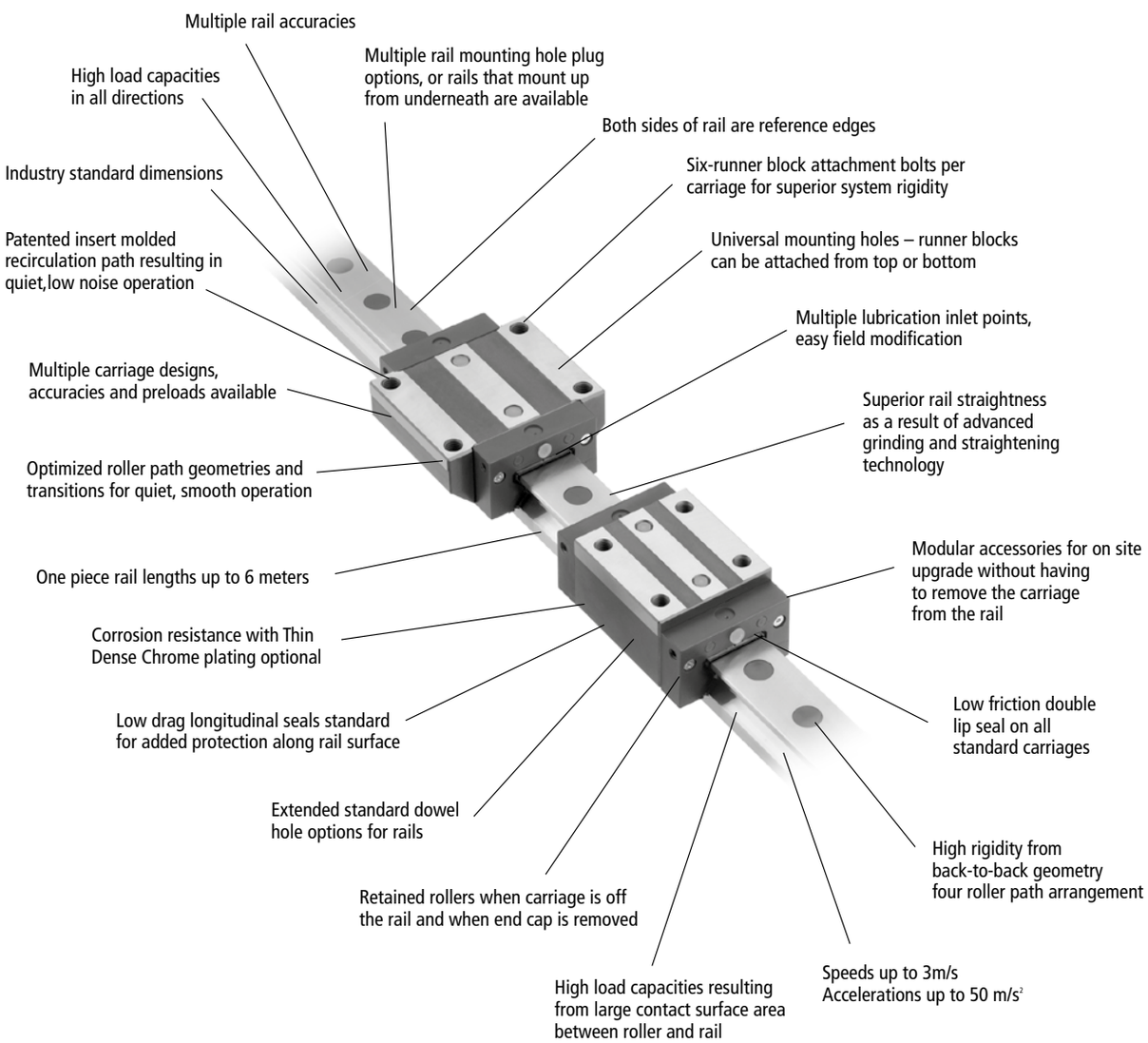
THOMSON Linear Motion. Optimized.™

500 Series Roller Profile Rail Linear Guide



500 Series Roller Profile Rail Linear Guide

Features
The Thomson 500 Series Linear Guide provides long life, exceptional rigidity, high dynamic and static load capacities, accommodation for high moment loads, high running accuracy, multiple sealing options and multiple lubrication inlet options. This allows for on-site field modification, and interchangeability with competitor offering.

These properties result in improved machine accuracies and rigidity resulting in reduced vibration extending machine and tool life. This has a direct effect on your operational efficiency resulting in cost savings for the user.

Available in 4 carriage designs.

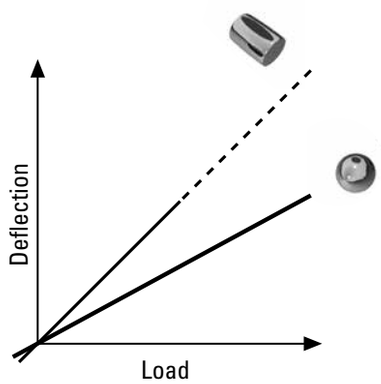
Materials
The 500 Series Roller Linear Guide is produced from high quality bearing steel. The end cap is made of a high strength, glass-filled nylon with a nitrile rubber seal. All carriages and rolling elements are through hardened and all rails are case hardened. Stringent quality controls are in place to ensure consistency of materials from the source, allowing us to ensure that we deliver the highest quality product.

Interchangeability
The 500 Series Roller Linear Guide is completely interchangeable. Any carriage can be run on any rail of the same accuracy without compromising system accuracy. This is the result of our stringent manufacturing process controls.

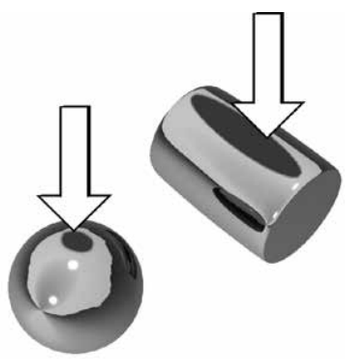
Accuracy and Preload
The 500 Series Roller Linear Guide is available in three different accuracy classes, and three different preloads ranges to allow for customization to your application needs.

Straightness
The 500 Series Roller rail is subjected to multiple straightening processes during and after grinding of the roller paths, on one piece rails up to 6 meters long.

These added processes and inspections result in some of the straightest rails in the market today, improving machine accuracies wherever the 500 Series Roller is used.

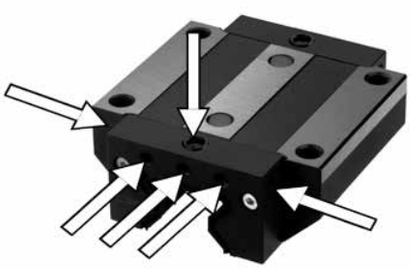


Rigidity
Profile Rail Linear Guide bearings have a significant effect on the overall system rigidity. The 500 Series Roller rigidity is achieved by using the equivalent of a back-to-back bearing arrangement, complemented by special rollers that are crowned to prevent roller edge loading when misalignment is present. This results in lower elastic deformation as the load increases compared to a ball carriage or face-to-face bearing arrangement.



Load Capacity
The roller has an increased load capacity over the ball as a result of the increased contacting surface across the length of the roller. A ball provides a single point contact area, while a roller provides a much greater line contact area. This results in a substantially higher load carrying capacity and lower wear with minimum rolling friction.

Running Smoothness / Low Noise
The running smoothness and low noise are the result of a propriety insert molded recirculation path that has an optimized geometric shape and minimal transitions. This ensures smooth, quiet operation.



Multiple Lubrication Options
The carriage standard end cap is designed for flexibility. The end cap is equipped with six lubrication inlet points and additional internal options for directing grease or oil to the proper location. These options are easily changed on-site in the field or can be supplied from the factory. Not all options available on size 25.

Unsure of the best lubrication inlet location? These carriages will allow the user to make these changes easily in the field to optimize the system performance. In addition, they allow for ease in maintenance.

Modular Accessory Options
The carriage is supplied standard with low friction double lip seals and longitudinal seals that completely enclose the bearing carriage to protect the rollers and track surfaces and minimize lubrication loss.

Optional metal scrapers or wiper and oil reservoir components can be easily added on-site in the field or can be supplied assembled from the factory.

These innovative design features allow users to easily, efficiently, and economically upgrade carriage sealing and lubrication without needing to replace the entire carriage assembly.

Longitudinal Seals
The carriage has built-in under carriage low drag longitudinal seals that protect the rollers and roller track surfaces from contamination. These longitudinal seals are an added protection to increase the life and overall performance.

Rail Accessories
The rails have multiple options to fill the mounting holes to eliminate possible contamination entry into the bearing. Custom designed plugs are available in plastic, brass, or stainless steel. A special rail is available that utilizes a custom cover strip. In addition, Thomson stocks an assortment of bellows to protect the entire assembly. All options are available from stock and represent another innovative design feature of the 500 Series. Mounting tools for easy and correct installation are available as well.

Retained Rollers
The rolling elements of the carriages are retained within the bearing so the carriage can be removed from the rail, or the end cap from the carriage, without worrying about the rollers falling out. It is recommended to place any removed carriage onto a mounting rail or shipping arbor to provide added protection to the rolling elements.

