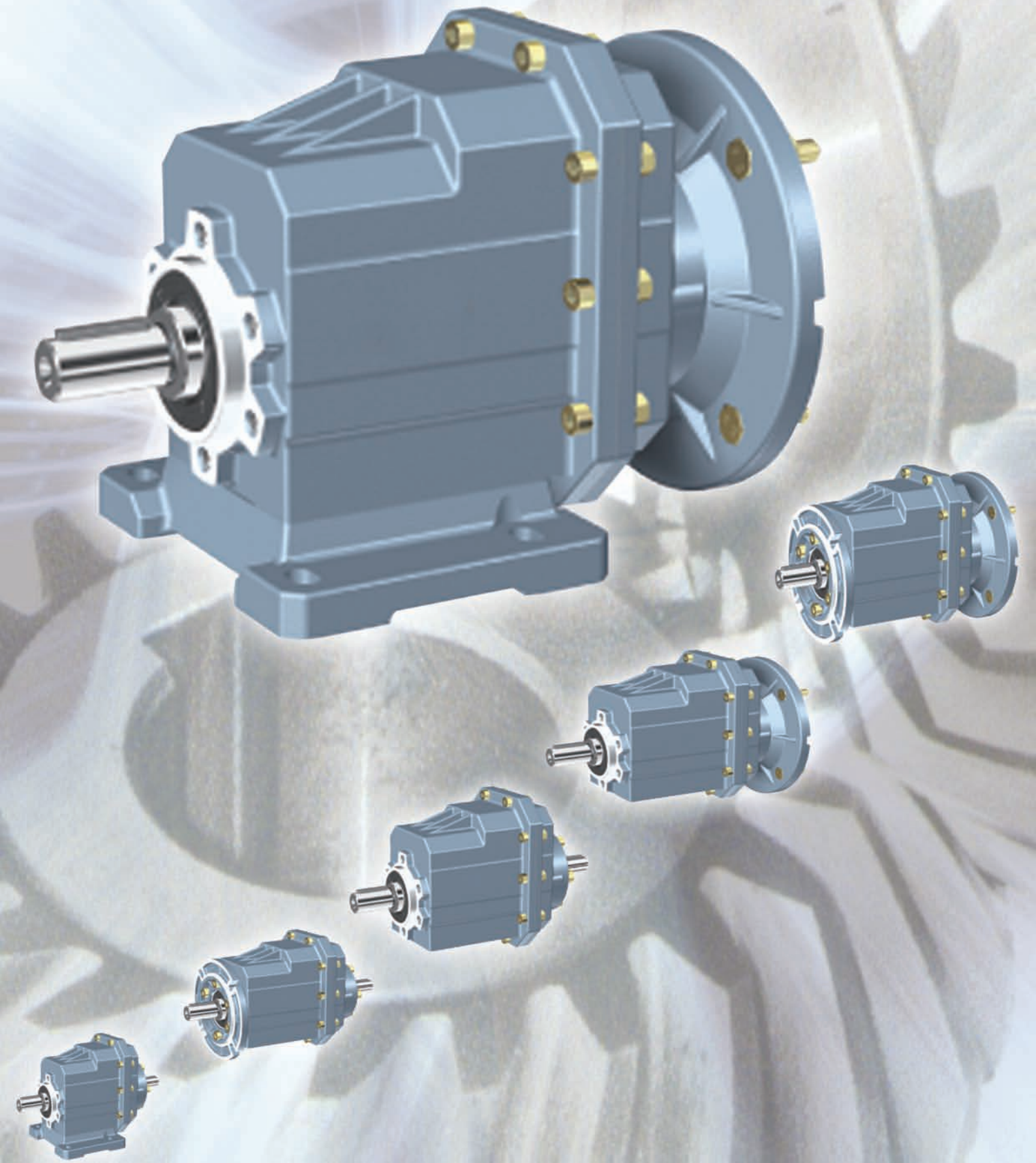
YUEMA

CHC SERIES MINI HELICAL GEAR UNITS



1. SUMMARIZE

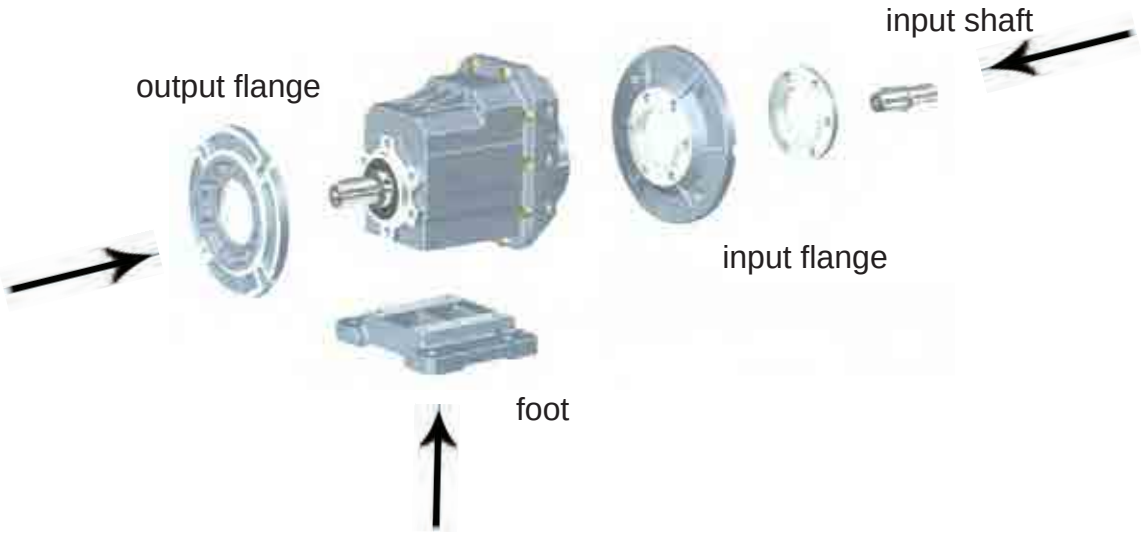
CHC Series helical gear units is a new generation mechanic-electrical integrated product, which designed basing on the modular system. It can be connected respectively with motors such as normal motor, brake motor, explosion-proof motor, frequency conversion motor, servo motor, IEC motor and so on. It can be mounted discretionary six orientation in solid space. This kind of product is widely used in drive fields such as textile, foodstuff, beverage, chemical industry, automatic arm ladder, automatic storage equipment, metallurgy, tobacco, environment-protection, logistics and so on.

1.1 Products characteristics

- Modularity;
- High efficiency;
- Low noise;
- Space effective, refined design;
- Universal mounting;
- Aluminium housing, light in weight;
- Gears in carbonize hard,durable;
- Multistructure, can be combined in many forms to meet needs of all kinds of transmission conditions.

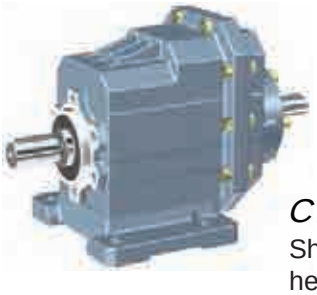
CHC Series helical gear units has more than 4 types. Power 0.12-4KW; Ratio 3.66-54;Torque max 120-500Nm. It can be connected (foot, flange) discretionary and use multi-mounting positions according to customers' requirements.

1.2 Structure feature

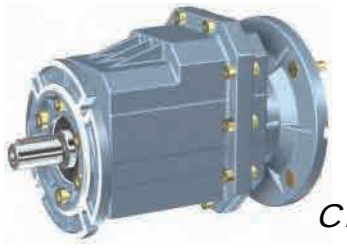


2. PRODUCT STRUCTURE PICTURE

CHC..P(IEC)
Foot-mounted helical gear unit

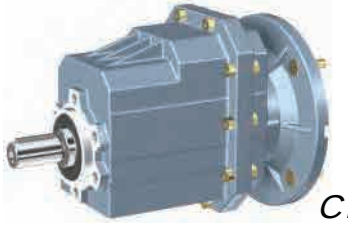


CHC..HS
Shaft input foot-mounted helical gear unit



CHCF..P(IEC)
Flange-mounted helical gear unit

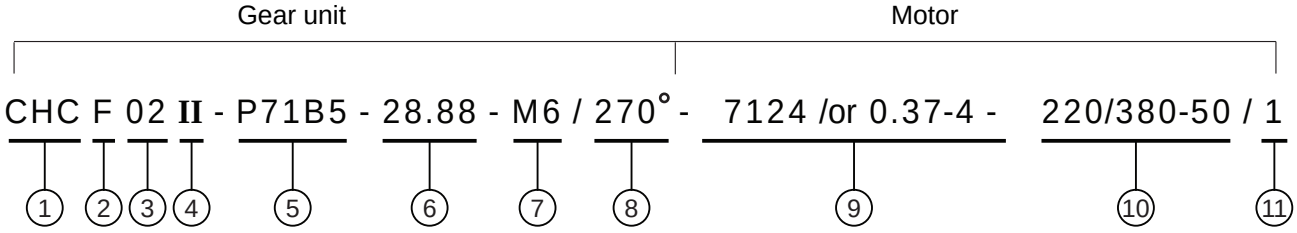
CHCF..HS
Shaft input flange-mounted helical gear unit



CHCZ..P(IEC)
B14 Flange-mounted helical gear unit

CHCZ..HS
Shaft input B14 flange-mounted helical gear unit

3. MODEL ILLUMINATE



No	Comments
1	CHC: code for gear units series
2	1). No code means foot-mounted 2). F: b5 flange mounted 3). Z: b14 flange mounted
3	Specification code of gear units 01,02,03,04
4	1). No code means foot-mounted, no flange 3). I, II, III: B5 Output flange specification, default I not to write out is ok
5	1). IEC Motor adapters 2). HS: Shaft input
6	Transmission ratio of gear units i
7	M1: Mounting position default mounting position M1 not to write out is ok
8	Position diagram for motor terminal box default position 0°(R) not to write out is ok
9	1). No mark means without motor 2). Model motos (poles of power)
10	Voltage - frequency
11	Position diagram for motor terminal box default position 1 not to write out is ok

Example: CHC01-P71B5 - 28.50

CHCZ03 - HS - 6.31

CHCF02III - P80B14- 8.78-7124 -220/380-50 / 2

When ordering, you should show whether the reducers are equipped with motors, otherwise reducers aren't supplied with motors.

4. RELEVANT PARAMETER

4.1 Power P

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

$$P_{1n} \geqslant P_1 \cdot f_s \text{ [kW]}$$

P_1	Input power
P_2	Output power
P_{1n}	Rated input motor power
f_s	Service factor
η	Transmission efficiency

CHC Series helical gear units has 2 stage and the efficiency is about 96%.

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

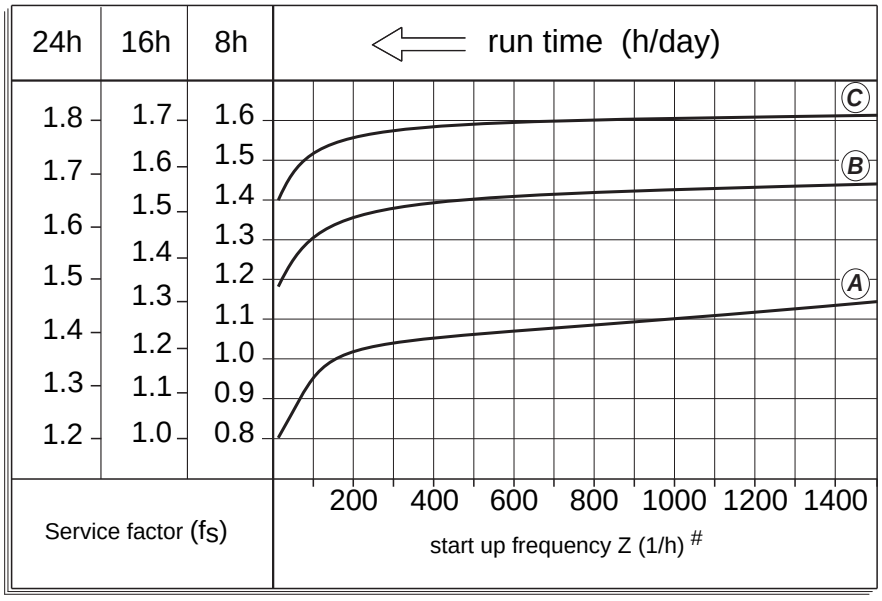
$$M_2 = \frac{9550 \cdot P_1 \cdot \eta}{n_2} \text{ [Nm]}$$

$$M_{2n} \geqslant M_2 \cdot f_s \text{ [Nm]}$$

M_2	Output torque
M_{2n}	Rated output torque
P_1	Input power
η	Transmission efficiency
f_s	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.



