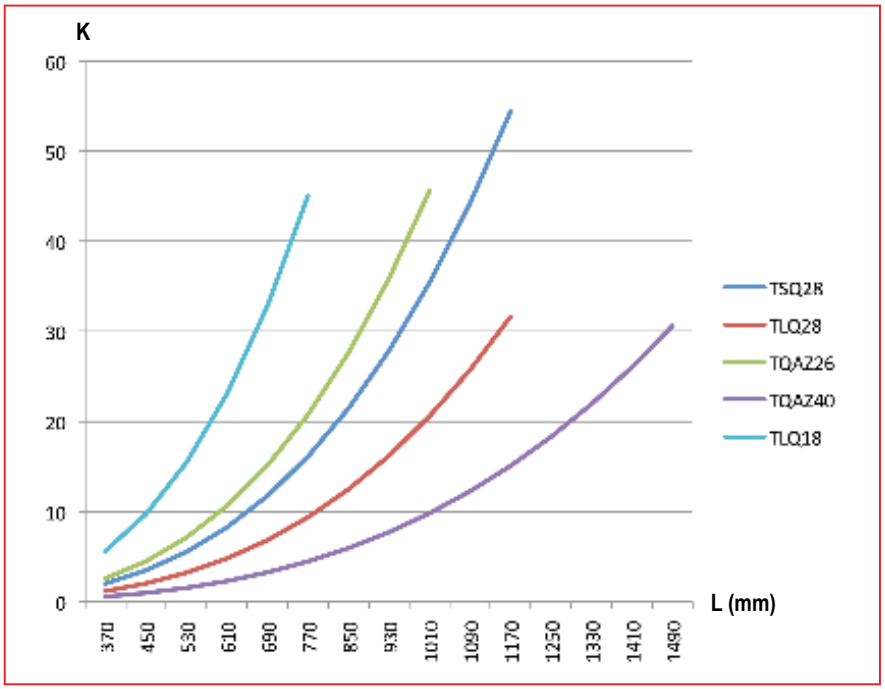
The slides TSQ and TQA can be used with both radial and axial loads. In this case P, is substituted by Pe, to include axial load in the Lifetime formula.

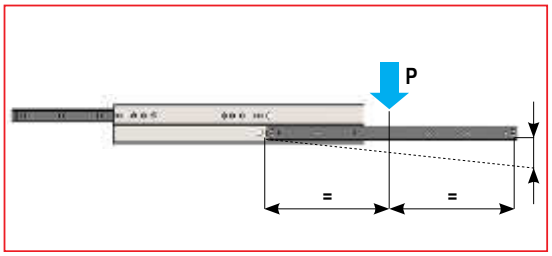
$$Pe = Co\ rad \cdot \left(\frac{Pe\ rad}{Co\ rad} + \frac{Pe\ ax}{Co\ ax}\right)$$

The slides TLQ and SR might too include moments Mex, Mey and Mez, in addition to radial and axial loads. The formula in case of monents is

$$Pe = Co\ rad \cdot \left(\frac{Pe\ rad}{Co\ rad} + \frac{Pe\ ax}{Co\ ax} + \frac{Mex}{Mx} + \frac{Mey}{My} + \frac{Mez}{Mz}\right)$$

Calculation of flexion





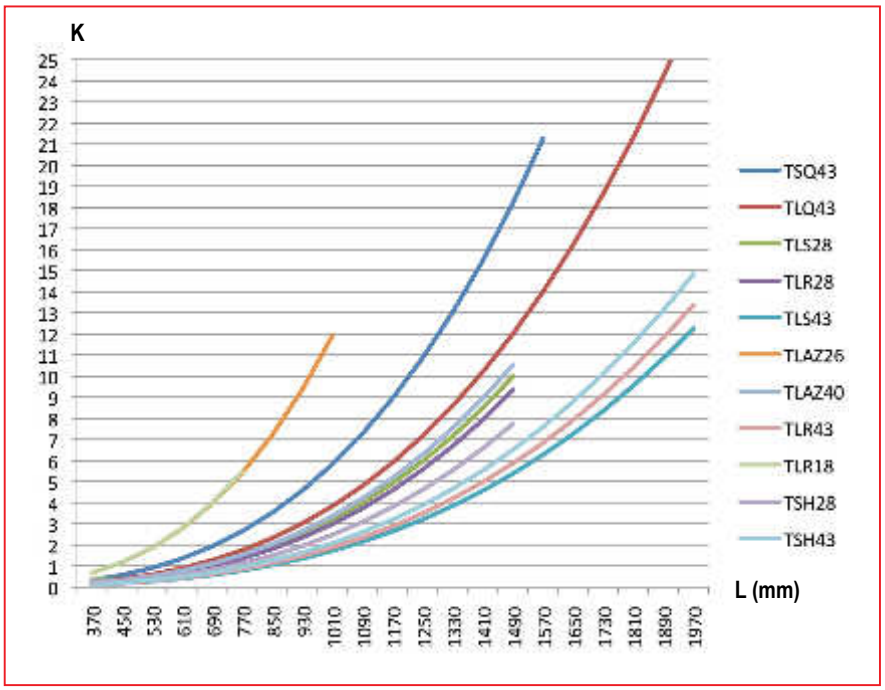
The extended slides have a minor flexion " f " in function of applied load P and its own construction. What gives the strength of the slides, are merely the intermediate element's shape. The slides with a long S-shape intermediate element TLS, TLR, TLA allow for much lower flexion, than the compact slides TSQ, TLQ, TQA, even though all base components are identical.

