

13.6 Ballscrews For Heavy Load

Features

Focused on improvements of contact points of balls and thread grooves, ball diameter and circulation system for new type, FSVH. The rated dynamic load has been increased to as two times as that of conventional type, FSVC.

Long Life

Structure of the newly developed circulation system is designed to distribute the load uniformly to the load balls and it also increases the life of ballscrews.

On conventional circulation system, FSVC, the returning tube is inserted into the holes on ballnut perpendicularly which forms an advancing angle. While ball moves into returning tube, it will hit tube end area and then move into returning tube.

New circulation system, FSVH, ball will move into returning tube smoothly by tangent line as the same direction as lead angle. It can increase the life of circulation system structure.

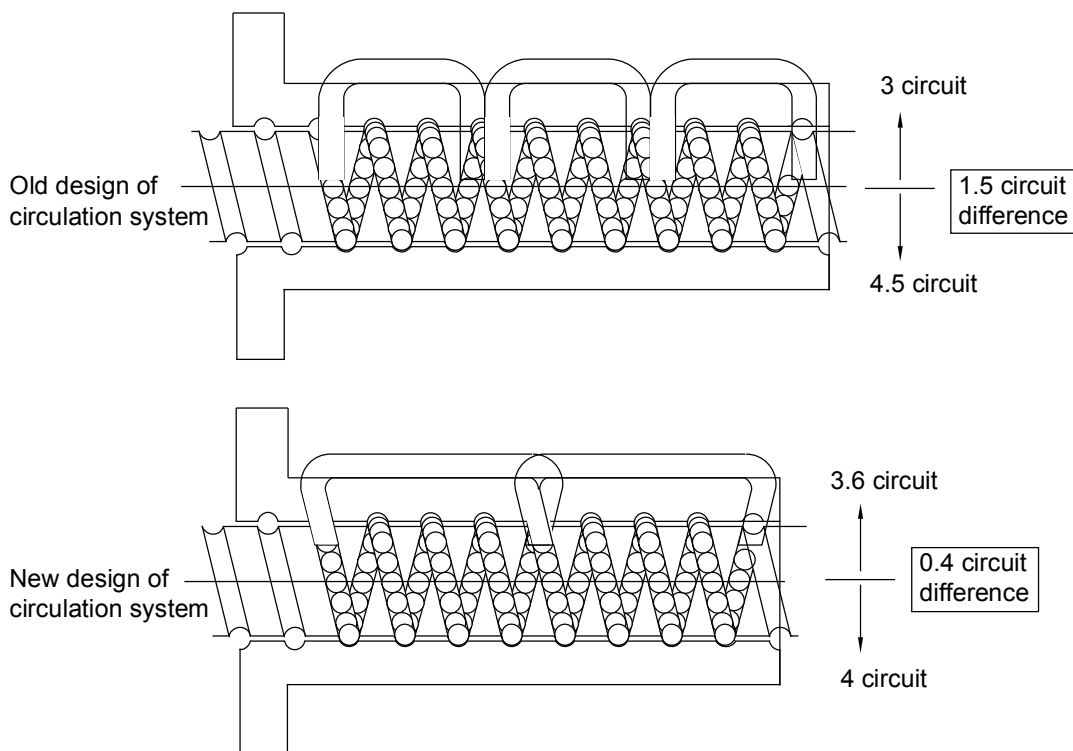


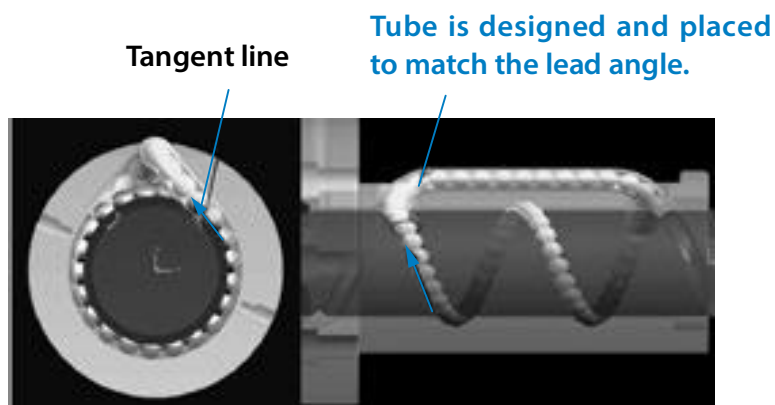
Fig.13.4 Circuit difference for heavy load ballscrew

