



Spur
Gears

Helical
Gears

Internal
Gears

Racks

CP Racks
& Pinions

Miter
Gears

Bevel
Gears

Screw
Gears

Worm
Gear Pair

Bevel
Gearboxes

Other
Products



■ Features

Characteristics of Pawls and Ratchets

- A simple structure used to restrict the rotational direction in one-way.
- The tips of pawls and the teeth of ratchets are induction hardened and therefore have superior durability.

■ Points to observe during use

- No secondary operations can be performed on tooth areas including the bottom land (approx. 2 to 3 mm), due to gear teeth induction hardened.
- The pawls are designed to prevent reverse rotation. They are not suitable for use as driving ratchets or driving rotation.
- SRT2/ 3-C is manufactured using a lost wax casting method.
- Regarding SRTB ratchets with hubs, please note the direction of teeth, viewing from the hub side. KHK can produce ratchets which have the teeth pointed in the opposite direction as a custom order item.

■ Bending strength of Ratchets

The allowable transmission forces F_b (N) of ratchets is the value calculated by the following formula.

$$F_b = \sigma_b \cdot \frac{b \cdot e^2}{6} \cdot \frac{1}{h} \cdot \frac{1}{S_F}$$

Also, the SRT Ratchet's allowable torque T (N · m) for bending strength is calculated by the following formula.

$$T = F_b \cdot r_f$$

Where

σ_b = Bending stress (Assumed 225.55MPa)

b = Face width E (mm)

e = Root length (mm)

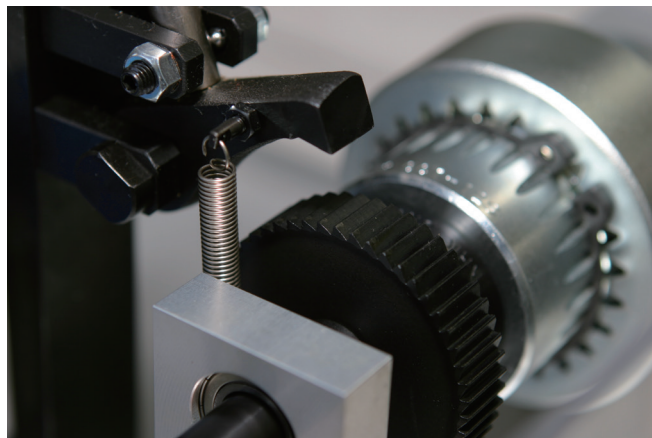
$$e = \text{Depth of teeth } (h) \times \tan \left(60 - \frac{360}{\text{No. of teeth } (z)} \right)$$

h = Depth of teeth (H) (mm)

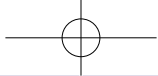
S_F = Safety factor (Assumed 2)

r_f = Tooth root radius (m)

