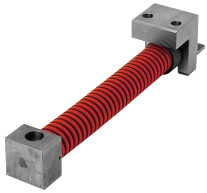


# Spring Unit for Cam Return [Overview]

## Cam Slide Components

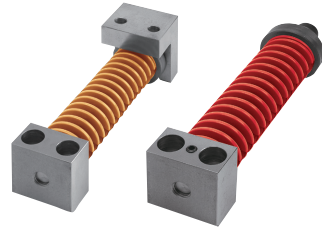
### Types and Features of Spring Unit For Cam Return

Standard initial pressure and final pressure type SHSU series



P.199~P.204

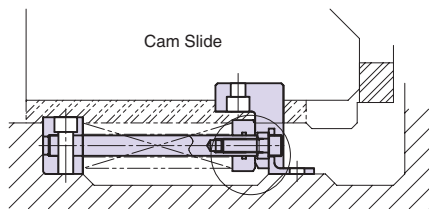
Selective initial pressure and final pressure type CRUV/CRFV series



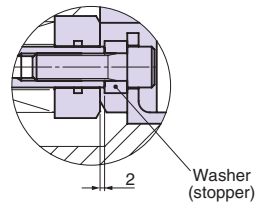
P.191~P.198

#### (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 ( $\geq$  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.



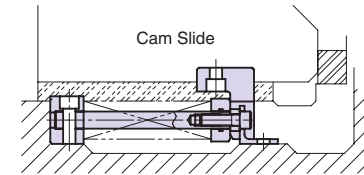
(Enlarged view of circle)



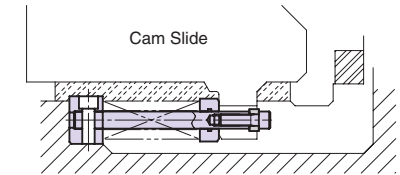
#### (2) Selective initial pressure and final pressure type CRUV series / CRFV series

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

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

$$\text{Stripping force (N)} = \text{Stamping force (N)} \times \beta$$

Customer should determine  $\alpha$  and  $\beta$  values according to the stamping conditions.

( $\alpha$ : Wear coefficient,  $\beta$ : 3~5%)

- 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 [Overview]

## Selection Method

### Cam Slide Components

For spring unit CRUV and CRFV series, customer can determine parameters such as return force according to the die specification.

The table on the following page shows L size and final pressure (return force) of the spring guide pin for a standard travel. Please refer to this table for using the unit.

#### Simplified Chart



Initial Load : 150 kg (1470 N)

Travel : 50 mm

Example

From 300,000 strokes in the table, find the type that gives 1470 N or more for initial pressure. Then, find the type that gives the travel of 50 mm. The applicable name of the spring unit, free length FL and spring guide pin L can be obtained.

#### CRUVL

D	Free Length FL	Spring Constant N/mm	Standard Travel S	Reference Value for Standard Travel (300,000 strokes) Free Length x40%			
				Compression	L	Initial Load N	Final Load N
	90	91.98	20	36.0	89	1472	3310
	100	82.78	25	40.0	100	1242	
	125	66.22	30	50.0	120	1324	
	150	55.19	35	60.0	140	1380	
	175	47.30	40	70.0	160	1419	
50	200	41.39	45	80.0	180	1449	
	225	36.79	50	90.0	200	1472	
	250	33.11	55	100.0	220	1490	
	275	30.10	60	110.0	240	1505	
	300	27.59	70	120.0	265	1380	
	350	23.65	80	140.0	305	1419	

CRUVL50-225-200 meets the requirements in this example.

#### CRUVF

D	Free Length FL	Spring Constant N/mm	Standard Travel S	Reference Value for Standard Travel (1,000,000 strokes) Free Length x40%				Reference Value for Standard Travel (500,000 strokes) Free Length x45%				Reference Value for Standard Travel (300,000 strokes) Free Length x50%			
				Compression	L	Initial Load N	Final Load N	Compression	L	Initial Load N	Final Load N	Compression	L	Initial Load N	Final Load N
40	90	27.85	20	36.0	89	446		40.5	85	571		45.0	80	696	
	100	25.07	25	40.0	100	376		45.0	95	501		50.0	90	627	
	125	20.05	30	50.0	120	401		56.3	114	527		62.5	108	652	
	150	16.71	35	60.0	140	418		67.5	133	543		75.0	125	668	
	175	14.32	40	70.0	160	430		78.8	151	556		87.5	143	680	
	200	12.53	45	80.0	180	439	1000	90.0	170	564	1128	100.0	160	689	1255
	225	11.14	50	90.0	200	446		101.3	189	571		112.5	178	696	
	250	10.03	55	100.0	220	451		112.5	208	577		125.0	195	702	
	275	9.12	65	110.0	245	410		123.8	231	536		137.5	218	661	
	300	8.36	70	120.0	265	418		135.0	250	543		150.0	235	669	
50	100	39.22	20	40.0	95	784		45.0	90	981		50.0	85	1177	
	125	31.38	25	50.0	115	785		56.3	109	982		62.5	103	1177	
	150	26.15	30	60.0	135	785		67.5	128	981		75.0	120	1177	
	175	22.41	35	70.0	155	784		78.8	146	982		87.5	138	1177	
	200	19.61	40	80.0	175	784		90.0	165	981		100.0	155	1177	
	225	17.43	45	90.0	195	784	1569	101.3	184	981	1765	112.5	173	1177	1961
	250	15.69	50	100.0	215	785		112.5	203	981		125.0	190	1177	
	275	14.26	55	110.0	235	784		123.8	221	981		137.5	208	1176	
	300	13.07	60	120.0	255	784		135.0	240	980		150.0	225	1176	
	350	11.21	70	140.0	295	785		157.5	278	981		175.0	260	1177	
60	400	9.81	80	160.0	335	785		180.0	315	981		200.0	295	1177	
	100	56.44	20	40.0	95	1129		45.0	90	1411		50.0	85	1693	
	125	45.16	25	50.0	115	1129		56.3	109	1414		62.5	103	1694	
	150	37.63	30	60.0	135	1129		67.5	128	1411		75.0	120	1693	
	175	32.25	35	70.0	155	1129		78.8	146	1413		87.5	138	1693	
	200	28.22	40	80.0	175	1129		90.0	165	1411		100.0	155	1693	
	225	25.09	45	90.0	195	1129	2260	101.3	184	1413	2540	112.5	173	1694	2820
	250	22.58	50	100.0	215	1129		112.5	203	1411		125.0	190	1694	
	275	20.53	55	110.0	235	1129		123.8	221	1412		137.5	208	1694	
	300	18.81	60	120.0	255	1129		135.0	240	1411		150.0	225	1693	
350	16.13	70	140.0	295	1129		157.5	278	1411		175.0	260	1694		
400	14.11	80	160.0	335	1129		180.0	315	1411		200.0	295	1693		

