

2-2-2 The Structure of TR-series

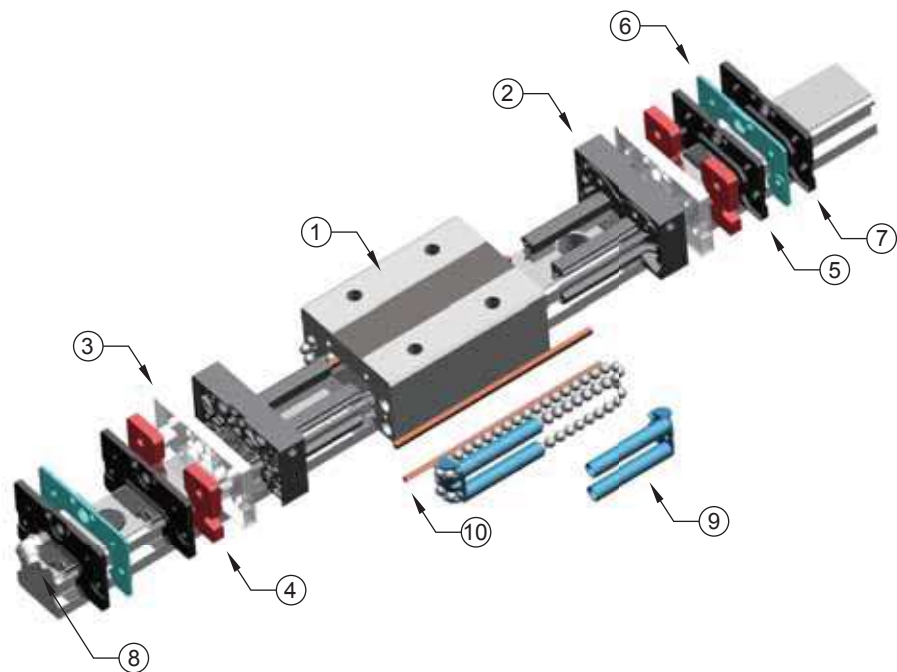


Fig2.2.1

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	TRS-V	Mounting from Above 	24	100	
	TRS-F		60	4000	

Mounting Location

The standard location of the grease fitting is at both ends of the block, but the nipple can be mounted at each side of block. For lateral installation, we recommend that the nipple be mounted at the non-reference side, otherwise please contact us. It is possible to perform lubrication by using the oil-piping joint.

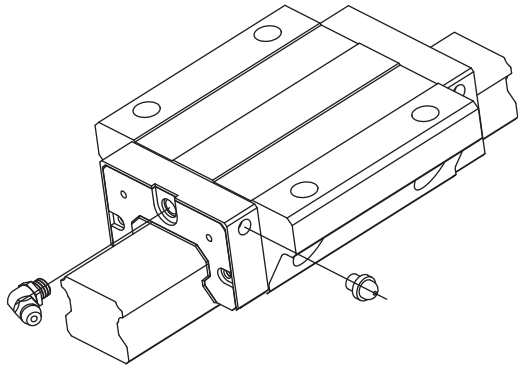


Fig2.2.7 Mounting Location

The lubricant amount for a block filled with grease

Table2.2.11

Size	Grease(cm ³)
TR15	1.3
TR20	2.5
TR25	2.5
TR30	7
TR35	9
TR45	15.2
TR55	40
TR65	75

Table2.2.12 Oil refilling rate

Size	Oil refilling rate (cm ² /hr)
TR15	0.2
TR20	0.2
TR25	0.3
TR30	0.3
TR35	0.3
TR45	0.4
TR55	0.5
TR65	0.6

Table2.2.13 Type of Lubrication Coupler

<p>SD-037</p> <p>TR15</p>	<p>SD-038</p> <p>TR35 TR30 TR25 TR20</p>	<p>SD-039</p> <p>TR65 TR55 TR45</p>
<p>SD-029</p> <p>TR35 TR30 TR25 TR20</p>	<p>SD-040</p> <p>TR65 TR55 TR45</p>	
<p>SD-041</p> <p>TR35 TR30 TR25 TR20</p>	<p>SD-042</p> <p>TR65 TR55 TR45</p>	
<p>SD-043</p> <p>TR35 TR30 TR25 TR20</p>	<p>SD-044</p> <p>TR65 TR55 TR45</p>	

