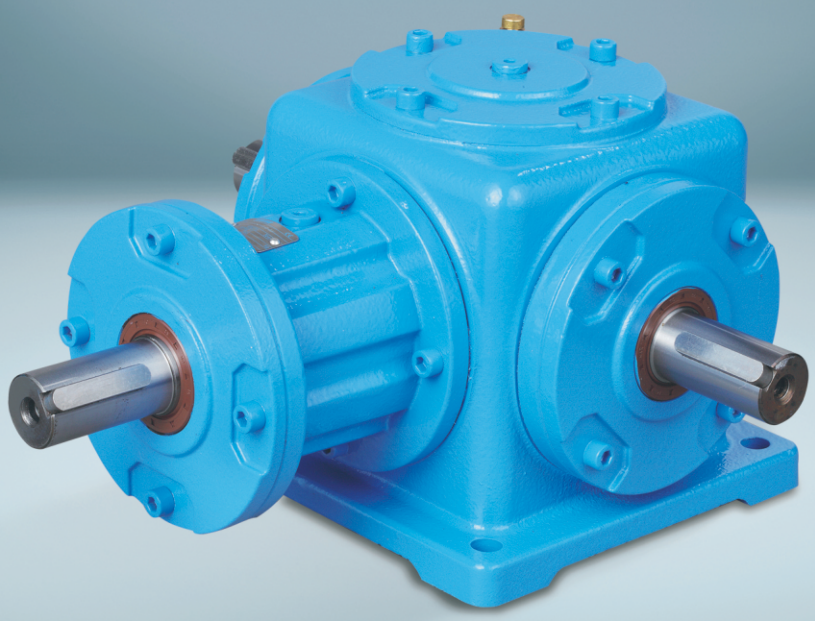
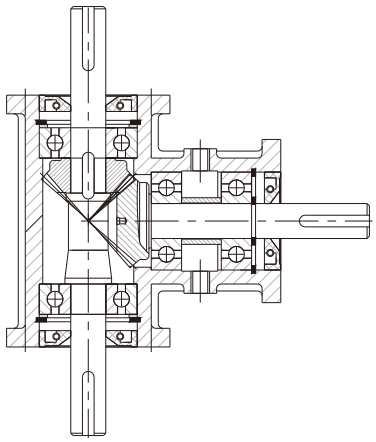
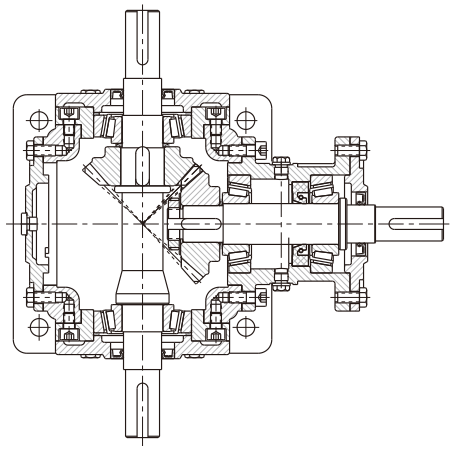
T Series Spiral Bevel Gear Units