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

Ⓐ Uniformshock load, permitted mass acceleration factor $\leqslant$ 0.2

Ⓑ Moderate shock load, permitted mass acceleration factor $\leqslant$ 3

Ⓒ Heavy shock load, permitted mass acceleration factor $\leqslant$ 10

Load classifications see the addendum.

4.5.2 Mass acceleration factor

The mass acceleration factor is calculated as follows:

$$fa = \frac{Jc}{Jm}$$

fa Mass acceleration factor

Jc All external mass moments of inertia [kgm^2]

Jm 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 f_S selected from the catalogue must be equal or slightly higher than the calculated use factor f_S .

4.6 Radial loads Fr

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 f_Z :

Transmission element	Transmission element factor F_Z	Comments
Gears	1.00	⩾ 17 / teeth
	1.15	< 17 / teeth
Chain sprockets	1.00	⩾ 20 / teeth
	1.25	< 20 / teeth
	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:

$$F_r = \frac{M \cdot 2000 \cdot f_z}{d_0} \text{ [N]}$$

Fr Resulting radial load [N]

M Torque on the shaft [Nm]

d_0 Mean diameter of the mounted transmis sion element in [mm]

f_z Transmission element factor

The allowed radial load force on the shaft is calculated with the following formula:

$$FxL \quad \frac{Fr2 \cdot a}{(b+x)} \text{ [N]}$$

Fr2 Permitted overhung load (x = L/2) for foot-mounted gear units according to the selection tables in [N]

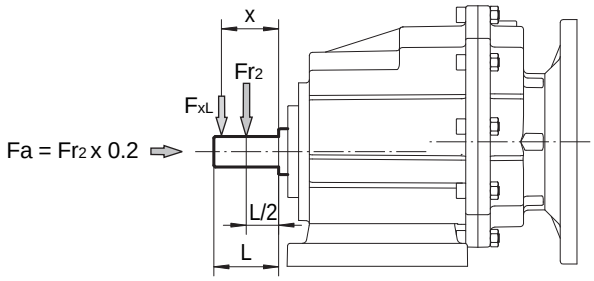
a, b Gear unit constant for overhung load conversion [mm]

x Distance from the shaft shoulder to the force application point in (mm)

The values of a , b , Fr2 are given in the following tables:

	CHC01	CHC02	CHC03	CHC04
a	103	116.5	130	147
b	83	91.5	100	112

Output shafts radial loads & axial loads Fr2, Fa



n2 [min $^{-1}$]		10	40	60	80	100	120	150	180	250	400
Fr2 [N]	CHC01	2500	2500	2180	1980	1840	1630	1400	1320	1080	920
	CHC02	5000	5000	4370	3970	3680	3470	2710	2550	2150	1840
	CHC03	6500	6500	5550	5040	4510	3800	3530	3320	2800	2390
	CHC04	8000	8000	6590	5990	5230	4570	4240	3900	3350	2860

4.7 SELECTION TABLES COMMENTS

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	fs			Page

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

n_2 Output speed [r/min];

M_{2n} Rated output torque [Nm];

$M_{2\,max}$ Permissible output torque [Nm];

i Gear unit ratio;

f_S Service factor;

Gear unit type;

Motor type;

page Dimension sheet page no;

* Finite gear unit reduction ratio.

5. SELECTION EXAMPLE

5.1 Gear units

Example: The required torque on driven machine is 400Nm, works for 6 hours per day, Uniform shock load, start-up frequency is 400 times per hour, ø200mm output flange-mounted, n_2=30 r/min.

see tables, f_S=1.05

$$M_{2n} \geqslant M_2 \cdot f_s = 400 \times 1.05 = 420[Nm]$$

$$i = \frac{n_1}{n_2} = \frac{1400}{30} = 46.67$$

Choose type:

CHCF04 II - P90B5 - 44.18

5.2 Gear motor

Example: The required power on driven machine 1kW, works for 8 hours per day, moderate shock load, start-up cootinnously, M6 foot-mounted, n_2=95 r/min.

see tables, f_S=1.35

$$i = \frac{n_1}{n_2} = \frac{1400}{95} = 14.74$$

$$P_{1n} \quad P_1 \cdot f_s = \frac{P_2}{\eta} \cdot f_s = \frac{1}{0.96} \times 1.35 = 1.41[kW]$$

Choose type:

CHC02 - P90B5 - 14.81 - 1.5-4 - M6

6. RATIO AND IEC MOTOR ADAPTERS

CHC..01..P(IEC)

i	63B5	71B5 71B14	80B5 80B14	90B5 90B14
53.33				
45.89				
40.10				
35.47				
28.50				
23.56				
19.83				
17.86				
14.62				
13.80*				
11.90				
9.81				
9.17				
7.72				
5.69				
4.63				
3.82				

CHC..02..P(IEC)

i	63B5	71B5 71B14	80B5 80B14	90B5 90B14
54.00*				
46.46*				
40.60*				
35.91*				
28.88*				
23.85*				
20.08*				
17.10				
14.81*				
13.21				
12.05				
9.93				
8.78				
7.39				
5.45				
4.43				
3.66				

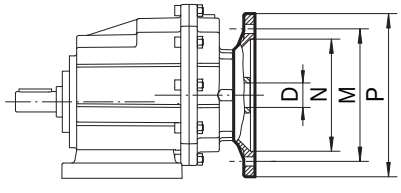
CHC..03..P(IEC)

i	71B5	80B5 80B14	90B5 90B14	100B5 100B14	112B5 112B14
51.30*					
44.18*					
38.63					
34.20*					
30.57					
24.99					
21.15*					
19.24*					
18.21*					
15.30*					
13.30*					
12.60					
10.93*					
9.08					
7.93*					
6.31					
5.48					
4.50					
3.74					

CHC..04..P(IEC)

i	80B5 80B14	90B5 90B14	100B5 100B14	112B5 112B14
51.30*				
44.18*				
38.63				
34.20*				
30.57				
24.99				
21.15*				
19.24*				
18.21*				
15.30*				
13.30*				
12.60				
10.93*				
9.08				
7.93*				
6.31				
5.48				
4.50				
3.74				

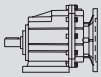
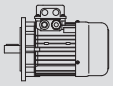
Finite gear unit reduction ratio

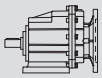
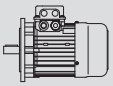


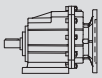
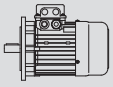
IEC	63B5	71B5	71B14	80B5	80B14	90B5	90B14	100B5	100B14	112B5	112B14
D_{E8}	11	14		19		24		28		28	
P	140	160	105	200	140	200	140	250	160	250	160
M	115	130	85	165	115	165	115	215	130	215	130
N	95	110	70	130	95	130	95	180	110	180	110

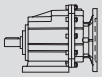
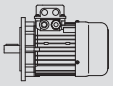
7. GEAR UNIT SELECTION TABLES

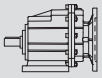
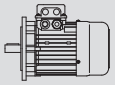
7.1 CHC..P(IEC).. / Performance parameter

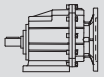
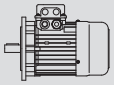
P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	fs				Page
0.12	26.3	42	53.33	2.9	***CHC01***	***63B5***	***6314***	***21***
	30.5	36	45.89	3.3	***CHCF01***	***63B5***	***6314***	***21***
	34.9	32	40.10	3.8	***CHCZ01***	***63B5***	***6314***	***21***
	39.5	28	35.47	4.3				
	49.1	22	28.50	5.4				
	59.4	18.5	23.56	6.5				
	70.6	15.6	19.83	7.7				
	78.4	14.0	17.86	7.1				
	95.8	11.5	14.62	10.4				
	101	10.8	13.80*	9.2				
	118	9.4	11.90	12.8				
	143	7.7	9.81	13.0				
	153	7.2	9.17	11.1				
	181	6.1	7.72	13.2				
	246	4.5	5.69	13.4				
	302	3.6	4.63	16.5				
	366	3.0	3.82	20.0				
0.18	16.9	98	53.33	1.2	***CHC01***	***71B5***	***7116***	***21***
	19.6	84	45.89	1.4	***CHCF01***	***71B5***	***7116***	***21***
	22.4	74	40.10	1.6	***CHCZ01***	***71B5***	***7116***	***21***
	25.4	65	35.47	1.8				
	31.6	52	28.50	2.3				
	26.3	63	53.33	1.9	***CHC01***	***63B5***	***6324***	***21***
	30.5	54	45.89	2.2	***CHCF01***	***63B5***	***6324***	***21***
	34.9	47	40.10	2.5	***CHCZ01***	***63B5***	***6324***	***21***
	39.5	42	35.47	2.9				
	49.1	34	28.50	3.6				
	59.4	28	23.56	4.3				
	70.6	23	19.83	5.1				
	78.4	21	17.86	4.8				
	95.8	17.2	14.62	7.0				
	101	16.3	13.80*	6.1				
	118	14.0	11.90	8.6				
	143	11.6	9.81	8.6				
	153	10.8	9.17	7.4				
	181	9.1	7.72	8.8				
	246	6.7	5.69	8.9				
	302	5.5	4.63	11.0				
	366	4.5	3.82	13.3				
	16.7	99	54.00*	2.0	***CHC02***	***71B5***	***7116***	***23***
	19.4	85	46.46*	2.3	***CHCF02***	***71B5***	***7116***	***23***
	22.2	74	40.60*	2.7	***CHCZ02***	***71B5***	***7116***	***23***
	25.1	66	35.91*	3.0				
	31.2	53	28.88*	3.8				
	25.9	64	54.00*	3.1	***CHC02***	***63B5***	***6324***	***23***
	30.1	55	46.46*	3.7	***CHCF02***	***63B5***	***6324***	***23***
	34.5	48	40.60*	4.2	***CHCZ02***	***63B5***	***6324***	***23***

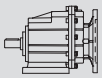
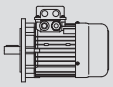
P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	fs			Page
0.25	16.9	136	53.33	0.88	***CHC01***	***71B5/B14***	***7126***	21
	19.6	117	45.89	1.0	***CHCF01***	***71B5/B14***	***7126***	21
	22.4	102	40.10	1.2	***CHCZ01***	***71B5/B14***	***7126***	21
	25.4	90	35.47	1.3				
	31.6	73	28.50	1.7				
	26.3	87	53.33	1.4	***CHC01***	***71B5/B14***	***7114***	21
	30.5	75	45.89	1.6	***CHCF01***	***71B5/B14***	***7114***	21
	34.9	66	40.10	1.8	***CHCZ01***	***71B5/B14***	***7114***	21
	39.5	58	35.47	2.1				
	49.1	47	28.50	2.6				
	59.4	39	23.56	3.1				
	70.6	32	19.83	3.7				
	78.4	29	17.86	3.4				
	95.8	24	14.62	5.0				
	101	23	13.80*	4.4				
	118	19.5	11.90	6.2				
	143	16.1	9.81	6.2				
	153	15.0	9.17	5.3				
	181	12.6	7.72	6.3				
	246	9.3	5.69	6.4				
	302	7.6	4.63	7.9				
	366	6.3	3.82	9.6				
	16.7	138	54.00*	1.5	***CHC02***	***71B5/B14***	***7126***	23
	19.4	118	46.46*	1.7	***CHCF02***	***71B5/B14***	***7126***	23
	22.2	103	40.60*	1.9	***CHCZ02***	***71B5/B14***	***7126***	23
	25.1	91	35.91*	2.2				
	31.2	74	28.88*	2.7				
	25.9	88	54.00*	2.3	***CHC02***	***71B5/B14***	***7114***	23
	30.1	76	46.46*	2.6	***CHCF02***	***71B5/B14***	***7114***	23
	34.5	66	40.60*	3.0	***CHCZ02***	***71B5/B14***	***7114***	23
	39.0	59	35.91*	3.4				
	48.5	47	28.88*	4.2				
0.37	22.4	151	40.10	0.79	***CHC01***	***80B5/B14***	***8016***	21
	25.4	134	35.47	0.90	***CHCF01***	***80B5/B14***	***8016***	21
	31.6	107	28.50	1.1	***CHCZ01***	***80B5/B14***	***8016***	21
	38.2	89	23.56	1.4				
	26.3	129	53.33	0.93	***CHC01***	***71B5/B14***	***7124***	21
	30.5	111	45.89	1.1	***CHCF01***	***71B5/B14***	***7124***	21
	34.9	97	40.10	1.2	***CHCZ01***	***71B5/B14***	***7124***	21
	39.5	86	35.47	1.4				
	49.1	69	28.50	1.7				
	59.4	57	23.56	2.1				
	70.6	48	19.83	2.5				
	78.4	43	17.86	2.3				
	95.8	35	14.62	3.4				
	101	33	13.80*	3.0				
	118	29	11.90	4.2				
	143	24	9.81	4.2				
	153	22	9.17	3.6				
	181	19	7.72	4.3				
	246	14	5.69	4.4				
	302	11	4.63	5.3				
	366	9	3.82	6.5				

