

YASKAWA

GEAR BOXES FOR AC SERVO MOTORS SIGMA SERIES CATALOG

EN

DE



Gear Boxes

Gear Boxes

Gear Boxes

Gear Boxes

Gear Boxes

Content

- ▶ 02 **About YASKAWA**
Experience and Innovation
- ▶ 03 Ultra-Precise Gears meet
High-Performance Servo Motors
- ▶ 04 **Model Number Keys**
- ▶ 05 **For Your Perfect Solution**
- ▶ 06 **Eco Series**
Recommended Combinations
- ▶ 07 Dimensions
- ▶ 13 **Eco Series - Bevelled**
Recommended Combinations
- ▶ 14 Dimensions
- ▶ 16 **Pure Series**
Recommended Combinations
- ▶ 17 Dimensions
- ▶ 23 **Find the Perfect Planetary Gear**

Experience and Innovation

Since 1915 YASKAWA has manufactured and supplied products for machine building and industrial automation. Our standard products as well as tailor-made solutions are well known and have a high reputation for outstanding quality and reliability.

YASKAWA is the leading global manufacturer of inverter drives, servo drives, machine controllers, medium voltage inverters, and industrial robots.

We have always been a pioneer in motion control and drive technology, launching product innovations, which optimise the productivity and efficiency of both machines and systems.



Today we produce more than 1.8 million inverters per year. Considering this, YASKAWA is probably the biggest inverter manufacturer in the world.



Furthermore, with a yearly production of more than 800,000 servo motors and 20,000 robots we offer a wide range of products for drive automation processes in many different industries. YASKAWA technology is used in all fields of machine building and industrial automation.

Wherever You Are – Our Local Support is Near.



Employing more than 15,000 People Worldwide

More than 1,350 Employees in Worldwide Service Network

More than 1,500 Employees in Europe

Ultra-Precise Gears meet High-Performance Servo Motors

YASKAWA provides packages of gears and servo motors together with our partner SPN. Carefully selected servo motors are teamed up with two types of perfectly matching gear boxes to offer an easy-to-use solution for various applications.

In addition to the gear boxes in combination with our servo motors, our partner SPN also provides milled and grinded racks and spur gears for even more specific tasks. This provides an outstanding range of solutions for every day's tasks of machine manufacturers.



PERFECTLY MATCHING GEAR AND MOTOR

A broad line-up of gear boxes that perfectly matches the various motor characteristics.



LIFETIME LUBRICATION

No need to shut down the production plant to add grease. The gear boxes are lubricated to last a lifetime with ease!



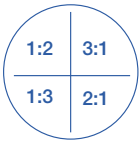
SCALABLE TO SUIT EACH DEMAND

Motors with rated torque from 0.159 to 224 Nm provide the power you need for your application.



SILENT OPERATION

With up to only 70 dB(A) the ECO series keeps noise at a low level. The Pure series reduces noise pollution even more with max. 65 dB(A).



PLENTY OF COMBINATIONS FOR GEARING

No matter if you need speed or torque - the gearing options provide solutions for many different needs and applications.

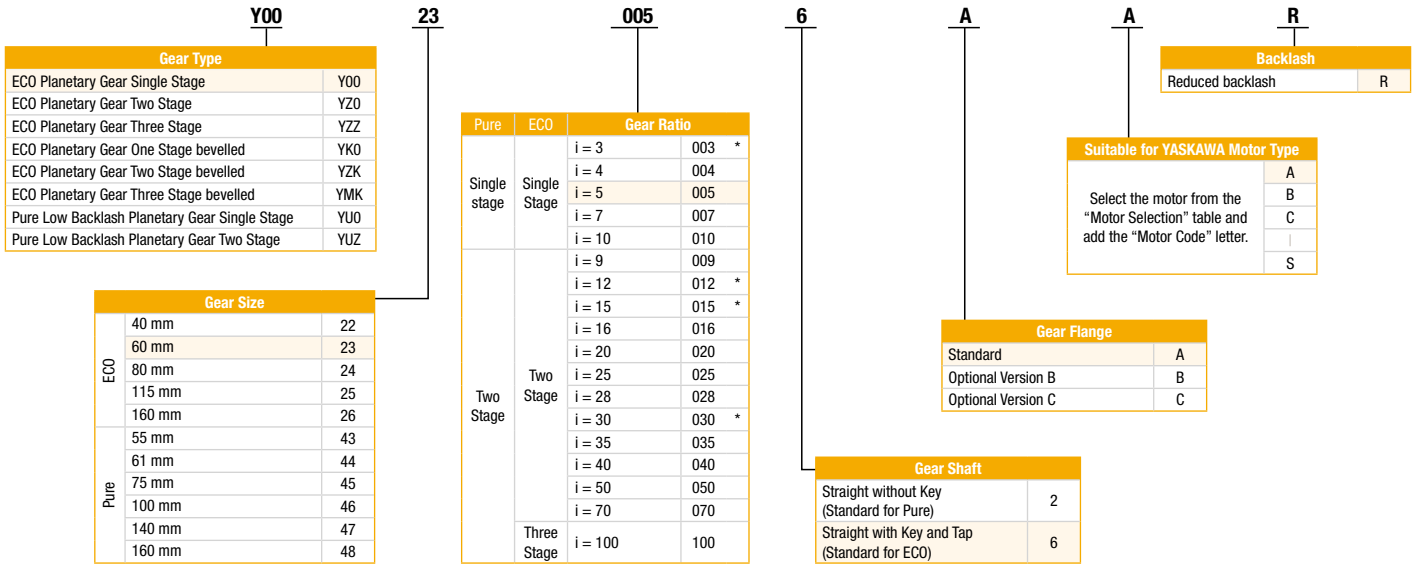


COSTS REDUCTION

Getting motor and the matching gear from just one supplier helps you keeping the supplier list short.



Model Number Keys for Planetary Gears



* Not available for Y0022 and YZ022.

- ▶ Please refer to the recommended combinations of the Pure and the ECO series in this brochure.
- ▶ For combinations other than the recommended ones please contact the YASKAWA Customer Service.



For Your Perfect Solution

Sigma-5 Motor Model	Motor Code	Rated Torque [Nm]	Peak Torque [Nm]	Flange [mm]	Rated Speed [rpm]	Max Speed [rpm]	SERVOPACK Model SGD□-□□□□	
							Three-phase 400 VAC	Three-phase 200 VAC
SGMGV-03	G	1.96	5.88	90	1500	3000	1R9D	3R8A
SGMGV-05	H	2.86	8.92	90				
SGMGV-09	L	5.39	13.8	130			3R5D	7R6A
SGMGV-13	M	8.34	23.3	130				
SGMGV-20	N	11.5	28.7	130			5R4D	120A
SGMGV-30	P	18.6	45.1	180				
SGMGV-44	P	28.4	71.1	180			8R4D	180A
SGMGV-55	Q	35	87.6	180				
SGMGV-75	Q	48	119	180			120D	330A/200A
SGMGV-1A	R	70	175	220				
SGMGV-1E	S	95.4	224	220			170D	330A
SGMSV-10	I	3.18	9.54	100				
SGMSV-15	I	4.9	14.7	100			210D	470A
SGMSV-20	I	6.36	19.1	100				
SGMSV-25	I	7.96	23.9	100	260D	550A		
SGMSV-30	O	9.8	29.4	130				
SGMSV-40	O	12.6	37.8	130	280D	590A		
SGMSV-50	O	15.8	47.6	130				
SGMEV-01	B	0.318	0.955	60	3000	5000	3R5D	7R6A
SGMEV-02	D	0.637	1.91	80				
SGMEV-03	C	0.955	3.82	60			5R4D	120A
SGMEV-04	D	1.27	3.82	80				
SGMEV-07	E	2.07	7.16	80			8R4D	180A
SGMEV-08	J	2.39	7.16	120				
SGMEV-15	K	4.77	14.3	120			120D	200A
SGMAV-A5	A	0.159	0.477	40				
SGMAV-01	A	0.318	0.955	40			170D	330A
SGMAV-C2	A	0.477	1.43	40				
SGMAV-02	C	0.637	1.91	60			-	R70A
SGMAV-04	C	1.27	3.82	60				
SGMAV-06	C	1.75	5.25	60			-	R90A
SGMAV-08	F	2.39	7.16	80				
SGMAV-10	F	3.18	9.55	80	-	1R6A		
SGMJV-A5	A	0.159	0.557	40				
SGMJV-01	A	0.318	1.11	40	-	2R8A		
SGMJV-02	C	0.637	2.23	60				
SGMJV-04	C	1.27	4.46	60	-	5R5A		
SGMJV-08	F	2.39	8.36	80				



Insert this letter at the last position of the Model Number Key for Planetary Gears.

The ECO Series of Planetary Gear Boxes

We offer perfect matching gear boxes for the proven Sigma-5 and Sigma-7 servo motors in a broad range of characteristics and gearings. The ECO series provides low noise pollution in combination with reliable operation at very reasonable costs.