The flexion can be estimated as approximately:

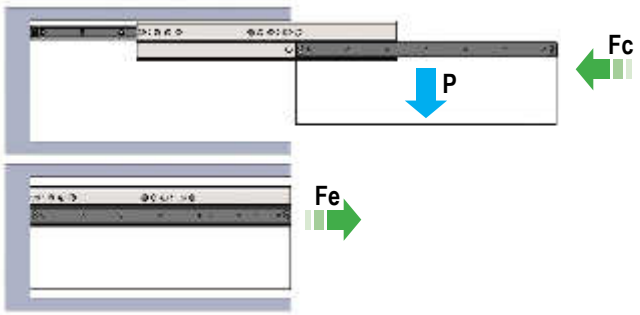
$$f = \frac{(K \cdot P)}{1000} + X$$

Where:
K = coefficient obtained from graph, in function of slide type and length.
P = applied load in the central point of the single slides
X = external factors as : rigidity and precision of mobile structure and fixed structure

In case the load P was applied on two slides in an eccentric position, it is necessary to determine the equivalent component Pe for each slides (see page 74) and replace it to P in the formula.



Extension & closing forces



The required force Fe to extend the applied load, is determined by the friction of the slide's rolling components and applied load Pe is:
Fe ≈ 0,01 • P (N)

The required force Fc to close the applied load is

$$Fc = 0{,}01 \cdot P + \frac{f}{H} \cdot P \text{ (N)}$$

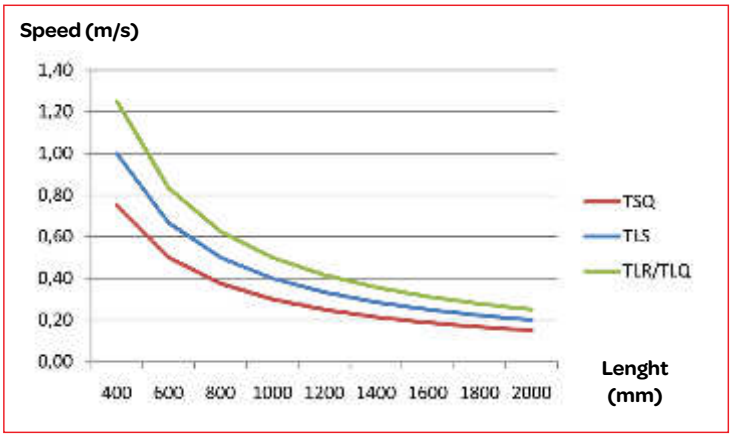
Where :
P = radial load applied on single rail
f = calculated flexion
H = stroke of slide
For applications with 2 slides, with even load the force is x 2 .
In addition there might be some additional "binding friction" from non precise assembly. For applications requiring lowest extension/closing forces is recommended roller slides series TLR and TLQ .

Speed limitation

The speed of the slides is limited by strength of the stoppers , which move the intermediate element along with each opening/closing of the slides. The critical point is the impact, when stopper in rail hits the stopper in intermediate element. The stoppers are different among types of slides, but the same for all lengths of same slide. As the impact force, increase with the lenght og slides, based of same speed, as the weight of intermdiate element increases propotional with the increased lengths, the max impact the stoppers can absorb is: **Ek = m • v**

Where:
m = weight of element
v = Speed of slide
Hereby short slides can operate at faster speeds than long slides.

The roller telescopic slides TLR, TLQ , TLA and TQA have strong impact stoppers, to provide the highest speed. The speed range is from 1m/s for the shorter slides to 0,2m for the longest slides. Besides higest speed, the roller telescopic slides are also the most silent and smooth moving slides due to the roller.
The strong ball-cage slides TLS offer a speed range of 0,8m/s for shorter slides to 0,2m/s for the longest slides.
The TSQ and SR slides are without any rubber inserts, just square pins, so metal against metal impact. The speed range is hereby lower; 0,6m/s for shorter slides to 0,1m/s for max. lengths.



