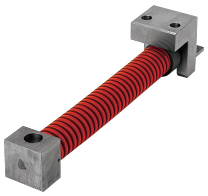
Spring Unit for Cam Return [Overview]

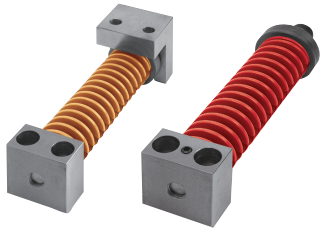
■Types and Features of Spring Unit For Cam Return

Standard initial pressure and final pressure type SHSU series



P.199～P.204

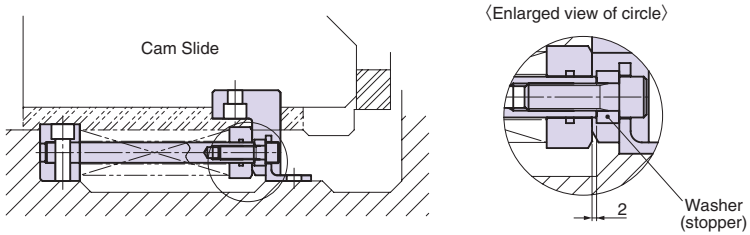
Selective initial pressure and final pressure type CRUV/CRFV series



P.191～P.198

(1) Standard initial pressure and final pressure type SHSU series

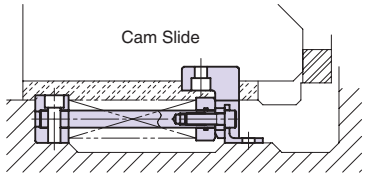
Initial pressure and final pressure are determined as the standard. The appropriate type can be selected by confirming that the specified travel meets the mass (x safety factor) and the final pressure (≧stopper force) of the cam slider (including cutting tool). Assemble the unit so that the spring holder may stop 2 mm before the stopper (washer) at the final return position.



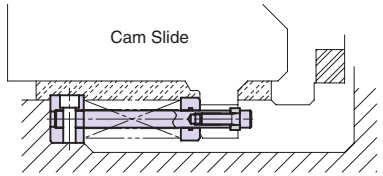
(2) Selective initial pressure and final pressure type CRUV series / CRFV series

Both initial pressure and final pressure can be determined according to the cam type. This part gives high degree of freedom in design. Two types of both side fixing and one side fixing are available.

● Status without initial pressure



● Status with initial pressure



〈Procedures to determine part〉

① Determine the initial pressure, travel and final load for one unit.

② Determine the coil spring outer diameter (D) and free length (FL) of the coil spring satisfying ① and other conditions.

③ Obtain the length of the spring guide pin from the calculation formula in the table.

The procedures to determine the part are now completed.

■Determination of basic spring unit conditions

① Calculation of cam slider return force

Cam return force (N) = Cam slide weight (kg) × α+ Stripping force (N)

Stripping force (N)= Stamping force (N)×β

Customer should determine α and β values according to the stamping conditions. (α: Wear coefficient, β : 3～5%)

② Calculate the spring compression from the travel required for the cam slide.

Effective cam travel (mm) = Panel thickness + Flange length at cam + Allowance

Allow the distance required for replacement of the punch.

Spring compression (mm) = Effective travel length (mm) + 2 mm (for preload)

③ Select the spring unit suitable for conditions from ① and ②.

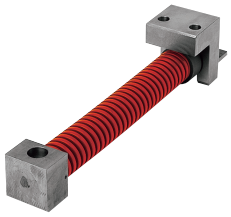
If the load is large and an appropriate spring is not available, consider use of 2 or 3 sets of springs in parallel.