- ▶ Easy motor installation due to tangential-clamping
- ▶ Efficiency > 96%
- ▶ Compact rigid steel housing with B14 flanging
- ▶ Backlash < 10'/15'
- ▶ Any mounting position
- ▶ Lifetime lubrication with synthetic grease

Recommended Combinations

Sigma-5 motor						Gear type								
Motor model	Motor code	Rated torque [Nm]	Peak torque [Nm]	Rated speed [rpm]	Max speed [rpm]	one staged		two staged						three staged
						i = 4	5	9	12	20	25	35	50	100
SGMGV-05	H	2.86	8.92	1500	3000	Y0023	Y0023	YZ023	YZ023	-	YZ024	-	-	-
SGMGV-09	L	5.39	13.8	1500	3000	Y0024	Y0024	YZ024	YZ024	-	YZ025	-	-	-
SGMGV-13	M	8.34	23.3	1500	3000	Y0024	Y0024	YZ024	YZ024	-	YZ025	-	-	-
SGMGV-20	N	11.5	28.7	1500	3000	Y0024	Y0024	YZ024	YZ024	-	YZ026	-	-	-
SGMGV-30	P	18.6	45.1	1500	3000	Y0025	Y0025	YZ025	YZ025	-	YZ026	-	-	-
SGMGV-44	P	28.4	71.1	1500	3000	Y0025	Y0025	YZ025	YZ026	-	YZ026	-	-	-
SGMSV-10	I	3.18	9.54	3000	6000	Y0024	-	YZ024	-	YZ024	YZ024	YZ024	YZ025	YZZ26
SGMSV-15	I	4.9	14.7	3000	5000	Y0024	-	YZ024	-	YZ024	YZ024	YZ025	YZ025	YZZ26
SGMSV-20	I	6.36	19.1	3000	5000	Y0024	-	YZ024	-	YZ024	YZ025	YZ025	YZ026	YZZ26
SGMSV-25	I	7.96	23.9	3000	5000	Y0024	-	YZ024	-	YZ025	YZ025	YZ026	YZ026	YZZ26
SGMEV-04	D	1.27	3.82	3000	5000	Y0023	-	YZ023	-	YZ023	YZ023	YZ024	YZ024	YZZ24
SGMEV-08	J	2.39	7.16	3000	5000	Y0023	-	YZ023	-	YZ024	YZ024	YZ024	YZ024	YZZ25
SGMAV-01	A	0.318	0.955	3000	6000	Y0022	-	YZ023	-	YZ022	YZ022	YZ022	YZ022	YZZ23
SGMAV-02	C	0.637	1.91	3000	6000	Y0023	-	YZ023	-	YZ023	YZ023	YZ023	YZ023	YZZ24
SGMAV-04	C	1.27	3.82	3000	6000	Y0023	-	YZ023	-	YZ023	YZ023	YZ024	YZ024	YZZ24
SGMAV-08	F	2.39	7.16	3000	6000	Y0024	-	YZ024	-	YZ024	YZ024	YZ024	YZ024	YZZ25
SGMJV-01	A	0.318	1.11	3000	6000	Y0022	-	YZ023	-	YZ022	YZ022	YZ022	YZ022	YZZ23
SGMJV-02	C	0.637	2.23	3000	6000	Y0023	-	YZ023	-	YZ023	YZ023	YZ023	YZ023	YZZ24
SGMJV-04	C	1.27	4.46	3000	6000	Y0023	-	YZ023	-	YZ023	YZ023	YZ024	YZ024	YZZ24
SGMJV-08	F	2.39	8.36	3000	6000	Y0024	-	YZ024	-	YZ024	YZ024	YZ024	YZ024	YZZ25

Output Torque [Nm]

Gear type	one staged				two staged				
	i = 4	5	7	10	16	20	25	35	50
Y□□22	15	15	8	4	15	15	15	15	15
Y□□23	38	38	20	13	38	38	38	38	38
Y□□24	115	115	55	30	115	115	115	115	115
Y□□25	225	225	140	75	225	225	225	225	225
Y□□26	650	650	470	225	650	650	650	650	650

Torsion Rigidity [Nm/arcmin]

Gear type	
Y□□22	0.8
Y□□23	2.1
Y□□24	5.5
Y□□25	11
Y□□26	40

Running Noise [dB(A)]

Gear type	
Y□□22	60
Y□□23	62
Y□□24	64
Y□□25	67
Y□□26	68

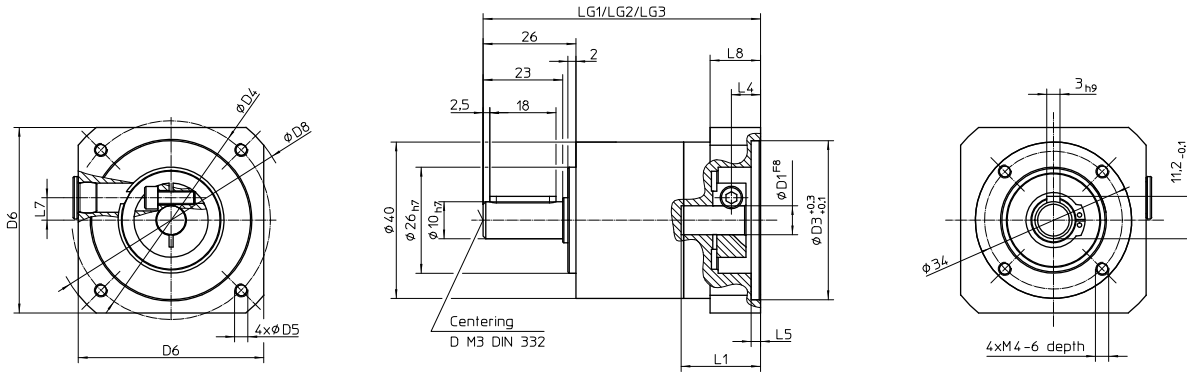
Characteristics

Gear type		one staged	two staged
Backlash	Y□□22	< 25 arcmin	< 30 arcmin
	Y□□23	< 15 arcmin	< 20 arcmin
	Y□□24	< 10 arcmin	< 15 arcmin
	Y□□25	< 10 arcmin	< 15 arcmin
	Y□□26	< 10 arcmin	< 15 arcmin
Gear type		Standard	With option
Radial Force*1	Y□□22	150 N	600 N
	Y□□23	400 N	1300 N
	Y□□24	1050 N	2000 N
	Y□□25	1750 N	2900 N
	Y□□26	5500 N	-
Axial Force*1	Y□□22	150 N	450 N
	Y□□23	500 N	1000 N
	Y□□24	1200 N	1700 N
	Y□□25	2300 N	3000 N
	Y□□26	7000 N	-
Efficiency	> 96%		
Lubrication	Synthetic grease		
Surface	Black		
Acceptable temp. range	-25 °C ... +80 °C (short term: 100 °C)		
Protection	IP54 (optionally: IP65/IP66)		
Emergency stop torque	$2.5 \times T_{2N}$		
Max. acceleration torque	$1.5 \times T_{2N}$		
Max. input speed	6000 min ⁻¹		

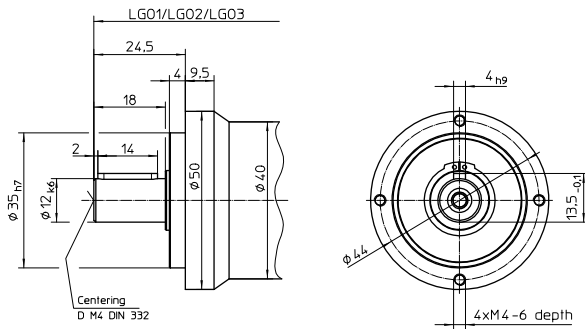
*1 Estimated Life Time: 20,000 h; related to drive shaft center with $n_2 = 100 \text{ min}^{-1}$



Planetary Gears Y0022/YZ022/YZZ22



► Standard



► Optional Version B

Dimensions [mm]

Motor code	Gear Box only																
	D1	D3	D4	D5	D6	D8	L1	L4	L5	L7	L8	LG1	LG2	LG3	LG01	LG02	LG03
A	8	30	46	M4	40	54	25	11.5	3	8.5	20	85	101	116	96	112	127

Inertia [$\times 10^{-6}$ kgm²]