#### CRUVL

D	Free Length FL	Spring Constant N/mm	Standard Travel S	Reference Value for Standard Travel (1,000,000 strokes) Free Length x32%				Reference Value for Standard Travel (500,000 strokes) Free Length x36%				Reference Value for Standard Travel (300,000 strokes) Free Length x40%			
				Compression	L	Initial Load N	Final Load N	Compression	L	Initial Load N	Final Load N	Compression	L	Initial Load N	Final Load N
40	90	58.73	20	28.8	96.0	517		32.4	93	728		36.0	89	940	
	100	52.86	25	32.0	108	370		36.0	104	581		40.0	100	793	
	125	42.29	30	40.0	130	423		45.0	125	634		50.0	120	846	
	150	35.24	35	48.0	152	458		54.0	146	670		60.0	140	881	
	175	30.21	40	56.0	174	483		63.0	167	695		70.0	160	906	
	200	26.43	45	64.0	196	502	1697	72.0	188	714	1903	80.0	180	925	2120
	225	23.49	50	72.0	218	517		81.0	209	728		90.0	200	940	
	250	21.14	55	80.0	240	529		90.0	230	740		100.0	220	951	
	275	19.22	65	88.0	267	442		99.0	256	653		110.0	245	865	
	300	17.62	70	96.0	289	458		108.0	277	670		120.0	265	881	
50	90	91.98	20	28.8	96	809		32.4	93	1141		36.0	89	1472	
	100	82.78	25	32.0	108	579		36.0	104	911		40.0	100	1242	
	125	66.22	30	40.0	130	662		45.0	125	993		50.0	120	1324	
	150	55.19	35	48.0	152	717		54.0	146	1049		60.0	140	1380	
	175	47.30	40	56.0	174	757		63.0	167	1088		70.0	160	1419	
	200	41.39	45	64.0	196	786	2650	72.0	188	1118	2980	80.0	180	1449	3310
	225	36.79	50	72.0	218	809		81.0	209	1140		90.0	200	1472	
	250	33.11	55	80.0	240	828		90.0	230	1159		100.0	220	1490	
	275	30.10	60	88.0	262	843		99.0	251	1174		110.0	240	1505	
	300	27.59	70	96.0	289	717		108.0	277	1048		120.0	265	1380	
350	23.65	80	112.0	333	757		126.0	319	1088		140.0	305	1419		
60	90	132.41	20	28.8	96	1165		32.4	93	1642		36.0	89	2119	
	100	119.17	25	32.0	108	834		36.0	104	1311		40.0	100	1788	
	125	95.33	30	40.0	130	953		45.0	125	1430		50.0	120	1907	
	150	79.44	35	48.0	152	1033		54.0	146	1509		60.0	140	1986	
	175	68.10	40	56.0	174	1090		63.0	167	1566		70.0	160	2043	
	200	59.58	45	64.0	196	1132	3810	72.0	188	1609	4290	80.0	180	2085	4770
	225	52.96	50	72.0	218	1165		81.0	209	1642		90.0	200	2118	
	250	47.67	60	80.0	245	953		90.0	235	1430		100.0	225	1907	
	275	43.33	65	88.0	267	997		99.0	256	1473		110.0	245	1950	
	300	39.72	70	96.0	289	1033		108.0	277	1509		120.0	265	1986	
350	34.05	80	112.0	333	1090		126.0	319	1566		140.0	305	2043		

