

1. Product Introduction

High load and high moment capacity

The ST Miniature Stroke Slide series is designed with two rows of balls. The ball track has a Gothic profile design with a 45 degree contact angle to achieve equal load capacity in a mono block. This provides more space for the larger rolling elements while enhancing the load and moment capacity.

High running accuracy and smoothness

The steel balls of the ST Miniature Stroke Slide series roll on the rail without recirculation, resulting in excellent running behavior, smoothness, low friction, and high accuracy without vibration.

Dual plate design

The ST Miniature Stroke Slide series adopts a pair of end plates into the design. Both the center rail and bearing block sides have a plate installed that prevents the linear guide from over-stroking.

Easy mounting

The mounting of the ST Miniature Stroke Slide series is accomplished by fitting the fixing screw downward into the count bore of the rail by intersecting the bore pattern on the block and cage within a hole pitch. The one piece cage therefore does not influence the mounting of the rail. The preload is preset by ball sorting.



Temperature

The ST Miniature Stroke Slide series can withstand temperatures up to 150°C. There are two treatment options for higher temperature applications:

T1 : 200°C
T2 : 300°C

Applying treatments for higher temperature applications will reduce the load capacity.

Anti-corrosion feature

The ST Miniature Stroke Slide series is composed of quenched hardened process stainless steel for the rail, block, and steel balls. The block plate and screw are made of stainless steel as well -- great for maintenance and inspection applications.

2. Technical Information

Accuracy

The ST Miniature Stroke Slide series have three grades for accuracy. Precision (P), High (H) and Normal (N).

Preload

The ST Miniature Stroke Slide series have two classes of preload, V0 and V1, as described in the MR miniature linear guide series table of preload.

Geometric and positional accuracy of the mounting surface

The inaccuracy of the mounting surfaces will affect the running accuracy and reduce the operating lifetime of the ST Miniature Stroke Slide. If the inaccuracies of the mounting surface exceed the values calculated by formulas (15), (21), and (17), the lifetime will be shortened, as calculated by formulas (19) and (20).

$$e_{1(mm)} = b_{(mm)} \cdot f_1 \cdot 10^{-4} \quad \text{--- (15)}$$

$$e_{2(mm)} = \left(\frac{d}{L_C} \frac{(mm)}{(mm)} \right) \cdot f_2 \cdot 10^{-5} \quad \text{--- (21)}$$

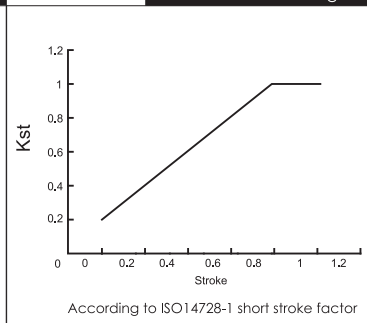
$$e_{3(mm)} = f_3 \cdot 10^{-3} \quad \text{--- (17)}$$

Rating life calculation

$$L = K_{st} \left(\frac{C_{1008}}{P} \right)^3 \cdot 10^5 \quad \text{--- (19)}$$

$$L_h = \frac{L}{2 \cdot s \cdot n \cdot 60} = K_{st} \cdot \frac{L}{v_m \cdot 60} \quad \text{--- (20)}$$

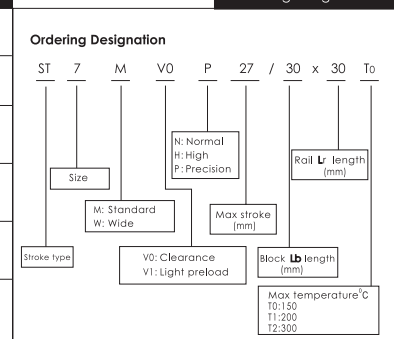
Short stroke factor diagram



The mounting surface geometric and positional accuracy factor

Size	V0			V1		
	f1	f2	f3	f1	f2	f3
7	5	200	4	3	130	3
9	5	300	6	4	200	4
12	6	380	8	4	250	6
15	7	530	12	5	350	8

Ordering designation



Lubrication

Lubrication of the ST Miniature Stroke Slide series can be done by adding the lubricant onto the raceway of the rail.

Rating life L

The rating life of the ST Miniature Stroke Slide series can be calculated by the formulas (19) , (20) in accordance with ISO 14728-1.

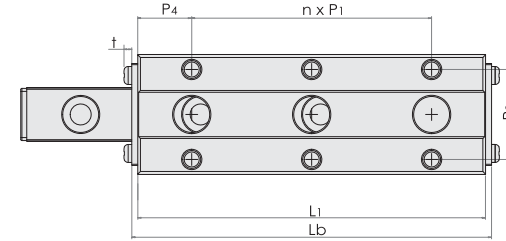
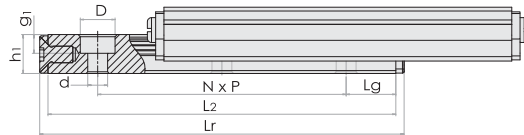
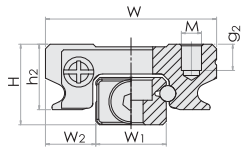
Height and chamfered reference edge

The tables for the chamfered reference edge corner and the height of the reference edge for the MR Miniature Linear Guide series are also suitable for the ST Miniature Stroke Slide series.

