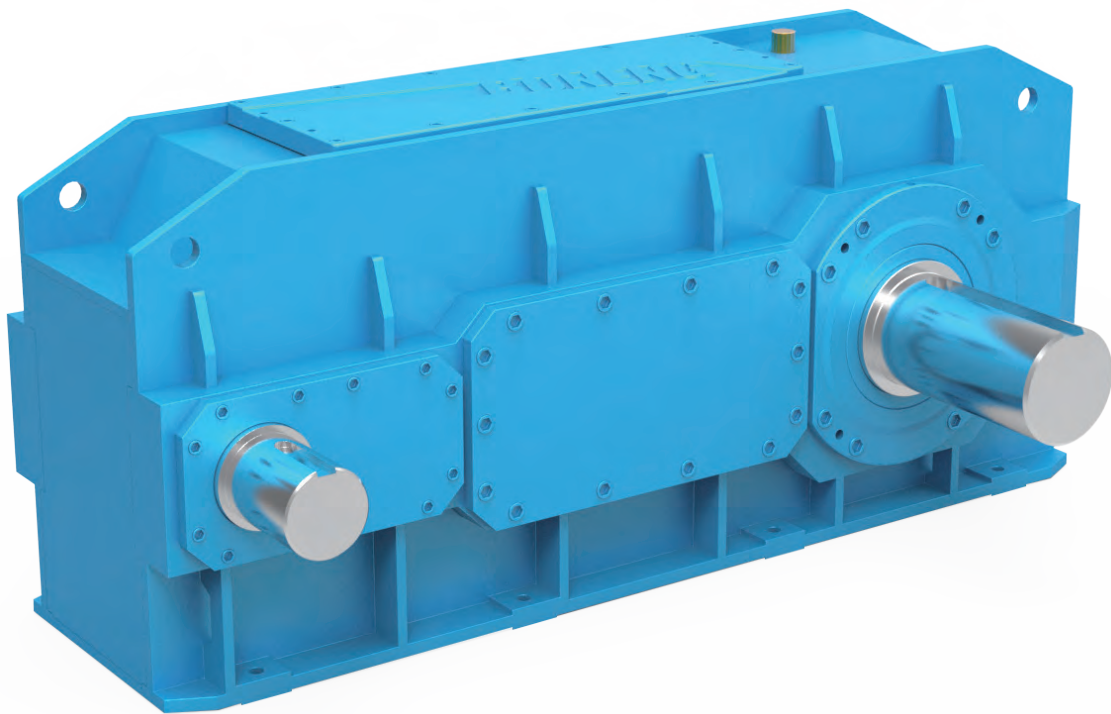




BONENG



HK Helical Gearbox with Extended Center Distance

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

Boneng Transmission

www.motiontech.com.au



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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 subsidiary 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, shipbuilding 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 convenient.
- ◆ 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 before 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 f_1 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 S_F table on page 6	
4	Transmission Efficiency	η	3 stage: 94%; 4 stage: 92%	
5	Input Speed	n_1	$\leq 1500\text{r/min}$ 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}	$T_{2N} \geq T_2 \cdot f_1 \cdot f_2 \cdot S_F$ or $P_{1N} \geq P_1 \cdot f_1 \cdot f_2 \cdot S_F$ Check S_F table on page 6	
9	Check Peak Torque*	T_A	$P_{1N} \geq T_A \cdot n_1 \cdot f_3/9550$ Check f_3 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

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

Load level	Specification	Service factor	Factor for driven machine f1										Peak torque factor f3	
			Working hours											
			U0		U1		U2		U3		U4			
			≤ 200		$> 200 \sim 400$		$> 400 \sim 800$		$> 800 \sim 1600$		$> 1600 \sim 3200$			
Q1 Light	Rarely hoisting nominal load,normally hoisting light load	1) f1	0.8	A1	0.8	A1	0.8	A1	0.8	A2	0.8	A3		
		2) f3	0.8		0.8		0.8		0.8		0.8			
		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	A1	0.8	A1	0.8	A2	0.9	A3	0.9	A4		
		2) f3	0.5		0.5		0.5		0.5		0.5			
		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	A1	0.8	A2	0.9	A3	1	A4	1	A5		
		2) f3	0.5		0.5		0.5		0.5		0.5			
		3) f3	0.8		0.8		0.8		0.8		0.8			
Q4 Super heavy	Frequently hoisting nominal load	1) f1	0.9	A2	0.9	A3	1	A4	1.1	A5	1.2	A6		
		2) f3	0.5		0.5		0.5		0.5		0.5			
		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			
			$> 3200 \sim 6300$		$> 6300 \sim 12500$		$> 12500 \sim 50000$		$> 25000 \sim 50000$		> 50000			
Q1 Light	Rarely hoisting nominal load,normally hoisting light load	1) f1	0.9	A4	1	A5	1	A6	1.1	A7	1.2	A8		
		2) f3	0.5		0.56		0.63		0.71		0.8			
		3) f3	0.8		0.8		1.9		1		1.12			
Q2 Medium	Sometimes hoisting nominal load,normally hoisting medium load	1) f1	1	A5	1.1	A6	1.2	A7	1.3	A8	1.4	A8		
		2) f3	0.5		0.56		0.63		0.71		0.8			
		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	A6	1.2	A7	1.3	A8	1.4	A8	1.6	A8		
		2) f3	0.56		0.63		0.71		0.8		0.9			
		3) f3	0.8		0.9		1		1.12		1.25			
Q4 Super heavy	Frequently hoisting nominal load	1) f1	1.3	A7	1.4	A8	1.6	A8	1.8	A8	2	A8		
		2) f3	0.56		0.63		0.71		0.8		0.9			
		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, lifting 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 coefficient	
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=Solid shaft with 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: $P_m=30\text{kW}$

Speed: $n_1=710\text{rpm}$

Max starting torque: $T_A=645\text{N.m}$

Driven machine:

Main hoisting gears of bridge crane

hoisting power: $P_2=22\text{kW}$

Drum speed: $n_2=10\text{rpm}$

Working level: Q3-U9-A8

Working hour: > 50000 hours

Ambient temperature: 30°C

Gear units:

Parallel shaft gear units

Shaft arrangement: G

Center distance: $\geq 900\text{mm}$

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:

$$P_1=P_2/\eta=22/92\%=23.9\text{kW}$$

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

$$=23.9 \times 1.6 \times 1 \times 1.2=45.9\text{kW}$$

Referring to transmission capacity:

Gear unit size is 10,corresponding rated power

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

3.Verify peak torque:

