iFit series

Rossi
Habasit Group

Helical in line gearmotors

Contents

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Rossi for You

Innovation

Rossi S.p.A. offers a wide range of solutions for an evolving industry, flexible and innovative gear reducers and gearmotors for customer tailored solutions to maximize performances and minimize the Total Cost of Ownership (TCO).

High quality, 3 years warranty

Our drive is to innovate and boost operations by manufacturing performing, precise, reliable and high-quality products all over the world. We are always one step forward in offering and developing solutions that can satisfy an unlimited number of application needs, even in the most demanding conditions.

Reliability

We are a reliable company with the right flexibility and know-how to respond to worldwide market requests, in all application fields, without leaving aside our commitment for the environment and value on human safety, to protect everyone's future.

Tools and processes

We continue to invest in new tools and processes, so our highly skilled specialist team in different fields are supporting you to find the best solution suitable for your demands, always by your side on every step of the project.

After-sale service

Highly trained mechanics and support teams can ensure a fast and efficient after-sale service providing support worldwide.

Digital support

Alongside our 24/7 Rossi for You portal you have a suite of digital support tools enabling real time access to your order tracking, invoices, spare part tables download and contact to our service.

Experience

Shaped by more than 60 years of history Rossi meets your unique needs whether you need a standard design or a customized solution.

1.1

Global presence local service

Local support
Sales, customer service,
technical support, spare parts

15 branches*

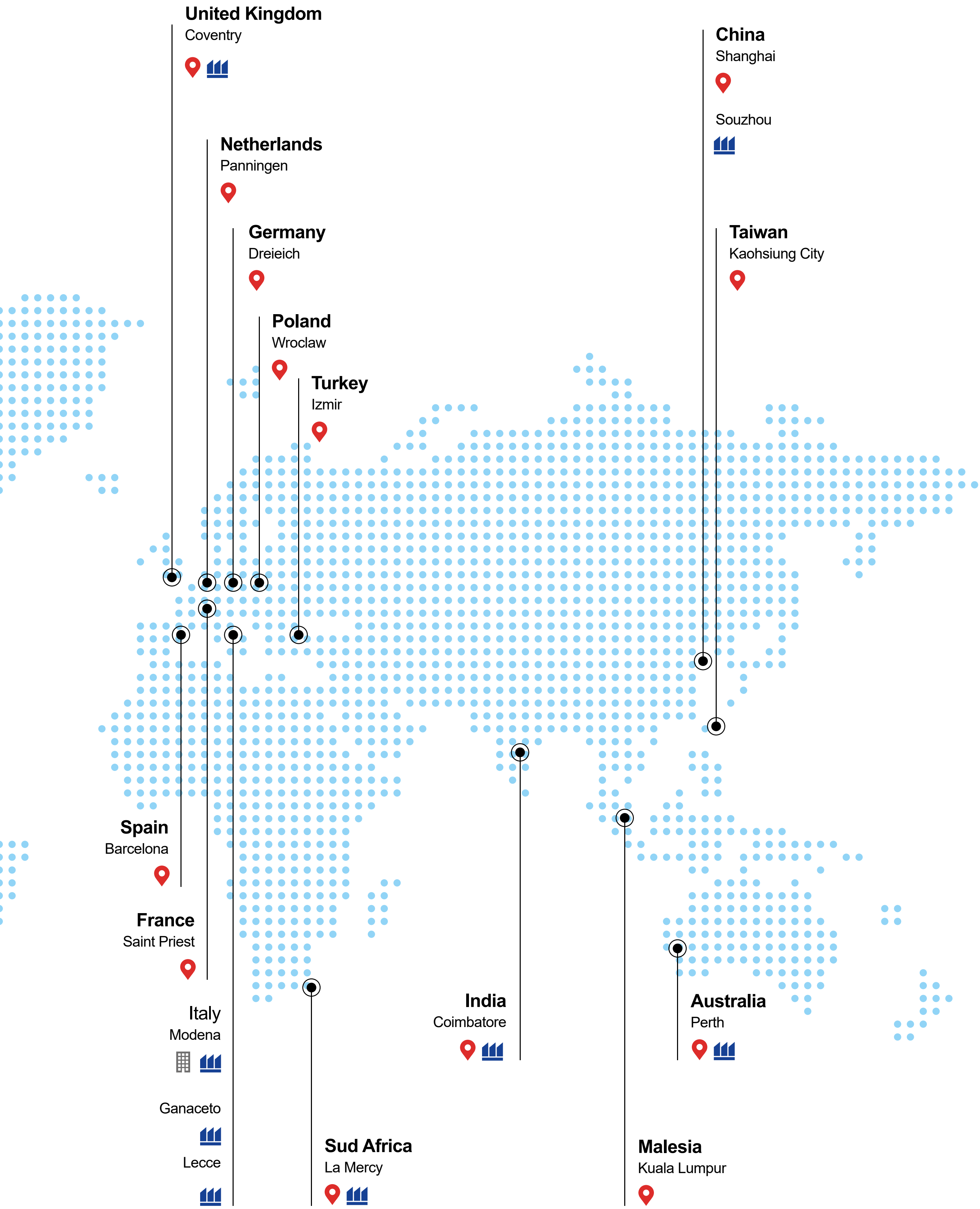
Worldwide distribution network *

A global network of subsidiaries and dealers.
From design and execution to after sales service.
Rossi S.p.A. is always close to you, a local reliable and flexible partner.

Alongside our 24/7 **Rossi for You** portal you have a suite of digital support tools enabling real time access to your order tracking, invoices, spare part tables download and contact to our service.

*All contacts available on **www.rossi.com**

▦ Headquarters 📍 Branches 🏭 Production facilities/Assembly plants



United Kingdom
Coventry
📍 🏭

Netherlands
Panningen
📍

Germany
Dreieich
📍

Poland
Wroclaw
📍

Turkey
Izmir
📍

China
Shanghai
📍

Souzhou
🏭

Taiwan
Kaohsiung City
📍

Spain
Barcelona
📍

France
Saint Priest
📍

Italy
Modena
▦ 🏭

Ganaceto
🏭

Lecce
🏭

Sud Africa
La Mercy
📍 🏭

India
Coimbatore
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Australia
Perth
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Malesia
Kuala Lumpur
📍

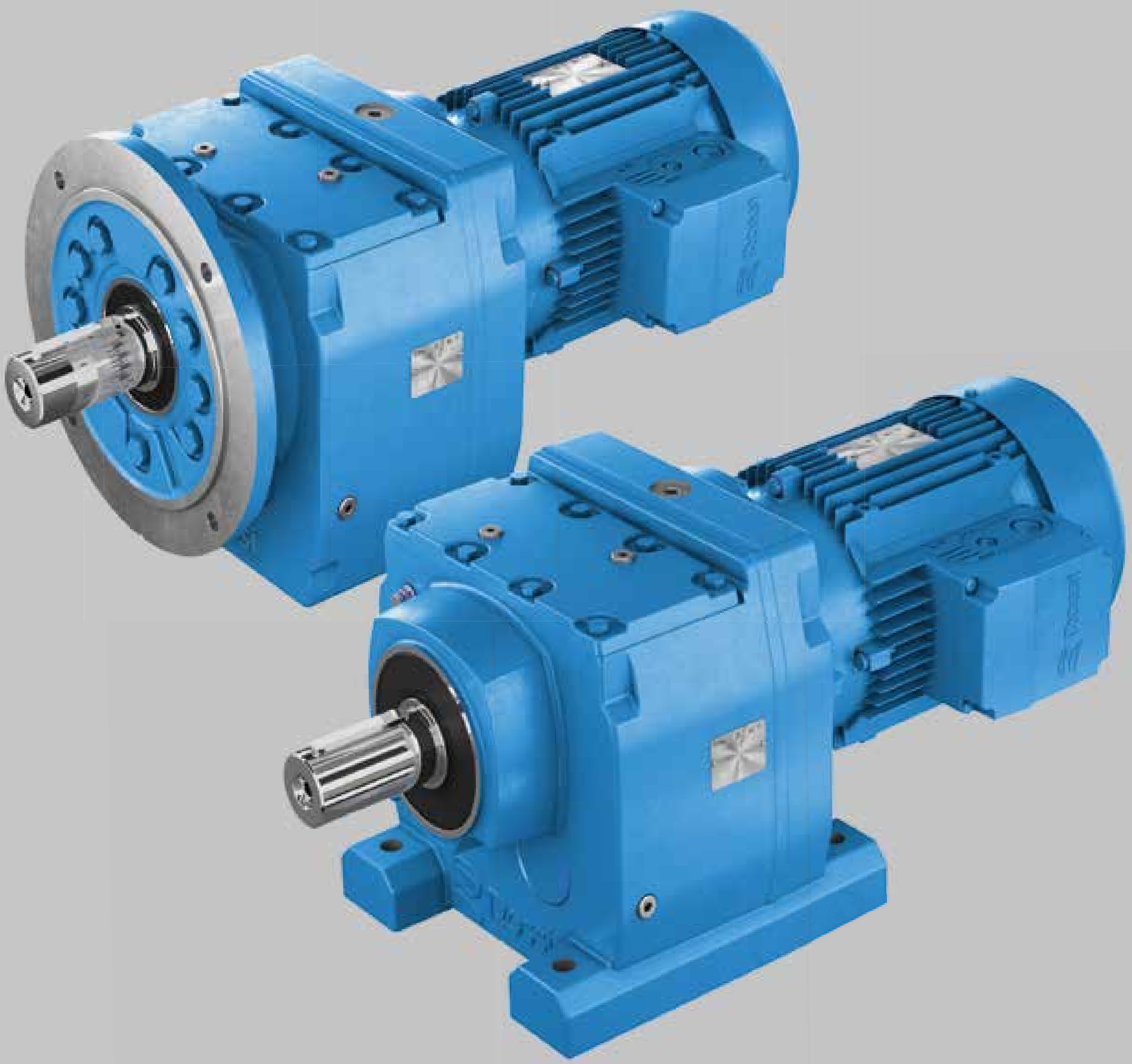
2

Product Overview

Section contents

2.1

Features & Benefits

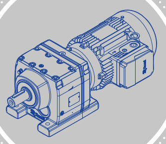


Fully interchangeable

Plug&Play.
No re-engineering costs.

100% made in EU

Superior quality,
minimum maintenance

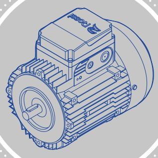


Cast iron housing

Maximum performance and
reliability

Gear precision DIN/ISO 6

Energy saving, low noise level,
reduced backlash



IE3 electric motors

Premium efficiency

High quality

Long life lubrication. Dedicated
motor side sealing system

Compact design

Wash down capability thanks to round
shaped, smooth housing surface

High performance

Up to 12% higher
than market standard

Additional benefits

↑

- High Customer Value
- Short Lead Times for standard products
- 3 Years Guarantee

2.2

Electric motors

- Standard and brake motors
- IE3 class of the international efficiency standard (IEC 60034-30) ⩾ 0,75 kW
- IE2 class of the international efficiency standard (IEC 60034-30) ⩽ 0,55 kW
- Multivoltage, 2, 4 and 6 poles
- Aluminium frame sizes 63 ... 132
- Aluminium frame sizes 160 ... 200 (available soon)
- Cable entry possible from two sides (at 180°)
- Motor insulation class F, rise temperature B

COMPLIANCE

- Test documents
- cURus motors certified to UL
- Machinery Directive 2006/42/EC
- Directive 2011/65/EC RoHS
- Directive «ErP» 2009/125/EC

PROTECTION/PAINTING

- Blue RAL 5010 paint with corrosivity class C3 as standard
  (hard and smooth clinging painting)
- IP 55, IP 66 for the motor

OPTIONALS

- Motor insulation class H
- Bi-metal type and thermistor type (PTC) thermal probes
- Motor with connectors
- Anti-condensation heater
- Forced fan cooling (IC 416)
- Drip-proof cover
- Double shaft extension
- Incremental encoder sin/cos
- Brake: manual release, manual release lever with different orientation, separate brake power supply
- Optional painting

2.3

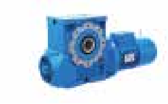
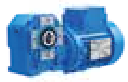
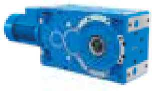
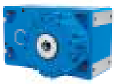
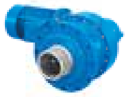
Inverter

- Max overloads: up to 200%
- Best sensor-less ability to handle overloads
- Flexibility in motor-mounted or wall-mounted installation
- Full "Plug & Play"
- Autotuning, software programming and updating included
- In compliance with IE2 class ECODESIGN EN 50598 IEC/EN 60034-30-1 and Ecodesign Directive in accordance with IEC 61800-9-2
- Remote commissioning, monitoring and diagnostics, Bluetooth, App and Safety (STO)
- Communication and connection among several inverters
- A wide range of Field buses
- Comprehensive options range, components and design concept guarantee the best reliability and vibration resistance. Dust-tight and protected against water jets (IP 65).

