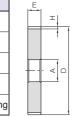
Bevel Gears

Screw Gears

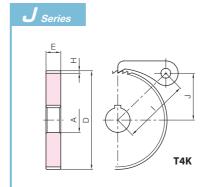




Sp	Specifications					
Tooth groove angle	60°					
Material	S45C					
Heat treatment	Gear teeth induction hardened					
Tooth hardness	50 to 60HRC					
Surface treatment	Black oxide coating					
	·					



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### 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.

Outstan Namehan	Dir. I	No. of	01	Bore	Hub dia.	Outside dia.	Face width	Hub width	Total length	Tooth height	Center distance	Mounting height	Allowable torque (N·m)	Allowable torque (kgf·m)	Weight
Catalog Number	Pitch	teeth	Shape	Α	В	D	Е	F	G	Н	I	J	Bending strength	Bending strength	(kg)
SRT2/3-50		50		10		33.3					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	2.09	80		12	—	53.3	6	—	6	1	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		50		12		50					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	3.14	80		15	—	80	12	—	12	1.6	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		30	T4			60			15	3.1	61.23	26.9	29.0	2.96	0.28
SRT2-40	6.28	40		15 —		80	15				66.23	36.9	49.2	5.02	0.53
SRT2-50	0.28	50		13	_	100	13	-	13	3.1	72.28	46.9	70.8	7.22	0.85
SRT2-60		60				120					79.14	56.9	94.3	9.61	1.24
SRT3-30		30		15		90					76.32	40	92.6	9.44	0.86
SRT3-40	9.42	40		20	_	120	20	—	20	5	85.15	55	158	16.1	1.58
SRT3-50		50		20		150					95.52	70	229	23.3	2.54
SRT4-30		30				120					95.74	52.6	226	23.0	1.89
SRT4-40	12.57	40		20	_	160	25	—	25	7.4	108.03	72.6	385	39.3	3.53
SRT4-50		50				200					122.37	92.6	559	57.0	5.66

[Caution on Product Characteristics] ① The bore may slightly vary due to the effect of heat treatment. When using with the indicated hole diameter, provide machining with a reamer or the like before use.

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

# To order J Series products, please specify: Catalog No. + J + BORE.

₹	××××××××××××××××××××××××××××××××××××××	**********	***********															
Bore H7 * 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 Number										_								
SRT2/3-50J BORE		T4K	T4K	T4K														
SRT2/3-60 J BORE		T4K	T4K	T4K	T4K	T4K	T4K	T4K										
SRT2/3-80 J BORE			T4K	T4K	T4K	T4K	T4K	T4K	T4K	T4K	T4K							
SRT2/3-90 J BORE			T4K	T4K	T4K	T4K	T4K	T4K	T4K	T4K	T4K	T4K						
SRT2/3-100 J BORE			T4K	T4K	T4K	T4K	T4K	T4K	T4K	T4K	T4K	T4K	T4K	T4K				
SRT1-50 J BORE			T4K	T4K	T4K	T4K	T4K	T4K	T4K	T4K								
SRT1-60 J BORE					T4K													
SRT1-80 J BORE					T4K	T4K	T4K	T4K										
SRT1-90 J BORE					T4K	T4K	T4K	T4K	T4K									
SRT1-100 J BORE					T4K	T4K	T4K	T4K	T4K	T4K								
SRT2-30 J BORE					T4K													
SRT2-40 J BORE					T4K	T4K	T4K	T4K										
SRT2-50 J BORE					T4K	T4K	T4K	T4K	T4K	T4K								
SRT2-60 J BORE					T4K	T4K	T4K	T4K	T4K	T4K	T4K							
SRT3-30 J BORE					T4K	T4K	T4K	T4K	T4K									
SRT3-40 J BORE										T4K	T4K	T4K	T4K	T4K	T4K	T4K	T4K	T4K
SRT3-50 J BORE										T4K	T4K	T4K	T4K	T4K	T4K	T4K	T4K	T4K
SRT4-30 J BORE										T4K	T4K	T4K	T4K	T4K	T4K	T4K	T4K	T4K
SRT4-40 J BORE										T4K	T4K	T4K	T4K	T4K	T4K	T4K	T4K	T4K
SRT4-50 J BORE										T4K	T4K	T4K	T4K	T4K	T4K	T4K	T4K	T4K

[Caution on J series] ① As available-on-request products, these require a lead-time for shipping of 2 working days (excludes the day ordered), after placing an order. Because the machining starts immediately, we cannot accept cancellations. Please see Page 38

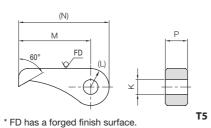
- 2) Number of pieces we can process for one order is 1 to 20 units. For larger quantities, please request price and delivery
- ③ Keyways are made according to JIS B1301 standards, Js9 tolerance. Also note that tooth phase matching is not performed.
- 4 Black oxide is not re-applied after hole and key secondary operations.
- (5) Certain products which would otherwise have a very long tapped hole are counterbored. Please see the website for more details.