Materials and treatments

The rails, except TLAZ-TLAX-TQAZ-TQAX slides are hardened steel profiles with T RACE NOX treatment, to provide a hardened surface, min 58HRC on all surfaces, an overall high corrosion resistance of the entire profile. The treatment provides unique long lasting telescopic slides, even for severe high frequency application and corrosive ambients. The T RACE NOX treatment is made in 3 steps :
1) High-depth nitriding hardening
2) Black oxidation
3) Impregnation in protective black mineral oil
The T RACE NOX treatment is done on the complete profile, leaving the rail a smooth matt black finish.

Materials	**TLR**	**TLQ**	**TLRX**	**TLQX**	**TLS TSH**	**TSQ**	**TLSX TSHX**	**TSQX**	**TLAZ**	**TQAZ**	**TLAX**	**TQAX**
Rails/ Profiles	Nitriding hardened steel, black (TRACE-NOX)				Nitriding hardened steel, black (TRACE-NOX)				Bright zinc plated steel		Stainless steel Inox AISI 304	
Intermediate element	Bright zinc plated steel	no	Stainless steel Inox AISI 304	no	Bright zinc plated steel	no	Stainless steel Inox AISI 304	no	Bright zinc plated steel	no	Stainless steel Inox AISI 304	no
Rotelle/ sfere	Core hardened 100Cr6 steel		Core hardened stainless steel Inox AISI 440C		Core hardened 100Cr6 steel		Core hardened stainless steel Inox AISI 440C		Core hardened 100Cr6 steel		Core hardened stainless steel Inox AISI 440C	
Rollers / balls	no				Bright zinc plated steel		Stainless steel Inox AISI 304					
Wipers	Polycarbonate elastomer				no				no	no	no	no
Lubricant sponge	Synthetic fibre with litium grease				no				no	no	no	no
Screws	Zinc plated steel		Stainless steel Inox		Zinc plated steel		Stainless steel Inox		Stainless steel Inox		Stainless steel Inox	
Element stoppers	Zinc plated steel - Nitrilic rubber		Zinc plated steel - Nitrilic rubber		Zinc plated steel - Nitrilic rubber	Stainless steel Inox	Zinc plated steel - Nitrilic rubber	Stainless steel Inox	Stainless steel Inox - Nitrilic rubber			
Roller seals	(Type 2RS) Neoprene				no				(Type 2Z) Zinc plated steel		(Type 2RS) Neoprene	
Inner bearing ball-cage	Polyamide				no				Zinc plated steel		Polyamide	

