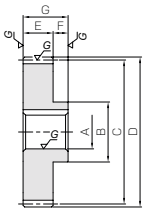
Specifications	
Precision grade	JIS grade N5 (JIS B1702-1: 1998) JIS grade 1 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SCM415
Heat treatment	Overall carburizing
Tooth hardness	55 ~ 60HRC



S1

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.
				A_{H7}	B	C	D	E	F	G	H	I
MSGA1-18		18	S1	8	15	18	20	10	5	15	—	—
MSGA1-20 **MSGB1-20****		20	S1	8 10	17	20	22	10	5	15	—	—
MSGA1-24 **MSGB1-24**		24	S1	10 12	20	24	26	10	5	15	—	—
MSGA1-25 **MSGB1-25**		25	S1	10 12	20	25	27	10	5	15	—	—
MSGA1-30 **MSGB1-30**		30	S1	10 12	25	30	32	10	5	15	—	—
MSGA1-35 **MSGB1-35**		35	S1	10 15	25	35	37	10	5	15	—	—
MSGA1-36 **MSGB1-36**		36	S1	12 15	25	36	38	10	5	15	—	—
MSGA1-40 **MSGB1-40**		40	S1	12 15	30	40	42	10	5	15	—	—
MSGA1-45 **MSGB1-45**	*m*1	45	S1	12 15	30	45	47	10	5	15	—	—
MSGA1-48 **MSGB1-48**		48	S1	12 15	30	48	50	10	5	15	—	—
MSGA1-50 **MSGB1-50**		50	S1	12 15	35	50	52	10	5	15	—	—
MSGA1-55 **MSGB1-55**		55	S1	15 20	40	55	57	10	10	20	—	—
MSGA1-60 **MSGB1-60**		60	S1	15 20	40	60	62	10	10	20	—	—
MSGA1-70 **MSGB1-70**		70	S1	20 25	45	70	72	10	10	20	—	—
MSGA1-80 **MSGB1-80**		80	S1	20 25	45	80	82	10	10	20	—	—
MSGA1-100 **MSGB1-100**		100	S1	20 25	45	100	102	10	10	20	—	—

[Caution on Product Characteristics]
① Although the dimensions of the keyway are made to the JIS (Js9) tolerance, there may be some deviations due to the effects of the heat treatment.
②The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 31 for more details.
③ The backlash values shown in the table are the theoretical values for the backlash in the normal direction for a pair of identical gears in mesh.
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Keyway	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash	Weight	Catalog No.
Width×Depth	Bending strength	Surface durability	Bending strength	Surface durability	(mm)	(kg)	
3 x 1.4	12.1	6.37	1.24	0.65	0.08~0.16	0.020	**MSGA1-18**
3 x 1.4 4 x 1.8	14.2	8.04	1.45	0.82	0.08~0.16	0.027 0.023	**MSGA1-20** **MSGB1-20****
4 x 1.8 4 x 1.8	18.5	12.0	1.88	1.22	0.08~0.16	0.038 0.034	**MSGA1-24** **MSGB1-24**
4 x 1.8 4 x 1.8	19.6	13.1	2.00	1.33	0.08~0.16	0.041 0.037	**MSGA1-25** **MSGB1-25**
4 x 1.8 4 x 1.8	25.1	19.0	2.56	1.94	0.08~0.16	0.065 0.061	**MSGA1-30** **MSGB1-30**
4 x 1.8 5 x 2.3	30.7	26.2	3.13	2.67	0.08~0.16	0.085 0.073	**MSGA1-35** **MSGB1-35**
4 x 1.8 5 x 2.3	31.9	27.8	3.25	2.84	0.08~0.16	0.085 0.077	**MSGA1-36** **MSGB1-36**
4 x 1.8 5 x 2.3	36.5	34.6	3.72	3.53	0.08~0.16	0.11 0.10	**MSGA1-40** **MSGB1-40**
4 x 1.8 5 x 2.3	42.3	44.3	4.31	4.51	0.08~0.16	0.14 0.13	**MSGA1-45** **MSGB1-45**
4 x 1.8 5 x 2.3	45.8	50.6	4.67	5.16	0.08~0.16	0.16 0.15	**MSGA1-48** **MSGB1-48**
4 x 1.8 5 x 2.3	48.1	55.1	4.91	5.62	0.08~0.16	0.18 0.17	**MSGA1-50** **MSGB1-50**
5 x 2.3 6 x 2.8	54.0	67.3	5.51	6.86	0.10~0.18	0.26 0.23	**MSGA1-55** **MSGB1-55**
5 x 2.3 6 x 2.8	59.9	80.6	6.11	8.22	0.10~0.18	0.29 0.27	**MSGA1-60** **MSGB1-60**
6 x 2.8 8 x 3.3	71.9	111	7.33	11.4	0.10~0.18	0.37 0.35	**MSGA1-70** **MSGB1-70**
6 x 2.8 8 x 3.3	83.9	147	8.55	15.0	0.10~0.18	0.47 0.44	**MSGA1-80** **MSGB1-80**
6 x 2.8 8 x 3.3	103	224	10.5	22.8	0.10~0.18	0.69 0.66	**MSGA1-100** **MSGB1-100**

