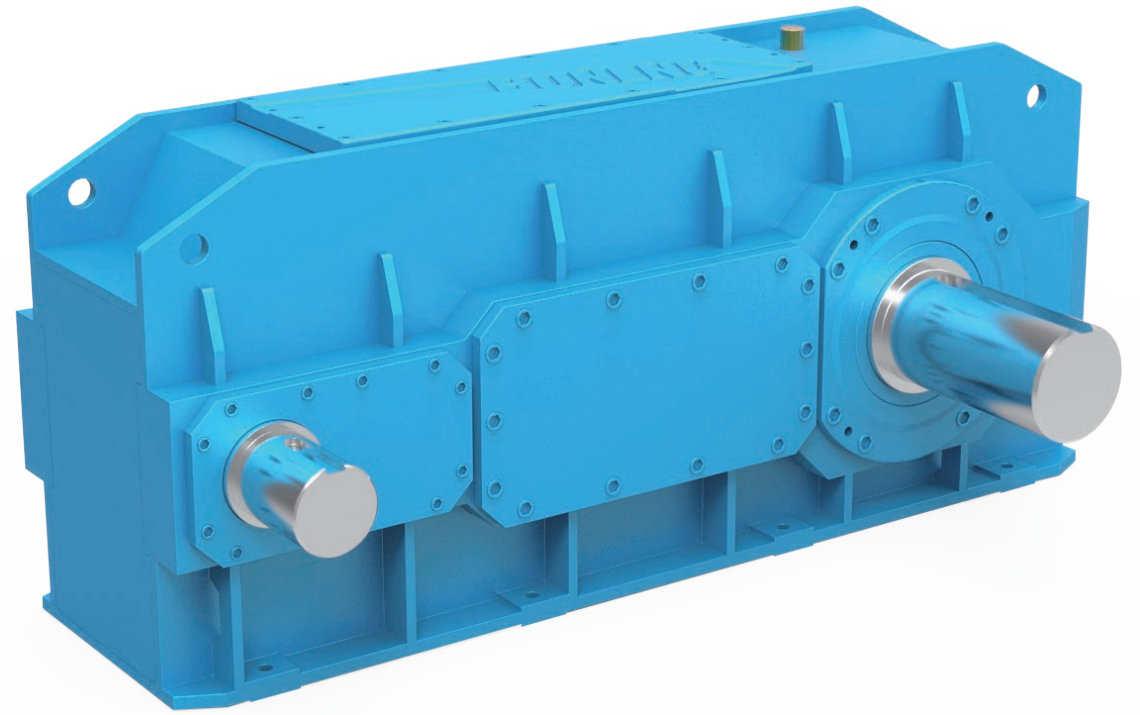
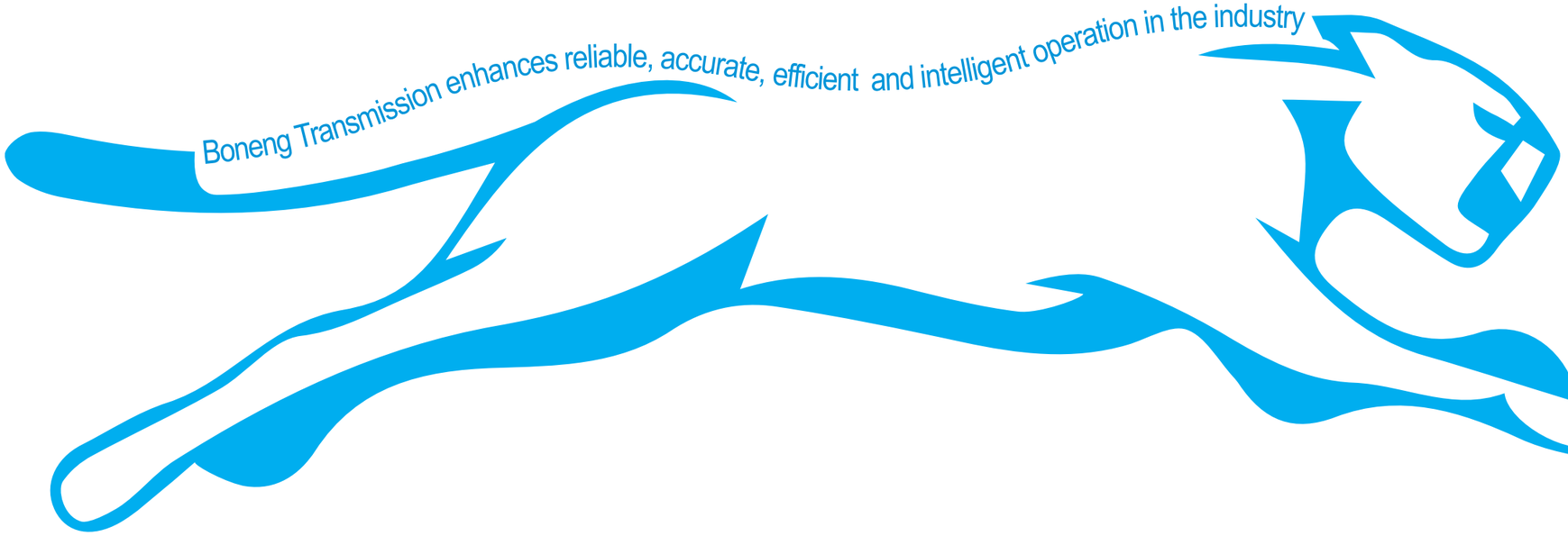
BONENG



HK Helical Gearbox with Extended Center Distance

Modified date 06/2021
Selection Sample C05.0005–EN

Boneng Transmission



Boneng Transmission More products: drive / motor / gearmotor / gear box
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Contents

1 Overview

Boneng gear units win wide reputation with good service and stable quality both at home and abroad.The products are widely applied in main and subsidirary lifting of portal crane,tower crane,vehicle crane,tyre crane,belt crane,deck crane,float crane,cable crane,loading and unloading bridge,bridge crane and various kinds of cranes,rotary,running and trolley traveling mechanisms. We obtain obvious achievements in port,mine,melt,construction,shipping and other industries.

HK Series is a special kind of gear unit designed according to structure and transmission characteristics of lifting equipment. It has the following characteristics:

- It expands the central distance between input and output shaft under the same transmission capacity,which avoids the situation of wasting power to satisfy mounting dimension,which is especially appropriate for main and subsidiary lifting mechanisms of portal crane,bridge crane and container crane.
- Modular design,international production,delivery is more lonveninet.
- In HK series,you can select level 3 or level 4 transmission,the ratio range is from 14 to 250.
- Gear box of HK series(regulation 05~22) applies steel plate welding.
- Applying grease–filled, refillable Labyrinth seal combinations sealing method, which can guard against ingress of dust–like materials into the gear box effectively with high safety reliable.

Note: 1.Gear unit is on running–permission status bofore delivery,lubrication oil should be filled before running.
2.The dimension unit not marked in the sample is millimeter(mm).

2 Product function mark

Oil glass


Breather

Oil filler

Oil drain

3 Type selection

Serial NO.	Description	Codes	Parameters calculation	
1	Driven machine factor	f_1	Check f1 table on page 6 according to working level	
2	Prime mover factor	f_2	Prime Mover Factor	f_2
			Electric motor,hydraulic motor,turbine	1.0
			Piston engine with 4–6 cylinders, cycle variation 1:100 to 1:200	1.25
			Piston engine with 1–3 cylinders,cycle variation 1:100	1.5
3	Factor for gear unit reliability	S_F	Check SF table on page 6	
4	Transmission Efficiency	η	3 stage: 94%; 4 stage: 92%	
5	Input Speed	n_1	⩽1500r/min Consult us if higher speed required.	
6	Calculation of the ratio	i	$i=n_1/n_2$	
7	Calculate the input power of the gear unit on basis of the torque and power required by the driven machine.	P_1	$P_1=T_2 \cdot n_1/(9550 \cdot i \cdot \eta)$ or $P_1=P_2/\eta$	
8	Determination of gear unit type referring to the table of Transmission Capacity.	T_{2N}、P_{1N}	$T_{2N} \geqslant T_2 \cdot f_1 \cdot f_2 \cdot S_F$ or $P_{1N} \geqslant P_1 \cdot f_1 \cdot f_2 \cdot S_F$ Check SF table on page 6	
9	Check Peak Torque*	T_A	$P_{1N} \geqslant T_A \cdot n_1 \cdot f_3/9550$ Check f3 table on page 6 according to working level	
10	Check permissible strength of the shaft after output mode and accessories are selected.	F_{r1}/F_{r2} F_{a1}/F_{a2}	It is crucial to check radial forces on the shafts when input and output shafts are for pulleys,sprockets or gears.	
11	Determination of Lubrication Systems and Lubricants		Optional lubrications 1) Splash 2) Forced Shaft–end pump Motor pump User–supplied oil station	
12	Determination of every item included in the type designation		For details about type designation,see Page 7	

* Peak torque: max.load torque,e.g.peak starting,braking and operating torque.(Generally,it refers to peak starting or braking torque.)

4 Working level and Service factors

Cranes type		Working level	Cranes type			Working level
Portal Crane	Fitting hook type	A3–A5	Bridge Crane	Hook type	For power plant installment and inspection	A1–A3
	Loading and unloading hook type	A6–A7			For workshop and warehouse	A3–A5
	Loading and unloading grab type	A7–A8			For arduous workshop and warehouse	A6–A7
Tower Crane	For normal construction fitting	A2–A4		Grab type	For intermittent loading and unloading	A6–A7
	Loading and unloading concrete with bucket	A4–A6			For continuous loading and unloading	A8
Truck、tyre、crawler crane	Fitting loading and unloading hook type	A1–A4		Metallurgy special type	For lifting material box	A7–A8
	Loading and unloading grab type	A4–A6			For feeding material	A8
Deck crane	Hook type	A4–A6			For casting	A6–A8
	Grab type	A6–A7			For forging	A7–A8
Floating crane	Loading and unloading hook type	A5–A6			For quenching	A8
	Loading and unloading grab type	A6–A7			For clamping and ingot drawing	A8
	Shipbuilding mounting type	A4–A6			For uncovering	A7–A8
Cable crane	Fitting hook type	A3–A5			Raking type	A8
	Loading, unloading or construction hook type	A6–A7			Electric magnet type	A7–A8
	Loading, unloading or construction grab type	A7–A8	Portal Crane	Normal using hook type		A5–A6
Loading and unloading bridge	Loading and unloading grab for stockyard	A7–A8		Loading and unloading grab type		A7–A8
	Loading and unloading grab for habor	A8		Hook for power plant		A2–A3
	Loading and unloading container for harbor	A6–A8		Ship–building mounting hook type		A4–A5
–	–	–		Loading and unloading container type		A6–A8

Realiability Factor	S_F
Ordinary:single machine halts when gear units fail,easy to replace spare parts and minor loss occurred.	$1.0 \leqslant S_F \leqslant 1.3$
Important: a product line or and entire plant halts when gear units fail,heavy loss.	$1.3 < S_F \leqslant 1.5$
Highly reliable: severe production problem happens when gear units fail,enormous loss and life injuries.	$1.5 < S_F$

Load level	Specification	Service factor	Factor for driven machine f1 / Peak torque factor f3									
			Working hours									
			U0		U1		U2		U3		U4	
			⩽200		> 200~400		> 400~800		> 800~1600		> 1600~3200	
Q1 Light	Rarely hoisting norminal load,normally hoisting light load	1) f1	0.8		0.8		0.8		0.8		0.8	
		2) f3	0.8	A1	0.8	A1	0.8	A1	0.8	A2	0.8	A3
		3) f3	0.8		0.8		0.8		0.8		0.8	
Q2 Medium	Sometimes hoisting nominal load,normally hoisting medium load	1) f1	0.8		0.8		0.8		0.9		0.9	
		2) f3	0.5	A1	0.5	A1	0.5	A2	0.5	A3	0.5	A4
		3) f3	0.8		0.8		0.8		0.8		0.8	
Q3 Heavy	Often hoisting nominal load,normally hoisting heavy load	1) f1	0.8		0.8		0.9		1		1	
		2) f3	0.5	A1	0.5	A2	0.5	A3	0.5	A4	0.5	A5
		3) f3	0.8		0.8		0.8		0.8		0.8	
Q4 Super heavy	Frequently hoisting nominal load	1) f1	0.9		0.9		1		1.1		1.2	
		2) f3	0.5	A2	0.5	A3	0.5	A4	0.5	A5	0.5	A6
		3) f3	0.8		0.8		0.8		0.8		0.8	

Load level	Specification	Service factor	Factor for driven machine f1 / Peak torque factor f3									
			Working hours									
			U5		U6		U7		U8		U9	
			> 3200~6300		> 6300~12500		> 12500~50000		> 25000~50000		> 50000	
Q1 Light	Rarely hoisting norminal load,normally hoisting light load	1) f1	0.9		1		1		1.1		1.2	
		2) f3	0.5	A4	0.56	A5	0.63	A6	0.71	A7	0.8	A8
		3) f3	0.8		0.8		1.9		1		1.12	
Q2 Medium	Sometimes hoisting nominal load,normally hoisting medium load	1) f1	1		1.1		1.2		1.3		1.4	
		2) f3	0.5	A5	0.56	A6	0.63	A7	0.71	A8	0.8	A8
		3) f3	0.8		0.8		0.9		1		1.12	
Q3 Heavy	Often hoisting nominal load,normally hoisting heavy load	1) f1	1.1		1.2		1.3		1.4		1.6	
		2) f3	0.56	A6	0.63	A7	0.71	A8	0.8	A8	0.9	A8
		3) f3	0.8		0.9		1		1.12		1.25	
Q4 Super heavy	Frequently hoisting nominal load	1) f1	1.3		1.4		1.6		1.8		2	
		2) f3	0.56	A7	0.63	A8	0.71	A8	0.8	A8	0.9	A8
		3) f3	0.8		0.9		1		1.12		1.25	

Note: 1) f1=Factor for driven machine
2) f3=Peak torque factor when load direction is unchanging, such as hoisting mechanisms, liffing mechanisms,etc.
3) f3=Peak torque factor when load direction is alternating, such as rotary,running mechanisms,etc.