2.4

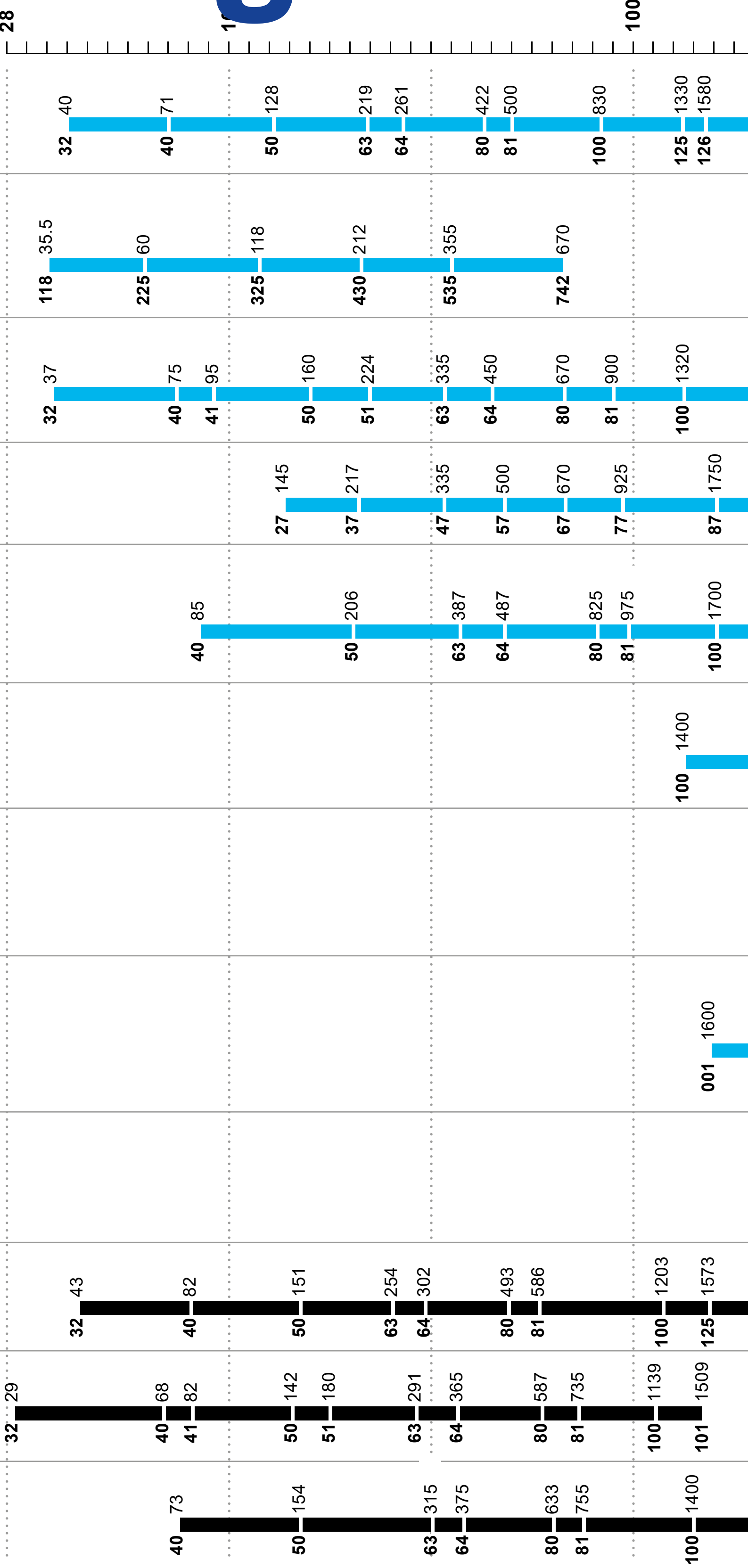
Product Range

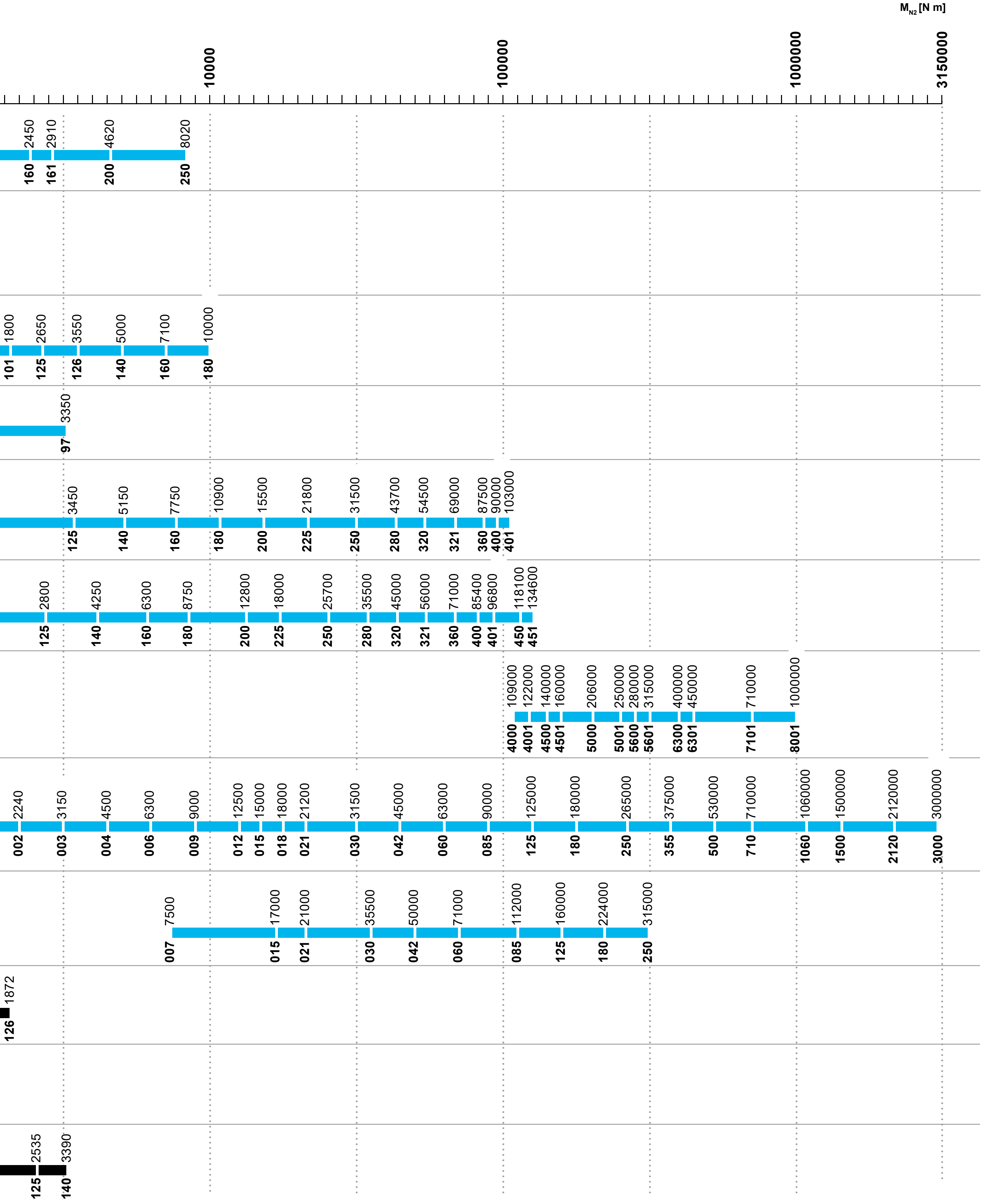
Gear reducers and gearmotors

	**A Series** Worm	N m 14 sizes	40, 71, 128, 219, 261, 422, 500, 830, 1330, 1580	32, 40, 50, 63, 64, 80, 81, 100, 125, 126
	**AS series** Worm Standardfit	N m 6 sizes	35.5, 60, 118, 212, 355, 670	118, 225, 325, 430, 535, 742
	**E Series** Helical in line	N m 16 sizes	37, 75, 95, 160, 224, 335, 450, 670, 900, 1320	32, 40, 41, 50, 51, 63, 64, 80, 81, 100
	**i-FIT Series** Helical in line New range	N m 8 sizes	145, 217, 335, 500, 670, 925, 1750	27, 37, 47, 57, 67, 77, 87
	**G Series** Helical and bevel helical	N m 20 sizes	85, 206, 387, 487, 825, 975, 1700	40, 50, 63, 64, 80, 81, 100
	**GX Series Extruder** Helical and bevel helical	N m 16 sizes	1400	100
	**H series** Helical and bevel helical	N m 12 sizes		
	**EP Series** Planetary	N m 24 sizes	1600	100
	**EPS Series** Planetary Slewing	N m 10 sizes		

Motion control

	**SR series** Worm	N m 10 sizes	43, 82, 151, 254, 302, 493, 586, 1203, 1573	32, 40, 50, 63, 64, 80, 81, 100, 125
	**SR series** Helical in line	N m 11 sizes	29, 68, 82, 142, 180, 291, 365, 587, 735, 1139, 1509	32, 40, 41, 50, 51, 63, 64, 80, 81, 100, 101
	**SR series** Helical and bevel helical	N m 9 sizes	73, 154, 315, 375, 633, 755, 1400	40, 50, 63, 64, 80, 81, 100




M_{N2} [N m]
10000
100000
1000000
3150000
2450
2910
4620
8020
160
161
200
250
1800
2650
3550
5000
7100
10000
101
125
126
140
160
180
3350
97
3450
5150
7750
10900
15500
21800
31500
43700
54500
69000
87500
90000
103000
125
140
160
180
200
225
250
280
320
321
360
400
401
2800
4250
6300
8750
12800
18000
25700
35500
45000
56000
71000
85400
96800
118100
134600
125
140
160
180
200
225
250
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321
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401
450
451
109000
122000
140000
160000
206000
250000
280000
315000
400000
450000
710000
1000000
4000
4001
4500
4501
5000
5001
5600
5601
6300
6301
7101
8001
2240
3150
4500
6300
9000
12500
15000
18000
21200
31500
45000
63000
90000
125000
180000
265000
375000
530000
710000
1060000
1500000
2120000
3000000
002
003
004
006
009
012
015
018
021
030
042
060
085
125
180
250
355
500
710
1060
1500
2120
3000
7500
17000
21000
35500
50000
71000
112000
160000
224000
315000
007
015
021
030
042
060
085
125
180
250
1872
126
2535
3390
125
140

3

Symbols and units of measure

Section contents

Symbols and units of measure 3

3.1

Symbols and units of measure

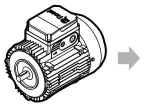
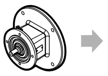
Symbols	Description	Unit of Measure SI
fs	service factor	
f_T	thermal factor	
H	altitude	[m]
$IP..$	protection degree	
J	moment of inertia of mass	[kg m^2]
M	torque	[N m]
n	rotational speed	[min^{-1}]
p	weight	[kg]
P	power	[kW]
$S1...S10$	duty cycle	
T	temperature	[°C]
t	time	[s]
v	linear speed	[m/s]
z	number of starts per hour	[start/h]
Gear reducer		
η	efficiency	
η_s	static efficiency	
F_{r1}	radial loads on high speed shaft	[N]
F_{r2}	radial loads on low speed shaft	[N]
F_{a1}	axial loads on high speed shaft	[N]
F_{a2}	axial loads on low speed shaft	[N]
i	transmission ratio	
L_h	bearing life	[h]
M_{N1}	nominal torque on high speed shaft	[N m]
M_{N2}	nominal torque on low speed shaft	[N m]
M_1	nominal torque on high speed shaft	[N m]
M_2	nominal torque on low speed shaft	[N m]
M_{2max}	maximum torque on low speed shaft	[N m]
M_s	tightening torque for fastening bolts	[N m]
n_1	rotation speed of high speed shaft	[min^{-1}]
n_2	rotation speed of low speed shaft	[min^{-1}]
P_{N1}	nominal power on high speed shaft	[kW]
P_{N2}	nominal power on low speed shaft	[kW]
P_T	thermal power	[kW]
P_{TN}	nominal thermal power	[kW]
P_1	power on high speed shaft	[kW]
P_2	power on low speed shaft	[kW]

Symbols	Description	Unit of Measure SI
Motor		
$\cos\varphi$	power factor	
C_{max}	maximum brake disk wear	[mm]
η_0	motor efficiency	
f	supply frequency	[Hz]
I_N	motor nominal current	[A]
I_S	starting current of the motor	[A]
J_0	moment of inertia (of mass) of the motor	[kg m^2]
M_S	starting torque, with direct on-line start	[N m]
M_{max}	maximum torque, with direct on-line start	[N m]
M_N	nominal torque of the motor	[N m]
M_{fmax}	maximum braking torque	[N m]
M_f	calibration braking torque	[N m]
n_N	number of motor nominal rotations	[min^{-1}]
P_N	motor nominal power	[kW]
t_a	starting time	[s]
t_f	braking time	[s]
t_1	delay of brake anchor release	[ms]
t_2	delay of braking	[ms]
t_{2cc}	braking delay with d.c. rectifier	[ms]
U	supply voltage	[V]
W_1	work of friction generating a brake disk wear of 1 mm	[MJ/mm]
W_{max}	maximum work due to friction for each braking	[J]

3.2

Icons

Icons	Description
p.	refer to page
⚠	attention
▼	breather plug
●	level plug
■	drain plug
▽	breather plug not in view (opposite side)
◍	level plug not in view (opposite side)
▨	drain plug not in view (opposite side)

Icons	Description
kg	weight (without oil)
l	oil quantity
2	2 reduction stages
3	3 reduction stages
	refer to motor section
	refer to section motor adapters
⚙	refer to section geometrical pairings

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4

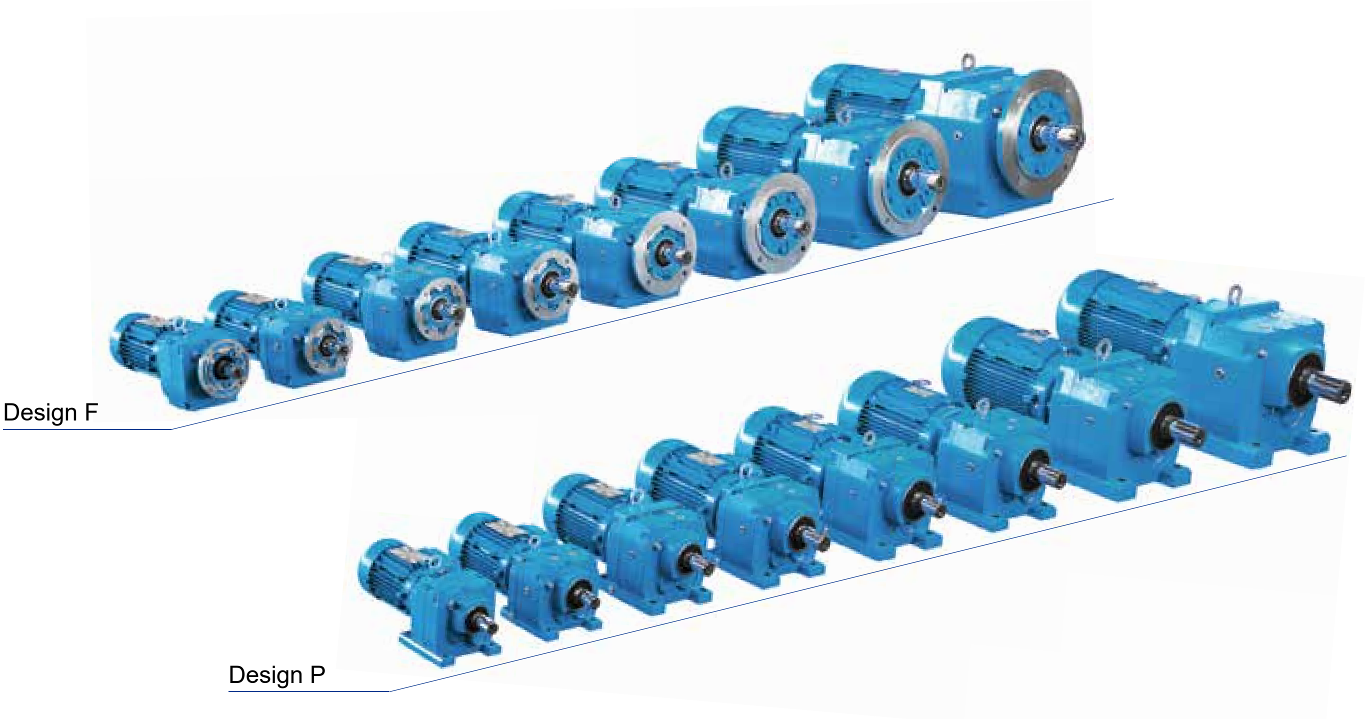
Product specifications

Section contents

4.1

General specifications

- **Maximum interchangeability** (shaft height, low speed shaft end, foot dimensions and fitting holes, designs), and performance equal or higher than market standards;
- **IE3, IE2 efficiency motors**;
- **foot mounting** (foot mounted gear reducer housing) or **flange mounting** (up to 4 flanges for each gear reducer size);
- **gear reducer cast iron single piece housing**, high stiffness and dimensional accuracy;
- generously proportioned bearings of **low speed shaft** (bearings and shaft) in order to withstand high loads on shaft end;
- **high manufacturing quality standard**
- **high, reliable and tested performances**
- **compact motors**, under accuracy rating, also in brake version, suitable for applications with inverter.



		iC 27	iC 37	iC 47	iC 57	iC 67	iC 77	iC 87	iC 97
Low speed shaft diameter	[mm]	25	25	30	35	35	40	50	60
Shaft height (design P)	[mm]	90	90	115	115	130	140	180	225
B5 flange diameter (design F)	[mm]	120...160	120...200	140...200	160...250	200, 250	250, 300	300, 350	350, 450
Maximum nominal torque	[N m]	145	224	335	500	670	925	1750	3350
Maximum nominal radial load	[N]	4230	4940	5420	7100	6980	9900	16900	19800

4.1.1 Gear reducer

Main structural features:

- cast iron single-piece housing 250 UNI ISO 185 with stiffening ribs and high lubricant capacity;
- ball bearings of low speed shaft generously proportioned in order to withstand high loads on low speed shaft end (which is also proportioned for the same purpose);
- pinion of final reduction with three bearings (sizes ≥ iC 57) in order to ensure the best meshing conditions (no overhung wheel, maximum rigidity and overload capacity, maximum reduction of noise level);
- first reduction stage pinion directly fitted with interference onto the motor shaft end;
- cylindrical helical gear pairs with ground profile, for the maximum load capacity, smooth and low noise running;
- gears load capacity calculated for tooth breakage and pitting according to ISO 6336;

- oil-bath lubrication; all sizes are supplied filled with polyglycol synthetic oil (PAG), "for life" lubrication;
- metal plugs (filler plug with valve; drain plug; level plug);
- paint: external coating with two-component water-based acrylic enamel appropriate for resistance to normal industrial environments (corrosivity class C3 ISO 12944-2); color blue RAL 5010 DIN 1843; internal protection with paint providing resistance to synthetic oils.