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

$$=645 \times 710 \times 0.9/9550=43.2\text{kW}$$

$P_{1N}=60\text{kW} > 43.2\text{kW}$ 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)	i _{ex}	P _{1N} (kW)	T _{2N} (kN•m)	i _{ex}	P _{1N} (kW)	T _{2N} (kN•m)	i _{ex}	P _{1N} (kW)	T _{2N} (kN•m)	i _{ex}	P _{1N} (kW)	T _{2N} (kN•m)	i _{ex}	P _{1N} (kW)	T _{2N} (kN•m)	i _{ex}	P _{1N} (kW)	T _{2N} (kN•m)	i _{ex}	P _{1N} (kW)	T _{2N} (kN•m)	i _{ex}	P _{1N} (kW)	T _{2N} (kN•m)	i _{ex}	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			253			301			481			540			658			768				
		960	53.3			65						103			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			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 (r/min)	n _{2N} (r/min)	i _s	Code																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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125	17.16	1265	153	17.48	1549	190	17.47	1923	220	18.07	2227	265	18.27	2682	330	18.28	3340				460	17.55	4656				1740	96.7	18	C18																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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		698						854						1061						1480						1843		2569				960	53.3																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
		516						632						785						909						1095		1363				1900		710	39.4																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
125	19.16	1139	153	20.45	1394	190	20.44	1731	220	20.50	2004	265	20.86	2414	330	20.98	3006	380	20.68	3462	460	19.56	4191	520	19.37	4737	1740	87.0	20	C20																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
		949						1442						2012						2505						2885		3492				3948	1450	72.5																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
		628						769						1106						1332						1659		1910				2312		2614	960	48.0																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
		465						569						706						818						985		1227				1413		1710		1933	710	35.5																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
125	21.47	1017	153	23.30	1244	190	23.29	1545	220	22.35	1789	265	23.66	2155	330	23.00	2684	380	23.74	3091	460	21.84	3742	520	21.58	4230	1740	77.7	22.4	C22																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
		847						1288						1796						2237						2576		3118				3525	1450	64.7																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
		561						853						987						1189						1481		1705				2064		2334	960	42.9																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
		415						631						730						880						1095		1261				1527		1726	710	31.7																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
125	24.27	911	153	25.47	1115	190	25.45	1385	220	25.12	1603	265	25.80	1931	330	25.98	2405	380	26.03	2769	460	25.07	3352	520	24.10	3790	1740	69.6	25	C25																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
		759						1154						1609						2004						2308		2794				3158	1450	58.0																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
		503						764						1066						1327						1528		1850				2091	960	38.4																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
		372						455						565						654						788		981				1130		1368		1546	710	28.4																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
125	27.11	813	153	28.79	996	190	28.77	1236	220	27.56	1432	265	29.00	1724	330	29.14	2147	380	29.39	2473	460	27.49	2993	520	27.67	3384	1740	62.1	28	C28																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
		678						1030						1193						1437						1789		2061				2494		2820	1450	51.8																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
		449						682						790						951						1185		1364				1651		1867	960	34.3																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
		332						406						504						584						704		876				1009		1221		1381	710	25.4																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
125	30.98	723	153	31.75	885	190	31.73	1099	220	30.77	1273	265	31.82	1533	330	32.96	1909	380	32.97	2198	460	31.04	2661	520	30.33	3008	1740	55.2	31.5	C32																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
		603						737						916						1060						1277		1591				1832		2217		2506	1450	46.0																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
		399						488						606						702						846		1053				1213		1468		1659	960	30.5																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
		295						361						448						519						625		779				897		1086		1227	710	22.5																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
125	35.85	642	153	35.56	785	190	35.54	975	220	34.45	1129	265	35.52	1360	330	36.69	1694	380	37.29	1950	460	34.82	2361	520	34.25	2669	1740	49.0	35.5	C36																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
		535						654						813						941						1133		1411				1625		1967		2224	1450	40.8																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
		354						433						538						623						750		934				1076		1303		1472	960	27.0																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
		262						320						398						461						555		691				796		963		1089	710	20.0																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
125	39.77	569	153	39.93	697	190	39.90	865	220	37.95	1002	265	39.77	1207	330	41.03	1503	380	41.52	1731	460	39.38	2095	520	38.42	2369	1740	43.5	40	C40																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
		474						581						721						835						1006		1253				1442		1746		1974	1450	36.3																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
		314						385						477						553						666		829				955		1156		1307	960	24.0																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
		232						284						353						409						493		613				706		855		966	710	17.8																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
125	44.41	506	153	44.17	619	190	44.14	769	220	42.84	891	265	43.81	1073	330	45.73	1336	380	46.43	1539	460	43.85	1862	520	43.46	2105	1740	38.7	45	C45																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
		422						516						641						742						894		1113				1282		1552		1755	1450	32.2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
		279						342						424						491						592		737				849		1028		1162	960	21.3																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
		207						253						314						363						438		545				628		760		859	710	15.8																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
			153	50.13	558	190	50.09	692										380	51.74	1385	460	49.03	1676	520	48.39	1895	1740	34.8	50	C50																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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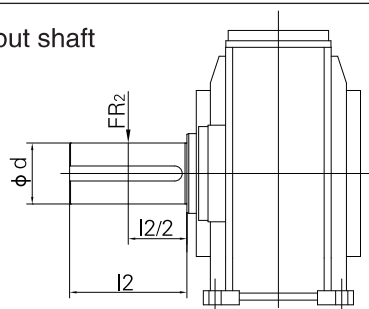
Code	i _N	n ₁ (r/min)	n _{2N} (r/min)	HK405			HK406			HK407			HK408			HK409			HK410			HK411			HK412			HK413		
				T _{2N} (kN•m)	ie _x	P _{1N} (kW)	T _{2N} (kN•m)	ie _x	P _{1N} (kW)	T _{2N} (kN•m)	ie _x	P _{1N} (kW)	T _{2N} (kN•m)	ie _x	P _{1N} (kW)	T _{2N} (kN•m)	ie _x	P _{1N} (kW)	T _{2N} (kN•m)	ie _x	P _{1N} (kW)	T _{2N} (kN•m)	ie _x	P _{1N} (kW)	T _{2N} (kN•m)	ie _x	P _{1N} (kW)	T _{2N} (kN•m)	ie _x	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			207
		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		225.49																									