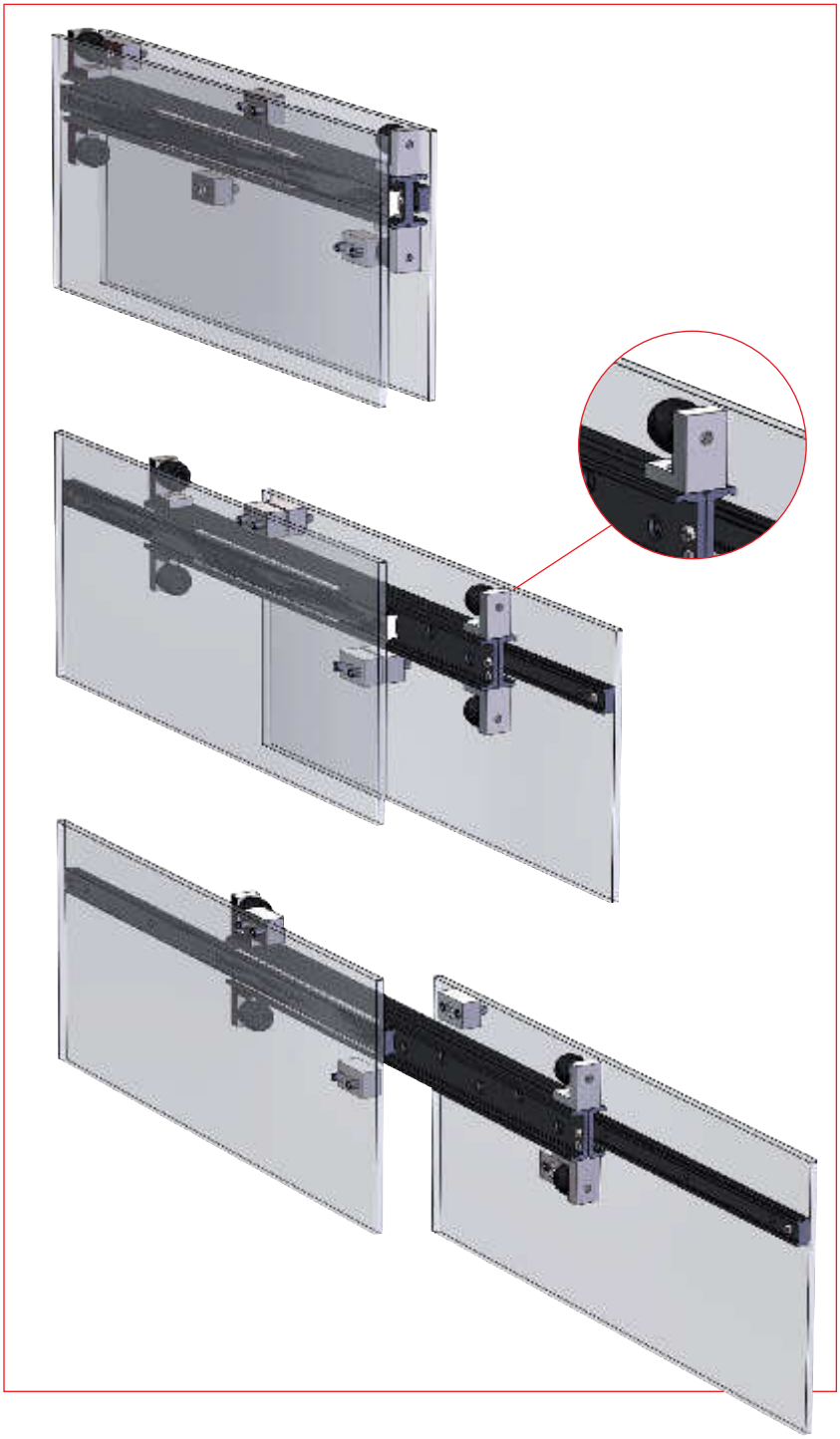
ADDITIONAL EXTERNAL STOPPERS

The use of telescopic slides require strong external movement end-stoppers, as the incoporporated stoppers in all T RACE's sliders are solely designed to drag along the intermediate element, during opening/closing of the slides.
The dimensioning of external stoppers, depends on the total weight of mobile part and the speed of which it is being moved.
T RACE's additional 8 end-stoppers provide an easy solution for good movement end-stoppers, which also are fast to install.
The solution is based on 8 parts fixed, for which 4 are fixed to the intermediate element and remaining 4 installed on fixed and mobile structure. The shape of the strong rubber also provides a high damping property.
The advantages are :

1) The end-stopper system assures full stroke of the slide, unlike stopping system installed after on mobile and fixed structure. Such non-TRACE solutions tend to reduce full stroke with 30-60mm .

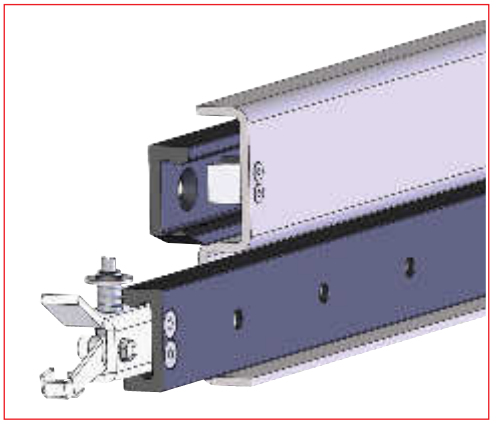
2) The end-stopper system provides a smooth and silent stopping at the reach of full extraction and closing, eliminating any metalic sound. at in impact.

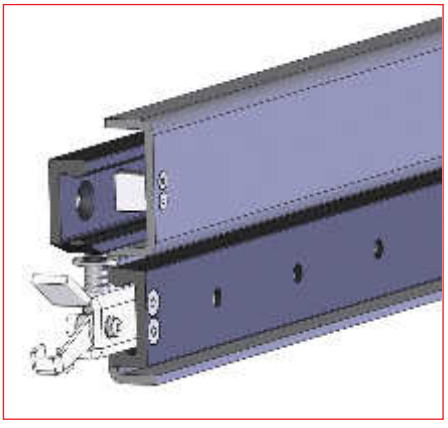
For further technical data and dimensions, please contact T RACE's Technical dept.

