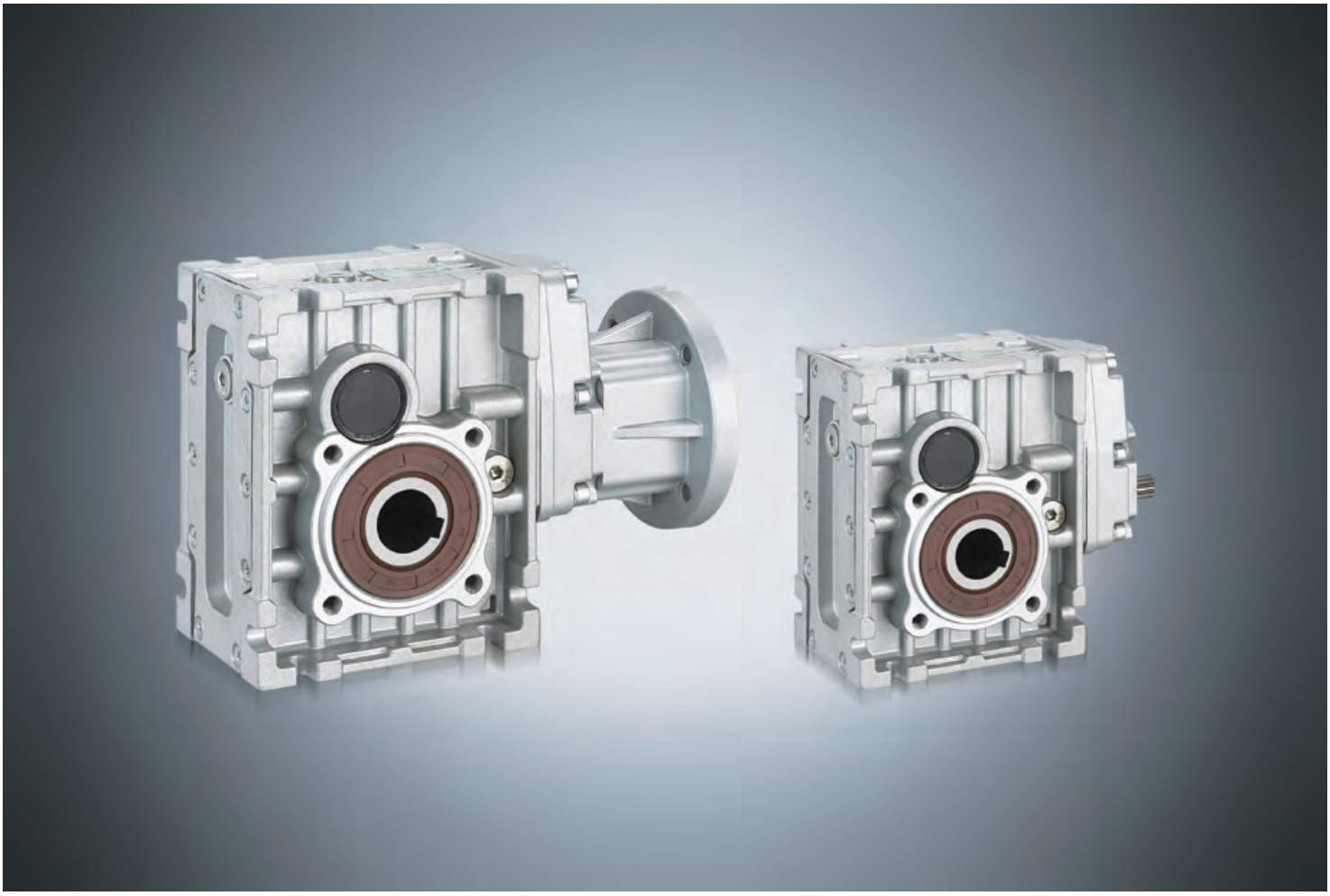
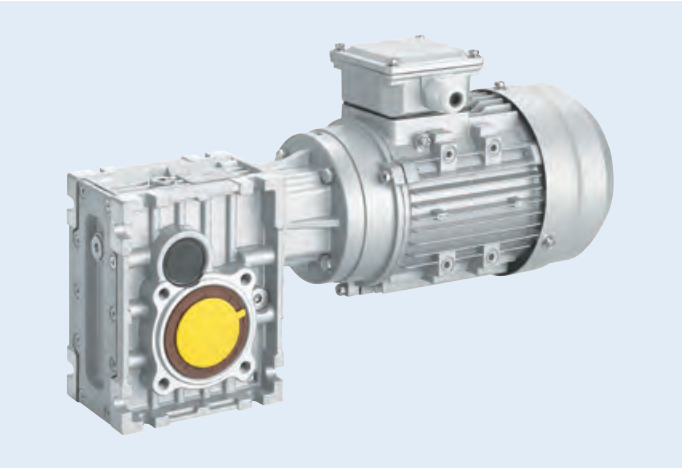


TKM Series Helical-Hypoid Gear Units

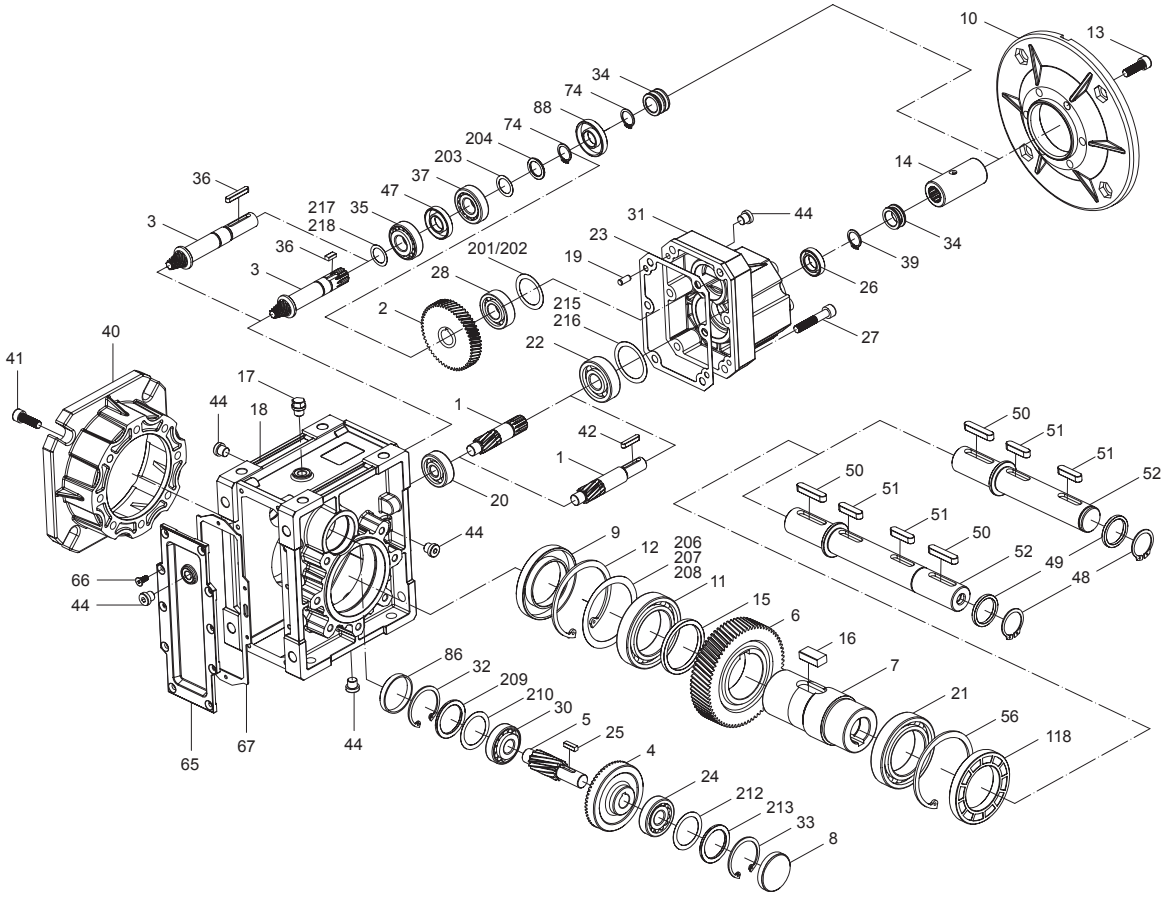
Mach Motion Products

Mach Motion Products



TKM Series Helical-Hypoid Gear Units

1. Basic Structure



Number	Parts
1	Pinion
2	Gear
3	Pinion Shaft
4	Gear
5	Pinion Shaft
6	Gear
7	Hollow Shaft
8	Closing Cap
9	Oil Seal
10	Input Flange
11	Bearing
12	Hole Circlip
13	Inner Hex Screw
14	Input Shaft
15	Spacer
16	Key
17	Breather Valve
18	Gear Case
19	Dowel Pin
20	Bearing
21	Bearing
22	Bearing
23	Housing Gasket
24	Bearing

Number	Parts
25	Key
26	Oil Seal
27	Inner Hex Screw
28	Bearing
30	Bearing
31	3 Stage
32	Hole-circlip
33	Hole-circlip
34	Rubber Boot
35	Bearing
36	Key
37	Bearing
39	Shaft-circlip
40	Output Flange
41	Inner Hex Screw
42	Key
44	Oil Plug
47	Oil Seal
48	Shaft-circlip
49	Gasket
50	Key
51	Key
52	Double Output Shaft
53	Single Output Shaft

Number	Parts
56	Hole-circlip
65	Gearcase Cover
66	Hexagon Sunk Screw
67	Rubber Gasket
74	Shaft-circlip
86	Closing Cap
88	Washer
118	Oil Seal
201	Shim Ring
202	Shim Ring
203	Shim Ring
204	Shim Ring
206	Shim Ring
207	Shim Ring
208	Shim Ring
209	Shim Ring
210	Shim Ring
212	Shim Ring
213	Shim Ring
215	Shim Ring
216	Shim Ring
217	Shim Ring
218	Shim Ring

2. Summary

2.1 Product Characteristics

TKM series helical-hypoid gear units is a new-generation of product developed by our company, with a compromise of advanced technology both at home and abroad, its main features are as follows:

- Driven by hypoid gear, has big ratios.
- Large in output torque, high efficiency, energy saving and environmental protection.
- Made of high quality aluminum alloy, light in weight and non rusting.
- Smooth in running and low in noise, can work long time in dreadful conditions.
- Good looking in appearance, durable in service life and small in volume.
- Suitable for all round installation, wide application and easy of use.
- The mounting dimensions of the TKM series are compatible with TNRV050 dimensions, but will not fit the TKM050 with TNRV series worm gear unit.
- Modules and multi structure can meet the demands of various conditions.

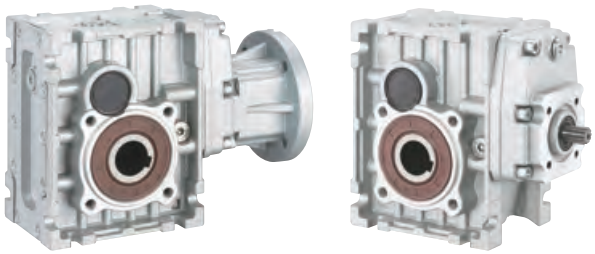
2.2 Main Materials

- Housing: die-cast aluminum alloy (frame size: 28 to 58);
- Gear wheel: 20CrMnTi. Carbonize & quencher heat treatment make the hardness of gera's surface up to 56-62 HRC, retain carburization layer's thickness between 0.5 and 0.8mm after precise grinding.

2.3 Surface Painting

Aluminum alloy housing:

- Shot blasting and special antiseptic treatment on the aluminum alloy surface.
- After phosphating, thermosetting plastic powder spray.



3. Model Information

TKM	050	B	-	300	-	FA1	SS1	-	71B5	B3	-	6IK or 0.75KW-4	/	1
(1)	(2)	(3)		(4)		(5)	(6)		(7)	(8)		(9)		(10)

Number	Model Information
(1)	Code for gear units series: TKM
(2)	Specification code of gear units: 050, 063, 075, 090
(3)	B: Means 2 stages C: Means 3 stages
(4)	Speed ratio of reducer
(5)	1) No mark means without output flange 2) FA, FB, FC, FD, FE (1/2) output flange and position
(6)	1) No mark means hole output 2) SS(1/2): Single output shaft and position 3) DS: Double output shaft
(7)	1) Input flange code (63B5, 71B5.....) 2) HS: Double output input
(8)	Installation position code (B3, B6, B7, B8, V5, V6)
(9)	1) No mark means without motor 2) Model motor (poles of power)
(10)	Position diagram for motor terminal box default position 1

4. Relevant Parameters

4.1 Power (P)

$$P_1 = \frac{P_2}{\eta} \text{ [kW]}$$

$$P_{1n} \geq P_1 \cdot fs \text{ [kW]}$$

P_1 Input power
P_2 Output power
P_{1n} Rated power driving motor
fs Service factor
η Transmission efficien

The efficiency of TKM gear units varies with the number of gear stages, between 94% (2-stage), 92% (3-stage).

4.2 Rotation Speed (n)

n_1 Gear units input speed
n_2 Gear units output speed

If driven by the external gearing, 1400r/min or lower rotation speed is suggested so as to optimize the working conditions and prolong the service life.

Higher input rotation speed is permitted, but in this situation, the rated torque M_2 will be reduced.

4.3 Transmission Ratio (i)

$$i = \frac{n_1}{n_2}$$

Usually transmission ratio is decimal fraction with 2 radix point tagged in selection tables.

4.4 Torque (M)

$$M_2 = \frac{9550 \cdot P_1 \cdot \eta}{n_2} \text{ [Nm]}$$

$$M_{2n} \geq M_2 \cdot fs \text{ [Nm]}$$

M_2 Output torque
M_{2n} Selected output torque
P_1 Input power
η Transmission efficiency
fs Service factor

4.5 Service Factor (fs)

The effect of the driven machine on the gear unit is taken into account to a sufficient level of accuracy using the service factor fs. The service factor is determined according to the daily operating time and the starting frequency Z.

Three load classifications are considered depending on the mass acceleration factor. You can read off the service factor applicable to your application in following figure. The service factor selected using this diagram must be less than or equal to the service factor as given in the performance parameter table.

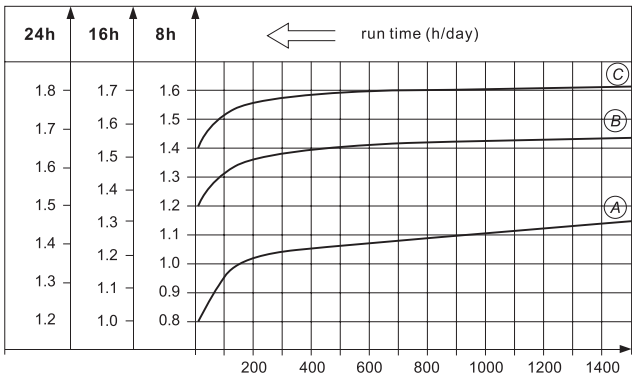


Fig: Service factor (fs) Start up frequency Z (1/h)#

Starting frequency Z: The cycles include all starting and braking procedures as well as change overs from low to high speed.

4.5.1 Load Classifications

A. Uniform, permitted mass acceleration factor fa ≤ 0.2
B. Moderate shock load, permitted mass acceleration factor fa ≤ 3
C. Heavy shock load, permitted mass acceleration factor fa ≤ 10

Load classifications:

• Screw feeders for light materials, fans, assembly lines, conveyor belts for light materials, small mixers, lifts, cleaning machines, fillers, control machines.