[Caution on Secondary Operations]
① No secondary operations can be performed on these precision finished gears due to the applied carburizing process.
For products which are different in specifications, such as bore size, we accept custom-made gear orders and provide a price quote.

* For products not categorized in our KHK Stock Gear series, custom gear production services with short lead times is available. For details see Page 8.

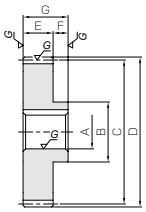
GCU-S Spur Gear Kit

Installment : Parallel axes gears (Two-stage)
Gear Type : Spur Gears
Gears : 2 units of SS1.5-16
2 units of PS1.5-22
Gear Ratio : 1.89
Weight : Approx. 1kg

The Gear Kit contains two-stage spur gears and allows speed increases / reductions, and includes the most commonly used combinations of gears.

Spur Gears
Helical Gears
Internal Gears
Racks
CP Racks & Pinions
Miter Gears
Bevel Gears
Screw Gears
Worm Gear Pair
Bevel Gearboxes
Other Products

Specifications	
Precision grade	JIS grade N5 (JIS B1702-1: 1998) JIS grade 1 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SCM415
Heat treatment	Overall carburizing
Tooth hardness	55 ~ 60HRC



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Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.
				A_{H7}	B	C	D	E	F	G	H	I
MSGA1.5-15**	*m*1.5	15	S1	10	18	22.5	25.5	15	10	25	—	—
MSGA1.5-18 **MSGB1.5-18**		18	S1	10 12	22	27	30	15	10	25	—	—
MSGA1.5-20 **MSGB1.5-20**		20	S1	12 15	25	30	33	15	10	25	—	—
MSGA1.5-24 **MSGB1.5-24**		24	S1	12 15	28	36	39	15	10	25	—	—
MSGA1.5-25 **MSGB1.5-25**		25	S1	14 16	30	37.5	40.5	15	10	25	—	—
MSGA1.5-30 **MSGB1.5-30**		30	S1	15 18	30	45	48	15	10	25	—	—
MSGA1.5-35 **MSGB1.5-35**		35	S1	15 18	32	52.5	55.5	15	10	25	—	—
MSGA1.5-36 **MSGB1.5-36**		36	S1	15 18	32	54	57	15	10	25	—	—
MSGA1.5-40 **MSGB1.5-40**		40	S1	16 20	35	60	63	15	10	25	—	—
MSGA1.5-45 **MSGB1.5-45**		45	S1	16 20	40	67.5	70.5	15	10	25	—	—
MSGA1.5-48 **MSGB1.5-48**		48	S1	16 20	40	72	75	15	10	25	—	—
MSGA1.5-50 **MSGB1.5-50**		50	S1	18 22	40	75	78	15	10	25	—	—
MSGA1.5-55 **MSGB1.5-55**		55	S1	20 25	45	82.5	85.5	15	10	25	—	—
MSGA1.5-60 **MSGB1.5-60**		60	S1	20 25	45	90	93	15	10	25	—	—
MSGA1.5-70 **MSGB1.5-70**		70	S1	20 25	45	105	108	15	10	25	—	—
MSGA1.5-80 **MSGB1.5-80**		80	S1	20 25	45	120	123	15	10	25	—	—
MSGA1.5-100 **MSGB1.5-100**		100	S1	25 30	50	150	153	15	10	25	—	—