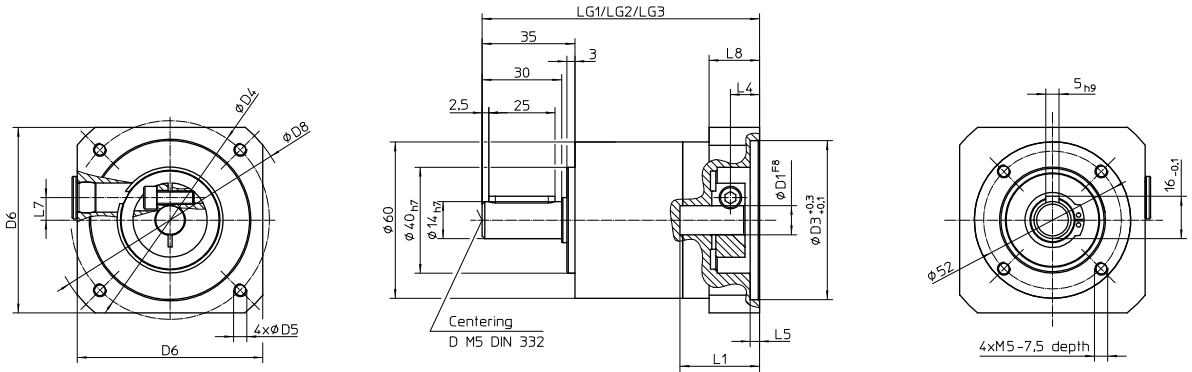
Motor code	one staged		two staged				three staged
	i = 4	5	20	25	35	50	100
A	6.60	6.42	6.48	6.38	6.33	6.25	6.28

Y00 22 005 6 A

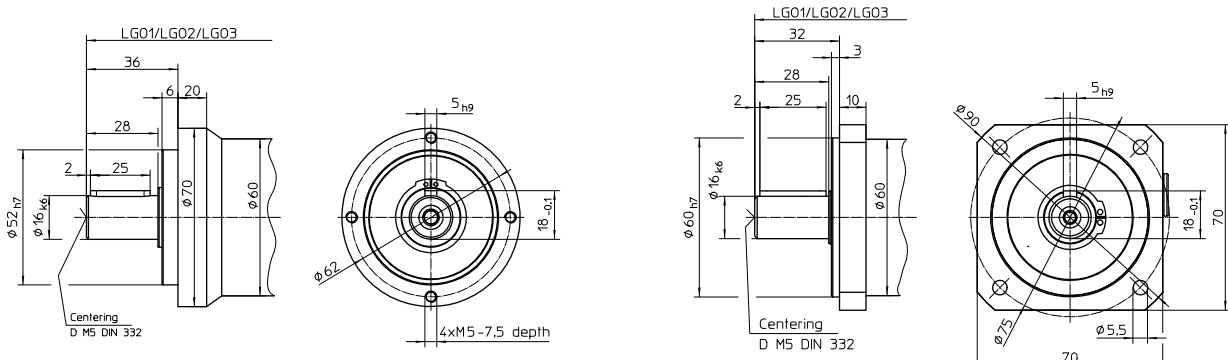
Weight [kg]

Gear box type	Weight	
	standard	B
one staged	0.4	0.6
two staged	0.5	0.7
three staged	0.6	0.8

Planetary Gears Y0023/YZ023/YZZ23



► Standard



► Optional Version B

► Optional Version C

Dimensions [mm]

Motor code	Gear Box only																
	D1	D3	D4	D5	D6	D8	L1	L4	L5	L7	L8	LG1	LG2	LG3	LG01	LG02	LG03
A	8	30	46	M4	60	80	30	11	3	8.5	19	105	121	137	121	137	153
C	14	50	70	M5	60	80	30	12.5	3.5	11	23	109	125	141	125	141	157
D	14	70	90	M6	80	105	30	12.5	3.5	11	23	109	125	141	125	141	157
H	16	80	100	M6	90	120	40	22.5	5.5	13.5	41	127	143	159	143	159	175
J	16	110	145	M8	120	160	40	22.5	4	13.5	41	127	143	159	143	159	175

Inertia [$\times 10^{-5}$ kgm²]

Motor code	one staged		two staged						three staged
	i = 4	5	9	12	20	25	35	50	100
A	1.30	1.20	1.54	1.41	1.20	1.15	1.13	1.09	1.10
C / D	1.80	1.69	2.04	1.91	1.70	1.65	1.62	1.58	1.60
H / J	2.02	1.92	2.26	2.13	1.92	1.87	1.84	1.80	1.82

Weight [kg]

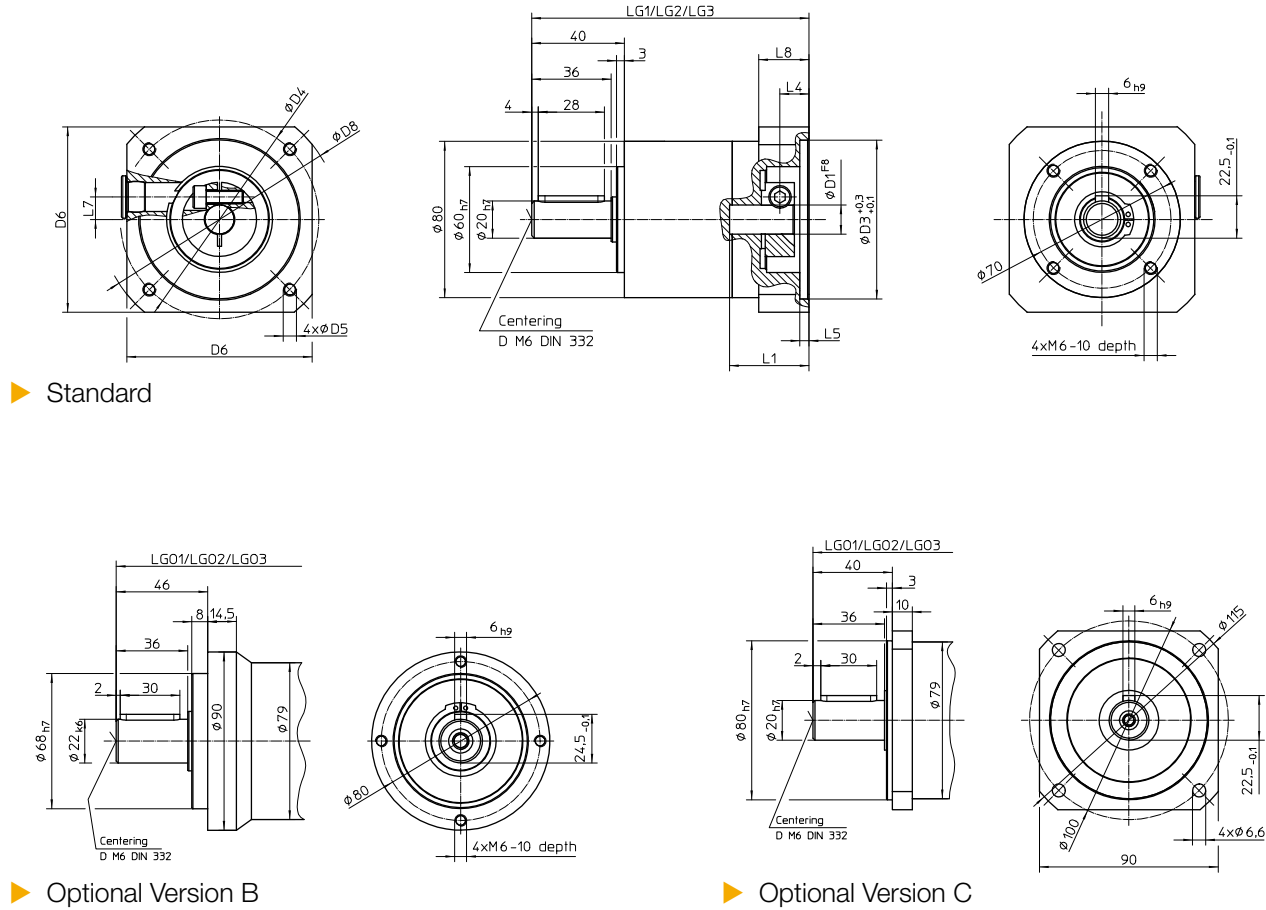
Gear box type	Option	
	standard	B / C
one staged	1.0	1.7
two staged	1.2	1.9
three staged	1.4	2.1

Y00 23 005 6 A □

LG1: Length one staged
LG2: Length two staged
LG3: Length three staged

LG01: Length one staged with option
LG02: Length two staged with option
LG03: Length three staged with option

Planetary Gears Y0024/YZ024/YZZ24



► Standard

► Optional Version B

► Optional Version C

Dimensions [mm]

Motor code	Gear Box only																
	D1	D3	D4	D5	D6	D8	L1	L4	L5	L7	L8	LG1	LG2	LG3	LG01	LG02	LG03
C	14	50	70	M5	80	105	30	12	3.5	11	23	134.5	157.5	180	149	172	194.5
D	14	70	90	M6	80	105	30	12	3.5	11	23	134.5	157.5	180	149	172	194.5
F	19	70	90	M6	80	105	40	22	3.5	13.5	32	144.5	167.5	190	159	182	204.5
H	16	80	100	M6	90	120	40	22	5.5	13.5	32	144.5	167.5	190	159	182	204.5
I	24	95	115	M6	100	130	45	25	3.5	15.5	37	149.5	172.5	195	164	187	209.5
J	16	110	145	M8	120	160	40	22	4	13.5	32	144.5	167.5	190	159	182	204.5
L	19	110	145	M8	120	160	60	39.5	6.5	15.5	51.5	164.5	187.5	210	179	202	224.5
M	22	110	145	M8	120	160	60	39.5	6.5	15.5	51.5	164.5	187.5	210	179	202	224.5
N	24	110	145	M8	120	160	60	39.5	6.5	15.5	51.5	164.5	187.5	210	179	202	224.5