• Winding devices, woodworking machine feeders, goods lifts, balancers, threading machines, medium mixers, conveyor belts for heavy materials, winches, sliding doors, fertilize scrapers, packing machines, concrete mixers, crane mechanisms, milling cutters, folding machines, gear pumps.

• Mixers for heavy materials, shears, presses, centrifuges, rotating supports, winches and lifts for heavy materials, grinding lathes, stone mills, bucket elevators, drilling machines, hammer mills, cam presses, folding machines, turntables, tumbing barrels, vibrators, shredders.

4.5.2 Mass Acceleration Factor

The mass acceleration factor is calculated as follows:

$$f_a = \frac{J_c}{J_m}$$

f_a Mass acceleration factor

J_c All external mass moments of inertia (kgm^2)

J_m Mass moment of inertia on the motor end (kgm^2)

If mass acceleration factors fa>10, please call our Technical Service.

To keep the service life of gear units, the use factor fs selected from the catalogue must be equal or slightly higher than the calculated use factor fs.

Example:

Mass acceleration factor 2.5 (load classification B), 14 hours/day operating time (read off at 16h/d) and 200 cycles/hour result in a service factor fs = 1.48. choose the service factor fs ≥ 1.48 according to the parameter sheet.

4.6 Overhung loads and axial forces

When determining the resulting radial loads, the type of transmission elements, mounted on the shaft end must be considered. Various transmission elements are corresponding with following transmission element factors fz:

Transmission Element	Transmission Element Factor Fz	Comments
Gears	1.15	<17 teeth
Chain sprockets	1.25	<20 teeth
Chain sprockets	1.40	<13 teeth
Narrow V-belt pulleys	1.75	Influence of the tensile force
Flat belt pulleys	2.50	Influence of the tensile force
Toothed belt pulleys	2.50	Influence of the tensile force

The overhung loads exerted on the motor or gear shaft is then calculated as follows:

$$Fr = \frac{M \cdot 2000 \cdot fz}{d_0} \text{ [N]}$$

Fr Resulting radial load [N]

M Torque on the shafts [Nm]

do Mean diameter of the mounted transmission element in [mm]

fz Transmission element factor

The basis for determining the permitted radial loads is the computation of the rated service life L_{10h} of the bearings (according to ISO281). For special operating conditions, the permitted radial loads can be determined with regard to the modified service life L_{na}.

The permitted radial loads given in the selection tables must be calculated using the following formula in the event of force application not in the center of the shaft end. The smaller of the two values F_{XL} (according to bearing service life).

According to bearing service life:

$$F_{XL} = F_{r(1,2)} \cdot \frac{a}{b+x} \text{ [N]}$$

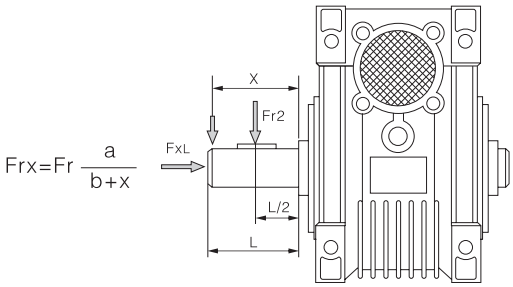
F_{r1}, F_{r2} = Permitted overhung load (x=L/2) for foot-mounted gear units according to he selection tables in [N]

X = Distance from the shaft shoulder to the force application point in [mm]

a, b, = Gear unit constant for overhung load conversion [mm]

Output shafts radial loads

Fa2 = Output axial loads



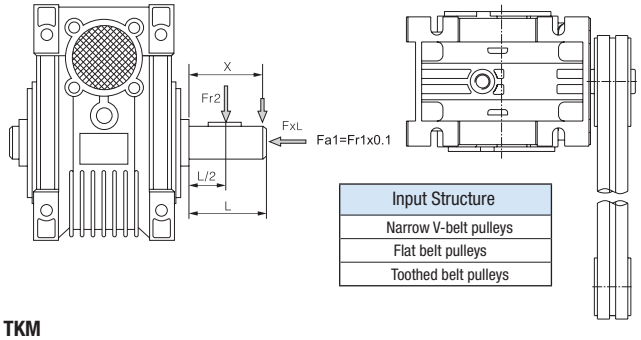
TKM
Gear unit constants for overhung load conversion:

Item	TKM050B	TKM050C	TKM063B	TKM063C	TKM075B	TKM075C	TKM090B	TKM090C
a	104	104	118	118	131	131	159	159
b	78	78	93	93	101	101	119	119

Input shafts radial loads

Fa1 = Input axial loads

CAUTION: Do not use the input on the right chart (including 3 stage input)!



TKM
Gear unit constants for overhung load conversion:

Item	TKM050B	TKM050C	TKM063B	TKM063C	TKM075B	TKM075C	TKM090B	TKM090C
a	51.5	56	58	56	73	70	81	70
b	40	44.5	43	44.5	53	55	61	55

4.7 Selection Table Key / Comments

Combination with the motor in the header row is possible

Combination with the motor in the header row is not possible

* Finite gear unit reduction ratio

P_{1n} Rated power driving motor [kW]

n_2 Output speed [r/min]

M_{2n} Output torque [Nm]

page Dimension sheet page number

M_{2max} Max. permissible output torque [Nm]

F_{r2} Permissible overhung load output side [N]

i Gear unit nominal ratio

i_a Gear unit actual ratio

fs Service factor

Gear unit type

Motor type

5. Selection Example

5.1 Gear Motor

Example: Required power 0.25kW on driven machine, work for 8h/day, moderate shock load, start up frequency 100(1/h), n_2=35r/min, B3 mounted

So:

Check the service factor table on page 6, choose fs=1.3

$$i = \frac{n_1}{n_2} = \frac{1400}{35} = 40$$

$$P_{1n} \geq P_1 \cdot fs = \frac{P_2}{\eta} \cdot fs = \frac{0.25}{0.94} \times 1.3 = 0.345 \text{ [kW]}$$

5.2 Gear Units

Example: Required torque 200Nrn on driven machine, work for 8h/day, uniform load, start up frequency 400(1/h), FA1 mounted, n_1=900 r/min, n_2=2.5 r/min

So:

Checking the table, stage 3 is the correct selection.

Check the service factor table on page 6, choose fs=1.05

$$i = \frac{n_1}{n_2} = \frac{900}{6} = 150$$

$$M_{2n} \geq M_2 \cdot fs = 200 \times 1.05 = 210 \text{ [Nm]}$$

$$P_{1n} \geq P_1 \cdot fs = \frac{M_2 \cdot n_1}{9550 \cdot \eta \cdot i} \cdot fs = \frac{210 \times 900}{9550 \times 0.92 \times 150} \times 1.05 = 0.151 \text{ [kW]}$$

TKM050B - 40.09 - 7185 - 7124 - B3

TKM075C - 151.20 - FA1

6. Gear Unit Selection Tables

6.1 Possible Geometrical Combinations

TKM050.... n_1=1400r/min **Maximum Allowable Load 130Nm**

Gear Unit	i Nominal	i Actual	n_2 [r/min]	M_{2max} [Nm]	F_{r2} [N]	63B5	71B5 71B14	80B5 80B14	90B5 90B14
3 Stage									
TKM050C	300	283.14	4.8	110	4100				
TKM050C	250	239.8	5.8	130	4100				
TKM050C	200	196.7	7	130	4100				
TKM050C	150	144	9.6	130	4000				
TKM050C	120	118	12	130	3770				
TKM050C	100	99.2	14	130	3560				
TKM050C	75	73.2	19	130	3220				
TKM050C	60	67.22	23	120	3030				
TKM050C	50	51.4	27	110	2860				
2 Stage									
TKM050B	60	57.67	24	110	2960				
TKM050B	50	48.85	29	130	2790				
TKM050B	40	40.08	35	130	2610				
TKM050B	30	29.33	48	130	2350				
TKM050B	25	24.06	59	130	2200				
TKM050B	20	20.20	70	130	2080				
TKM050B	15	14.92	94	130	1880				
TKM050B	12.5	12.47	113	130	1770				
TKM050B	10	10.47	134	130	1670				
TKM050B	7.5	7.73	182	100	1510				

TKM063.... n_1=1400r/min **Maximum Allowable Load 200Nm**

Gear Unit	i Nominal	i Actual	n_2 [r/min]	M_{2max} [Nm]	F_{r2} [N]	63B5	71B5 71B14	80B5 80B14	90B5 90B14
3 Stage									
TKM063C	300	289	4.7	170	4800				
TKM063C	250	230	5.8	200	4800				
TKM063C	200	200	7.2	200	4800				
TKM063C	150	157	9.3	200	4650				
TKM063C	125	124.9	12	200	4330				
TKM063C	100	97.7	14	200	4070				
TKM063C	75	71.5	20	160	3650				
TKM063C	60	64.7	23	140	3480				
TKM063C	50	50.65	27	120	3270				
2 Stage									
TKM063B	60	63.83	24	170	3430				
TKM063B	50	50.28	29	200	3190				
TKM063B	40	40.15	36	200	2940				
TKM063B	30	31.42	47	200	2720				
TKM063B	25	24.98	58	200	2530				
TKM063B	20	19.5	70	200	2380				
TKM063B	15	14.3	96	190	2130				
TKM063B	12.5	12.94	111	165	2030				
TKM063B	10	10.13	134	135	1910				
TKM063B	7.5	7.41	185	100	1710				

TKM075.... n_1=1400r/min **Allowed Maximum Load 350 Nm**

Gear Unit	i Nominal	i Actual	n_2 [r/min]	M_{2max} [Nm]	F_{r2} [N]	63B5	71B5	80B5 80B14	90B5 90B14	100B5 100B14	112B5 112B14
3 Stage											
TKM075C	300	291.3	4.8	350	6500						
TKM075C	250	254	5.9	350	6500						
TKM075C	200	194.5	7.0	350	6500						
TKM075C	150	148.5	9.3	350	6500						
TKM075C	120	127	12	350	5980						
TKM075C	100	97.5	15	350	5520						
TKM075C	75	76	19	350	5040						
TKM075C	60	60	23	350	4730						
TKM075C	50	47	29	350	4370						
2 Stage											
TKM075B	60	57	24	350	4660						
TKM075B	50	49.76	30	350	4340						
TKM075B	40	38	35	350	4080						
TKM075B	30	29.6	47	350	3720						
TKM075B	25	25.78	56	350	3500						
TKM075B	20	19.09	71	350	3230						
TKM075B	15	14.87	93	350	2950						
TKM075B	12.5	11.8	113	350	2770						
TKM075B	10	9.21	143	350	2550						
TKM075B	7.5	8	188	280	2330						

TKM090.... n_1=1400r/min **Allowed Maximum Load 500 Nm**

Gear Unit	i Nominal	i Actual	n_2 [r/min]	M_{2max} [Nm]	F_{r2} [N]	63B5	71B5	80B5 80B14	90B5 90B14	100B5 100B14	112B5 112B14
3 Stage											
TKM090C	300	300.5	4.8	460	8300						
TKM090C	250	266.3	5.9	500	8300						
TKM090C	200	203.14	7.0	500	8300						
TKM090C	150	158.09	9.3	500	8050						
TKM090C	125	128.65	12	500	7580						
TKM090C	100	99.74	12	500	7000						
TKM090C	75	80.3	19	500	6390						
TKM090C	60	63.3	23	450	6000						
TKM090C	50	49.4	29	350	5540						
2 Stage											
TKM090B	60	58.8	24	460	5890						
TKM090B	50	52.1	30	500	5500						
TKM090B	40	39.8	35	500	5170						
TKM090B	30	31.09	47	500	4710						
TKM090B	25	25.05	56	500	4430						
TKM090B	20	19.51	71	500	4090						
TKM090B	15	15.7	93	500	3730						
TKM090B	12.5	12.38	113	460	3510						
TKM090B	10	9.67	143	360	3240						
TKM090B	7.5	7.79	188	280	2950						

6.2 TKM Performance Parameters

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i Nominal	i Actual	F_{r2} [N]	fs			Page
	5.7	184	250	239.8	4100	0.7	TKM050C	63B5	28
	7.0	151	200	196.7	4100	0.9			
	9.5	110	150	144	4000	1.2			
	11.6	91	120	118	3770	1.4			
	13.9	76	100	99.2	3580	1.7			
	18.8	56	75	73.2	3220	2.3			
	22.5	47	60	61.22	3030	2.6			
	26.7	39	50	51.4	2860	2.8			
	24.0	45	60	57.67	2960	2.4	TKM050B	63B5	28
	28.7	38	50	48.85	2790	3.5			
	35	31	40	40.08	2610	4.2			
	48	23	30	29.33	2350	5.8			
	58	18.5	25	24.06	2200	7.0			
	69	15.6	20	20.20	2080	8.4			
	94	11.5	15	14.92	1880	11.3			
	112	9.6	12.5	12.47	1770	13.5			
	134	8.1	10	10.47	1670	16.1			
	181	5.9	8	7.73	1510	16.8			
	5.7	183	250	230	4800	1.1	TKM063C	63B5	29
0.12	7.1	148	200	200	4800	1.4			
	9.2	114	150	157	4650	1.8			
	11.5	92	125	124.9	4330	2.2			
	13.8	76	100	97.7	4070	2.6			
	19.1	55	75	71.5	3650	2.9			
	22.1	48	60	64.7	3480	2.9			
	26.7	40	50	50.65	3270	3.0			
	23.1	47	60	63.83	3430	3.7	TKM063B	63B5	29
	28.7	37	50	50.28	3190	5.3			
	36	30	40	40.15	2970	6.6			
	46	23	30	31.42	2720	8.6			
	4.7	224	300	291.3	6500	1.6	TKM075C	63B5	30
	5.8	181	250	254	6500	1.9			
	7.0	151	200	194.5	6500	2.3			
	9.3	114	150	148.5	6500	3.1			
	11.1	95	125	127	5980	3.7			
	4.7	222	300	295.18	8300	2.1	TKM090C	63B5	31
	5.8	181	250	240.89	8300	2.8			
	7.0	151	200	200.66	8300	3.3			
	9.0	114	150	151.20	8050	4.4			
	9.6	165	300	283.14	4000	0.7	TKM050C	63B5	28
	11.5	138	250	239.8	3790	0.9			
0.18	14.0	113	200	196.7	3550	1.1			
	19.1	83	150	144	3200	1.6			
	23.3	68	125	118	2990	1.9			
	27.7	57	100	99.2	2820	2.3			

TKM Performance Parameters

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i Nominal	i Actual	F_{r2} [N]	fs			Page
	38	42	75	73.2	2550	3.1	TKM050C	63B5	28
	45	35	60	61.22	2400	3.4			
	53	30	50	51.40	2270	3.7			
	48	34	60	57.67	2350	3.3	TKM050B	63B5	28
	57	28	50	48.85	2220	4.6			
	70	23	40	40.08	2070	5.6			
	95	16.9	30	29.33	1870	7.7			
	116	13.9	20	24.06	1750	9.4			
	11.6	136	120	118	3770	1.0	TKM050C	63B5	28
	13.9	114	100	99.2	3560	1.1			
	18.8	84	75	73.2	3220	1.5			
	22.5	70	60	61.22	3030	1.7			
	26.7	59	50	51.40	2860	1.9			
	24.0	67	60	57.67	2960	1.6	TKM050B	63B5	28
	28.7	56	50	48.85	2790	2.3			
	35	46	40	40.08	2610	2.8			
	48	34	30	29.33	2350	3.8			
	58	28	25	24.06	2200	4.7			
	69	23	20	20.20	2080	5.6			
	94	17.2	15	14.92	1880	7.5			
	112	14.4	13	12.47	1770	9.0			
	134	12.1	10	10.47	1670	10.8			
0.18	181	8.9	7.5	7.73	1510	11.2			
	12.1	131	75	74.62	3730	1.0	TKM050C	71B5/B14	28
	14.4	110	60	61.22	3510	1.1			
	17.2	92	50	51.40	3310	1.2			
	15.4	105	60	57.67	3430	1.0	TKM050B	71B5/B14	28
	18.4	88	50	48.85	3240	1.5			
	22.4	72	40	40.08	3030	1.8			
	31	53	30	29.33	2730	2.5			
	37	43	25	24.06	2550	3.0			
	45	36	20	20.20	2410	3.6			
	60	27	15	14.92	2180	4.9			
	72	22	12	12.47	2050	5.8			
	9.3	171	300	289	4650	1.0	TKM063C	63B5	29
	11.5	138	250	230	4330	1.5			
	14.3	111	200	200	4030	1.8			
	18.5	86	150	157	3690	2.3			
	22.9	89	125	124.9	3440	2.9			
	27.6	57	100	97.7	3230	3.5			
	38	41	75	71.5	2900	3.9			
	44	36	60	64.7	2760	3.9			
	53	30	50	50.65	2590	4.0			
	7.1	222	200	200	4800	0.9	TKM063C	63B5	29
	9.2	171	150	157	4650	1.2			