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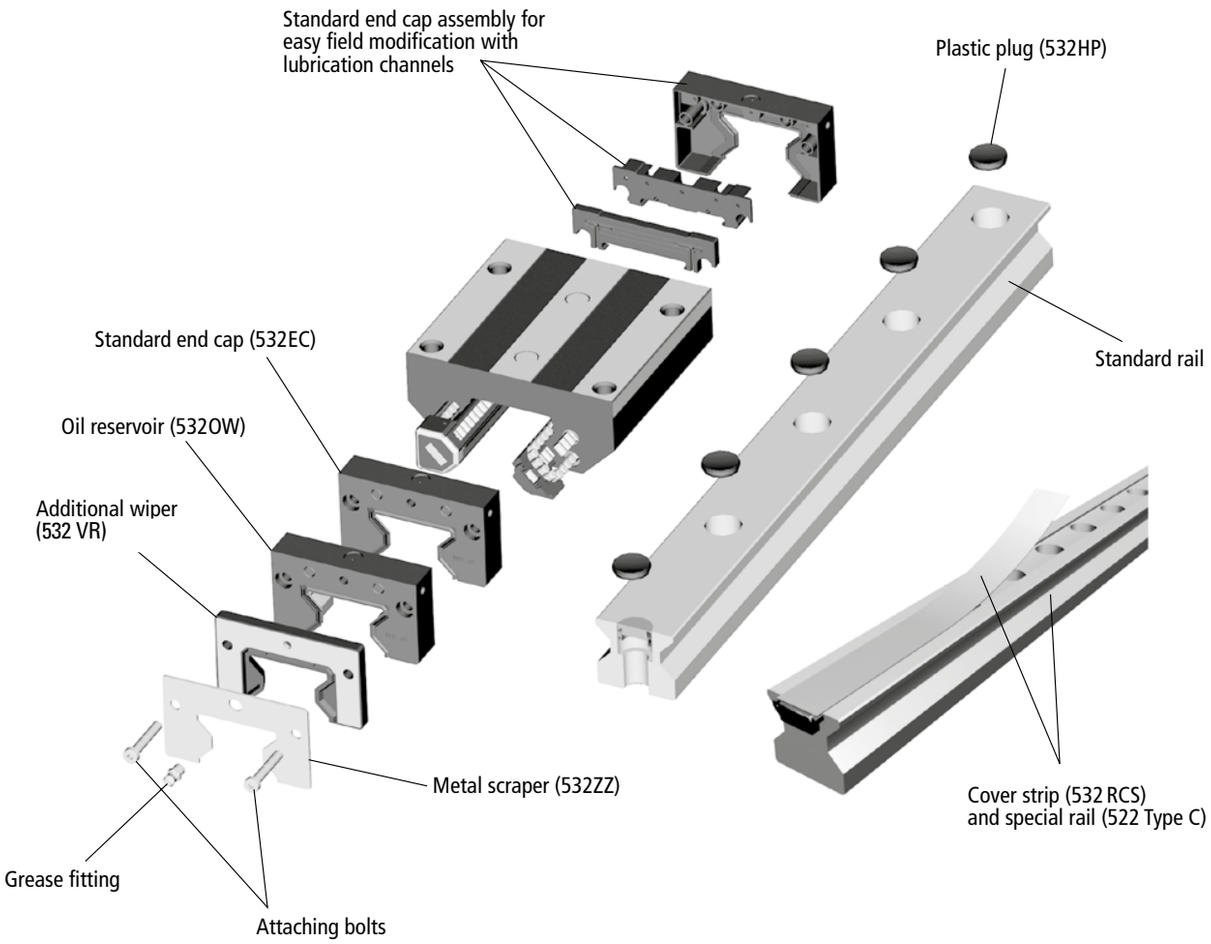
500 Series Roller Profile Rail Linear Guide

Modular Design Exploded View

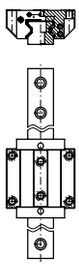
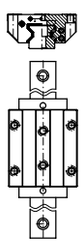
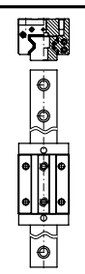
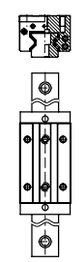


Also available (not shown):
- Stainless Steel Rail Plugs (532 HS)
- Brass Rail Plugs (532 HB)
- Bolt up from bottom rail (522 Type U)

The modular, building block design of the 500 Series Roller Profile Rail Linear Guide assembly for easy on-site field upgrades, for quick seal or lubrication upgrades all without the need for new carriage or rails.

500 Series Roller Standard Carriages

Thomson offers four carriage styles with six mounting holes allowing for additional mounting configurations in the field or retrofitting. All provide superior rigidity and design flexibility.

Style			Size	Accuracy	Basic Part Number Preload 0.03C	Basic Part Number Preload 0.08C	Basic Part Number Preload 0.13C	Standard Rail Part Number	Max. Single Piece Rail Length (mm)
Standard Carriage	A		25	P	512P25A1	512P25A2	512P25A3	522P25A	6000
				S	512S25A1	512S25A2	512S25A3	522S25A	
				U	512U25A1	512U25A2	512U25A3	522U25A	
			35	P	512P35A1	512P35A2	512P35A3	522P35A	6000
				S	512S35A1	512S35A2	512S35A3	522S35A	
				U	512U35A1	512U35A2	512U35A3	522U35A	
			45	P	512P45A1	512P45A2	512P45A3	522P45A	6000
				S	512S45A1	512S45A2	512S45A3	522S45A	
				U	512U45A1	512U45A2	512U45A3	522U45A	
			55	P	512P55A1	512P55A2	512P55A3	522P55A	6000
				S	512S55A1	512S55A2	512S55A3	522S55A	
				U	512U55A1	512U55A2	512U55A3	522U55A	
Standard Long Carriage	B		25	P	512P25B1	512P25B2	512P25B3	522P25A	6000
				S	512S25B1	512S25B2	512S25B3	522S25A	
				U	512U25B1	512U25B2	512U25B3	522U25A	
			35	P	512P35B1	512P35B2	512P35B3	522P35A	6000
				S	512S35B1	512S35B2	512S35B3	522S35A	
				U	512U35B1	512U35B2	512U35B3	522U35A	
			45	P	512P45B1	512P45B2	512P45B3	522P45A	6000
				S	512S45B1	512S45B2	512S45B3	522S45A	
				U	512U45B1	512U45B2	512U45B3	522U45A	
			55	P	512P55B1	512P55B2	512P55B3	522P55A	6000
				S	512S55B1	512S55B2	512S55B3	522S55A	
				U	512U55B1	512U55B2	512U55B3	522U55A	
			65	P	512P65B1	512P65B2	512P65B3	522P65A	6000
				S	512S65B1	512S65B2	512S65B3	522S65A	
				U	512U65B1	512U65B2	512U65B3	522U65A	
Narrow Carriage	C		25	P	512P25C1	512P25C2	512P25C3	522P25A	6000
				S	512S25C1	512S25C2	512S25C3	522S25A	
				U	512U25C1	512U25C2	512U25C3	522U25A	
			35	P	512P35C1	512P35C2	512P35C3	522P35A	6000
				S	512S35C1	512S35C2	512S35C3	522S35A	
				U	512U35C1	512U35C2	512U35C3	522U35A	
			45	P	512P45C1	512P45C2	512P45C3	522P45A	6000
				S	512S45C1	512S45C2	512S45C3	522S45A	
				U	512U45C1	512U45C2	512U45C3	522U45A	
			55	P	512P55C1	512P55C2	512P55C3	522P550A	6000
				S	512S55C1	512S55C2	512S55C3	522S55A	
				U	512U55C1	512U55C2	512U55C3	522U55A	
Narrow Long Carriage	D		25	P	512P25D1	512P25D2	512P25D3	522P25A	6000
				S	512S25D1	512S25D2	512S25D3	522S25A	
				U	512U25D1	512U25D2	512U25D3	522U25A	
			35	P	512P35D1	512P35D2	512S35D3	522P35A	6000
				S	512S35D1	512S35D2	512S35D3	522S35A	
				U	512U35D1	512U35D2	512U35D3	522U35A	
			45	P	512P45D1	512P45D2	512P45D3	522P45A	6000
				S	512S45D1	512S45D2	512S45D3	522S45A	
				U	512U45D1	512U45D2	512U45D3	522U45A	
			55	P	512P55D1	512P55D2	512P55D3	522P55A	6000
				S	512S55D1	512S55D2	512S55D3	522S55A	
				U	512U55D1	512U55D2	512U55D3	522U55A	
			65	P	512P65D1	512P65D2	512P65D3	522P65A	6000
				S	512S65D1	512S65D2	512S65D3	522S65A	
				U	512U65D1	512U65D2	512U65D3	522U65A	

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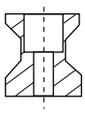
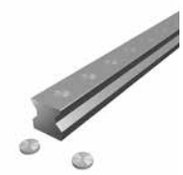
500 Series Roller Rail Options

Bolt down from the top – 522 Type A



Bolt down from the bottom – 522 Type U



Rail Types and Accessories
The 500 Series Roller Profile Rail is available in two configurations:
- Bolt Down from the top – 522 Type A
- Bolt Up from the bottom – 522 Type U

The bolt down from the top design has various types of options to plug the holes.

The standard 522 Type A rail mounting holes can be plugged or sealed after installation using the options below.

Plastic Plugs
532 HP plastic plugs are an inexpensive and simple method to seal the rail attachment bolt area. The plastic plugs are easy driven in place to any rails with a soft non-metallic drift. They can easily be removed.

Brass Plugs
532 HB brass plugs are more rugged than the plastic plug, slightly more expensive, and require more precision during installation. They fit in all stand 500 Series Roller Rails and require some hand buffing or polishing of the rail surface after installation.