1 Sectional Drawings:



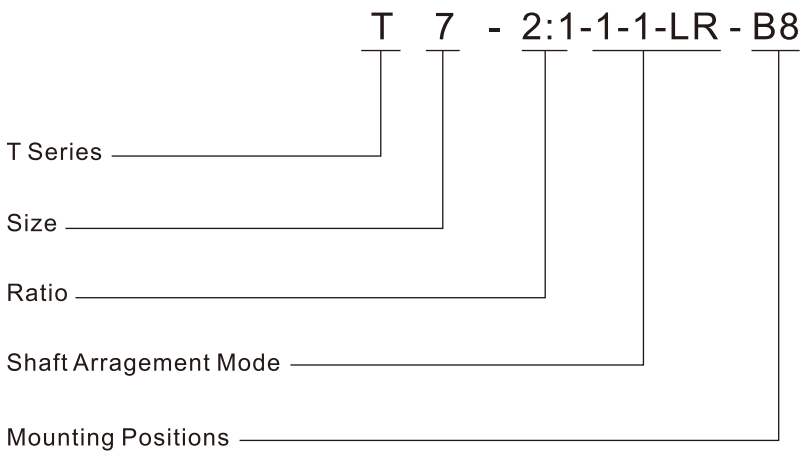
ARA1–ARA4



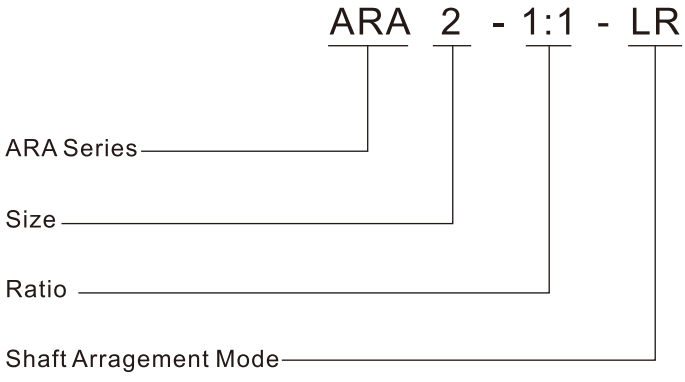
T4–T25

2 Type Designation:

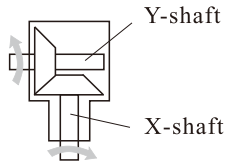
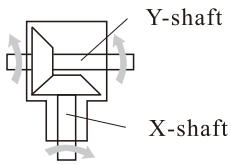
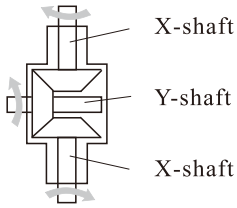
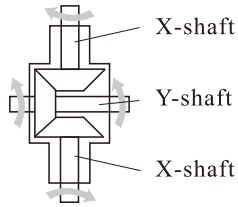
2.1 T Series:



2.1 ARA Series:



3 Direction of Rotation:

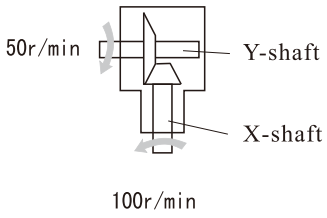
One X-shaft		Two X-shafts	
Two extended shafts	Three extended shafts	Three extended shafts	Four extended shafts
			

Note: Direction of rotation of the output shaft varies with that of the input shaft.

4 Relation between input shaft and speed:

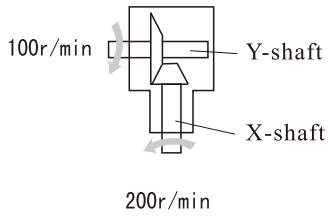
e.g.: i=2

［Reducer］



When X shaft inputs 100r/min, Y shaft outputs 50r/min

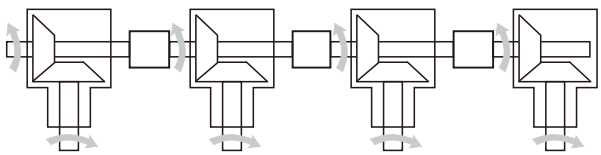
［Increaser］



When Y-shaft inputs 100r/min, X-shaft outputs 200r/min

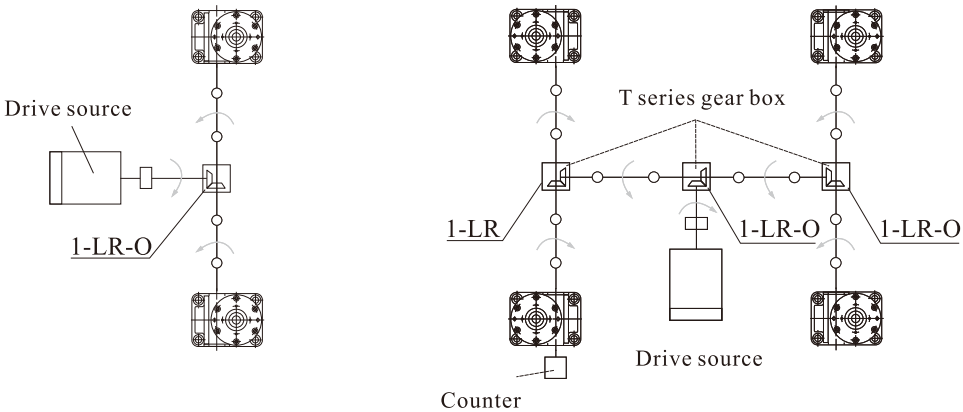
5 Application Examples:

Side-by-side Transmission



The connected Y shafts drives the X shafts to rotate in synchronism.