4.1.2 Electric three-phase motor

Dimensions and masses of gearmotors described in present catalog are referred to standard motor and brake motors of catalog TX.

Main structural features:

- compact motor: asynchronous three-phase, totally-enclosed, externally ventilated, with cage rotor;
- IP 55 protection, insulation class F, temperature rise class B;
- rated power delivered on continuous duty (S1) and referred to nominal voltage and frequency, ambient temperature 40 °C and maximum altitude 1 000 m.
- capacity to withstand one or more overloads up to 1,6 times the nominal load for a maximum total period of 2 min per hour;
- starting torque with direct on-line start at least 1,6 times the nominal one (it is usually higher);
- suitable for running with inverter (generous electromagnetic sizing, low-loss eletrical stamping, phase separators, etc.);
- design available for every application need: flywheel, independent cooling fan, independent cooling fan and encoder, etc.
- paint: external protection with two-component water-based acrylic enamel appropriate for resistance to normal industrial environments (corrosivity class C3 ISO 12944-2); color blue RAL 5010 DIN 1843.

Brake motor main structural features

- particularly strong construction to withstand braking stresses; maximum reduction of noise level;
- spring-loaded d.c. electromagnetic brake; feeding from the terminal box;
- brake can also be independently fed directly from the line;
- braking torque proportioned to motor torque (usually $M_f \approx 2\ M_N$) and adjustable by adding or removing spring pairs;
- high frequency of starting enabled;
- rapid, precise stopping;
- hand lever for manual release with automatic return; removable lever rod.

For other specifications and details see specific documentation of catalog TX.

Specific standards for electric motors:

- nominal powers and dimensions to CENELEC HD 231 (IEC 72-1, CNR-CEI UNEL 13117-71 and 13118-71, DIN 42677, NF C 51- 120, BS 5000-10 and BS 4999-141) for mounting positions IM B5, IM B14 and derivatives;
- nominal performances and running specifications to CENELEC EN 60034-1 (IEC 34-1, CEI EN 60034-1, DIN VDE 0530-1, NF C51-111, BS EN 60034-1);
- protection to CENELEC EN 60034-5 (IEC 34-5, CEI 2-16, DIN EN 60034-5, NF C51-115, BS 4999-105);
- mounting positions to CENELEC EN 60034-7 (IEC 34-7, CEI EN 60034-7, DIN IEC 34-7, NF C51-117, BS EN 60034-7);
- sound levels to CENELEC 60034-9 (IEC 34.9, DIN 57530 pt. 9);
- balancing and vibration velocity (vibration under standard rating N) to CENELEC HD 53.14 S1 (IEC 34-14, ISO 2373 CEI 2-23, BS 4999-142); motors are balanced with half key inserted into shaft extension;
- cooling to CENELEC EN 60034-6 (CEI 2-7, IEC 34-6): standard type IC 411; type IC 416 for non-standard design with axial independent cooling fan.

4.2

Operational conditions

4.2.1 Operational ambient temperature

Gear reducers

Gear reducers are suitable for operation at ambient temperature 0 °C / +40 °C (with peaks down to -20 °C / +50 °C), with synthetic oil PAG ISO VG 220 cSt and standard seal rings.
The operation outside this range, with a minimum of -40 °C and a maximum of +60 °C, must be evaluated in relation to the specific operating conditions, duty cycle, type of lubricant, type of seals and cooling/heating system (where possible); please contact Rossi S.p.A.
The catalog data are based on an operational ambient temperature of 25 °C (see pages 49 and 50).

Motors

HB series motors are suitable for operation in an ambient temperature range of -15°C / +40°C.
The operation outside this range is possible by adopting some precautions: contact Rossi S.p.A.

In general, the nominal motor power should be derated according to the following table;

Ambient temperature °C	30	40	45	50	55	60
P / P_N [%]	106	100	96,5	93	90	86,5

For drives with inverters, it is necessary to take into account the higher thermal stresses to which the motor windings may be subjected.
If needed, contact Rossi S.p.A.

4.2.2 Installation altitude

Installation altitude affects the effectiveness of convection heat dissipation; heat dissipation capacity decreases as installation altitude increases.
Catalog data are referred to a maximum altitude of 1000 m.

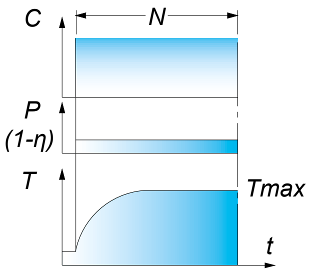
Above this threshold, the nominal motor power must be downgraded according to the following table:

Altitude a.s.l. m	1000	1500	2000	2500	3000	3500	4000
P / P_N [%]	100	96	92	88	84	80	76

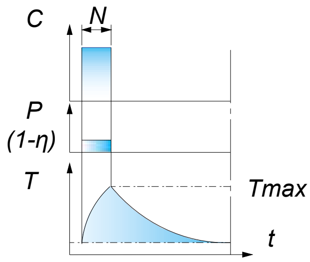
for gear reducer part see pages 49 and 50.

4.2.3 Duty cycles

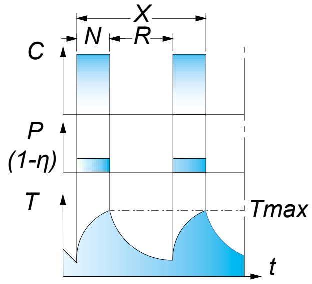
Continuous duty (S1)
Operation at a constant load maintained for sufficient time to allow the motor to reach thermal equilibrium.
Abbr. S1



Short time duty (S2)
Running at constant load for a given period of time less than that necessary to reach normal running temperature, followed by a rest period long enough for motor's return to ambient temperature.
Abbr. S2 + time N (minimum)



Intermittent periodic duty (S3)
Succession of identical work cycles consisting of a period of running at constant load and a rest period. Current peaks on starting are not to be of an order that will influence motor heat to any significant extent.
Abbr. S3 + cyclic duration factor



Cyclic duration factor = N/(N+R)·100 [%]

where

N = running time at constant load
R= rest time
For values of N+R > 10 min contact Rossi S.p.A.

In case of a duty-requirement type S2 ... S10 the motor power can be increased as per the following table; starting torque keeps unchanged.

Duty cycle			**Motor size**		
			63 ... 90	**100 ... 132**	**160 ... 315**
S2	duration of running	**90 min**	1	1	1,06
		60 min	1	1,06	1,12
		30 min	1,25	1,18	1,25
		10 min	1,25	1,25	1,32
S3	cyclic duration factor	**60%**	1,12		
		40%	1,18		
		25%	1,25		
		15%	1,32		
S4 ... S10			Contact Rossi S.p.A.		

4.2.4 Frequency 60 Hz

Standard motors up to size 132 wound for 50 Hz can be fed at 60 Hz; in this case speed increases by 20%.

If input-voltage corresponds to winding voltage, power remains unchanged, providing that higher temperature rise values are acceptable and that the power requirement is not unduly demanding, whilst starting and maximum torques decrease by 17%.
If input-voltage is 20% higher than winding voltage, power increases by 20% whilst starting and maximum torques keep unchanged.
For brake motors, see catalog TX.

From size 160 upwards motors – both standard and brake ones – should be wound for 60 Hz exploiting the 20% power increase as a matter of course.

4.2.5 Speed

Gearmotor low speed shaft rotation speeds indicated in the catalog are determined from the nominal HB motor speed under nominal operating conditions and gear reducer transmission ratio.
Actual speed may deviate from this value depending on load, actual operating conditions and power system.

4.2.6 Sound levels

The standard levels of sound power emission L_{WA} relevant to the gearmotors of this catalog, running at nominal load and speed, fulfill the limits settled by VDI 2159 for gear reducers and EN 60034 for motors.

4.2.7 Accessibility and heat dissipation

Position the gearmotor so as to allow a free passage of air for cooling both gear reducer and motor (especially at motor fan side).
Avoid any obstruction to the air-flow; heat sources near the gear reducer that might affect the temperature of cooling-air and of gear reducer for radiation; insufficient air recycle or any other factor hindering the steady dissipation of heat.
Also provide adequate spacing or shielding of heat-sensitive components (motor, brake, motor-inverter, electronic components, etc.) from hot surfaces of the driven machine, and provide adequate accessibility space for maintenance operations.

4.2.8 Weights

The weights shown in the catalog refer to gearmotors without lubricating oil.
Actual weights may vary depending on size, gearbox, transmission ratio, motor and whether there are accessories or special designs.

4.2.9 Reduced backlash

For sizes ≥ iC 37, the gearmotor can be supplied with reduced backlash.
The values are given in paragraph 9.2 in the "Geometric Coupling Tables" and refer to the low speed shaft with locked high speed shaft.
They are valid in the absence of applied loads (max. 0,01 of the nominal load of the gear reducer), with the gear reducer at ambient temperature (25 °C) and are subject to a tolerance of ± 2 arc min.

If the value is not specified, the reduced backlash option is not available.

4.2.10 Low speed shaft seals

For aggressive environmental conditions or particularly severe operating conditions, the option "Sealing rings (gear reducer and motor) in fluoride compound" is available.
For gear units in flange-mounted design, the "Double low speed shaft seal" option is also available (except for size iC 27).

4.3

Surface protection

The gearmotors are protected externally with a water-based dual compound acrylic enamel paint suitable for withstanding normal industrial environments (corrosivity class C3 ISO 12944-2; color blue RAL 5010).
Other paints and protection degrees are available on request as per table below.

Field of use	Features	Corrosivity class ISO 12944-2	Durability class ISO 12944-2	Description treatment	Thickness treatment µm	Code
Applications in aggressive ambients	Good resistance to atmospheric and aggressive agents	C4	Low	1) Dual-compound epoxy primer 2) Water-soluble polyurethane dual-compound enamel with polyurethane acrylic resins	150	**1HRAL5010 (blue)**
			Medium	1) Dual-compound epoxy primer (2 layers) 2) Water-soluble polyurethane dual-compound enamel with polyurethane acrylic resins	200	**2HRAL5010 (blue)**
			High	1) Dual-compound epoxy primer (4 layers) 2) Water-soluble polyurethane dual-compound enamel with polyurethane acrylic resins	300	**3HRAL5010 (blue)**
Outdoor applications in saline environment	Excellent resistance to atmospheric and aggressive agents Outdoor applications in saline environment	C5 - M	Medium	1) Sanding 2) Dual-compound antirust primer with zinc phosphates 3) Dual-compound epoxy primer 4) Water-soluble polyurethane dual-compound enamel with polyurethane acrylic resins	300	**2IRAL5010 (blue)**
			High	1) Sanding 2) Dual-compound antirust primer with zinc phosphates 3) Sealing with polyurethane sealant 4) Dual-compound epoxy primer 5) Polyurethane dual-compound enamel with polyurethane acrylic resins	400	**2KRAL5010 (blue)**
Outdoor applications in chemically aggressive environment and high humidity industrial areas	Excellent resistance to atmospheric and aggressive agents Outdoor applications in chemically aggressive environment (fertilizers, etc.)	C5 - I	Medium	1) Sanding 2) Dual-compound antirust primer with zinc phosphates 3) Dual-compound epoxy primer 4) Water-soluble dual-compound enamel with epoxy resins	300	**2LRAL5010 (blue)**
			High	1) Sanding 2) Dual-compound antirust primer with zinc phosphates 3) Sealing with polyurethane sealant 4) Dual-compound epoxy enamel 5) Water-soluble dual-compound enamel with epoxy resins	400	**2YRAL5010 (blue)**

4.4

Storage and warehousing

Rossi gearmotors must be stored in a closed environment where they are protected from solar radiation and corrosive agents. The ambient must be sufficiently clean, dry (relative humidity < 50 %), free from excessive vibrations ($v_{eff} \leq 0{,}2$ mm/s) to avoid damage to bearings.

Ambient temperature 0 ÷ 40 °C; with peaks up to a ± 10 °C.

For different ambient conditions, contact Rossi S.p.A.

The gear units and gearmotors must be positioned according to the mounting position stated in the order and on the nameplate. **Do not stack units.**

Do not, under any circumstances, loosen the closed plugs or activate the drain plug before commissioning.

For storage periods of 12 to 24 months, we recommend requesting the "Long term storage" option, which provides:

- supply of the gearbox without oil filling;
- protection of the internal volume of the gearbox by applying VCI lubricant;
- application of a layer of special anti-corrosive oil on all unpainted external parts (shafts, feet, flanges), including galvanized components (screws, nuts, washers, eyebolts, etc.);
- application of adhesive label specific to the type of protection treatment;
- the single packing with sealed VCI bag.

For longer periods please contact Rossi S.p.A.

