

2-2-2 The Structure of TR-series

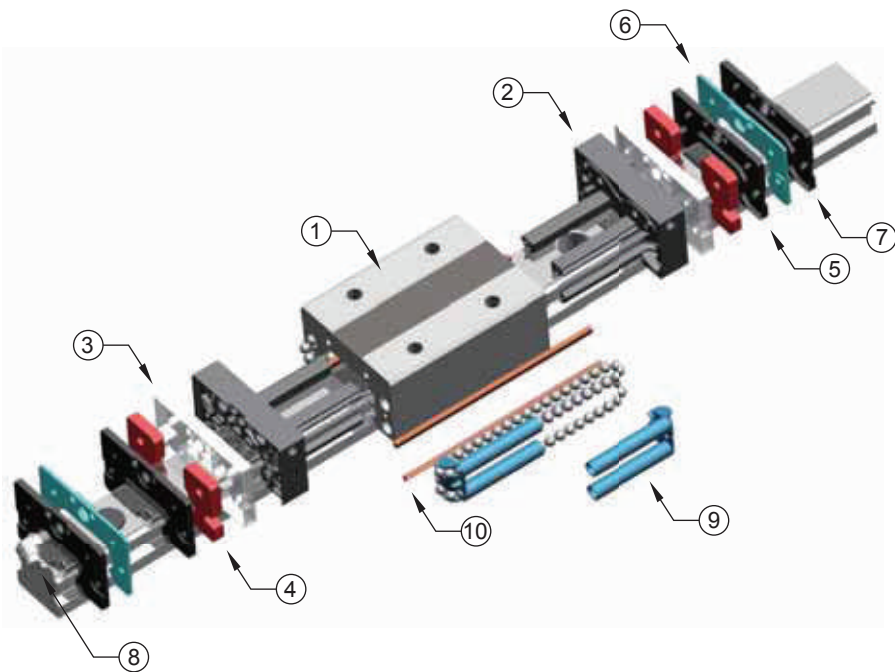


Fig2.2.1

Item	Name	Amount
①	Block	1
②	End Cap	2
③	Oil tank	2
④	Wool felt	4
⑤	End Seal	2
⑥	Spacer	2
⑦	Double end seal	2
⑧	Mounting	1
⑨	Circulation tube	4
⑩	Top+Bottom seal	4

Fig2.2.2

Circulation unit : Block, Rail, End Cap, Steel Balls, Circulation tube.

Lubrication unit : Grease Fitting.

Anti-Dust Unit : Wiper, Top and Bottom Seal, Mounting Hole Cap.

2-2-3 TR-series

(Block types)

TBI MOTION offers flange and square types of flange. The assembly height and category lists as below :