Lifter



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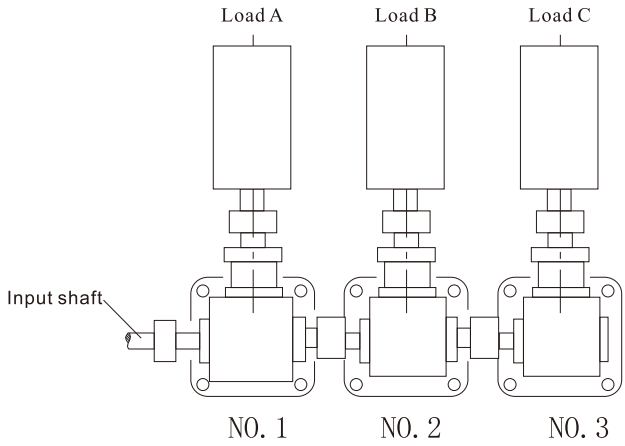
6 Driven Machine Factor(f1):

Load Characteristic	Operating hours per day (h)		
	≤2	2～10	10～24
Uniform	1.00(1.00)	1.00(1.25)	1.25(1.50)
Moderate	1.00(1.25)	1.25(1.50)	1.50(1.75)
Heavy	1.25(1.50)	1.50(1.75)	1.75(2.00)

Note: Apply values in the brackets when starts per hour are 10 times or more.

7 Examples of Type Selection:



Load characteristics of each gear unit: 196N.m, moderate, working 8 hours/d continuously:
i.e: driven machine factor f1=1.25, input speed=300r/min, ratio i=1
Calculated with the following formula, the torque required by each gear unit is

T2N≥T2 • f1=196*1.25=245N.m

No.1 gear unit:

No.1 gear unit carries its own toque of 245N.m and at the same time transmits torques to No.2 and No.3 gear units, so the total load is:

245N m+245N m+245N m =735N m

In the table of Transmission Capacity, **T12** is selected.

No.2 gear unit:

Besides its own torque, No.2 gear unit has to transmit torque to No.3 gear unit, so the total load is:

245N m+245N m=490N m

In the table of Transmission Capacity, **T10** is selected.

No. 3 gear unit:

As only load C exists, torque larger than 245N.m is acceptable. In the table of Transmission Capacity, **T8** is selected.

Notes:

1. When i≠1, please make a choice of the input shaft. When X shaft acts as the input shaft, the machine is a reducer; when Y shaft acts as the input shaft, it is an increaser. The positions of the two shafts cannot be changed once the mounting positions and dimensions are fixed.
2. When several gear units are connected for output, load capacity of the connection shaft should be checked.