HK414			HK415			HK416			HK417			HK418			HK419			HK420			HK421			HK422								
T _{2N} (kN•m)	i _{ex}	P _{1N} (kW)	T _{2N} (kN•m)	i _{ex}	P _{1N} (kW)	T _{2N} (kN•m)	i _{ex}	P _{1N} (kW)	T _{2N} (kN•m)	i _{ex}	P _{1N} (kW)	T _{2N} (kN•m)	i _{ex}	P _{1N} (kW)	T _{2N} (kN•m)	i _{ex}	P _{1N} (kW)	T _{2N} (kN•m)	i _{ex}	P _{1N} (kW)	T _{2N} (kN•m)	i _{ex}	P _{1N} (kW)	T _{2N} (kN•m)	i _{ex}	P _{1N} (kW)	n ₁ (r/min)	n _{2N} (r/min)	i _N	Code		
125	21.56	1017							220	22.27	1789				330	22.57	2684	380	22.80	3091							1740	77.7	22.4	C22		
		847									1491						2237			2576							1450	64.7				
		561									987						1481			1705							960	42.9				
		415									730						1095			1261							710	31.7				
125	24.31	911	153	25.21	1115	190	25.19	1385	220	25.29	1603	265	25.71	1931	330	25.86	2405	380	25.54	2769							1740	69.6	25	C25		
		759			929			1154			1336			1609			2004			2308							1450	58.0				
		503			615			764			885			1066			1327			1528							960	38.4				
		372			455			565			654			788			981			1130							710	28.4				
125	28.08	813	153	28.64	996	190	28.62	1236	220	28.81	1432	265	29.20	1724	330	28.88	2147	380	29.27	2473	460	26.52	520	29.27			3384	1740	62.1	28	C28	
		678			830			1030			1193			1437			1789			2061							2820	1450	51.8			
		449			549			682			790			951			1185			1364							1867	960	34.3			
		332			406			504			584			704			876			1009							1381	710	25.4			
125	32.03	723	153	32.62	885	190	32.59	1099	220	31.50	1273	265	33.26	1533	330	32.36	1909	380	32.68	2198	460	31.04	520	34.25			3008	1740	55.2	31.5	C32	
		603			737			916			1060			1277			1591			1832							2506	1450	46.0			
		399			488			606			702			846			1053			1213							1468	1659	960			30.5
		295			361			448			519			625			779			897							1086	1227	710			22.5
125	34.06	642	153	35.66	785	190	35.64	975	220	33.97	1129	265	36.36	1360	330	36.59	1694	380	36.62	1950	460	35.36	520	39.02			2669	1740	49.0	35.5	C36	
		535			654			813			941			1133			1411			1625							2224	1450	40.8			
		354			433			538			623			750			934			1076							1472	960	27.0			
		262			320			398			461			555			691			796							963	1089	710			20.0
125	38.40	569	153	39.77	697	190	39.74	865	220	38.59	1002	265	39.22	1207	330	39.66	1503	380	41.40	1731	460	38.64	520	42.64			2369	1740	43.5	40	C40	
		474			581			721			835			1006			1253			1442							1974	1450	36.3			
		314			385			477			553			666			829			955							1156	1307	960			24.0
		232			284			353			409			493			613			706							855	966	710			17.8
125	44.36	506	153	43.83	619	190	43.80	769	220	43.95	891	265	44.55	1073	330	45.44	1336	380	44.87	1539	460	43.68	520	48.20			2105	1740	38.7	45	C45	
		422			516			641			742			894			1113			1282							1755	1450	32.2			
		279			342			424			491			592			737			849							1028	1162	960			21.3
		207			253			314			363			438			545			628							760	859	710			15.8
125	50.60	455	153	49.79	558	190	49.75	692	220	48.06	802	265	50.74	966	330	50.74	1203	380	51.42	1385	460	48.18	520	53.17			1895	1740	34.8	50	C50	
		380			465			577			668			805			1002			1154							1397	1579	1450			29.0
		251			308			382			442			533			663			764							925	1045	960			19.2
		186			227			283			327			394			491			565							684	773	710			14.2
125	54.21	407	153	56.71	498	190	56.66	618	220	53.59	716	265	55.48	862	330	56.86	1074	380	57.41	1236	460	53.24	520	58.75			1692	1740	31.1	56	C56	
		339			415			515			596			718			895			1030							1247	1410	1450			25.9
		224			275			341			395			476			592			682							826	933	960			17.1
		166			203			252			292			352			438			504							611	690	710			12.7
125	62.79	362	153	62.00	442	190	61.96	549	220	60.97	636	265	61.87	766	330	64.28	954	380	64.34	1099	460	62.31	520	68.76			1504	1740	27.6	63	C63	
		301			369			458			530			639			795			916							1109	1253	1450			23.0
		199			244			303			351			423			527			606							734	830	960			15.2
		148			181			224			260			313			389			448							543	614	710			11.3
125	70.80	321	153	69.15	393	190	69.10	488	220	68.65	565	265	70.39	680	330	69.52	847	380	72.74	975	460	70.99	520	78.34			1180	1334	1740	24.5	71	C71
		267			327			406			470			567			706			813							984	1112	1450	20.4		
		177			217			269			311			375			467			538							651	736	960	13.5		
		131			160			199			230			277			346			398							482	545	710	10.0		
125	81.77	285	153	78.67	348	190	78.61	433	220	78.19	501	265	79.25	604	330	79.66	752	380	78.67	865	460	77.57	520	85.60			1048	1184	1740	21.8	80	C80
		237			290			361			418			503			626			721							873	987	1450	18.1		
		157			192			239			276			333			415			477							578	653	960	12.0		
		116			142			177			204			246			307			353							427	483	710	8.9		
125	93.28	253	153	89.00	310	190	88.94	385	220	85.50	445	265	90.27	536	330	88.95	668	380	90.15	769	460	87.69	520	96.77			931	1053	1740	19.3	90	C90
		211			258			321			371			447			557			641							776	877	1450	16.1		
		140			171			212			246			296			369			424							514	581	960	10.7		
		103			126			157			182			219			273			314							380	430	710	7.9		
125	99.95	228	153	101.37	279	190	101.30	346	220	95.35	401	265	98.70	483	330	99.69	601	380	100.65	692	460	96.72	520	106.73			838	947	1740	17.4	100	D10
		190			232			288			334			402			501			577							698	790	1450	14.5		
		126			154			191			221			266			332			382							462	523	960	9.6		
		93			114			141			164			197			245			283							342	387	710	7.1		
125	108.01	203	153	110.85	249	190	110.76	309	220	108.47	358	265	110.07	431	330	112.70	537	380	112.80	618	460	107.81	520	118.96			748	846	1740	15.5	112	D11
		169			207			258			298			359			447			515							624	705	1450	12.9		
		112			137			171			197			238			296			341							413	467	960	8.6		
		83			102			126			146			176			219			252							305	345	710	6.3		
125	124.93	182	153	123.61	223	190	123.52	277	220	122.59	321	265	125.22	386	330	125.86	481	380	127.52	554	460	121.87	520	134.48			670	758	1740	13.9	125	D13
		152			186			231			267			322			401			462							559	632	1450	11.6		
		101			123			153			177			213			265			306							370	418	960	7.7		
		74			91			113			131			158			196			226							274	309	710	5.7		
125	139.58	163	153	140.63	199	190	140.53	247	220	140.78	286	265	141.52	345	330	143.84	429	380	142.42	495	460	134.41	520	148.32			599	677	1740	12.4	140	D14
		136			166			206			239			287			358			412							499	564	1450	10.4		
		90			110			136			158			190			237			273							330	373	960	6.9		
		66			81			101			117			141			175			202							244	276	710	5.1		
125	157.32	142	153	158.93	174	190	158.81	216	220	161.11	251	265	162.52	302	330	162.77	433	380	162.77	477	460	150.54	520	166.12			524	592	1740	10.9	160	D16
		119			145			180			209			251			312			361							437	493	1450	9.1		
		79			96			119			138			166			206			239							289	327	960	6.0		
		58			71			88			102			123			151			177							214	242	710	4.4		
125	173.91	127	153	182.52	155	190	182.38	192	220	177.54	223	265	185.99	268	330		343	380		466	460	169.04	520	186.54			466	526	1740	9.7	180	D18
		105			129			160			186			224			274			312							388	439	1450	8.1		
		70			85			106			123			148			177			206							257	290	960	5.3		
		52			63			78			91			109			133			159							190	215	710	3.9		
125	195.55	114	153	208.88	139	190	208.73	173	220	199.77	200	265	204.96	241</																		

9 Permissible additional radial forces on output shaft

9.1 permissible Additional Radial Forces on Output Shaft d

acting on the center of the output shaft



Permissible Additional Radial Forces FR_2 (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

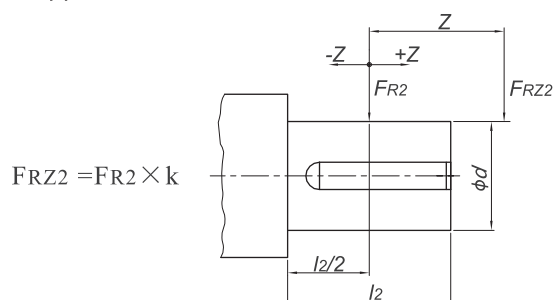
Note: 1) If angle of action and turning direction of the force are known, in most cases, higher radial force can be allowed. Please consult us.

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 d_1 is upon request.