5

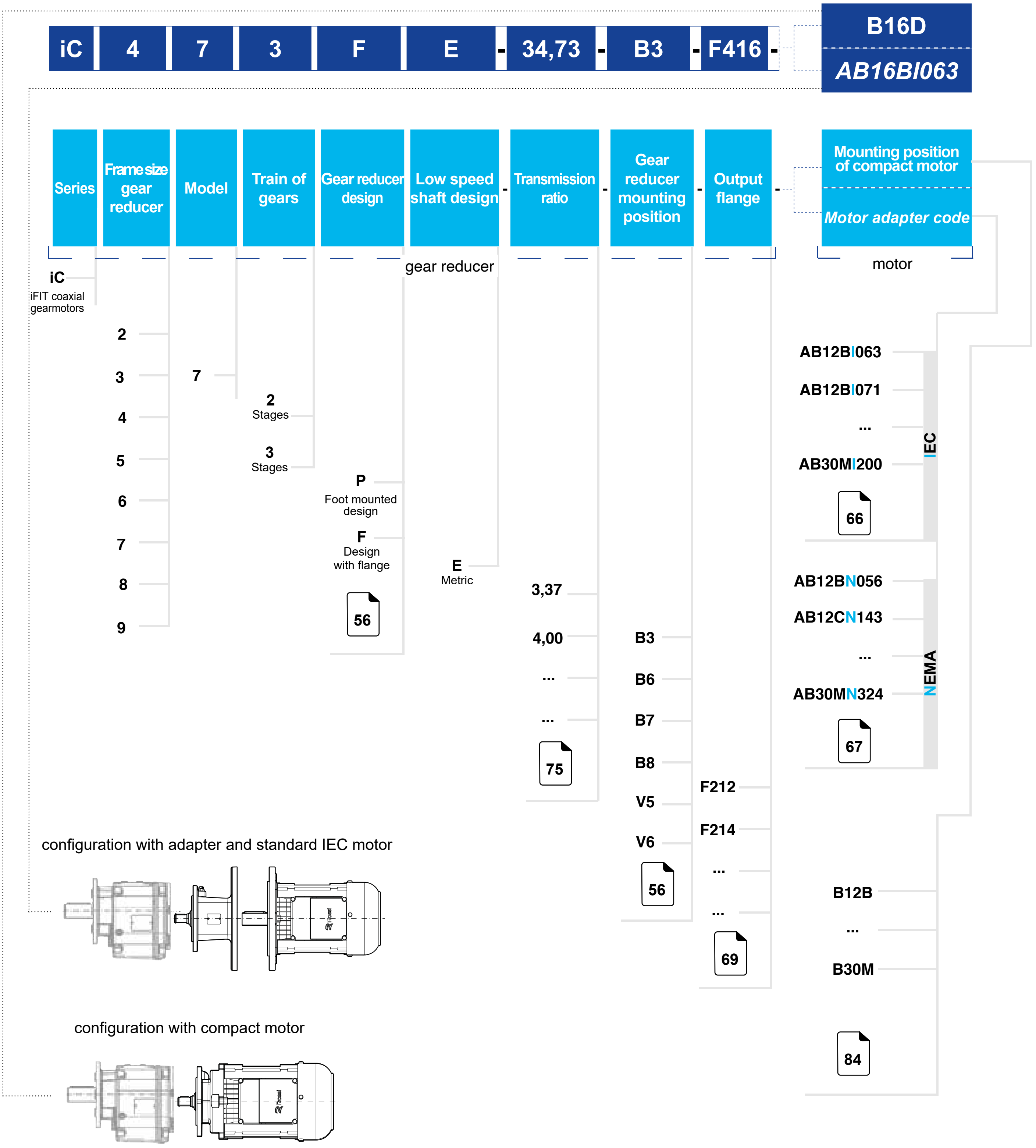
Designation

Section contents

5.1

Coding

5.1.1 Gearmotor designation

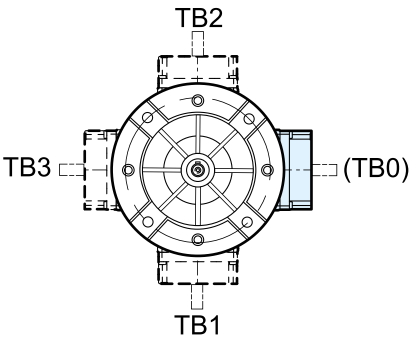


5.1.2 Motor designation

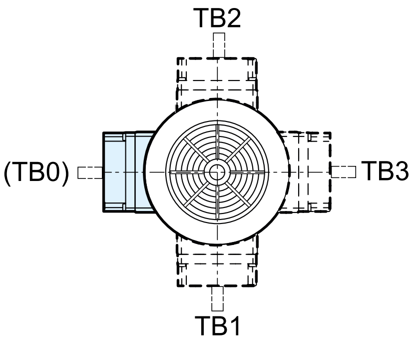
HB 3 Z 90S - 4 230.400 50 - B16D - TB2[1]

Series	Energy class	Integrated brake	Motor size	N. poles	Supply voltage	Frequency	Motor mounting position compact	Motor mounting position IEC	Terminal box position
HB	3	Z	90S	4	230.400	50	B16D		TB2[1]
HB	2 efficiency IE2	-	63A	2	230.400	50	B12B	B5	TB1
	3 efficiency IE3	Z	63B	4	400	60	...		TB2
			71B	6	...		B30C		TB3
			...						
	144	147	144	144	144	144	84		

5.1.3 Motor terminal block



Drive end (D)



Non-drive end (N)

The designation is to be completed with the statement of motor terminal box position if differing from the standard one TB0 (see also pages 60 and 61).
The release lever (for brake motor) follows the position of the terminal box.

The cable entry is the responsibility of the Buyer: the terminal box is integral with housing with knockout cable openings on both sides (one for power cable and one for auxiliary equipment).

---

(1) For standard terminal box position TB0, no indication in motor designation is necessary.

5.1.4 Gear reducer options coding

Ref.	Description	Code	Gear reducer sizes
(1)	Strengthened low speed shaft bearings	SP2	≥ iC 67...
(2)	Low speed shaft double seal (only for design with flange)	DT2	≥ iC 37...F
(3)	Seal rings (gear reducer and motor) in fluoro rubber	TV2	all
(4)	Special painting cycle (gear reducer and motor)	see page 32	all
(5)	Reduced backlash	GR	see page 31
(6)	Universal mounting position	BX	all
(7)	Stainless steel nameplate (gear reducer and motor)	TI	all
(9)	Prearranged for "long-term storage"	LS	all
(10)	Terminal box position differing from TB0	TB1, TB2, TB3	all

5.1.5 Motor options coding

Ref.	Description	Code	HB	HBZ
(1)	Special motor supply	–	•	•
(3)	Motor insulation class H	,H	•	•
(8)	Condensate drain holes	,CD	•	•
(9)	Additional windings impregnation	,SP	•	•
(13)	Anti-condensation heater	,S	•	•
(16)	Second shaft end	,AA	•	•
(17)	Axial independent cooling fan	,V ...	•	•
(18)	Axial independent cooling fan and encoder	,V ... ,E...	•	•
(19)	Thermistor type thermal probes (PTC)	,T15 ,T17	•	•
(20)	Bi-metal thermal probes	,B15 ,B17	•	•
(21)	Drip-proof cover	,PP	•	•
(25)	Manual release lever position different from standard position (L)	,L1 ,L2 ,L3	–	•
(26)	D.c. brake separate supply	…	–	•
(35)	Light alloy fan	,VL	•	•
(36)	Encoder	,E1 ... ,E5	•	•
(42)	Motor certified to UL	,UL	•	•
(47)	Design for damp and corrosive environment,	,UC	–	•
	stainless steel bolts and screws of brake disk	,DB	–	•
(48)	IP 56 protection	,IP 56	–	•
(49)	IP 65 protection	,IP 65	–	•
(51)	Strengthened design for supply from inverter (sizes 160 ... 200)	,IR	•	•
(61)	Manual rotation	,MM	–	•
(62)	Prearranged for encoder	,PE	•	•
(63)	Axial independent cooling fan and prearranged for encoder	,V... ,PE	•	•
(64)	IP 66 protection	,IP 66	•	–

For a complete motor options description see cat. TX motors of series HB.

5.1.6 Designation examples

Example 1: compact gearmotor

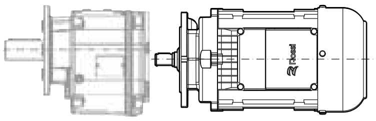
iC	4	7	3	F	E	-	34,73	-	B3	-	F416	-	B16D

- gearmotor size iC 47
- 3 reduction stages
- design with flange
- metric shaft
- transmission ratio 34,73
- gear reducer mounting position B3
- output flange F416
- compact motor with mounting position B16D

Compact motor designation compatible with above coded gear reducer follows

HB	3	Z	90S	-	4	230.400	50	-	B16D	-	TB2

- motor type HB, with efficiency IE3, brake type
- motor size 90S
- number of poles 4
- supply voltage 230-400 V at 50 Hz
- compact motor with mounting position B16D
- terminal box position TB2



Example 2: gearmotor with IEC adapter

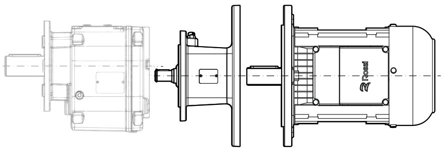
iC	4	7	3	F	E	-	34,73	-	B3	-	F416	-	AB16DI090

- gearmotor size iC 47
- 3 reduction stages
- design with flange
- metric shaft
- transmission ratio 34,73
- gear reducer mounting position B3
- output flange F416
- standard IEC motor with adapter AB16DI090

IEC motor designation compatible with above coded gear reducer follows

HB	3	Z	90S	-	4	230.400	50	-	B5	-	TB2

- motor type HB, with efficiency IE3, brake type
- motor size 90S
- number of poles 4
- supply voltage 230-400 V at 50 Hz
- IEC motor mounting position TB2
- terminal box position TB2

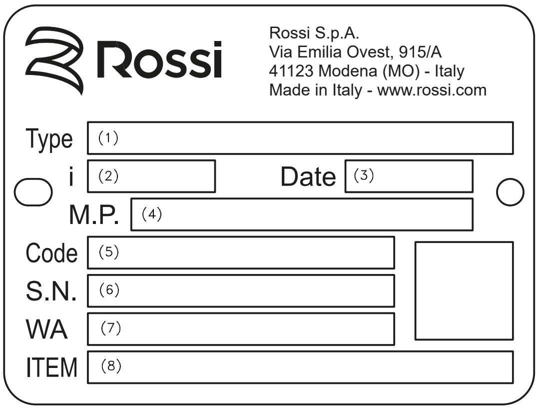


5.2

Nameplate data

5.2.1 Gear reducer nameplate

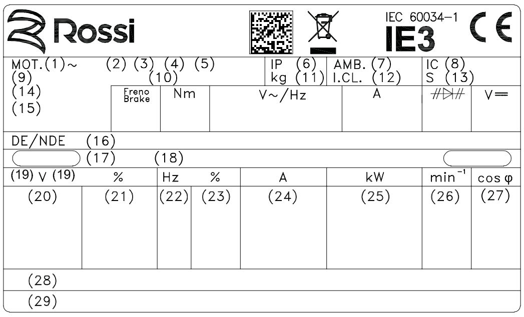
Every gear reducer is provided with a name plate in anodized aluminium containing main informations necessary for a correct identification of the product.
The name plate must not be removed and must be kept integral and readable.
All name plate data must be specified on eventual spare part orders.



(1) Gear reducer type
(2) Transmission ratio
(3) Production date
(4) Gear reducer mounting position
(5) Product code
(6) Serial number
(7) Production batch
(8) Customer code [1]

5.2.2 Motor nameplate

The motor is provided with a nameplate in anodized aluminium containing main information necessary for a correct identification of the project.
The name plate must not be removed and must be kept integral and readable.
All name plate data must be specified on eventual spare part orders.



HB

(1) Number of phases
(2) Motor type
(3) Frame size
(4) Number of poles
(5) Mounting position designation position
(6) Protection IP
(7) Ambient temperature maximum
(8) IC code
(9) Production batch
(10) Two months, year of manufacturing and serial number
(11) Motor mass
(12) Insulation class I.CL.
(13) Duty cycle S...
(14) Motor code
(15) Customer code [1]
(16) Bearings
(17) Additional note
(18) Additional note
(19) Connection of the phases
(20) Rated voltage
(21) Voltage tolerance
(22) Nominal frequency
(23) Frequency tolerance
(24) Nominal current
(25) Nominal power
(26) Rated speed
(27) Nominal power factor
(28) Nominal efficiency IEC 60034-2-1
(29) Design - code

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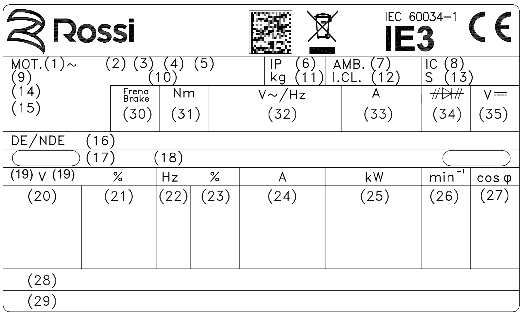
[1] On request



HBZ

(1) Number of phases
(2) Motor type
(3) Frame size
(4) Number of poles
(5) Mounting position designation position
(6) Protection IP
(7) Ambient temperature maximum
(8) IC code
(9) Production batch
(10) Two months, year of manufacturing and serial number
(11) Motor mass
(12) Insulation class I.CL.
(13) Duty cycle S...
(14) Motor code
(15) Customer code (1)
(16) Bearings
(17) Additional note
(18) Additional note
(19) Connection of the phases
(20) Rated voltage
(21) Voltage tolerance
(22) Nominal frequency
(23) Frequency tolerance
(24) Nominal current
(25) Nominal power
(26) Rated speed
(27) Nominal power factor
(28) Nominal efficiency IEC 60034-2-1
(29) Design - code
(30) Brake size
(31) Braking torque
(32) Supply of rectifier
(33) Current absorbed by brake
(34) Nominal d.c. voltage supply of brake
(35) Nominal d.c. voltage of brake supply

(1) On request

6

Project Planning

Section contents

6.1

Selection

6.1.1 Selection data

For a correct selection of gearmotor and drive, the following information about the application is required

Symbols	Description	Unit of Measure SI
n_{2min}	minimum rotation speed required on low speed shaft	[min^{-1}]
n_{2max}	maximum rotation speed required on low speed shaft	[min^{-1}]
$P_{2-n2\ min}$	power required at low speed shaft at minimum speed	[kW]
$P_{2-n2\ max}$	power required at low speed shaft at maximum speed	[kW]
$M_{2-n2\ min}$	torque required at low speed shaft at minimum speed	[N m]
$M_{2-n2\ max}$	torque required at low speed shaft at maximum speed	[N m]
F_{a2}	axial loads on low speed shaft	[N]
F_{r2}	radial loads on low speed shaft	[N]
J	external moment of inertia of mass (couplings, driven machine)	[kg m^2]
T_{amb}	(maximum and minimum) ambient temperature	[°C]
H	installation altitude	[m]
$S1, S2,..$	duty cycle	[%]
z	number of starts per hour	[start/h]
f	supply frequency	[Hz]
U_{mot}	motor supply voltage	[V]
U_f	brake supply voltage	[V]
M_f	braking torque	[N m]
$B3 ... V6$	gearmotor mounting position	

6.1.2 Selection of gearmotor size

In order to select the most suitable gearmotor size for the application, you must:

1 have the necessary data as indicated in the previous paragraph:
  - power P_2 required at gearmotor output;
  - angular speed n_2,
  - operating conditions (nature of the load, duration, frequency of starting z, other considerations).

2 determine service factor *fs* on the basis of running conditions (page 48).

3 select the gearmotor size on the basis of:
  - n_2
  - *fs*
  - power P_1 equal or greater than P_2

If power P_2 required is the result of a precise calculation, the gearmotor should be selected on the basis of a power P_1 equal or greater than P_2 / η , where η = 0,97 ÷ 0,98 is gear reducer efficiency (page 48).
When for reasons of motor standardization, power P_1 available in catalog is much greater than the power P_2 required, the gearmotor can be selected on the basis of a lower service factor provided it is certain that this excess power available will never be required and frequency of starting z is low enough not to affect service factor (page 47).
Calculations can also be made on the basis of torque instead of power; this method is even preferable for low n_2 values.

6.1.3 Verifications

- Verify possible radial load F_{r2} referring to directions given on pages 51 and 52.
- For the motor, verify frequency of starting z when higher than that normally permissible, referring to directions and values given in ch. 2 cat. TX; this will normally be required for brake motors only.
- When a load chart is available, and/or there are overloads – due to starting on full load (especially with high inertias and low transmission ratios), braking, shocks, gear reducers in which the low speed shaft becomes driving member due to driven machine inertia, applied power higher than strictly required, other static or dynamic causes - verify that the maximum torque peak is always smaller than **$1{,}6 \cdot M_{N2}$** (where $M_{N2} = M_2 \cdot fs$).
  If higher or if it cannot be evaluated in the above cases, install safety devices so that **$1{,}6 \cdot M_{N2}$** will never be exceeded.