Spring Unit for Cam Return

Cam Slide Components

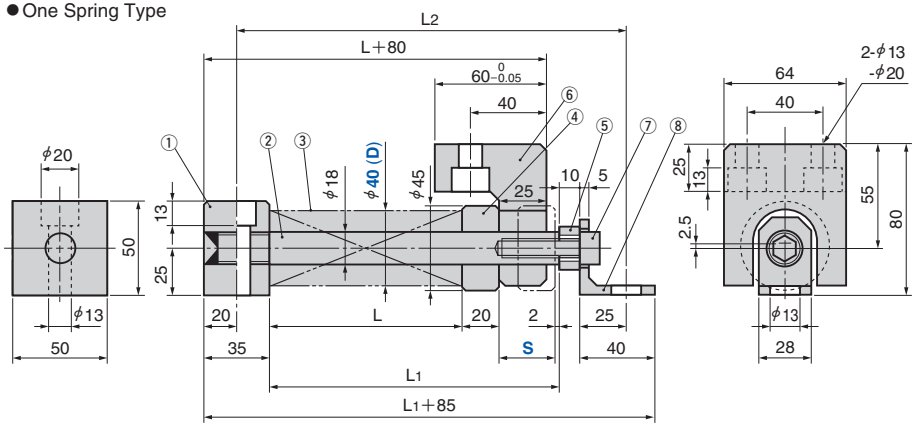
SHSUL40
SHSUM40

CAD FILE

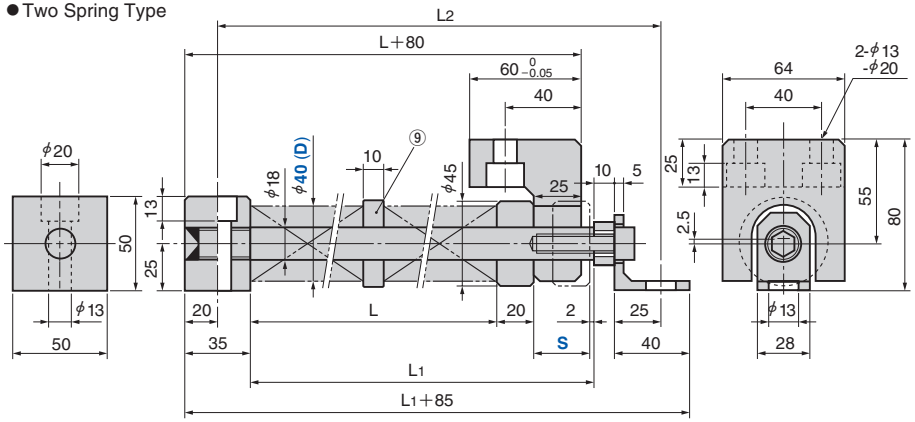


Please follow the wear examples shown.

● One Spring Type



● Two Spring Type



No.	Description	Qty	Material and Remark
1	Spring Block	1	Steel
2	Spring Guide Pin	1	Steel
3	Coil Spring	1 (2)	See standard table
4	Spring Retainer	1	Cast Iron
5	Washer	1	Steel

No.	Description	Qty	Material and Remark
6	Return Plate	1	Steel
7	Hexagon Socket Head Bolt	1	M12x40
8	Angle	1	Steel
9	Collar	1	Cast Iron

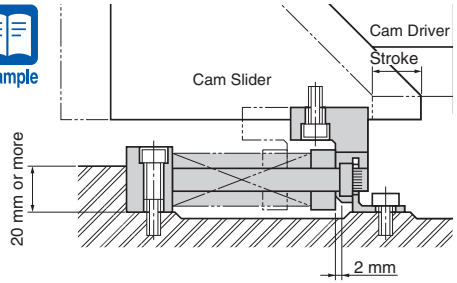
Catalog No.	D	S	Spring Type (Qty)	Load [N (kgf)] Min	Load [N (kgf)] Max	L	L1	L2
		20	TL40-100 (1)	635 (64.8)		68	110	160
		25	TL40-125 (1)	632 (64.4)		85	132	182
		30	TL40-150 (1)	635 (64.8)		102	154	204
		35	TL40-150 (1)	459 (46.8)		102	159	209
		40	TL40-175 (1)	485 (49.5)		119	181	231
		45	TL40-200 (1)	503 (51.3)		136	203	253
		50	TL40-250 (1)	647 (66.0)		170	242	292
		55	TL40-250 (1)	539 (55.0)		170	247	297
		60	TL40-150 (2)	627 (63.9)		214	296	346
SHSUL	40	65	TL40-150 (2)	547 (55.8)	1695 (172.8)	214	301	351
		70	TL40-175 (2)	633 (64.5)		248	340	390
		75	TL40-175 (2)	562 (57.3)		248	345	395
		80	TL40-200 (2)	635 (64.8)		282	384	434
		85	TL40-200 (2)	568 (57.9)		282	389	439
		90	TL40-200 (2)	503 (51.3)		282	394	444
		95	TL40-200 (2)	436 (44.5)		282	399	449
		100	TL40-250 (2)	647 (66.0)		350	472	522
		105	TL40-250 (2)	593 (60.5)		350	477	527
		110	TL40-250 (2)	539 (55.0)		350	482	532
		20	TM40-125 (1)	940 (95.8)		93	135	185
		25	TM40-150 (1)	914 (93.2)		111	158	208
		30	TM40-200 (1)	1027 (104.7)		149	201	251
		35	TM40-225 (1)	957 (97.6)		168	225	275
		40	TM40-250 (1)	938 (95.7)		186	248	298
		45	TM40-300 (1)	1012 (103.2)		224	291	341
SHSUM	40	50	TM40-175 (2)	1119 (114.1)	2510 (255.9)	270	342	392
		55	TM40-175 (2)	979 (99.9)		270	347	397
		60	TM40-200 (2)	1027 (104.7)		308	390	440
		65	TM40-200 (2)	905 (92.3)		308	395	445
		70	TM40-225 (2)	1001 (102.1)		344	436	486
		75	TM40-250 (2)	1039 (106.0)		382	479	529
		80	TM40-250 (2)	941 (96.0)		382	484	534

Type with travel S of 55 or more is made to order.