5 Symbol specification

Code	Description	Unit
i	actual ratio	/
i_N	Nominal ratio	
i_{ex}	Exact ratio	
T_{2N}	Rated output torque	N • m
T_A	Peak torque	
P_{1N}	Rated input power of gear unit	kW
P_1	Input power	
P_2	Power for driven equipment	
P_m	Motor power	
f_1	Driven machine factor	/
f_2	Prime mover factor	
f_3	Peak loading conefficient	
S_F	Factor for gear unit reliability	
n_1	Input speed	r/min
n_{2N}	Nominal output speed	
n_2	Output speed	

6 Type designation

HK 4 10 H S A – D10 – S + UV32

Series

Stages
Stages 3、4

Size

Mounting Mode
H=Horizontal

Output shaft type
S=Solid shaft with parallel key
H=Hollow shaft with parallel key
D=Hollow shaft with shrink disk
K=Hollow shaft with involute spline
E=Soild shaft tith involute spline
C=Type C gear output shaft

Arrangement design
A/B/C/D/E/F/G/H/I

Nominal Ratio Code

Input part
S=Shaft Input

Accessories and specific configuration

7 Examples

Selection example:

Prime mover:

Motor power: Pm=30kW

Speed: n_1=710rpm

Max starting torque: T_A=645N.m

Driven machine:

Main hoisting gears of bridge crane

hoisting power: P_2=22kW

Drum speed: n_2=10rpm

Working level: Q3–U9–A8

Working hour: >50000 hours

Ambient temperature: 30℃

Gear units:

Parallel shaft gear units

Shaft arrangement: G

Center distance: ⩾900mm

Selection steps:

1.Calculation of ratio:

$i=n_1/n_2=710/10=71$

take i_N=C71 four stage.

2.Determination of nominal power of gear unit:

$P1=P2/\eta=22/92\%=23.9kW$

$P_{1N} \geqslant P_1 \cdot f_1 \cdot f_2 \cdot S_F$

$=23.9\times1.6\times1\times1.2=45.9kW$

Refering to transmission capacity:

Gear unit size is 10,corresponding rated power

P_{1N}=60kW,Center distance E=940mm>900mm meet requirement

3.Verify peak torque:

$P_{1N} \geqslant T_A \cdot n_1 \cdot f_3/9550$

$=645\times710\times0.9/9550=43.2kW$

P_{1N}=60kW>43.2kW meet requirement

4.Determination of type:

HK410HSG–C71–S

8 Transmission capacity

Code	i_N	n_1 (r/min)	n_{2N} (r/min)	HK305			HK306			HK307			HK308			HK309			HK310			HK311			HK312			HK313		
				T_{2N} (kN•m)	iex	P_{1N} (kW)	T_{2N} (kN•m)	iex	P_{1N} (kW)	T_{2N} (kN•m)	iex	P_{1N} (kW)	T_{2N} (kN•m)	iex	P_{1N} (kW)	T_{2N} (kN•m)	iex	P_{1N} (kW)	T_{2N} (kN•m)	iex	P_{1N} (kW)	T_{2N} (kN•m)	iex	P_{1N} (kW)	T_{2N} (kN•m)	iex	P_{1N} (kW)	T_{2N} (kN•m)	iex	P_{1N} (kW)
C14	14	1740	124.3	11.6	14.02	151				21.7	13.76	282	30	13.58	390	35.7	13.86	465	57	13.69	742	64	13.56	833	78	13.58	1015	91	13.36	1184
		1450	103.6			126						235			325			387			618			694			846			987
		960	68.6			83						156			215			256			409			460			560			653
		710	50.7			62						115			159			190			303			340			414			483
C16	16	1740	108.8	11.6	15.71	132				21.7	15.39	247	30	15.19	342	35.7	15.63	407	57	15.44	649	64	15.41	729	78	15.43	888	91	14.96	1036
		1450	90.6			110						206			285			339			541			607			740			864
		960	60.0			73						136			188			224			358			402			490			572
		710	44.4			54						101			139			166			265			297			362			423
C18	18	1740	96.7	11.6	18.52	117	18.5	17.93	187	21.7	17.12	220	30	16.90	304	35.7	18.06	361	57	17.83	577	64	17.55	648	78	17.57	790	91	17.14	921
		1450	80.6			98			156			183			253			301			481			540			658			768
		960	53.3			65			103			121			168			199			318			357			436			508
		710	39.4			48			76			90			124			147			235			264			322			376
C20	20	1740	87.0	11.6	20.09	106	18.5	20.08	169	21.7	19.29	198	30	19.03	273	35.7	20.60	325	57	20.34	519	64	19.19	583	78	19.21	711	91	19.14	829
		1450	72.5			88			140			165			228			271			433			486			592			691
		960	48.0			58			93			109			151			179			286			322			392			457
		710	35.5			43			69			81			112			133			212			238			290			338
C22	22.4	1740	77.7	11.6	23.46	94	18.5	23.67	150	21.7	22.23	177	30	21.94	244	35.7	22.07	290	57	21.79	464	64	21.40	521	78	21.43	634	91	21.45	740
		1450	64.7			79			125			147			203			242			386			434			529			617
		960	42.9			52			83			97			135			160			256			287			350			408
		710	31.7			39			61			72			100			118			189			212			259			302
C25	25	1740	69.6	11.6	25.99	85	18.5	25.68	135	21.7	24.53	158	30	24.21	219	35.7	23.85	260	57	23.55	415	64	24.34	466	78	24.38	568	91	24.25	663
		1450	58.0			70			112			132			182			217			346			389			474			553
		960	38.4			47			74			87			121			144			229			257			314			366
		710	28.4			34			55			65			89			106			170			190			232			271
C28	28	1740	62.1	11.6	27.57	75	18.5	29.99	120	21.7	27.17	141	30	26.81	195	35.7	27.59	232	57	27.24	371	64	27.51	416	78	27.55	508	91	27.09	592
		1450	51.8			63			100			118			163			194			309			347			423			493
		960	34.3			42			66			78			108			128			205			230			280			327
		710	25.4			31			49			58			80			95			151			170			207			242
C32	31.5	1740	55.2	11.6	31.33	67	18.5	33.23	107	21.7	30.23	126	30	29.83	174	35.7	30.82	206	57	30.44	330	64	31.59	370	78	31.64	451	91	30.96	526
		1450	46.0			56			89			105			145			172			275			308			376			439
		960	30.5			37			59			69			96			114			182			204			249			290
		710	22.5			27			44			51			71			84			135			151			184			215
C36	35.5	1740	49.0	11.6	35.06	60	18.5	35.24	95	21.7	34.31	111	30	33.86	154	35.7	34.74	183	57	34.30	293	64	36.16		78	36.21		91	35.82	467
		1450	40.8			50			79			93			128			153			244			274			334			389
		960	27.0			33			52			61			85			101			161			181			221			258
		710	20.0			24			39			45			63			75			119			134			163			191
C40	40	1740	43.5	11.6	38.93	53	18.5	40.06	84	21.7	38.11	99	30	37.60	137	35.7	38.40	163	57	37.92	260	64	39.84	292	78	39.90	355	91	39.74	415
		1450	36.3			44			70			82			114			136			216			243			296			345
		960	24.0			29			46			55			75			90			143			161			196			229
		710	17.8			22			34			40			56			66			106			119			145			169
C45	45	1740	38.7	11.6	45.58	47	18.5	44.82	75	21.7	43.29	88	30	42.72	121	35.7	43.18	145	57	42.64	231	64	44.83	259	78	44.89	316	91	44.38	368
		1450	32.2			39			62			73			101			120			192			216			263			307
		960	21.3			26			41			48			67			80			127			143			174			203
		710	15.8			19			31			36			50			59			94			106			129			150
C50	50	1740	34.8	11.6	49.00	42	18.5	49.77	67	21.7	49.69	79	30	49.03	109	35.7	47.82	130	57	47.22	208	64	49.30	233	78	49.37	284			
		1450	29.0			35			56			66			91			108			173			194			237			
		960	19.2			23			37			44			60			72			115			129			157			
		710	14.2			17			28			32			45			53			85			95			116			
C56	56	1740	31.1				18.5	58.27	60																					
		1450	25.9						50																					
		960	17.1						33																					
		710	12.7						25																					
C63	63	1740	27.6				18.5	62.64	54																					
		1450	23.0						45																					
		960	15.2						30																					
		710	11.3						22																					

HK314			HK315			HK316			HK317			HK318			HK319			HK320			HK321			HK322			n_1	n_{2N}	i_N	Code
T_{2N} (kN•m)	iex	P_{1N} (kW)	T_{2N} (kN•m)	iex	P_{1N} (kW)	T_{2N} (kN•m)	iex	P_{1N} (kW)	T_{2N} (kN•m)	iex	P_{1N} (kW)	T_{2N} (kN•m)	iex	P_{1N} (kW)	T_{2N} (kN•m)	iex	P_{1N} (kW)	T_{2N} (kN•m)	iex	P_{1N} (kW)	T_{2N} (kN•m)	iex	P_{1N} (kW)	T_{2N} (kN•m)	iex	P_{1N} (kW)	(r/min)	(r/min)		
		1627									2603																1740	124.3		
		1356									2169																1450	103.6		
125	13.37	898							200	13.56	1436																960	68.6	14	C14
		664									1062																710	50.7		
		1423									2505			3018													1740	108.8		
		1186									2088			2515													1450	90.6		
125	14.97	785							220	15.83	1382	265	15.65	1665													960	60.0	16	C16
		581									1022			1231													710	44.4		
		1265			1549			1923			2227			2682			3340						4656				1740	96.7		
		1054			1291			1603			1856			2235			2784						3880				1450	80.6		
125	17.16	698	153	17.48	854	190	17.47	1061	220	18.07	1229	265	18.27	1480	330	18.28	1843				460	17.55	2569				960	53.3	18	C18
		516			632			785			909			1095			1363						1900				710	39.4		
		1139			1394			1731			2004			2414			3006			3462			4191			4737	1740	87.0		
		949			1162			1442			1670			2012			2505			2885			3492			3948	1450	72.5		
125	19.16	628	153	20.45	769	190	20.44	955	220	20.50	1106	265	20.86	1332	330	20.98	1659	380	20.68	1910	460	19.56	2312	520	19.37	2614	960	48.0	20	C20
		465			569			706			818			985			1227			1413			1710			1933	710	35.5		
		1017			1244			1545			1789			2155			2684			3091			3742			4230	1740	77.7		
		847			1037			1288			1491			1796			2237			2576			3118			3525	1450	64.7		
125	21.47	561	153	23.30	687	190	23.29	853	220	22.35	987	265	23.66	1189	330	23.00	1481	380	23.74	1705	460	21.84	2064	520	21.58	2334	960	42.9	22.4	C22
		415			508			631			730			880			1095			1261			1527			1726	710	31.7		
		911			1115			1385			1603			1931			2405			2769			3352			3790	1740	69.6		
		759			929			1154			1336			1609			2004			2308			2794			3158	1450	58.0		
125	24.27	503	153	25.47	615	190	25.45	764	220	25.12	885	265	25.80	1066	330	25.98	1327	380	26.03	1528	460	25.07	1850	520	24.10	2091	960	38.4	25	C25
		372			455			565			654			788			981			1130			1368			1546	710	28.4		
		813			996			1236			1432			1724			2147			2473			2993			3384	1740	62.1		
		678			830			1030			1193			1437			1789			2061			2494			2820	1450	51.8		
125	27.11	449	153	28.79	549	190	28.77	682	220	27.56	790	265	29.00	951	330	29.14	1185	380	29.39	1364	460	27.49	1651	520	27.67	1867	960	34.3	28	C28
		332			406			504			584			704			876			1009			1221			1381	710	25.4		
		723			885			1099			1273			1533			1909			2198			2661			3008	1740	55.2		
		603			737			916			1060			1277			1591			1832			2217			2506	1450	46.0		
125	30.98	399	153	31.75	488	190	31.73	606	220	30.77	702	265	31.82	846	330	32.96	1053	380	32.97	1213	460	31.04	1468	520	30.33	1659	960	30.5	31.5	C32
		295			361			448			519			625			779			897			1086			1227	710	22.5		
		642			785			975			1129			1360			1694			1950			2361			2669	1740	49.0		
		535			654			813			941			1133			1411			1625			1967			2224	1450	40.8		
125	35.85	354	153	35.56	433	190	35.54	538	220	34.45	623	265	35.52	750	330	36.69	934	380	37.29	1076	460	34.82	1303	520	34.25	1472	960	27.0	35.5	C36
		262			320			398			461			555			691			796			963			1089	710	20.0		
		569			697			865			1002			1207			1503			1731			2095			2369	1740	43.5		
		474			581			721			835			1006			1253			1442			1746			1974	1450	36.3		
125	39.77	314	153	39.93	385	190	39.90	477	220	37.95	553	265	39.77	666	330	41.03	829	380	41.52	955	460	39.38	1156	520	38.42	1307	960	24.0	40	C40
		232			284			353			409			493			613			706			855			966	710	17.8		
		506			619			769			891			1073			1336			1539			1862			2105	1740	38.7		
		422			516			641			742			894			1113			1282			1552			1755	1450	32.2		
125	44.41	279	153	44.17	342	190	44.14	424	220	42.84	491	265	43.81	592	330	45.73	737	380	46.43	849	460	43.85	1028	520	43.46	1162	960	21.3	45	C45
		207			253			314			363			438			545			628			760			859	710	15.8		
					558			692												1385			1676			1895	1740	34.8		
					465			577												1154			1397			1579	1450	29.0		
			153	50.13	308	190	50.09	382										380	51.74	764	460	49.03	925	520	48.39	1045	960	19.2	50	C50
					227			283												565			684			773	710	14.2		
																							1497			1692	1740	31.1		
																							1247			1410	1450	25.9		
																					460	54.64	826	520	54.10	933	960	17.1	56	C56
																							611			690	710	12.7		
																										1504	1740	27.6		
																										1253	1450	23.0		
																								520	60.30	830	960	15.2	63	C63
																										614	710	11.3		