High DN Value

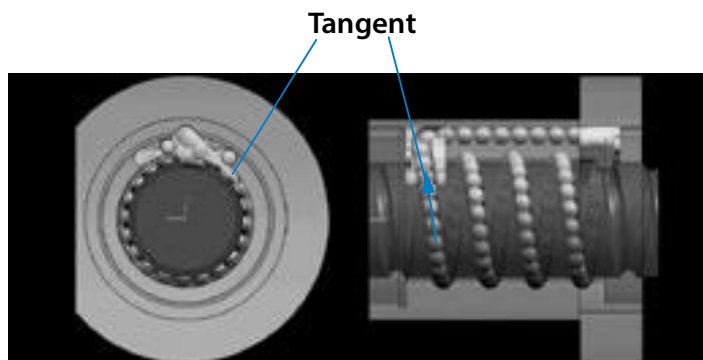
With the newly developed circulation system, ballscrews can meet the demands of high speed running with high DN value.

Low Noise

To use tangential circulation system structure, it can eliminate the noise while balls run into the returning tube.

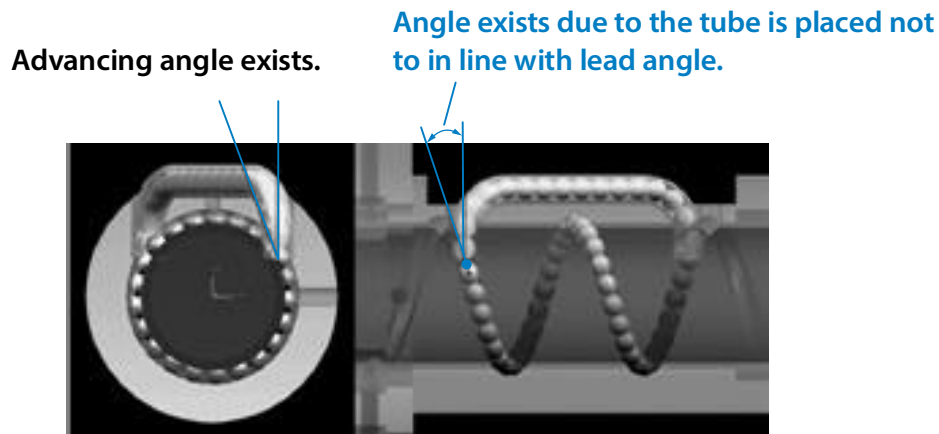


FSVH circulation system structure(NEW)



FSDH circulation system structure (NEW)

Fig.13.5 Circulation system structure for FSVH and FSDH



FSVC circulation system structure

Fig.13.6 Circulation system structure for FSVC

Various Specifications Combination

PMI can supply various ball screws with diameter $40 \times 120\text{mm}$ and lead 10mm to 60mm (Please contact PMI for your specific design requirement)

Recommend mounting direction of heavy load ball screws

In order to support equal load distribution for shaft and nut, recommend mounting direction of ball screws allow fig. 13.7. This mounting direction can avoided vibration as axial load uneven distribution for ball screws, therefore increase service life efficient.

Application

Plastic Injection Machines / Press and Forging Machines
Semi-conductor Equipments / General Machines