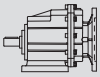
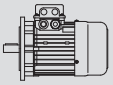
P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	fs			Page
0.37	16.7	204	54.00*	1.0	***CHC02***	***80B5/B14***	***8016***	23
	19.4	175	46.46*	1.1	***CHCF02***	***80B5/B14***	***8016***	23
	22.2	153	40.60*	1.3	***CHCZ02***	***80B5/B14***	***8016***	23
	25.1	135	35.91*	1.5				
	31.2	109	28.88*	1.8				
	25.9	131	54.00*	1.5	***CHC02***	***71B5/B14***	***7124***	23
	30.1	113	46.46*	1.8	***CHCF02***	***71B5/B14***	***7124***	23
	34.5	98	40.60*	2.0	***CHCZ02***	***71B5/B14***	***7124***	23
	39.0	87	35.91*	2.3				
	48.5	70	28.88*	2.9				
	58.7	58	23.85*	3.5				
	81.9	41	17.10	3.9				
	17.5	193	51.30*	1.6	***CHC03***	***80B5/B14***	***8016***	25
	20.4	167	44.18*	1.8	***CHCF03***	***80B5/B14***	***8016***	25
	23.3	146	38.63	2.1	***CHCZ03***	***80B5/B14***	***8016***	25
	26.3	129	34.20*	2.3				
	29.4	115	30.57	2.6				
	27.3	124	51.30*	2.4	***CHC03***	***71B5***	***7124***	25
	31.7	107	44.18*	2.8	***CHCF03***	***71B5***	***7124***	25
	36.2	94	38.63	3.2	***CHCZ03***	***71B5***	***7124***	25
	40.9	83	34.20*	3.6				
0.55	31.6	160	28.50	0.75	***CHC01***	***80B5/B14***	***8026***	21
	38.2	132	23.56	0.91	***CHCF01***	***80B5/B14***	***8026***	21
	45.4	111	19.83	1.1	***CHCZ01***	***80B5/B14***	***8026***	21
	34.9	144	40.10	0.8	***CHC01***	***80B5/B14***	***8014***	21
	39.5	128	35.47	0.9	***CHCF01***	***80B5/B14***	***8014***	21
	49.1	103	28.50	1.2	***CHCZ01***	***80B5/B14***	***8014***	21
	59.4	85	23.56	1.4				
	70.6	71	19.83	1.7				
	78.4	64	17.86	1.6				
	95.8	53	14.62	2.3				
	101	50	13.80*	2.0				
	118	43	11.90	2.8				
	143	35	9.81	2.8				
	153	33	9.17	2.4				
	181	28	7.72	2.9				
	246	20	5.69	2.9				
	302	17	4.63	3.6				
	366	14	3.82	4.4				
	19.4	260	46.46*	0.77	***CHC02***	***80B5/B14***	***8026***	23
	22.2	227	40.60*	0.88	***CHCF02***	***80B5/B14***	***8026***	23
	25.1	201	35.91*	1.0	***CHCZ02***	***80B5/B14***	***8026***	23
	31.2	162	28.88*	1.2				
	37.7	134	23.85*	1.5				
	25.9	194	54.00*	1.0	***CHC02***	***80B5/B14***	***8014***	23
	30.1	167	46.46*	1.2	***CHCF02***	***80B5/B14***	***8014***	23
	34.5	146	40.60*	1.4	***CHCZ02***	***80B5/B14***	***8014***	23
	39.0	129	35.91*	1.5				
	48.5	104	28.88*	1.9				
	58.7	86	23.85*	2.3				

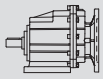
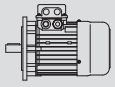
P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	fs				Page
0.55	69.7	72	20.08*	2.8	***CHC02***	***80B5/B14***	***8014***	23
	81.9	62	17.10	2.6	***CHCF02***	***80B5/B14***	***8014***	23
	94.5	53	14.81*	3.7	***CHCZ02***	***80B5/B14***	***8014***	23
	17.5	287	51.30*	1.0	***CHC03***	***80B5/B14***	***8026***	25
	20.4	248	44.18*	1.2	***CHCF03***	***80B5/B14***	***8026***	25
	23.3	216	38.63	1.4	***CHCZ03***	***80B5/B14***	***8026***	25
	26.3	192	34.20*	1.6				
	29.4	171	30.57	1.8				
	27.3	185	51.30*	1.6	***CHC03***	***80B5/B14***	***8014***	25
	31.7	159	44.18*	1.9	***CHCF03***	***80B5/B14***	***8014***	25
	36.2	139	38.63	2.2	***CHCZ03***	***80B5/B14***	***8014***	25
	40.9	123	34.20*	2.4				
	45.8	110	30.57	2.7				
	56.0	90	24.99	3.3				
0.75	49.1	140	28.50	0.86	***CHC01***	***80B5/B14***	***8024***	21
	59.4	116	23.56	1.0	***CHCF01***	***80B5/B14***	***8024***	21
	70.6	97	19.83	1.2	***CHCZ01***	***80B5/B14***	***8024***	21
	78.4	88	17.86	1.1				
	95.8	72	14.62	1.7				
	101	68	13.80*	1.5				
	118	58	11.90	2.1				
	143	48	9.81	2.1				
	153	45	9.17	1.8				
	181	38	7.72	2.1				
	246	28	5.69	2.1				
	302	23	4.63	2.6				
	366	19	3.82	3.2				
	31.2	221	28.88*	0.91	***CHC02***	***90B5/B14***	***90S6***	23
	37.7	182	23.85*	1.1	***CHCF02***	***90B5/B14***	***90S6***	23
	44.8	153	20.08*	1.3	***CHCZ02***	***90B5/B14***	***90S6***	23
	30.1	228	46.46*	0.88	***CHC02***	***80B5/B14***	***8024***	23
	34.5	199	40.60*	1.0	***CHCF02***	***80B5/B14***	***8024***	23
	39.0	176	35.91*	1.1	***CHCZ02***	***80B5/B14***	***8024***	23
	48.5	142	28.88*	1.4				
	58.7	117	23.85*	1.7				
	69.7	99	20.08*	2.0				
	81.9	84	17.10	1.9				
	94.5	73	14.81*	2.7				
	106	65	13.21	2.5				
	116.2	59	12.05	3.4				
	141	49	9.93	3.3				
	159	43	8.78	2.8				
	189	36	7.39	3.3				
	257	27	5.45	3.7				
	97.0	71	28.88*	2.8	***CHC02***	***80B5/B14***	***8012***	23
	117.4	59	23.85*	3.4	***CHCF02***	***80B5/B14***	***8012***	23
	139.4	49	20.08*	4.1	***CHCZ02***	***80B5/B14***	***8012***	23
	163.7	42	17.10	3.8				

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	fs				Page
0.75	17.5	392	51.30*	0.77	***CHC03***	***90B5/B14***	***90S6***	25
	20.4	338	44.18*	0.89	***CHCF03***	***90B5/B14***	***90S6***	25
	23.3	295	38.63	1.0	***CHCZ03***	***90B5/B14***	***90S6***	25
	26.3	261	34.20*	1.1				
	29.4	234	30.57	1.3				
	36.0	191	24.99	1.6				
	27.3	252	51.30*	1.2	***CHC03***	***80B5/B14***	***8024***	25
	31.7	217	44.18*	1.4	***CHCF03***	***80B5/B14***	***8024***	25
	36.2	190	38.63	1.6	***CHCZ03***	***80B5/B14***	***8024***	25
	40.9	168	34.20*	1.8				
	45.8	150	30.57	2.0				
	56.0	123	24.99	2.4				
	66.2	104	21.15*	2.7				
	72.8	94	19.24*	3.0				
	76.9	89	18.21*	3.1				
	91.5	75	15.30*	3.7				
	105	65	13.30*	3.8				
	111	62	12.60	4.0				
	17.5	392	51.30*	1.3	***CHC04***	***90B5/B14***	***90S6***	27
	20.4	338	44.18*	1.5	***CHCF04***	***90B5/B14***	***90S6***	27
	23.3	295	38.63	1.7	***CHCZ04***	***90B5/B14***	***90S6***	27
	26.3	261	34.20*	1.8				
	29.4	234	30.57	2.1				
	27.3	252	51.30*	2.0	***CHC04***	***80B5/B14***	***8024***	27
	31.7	217	44.18*	2.3	***CHCF04***	***80B5/B14***	***8024***	27
	36.2	190	38.63	2.6	***CHCZ04***	***80B5/B14***	***8024***	27
	40.9	168	34.20*	2.9				
	45.8	150	30.57	3.2				
	56.0	123	24.99	3.9				
	66.2	104	21.15*	4.0				
1.1	70.6	143	19.83	0.84	***CHC01***	***90B5/B14***	***90S4***	21
	78.4	129	17.86	0.78	***CHCF01***	***90B5/B14***	***90S4***	21
	95.8	105	14.62	1.1	***CHCZ01***	***90B5/B14***	***90S4***	21
	101	99	13.80*	1.0				
	118	86	11.90	1.4				
	143	71	9.81	1.4				
	153	66	9.17	1.2				
	181	56	7.72	1.4				
	246	41	5.69	1.5				
	302	33	4.63	1.8				
	366	28	3.82	2.2				
	285	35	9.81	2.8	***CHC01***	***80B5/B14***	***8022***	21
	305	33	9.17	2.4	***CHCF01***	***80B5/B14***	***8022***	21
	363	28	7.72	2.9	***CHCZ01***	***80B5/B14***	***8022***	21
	492	20	5.69	2.9				
	605	17	4.63	3.6				
	733	14	3.82	4.4				
	39.0	259	35.91*	0.77	***CHC02***	***90B5/B14***	***90S4***	23
	48.5	208	28.88*	1.0	***CHCF02***	***90B5/B14***	***90S4***	23
	58.7	172	23.85*	1.2	***CHCZ02***	***90B5/B14***	***90S4***	23
	69.7	145	20.08*	1.4				
	81.9	123	17.10	1.3				

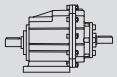
P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	fs			Page
1.1	94.5	107	14.81*	1.9	***CHC02***	***90B5/B14***	***90S4***	23
	106	95	13.21	1.7	***CHCF02***	***90B5/B14***	***90S4***	23
	116	87	12.05	2.3	***CHCZ02***	***90B5/B14***	***90S4***	23
	141	72	9.93	2.2				
	159	63	8.78	1.9				
	189	53	7.39	2.3				
	257	39	5.45	2.5				
	316	32	4.43	3.1				
	383	26	3.66	3.8				
	27.3	370	51.30*	0.81	***CHC03***	***90B5/B14***	***90S4***	25
	31.7	318	44.18*	0.94	***CHCF03***	***90B5/B14***	***90S4***	25
	36.2	278	38.63	1.1	***CHCZ03***	***90B5/B14***	***90S4***	25
	40.9	246	34.20*	1.2				
	45.8	220	30.57	1.4				
	56.0	180	24.99	1.7				
	66.2	152	21.15*	1.8				
	72.8	139	19.24*	2.0				
	76.9	131	18.21*	2.1				
	91.5	110	15.30*	2.5				
	72.5	139	38.63	2.2	***CHC03***	***80B5/B14***	***8022***	25
	81.9	123	34.20*	2.4	***CHCF03***	***80B5/B14***	***8022***	25
	91.6	110	30.57	2.7	***CHCZ03***	***80B5/B14***	***8022***	25
	112.0	90	24.99	3.3				
	132.4	76	21.15*	3.7				
	145.5	69	19.24*	4.0				
	153.8	66	18.21*	4.3				
	27.3	370	51.30*	1.4	***CHC04***	***90B5/B14***	***90S4***	27
	31.7	318	44.18*	1.6	***CHCF04***	***90B5/B14***	***90S4***	27
	36.2	278	38.63	1.8	***CHCZ04***	***90B5/B14***	***90S4***	27
	40.9	246	34.20*	1.9				
	45.8	220	30.57	2.2				
	56.0	180	24.99	2.7				
	66.2	152	21.15*	2.8				
	72.8	139	19.24*	3.0				
	76.9	131	18.21*	3.2				
	91.5	110	15.30*	3.8				
	105	96	13.30*	3.7				
1.5	118	117	11.90	1.0	***CHC01***	***90B5/B14***	***90L4***	21
	143	96	9.81	1.0	***CHCF01***	***90B5/B14***	***90L4***	21
	153	90	9.17	0.9	***CHCZ01***	***90B5/B14***	***90L4***	21
	181	76	7.72	1.1				
	246	56	5.69	1.1				
	302	45	4.63	1.3				
	366	38	3.82	1.6				
	305	45	9.17	1.8	***CHC01***	***90B5/B14***	***90S2***	21
	363	38	7.72	2.1	***CHCF01***	***90B5/B14***	***90S2***	21
	492	28	5.69	2.1	***CHCZ01***	***90B5/B14***	***90S2***	21
	605	23	4.63	2.6				
	733	19	3.82	3.2				