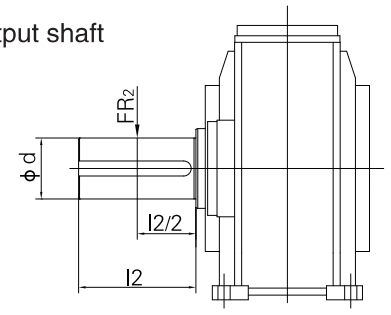
Code	i_N	n_1 (r/min)	n_{2N} (r/min)	HK405			HK406			HK407			HK408			HK409			HK410			HK411			HK412			HK413		
				T_{2N} (kN•m)	iex	P_{1N} (kW	T_{2N} (kN•m)	iex	P_{1N} (kW	T_{2N} (kN•m)	iex	P_{1N} (kW	T_{2N} (kN•m)	iex	P_{1N} (kW	T_{2N} (kN•m)	iex	P_{1N} (kW	T_{2N} (kN•m)	iex	P_{1N} (kW	T_{2N} (kN•m)	iex	P_{1N} (kW	T_{2N} (kN•m)	iex	P_{1N} (kW	T_{2N} (kN•m)	iex	P_{1N} (kW
C22	22.4	1740	77.7	11.6	23.26	94				21.7	21.40	177	30	21.12	244	35.7	22.22	290	57	21.95	464	64	21.72	521	78	21.75	634	91	21.54	740
		1450	64.7			79						147			203			242			386			434			529			617
		960	42.9			52						97			135			160			256			287			350			408
		710	31.7			39						72			100			118			189			212			259			302
C25	25	1740	69.6	11.6	25.52	85				21.7	23.43	158	30	23.12	219	35.7	24.89	260	57	24.58	415	64	24.30	466	78	24.33	568	91	24.29	663
		1450	58.0			70						132			182			217			346			389			474			553
		960	38.4			47						87			121			144			229			257			314			366
		710	28.4			34						65			89			106			170			190			232			271
C28	28	1740	62.1	11.6	26.45	75	18.5	29.74	120	21.7	27.70	141	30	27.33	195	35.7	29.34	232	57	28.98	371	64	27.03	416	78	27.07	508	91	28.05	592
		1450	51.8			63			100			118			163			194			309			347			423			493
		960	34.3			42			66			78			108			128			205			230			280			327
		710	25.4			31			49			58			80			95			151			170			207			242
C32	31.5	1740	55.2	11.6	30.67	67	18.5	32.63	107	21.7	31.03	126	30	30.62	174	35.7	31.84	206	57	31.44	330	64	30.45	370	78	30.49	451	91	32.00	526
		1450	46.0			56			89			105			145			172			275			308			376			439
		960	30.5			37			59			69			96			114			182			204			249			290
		710	22.5			27			44			51			71			84			135			151			184			215
C36	35.5	1740	49.0	11.6	34.64	60	18.5	33.82	95	21.7	33.96	111	30	33.51	154	35.7	33.95	183	57	33.53	293	64	34.06	328	78	34.11	400	91	34.03	467
		1450	40.8			50			79			93			128			153			244			274			334			389
		960	27.0			33			52			61			85			101			161			181			221			258
		710	20.0			24			39			45			63			75			119			134			163			191
C40	40	1740	43.5	11.6	39.38	53	18.5	39.20	84	21.7	37.18	99	30	36.69	137	35.7	38.02	163	57	37.55	260	64	38.09	292	78	38.14	355	91	38.37	401
		1450	36.3			44			70			82			114			136			216			243			296			334
		960	24.0			29			46			55			75			90			143			161			196			229
		710	17.8			22			34			40			56			66			106			119			145			169
C45	45	1740	38.7	11.6	45.66	47	18.5	44.28	75	21.7	43.95	88	30	43.37	121	35.7	44.83	145	57	44.27	231	64	42.38	259	78	42.44	316	91	44.32	368
		1450	32.2			39			62			73			101			120			192			216			263			307
		960	21.3			26			41			48			67			80			127			143			174			307
		710	15.8			19			31			36			50			59			94			106			129			150
C50	50	1740	34.8	11.6	49.77	42	18.5	50.35	67	21.7	49.24	79	30	48.59	109	35.7	48.64	130	57	48.03	208	64	47.74	233	78	47.80	284	91	50.56	332
		1450	29.0			35			56			66			91			108			173			194			237			276
		960	19.2			23			37			44			60			72			115			129			157			183
		710	14.2			17			28			32			45			53			85			95			116			135
C56	56	1740	31.1	11.6	55.97	38	18.5	58.37	60	21.7	52.58	71	30	51.89	98	35.7	56.80	116	57	56.09	185	64	55.02	208	78	55.10	254	91	54.17	296
		1450	25.9			31			50			59			81			97			155			174			211			247
		960	17.1			21			33			39			54			64			102			115			140			163
		710	12.7			15			25			29			40			47			76			85			104			121
C63	63	1740	27.6	11.6	61.56	34	18.5	63.63	54	21.7	60.16	63	30	59.37	87	35.7	62.93	103	57	62.14	165	64	60.71	185	78	60.80	226	91	62.74	263
		1450	23.0			28			45			52			72			86			137			154			188			219
		960	15.2			19			30			35			48			57			91			102			124			145
		710	11.3			14			22			26			35			42			67			76			92			107
C71	71	1740	24.5	11.6	69.99	30	18.5	71.55	47	21.7	67.99	56	30	67.10	77	35.7	65.91	92	57	65.09	146	64	71.37	164	78	71.47	200	91	70.74	234
		1450	20.4			25			40			46			64			76			122			137			167			195
		960	13.5			16			26			31			42			51			81			91			110			129
		710	10.0			12			19			23			31			37			60			67			82			95
C80	80	1740	21.8	11.6	81.15	26	18.5	78.70	42	21.7	80.37	49	30	79.32	68	35.7	77.70	81	57	76.73	130	64	79.40	146	78	79.52	178	91	81.71	207
		1450	18.1			22			35			41			57			68			108			121			148			173
		960	12.0			15			23			27			38			45			72			80			98			114
		710	8.9			11			17			20			28			33			53			59			72			85
C90	90	1740	19.3	11.6	88.47	23	18.5	89.48	37	21.7	90.06	44	30	88.87	61	35.7	84.31	72	57	83.25	115	64	89.44	130	78	89.57	158	91	93.21	184
		1450	16.1			20			31			37			51			60			96			108			132			154
		960	10.7			13			21			24			34			40			64			71			87			102
		710	7.9			10			15			18			25			29			47			53			64			75
D10	100	1740	17.4	11.6	99.48	21	18.5	103.74	34	21.7	96.17	40	30	94.90	55	35.7	98.44	65	57	97.21	104	64	103.09	117	78	103.23	142	91	99.87	166
		1450	14.5			18			28			33			46			54			87			97			118			138
		960	9.6			12			19			22			30			36			57			64			78			91
		710	7.1			9			14			16			22			27			42			48			58			68
D11	112	1740	15.5	11.6	109.05	19	18.5	113.09	30	21.7	110.02	35	30	108.57	49	35.7	109.08	58	57	107.72	93	64	113.75	104	78	113.91	127	91	107.93	148
		1450	12.9			16			25			29			41			48			77			87			106			123
		960	8.6			10			17			19			27			32			51			57			70			82
		710	6.3			8			12			14			20			24			38			42			52			60
D13	125	1740	13.9	11.6	125.99	17	18.5	127.17	27	21.7	122.30	32	30	120.70	44	35.7	115.68	52	57	114.24	83	64	125.99	93	78	126.17	114	91	124.84	133
		1450	11.6			14			22			26			36			43			69			78			95			111
		960	7.7			9			15			17			24			29			46			51			63			73
		710	5.7			7			11			13			18			21			34			38			46			54
D14	140	1740	12.4	11.6	134.34	15	18.5	139.42	24	21.7	138.71	28	30	136.88	39	35.7	131.49	46	57	129.85	74	64	140.20	83	78	140.39	102	91	139.48	118
		1450	10.4			13			20			24			33			39			62			69			85			99
		960	6.9			8			13			16			22			26			41			46			56			65
		710	5.1			6			10			12			16			19			30			34			41			48
D16	160	1740	10.9	11.6	155.15	13	18.5	161.07	21	21.7	155.47	25	30	153.42	34	35.7	147.13	41	57	145.29	65	64	159.11	73	78	159.33	89	91	157.21	104
		1450	9.1			11			18			21			28			34			54			61			74			86
		960	6.0			7			12			14			19			22			36			40			49			57
		710	4.4			5			9			10			14			17			26			30			36			42
D18	180	1740	9.7	11.6	176.38	12	18.5	171.75	19	21.7	177.45	22	30	175.12	30	35.7	163.37	36	57	161.33	58	64	176.72	65	78	176.97	79	91	173.78	92
		1450	8.1			10			16			18			25			30			48			54			66			77
		960	5.3			6			10			12			17			20			32			36			44			51
		710	3.9			5			8			9			12			15			24			26			32			38
D20	200	1740	8.7	11.6	195.98	11	18.5	198.35	17	21.7	189.13	20	30	186.64	27	35.7	191.26	33	57	188.87	52	64	200.75	58	78	201.03	71	91	195.40	83
		1450	7.3			9			14			16			23			27			43			49			59			69
		960	4.8			6			9			11			15			18			29			32			39			46
		710	3.6			4			7			8			11			13			21			24			29			34
D22	224	1740	7.8				18.5	225.49	15							35.7	205.61	29	57	203.04	46	64	230.43	52	78	230.75	63	91	216.39	74
		1450	6.5						13									24			39			43			53			62
		960	4.3						8									16			26			29			35			41
		710	3.2						6									12			19			21			26			30
D25	250	1740	7.0				18.5	250.55	13																					
		1450	5.8						11																					
		960	3.8						7																					
		710	2.8						6																					