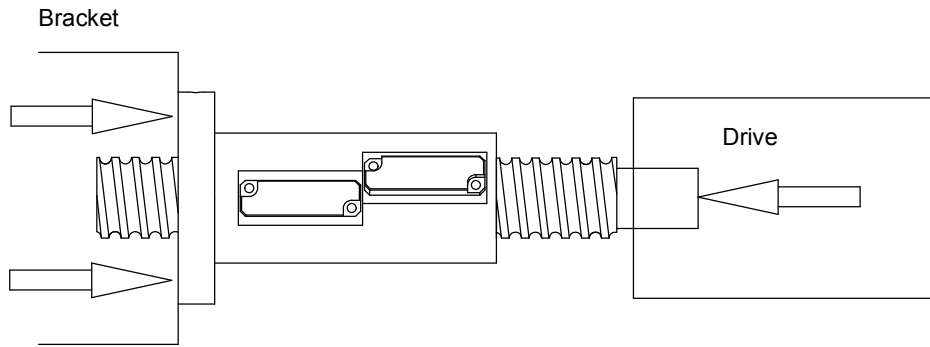


Fig.13.7 Recommend mounting direction of heavy load ballscrew

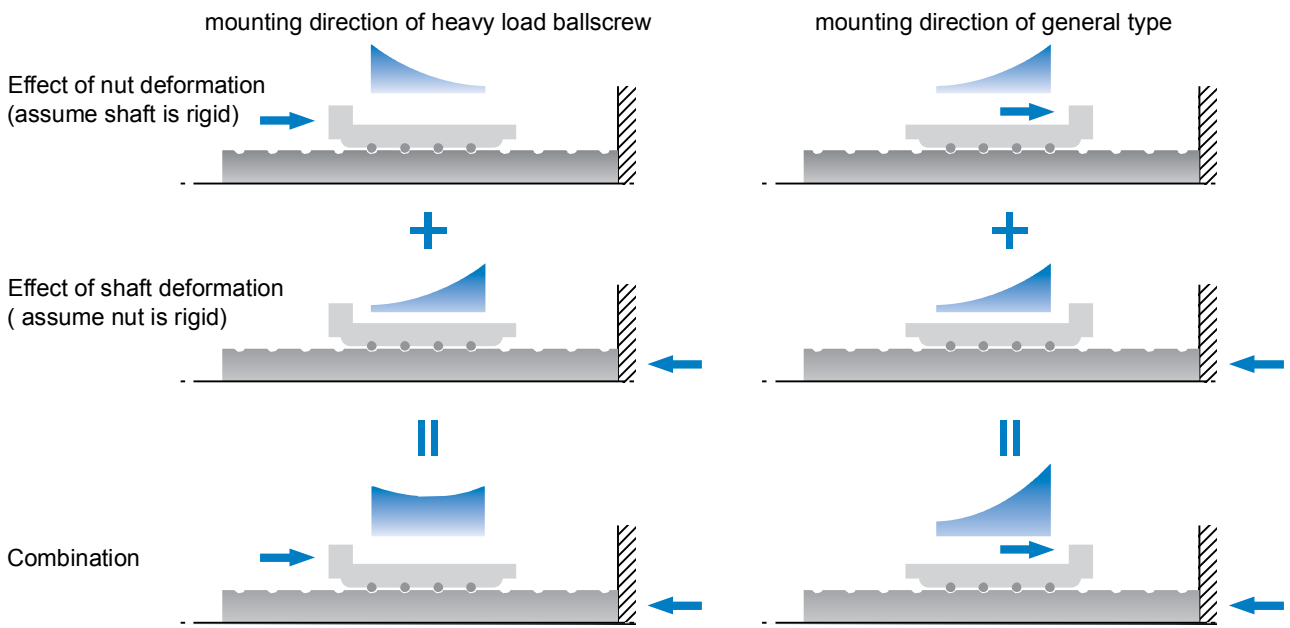
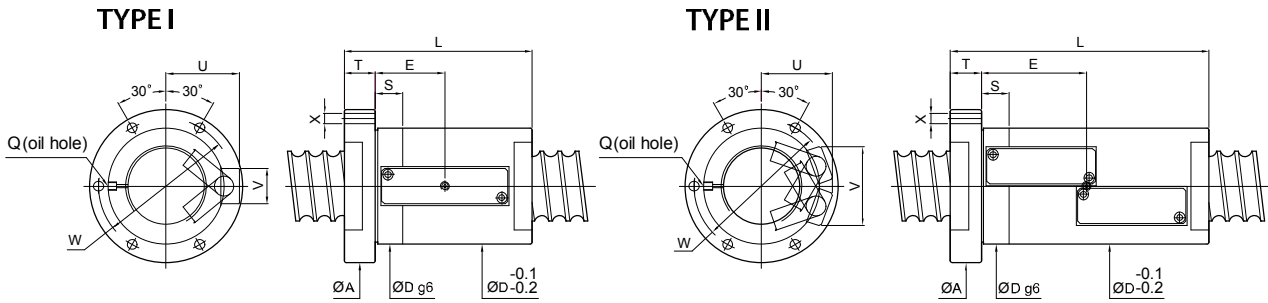