# Spring Unit for Cam Return [Overview]

## Selection Method

### Cam Slide Components

#### CRUVM

D	Free Length FL	Spring Constant N/mm	Standard Travel S	Reference Value for Standard Travel (1,000,000 strokes) Free Length x25.6%				Reference Value for Standard Travel (500,000 strokes) Free Length x28.8%				Reference Value for Standard Travel (300,000 strokes) Free Length x32%						
				Compression	L	Initial Load N	Final Load N	Compression	L	Initial Load N	Final Load N	Compression	L	Initial Load N	Final Load N			
				100	97.92	20	25.6	109	548			28.8	106	862			32.0	103
125	78.33	25	32.0	133	548			36.0	129	862			40.0	125	1175			
150	65.28	30	38.4	157	548			43.2	152	862			48.0	147	1175			
175	55.95	35	44.8	180	548			50.4	175	862			56.0	169	1175			
40	200	48.96	40	51.2	204	548	2510		57.6	197	862	2820		64.0	191	1175	3140	
	225	43.52	45	57.6	227	548			64.8	220	862			72.0	213	1175		
	250	39.17	50	64.0	251	548			72.0	243	862			80.0	235	1175		
	275	35.61	60	70.4	280	370			79.2	271	684			88.0	262	997		
	300	32.64	70	76.8	308	222			86.4	299	535			96.0	289	849		
	100	153.13	20	25.6	109	858			28.8	106	1348			32.0	103	1838		
125	122.50	25	32.0	133	858			36.0	129	1348			40.0	125	1838			
150	102.08	30	38.4	157	857			43.2	152	1347			48.0	147	1837			
175	87.50	35	44.8	180	858			50.4	175	1348			56.0	169	1838			
50	200	76.56	40	51.2	204	857	3920		57.6	197	1347	4410		64.0	191	1837	4900	
	225	68.06	45	57.6	227	858			64.8	220	1348			72.0	213	1838		
	250	61.25	50	64.0	251	858			72.0	243	1348			80.0	235	1838		
	275	55.68	55	70.4	275	857			79.2	266	1347			88.0	257	1837		
	300	51.04	60	76.8	298	857			86.4	289	1347			96.0	279	1837		
	350	43.75	70	89.6	345	858			100.8	334	1348			112.0	323	1838		
100	220.49	20	25.6	109	1235			28.8	106	1940			32.0	103	2646			
125	176.39	25	32.0	133	1235			36.0	129	1940			40.0	125	2646			
150	146.99	30	38.4	157	1235			43.2	152	1940			48.0	147	2646			
175	125.99	35	44.8	180	1235			50.4	175	1940			56.0	169	2646			
60	200	110.24	40	51.2	204	1235	5640		57.6	197	1940	6350		64.0	191	2646	7060	
	225	97.99	45	57.6	227	1235			64.8	220	1940			72.0	213	2646		
	250	88.19	50	64.0	251	1235			72.0	243	1940			80.0	235	2646		
	275	80.18	55	70.4	275	1235			79.2	266	1940			88.0	257	2646		
	300	73.50	60	76.8	298	1235			86.4	289	1940			96.0	279	2646		
	350	63.00	70	89.6	345	1235			100.8	334	1940			112.0	323	2646		