Two-piece Stainless Steel Plugs
532 HS two-piece stainless plugs are the most rugged plugs available for the roller rails. The two piece construction and design allows the plugs to lock into place and rest on the top of the socket head bolt. They require no post installation polishing. The recommended hex head socket must be used to properly install the 532 HS plugs. For correct installation, we recommend use of the 532 HST mounting tools found on page 74.

Optional 500 Series Rail
Option 532 RC utilizes a special rail 522 Type C that is easily installed with the 532 RCT mounting tool found on page 74.

Carriage Option
The 500 Series Roller Profile carriages are also available with special lubrications. They can be ordered directly from stock or with a short lead-time.

500 Series Roller Profile Rail

Additional Seal Types and Lubrication Accessories
The carriages are designed with modular sealing and lubrication options for simple on-site field modification or factory direct.

The standard carriage end cap has an integral low friction double lip seal and longitudinal seals that completely enclose the bearing carriage. The double lip design keeps contaminants out and lubrication in. It also allows for grease to purge out of the carriage to prevent excessive lubrication, which can result in higher operating temperatures. This double lip design allows for use with oil lubrication.

This standard carriage end cap comes standard with a lubrication inlet centered in the end cap with specially designed and modified lubrication channels to direct the lubrication to the different roller tracks. The lubrication inlet can be easily changed in the field or supplied from the factory for side inlet, offset inlet or top inlet. Additionally, the internal configuration can be modified to allow for separating the lubrication paths for vertical mounting or oil lubrication.

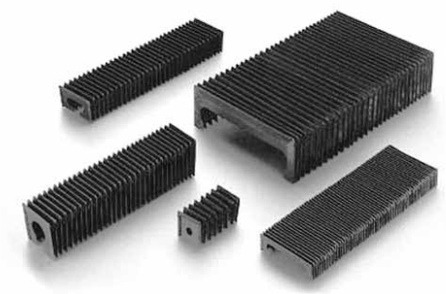
The standard carriage end cap is equipped with lubrication channels directing lubrication to proper roller paths. The standard carriage end plate can be easily modified on-site in the field to channel lubrication separately or can be factory ordered.

Optional – on site field installable modular seals and accessories

Additional Seal
The **532 VR** seal provide an additional level of protection from contaminants to the assembly. This additional component can be easily added on-site. It is supplied with the required screws to make installation simple.
- 532 VR is made of durable Viton®

This seal can be used in conjunction with other optional modular accessories providing an easy upgrade to the standard seal. It can be easily installed on-site in the field or can be supplied from the factory.

Metal Scraper
The **532 ZZ Metal Scraper** made of stainless steel, serves as an added protection to the seal lips against large dirt particles, metal shavings or chips. Large contaminants are easily pushed away for an extra level of protection to the seal lips. The Metal Scraper is easily installed in conjunction with other optional modular accessories providing you with an easy upgrade to the standard seal. These are easily installed on-site in the field or can be supplied from the factory.



Oil Reservoir

The **532 OW Oil Reservoir** is a cost effective, automatic lubrication system. It is constructed with an integrated oil reservoir that provides a uniform, consistent lubricating oil to the roller paths for extended periods of time. The Type 532 OW oil reservoir eliminates the need for a routine maintenance schedule, assures lubrication gets to the required points, can be refilled if required, and can operate up to 5000 km of travel.

The Type 532 OW oil reservoir can be easily installed in conjunction with other optional modular seals for an easy upgrade to the standard seal. These can be easily installed on-site in the field or can be supplied from the factory.

Bellows

Standard bellows are available for all assemblies. The bellows cover the entire length of the rail. The bellows are used to provide additional protection against dirt, dust and splashed liquid. Installation is simple and requires little time. Retrofitting is possible when the rail ends are drilled for the attachment of the rail clip 532 CR.

Bellows are available in three styles:

- Type B "Low Profile" with outside dimensions that do not exceed the carriage
- Type C "High Compression"
- Type W "Walk-On" capable of handling the harshest environments with a 90 kg load bearing capacity

The bellows can be easily installed in conjunction with the other optional modular accessories and are an easy upgrade to the standard seal. These can be easily installed on-site in the field.

Note: Additional Modular accessories add additional drag to the carriage assembly resulting in increased start-up friction and power consumption.

Relative Drag Comparison for Design Consideration

Type	Relative Drag*
Standard carriage	•
Viton® Wiper (531 VR)	• • •
Metal Scraper (531 ZZ)	•
Oil Reservoir (531 OW)	• •

* • = Lowest / • • • = Highest

For ordering information or for additional Seal Types and Lubrication Accessories, see pages 69-70.

Roller Carriage

STANDARD							OPTIONS				
5	1	2	P	25	A	1	D	N V Z	ES1	SM

500 Series Profile Carriage

Product Type
1 Carriage

Type
2 Roller

Accuracy Class
P Precision Grade
S Super Precision Grade
U Ultra Precision Grade

Size
25, 35, 45, 55, 65

Carriage Style
A Standard
B Standard Long
C Narrow
D Narrow Long

Preload
1 Approximately 0.03 C
2 Approximately 0.08 C
3 Approximately 0.13 C

Coating Option
D Duralloy

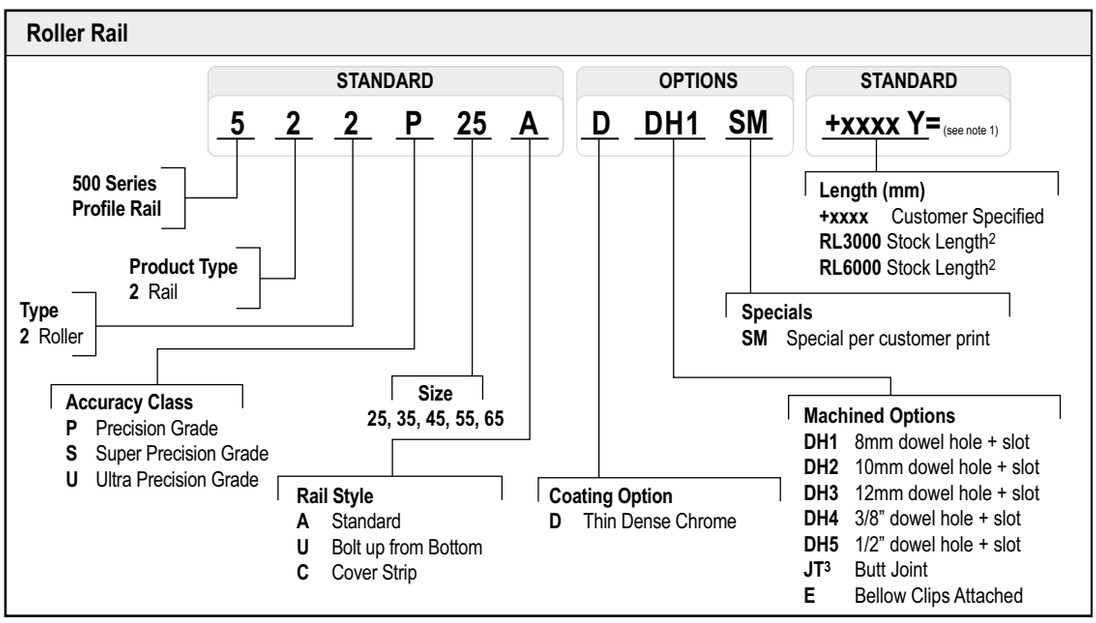
Specials
SM Special per customer print

Extended Standards[3]
ES1 Offset lubrication in end caps[1]
ES2 Side lubrication in end caps[1]
ES3 Top lubrication in end caps
ES4 ES1 + individual lubrication channels[1]
ES5 ES2 + individual lubrication channels[1]
G1 Greased with Mobilux® EP2
G2 Greased with Krytox® GPL227
G3 Greased with Thomson Linear Lube
GS Greased per customer specification

Accessories[2]
N Additional Oil Reservoir
V Additional Viton® Wiper
Z Metal Scraper
C Bellow Clips