Inertia [$\times 10^{-5} \text{kgm}^2$]

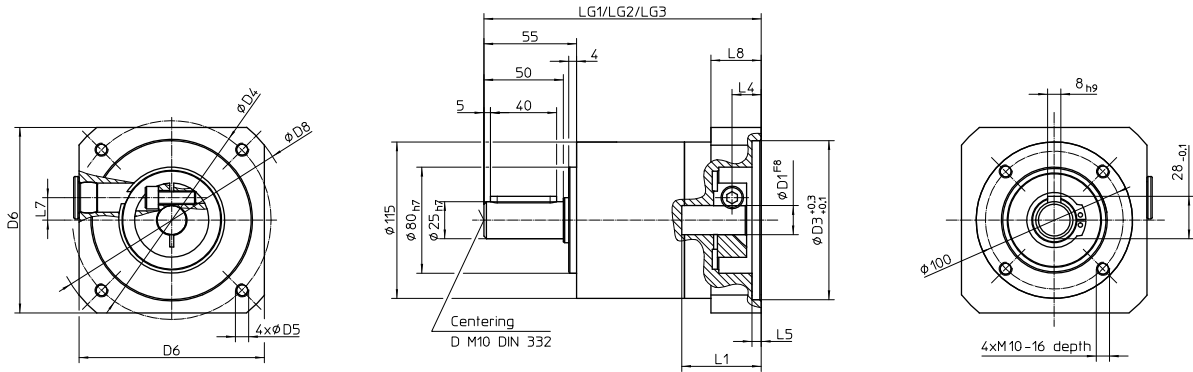
Motor code	one staged		two staged						three staged
	i = 4	5	9	12	20	25	35	50	10
C / D	5.12	4.59	5.56	5.21	4.55	4.31	4.18	3.99	4.07
F / L	5.84	5.30	6.84	6.24	5.26	5.02	4.89	4.70	4.78
H / J	5.38	4.85	6.42	5.81	4.81	4.57	4.44	4.25	4.33
I / N	6.76	6.23	7.70	7.13	6.18	5.95	5.82	5.63	5.71
M	6.37	5.83	7.34	6.75	5.79	5.55	5.42	5.23	5.31

Weight [kg]

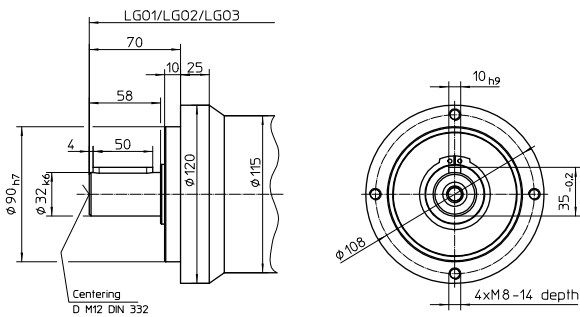
Gear box type	Option	
	standard	B / C
one staged	2.2	3.6
two staged	2.7	4.1
three staged	3.2	4.6

Y00 24 005 6 A □

Planetary Gears Y0025/YZ025/YZZ25



► Standard



► Optional Version B

Dimensions [mm]

Motor code	Gear Box only																
	D1	D3	D4	D5	D6	D8	L1	L4	L5	L7	L8	LG1	LG2	LG3	LG01	LG02	LG03
F	19	70	90	M6	115	140	40	20	3.5	13.5	28	171	198.5	226.5	198	225.5	253.5
L	19	110	145	M8	120	160	60	39.5	6.5	15.5	50	190.5	218	246	217.5	245	273
M	22	110	145	M8	120	160	60	39.5	6.5	15.5	50	190.5	218	246	217.5	245	273
I	24	95	115	M6	115	130	45	24.5	3.5	15.5	35	175.5	203	231	202.5	230	258
P	35	114.3	200	M12	180	240	80	45.5	6.5	24.5	71	211.5	239	267	238.5	266	294

Inertia [$\times 10^{-4}$ kgm²]

Motor code	one staged		two staged						three staged
	i = 4	5	9	12	20	25	35	50	100
F / L	2.66	2.39	3.51	3.08	2.41	2.29	2.22	2.11	2.14
M	2.78	2.52	3.63	3.21	2.54	2.41	2.34	2.24	2.26
I	2.87	2.61	3.72	3.30	2.63	2.50	2.43	2.33	2.35
P	3.55	3.28	4.40	3.97	3.30	3.18	3.11	3.00	3.03

Weight [kg]

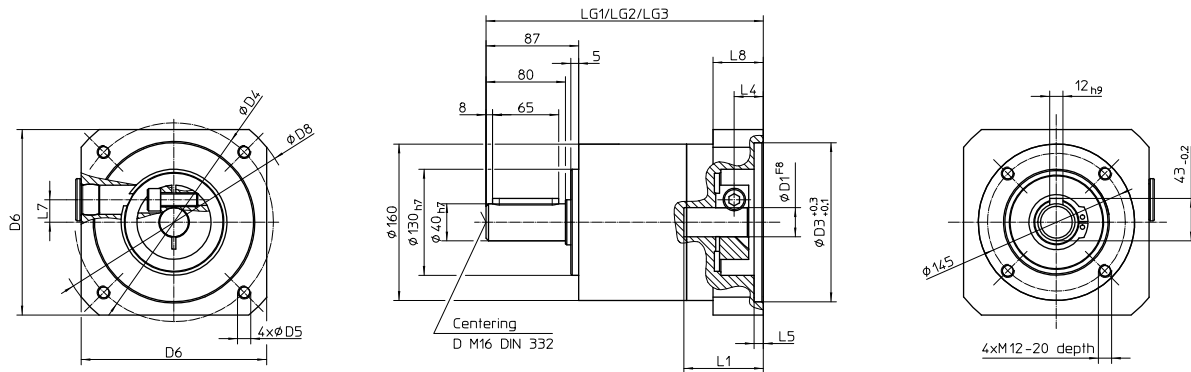
Gear box type	Option	
	standard	B
one staged	8.5	8.8
two staged	10.5	10.8
three staged	12.5	12.8

Y00 25 005 6 A □

LG1: Length one staged
LG2: Length two staged
LG3: Length three staged

LG01: Length one staged with option
LG02: Length two staged with option
LG03: Length three staged with option

Planetary Gears YZ026/YZZ26



► Standard

Dimensions [mm]

Motor code	Gear Box only													
	D1	D3	D4	D5	D6	D8	L1	L4	L5	L7	L8	LG1	LG2	LG3
I	24	95	115	M6	120	161	45	18.5	3.5	15.5	39	252	293	334
N	24	110	145	M8	130	161	60	32	6.5	15.5	52.5	265	306.5	347.5
P	35	114.3	200	M12	180	240	80	46.5	6.5	24.5	73.5	286	327.5	368.5

Inertia [$\times 10^{-3}$ kgm²]

Motor code	one staged		two staged						three staged
	i = 4	5	9	12	20	25	35	50	100
I / N	1.61	1.40	2.30	1.94	1.39	1.30	1.24	1.16	1.17
P	1.78	1.57	2.49	2.13	1.56	1.47	1.41	1.33	1.34

Weight [kg]

Gear box type	Option
	standard
one staged	19.5
two staged	24.5
three staged	29.5

YZ0 26 005 6 A □

LG1: Length one staged
 LG2: Length two staged
 LG3: Length three staged

LG01: Length one staged with option
 LG02: Length two staged with option
 LG03: Length three staged with option

The bevelled ECO Series of Planetary Gear Boxes

The bevelled gear boxes combine the characteristics of the ECO series with the option of transmitting torque and speed in a 90° angle. This extends possibilities and options in designing and realizing machines and plants.