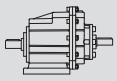
P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	fs			Page
1.5	58.7	234	23.85*	0.85	***CHC02***	***90B5/B14***	***90L4***	23
	69.7	197	20.08*	1.0	***CHCF02***	***90B5/B14***	***90L4***	23
	81.9	168	17.10	1.0	***CHCZ02***	***90B5/B14***	***90L4***	23
	94.5	145	14.81*	1.4				
	106	130	13.21	1.2				
	116	118	12.05	1.7				
	141	98	9.93	1.6				
	159	86	8.78	1.4				
	189	73	7.39	1.7				
	257	54	5.45	1.9				
	316	44	4.43	2.3				
	383	36	3.66	2.8				
	212	65	13.21	2.5	***CHC02***	***90B5/B14***	***90S2***	23
	232	59	12.05	3.4	***CHCF02***	***90B5/B14***	***90S2***	23
	282	49	9.93	3.3	***CHCZ02***	***90B5/B14***	***90S2***	23
	319	43	8.78	2.8				
	379	36	7.39	3.3				
	514	27	5.45	3.7				
	40.9	336	34.20*	0.89	***CHC03***	***90B5/B14***	***90L4***	25
	45.8	300	30.57	1.0	***CHCF03***	***90B5/B14***	***90L4***	25
	56.0	245	24.99	1.2	***CHCZ03***	***90B5/B14***	***90L4***	25
	66.2	208	21.15*	1.3				
	72.8	189	19.24*	1.5				
	76.9	179	18.21*	1.6				
	91.5	150	15.30*	1.9				
	105	131	13.30*	1.9				
	111	124	12.60	2.0				
	128	107	10.93*	1.7				
	154	89	9.08	2.0				
	177	78	7.93*	2.3				
	222	62	6.31	2.9				
	255	54	5.48	2.8				
	311	44	4.50	3.4				
	374	37	3.74	4.1				
	256	54	10.93*	3.4	***CHC03***	***90B5/B14***	***90S2***	25
	308	45	9.08	4.0	***CHCF03***	***90B5/B14***	***90S2***	25
	353	39	7.93*	4.6	***CHCZ03***	***90B5/B14***	***90S2***	25
	26.3	523	34.20*	0.92	***CHC04***	***100B5/B14***	***100L6***	27
	29.4	467	30.57	1.0	***CHCF04***	***100B5/B14***	***100L6***	27
	36.0	382	24.99	1.3	***CHCZ04***	***100B5/B14***	***100L6***	27
	27.3	504	51.30*	1.0	***CHC04***	***90B5/B14***	***90L4***	27
	31.7	434	44.18*	1.2	***CHCF04***	***90B5/B14***	***90L4***	27
	36.2	379	38.63	1.3	***CHCZ04***	***90B5/B14***	***90L4***	27
	40.9	336	34.20*	1.4				
	45.8	300	30.57	1.6				
	56.0	245	24.99	2.0				
	66.2	208	21.15*	2.0				
	72.8	189	19.24*	2.2				
	76.9	179	18.21*	2.3				
	91.5	150	15.30*	2.8				
	105	131	13.30*	2.7				
	111	124	12.60	2.8				
	128	107	10.93*	2.6				
	154	89	9.08	3.1				
	177	78	7.93*	3.3				

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	fs				Page
2.2	66.2	305	21.15*	0.92	***CHC03***	***100B5/B14***	***100LA4***	25
	72.8	277	19.24*	1.0	***CHCF03***	***100B5/B14***	***100LA4***	25
	76.9	262	18.21*	1.1	***CHCZ03***	***100B5/B14***	***100LA4***	25
	91.5	220	15.30*	1.1				
	105	192	13.30*	1.3				
	111	182	12.60	1.4				
	128	157	10.93*	1.1				
	154	131	9.08	1.4				
	177	114	7.93*	1.6				
	222	91	6.31	2.0				
	255	79	5.48	1.9				
	311	65	4.50	2.3				
	374	54	3.74	2.8				
	308	65	9.08	2.8	***CHC03***	***90B5/B14***	***90L2***	25
	353	57	7.93*	3.2	***CHCF03***	***90B5/B14***	***90L2***	25
	444	45	6.31	4.0	***CHCZ03***	***90B5/B14***	***90L2***	25
	511	39	5.48	3.8				
	36.0	560	24.99	0.86	***CHC04***	***112B5/B14***	***112M6***	27
	42.6	474	21.15*	0.9	***CHCF04***	***112B5/B14***	***112M6***	27
	46.8	431	19.24*	1.0	***CHCZ04***	***112B5/B14***	***112M6***	27
	49.4	408	18.21*	1.0				
	40.9	493	34.20*	1.0	***CHC04***	***100B5/B14***	***100LA4***	27
	45.8	440	30.57	1.1	***CHCF04***	***100B5/B14***	***100LA4***	27
	56.0	360	24.99	1.3	***CHCZ04***	***100B5/B14***	***100LA4***	27
	66.2	305	21.15*	1.4				
	72.8	277	19.24*	1.5				
	76.9	262	18.21*	1.6				
	91.5	220	15.30*	1.9				
	105	192	13.30*	1.8				
	111	182	12.60	1.9				
	128	157	10.93*	1.8				
	154	131	9.08	2.1				
	177	114	7.93*	2.3				
	222	91	6.31	2.9				
	255	79	5.48	2.9				
	311	65	4.50	3.5				
	374	54	3.74	4.3				
3	91.5	301	15.30*	0.93	***CHC03***	***100B5/B14***	***100LB4***	25
	105	261	13.30*	1.0	***CHCF03***	***100B5/B14***	***100LB4***	25
	111	248	12.60	1.0	***CHCZ03***	***100B5/B14***	***100LB4***	25
	128	215	10.93*	0.8				
	154	178	9.08	1.0				
	177	156	7.93*	1.2				
	222	124	6.31	1.5				
	255	108	5.48	1.4				
	311	88	4.50	1.7				
	374	73	3.74	2.0				
	45.8	601	30.57	0.80	***CHC04***	***100B5/B14***	***100LB4***	27
	56.0	491	24.99	1.0	***CHCF04***	***100B5/B14***	***100LB4***	27
	66.2	416	21.15*	1.0	***CHCZ04***	***100B5/B14***	***100LB4***	27
	72.8	378	19.24*	1.1				

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	fs			Page
3	76.9	358	18.21*	1.2	***CHC04***	***100B5/B14***	***100LB4***	27
	91.5	301	15.30*	1.4	***CHCF04***	***100B5/B14***	***100LB4***	27
	105	261	13.30*	1.3	***CHCZ04***	***100B5/B14***	***100LB4***	27
	111	248	12.60	1.4				
	128	215	10.93*	1.3				
	154	178	9.08	1.6				
	177	156	7.93*	1.7				
	222	124	6.31	2.1				
	255	108	5.48	2.1				
	311	88	4.50	2.6				
	374	73	3.74	3.1				
	308	89	9.08	3.1	***CHC04***	***100B5/B14***	***100L2***	27
	353	78	7.93*	3.3	***CHCF04***	***100B5/B14***	***100L2***	27
	444	62	6.31	4.2	***CHCZ04***	***100B5/B14***	***100L2***	27
	511	54	5.48	4.3				
4	177	208	7.93*	0.87	***CHC03***	***112B5/B14***	***112M4***	25
	222	165	6.31	1.1	***CHCF03***	***112B5/B14***	***112M4***	25
	255	144	5.48	1.0	***CHCZ03***	***112B5/B14***	***112M4***	25
	311	118	4.50	1.3				
	374	98	3.74	1.5				
	105	348	13.30*	1.0	***CHC04***	***112B5/B14***	***112M4***	27
	111	330	12.60	1.1	***CHCF04***	***112B5/B14***	***112M4***	27
	128	286	10.93*	1.0	***CHCZ04***	***112B5/B14***	***112M4***	27
	154	238	9.08	1.2				
	177	208	7.93*	1.3				
	222	165	6.31	1.6				
	255	144	5.48	1.6				
	311	118	4.50	2.0				
	374	98	3.74	2.3				
	308	119	9.08	2.4	***CHC04***	***112B5/B14***	***112M2***	27
	353	104	7.93*	2.5	***CHCF04***	***112B5/B14***	***112M2***	27
	444	83	6.31	3.1	***CHCZ04***	***112B5/B14***	***112M2***	27
	511	72	5.48	3.2				
	622	59	4.50	3.9				

7.2 CHC..HS.. / Performance parameter

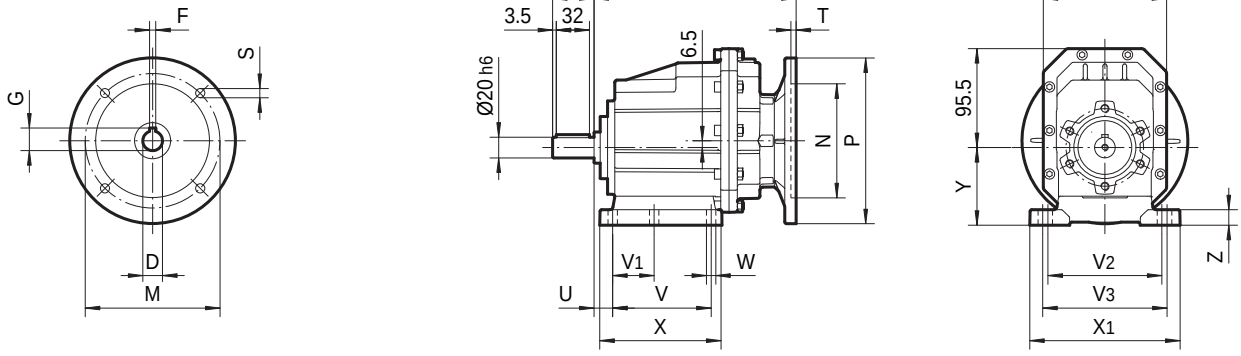
M_{2max} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]		Page
120	1400	53.3	0.34	26.3	***CHC01-HS***	22
120	1400	45.9	0.40	30.5	***CHCF01-HS***	22
120	1400	40.1	0.46	34.9	***CHCZ01-HS***	22
120	1400	35.5	0.52	39.5		
120	1400	28.5	0.64	49.1		
120	1400	23.6	0.78	59.4		
120	1400	19.8	0.92	70.6		
100	1400	17.9	0.86	78.4		
120	1400	14.6	1.25	95.7		
100	1400	13.8	1.10	101		
120	1400	11.9	1.54	118		
100	1400	9.8	1.56	143		
80	1400	9.2	1.34	153		
80	1400	7.7	1.58	181		
60	1400	5.7	1.61	246		
60	1400	4.6	1.98	302		
60	1400	3.8	2.40	367		
200	1400	54.0	0.57	25.9	***CHC02-HS***	24
200	1400	46.5	0.66	30.1	***CHCF02-HS***	24
200	1400	40.6	0.75	34.5	***CHCZ02-HS***	24
200	1400	35.9	0.85	39.0		
200	1400	28.9	1.06	48.5		
200	1400	23.9	1.28	58.7		
200	1400	20.1	1.52	69.7		
160	1400	17.1	1.43	81.9		
200	1400	14.8	2.06	94.6		
160	1400	13.2	1.85	106		
200	1400	12.1	2.53	116		
160	1400	9.9	2.46	141		
120	1400	8.8	2.08	159		
120	1400	7.4	2.49	190		
100	1400	5.5	2.80	257		
100	1400	4.4	3.45	316		
100	1400	3.7	4.18	383		

M_{2max} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]		Page
300	1400	51.3	0.89	27.3	***CHC03-HS***	26
300	1400	44.2	1.04	31.7	***CHCF03-HS***	26
300	1400	38.6	1.19	36.2	***CHCZ03-HS***	26
300	1400	34.2	1.34	40.9		
300	1400	30.6	1.50	45.8		
300	1400	25.0	1.83	56.0		
280	1400	21.2	2.02	66.2		
280	1400	19.2	2.22	72.8		
280	1400	18.2	2.35	76.9		
280	1400	15.3	2.79	91.5		
250	1400	13.3	2.86	105		
250	1400	12.6	3.03	111		
180	1400	10.9	2.51	128		
180	1400	9.1	3.02	154		
180	1400	7.9	3.46	176		
180	1400	6.3	4.36	222		
150	1400	5.5	4.17	255		
150	1400	4.5	5.09	311		
150	1400	3.7	6.12	374		
500	1400	51.3	1.49	27.3	***CHC04-HS***	28
500	1400	44.2	1.73	31.7	***CHCF04-HS***	28
500	1400	38.6	1.98	36.2	***CHCZ04-HS***	28
480	1400	34.2	2.14	40.9		
480	1400	30.6	2.40	45.8		
480	1400	25.0	2.93	56.0		
420	1400	21.2	3.03	66.2		
420	1400	19.2	3.34	72.8		
420	1400	18.2	3.52	76.9		
420	1400	15.3	4.19	91.5		
350	1400	13.3	4.01	105		
350	1400	12.6	4.24	111		
280	1400	10.9	3.91	128		
280	1400	9.1	4.70	154		
260	1400	7.9	4.99	176		
260	1400	6.3	6.30	222		
230	1400	5.5	6.40	255		
230	1400	4.5	7.80	311		
230	1400	3.7	9.38	374		

