

# Outline of Spring Unit

## FOR CAM RETURN

### Types and Features of Spring Unit For Cam Return

- Standard initial pressure and final pressure type  
**SHSU series**



P.217 ~ P.222

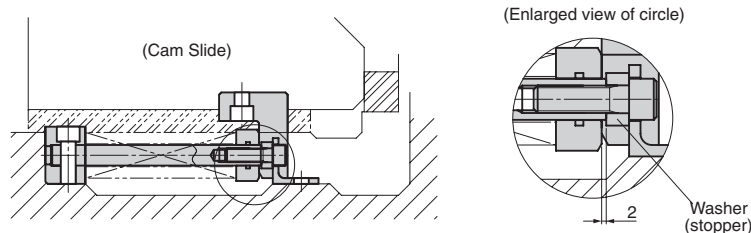
- Selective Initial pressure and final pressure type  
**CRUV/CRFV series**



P.209 ~ P.222

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

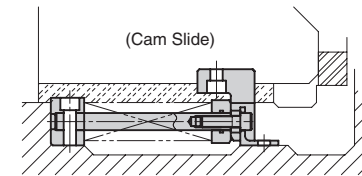
Initial pressure and final pressure are determined as the standard. The appropriate type can be selected by confirming that the specified travel meets the mass (x safety factor) and the final pressure ( $\geq$  stopper force) of the cam slider (including cutting tool). Assemble the unit so that the spring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



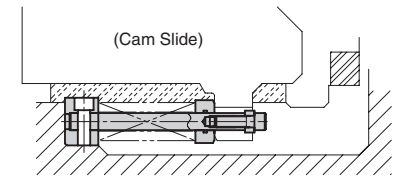
#### (2) Selective initial pressure and final pressure type CRUV series/ CRFV series

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

$$\text{Cam return force (N)} = \text{Cam slide weight (kg)} \times \alpha + \text{Stripping force (N)}$$

(Note) Stripping force (N) = Stamping force (N)  $\times \beta$

- Customer should determine  $\alpha$  and  $\beta$  values according to the stamping conditions.  
( $\alpha$ : Wear coefficient,  $\beta$ : 3 to 5%)

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

$$\text{Effective cam travel (mm)} = \text{Panel thickness} + \text{Flange length at cam} + \text{Allowance}$$

\* Allow the distance required for replacement of the punch.

$$\text{Spring compression (mm)} = \text{Effective travel length (mm)} + 2 \text{ mm (for preload)}$$

- 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

PRE-LOADED TYPE

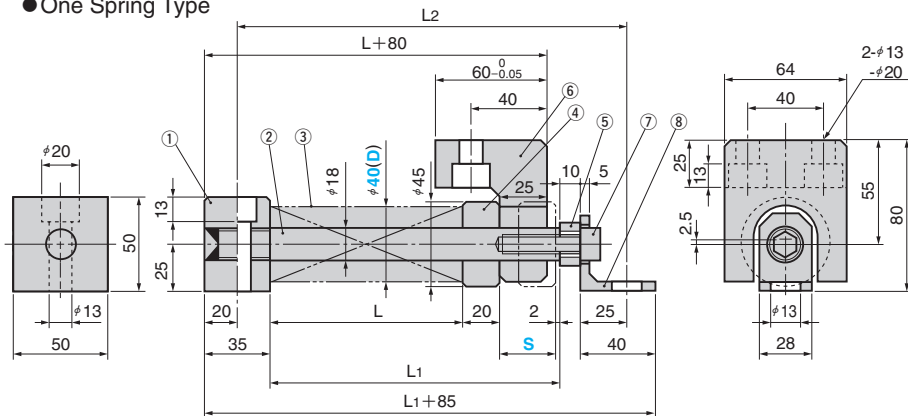
CAD  
FILE

SHSUL 40  
SHSUM 40

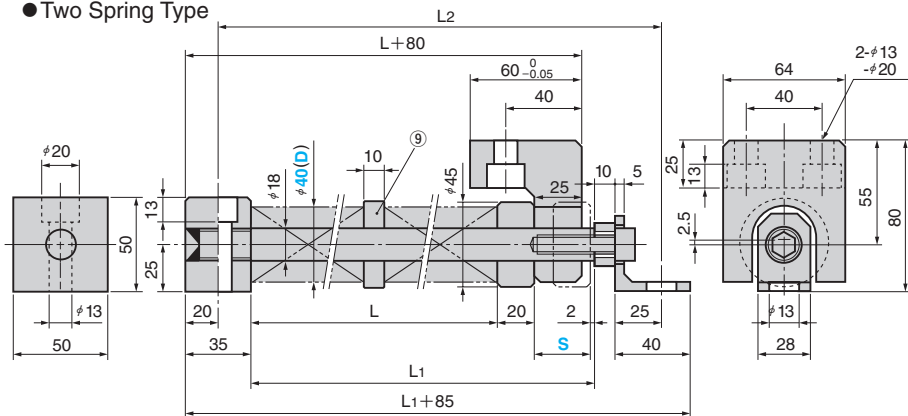


⚠ Please follow the wear examples shown.