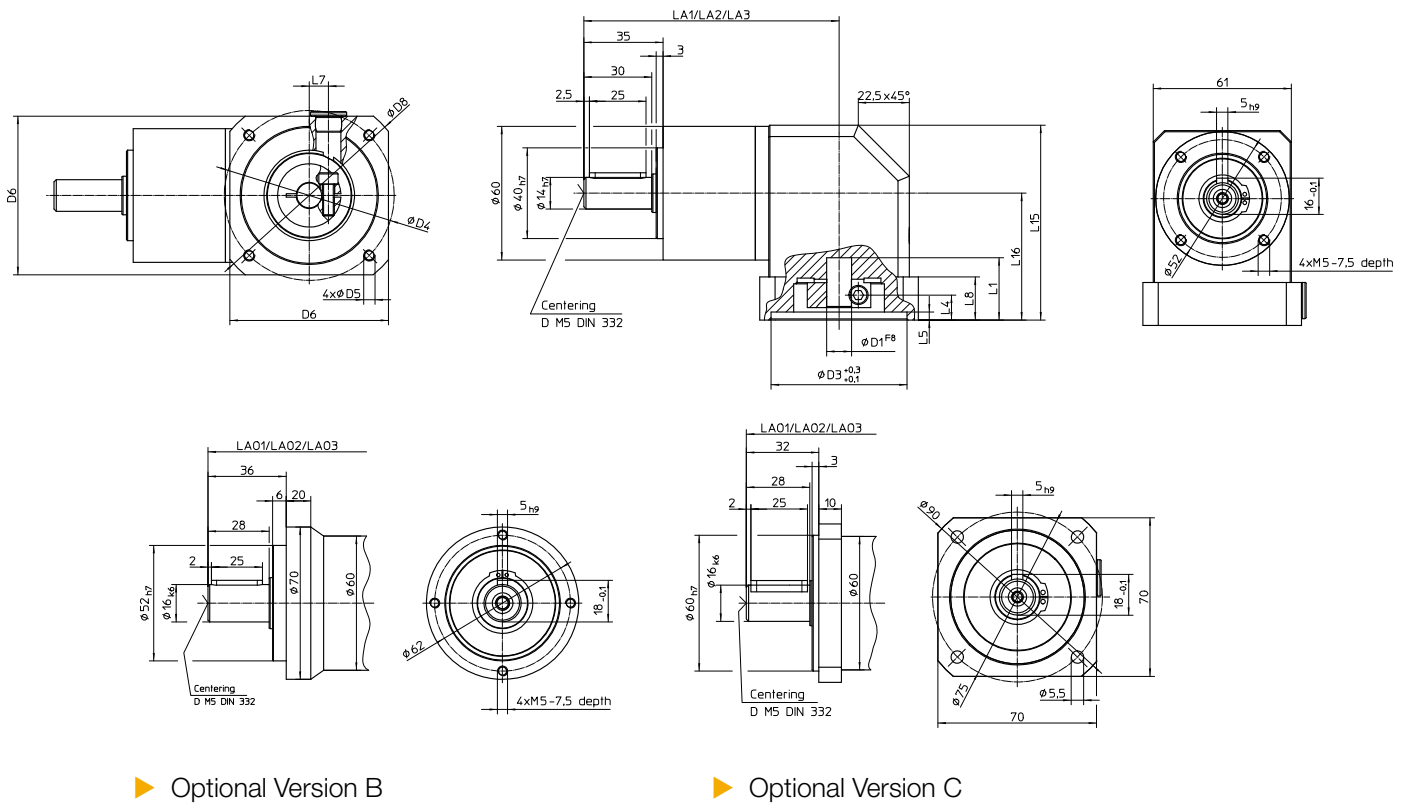
- ▶ Easy motor installation due to tangential-clamping
- ▶ Efficiency > 94%
- ▶ Compact rigid steel housing with B5 flanging
- ▶ Backlash < 15'/20'
- ▶ Any mounting position
- ▶ Lifetime lubrication with synthetic grease



Recommended Combinations (bevel)

Sigma-5 motor						Gear type								
Motor model	Motor code	Rated torque [Nm]	Peak torque [Nm]	Rated speed [rpm]	Max speed [rpm]	one staged		two staged						three staged
						i = 4	5	9	12	20	25	35	50	100
SGMGV-05	H	2.86	8.92	1500	3000	YK023	YK023	YZK23	YZK23	-	-	-	-	-
SGMGV-09	L	5.39	13.8	1500	3000	YK024	YK024	YZK24	YZK24	-	-	-	-	-
SGMGV-13	M	8.34	23.3	1500	3000	YK024	YK024	YZK24	YZK24	-	-	-	-	-
SGMGV-20	N	11.5	28.7	1500	3000	YK024	YK024	YZK24	YZK24	-	-	-	-	-
SGMSV-10	I	3.18	9.54	3000	6000	YK024	-	YZK24	-	YZK24	YZK24	YZK24	-	-
SGMSV-15	I	4.9	14.7	3000	5000	YK024	-	YZK24	-	YZK24	YZK24	-	-	-
SGMEV-04	D	1.27	3.82	3000	5000	YK023	-	YZK23	-	YZK23	YZK23	YZK24	YZK24	YMK24
SGMEV-08	J	2.39	7.16	3000	5000	YK023	-	YZK23	-	YZK24	YZK24	YZK24	YZK24	-
SGMAV-02	C	0.637	1.91	3000	6000	YK023	-	YZK23	-	YZK23	YZK23	YZK23	YZK23	YMK24
SGMAV-04	C	1.27	3.82	3000	6000	YK023	-	YZK23	-	YZK23	YZK23	YZK24	YZK24	YMK24
SGMAV-08	F	2.39	7.16	3000	6000	YK024	-	YZK24	-	YZK24	YZK24	YZK24	YZK24	-
SGMJV-02	C	0.637	2.23	3000	6000	YK023	-	YZK23	-	YZK23	YZK23	YZK23	YZK23	YMK24
SGMJV-04	C	1.27	4.46	3000	6000	YK023	-	YZK23	-	YZK23	YZK23	YZK24	YZK24	YMK24
SGMJV-08	F	2.39	8.36	3000	6000	YK024	-	YZK24	-	YZK24	YZK24	YZK24	YZK24	-

Bevelled Planetary Gears YK023/YZK23/YMK23



► Optional Version B

► Optional Version C

Dimensions [mm]

Motor code	Gear Box only																		
	D1	D3	D4	D5	D6	D8	L1	L4	L5	L7	L8	L15	L16	LA1	LA2	LA3	LA01	LA02	LA03
A	8	30	46	M4	60	80	30	11	3	8.5	19	86	56	113	129	145	129	145	161
C	14	50	70	M5	60	80	30	12.5	3.5	11	23	90	60	113	129	145	129	145	161
D	14	70	90	M6	80	105	30	12.5	3.5	11	23	90	60	113	129	145	129	145	161
H	16	80	100	M6	90	120	40	22.5	5.5	13.5	41	108	78	113	129	145	129	145	161
J	16	110	145	M8	120	160	40	22.5	4	13.5	41	108	78	113	129	145	129	145	161

Inertia [$\times 10^{-5}$ kgm²]

Motor code	one staged		two staged							three staged
	i = 4	5	9	12	20	25	35	50	100	
A	3.01	2.90	3.25	3.12	2.91	2.86	2.83	2.79	2.81	
C / D	3.50	3.40	3.74	3.61	3.40	3.35	3.33	3.29	3.30	
H / J	3.72	3.62	3.96	3.84	3.62	3.57	3.55	3.51	3.52	

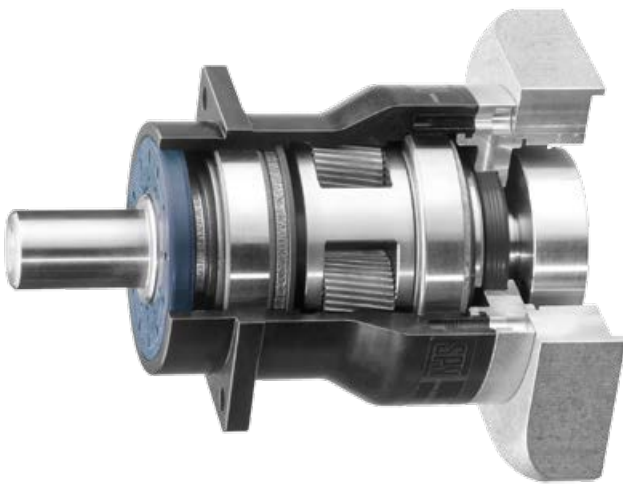
Weight [kg]

Gear box type	Option	
	standard	B / C
one staged	1.7	2.4
two staged	1.9	2.6
three staged	2.1	2.8

YK0 23 005 6 A

The Pure Series of Planetary Gear Boxes

The Pure series of gear boxes provide more premium characteristics. With better efficiency, better backlash and even less noise pollution the Pure series provides a high quality solution for demanding applications in many different industries.