[Caution on Product Characteristics]
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② The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 31 for more details.
③ The backlash values shown in the table are the theoretical values for the backlash in the normal direction for a pair of identical gears in mesh.
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Keyway	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash	Weight	Catalog No.
Width×Depth	Bending strength	Surface durability	Bending strength	Surface durability	(mm)	(kg)	
4 x 1.8	30.8	14.8	3.15	1.51	0.08~0.16	0.050	**MSGA1.5-15****
4 x 1.8 4 x 1.8	41.0	22.1	4.18	2.26	0.08~0.16	0.080 0.074	**MSGA1.5-18** **MSGB1.5-18**
4 x 1.8 5 x 2.3	48.0	27.9	4.89	2.84	0.08~0.16	0.098 0.085	**MSGA1.5-20** **MSGB1.5-20**
4 x 1.8 5 x 2.3	62.4	41.5	6.36	4.24	0.08~0.16	0.14 0.13	**MSGA1.5-24** **MSGB1.5-24**
5 x 2.3 5 x 2.3	66.0	45.4	6.73	4.63	0.08~0.16	0.15 0.14	**MSGA1.5-25** **MSGB1.5-25**
5 x 2.3 6 x 2.8	84.7	66.4	8.63	6.77	0.08~0.16	0.21 0.19	**MSGA1.5-30** **MSGB1.5-30**
5 x 2.3 6 x 2.8	104	91.5	10.6	9.34	0.10~0.18	0.28 0.26	**MSGA1.5-35** **MSGB1.5-35**
5 x 2.3 6 x 2.8	108	97.1	11.0	9.90	0.10~0.18	0.30 0.28	**MSGA1.5-36** **MSGB1.5-36**
5 x 2.3 6 x 2.8	123	121	12.6	12.3	0.10~0.18	0.37 0.34	**MSGA1.5-40** **MSGB1.5-40**
5 x 2.3 6 x 2.8	143	155	14.5	15.8	0.10~0.18	0.48 0.46	**MSGA1.5-45** **MSGB1.5-45**
5 x 2.3 6 x 2.8	155	177	15.8	18.1	0.10~0.18	0.54 0.51	**MSGA1.5-48** **MSGB1.5-48**
6 x 2.8 6 x 2.8	162	193	16.6	19.7	0.10~0.18	0.57 0.54	**MSGA1.5-50** **MSGB1.5-50**
6 x 2.8 8 x 3.3	182	236	18.6	24.0	0.10~0.18	0.69 0.65	**MSGA1.5-55** **MSGB1.5-55**
6 x 2.8 8 x 3.3	202	283	20.6	28.8	0.10~0.18	0.81 0.77	**MSGA1.5-60** **MSGB1.5-60**
6 x 2.8 8 x 3.3	231	372	23.6	38.0	0.12~0.20	1.08 1.04	**MSGA1.5-70** **MSGB1.5-70**
6 x 2.8 8 x 3.3	270	494	27.5	50.3	0.12~0.20	1.39 1.36	**MSGA1.5-80** **MSGB1.5-80**
8 x 3.3 8 x 3.3	347	787	35.4	80.2	0.12~0.20	2.13 2.09	**MSGA1.5-100** **MSGB1.5-100**

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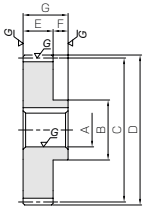
Spur Gears
Helical Gears
Internal Gears
Racks
CP Racks & Pinions
Miter Gears
Bevel Gears
Screw Gears
Worm Gear Pair
Bevel Gearboxes
Other Products

Specifications	
Precision grade	JIS grade N5 (JIS B1702-1: 1998) JIS grade 1 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SCM415
Heat treatment	Overall carburizing
Tooth hardness	55 ~ 60HRC