● One Spring Type



● Two Spring Type



■ Table of Components

No.	Description	Qty	Material and Remark
①	Spring Block	1	SS400
②	Spring Guide Pin	1	S45C Hardness: HRC55 or more
③	Spring	1(2)	Refer to the standard table.
④	Spring Retainer	1	FC250
⑤	Washer	1	SS400

No.	Description	Qty	Material and Remark
⑥	Return Plate	1	SS400
⑦	Hexagon Socket Head Bolt	1	SCM435 M12×40
⑧	Angle	1	SS400
⑨	Collar	1	FC250

Spring Type(Qty)	Load N(kgf)		L	L <sub>1</sub>	L <sub>2</sub>	Catalog No.	(D)	S
	min	max						
TL40-100(1)	635 ( 64.8)		68	110	160			20
TL40-125(1)	632 ( 64.4)		85	132	182			25
TL40-150(1)	635 ( 64.8)		102	154	204			30
TL40-150(1)	459 ( 46.8)		102	159	209			35
TL40-175(1)	485 ( 49.5)		119	181	231			40
TL40-200(1)	503 ( 51.3)		136	203	253			45
TL40-250(1)	647 ( 66.0)		170	242	292			50
TL40-250(1)	539 ( 55.0)		170	247	297			55
TL40-150(2)	627 ( 63.9)	1,695 (172.8)	214	296	346	SHSUL	40	60
TL40-150(2)	547 ( 55.8)		214	301	351			65
TL40-175(2)	633 ( 64.5)		248	340	390			70
TL40-175(2)	562 ( 57.3)		248	345	395			75
TL40-200(2)	635 ( 64.8)		282	384	434			80
TL40-200(2)	568 ( 57.9)		282	389	439			85
TL40-200(2)	503 ( 51.3)		282	394	444			90
TL40-200(2)	436 ( 44.5)		282	399	449			95
TL40-250(2)	647 ( 66.0)		350	472	522			100
TL40-250(2)	593 ( 60.5)		350	477	527			105
TL40-250(2)	539 ( 55.0)		350	482	532			110
TM40-125(1)	940 ( 95.8)		93	135	185			20
TM40-150(1)	914 ( 93.2)		111	158	208			25
TM40-200(1)	1027(104.7)		149	201	251			30
TM40-225(1)	957( 97.6)		168	225	275			35
TM40-250(1)	938 ( 95.7)		186	248	298			40
TM40-300(1)	1012(103.2)		224	291	341			45
TM40-175(2)	1119(114.1)	2510 (255.9)	270	342	392	SHSUM	40	50
TM40-175(2)	979 ( 99.9)		270	347	397			55
TM40-200(2)	1027(104.7)		308	390	440			60
TM40-200(2)	905 ( 92.3)		308	395	445			65
TM40-225(2)	1001(102.1)		344	436	486			70
TM40-250(2)	1039(106.0)		382	479	529			75
TM40-250(2)	941 ( 96.0)		382	484	534			80



Order

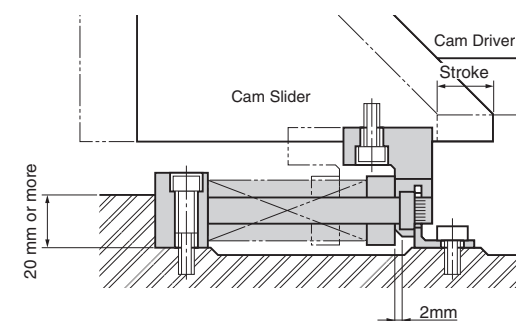
Catalog No.	(D)	—	S
SHSUL	40	—	50
SHSUM	40	—	30