Order

Catalog No.	D		S
SHSUL	40	–	50
SHSUM	40	–	30

Example



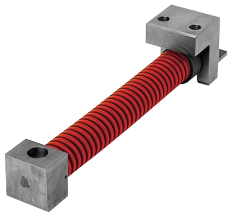
Cam Slide Components

Spring Unit for Cam Return

Cam Slide Components

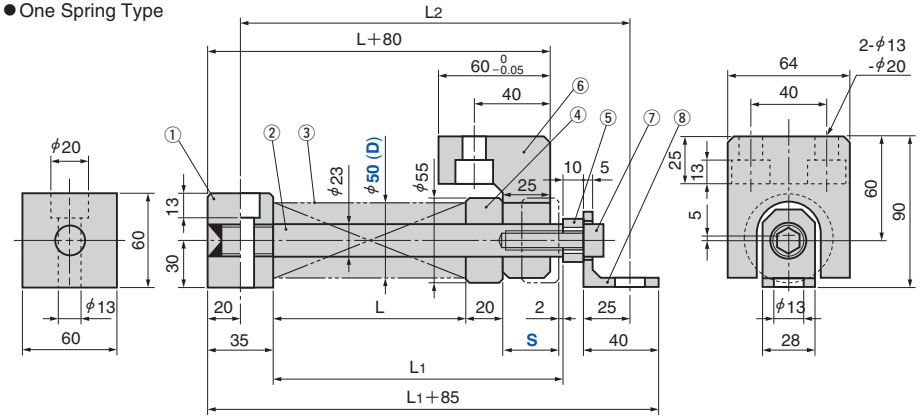
SHSUL50
SHSUM50

CAD FILE

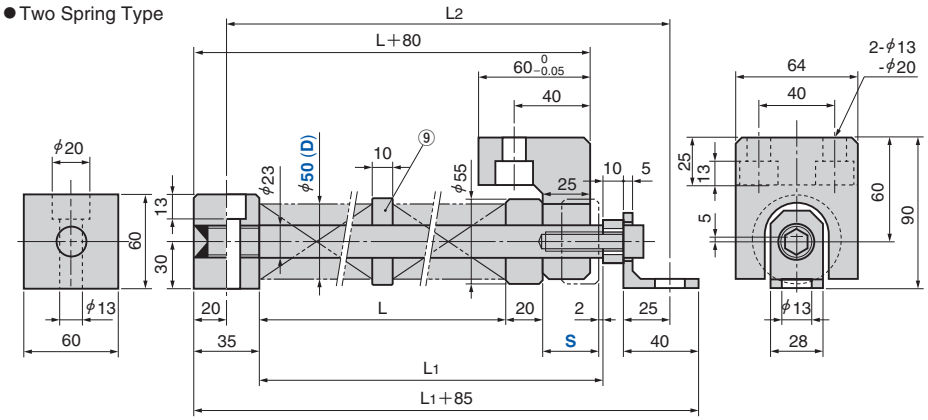


Please follow the wear examples shown.

● One Spring Type



● Two Spring Type



No.	Description	Qty	Material and Remark
1	Spring Block	1	Steel
2	Spring Guide Pin	1	Steel
3	Coil Spring	1 (2)	See standard table.
4	Spring Retainer	1	Cast Iron
5	Washer	1	Steel

No.	Description	Qty	Material and Remark
6	Return Plate	1	Steel
7	Hexagon Socket Head Bolt	1	M12x40
8	Angle	1	Steel
9	Collar	1	Cast Iron