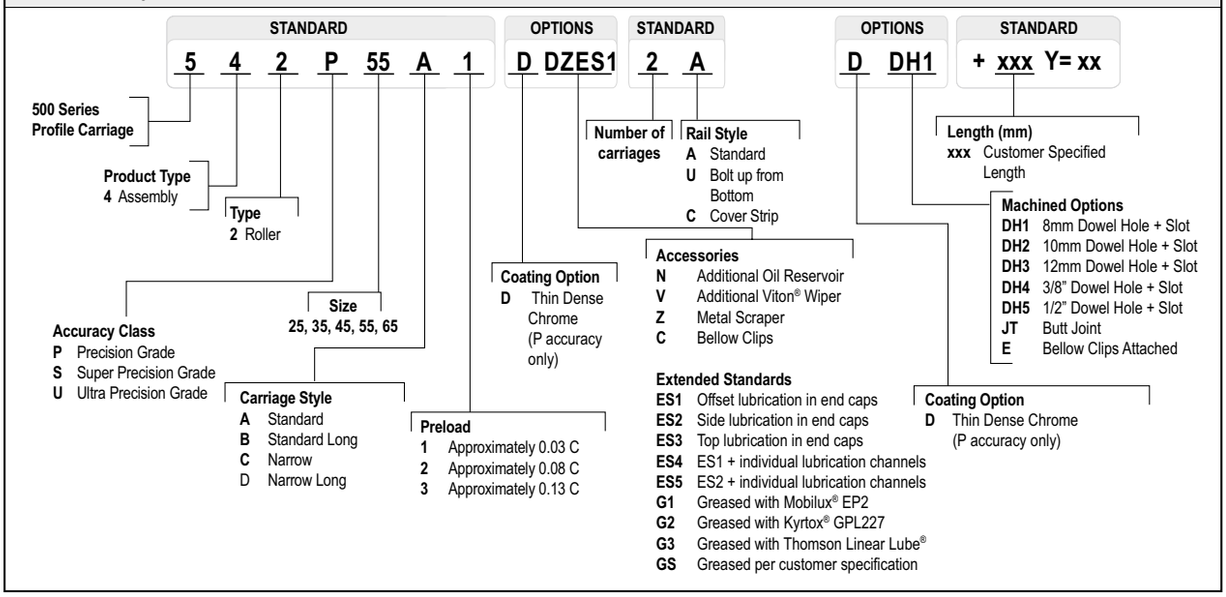
1. ES1, ES2, ES4 and ES5 options are available size 35, 45, 55 and 65 only.
2. Accessory combination part numbers are listed from carriage end cap outward. Not all combinations are available. For specific combination availability see page 68 or consult Thomson.
3. Optional inlet and grease options may not be functional with all accessory combinations. (Example: G1 and Oil Reservoir "N"). Prior to selecting an inlet option review any interference or conflicts with the accessories selected.
4. Size 100 available upon request. Please contact customer service for more information.

Roller Rail



1. Y = Distance from end of rail to center of first mounting hole, Y1 = Y2 unless specified.
2. Stock length rails are considered random length, total length may exceed specified length, and Y1/Y2 are not equal. To be used by customer who will cut to length.
3. Customer drawing required at time of quote and order.

Roller Assembly



Roller Accessories

5 3 2 EC 25

500 Series Profile Rail

Product Type
3 Accessories

Type
2 Roller

Size
25, 35, 45, 55, 65

Bellows
BB Low Profile Bellows[1]
BC High Compression Bellows[1]
BW Walk On Bellows[1]
CC Bellow clips for Carriage
CR Bellow clips for Rail

Rail Hole Covers and Plugs
HP Plastic Rail Plugs
HS Stainless Steel 2pc plugs
HB Brass Rail Plugs
HST HS and HB Installation Tool
HSTC Hydraulic Cylinder for HST
RCS Rail Cover Strip[1]
RCT Rail Cover Installation Tool
RCP Rail Cover End Cap

Modular Seal/Accessory
EC Replacement End Cap
VR Viton® Wiper
ZZ Metal Scraper
OW Oil Reservoir

Mounting Assembly Tools
MT Mounting Rail

1. Bellows and rail cover strip must include length at time of order.
(Example: 532BB35+1000 mm). See page 154 for how to calculate bellows length.

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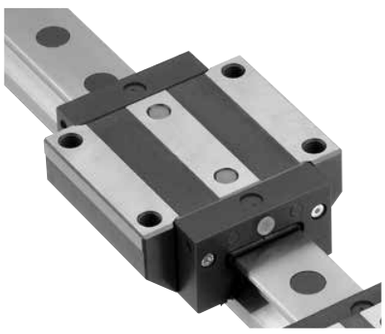
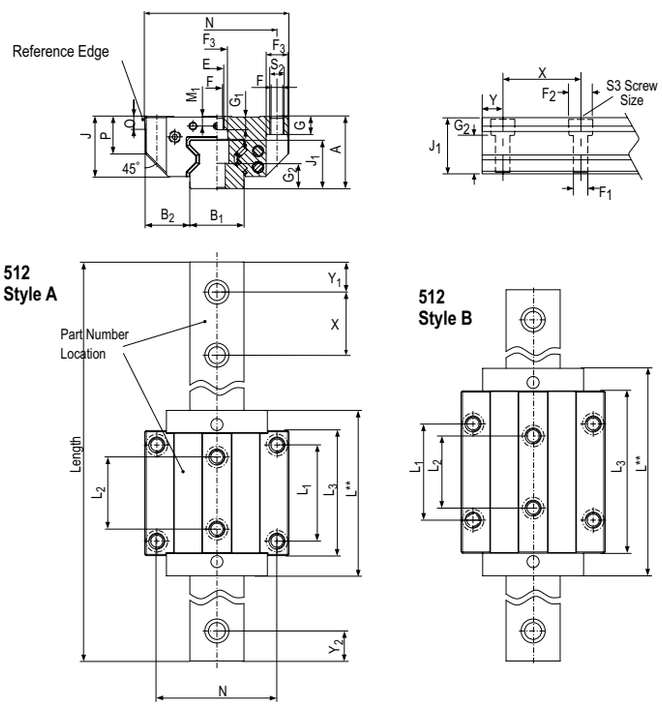
500 Series Roller

512 Style A and B





512 Style A – Standard Roller

Size	Dimensions (mm)																	Roller						
	A	B	B_1* ±0.05	B_2	J	J_1	L**	L_1	L_2	L_3	X	N	S_2	S_3	F	F_1	F_2	F_3	Ø	G	G_1	G_2	M_1	O	P
25	36	70	23	23.5	29.5	24.5	81	45	40	60	30	57	M8	M6	6.8	7	11	11	3.2	9	6.5	13	5.5	7.5	17.5
35	48	100	34	33	40	32	109	62	52	80	40	82	M10	M8	8.5	9	15	15	4.5	12	10	15	7	8	23
45	60	120	45	37.5	50	40	137.5	80	60	104	52.5	100	M12	M12	10.5	14	20	18	5	15	11	21	8	10	30.5
55	70	140	53	43.5	57	48	163.5	95	70	120	60	116	M14	M14	12.5	16	24	20	6	18	13.5	26	9	12	34.5

512 Style B – Standard Long Roller

Size	Dimensions (mm)																	Roller						
	A	B	B_1* ±0.05	B_2	J	J_1	L**	L_1	L_2	L_3	X	N	S_2	S_3	F	F_1	F_2	F_3	Ø	G	G_1	G_2	M_1	O	P
25	36	70	23	23.5	29.5	24.5	103.4	45	40	79.4	30	57	M8	M6	6.8	7	11	11	3.2	9	6.5	13	5.5	7.5	17.5
35	48	100	34	33	40	32	136	62	52	103	40	82	M10	M8	8.5	9	15	15	4.5	12	10	15	7	8	23
45	60	120	45	37.5	50	40	172.5	80	60	135	52.5	100	M12	M12	10.5	14	20	18	5	15	11	21	8	10	30.5
55	70	140	53	43.5	57	48	205.5	95	70	162	60	116	M14	M14	12.5	16	24	20	6	18	13.5	26	9	12	34.5
65	90	170	63	53.5	76	58	251	110	82	201	75	142	M16	M16	14.5	18	26	25.5	7	23	19	32	13	15	51

* Standard tolerance shown, special lower tolerances are available upon request. Please consult application engineering for additional information.

** When using additional modular seals or lubrication plates, the total length L will increase. Consult pages 69-70 for additional information.

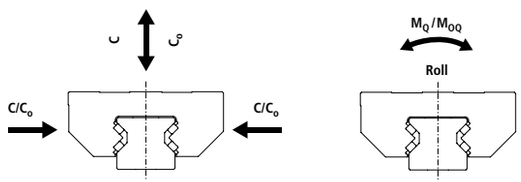
Length of rail to be specified at time of order, $Y_1 = Y_2$ unless specified otherwise at time of order.

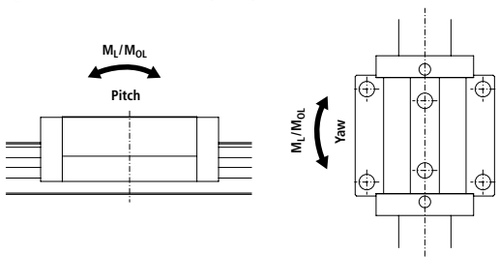
500 Series Roller

512 Style A and B

Dynamic Load and Moment Ratings
C = Dynamic load rating
M_L = Dynamic pitch and yaw moment rating
M_Q = Dynamic roll moment rating

Static Load and Moment Capacities
C_O = Static load capacity
M_{OL} = Static pitch and yaw moment capacity
M_O = Static roll moment capacity





Size & Style	Loading Capabilities Co (N)	C (N)	Moments M_{OQ} (Nm)	M_Q (Nm)	M_{OL} (Nm)	M_L (Nm)	Weights Carriage (kg)	Rail (kg/m)
25A	49800	27700	733	408	476	265	0.7	
25B	70300	39100	1035	576	936	521	0.9	3.4
35A	93400	52000	2008	1118	1189	662	1.6	
35B	128500	71500	2762	1537	2214	1232	2.2	6.5
45A	167500	93400	4621	2577	2790	1556	3.2	
45B	229500	127800	6333	3527	5161	2874	4.3	10.7
55A	237000	131900	7771	4325	6650	2637	5.0	
55B	324000	180500	10624	5919	8745	4872	6.8	15.2
65B	530000	295000	20912	11640	17930	9980	13.5	22.5

1. The dynamic load and moment ratings are based upon 100 km travel life. When comparing these load ratings with other bearings take into consideration that some manufacturers dynamic and moment ratings are based on 50 km travel life. In order to compare with bearing dynamic and moment ratings based on 50 km travel life, divide the dynamic capacity of the bearing rated for 50 km by 1.23 to get an accurate comparison.
2. The static load and moment rating are the maximum radial load and moment load that should be applied to the bearing while there is no relative motion between the carriage and rail.