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#### CRUVH

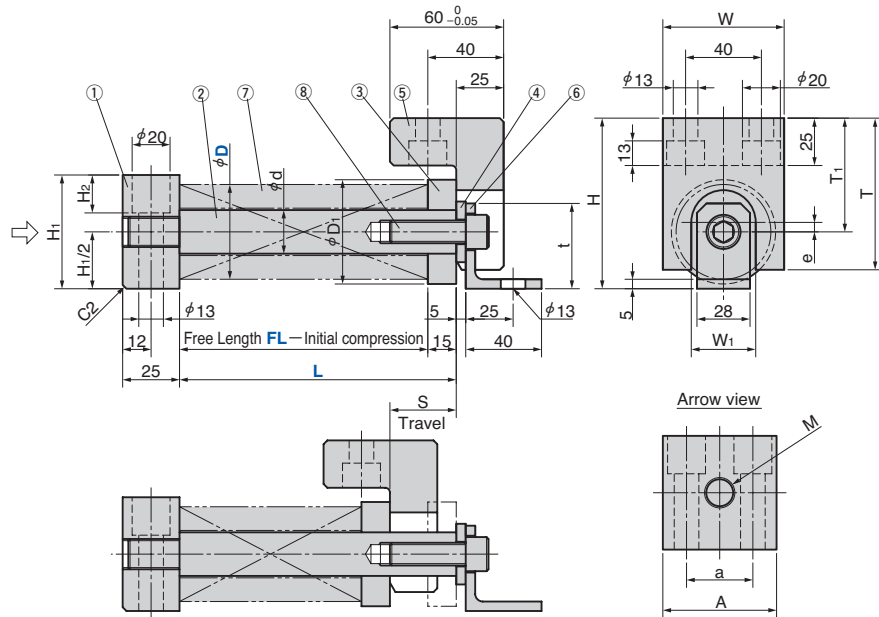
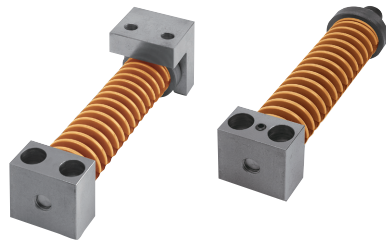
D	Free Length FL	Spring Constant N/mm	Standard Travel S	Reference Value for Standard Travel (1,000,000 strokes) Free Length x19.2%				Reference Value for Standard Travel (500,000 strokes) Free Length x21.6%				Reference Value for Standard Travel (300,000 strokes) Free Length x24%						
				Compression	L	Initial Load N	Final Load N	Compression	L	Initial Load N	Final Load N	Compression	L	Initial Load N	Final Load N			
				100	196.30	20	19.2					21.6	113	314			24.0	111
125	157.04	25	24.0					27.0	138	314			30.0	135	785			
150	130.86	30	28.8					32.4	163	314			36.0	159	785			
175	112.17	35	33.6					37.8	187	314			42.0	183	785			
40	200	98.15	40	38.4			3770		43.2	212	314	4240		48.0	207	785	4710	
	225	87.24	45	43.2					48.6	236	314			54.0	231	785		
	250	78.52	50	48.0					54.0	261	314			60.0	255	785		
	275	71.38	55	52.8					59.4	286	314			66.0	279	785		
	300	65.43	60	57.6					64.8	310	314			72.0	303	785		
	100	306.48	20	19.2					21.6	113	490			24.0	111	1226		
125	245.19	25	24.0					27.0	138	490			30.0	135	1226			
150	204.32	30	28.8					32.4	163	490			36.0	159	1226			
175	175.13	35	33.6					37.8	187	490			42.0	183	1226			
50	200	153.24	40	38.4			5880		43.2	212	490	6620		48.0	207	1226	7360	
	225	136.21	45	43.2					48.6	236	490			54.0	231	1226		
	250	122.59	50	48.0					54.0	261	490			60.0	255	1226		
	275	111.45	55	52.8					59.4	286	490			66.0	279	1226		
	300	102.16	60	57.6					64.8	310	490			72.0	303	1226		
	350	87.57	70	67.2					75.6	359	490			84.0	351	1226		
100	441.67	20	19.2					21.6	113	707			24.0	111	1767			
125	353.33	25	24.0					27.0	138	707			30.0	135	1767			
150	294.44	30	28.8					32.4	163	707			36.0	159	1767			
175	252.38	35	33.6					37.8	187	707			42.0	183	1767			
60	200	220.83	40	38.4			8470		43.2	212	707	9540		48.0	207	1767	10590	
	225	196.30	45	43.2					48.6	236	707			54.0	231	1767		
	250	176.67	50	48.0					54.0	261	707			60.0	255	1767		
	275	160.61	55	52.8					59.4	286	707			66.0	279	1767		
	300	147.22	60	57.6					64.8	310	707			72.0	303	1767		
	350	126.19	70	67.2					75.6	359	707			84.0	351	1767		

# Spring Unit for Cam Return

## Selective Pressure and Final Pressure Type

### Cam Slide Components

CRUVF  
CRFVF (Type without ⑤ and ⑥)



No.	Description	Qty	Material and Remark
1	Spring Block	1	Steel
2	Spring Guide Pin	1	Steel
3	Spring Retainer	1	Cast Iron
4	Washer	1	Steel

No.	Description	Qty	Material and Remark
5	Return Plate	1	Steel (Only CRUVF)
6	Angle	1	Steel (Only CRUVF)
7	Coil Spring	1	TF by TOHATSU
8	Hexagon Socket Head Bolt	1	M12x40

D	d	D1	H1	H2	t	A	a	M	W	W1	H	T	T1	e
40	18	45	50	15	40	55	30	M12	64	34	80	75	55	2.5
50	23	55	60	20	45	60	35	M16			90	80	60	
60	28	65	70	25	50	70	40	M20	74	39	100	85	65	

● Coil spring TF load table and reference value for standard travel (Standard value: 500,000 strokes)

D	Free Length FL	Spring Constant N/mm	Free Length x40% (1,000,000 strokes)		Free Length x45% (500,000 strokes)		Free Length x50% (300,000 strokes)		Reference Value for Standard Travel (500,000 strokes)				
			Compression	Load N	Compression	Load N	Compression	Load N	S	L	Initial Load N	Final Load N	
40	90	27.85	36.0		40.5		45.0		20	85	571		
	100	25.07	40.0		45.0		50.0		25	95	501		
	125	20.05	50.0		56.3		62.5		30	114	527		
	150	16.71	60.0		67.5		75.0		35	133	543		
	175	14.32	70.0	1000	78.8	1128	87.5	1255	40	151	556	1128	
	200	12.53	80.0		90.0		100.0		45	170	564		
	225	11.14	90.0		101.3		112.5		50	189	571		
	250	10.03	100.0		112.5		125.0		55	208	577		
	275	9.12	110.0		123.8		137.5		65	231	536		
	300	8.36	120.0		135.0		150.0		70	250	543		
50	100	39.22	40.0		45.0		50.0		20	90	981		
	125	31.38	50.0		56.3		62.5		25	109	982		
	150	26.15	60.0		67.5		75.0		30	128	981		
	175	22.41	70.0		78.8		87.5		35	146	982		
	200	19.61	80.0	1569	90.0	1765	100.0	1961	40	165	981	1765	
	225	17.43	90.0		101.3		112.5		45	184	981		
	250	15.69	100.0		112.5		125.0		50	203	981		
	275	14.26	110.0		123.8		137.5		55	221	981		
	300	13.07	120.0		135.0		150.0		60	240	980		
	350	11.21	140.0		157.5		175.0		70	278	981		
400	9.81	160.0		180.0		200.0		80	315	981			
60	100	56.44	40.0		45.0		50.0		20	90	1411		
	125	45.16	50.0		56.3		62.5		25	109	1414		
	150	37.63	60.0		67.5		75.0		30	128	1411		
	175	32.25	70.0		78.8		87.5		35	146	1413		
	200	28.22	80.0		90.0		100.0		40	165	1411		
	225	25.09	90.0	2260	101.3	2540	112.5	2820	45	184	1413	2540	
	250	22.58	100.0		112.5		125.0		50	203	1411		
	275	20.53	110.0		123.8		137.5		55	221	1412		
	300	18.81	120.0		135.0		150.0		60	240	1411		
	350	16.13	140.0		157.5		175.0		70	278	1411		
400	14.11	160.0		180.0		200.0		80	315	1411			