6.1.4 Start and stop overloads

Starting torque

When starting on full load (especially for high inertias and low transmission ratios) verify that starting torque $M_{2\,starting}$ is:

$$M_{2\,starting} = \left(\frac{M_{starting}}{M_N} \cdot M_{2\,available} - M_{2\,required} \right) \cdot \frac{J_1}{J_1 + J_0} + M_{2\,required} < 1{,}6 \cdot M_{N2}$$

where

$M_{2\,required}$	is the torque absorbed by the machine through work and frictions;
$M_{2\,available}$	is the output torque due to motor nominal power;
J_0	is the moment of inertia (of mass) of the motor;
J_1	is the external moment of inertia (of mass) in kg m^2 (gear reducers, couplings, driven machine) referred to the motor shaft $J_1 = J / i^2$.

When seeking to verify that starting torque is sufficiently high for starting, take into account starting friction, if any, in evaluating M_2 required.

Braking torque

In case of **stopping machines with high kinetic energy** (high moments of inertia combined with high speeds) and **with brake motors**, verify braking stress by means of the formula

$$\left(\frac{M_f}{\eta} \cdot i + M_{2\,required} \right) \cdot \frac{J_1}{J_1 + J_0} + M_{2\,required} < 1{,}6 \cdot M_{N2}$$

where

M_f	is the braking torque setting (see table on page 150)
η	is the efficiency
i	is the transmission ratio
J_0	is the moment of inertia (of mass) of the motor;
J_1	is the external moment of inertia (of mass) in kg m^2 (gear reducers, couplings, driven machine) referred to the motor shaft $J_1 = J / i^2$.

Attention:
Where no evaluation is possible, install safety devices which will keep values within $M_{2\,max} = 1{,}6 \cdot M_{N2}$

6.1.5 Operation with brake motor

Starting time t_a and revolutions of motor φ_{a1}

$$t_a = \frac{(J_0 + J_1) \cdot n_1}{9.55 \cdot \left(M_{starting} - \frac{M_{2\,required}}{i}\right)} \quad [s] \qquad \varphi_{a1} = \frac{t_a \cdot n_1}{19.1} \quad [rad]$$

Braking time t_f and revolutions of motor φ_{f1}

$$t_f = \frac{(J_0 + J_1) \cdot n_1}{9.55 \cdot \left(M_f + \frac{M_{2\,required}}{i}\right)} \quad [s] \qquad \varphi_{f1} = \frac{t_f \cdot n_1}{19.1} \quad [rad]$$

where:

• $M_{starting}$	is the motor starting torque	$\left(\frac{9550 \cdot P_1}{n_1} \cdot \frac{M_{starting}}{M_N}\right)$
• M_f	is the braking torque setting of the motor (see page 150)	
• φ_{a1}	is the revolution of motor during starting time t_a (see page 150)	
• φ_{f1}	is the revolution of motor during braking time t_f (see page 150)	
• J_0	is the moment of inertia (of mass) of the motor;	
• J_1	is the external moment of inertia (of mass) in kg m^2 (gear reducers, couplings, driven machine) referred to the motor shaft.	

For other symbols, see page 20 and table on page 44.

Assuming a regular air-gap and ambient humidity, and utilizing suitable electrical equipment, repetition of the braking action, as affected by variation in temperature of the brake and by the state of wear of friction surface, is approx 0,1 · φ_{f1}.

6.1.6 Considerations on motor power

Taking into account the efficiency of the gear reducer, and other drives – if any – **motor power** is to be as near as possible to the power rating required by the driven machine: accurate calculation is therefore recommended.

The power required by the machine can be calculated, taking into account its components:

- power due to the work to be done,
- power required to overcome friction (first detachment, sliding or rolling)
- power required to overcome inertia (especially when the mass and/or acceleration or deceleration is large);

or determined experimentally based on tests and comparisons with existing applications, amperometric and wattmetric readings.

Oversizing the motor involves:

- higher starting current and therefore larger fuse valves and conductor section;
- a higher operating cost as it worsens the power factor (cos φ) and also the efficiency;
- greater stress on the drive, causing danger of mechanical failure, drive being normally proportionate to the power rating required by the machine, not to motor power.

Only high values of ambient temperature, altitude, frequency of starting or other particular conditions require an increase in motor power.

6.2

Service factor fs

Service factor *fs* takes into account the different running conditions which the gearmotor must be referred to:

- nature of load;
- duration;
- frequency of starting;

and other consideration to be considered in the calculations of gear reducer selection and verification.
For a quick and rough selection, the following table gives the minimum service factor *fs* required according to the kind of the driven machine.

Load classification		Driven machine	*fs* ≥
I	**Uniform load** ($m_J \le 0,3$)	Fans (small diameters) Agitators (liquids at low and constant density) Mixers (low density and uniform materials) Belt conveyors (fine grade loose materials) Auxiliary commands Assembly lines Filling machines Compressors Centrifugal pumps (liquids with low and constant density) Elevators Escalations	**1**
II	**Moderate overloads** ($m_J \le 3$)	Fans (average diameters) Agitators (liquids, high or variable density) Mixers (variable density materials) Belt conveyors (coarse bulk materials) Translations Dosing pumps Gear pumps Multi-cylinder piston pumps Centrifugal Pumps (high or variable density liquids) Palletizers Slewing gears Palletizing equipments Bottling machines Hoists Sliding doors	**1.32**
III	**Heavy overloads** ($m_J \le 10$)	Bucket elevators Roller ways Heavy duty mixers (solid and heterogeneous materials) Bridge crane translations Mechanisms (cranks, eccentrics) Shears (sheet metal) Bending rolls Centrifuges Presses (crank, toggle, eccentric)	**1.6**

For a more accurate calculation of the required service factor (especially considering the running hours), proceed as stated below

1) Calculate the mass acceleration factor $\boldsymbol{m_J}$:

$$m_J = \frac{J_1}{J_0}$$

where:

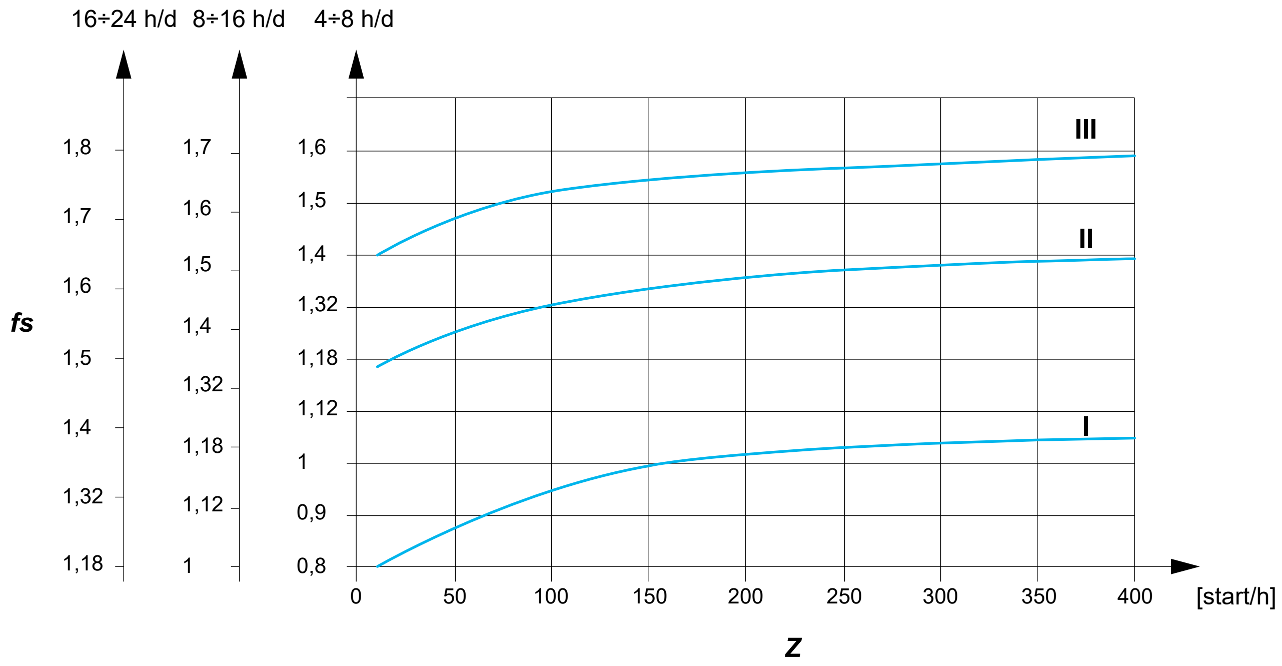
- J_1 [kg m^2] is the external moment of inertia J (of mass; coupling, driven machine), referred to motor shaft $J_1 = J / i^2$;
- J_0 [kg m^2] is the moment of inertia (of mass) of motor (see. cat. TX) including brakes, flywheel, etc.
- i is the transmission ratio of selected gear reducer.

2) Select the proper overload class according to the acceleration mass factor m_J

$m_J \leq 0,3$ (uniform) **class I**
$m_J \leq 3$ (moderate overloads: ≈ 1,6 x normal) **class II**
$m_J \leq 10$ (heavy overloads: ≈ 2,5 x normal) **class III**

For m_J values higher than 10, in presence of high values of backlash for kinematic chain and/or high radial loads a specific evaluation has to be carried out: contact Rossi S.p.A.

3) From the diagram below, according to the overload class, the running time and the starting frequency *z*, read off the service factor required.



6.3

Efficiency

Gear reducer efficiency is determined by the friction of the sliding and rolling surfaces (gears, bearings and seals) and by the oil splash leakage of the lubricating oil.
The value of efficiency is influenced by operating conditions (load and speed) and can reach a maximum value up to

- maximum efficiency 0,97 (for 3 stages gear reducer)
- maximum efficiency 0,98 (for 2 stages gear reducer).

The power loss due to efficiency is dissipated as heat flow through the outer surfaces of the gearmotor.

In order not to overheat the lubricant and seal material, **it must be ensured that the power applied does not exceed the heat dissipation capacity of the gearmotor.**

6.4

Thermal power Pt

The nominal thermal power $\boldsymbol{P_{TN}}$ [kW] is that which can be applied at the gear reducer input, without exceeding 95 °C approximately oil temperature when operating in following running conditions:

- input speed n_1 = 1400 min^{-1} (4 poles motor, 50 Hz);
- mounting position B3, B6, B7, B8;
- continuous duty *S1*;
- maximum ambient temperature 25 °C;
- maximum altitude 1000 m a.s.l.
- air speed ≥ 1,25 m/s (typical value in presence of a gearmotor with self-cooled motor)

The gearmotor combinations shown in chapter 9 are already thermally verified for all of the above conditions, including 2-pole combinations.

Otherwise it is necessary to verify that the applied power P_1 is less than or equal to the gearbox rated thermal power P_{TN} (indicated in the table) multiplied by the corrective coefficients f_{T1}, f_{T2}, f_{T3}, f_{T4}, f_{T5} (indicated in the tables) that take into account the different operating conditions:

$$P_1 \leq P_{TN} \cdot f_{T1} \cdot f_{T2} \cdot f_{T3} \cdot f_{T4} \cdot f_{T5}$$

If verification is not met, evaluate the use of special lubricants or heat exchanger cooling units, contact Rossi S.p.A.

Thermal power needs not be taken into account when maximum duration of continuous running time is 1 ÷ 3 h, for all gear reducer sizes, followed by rest periods long enough to restore the gear reducer to near ambient temperature.
In case of maximum ambient temperature above 50 °C or below 0 °C, contact Rossi S.p.A.

Nominal thermal power $\boldsymbol{P_{TN}}$ **[kW]:**

	$\boldsymbol{P_{TN}}$ [kW]							
	iC 27...	**iC 37...**	**iC 47...**	**iC 57...**	**iC 67...**	**iC 77...**	**iC 87...**	**iC 97...**
2	7,5	8	10,6	12,5	15	20	28	40
3	5,3	6	8,5	9,5	11,2	15	21,2	30

Thermal factor $\boldsymbol{f_{T1}}$ according to input speed $\boldsymbol{n_1}$:

	$\boldsymbol{f_{T1}}$ $\boldsymbol{n_1}$ [min^{-1}]					
	710	**900**	**1120**	**1400**	**1800**	**2800**
2	1,18	1,12	1,06	1	0,85	0,6
3	1,06	1,06	1,03	1	0,95	0,85

Thermal factor f_{T2} **according to ambient temperature** and **service**

$T_{amb\ max}$ °C	f_{T2}				
	Continuous duty **S1**	Intermittent duty **S3 ... S6** Cyclic duration factor [%] for 60 min running			
		60	**40**	**25**	**15**
60	0,5	0,6	0,67	0,8	0,85
50	0,63	0,75	0,85	1	1,06
40	0,8	0,95	1,06	1,18	1,32
30	0,95	1,12	1,25	1,4	1,6
25	1	1,18	1,32	1,5	1,7
10	1,18	1,4	1,6	1,8	2

Thermal factor f_{T3} **according to mounting position:**

Mounting position	f_{T3}	
	iC 272 ,,, 972	**iC 273 ,,, 973**
V5	0,8	0,9
V6	0,71	0,8

Thermal factor f_{T4} **according to altitude:**

Altitude	f_{T4}
≤ 1000	**1**
1000 ÷ 2000	0,95
2000 ÷ 3000	0,9
3000 ÷ 4000	0,85
≥ 4000	0,8

Thermal factor f_{T5} **according to cooling air speed on housing:**

Air speed **m/s**	**Installation environment**	f_{T5}
< 0,63	very small environment or without air movements or with protected gear reducer	(1)
0,63	very small environment and with limited air movements	0,71
1	wide environment without air movements	0,9
1,25	wide environment with light air movements (e,g, gearmotor with self-cooled motor)	**1**
2,5	open and cooled	1,18
4	with heavy air movements	1,32

(1) Contact Rossi S.p.A.

6.5

Radial loads on low speed shaft end

6.5.1 General

Radial loads generated on the shaft end by a drive connecting gearmotor and machine must be less than or equal to those given at ch. 9 as bearing life and wear (which also affects gears unfavourably) and low speed shaft strength clearly impose limits on permissible radial load.

6.5.2 Determination of the applied radial load

For the most common drives, radial load F_{r2} can be determined using the following formula where *k* takes on different values in relation to transmission type

$$F_{r2} = k \cdot \frac{2 \cdot M_2}{d} \text{ [N]}$$

where:

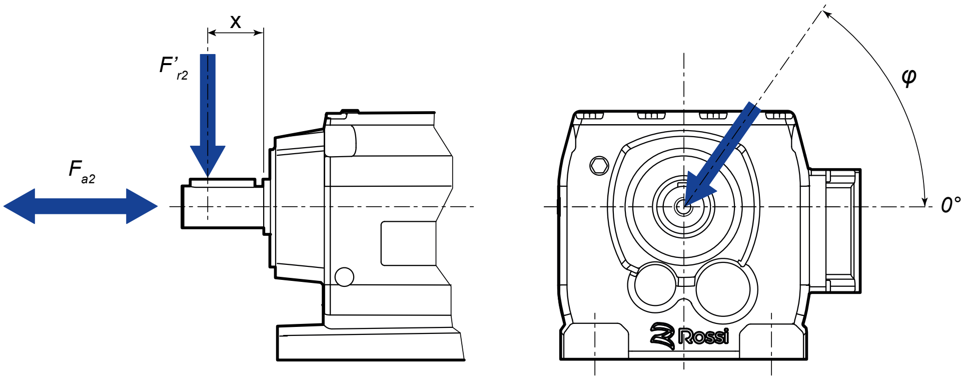
- M_2 [N m] is the torque required by the gearmotor low speed shaft;
- d [m] is the pitch diameter;
- k is a coefficient which assumes different values according to transmission type:

k = 1 for chain drive (lifting in general);
k = 1,5 for timing belt drive;
k = 2,5 for V-belt drive;
k = 1,1 for spur gear pair drive;
k = 3,55 for friction wheel drive.