8. OUTLINE DIMENSION SHEET

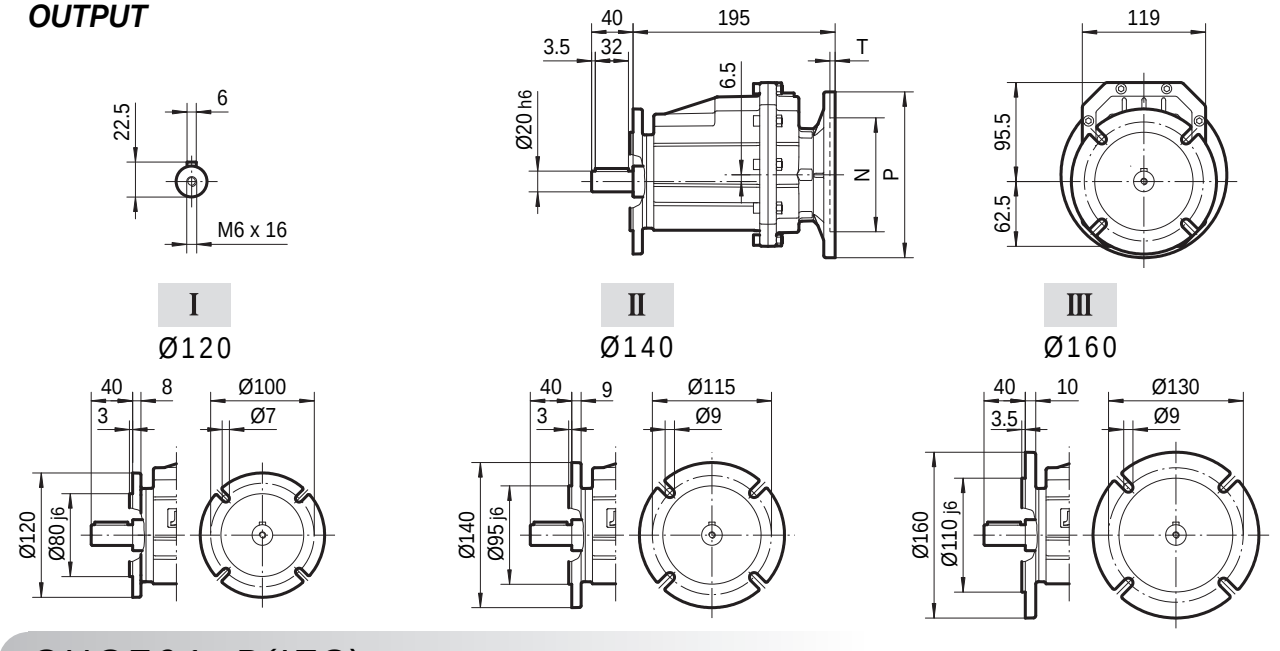
CHC01..P(IEC)

INPUT

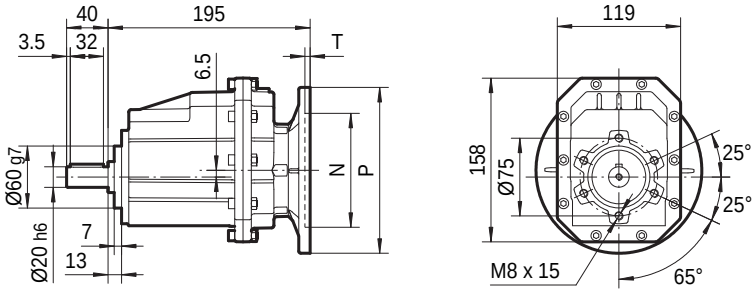


CHCF01..P(IEC)

OUTPUT



CHCZ01..P(IEC)

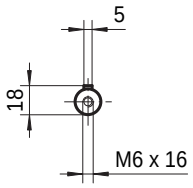


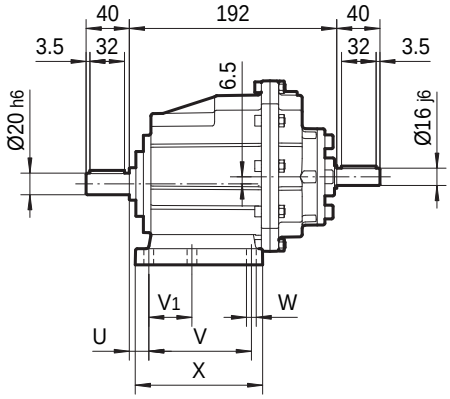
IEC	D	F	G	P	M	N	S	T
63B5	11	4	12.8	140	115	95	9	5
71B5	14	5	16.3	160	130	110	9	5
71B14	14	5	16.3	105	85	70	7	5
80B5	19	6	21.8	200	165	130	11	5
80B14	19	6	21.8	120	100	80	7	5
90B5	24	8	27.3	200	165	130	11	5
90B14	24	8	27.3	140	115	95	9	5

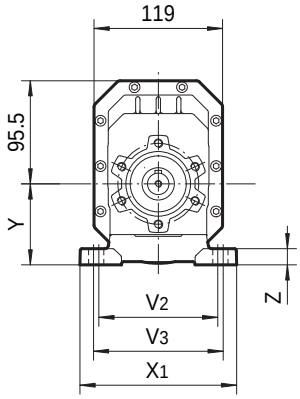
Foot Code	U	V	V1	V2	V3	W	X	X1	Y	Z
B01	18	87	50	110	—	9	118	130	85	15
M01	18	80	—	110	120	9	118	145	75	15
M02	25	85	—	110	120	9	112	145	75	15
B02	18	107.5	60	—	130	11	136	155	95	17

CHC01..HS

INPUT

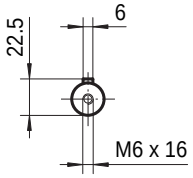


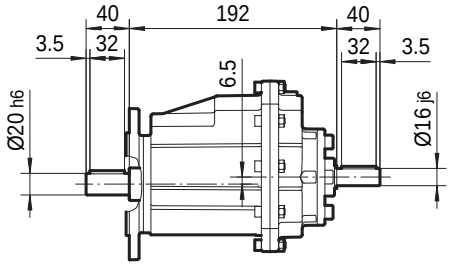


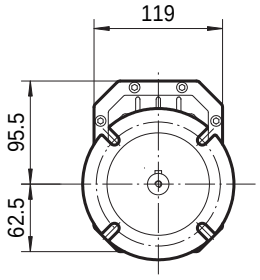


CHCF01..HS

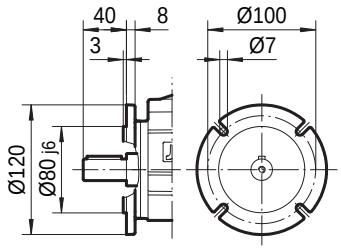
OUTPUT



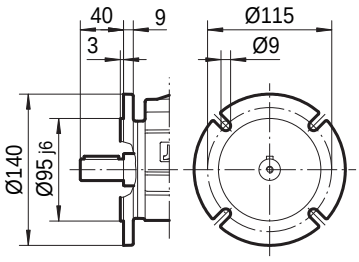




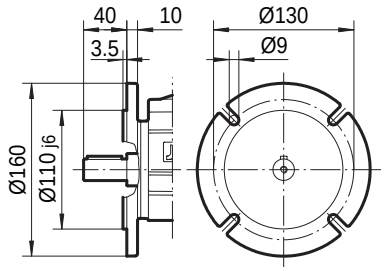
I Ø120



II Ø140



III Ø160



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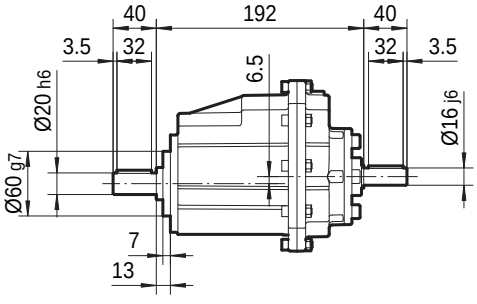
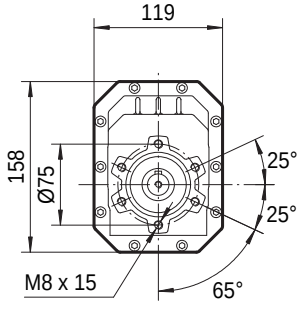
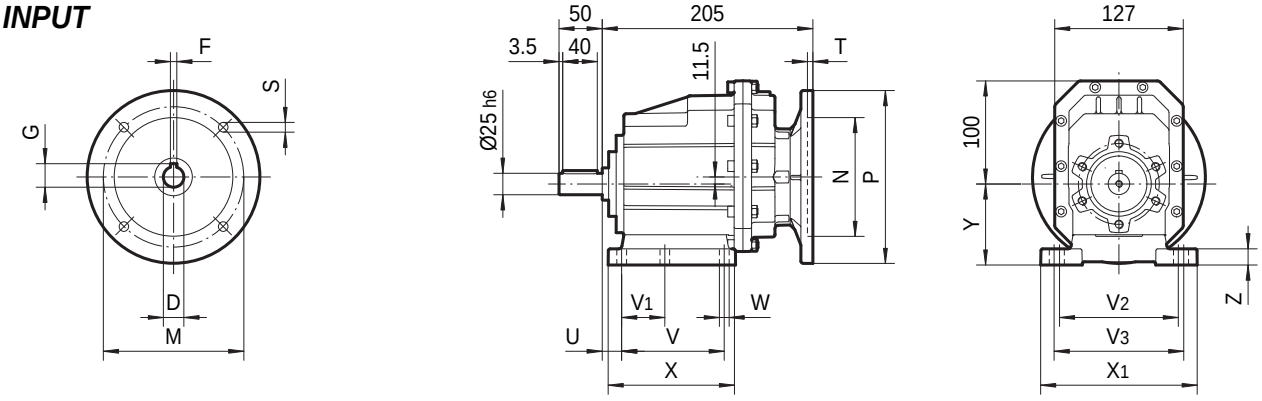




Foot Code	U	V	V1	V2	V3	W	X	X1	Y	Z
B01	18	87	50	110	—	9	118	130	85	15
M01	18	80	—	110	120	9	118	145	75	15
M02	25	85	—	110	120	9	112	145	75	15
B02	18	107.5	60	—	130	11	136	155	95	17

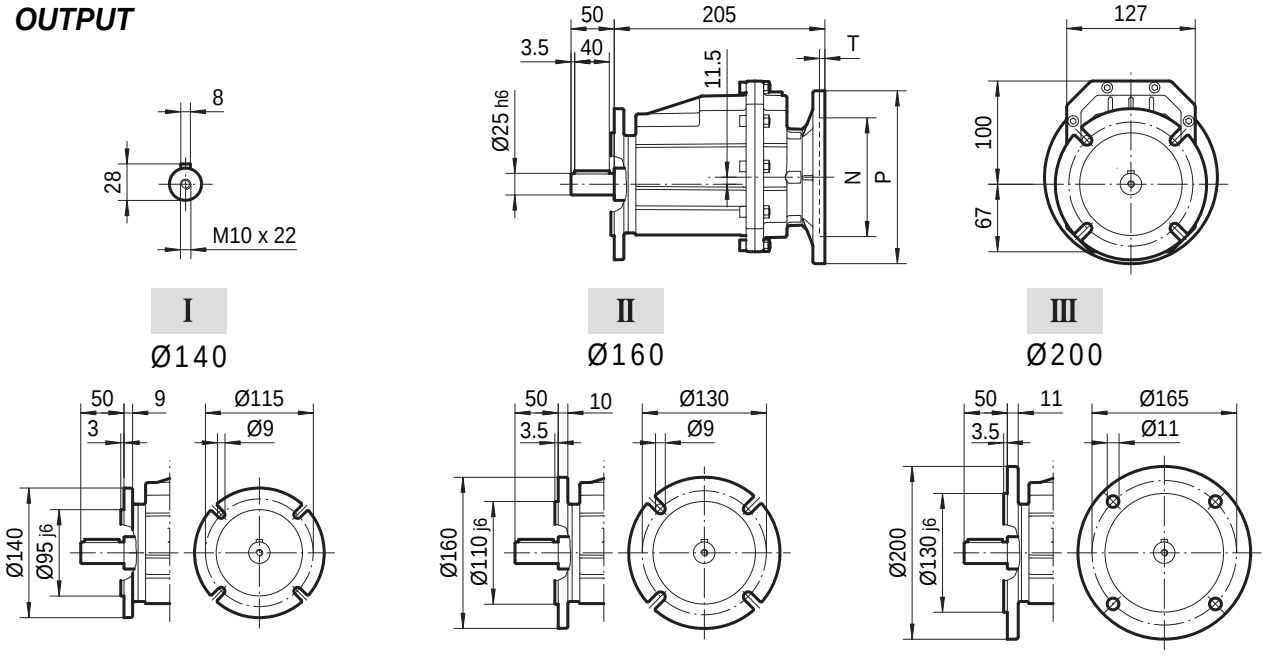
CHC02..P(IEC)