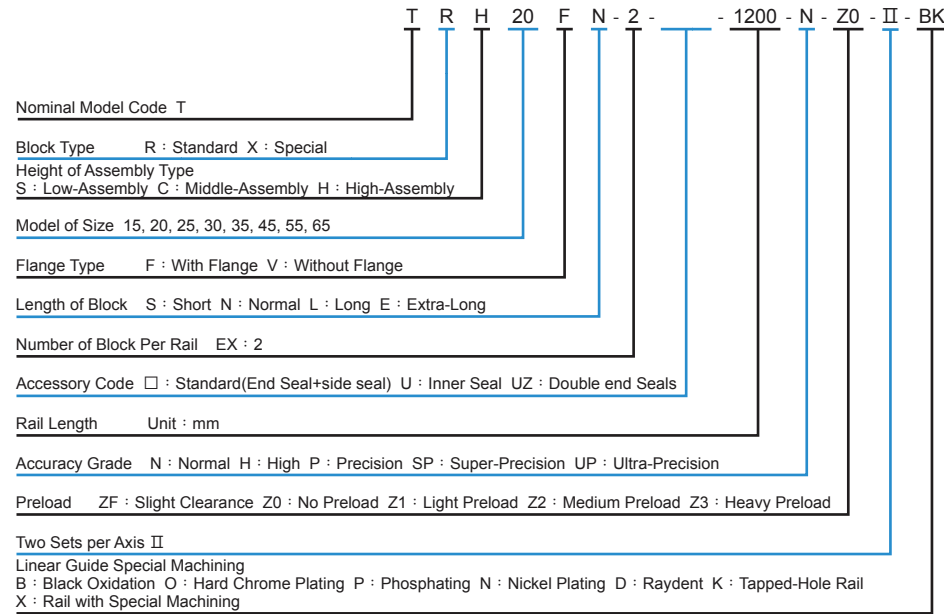
Fig2.2.2

Type	Model	Shape	Height	Rail Length	Main Application
Square	TRH-V	Mounting from Above 	28	100	<ul style="list-style-type: none"> ● Machine Centers. ● NC Lathes. ● Food Machine. ● Grinding Machines. ● CNC Machine. ● Heavy Cutting Machines. ● Punching Machine. ● Injection Molding Machine. ● Automation Equipment. ● Transportation Equipment. ● Sealing machine.
	TRC-V		90	4000	
Flange	TRH-F	Mounting from Above \ Mounting from Below 	24	100	
	TRS-F		60	4000	

2-2-4 TR Model Number for Non-interchangeable TR Type

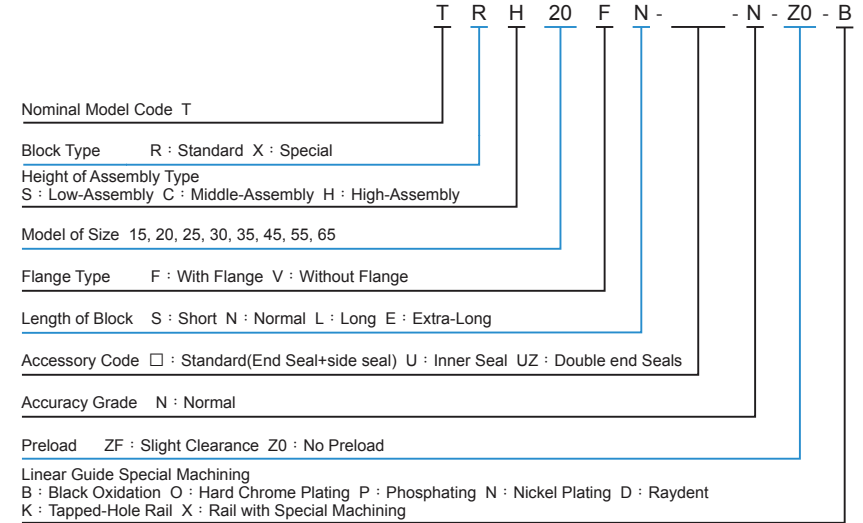
TR series can be classified into interchangeable and non-interchangeable types. The sizes are identical; the only difference between the two types is that the accuracy of non-interchangeable types could reach up to UP grade since *TBI MOTION* makes the linear guide set under strict international regulation. Interchangeable blocks and rails can be freely exchanged; however, the accuracy could be up to H grade only due to technical issue. It is much more convenient for those customers who do not need linear guides with very high accuracy to have interchangeable blocks and rails.

Non-interchangeable type code :