- ▶ Low noise due to helical toothing
- ▶ Efficiency > 97%
- ▶ Optimized shafts guarantee high rigidity
- ▶ Compact rigid steel housing with B5 flanging
- ▶ High approved radial loads due to optimized tapered roller bearings
- ▶ Backlash < 2'4'
- ▶ Any mounting position
- ▶ Lifetime lubrication with synthetic oil

Recommended Combinations

Sigma-5 motor						Gear type							
Motor model	Motor code	Rated torque [Nm]	Peak torque [Nm]	Rated speed [rpm]	Max speed [rpm]	one staged		two staged					
						i = 4	5	9	12	20	25	35	50
SGMGV-05	H	2.86	8.92	1500	3000	YU043	YU043	YUZ44	YUZ44	-	YUZ45	-	-
SGMGV-09	L	5.39	13.8	1500	3000	YU044	YU044	YUZ44	YUZ45	-	YUZ46	-	-
SGMGV-13	M	8.34	23.3	1500	3000	YU044	YU044	YUZ45	YUZ45	-	YUZ46	-	-
SGMGV-20	N	11.5	28.7	1500	3000	YU045	YU045	YUZ46	YUZ46	-	YUZ47	-	-
SGMGV-30	P	18.6	45.1	1500	3000	YU046	YU046	YUZ46	YUZ46	-	YUZ48	-	-
SGMGV-44	P	28.4	71.1	1500	3000	YU046	YU046	YUZ47	YUZ47	-	YUZ48	-	-
SGMSV-10	I	3.18	9.54	3000	6000	YU045	-	YUZ45	-	YUZ45	YUZ45	YUZ46	YUZ46
SGMSV-15	I	4.9	14.7	3000	5000	YU045	-	YUZ45	-	YUZ45	YUZ46	YUZ46	YUZ46
SGMSV-20	I	6.36	19.1	3000	5000	YU045	-	YUZ45	-	YUZ46	YUZ46	YUZ46	YUZ47
SGMSV-25	I	7.96	23.9	3000	5000	YU045	-	YUZ45	-	YUZ46	YUZ46	YUZ47	YUZ47
SGMEV-04	D	1.27	3.82	3000	5000	YU043	-	YUZ43	-	YUZ44	YUZ44	YUZ44	YUZ45
SGMEV-08	J	2.39	7.16	3000	5000	YU043	-	YUZ44	-	YUZ44	YUZ44	YUZ45	YUZ46
SGMAV-01	A	0.318	0.955	3000	6000	YU043	-	YUZ43	-	YUZ43	YUZ43	YUZ43	YUZ43
SGMAV-02	C	0.637	1.91	3000	6000	YU043	-	YUZ43	-	YUZ43	YUZ43	YUZ44	YUZ44
SGMAV-04	C	1.27	3.82	3000	6000	YU043	-	YUZ43	-	YUZ44	YUZ44	YUZ44	YUZ44
SGMAV-08	F	2.39	7.16	3000	6000	YU044	-	YUZ44	-	YUZ44	YUZ44	YUZ45	YUZ46
SGMJV-01	A	0.318	1.11	3000	6000	YU043	-	YUZ43	-	YUZ43	YUZ43	YUZ43	YUZ43
SGMJV-02	C	0.637	2.23	3000	6000	YU043	-	YUZ43	-	YUZ43	YUZ43	YUZ44	YUZ44
SGMJV-04	C	1.27	4.46	3000	6000	YU043	-	YUZ43	-	YUZ44	YUZ44	YUZ44	YUZ44
SGMJV-08	F	2.39	8.36	3000	6000	YU044	-	YUZ44	-	YUZ44	YUZ44	YUZ45	YUZ46

Output Torque [Nm]

Gear type	one staged				two staged				
	i = 4	5	7	10	16	20	25	35	50
YU□43	20	20	18	15	20	20	20	20	20
YU□44	60	60	40	30	60	60	60	60	60
YU□45	100	100	80	65	100	100	100	100	100
YU□46	250	250	180	110	250	250	250	250	250
YU□47	450	450	420	240	450	450	450	450	450
YU□48	900	900	800	450	900	900	900	900	900

Torsion Rigidity [Nm/arcmin]

Gear type	
YU□43	2
YU□44	4
YU□45	12
YU□46	32
YU□47	54
YU□48	168

Running Noise [dB(A)]

Gear type	
YU□43	58
YU□44	59
YU□45	59
YU□46	63
YU□47	65
YU□48	65

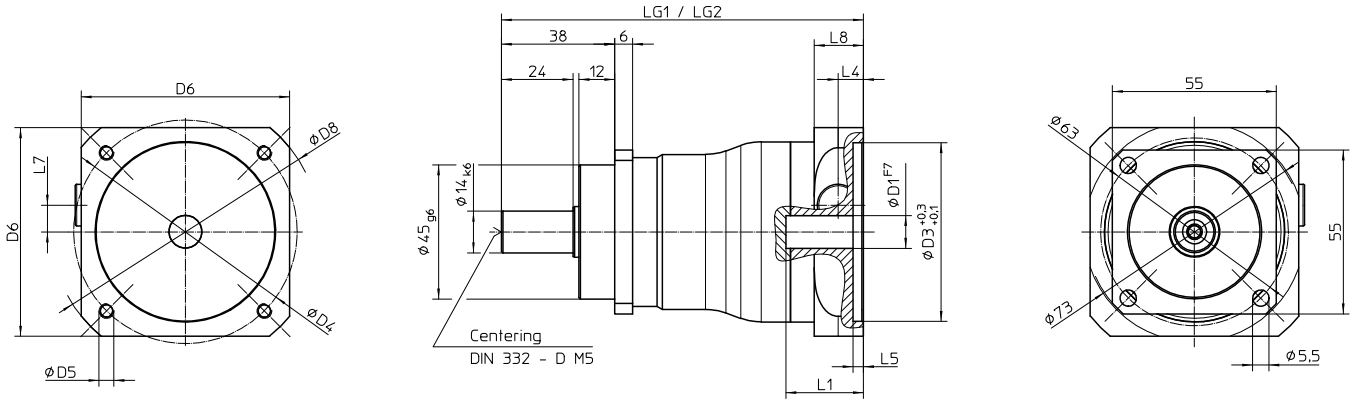
Characteristics

Gear type		one staged	two staged
Backlash		< 4 arcmin	< 6 arcmin
Backlash reduced		< 2 arcmin	< 4 arcmin
Gear type		Standard	
Radial Force*1	YU□43	2000 N	
	YU□44	4100 N	
	YU□45	6500 N	
	YU□46	8000 N	
	YU□47	14500 N	
	YU□48	23500 N	
Axial Force*1	YU□43	1200 N	
	YU□44	2800 N	
	YU□45	4000 N	
	YU□46	5400 N	
	YU□47	13000 N	
	YU□48	17000 N	
Efficiency		> 97%	
Lubrication		Synthetic oil	
Surface		Black	
Acceptable temp. range		-25 °C ... +80 °C (short term: 100 °C)	
Protection		IP54 (optionally: IP65/IP66)	
Emergency stop torque		$3.5 \times T_{2N}$	
Max. acceleration torque		$1.5 \times T_{2N}$	
Max. input speed		6000 min ⁻¹	

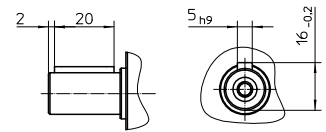
*1 Estimated Life Time: 20,000 h; related to drive shaft center with $n_2 = 100 \text{ min}^{-1}$



Planetary Gears YU043/YUZ43



► Straight with Key and Tap



Gear Shaft Option 6

Dimensions [mm]

Motor code	Gear Box only												
	D1	D3	D4	D5	D6	D8	L1	L4	L5	L7	L8	LG1	LG2
A	8	30	46	M4	60	80	26	10	3.5	9	17	120.5	162
C	14	50	70	M5	60	80	30	15.5	3.5	14	24	127.5	169
D	14	70	90	M6	80	105	30	15.5	3.5	14	24	127.5	169
H	16	80	100	M6	90	120	40	18	5.5	14	34	137.5	-
J	16	110	145	M8	120	160	40	18	4	14	34	137.5	-

Inertia [$\times 10^{-5}$ kgm²]

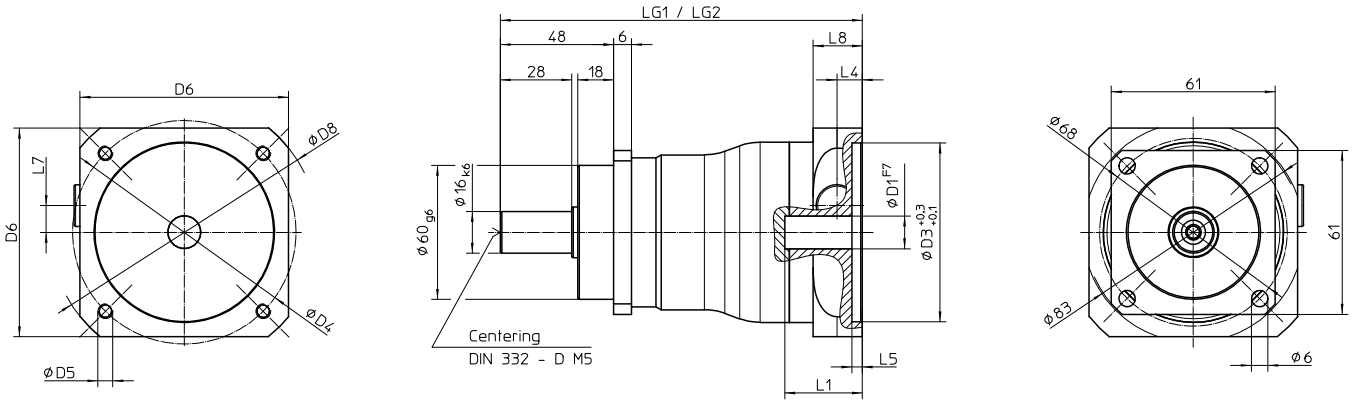
Motor code	one staged		two staged					
	i = 4	5	9	12	20	25	35	50
A	0.79	0.60	1.26	1.04	0.66	0.57	0.51	0.43
C / D	1.51	1.32	1.99	1.76	1.39	1.29	1.23	1.15
H / J	1.63	1.44	2.10	1.88	1.50	1.40	1.35	1.27