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



Example



# Spring Unit For Cam Return

PRE-LOADED TYPE

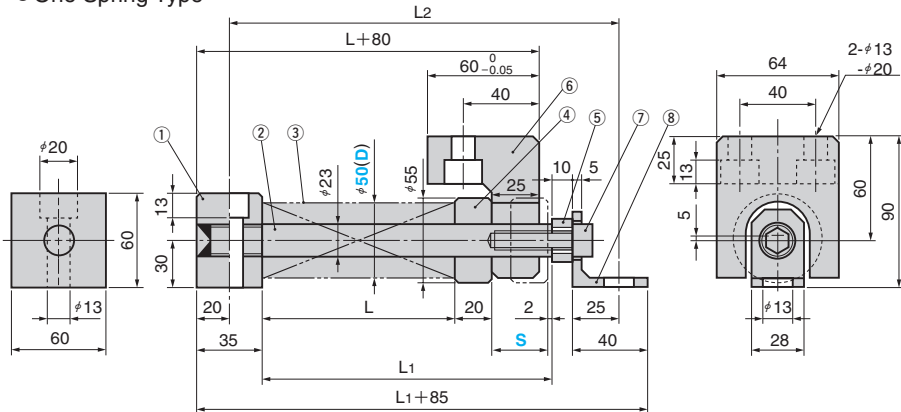
CAD FILE

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SHSUM 50

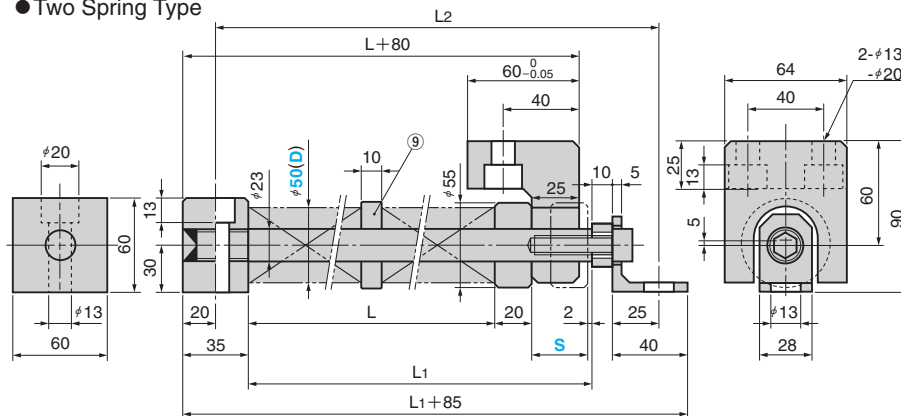


⚠ Please follow the wear examples shown.

● One Spring Type



● Two Spring Type



■ Table of Components

No.	Description	Qty	Material and Remark
①	Spring Block	1	SS400
②	Spring Guide Pin	1	S45C Hardness: HRC55 or more
③	Spring	1(2)	Refer to the standard table.
④	Spring Retainer	1	FC250
⑤	Washer	1	SS400

No.	Description	Qty	Material and Remark
⑥	Return Plate	1	SS400
⑦	Hexagon Socket Head Bolt	1	SCM435 M12×40
⑧	Angle	1	SS400
⑨	Collar	1	FC250

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



Order

Catalog No.	(D)	—	S
SHSUL	50	—	40
SHSUM	50	—	70

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

Cam Slide Components

# Spring Unit For Cam Return

PRE-LOADED TYPE

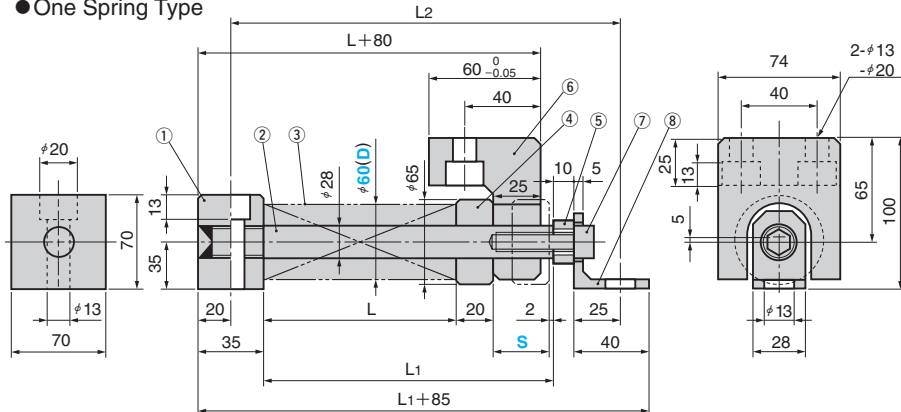
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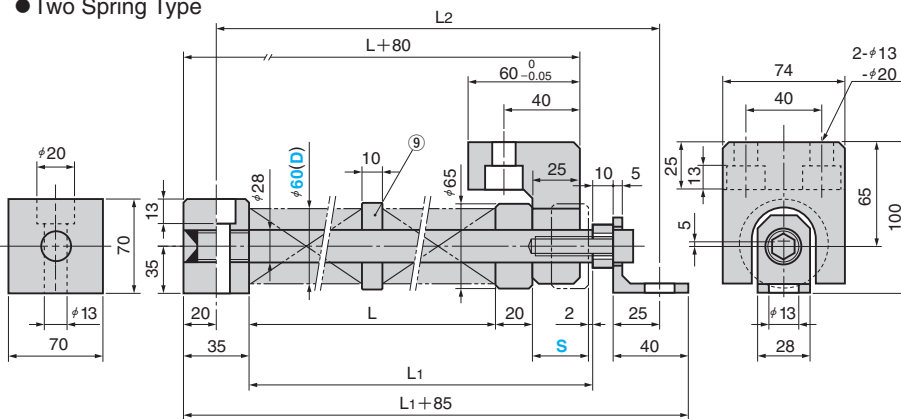