INPUT



CHCF02..P(IEC)

OUTPUT



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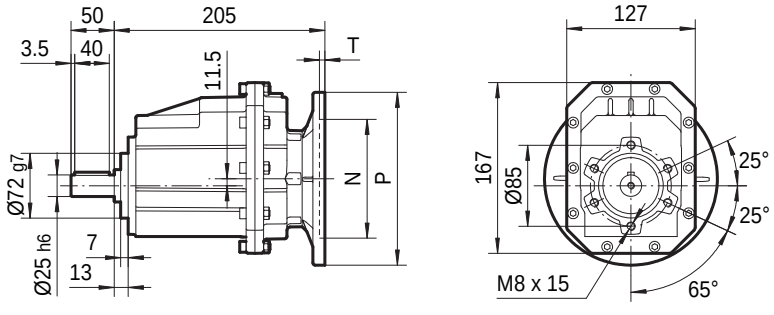
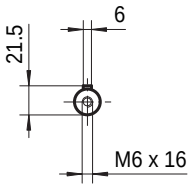


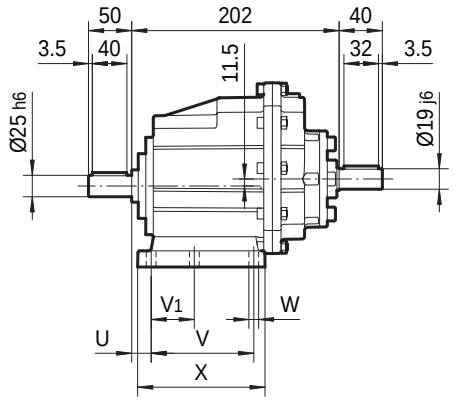
IEC	D	F	G	P	M	N	S	T
63B5	11	4	12.8	140	115	95	9	5
71B5	14	5	16.3	160	130	110	9	5
71B14	14	5	16.3	105	85	70	7	5
80B5	19	6	21.8	200	165	130	11	5
80B14	19	6	21.8	120	100	80	7	5
90B5	24	8	27.3	200	165	130	11	5
90B14	24	8	27.3	140	115	95	9	5

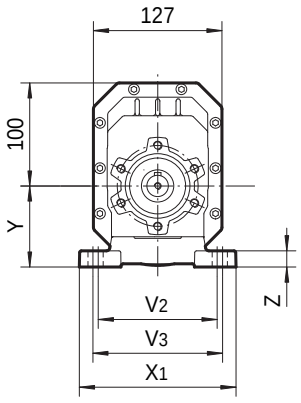
Foot Code	U	V	V1	V2	V3	W	X	X1	Y	Z
B02	18	107.5	60	—	130	11	136	155	100	17
M02	25	85	—	110	120	9	112	145	80	15
M01	18	80	—	110	120	9	118	145	80	15
B01	18	87	50	110	—	9	118	130	90	15

CHC02..HS

INPUT

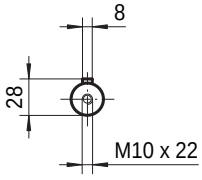


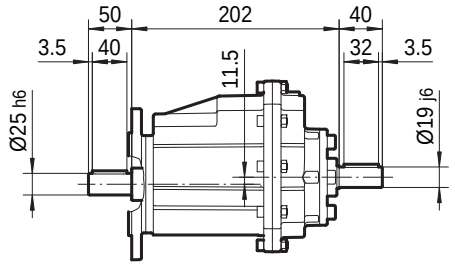


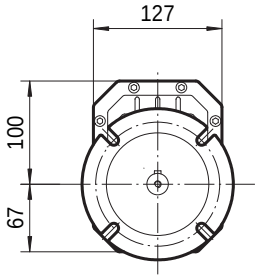


CHCF02..HS

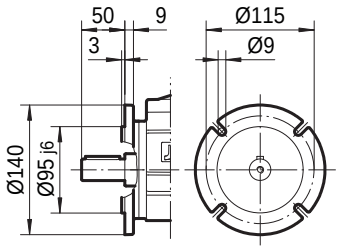
OUTPUT



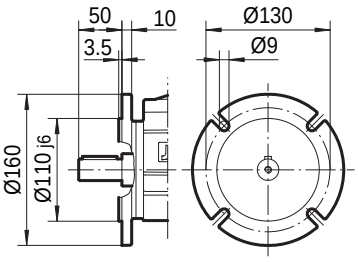




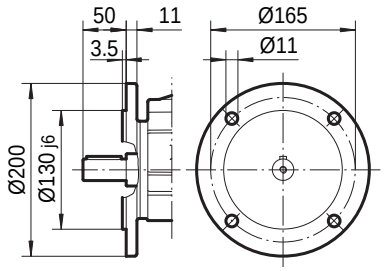
I Ø140



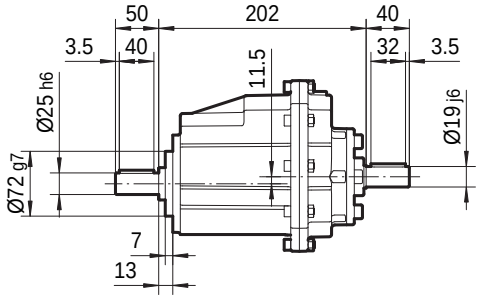
II Ø160

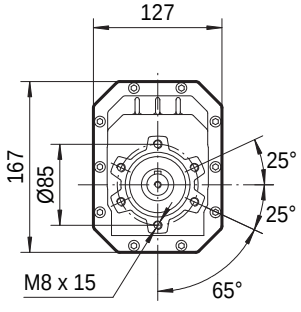


III Ø200



CHCZ02..HS

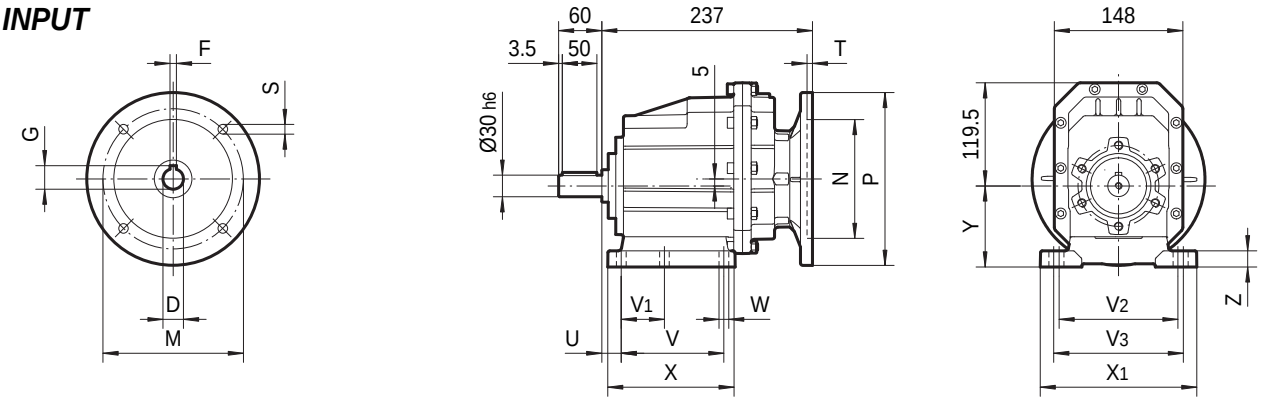




Foot Code	U	V	V_1	V_2	V_3	W	X	X_1	Y	Z
B02	18	107.5	60	—	130	11	136	155	100	17
M02	25	85	—	110	120	9	112	145	80	15
M01	18	80	—	110	120	9	118	145	80	15
B01	18	87	50	110	—	9	118	130	90	15

CHC03..P(IEC)

INPUT



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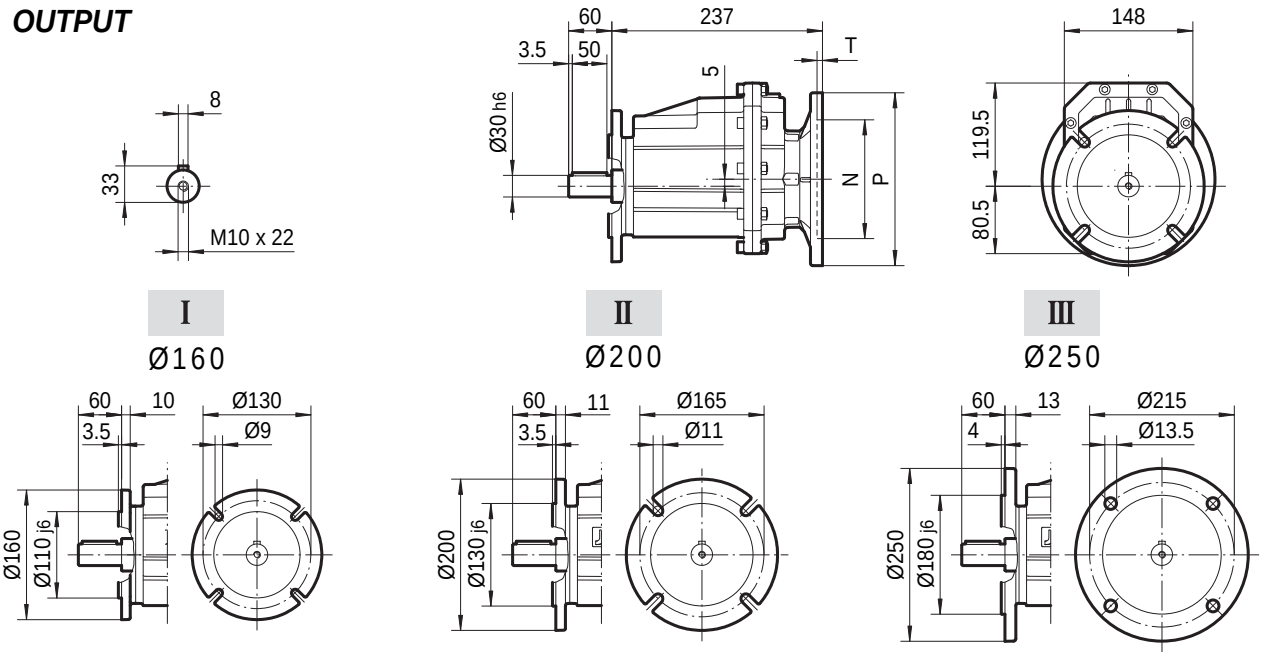

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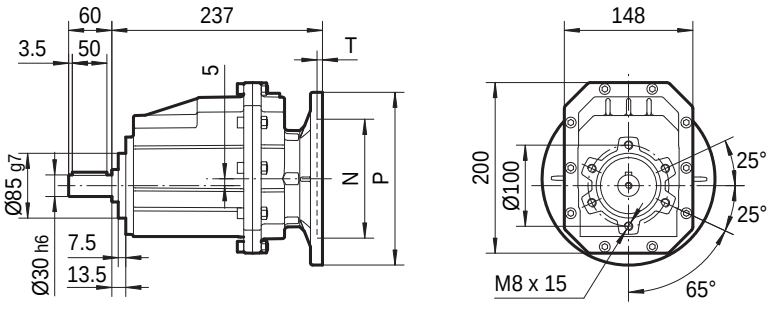

IEC	D	F	G	P	M	N	S	T
71B5	14	5	16.3	160	130	110	9	5
80B5	19	6	21.8	200	165	130	11	5
80B14	19	6	21.8	120	100	80	7	5
90B5	24	8	27.3	200	165	130	11	5
90B14	24	8	27.3	140	115	95	9	5
100/112B5	28	8	31.3	250	215	180	13.5	5
100/112B14	28	8	31.3	160	130	110	9	5