## **Pawls**

# SRT-C Pitch 2.09~12.57 **Ratchet Pawls**



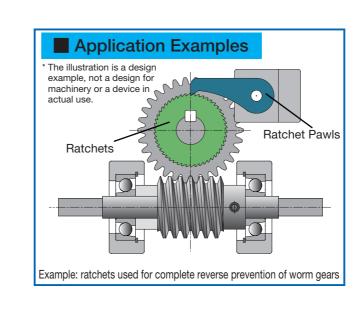
Specifications				
Tooth angle	60°			
Material	S45C			
Heat treatment	Pawl induction hardened			
Pawl hardness	50 to 60HRC			
Surface treatment	Black oxide coating			



Catalog Number	Shape	К	(L)	М	(N)	Р	Weight (kg)
SRT2/3-C		5	(8)	30	(38)	6	0.020
SRT1-C		8	(10)	39	(49)	12	0.057
SRT2-C	T5	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 ratchet pawl is for preventing reverse rotation. It cannot be used for feeding or indexing.

② SRT2/3-C is a lost wax product that uses S45C-equivalent material.



# Bending Strength of Ratchets

The allowable transmission force F<sub>b</sub> (N) of ratchets is the value calculated by the following formula.

$$\mathsf{F}_{\mathsf{b}} = \sigma_{\mathsf{b}} \cdot \frac{b \cdot \mathsf{e}^2}{6} \cdot \frac{1}{h} \cdot \frac{1}{S_{\mathsf{F}}}$$

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

- $\sigma_{\rm b}$ : Bending stress  $\rightarrow$  Assumed 225.55MPa (23kgf/mm<sup>2</sup>)
- b: Face width mm  $\rightarrow$  Dimension Table ratchet face width E
- $\rightarrow$  e= $h \times \tan \left(60 \frac{1}{\text{No. of teeth}}\right)$ is the calculation

- h: Depth of teeth mm  $\rightarrow$  Dimension Table ratchet tooth depth H
- $S_F$ : Safety factor  $\rightarrow$  Assumed 2
- $r_{\rm f}$ : Tooth root radius m
- $\rightarrow r_{\rm f} = \frac{\text{Outside dia. D} 2h}{2000}$  is the calculation

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Spur Gears

Screw Bevel Miter CP Racks & Racks Internal Gears Gears Pinions Gears Gears

Worm Gears

Gearboxes

Specifications					
Tooth groove angle	60°				
Material	S45C				
Heat treatment	Gear teeth induction hardened				
Tooth hardness	50 to 60HRC				
Surface treatment	Black oxide coating				

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### 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.

Catalog Number	Pitch	No. of teeth	Shape	Bore	Hub dia.	Outside dia.	Face width	Hub width	Total length	Tooth height
Catalog Number	Pilch	No. or teetri	Snape	А	В	D	Е	F	G	Н
SRTB2/3-50 (Made to Order)		50		10	25	33.3				
SRTB2/3-60 (Made to Order)		60		10	30	40				
SRTB2/3-80 (Made to Order)	2.09	80		12	35	53.3	6	10	16	1
SRTB2/3-90 (Made to Order)		90		12	40	60				
SRTB2/3-100 (Made to Order)		100		12	40	66.6				
SRTB1-50 (Made to Order)		50		12	35	50				
SRTB1-60 (Made to Order)		60		15	40	60		12	24	
SRTB1-80 (Made to Order)	3.14	80		15	50	80	12			1.6
SRTB1-90 (Made to Order)		90		15	50	90				
SRTB1-100 (Made to Order)		100		15	50	100				
SRTB2-30 (Made to Order)		30	T9		50	60				
SRTB2-40 (Made to Order)		40		15	60	80	15	14	29	3.1
SRTB2-50 (Made to Order)	6.28	50			60	100				3.1
SRTB2-60 (Made to Order)		60			65	120				
SRTB3-30 (Made to Order)		30		15	75	90				
SRTB3-40 (Made to Order)	9.42	40		20	80	120	20	16	36	5
SRTB3-50 (Made to Order)		50		20	85	150				
SRTB4-30 (Made to Order)		30			90	120				
SRTB4-40 (Made to Order)	12.57	40		20	90	160	25	18	43	7.4
SRTB4-50 (Made to Order)		50			100	200				

[Caution on Product Characteristics] ① For the ratchet with SRTB hub, pay attention to the orientation of the teeth with respect to the hub. Items with	
opposite orientation can be made to order.	