2-2-12 Dust-proof/Linear Guide Self-lubrication Series Accessory

TBI MOTION Linear Guide with Strong Dust-proof End Seal

Characteristics of TBI MOTION Dust-proof End Seal

1. Seal Function: Seal design from single-lip to double-lips to prevent more dust go into the block.
2. Hardness: Heat treatment for end seals to make hardness higher in order to absorb high impact when operation.
3. Environment: Better solution for dust-proof when using double seals in environment with high pollution.
4. Lifetime Extension: Double-lip seal prevents dust go into the block and provides a solution for block damage due to dust issue.

TBI MOTION Linear Guide Self-lubrication Series

There is a wool felt accessory between end cap and seals. Wool felt with oil will lubricate the rail when operating; grease nipple is not needed. The design is shown as below.

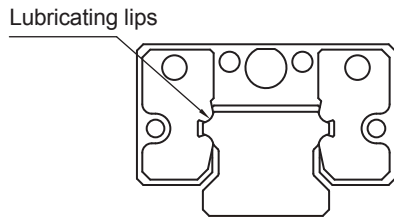


Fig2.2.8

Characteristics:

1. Easy Assembly and Removal-- Only screws are needed when assemble and disassemble the accessory.
2. Environmentally Friendly-- No need of grease nipple and other equipment to save energy.
3. Low Maintenance-- Optimized oil usage prevents leaking, making it the ideal solution for clean working environments. Self-lubricating block is maintenance free in most applications.
4. Strong Dust-proof-- With dust-proof accessory, lifetime will be extended.

Table2.2.14 Test

	Control Group	Experiment Group
Test Environment	Standard	Self-lubricating
Dimension	TRH20VL	TRH20VL
Rating Load	1000 kg	1000 kg
Speed	6 m/min	6 m/min
Travel Length	600 mm	600 mm

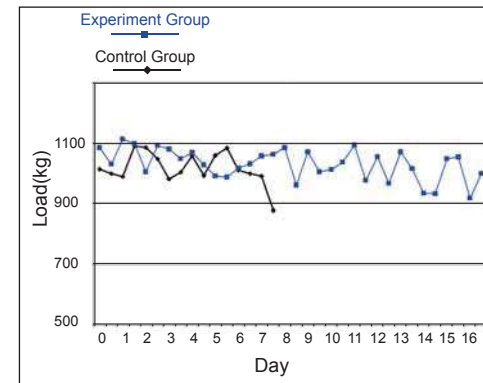


Fig2.2.9

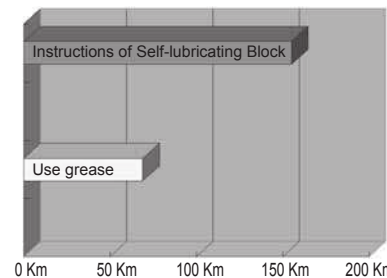


Fig2.2.10

No more grease is added during the test for both standard series and self-lubricating series.

Lifetime Comparison

As shown in the chart, the lifetime of self-lubricating blocks is one time longer than that of standard series blocks.

Instructions of Self-lubricating Block

It is suggested to soak the wool felt in the oil tank for more than 8 hours before using. The wool felt can be refilled with any approved lubrication oil depending on the requirement (ISOVG 32 ~ 68).

Characteristics of Suggested Oil:

- (1) Form a strong oil film.
- (2) Reduce wear as much as possible.
- (3) Have high wear resistance.
- (4) Have high thermal stability.
- (5) Be noncorrosive.
- (6) Be highly rust-preventive.
- (7) Be free from dust and some moisture.

Codes of accessories

If the following accessories are needed, please add the code followed by the model number.

Special Option : Steel end seal, Steel end cap, Cover Strip ,contact **TBI MOTION**.