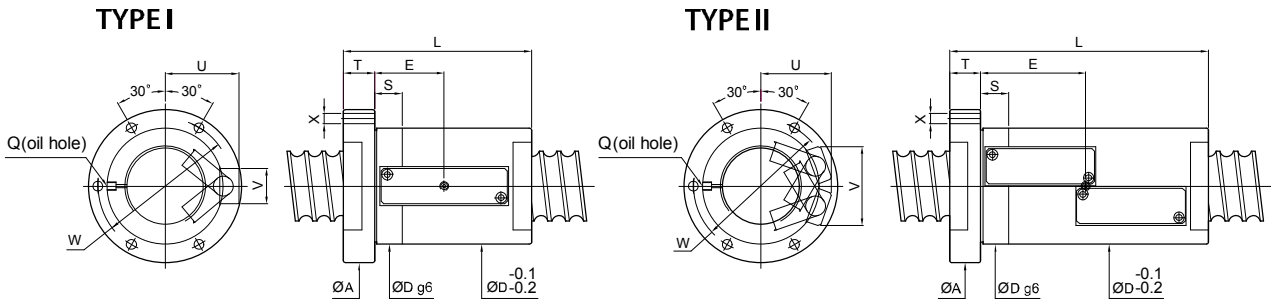
Fig.13.8 Load distribution



Unit: mm

SCREW SIZE		BALL DIA.	EFFECTIVE TURNS circuit \times row	BASIC RATE LOAD (kgf)		NUT		FLANGE			FIT S	OIL HOLE		BOLT X	RETURN TUB		Type
O.D.	LEAD			Dynamic (1 \times 10 ⁶ REV.) Ca	Static Co	Dg6	L	A	T	W		Q	E		V	U	
40	10	7.938	3.5 \times 2	15000	41800	66	124	98	18	83	20	M6x1P	50.75	9	51	43	II
	12	9.525	3.5 \times 2	18600	48200	70	156	93	18	86	20	M6x1P	58	9	55	45	II
45	10	7.938	3.5 \times 2	15900	47300	70	134	104	18	87	20	M6x1P	54.2	9	54	45	II
50	10	7.938	3.5 \times 2	16700	52900	77	133	109	18	92	20	M6x1P	53.7	9	60	48	II
	16	12.7	6 \times 1	24800	63700	95	168	128	28	112	20	PT1/8 \times	70.5	9	32	60	I
		12.7	3.5 \times 2	31200	83500		200	128	28	112	20		86	9	72	62	II
20	12.7	3.5 \times 2	31200	84800	95	235	128	28	112	20	PT1/8 \times	97	9	72	62	II	
55	10	7.938	3.5 \times 2	17500	58500	80	153	114	28	97	20	PT1/8 \times	62.1	9	61	49	II
	16	12.7	6 \times 1	25800	71800	100	168	133	28	115	20	PT1/8 \times	69.5	9	32	63	I
3.5 \times 2			32600	94000	100	200	133	28	115	20	84.5		9	77	64	II	
63	16	12.7	6 \times 1	27800	81700	105	168	138	28	122	25	PT1/8 \times	65.25	9	32	66	I
			3.5 \times 2	35000	107000	105	202	138	28	122	25		82.25	9	80	67	II
			6 \times 2	50300	164000	105	266	138	28	122	25		114.25	9	80	67	II
	20	15.875	2.5 \times 2	35900	99300	117	210	157	32	137	25	PT1/8 \times	96	11	88	74	II
3.5 \times 2	46600	134700	117	246	157	32	137	25	105.5	11	88		74	II			
25	15.875	2.5 \times 2	35900	99300	117	235	157	32	137	25	PT1/8 \times	91	11	88	75	II	
80	16	12.7	6 \times 1	30900	104400	120	172	158	32	139	25	PT1/8 \times	66	9	36	73	I
			3.5 \times 2	39000	136700	120	205	158	32	139	25		84	9	89	74	II
			6 \times 2	56000	208700	120	275	158	32	139	25		122	9	89	74	II
	20	15.875	2.5 \times 2	40100	127000	130	210	168	32	150	25	PT1/8 \times	87.5	11	90	83	II
			3.5 \times 2	52100	172400	130	250	168	32	150	25		107.5	11	90	83	II
			6 \times 2	75000	263200	130	330	168	32	150	30		147.5	11	90	83	II
25	19.05	3.5 \times 2	67700	206100	145	305	188	40	165	25	PT1/8 \times	119	11	108	94	II	
		6 \times 2	97200	314600	145	402	188	40	165	30		169	11	108	94	II	