8 Radial Force on Shafts (Fr)(N):

i_N	n_1 (r/min)	T4		T6		T7		T8		T10		T12		T16		T20		T25	
		X-shaft	Y-shaft	X-shaft	Y-shaft	X-shaft	Y-shaft	X-shaft	Y-shaft	X-shaft	Y-shaft	X-shaft	Y-shaft	X-shaft	Y-shaft	X-shaft	Y-shaft	X-shaft	Y-shaft
1	1740	784	902	1813	2303	2156	2842	3087	3234	3969	4263	4851	5341						
	1450	833	951	1911	2450	2450	3136	3234	3381	4165	4508	5096	5586	10633	10976				
	960	882	1029	2058	2597	2744	3234	3479	3626	4459	4851	5488	6076	11368	11760	15386	15608		
	730	960	1127	2205	2842	2989	3381	3773	3969	4851	5292	5880	6566	12446	12740	16660	17150	24794	25480
	580	1078	1323	2499	3185	3381	3822	4263	4459	5488	5880	6713	7301	14014	14504	18816	19404	28028	28910
	480	1372	1715	3185	3528	4018	4900	4851	5978	6272	7056	7742	8134	15680	16170	21070	21756	31360	32340
	360	1519	1960	3430	3528	4410	5537	5243	6958	6713	7987	8232	9065	17150	17640	23422	24108	34300	35280
	240	1911	1960	3430	3528	5096	6272	7889	8820	8575	9604	9261	10290	19600	19894	25970	26754	38612	39788
	100	1911	1960	3430	3528	5096	6272	8428	8820	9996	11760	11368	12593	22540	22540	28420	32928	39200	49000
	10	1911	1960	3430	3528	5096	6272	8428	8820	9996	11760	11858	14504	22540	22540	28420	33320	39200	49000
1.5 2 3	1740	1078	1960	2205	2744	3038	4998	3822	7252	4459	8232	5096	9212	5439	10339				
	1450	1078	1960	2548	2842	3430	5390	4361	7987	5194	9212	5978	10486	5978	12152	7693	14602		
	960	1078	1960	3038	3087	4067	5978	5096	8820	6174	10486	7252	12152	6419	13083	8771	17934	12985	24647
	730	1078	1960	3430	3332	4753	6076	6076	8820	7448	11760	8869	14504	6958	14210	9506	19453	13573	29400
	580	1078	1960	3430	3528	5096	6174	7644	8820	9555	11760	11466	14504	7840	16072	10780	22001	15680	33222
	480	1078	1960	3430	3528	5096	6272	8428	8820	9996	11760	11858	14504	8820	17934	12005	24598	17542	37142
	360	1078	1960	3430	3528	5096	6272	8428	8820	9996	11760	11858	14504	9604	19600	13132	27342	19159	40474
	240	1078	1960	3430	3528	5096	6272	8428	8820	9996	11760	11858	14504	10829	22148	14798	30282	21658	45766
	100	1078	1960	3430	3528	5096	6272	8428	8820	9996	11760	11858	14504	13328	22540	18228	33320	26656	49000
	10	1078	1960	3430	3528	5096	6272	8428	8820	9996	11760	11858	14504	22540	22540	28420	33320	39200	49000

Note: For lower output speed, apply the largest Fr2 value in each type.

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9 Transmission Capacity:

i	n_1 r/min	ARA1		ARA2		ARA4		T4		T6		T7	
		T_{2N} (N·m)	P_{1N} (kw)	T_{2N} (N·m)	P_{1N} (kw)	T_{2N} (N·m)	P_{1N} (kw)	T_{2N} (N·m)	P_{1N} (kw)	T_{2N} (N·m)	P_{1N} (kw)	T_{2N} (N·m)	P_{1N} (kw)
1	1740	7.15	1.33	12.25	2.3	30	5.58	30	5.61	91.1	17.1	132	22.00
	1450	7.15	1.108	12.25	1.92	31.9	4.94	31.9	4.94	96	14.90	142	22.00
	960	7.15	0.733	14.3	1.48	35.2	3.61	36.0	3.69	108	11.08	152	15.59
	730	7.15	0.558	16.5	1.3	39.5	3.08	38.0	2.96	115	8.97	170	13.26
	580	7.15	0.443	17.74	1.11	39.5	2.45	39.5	2.45	119	7.37	184	11.40
	480	7.15	0.367	17.74	0.92	39.5	2.03	40.1	2.06	122	6.26	192	9.85
	360	7.15	0.275	17.74	0.69	39.5	1.52	40.5	1.56	125	4.81	197	7.58
	240	7.15	0.183	17.74	0.46	41.2	1.06	41.0	1.05	124	3.18	200	5.13
	100	7.15	0.076	17.74	0.19	41.2	0.44	41.9	0.45	127	1.36	206	2.20
	10	7.15	0.008	17.74	0.02	41.2	0.04	43.0	0.05	132	0.14	214	0.23
1.5	1740									110	13.7	139	17.4
	1450									117	12.08	145	14.98
	960									122	8.34	148	10.12
	730									123	6.40	150	7.80
	580									126	5.21	153	6.32
	480									127	4.34	155	5.30
	360									128	3.28	156	4.00
	240									130	2.22	160	2.74
	100									134	0.95	163	1.16
	10									139	0.10	169	0.12
2	1740									101	9.44	135	12.7
	1450									102	7.90	137	10.61
	960									105	5.39	140	7.18
	730									106	4.13	142	5.54
	580									108	3.35	144	4.46
	480									109	2.80	146	3.74
	360									110	2.12	147	2.83
	240									111	1.42	149	1.91
	100									114	0.61	152	0.81
	10									116	0.06	157	0.08
3	1740									92.7	5.78	104	6.48
	1450									93.6	4.83	105	5.42
	960									95.1	3.25	107	3.66
	730									96.2	2.50	108	2.81
	580									97.6	2.02	109	2.25
	480									99.3	1.70	110	1.88
	360									100	1.28	111	1.42
	240									100	0.85	113	0.97
	100									102	0.36	115	0.41
	10									104	0.04	118	0.04