Catalog No.	D	Free Length FL	Spring Guide Pin L (1 mm increments, Fractions to be rounded)
CRUVF CRFVF	40	Select the value from the table above.	FL – Initial compression + 15
	50	(Note) Please note, a size not in the table may be specified.	
	60		



Catalog No.	D	FL	L
CRUVF	40	125	114
CRFVF	40	125	114

### For your order

Determine the specification with the steps below:

- Determine the Initial Load, travel and Final Load per unit.
- Select the outer diameter (D) and the free length (FL) of the coil spring satisfying ① and other conditions.
- With the calculation formula in L of the table, obtain the length of the spring guide pin.

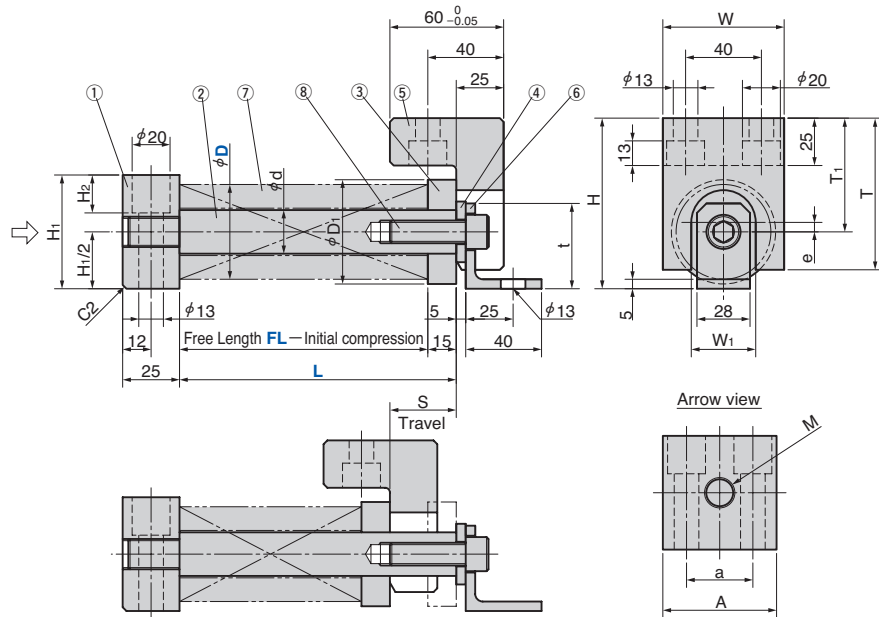
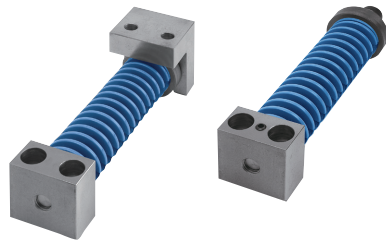
Now, the steps for the specification are completed. The order codes are determined by ② and ③.

# Spring Unit for Cam Return

Selective Pressure and Final Pressure Type

## Cam Slide Components

CRUVL  
CRFVL (Type without ⑤ and ⑥)



No.	Description	Qty	Material and Remark
1	Spring Block	1	Steel
2	Spring Guide Pin	1	Steel
3	Spring Retainer	1	Cast Iron
4	Washer	1	Steel

No.	Description	Qty	Material and Remark
5	Return Plate	1	Steel (Only CRUVL)
6	Angle	1	Steel (Only CRUVL)
7	Coil Spring	1	TL by TOHATSU
8	Hexagon Socket Head Bolt	1	M12x40

D	d	D <sub>1</sub>	H <sub>1</sub>	H <sub>2</sub>	t	A	a	M	W	W <sub>1</sub>	H	T	T <sub>1</sub>	e
40	18	45	50	15	40	55	30	M12	64	34	80	75	55	2.5
50	23	55	60	20	45	60	35	M16			90	80	60	
60	28	65	70	25	50	70	40	M20	74	39	100	85	65	5

● Coil spring TL load table and reference value for standard travel (Standard value: 500,000 strokes)