Weight [kg]

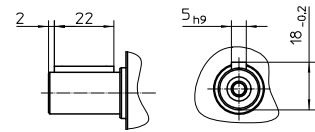
Gear box type	Option
	standard
one staged	1.1
two staged	1.8

YU0 43 005 2 A

Planetary Gears YU044/YUZ44



► Straight with Key and Tap



Gear Shaft Option 6

Dimensions [mm]

Motor code	Gear Box only												
	D1	D3	D4	D5	D6	D8	L1	L4	L5	L7	L8	LG1	LG2
C	14	50	70	M5	70	90	30	13.5	3.5	14	22	-	187
D	14	70	90	M6	80	105	30	13.5	3.5	14	22	-	187
F	19	70	90	M6	80	105	40	15	3.5	19	34	-	199
	19	70	90	M6	80	105	40	17.5	3.5	19	53	160	-
H	16	80	100	M6	90	120	40	18	5.5	14	34	-	199
J	16	110	145	M8	120	160	40	18	4	14	34	-	199
L	19	110	145	M8	130	160	60	33	6.5	19	52	-	217
	19	110	145	M8	130	160	60	33.5	6.5	19	51	178	-
M	22	110	145	M8	130	160	60	33.5	6.5	19	51	178	-

Inertia [$\times 10^{-5}$ kgm²]

Motor code	one staged		two staged					
	i = 4	5	9	12	20	25	35	50
C / D	2.72	2.18	2.38	2.06	1.52	1.38	1.30	1.19
F / L	5.71	5.17	5.37	5.04	4.50	4.37	4.29	4.18
H / J	2.84	2.30	2.50	2.17	1.63	1.50	1.42	1.31
M	9.46	9.46	9.12	8.79	8.25	8.12	8.04	7.93

Weight [kg]

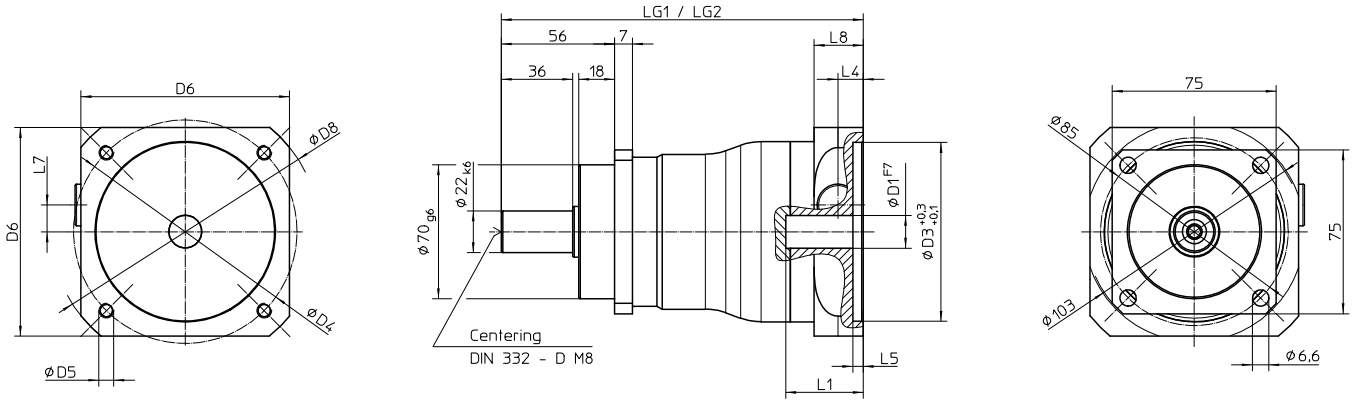
Gear box type	Option
	standard
one staged	2.2
two staged	2.9

YU0 44 005 2 A □

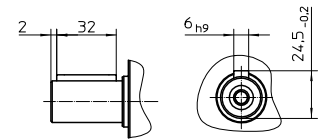
LG1: Length one staged
LG2: Length two staged
LG3: Length three staged

LG01: Length one staged with option
LG02: Length two staged with option
LG03: Length three staged with option

Planetary Gears YU045/YUZ45



► Straight with Key and Tap



Gear Shaft Option 6

Dimensions [mm]

Motor code	Gear Box only												
	D1	D3	D4	D5	D6	D8	L1	L4	L5	L7	L8	LG1	LG2
D	14	70	90	M6	80	105	30	13	3.5	14	24.5	-	203.5
F	19	70	90	M6	80	105	40	15.5	3.5	19	34.5	-	213.5
H	16	80	100	M6	90	120	40	20	5.5	14	32.5	-	220
I	24	95	115	M6	100	130	50	23	3.5	20	54.5	-	233.5
	24	95	115	M6	100	130	50	17	3.5	20	54.5	178.5	-
J	16	110	145	M8	120	160	40	20	4	14	32.5	-	220
L	19	110	145	M8	130	160	60	40	6.5	19	50.5	-	238
M	22	110	145	M8	130	160	60	29	6.5	19	50.5	-	238
N	24	110	145	M8	130	160	60	30	6.5	20	54.5	191.5	-

Inertia [$\times 10^{-5}$ kgm²]

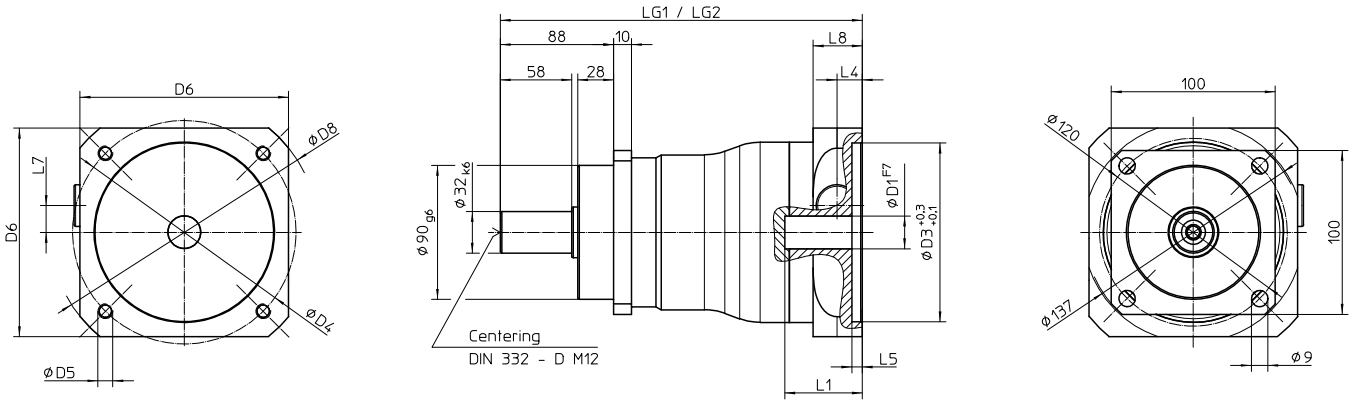
Motor code	one staged		two staged					
	i = 4	5	9	12	20	25	35	50
D	6.18	4.88	4.76	3.94	2.53	2.14	1.97	1.71
F/L	9.17	7.86	7.75	6.93	5.52	5.13	4.95	4.70
H/J	6.30	4.99	4.88	4.06	2.65	2.26	2.08	1.83
I/N	12.3	11.0	10.8	10.0	8.62	8.23	8.05	7.80
M	12.9	11.6	11.5	10.7	9.27	8.88	8.70	8.45

Weight [kg]

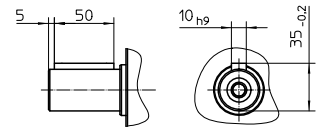
Gear box type	Option
	standard
one staged	3.6
two staged	4.9

YU0 45 005 2 A □

Planetary Gears YU046/YUZ46



► Straight with Key and Tap



Gear Shaft Option 6

Dimensions [mm]

Motor code	Gear Box only												
	D1	D3	D4	D5	D6	D8	L1	L4	L5	L7	L8	LG1	LG2
F	19	70	90	M6	96	110	40	14.5	3.5	19	25.5	-	258
I	24	95	115	M6	100	130	50	21	3.5	20	47	-	279.5
J	16	110	145	M8	120	160	40	14	4	14	25.5	-	258
L	19	110	145	M8	130	160	60	31	6.5	19	42	-	274.5
M	22	110	145	M8	130	160	60	29	6.5	20	55	-	287.5
N	24	110	145	M8	130	160	60	29	6.5	20	55	-	287.5
P	35	114.3	200	M12	180	230	80	51	4	25	75	-	307.5
	35	114.3	200	M12	180	230	80	50	4	25	67	250	-