Bearing Travel Life Comparison

$L = (C/F)^3 \times 100km$
where:
L = travel life, km
C = dynamic load rating, N
F = applied dynamic load, N

$C_{min} = F \left(\frac{L}{100}\right)^{1/3}$
where:
C_{min} = minimum required dynamic load rating, N
F = applied dynamic load, N
L = required travel life, km

Operating Parameters:

Maximum Velocity:	**3 m/s**	
Maximum Acceleration:	**50 m/s²**	
Temperature:	**Min:**	**– 40° C**
	Max:	**80° C**
	Max peak:	**120° C short time***

*without bellows

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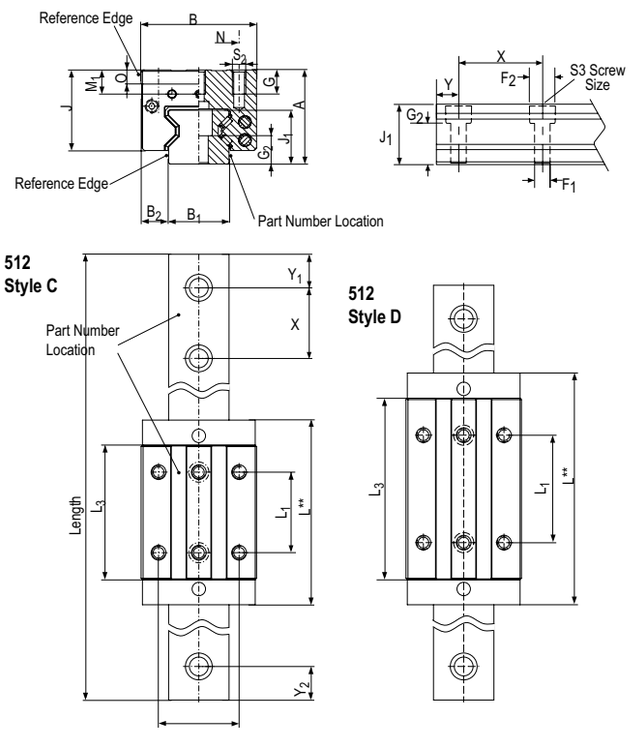
500 Series Roller

512 Style C and D



512 Style C Narrow Roller

Size	Dimensions (mm) A	B	B_1* +0.05	B_2	J	J_1	L**	L_1	L_3	X	N	S_2	S_3	F_1	F_2	Roller Ø	G	G_2	M_1	O
25	40	48	23	12.5	33.5	24.5	81	35	57	30	35	M6	M6	7	11	3.2	9	13	9.5	7.5
35	55	70	34	18	47	32	109	50	76	40	50	M8	M8	9	15	4.5	12	15	14	8
45	70	86	45	20.5	60	40	137.5	60	100	52.5	60	M10	M12	14	20	5	18	21	18	10
55	80	100	53	23.5	67	48	163.5	75	120	60	75	M12	M14	16	24	6	19	26	19	12

512 Style D Narrow Long Roller

Size	Dimensions (mm) A	B	B_1* +0.05	B_2	J	J_1	L**	L_1	L_3	X	N	S_2	S_3	F_1	F_2	Roller Ø	G	G_2	M_1	O
25	40	48	23	12.5	33.5	24.5	103.4	50	79.4	30	35	M6	M6	7	11	3.2	9	13	9.5	7.5
35	55	70	34	18	47	32	136	72	103	40	50	M8	M8	9	15	4.5	12	15	14	8
45	70	86	45	20.5	60	40	172.5	80	135	52.5	60	M10	M12	14	20	5	18	21	18	10
55	80	100	53	23.5	67	48	205.5	95	162	60	75	M12	M14	16	24	6	19	26	19	12
65	90	126	63	31.5	76	58	251	120	201	75	76	M16	M16	18	26	7	20	32	13	15

* Standard tolerance shown, special lower tolerances are available upon request. Please consult application engineering for additional information.

** When using additional modular seals or lubrication plates, the total length L will increase. Consult pages 69-70 for additional information.

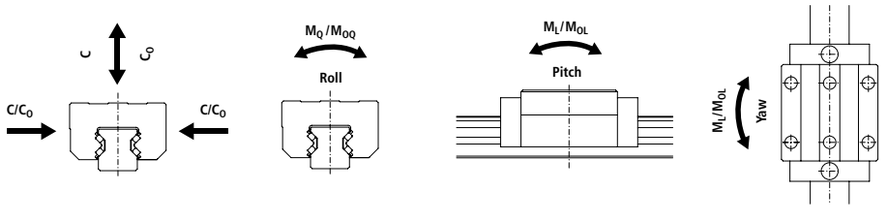
Length of rail to be specified at time of order, Y1 = Y2 unless specified otherwise at time of order.

500 Series Roller

512 Style C and D

Dynamic Load and Moment Ratings
C = Dynamic load rating
M_L = Dynamic pitch and aw moment rating
M_Q = Dynamic roll moment rating

Static Load and Moment Capacities
C_0 = Static load capacity
M_{0L} = Static pitch and yaw moment capacity
M_{0Q} = Static roll moment capacity



Size & Style	Loading Capabilities Co (N)	C (N)	Moments M_{0Q} (Nm)	M_Q (Nm)	M_{0L} (Nm)	M_L (Nm)	Weights Carriage (kg)	Rail (kg/m)
25C	49800	27700	733	408	476	265	0.6	
25D	70300	39100	1035	576	936	521	0.7	3.4
35C	93400	52000	2008	1118	1189	662	1.5	
35D	128500	71500	2762	1537	2214	1232	2.0	6.5
45C	167500	93400	4621	2577	2790	1556	3.0	
45D	229500	127800	6333	3527	5161	2874	4.0	10.7
55C	237000	131900	7771	4325	4738	2637	4.5	
55D	324000	180500	10624	5919	8745	4872	6.1	15.2
65D	530000	295000	20912	11640	17930	9980	10.4	22.5

1. The dynamic load and moment ratings are based upon 100 km travel life. When comparing these load ratings with other bearings take into consideration some manufacturers dynamic and moment ratings are based on 50 km travel life. In order to compare with bearing dynamic and moment ratings based on 50 km travel life, divide the dynamic capacity of the bearing rated for 50 km by 1.23 to get an accurate comparison.
2. The static load and moment rating are the maximum radial load and moment load that should be applied to the bearing while there is no relative motion between the carriage and rail.

Bearing Travel Life Comparison

$L = (C/F)^3 \times 100km$
where:
L = travel life, km
C = dynamic load rating, N
F = applied dynamic load, N

$C_{min} = F \left(\frac{L}{100}\right)^{1/3}$
where:
C_{min} = minimum required dynamic load rating, N
F = applied dynamic load, N
L = required travel life, km

Operating Parameters:
Maximum Velocity: 3 m/s
Maximum Acceleration: 50 m/s²
Temperature: Min: – 40° C
Max: 80° C
Max peak: 120° C short time*
*without bellows

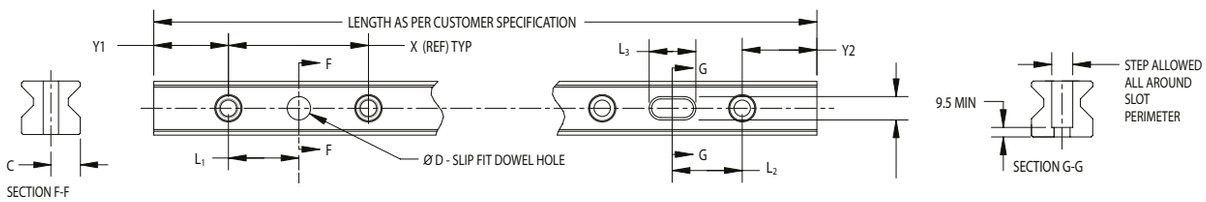
Rail Modifications

The rails can be supplied with dowel holes, radial holes and coaxial holes. Please provide a drawing of your requirement and our Application Engineering Team can provide a quote.

Maximum Length of Single Piece Rail

Size (mm)	25	35	45	55	65
Maximum Length	6000 mm				

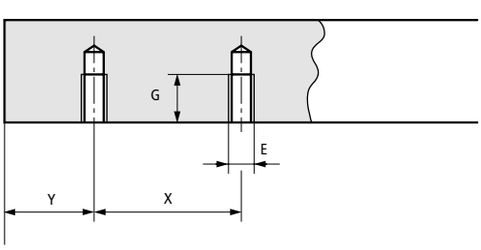
Extended Standard Rail Options



Option	Size	D +.013 -0	L_1 ±0.12	L_2 ±0.40	L_3 +1.5 -0	C ±0.05
DH1	25	8	15	15	12	11.5
	35		20	20		17
	45		30	30		22.5
	55					26.5
	65					31.5
DH2	25	N/A	N/A	N/A	N/A	N/A
	35	10	20	20	15	17
	45		30	30		22.5
	55					26.5
	65					31.5
DH3	25	N/A	N/A	N/A	N/A	N/A
	35					
	45	12	30	30	18	22.5
	55					26.5
	65					31.5
DH4	25	N/A	N/A	N/A	N/A	N/A
	35	3/8″	.787″	.787″	.550″	.669″
	45		1.181″	1.181″		.886″
	55					1.043″
	65					1.240″
DH5	25	N/A	N/A	N/A	N/A	N/A
	35					
	45	1/2″	1.181″	1.181″	.750″	.886″
	55					1.043″
	65					1.240″

All dimensions in mm unless otherwise specified.
Y1 = Y2 unless otherwise specified.