9.2 Permissible Additional Radial Forces on Output Shaft d

The application of forces outside the center of shaft end



$$FR_{Z2} = FR_2 \times k$$

FR_{Z2} Permissible external radial force

FR_2 Permissible additional radial force

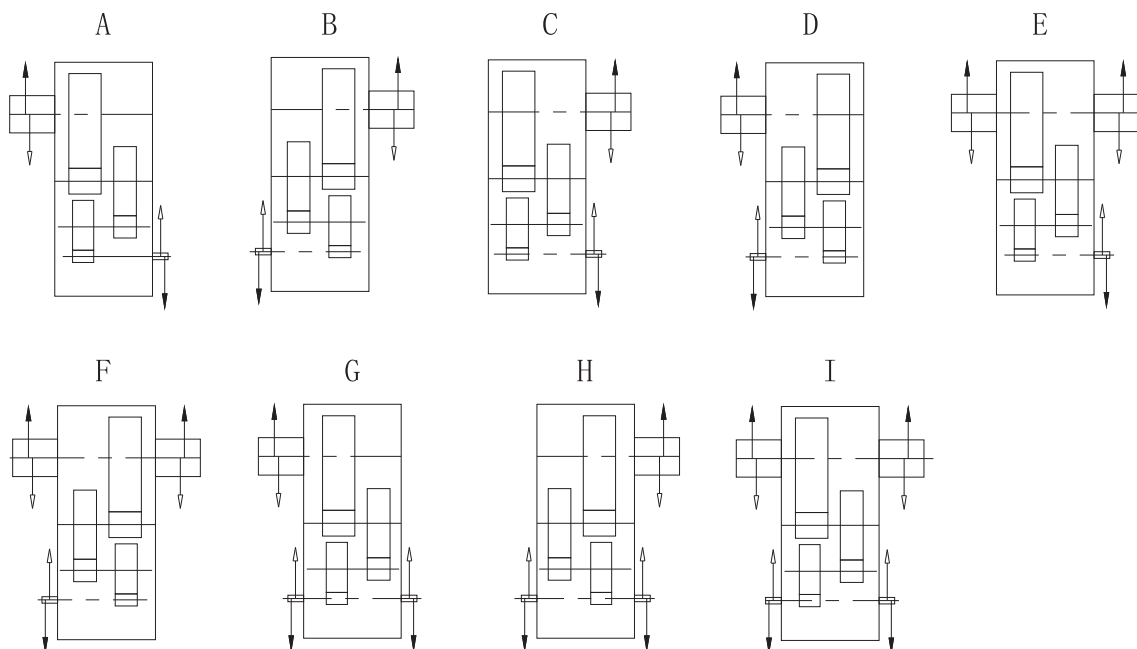
k The factor for action force is in the table below

Factor for action force (K)

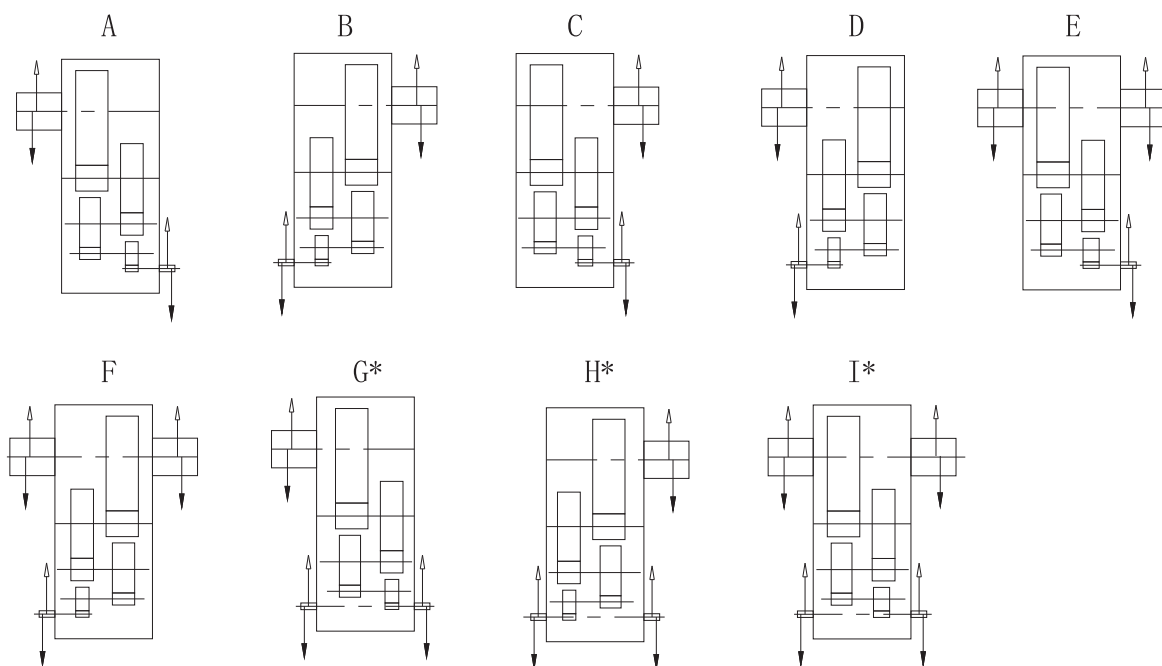
Z (mm)																
Size	-250	-200	-150	-100	-75	-50	-25	0	25	50	75	100	150	200	250	300
05/06					1.22	1.14	1.06	1	0.88	0.79	0.72	0.66	0.62	0.52	0.44	
07/08					1.19	1.12	1.06	1	0.89	0.81	0.74	0.68	0.58	0.51	0.46	0.41
09/10				1.22	1.15	1.1	1.05	1	0.9	0.82	0.76	0.7	0.61	0.54	0.48	0.44
11/12				1.18	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



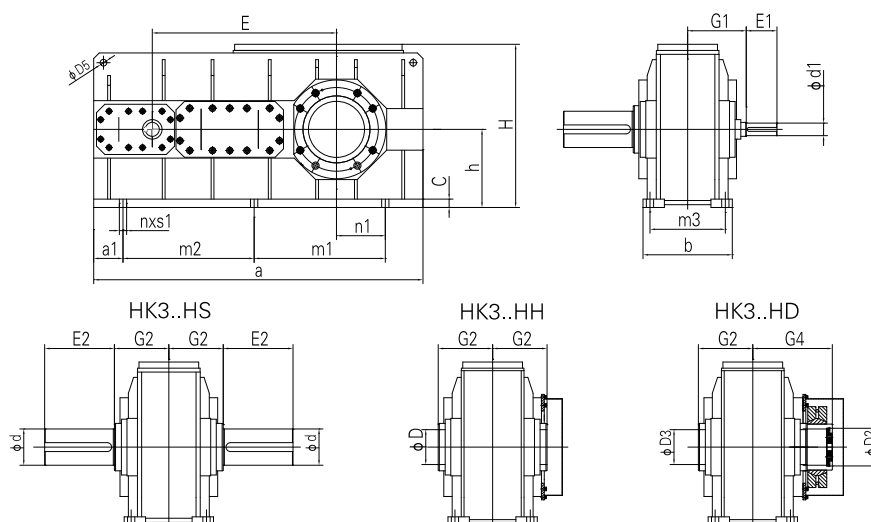
HK4



	Type	Size iN	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
			35.5	45	35.5	35.5	35.5	35.5	35.5	35.5	35.5	35.5	45	45	40	45	35.5	40	45	50
*)Please consult us for arrangement G/H/I when iN are in right table	HK3		40	50	40	40	40	40	40	40	40	40	45	45	40	45	40	45	50	56
			45	56	45	45	45	45	45	45	45	45	50	50	45	50	45	50	56	63
			50	63	50	50	50	50	50	50	50	50					45	50	56	63
	HK4		160	200	160	160	160	160	160	160	160	160	200	200	160	180			200	200
			180	224	180	180	180	180	180	180	180	180	224	224	200	200			224	224
			200	250	200	200	200	200	200	200	200	200	250	250	224	224				
															250	250				

11 Outline dimensions

HK305~HK314

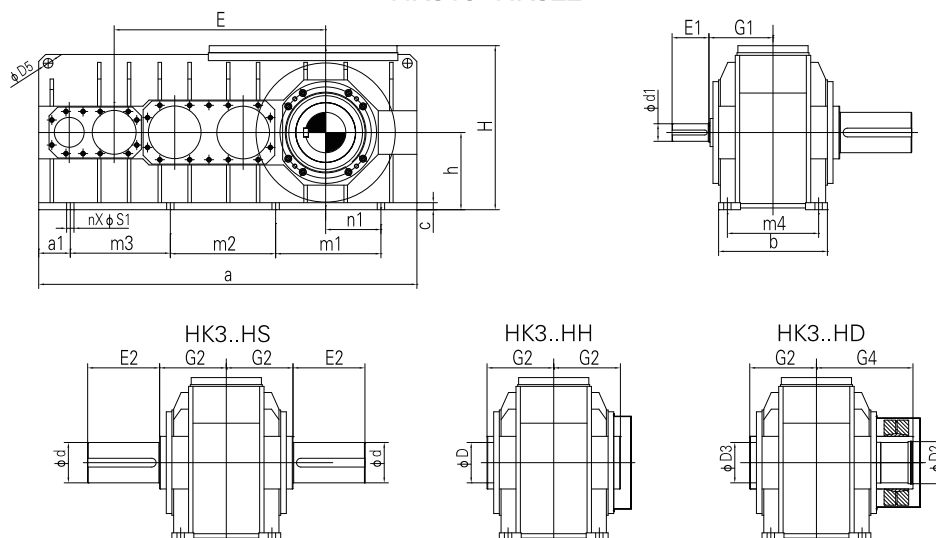


Size	iN=14-25		iN=18-31.5		iN=28-45		iN=28-50		iN=35.5-63		G1
	d1	E1	d1	E1	d1	E1	d1	E1	d1	E1	
05	50k6	110					38k6	80			195
06			50k6	110					38k6	80	195
07	60m6	140					50k6	110			210
08	60m6	140					50k6	110			210
09	75m6	140					60m6	140			240
10	75m6	140					60m6	140			240
11	90m6	170					70m6	140			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	Page 21	Page 22	Page 22	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				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