TKM Performance Parameters

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i Nominal	i Actual	F_{r2} [N]	fs			Page
	11.5	138	125	124.9	4330	1.4	TKM063C	63B5	29
	13.8	114	100	97.7	4070	1.7			
	19.1	83	75	71.5	3650	1.9			
	22.1	72	60	64.7	3480	2.0			
	26.7	59	50	50.28	3270	2.0	TKM063B	63B5	29
	23.1	70	60	63.83	3430	2.4			
	28.7	56	50	50.28	3190	3.6			
	36.0	45	40	40.15	2970	4.4			
	7.4	215	125	124.9	4800	0.9	TKM063C	71B5/B14	29
	8.9	178	100	97.7	4720	1.1			
	12.3	129	75	71.5	4230	1.2			
	14.2	111	60	64.7	4030	1.3			
	17.1	92	50	50.65	3790	1.3			
	14.9	109	60	63.83	3970	1.6	TKM063B	71B5/B14	29
	18.5	87	50	50.28	3690	2.3			
	22.9	71	40	40.15	3440	2.8			
	29.7	54	30	31.42	3150	3.7			
	9.4	168	300	291.3	6320	2.1	TKM075C	63B5	30
	11.6	136	250	254	5890	2.6			
	14.0	113	200	194.5	5540	3.1			
	18.5	85	150	148.5	5040	3.1			
	4.7	336	300	291.3	6500	1.0	TKM075C	63B5	30
0.18	5.8	272	250	254	6500	1.3			
	7.0	227	200	194.5	6500	1.5			
	9.3	171	150	148.5	6500	2.0			
	11.1	142	120	127	5980	2.5			
	14.1	112	100	97.5	5520	3.1			
	18.6	85	75	76	5040	4.1			
	4.5	353	200	194.5	6500	1.0	TKM075C	71B5	30
	6.0	266	150	148.5	6500	1.3			
	7.1	221	120	127	6500	1.6			
	9.1	174	100	97.5	6400	2.0			
	11.9	133	75	76	5840	2.6			
	14.4	110	60	60	5480	3.2			
	18.3	86	50	47	5060	4.1			
	15.1	107	60	57	5390	3.3	TKM075B	71B5	30
	18.7	87	50	49.76	5030	4.0			
	9.5	167	300	295.18	7990	2.8	TKM090C	63B5	31
	11.6	136	250	240.89	7470	3.7			
	4.7	333	300	295.18	8300	1.4	TKM090C	63B5	31
	5.8	272	250	240.89	8300	1.8			
	7.0	227	200	200.66	8300	2.2			
	9.3	171	150	151.20	8050	2.9			
	11.1	142	125	125.95	7580	3.5			
	3.7	423	250	240.89	8300	1.2	TKM090C	71B5	31

TKM Performance Parameters

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i Nominal	i Actual	F_{r2} [N]	fs			Page
0.18	4.5	353	200	200.66	8300	1.4	TKM090C	71B5	31
	6.0	266	150	151.20	8300	1.9			
	7.1	221	125	125.95	8300	2.3			
	9.1	174	100	99.22	8110	2.9			
	11.9	133	75	75.45	7400	3.8			
	14.4	110	60	62.43	6950	4.1			
0.25	19.1	115	150	144	3200	1.1	TKM050C	63B5	28
	23.3	94	120	118	2990	1.4			
	27.7	79	100	99.2	2820	1.6			
	38	59	75	73.2	2550	2.2			
	45	49	60	61.22	2400	2.5			
	53	41	50	51.40	2270	2.7			
	48	47	60	57.67	2350	2.4	TKM050B	63B5	28
	57	39	50	48.85	2220	3.3			
	70	32	40	40.08	2070	4.0			
	18.8	117	75	73.2	3220	1.1	TKM050C	71B5/B14	28
	22.5	98	60	61.22	3030	1.2			
	26.7	82	50	51.40	2860	1.3			
	24	94	60	57.67	2960	1.2	TKM050B	71B5/B14	28
	28.7	78	50	48.85	2790	1.7			
	35	64	40	40.08	2610	2.0			
	48	47	30	29.33	2350	2.8			
	58	39	25	24.06	2200	3.4			
	69	32	20	20.20	2080	4.0			
	94	24	15	14.92	1880	5.4			
	18.4	122	50	48.85	3240	1.1	TKM050B	71B5/B14	28
	22.4	100	40	40.08	3030	1.3			
	31	73	30	29.33	2780	1.8			
	37	60	25	24.06	2550	2.2			
	45	50	20	20.20	2410	2.6			
	60	37	15	14.92	2180	3.5			
	72	31	13	12.47	2050	4.2			
	86	26	10	10.47	1930	5.0			
	116	19	8	7.73	1750	5.2			
	11.5	191	250	239.8	4330	1.0	TKM063C	63B5	29
	14.3	154	200	196.7	4030	1.3			
	18.5	119	150	144	3690	1.7			
	22.9	96	120	118	3440	2.1			
	27.6	79	100	99.2	3230	2.5			
	38	58	75	73.2	2900	2.8			
	44	50	60	61.22	2760	2.8			
	55	41	50	51.40	2590	2.9			
	11.5	192	120	118	4330	1.0	TKM063C	71B5/B14	29
	13.8	159	100	99.2	4070	1.3			
	19.1	115	75	73.2	3650	1.4			

TKM Performance Parameters

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i Nominal	i Actual	F_{r2} [N]	fs			Page
	22.1	99	60	61.22	3480	1.4	TKM063C	71B5/B14	29
	26.7	82	50	51.40	3270	1.5			
	23.1	97	60	57.67	3430	1.8	TKM063B	71B5/B14	29
	28.7	78	50	48.85	3190	2.6			
	36	63	40	40.08	2970	3.2			
	46	49	30	29.33	2720	4.1			
	12.3	179	75	73.2	4230	0.9	TKM063C	71B5/B14	29
	14.2	155	60	61.22	4030	0.9			
	17.1	128	50	51.40	3790	0.9			
	14.9	151	60	57.67	3970	1.1	TKM063B	71B5/B14	29
	18.5	121	50	48.85	3690	1.6			
	22.9	98	40	40.08	3440	2.0			
	29.7	76	30	29.33	3150	2.6			
	37	61	25	24.06	2930	3.3			
	44	50	20	20.20	2760	4.0			
	9.4	233	300	291.3	6320	1.5	TKM075C	63B5	30
	11.6	189	250	254	5890	1.9			
	14.0	157	200	194.5	5540	2.2			
	18.5	119	150	148.5	5040	3.0			
	22.2	99	125	127	4750	3.5			
	5.8	378	250	254	6500	0.9	TKM075C	71B5	30
	7.0	315	200	194.5	6500	1.1			
0.25	9.0	237	150	148.5	6500	1.5			
	11	198	120	127	5980	1.8			
	14	156	100	97.5	5520	2.2			
	19	118	75	76	5040	3.0			
	22.4	98	60	60	4730	3.6			
	6	369	150	148.5	6500	0.9	TKM075C	71B5	30
	7.1	307	125	127	6500	1.1			
	9.1	242	100	97.5	6400	1.4			
	11.9	184	75	76	5840	1.9			
	14	152	60	60	5480	2.3			
	18.3	120	50	47	5060	2.9			
	15.1	148	60	57	5390	2.4	TKM075B	71B5	30
	18.7	120	50	49.76	5030	2.9			
	22.4	100	40	38	4730	2.5			
	9.5	232	300	295.18	7990	2.0	TKM090C	63B5	31
	11.6	189	250	240.89	7470	2.6			
	14.0	157	200	200.66	7030	3.2			
	18.5	119	150	151.20	6390	4.2			
	4.7	463	300	295.18	8300	1.0	TKM090C	71B5	31
	5.8	378	250	240.89	8300	1.3			
	7.0	315	200	200.66	8300	1.6			
	9	237	150	151.20	8050	2.1			
	11	198	125	125.95	7580	2.5			

TKM Performance Parameters

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i Nominal	i Actual	F_{r2} [N]	fs			Page
0.25	14	156	100	99.22	7000	3.2	TKM090C	71B5	31
	18.6	118	75	75.45	6390	4.2			
	4.5	490	200	200.66	8300	1.0	TKM090C	71B5	31
	6.0	369	150	151.26	8300	1.4			
	7.1	307	125	125.95	8300	1.6			
	9.1	242	100	99.22	8110	2.1			
	11.9	184	75	75.45	7400	2.7			
	14.4	152	60	62.43	6950	3.0			
	18.3	120	50	49.18	6420	2.9			
	15.2	147	60	59.04	6820	3.1	TKM090B	71B5	31
	18.7	120	50	48.18	6370	4.2			
0.37	23.3	140	120	118	2990	0.9	TKM050C	71B5/B14	28
	27.7	117	100	99.2	2820	1.1			
	38	87	75	73.2	2550	1.5			
	45	72	60	61.22	2400	1.7			
	53	61	50	51.40	2270	1.8			
	48	69	60	57.67	2350	1.6	TKM050B	71B5/B14	28
	57	58	50	48.85	2220	2.2			
	70	48	40	40.08	2070	2.7			
	95	35	30	29.33	1870	3.7			
	28.7	116	50	48.85	2790	1.1	TKM050B	71B5/B14	28
	35	95	40	40.08	2610	1.4			
	48	70	30	29.33	2350	1.9			
	58	57	25	24.06	2200	2.3			
	69	48	20	20.20	2080	2.7			
	94	35	15	14.92	1880	3.7			
	112	30	13	12.47	1770	4.4			
	134	25	10	10.47	1670	5.2			
	181	18	7.5	7.73	1510	5.5			
	31	108	30	29.33	2730	1.2	TKM050B	80B5/B14	28
	37	89	25	24.06	2550	1.5			
	45	75	20	20.20	2410	1.7			
	60	55	15	14.92	2180	2.4			
	72	46	13	12.47	2050	2.8			
	86	39	10	10.47	1930	3.4			
	116	29	7.5	7.73	1750	3.5			
	14.3	228	200	200	4030	0.8	TKM063C	71B5/B14	29
	18.5	176	150	157	3690	1.1			
	22.9	142	125	124.9	3440	1.4			
	27.6	118	100	99.7	3230	1.7			
	38	85	75	71.5	2900	1.9			
	44	74	60	64.7	2760	1.9			
	53	61	50	50.65	2590	2.0			
	46	72	60	63.83	2720	2.4	TKM063B	71B5/B14	29
	57	58	50	50.28	2530	3.5			

TKM Performance Parameters

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i Nominal	i Actual	F_{r2} [N]	fs			Page
	71	47	40	40.15	2350	4.3	TKM063B	71B5/B14	29
	13.8	235	100	97.7	4070	0.9	TKM063C	71B5/B14	29
	19.1	170	75	71.5	3650	0.9			
	22.1	147	60	64.7	3480	1.0			
	26.7	122	50	50.65	3270	1.0			
	23.1	144	60	63.83	3430	1.2	TKM063B	71B5/B14	29
	28.7	116	50	50.28	3190	1.7			
	36	93	40	40.15	2970	2.1			
	46	72	30	31.42	2720	2.8			
	57	58	25	24.98	2530	3.4			
	69	48	20	19.5	2380	4.2			
	18.5	180	50	50.28	3690	1.1	TKM063B	80B5/B14	29
	22.9	145	40	40.15	3440	1.4			
	29.7	112	30	31.42	3150	1.8			
	37	90	25	24.98	2930	22			
	44	75	20	19.5	2760	27			
	61	54	15	14.3	2470	3.5			
	71	47	12.5	12.94	2360	3.5			
	86	39	10	10.13	2210	3.5			
	118	28	7.5	7.41	1990	3.6			
	9.4	345	300	291.3	6320	1.0	TKM075C	71B5	30
	11.6	280	250	254	5890	1.3			
0.37	14.0	233	200	194.5	5540	1.5			
	18.5	176	150	148.5	5040	2.0			
	22.2	146	125	127	4750	2.4			
	28.2	115	100	97.5	4380	3.0			
	37	88	75	76	4000	4.0			
	9.3	351	150	148.5	6500	1.0	TKM075C	71B5	30
	11.1	292	125	127	5980	1.2			
	14.1	230	100	97.5	5520	1.5			
	18.6	175	75	76	5040	2.0			
	22.4	145	60	60	4730	2.4			
	28.5	114	50	47	4370	3.1			
	23.6	141	60	57	4660	2.5	TKM075B	71B5	30
	29.1	114	50	49.76	4340	3.1			
	35	95	40	38	4080	3.7			
	9.1	358	100	97.5	6400	1.0	TKM075C	80B5/B14	30
	11.9	273	75	76	5840	1.3			
	14.4	225	60	60	5480	1.6			
	18.3	178	50	47	5060	2.0			
	15.1	219	60	57	5390	1.6	TKM075B	80B5/B14	30
	18.7	178	50	49.76	5030	2.0			
	22.4	148	40	38	4730	2.4			
	29.8	112	30	29.6	4310	3.1			
	36	93	25	25.78	4050	3.8			

TKM Performance Parameters

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i Nominal	i Actual	F_{r2} [N]	fs			Page
0.37	9.5	343	300	295.18	7990	1.3	TKM090C	71B5	31
	11.6	280	250	240.89	7470	1.8			
	14	233	200	200.66	7030	2.1			
	18.5	176	150	151.20	6390	2.8			
	22.2	146	125	125.95	6010	3.4			
	5.8	559	250	240.89	8300	0.9	TKM090C	71B5	31
	7	466	200	200.66	8300	1.1			
	9.3	351	150	151.20	8050	1.4			
	11.1	292	125	125.95	7580	1.7			
	14.1	230	100	99.22	7000	2.2			
	18.6	175	75	75.45	6390	2.9			
	22.4	145	60	62.43	6000	3.1			
	28.5	114	50	49.18	5540	3.1			
	23.7	140	60	59.04	5890	3.3	TKM090B	71B5	31
	29.1	114	50	48.18	5500	4.4			
	6.0	546	150	151.20	8300	0.9	TKM090C	80B5/B14	31
	7.1	455	125	125.95	8300	1.1			
	9.1	358	100	99.22	8110	1.4			
	11.9	273	75	75.45	7400	1.8			
	14.4	225	60	62.43	6950	2.0			
	18.3	178	50	49.18	6420	2.0			
	15.2	218	60	59.04	3820	2.1	TKM090B	80B5/B14	31
	18.7	178	50	48.18	6370	2.8			
	22.4	148	40	40.13	6000	3.4			
0.55	38	129	75	73.2	2550	1.0	TKM050C	71B5/B14	28
	45	108	60	61.22	2400	1.1			
	53	90	50	51.40	2270	1.2			
	48	103	60	57.67	2350	1.1	TKM050B	70B5/B14	28 ☒
	57	86	50	48.85	2220	1.5			
	70	71	40	40.08	2070	1.8			
	95	52	30	29.33	1870	2.5			
	116	42	25	24.06	1750	3.1			
	139	36	20	20.20	1650	3.6			
	35	141	40	40.08	2610	0.9	TKM050B	80B5/B14	28
	48	103	30	29.33	2350	1.3			
	58	85	25	24.06	2200	1.5			
	69	71	20	20.20	2080	1.8			
	94	53	15	14.92	1880	2.5			
	112	44	12.5	12.47	1770	3.0			
	134	37	10	10.47	1670	3.5			
	181	27	7.5	7.73	1510	3.7			
	37	132	25	24.06	2550	1.0	TKM050B	80B5/B14	28
	45	111	20	20.20	2410	1.2			
	60	82	15	14.92	2180	1.6			
	72	68	12.5	12.47	2050	1.9			