② The bore may slightly vary due to the effect of heat treatment. When using with the indicated hole diameter, provide mer or the like before use.

being induction hardened, no secondary operations can be performed on tooth areas including rox. 2 to 3 mm).

r Made to Order products require separate estimates. Contact your dealer.

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	condary Operations]  lade to Order Products]	1	he bott	om lar	nd (ap	pr
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Specifications				
Tooth angle	60°			
Material	S45C			
Heat treatment	Pawl induction hardened			
Pawl hardness	50 to 60HRC			
Surface treatment Black oxide coating				

(N)	
M FD (L)	- Y
FD has a forged finish su	urface. T5

Catalog Number	Shape	К	(L)	М	(N)	Р	Weight (kg)
SRT2/3-C		5	(8)	30	(38)	6	0.020
SRT1-C		8	(10)	39	(49)	12	0.057
SRT2-C	T5	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 ratchet pawl is for preventing reverse rotation. It cannot be used for feeding or indexing.

② SRT2/3-C is a lost wax product that uses S45C-equivalent material.

Catalog Number	Weight	Allowable torque (kgf·m)	Allowable torque (N·m)	Mounting height	Center distance
Catalog Number	(kg)	Bending strength	Bending strength	J	I
SRTB2/3-50 (Made to Order)	0.067	0.31	3.07	15.67	33.84
SRTB2/3-60 (Made to Order)	0.10	0.42	4.10	19	35.51
SRTB2/3-80 (Made to Order)	0.16	0.61	6.00	25.67	39.48
SRTB2/3-90 (Made to Order)	0.21	0.73	7.11	29	41.73
SRTB2/3-100 (Made to Order)	0.24	0.84	8.24	32.33	44.11
SRTB1-50 (Made to Order)	0.24	1.50	14.7	23.4	45.48
SRTB1-60 (Made to Order)	0.34	1.99	19.5	28.4	48.24
SRTB1-80 (Made to Order)	0.61	3.00	29.4	38.4	54.73
SRTB1-90 (Made to Order)	0.73	3.52	34.5	43.4	58.35
SRTB1-100 (Made to Order)	0.87	4.02	39.4	48.4	62.16
SRTB2-30 (Made to Order)	0.47	2.96	29.0	26.9	61.23
SRTB2-40 (Made to Order)	0.82	5.02	49.2	36.9	66.23
SRTB2-50 (Made to Order)	1.14	7.22	70.8	46.9	72.28
SRTB2-60 (Made to Order)	1.59	9.61	94.3	56.9	79.14
SRTB3-30 (Made to Order)	1.40	9.44	92.6	40	76.32
SRTB3-40 (Made to Order)	2.17	16.1	158	55	85.15
SRTB3-50 (Made to Order)	3.22	23.3	229	70	95.52
SRTB4-30 (Made to Order)	2.75	23.0	226	52.6	95.74
SRTB4-40 (Made to Order)	4.38	39.3	385	72.6	108.03
SRTB4-50 (Made to Order)	6.72	57.0	559	92.6	122.37

Application Examples

Example: ratchets used for complete reverse prevention of worm gears

\* The illustration is a

Ratchets

design example, not a design for machinery or a device in actual

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

$$\mathsf{F}_{\mathsf{b}} = \sigma_{\mathsf{b}} \cdot \frac{b \cdot \mathsf{e}^2}{6} \cdot \frac{1}{h} \cdot \frac{1}{S_{\mathsf{F}}}$$

Bending Strength of Ratchets

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

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Ratchet Pawls

 $\sigma_b$ : Bending stress  $\rightarrow$  Assumed 225.55MPa (23kgf/mm²)

b: Face width mm  $\rightarrow$  Dimension Table ratchet face width E

e : Root length mm

→ e=
$$h \times \tan \left( 60 - \frac{360}{\text{No. of teeth}} \right)$$
 is the calculation

h: Depth of teeth mm  $\rightarrow$  Dimension Table ratchet tooth depth H

 $S_F$ : Safety factor  $\rightarrow$  Assumed 2

 $r_{
m f}$  : Tooth root radius m

 $\rightarrow r_f = \frac{\text{Outside dia. D} - 2h}{\text{Outside dia. D}}$  is the calculation

Miter CP Racks & Racks Gears Pinions

**Pawls** 

Gearboxes

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