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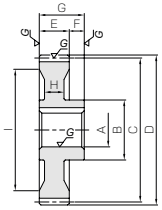

S2

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.
				A_{H7}	B	C	D	E	F	G	H	I
MSGA2-15 **MSGB2-15****	*m*2	15	S1	12 15	24	30	34	20	10	30	—	—
MSGA2-18 **MSGB2-18**		18	S1	12 15	30	36	40	20	10	30	—	—
MSGA2-20 **MSGB2-20**		20	S1	15 18	32	40	44	20	10	30	—	—
MSGA2-24 **MSGB2-24**		24	S1	15 18	35	48	52	20	10	30	—	—
MSGA2-25 **MSGB2-25**		25	S1	16 20	35	50	54	20	10	30	—	—
MSGA2-30 **MSGB2-30**		30	S1	18 22	40	60	64	20	10	30	—	—
MSGA2-35 **MSGB2-35**		35	S1	18 22	40	70	74	20	10	30	—	—
MSGA2-36 **MSGB2-36**		36	S1	18 22	40	72	76	20	10	30	—	—
MSGA2-40 **MSGB2-40**		40	S1	20 25	45	80	84	20	10	30	—	—
MSGA2-45 **MSGB2-45**		45	S1	20 25	45	90	94	20	10	30	—	—
MSGA2-48 **MSGB2-48**		48	S1	22 28	50	96	100	20	10	30	—	—
MSGA2-50 **MSGB2-50**		50	S1	22 28	50	100	104	20	10	30	—	—
MSGA2-55 **MSGB2-55**		55	S1	25 30	55	110	114	20	10	30	—	—
MSGA2-60 **MSGB2-60**		60	S1	25 30	55	120	124	20	10	30	—	—
MSGA2-70 **MSGB2-70**		70	S1	25 30	55	140	144	20	10	30	—	—
MSGA2-80 **MSGB2-80**		80	S2	30 35	60	160	164	20	10	30	13	144
MSGA2-100 **MSGB2-100**		100	S2	35 40	80	200	204	20	10	30	13	174

Keyway	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash	Weight	Catalog No.
Width×Depth	Bending strength	Surface durability	Bending strength	Surface durability	(mm)	(kg)	
4 x 1.8 5 x 2.3	73.1	35.7	7.46	3.64	0.10~0.20	0.12 0.10	**MSGA2-15** **MSGB2-15****
4 x 1.8 5 x 2.3	97.2	53.5	9.91	5.46	0.10~0.20	0.19 0.17	**MSGA2-18** **MSGB2-18**
5 x 2.3 6 x 2.8	114	67.6	11.6	6.89	0.10~0.20	0.22 0.20	**MSGA2-20** **MSGB2-20**
5 x 2.3 6 x 2.8	148	101	15.1	10.3	0.10~0.20	0.32 0.30	**MSGA2-24** **MSGB2-24**
5 x 2.3 6 x 2.8	157	110	16.0	11.2	0.10~0.20	0.33 0.31	**MSGA2-25** **MSGB2-25**
6 x 2.8 6 x 2.8	201	161	20.5	16.5	0.12~0.22	0.48 0.45	**MSGA2-30** **MSGB2-30**
6 x 2.8 6 x 2.8	246	223	25.1	22.7	0.12~0.22	0.64 0.61	**MSGA2-35** **MSGB2-35**
6 x 2.8 6 x 2.8	255	236	26.0	24.1	0.12~0.22	0.67 0.64	**MSGA2-36** **MSGB2-36**
6 x 2.8 8 x 3.3	292	294	29.7	30.0	0.12~0.22	0.84 0.79	**MSGA2-40** **MSGB2-40**
6 x 2.8 8 x 3.3	338	377	34.5	38.4	0.12~0.22	1.05 1.00	**MSGA2-45** **MSGB2-45**
6 x 2.8 8 x 3.3	349	411	35.6	41.9	0.12~0.22	1.20 1.14	**MSGA2-48** **MSGB2-48**
6 x 2.8 8 x 3.3	367	448	37.4	45.7	0.12~0.22	1.29 1.24	**MSGA2-50** **MSGB2-50**
8 x 3.3 8 x 3.3	412	548	42.0	55.8	0.14~0.24	1.56 1.51	**MSGA2-55** **MSGB2-55**
8 x 3.3 8 x 3.3	457	658	46.6	67.1	0.14~0.24	1.84 1.79	**MSGA2-60** **MSGB2-60**
8 x 3.3 8 x 3.3	547	909	55.8	92.7	0.14~0.24	2.48 2.43	**MSGA2-70** **MSGB2-70**
8 x 3.3 10 x 3.3	610	1150	62.2	117	0.14~0.24	2.55 2.49	**MSGA2-80** **MSGB2-80**
10 x 3.3 12 x 3.3	785	1820	80.1	186	0.14~0.24	4.16 4.09	**MSGA2-100** **MSGB2-100**