1. Apply 10r/min when speed of X-shaft is less than 10r/min.

2. Please consult us when order models with yellow mark or when input speed is more than 1450r/min.

	T8		T10		T12		T16		T20		T25	
	T_{2N} (N·m)	P_{1N} (kw)	T_{2N} (N·m)	P_{1N} (kw)	T_{2N} (N·m)	P_{1N} (kw)	T_{2N} (N·m)	P_{1N} (kw)	T_{2N} (N·m)	P_{1N} (kw)	T_{2N} (N·m)	P_{1N} (kw)
	279	52.3	399	74.6	586	110						
	294	45.55	421	65.23	619	96.00	1019	162.86				
	304	31.18	460	47.18	670	68.80	1120	118.51	1842	194.91		
	315	24.57	485	37.83	740	57.78	1230	98.97	2050	164.95	3740	302.5
	319	19.77	493	30.55	802	49.75	1343	85.86	2274	145.38	3940	253.2
	323	16.57	500	25.64	810	41.59	1470	77.77	2330	123.27	4100	218.1
	328	12.62	510	19.62	830	31.96	1550	61.50	2590	102.77	4500	179.5
	335	8.59	516	13.23	843	21.64	1700	44.97	2900	76.72	4900	130.3
	346	3.70	535	5.72	875	9.36	1842	20.30	3205	35.33	5439	60.3
	361	0.39	561	0.60	919	0.98	1940	2.14	3205	3.53	5713	6.3
	182	22.7	368	46	528	65.9						
	185	19.11	374	38.71	564	58.31						
	190	12.99	385	26.38	620	42.44						
	193	10.04	392	20.43	675	35.14						
	197	8.14	396	16.39	699	28.91						
	200	6.84	401	13.74	705	24.13						
	203	5.21	410	10.54	716	18.38						
	204	3.49	420	7.19	730	12.49						
	210	1.50	426	3.04	754	5.38						
	218	0.16	443	0.32	785	0.56						
	180	16.9	302	28.2	516	48.3	908	87.7				
	180	13.94	305	23.68	516	40.01	921	73.60	1578	126.10		
	185	9.49	309	15.88	516	26.49	940	49.73	1625	85.97	3180	169.1
	189	7.37	318	12.43	520	20.30	965	38.82	1670	67.19	3280	132.7
	191	5.92	322	10.00	524	16.25	980	31.33	1695	54.18	3332	107.1
	192	4.92	325	8.35	530	13.61	990	26.19	1710	45.24	3380	89.9
	195	3.75	330	6.36	540	10.40	1000	19.84	1735	34.42	3450	68.8
	198	2.54	335	4.30	545	7.00	1115	14.75	1760	23.28	3520	46.8
	202	1.08	344	1.84	563	3.01	1058	5.83	1833	10.10	3646	20.2
	209	0.11	357	0.19	586	0.31	1098	0.61	1921	1.06	3822	2.1
	157	9.78	290	21.7	500	37.4	890	49				
	159	8.21	270	13.97	458	23.65	904	48.21	1529	82.32	2935	158.0
	161	5.50	276	9.46	465	15.90	930	32.84	1570	55.97	3100	110.5
	165	4.29	282	7.35	472	12.27	950	25.51	1620	43.91	3200	86.7
	166	3.43	285	5.90	480	9.92	960	20.48	1644	35.41	3246	69.9
	167	2.86	287	4.92	485	8.29	970	17.12	1655	29.50	3280	58.5
	168	2.15	290	3.73	490	6.28	980	12.98	1685	22.52	3350	44.8
	170	1.45	292	2.50	500	4.27	1000	8.83	1720	15.33	3400	30.3
	173	0.62	300	1.07	510	1.82	1038	3.82	1777	6.60	3537	13.1
	179	0.06	308	0.11	527	0.19	1076	0.40	1865	0.69	3713	1.4