Foot Code	U	V	V1	V2	V3	W	X	X1	Y	Z
B03	18	130	70	—	160	11	156	190	110	20
M03	30	100	—	135	150	11	150	190	110	18
M04	32	110	—	170	185	14	150	230	110	20
B04	20.5	130	—	170	—	14	168	205	105	20

CHC03..HS

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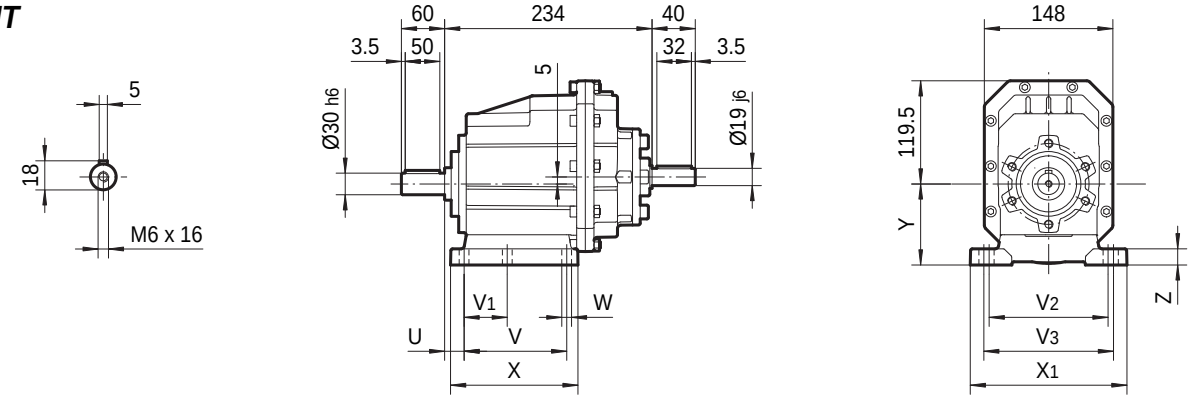

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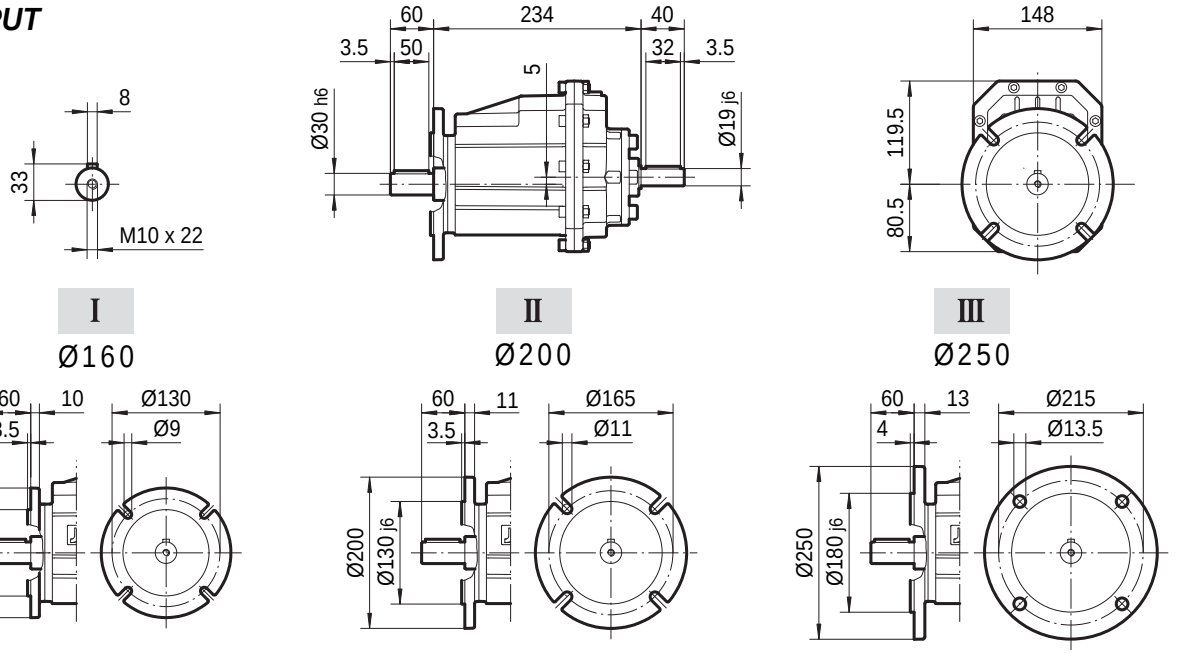

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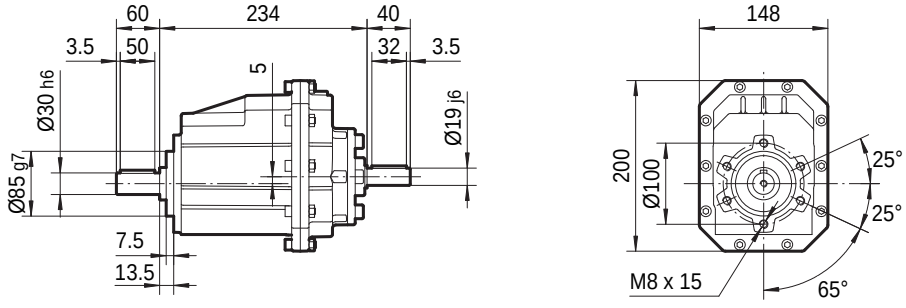

Foot Code	U	V	V1	V2	V3	W	X	X1	Y	Z
B03	18	130	70	—	160	11	156	190	110	20
M03	30	100	—	135	150	11	150	190	110	18
M04	32	110	—	170	185	14	150	230	110	20
B04	20.5	130	—	170	—	14	168	205	105	20

CHC04..P(IEC)

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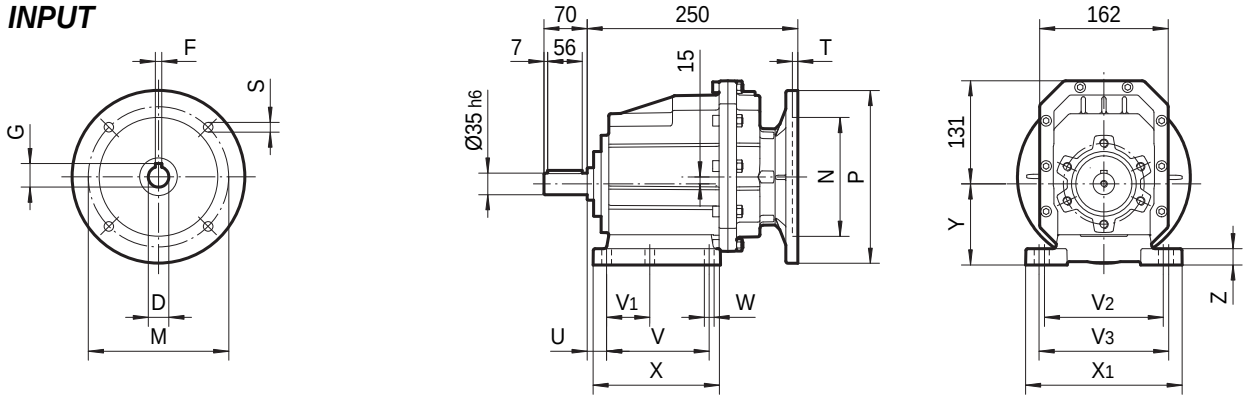

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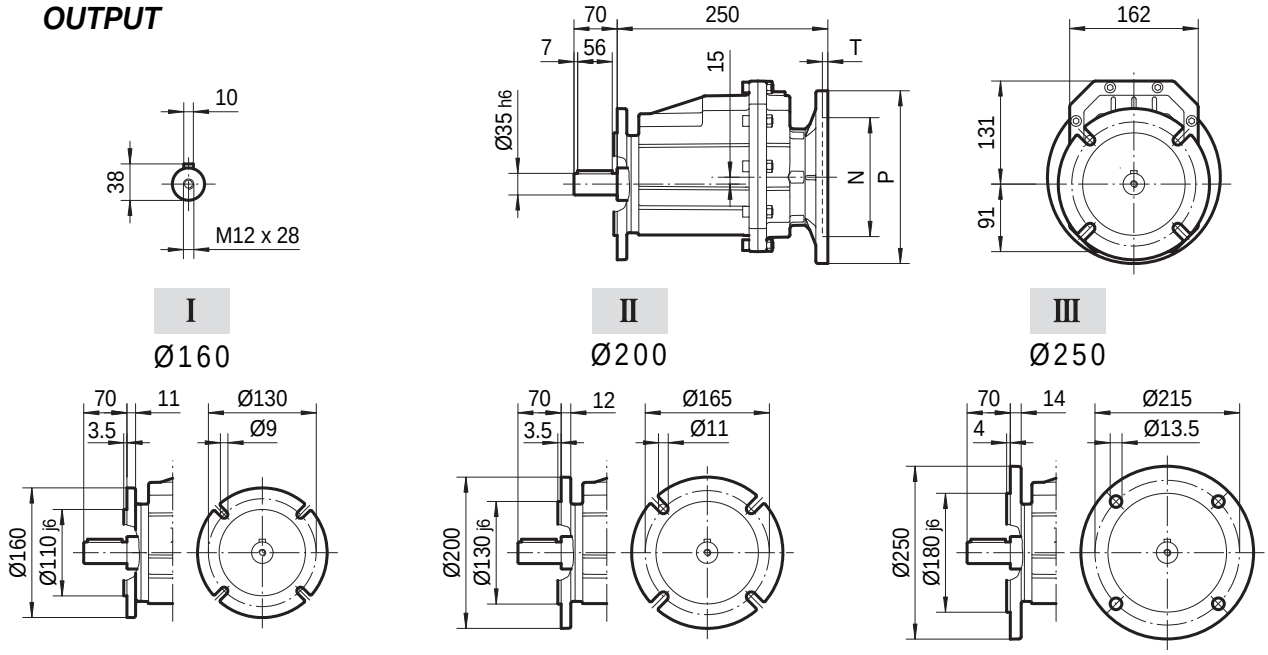

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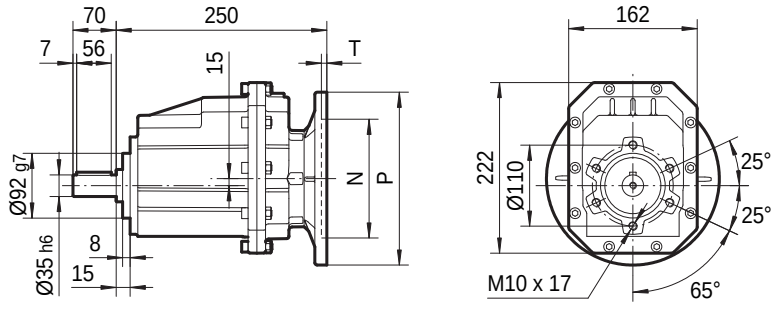
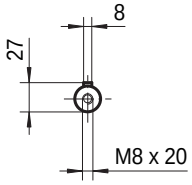


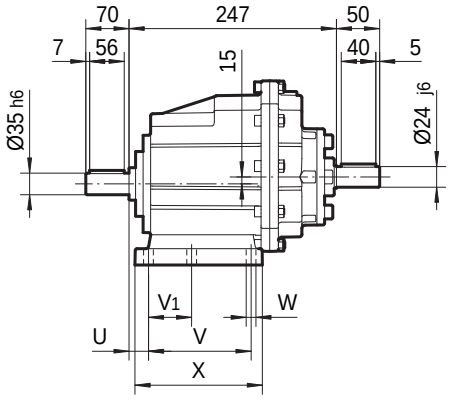
IEC	D	F	M	P	G	N	S	T
80B5	19	6	21.8	200	165	130	11	5
80B14	19	6	21.8	120	100	80	7	5
90B5	24	8	27.3	200	165	130	11	5
90B14	24	8	27.3	140	115	95	9	5
100/112B5	28	8	31.3	250	215	180	13.5	5
100/112B14	28	8	31.3	160	130	110	9	5

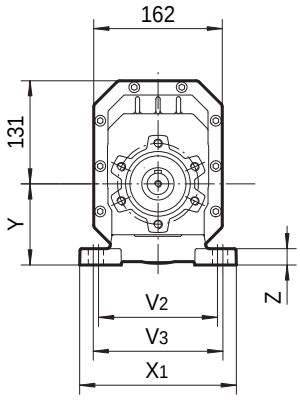
Foot Code	U	V	V1	V2	V3	W	X	X1	Y	Z
B04	23.5	130	—	170	—	14	168	205	115	20
B05	19.5	149.5	—	180	—	14	185	215	130	20
M04	35	110	—	170	185	14	150	230	120	20
M03	33	100	—	135	150	11	150	190	120	18
B03	21	130	70	—	160	11	156	190	120	20