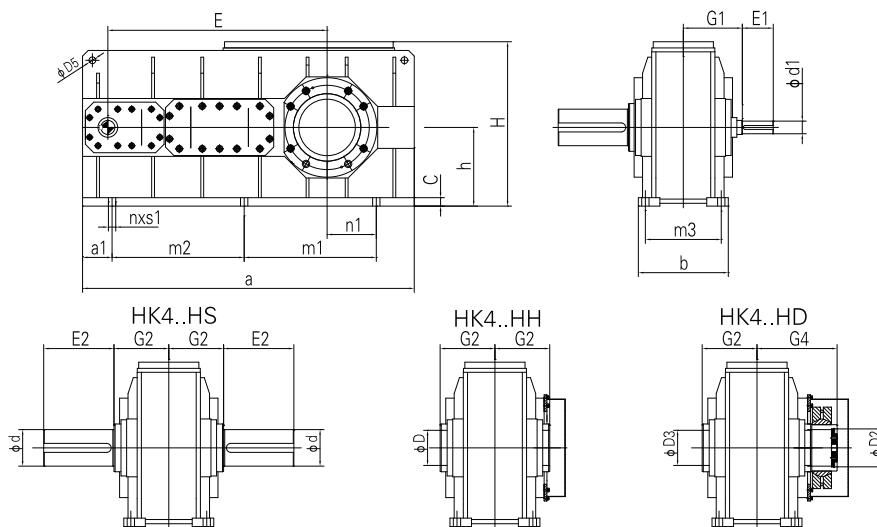


Size	iN=14-28		iN=16-31.5		iN=18-25		iN=20-35.5		iN=28-45		iN=31.5-50		iN=35.5-56		iN=40-63		G1
	d1	E1	d1	E1	d1	E1	d1	E1	d1	E1	d1	E1	d1	E1	d1	E1	
15			120m6	210									100m6	210			365
16			120m6	210									100m6	210			365
17	125m6	210									110m6	210					420
18			125m6	210									110m6	210			420
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

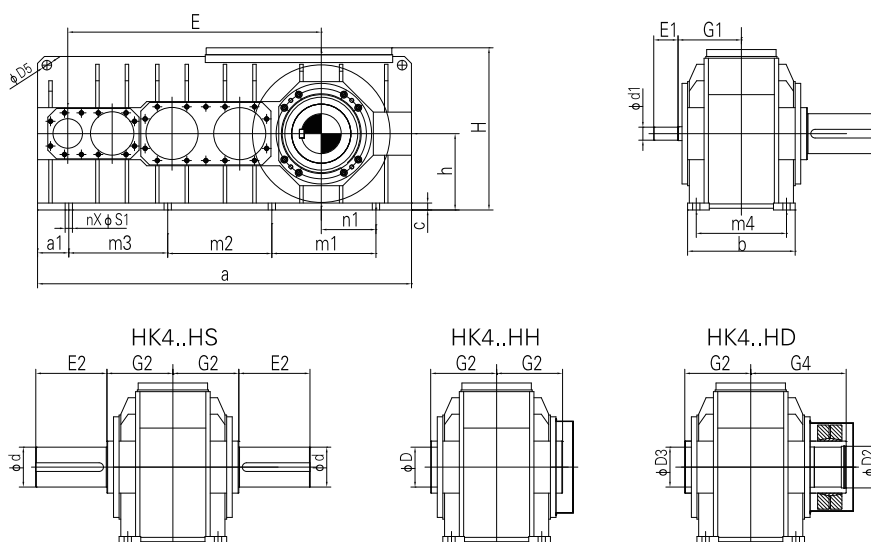


Size	iN=22. 4-100		iN=22. 4-112		iN=28-125		iN=112-200		iN=125-200		iN=125-224		iN=140-250		G1
	d1	E1	d1	E1	d1	E1	d1	E1	d1	E1	d1	E1	d1	E1	
05	40k6	80					30k6	60							170
06					40k6	80							30k6	60	170
07			45k6	110					35k6	80					210
08			45k6	110					35k6	80					210
09			60m6	140							45k6	110			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	Page 21	Page 22	Page 22	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				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



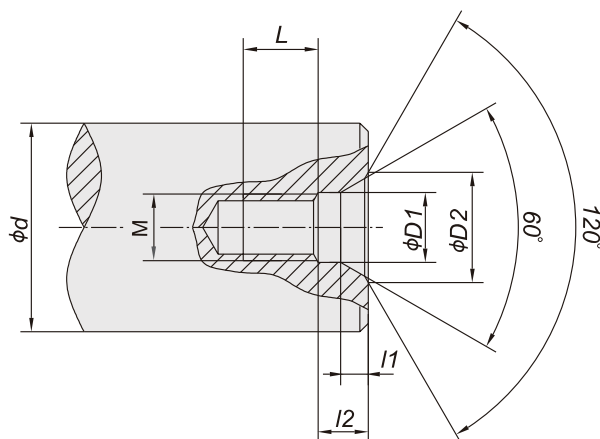
Size	iN=22. 4-112		iN=22. 4-125		iN=25-140		iN=125-250		iN=140-250		iN=160-250		G1
	d1	E1	d1	E1	d1	E1	d1	E1	d1	E1	d1	E1	
15					100m6	210					75m6	140	365
16					100m6	210					75m6	140	365
17	100m6	210						75m6	140				400
18			100m6	210					75m6	140			400
19	110m6	210						90m6	170				440
20			110m6	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

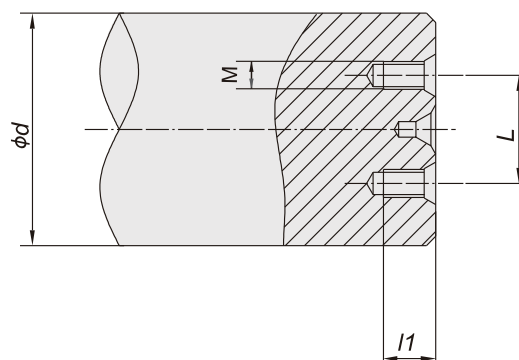
Size		HK4. . HS		HK4. . HH					
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12 Screw hole in shaft end