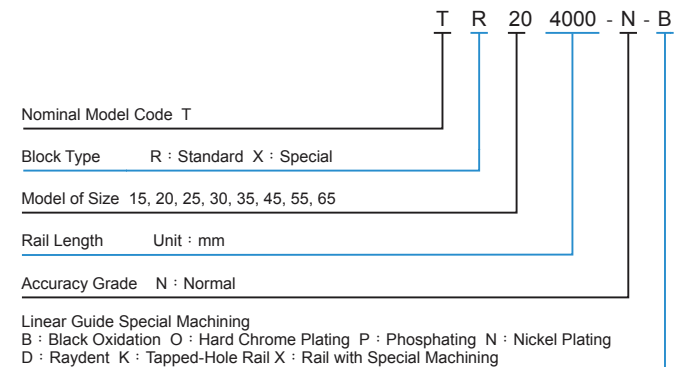


2-2-5 Model Number for Interchangeable TR Type

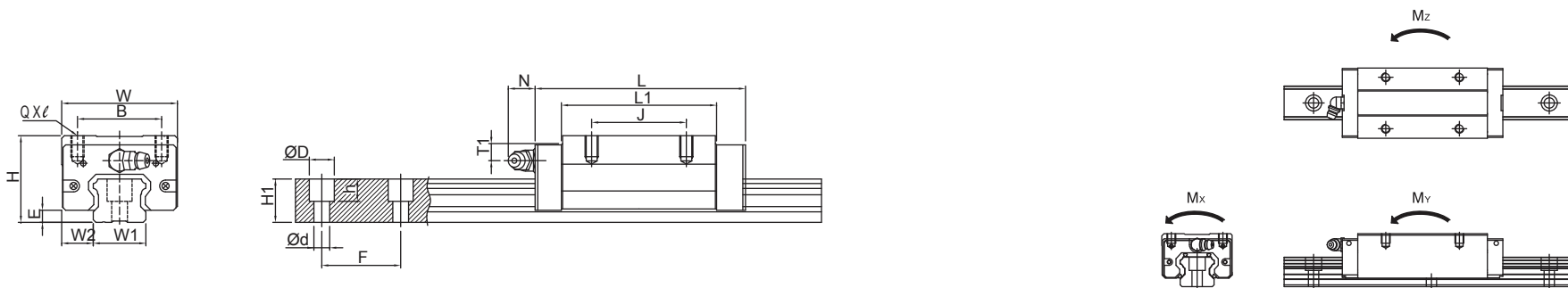
Interchangeable Type of block :



Interchangeable Type of rail :



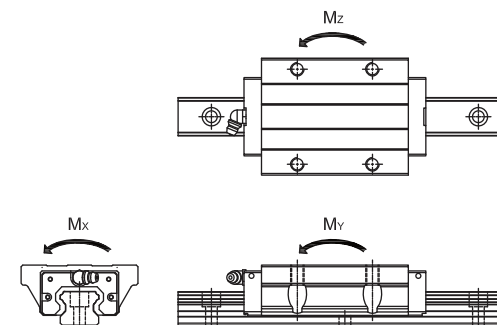
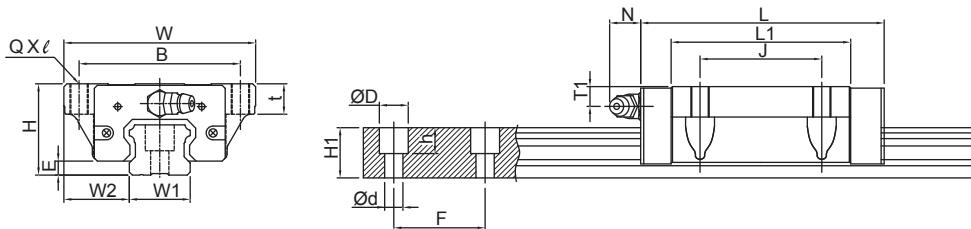
2-2-6 TRH-V Series Dimension Table



Model No.	Assembly(mm)			Block(mm)								Rail(mm)							
	H	W2	E	W	B	J	L	L1	QXℓ	T1	Oil Hole	N	W1	H1	ØD	h	Ød	F	
TRH15VN	28	9.5	3.2	34	26	26	55.9	39.5	M4X5	9.5	M4X0.7	7	15	13	7.5	6	4.5	60	
TRH15VL							64.4	48											
TRH20VN	30	12	4.6	44	32	36	74	54	M5X5	6.5	M6X1	14	20	16.5	9.5	8.5	6	60	
TRH20VL							79	59											
TRH20VE							50	98											78
TRH25VN	40	12.5	5.8	48	35	35	80	59	M6X8	11.5	M6X1	14	23	20	11	9	7	60	
TRH25VL							92	71											
TRH25VE							50	109											88
TRH30VN	45	16	7	60	40	40	95.3	69.3	M8X10	11	M6X1	14	28	23	14	12	9	80	
TRH30VL							106	80											
TRH30VE							60	131											105
TRH35VN	55	18	7.5	70	50	50	108	79	M8X10	15	M6X1	14	34	26	14	12	9	80	
TRH35VL							122	93											
TRH35VE							72	152											123
TRH45VL	70	20.5	8.9	86	60	60	140	106	M10X15	20.5	PT1/8	12.5	45	32	20	17	14	105	
TRH45VE							80	174											140
TRH55VL	80	23.5	13	100	75	75	175	118	M12X18	21	PT1/8	12.5	53	44	23	20	16	120	
TRH55VE							95	201.1											156.1
TRH65VL	90	31.5	14	126	76	76	197	147	M16X20	19	PT1/8	12.5	63	53	26	22	18	150	
TRH65VE							120	256.5											206.5