⚠ Please follow the wear examples shown.

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● Two Spring Type



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④	Spring Retainer	1	FC250
⑤	Washer	1	SS400

No.	Description	Qty	Material and Remark
⑥	Return Plate	1	SS400
⑦	Hexagon Socket Head Bolt	1	SCM435 M12×40
⑧	Angle	1	SS400
⑨	Collar	1	FC250

Spring Type(Qty)	Load N(kgf)		L	L <sub>1</sub>	L <sub>2</sub>	Catalog No.	(D)	S
	min	max						
TL60-100(1)	1464(149.3)		68	110	160			20
TL60-125(1)	1455(148.4)		85	132	182			25
TL60-150(1)	1458(148.7)		102	154	204			30
TL60-150(1)	1053(107.4)		102	159	209			35
TL60-175(1)	1104(112.6)		119	181	231			40
TL60-200(1)	1159(118.2)		136	203	253			45
TL60-250(1)	1470(149.9)		170	242	292			50
TL60-250(1)	1225(124.9)		170	247	297			55
TL60-300(1)	1476(150.5)		204	286	336			60
TL60-300(1)	1271(129.6)		204	291	341			65
TL60-300(1)	1066(108.7)		204	296	346			70
TL60-175(2)	1276(130.1)		248	345	395			75
TL60-200(2)	1464(149.3)		282	384	434			80
TL60-200(2)	1331(135.7)	3890 (396.7)	282	389	439	SHSUL	60	85
TL60-200(2)	1159(118.2)		282	394	444			90
TL60-200(2)	1006(102.6)		282	399	449			95
TL60-250(2)	1470(149.9)		350	472	522			100
TL60-250(2)	1347(137.4)		350	477	527			105
TL60-250(2)	1225(124.9)		350	482	532			110
TL60-250(2)	1103(112.5)		350	487	537			115
TL60-300(2)	1476(150.5)		418	560	610			120
TL60-300(2)	1373(140.0)		418	565	615			125
TL60-300(2)	1271(129.6)		418	570	620			130
TL60-300(2)	1168(119.1)		418	575	625			135
TL60-300(2)	1066(108.7)		418	580	630			140
TL60-300(2)	963(98.2)		418	585	635			145
TL60-300(2)	861(87.9)		418	590	640			150
TM60-125(1)	2116(215.7)		93	135	185			20
TM60-150(1)	2057(209.7)		111	158	208			25
TM60-200(1)	2313(235.9)		149	201	251			30
TM60-225(1)	2154(219.6)		168	225	275			35
TM60-250(1)	2114(215.6)		186	248	298			40
TM60-300(1)	2275(232.0)		224	291	341			45
TM60-350(1)	2454(250.2)	5640 (575.0)	261	333	383	SHSUM	60	50
TM60-350(1)	2139(218.1)		261	338	388			55
TM60-200(2)	2864(292.1)		298	380	430			60
TM60-200(2)	2589(264.0)		298	385	435			65
TM60-225(2)	2741(279.6)		334	426	476			70
TM60-250(2)	2775(283.0)		372	469	519			75
TM60-250(2)	2555(260.6)		372	474	524			80



Order

Catalog No.	(D)	—	S
SHSUL	60	—	80
SHSUM	60	—	50



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

Cam Slide Components