HK414			HK415			HK416			HK417			HK418			HK419			HK420			HK421			HK422			n_1	n_{2N}	i_N	Code
T_{2N} (kN•m)	iex	P_{1N} (kW)	T_{2N} (kN•m)	iex	P_{1N} (kW)	T_{2N} (kN•m)	iex	P_{1N} (kW)	T_{2N} (kN•m)	iex	P_{1N} (kW)	T_{2N} (kN•m)	iex	P_{1N} (kW)	T_{2N} (kN•m)	iex	P_{1N} (kW)	T_{2N} (kN•m)	iex	P_{1N} (kW)	T_{2N} (kN•m)	iex	P_{1N} (kW)	T_{2N} (kN•m)	iex	P_{1N} (kW)	(r/min)	(r/min)		
		1017									1789						2684			3091							1740	77.7		
125	21.56	847							220	22.27	1491				330	22.57	2237	380	22.80	2576							1450	64.7	22.4	C22
		561									987						1481			1705							960	42.9		
		415									730						1095			1261							710	31.7		
		911			1115			1385			1603			1931			2405			2769							1740	69.6		
125	24.31	759	153	25.21	929	190	25.19	1154	220	25.29	1336	265	25.71	1609	330	25.86	2004	380	25.54	2308							1450	58.0	25	C25
		503			615			764			885			1066			1327			1528							960	38.4		
		372			455			565			654			788			981			1130							710	28.4		
		813			996			1236			1432			1724			2147			2473			2993			3384	1740	62.1		
125	28.08	678	153	28.64	830	190	28.62	1030	220	28.81	1193	265	29.20	1437	330	28.88	1789	380	29.27	2061	460	26.52	2494	520	29.27	2820	1450	51.8	28	C28
		449			549			682			790			951			1185			1364			1651			1867	960	34.3		
		332			406			504			584			704			876			1009			1221			1381	710	25.4		
		723			885			1099			1273			1533			1909			2198			2661			3008	1740	55.2		
125	32.03	603	153	32.62	737	190	32.59	916	220	31.50	1060	265	33.26	1277	330	32.36	1591	380	32.68	1832	460	31.04	2217	520	34.25	2506	1450	46.0	31.5	C32
		399			488			606			702			846			1053			1213			1468			1659	960	30.5		
		295			361			448			519			625			779			897			1086			1227	710	22.5		
		642			785			975			1129			1360			1694			1950			2361			2669	1740	49.0		
125	34.06	535	153	35.66	654	190	35.64	813	220	33.97	941	265	36.36	1133	330	36.59	1411	380	36.62	1625	460	35.36	1967	520	39.02	2224	1450	40.8	35.5	C36
		354			433			538			623			750			934			1076			1303			1472	960	27.0		
		262			320			398			461			555			691			796			963			1089	710	20.0		
		569			697			865			1002			1207			1503			1731			2095			2369	1740	43.5		
125	38.40	474	153	39.77	581	190	39.74	721	220	38.59	835	265	39.22	1006	330	39.66	1253	380	41.40	1442	460	38.64	1746	520	42.64	1974	1450	36.3	40	C40
		314			385			477			553			666			829			955			1156			1307	960	24.0		
		232			284			353			409			493			613			706			855			966	710	17.8		
		506			619			769			891			1073			1336			1539			1862			2105	1740	38.7		
125	44.36	422	153	43.83	516	190	43.80	641	220	43.95	742	265	44.55	894	330	45.44	1113	380	44.87	1282	460	43.68	1552	520	48.20	1755	1450	32.2	45	C45
		279			342			424			491			592			737			849			1028			1162	960	21.3		
		207			253			314			363			438			545			628			760			859	710	15.8		
		455			558			692			802			966			1203			1385			1676			1895	1740	34.8		
125	50.60	380	153	49.79	465	190	49.75	577	220	48.06	668	265	50.74	805	330	50.74	1002	380	51.42	1154	460	48.18	1397	520	53.17	1579	1450	29.0	50	C50
		251			308			382			442			533			663			764			925			1045	960	19.2		
		186			227			283			327			394			491			565			684			773	710	14.2		
		407			498			618			716			862			1074			1236			1497			1692	1740	31.1		
125	54.21	339	153	56.71	415	190	56.66	515	220	53.59	596	265	55.48	718	330	56.86	895	380	57.41	1030	460	53.24	1247	520	58.75	1410	1450	25.9	56	C56
		224			275			341			395			476			592			682			826			933	960	17.1		
		166			203			252			292			352			438			504			611			690	710	12.7		
		362			442			549			636			766			954			1099			1330			1504	1740	27.6		
125	62.79	301	153	62.00	369	190	61.96	458	220	60.97	530	265	61.87	639	330	64.28	795	380	64.34	916	460	62.31	1109	520	68.76	1253	1450	23.0	63	C63
		199			244			303			351			423			527			606			734			830	960	15.2		
		148			181			224			260			313			389			448			543			614	710	11.3		
		321			393			488			565			680			847			975			1180			1334	1740	24.5		
125	70.80	267	153	69.15	327	190	69.10	406	220	68.65	470	265	70.39	567	330	69.52	706	380	72.74	813	460	70.99	984	520	78.34	1112	1450	20.4	71	C71
		177			217			269			311			375			467			538			651			736	960	13.5		
		131			160			199			230			277			346			398			482			545	710	10.0		
		285			348			433			501			604			752			865			1048			1184	1740	21.8		
125	81.77	237	153	78.67	290	190	78.61	361	220	78.19	418	265	79.25	503	330	79.66	626	380	78.67	721	460	77.57	873	520	85.60	987	1450	18.1	80	C80
		157			192			239			276			333			415			477			578			653	960	12.0		
		116			142			177			204			246			307			353			427			483	710	8.9		
		253			310			385			445			536			668			769			931			1053	1740	19.3		
125	93.28	211	153	89.00	258	190	88.94	321	220	85.50	371	265	90.27	447	330	88.95	557	380	90.15	641	460	87.69	776	520	96.77	877	1450	16.1	90	C90
		140			171			212			246			296			369			424			514			581	960	10.7		
		103			126			157			182			219			273			314			380			430	710	7.9		
		228			279			346			401			483			601			692			838			947	1740	17.4		
125	99.95	190	153	101.37	232	190	101.30	288	220	95.35	334	265	98.70	402	330	99.69	501	380	100.65	577	460	96.72	698	520	106.73	790	1450	14.5	100	D10
		126			154			191			221			266			332			382			462			523	960	9.6		
		93			114			141			164			197			245			283			342			387	710	7.1		
		203			249			309			358			431			537			618			748			846	1740	15.5		
125	108.01	169	153	110.85	207	190	110.76	258	220	108.47	298	265	110.07	359	330	112.70	447	380	112.80	515	460	107.81	624	520	118.96	705	1450	12.9	112	D11
		112			137			171			197			238			296			341			413			467	960	8.6		
		83			102			126			146			176			219			252			305			345	710	6.3		
		182			223			277			321			386			481			554			670			758	1740	13.9		
125	124.93	152	153	123.61	186	190	123.52	231	220	122.59	267	265	125.22	322	330	125.86	401	380	127.52	462	460	121.87	559	520	134.48	632	1450	11.6	125	D13
		101			123			153			177			213			265			306			370			418	960	7.7		
		74			91			113			131			158			196			226			274			309	710	5.7		
		163			199			247			286			345			429			495			599			677	1740	12.4		
125	139.58	136	153	140.63	166	190	140.53	206	220	140.78	239	265	141.52	287	330	143.84	358	380	142.42	412	460	134.41	499	520	148.32	564	1450	10.4	140	D14
		90			110			136			158			190			237			273			330			373	960	6.9		
		66			81			101			117			141			175			202			244			276	710	5.1		
		142			174			216			251			302						433			524			592	1740	10.9		
125	157.32	119	153	158.93	145	190	158.81	180	220	161.11	209	265	162.52	251				380	162.77	361	460	150.54	437	520	166.12	493	1450	9.1	160	D16
		79			96			119			138			166						239			289			327	960	6.0		
		58			71			88			102			123						177			214			242	710	4.4		
		127			155			192			223			268									466			526	1740	9.7		
125	173.91	105	153	182.52	129	190	182.38	160	220	177.54	186	265	185.99	224							460	169.04	388	520	186.54	439	1450	8.1	180	D18
		70			85			106			123			148									257			290	960	5.3		
		52			63			78			91			109									190			215	710	3.9		
		114			139			173			200			241									419			474	1740	8.7		
125	195.55	95	153	208.88	116	190	208.73	144	220	199.77	167	265	204.96	201							460	187.00	349	520	206.36	395	1450	7.3	200	D20
		63			77			95			111			133									231			261	960	4.8		
		46			57			71			82			99									171			193	710	3.6		
		102			124			155			179			216									374			423	1740	7.8		
125	216.55	85	153	230.18	104	190	230.01	129	220	219.67	149	265	230.62	180							460	212.22	312	520	234.18	352	1450	6.5	224	D22
		56			69			85			99			119									206			233	960	4.3		
		41			51			63			73			88									153			173	710	3.2		
					112			138			160			193													1740	7.0		
			153	259.00	93	190	258.81	115	220	245.17	134	265	253.60	161													1450	5.8	250	D25
					62			76			88			107													960	3.8		
					45			57			65			79													710	2.8		

9 Permissible additional radial forces on output shaft

9.1 permissible Additional Radial Forces on Output Shagft d

acting on the center of the output shaft



Permissible Additional Radial Forces F_{R2}(kN)

Type	Arrangement	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22
HK3...SH	A+B+G+H	18	18	26	26	30	40	50	50	150	150	160	185	185	190	284	305	308	330
	C+D	29	29	40	40	40	60	85	85	190	190	200	265	265	265	365	372	395	400
HK4...SH	A+B+G+H	18	18	26	26	30	40	50	50	150	150	160	185	185	190	284	305	308	330
	C+D	29	29	40	40	40	60	85	85	190	190	200	265	265	265	365	372	395	400

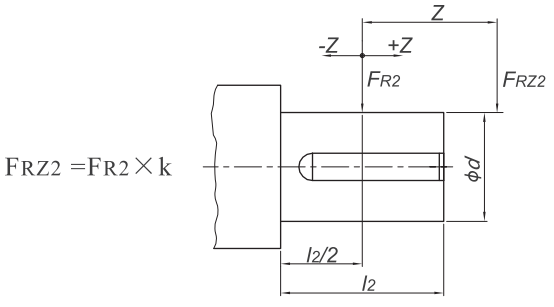
Note: 1) If angle of action and turning direction of the force are known,in most cases,higher radial force can be allowed.Please consult us.

2) *For application of force outside the center of the shaft end,see 9.2.

3) The foundation must be dry and grease–free. Permissible additional radial force on input shaft d1 is upon request.

9.2 Permissible Additional Radial Forces on Output Shaft d

The application of forces outside the center of shaft end



F_{RZ2} Permissible external radial force

F_{R2} Permissible additional radial force

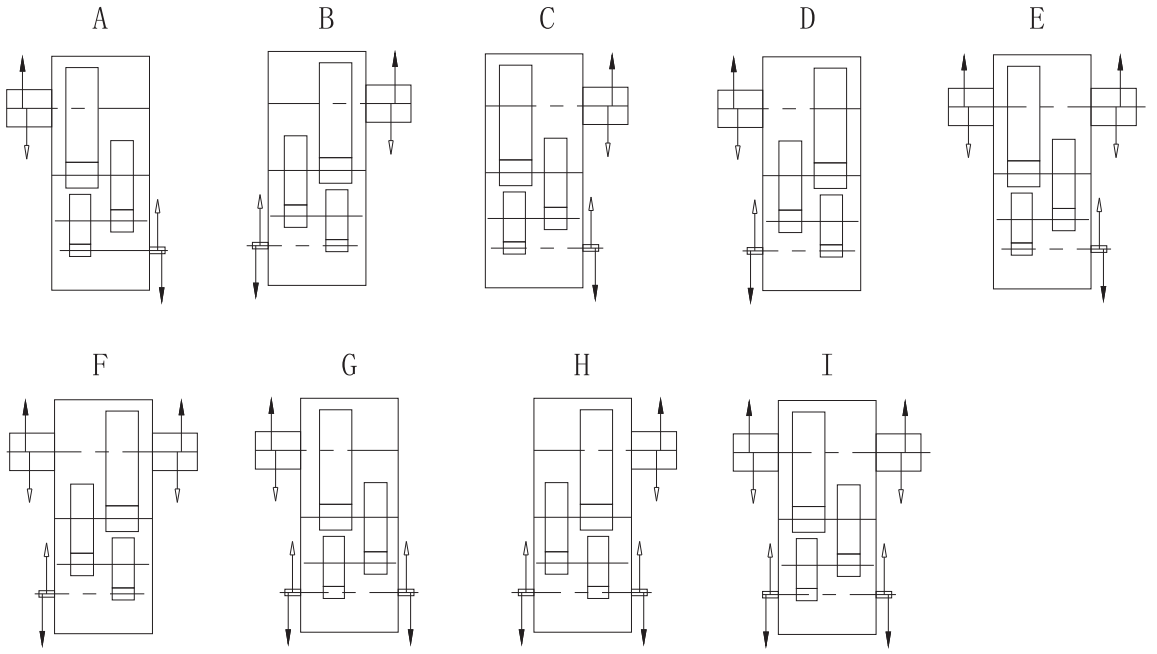
k The factor for action force is in the table below

Factor for action force(K)