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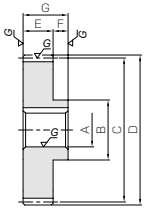
Module 2.5

Specifications	
Precision grade	JIS grade N5 (JIS B1702-1: 1998) JIS grade 1 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SCM415
Heat treatment	Overall carburizing
Tooth hardness	55 ~ 60HRC



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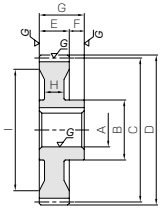

S2

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.
				A_{H7}	B	C	D	E	F	G	H	I
MSGA2.5-15 **MSGB2.5-15****	*m*2.5	15	S1	15 18	30	37.5	42.5	25	12	37	—	—
MSGA2.5-18 **MSGB2.5-18**		18	S1	18 20	38	45	50	25	12	37	—	—
MSGA2.5-20 **MSGB2.5-20**		20	S1	18 22	40	50	55	25	12	37	—	—
MSGA2.5-24 **MSGB2.5-24**		24	S1	18 22	40	60	65	25	12	37	—	—
MSGA2.5-25 **MSGB2.5-25**		25	S1	20 25	45	62.5	67.5	25	12	37	—	—
MSGA2.5-30 **MSGB2.5-30**		30	S1	22 28	50	75	80	25	12	37	—	—
MSGA2.5-35 **MSGB2.5-35**		35	S1	25 30	55	87.5	92.5	25	12	37	—	—
MSGA2.5-36 **MSGB2.5-36**		36	S1	25 30	55	90	95	25	12	37	—	—
MSGA2.5-40 **MSGB2.5-40**		40	S1	25 32	55	100	105	25	12	37	—	—
MSGA2.5-45 **MSGB2.5-45**		45	S1	30 35	60	112.5	117.5	25	12	37	—	—
MSGA2.5-48 **MSGB2.5-48**		48	S1	30 35	60	120	125	25	12	37	—	—
MSGA2.5-50 **MSGB2.5-50**		50	S1	30 35	60	125	130	25	12	37	—	—
MSGA2.5-55 **MSGB2.5-55**		55	S1	30 40	70	137.5	142.5	25	12	37	—	—
MSGA2.5-60 **MSGB2.5-60**		60	S1	30 40	70	150	155	25	12	37	—	—
MSGA2.5-70 **MSGB2.5-70**		70	S2	40 50	85	175	180	25	12	37	17	150