Model No.	Rating Load (kgf)		Static permissible moment of load					Weight		
	C	Co	Mx(kgf-mm)		My(kgf-mm)		Mz(kgf-mm)		Block (kg)	Rail (kg/m)
			Single Block	Double Block	Single Block	Double Block	Single Block	Double Block		
TRH15VN	1206	2206	16,436	14,884	70,960	14,884	70,960	0.13	1.32	
TRH15VL	1343	2574	19,175	20,429	95,224	20,429	95,224	0.2		
TRH20VN	2050	3696	37,334	33,268	157,298	33,268	157,298	0.26	2.28	
TRH20VL	2125	3891	39,299	36,965	176,924	36,965	176,924	0.29		
TRH20VE	2553	5058	51,089	63,229	284,163	63,229	284,163	0.38	3.17	
TRH25VN	2581	4503	52,239	43,407	207,324	43,407	207,324	0.54		
TRH25VL	2875	5254	60,945	59,579	277,678	59,579	277,678	0.55		
TRH25VE	3248	6255	72,554	85,112	391,311	85,112	391,311	0.68	4.54	
TRH30VN	3807	6483	90,722	74,970	355,321	74,970	355,321	0.76		
TRH30VL	4098	7203	100,803	93,100	438,966	93,100	438,966	0.85		
TRH30VE	4791	9004	126,003	147,000	677,068	147,000	677,068	1.12	6.27	
TRH35VN	5090	8346	142,722	106,070	519,799	106,070	519,799	1.31		
TRH35VL	5502	9328	159,512	133,367	656,509	133,367	656,509	1.52		
TRH35VE	6667	12274	209,885	233,977	1,070,533	233,977	1,070,533	2	10.4	
TRH45VL	7572	12808	292,657	220,751	1,030,183	220,751	1,030,183	2.7		
TRH45VE	8852	16010	365,821	348,554	1,598,703	348,554	1,598,703	3.58		
TRH55VL	14703	21613	571,342	411,729	2,019,184	411,729	2,019,184	3.60	16.1	
TRH55VE	17349	27377	723,699	670,530	3,148,637	670,530	3,148,637	4.70		
TRH65VL	22526	31486	973,074	695,840	3,594,277	695,840	3,594,277	7.76	22.54	
TRH65VE	27895	42731	1,320,601	1,307,568	6,312,759	1,307,568	6,312,759	11.15		

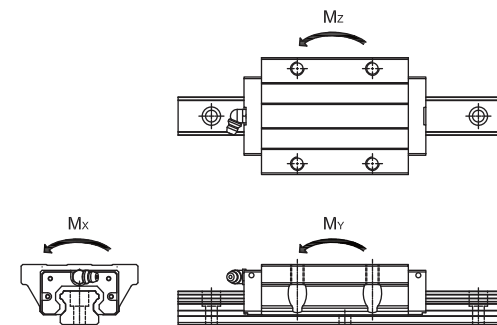
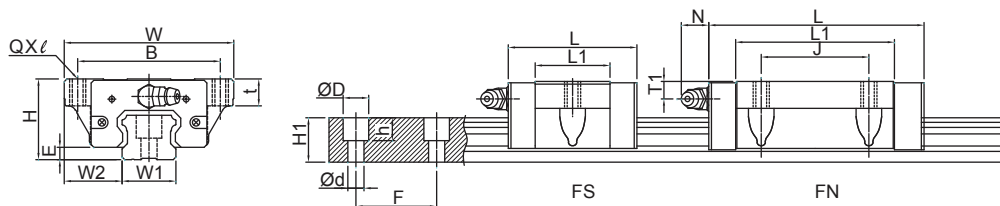
TRH-F Series Dimension Table