522 Type U Rail Bolt Up From Bottom

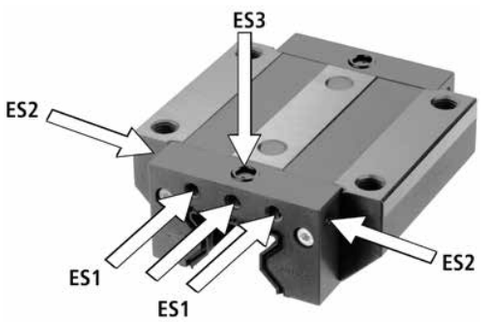


Size	X	E	G (mm)	Weight (kg/in)
25	30	M6	12	3.4
35	40	M8	15	6.5
45	52.5	M12	19	10.7
55	60	M14	22	15.2
65	75	M16	25	22.5

Y1 = Y2 unless specified at time of ordering.

Lubrication Inlet Options

The standard carriage is supplied with a straight lubrication fitting centered. The carriage end cap has multiple lubrication inlet points and lubrication channels options and is supplied standard with the end cap center inlet plugged. These options can be easily modified on-site in the field or can be supplied factory direct. (Not available for size 25.)



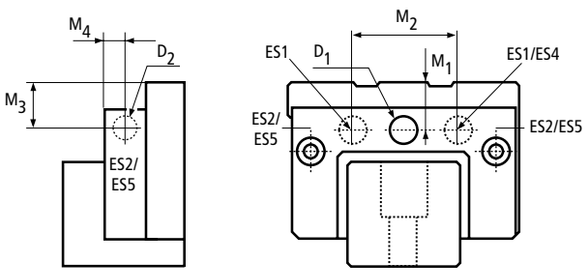
Option	Inlet	Lubrication Channel
ES 1[2]	Inlets offset - both sides - all four	Standard channel
ES 2	Inlets on side - both sides - all four	Standard channel
ES 3[1]	Inlet on top	Standard channel
ES 4[2]	Inlets offset - both sides - all four	Individually channeled path
ES 5	Inlets offset - both sides - all four	Individually channeled path

1. An O-Ring or adapter is required to properly seal the mating surfaces to prevent grease or oil from escaping. One is supplied with this option. The adapter is for C and D style carriages. Lubrication options available in size 35, 45, 55 and 65 only.
2. Option can not be used in combination with additional modular accessories.
3. Set screw is installed in Standard inlet hole when ES2 and ES3 options are specified.
4. Inlets on side and top are solid plugs. When modified on-site, inlets must be punctured to be utilized.

Lubrication inlet locations. Front of end cap above rail and slide.

Size	Style	M_1	M_2	M_4	M_3	D_1	D_2
25	A	5.5	N/A	N/A	N/A	M6	N/A
	B						
	C	9.5					
	D						
35	A	7	32	6.5	7	M6	M6
	B						
	C	14			14		
	D						
45	A	8	40	7.5	8	M6	M6
	B						
	C	18			18		
	D						
55	A	9	50	8.5	9	M6	M6
	B						
	C	19			19		
	D						
65	B	13	64	12.5	13	M6	M6
	D						

All dimensions in mm.

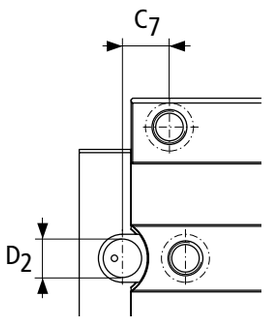


1. D1 and D2 are threaded holes in the end cap to ensure proper integrity and durability of connection.
2. Carriages are shipped with a grease fitting in the box (fitting 530LN). See page 75 for more information.

Lubricant Inlet Options, cont'd

Lubrication inlet locations. Inlet on top. "ES3"

Size	Style	C7	D1	D2	D3	D4	Adapter[1]
25	A	12.0	6.75	10	1.78	6	N/A
	B	23.2					
	C	17.0					532ES3ADP25
	D	20.7					
35	A	14.0	6.75	10	1.78	6	N/A
	B	27.5					
	C	20.0					532ES3ADP35
	D	22.5					
45	A	17.0	6.75	10	1.78	6	N/A
	B	34.5					
	C	27.0					532ES3ADP45/55
	D	34.5					
55	A	21.5	6.75	10	1.78	6	N/A
	B	42.5					
	C	31.5					532ES3ADP45/55
	D	42.5					
65	B	54.0	6.5	10	2	6	N/A
	D	49.0					



D1 = O-Ring internal diameter
D2 = Counterbore diameter
D3 = O-Ring thickness
D4 = Max. diameter of lubrication inlet diameter from above

All dimensions in mm.
1. Adapter supplied when ordering ES3 option.

Grease Lubricants

Standard carriages are sold with oil preservative to protect the rollers from corrosion during storage and transit. The carriages are available with the following assortment of lubricants as standard.

Option	Type	Notes	Viscosity	Temperature Range
G1	Mobilux® EP2	All purpose NLGI 2 grease	160cSt @40°C	–20°C to 130°C
G2	Krytox® GPL227	High Temperature NLGI 2	440cSt @40°C	–30°C to 288°C
G3	Thomson LinearLube	Food Grade NLGI2 grease	350cSt @40°C	–54°C to 230°C
GS	Customer specified grease			

Additional greases may be available upon request. Please consult Thomson Application Engineering.

Thin Dense Chrome Plating

Rails and carriages are available with Thin Dense Chrome Plating with a thickness of 2-4 µm. As a result of the plating thickness range compared to the tolerance ranges in the different accuracy classes, it is only available with Precision accuracy classes up to 3 meters long as a single rail; long lengths can be butt jointed.

Carriage Assortment with Thin Dense Chrome

				Preload			Appropriate Standard Rail	Max One Piece Rail Length (mm)
Type	Style	Size	Accuracy	0.03C	0.08C	0.13C		
512	A	25	P	512P25A1D	512P25A2D	512P25A3D	522P25AD	3000
		35	P	512P35A1D	512P35A2D	512P35A3D	522P35AD	3000
		45	P	512P45A1D	512P45A2D	512P45A3D	522P45AD	3000
		55	P	512P55A1D	512P55A2D	512P55A3D	522P55AD	3000
	B	25	P	512P25B1D	512P25B2D	512P25B3D	522P25AD	3000
		35	P	512P35B1D	512P35B2D	512P35B3D	522P35AD	3000
		45	P	512P45B1D	512P45B2D	512P45B3D	522P45AD	3000
		55	P	512P55B1D	512P55B2D	512P55B3D	522P55AD	3000
		65	P	512P65B1D	512P65B2D	512P65B3D	522P65AD	3000
	C	25	P	512P25C1D	512P25C2D	512P25C3D	522P25AD	3000
		35	P	512P35C1D	512P35C2D	512P35C3D	522P35AD	3000
		45	P	512P45C1D	512P45C2D	512P45C3D	522P45AD	3000
		55	P	512P55C1D	512P55C2D	512P55C3D	522P55AD	3000
	D	25	P	512P25D1D	512P25D2D	512P25D3D	522P25AD	3000
		35	P	512P35D1D	512P35D2D	512P35D3D	522P35AD	3000
		45	P	512P45D1D	512P45D2D	512P45D3D	522P45AD	3000
		55	P	512P55D1D	512P55D2D	512P55D3D	522P55AD	3000
		65	P	512P65D1D	512P65D2D	512P65D3D	522P65AD	3000

Note: Chrome plated carriages and rails are designed and manufactured to be used together. If a non-chrome plated carriage is used on a chrome plated rail the preload of the carriage will be increased approximately one class.

If a chrome plated carriage is used on a non-chrome plated rail the preload will be decreased approximately one class. This is the result of the coating thickness.