CHC04..HS

INPUT







CHCF04..HS

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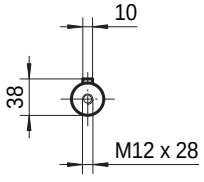

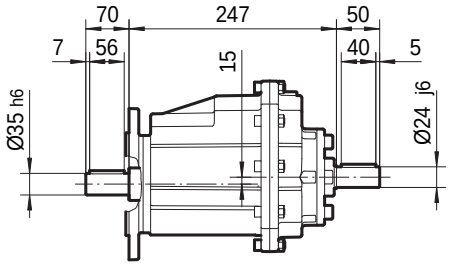

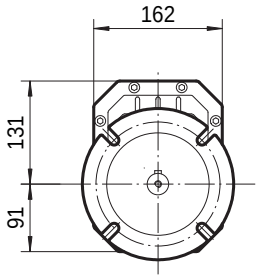

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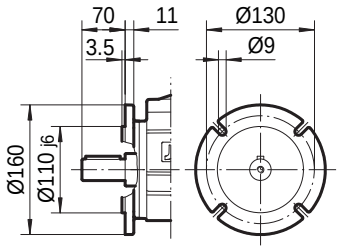

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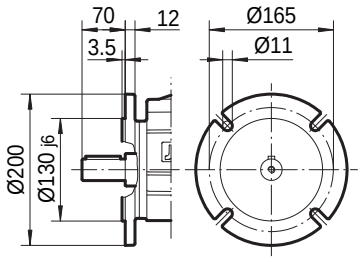

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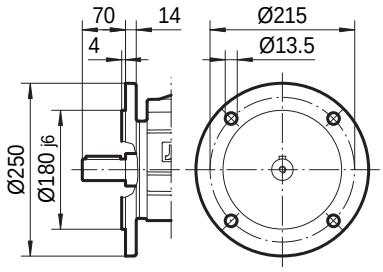

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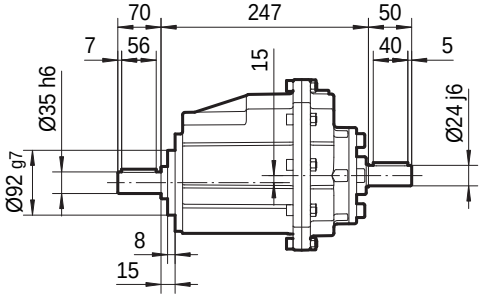
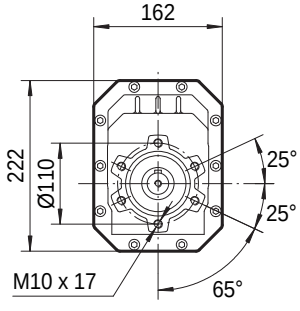
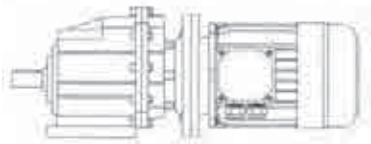
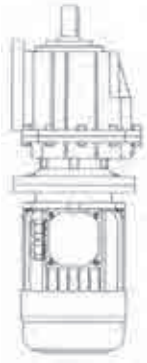
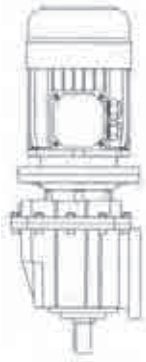
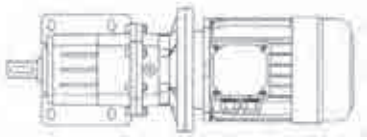
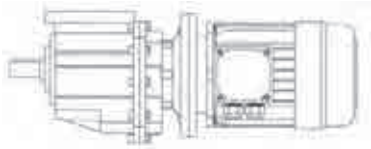
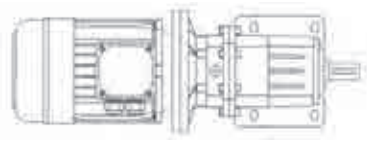
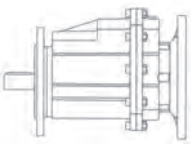
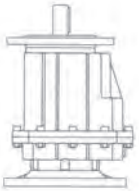
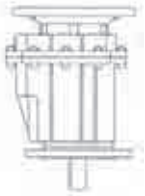


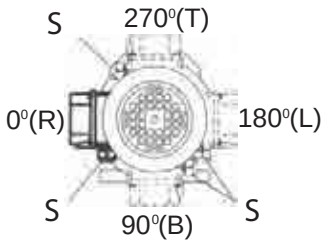


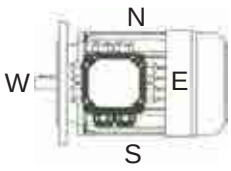
Foot Code	U	V	V1	V2	V3	W	X	X1	Y	Z
B04	23.5	130	—	170	—	14	168	205	115	20
B05	19.5	149.5	—	180	—	14	185	215	130	20
M04	35	110	—	170	185	14	150	230	120	20
M03	33	100	—	135	150	11	150	190	120	18
B03	21	130	70	—	160	11	156	190	120	20

9. MOUNTING POSITION AND TERMINAL BOX ORIENTATION

CHC.. M1	M2	M4	M5
			
M3			**M6**
			

CHCF.. M1	M2	M4
		





10. LUBRICATION

10.1 Type of Lubrication

	℃ -50 0 +50 +100	ISO	SHELL	MOBIL	BP	lubrication type
CHC..	Standard −10 +40	VG 220	Shell Omala 220	Mobilgear 630	BP Energol GR-XP 220	Mineral oil
	−20 +25	VG 150 VG 100	Shell Omala 100	Mobilgear 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	Shell Omala HD 150	Mobil SHC 629		
	−40 +10	VG 32		Mobil SHC 624		

10.2 Lubricant fill quantity

Gear units	Fill quantity in liters unit: (L)					
	M1	M2	M3	M4	M5	M6
CHC..01..	0.4	0.6	0.4	0.3	0.3	0.3
CHC..02..	0.5	0.7	0.5	0.4	0.4	0.4
CHC..03..	0.8	1.1	0.8	0.6	0.6	0.6
CHC..04..	1.2	1.6	1	1	0.9	0.9

The fill quantity in the table is referenced,the exact value velating to the ratio.
All CHC Series helical gear units are filled with life lubrication before deliveny, do not need to change it in general.

11. INSTALLATION METHODS

11.1 Preparation before the installation

1). Check if the data on the nameplates of the gearmotor matches
The voltage supply system.

2). For standard gear unit, the ambient temperature must be in
accordance with the corresponding lubricant table.

3). The drive must not be assembled in conditions such as
Oil, gas, vapors, acids, radiation and so on.

4). Output shaft and flange surfaces must thoroughly cleaned
To ensure they are free of anticorrosion agents, contamination or
similar. Use a commercially available solvent. Do not let the solvent
come into contact with the sealing lip of the oil seals, or will damage the material!

5). The supporting structure must have the following characteristics:
level, vibration damping and torsionally rigid.

11.2 The installation of the gear units

1). Do not tighten the housing legs and mounting flanges against one another
and ensure that you comply with the permitted radial load and axial load.

2). Never drive belt pulleys, couplings, pinions, etc. onto the shaft end by hitting
them with a hammer. This will damage the bearing, housing and the shaft.

3). Prior to startup, check that if the oil level is as specified for the mounting position.
if the oil checking and drain screw and the breather valves are free accessible.

12. CORRECT THE MALFUNCTION

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 bearings B. Contact customer service
Unusual, irregular running noise	Foreign bodies in the oil	• Check the oil • Stop the drive, contact customer service
Oil leaking1) • From the gear cover plate • From the motor flange • From the motor oil seal • From the gear unit flange • From the output end oil seal	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 oillevel	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/gearmotor for repair

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

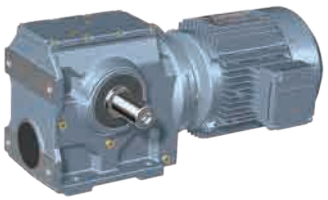
13. Charge Characteristic Chart (for reference)

AIR BLOWERS		Hoist gear assembly	A
Air blower (axial or radial)	A	Derrick gear assembly	B
Fan of cooling tower	B	Steering gear assembly	B
Induced draught fan	B	Moving gear assembly	C
Rotary piston type fan	B	***LAND DREDGER***	
Turbo-fan	A	Drum-type coveyer	C
CONSTRUCTION MACHINERY		Drum-type rotation wheel	C
Concrete mixer	B	Dredger head	C
Hoist	B	Powered crab	B
Road building machinery	B	Pump	B
Boring mill	B	Pump turning gear assembly	B
CHEMICAL MACHINERY		Moving gear assemhly (apron wheel)	C
Mixer (liquid)	A	Moving gear assembly (track)	B
Mixer (half liquid)	B	***FOODSTUFF PROCESSING MACHINERY***	
Centrifuge (heavy)	B	Placer or box filler	A
Centrifuge(light)	A	Cane crusher	A
** Cooling rolling drum	B	** Cane cutter	B
** Dry rolling drum	B	** Cane crasher	C
Mixer	B	Mixer	B
COMPRESSOR		Paste bucket	B
Piston type compressor	C	Packager	A
Turbo-compressor	B	Beet slicer	B
TRANSMISSION FREIGHTER		Beet washing machine	B
Pan conveyer	B	***MOTOR AND CONVERSION EQUIPMENT***	
Balance lifter	B	Frequency converter	C
Trough conveyer	B	Motor	C
Ribbon conveyer (large piece)	C	Welding motor	C
Ribbon coveyer (small piece)	B	***WASHING MACHINE***	
Drum-type flour conveyer	A	Rolling drum	B
Chain conveyer	B	Washing machine	B
Ring type conveyer	B	***METAL ROLLER MACHINE***	
Lifter	B	** Steel cutter	C
Hoist	B	** Chain conveyer	B
Crank-connecting conveyer	B	** Cold mill	C
Lifter	B	Continuous casting equipments	B
Worm conveyer	B	Cold bed	B
Steel-band conveyer	B	Cropper	C
Chain reed-type conveyer	B	** Cross steering transmitter	B
Crab freighter	B	** Deruster	C
HOIST		** Heavy and medium steel mill	C
Bracket swing gear assembly	B	** Bar mill	C

BAR TRANSMISSION EQUIPMENTS	B	***PUMPS***	
Bar pusher	B	Centrifugal pump (thin liquid)	A
Push bed	B	Centrifugal pump (half liquid)	B
** Shears	C	Displacement pump	C
** Lumber elevator platform	B	Plunger pump	C
ROLL ADJUSTING EQUIPMENTS	B	Force pump	C
Roller leveling machine	B	***PLASTIC EQUIPMENTS***	
** Mill rolling way (heavy)	C	** Glazing press	B
** Mill rolling way (light)	B	** Ejecting press	B
** Sheet rolling mill	C	** Spiral extruding machine	B
** Trimming shears	B	** Mixing machine	B
Pipe welder	C	***RUBBER EQUIPMENT***	
Soldering machine(belt material and wire rod)	B	** Glazing press	B
Wire drawbench	B	** Ejecting press	C
METAL PROCESSING MACHINE TOOLS		** Mixing stir machine	B
Power shaft	A	Kneading machine	B
Forging machine	C	** Roller machine	C
Drop hammer	C	***STONE PORCELAIN CLAY PROCESSING EQUIPMENTS***	
Machine tool and necessary	A		
Machine tool and main driving equipment	B	Ball crusher	B
* Metal facing machine	C	** Ejecting press and breaker	C
Plate-leveling machine tool	C	Breaker	C
* Backing-out punch	C	Brick press	C
Press machine tool	C	** Beating crusher	C
Cutting machine	B	** Converter	C
Sheet bending machine tool	B	** Cylinder mill	C
PETROLEUM PROCESSING MACHINERY		***TEXTILE MACHINERY***	
** Pump of oil pipe line	B	Feeding machine	B
Rotary drilling equipment	C	Loom machine	B
PAPERING MACHINE		Dyeing machine	B
** Glazing press	C	Purified drum	B
** Multilayer paper board machine	C	Welon machine	B
** Drying cylinder	C	***WASTER TREATMENT EQUIPMENTS***	
** Glazing cylinder	C	** Air blast	B
** Masher	C	Screw pump	B
** Mashing and breaking machine	C	***WOOD PROCESSING MACHINE TOOL***	
** Suction roll	C	Barker	C
** Wet paper roller machine	C	Facing machine	B
** Water absorbing roller machine	C	** Saw bench	C
Welon machine	C	Wood processing machine tool	A

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

TR Series helical geared motors



TS Series helical-worm geared motors

TK Series helical-bevel geared motors

TF Series parallel shaft helical geared motors

G3 Series mini helical geared motors

TRC Series mini helical gear units