$$\rightarrow r_f = \frac{\text{Outside dia. } D - (2 \cdot h)}{2000}$$

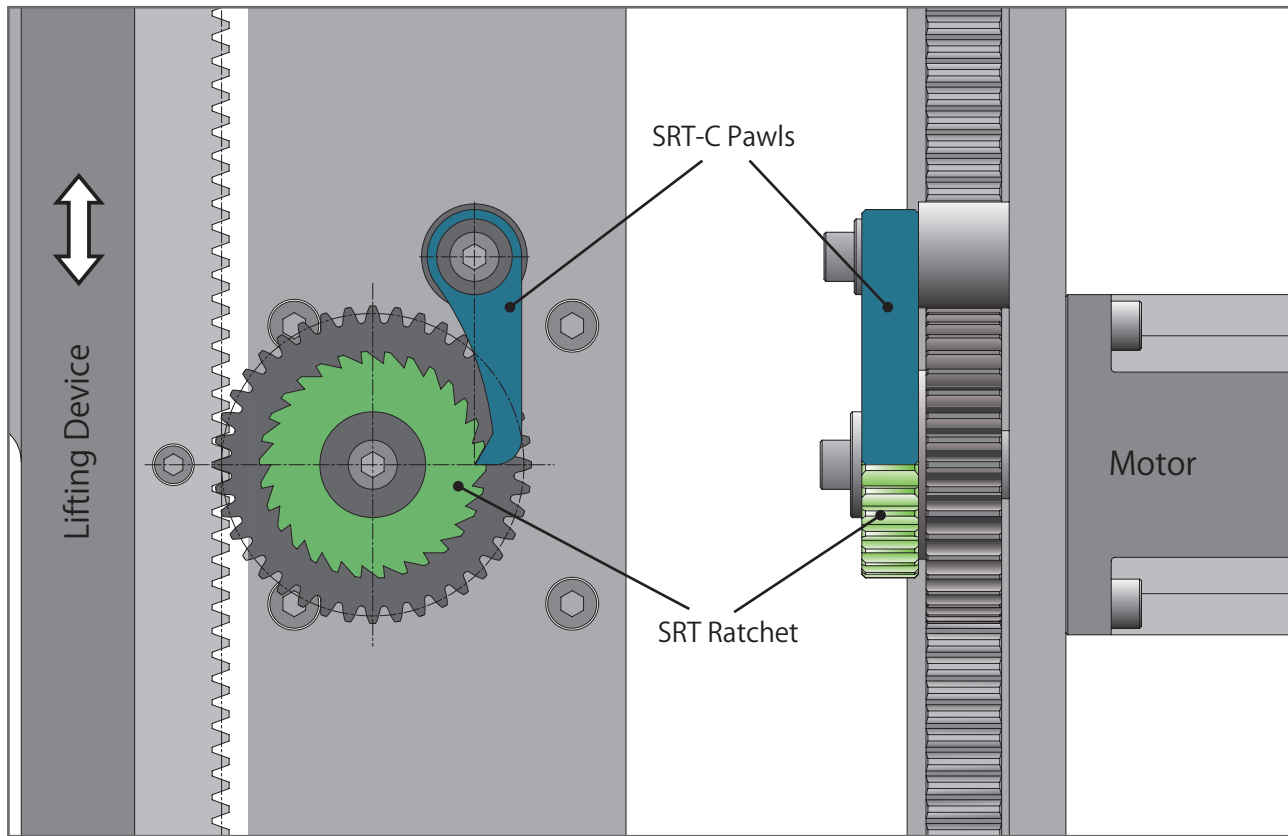


Assembly example: KHK Stock Gears Sample Units

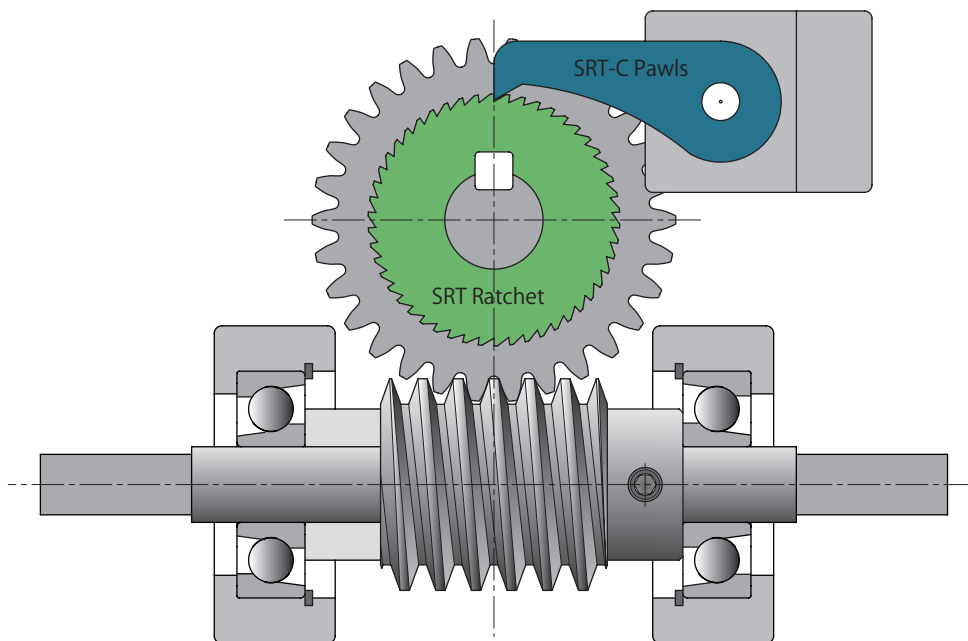


Application

* The illustration is a design example, not a design for machinery or a device in actual use.