Modular Accessory Combination Options and Screw Size

Option	Description	Size				
		25	35	45	55	65
N[3]	Oil Reservoir	Low/socket head screw M4x30	Low/socket head screw M4x35	Low/socket head screw M5x45	Low/socket head screw M6x45	Low/socket head screw M6x55
V[3]	Viton Wiper	Low/socket head screw M4x25	Low/socket head screw M4x30	Low/socket head screw M5x35	Low/socket head screw M6x35	Low/socket head screw M6x40
Z[3]	Metal Scraper	Low/socket head screw M4x20	Low/socket head screw M4x25	Low/socket head screw M5x30	Low/socket head screw M6x35	Low/socket head screw M6x35
C[3]	Bellows Clips	Flat/socket head screw M4x20	Flat/socket head screw M4x25	Flat/socket head screw M5x25	Flat/socket head screw M6x30	Flat/socket head screw M6x35
NV	Oil Reservoir + Wiper	Low/socket head screw M4x40	Low/socket head screw M4x45	Low/socket head screw M5x50	Low/socket head screw M6x55	Low/socket head screw M6x65
NVZ	Oil Reservoir, Wiper + Scraper	Low/socket head screw M4x40	Low/socket head screw M4x45	Low/socket head screw M5x55	Low/socket head screw M6x60	Low/socket head screw M6x65
NVC	Oil Reservoir, Wiper + Bellows Clip	Flat/socket head screw M4x40	Flat/socket head screw M4x45	Flat/socket head screw M5x50	Flat/socket head screw M6x55	Flat/socket head screw M6x65
NVZC	Oil Reservoir, Wiper, Scraper + Bellows Clip	Flat/socket head screw M4x40	Flat/socket head screw M4x50	Flat/socket head screw M5x55	Flat/socket head screw M6x60	Flat/socket head screw M6x65
NZ	Oil Reservoir + Scraper	Low/socket head screw M4x35	Low/socket head screw M4x40	Low/socket head screw M5x50	Low/socket head screw M6x55	Low/socket head screw M6x60
NZC	Oil Reservoir, Scraper + Bellows Clips	Flat/socket head screw M4x35	Flat/socket head screw M4x40	Flat/socket head screw M5x50	Flat/socket head screw M6x55	Flat/socket head screw M6x60
NC	Oil Reservoir + Bellows Clips	Flat/socket head screw M4x35	Flat/socket head screw M4x40	Flat/socket head screw M5x50	Flat/socket head screw M6x55	Flat/socket head screw M6x60
VC	Wiper + Bellows Clip	Flat/socket head screw M4x25	Flat/socket head screw M4x30	Flat/socket head screw M5x30	Flat/socket head screw M6x35	Flat/socket head screw M6x40
VZ	Wiper + Scraper	Low/socket head screw M4x25	Low/socket head screw M4x30	Low/socket head screw M5x35	Low/socket head screw M6x35	Low/socket head screw M6x40
VZ	Viton Wiper + Scraper	Low/socket head screw M4x25	Low/socket head screw M4x30	Low/socket head screw M5x35	Low/socket head screw M6x35	Low/socket head screw M6x40
ZC	Scraper + Bellows Clip	Flat/socket head screw M4x20	Flat/socket head screw M4x25	Flat/socket head screw M5x25	Flat/socket head screw M6x30	Flat/socket head screw M6x35

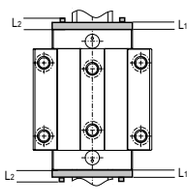
1. All fasteners standard thread.
2. Consult Thomson for options not listed, engineering review is required.
3. Each modular accessory is supplied with proper screws to install over end cap only and not combinations of modular accessories.

Modular Seals and Lubrication Accessories

Additional Wipers
532VR – Viton® Wiper

Size	Viton® Part Number	L1 (mm)	L2 (mm)	Weight (kg)
25	532VR25	7	4	0.005
35	532VR35	7	4	0.012
45	532VR45	7	4	0.024
55	532VR55	7	4	0.029
65	532VR65	7	4	0.040

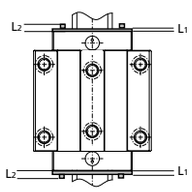
L1 – wiper thickness, L2 – max. screw head stickout



Metal Scraper
532 ZZ

Size	Part Number	L1 (mm)	L2 (mm)	Weight (kg)
25	532ZZ25	1.5	4	0.011
35	532ZZ35	1.5	4	0.022
45	532ZZ45	1.5	4	0.034
55	532ZZ55	1.5	4	0.044
65	532ZZ65	1.5	4	0.078

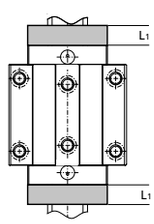
L1 = scraper thickness, L2 = max. screw head stickout



Oil Reservoir
532 OW

Size	Lubrication Plate	L1 (mm)	Weight (kg)
25	532OW25	12.7	0.013
35	532OW35	16.7	0.032
45	532OW45	19	0.056
55	532OW55	22	0.103
65	532OW65	25.2	0.179

L1 = lubrication plate thickness, screw heads are recessed in plate



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When using a combination of different plates, add the cumulative thickness of the plates to get an accurate overall carriage length.

Example:
512 Size 45 carriage with 532 OW and 532 VR modular seals on both sides:

Carriage Length (L)	= 137.5
532 OW L1 x 2	= 19 x 2
532 WR L1 x 2	= 7 x 2
532 VR L2 x 2	= 4 x 2
Total Length	= 193.5 mm

511 Size 35 carriage with 531OW modular seal on both sides and 531VR modular seals on one side:

Carriage Length (L)	= 109
532 OW L1 x 2	= 16.7 x 2
532 VR L1 x 1	= 7 x 1
532 VR L2 x 1	= 4 x 1
Total Length	= 153.4 mm

Each modular accessory is supplied with the proper screws to install them over the end cap. When combinations of modular seals are used longer screws may be required. The following sizes are available from our stock.

Bellows Dimensional Information

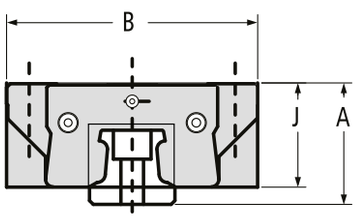
Bellows are available in three styles:

532 BB "Low Profile" with outside dimensions that do not exceed the carriage, constructed of polyurethane coated polyester, maximum ambient temperature of 80°C (175°F).

532 BC "High Compression" constructed of a spark resistant Teflon® coated fiberglass and designed to allow for higher compression, maximum ambient temperature exceeds maximum bearing peak temperatures.

532 BW "Walk On" capable of handling the harshest environments, including welding and grinding applications, with a 90 kg load bearing capacity.

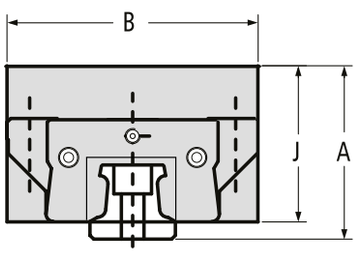
The bellows can be easily installed in conjunction with the other optional modular seals providing you with an easy upgrade to the standard seal. Installation is simple and requires little time. Retrofitting is possible. The rail ends have to be drilled for the attachment of the bellow clip adapter plate, 532 CR. These can be easily installed on-site in the field or can be supplied from the factory.



532 BB " Profile" Bellows

Size	Part No.	B	J	A	CR
25	532 BB25	47	30.5	36	0.17
35	532 BB35	70	41.3	47.5	0.15
45	532 BB45	81	51	59	0.15
55	532 BB55	99	58	69	0.10
65	532 BB65	109	65	79	0.10

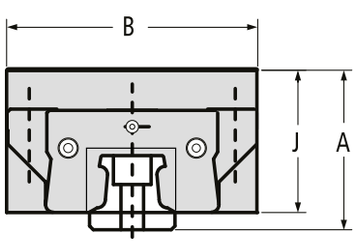
Customer to specify extended length at time of order, see page 154 for how to calculate.



532 BC "High Compression" Bellows

Size	Part No.	B	J	A	CR
25	532 BC25	67	40.5	46	0.10
35	532 BC35	90	51.3	57.5	0.07
45	532 BC45	101	61	69	0.07
55	532 BC55	119	68	79	0.06
65	532 BC65	129	75	89	0.06

Customer to specify extended length at time of order, see page 154 for how to calculate.



532 BW "Walk On" Bellows

Size	Part No.	B	J	A	CR
25	532 BW25	57	35,5	41	0.19
35	532 BW35	77	42	48.2	0.19
45	532 BW45	101	53	61	0.15
55	532 BW55	111	58	69	0.15
65	532 BW65	119	70	84	0.15

Customer to specify extended length at time of order, see page 154 for how to calculate.

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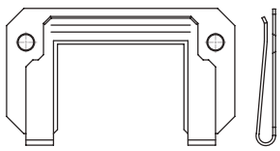
Bellow Clip Adapter Plates

532 CC Carriage Bellow Clips – Attachment Plate

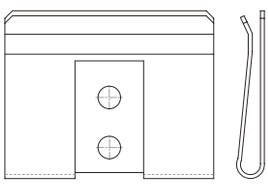
The 532 CC Carriage Bellow Clip – Attachment Plate is used to attach the bellows to the carriage. The bellows clip – adapter plate is made of steel.

Size	Part No.
25	532 CC25
35	532 CC35
45	532 CC45
55	532 CC55
65	532 CC65

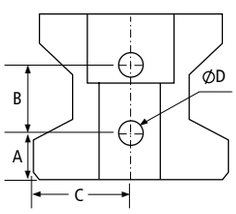


532 CR Rail Bellow Clips – Attachment Plate

The 532 CR Rail Bellow Clip – Attachment Plate is used to attach the bellows to the rail. The attaching holes can be drilled in the end of the rail if retrofitting or can be supplied from the factory. The bellows clip – adapter plate is made of steel.



Size	Part No.	Rail Machining Detail					Screw[1]				MinY[2]
		A	B	C	Depth Min	Depth Max	Size	Pitch	Length	Type	
25	532 CR25	7.24	10	11.50	7.7	9.70	M4	0.70	10.00	Button Head Cap Screw	12
35	532 CR35	11.00		17.00							20
45	532 CR45	15.01		22.50							22
55	532 CR55	18.01		26.50							24
65	532 CR65	24.00		31.50							28



All dimensions in mm.

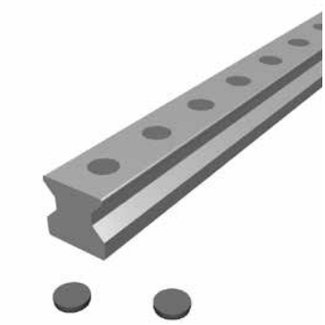
1. Two screws are supplied with each Rail Bellow Clip.
2. Min Y dimension to ensure drill depth does not break through rail mounting hole.