TKM Performance Parameters

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i Nominal	i Actual	F_{r2} [N]	fs			Page
	86	57	10	10.47	1930	2.3	TKM050B	80B5/B14	28
	116	42	7.5	7.73	1750	2.4			
	22.9	211	125	124.9	3440	0.9	TKM063C	71B5/B14	29
	27.6	175	100	97.7	3230	1.1			
	38	127	75	71.5	2990	1.3			
	44	109	60	64.7	2760	1.3			
	53	91	50	50.65	2590	1.3			
	46	107	60	63.83	2720	1.6	TKM063B	71B5/B14	29
	57	86	50	50.28	2530	2.3			
	71	69	40	40.15	2350	2.9			
	92	53	30	31.42	2160	3.7			
	28.7	172	50	50.28	3190	1.2	TKM063B	80B5/B14	29
	36	139	40	40.15	2970	1.4			
	46	107	30	31.42	2720	1.9			
	57	86	25	24.98	2530	2.3			
	69	71	20	19.5	2380	2.8			
	95	52	15	14.3	2130	3.7			
	110	45	12.5	12.94	2030	3.7			
	133	37	10	10.13	1910	3.6			
	184	27	7.5	7.41	1710	3.7			
	22.9	216	40	40.15	3440	0.9	TKM063B	80B5/B14	29
	29.7	166	30	31.42	3150	1.2			
0.55	37	134	25	24.98	2930	1.5			
	44	111	20	19.5	2760	1.8			
	61	80	15	14.3	2470	2.4			
	71	70	12.5	12.94	2360	2.4			
	86	58	10	10.13	2210	2.3			
	118	42	7.5	7.41	1990	2.4			
	14.0	346	200	194.5	5540	1.0	TKM075C	71B5	30
	18.5	261	150	148.5	5040	1.3			
	22.2	217	125	127	4750	1.6			
	28.2	171	100	97.5	4380	2.0			
	37	130	75	76	4000	2.7			
	45	108	60	60	3750	3.2			
	57	85	50	47	3470	4.1			
	47	105	60	57	3690	3.3	TKM075B	71B5	30
	58	85	50	49.76	3440	4.1			
	14.1	342	100	97.5	5520	1.0	TKM075C	80B5/B14	30
	18.6	260	75	76	5040	1.3			
	22.4	215	60	60	4730	1.6			
	28.5	170	50	47	4370	2.1			
	23.6	210	60	57	4660	1.7	TKM075B	80B5/B14	30
	29.1	170	50	49.76	4340	2.1			
	35	142	40	38	4080	2.5			
	46	107	30	29.6	3720	3.3			

TKM PERFORMANCE PARAMETERS

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i Nominal	i Actual	F_{r2} [N]	fs			Page
0.55	56	89	25	25.78	3500	3.9	TKM075B	80B5/B14	30
	14.4	335	60	60	5480	1.0	TKM075C	80B5/B14	30
	18.3	264	50	47	5060	1.3			
	15.1	326	60	57	5390	1.1	TKM075B	80B5/B14	30
	18.7	264	50	49.76	5030	1.3			
	22.4	220	40	38	4730	1.6			
	29.8	166	30	29.6	4310	2.1			
	36	138	25	25.78	4050	2.5			
	45	109	20	19.09	3740	3.2			
	60	83	15	14.87	3410	4.2			
	9.5	509	300	295.18	7990	0.9	TKM090C	80B5/B14	31
	11.6	416	250	240.89	7470	1.2			
	14.0	346	200	200.66	7030	1.4			
	18.5	261	150	151.20	6390	1.9			
	22.2	217	125	125.95	6010	2.3			
	28.2	171	100	99.22	5550	2.9			
	37	130	75	75.45	5070	3.8			
	45	108	60	62.43	4760	4.2			
	57	85	50	49.18	4390	4.1			
	9.3	522	150	151.20	8050	1.0	TKM090C	71B5	31
	11.1	435	125	125.95	7580	1.2			
	14.1	342	100	99.22	7000	1.5			
	18.6	260	75	75.45	6390	1.9			
	22.4	215	60	62.43	6000	2.1			
	28.5	170	50	49.18	5540	2.1			
	23.7	208	60	59.04	5890	2.2	TKM090B	80B5/B14	31
	29.1	170	50	48.18	5500	2.9			
	35	142	40	40.13	5170	3.5			
	9.1	533	100	99.22	8110	0.9	TKM090C	80B5/B14	31
	11.9	405	75	75.45	7400	1.2			
	14.4	335	60	62.43	6950	1.3			
	18.3	264	50	49.18	6420	1.3			
	15.2	324	60	59.04	6820	1.4	TKM090B	80B5/B14	31
	18.7	264	50	48.18	6370	1.9			
	22.4	220	40	40.13	6000	2.3			
	29.8	166	30	30.24	5460	3.0			
	36	138	25	25.19	5130	3.6			
0.75	57	117	50	48.85	2220	1.1	TKM050B	80B5/B14	28
	70	96	40	40.08	2070	1.3			
	95	71	30	29.33	1870	1.8			
	116	58	25	24.06	1750	2.2			
	139	49	20	20.20	1650	2.7			
	188	36	15	14.92	1490	3.6			
	48	141	30	29.33	2350	0.9	TKM050B	80B5/B14	28
	58	116	25	24.06	2200	1.1			

TKM Performance Parameters

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i Nominal	i Actual	F_{r2} [N]	fs			Page
	69	97	25	20.20	2080	1.3	TKM050B	80B5/B14	28
	94	72	15	14.92	1880	1.8			
	112	60	12.5	12.47	1770	2.2			
	134	50	10	10.47	1670	2.6			
	181	37	7.5	7.73	1510	2.7			
	60	112	15	14.92	2180	1.2	TKM050B	90B5/B14	28
	72	93	12.5	12.47	2050	1.4			
	86	78	10	10.47	1930	1.7			
	116	58	7.5	7.73	1750	1.7			
	38	173	75	71.5	2900	0.9	TKM063C	80B5/B14	29
	44	149	60	64.7	2760	0.9			
	53	124	50	50.65	2590	1.0			
	46	145	60	63.83	2720	1.2	TKM063B	80B5/B14	29
	57	117	50	50.28	2530	1.7			
	71	94	40	40.15	2350	2.1			
	92	73	30	31.42	2160	2.7			
	115	59	25	24.98	2010	3.4			
	138	49	20	19.5	1890	4.1			
	28.7	234	50	50.28	3190	0.9	TKM063B	80B5/B14	29
	36	189	40	40.15	2970	1.1			
	46	146	30	31.42	2720	1.4			
	57	118	25	24.98	2530	1.7			
0.75	69	97	20	19.5	2380	2.1			
	95	71	15	14.3	2130	2.7			
	110	61	12.5	12.94	2030	2.7			
	133	50	10	10.13	1910	2.7			
	184	37	7.5	7.41	1710	2.7			
	37	183	25	24.98	2930	1.1	TKM063B	90B5/B14	29
	44	151	20	19.5	2760	1.3			
	61	110	15	14.3	2470	1.7			
	71	95	12.5	12.94	2360	1.7			
	86	79	10	10.13	2210	1.7			
	118	57	7.5	7.41	1990	1.8			
	18.5	356	150	148.5	5040	1.0	TKM075C	80B5/B14	30
	22.2	296	125	127	4750	1.2			
	28.2	234	100	97.5	4380	1.5			
	37	178	75	76	4000	2.0			
	45	147	60	60	3750	2.4			
	57	116	50	47	3470	3.0			
	47	143	60	57	3690	2.4	TKM075B	80B5/B14	30
	58	116	50	49.76	3440	3.0			
	70	96	40	38	3240	3.6			
	18.6	355	75	76	5040	1.0	TKM075C	80B5/B14	30
	22.4	294	60	60	4730	1.2			
	28.5	231	50	47	4370	1.5			

TKM Performance Parameters

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i Nominal	i Actual	F_{r2} [N]	fs			Page
0.75	23.6	289	60	57	4660	1.2	TKM075B	80B5/B14	30
	29.1	232	50	49.76	4340	1.5			
	35	193	40	38	4060	1.8			
	46	145	30	29.6	3720	2.4			
	56	121	25	25.78	3600	2.9			
	71	95	20	19.09	3230	3.7			
	18.7	360	50	49.76	5030	1.0	TKM075B	90B5/B14	30
	22.4	300	40	38	4730	1.0			
	29.8	226	30	29.6	4310	1.5			
	36	188	25	25.78	4050	1.9			
	45	148	20	19.09	3740	2.4			
	60	113	15	14.87	3410	3.1			
	72	93	12.5	11.8	3210	3.7			
	11.6	567	250	240.89	7470	0.9	TKM090C	80B5/B14	31
	14.0	472	200	200.66	7030	1.1			
	18.5	356	150	151.20	6390	1.4			
	22.2	296	125	125.95	6010	1.7			
	28.2	234	100	99.22	5550	2.1			
	37	178	75	75.45	5070	2.8			
	45	147	60	62.43	4760	3.1			
	57	116	50	49.18	4390	3.0			
	14.1	467	100	99.22	7000	1.1	TKM090C	80B5/B14	31
	18.6	355	75	75.45	6390	1.4			
	22.4	294	60	62.43	6000	1.5			
	28.5	231	50	49.18	5540	1.5	TKM090B	80B5/B14	31
	23.7	284	60	59.04	5890	1.6			
	29.1	232	50	48.18	5500	2.2			
	35	193	40	40.13	5170	2.6			
	46	145	30	30.24	4710	3.4			
	56	121	25	25.19	4430	4.1			
	11.9	552	75	75.45	7400	0.9	TKM090C	90B5/B14	31
	14.4	457	60	62.43	6950	1.0			
	18.3	360	50	49.18	6420	1.0			
	15.2	442	60	59.04	6820	1.0	TKM090B	90B5/B14	31
	18.7	360	50	48.18	6370	1.4			
	22.4	300	40	40.13	6000	1.7			
	29.8	226	30	30.24	5460	2.2			
	36	188	25	25.19	5130	2.7			
	45	148	20	19.84	4740	3.4			
	60	113	15	15.09	4330	4.4			
1.1	70	141	40	40.08	2070	0.9	TKM050B	80B5/B14	28
	95	103	30	29.33	1870	1.3			
	116	85	25	24.06	1750	1.5			
	139	71	20	20.20	1650	1.8			
	188	53	15	14.92	1490	2.5			

TKM Performance Parameters

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i Nominal	i Actual	F_{r2} [N]	fs			Page
	225	44	12.5	12.47	1400	3.0	TKM050B	80B5/B14	28
	267	37	10	10.47	1320	3.5			
	362	27	7.5	7.73	1200	3.7			
	69	143	20	20.20	2080	0.9	TKM050B	90B5/B14	28
	94	105	15	14.92	1880	1.2			
	112	88	12.5	12.47	1770	1.5			
	134	74	10	10.47	1670	1.8			
	181	55	7.5	7.73	1510	1.8			
	72	137	12.5	12.47	2050	1.0	TKM050B	90B5/B14	28
	86	115	10	10.47	1930	1.1			
	116	85	7.5	7.73	1750	1.2			
	57	172	50	50.28	2530	1.2	TKM063B	80B5/B14	29
	71	139	40	40.15	2350	1.4			
	92	107	30	31.42	2160	1.9			
	115	86	25	24.98	2010	2.3			
	138	71	20	19.5	1890	2.8			
	191	52	15	14.3	1690	3.7			
	221	45	12.5	12.94	1610	3.7			
	267	37	10	10.13	1510	3.6			
	368	27	7.5	7.41	1360	3.7			
	46	214	30	31.42	2720	0.9	TKM063B	90B5/B14	29
	57	172	25	24.98	2530	1.2			
1.1	69	143	20	19.5	2380	1.4			
	95	103	15	14.3	2130	1.8			
	110	89	12.5	12.94	2030	1.8			
	133	74	10	10.13	1910	1.8			
	184	54	7.5	7.41	1710	1.9			
	44	222	20	19.5	2760	0.9	TKM063B	90B5/B14	29
	61	161	15	14.3	2470	1.2			
	71	139	12.5	12.94	2360	1.2			
	86	115	10	10.13	2210	1.2			
	118	83	7.5	7.41	1990	1.2			
	28.2	342	100	97.5	4380	1.0	TKM075C	80B5/B14	30
	37	260	75	76	4000	1.3			
	45	215	60	60	3750	1.6			
	57	170	50	47	3470	2.1			
	47	210	60	57	3690	1.7	TKM075B	80B5/B14	30
	58	170	50	49.76	3440	2.1			
	70	142	40	38	3240	2.5			
	93	107	30	29.6	2950	3.3			
	111	89	25	25.78	2770	3.9			
	29.1	340	50	49.76	4340	1.0	TKM075B	90B5/B14	30
	35	283	40	38	4080	1.2			
	46	213	30	29.6	3720	1.6			
	56	178	25	25.78	3500	2.0			

TKM Performance Parameters

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i Nominal	i Actual	F_{r2} [N]	fs			Page
	71	140	20	19.09	3230	2.5	TKM075B	90B5/B14	30
	93	106	15	14.87	2950	3.3			
	113	88	12.5	11.8	2770	4.0			
	29.8	332	30	29.6	4310	1.1	TKM075B	90B5/B14	30
	36	276	25	25.78	4050	1.3			
	45	218	20	19.09	3740	1.6			
	60	166	15	14.87	3410	2.1			
	72	137	12.5	11.8	3210	2.6			
	91	108	10	9.21	2960	3.2			
	120	82	7.5	8	2700	3.4			
	18.5	522	150	151.20	6390	1.0	TKM090C	80B5/B14	31
	22.2	435	125	125.95	6010	1.2			
	28.2	342	100	99.22	5550	1.5			
	37	260	75	75.45	5070	1.9			
	45	215	60	62.43	4760	2.1			
	57	170	50	49.18	4390	2.1			
	47	208	60	59.04	4670	2.2	TKM090B	80B5/B14	31
	58	170	50	48.18	4360	2.9			
1.1	70	142	40	40.13	4110	3.5			
	18.6	521	75	75.45	6390	1.0	TKM090C	90B5/B14	31
	22.4	431	60	62.43	6000	1.0			
	28.5	340	50	49.18	5540	1.0			
	23.7	416	60	59.04	5890	1.1	TKM090B	90B5/B14	31
	29.1	340	50	48.18	5500	1.6			
	35	283	40	40.13	5170	1.8			
	46	213	30	30.24	4710	2.3			
	56	178	25	25.19	4430	2.8			
	71	140	20	19.84	4090	3.6			
	18.7	529	50	48.18	6370	0.9	TKM090B	90B5/B14	31
	22.4	440	40	40.13	6000	1.1			
	29.8	332	30	30.24	5460	1.5			
	36	276	25	25.19	5130	1.8			
	45	218	20	19.84	4740	2.3			
	60	166	15	15.09	4330	3.0			
	72	137	12.5	12.49	4060	3.4			
	91	108	10	9.84	3750	3.3			
	120	82	7.5	7.48	3420	3.4			
	116	116	25	24.06	1750	1.1	TKM050B	90B5/B14	28
	139	97	20	20.20	1650	1.3			
	188	72	15	14.92	1490	1.8			
1.5	225	60	12.5	12.47	1400	2.2			
	267	50	10	10.47	1320	2.6			
	362	37	7.5	7.73	1200	2.7			
	94	144	15	14.92	1880	0.9	TKM050B	90B5/B14	28
	112	120	12.5	12.47	1770	1.1			