Model No.	Assembly(mm)			Block(mm)										Rail(mm)					
	H	W2	E	W	B	J	t	L	L1	QXl	T1	Oil Hole	N	W1	H1	ØD	h	Ød	F
TRH15FN	24	16	3.2	47	38	30	8	55.9	39.5	M5X8	5.5	M4X0.7	7	15	13	7.5	6	4.5	60
TRH15FL								64.4	48										
TRH20FN	30	21.5	4.6	63	53	40	10	74	54	M6X10	6.5	M6X1	14	20	16.5	9.5	8.5	6	60
TRH20FL								79	59										
TRH20FE								98	78										
TRH25FN	36	23.5	5.8	70	57	45	12	80	59	M8X12	7.5	M6X1	14	23	20	11	9	7	60
TRH25FL								92	71										
TRH25FE								109	88										
TRH30FN	42	31	7	90	72	52	15	95.3	69.3	M10X15	8	M6X1	14	28	23	14	12	9	80
TRH30FL								106	80										
TRH30FE								131	105										
TRH35FN	48	33	7.5	100	82	62	15	108	79	M10X15	8	M6X1	14	34	26	14	12	9	80
TRH35FL								122	93										
TRH35FE								152	123										
TRH45FN	60	37.5	8.9	120	100	80	18	140	106	M12X18	10.5	PT1/8	12.5	45	32	20	17	14	105
TRH45FE								174	140										
TRH55FL	70	43.5	13	140	116	95	29	163	118	M14X17	11	PT1/8	12.5	53	44	23	20	16	120
TRH55FE								201.1	156.1										
TRH65FL	90	53.5	14	170	142	110	37	197	147	M16X23	19	PT1/8	12.5	63	53	26	22	18	150
TRH65FE								256.5	206.5										

Model No.	Rating Load (kgf)		Static permissible moment of load					Weight		
	C	Co	Mx(kgf-mm)		My(kgf-mm)		Mz(kgf-mm)		Block (kg)	Rail (kg/m)
			Single Block	Double Block	Single Block	Double Block	Single Block	Double Block		
TRH15FN	1206	2206	16,436	14,884	70,960	14,884	70,960	0.18	1.32	
TRH15FL	1343	2574	19,175	20,429	95,224	20,429	95,224	0.22		
TRH20FN	2050	3696	37,334	33,268	157,298	33,268	157,298	0.39	2.28	
TRH20FL	2125	3891	39,299	36,965	176,924	36,965	176,924	0.43		
TRH20FE	2553	5058	51,089	63,229	284,163	63,229	284,163	0.58		
TRH25FN	2581	4503	52,239	43,407	207,324	43,407	207,324	0.60	3.17	
TRH25FL	2875	5254	60,945	59,579	277,678	59,579	277,678	0.67		
TRH25FE	3248	6255	72,554	85,112	391,311	85,112	391,311	0.85		
TRH30FN	3807	6483	90,722	74,970	355,321	74,970	355,321	1.01	4.54	
TRH30FL	4098	7203	100,803	93,100	438,966	93,100	438,966	1.18		
TRH30FE	4791	9004	126,003	147,000	677,068	147,000	677,068	1.54		
TRH35FN	5090	8346	142,722	106,070	519,799	106,070	519,799	1.47	6.27	
TRH35FL	5502	9328	159,512	133,367	656,509	133,367	656,509	1.72		
TRH35FE	6667	12274	209,885	233,977	1,070,533	233,977	1,070,533	2.29		
TRH45FL	7572	12808	292,657	220,751	1,030,183	220,751	1,030,183	2.80	10.4	
TRH45FE	8852	16010	365,821	348,554	1,598,703	348,554	1,598,703	3.79		
TRH55FL	14703	21613	571,342	411,729	2,019,184	411,729	2,019,184	4.22	16.1	
TRH55FE	17349	27377	723,699	670,530	3,148,637	670,530	3,148,637	5.6		
TRH65FL	22526	31486	973,074	695,840	3,594,277	695,840	3,594,277	9.31	22.54	
TRH65FE	27895	42731	1,320,601	1,307,568	6,312,759	1,307,568	6,312,759	12.98		

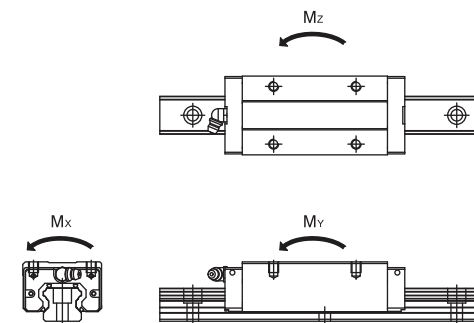
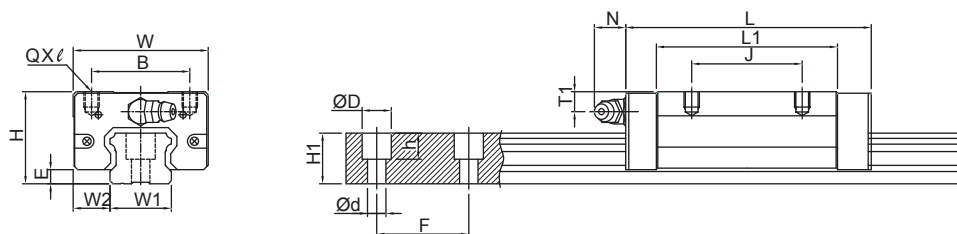
TRS-F Series Dimension Table