Type C screw central hole in shaft end

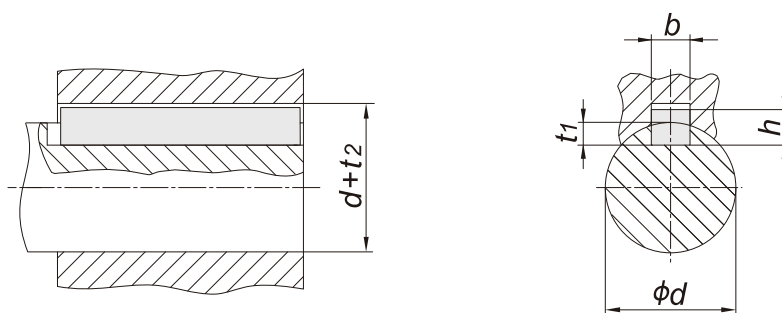


Double screw holes in shaft end



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

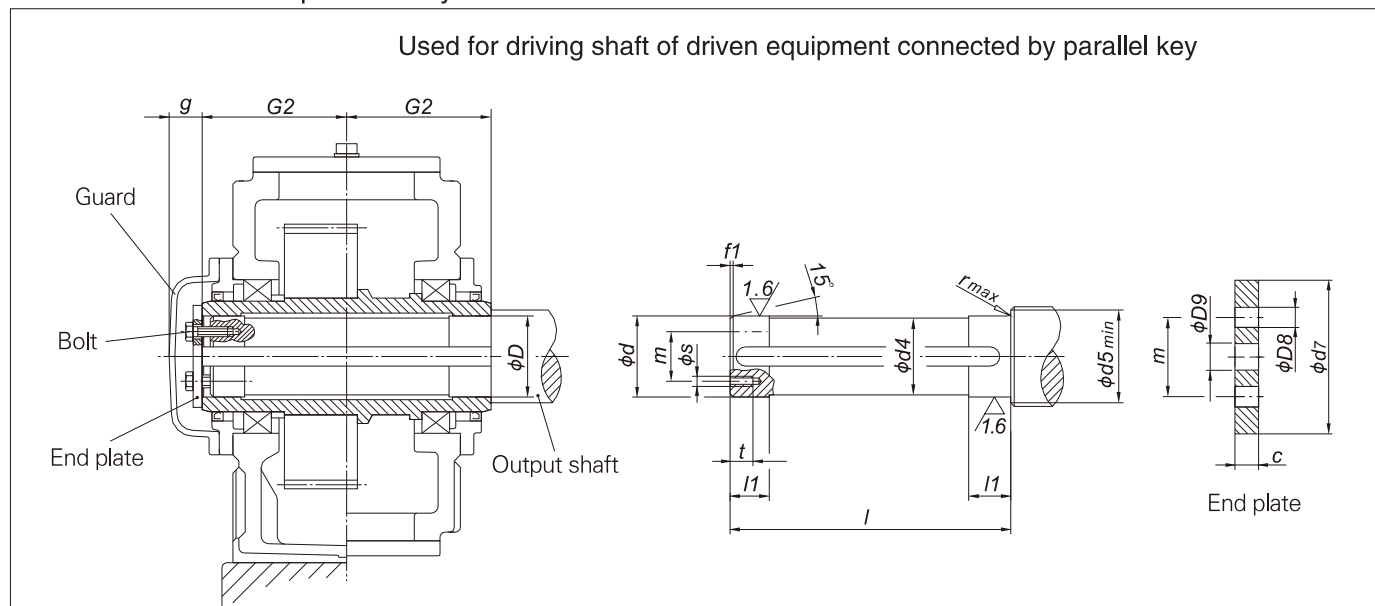
13 Parallel keys and keyway



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

14 Dimensions for recommended output connections

14.1 Hollow shaft with parallel keys



Type HK3H HK4H

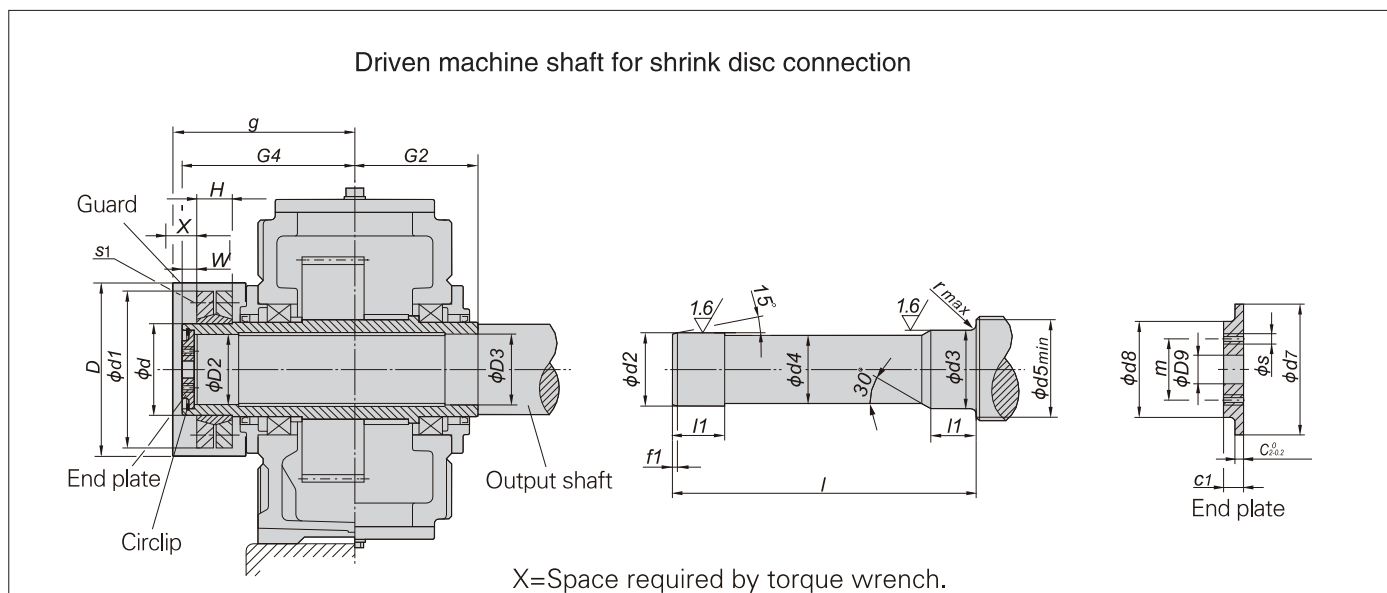
Size	Driven machine shaft									End plate					Bolt		Hollow shaft		
	d	d ₄	d ₅	f ₁	l	l ₁	r	s	t	c	D ₈	D ₉	d ₇	m	Size	Qty.	D	G ₂	g
05	95h6	94.5	105	5	328	40	1.6	M10	18	10	11	26	120	70	M10×25	2	95H7	165	40
06	105h6	104.5	116	5	328	45	1.6	M10	18	10	11	26	120	70	M10×25	2	105H7	165	40
07	115h6	114.5	126	5	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

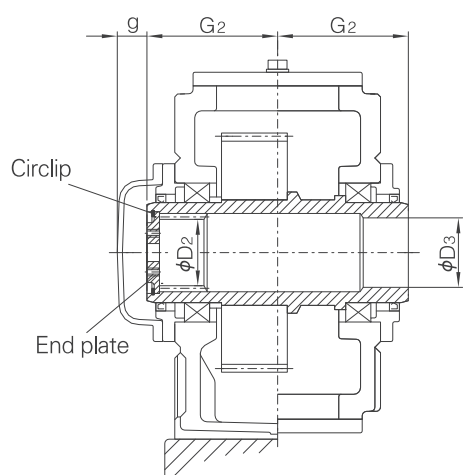


Type HK3D HK4D

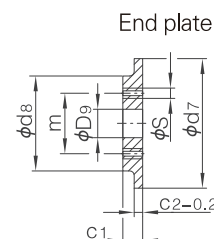
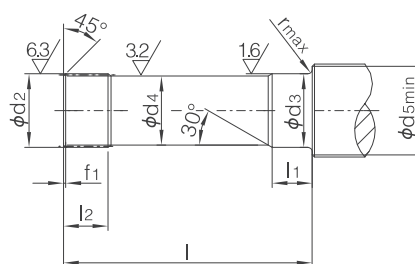
Size	Driven machine shaft ²⁾								End plate								Circlip	Hollow shaft				Shrink disk ¹⁾					Bolt		Guard	
	d2	d3	d4	d5	f1	l	l1	r	c1	c2	d7	d8	D9	m	s	Qty.		D2	D3	G2	G4	Type	d	d1	H	W	S1	D	g	
05	100g6	100h6	99.5	114	5	383	53	2	20	8	105	80	26	55	M10	2	105	100H7	100	165	240	SP2-125	125	215	53	20	M12	275	255	
06	110g6	110h6	109.5	124	5	383	58	3	20	8	115	85	26	60	M10	2	115	110H7	110	165	240	SP2-140	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	SP2-155	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	SP2-165	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	SP2-175	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	SP2-200	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	SP2-220	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	SP2-240	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	SP2-260	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	SP2-280	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	SP2-300	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	SP2-320	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	SP2-340	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	SP2-360	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.