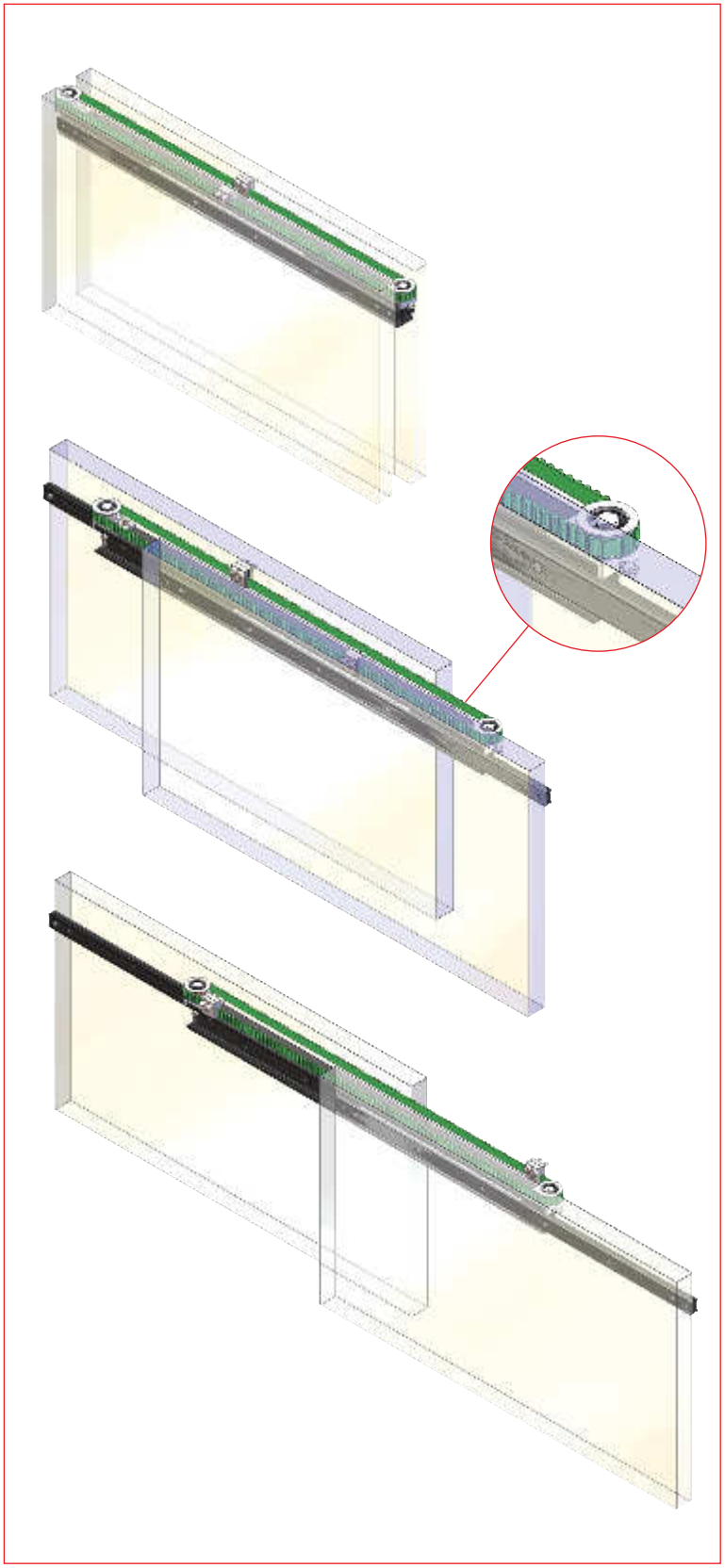


BLOCKING DEVICE FOR CLOSED POSITION

The telescopic slides TLS and TLR can include strong blocking device for closed position.
When closing, the mechanism fixed at mobile part, forces the robust spring-loaded pin to enter the upper rail, fixed to structure, to hereby assure a strong and safe blocking of the mobile part.
To release the blocking, the handle is manually pressed down.
For further data and dimensions, please contact T RACE's Technical dept.