Example: SRT Ratchets used as a free-fall prevention mechanism of a lift device*



Example: ratchets used for complete reverse prevention of worm gears *

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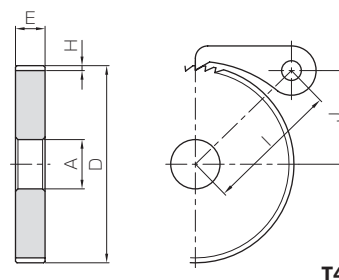
SRT Ratchets



Pitch 2.09 ~ 12.57



Specifications	
Angle of teeth	60°
Material	S45C
Heat treatment	Induction hardened teeth
Tooth hardness	50 ~ 60HRC



Catalog No.	Pitch	No. of teeth	Shape	Bore		Outside dia.	Face width		Hub width	Total length	Depth of teeth	Center distance	Mounting distance	Allowable torque (N · m)		Weight (kg)
				A	B		E	F						Bending strength	Bending strength	
SRT2/3-50	2.09	50	T4	10		33.3	6	—	6	1		33.84	15.67	3.07	0.31	0.035
SRT2/3-60		60		10		40						35.51	19	4.10	0.42	0.053
SRT2/3-80		80		12		53.3						39.48	25.67	6.00	0.61	0.096
SRT2/3-90		90		12		60						41.73	29	7.11	0.73	0.12
SRT2/3-100		100		12		66.6						44.11	32.33	8.24	0.84	0.15
SRT1-50	3.14	50	T4	12		50	12	—	12	1.6		45.48	23.4	14.7	1.50	0.16
SRT1-60		60		15		60						48.24	28.4	19.5	1.99	0.24
SRT1-80		80		15		80						54.73	38.4	29.4	3.00	0.44
SRT1-90		90		15		90						58.35	43.4	34.5	3.52	0.56
SRT1-100		100		15		100						62.16	48.4	39.4	4.02	0.70
SRT2-30	6.28	30	T4	15		60	15	—	15	3.1		61.23	26.9	29.0	2.96	0.28
SRT2-40		40		15		80						66.23	36.9	49.2	5.02	0.53
SRT2-50		50		15		100						72.28	46.9	70.8	7.22	0.85
SRT2-60		60		15		120						79.14	56.9	94.3	9.61	1.24
SRT3-30	9.42	30	T4	15		90	20	—	20	5		76.32	40	92.6	9.44	0.86
SRT3-40		40		20		120						85.15	55	158	16.1	1.58
SRT3-50		50		20		150						95.52	70	229	23.3	2.54
SRT4-30	12.57	30	T4	20		120	25	—	25	7.4		95.74	52.6	226	23.0	1.89
SRT4-40		40		20		160						108.03	72.6	385	39.3	3.53
SRT4-50		50		20		200						122.37	92.6	559	57.0	5.66

- [Caution on Product Characteristics] ① Regarding SRTB ratchets with hubs, please note the direction of teeth, viewed from the hub side. KHK can produce ratchets that have teeth pointed in the opposite direction as a custom order item.
 ② Due to heat treating, some deformation of the bore may occur. It may be necessary to ream the bore to bring to the stated dimensions.

- [Caution on Secondary Operations] ① Due to gear teeth induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 2 to 3 mm).