Keyway	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash	Weight	Catalog No.
Width×Depth	Bending strength	Surface durability	Bending strength	Surface durability	(mm)	(kg)	
5 x 2.3 6 x 2.8	143	71.0	14.6	7.24	0.10~0.20	0.23 0.20	**MSGA2.5-15** **MSGB2.5-15****
6 x 2.8 6 x 2.8	190	107	19.4	10.9	0.10~0.20	0.34 0.32	**MSGA2.5-18** **MSGB2.5-18**
6 x 2.8 6 x 2.8	222	134	22.7	13.7	0.10~0.20	0.42 0.39	**MSGA2.5-20** **MSGB2.5-20**
6 x 2.8 6 x 2.8	289	201	29.4	20.5	0.12~0.22	0.59 0.56	**MSGA2.5-24** **MSGB2.5-24**
6 x 2.8 8 x 3.3	306	220	31.2	22.4	0.12~0.22	0.66 0.60	**MSGA2.5-25** **MSGB2.5-25**
6 x 2.8 8 x 3.3	392	322	40.0	32.8	0.12~0.22	0.94 0.87	**MSGA2.5-30** **MSGB2.5-30**
8 x 3.3 8 x 3.3	480	444	49.0	45.3	0.12~0.22	1.25 1.19	**MSGA2.5-35** **MSGB2.5-35**
8 x 3.3 8 x 3.3	498	471	50.8	48.0	0.12~0.22	1.32 1.26	**MSGA2.5-36** **MSGB2.5-36**
8 x 3.3 10 x 3.3	543	560	55.3	57.1	0.12~0.22	1.61 1.52	**MSGA2.5-40** **MSGB2.5-40**
8 x 3.3 10 x 3.3	629	718	64.1	73.2	0.14~0.24	2.00 1.93	**MSGA2.5-45** **MSGB2.5-45**
8 x 3.3 10 x 3.3	681	823	69.5	83.9	0.14~0.24	2.27 2.20	**MSGA2.5-48** **MSGB2.5-48**
8 x 3.3 10 x 3.3	716	897	73.0	91.5	0.14~0.24	2.46 2.39	**MSGA2.5-50** **MSGB2.5-50**
8 x 3.3 12 x 3.3	804	1090	82.0	112	0.14~0.24	3.06 2.90	**MSGA2.5-55** **MSGB2.5-55**
8 x 3.3 12 x 3.3	892	1310	90.9	134	0.14~0.24	3.62 3.45	**MSGA2.5-60** **MSGB2.5-60**
12 x 3.3 14 x 3.8	1020	1730	104	176	0.14~0.24	4.24 4.03	**MSGA2.5-70** **MSGB2.5-70**

[Caution on Product Characteristics]

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②The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 31 for more details.
③ The backlash values shown in the table are the theoretical values for the backlash in the normal direction for a pair of identical gears in mesh.
④ Products marked with "**" have a small amount of material between the corner of the keyway and the tooth root. This mode of failure must be considered when selecting these gears. For details, please see our web site.

[Caution on Secondary Operations]

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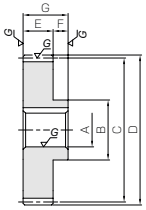
GCU-S Spur Gear Kit

Installment : Parallel axes gears (Two-stage)
Gear Type : Spur Gears
Gears : 2 units of SS1.5-16
2 units of PS1.5-22
Gear Ratio : 1.89
Weight : Approx. 1kg

The Gear Kit contains two-stage spur gears and allows speed increases / reductions, and includes the most commonly used combinations of gears.

Spur Gears
Helical Gears
Internal Gears
Racks
CP Racks & Pinions
Miter Gears
Bevel Gears
Screw Gears
Worm Gear Pair
Bevel Gearboxes
Other Products

Specifications	
Precision grade	JIS grade N5 (JIS B1702-1: 1998) JIS grade 1 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SCM415
Heat treatment	Overall carburizing
Tooth hardness	55 ~ 60HRC



S1

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.
				A_{H7}	B	C	D	E	F	G	H	I
MSGA3-15 **MSGB3-15****	*m*3	15	S1	18 22	36	45	51	30	15	45	—	—
MSGA3-18 **MSGB3-18**		18	S1	20 25	45	54	60	30	15	45	—	—
MSGA3-20 **MSGB3-20**		20	S1	20 25	45	60	66	30	15	45	—	—
MSGA3-24 **MSGB3-24**		24	S1	20 25	45	72	78	30	15	45	—	—
MSGA3-25 **MSGB3-25**		25	S1	25 30	55	75	81	30	15	45	—	—
MSGA3-30 **MSGB3-30**		30	S1	28 35	60	90	96	30	15	45	—	—
MSGA3-35 **MSGB3-35**		35	S1	30 35	60	105	111	30	15	45	—	—
MSGA3-36 **MSGB3-36**		36	S1	30 35	60	108	114	30	15	45	—	—
MSGA3-40 **MSGB3-40**		40	S1	30 40	70	120	126	30	15	45	—	—
MSGA3-45 **MSGB3-45**		45	S1	30 40	70	135	141	30	15	45	—	—
MSGA3-48 **MSGB3-48**		48	S1	35 40	70	144	150	30	15	45	—	—
MSGA3-50 **MSGB3-50**		50	S2	32 40	70	150	156	30	15	45	20	126
MSGA3-55 **MSGB3-55**		55	S2	35 40	70	165	171	30	15	45	20	140
MSGA3-60 **MSGB3-60**		60	S2	35 45	80	180	186	30	15	45	20	156