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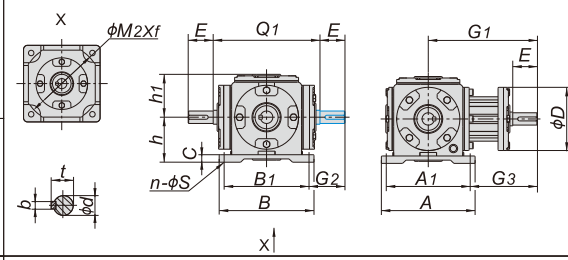
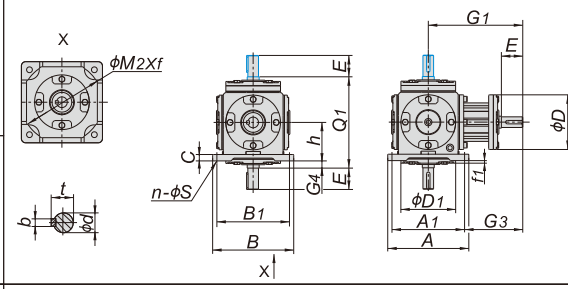
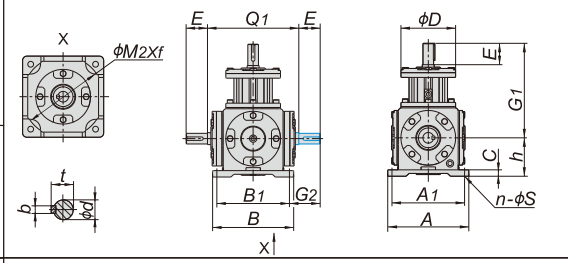
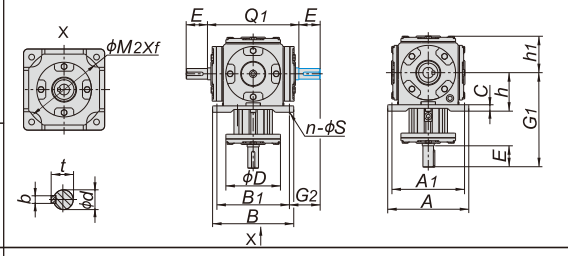
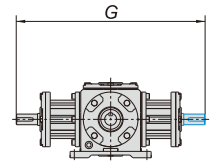
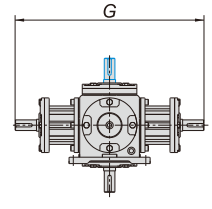
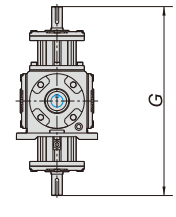
10 Relation between Shaft Arrangement and Direction of Rotation; Mounting Positions and Dimensions:

Shaft Arragement Mode	Mounting Positions			T4-T16
1-LR 1-R 1-L 1-LR-O 1-R-O 1-L-O	B3 B6 V5 B8 B7 V6			
1-UD 1-U 1-D 1-UD-O 1-U-O 1-D-O	B3 B6 V5 B8 B7 V6			
U-LR U-R U-L U-LR-O U-R-O U-L-O	B3 B6 V5 B8 B7 V6			
D-LR D-R D-L D-LR-O D-R-O D-L-O	B3 B6 V5 B8 B7 V6			
1-1-LR 1-1-R 1-1-L 1-1-LR-O 1-1-R-O 1-1-L-O	B3 B6 V5 B8 B7 V6			
1-1-UD 1-1-U 1-1-D 1-1-UD-O 1-1-U-O 1-1-D-O	B3 B6 V5 B8 B7 V6			
U-D-LR U-D-R U-D-L U-D-LR-O U-D-R-O U-D-L-O	B3 B6 V5 B8 B7 V6			