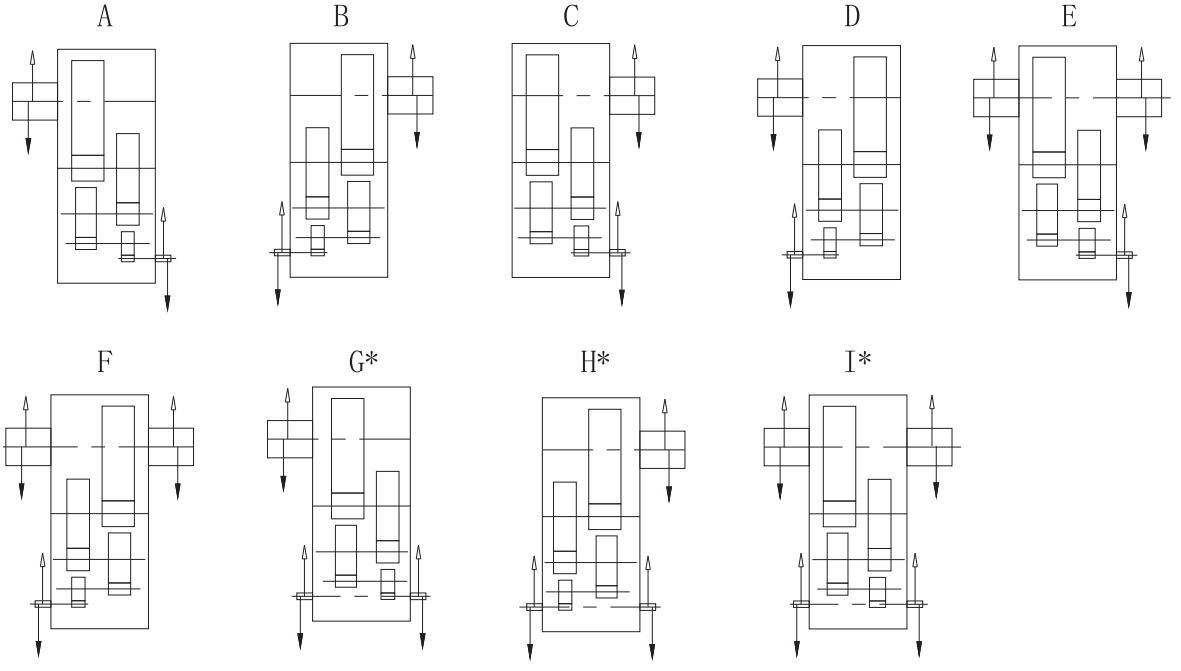
Z(mm)																
Size	-250	-200	-150	-100	-75	-50	-25	0	25	50	75	100	150	200	250	300
05/06					1.22	1.14	1.06	1	0.88	0.79	0.72	0.66	0.62	0.52	0.44	
07/08					1.19	1.12	1.06	1	0.89	0.81	0.74	0.68	0.58	0.51	0.46	0.41
09/10				1.22	1.15	1.1	1.05	1	0.9	0.82	0.76	0.7	0.61	0.54	0.48	0.44
11/12				1.18	1.13	1.08	1.04	1	0.91	0.84	0.78	0.73	0.64	0.57	0.51	0.47
13/14			1.24	1.15	1.11	1.07	1.03	1	0.92	0.86	0.8	0.75	0.67	0.6	0.55	0.5
15/16			1.2	1.12	1.09	1.06	1.03	1	0.93	0.87	0.82	0.77	0.69	0.63	0.58	0.53
17/18		1.25	1.17	1.11	1.08	1.05	1.03	1	0.94	0.88	0.84	0.79	0.72	0.66	0.6	0.56
19/20		1.22	1.13	1.1	1.06	1.04	1.02	1	0.95	0.9	0.85	0.81	0.74	0.69	0.62	0.58
21/22	1.27	1.21	1.12	1.09	1.05	1.04	1.02	1	0.96	0.92	0.86	0.83	0.75	0.71	0.64	0.6

10 Shaft arrangement

HK3



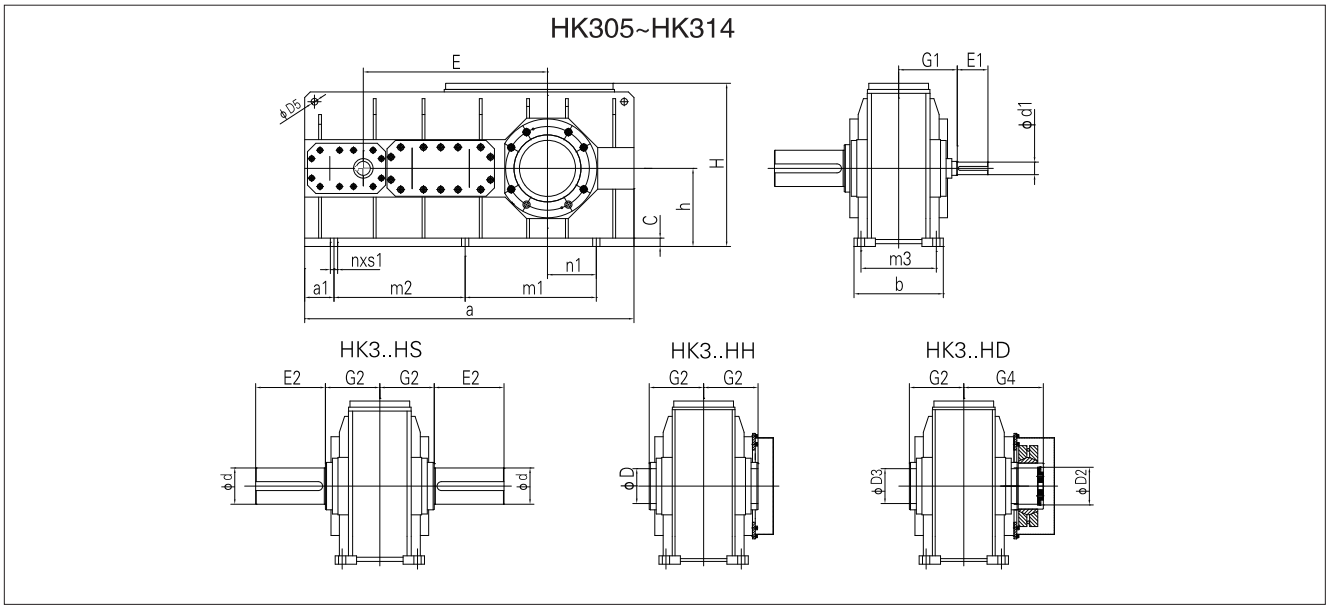
HK4



Type \ Size iN	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
HK3	35.5 40 45 50	45 50 56 63	35.5 40 45 50	35.5 40 45 50	35.5 40 45 50	35.5 40 45 50	35.5 40 45 50	35.5 40 45 50	35.5 40 45	35.5 40 45	45 50	45 50	40 45	45 50	35.5 40 45	40 45 50	45 50 56	50 56 63
HK4	160 180 200	200 224 250	160 180 200	160 180 200	160 180 200 224	160 180 200 224	160 180 200 224	160 180 200 224	160 180 200 224	160 180 200 224	200 224 250	200 224 250	160 180 200 224 250	180 200 224 250			200 224	200 224

*)Please consult us for arrangement G/H/I when iN are in right table

11 Outline dimensions

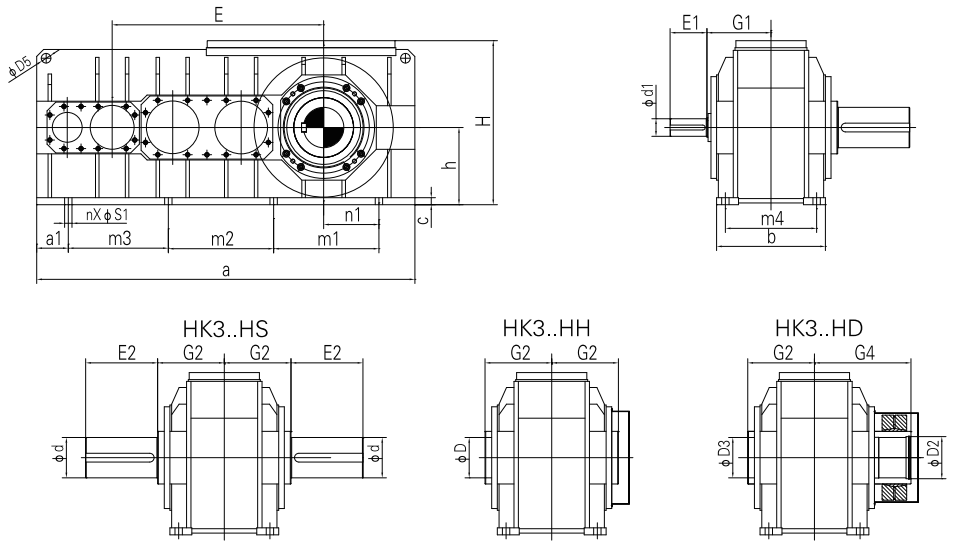


Size	iN=14-25		iN=18-31.5		iN=28-45		iN=28-50		iN=35.5-63		G1
	d1	E1	d1	E1	d1	E1	d1	E1	d1	E1	
05	50k6	110					38k6	80			195
06			50k6	110					38k6	80	195
07	60m6	140					50k6	110			210
08	60m6	140					50k6	110			210
09	75m6	140					60m6	140			240
10	75m6	140					60m6	140			240
11	90m6	170					70m6	140			275
12	90m6	170					70m6	140			275
13	100m6	210			85m6	170					330
14	100m6	210			85m6	170					330

Size	a	b	C	D5	E	h	H	m1	m2	m3	a1	n1	n	S1
05	870	255	30	24	497	220	505	375	315	215	85	158	6	22
06	975	255	30	24	555	230	555	420	400	215	80	213	6	22
07	1165	320	30	24	625	240	575	480	430	270	155	190	6	26
08	1235	320	30	24	665	280	645	505	470	270	150	210	6	26
09	1350	390	35	36	740	280	655	550	500	330	185	210	6	33
10	1460	390	35	36	800	320	745	600	550	330	195	260	6	33
11	1650	470	35	40	886	320	750	605	605	400	240	200	6	39
12	1750	470	35	40	936	380	855	675	675	400	230	270	6	39
13	1870	545	40	48	1027	380	880	712.5	712.5	465	245	240	6	45
14	2025	545	40	48	1105	440	1010	782.5	782.5	465	250	310	6	45

Size	HK3..HS			HK3..HH		HK3..HD				H3..HK	H3..HE	H3..HC	Oil(L)	Weight(Kg)
	d	E2	G2	D	G2	D2	D3	G2	G4					
05	100m6	210	165	95H7	165	100H7	100H7	165	240				20	435
06	110m6	210	165	105H7	165	110H7	110H7	165	240				24	505
07	120m6	210	195	115H7	195	120H7	120H7	195	280				36	720
08	130m6	250	195	125H7	195	130H7	130H7	195	285				44	830
09	140m6	250	235	135H7	235	140H7	140H7	235	330	Page 21	Page 22	Page 22	56	1150
10	160m6	300	235	150H7	235	150H7	150H7	235	350				67	1330
11	170m6	300	270	165H7	270	165H7	165H7	270	400				95	1860
12	180m6	300	270	180H7	270	180H7	180H7	270	405				128	2205
13	200m6	350	335	190H7	335	190H7	190H7	335	480				153	2890
14	220m6	350	335	210H7	335	210H7	210H7	335	480				190	3405

HK315~HK322

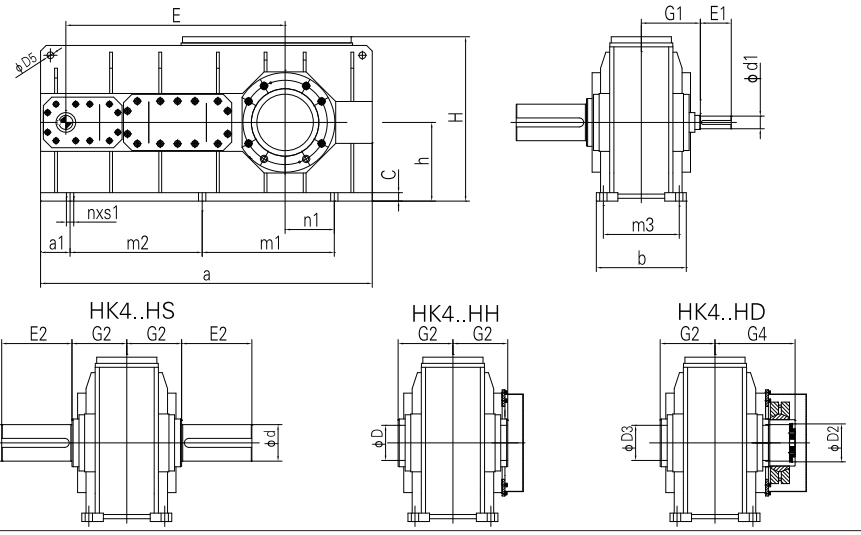


Size	iN=14-28		iN=16-31.5		iN=18-25		iN=20-35.5		iN=28-45		iN=31.5-50		iN=35.5-56		iN=40-63		G1
	d1	E1	d1	E1	d1	E1	d1	E1	d1	E1	d1	E1	d1	E1	d1	E1	
15			120m6	210									100m6	210			365
16			120m6	210									100m6	210			365
17	125m6	210									110m6	210					420
18			125m6	210									110m6	210			420
19					150m6	250			120m6	210							475
20	150m6	250									120m6	210					475
21			170m6	300									140m6	250			495
22							170m6	300							140m6	250	495