6.5.3 Permissible radial load

The values of permissible radial load F_{r2} are indicated in the tables of ch. 9 and are valid for foot mounted gearmotor design (P…).
These values are referred to gearmotor's output speed n_2 and torque M_2,considering overhung load acting on centre line of low speed shaft end, in the most unfavorable direction of rotation and angular position of load.

If the exact direction of rotation and angular position of load are known, an increase of permissible radial load may be achieved.
On request, the option with strengthened bearings on low speed shaft is available (see page 38).
For the verification of each specific case contact Rossi S.p.A. with the notation shown in the figure.



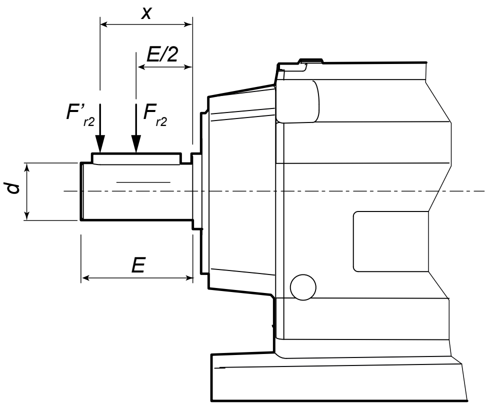
6.5.4 Permissible axial load

In absence of the radial load, an axial load may be acting on center line, not higher than 0,5 times the radial load stated in ch. 9. An **axial load** of up to 0,2 times the value in the table is permissible, simultaneously with the radial load, see ch. 9.

If exceeded and/or for **misaligned axial loads**, contact Rossi S.p.A.

6.5.5 Radial load not in center line

In the case of radial load acting in a position other than the centre line, i.e. at a distance from the shoulder other than 0,5 · E, you have to recalculate the permissible radial load value at distance x (F'_{r2x}) from the value given in chap. 9 using the minimum value given by the following formulae



$$F'_{r2b} = F_{r2} \cdot \frac{E/2 + y}{x + y} \quad [N]$$

$$F'_{r2s} = \frac{m}{x + q} \quad [N]$$

$$F'_{r2} = min\,(F'_{r2b}\,;\,F'_{r2s}) \quad [N]$$

where

F'_{r2b} [N]	is the permissible radial load, according to bearing life, acting at the distance *x* from shaft shoulder;
F'_{r2s} [N]	is the permissible radial load, according to shaft strength, acting at the distance *x* from shaft shoulder;
F_{r2} [N]	is the permissible radial load acting on center line of gearmotor low speed shaft end (see ch. 9);
F'_{r2} [N]	is the permissible radial load acting at the distance *x* from shaft shoulder;
E [mm]	is the gearmotor low speed shaft end length;
d [mm]	diameter of gearmotor low speed shaft end;
x [mm]	is the distance between the gearmotor low speed shaft shoulder and the load application point;
y [mm]	is a parameter that depends on the geometry of the gearmotor low speed shaft;
m [N mm]	is a parameter that depends on the geometry of the gearmotor low speed shaft;
q [mm]	is a parameter that depends on the geometry of the gearmotor low speed shaft.

Gearmotor size	*E/2 + y* mm	*y* mm	*m* N mm	*q* mm	*d* mm	*E* mm
iC 272 - iC 273	106,5	81,5	155700	11,8	25	50
iC 372 - iC 373	118	93	123500	0	25	50
iC 472 - iC 473	137	107	243900	15	30	60
iC 572 - iC 573	147,5	112,5	376300	18	35	70
iC 672 - iC 673	168,5	133,5	264600	0	35	70
iC 772 - iC 773	173,7	133,7	396800	0	40	80
iC 872 - iC 873	216,7	166,7	845000	0	50	100
iC 972 - iC 973	255,5	195,5	1060000	0	60	120

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7

Mounting positions

Section contents

7.1

Mounting positions

7.1.1 General

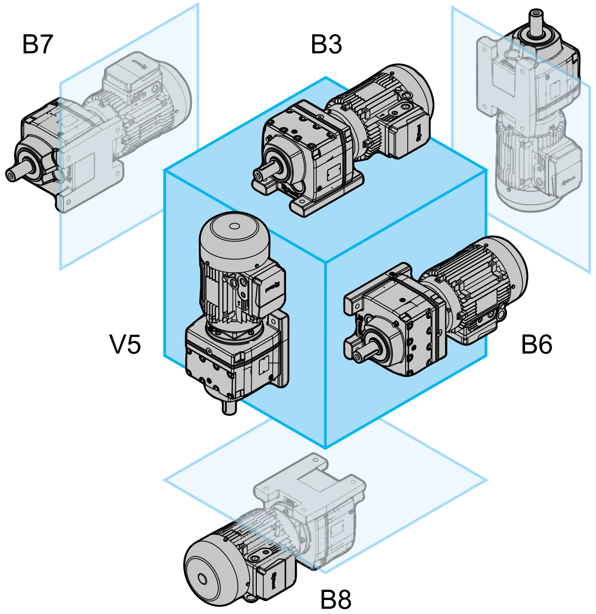
The mounting positions below show the possible mounting positions of the different gearmotor designs by Rossi S.p.A.

Except specific needs, prefer mounting position B3 as it is the most advised from a technical and economic point of view:

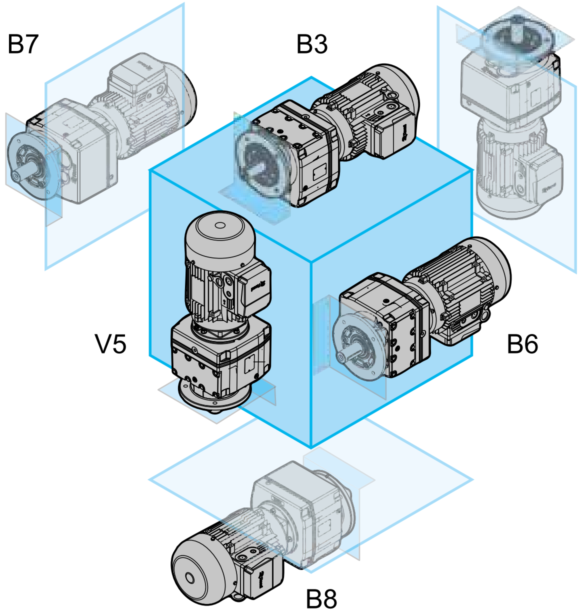
- maximum simplification of lubrication system,
- less oil splash,
- less gear reducer heating;
- greater availability of stock products.

For inclined or oscillating mounting positions contact Rossi S.p.A.

P



F



7.1.2 Change of mounting position

If gear reducer is installed in a mounting position differing from the one stated on name plate please follow these instructions:

- adjust the position of breather plug (see pages 60 and 61)
- adjust lubricant quantity (see page 64) up to the oil level foreseen, checking that there are no more gas pockets in the oil which is included in the gear reducer
- for the changeover to mounting position V6 contact Rossi S.p.A.

7.1.3 Universal mounting position BX

In this mounting position the gearmotors are supplied completely full of lubricant with all closed plugs, and with a loose breather plug as standard.

Before commissioning, please follow these instructions:

- position the breather plug correctly in the position foreseen by the operation mounting position (see pages 60 and 61)
- adjust oil quantity according to operation mounting position (see page 64).

7.2

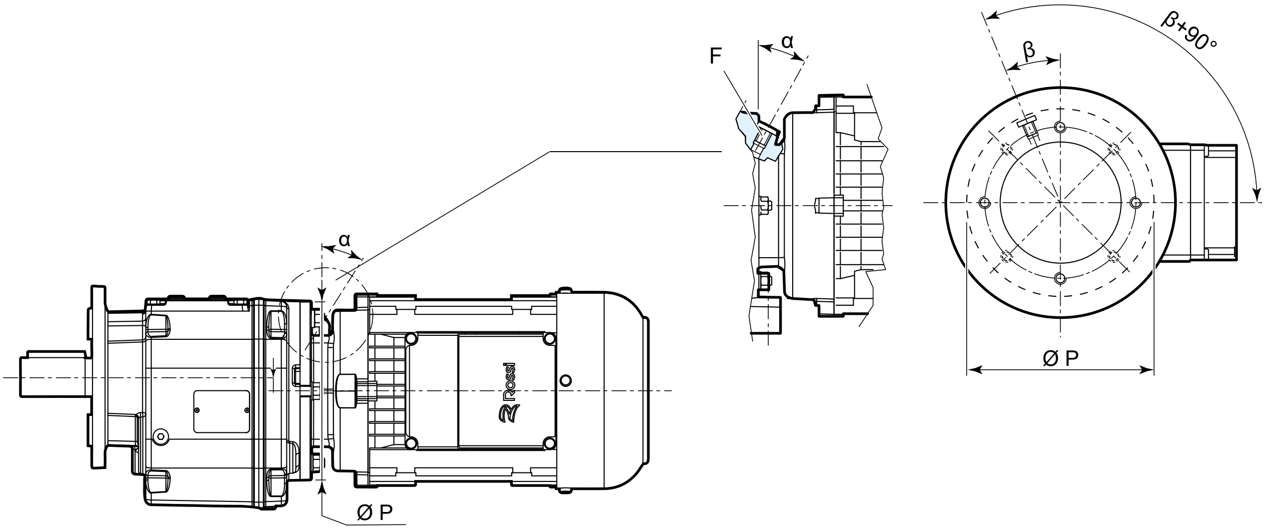
Plug position

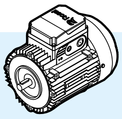
7.2.1 Positions of breather and drain plug

The position of breather and drain plug depend from gearmotor mounting position, see following pages.
Following table shows when the breather or drain plugs lay on motor flange, according to gearmotor mounting position.

Mounting position	Position of breather plug	Position of drain plug
B3, B6, B7, B8	in gear reducer housing	in gear reducer housing
V5	in motor flange	in gear reducer housing
V6	in gear reducer housing	in motor flange

When the breather plug or the drain plug are on motor flange, their angular position is determined on the basis of motor terminal box position.
All figures in this catalog represent breather and drain plugs with motor terminal box in standard TB0 position (see pages 37, 60 and 61).
The exact position of the breather and drain plugs according to the position of the motor terminal box is shown on the next page.



	P Ø	α °	β °	F
63	120	0	45	M10x1
	160	0	45	M10x1
	200	30	22,5	M12x1,5
71	120	0	45	M10x1
	160	0	45	M10x1
	200	30	22,5	M12x1,5
80	120	15	22,5	M10x1
	160	30	22,5	M12x1,5
	200	30	22,5	M12x1,5
	250	30	22,5	M12x1,5
	300	90	22,5	M22x1,5
90	120	30	22,5	M10x1
	160	30	22,5	M10x1
	200	30	22,5	M12x1,5
	250	30	22,5	M12x1,5
	300	30	22,5	M22x1,5
100 **112MA**	120	30	22,5	M10x1
	160	30	22,5	M10x1
	200	30	22,5	M12x1,5
	250	30	22,5	M12x1,5
	300	30	22,5	M22x1,5
112M	160	30	22,5	M10x1
	200	30	22,5	M12x1,5
	250	30	22,5	M12x1,5
	300	30	22,5	M22x1,5
132S **132M**	160	30	22,5	M10x1
	200	15	22,5	M12x1,5
	250	30	22,5	M12x1,5
	300	30	22,5	M22x1,5
132L **160**	200	30	22,5	M10x1
	250	30	22,5	M12x1,5
	300	30	22,5	M22x1,5
180	250	30	22,5	M12x1,5
	300	30	22,5	M22x1,5
200	250	30	22,5	M12x1,5
	300	30	22,5	M22x1,5

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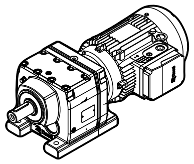
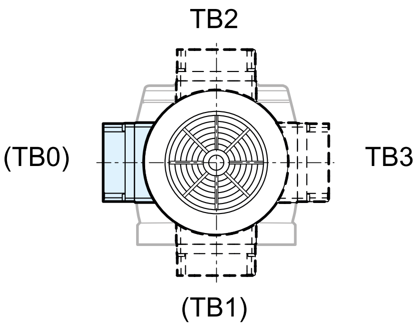
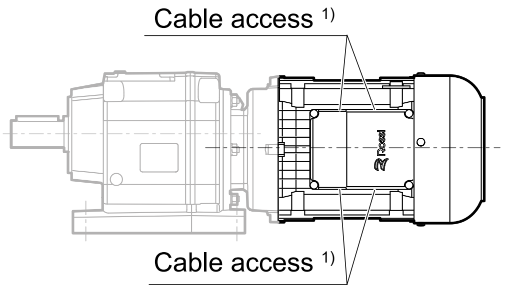
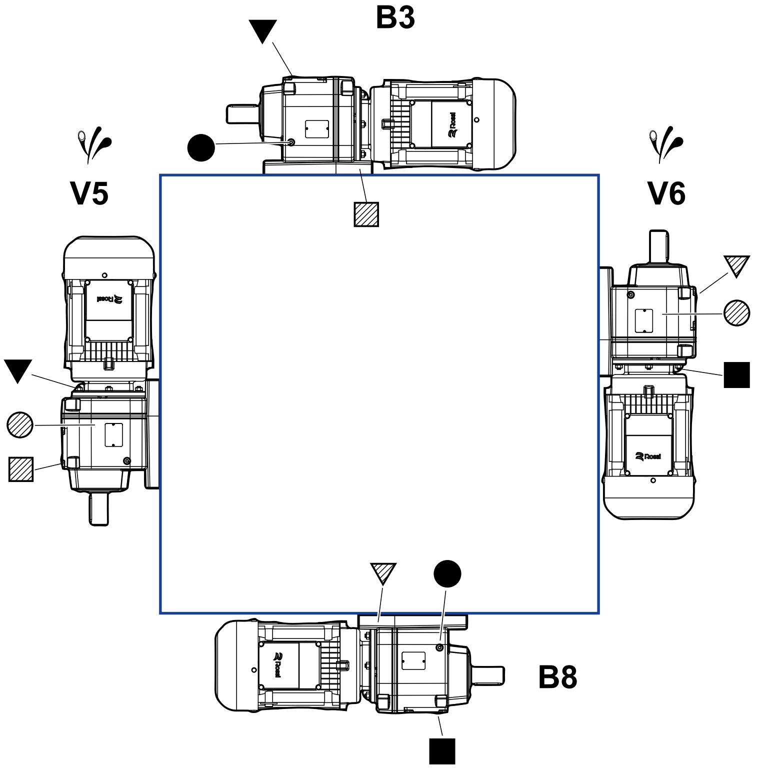
7.2.2 Position of breather and drain plug of foot mounted gearmotor

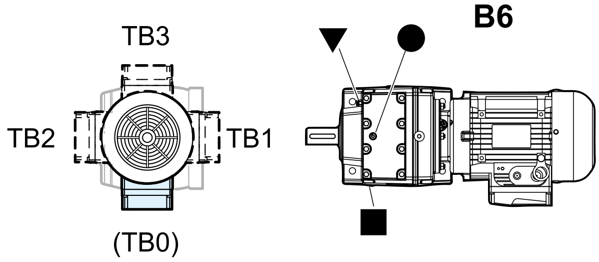


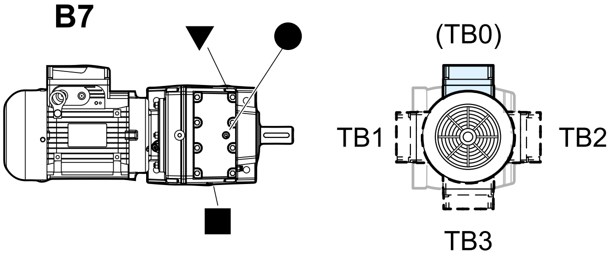
iC 272 / 273 PE ... iC 972 / 973 PE











iC 27... : breather plugs not present for B3, B8, B6, B7
iC 27... : oil level and drain plugs not present
iC 47..., **iC 57**... : level plug not present for B6

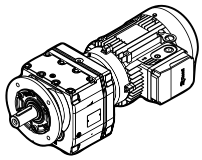
▼	breather plug	▽	breather plug on opposite side (not in view)
●	oil level plug	◍	oil level plug on opposite side (not in view)
■	oil drain plug	▨	oil drain plug on opposite side (not in view)

Possible high oil splash: for the corrective factor f_{t3} of nominal thermal power P_{tN} see page 49.