Table2.2.15 Codes of accessories

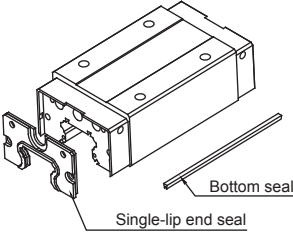
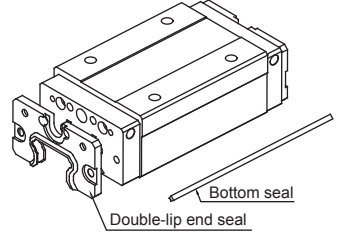
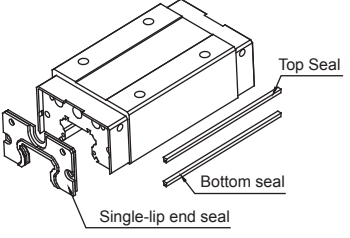
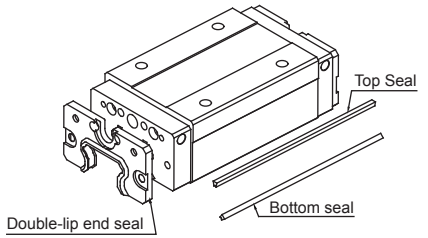
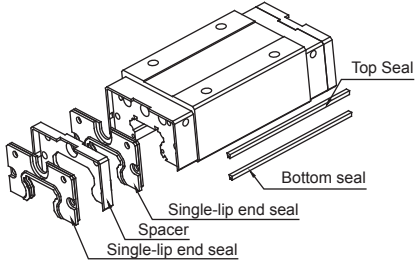
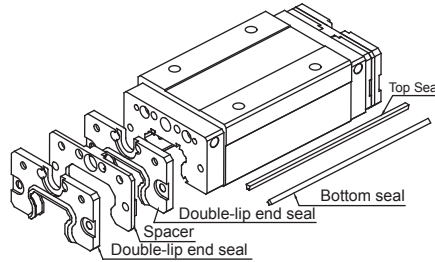
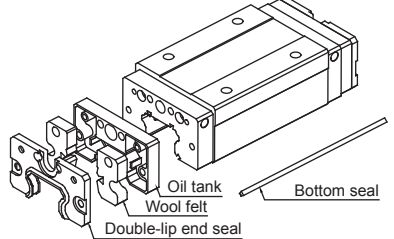
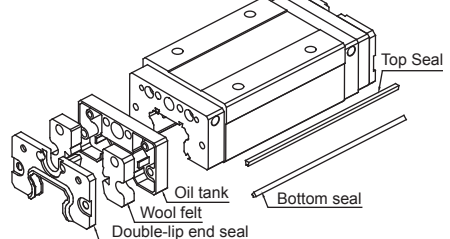
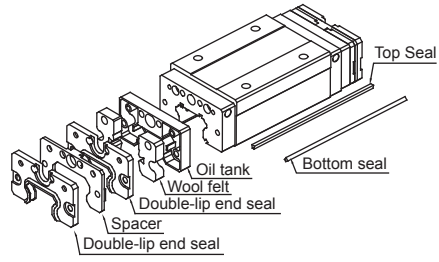
No symbol: Standard Protection(End Seals+Bottom Seals) DD(Single-lip end seals+Bottom seals)	XN(Double-lip end seals+Bottom seals)
	
U(End Seals+Bottom Seals+Top seals) UD(Single-lip end seals+Bottom seals+Top seals)	UN(Double-lip end seals+Bottom seals+Top seals)
	
UZ(Double end seals+Bottom seals+Top seals)	ZN(Two Double-lip end seals+Bottom seals+Top seals)
	

Table2.2.15 Codes of accessories

WW(Double-lip end seals+Bottom seals+Wool felts)

WU(Double-lip end seals+Bottom seals+Top Seals+Wool felts)

WZ(Two Double-lip end seals+Bottom seals+Top Seals+Wool felts)


End seal and Bottom seal

To prevent life reduction caused by iron chips or dust entering the block.

Inner Seal

Efficiently avoid dust from the surface of rail or tapping hole getting inside the block.

Double end seal

Enhances the wiping effect, foreign matter can be completely wiped off.

Double-lip end seals

Double-lip end seal is suitable for environment with high pollution.

Wool felt

Double-lip end seal is suitable for environment with high pollution. Wool felt lubricates the ball track of the rail to increase the lifetime. This accessory is suitable for light rating load environment.

Table2.2.16

Spacer	Thickness(mm)
TR15	4
TR20	4.5
TR25	4.5
TR30	4.5
TR35	5
TR45	6
TR55	6
TR65	8

Table2.2.17 TR Type block length of accessories

Unit : mm

Double-lip end seals(XN \ UN)								
Length of Block Code \ Type	TR15	TR20	TR25	TR30	TR35	TR45	TR55	TR65
S	40.5	49.4	57.2	67.4	75.7			
N	57.1	TRS(68.3) TRH(75.6)	81	96.2	109.2	124.5		
L	65.6	80.6	93	107	123	140	150.4	185.5
E	80.6	99.6	110	132	153	174	188.4	245

Two Double-lip end seals(ZN)								
Length of Block Code \ Type	TR15	TR20	TR25	TR30	TR35	TR45	TR55	TR65
S	48.1	58.4	65.6	76.4	84.7			
N	64.7	TRS(77.3) TRH(84.6)	89.4	105.2	118.2	134.5		
L	73.2	89.6	101.4	116	132	150	161.6	196.5
E	88.2	108.6	118.4	141	162	184	199.6	256

Double-lip end seals+Wool felt(WW \ WU)								
Length of Block Code \ Type	TR15	TR20	TR25	TR30	TR35	TR45	TR55	TR65
S	52	69.9	68.7	78.9	87.2			
N	68.6	TRS(79.8) TRH(87.1)	92.5	107.7	120.7	136		
L	77.1	92.1	104.5	118.5	134.5	151.5	161.9	197
E	92.1	111.1	121.5	143.5	164.5	185.5	199.9	256.5

Two Double-lip end seals+Wool felt(WZ)								
Length of Block Code \ Type	TR15	TR20	TR25	TR30	TR35	TR45	TR55	TR65
S	59.6	69.9	77.1	87.9	96.2			
N	76.2	TRS(88.8) TRH(96.1)	100.9	116.7	129.7	146		
L	84.7	101.1	112.9	127.5	143.5	161.5	173.1	208
E	99.7	120.1	129.9	152.5	173.5	195.5	211.1	267.5

Dustproof Rails

Once the Linear Guide in the cutting machine is in operating, dust and foreign matter that enter the Linear Guide may cause abnormal wear and shorten the service life.

Linear Guide rail mounting-hole cap :

Chips and foreign matter clogging the mounting holes of a Linear Guide rail may enter the Linear Guide block. To prevent from this situation, the mounting holes must be closed with dedicated caps, which must be installed to flush with the Linear Guide rail top surface.

To insert a dedicated cap into a mounting hole, drive the cap in using a plastic hammer with a flat metal pad placed on the cap until it is flush with the Linear Guide rail top surface.

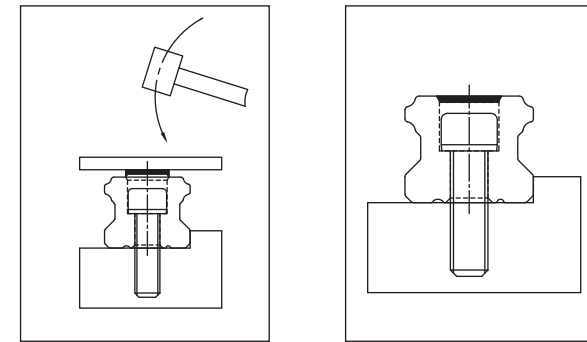


Fig2.2.11 Dustproof Rails

Rail with tapped holes :

Fixing a rail with tapped hole is different from fixing a standard one. A major strength of it is the shape of the tapped hole; dust and chippings would not enter.

2-2-13 Friction

The figure showed in the chart is the maximum friction.

Table2.2.18 End Cap friction rate Unit : kgf

Model No.	End Cap friction rate(Max)
TR15	0.25
TR20	0.35
TR25	0.4
TR30	0.5
TR35	0.7
TR45	1.3
TR55	1.6
TR65	2

2-2-14 Mounting-Surface Dimensional Tolerance

TR series Linear Guide has a Four-Way Equal-Load design, a slight dimensional error in the mounting surface can be absorbed by the natural self-adjusting capability of the product, thus ensuring smooth linear motion. In the table below are the dimensional tolerances for the mounting surface of TR Linear Guide.

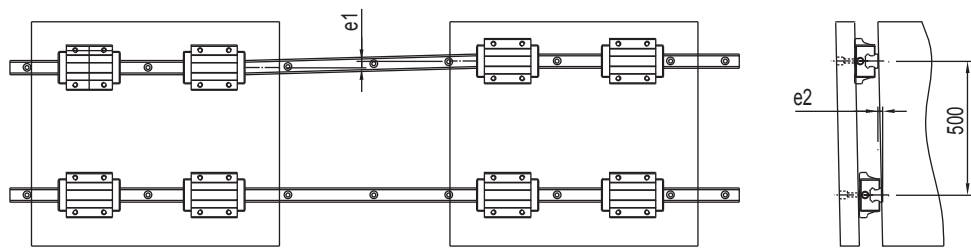


Fig2.2.12

Table2.2.19

Unit : μm

Model No.	Tolerance for Parallelism Between Two Axis(e1)					Tolerance for Parallelism Between Two Axis(e2)				
	Z3	Z2	Z1	Z0	ZF	Z3	Z2	Z1	Z0	ZF
TR15			18	25	35			85	130	190
TR20		18	20	25	35		50	85	130	190
TR25	15	20	22	30	42	60	70	85	130	195
TR30	20	27	30	40	55	80	90	110	170	250
TR35	22	30	35	50	68	100	120	150	210	290
TR45	25	35	40	60	85	110	140	170	250	350
TR55	34	45	50	70	98	130	170	210	300	410
TR65	42	55	60	80	105	150	200	250	350	460

2-3 TM Miniature Linear Guide

2-3-1 The Characteristics of TM Series

Dust-proof design

The stainless bottom seal is the innovative new design of TBI Motion TM series. It prevents effectively the abnormal chips getting into the ball track from the bottom side of the block and keep the good running performance and extend the life time of the slider because the friction is low by keeping some small backlash between the slider and rail.

Standard end seals provide extreme protection from dust, metal scrapers to maintain long service life and lower maintenance period. Unique low friction seal lips provide best smoothness and lower friction.

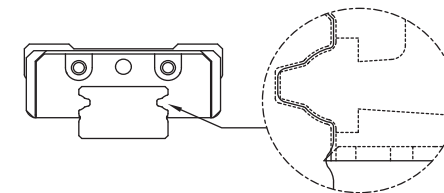


Fig2.3.1

High tensile performance stainless steel reinforcement plate

Dual fully covered stainless steel plates design delivers the best coverage for plastic on each ends. Stainless steel screws are used to strength the rigidity, protection with end cap in order to sustain higher operational speed $V_{max}=5\text{m/s}$, a $\text{max}=300\text{m/s}^2$, When linear block is equipped with reinforcement plates and dust-proof seal, it can also function as scraper.

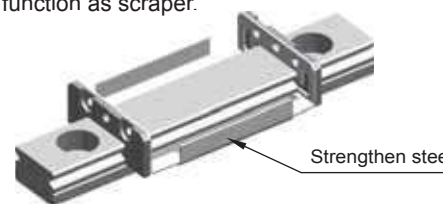


Fig2.3.4

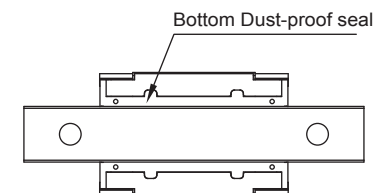


Fig2.3.5

High loading and moment capacity performance

TM Miniature Linear Guide series uses two row re-circulating methods with Gothic 45° contact angle on the rail groove to achieve equal load capacity in four directions. Larger steel balls are used to enhance the loading and torsion resistance performance in limited space.

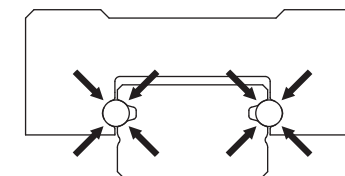


Fig2.3.6 The Gothic 45 degrees four-direction load structure