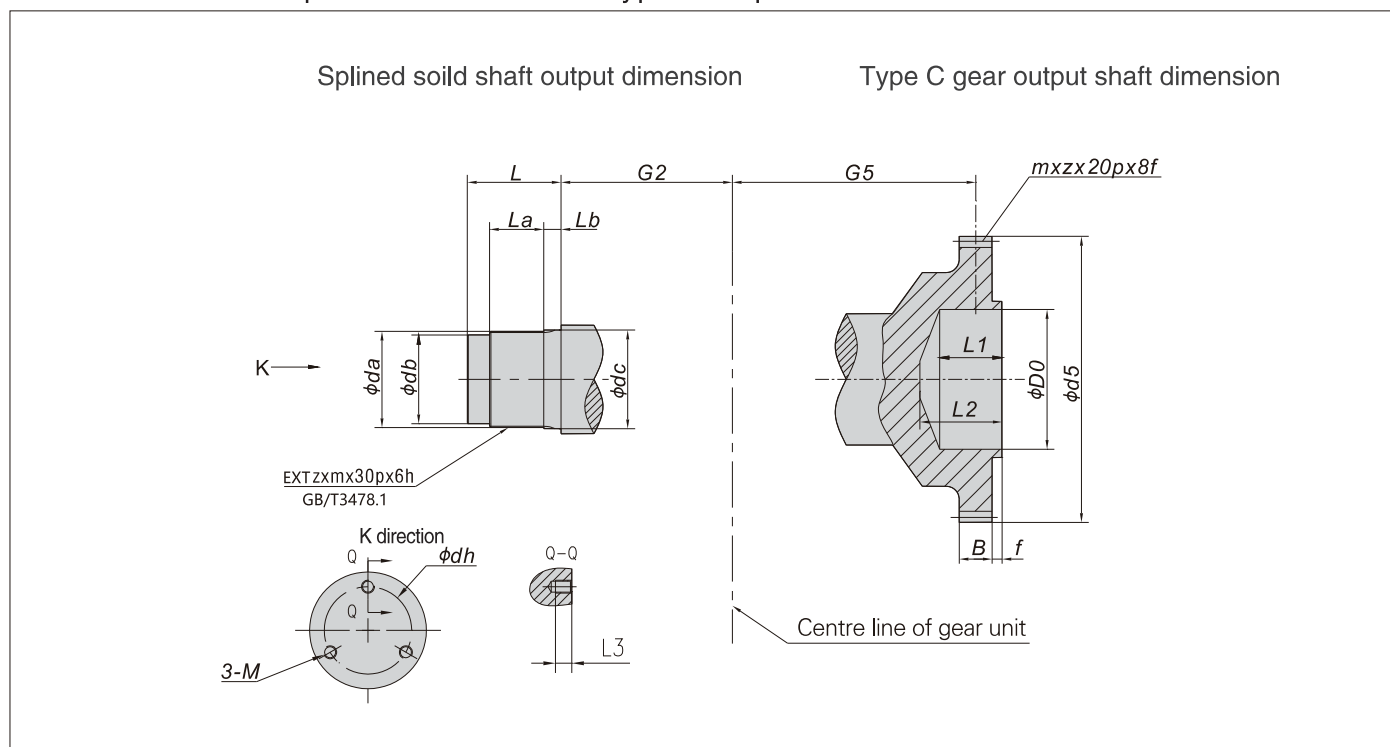
Driven machine shaft with DS center hole machined acc. to DIN 332.

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.

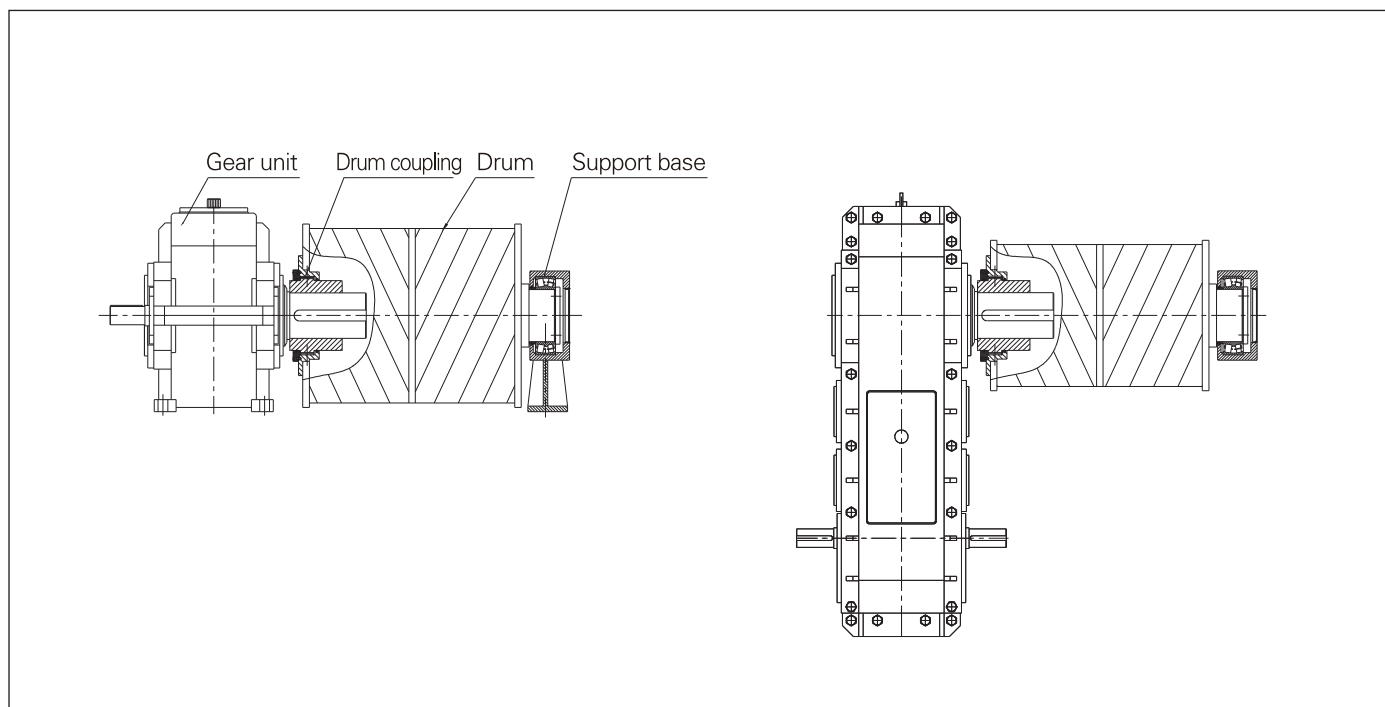
14.4 Dimensions of splined solid shaft and type C output shaft