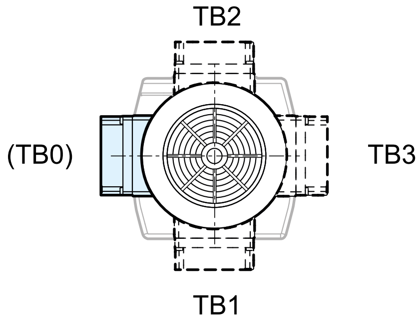
---

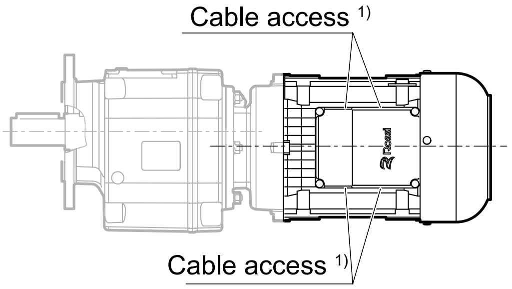
[1] Cable connection is by the customer: terminal box is integral with motor housing and equipped with knockout cable openings on both sides (one for power cable and one for auxiliary equipment).

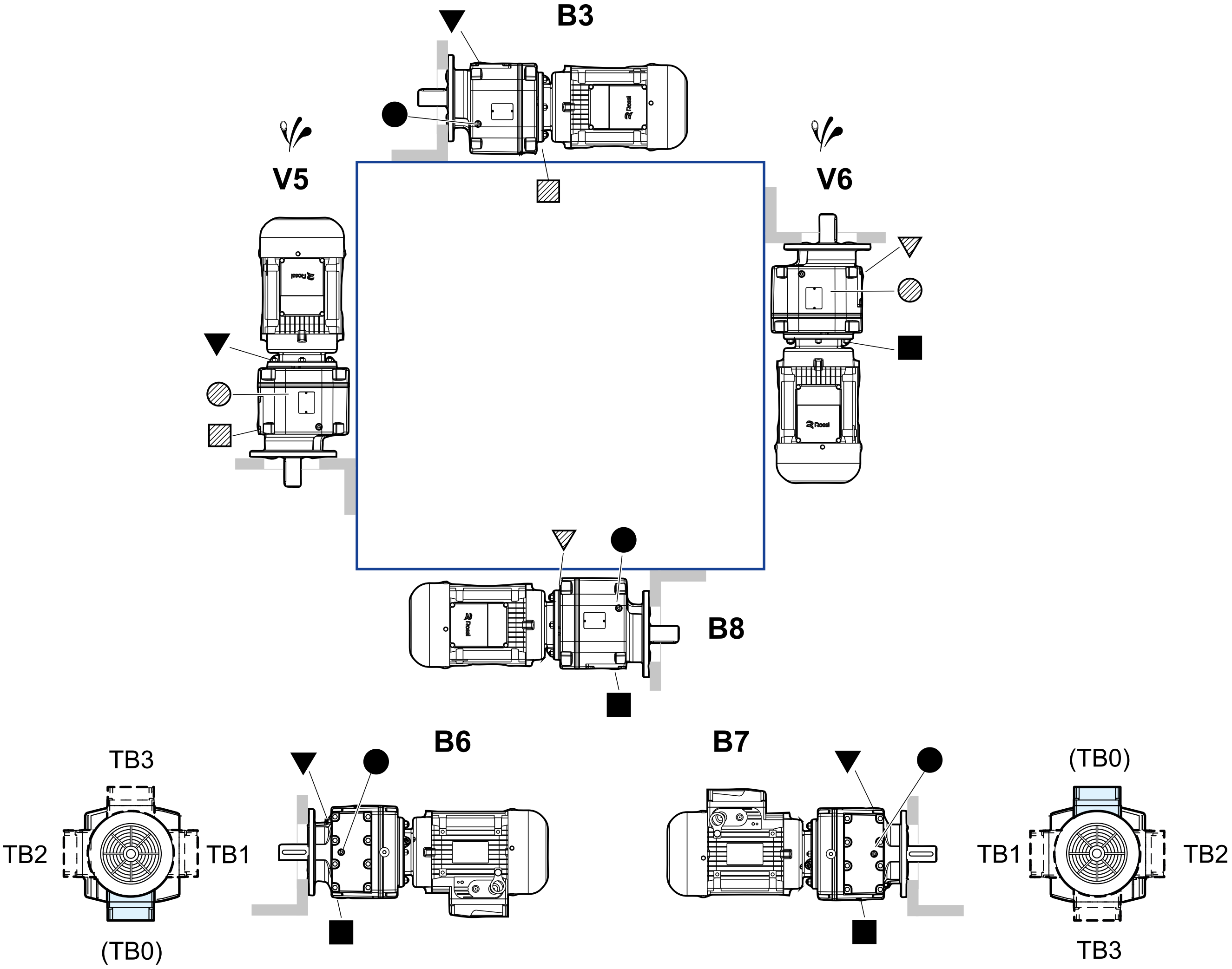
7.2.3 Position of breather and drain plug of flange mounted gearmotor



iC 272 / 273 FE ... iC 972 / 973 FE







iC 27... : breather plugs not present for B3, B8, B6, B7

iC 27... : oil level and drain plugs not present

iC 47..., **iC 57**... level plug not present for B6

▼ breather plug
● oil level plug
■ oil drain plug

▽ breather plug on opposite side (not in view)
◍ oil level plug on opposite side (not in view)
▨ oil drain plug on opposite side (not in view)

Possible high oil splash: for the corrective factor f_{t3} of nominal thermal power P_{tN} see page 49.

---

[1] Cable connection is by the customer: terminal box is integral with motor housing and equipped with knockout cable openings on both sides (one for power cable and one for auxiliary equipment).

8

Structural and operational details

Section contents

8.1

Lubrication

8.1.1 General

The gear pairs and the bearings are oil bathed, splashed or lubricated “for life” with grease (with or without NILOS ring).
Unless otherwise stated, gearmotors are **supplied filled with synthetic oil** (KLÜBER Klünersynth GH 6-220, MOBIL Glygoyle 220, SHELL Omala S4 WE 220), providing lubrication – assuming pollution-free surroundings – “long life”.

Ambient temperature range 0 ÷ 40 °C with peaks of -20 °C and +50 °C.
Mounting position V6 foresees low speed shaft bearings grease lubricated (for life) with metal protection shield.

Important:
the order-specific mounting position determines the quantity of lubricant supplied to the gear unit at the time of delivery as well as whether there are bearings with independent lubrication.
Always be sure that the gearmotor is located as per the mounting position ordered, which appears on the name plate.
If the gearmotor is installed in a different mounting position verify, according to the values given in the table, that the oil quantity doesn't change; if so, adjust it consequently.
In addition, the vertical V6 mounting position requires the application of special grease in the upper bearing.
The mounting position can be changed only with previous authorization by Rossi S.p.A., otherwise the warranty is void.

8.1.2 Oil quantity

Stated lubricant quantities are approximate and indicative for provisioning. The exact quantity the gear reducer is to be filled with is definitely given by the level.

Gearmotor size	**Oil quantities [l]**					
	B3	B6	B7	B8	V5	V6
iC 272 - iC 273	0,25	0,5	0,5	0,5	0,7	0,7
iC 372 - iC 373	0,3	0,75	0,95	0,95	1,05	0,85
iC 472 - iC 473	0,7	1,5	1,5	1,5	1,65	1,6
iC 572 - iC 573	0,8	1,7	1,7	1,7	2,1	1,9
iC 672 - iC 673	1,1	1,8	2,0	2,8	2,9	2,4
iC 772 - iC 773	1,2	2,5	3,4	3,6	3,8	3,3
iC 872 - iC 873	2,3	6,3	6,5	7,2	7,2	6,4
iC 972 - iC 973	4,6	11,3	11,7	11,7	13,4	11,7

8.1.3 Lubricants table

Important:
Inappropriate lubricants can cause damage to the gear reducer.

The viscosity and type of lubricating oil used for filling **are indicated on the adhesive name plate on the gear reducer.** Rossi S.p.A. declines any responsibility for damages deriving from the use of other lubricants or from the use outside the expected ambient temperature range. The indications on lubricants do not bind Rossi S.p.A. on the quality of the lubricant supplied by each respective manufacturer. Do not mix different lubricating oils; do not mix synthetic oils with mineral oils.

Brand	**Synthetic PAO oil**	**Synthetic PAG oil**	**Mineral oil**
AGIP	Blasia SX	Blasia S	Blasia
ARAL	Degol PAS	Degol GS	Degol BG
BP	Enersyn EPX	Enersyn SG-XP	Energol GR-XP
CASTROL	Alphasyn EP	Optiflex A	Alpha SP
FUCHS	Renolin Unisys	Renolin PG	Renolin CLP

Brand	**Synthetic PAO oil**	**Synthetic PAG oil**	**Mineral oil**
KLÜBER	Klübersynth GEM4	Klübersynth GH6	Klübersynth GEM1
MOBIL	Mobil SHC Gear	Mobil Glygoyle	Mobilgear 600 XP
SHELL	Omala S4 GX	Omala S4 WE	Omala S2 G
TEXACO	Pinnacle	Synlube CLP	Meropa
TOTAL	Carter SH	Carter SY	Carter EP

8.1.4 ISO viscosity grade

Unless otherwise specified, the gearmotors are **supplied complete with synthetic oil** of viscosity grade ISO VG 220 suitable for most applications in normal industrial environments. For different application conditions or specific needs, please contact Rossi S.p.A.
The following table provides a general guideline for lubricant viscosity selection (average cSt value of kinematic viscosity at 40 °C).

Speed n_2 min^{-1}	**Ambient temperature** T_{amb} C°		
	Mineral Oil		*Synthetic oil*
	0 ÷ 20	10 ÷ 40	0 ÷ 40
> 224	150	150	150
224 ÷ 22.4	150	220	220
22.4 ÷ 5.6	220	320	320
< 5.6	320	460	460

Ambient temperature peaks of ± 10 °C for mineral oils and ± 20 °C for synthetic oils are permissible with respect to the conditions given in the table.

8.1.5 Oil change intervals

An overall guide to oil-change interval is given in the table, and assumes pollution-free surroundings.
When heavy overloads are present, halve the values.

Oil temperature °C	**Oil change interval** [h]	
	Mineral Oil	*Synthetic oil*
≤ 65	8000	25000
65 ÷ 80	4000	18000
80 ÷ 95	2000	12500

Seal rings:
Duration depends on several factors such as dragging speed, temperature, ambient conditions, etc.; as a rough guide it can vary from 3150 to 25000 h.

8.1.6 Breather plugs

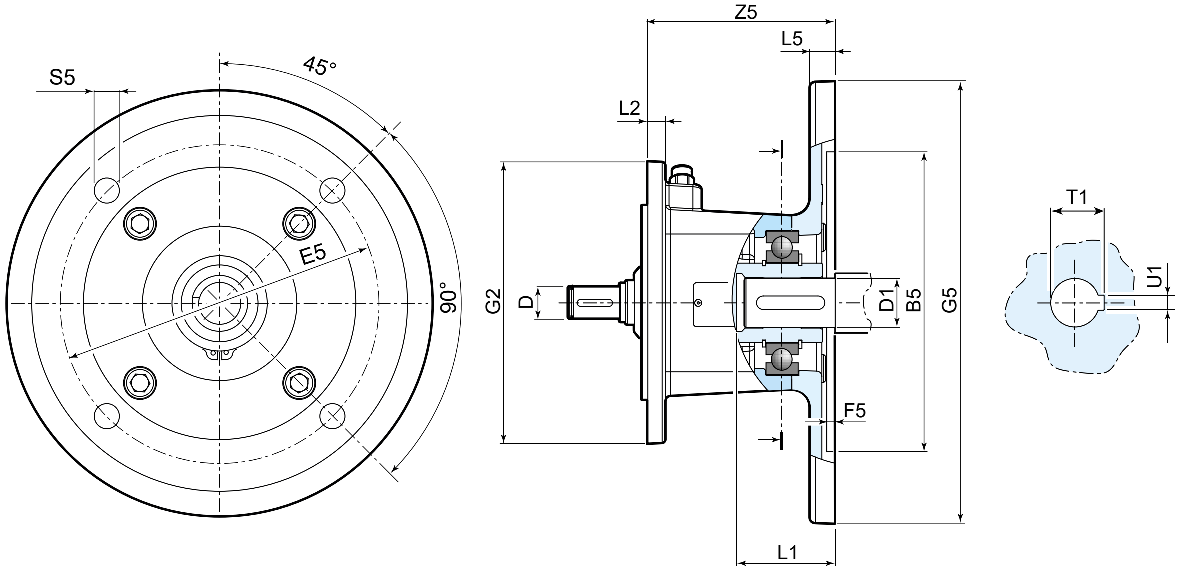
The gearmotors are supplied complete with a (metal) breather plug with valve mounted in the correct position according to the type of mounting position (except for type BX, see page 57).

Before commissioning it is necessary to activate the breather by tearing the closing tab on the plug.
It is necessary to keep the breather free from dirt that could compromise its functionality.
In case this is not possible, please contact Rossi S.p.A. to find a different solution.