Model No.	Assembly(mm)		Block(mm)										Rail(mm)						
	H	W2	E	W	B	J	t	L	L1	QXℓ	T1	Oil Hole	N	W1	H1	ØD	h	Ød	F
TRS15FS	24	18.5	3.2	52	41	26	7	39.3	22.9	M5X7	5.5	M4X0.7	7	15	13	7.5	6	4.5	60
TRS15FN								55.9	39.5										
TRS20FS	28	19.5	4.6	59	49	32	9	47.8	27.8	M6X9	4.5	M6X1	14	20	16.5	9.5	8.5	6	60
TRS20FN								66.7	46.7										
TRS25FN	33	25	5.8	73	60	35	10	80	59	M8X10	4.5	M6X1	14	23	20	11	9	7	60

Model No.	Rating Load (kgf)		Static permissible moment of load					Weight		
	C	Co	Mx(kgf-mm)		My(kgf-mm)		Mz(kgf-mm)		Block (kg)	Rail (kg/m)
			Single Block	Double Block	Single Block	Double Block	Single Block	Double Block		
TRS15FS	908	1471	10,957	6,420	33,531	6,420	33,531	0.12	1.32	
TRS15FN	1206	2206	16,436	14,884	70,960	14,884	70,960	0.19		
TRS20FS	1398	2140	21,615	10,700	59,798	10,700	59,798	0.19	2.28	
TRS20FN	1896	3307	33,404	26,459	126,998	26,459	126,998	0.29		
TRS25FN	2581	4503	52,239	43,407	207,324	43,407	207,324	0.51	3.17	

TRC-V Series Dimension Table



Model No.	Assembly(mm)		Block(mm)										Rail(mm)					
	H	W2	E	W	B	J	L	L1	QXℓ	T1	Oil Hole	N	W1	H1	ØD	h	Ød	F
TRC25VL	36	12.5	5.8	48	35	35	92	71	M6X6.5	7.5	M6X1	14	23	20	11	9	7	60
TRC25VE						50	109	88										

Model No.	Rating Load (kgf)		Static permissible moment of load					Weight		
	C	Co	Mx(kgf-mm)		My(kgf-mm)		Mz(kgf-mm)		Block (kg)	Rail (kg/m)
			Single Block	Double Block	Single Block	Double Block	Single Block	Double Block		
TRC25VL	2875	5254	60,945	59,579	277,678	59,579	277,678	0.52	3.17	
TRC25VE	3248	6255	72,554	85,112	391,311	85,112	391,311	0.65		

2-2-7 The Standard length and maxima length of linear rail

TBI MOTION offer our customer standard and customized rail length to meet the requirement for our customer. TBI suggests that when ordering customized rail length, to prevent unbalance running performance after mounting, the end cap value G should be no greater than 1/2P.

$$L = [n-1] \cdot F + 2 \cdot G$$

L : Total length of rail (mm)

n : Number of mounting holes

F : Distance between any two holes (mm)

G : Distance from the center of the last hole to the edge (mm)

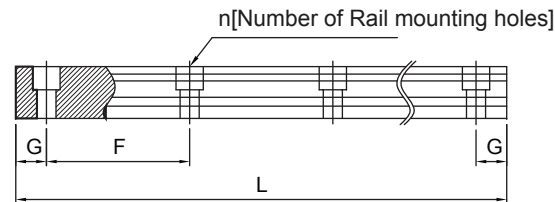


Fig2.2.3

Table2.2.3

Item	TR15	TR20	TR25	TR30	TR35	TR45	TR55	TR65
F : Pitch	60	60	60	80	80	105	120	150
G : Distance to End	20	20	20	20	20	22.5	30	35
L : Max. Length	4000	4000	4000	4000	4000	4000	4000	4000

2-2-8 Type

Besides the standard top mounting type, **TBI MOTION** also offers bottom mounting type rails.