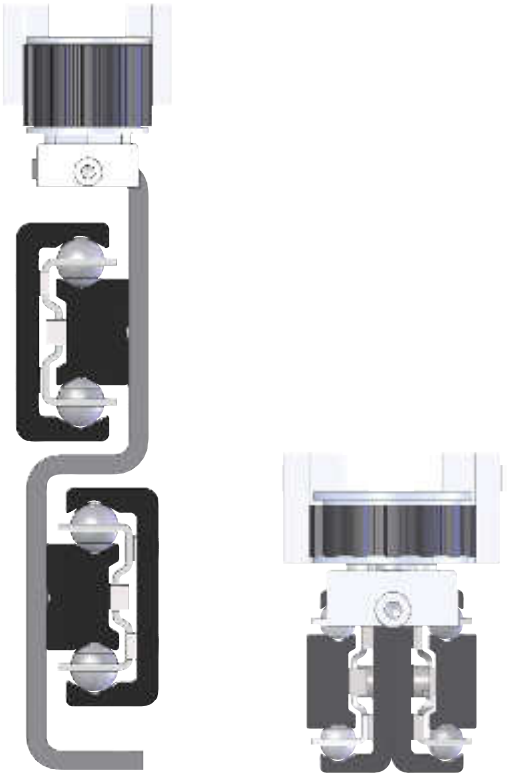




SYNCHRONISATION OF THE INTERMEDIATE ELEMENT

The standard slides TLR, TLS, TSQ e TLQ can be provided as synchronised slides. The synchronization is obtained by mounting of pulleys and a strong belt fixed to standard slides. Hereby the slide will open/close, just by acting on the intermediate element.
The advantages of this synchronization feature are :
1) Solve the problem of protruding element for double stroke applications with TSQ and TLS..D slides. See page 71.
2) Synchronized slides can reach max. speed 100% higher than standard version, as no impacts with intermediate element, ref. Page 76.
3) Very silent movement.
4) Possible to implement in high frequency telescopic applications, or automation at high speed.

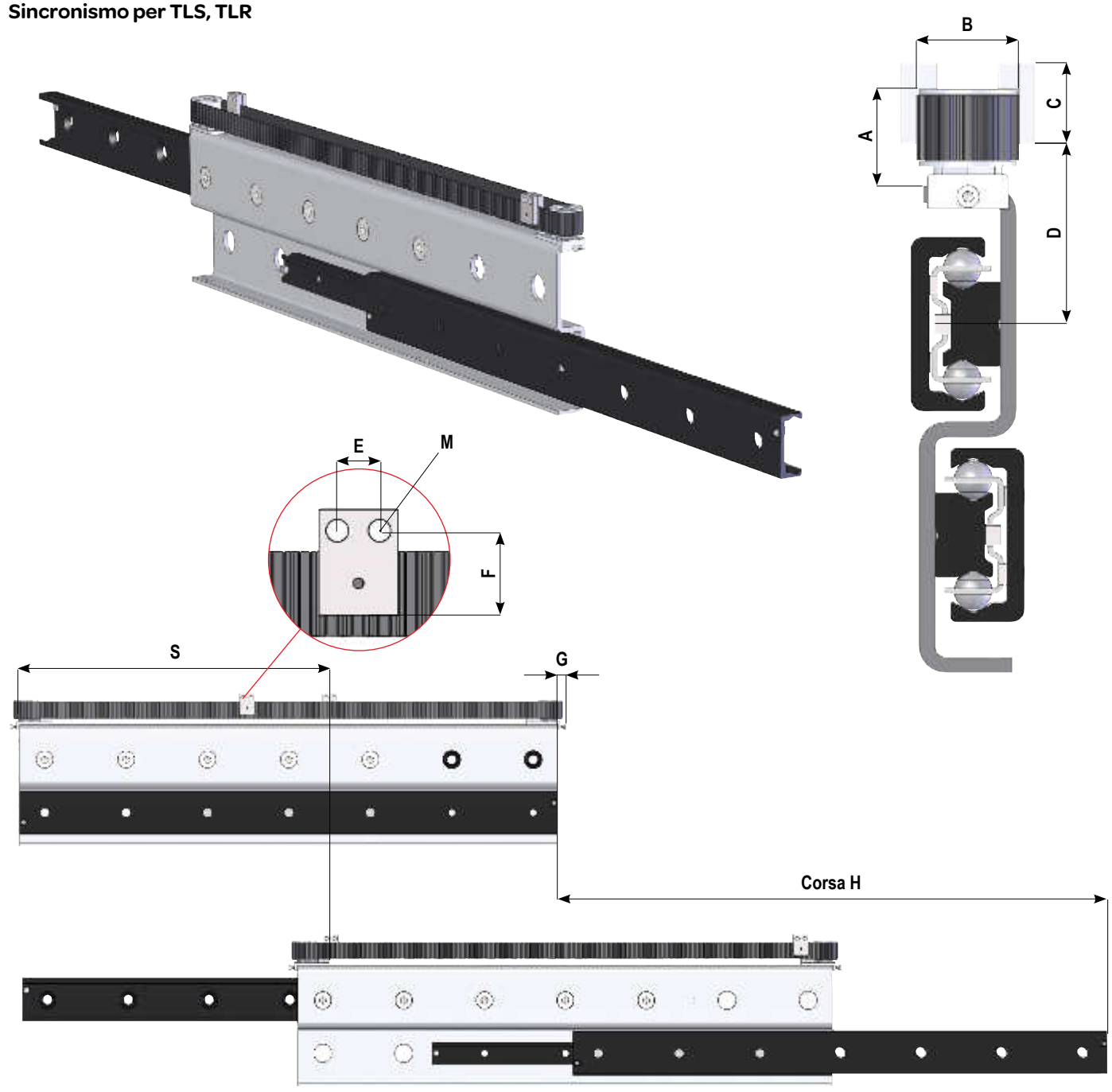
Alternatively it is also possible to provide synchronized telescopic slides with “Rack & Pinion” movement.
Based on customized intermediate elements, like below, telescopic slides with much higher load capacities can be obtained.
Also slides with high rigidity in all directions for severe load conditions or applications demanding minimal flexion.