D	Free Length FL	Spring Constant N/mm	Free Length x32% (1,000,000 strokes)		Free Length x36% (500,000 strokes)		Free Length x40% (300,000 strokes)		Reference Value for Standard Travel (500,000 strokes)				
			Compression	Load N	Compression	Load N	Compression	Load N	S	L	Initial Load N	Final Load N	
40	90	58.73	28.8		32.4		36.0		20	93	728		
	100	52.86	32.0		36.0		40.0		25	104	581		
	125	42.29	40.0		45.0		50.0		30	125	634		
	150	35.24	48.0		54.0		60.0		35	146	670		
	175	30.21	56.0		63.0	1903	70.0	2120	40	167	695		
	200	26.43	64.0	1697	72.0		80.0		45	188	714		1903
	225	23.49	72.0		81.0		90.0		50	209	728		
	250	21.14	80.0		90.0		100.0		55	230	740		
	275	19.22	88.0		99.0		110.0		65	256	653		
	300	17.62	96.0		108.0		120.0		70	277	670		
50	90	91.98	28.8		32.4		36.0		20	93	1141		
	100	82.78	32.0		36.0		40.0		25	104	911		
	125	66.22	40.0		45.0		50.0		30	125	993		
	150	55.19	48.0		54.0		60.0		35	146	1049		
	175	47.30	56.0		63.0		70.0		40	167	1088		
	200	41.39	64.0	2650	72.0	2980	80.0	3310	45	188	1118		2980
	225	36.79	72.0		81.0		90.0		50	209	1140		
	250	33.11	80.0		90.0		100.0		55	230	1159		
	275	30.10	88.0		99.0		110.0		60	251	1174		
	300	27.59	96.0		108.0		120.0		70	277	1048		
60	90	132.41	28.8		32.4		36.0		20	93	1642		
	100	119.17	32.0		36.0		40.0		25	104	1311		
	125	95.33	40.0		45.0		50.0		30	125	1430		
	150	79.44	48.0		54.0		60.0		35	146	1509		
	175	68.10	56.0		63.0		70.0		40	167	1566		
	200	59.58	64.0	3810	72.0	4290	80.0	4770	45	188	1609		4290
	225	52.96	72.0		81.0		90.0		50	209	1642		
	250	47.67	80.0		90.0		100.0		60	235	1430		
	275	43.33	88.0		99.0		110.0		65	256	1473		
	300	39.72	96.0		108.0		120.0		70	277	1509		
350	34.05	112.0		126.0		140.0		80	319	1088			

Catalog No.	D	Free Length FL	Spring Guide Pin L (1 mm increments, Fractions to be rounded)
CRUVL CRFVL	40	Select the value from the table above.	FL – Initial compression + 15
	50	Note) Please note, a size not in the table may be specified.	
	60		



Catalog No.	D	FL	L
CRUVL	50	175	167
CRFVL	50	175	167

### For your order

Determine the specification with the steps below:

- Determine the Initial Load, travel and Final Load per unit.
- Select the outer diameter (D) and the free length (FL) of the coil spring satisfying ① and other conditions.
- With the calculation formula in L of the table, obtain the length of the spring guide pin.

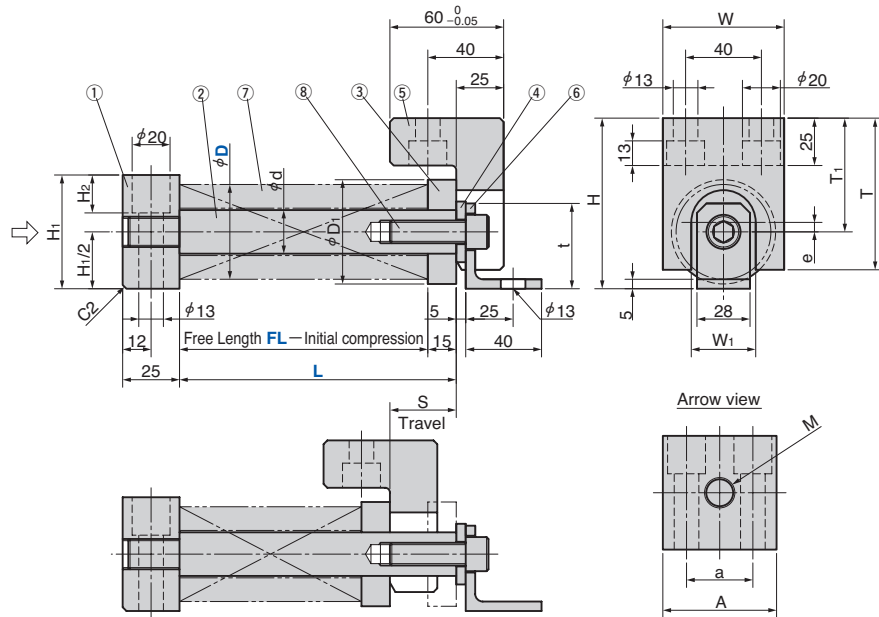
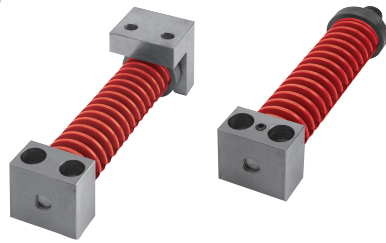
Now, the steps for the specification are completed. The order codes are determined by ② and ③.