Fig2.2.4

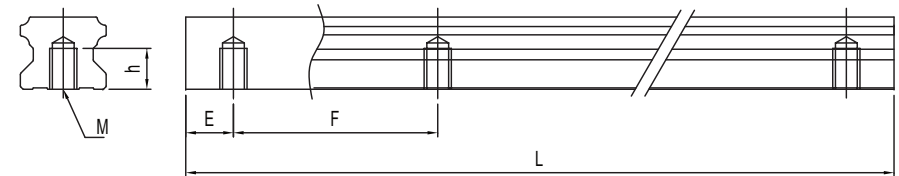
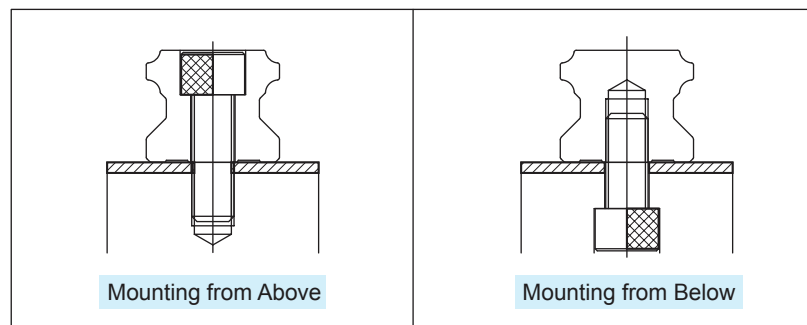


Fig2.2.4 Monting from below

Table2.2.5 Rail Size Chart

Unit : mm

	M	h	E	F
TR15	M5 · 0.8P	8	20	60
TR20	M6 · 1P	10	20	60
TR25	M6 · 1P	12	20	60
TR30	M8 · 1.25P	15	20	80
TR35	M8 · 1.25P	17	20	80
TR45	M12 · 1.75P	24	22.5	105
TR55	M14 · 2P	24	30	120
TR65	M20 · 2.5P	30	35	150

2-2-9 Accuracy Standard

The accuracy standards of TR-Series range, from normal, high, precision, super-precision and ultra-precision. It allows our user to choose according to the accuracy standards of the equipment.

LINEAR GUIDE

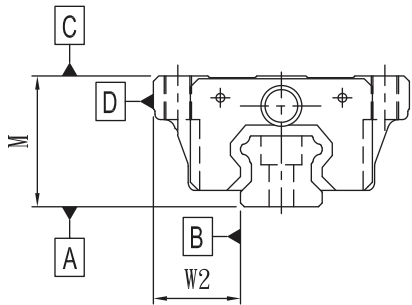
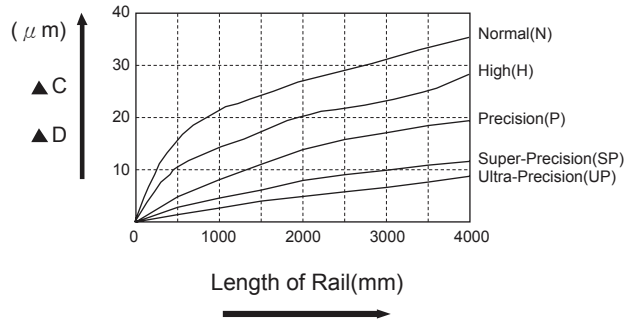


Fig2.10.1 Accuracy Standard



TR Rail Length and Running Accuracy.