Size	a	b	C	D5	E	h	H	m1	m2	m3	m4	a1	n1	n	S1
15	2250	595	40	55	1205	440	1020	600	600	570	520	275	315	8	42
16	2300	595	40	55	1230	500	1100	690	600	570	520	255	360	8	42
17	2410	655	45	55	1315	500	1100	660	660	675	580	205	350	8	42
18	2535	655	45	55	1380	550	1210	790	660	675	580	210	420	8	42
19	2490	750	50	65	1580	550	1255	760	760	525	645	235	400	8	48
20	2600	750	50	65	1635	620	1380	890	760	520	645	220	470	8	48
21	3085	830	55	72	1725	700	1485	870	870	810	700	277.5	450	8	56
22	3195	830	55	72	1780	700	1485	985	870	810	700	280	510	8	56

Size	HK3..HS			HK3..HH		HK3..HD				H3..HK	H3..HE	H3..HC	Oil(L)	Weight(Kg)
	d	E2	G2	D	G2	D2	D3	G2	G4					
15	240m6	410	380	230H7	380	230H7	230H7	380	550	Page 21	Page 22	Page 22	235	4095
16	250m6	410	380	240H7	380	240H7	240H7	380	550				225	4715
17	260m6	410	415	250H7	415	250H7	250H7	415	600				290	5565
18	280m6	470	415	275H7	415	280H7	280H7	415	600				375	6415
19	290m6	470	465	On request									415	8420
20	310m6	470	465										500	9500
21	330m6	550	490										700	11660
22	350m6	550	490										710	12960

HK405~HK414

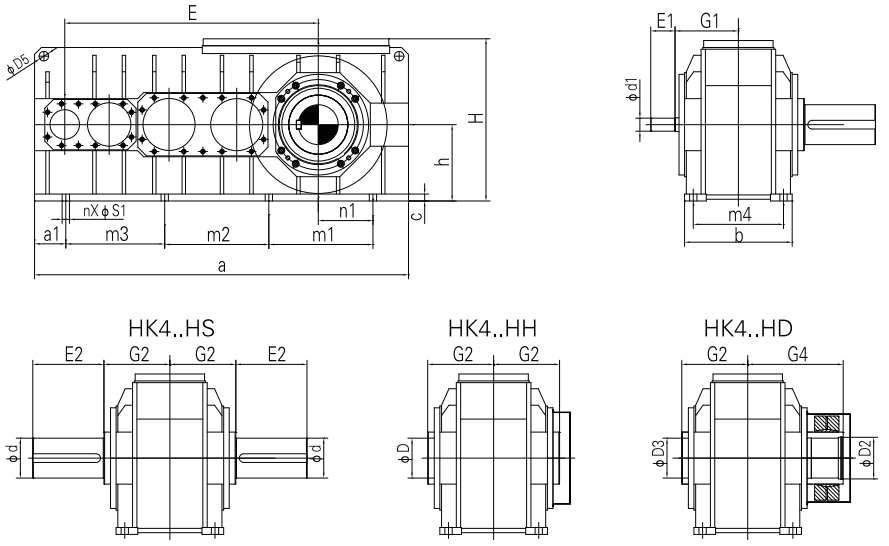


Size	iN=22.4-100		iN=22.4-112		iN=28-125		iN=112-200		iN=125-200		iN=125-224		iN=140-250		G1
	d1	E1	d1	E1	d1	E1	d1	E1	d1	E1	d1	E1	d1	E1	
05	40k6	80					30k6	60							170
06					40k6	80							30k6	60	170
07			45k6	110					35k6	80					210
08			45k6	110					35k6	80					210
09			60m6	140							45k6	110			240
10			60m6	140							45k6	110			240
11			70m6	140							50k6	110			275
12			70m6	140							50k6	110			275
13			85m6	170							60m6	140			325
14			85m6	170							60m6	140			325

Size	a	b	C	D5	E	h	H	m1	m2	m3	a1	n1	n	S1
05	950	255	30	24	590.5	220	505	375	375	215	110	158	6	22
06	1040	255	30	24	648.5	230	555	420	420	400	130	213	6	22
07	1165	320	30	24	745	240	575	480	430	270	155	190	6	26
08	1235	320	30	24	785	280	645	505	470	270	150	210	6	26
09	1350	390	35	36	880	280	655	550	500	330	185	210	6	33
10	1460	390	35	36	940	320	745	600	550	330	195	260	6	33
11	1650	470	35	40	1061	320	750	605	605	400	240	200	6	39
12	1750	470	35	40	1111	380	855	675	675	400	230	270	6	39
13	1870	545	40	48	1237	380	880	712.5	712.5	465	245	240	6	45
14	2025	545	40	48	1315	440	1010	782.5	782.5	465	250	310	6	45

Size	HK4..HS			HK4..HH		HK4..HD				H4..HK	H4..HE	H4..HC	Oil(L)	Weight(Kg)
	d	E2	G2	D	G2	D2	D3	G2	G4					
05	100m6	210	165	95H7	165	100H7	100H7	165	240				20	450
06	110m6	210	165	105H7	165	110H7	110H7	165	240				24	520
07	120m6	210	195	115H7	195	120H7	120H7	195	280				35	730
08	130m6	250	195	125H7	195	130H7	130H7	195	285				42	825
09	140m6	250	235	135H7	235	140H7	140H7	235	330	Page 21	Page 22	Page 22	55	1155
10	160m6	300	235	150H7	235	150H7	150H7	235	350				65	1340
11	170m6	300	270	165H7	270	165H7	165H7	270	400				90	1855
12	180m6	300	270	180H7	270	180H7	180H7	270	405				125	2215
13	200m6	350	335	190H7	335	190H7	190H7	335	480				150	2890
14	220m6	350	335	210H7	335	210H7	210H7	335	480				187	3450

HK415~HK422



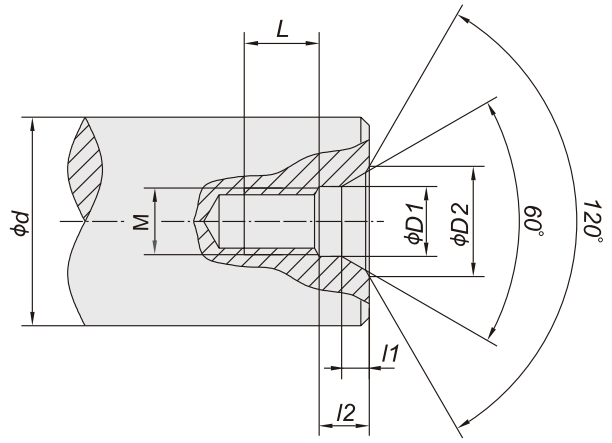
Size	iN=22.4-112		iN=22.4-125		iN=25-140		iN=125-250		iN=140-250		iN=160-250		G1
	d1	E1	d1	E1	d1	E1	d1	E1	d1	E1	d1	E1	
15					100m6	210					75m6	140	365
16					100m6	210					75m6	140	365
17	100m6	210					75m6	140					400
18			100m6	210					75m6	140			400
19	110m6	210					90m6	170					440
20			110m6	210					90m6	170			440
21					130m6	250					110m6	210	470
22					130m6	250					110m6	210	470

Size	a	b	C	D5	E	h	H	m1	m2	m3	m4	a1	n1	n	S1
15	2250	595	40	55	1461	440	1020	600	600	570	520	275	315	8	42
16	2300	595	40	55	1486	500	1100	690	600	570	520	255	360	8	42
17	2410	655	45	55	1571	500	1100	660	660	675	580	205	350	8	42
18	2535	655	45	55	1636	550	1210	790	660	675	580	210	420	8	42
19	2700	750	50	65	1776	550	1255	760	760	700	645	235	400	8	48
20	2810	750	50	65	1831	620	1380	890	760	700	645	235	470	8	48
21	3085	830	55	72	2070	700	1485	870	870	810	700	277.5	450	8	56
22	3195	830	55	72	2125	700	1485	985	870	810	700	280	510	8	56

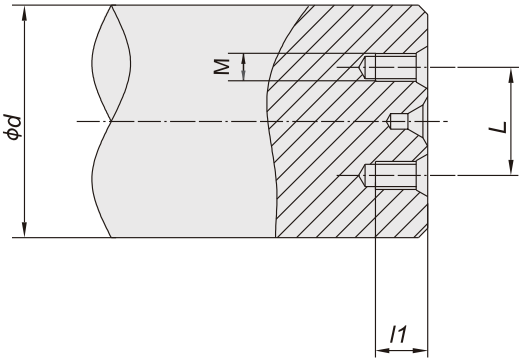
Size		HK4..HS		HK4..HH			HK4..HD			H4..HK	H4..HE	H4..HC	Oil(L)	Weight(Kg)
	d	E2	G2	D	G2	D2	D3	G2	G4					
15	240m6	410	380	230H7	380	230H7	230H7	380	550	Page 21	Page 22	Page 22	235	4635
16	250m6	410	380	240H7	380	240H7	240H7	380	550				220	5150
17	260m6	410	415	250H7	415	250H7	250H7	415	600				290	6190
18	280m6	470	415	275H7	415	280H7	280H7	415	600				375	7280
19	290n6	470	465	On Request									440	9135
20	310n6	470	465										510	10180
21	330n6	550	490										695	12600
22	350n6	550	490										705	13915

12 Screw hole in shaft end

Type C screw central hole in shaft end

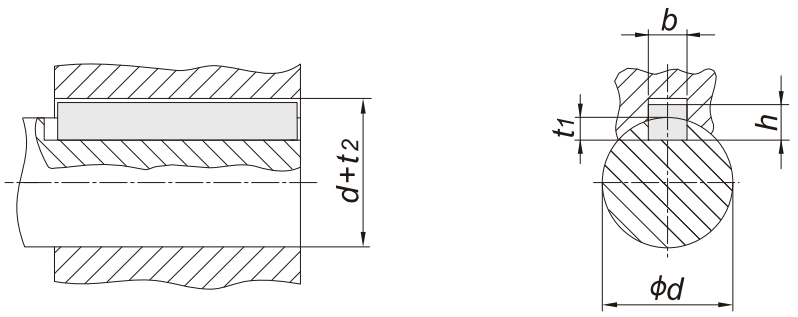


Double screw holes in shaft end



Type C screw central hole in shaft end 7<d≤225							Double screw holes in shaft end 225<d			
d	M	L	12	11	D1	D2	d	M	11	L
7<d≤10	M3	10	2.6	1.8	3.2	5.8	225<d≤230	M16	28	160
10<d≤13	M4	10	3.2	2.1	4.3	7.4	230<d≤280	M20	38	180
13<d≤16	M5	10	4	2.4	5.3	8.8	280<d≤290			190
16<d≤21	M6	12	5	2.8	6.4	10.5	290<d≤310	M24	45	220
21<d≤24	M8	12	6	3.3	8.4	13.2	310<d≤330			230
24<d≤30	M10	15	7.5	3.8	10.5	16.3	330<d≤340			240
30<d≤38	M12	20	9.5	4.4	13	19.8	340<d≤360			250
38<d≤50	M16	25	12	5.2	17	25.3	360<d≤390			270
50<d≤85	M20	30	15	6.4	21	31.3	390<d≤420	M30	55	300
85<d≤130	M24	35	18	8	25	38	420<d≤460			320
130<d≤225	M30	45	18	11	31	48	460<d≤500			350