# Spring Unit for Cam Return

## Selective Pressure and Final Pressure Type

### Cam Slide Components

CRUVM  
CRFVM (Type without ⑤ and ⑥)



No.	Description	Qty	Material and Remark
1	Spring Block	1	Steel
2	Spring Guide Pin	1	Steel
3	Spring Retainer	1	Cast Iron
4	Washer	1	Steel

No.	Description	Qty	Material and Remark
5	Return Plate	1	Steel (Only CRUVM)
6	Angle	1	Steel (Only CRUVM)
7	Coil Spring	1	TM by TOHATSU
8	Hexagon Socket Head Bolt	1	M12x40

D	d	D1	H1	H2	t	A	a	M	W	W1	H	T	T1	e
40	18	45	50	15	40	55	30	M12	64	34	80	75	55	2.5
50	23	55	60	20	45	60	35	M16			90	80	60	
60	28	65	70	25	50	70	40	M20	74	39	100	85	65	5

● Coil spring TM load table and reference value for standard travel (Standard value: 300,000 strokes)

D	Free Length FL	Spring Constant N/mm	Free Length x25.6% (1,000,000 strokes)		Free Length x28.8% (500,000 strokes)		Free Length x32% (300,000 strokes)		Reference Value for Standard Travel (300,000 strokes)				
			Compression	Load N	Compression	Load N	Compression	Load N	S	L	Initial Load N	Final Load N	
40	100	97.92	25.6		28.8		32.0		20	103	1175		
	125	78.33	32.0		36.0		40.0		25	125	1175		
	150	65.28	38.4		43.2		48.0		30	147	1175		
	175	55.95	44.8		50.4		56.0		35	169	1175		
	200	48.96	51.2	2510	57.6	2820	64.0	3140	40	191	1175	3140	
	225	43.52	57.6		64.8		72.0		45	213	1175		
	250	39.17	64.0		72.0		80.0		50	235	1175		
50	275	35.61	70.4		79.2		88.0		60	262	997		
	300	32.64	76.8		86.4		96.0		70	289	849		
	100	153.13	25.6		28.8		32.0		20	103	1838		
	125	122.50	32.0		36.0		40.0		25	125	1838		
	150	102.08	38.4		43.2		48.0		30	147	1837		
	175	87.50	44.8		50.4		56.0		35	169	1838		
	200	76.56	51.2	3920	57.6	4410	64.0	4900	40	191	1837	4900	
60	225	68.06	57.6		64.8		72.0		45	213	1838		
	250	61.25	64.0		72.0		80.0		50	235	1838		
	275	55.68	70.4		79.2		88.0		55	257	1837		
	300	51.04	76.8		86.4		96.0		60	279	1837		
	350	43.75	89.6		100.8		112.0		70	323	1838		
	100	220.49	25.6		28.8		32.0		20	103	2646		
	125	176.39	32.0		36.0		40.0		25	125	2646		
60	150	146.99	38.4		43.2		48.0		30	147	2646		
	175	125.99	44.8		50.4		56.0		35	169	2646		
	200	110.24	51.2	5640	57.6	6350	64.0	7060	40	191	2646	7060	
	225	97.99	57.6		64.8		72.0		45	213	2646		
	250	88.19	64.0		72.0		80.0		50	235	2646		
	275	80.18	70.4		79.2		88.0		55	257	2646		
	300	73.50	76.8		86.4		96.0		60	279	2646		
350	63.00	89.6		100.8		112.0		70	323	2646			

Catalog No.	D	Free Length FL	Spring Guide Pin L (1 mm increments, Fractions to be rounded)
CRUVM CRFVM	40	Select the value from the table above.	FL - Initial compression + 15
	50	Note) Please note, a size not in the table may be specified.	
	60		



Catalog No.	D	FL	L
CRUVM	50	150	147
CRFVM	50	150	147

### For your order

Determine the specification with the steps below:

- Determine the Initial Load, travel and Final Load per unit.
- Select the outer diameter (D) and the free length (FL) of the coil spring satisfying ① and other conditions.
- With the calculation formula in L of the table, obtain the length of the spring guide pin.

Now, the steps for the specification are completed. The order codes are determined by ② and ③.

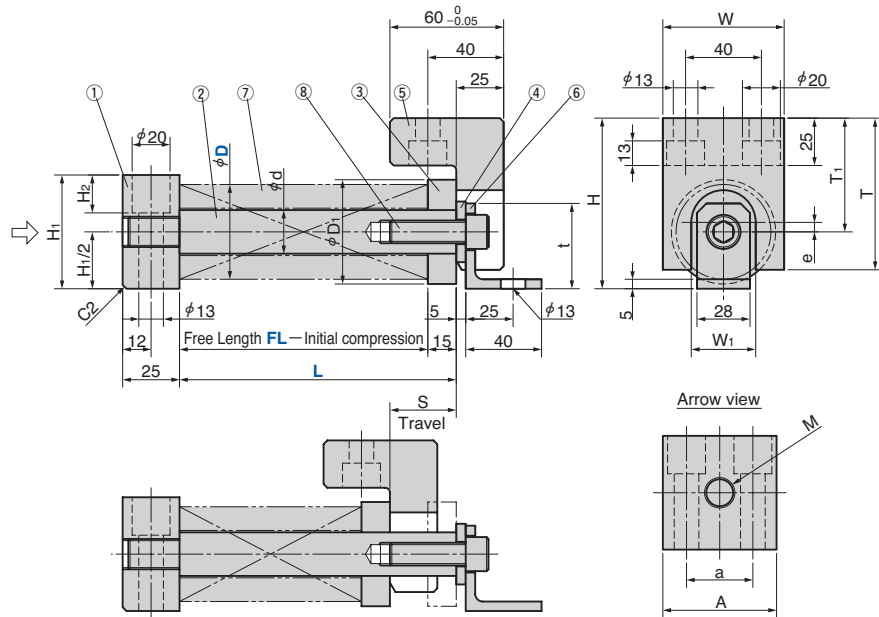
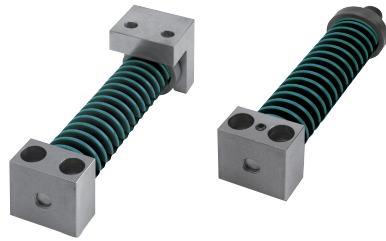