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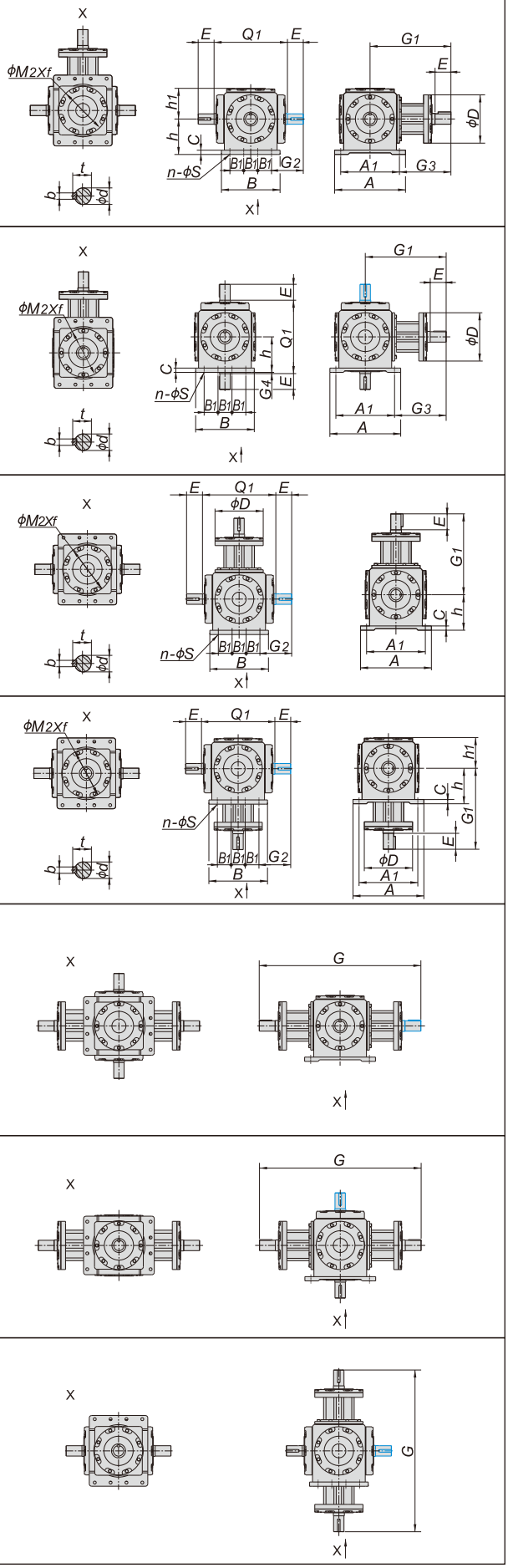
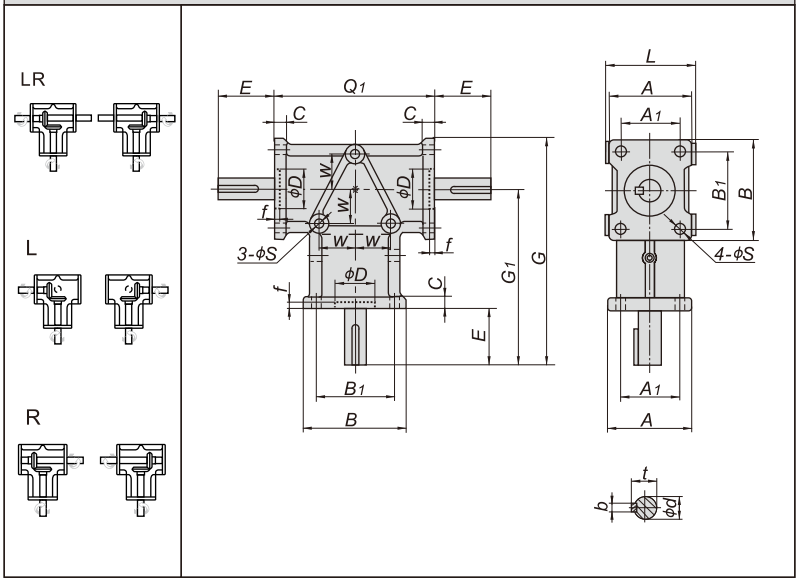
T20-T25