500 Series Roller Rail Information

Maintenance and Installation Tools & Accessories: Assembly Rail – 532 MT

An assembly rail is required when the carriage must be removed from the rail and then reinstalled during the installation. It is recommended to leave the carriage on the assembly rail to protect the rollers against con the carriage can be tightened. The assembly rail is made of plastic.

Size	Standard Rail Part Number	Length (mm)	Weight (kg)
25	532 MT25	145	0.062
35	532 MT35	185	0.152
45	532 MT45	230	0.317
55	532 MT55	265	0.525
65	532 MT65	320	0.914



Standard Rail Plugs and Tape

HP plastic plugs

Size	Part Number	Qty per pack	Weight (kg)
25	532 HP25	25	.007
35	532 HP35	25	.014
45	532 HP45	25	.025
55	532 HP55	25	.047
65	532 HP65	25	.053

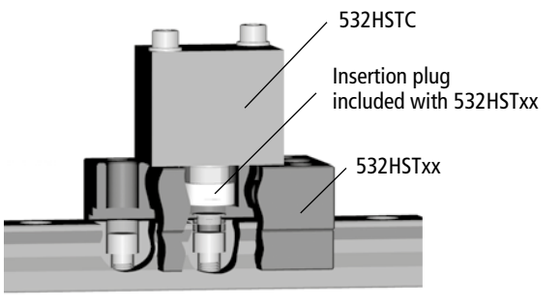
HB brass plugs

Size	Part Number	Qty per pack	Weight (kg)
25	532 HB 25	1	.002
35	532 HB 35	1	.005
45	532 HB 45	1	.008
55	532 HB 55	1	.011
65	532 HB 65	1	.013

HS two-piece stainless steel plugs

Size	Part Number	Qty per pack	Weight (kg)
25	532 HS 25	1 set	.003
35	532 HS 35	1 set	.008
45	532 HS 45	1 set	.012
55	532 HS 55	1 set	.019
65	532 HS 65	1 set	.026

HST Stainless Steel and Brass installation tool



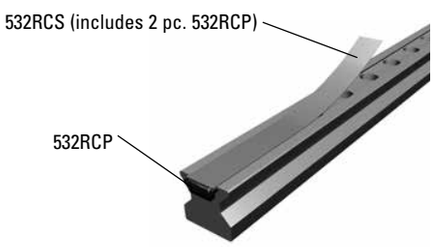
Sliding Block with insertion plug	Weight (kg)
532 HST 25 For size 25 rail	2.0
532 HST 35 For size 35 rail	3.5
532 HST 45 For size 45 rail	3.9
532 HST 55 For size 55 rail	5.4
532 HST 65 For size 65 rail	6.5
Hydraulic cylinder (for all sizes)	**Weight (kg)**
532 HSTC[1]	0.53

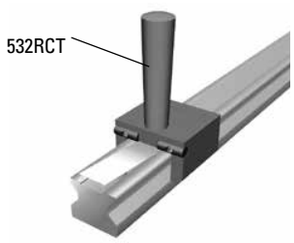
1. Hydraulic fitting size 1/4"-18 NPT, max pressure 120 x 103 hPa (120 bar).

Optional 500 Series Rail with Stainless Steel Cover Strip

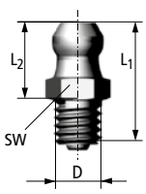
	Rail Coverstrip End Caps	Mounting Tool	Replacement End Caps	Standard Coverstrip Rail	Coverstrip Width (mm)	Max Single PC Length (mm)
Size	Part Number[1]	Part Number	Part Number[2]	Part Number[3]		
25	532RCS25	532RCT25	532RCP25	522P25C	15	6000
35	532RCS35	532RCT35	532RCP35	522P35C	19	6000
45	532RCS45	532RCT45	532RCP45	522P45C	25	6000
55	532RCS55	532RCT55	532RCP55	522P55C	28.5	6000
65	532RCS65	532RCT65	532RCP65	522P65C	32	6000

1. Customer to specify length of rail to be used on at time of order. Delivered piece will be 2 to 3.5 mm longer in order to properly install and fit end caps.
2. Two end caps are supplied with each piece of 532RCS ordered.
3. P grade accuracy shown for example purposes, S and U grade accuracy are available.
4. Cover strip should not be installed more than 3 times.





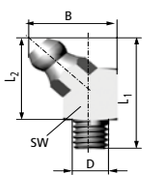
Lubrication Fittings



530LN
Hydraulic-type lubricating nipple, straight.
530BF6 = 2.5 mm / 530BF8 = 4mm

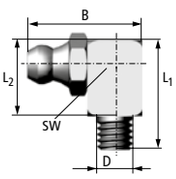
D	L_1	L_2	SW
M6	16	10.5	7

* Note: 1 pc included with each carriage



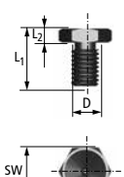
530LN45
Hydraulic-type lubricating nipple, 45° angle

D	L_1	L_2	B	SW
M6	21	15.5	15	9



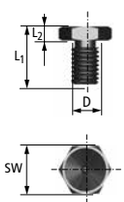
530LN90
Hydraulic-type lubricating nipple, 90° angle

D	L_1	L_2	B	SW
M6	18	12.5	19	9



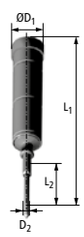
530LF3
Funnel type lubricating nipple M3

D	L_1	L_2	SW
M3	6.6	1.6	5



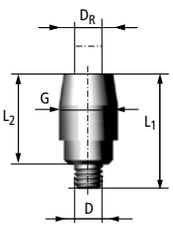
530LF6
Funnel type lubricating nipple M6

D	L_1	L_2	SW
M6	9.5	3	7



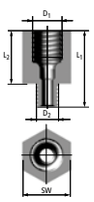
530LG
Grease gun for funnel type lubricating nipple M3

L_1	L_1	$ØD_1$	$ØD_2$
210	55	34	5.5



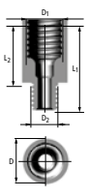
530LA3
Straight screw-in connection M3
For tubing with ext. diameter D_R = 3 mm

D	ØG	L_1	L_2
M3	6	12	9.5



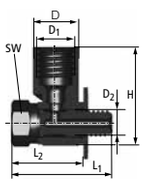
530LA... Adapter
Adapter with hexagon insert bit
For tubing with ext. diameter = 4 mm

PIN	D_1	D_2	L_1	L_2
530LA4	G1/8	M6	20	14
530LA5	M8x1	M6	20	14



530LA6
Adapter, external round
For tubing with ext. diameter = 4 mm

D_1	D_2	L_1	L_2	Ø
M8x1	M6	20	14	10



530BF... Banjo Fittings
For tubing with ext. diameter
530BF6=2.5 mm/530BF8 =4mm

P/N	D_1	D_2	L_1	L_2	H
530BF6	M6x0.75	M6	22	16	18
530BF8	M8x1	M6	22	15.5	22

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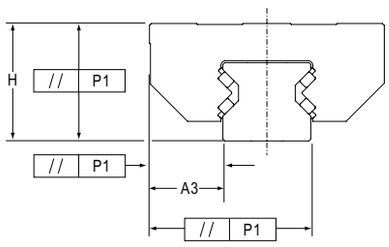
Accuracy Class

Three tolerances describe the accuracy of a Profile Rail bearing: Running Parallelism, Pair Variation, and Assembly Accuracy. These are measured from the rail base to the center of the carriage top (H), and from the rail reference edge to the center of the carriage reference edge (A3).

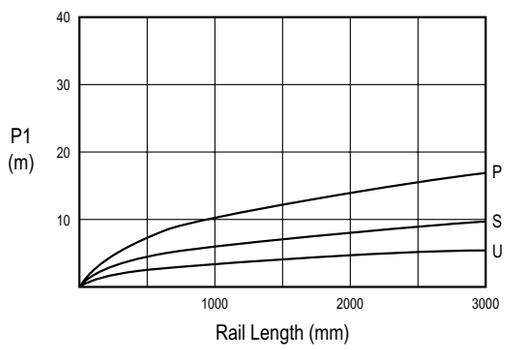


Running Parallelism describes the tolerance on H and A3 as a function of axial travel, measured from one carriage down the length of the rail. This is analogous to straightness of travel. As such, parallelism describes attributes of the rail only.

Assembly Accuracy describes the tolerance on H and A3 as a function of a carriage – rail assembly, measured from the nominal dimensions.

Pair Variation describes tolerance on H and A3 as a function of carriages at the same position on a common rail. Pair variation describes carriage precision only.

The accuracy class selected will partially determine the accuracy of the system. Other factors such as mounting surface flatness and straightness also significantly affect system accuracy.



Tolerances

	Accuracy Class		
	P - Precision	S - Super Precision	U - Ultra Precision
Assembly Accuracy Tolerance on dimension H and A3 (measured at middle of carriage at any point along rail)	±20	±10	±5
Pair Variation Max variation in dimensions H and A3 measured on multiple carriages mounted on the same rail (measured at the middle of carriage at same position on rail)	10	5	3
Running Parallelism	40	20	10

All values in µm

Preload

Three Preload classes are available with the 500 Series Roller Profile rail carriages. Preload will minimize elastic deformation caused by external forces resulting in increased rigidity.

Preload Accuracy Combinations

Accuracy Class	Preload		
	0.03C[1]	0.08C[1]	0.13C[1]
P, S, U	1	2	3

1. C = Dynamic load capacity of the bearing

NOTES: