15 Options

15.1 Dust Proof

A. Code of contamination protection

Code of contamination protection for Carriage

MSA、MSB Series：

Code	Contamination Protection
no symbol	Scraper(both ends)
UU	Bidirectional end seal(both ends)
SS	Bidirectional end seal+Bottom seal
ZZ	SS+Scraper
DD	Double bidirectional end seal+Bottom seal
KK	DD+Scraper
LL	Low frictional end seal
RR	LL+Bottom seal

SME、SMR、MSR Series：

Code	Contamination Protection
no symbol	Scraper(both ends)
UU	Bidirectional end seal(both ends)
SS	Bidirectional end seal+Bottom seal+Inner seal
ZZ	SS+Scraper
DD	Double bidirectional end seal+Bottom seal+Inner seal
KK	DD+Scraper

MSC、MSD Series：

Code	Contamination Protection
LL	Low frictional end seal
RR	LL+Bottom seal

Code of contamination protection for Rail

MSA、MSB、SME、MSR、SMR Series：

Code	Contamination Protection
/CC	Cover strip
/MC	Copper bolt cap
/MD	Stainless bolt cap

Note: There are two metallic bolt caps of copper and stainless that could be supplied by customer's choice.

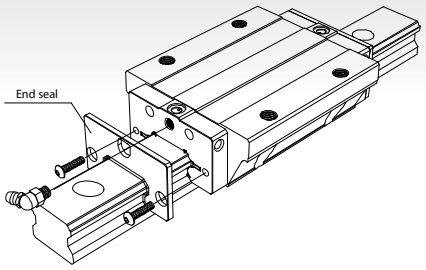
Seal materials choice

Beside the standard seal NBR that FKM (Fluorocarbon Rubber) seal or HNBR (Hyfrogenated Nitrile Butadiene Rubber) seal could be supplied as requirement by customer's choice.

B. Contamination protection

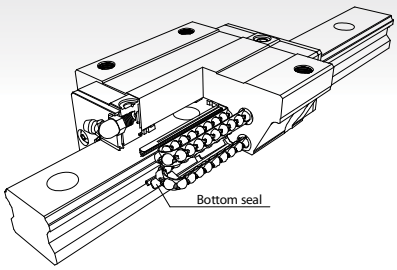
Each series of linear guideway offers various kinds of dust protection accessory to keep the foreign matters from entering into the carriage.

End seal



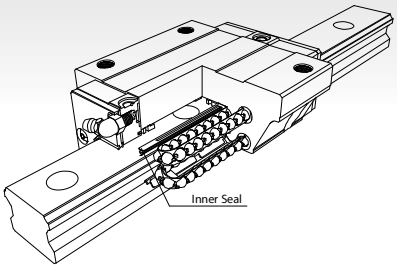
Tow types sealing are available:
1. Bidirectional seal for high dust protection required.
2. Monodirectional seal for low frictional resistance required.

Bottom seal



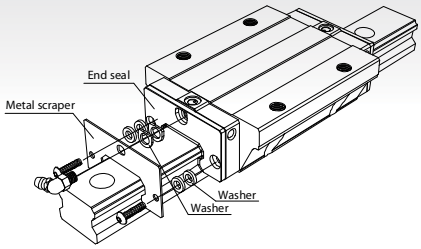
Prevent the inclusion of foreign matters form the bolt hole.

Inner Seal



Preventing the inclusion of foreign matters from bottom of carriage.

Metal scraper



Removing spatters, iron chips , and large foreign matters as well as protecting the end seals.

Types of seal to the carriage overall length,see the table shown as below

MSA Series

Unit: mm

Model No.	no symbol	UU	SS	LL	RR	ZZ	DD	KK
15	1	-	-	-	-	6	5	11
20	1.4	-	-	-	-	7	5.6	12.6
25	1.4	-	-	-	-	7	5.6	12.6
30	1.4	-	-	-	-	7	5.6	12.6
35	0.6	-	-	-	-	7.8	7.2	15
45	0.6	-	-	-	-	7.8	7.2	15
55	-	-	-	-	-	7.8	7.8	15.6
65	-	-	-	-	-	7.8	7.8	15.6

MSB Series

Unit: mm

Model No.	no symbol	UU	SS	LL	RR	ZZ	DD	KK
15	-	-	-	-	-	5	5	10
20	1	-	-	-	-	7	6	13
25	1	-	-	-	-	7	6	13
30	1	-	-	-	-	7	6	13
35	0.6	-	-	-	-	7.8	7.2	15

SME Series

Unit: mm

Model No.	no symbol	UU	SS	ZZ	DD	KK
15	0.4	-	-	6	5.6	11.6
20	1	-	-	7	6	13
25	1	-	-	7	6	13
30	1.4	-	-	7	5.6	12.6
35	1	-	-	7.8	6.8	14.6
45	0.6	-	-	7.8	7.2	15

MSR、SMR Series

Unit: mm

Model No.	no symbol	UU	SS	ZZ	DD	KK
25	2	-	-	6	6	12
30	2	-	-	7	6	13
35	2	-	-	7	6	13
45	1.6	-	-	7	6.4	13.4
55	0.8	-	-	7.8	7.2	15
65	0.8	-	-	7.8	7.8	15.6

Resistance value of seal

MSA series

The maximum resistance value of MSA series with seals type UU when it is applied with grease is shown below.

Unit: N

Model No.	Resistance
15	2
20	3.5
25	4
30	6
35	10
45	12
55	18
65	30

MSB series

The maximum resistance value of MSB series with seals type UU when it is applied with grease is shown below.

Unit: N

Model No.	Resistance
15	2
20	3
25	4
30	5.5
35	9

MSC、MSD series

The maximum resistance value of MSC series with seals type LL when it is applied with grease is shown below.

MSC

Unit: N

Model No.	Resistance
7	0.08
9	0.1
12	0.4
15	0.8

MSD

Unit: N

Model No.	Resistance
7	0.4
9	0.8
12	1.1
15	1.3

MSR、SMR series

The maximum resistance value of MSR and SMR series with seals type UU when it is applied with grease is shown below.

Unit: N

Model No.	Resistance
25	4.5
30	8
35	12
45	18
55	20
65	35

SME series

The maximum resistance value of SME series with seals type UU when it is applied with grease is shown below.

Unit: N

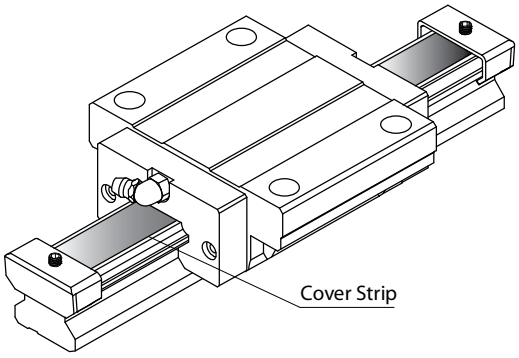
Model No.	Resistance
15	2
20	3.5
25	4
30	6
35	10
45	12

C. Cover Strip

A special designed of cover strip is used to cover the bolt hole to prevent the foreign matters from entering the carriage. Please specify when ordering.

Note:When mounting the cover strip the rail needs to be machined.Indicate that the cover strip is required when ordering the guideway. The cover strip could not increase the height of rail.

MSA、MSB、SME、MSR、SMR series



D. Caps for rail mounting hole

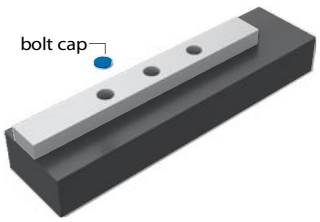
A special designed of cap is used to cover the bolt hole to prevent the foreign matters from entering the carriage. According to difference of application, PMI provide two kind of caps for selection, made by plastic and metal. The metallic cap is for opyion,please specify when ordering. The plastic cap is mounted by using a plastic hammer with a flat pad placed on the top,until the top of cap is flush to the top surface of rail.The dimension of caps for different sizes of rail is shown.

Installation of plastic and metal cap

According to the environmental and operational conditions, choose plastic or metal, plastic and metal model cap size, please refer to Table I Table II.

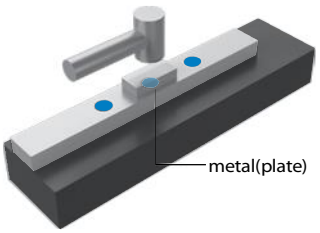
The steps of installing bolt cap with rail by below indicated figures

step.1



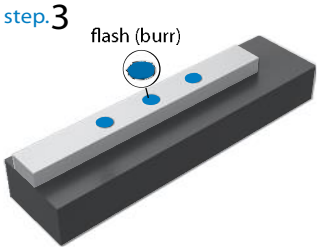
Put the cap into the bolt hole of rail.

step.2



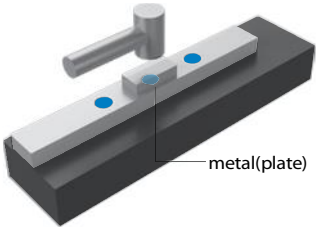
Put the plate on the cap,then pound it into the bolt of rail with rubber hammer vertically.

step.3



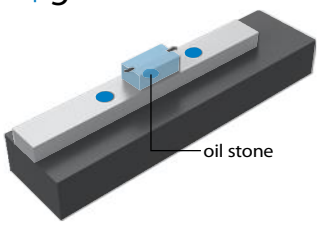
Clear the "shaving " away from the side of bolt hole.

step.4



Continue pounding the cap until the cap is on the same plane with the top surface of rail.

step.5



Use oil stone to polish the surface of caps and mop them with clean bunny cloth. And finally check the installation is good for smoothing by your finger.

Install attention:

Owing to the side of hole is very sharp during installation.Therefore,pay special attention for safety in case of finger and hands be slashed.

Table I

Code of Plastic Cap	Bolt Size	Rail Model				
M3C	M3		MSB15R			
M4C	M4	MSA15R	MSB15U		SME15R	
M5C	M5	MSA20R	MSB20R		SME20R	
M6C	M6	MSA25R	MSB25R MSB30R	MSR25R	SME25R	SMR25R
M8C	M8	MSA30R MSA35R	MSB35R	MSR30R MSR35R	SME30R SME35R	SMR30R SMR35R
M12C	M12	MSA45R		MSR45R	SME45R	SMR45R
M14C	M14	MSA55R		MSR55R		SMR55R
M16C	M16	MSA65R		MSR65R		SMR65R

Table II

Code of Metallic Cap	Bolt Size	Rail Model				
M4MC	M4	MSR15R	MSB15R		SME15R	
M5MC	M5	MSR20R	MSB20R		SME20R	
M6MC	M6	MSR25R	MSB25R MSB30R	MSR25R	SME25R	SMR25R
M8MC	M8	MSR30R MSR35R	MSB35R	MSR30R MSR35R	SME30R SME35R	SMR30R SMR35R
M12MC	M12	MSR45R		MSR45R	SME45R	SMR45R
M14MC	M14	MSR55R		MSR55R		SMR55R
M16MC	M16	MSR65R		MSR65R		SMR65R

15.2 Lubrication

A well lubrication is important for maintaining the function of linear guideway. If the lubrication is not sufficient, the frictional resistance at rolling area will increase and the service life will be shortened as a result of wear of rolling parts.

Two primary lubricants are both grease and oil used for linear motion system, and the lubrication methods are categorized into manual and forced oiling. The selection of lubricant and its method should be based on the consideration of operating speed and environment requirement.

Grease lubrication

The grease feeding interval will be varied with different operating conditions and environments. Under normal operating condition, the grease should be replenished every 100km of travel. The standard grease is lithium-based grease No.2. Moving the carriage back and forth with minimum stroke length of length of 3 carriages after the carriages been greased. To assure the grease is evenly distributed inside of carriage, the mentioned process should be repeated twice at least.

Grease amount to be bed

Model No.	Initial Feeding Amount(cm^3)	Amount for Replenishing(cm^3)
MSA 15	1.1	0.4
MSA 20	2.1	0.7
MSA 25	3.5	1.2
MSA 30	5.8	1.9
MSA 35	8.2	2.7
MSA 45	16.1	5.4
MSA 55	27.1	9.0
MSA 65	51.6	17.2
MSB 15T	0.4	0.1
MSB 20T	0.7	0.2
MSB 25T	1.5	0.5
MSB 30T	2.2	0.7
MSB 35	8.2	2.7
MSR 25	4.5	1.5
MSR 30	7.0	2.3
MSR 35	9.6	3.2
MSR 45	17.1	5.7
MSR 55	26.0	8.7
-	-	-
MSC 7	0.06	0.02
MSC 9	0.16	0.05
MSC 12	0.25	0.08
MSC 15	0.49	0.16
MSD 7	0.19	0.06
MSD 9	0.42	0.14
MSD 12	0.73	0.24
MSD 15	1.51	0.50
SME 15	1.6	0.5
SME 20	2.6	0.9
SME 25	4.1	1.4
SME 30	6.0	2.0
SME 35	9.7	3.2
SME 45	13.2	4.4
SMR 25	5.9	2.0
SMR 30	8.8	2.9
SMR 35	12.6	4.2
SMR 45	21.0	7.0
SMR 55	32.1	10.7
-	-	-

Model No.	Initial Feeding Amount(cm^3)	Amount for Replenishing(cm^3)
-	-	-
MSA 20L	3.1	1.0
MSA 25L	5.1	1.7
MSA 30L	8.2	2.7
MSA 35L	11.8	3.9
MSA 45L	23.0	7.7
MSA 55L	38.8	12.9
MSA 65L	77.8	25.9
MSB 15	1.0	0.3
MSB 20	1.5	0.5
MSB 25	2.8	0.9
MSB 30	4.5	1.5
MSB 35L	11.8	3.9
MSR 25L	5.5	1.8
MSR 30L	8.7	2.9
MSR 35L	12.3	4.1
MSR 45L	22.0	7.3
MSR 55L	34.3	11.4
MSR 65L	64.8	21.6
MSC 7L	0.11	0.04
MSC 9L	0.24	0.08
MSC 12L	0.42	0.14
MSC 15L	0.80	0.27
MSD 7L	0.28	0.09
MSD 9L	0.60	0.20
MSD 12L	1.07	0.36
MSD 15L	2.18	0.73
-	-	-
SME 20L	3.6	1.2
SME 25L	5.2	1.7
SME 30L	8.1	2.7
SME 35L	13.0	4.3
SME 45L	18.5	6.2
SMR 25L	7.2	2.4
SMR 30L	11.0	3.7
SMR 35L	16.0	5.3
SMR 45L	26.5	8.8
SMR 55L	42.6	14.2
SMR 65L	76.1	25.4

Oil lubrication

The recommended viscosity of oil is 30~150 cst, and the recommended feeding rate per hour is shown as table below. The installation other than horizontal may caused the oil unable to reach raceway area, so please specify the installed direction your linear guideway applied. Reference is shown in Section 13.1 Installation Direction of Linear Guideway.

Oil lubrication feeding rate

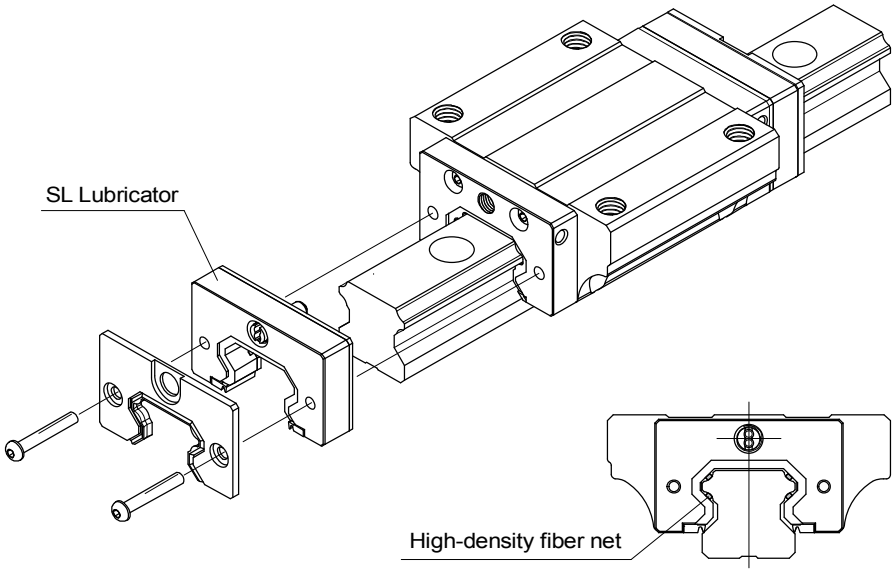
Model No.	Initial Feeding Amount(cm^3)	Feeding Rate (cm^3/hr)
15	0.6	0.2
20	0.6	0.2
25	0.9	0.3
30	0.9	0.3
35	0.9	0.3
45	1.2	0.4
55	1.5	0.5
65	1.8	0.6

Note:

When the operating stroke length less than the sum of length of two carriages, the lubrication fitting should be applied on both ends of carriage for adequacy. Moreover, if the stroke length less than a half of the length of a carriage, the carriage should be moved back and forth up to the length of two carriages while lubricating.

A. SL Lubricator

1.Construction and Characteristics



Characteristics

PMI SL lubricator unit is designed with an oil reservoir which equipped with a high-density fiber net. Through the fiber net the lubricant can be steadily fed onto the surface of raceway to satisfy the required lubricating function.

1. Lengthening the interval between maintenance works

Contrary to the oil losing problem caused from ordinary lubrication, the SL lubricator effectively and evenly distribute needed amount of oil on to ball raceway during the movement. Therefore, the interval between maintenance works can be greatly extended.

2. To avert the pollution

Through the use of SL lubricator, only the needed amount of oil will be fed for the purpose of lubrication, thereby the oil is almost nothing to lose in application. As a result, the environment will not be contaminated by waste oil.

3. Cost reduction

Saving the expense from oil loss and lubricating device.

4. Enables the most suitable oil for the purpose of use to be selected

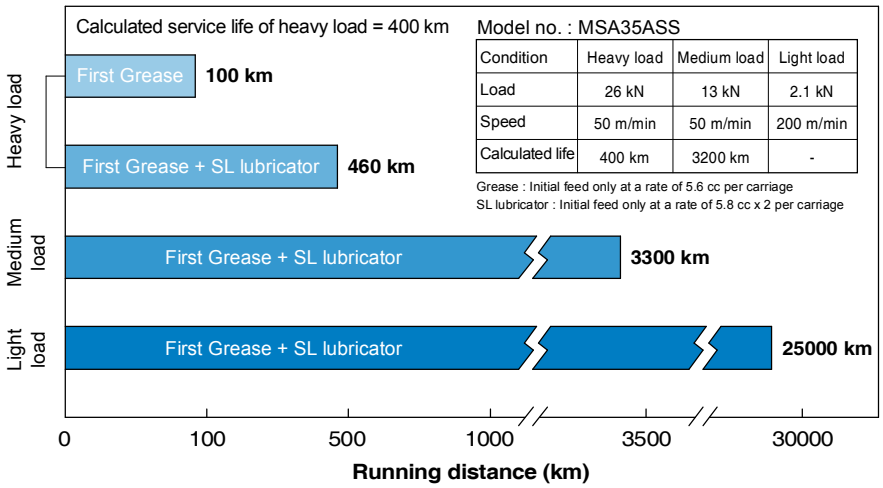
The SL lubricator makes it possible to select the most proper lubricant for your application of linear guideway.

2. Performance

Lengthening the interval between maintenance works

By using the SL lubricator, the interval between maintenance work can be lengthened at all load rating.

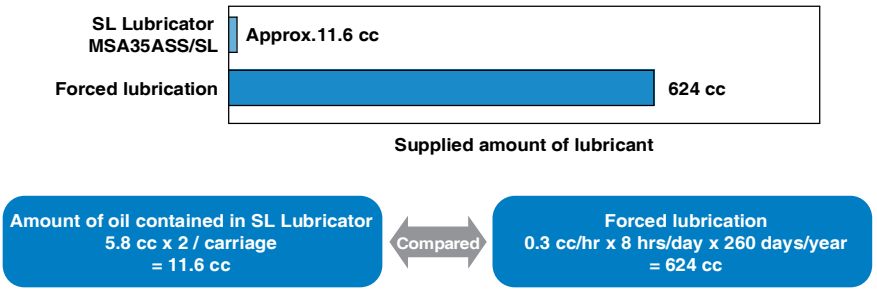
Running Test without Replenishment of Lubricant



Effective use of lubricant

Since only the needed amount of lubricant will be applied to needed location, thereby effective use of lubricant can be achieved and the waste of lubricant can also be avoided.

Annual Lubricant Consumption per Carriage



Amount of oil contained in SL Lubricator
5.8 cc x 2 / carriage
= 11.6 cc

Compared

Forced lubrication
0.3 cc/hr x 8 hrs/day x 260 days/year
= 624 cc