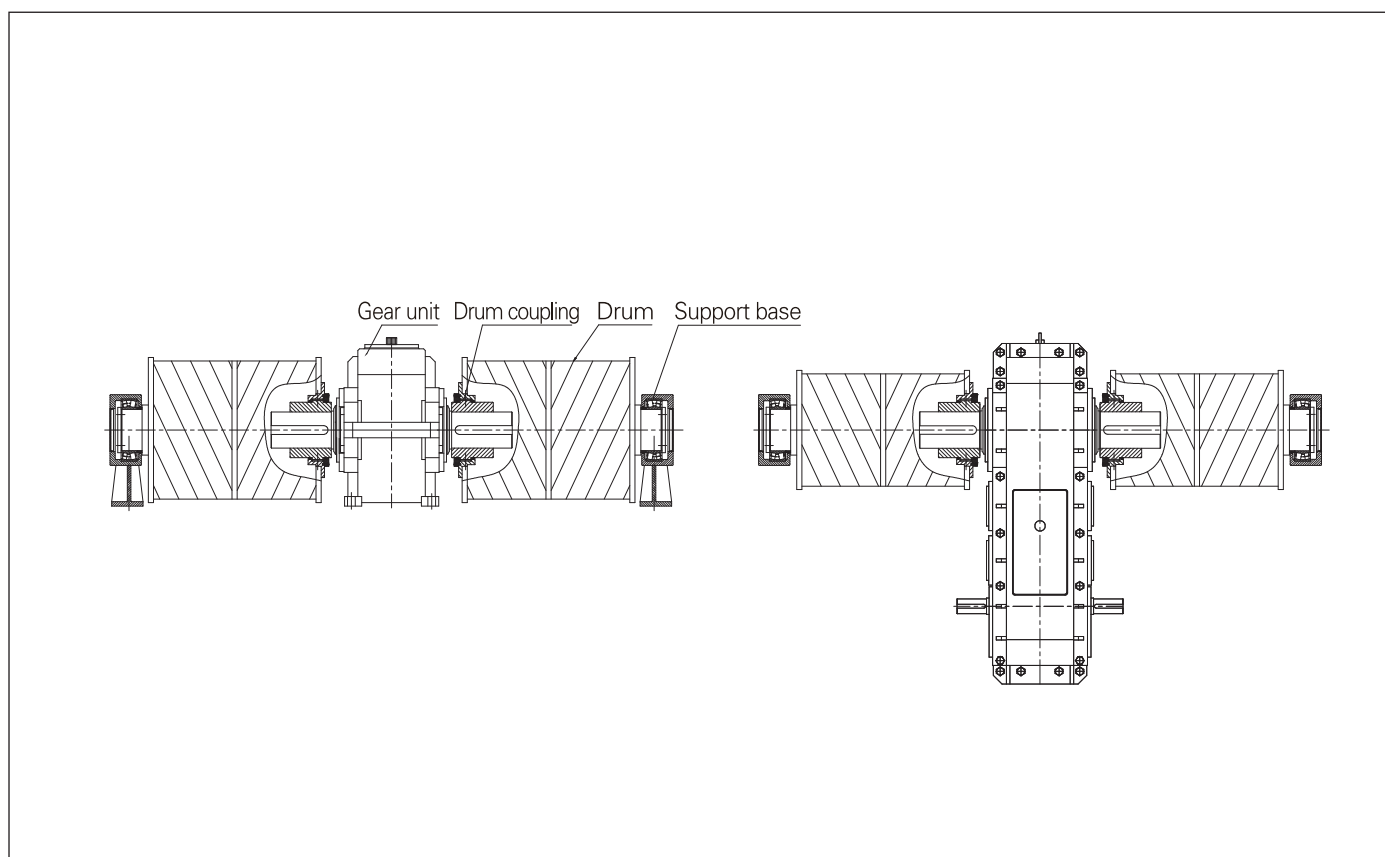
Splined solid shaft output dimension												Type C gear output shaft dimension								
Size	G ₂	z×m	d _a	d _b	d _c	d _h	L	L _a	L _b	M	L ₃	m×z	d ₅	D ₀	L ₁	L ₂	B	f	G ₅	
05	165	18×5	95h6	80h6	100	50	125	55	35	M10	17	4×56	232h11	120H7	50	75	35	14	271	
06	165	22×5	115h6	100h6	120	70	135	60	40	M12	20	4×56	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 :

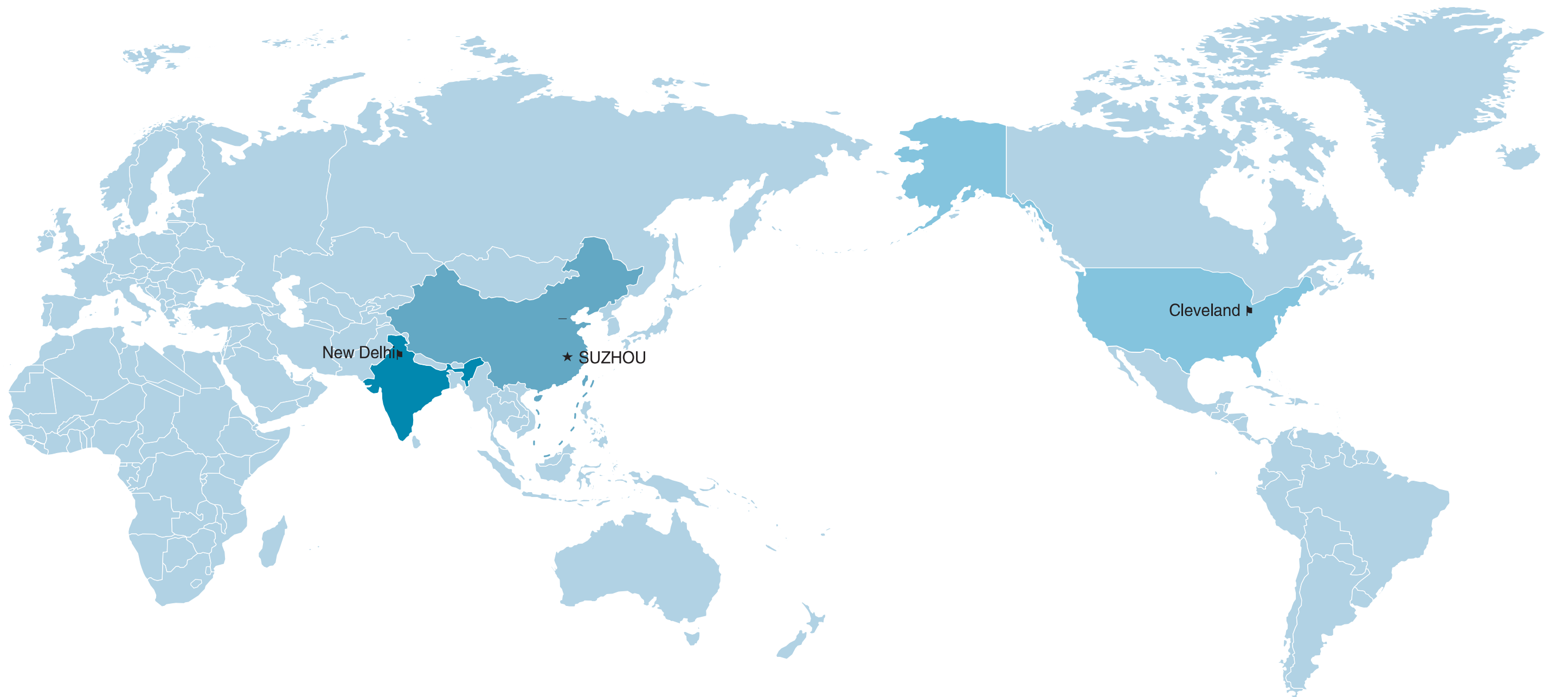
VG320 (Accessory codeUV32)

VG460 (Accessory codeUV46)

Ambient temperature °C	-20 °C ~+40 °C	+30 °C ~+50 °C
Viscosity brand number	VG320	VG460

-  Note: 1.Viscosity brand number in the above table is ISO-VG viscosity under 40°C.
 2.Synthetic oil must be used when ambient temperature is lower than -10°C.
 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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