TKM Performance Parameters

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i Nominal	i Actual	F_{r2} [N]	fs			Page
1.5	134	101	10	10.47	1670	1.3	TKM050B	90B5/B14	28
	181	74	7.5	7.73	1510	1.3			
	57	234	50	50.28	2530	0.9	TKM063B	90B5/B14	29
	71	189	40	40.15	2350	1.1			
	92	146	30	31.42	2160	1.1			
	115	118	25	24.98	2010	1.7			
	138	97	20	19.5	1890	2.1			
	191	71	15	14.3	1690	2.7			
	221	61	12.5	12.94	1610	2.7			
	267	50	10	10.13	1510	2.7			
	368	37	7.5	7.41	1360	2.7			
	57	235	25	24.98	2630	0.9	TKM063B	90B5/B14	29
	69	195	20	19.5	2380	1.0			
	95	141	15	14.3	2130	1.3			
	110	122	12.5	12.94	2030	1.4			
	133	101	10	10.13	1910	1.3			
	184	73	7.5	7.41	1710	1.4			
	37	355	75	71.5	4000	1.0	TKM063C	90B5/B14	29
	45	294	60	64.7	3750	1.2			
	57	231	50	50.65	3470	1.5			
	47	286	60	57	3690	1.2	TKM075B	90B5/B14	30
	58	232	50	49.76	3440	1.5			
	70	193	40	38	3240	1.8			
	93	145	30	29.6	2950	2.4			
	111	121	25	25.78	2770	2.9			
	141	95	20	19.09	2650	3.7			
	35	386	40	38	4080	0.9	TKM075B	90B5/B14	30
	46	291	30	29.6	3720	1.2			
	56	242	25	25.78	3500	1.4			
	71	191	20	19.09	3230	1.8			
	93	145	15	14.87	2950	2.4			
	112	120	12.5	11.8	2770	2.9			
	142	95	10	9.21	2550	3.7			
	187	72	7.5	8	2330	3.9			
	28.2	467	100	99.22	5550	1.1	TKM090C	90B5/B14	31
	37	355	75	75.45	5070	1.4			
	45	294	60	62.43	4760	1.5			
	57	231	50	49.18	4390	1.5			
	47	284	60	59.04	4670	1.6	TKM090B	90B5/B14	31
	58	232	50	48.18	4360	2.2			
	70	193	40	40.13	4110	2.6			
	93	145	30	30.24	3740	3.4			
	111	121	25	25.19	3520	4.1			
	29.1	463	50	48.18	5500	1.1	TKM090B	90B5/B14	31
	35	386	40	40.13	5170	1.3			

TKM Performance Parameters

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i Nominal	i Actual	F_{r2} [N]	fs			Page
1.5	46	291	30	30.24	4710	1.7	TKM090B	90B5/B14	31
	56	242	25	25.19	4430	2.1			
	71	191	20	19.84	4090	2.6			
	93	145	15	15.09	3730	3.4			
	112	120	12.5	12.49	3510	3.8			
	142	95	10	9.84	3240	3.8			
	187	72	7.5	7.48	2950	3.9			
2.2	139	143	20	20.20	1650	0.9	TKM050B	95B5/B14	28
	188	105	15	14.92	1490	1.2			
	225	88	12.5	12.47	1400	1.5			
	267	74	10	10.47	1320	1.8			
	362	55	7.5	7.73	1200	1.8			
	92	214	30	31.42	2160	0.9	TKM063B	90B5/B14	29
	115	172	25	24.98	2010	1.2			
	138	143	20	19.5	1890	1.4			
	191	103	15	14.3	1690	1.8			
	221	89	12.5	12.94	1610	1.8			
	267	74	10	10.13	1510	1.8			
	368	54	7.5	7.41	1360	1.9			
	58	340	50	49.76	3440	1.0	TKM075B	90B5/B14	30
	70	283	40	38	3240	1.5			
	93	213	30	29.6	2950	1.6			
	111	178	25	25.78	2770	2.0			
	141	140	20	19.09	2560	2.5			
	186	106	15	14.87	2340	3.3			
	224	88	12.5	11.8	2190	4.0			
	56	355	25	25.78	3500	1.0	TKM075B	100B5/B14	30
	71	280	20	19.09	3230	1.3			
	93	213	15	14.87	2950	1.6			
	112	176	12.5	11.8	2770	2.0			
	142	139	10	9.21	2550	2.5			
	187	106	7.5	8	2330	2.7			
	60	331	15	14.87	3410	1.1	TKM075B	112B5/B14	30
	72	274	12.5	11.8	3210	1.3			
	91	216	10	9.21	2960	1.6			
	120	164	7.5	8	2700	1.7			
	37	521	75	75.45	5070	1.0	TKM090C	90B5/B14	31
	45	431	60	62.43	4760	1.0			
	57	340	50	49.18	4390	1.0			
	47	416	60	59.04	4670	1.1	TKM090B	90B5/B14	31
	58	340	50	48.18	4360	1.5			
	70	283	40	40.13	4110	1.8			
	93	213	30	30.24	3740	2.3			
	111	178	25	25.19	3520	2.8			
	141	140	20	19.84	3250	3.6			

TKM Performance Parameters

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i Nominal	i Actual	F_{r2} [N]	fs			Page
2.2	35	566	40	40.13	5170	0.9	TKM090B	100B5/B14	31
	46	427	30	30.24	4710	1.2			
	56	355	25	25.19	4430	1.4			
	71	280	20	19.84	4090	1.8			
	93	213	15	15.09	3730	2.3			
	112	176	12.5	12.49	3510	2.6			
	142	139	10	9.84	3240	2.6			
	187	106	7.5	7.48	2950	2.7			
	36	553	25	25.19	5130	0.9	TKM090B	112B5/B14	31
	45	435	20	19.84	4740	1.1			
	60	331	15	15.09	4330	1.5			
	72	274	12.5	12.49	4060	1.7			
	91	216	10	9.84	3750	1.7			
	120	164	7.5	7.48	3420	1.7			
3.0	70	386	40	38	3240	0.9	TKM075B	100B5/B14	30
	93	291	30	29.6	2950	1.2			
	111	242	25	25.78	2770	1.4			
	141	191	20	19.09	2560	1.8			
	186	145	15	14.87	2340	2.4			
	224	120	12.5	11.8	2190	2.9			
	285	95	10	9.21	2030	3.7			
	374	72	7.5	8	1850	3.9			
	93	290	15	14.87	2950	1.2	TKM075B	100B5/B14	30
	112	240	12.5	11.8	2770	1.5			
	142	189	10	9.21	2550	1.8			
	187	144	7.5	8	2330	1.9			
	47	568	60	59.04	4670	0.8	TKM090B	100B5/B14	31
	58	463	50	48.48	4360	1.1			
	70	386	40	40.13	4110	1.3			
	93	291	30	30.24	3740	1.7			
	111	242	25	25.19	3520	2.1			
	141	191	20	19.84	3250	2.6			
	186	145	15	15.09	2960	3.4			
	224	120	12.5	12.49	2780	3.8			
	285	95	10	9.84	2570	3.8			
	374	72	7.5	7.48	2340	3.9			
	56	485	25	25.19	4430	1.0	TKM090B	100B5/B14	31
	71	382	20	19.84	4090	1.3			
	93	290	15	15.09	3730	1.7			
	112	240	12.5	12.49	3510	1.8			
	142	189	10	9.84	3240	1.9			
	187	144	7.5	7.48	2950	1.9			
4.0	111	323	25	25.78	2770	1.1	TKM075B	112B5/B14	30
	141	254	20	19.09	2560	1.4			
	186	194	15	14.87	2340	1.8			

TKM Performance Parameters

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i Nominal	i Actual	F_{r2} [N]	fs			Page
4.0	224	160	12.5	11.8	2190	2.2	TKM075B	112B5/B14	30
	285	126	10	9.21	2030	2.8			
	374	96	7.5	8	1850	2.9			
	112	320	12.5	11.8	2770	1.1	TKM075B	112B5/B14	30
	142	252	10	9.21	2550	1.1			
	187	192	7.5	8	2330	1.5			
	70	515	40	40.13	4110	1.0	TKM090B	112B5/B14	31
	93	388	30	30.24	3740	1.3			
	111	323	25	25.19	3520	1.5			
	141	254	20	19.84	3250	2.0			
	186	194	15	15.09	2960	2.3			
	224	160	12.5	12.49	2780	2.9			
	285	126	10	9.84	2570	2.9			
	374	96	7.5	7.48	2340	2.9			
	71	509	20	19.84	4090	1.0	TKM090B	112B5/B14	31
	93	387	15	15.09	3730	1.3			
	112	320	12.5	12.49	3510	1.4			
	142	252	10	9.84	3240	1.4			
	187	192	7.5	7.48	2950	1.5			

6.3 TKM HS Performance Parameters

M_{2max} [Nm]	n_2 [r/min]	i Nominal	i Actual	P_{1n} [kW]	F_{r2} [N]	F_{r1} [N]		Page
110	4.8	300	283.14	0.06	4100	400	TKM050C..HS	32
130	5.7	250	239.8	0.08	4100	400		
130	7	200	196.7	0.10	4100	400		
130	10	150	144	0.14	4000	400		
130	12	125	118	0.17	3770	400		
130	14	100	99.2	0.21	3560	400		
130	19	75	73.2	0.28	3220	400		
120	22	60	61.22	0.31	3030	400		
110	27	50	51.40	0.33	2860	400		
110	24	60	57.67	0.29	2960	400	TKM050B..HS	32
130	29	50	48.85	0.41	2790	400		
130	35	40	40.08	0.51	2610	400		
130	48	30	29.33	0.69	2350	400		
130	58	25	24.06	0.84	2200	400		
130	69	20	20.20	1.0	2080	400		
130	94	15	14.92	1.4	1880	400		
130	112	12.5	12.47	1.6	1770	400		
130	134	10	10.47	1.9	1670	400		
100	181	7.5	7.73	2.0	1510	400		
170	4.6	300	289	0.09	4800	400	TKM063C..HS	32
200	5.7	250	230	0.13	4800	400		
200	7.1	200	200	0.16	4800	400		
200	9.2	150	157	0.21	4650	400		
200	11	125	124.9	0.26	4330	400		
200	14	100	99.7	0.31	4070	400		
160	19	75	71.5	0.35	3650	400		
140	22	60	64.7	0.35	3480	400		
120	27	50	50.65	0.36	3270	400		
170	23	60	63.83	0.44	3430	530	TKM063B..HS	32
200	29	50	50.28	0.64	3190	530		
200	36	40	40.15	0.79	2970	530		
200	46	30	31.42	1.0	2720	530		
200	57	25	24.98	1.3	2530	530		
200	69	20	19.5	1.5	2380	530		
190	95	15	14.3	2.0	2130	530		
165	110	12.5	12.94	2.0	2030	530		
135	133	10	10.13	2.0	1910	530		
100	184	7.5	7.41	2.05	1710	530		
350	4.7	300	291.3	0.19	6500	560	TKM075C..HS	32
350	5.8	250	254	0.23	6500	560		
350	7	200	194.5	0.28	6500	560		
350	9.3	150	148.5	0.37	6500	560		
350	11	125	127	0.44	5980	560		
350	14	100	97.5	0.56	5520	560		
350	19	75	76	0.74	5040	560		

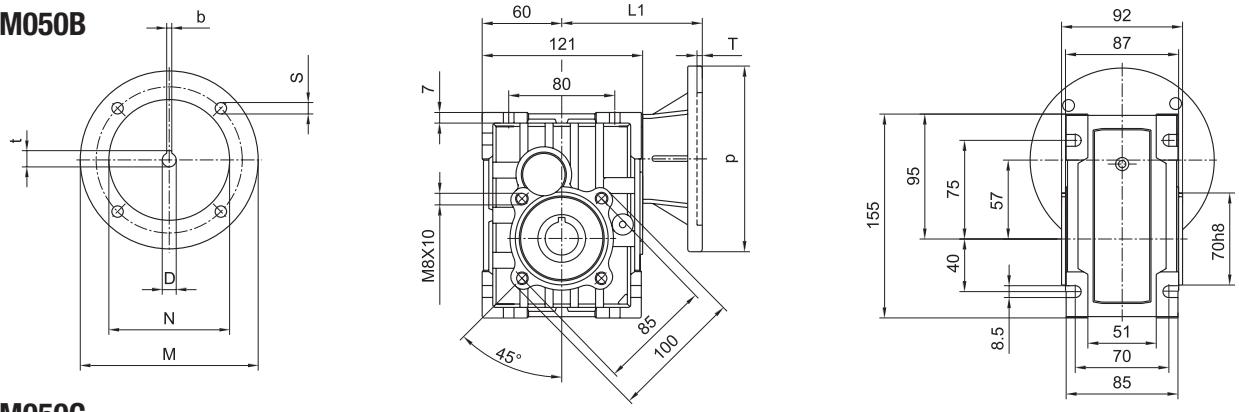
TKM HS Performance Parameters

M_{2max} [Nm]	n_2 [r/min]	i Nominal	i Actual	P_{1n} [kW]	F_{r2} [N]	F_{r1} [N]		Page
350	22	60	60	0.89	4730	560	TKM075C..HS	32
350	28	50	47	1.10	4370	560		
350	24	60	57	0.92	4660	860	TKM075B..HS	32
350	29	50	49.76	1.1	4340	860		
350	35	40	38	1.4	4080	860		
350	46	30	29.6	1.8	3720	860		
350	56	25	25.78	2.2	3500	860		
350	71	20	19.09	2.8	3230	860		
350	93	15	14.87	3.6	2950	860		
350	112	13	11.8	4.4	2770	860		
350	142	10	9.21	5.5	2550	860		
280	187	7.5	8	5.8	2330	860		
480	4.7	300	295.18	0.25	8300	560	TKM090C..HS	32
500	5.8	250	240.89	0.33	8300	560		
500	7	200	200.66	0.40	8300	560		
500	9	150	151.20	0.53	8050	560		
500	11	125	125.95	0.63	7580	560		
500	14	100	99.22	0.80	7000	560		
500	19	75	75.5	1.1	6390	560		
450	22	60	62.4	1.1	6000	560		
350	28	50	49.18	1.1	5540	560		
460	24	60	1.2	1.2	5890	560	TKM090B..HS	32
500	29	50	1.6	1.6	5500	1260		
500	35	40	1.9	1.9	5170	1260		
500	46	30	2.6	2.6	4710	1260		
500	56	25	3.1	3.1	4430	1260		
500	71	20	3.9	3.9	4090	1260		
500	93	15	5.2	5.2	3730	1260		
460	112	13	5.7	5.7	3510	1260		
360	142	10	5.7	5.7	3240	1260		
280	187	7.5	5.8	5.8	2950	1260		