Inertia [$\times 10^{-5}$ kgm²]

Motor code	one staged		two staged					
	i = 4	5	9	12	20	25	35	50
F / L	2.39	1.89	1.61	1.36	0.95	0.84	0.78	0.70
I / N	2.70	2.20	1.92	1.67	1.26	1.15	1.09	1.01
J	2.10	1.61	1.32	1.07	0.66	0.55	0.49	0.41
M	2.76	2.27	1.98	1.74	1.32	1.22	1.16	1.07
P	3.44	2.95	2.66	2.41	2.00	1.89	1.83	1.75

Weight [kg]

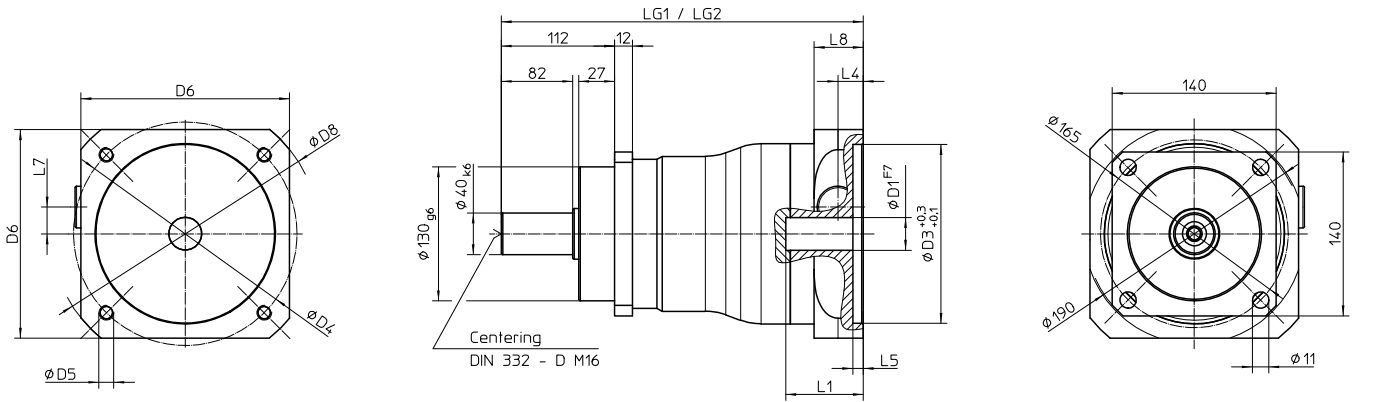
Gear box type	Option standard
	one staged
two staged	9.1

YU0 46 005 2 A □

LG1: Length one staged
 LG2: Length two staged
 LG3: Length three staged

LG01: Length one staged with option
 LG02: Length two staged with option
 LG03: Length three staged with option

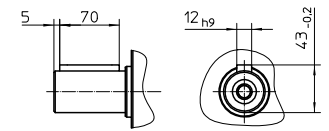
Planetary Gears YU047/YUZ47



Dimensions [mm]

Motor code	Gear Box only												
	D1	D3	D4	D5	D6	D8	L1	L4	L5	L7	L8	LG1	LG2
I	24	95	115	M6	100	130	50	17.5	3.5	20	34.5	-	344
N	24	110	145	M8	130	160	60	30.5	4	20	47.5	-	357
P	35	114.3	200	M12	180	230	80	50	4	25	67	-	376.5

► Straight with Key and Tap



Gear Shaft Option 6

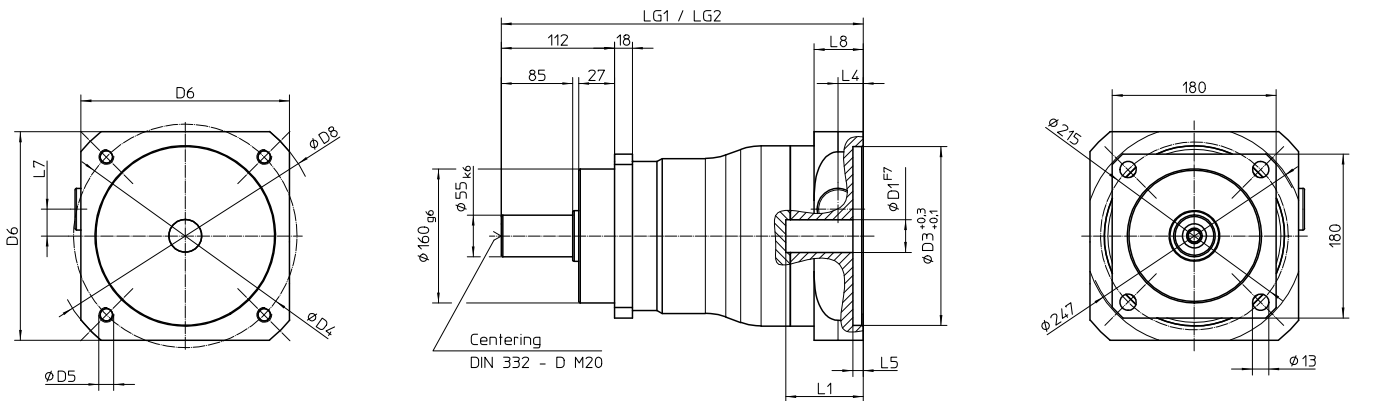
Inertia [$\times 10^{-4}$ kgm²]

Motor code	one staged		two staged					
	i = 4	5	9	12	20	25	35	50
I / N	8.08	6.20	4.98	4.11	2.66	2.29	2.10	1.82
P	8.82	6.94	5.73	4.85	3.40	3.03	2.84	2.56

Weight [kg]

Gear box type	Option standard
	one staged
two staged	23.3

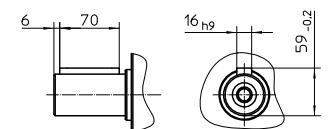
Planetary Gears YU048/YUZ48



Dimensions [mm]

Motor code	Gear Box only												
	D1	D3	D4	D5	D6	D8	L1	L4	L5	L7	L8	LG1	LG2
P	35	114.3	200	M12	180	230	80	30.5	4	25	46.5	-	424

► Straight with Key and Tap



Gear Shaft Option 6

Inertia [$\times 10^{-4}$ kgm²]

Motor code	one staged		two staged					
	i = 4	5	9	12	20	25	35	50
P	35.8	25.9	20.3	16.3	9.55	7.87	6.97	5.70

Weight [kg]

Gear box type	Option standard
	one staged
two staged	46.0

YU0 48 005 2 A □

Find the Perfect Planetary Gear

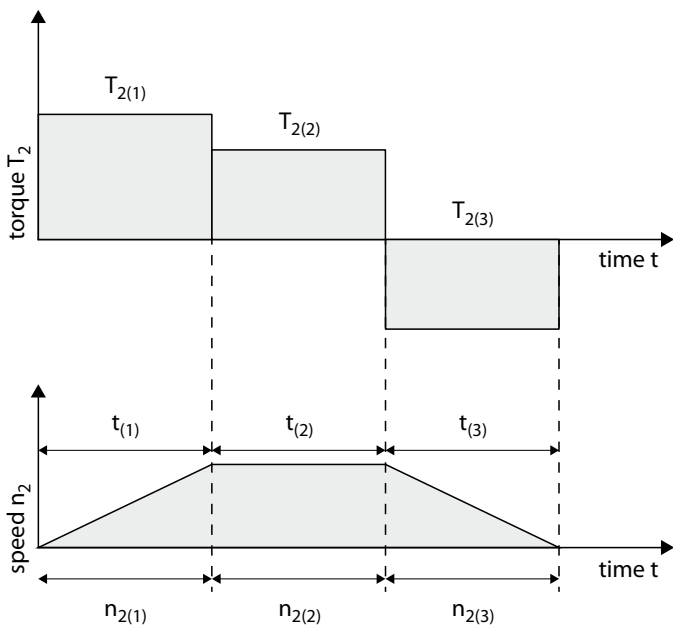
Finding the perfectly matching gear for an application can be done in some easy steps. The most important dimensions are the torques at the output.



- ▶ T_2 [Nm] greatest appearing output torque
- ▶ T_{2Bl} [Nm] blocking torque (emergency stop)
- ▶ i ratio
- ▶ n_2 [min⁻¹] output speed
- ▶ t [h] period of the load phases



Load Cycle



Calculation of the equivalent torque T_{2eq} [Nm]

By means of the calculated result it is possible to select a gear size from the table with the allowed output torques. Therefore the following conditions must be fulfilled:

$$T_{2Bl} \leq 3.5 T_{2N}$$

$$T_{2eq} \leq T_{2N}$$

$$T_{2max} \leq 1.5 T_{2N}$$

$$T_{2max} \text{ limited to } 10^5 \text{ rev. of output shaft}$$



YASKAWA Europe GmbH

Drives & Motion Division
Hauptstr. 185
65760 Eschborn
Germany

Tel: +49 6196-569 500
info@yaskawa.eu.com
www.yaskawa.eu.com