DESCRIPTION OF THE SYNCHRONISATION SYSTEM

The synchronisation system is composed of a pair of pulleys placed at the end of the telescopic slide connected by a pre-tensioned belt closed in a loop with two blocks gripping the belt placed on each of the two longitudinal sides of the belt. The two blocks must be fixed respectively on the fixed part and the movable part between which is interposed the telescopic slide. The system can be placed above or below the telescopic slide according to the availability of space occupied in the vertical plane as shown in table, while it is still contained horizontally in the thickness of the telescopic slide. To mount the system, in addition to the normal fixing holes of the guide, fixing holes must be arranged for lock gripper belt to be placed in the position shown in the table.
The pulleys are mounted on an adjustable slide that enables the adjusting of the preload of the belt according to the needs. The system must be ordered with the telescopic slide as desired. Even though the synchronization system is an additional device to add to the standard telescopic slide its application requires the

Sincronismo per TLS, TLR

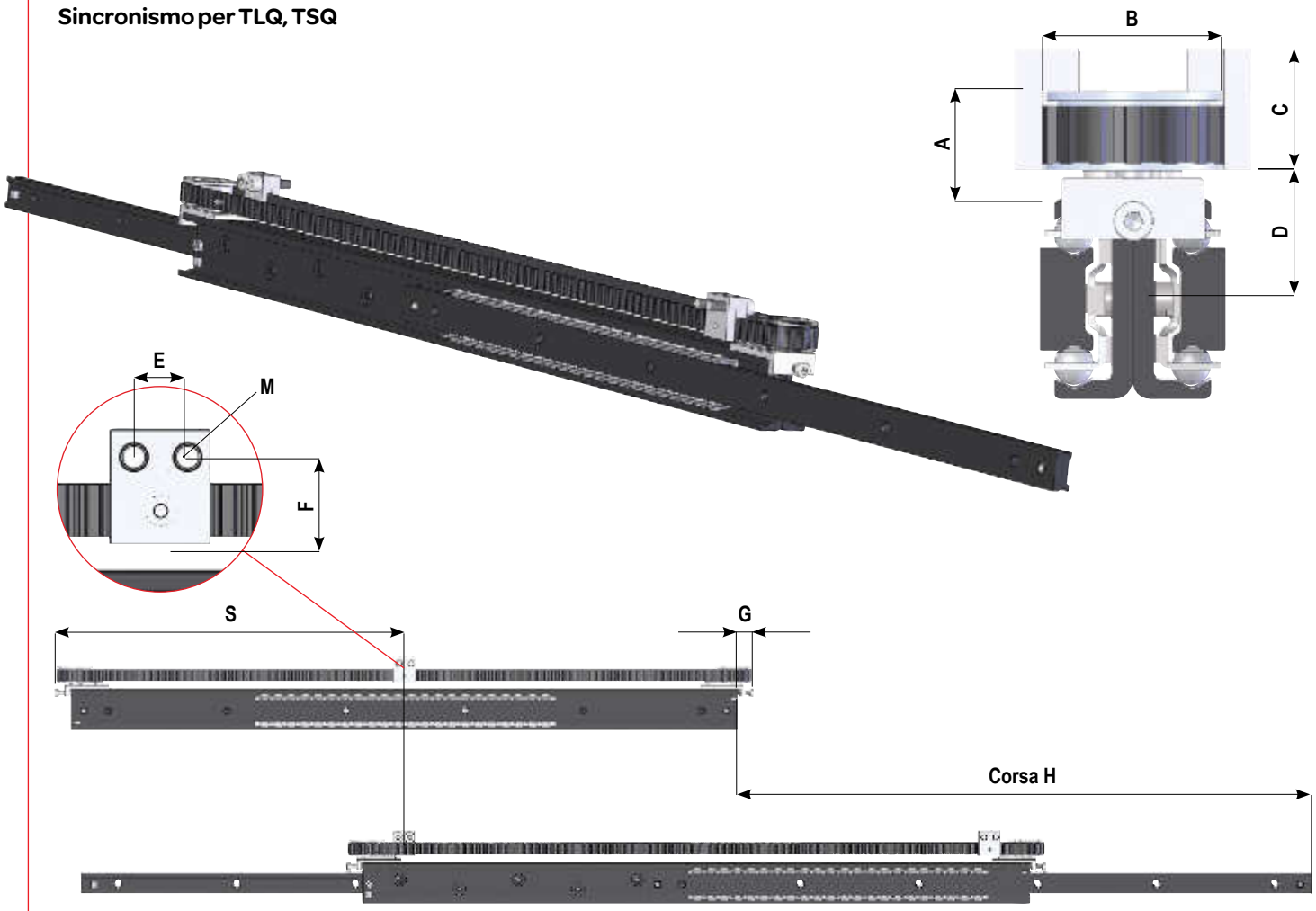


Code	A	B	C	D	E	F	G	M	S	Stroke	Width of the belt AT5
TLS43SY	24	26	24	40,4	8	20	10	Hole for screw M4	L/2+40	H	16
TLR.43SY				38,4							
TLS43DSY				40,4					L/2		