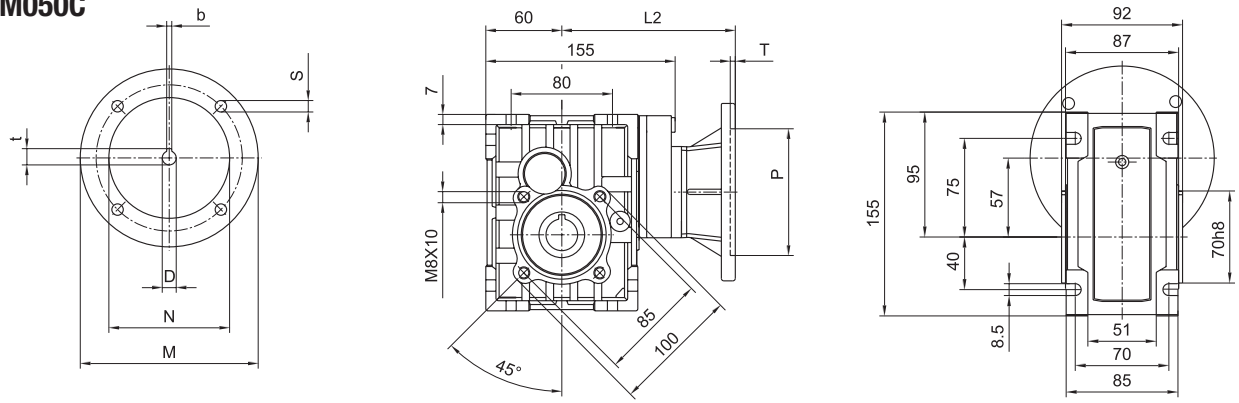
7. Outline Dimension Sheets

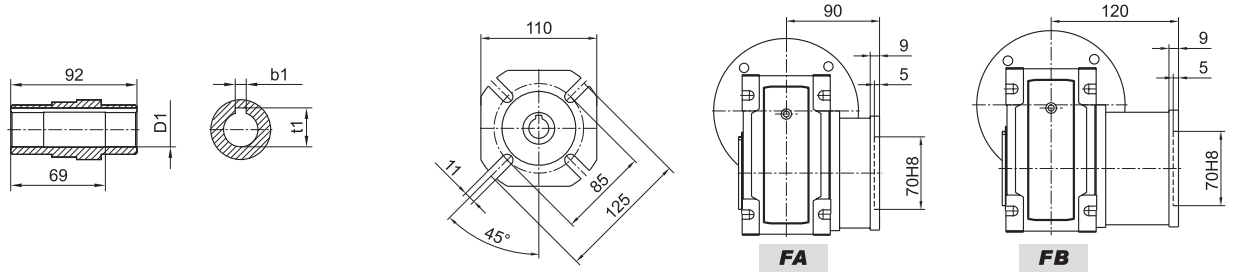
7.1 TKM Outline Dimensions

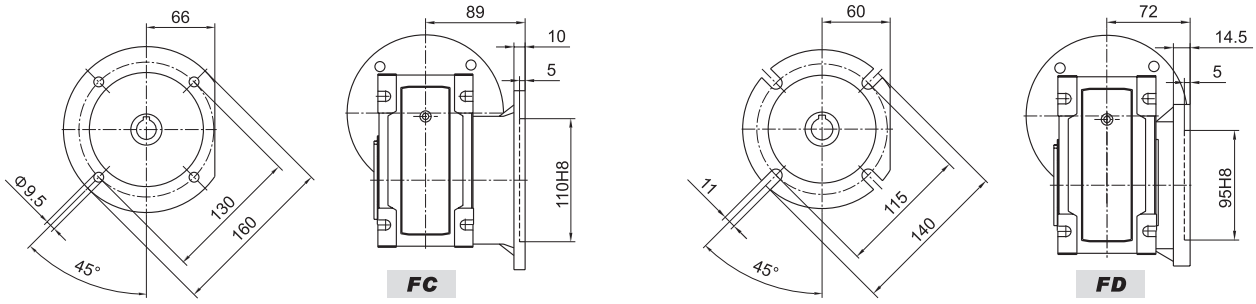
TKM050B



TKM050C



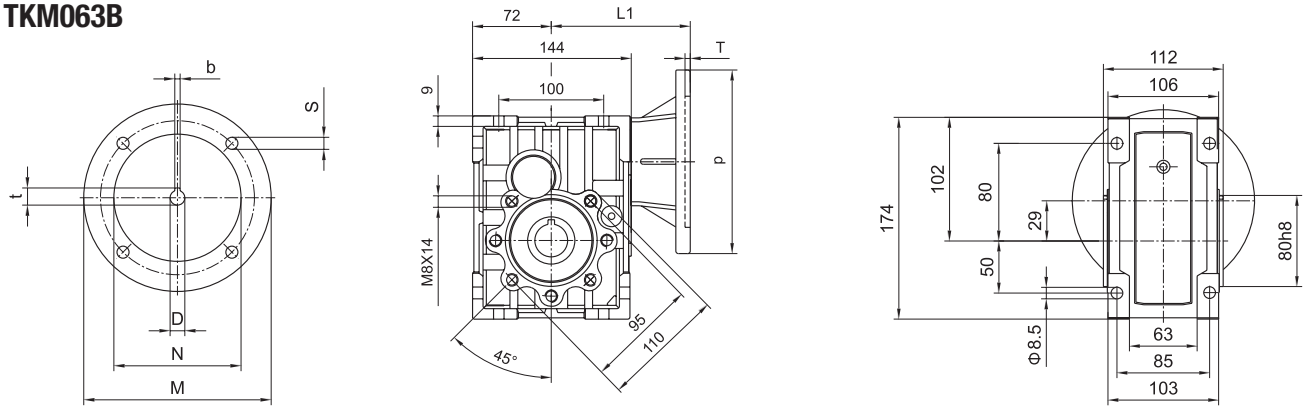




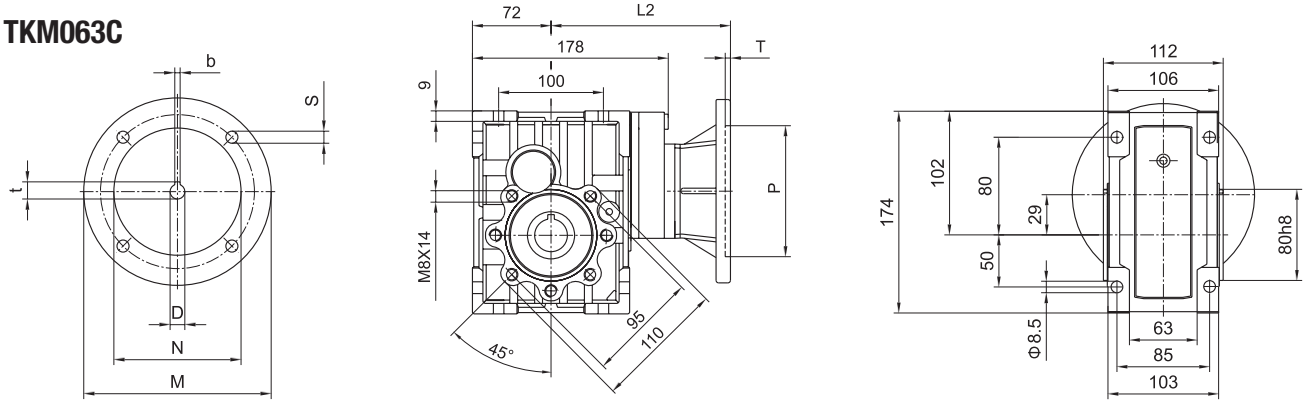
IEC	D(E8)	b	t	p	M	N	S	T	L1	L2	D1(H8)	b1	t1
63B5	11	4	12.8	140	115	95	9	4	106	140	20*	6*	22.8*
71B5	14	5	16.3	160	130	110	9	4	113	147	24*	8*	27.3*
71B14	14	5	16.3	105	85	70	7	4	113	147	25	8	28.3
80B5	19	6	21.8	200	165	130	11	4	133	167			
80B14	19	6	21.8	120	100	80	7	4	133	167	* Only on request		
90B14	24	8	27.3	140	115	95	9	4	133	167			

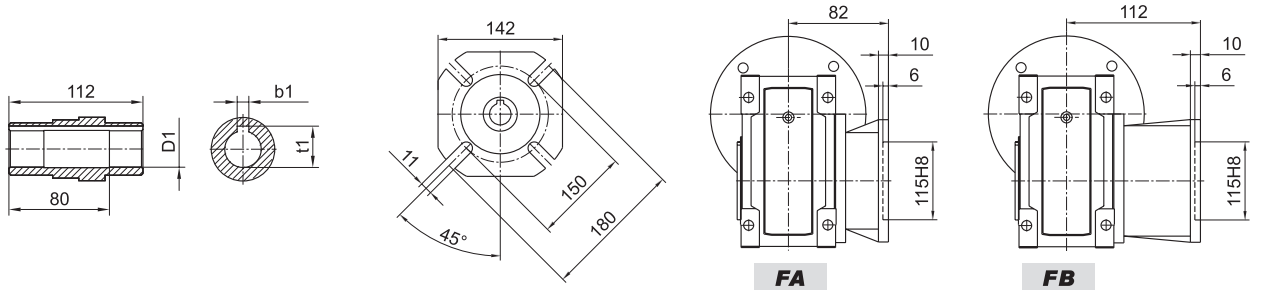
Weight (without motor) ≈ 4.2kg

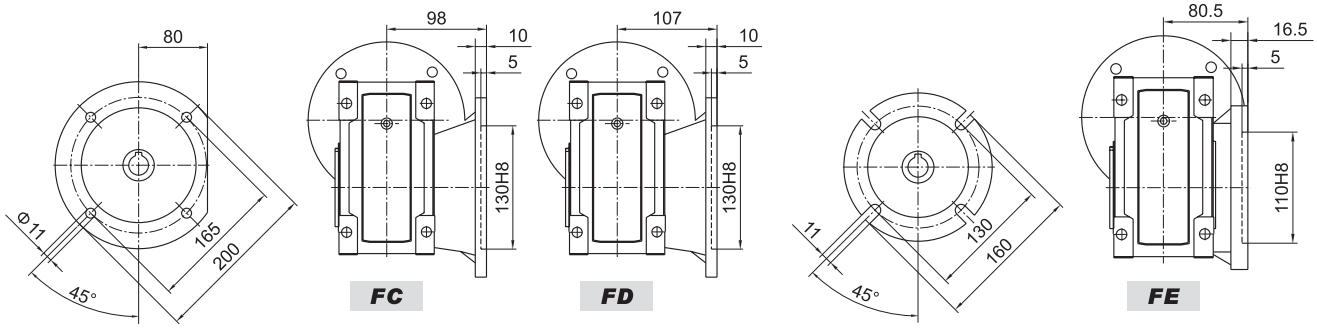
TKM063B



TKM063C



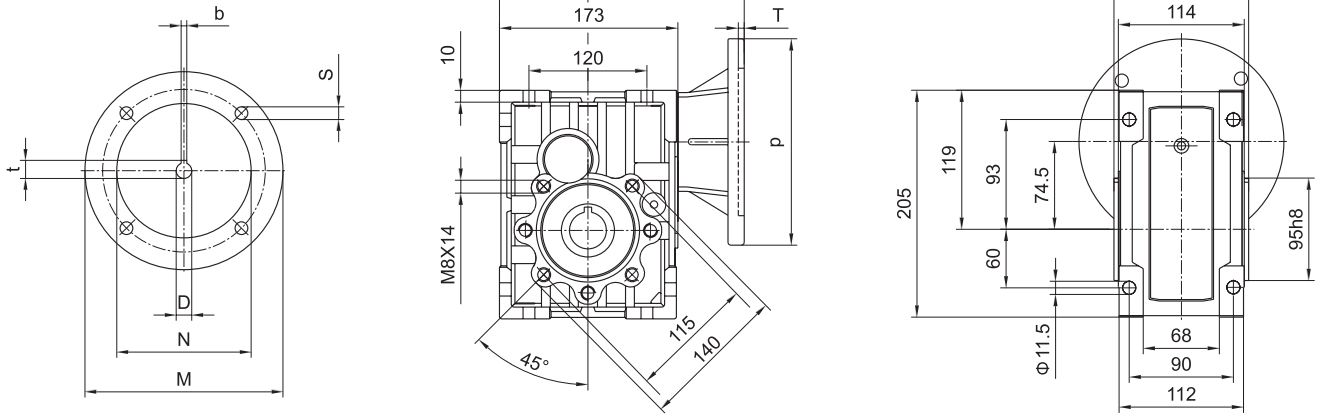




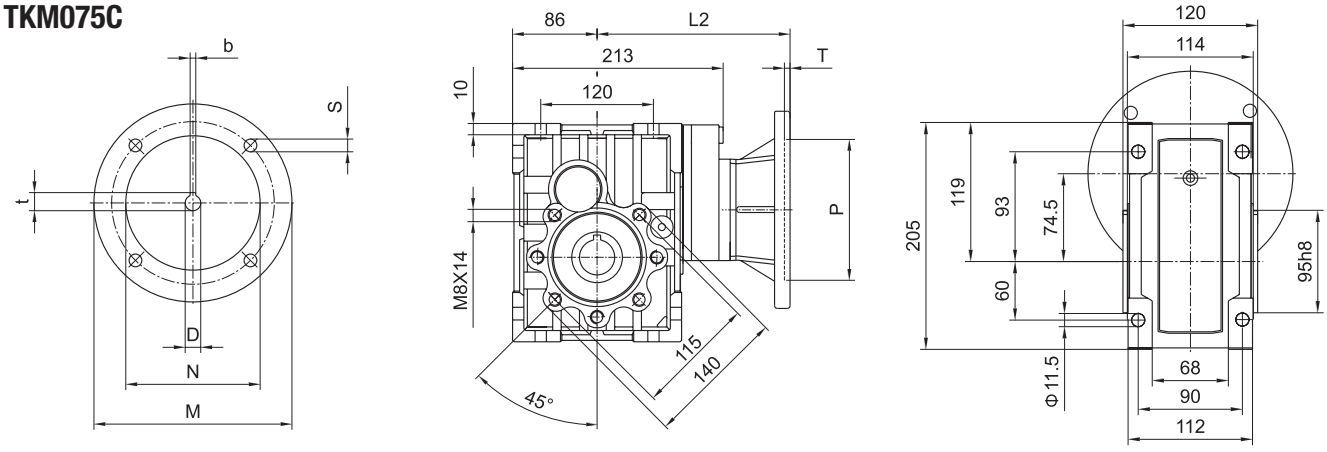
IEC	D(E8)	b	t	p	M	N	S	T	L1	L2	D1(H8)	b1	t1
63B5	11	4	12.8	140	115	95	9	4	117	151	25	8	28.3
71B5	14	5	16.3	160	130	110	9	4	124	158	28*	8	31.3
71B14	14	5	16.3	105	85	70	7	4	124	158	30*	8	33.3
80B5	19	6	21.8	200	165	130	11	4	144	178			
80B14	19	6	21.8	120	100	80	7	4	144	178	* Only on request		
90B5	24	8	27.3	200	165	130	11	4	144	178			
90B14	24	8	27.3	140	115	95	9	4	144	178			