3. Ordering Information

An example of the ST Miniature Stroke Slide series parts numbering system is shown above.

4. Dimensions and Specifications



Model Code	Fabricate Dimensions (mm)		Rail Dimensions (mm)				Block Dimensions (mm)						Model Code
	H	W ₂	P	W ₁	h ₁	D x d x g ₁	P ₁	P ₂	W	h ₂	M x g ₂	t	
ST7M	8	5	15	7	4.7	4.2x2.4x2.3	15	12	17	6.5	M2x2.5	1	ST7M
ST9M	10	5.5	20	9	5.5	6x3.5x3.5	20	15	20	7.8	M3x3.0	1.3	ST9M
ST12M	13	7.5	25	12	7.5	6x3.5x4.5	25	20	27	10	M3x3.5	1.3	ST12M

Model Code	Max Stroke	Rail Dimensions (mm)				Block Dimensions (mm)				Load Capacities		Static Moment		
	L _s	L _r	L ₂	L _g	N	L _b	L ₁	P ₄	n	C _{100s} (dyn)	C ₀ (stat)	M _{r0}	M _{p0}	M _{y0}
ST7M	27	30	28	6.5	1	30	28	6.5	1	910	1580	5.9	3.4	3.4
ST7M	41	45	43	6.5	2	45	43	6.5	2	1220	2500	9.1	8	8
ST7M	55	60	58	6.5	3	60	58	6.5	3	1490	3330	12.4	14.6	14.6
ST9M	38	40	38	9	1	40	38	9	1	1590	2773	13.1	6.8	6.8
ST9M	58	60	58	9	2	60	58	9	2	2080	4170	19.7	16	16
ST9M	78	80	78	9	3	80	78	9	3	2520	5547	26.2	29.2	29.2
ST12M	44	50	47.4	11.2	1	50	47.4	11.2	1	2550	4340	27	16	16
ST12M	69	75	72.4	11.2	2	75	72.4	11.2	2	3350	6510	40.1	35.6	35.6
ST12M	94	100	97.4	11.2	3	100	97.4	11.2	3	4050	8670	54	62.8	62.8

cpc AR/HR Z Series Lubrication Storage Pad Testing Report

A linear guide is a category of rolling guidance. By using unlimited recirculating stainless steel balls operating between the raceways of the rail and the runner block, the carriage achieves high precision and low friction linear movement. If the linear guides do not have sufficient lubrication, rolling friction will increase, causing wear and shortened linear guide life span.

cpc has added and embedded PU lubricant storage pads to prolong the life of the linear guide; the pads directly contact and lubricate the rolling balls. This design supplies sufficient lubrication even in short stroke operations.

cpc's design, due to the embedded pad's absorption and retention capabilities, results in a product that features a long operational life and long-term lubrication.

The following are the results of cpc's in-house testing.

AR15 Lubrication Storage Pad Testing Data

Tested products: AR15 blocks with lubrication storage pads, 8 pieces, and AR15 rails, N accuracy grade, 1500mm Length, 4 pieces

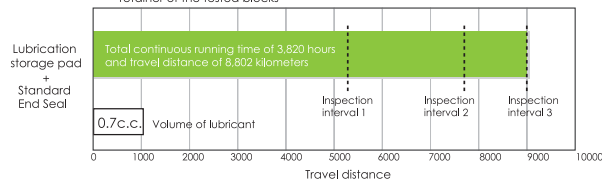
Testing condition	
Rating load capacities(each Block)	1.8kN(C=9kN · C0=17.5kN)
Stroke	0.96m
Max running speed	1m/s
Lubricant	DAPHNE SUPER MULTI 68 (Viscosity64.32 CST 400C)
Lubrication period	No lubrication added during testing period

■ Testing equipment



■ Testing result

Dried lubricant residue started appearing on rail profile, PU pads, and ball retainer of the tested blocks



■ Test results at inspection intervals



Inspection intervals 1 and 2: Lubrication Maintained



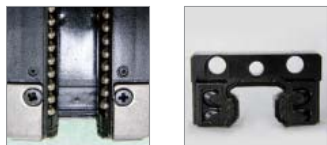
- Upward lubrication storage pads in good condition.
- Lubricant supply in good condition.
- No wear on the running profile of the rail.
- Downward lubrication storage pads in good condition.
- Lubricant supply in good condition.

Inspection interval 3: Lubricant residue



- Dried lubricant residue started appearing broken on the upward lubrication storage pads from the tested blocks.
- Dried lubricant residue started appearing broken on the downward lubrication storage pads from the tested blocks.

Plastic parts and end seal in good condition



Plastic parts in good condition End seal in good condition

■ Test Summary

Total continuous running time of 3820 hours and travel distance of 8802 kilometers.

Out of eight test blocks, dried lubricant residue appeared on 2 blocks and 1 rail. Dried lubricant residue is indicative of a need for re-lubrication.

The test results indicate that the lubrication pad design effectively extends the time between re-lubrication and thus lengthens the operational life of the linear guide.



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