execution of some specific holes on the intermediate beam of the telescopic slide. The device of synchronism, when it is used with a double-stroke telescopic slide, reduces the nominal stroke H listed in the catalog as shown in the table below.
The synchronization system does not have the function of limit stop of the movement of extraction and closing of the application, so it is necessary to provide adequate appropriate external stoppers sized as a function of the weight and speed of the moving part.
The ordering of the rail with synchronism is obtained by adding the suffix SY to the code of the standard guide.

Example:
- Standard Guide TLS43-1650
- with synchronism TLS43SY-1650

Sincronismo per TLQ, TSQ



Code	A	B	C	D	E	F	G	M	S	Stroke	Width of the belt AT5
TSQ..28.SY (single stroke)	15	26	17	18	8	13	10	Hole for screw M4	L/2+35	H	8
TSQ..28.SY (double stroke)									L/2	L-70	
TLQ..28SY									L/2+35	H	
TSQ..43.SY (single stroke)	24		24	27,9		20			L/2+40	H	16
TSQ..43.SY (double stroke)									L/2	L-80	
TLQ..43SY									L/2+40	H	

Operating temperature

The limitation of operating temperature is mainly based on a few plastic/rubber components.
The slides **TLS, TLQ, TSQR, TLR, TLA** and **TQA** may operation in a temperature range from -20 to +110°C.
The slides SR and TSQ which are without any plastic/rubber components may function properly even with temperature of 300°C as non property alteration of the nitriding hardened steel. Too possible with TLS slides, when removing the rubber stoppers , and used for slow speed applications.

FAX Bishop-Wisecarver at (925) 439-5931

DATI RICHIEDENTE / REQUESTED BY:

Nome / Name: ..... Cognome / Surname: .....

Mansione svolta / Position: ..... Società / Company: .....

Indirizzo / Address: .....

Tel.: ..... Cell: ..... Fax: ..... E-mail: .....

DATI GEOMETRICI / GEOMETRICAL DATA:

Lunghezza parte mobile M [mm] / Length of mobile part M (mm): .....

Lunghezza parte fissa F [mm] / Length of fix structure F (mm): .....

Corsa S [mm] / Stroke S (mm): .....

Distanza tra le guide I [mm] / Distance between the rails (mm): .....

Distanza tra l'asse delle guide e l'azionamento D [mm] / Distance between rails and drive axis D (mm): .....

Ingombro massimo ammesso [mm] / Max. permitted space for rails (mm): .....

Altre lunghezze ritenute significative [mm] / Other lengths of eventual importance (mm): .....

SCHEMA / APPLICATION DRAWING:

CARICHI APPLICATI / APPLIED LOADS:

Forze applicate [N] / Applied forces (N): F_1 ..... F_2 ..... F_3 ..... F_4 .....

Momenti applicati [Nm] / Applied moments (Nm): M_1 ..... M_2 ..... M_3 ..... M_4 .....

Indicazione punto di applicazione [mm] / Position-point of applied force (mm): D_1 ..... D_2 ..... D_3 ..... D_4 .....

TIPO DI MOVIMENTAZIONE / TYPE OF MOVEMENT:

Tipo di azionamento / Type of drive movement: .....

Velocità massima [m/s] / Max speed (m/s): .....

Accelerazione massima [m/s] / Max acceleration (m/s): Lungo X / axis X ..... Lungo Y / axis Y ..... Lungo Z / axis Z .....

Numero di cicli [Hz] / Number of cycles (Hz): .....

Tempo di movimento [s] / Time of movement [s]: .....

Tempo di stop [s] / Time of stop [s]: .....

CONDIZIONI AMBIENTALI / AMBIENT CONDITIONS:

Temperatura di esercizio [C°] / Working temperature (°C): .....

Polverosità ambientale / Environment dust/clearness: .....

ALTRI DATI / OTHER DATA:

Intervallo di lubrificazione-manutenzione [h o gg] / Lubrication/maintenance interval (h/d): .....

Livello di rumorosità [dB] / Level of noise [dB]: .....

Durata minima richiesta [km/anni/cicli] / Request life-time (km/years/circles): .....

Quantità [pz] / Quantity yearly/batches (pieces): .....

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