Catalog No.	D	S	Spring Type (Qty)	Load [N (kgf)] Min	Load [N (kgf)] Max	L	L1	L2
		20	TL50-100 (1)	1020 (104.0)		68	110	160
		25	TL50-125 (1)	1020 (104.0)		85	132	182
		30	TL50-150 (1)	1080 (110.1)		102	154	204
		35	TL50-150 (1)	728 (74.2)		102	159	209
		40	TL50-175 (1)	768 (78.3)		119	181	231
		45	TL50-200 (1)	798 (81.4)		136	203	253
		50	TL50-250 (1)	1020 (104.0)		170	242	292
		55	TL50-250 (1)	850 (86.7)		170	247	297
		60	TL50-300 (1)	1010 (103.0)		204	286	336
		65	TL50-300 (1)	868 (88.5)		204	291	341
		70	TL50-300 (1)	728 (74.2)		204	296	346
		75	TL50-175 (2)	888 (90.6)		248	345	395
		80	TL50-200 (2)	1010 (103.0)		282	384	434
SHSUL	50	85	TL50-200 (2)	903 (92.1)	2700 (275.3)	282	389	439
		90	TL50-200 (2)	798 (81.4)		282	394	444
		95	TL50-200 (2)	693 (70.7)		282	399	449
		100	TL50-250 (2)	1020 (104.0)		350	472	522
		105	TL50-250 (2)	935 (95.3)		350	477	527
		110	TL50-250 (2)	850 (86.7)		350	482	532
		115	TL50-250 (2)	765 (78.0)		350	487	537
		120	TL50-300 (2)	1010 (103.0)		418	560	610
		125	TL50-300 (2)	938 (95.6)		418	565	615
		130	TL50-300 (2)	868 (88.5)		418	570	620
		135	TL50-300 (2)	798 (81.4)		418	575	625
		140	TL50-300 (2)	728 (74.2)		418	580	630
		145	TL50-300 (2)	658 (67.1)		418	585	635
		150	TL50-300 (2)	588 (60.0)		418	590	640
		20	TM50-125 (1)	1470 (149.9)		93	135	185
		25	TM50-150 (1)	1428 (145.7)		111	158	208
		30	TM50-200 (1)	1607 (163.9)		149	201	251
		35	TM50-225 (1)	1496 (152.6)		168	225	275
		40	TM50-250 (1)	1470 (149.9)		186	248	298
		45	TM50-300 (1)	1580 (161.1)		224	291	341
SHSUM	50	50	TM50-350 (1)	1705 (173.8)	3920 (400.0)	261	333	383
		55	TM50-350 (1)	1486 (151.5)		261	338	388
		60	TM50-200 (2)	1990 (202.9)		298	380	430
		65	TM50-200 (2)	1799 (183.4)		298	385	435
		70	TM50-225 (2)	1904 (194.2)		334	426	476
		75	TM50-250 (2)	1929 (196.8)		372	469	519
		80	TM50-250 (2)	1776 (181.1)		372	474	524

Type with travel S of 55 or more is made to order.

Order

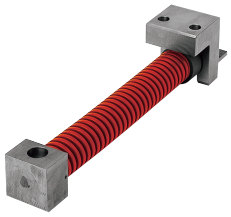
Catalog No.	D	–	S
SHSUL	50	–	40
SHSUM	50	–	70