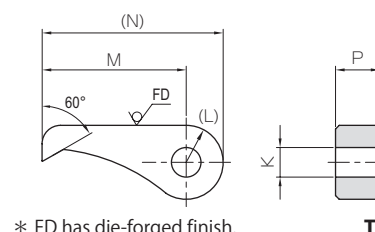
SRT-C Pawls



Pitch 2.09 ~ 12.57



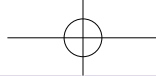
Specifications	
Angle of teeth	60°
Material	S45C
Heat treatment	Induction hardened teeth
Tooth hardness	50 ~ 60HRC



* FD has die-forged finish.

Catalog No.	Shape	K	(L)	M	(N)	P	Weight (kg)
SRT2/3-C	T5	5	(8)	30	(38)	6	0.020
SRT1-C		8	(10)	39	(49)	12	0.057
SRT2-C		10	(12.5)	55	(67.5)	15	0.13
SRT3-C		12	(15)	65	(80)	20	0.23
SRT4-C		13	(18)	80	(98)	25	0.38

- [Caution on Product Characteristics] ① The pawls are designed to prevent reverse rotation. They are not suitable for use as driving ratchets or driving rotation.
 ② SRT2/3-C is manufactured using a lost wax casting method.



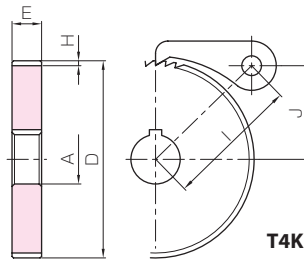
SRT

J Series



Ratchets

Newly added



To order J Series products, please specify; **Catalog No. + J + BORE**

Bore	* The product shapes of J Series items are identified by background color.																	
Keyway Js9	10	12	14	15	16	17	18	19	20	22	25	28	30	32	35	40	45	50
Screw size	4 × 1.8		5 × 2.3				6 × 2.8				8 × 3.3			10 × 3.3		12 × 3.3	14 × 3.8	
Catalog No.	—																	
SRT2/3-50 J BORE																		
SRT2/3-60 J BORE																		
SRT2/3-80 J BORE																		
SRT2/3-90 J BORE																		
SRT2/3-100 J BORE																		
SRT1-50 J BORE																		
SRT1-60 J BORE																		
SRT1-80 J BORE																		
SRT1-90 J BORE																		
SRT1-100 J BORE																		
SRT2-30 J BORE																		
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SRT4-50 J BORE																		

[Caution on J series]

- ① As available-on-request products, requires a lead-time for shipping within 2 working-days (excludes the day ordered), after placing an order.
Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap.
- ⑤ Areas of products which have been re-worked will not be black oxide coated.
- ⑥ For products having a tapped hole, a set screw is included.

SRT-C

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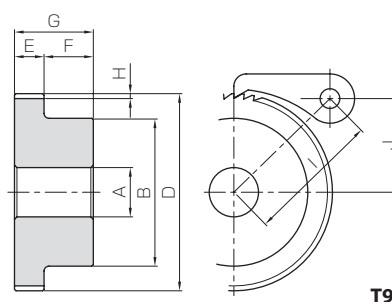
SRTB Ratchets



Pitch 2.09 ~ 12.57



Specifications	
Angle of teeth	60°
Material	S45C
Heat treatment	Induction hardened teeth
Tooth hardness	50 ~ 60HRC
Screw offset (K)	Half of (F)