# Spring Unit for Cam Return

## Selective Pressure and Final Pressure Type

### Cam Slide Components

CRUVH  
CRFVH (Type without ⑤ and ⑥)



No.	Description	Qty	Material and Remark
1	Spring Block	1	Steel
2	Spring Guide Pin	1	Steel
3	Spring Retainer	1	Cast Iron
4	Washer	1	Steel

No.	Description	Qty	Material and Remark
5	Return Plate	1	Steel (Only CRUVH)
6	Angle	1	Steel (Only CRUVH)
7	Coil Spring	1	TH by TOHATSU
8	Hexagon Socket Head Bolt	1	M12x40

D	d	D <sub>1</sub>	H <sub>1</sub>	H <sub>2</sub>	t	A	a	M	W	W <sub>1</sub>	H	T	T <sub>1</sub>	e
40	18	45	50	15	40	55	30	M12	64	34	80	75	55	2.5
50	23	55	60	20	45	60	35	M16						
60	28	65	70	25	50	70	40	M20	74	39	100	85	65	5

● Coil spring TH load table and reference value for standard travel (Standard value: 300,000 strokes)

D	Free Length FL	Spring Constant N/mm	Free Length x19.2% (1,000,000 strokes)		Free Length x21.6% (500,000 strokes)		Free Length x24% (300,000 strokes)		Reference Value for Standard Travel (300,000 strokes)				
			Compression	Load N	Compression	Load N	Compression	Load N	S	L	Initial Load N	Final Load N	
40	100	196.30	19.2		21.6		24.0		20	111	785		
	125	157.04	24.0		27.0		30.0		25	135	785		
	150	130.86	28.8		32.4		36.0		30	159	785		
	175	112.17	33.6		37.8		42.0		35	183	785		
	200	98.15	38.4	3770	43.2	4240	48.0	4710	40	207	785	4710	
	225	87.24	43.2		48.6		54.0		45	231	785		
	250	78.52	48.0		54.0		60.0		50	255	785		
50	275	71.38	52.8		59.4		66.0		55	279	785		
	300	65.43	57.6		64.8		72.0		60	303	785		
	100	306.48	19.2		21.6		24.0		20	111	1226		
	125	245.19	24.0		27.0		30.0		25	135	1226		
	150	204.32	28.8		32.4		36.0		30	159	1226		
	175	175.13	33.6		37.8		42.0		35	183	1226		
	200	153.24	38.4	5880	43.2	6620	48.0	7360	40	207	1226	7360	
60	225	136.21	43.2		48.6		54.0		45	231	1226		
	250	122.59	48.0		54.0		60.0		50	255	1226		
	275	111.45	52.8		59.4		66.0		55	279	1226		
	300	102.16	57.6		64.8		72.0		60	303	1226		
	350	87.57	67.2		75.6		84.0		70	351	1226		
	100	441.67	19.2		21.6		24.0		20	111	1767		
	125	353.33	24.0		27.0		30.0		25	135	1767		
60	150	294.44	28.8		32.4		36.0		30	159	1767		
	175	252.38	33.6		37.8		42.0		35	183	1767		
	200	220.83	38.4	8470	43.2	9540	48.0	10590	40	207	1767	10590	
	225	196.30	43.2		48.6		54.0		45	231	1767		
	250	176.67	48.0		54.0		60.0		50	255	1767		
	275	160.61	52.8		59.4		66.0		55	279	1767		
	300	147.22	57.6		64.8		72.0		60	303	1767		
350	126.19	67.2		75.6		84.0		70	351	1767			

Catalog No.	D	Free Length FL	Spring Guide Pin L (1 mm increments, Fractions to be rounded)
CRUVH CRFVH	40	Select the value from the table above.	FL – Initial compression + 15
	50	Note) Please note, a size not in the table may be specified.	
	60		



Catalog No.	D	FL	L
CRUVH	60	200	207
CRFVH	60	200	207

### For your order

Determine the specification with the steps below:

- Determine the Initial Load, travel and Final Load per unit.
- Select the outer diameter (D) and the free length (FL) of the coil spring satisfying ① and other conditions.
- With the calculation formula in L of the table, obtain the length of the spring guide pin.

Now, the steps for the specification are completed. The order codes are determined by ② and ③.