Spring Unit for Cam Return

Cam Slide Components

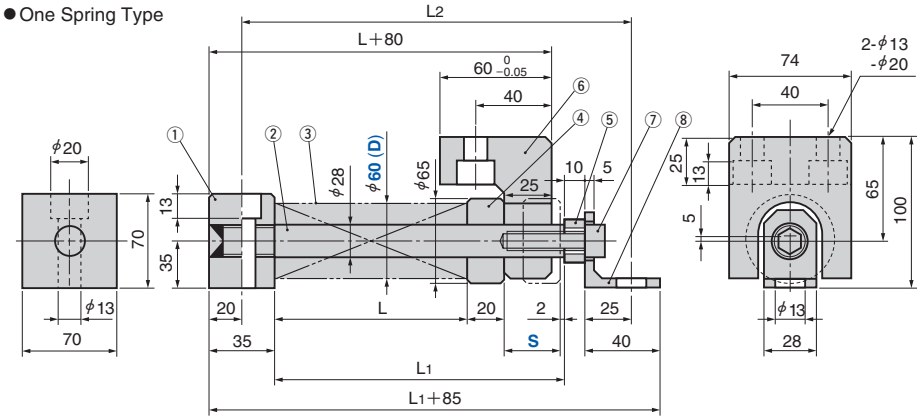
SHSUL60
SHSUM60

CAD FILE

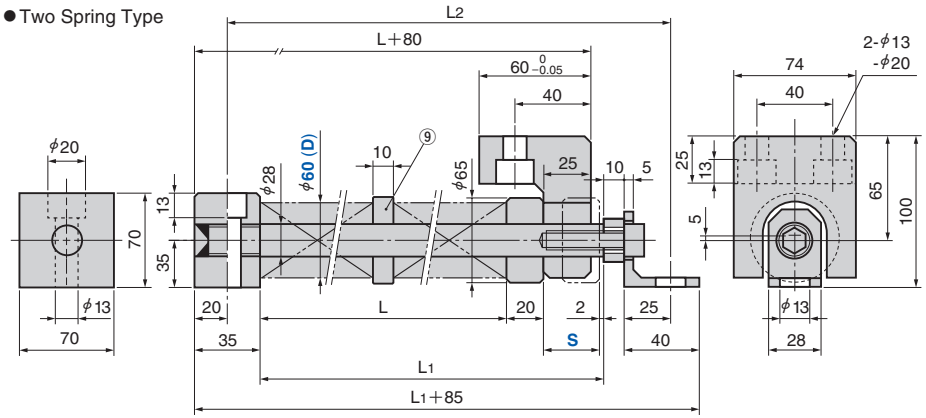


Please follow the wear examples shown.

● One Spring Type



● Two Spring Type



No.	Description	Qty	Material and Remark
1	Spring Block	1	Steel
2	Spring Guide Pin	1	Steel
3	Coil Spring	1 (2)	See standard table.
4	Spring Retainer	1	Cast Iron
5	Washer	1	Steel

No.	Description	Qty	Material and Remark
6	Return Plate	1	Steel
7	Hexagon Socket Head Bolt	1	M12x40
8	Angle	1	Steel
9	Collar	1	Cast Iron

Catalog No.	D	S	Spring Type (Qty)	Load [N (kgf)] Min	Load [N (kgf)] Max	L	L1	L2
		20	TL60-100 (1)	1464 (149.3)		68	110	160
		25	TL60-125 (1)	1455 (148.4)		85	132	182
		30	TL60-150 (1)	1458 (148.7)		102	154	204
		35	TL60-150 (1)	1053 (107.4)		102	159	209
		40	TL60-175 (1)	1104 (112.6)		119	181	231
		45	TL60-200 (1)	1159 (118.2)		136	203	253
		50	TL60-250 (1)	1470 (149.9)		170	242	292
		55	TL60-250 (1)	1225 (124.9)		170	247	297
		60	TL60-300 (1)	1476 (150.5)		204	286	336
		65	TL60-300 (1)	1271 (129.6)		204	291	341
		70	TL60-300 (1)	1066 (108.7)		204	296	346
		75	TL60-175 (2)	1276 (130.1)		248	345	395
		80	TL60-200 (2)	1464 (149.3)		282	384	434
SHSUL	60	85	TL60-200 (2)	1331 (135.7)	3890 (396.7)	282	389	439
		90	TL60-200 (2)	1159 (118.2)		282	394	444
		95	TL60-200 (2)	1006 (102.6)		282	399	449
		100	TL60-250 (2)	1470 (149.9)		350	472	522
		105	TL60-250 (2)	1347 (137.4)		350	477	527
		110	TL60-250 (2)	1225 (124.9)		350	482	532
		115	TL60-250 (2)	1103 (112.5)		350	487	537
		120	TL60-300 (2)	1476 (150.5)		418	560	610
		125	TL60-300 (2)	1373 (140.0)		418	565	615
		130	TL60-300 (2)	1271 (129.6)		418	570	620
		135	TL60-300 (2)	1168 (119.1)		418	575	625
		140	TL60-300 (2)	1066 (108.7)		418	580	630
		145	TL60-300 (2)	963 (198.2)		418	585	635
		150	TL60-300 (2)	861 (187.9)		418	590	640
		20	TM60-125 (1)	2116 (215.7)		93	135	185
		25	TM60-150 (1)	2057 (209.7)		111	158	208
		30	TM60-200 (1)	2313 (235.9)		149	201	251
		35	TM60-225 (1)	2154 (219.6)		168	225	275
		40	TM60-250 (1)	2114 (215.6)		186	248	298
		45	TM60-300 (1)	2275 (232.0)		224	291	341
SHSUM	60	50	TM60-350 (1)	2454 (250.2)	5640 (575.0)	261	333	383
		55	TM60-350 (1)	2139 (218.1)		261	338	388
		60	TM60-200 (2)	2864 (292.1)		298	380	430
		65	TM60-200 (2)	2589 (264.0)		298	385	435
		70	TM60-225 (2)	2741 (279.6)		334	426	476
		75	TM60-250 (2)	2775 (283.0)		372	469	519
		80	TM60-250 (2)	2555 (260.6)		372	474	524

Type with travel S of 55 or more is made to order.

Order

Catalog No.	D	–	S
SHSUL	60	–	80
SHSUM	60	–	50