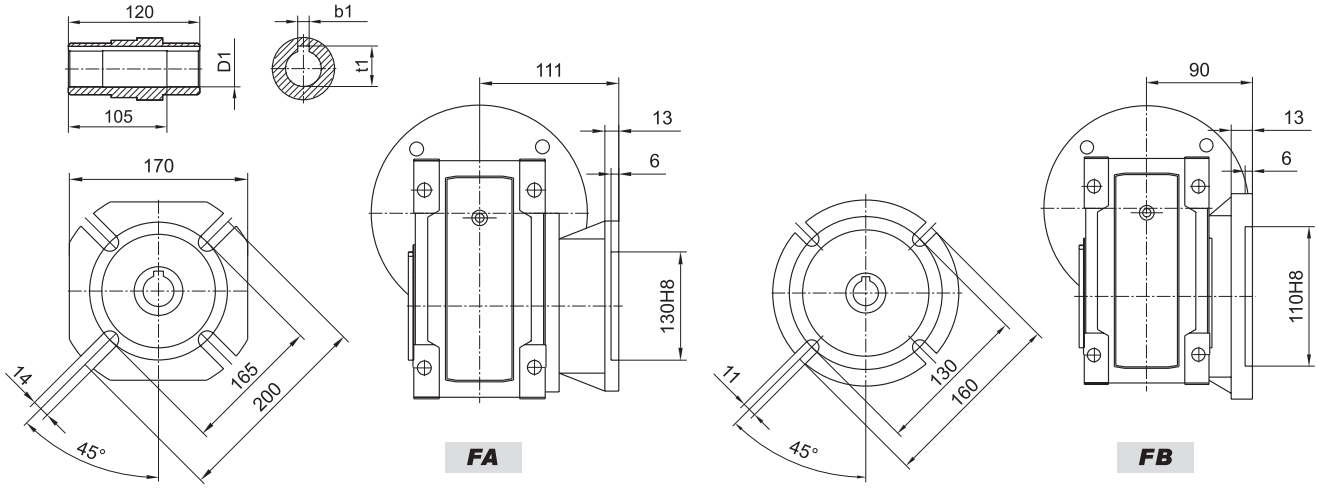
Weight (without motor) ≈ 6.0kg

TKM075B



TKM075C

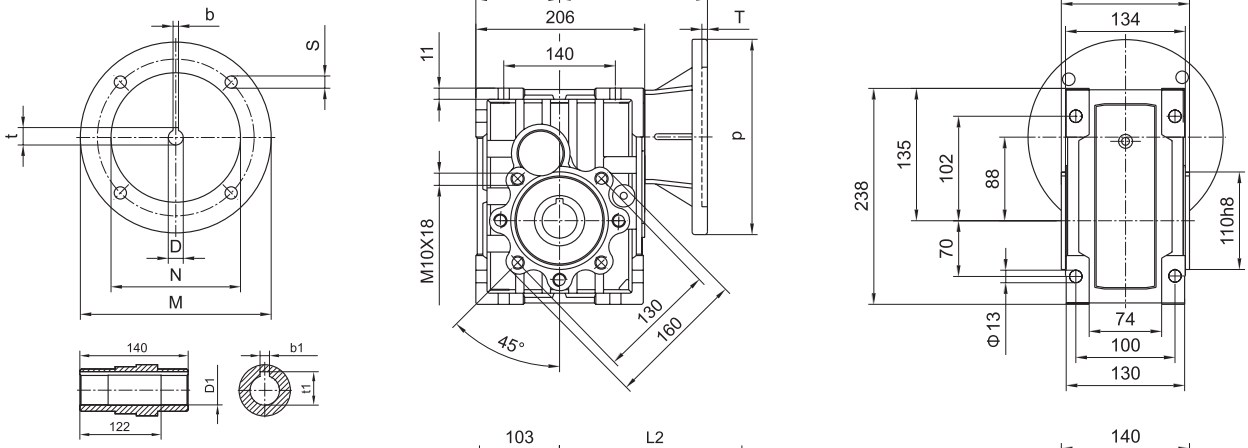




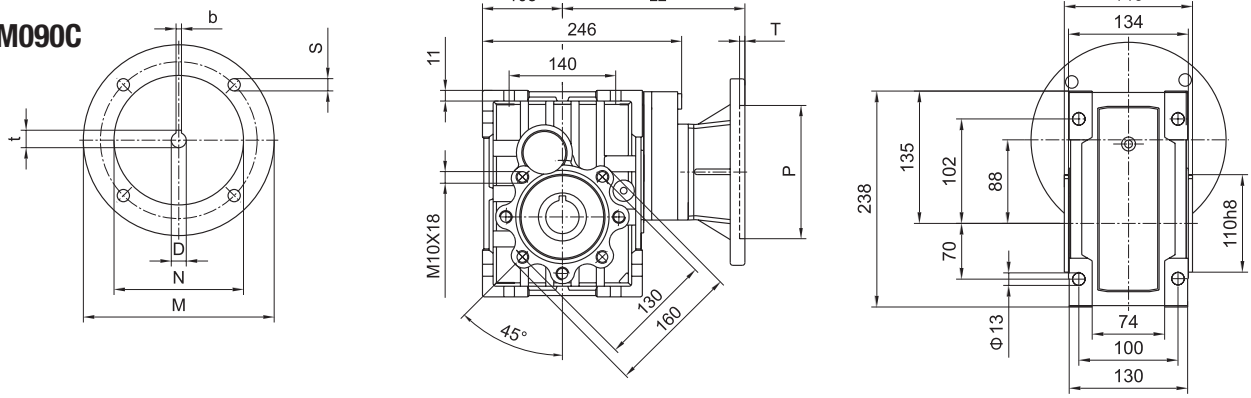
IEC	D(E8)	b	t	p	M	N	S	T	L1	L2	D1(H8)	b1	t1
63B5	11	4	12.8	140	115	95	9	4	139	179	28	8	31.3
71B5	14	5	16.3	160	130	110	9	4	146	186	30*	8*	33.3*
80B5	19	6	21.8	200	165	130	11	4	166	206	35*	10*	38.3*
80B14	19	6	21.8	120	100	80	7	4	166	206			
90B5	24	8	27.3	200	135	130	11	4	166	206			
90B14	24	8	27.3	140	115	95	9	4	166	206	* Only on request		
100/112B5	28	8	31.3	250	215	180	13.5	4.5	176	216			
100/112B14	28	8	31.3	160	130	110	9	4.5	176	216			

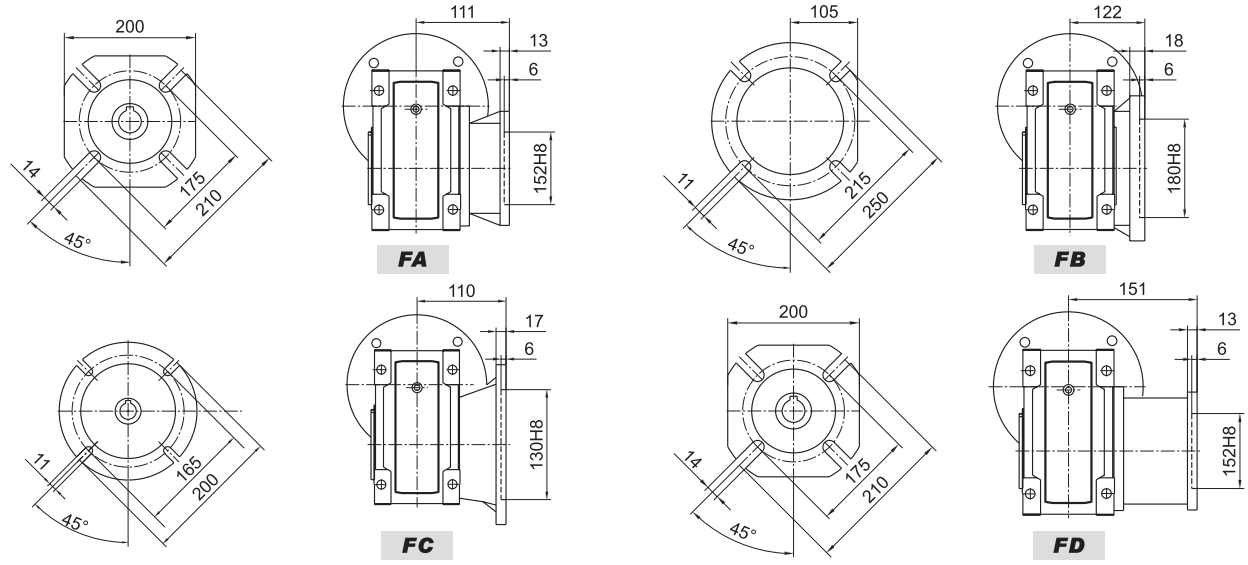
Weight (without motor) ≈ 9.2kg

TKM090B



TKM090C



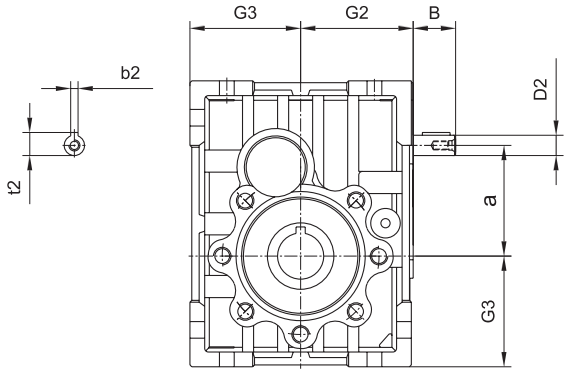


IEC	D(E8)	b	t	p	M	N	S	T	L1	L2	D1(H8)	b1	t1
63B5	11	4	12.8	140	115	95	9	4	155	195	35	10	38.3
71B5	14	5	16.3	160	130	110	9	4	162	202	38*	10*	41.3*
80B5	19	6	21.8	200	165	130	11	4	182	222	40*	10*	43.3*
80B14	19	6	21.8	120	100	80	7	4	182	222			
90B5	24	8	27.3	200	135	130	11	4	182	222			
90B14	24	8	27.3	140	115	95	9	4	182	222	* Only on request		
100/112B5	28	8	31.3	250	215	180	13.5	4.5	192	232			
100/112B14	28	8	31.3	160	130	110	9	4.5	192	232			

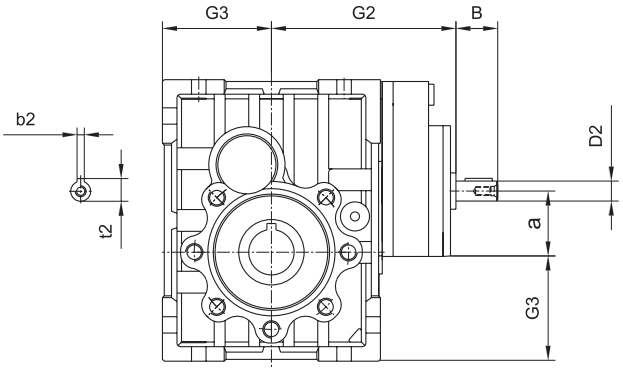
Weight (without motor) ≈ 13.3kg

7.2 TKM HS OUTLINE DIMENSIONS

TKM...B..HS



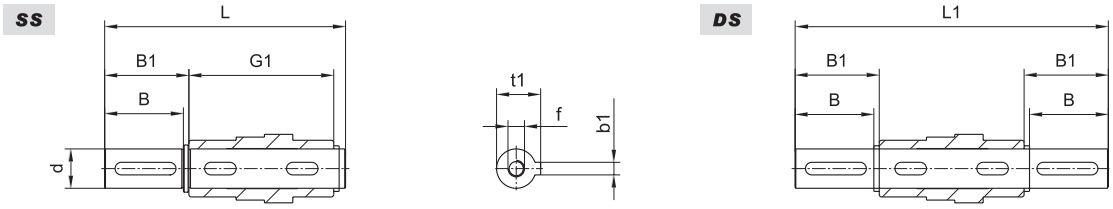
TKM...C..HS



Item	B	D2j6	G2	G3	a	b2	f2	t2
TKM050B	23	11	65	60	57	4		12.5
TKM050C	23	11	100	60	21.5	4		12.5
TKM063B	30	14	76	72	64.5	5	M6	16
TKM063C	23	11	111	72	29	4		12.5
TKM075B	40	16	91	86	74.5	5	M6	18
TKM075C	30	14	132	86	30.5	5	M6	16
TKM090B	40	19	107	103	88	6	M6	21.5
TKM090C	30	14	148	103	44	5	M6	16

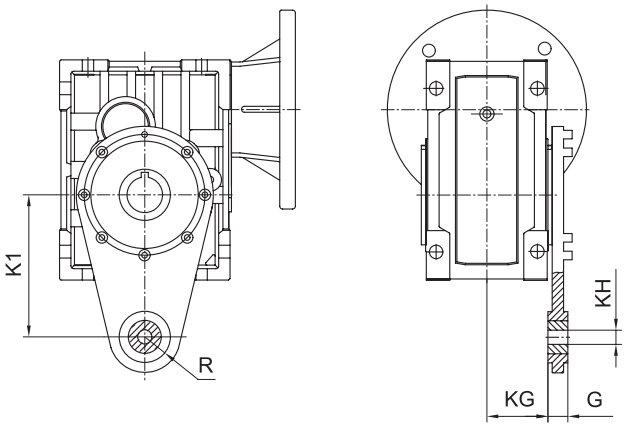
8. Accessories Outline Dimension Sheet

8.1 Output Shafts



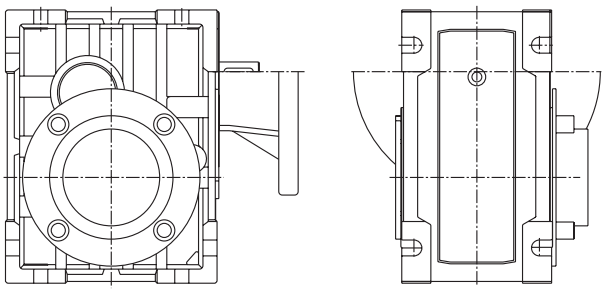
Item	dh6	B	B1	G1	L	L1	f	b1	t1
TKM050	25	50	53.5	92	153	199	M10	8	28
TKM063	25	50	53.5	112	173	219	M10	8	28
TKM075	28	60	63.5	120	192	247	M10	8	31
TKM090	35	80	84.5	140	234	309	M12	10	38

8.2 Torque Arm



Item	K1	G	KG	KH	R
TKM050	100	14	38.5	10	18
TKM063	150	14	49	10	18
TKM075	200	25	47.5	20	30
TKM090	200	25	57.5	20	30

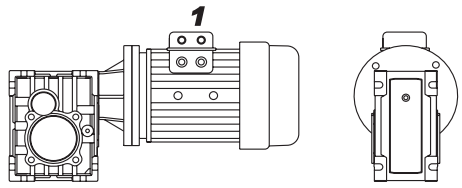
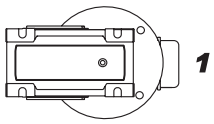
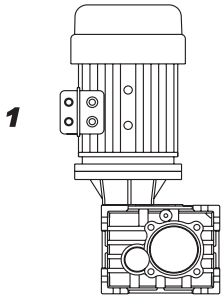
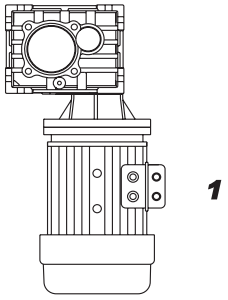
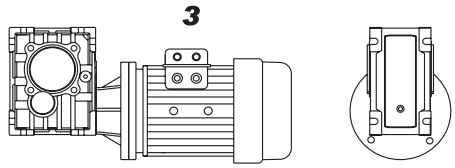
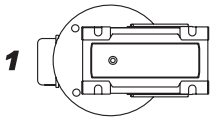
8.2 Cover



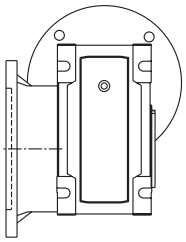
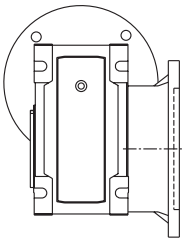
Item	N2
TKM050	63
TKM063	73
TKM075	79
TKM090	94

9. Installation Positions Diagram

9.1 TKM Mounting Positions

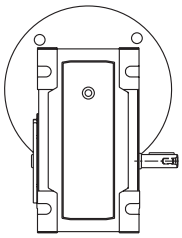
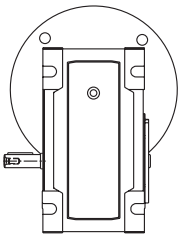
B3	B6	V5	V6
			
B8	**B7**		
			

9.2 Position Diagram For Output Flange

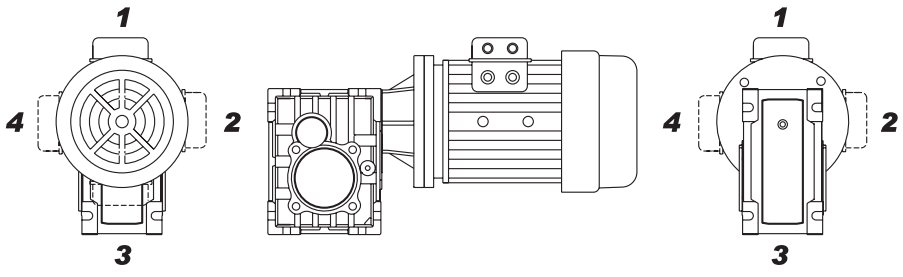
FA1, FB1, FC1, FD1, FE1	FA2, FB2, FC2, FD2, FE2
	

Unless specified otherwise, the reduction unit is supplied with the flange in pos. F..1 referred to position B3.