ARA1-ARA4



	ARA1	ARA2	ARA4	T4	T6	T7	T8	T10	T12	T16	T20	T25
A	56	72	110	155	190	210	235	285	340	390	490	580
A1	40	54	80	125	152	174	195	240	290	330	430	520
b	5	6	8	6	8	10	12	14	14	18	20	22
B	70	98	110	155	190	210	235	285	340	390	410	480
B1	54	76	80	125	152	174	195	240	290	330	110	130
C	8	12	10.5	13	15	19	20	25	28	30	32	35
d	14k6	19k6	24k6	19k6	25k6	32k6	40k6	45k6	50k6	60m6	70m6	85m6
D	42H7	42H7	62H7	100	128	142	170	195	215	215	270	270
D1	/	/	/	100	128	142	170	195	230	270	320	390
E	38	50	60	38	50	62	75	90	100	105	105	130
f	5	5	5	5	5	5	5	5	5	7	10	10
f1	/	/	/	2	11	13	13	10	1	6	0	0
G	155.5	226	265	360	444	530	616	720	830	910	1090	1324
G1	120.5	177	210	180	222	265	308	360	415	455	545	660
G2	/	/	/	53.5	81	88	110.5	120	130	150	195	235
G3	/	/	/	117.5	146	178	210.5	240	270	290	330	400
G4	/	/	/	2	17	13	18	10	0	10	10	10
h	/	/	/	76	90	100	115	140	175	200	245	290
h1	/	/	/	76	87	97	114.5	133	160	186	217	255
L	60	76	110	/	/	/	/	/	/	/	/	/
M2	/	/	/	155H8	190H8	220H8	250H8	305H8	370H8	420H8	360H8	430H8
n	/	/	/	4	4	4	4	4	4	4	8	8
Q1	108	152	160	156	214	226	266	300	350	420	510	600
s	6.8	9	10.8	9	13.5	13.5	13.5	17.5	22	26	22	26
t	16	21.5	27	21.5	28	35	43	48.5	53.5	64	74.5	90
w	24	38	40	/	/	/	/	/	/	/	/	/
Wt. (kg)	1.5	3.3	5.3	10	21	32	49	78	124	188	297	488

T

11 Accessories:

Oil :

Oil level (L)												
Type	ARA1	ARA2	ARA4	T4	T6	T7	T8	T10	T12	T16	T20	T25
V	Filled	Filled	Filled	Filled	0.95	1.5	1.9	3.5	7	10	11	18

Note: When ambient temperature is -10℃ ~+40℃,

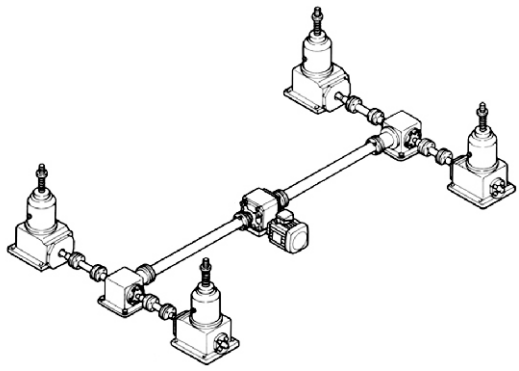
(1) ARA1\ARA2\ARA4\T4 series lubricant is 000# lithium grease;

(2) T6-T16 Series lubricant brand is VG220(ISO viscosity class), accessory code is V22;

(3) T20-T25Series lubricant brand is VG320(ISO viscosity class), accessory code is V32.

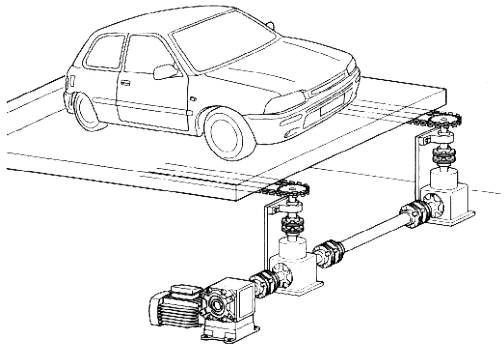
12 Application Exmaples:

Lifter



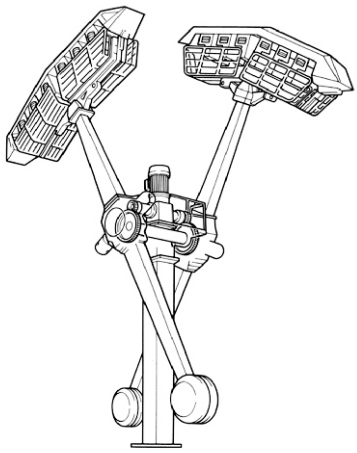
As the gear unit outputs on both sides, after shifting directions, it can lift things at the same time.

Stereo Garage



One gear unit drives both chain pulleys to roll at the same speed.

Amusement



Input on Y-shaft, two X-shafts run in reverse directions.

Packer