Fig2.2.6

Fig2.2.6

Unit : mm

Accuracy Standard										
	TR 15 20					TR 25 30 35				
Accuracy Standard	Normal	High	Precision	Super Precision	Ultra Precision	Normal	High	Precision	Super Precision	Ultra Precision
Item	N	H	P	SP	UP	N	H	P	SP	UP
Tolerance for height M	±0.1	±0.03	0 -0.03	0 -0.015	0 -0.008	±0.1	±0.04	0 -0.04	0 -0.02	0 -0.01
Tolerance for height M difference among Linear Guide Block	0.02	0.01	0.006	0.004	0.003	0.02	0.015	0.007	0.005	0.003
Tolerance for rail-to-block lateral distance W2	±0.1	±0.03	0 -0.03	0 -0.015	0 -0.008	±0.1	±0.04	0 -0.04	0 -0.02	0 -0.01
Tolerance for rail-to-block lateral distance W2 difference among Linear Guide Block	0.02	0.01	0.006	0.004	0.003	0.03	0.015	0.007	0.005	0.003
Running parallelism of Linear Guide Block surface [C] with respect to surface [A]	△ C, TR Rail Length and Running Accuracy(Fig2.10.1)					△ C, TR Rail Length and Running Accuracy(Fig2.10.1)				
Running parallelism of Linear Guide Block surface [D] with respect to surface [B]	△ D, TR Rail Length and Running Accuracy(Fig2.10.1)					△ D, TR Rail Length and Running Accuracy(Fig2.10.1)				
	TR 45 55					TR 65				
Accuracy Standard	Normal	High	Precision	Super Precision	Ultra Precision	Normal	High	Precision	Super Precision	Ultra Precision
Item	N	H	P	SP	UP	N	H	P	SP	UP
Tolerance for height M	±0.1	±0.05	0 -0.05	0 -0.03	0 -0.02	±0.1	±0.07	0 -0.07	0 -0.05	0 -0.03
Tolerance for height M difference among Linear Guide Block	0.03	0.015	0.007	0.005	0.003	0.03	0.02	0.01	0.007	0.005
Tolerance for rail-to-block lateral distance W2	±0.1	±0.05	0 -0.05	0 -0.03	0 -0.02	±0.1	±0.07	0 -0.07	0 -0.05	0 -0.03
Tolerance for rail-to-block lateral distance W2 difference among Linear Guide Block	0.03	0.02	0.01	0.007	0.005	0.03	0.025	0.015	0.01	0.007
Running parallelism of Linear Guide Block surface [C] with respect to surface [A]	△ C, TR Rail Length and Running Accuracy(Fig2.10.1)					△ C, TR Rail Length and Running Accuracy(Fig2.10.1)				
Running parallelism of Linear Guide Block surface [D] with respect to surface [B]	△ D, TR Rail Length and Running Accuracy(Fig2.10.1)					△ D, TR Rail Length and Running Accuracy(Fig2.10.1)				

2-2-10 Determining the Magnitude of a Preload

What's Preload

Replacing larger rolling elements helps strengthen the entire rigidity of the carriage while there exists clearance with in ball circulation.

Increasing preload would decrease the vibration and reduce the corrosion caused by running back and forth. However, it would also add the workload within those rolling elements. The greater the preload, the greater the inner workload. Therefore, choosing preload has to consider the effect carefully between vibration and preload.

Table2.2.7 Grade of Preload

C : Dynamic load rating

Grade	Symbol	Preload force
Slight Clearance	ZF	0
No Preload	Z0	0
Light Preload	Z1	0.02C
Medium Preload	Z2	0.05C
Heavy Preload	Z3	0.07C

Table2.2.8 TR Series Radial Clearances

Unit : μm

Preload Model No.	ZF	Z0	Z1	Z2	Z3
TR15	5~12	-4~4	-12~-5	-20~-13	-28~-21
TR20	6~14	-5~5	-14~-6	-23~-15	-32~-24
TR25	7~16	-6~6	-16~-7	-26~-17	-36~-27
TR30	8~18	-7~7	-18~-8	-29~-19	-40~-30
TR35	9~20	-8~8	-20~-9	-32~-21	-44~-33
TR45	10~22	-9~9	-22~-10	-35~-23	-48~-36
TR55	11~24	-10~10	-24~-11	-38~-25	-52~-39
TR65	12~26	-11~11	-26~-12	-41~-27	-56~-42

Table2.2.9 The difference between Interchangeability and Non-Interchangeability

Slight Clearance	Non-Interchangeable					Interchangeable	
	UP	SP	P	H	N	H	N
Preload			Z0	Z0	Z0	Z0	Z0
	Z1	Z1	Z1	Z1	Z1	Z1	Z1
	Z2	Z2	Z2	Z2	Z2		
	Z3	Z3	Z3	Z3			

2-2-11 Grease Nipples

Table2.2.10 Grease Nipples

<p>TR15</p> <p>M4X0.7P(SD-020) Dust Proof Double Sealed Nipple M4X0.7P(SD-024)</p>	<p>TR45 TR55 TR65</p> <p>PT1/8(SD-011) Dust Proof Double Sealed Nipple PT1/8(SD-027)</p>
<p>TR20 TR25 TR30</p> <p>M6X1P(SD-021) Dust Proof Double Sealed Nipple M6X1P(SD-025)</p>	<p>TR35</p> <p>M6X1P(SD-021) Dust Proof Double Sealed Nipple M6X1P(SD-026)</p>