[Caution on Product Characteristics]
① Although the dimensions of the keyway are made to the JIS (Js9) tolerance, there may be some deviations due to the effects of the heat treatment.
② The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 31 for more details.
③ The backlash values shown in the table are the theoretical values for the backlash in the normal direction for a pair of identical gears in mesh.
④ Products marked with "**" have a small amount of material between the corner of the keyway and the tooth root. This mode of failure must be considered when selecting these gears. For details, please see our web site.

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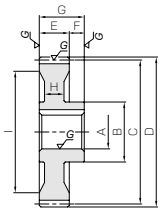

S2

Keyway	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash	Weight	Catalog No.
Width×Depth	Bending strength	Surface durability	Bending strength	Surface durability	(mm)	(kg)	
6 x 2.8 6 x 2.8	247	124	25.2	12.7	0.10~0.20	0.40 0.35	**MSGA3-15** **MSGB3-15****
6 x 2.8 8 x 3.3	328	187	33.4	19.1	0.12~0.22	0.61 0.54	**MSGA3-18** **MSGB3-18**
6 x 2.8 8 x 3.3	384	236	39.1	24.1	0.12~0.22	0.74 0.67	**MSGA3-20** **MSGB3-20**
6 x 2.8 8 x 3.3	499	353	50.9	36.0	0.12~0.22	1.03 0.96	**MSGA3-24** **MSGB3-24**
8 x 3.3 10 x 3.3	528	386	53.9	39.3	0.12~0.22	1.14 1.06	**MSGA3-25** **MSGB3-25**
8 x 3.3 10 x 3.3	677	565	69.1	57.7	0.12~0.22	1.60 1.48	**MSGA3-30** **MSGB3-30**
8 x 3.3 10 x 3.3	790	745	80.6	75.9	0.14~0.24	2.11 2.02	**MSGA3-35** **MSGB3-35**
8 x 3.3 10 x 3.3	820	790	83.6	80.6	0.14~0.24	2.23 2.14	**MSGA3-36** **MSGB3-36**
8 x 3.3 12 x 3.3	938	988	95.6	101	0.14~0.24	2.86 2.66	**MSGA3-40** **MSGB3-40**
8 x 3.3 12 x 3.3	1090	1260	111	129	0.14~0.24	3.57 3.37	**MSGA3-45** **MSGB3-45**
10 x 3.3 12 x 3.3	1180	1450	120	147	0.14~0.24	3.94 3.83	**MSGA3-48** **MSGB3-48**
10 x 3.3 12 x 3.3	1240	1570	126	161	0.14~0.24	3.79 3.62	**MSGA3-50** **MSGB3-50**
10 x 3.3 12 x 3.3	1330	1830	135	187	0.14~0.24	4.39 4.29	**MSGA3-55** **MSGB3-55**
10 x 3.3 14 x 3.8	1470	2200	150	224	0.14~0.24	5.31 5.08	**MSGA3-60** **MSGB3-60**

[Caution on Secondary Operations]
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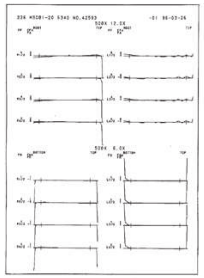
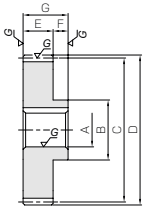


An example of KHK's inspection report on tooth profile and lead errors.

The precision grade of a spur gear (JIS B 1702-1:1998 and JIS B 1702-2:1998) is determined by factors such as single pitch error, pitch variation error, accumulated pitch error, tooth profile error, run out error, load error etc. For more details, please refer to the section "Accuracy of Spur and Helical Gears" in separate technical reference book.