Catalog No.	Pitch	No. of teeth	Shape	Bore	Hub dia.	Outside dia.	Face width	Hub width	Total length	Depth of teeth	Center distance	Mounting distance	Allowable torque (N · m)	Allowable torque (kgf · m)	Weight
				A	B	D	E	F	G	H	I	J	Bending strength	Bending strength	(kg)
SRTB2/3-50 SRTB2/3-60 SRTB2/3-80 SRTB2/3-90 SRTB2/3-100	2.09	50	T9	10	25	33.3	6	10	16	1	33.84 35.51 39.48 41.73 44.11	15.67 19 25.67 29 32.33	3.07	0.31	0.067
60		10		30	40	4.10							0.42	0.10	
80		12		35	53.3	6.00							0.61	0.16	
90		12		40	60	7.11							0.73	0.21	
100		12		40	66.6	8.24							0.84	0.24	
SRTB1-50 SRTB1-60 SRTB1-80 SRTB1-90 SRTB1-100	3.14	50	T9	12	35	50	12	12	24	1.6	45.48 48.24 54.73 58.35 62.16	23.4 28.4 38.4 43.4 48.4	14.7	1.50	0.24
60		15		40	60	19.5							1.99	0.34	
80		15		50	80	29.4							3.00	0.61	
90		15		50	90	34.5							3.52	0.73	
100		15		50	100	39.4							4.02	0.87	
SRTB2-30 SRTB2-40 SRTB2-50 SRTB2-60	6.28	30	T9	15	50	60	15	14	29	3.1	61.23 66.23 72.28 79.14	26.9 36.9 46.9 56.9	29.0	2.96	0.47
40		15		60	80	49.2							5.02	0.82	
50		15		60	100	70.8							7.22	1.14	
60		15		65	120	94.3							9.61	1.59	
SRTB3-30 SRTB3-40 SRTB3-50	9.42	30	T9	15	75	90	20	16	36	5	76.32 85.15 95.52	40 55 70	92.6	9.44	1.40
40		20		80	120	158							16.1	2.17	
50		20		85	150	229							23.3	3.22	
SRTB4-30 SRTB4-40 SRTB4-50	12.57	30	T9	20	90	120	25	18	43	7.4	95.74 108.03 122.37	52.6 72.6 92.6	226	23.0	2.75
40		20		90	160	385							39.3	4.38	
50		20		100	200	559							57.0	6.72	

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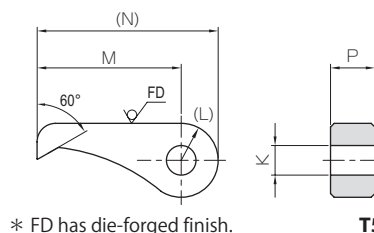
SRT-C Pawls



Pitch 2.09 ~ 12.57



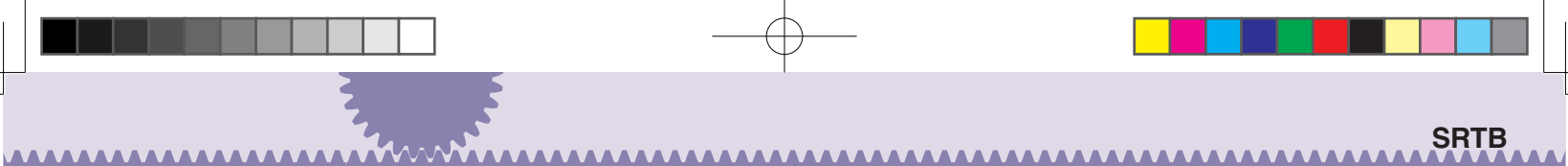
Specifications	
Angle of teeth	60°
Material	S45C
Heat treatment	Induction hardened teeth
Tooth hardness	50 ~ 60HRC



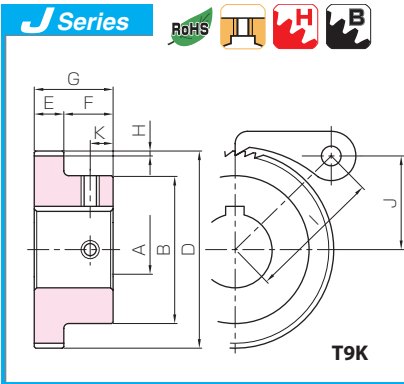
* FD has die-forged finish.

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SRTB



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Screw size		4 × 1.8		5 × 2.3				6 × 2.8				8 × 3.3			10 × 3.3		12 × 3.3	14 × 3.8	
Catalog No.		—																	
SRTB2/3-50 J BORE																			
SRTB2/3-60 J BORE																			
SRTB2/3-80 J BORE																			
SRTB2/3-90 J BORE																			
SRTB2/3-100 J BORE																			
SRTB1-50 J BORE																			
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