13 Parallel keys and keyway

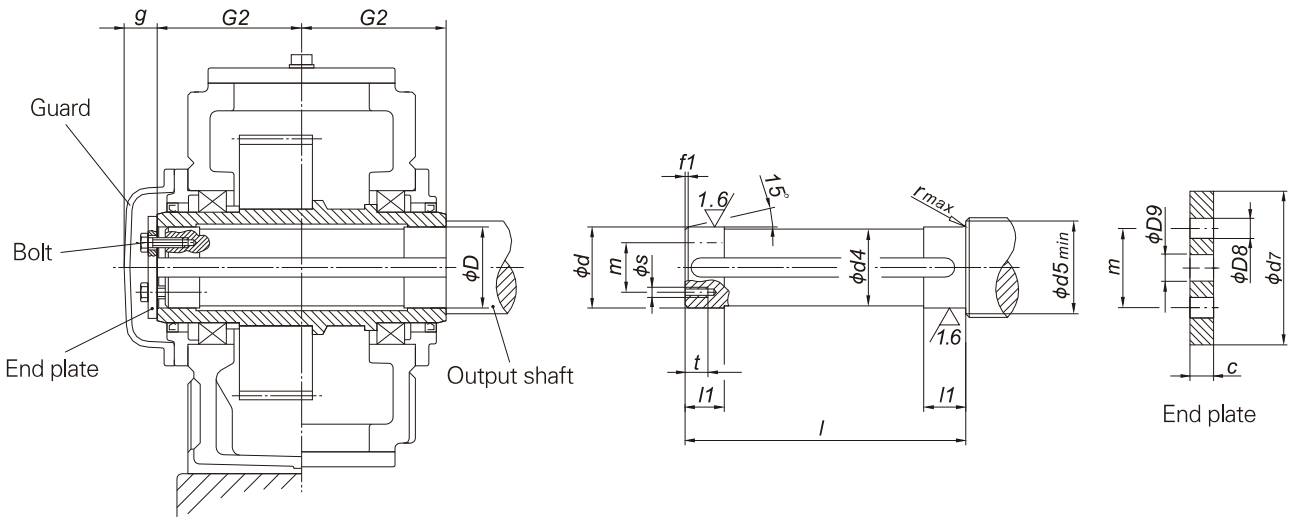


d	b	h	t1	d+t2
8<d≤10	3	3	1.8	d+1.4
10<d≤12	4	4	2.5	d+1.8
12<d≤17	5	5	3	d+2.3
17<d≤22	6	6	3.5	d+2.8
22<d≤30	8	7	4	d+3.3
30<d≤38	10	8	5	d+3.3
38<d≤44	12	8	5	d+3.3
44<d≤50	14	9	5.5	d+3.8
50<d≤58	16	10	6	d+4.3
58<d≤65	18	11	7	d+4.4
65<d≤75	20	12	7.5	d+4.9
75<d≤85	22	14	9	d+5.4
85<d≤95	25	14	9	d+5.4
95<d≤110	28	16	10	d+6.4
110<d≤130	32	18	11	d+7.4
130<d≤150	36	20	12	d+8.4
150<d≤170	40	22	13	d+9.4
170<d≤200	45	25	15	d+10.4
200<d≤230	50	28	17	d+11.4
230<d≤260	56	32	20	d+12.4
260<d≤290	63	32	20	d+12.4
290<d≤330	70	36	22	d+14.4
330<d≤380	80	40	25	d+15.4
380<d≤440	90	45	28	d+17.4
440<d≤500	100	50	31	d+19.5
500<d≤560	110	56	34.3	d+22.2
560<d≤640	120	63	39	d+24.5

14 Dimensions for recommended output connections

14.1 Hollow shaft with paralllel keys

Used for driving shaft of driven equipment connected by parallel key



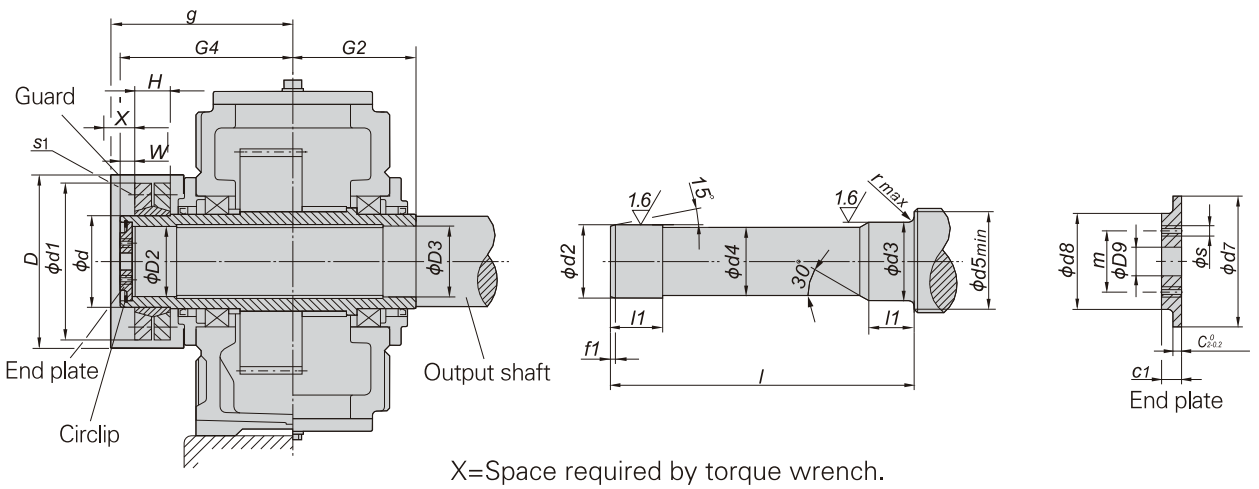
Type HK3H HK4H

Size	Driven machine shaft									End plate					Bolt		Hollow shaft		
	d	d_4	d_5	f_1	l	l_1	r	s	t	c	D_8	D_9	d_7	m	Size	Qty.	D	G_2	g
05	95h6	94.5	105	5	328	40	1.6	M10	18	10	11	26	120	70	M10×25	2	95H7	165	40
06	105h6	104.5	116	5	328	45	1.6	M10	18	10	11	26	120	70	M10×25	2	105H7	165	40
07	115h6	114.5	126	5	388	50	1.6	M12	20	12	13.5	26	140	80	M12×30	2	115H7	195	40
08	125h6	124.5	136	6	388	55	2.5	M12	20	12	13.5	26	150	85	M12×30	2	125H7	195	40
09	135h6	134.5	147	6	467	60	2.5	M12	20	12	13.5	33	160	90	M12×30	2	135H7	235	45
10	150h6	149.5	162	6	467	65	2.5	M12	20	12	13.5	33	185	110	M12×30	2	150H7	235	45
11	165h6	164.5	177	7	537	70	2.5	M16	28	15	17.5	33	195	120	M16×40	2	165H7	270	45
12	180h6	179.5	192	7	537	75	2.5	M16	28	15	17.5	33	220	130	M16×40	2	180H7	270	45
13	190h6	189.5	206	7	667	80	3	M16	28	18	17.5	33	230	140	M16×40	2	190H7	335	45
14	210h6	209.5	226	8	667	85	3	M16	28	18	17.5	33	250	160	M16×40	2	210H7	335	45
15	230h6	229.5	248	8	756	100	3	M20	38	25	22	39	270	180	M20×55	4	230H7	380	60
16	240h6	239.5	258	8	756	100	3	M20	38	25	22	39	280	180	M20×55	4	240H7	380	60
17	250h6	249.5	270	8	826	110	4	M20	38	25	22	39	300	190	M20×25	4	250H7	415	60
18	275h6	274.5	295	9	826	120	4	M20	38	25	22	39	330	210	M20×25	4	275H7	415	60

⚠Note：1.Material of driven machine shaft:40Cr or higher strength steel.
2.Driven machine shaft and parallel keys don't belong to the scope of our supply.Please order separately,if required.
3.Protection cover,end board and bolts are standed allocation of hollow shaft with parallel key connections.

14.2 Hollow shaft with shrink disk

Driven machine shaft for shrink disc connection



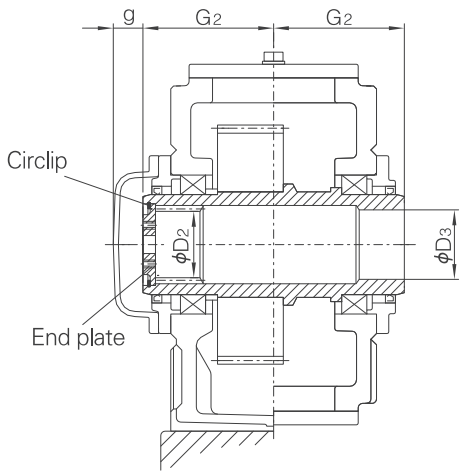
X=Space required by torque wrench.

Type HK3D HK4D

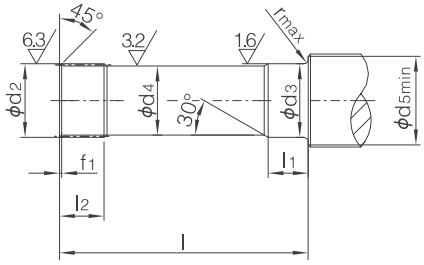
Size	Driven machine shaft 2)								End plate								Circlip	Hollow shaft				Shrink disk 1)					Bolt	Guard	
	d_2	d_3	d_4	d_5	f_1	l	l_1	r	c_1	c_2	d_7	d_8	D_9	m	s	Qty.		D_2	D_3	G_2	G_4	Type	d	d_1	H	W	S_1	D	g
05	100g6	100h6	99.5	114	5	383	53	2	20	8	105	80	26	55	M10	2	105	100H7	100	165	240	SP_2-125	125	215	53	20	M12	275	255
06	110g6	110h6	109.5	124	5	383	58	3	20	8	115	85	26	60	M10	2	115	110H7	110	165	240	SP_2-140	140	230	58	20	M12	285	255
07	120g6	120h6	119.5	134	5	453	68	3	20	8	125	90	26	65	M12	2	125	120H7	120	195	280	SP_2-155	155	263	62	23	M12	330	295
08	130g6	130h6	129.5	145	6	458	73	3	20	8	135	100	26	70	M12	2	135	130H7	130	195	285	SP_2-165	165	290	68	23	M16	340	300
09	140g6	140h6	139.5	160	6	539	82	4	23	10	150	110	33	80	M12	2	150	140H7	140	235	330	SP_2-175	175	300	68	28	M16	360	345
10	150g6	150h6	149.5	170	6	559	92	4	23	10	160	120	33	90	M12	2	160	150H7	150	235	350	SP_2-200	200	340	85	28	M16	395	365
11	165f6	165g6	164.5	185	7	644	112	4	23	10	175	130	33	90	M12	2	175	165H7	165	270	400	SP_2-220	220	370	103	30	M16	435	420
12	180f6	180g6	179.5	200	7	649	122	4	23	10	190	140	33	100	M16	2	190	180H7	180	270	405	SP_2-240	240	405	107	30	M20	450	420
13	190f6	190g6	189.5	213	7	789	137	5	23	10	200	150	33	110	M16	2	200	190H7	190	335	480	SP_2-260	260	430	119	30	M20	500	505
14	210f6	210g6	209.5	233	8	784	147	5	28	14	220	170	33	130	M16	2	220	210H7	210	335	480	SP_2-280	280	460	132	30	M20	525	505
15	230f6	230g6	229.5	253	8	899	157	5	28	14	240	180	39	140	M16	2	240	230H7	230	380	550	SP_2-300	300	485	140	35	M20	575	575
16	240f6	240g6	239.5	263	8	899	157	5	28	14	250	190	39	150	M20	2	250	240H7	240	380	550	SP_2-320	320	520	140	35	M20	595	575
17	250f6	250g6	249.5	278	8	982	177	5	30	14	265	200	39	150	M20	2	265	250H7	250	415	600	SP_2-340	340	570	155	35	M20	615	630
18	280f6	280g6	279.5	306	9	982	177	5	30	14	290	210	39	160	M20	2	290	280H7	280	415	600	SP_2-360	360	590	162	35	M24	635	625
19-22	On request																												

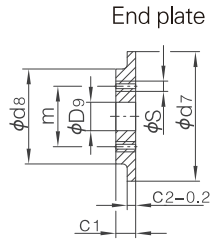
⚠Note：1.Material of driven machine shaft:40Cr or higher strength steel.
2.Driven machine shaft doesn't belong to the scope of our supply.But you can get the dimensions with e-mail.
3.Shrink disk,protective cover,end plate and circlip are standard allocation of hollow shaft with shrink disc.
4.Driven machine shaft must be free of oil or grease.

14.3 Hollow shaft with involute spline



Driven machine shaft with involute spline must be filled with grease before installation.





Driven machine shaft with DS center hole machined acc. to DIN 332.