Specifications	
Precision grade	JIS grade N5 (JIS B1702-1: 1998) JIS grade 1 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SCM415
Heat treatment	Overall carburizing
Tooth hardness	55 ~ 60HRC



S1

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.
				A_{H7}	B	C	D	E	F	G	H	I
MSGA4-15 **MSGB4-15****	*m*4	15	S1	25 30	48	60	68	40	20	60	—	—
MSGA4-18 **MSGB4-18**		18	S1	25 30	50	72	80	40	20	60	—	—
MSGA4-20 **MSGB4-20**		20	S1	28 32	60	80	88	40	20	60	—	—
MSGA4-24 **MSGB4-24**		24	S1	28 32	60	96	104	40	20	60	—	—
MSGA4-25 **MSGB4-25**		25	S1	30 35	60	100	108	40	20	60	—	—
MSGA4-30 **MSGB4-30**		30	S1	35 40	70	120	128	40	20	60	—	—
MSGA4-35 **MSGB4-35**		35	S1	35 40	70	140	148	40	20	60	—	—
MSGA4-36 **MSGB4-36**		36	S1	35 40	70	144	152	40	20	60	—	—
MSGA4-40 **MSGB4-40**		40	S1	40 45	80	160	168	40	20	60	—	—
MSGA4-45 **MSGB4-45**		45	S1	40 45	80	180	188	40	20	60	—	—
MSGA4-48 **MSGB4-48**		48	S2	40 45	80	192	200	40	20	60	26	160
MSGA4-50 **MSGB4-50**		50	S2	40 50	85	200	208	40	20	60	26	168

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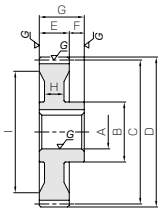

S2

Keyway	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash	Weight	Catalog No.
Width×Depth	Bending strength	Surface durability	Bending strength	Surface durability	(mm)	(kg)	
8 x 3.3 8 x 3.3	585	302	59.7	30.8	0.14~0.24	0.93 0.83	**MSGA4-15** **MSGB4-15****
8 x 3.3 8 x 3.3	777	455	79.3	46.4	0.14~0.24	1.34 1.24	**MSGA4-18** **MSGB4-18**
8 x 3.3 10 x 3.3	910	574	92.8	58.6	0.14~0.24	1.72 1.63	**MSGA4-20** **MSGB4-20**
8 x 3.3 10 x 3.3	1130	819	115	83.5	0.14~0.24	2.41 2.32	**MSGA4-24** **MSGB4-24**
8 x 3.3 10 x 3.3	1190	896	122	91.4	0.14~0.24	2.56 2.44	**MSGA4-25** **MSGB4-25**
10 x 3.3 12 x 3.3	1530	1320	156	134	0.16~0.26	3.69 3.54	**MSGA4-30** **MSGB4-30**
10 x 3.3 12 x 3.3	1870	1820	191	185	0.16~0.26	4.97 4.83	**MSGA4-35** **MSGB4-35**
10 x 3.3 12 x 3.3	1940	1930	198	197	0.16~0.26	5.25 5.11	**MSGA4-36** **MSGB4-36**
12 x 3.3 14 x 3.8	2120	2290	216	234	0.16~0.26	6.49 6.33	**MSGA4-40** **MSGB4-40**
12 x 3.3 14 x 3.8	2460	2930	251	299	0.16~0.26	8.17 8.01	**MSGA4-45** **MSGB4-45**
12 x 3.3 14 x 3.8	2660	3350	272	342	0.16~0.26	7.97 7.81	**MSGA4-48** **MSGB4-48**
12 x 3.3 14 x 3.8	2800	3650	285	372	0.16~0.26	8.71 8.37	**MSGA4-50** **MSGB4-50**

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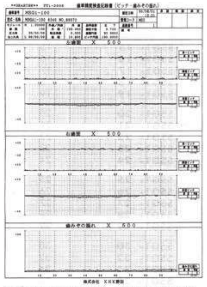

An example of KHK's inspection report on various pitch errors.

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