FSVH

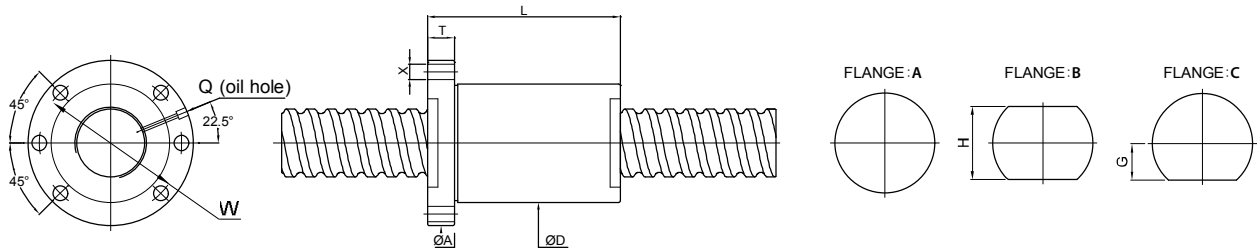


Unit: mm

SCREW SIZE		BALL DIA.	EFFECTIVE TURNS circuit row	BASIC RATE LOAD (kgf)		NUT		FLANGE			FIT S	OIL HOLE		BOLT X	RETURN TUB		Type
O.D.	LEAD			Dynamic (10 ⁶ REV.) Ca	Static Co	Dg6	L	A	T	W		Q	E		V	U	
100	16	12.7	6x1	34200	133200	145	172	185	32	165	25	PT1/8	63.5	11	38	85	I
			3.5x2	43200	174500	145	205	185	32	165	25		79.5	11	98	85	II
			6x2	62000	266300	145	275	185	32	165	25		117.5	11	98	85	II
	20	15.875	2.5x2	44800	160900	150	205	194	32	172	30	PT1/8	82	11	107	92	II
			3.5x2	58300	218400	150	245	194	32	172	30		102	11	107	92	II
			6x2	83800	333300	150	330	194	32	172	30		147	11	107	92	II
25	19.05	3.5x2	74900	260200	165	305	218	40	190	30	PT1/8	122	11	111	102	II	
		6x2	107700	397100	165	410	218	40	190	30		177	11	111	102	II	
120	16	12.7	6x1	34100	130200	173	205	213	40	193	30	PT1/8	84	11	38	93	I
			3.5x2	43000	170700	173	230	213	40	193	30		101	11	108	94	II
	20	15.875	6x1	46000	160800	173	222	213	40	193	30	PT1/8	95	11	54	100	I
			3.5x2	58100	210700	173	260	213	40	193	30		116	11	121	104	II
	25	19.0	6x1	59200	194500	183	261	213	40	193	30	PT1/8	109.5	11	50	106	I
			3.5x2	74700	254800	183	314	213	40	193	30		135.5	11	129	109	II

13.7 Heavy Load Series of End Deflector

FSDH



Unit: mm

SCREW SIZE		BALL DIA.	EFFECTIVE TURNS circuit \times number of thread	BASIC RATE LOAD (kgf)		NUT		FLANGE				OIL HOLE	BOLT
O.D.	LEAD			Dynamic (1×10^6 REV.) Ca	Static Co	D6	L	A	T	W	G	Q	X
45	12	9.525	5 \times 1	13600	35400	84	98	128	24	106	57	PT1/8 \times	14
	16	9.525	5 \times 1	13500	35300	84	122	128	24	106	57	PT1/8 \times	14
	20	9.525	4 \times 1	11000	27900	84	122	128	24	106	57	PT1/8 \times	14
50	16	12.7	5 \times 1	21100	53700	102	125	146	28	124	65	PT1/8 \times	14
	20	12.7	4 \times 1	17200	42400	102	124	146	28	124	65	PT1/8 \times	14
	40	12.7	3 \times 2	23400	61200	102	163	146	28	124	65	PT1/8 \times	14
63	32	15.875	4 \times 1	25500	66000	126	176	182	32	154	81	PT1/8 \times	18
	40	15.875	3 \times 2	35300	96600	126	169	182	32	154	81	PT1/8 \times	18
80	50	19.05	4 \times 2	66600	204000	155	255	224	40	190	100	PT1/8 \times	22
100	60	19.05	4 \times 2	73400	251500	175	295	244	40	210	100	PT1/8 \times	22