9.3 Position Diagram For Single Output Shaft

SS1	SS2
	

9.4 Position of Motor Terminal Box



In the case of specific requirements when ordering, specify the position of the terminal box as shown in the diagram.

10. Installation

10.1 Recommendations

Please note the following recommendations when installing the reduction unit:

- Check direction of reduction unit output shaft prior to fitting the unit to the machine.
- Check reducer's axial diameter, aperature, key, and key slot dimensions prior to mounting with the prime mover.
- Assembling the unit too tightly or too loosely will decrease the reducer's performance!
- Mounting on the machine must be stable to avoid vibration.
- If storing the unit for 4 months or longer, make sure the oil seal is immersed in lubricant inside the unit. If the seal is uncovered, change the lubrication to avoid rubber sticking to the shaft and losing elasticity and function.
- If possible, keep reduction unit out of sunlight and bad weather.
- Do not apply paint over any rubber parts or holes on breathing plugs.
- Grease the joint when connecting with a hollow or solid shaft to avoid locking or oxidation.
- Check the level of lubricant through the indicator on unit.
- When starting the unit, do not immediately apply the maximum load.
- If using a reducer directly with the motor, and the motor's weight is larger than normal, a supporting unit is required.
- Ensure air passage on the fan side is not impeded to keep the motor cool.
- In case of temperatures under -5 C (23 F) and over 40 C (140 F), contact our technical service for help.

10.2 Critical Applications

The performance given in the catalog corresponds to mounting position B3 or similar, when the first stage is not entirely immersed in oil. For other mounting positions and for particular input speeds, refer to the tables that highlight different critical situations for each size of reduction unit. It is also necessary to use extra caution when using in certain situations. Please call our technical service for assistance if:

- Unit's speed increases
- Use in applications with especially high inertia
- Use that could be hazardous if the reduction unit fails
- Applications that result in high dynamic strain on the case of the reduction unit.
- Use in environments under -5° C (23° F) or over 40° C (104° F)
- Use in heavy chemical, salty or radioactive environments
- Using mounting positions not listed in this catalog

CAUTION: Avoid applications where even partial immersian of the reduction unit is required.

The maximum torque that the gear reducer can support must not exceed two times the nominal torque (fs=1) states in the performance tables. Intended for momentary overloads due to starting at full load, braking, shocks or other causes, particularly those that are dynamic.

11. Lubrication

11.1 Types of Lubrication

	℃ -50 0 +50 +100	ISO	SHELL	Mobil MOBIL	bp BP	Lubrication Type
TKM...	标准 Standard -10 +40	VG 220	Shell Omala 220	Mobil gear 630	BP Energol GR-XP 220	Mineral oil
	-20 +25	VG 150 VG 100	Shell Omala 100	Mobil gear 627	BP Energol GR-XP 100	
	-30 +10	VG 68-46 VG 32	Shell Tellus T 32	Mobil D.T.E. 13M		
	-40 -20	VG 22 VG 15	Shell Tellus T 15	Mobil D.T.E. 11M	BP Energol HLP-HM 15	
	-40 +80	VG 220	Shell Omala HD 220	Mobil SHC 630		Synthetic oil
	-40 +40	VG 150		Mobil SHC 629		
	-40 +10	VG 32		Mobil SHC 624		

11.2 Lubrication Fill Quantity

The specified fill quantities are recommended values. The precise values vary depending on the number of stages and gear ratio. When filling, it is essential to check the oil level plug since it indicates the precise oil capacity. The following tables show guide values for lubricant fill quantities in relation to the mounting position (B3, B6, B7.....)

TKM Series Lubrication Fill Quantity

Gear Units	Fill quantity in liters					
	B3	B6	B7	B8	V5	V6
TKM050B	0.22	0.20*	0.13*	0.15	0.25	0.14
TKM050C	0.07	0.04	0.04	0.05	0.08	0.09
TKM063B	0.42	0.35*	0.24*	0.22	0.46	0.25
TKM063C	0.07	0.04	0.04	0.05	0.08	0.09
TKM075B	0.70	0.58*	0.42*	0.42	0.75	0.45
TKM075C	0.13	0.09	0.09	0.09	0.15	0.17
TKM090B	1.21	0.95*	0.72*	0.67	1.30	0.74
TKM090C	0.13	0.09	0.09	0.09	0.15	0.17

PLEASE NOTE: Lubricant should be added at the quantity shown in the above table, not to the oil level line!

12. Maintenance

For gear units, the first oil change should be after a 300 hour break in period. Use caution when cleaning the gear units, and always use the correct solution to not damage units. Never mix synthetic oil and mineral oil together!

Check oil level every 3000 hours of use or 6 months (which ever comes first). Check the seals visually for any leakage. For IEC input gear units, the elastomer should be tested or replaced as necessary.

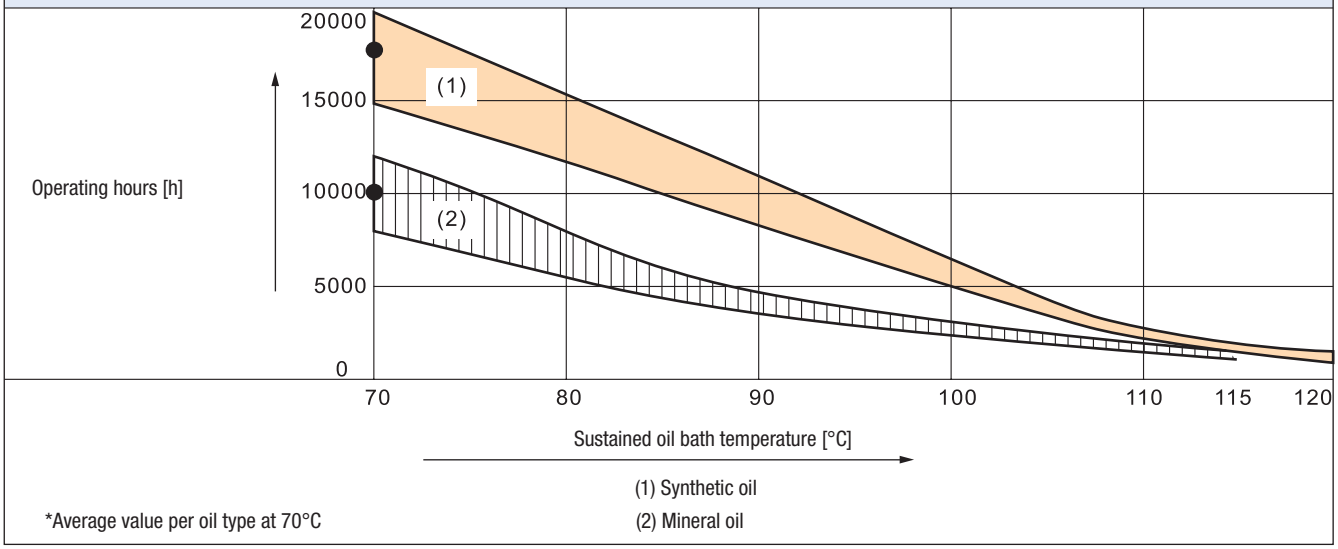
Perform regular maintenance on the unit as recommended - see below chart for schedule based on use (operating hours).

- Inspect the unit on a regular basis and change the mineral oil and bearing grease at a minimum of every 3 years.
- Change the oil seals on the output shaft on a regular basis as needed.

In the event of a malfunction, immediately discontinue use and contact customer service for assistance. When contacting, please have item specifications available, including:

- Manufacturer/Model Name & Series of machine
- Hours used
- Description of Problem

Oil change intervals for standard gear units with normal use and environmental conditions



*Average value per oil type at 70°C

(1) Synthetic oil

(2) Mineral oil

13. Storage

- Store equipment under cover, protected against rain and snow, without shock loads.
- Underlay the block and other material between the ground and equipment.
- Any opened (unused) gear units should be added with anti-corrosive oil coating the surface, and be returned to package after use.
- May be stored up to two years with regular inspections. Check for cleanliness, mechanical damage and corrosion protection.

14. Notice For Ordering

Please have the following information available when placing an order:

- Model Mark of the gear units (type, ratio power and mounting position)
- Gear units are typically painted silver
- Quantity of units ordered and any special requirements for your order
- Your company name, contact and telephone

15. Gear Unit Malfunctions

Problem	Possible Cause	Remedy
Unusual, regular running noise	A. Meshing/grinding noise: Bearing damage. B. Knocking noise: Irregularity in the gearing	A. Check the oil, change bearing B. Contact customer service
Unusual, irregular running noise	Foreign bodies in the oil	A. Check the oil B. Stop the drive, contact customer service
Oil leaking [1)] • From the gear cover plate • From the motor flange • From the motor oil seal • From the gear unit flange • From the output end oil sea	A. Rubber seal on the gear cover plate leaking B. Seal defective C. Gear unit not vented	A. Tighten the bolts on the gear cover plate and observe the gear unit. Oil still leaking: Contact customer service B. Contact customer service C. Vent the gear unit (see "Mounting Positions")
Oil leaking from breaking valve	A. Too much oil B. Drive operated in incorrect mounting position C. Frequent cold starts (oil foams) and/or high oil level	A. Correct the oil level (see Sec. "Inspection and Maintenance") B. Mount the breather valve correctly (see Sec."Mounting Positions") and correct the oil level (see "Lubricants")
Output shaft does not turn although the motor is running or the input shaft is rotated	Connection between shaft and hub in gear unit interrupted	Send in the gear unit/gear motor for repair

1) Short-term oil/grease leakage at the oil seal is possible in the run-in phase (24 hours running time).

16. Charge Characteristic Chart (for reference)

Air Blowers	
Air blower (axial or radial)	A
Fan of cooling tower	B
Induced draught fan	B
Rotary piston type fan	B
Turbo-fan	A
Construction Machinery	
Concrete mixer	B
Hoist	B
Road building machinery	B
Boring mill	B
Chemical Machinery	
Mixer (liquid)	A
Mixer (half liquid)	B
Centrifuge (heavy)	B
Centrifuge (light)	A
** Cooling rolling drum	B
** Dry rolling drum	B
Mixer	B
Compressor	
Piston type compressor	C
Turbo-compressor	B
Transmission Freighter	
Pan conveyer	B
Balance lifter	B
Trough conveyer	B
Ribbon conveyer (large piece)	C
Ribbon coveyer (small piece)	B
Drum-type flour conveyer	A
Chain conveyer	B
Ring type conveyer	B
Lifter	B
Hoist	B
Crank-connecting conveyer	B
Lifter	B
Worm conveyer	B
Steel-band conveyer	B
Chain reed-type conveyer	B
Crab freighter	B
Hoist	
Bracket swing gear assembly	B
Hoist gear assembly	A
Derrick gear assembly	B
Steering gear assembly	B
Moving gear assembly	C
-	-

Land Dredge	
Drum-type Conveyer	C
Drum-type rotation wheel	C
Dredger head	C
Powered crab	B
Pump	B
Pump turning gear assembly	B
Moving gear assembly (apron wheel)	C
Moving gear assembly (track)	B
Foodstuff Processing Machinery	
Placer or box filler	A
Cane crusher	A
** Cane cutter	B
** Cane crasher	C
Mixer	B
Paste bucket	B
Packager	A
Beet slicer	B
Beet washing machine	B
Motor and Conversion Equipment	
Frequency converter	C
Motor	C
Welding motor	C
Washing Machine	
Rolling drum	B
Washing machine	B
Metal Roller Machine	
** Steel cutter	C
** Chain conveyer	B
** Cold mill	C
Continuous casting equipment	B
** Cold bed	B
** Cropper	C
** Cross steering transmitter	B
** Deruster	C
** Heavy and medium steel mill	C
** Bar mill	C
Bar transmission equipment	B
Bar pusher	B
Push bed	B
** Shears	C
** Lumber elevator platform	B
Roll adjusting equipment	B
Roller Leveling Machine	B
** Mill rolling way (heavy)	C
** Mill rolling way (light)	B

Charge Characteristic Chart (for reference)

Metal Roller Machine	
** Sheet rolling mill	C
* Trimming shears	B
Pipe welder	C
Soldering machine (belt material and wire rod)	B
Wire drawbench	B
Metal Processing Machine Tools	
Power shaft	A
** Forging machine	C
Drop hammer	C
Machine tool and necessary	A
Machine tool and main driving equipment	B
Metal facing machine	C
Plate-leveling machine tool	C
Backing-out punch	C
Press machine tool	C
Cutting machine	B
Sheet bending machine tool	B
Petroleum Processing Machinery	
** Pump of oil pipe line	B
Rotary drilling equipment	C
Papering Machinery	
** Glazing press	C
** Multilayer paper board machine	C
** Drying cylinder	C
** Glazing cylinder	C
** Masher	C
** Mashing and breaking machine	C
** Suction roll	C
** Wet paper roller machine	C
** Water absorbing roller machine	C
Weldon Machine	C
Pumps	
Centrifugal pump (thin liquid)	A
Centrifugal pump (half liquid)	B
Displacement pump	C
Plunger pump	C
Force pump	C

Plastic Equipment	
** Glazing press	B
** Ejecting press	B
** Spiral extruding machine	B
** Mixing machine	B
Rubber Equipment	
** Glazing press	B
** Ejecting press	C
** Mixing stir machine	B
Kneading machine	B
** Roller machine	C
Stone, Porcelain & Clay Processing Equipment	
Ball crusher	B
** Ejecting press and breaker	C
Breaker	C
Brick press	C
** Beating crusher	C
** Converter	C
** Cylinder mill	C
Textile Machinery	
Feeding machine	B
Loom machine	B
Dyeing machine	B
Purified drum	B
Weldon machine	B
Water Treatment Equipment	
** Air blast	B
Screw pump	B
Wood Processing Machine Tool	
Barker	C
Facing machine	B
Saw bench	C
Wood processing machine tool	A

Note: A-Uniform load; B-Moderate shock load; C-Heavy shock load; ** - for 24 hour system.

7509 South 5th Street, Suite 110, Ridgefield, WA 98642 | Email: cs@machmo.com | Phone: 360.601.0666