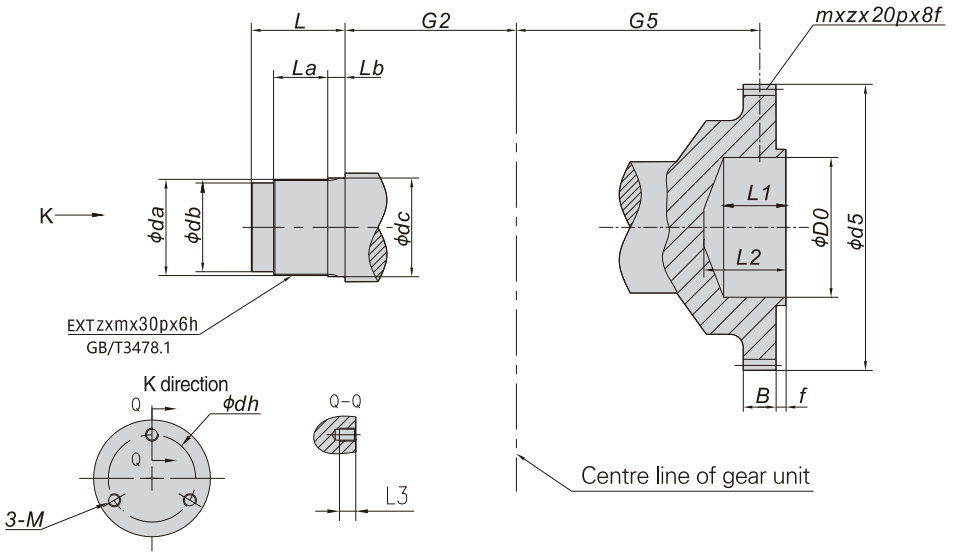
Types HK3K、HK4K																									
Size	Involute splines DIN5480	Driven equipment shaft[1)]									End plate								Circlip	Hollow shaft				Bolt
		d2	d3	d4	d5	f1	l	l1	l2	r	c1	c2	d7	d8	D9	m	s	Qty.		D2	D3	G2	G	
5	W95×3×30×30×8f	94.4h11	100h6	93	114	3	308	53	90	2	20	8	105d9	80	26	55	M10	2	105	89H11	100H7	165	45	M24
6	W95×3×30×30×8f	94.4h11	110h6	93	124	3	308	58	90	3	20	8	105d9	80	26	55	M10	2	105	89H11	110H7	165	45	M24
7	W120×3×30×38×8f	119.4h11	120h6	118	134	3	368	68	105	3	20	8	125d9	90	26	65	M12	2	125	114H11	120H7	195	55	M24
8	W120×3×30×38×8f	119.4h11	130h6	118	145	3	368	73	105	3	20	8	125d9	90	26	65	M12	2	125	114H11	130H7	195	55	M24
9	W140×3×30×45×8f	139.4h11	145h6	138	160	3	444	82	125	4	23	10	150d9	110	33	80	M12	2	150	134H11	145H7	235	55	M30
10	W140×3×30×45×8f	139.4h11	155h6	138	170	3	444	92	125	4	23	10	150d9	110	33	80	M12	2	150	134H11	155H7	235	55	M30
11	W170×5×30×32×8f	169h11	170h6	168	185	5	514	112	150	4	23	10	175d9	130	33	90	M12	2	175	160H11	170H7	270	65	M30
12	W170×5×30×32×8f	169h11	185h6	168	200	5	514	122	150	4	23	10	175d9	130	33	90	M12	2	175	160H11	185H7	270	65	M30
13	W190×5×30×36×8f	189h11	195h6	188	213	5	644	137	180	5	23	5	200d9	150	33	110	M16	2	200	180H11	195H7	335	45	M30
14	W190×5×30×36×8f	189h11	215h6	188	233	5	644	147	180	5	23	5	200d9	150	33	110	M16	2	200	180H11	215H7	335	45	M30
15~22	On request																							

⚠ Note: 1.Material of driven equipment shaft: 40cr or steel with higher strength.
2.Driven equipment shaft is not in scope of supply, please order if required.
3.Shrink disc, protection cover, end plate and circlip are supplied with gearbox as standard.
4.Driven machine shaft with involute spline must be filled with grease before installation.

14.4 Dimensions of splined solid shaft and type C output shaft

Splined soild shaft output dimension

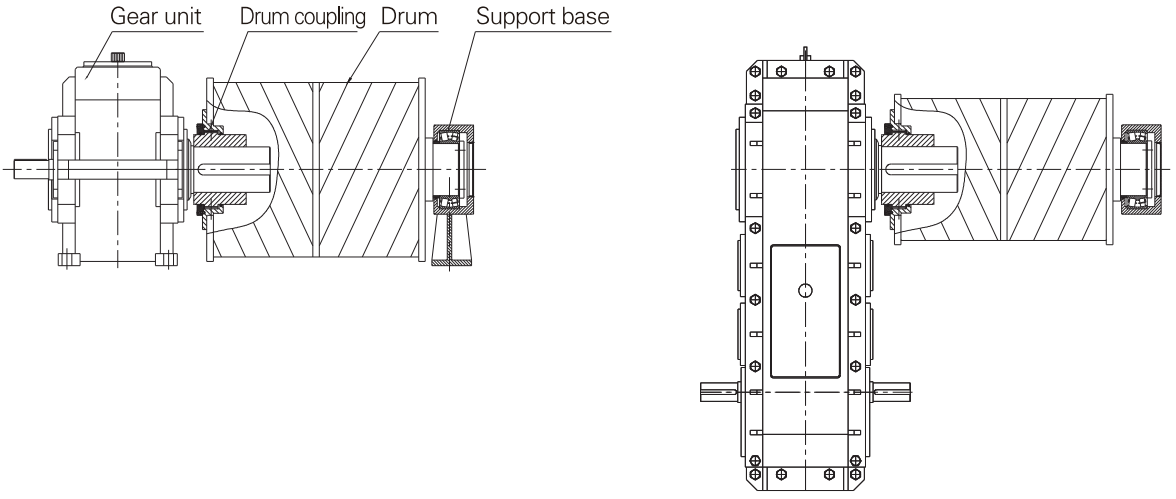
Type C gear output shaft dimension



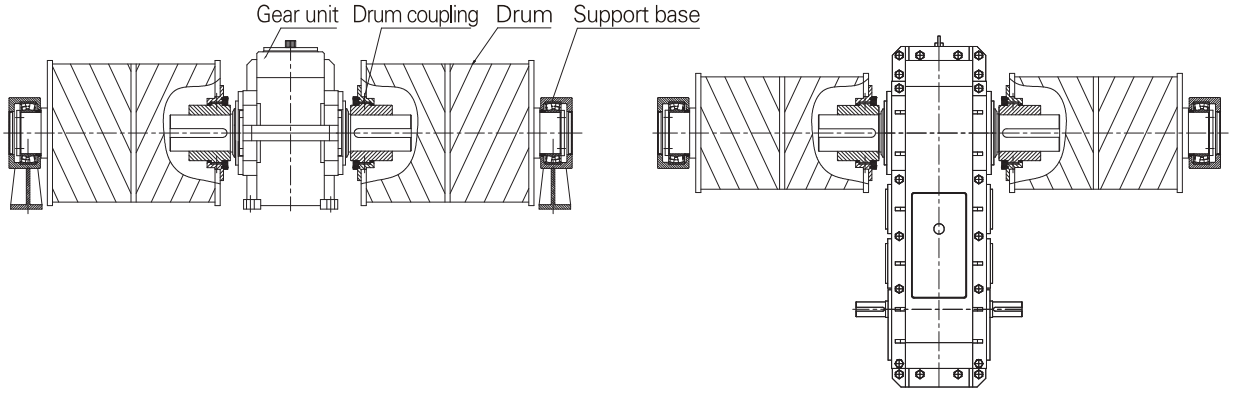
Splined solid shaft output dimension												Type C gear output shaft dimension							
Size	G_2	z×m	d_a	d_b	d_c	d_h	L	La	L_b	M	L_3	m×z	d_5	D_0	L_1	L_2	B	f	G_5
05	165	18×5	95h6	80h6	100	50	125	55	35	M10	17	4×56	232h11	120H7	50	75	35	14	271
06	165	22×5	115h6	100h6	120	70	135	60	40	M12	20	4×56	232h11	120H7	50	75	35	14	271
07	195	26×5	135h6	120h6	140	90	155	75	45	M12	20	4×56	232h11	120H7	76	100	35	14	346
08	195	26×5	135h6	120h6	140	90	155	75	45	M12	20	4×56	232h11	120H7	76	100	35	14	346
09	235	30×5	155h6	140h6	160	100	165	80	50	M12	20	8×54	448h11	200H7	78	100	50	15	370
10	235	34×5	175h6	160h6	180	110	180	80	55	M16	24	8×54	448h11	200H7	78	100	50	15	385
11	270	38×5	195h6	180h6	200	130	190	100	55	M16	24	8×54	448h11	200H7	78	100	50	15	420
12	270	38×5	195h6	180h6	200	130	190	100	55	M16	24	8×54	448h11	200H7	78	100	50	15	430
13	335	26×8	216h6	190h6	222	140	205	110	60	M16	24	10×48	500h11	200H7	78	100	60	35	513
14	335	26×8	216h6	190h6	222	140	205	110	60	M16	24	10×48	500h11	200H7	78	100	60	35	513
15	400	30×8	248h6	220h6	254	160	220	125	60	M16	24	10×48	500h11	200H7	78	100	60	35	550
16	400	30×8	248h6	220h6	254	160	220	125	60	M16	24	10×48	500h11	200H7	78	100	60	35	575
17	450	30×8	248h6	220h6	254	160	220	125	60	M16	24	12×54	672h11	290H7	78	100	75	45	600
18	450	34×8	280h6	250h6	286	180	235	140	60	M20	30	12×54	672h11	290H7	78	100	75	45	625
19	500	34×8	280h6	250h6	286	180	235	140	60	M20	30	12×54	672h11	290H7	78	100	75	45	625
20	500	38×8	312h6	280h6	318	200	260	155	70	M24	40	12×54	672h11	290H7	78	100	75	45	675
21	550	38×8	312h6	280h6	318	200	260	155	70	M24	40	/	/	/	/	/	/	/	/
22	550	44×8	360h6	320h6	366	230	315	205	75	M24	40	/	/	/	/	/	/	/	/

15 Application drawing

15.1 Single drum transmission



15.2 Double drums transmission



16 Lubrication oil

Heavy–loading industrial gear wheel oil viscosity brand selection：

VG320（Accessory codeUV32）

VG460（Accessory codeUV46）

Ambient temperature℃	−20℃~+40℃
Viscosity brand number	VG320

⚠ Note：1.Viscosity brand number in the above table is ISO–VG viscosity under 40℃.
2.Synthetic oil must be used when ambient temperature is lower than −10℃.
3.To ensure product lifespan,we suggest synthetic oil in application.
4.If ambient temperature exceeds the above range,please consult us.

Along with the technology advancedet.,the product of the manual of Boneng will be changed,please forgive.

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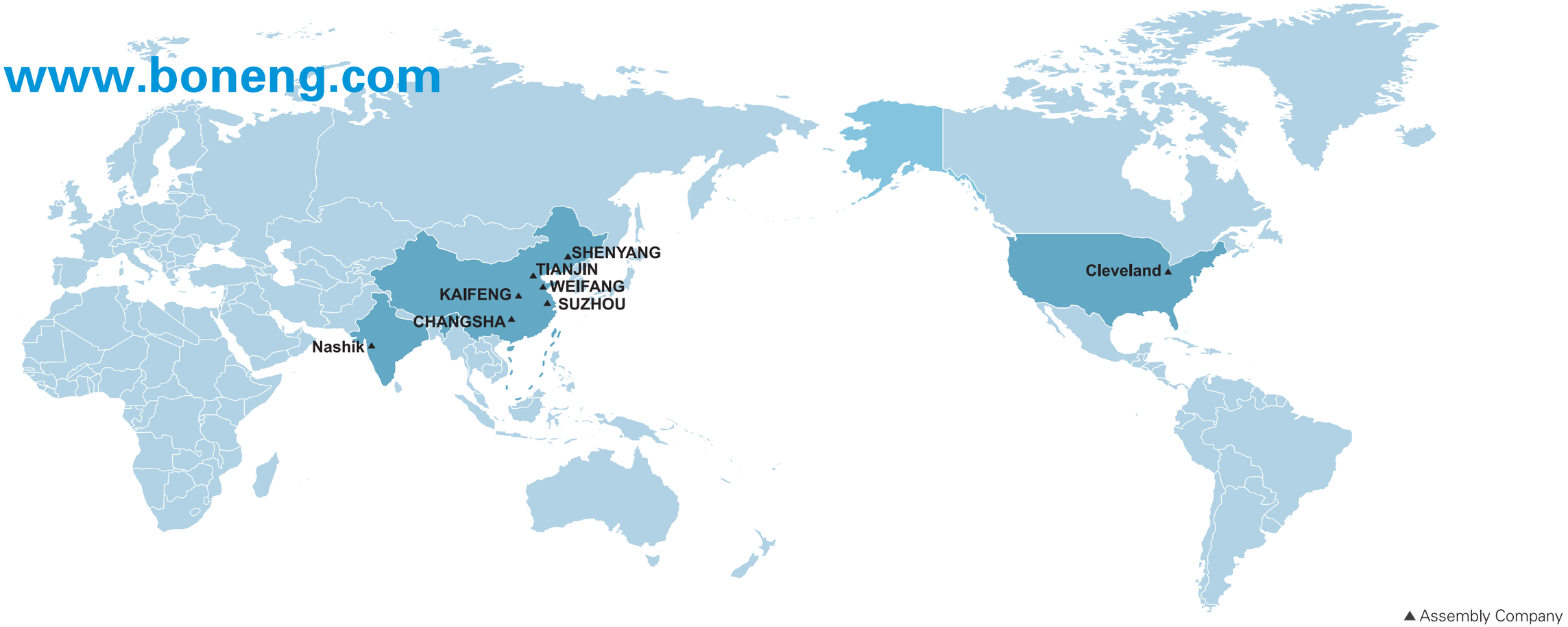

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