8.2

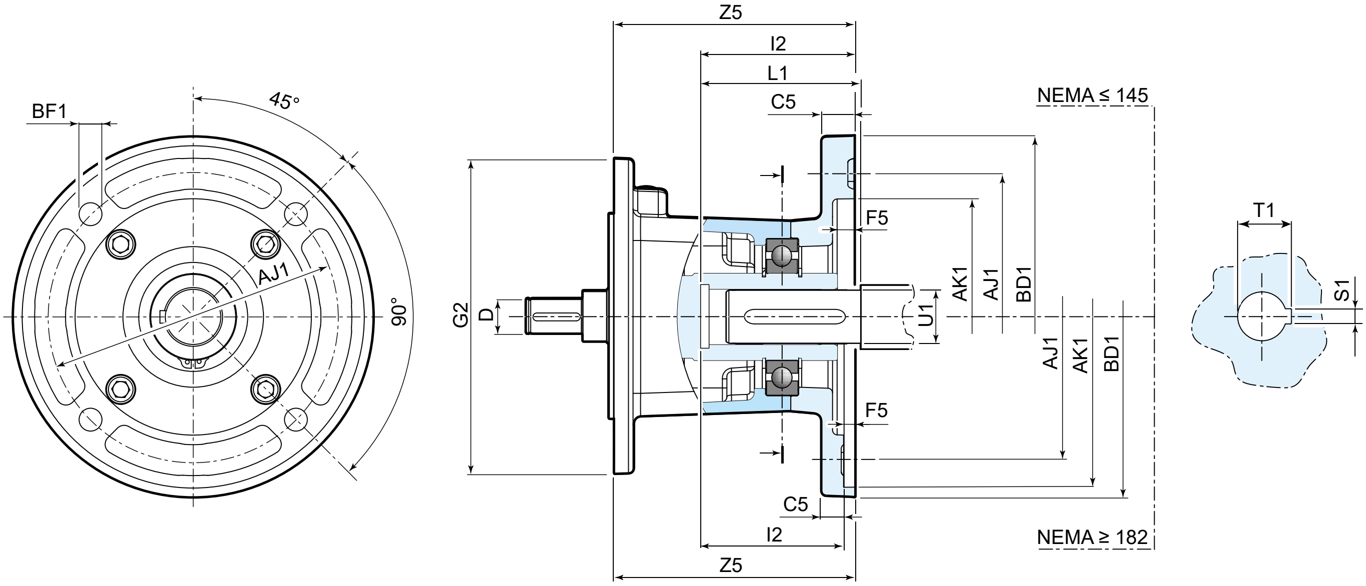
Adapters for motors

8.2.1 Adapters for the assembly of standard IEC motors



Gear reducer size	IEC motor size	Adapter code	B5 Ø H7	D Ø	D1 Ø F6	E5	F5	G2 Ø	G5 Ø	L1	L2	L5	S5 Ø	T1	U1 F9	Z5
iC 272, iC 273 iC 372, iC 373	**63**	**AB12BI063**	95	10	11	115	4	120	140	27	8	10	8,5	12,8	4	56,5
	71	**AB12BI071**	110	10	14	130	4,5	120	160	32	8	11	8,5	16,3	5	56,5
	80	**AB12CI080**	130	12	19	165	4,5	120	200	41,5	8	12	11	21,8	6	111
	90	**AB12DI090**	130	14	24	165	4,5	120	200	52	8	12	11	27,3	8	111
	100, 112MA	**AB12EI100**	180	16	28	215	5	120	250	62	8	14	13	31,3	8	113
iC 472, iC 473 iC 572, iC 573 iC 672, iC 673	**63**	**AB16BI063**	95	10	11	115	4	160	140	27	10	10	8,5	12,8	4	50,5
	71	**AB16BI071**	110	10	14	130	4,5	160	160	32	10	11	8,5	16,3	5	50,5
	80	**AB16CI080**	130	12	19	165	4,5	160	200	41,5	10	12	11	21,8	6	104
	90	**AB16DI090**	130	14	24	165	4,5	160	200	52	10	12	11	27,3	8	104
	100, 112MA	**AB16EI100**	180	16	28	215	5	160	250	62	10	14	13	31,3	8	106
	112M	**AB16FI112**	180	18	28	215	5	160	250	62	10	14	13	31,3	8	106
	132S, M	**AB16GI13S**	230	22	38	265	5	160	300	82	10	16,5	13	41,3	10	145
iC 772, iC 773	**63**	**AB20BI063**	95	10	11	115	4	200	140	27	12	10	8,5	12,8	4	44,5
	71	**AB20BI071**	110	10	14	130	4,5	200	160	32	12	11	8,5	16,3	5	44,5
	80	**AB20CI080**	130	12	19	165	4,5	200	200	41,5	12	12	11	21,8	6	98
	90	**AB20DI090**	130	14	24	165	4,5	200	200	52	12	12	11	27,3	8	98
	100, 112MA	**AB20EI100**	180	16	28	215	5	200	250	62	12	14	13	31,3	8	100
	112M	**AB20FI112**	180	18	28	215	5	200	250	62	12	14	13	31,3	8	100
	132S, M	**AB20GI13S**	230	22	38	265	5	200	300	82	12	16,5	13	41,3	10	139
	132MB	**AB20HI13L**	230	28	38	265	5	200	300	82	12	16,5	13	41,3	10	139
	160	**AB20HI160**	250	28	42	300	6	200	350	112	12	18	18	45,3	12	186
iC 872, iC 873	**80**	**AB25CI080**	130	12	19	165	4,5	250	200	41,5	14	12	11	21,8	6	94
	90	**AB25DI090**	130	14	24	165	4,5	250	200	52	14	12	11	27,3	8	94
	100, 112MA	**AB25EI100**	180	16	28	215	5	250	250	62	14	14	13	31,3	8	96
	112M	**AB25FI112**	180	18	28	215	5	250	250	62	14	14	13	31,3	8	96
	132S, M	**AB25GI13S**	230	22	38	265	5	250	300	82	14	16,5	13	41,3	10	134
	132MB	**AB25HI13L**	230	28	38	265	5	250	300	82	14	16,5	13	41,3	10	134
	160	**AB25HI160**	250	28	42	300	6	250	350	112	14	18	18	45,3	12	181
	180	**AB25LI180**	250	32	48	300	6	250	350	112	14	18	18	51,8	14	181
	200	**AB25MI200**	300	38	55 (E6)	350	6	250	400	113	14	18	18	59,3	16	211,5
iC 972, iC 973	**80**	**AB30CI080**	130	12	19	165	4,5	300	200	41,5	14	12	11	21,8	6	86
	90	**AB30DI090**	130	14	24	165	4,5	300	200	52	14	12	11	27,3	8	86
	100, 112MA	**AB30EI100**	180	16	28	215	5	300	250	62	14	14	13	31,3	8	88
	112M	**AB30FI112**	180	18	28	215	5	300	250	62	14	14	13	31,3	8	88
	132S, M	**AB30GI13S**	230	22	38	265	5	300	300	82	14	16,5	13	41,3	10	129
	132MB	**AB30HI13L**	230	28	38	265	5	300	300	82	14	16,5	13	41,3	10	129
	160	**AB30HI160**	250	28	42	300	6	300	350	112	14	18	18	45,3	12	175
	180	**AB30LI180**	250	32	48	300	6	300	350	112	14	18	18	51,8	14	175
	200	**AB30MI200**	300	38	55 (E6)	350	6	300	400	113	14	18	18	59,3	16	205,5

8.2.2 Adapters for the assembly of standard NEMA C-Face motors



Gear reducer size	NEMA C-face motor size	Adapter code	AJ1 Ø inch	AK1 Ø inch	BD1 Ø inch	BF1 Ø	C5	D Ø	F5	G2 Ø	L1	I2	S1 inch	T1	U1 Ø inch	Z5
iC 272, iC 273 iC 372, iC 373	**56**	**AB12BN056**	5 7/8	4 1/2	6,5	10,5	10	10	5	120	54,7	59,5	3/16	18	5/8	81
	143	**AB12CN143**	5 7/8	4 1/2	6,5	10,5	12	12	5	120	64,2	61	3/16	24,5	7/8	113
	145	**AB12DN145**	5 7/8	4 1/2	6,5	10,5	12	14	5	120	64,2	61	3/16	24,5	7/8	113
	182	**AB12EN182**	5 7/8	4 1/2	9	14,5	14	16	5,5	120	79,2	76	1/4	31,5	1 1/8	124
iC 472, iC 473 iC 572, iC 573 iC 672, iC 673	**56**	**AB16BN056**	5 7/8	4 1/2	6,5	10,5	10	10	5	160	54,7	59,5	3/16	18	5/8	75
	143	**AB16CN143**	5 7/8	4 1/2	6,5	10,5	12	12	5	160	64,2	61	3/16	24,5	7/8	106
	145	**AB16DN145**	5 7/8	4 1/2	6,5	10,5	12	14	5	160	64,2	61	3/16	24,5	7/8	106
	182	**AB16EN182**	7 1/4	8 1/2	9	14,5	14	16	5,5	160	79,5	76	1/4	31,5	1 1/8	117
	184	**AB16FN184**	7 1/4	8 1/2	9	14,5	14	18	5,5	160	79,2	76	1/4	31,5	1 1/8	117
	213/215	**AB16GN213**	7 1/4	8 1/2	9	14,5	14	22	5,5	160	97,3	91	5/16	38,6	1 3/8	152
iC 772, iC 773	**56**	**AB20BN056**	5 7/8	4 1/2	6,5	10,5	10	10	5	200	54,7	59,5	3/16	18	5/8	69
	143	**AB20CN143**	5 7/8	4 1/2	6,5	10,5	12	12	5	200	64,2	61	3/16	24,5	7/8	100
	145	**AB20DN145**	5 7/8	4 1/2	6,5	10,5	12	14	5	200	64,2	61	3/16	24,5	7/8	100
	182	**AB20EN182**	7 1/4	8 1/2	9	14,5	14	16	5,5	200	79,2	76	1/4	31,5	1 1/8	111
	184	**AB20FN184**	7 1/4	8 1/2	9	14,5	14	18	5,5	200	79,2	76	1/4	31,5	1 1/8	111
	213/215	**AB20GN213**	7 1/4	8 1/2	9	14,5	14	22	5,5	200	97,3	91	5/16	38,6	1 3/8	146
	254/256	**AB20HN254**	7 1/4	8 1/2	10	14,5	14	28	5,5	200	115,3	109	3/8	45,6	1 5/8	232
iC 872, iC 873	**143**	**AB25CN143**	5 7/8	4 1/2	6,5	10,5	12	12	5	250	64,2	61	3/16	24,5	7/8	96
	145	**AB25DN145**	5 7/8	4 1/2	6,5	10,5	12	14	5	250	64,2	61	3/16	24,5	7/8	96
	182	**AB25EN182**	7 1/4	8 1/2	9	14,5	14	16	5,5	250	79,2	76	1/4	31,5	1 1/8	107
	184	**AB25FN184**	7 1/4	8 1/2	9	14,5	14	18	5,5	250	79,2	76	1/4	31,5	1 1/8	107
	213/215	**AB25GN213**	7 1/4	8 1/2	9	14,5	14	22	5,5	250	97,3	91	5/16	38,6	1 3/8	141
	254/256	**AB25HN254**	7 1/4	8 1/2	10	14,5	14	28	5,5	250	115,3	109	3/8	45,6	1 5/8	227
	284/286	**AB25LN284**	9	10 1/2	11,25	14,5	16	32	5,5	250	134,3	128	1/2	53,4	1 7/8	229
	324/326	**AB25MN324**	11	12 1/2	14	18	20	38	5,5	250	150,3	144	1/2	59,7	2 1/8	214
iC 972, iC 973	**143**	**AB30CN143**	5 7/8	4 1/2	6,5	10,5	12	12	5	300	64,2	61	3/16	24,5	7/8	88
	145	**AB30DN145**	5 7/8	4 1/2	6,5	10,5	12	14	5	300	64,2	61	3/16	24,5	7/8	88
	182	**AB30EN182**	7 1/4	8 1/2	9	14,5	14	16	5,5	300	79,2	76	1/4	31,5	1 1/8	99
	184	**AB30FN184**	7 1/4	8 1/2	9	14,5	14	18	5,5	300	79,2	76	1/4	31,5	1 1/8	99
	213/215	**AB30GN213**	7 1/4	8 1/2	9	14,5	14	22	5,5	300	97,3	91	5/16	38,6	1 3/8	136
	254/256	**AB30HN254**	7 1/4	8 1/2	10	14,5	14	28	5,5	300	115,3	109	3/8	45,6	1 5/8	221
	284/286	**AB30LN284**	9	10 1/2	11,25	14,5	16	32	5,5	300	134,3	128	1/2	53,4	1 7/8	223
	324/325	**AB30MN324**	11	12 1/2	14	18	20	38	5,5	300	150,3	144	1/2	59,7	2 1/8	208

8.3

Fastening bolts

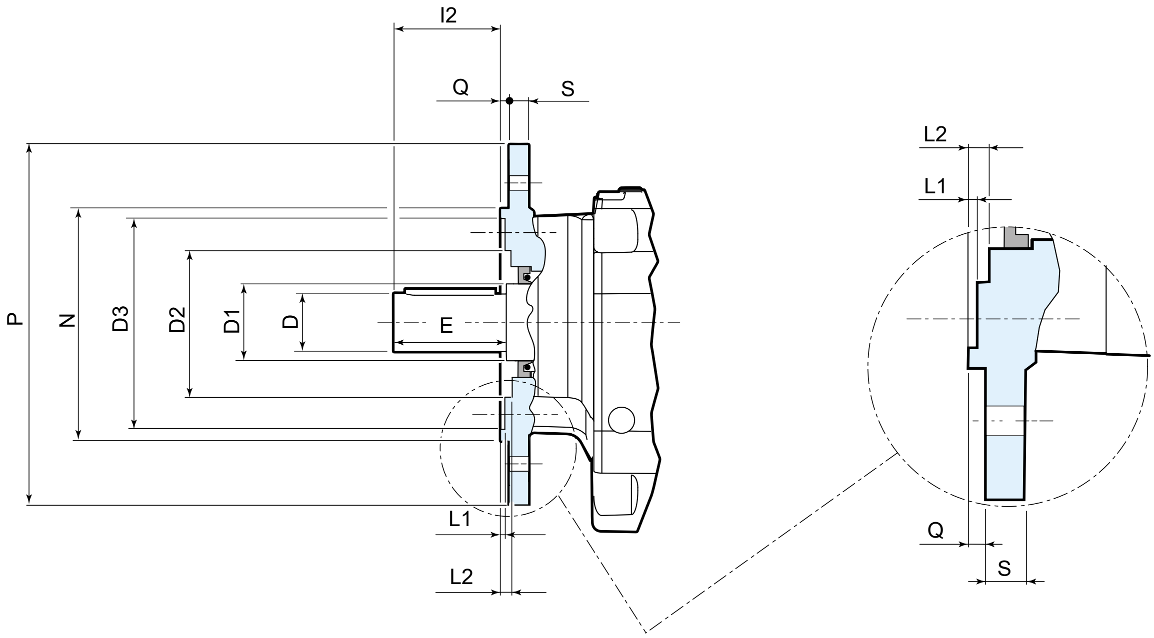
Unless otherwise stated, usually it is sufficient to use bolts in class 8.8; The following cases are an exception, for which bolts with strength class 10.9 must be used:

- iC 372 - iC 373 FE with flange F312
- iC 472 - iC 473 FE with flange F414
- iC 572 - iC 573 FE with flange F516

Thoroughly degrease the bolts before tightening. It is recommended to apply locking adhesives on the fastening bolts and on flange mating surfaces, in the event of heavy vibrations, heavy duties and/or frequent drive inversions.
Tighten the bolts to the tightening torque stated in the table.

Fastening bolts	**Tightening torque *Ms* for bolts for foot and flange fastening** N m	
	cl. 8.8	cl. 10.9
M4	2,9	4
M5	6	8,5
M6	11	15
M8	25	35
M10	50	70
M12	85	120
M14	135	190
M16	205	290
M18	280	400
M20	400	560
M22	550	770
M24	710	1000

Details of gearmotor fastening flanges



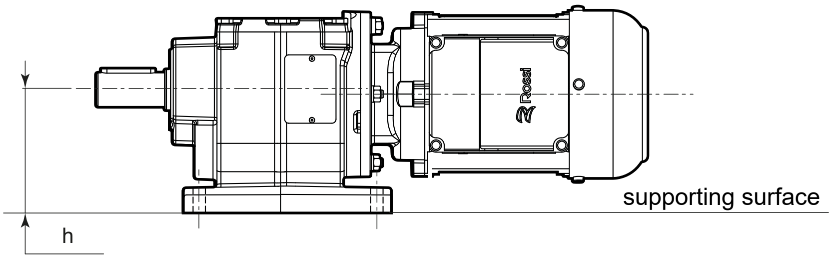
Gear reducer size	B5 flange code	P Ø	N Ø j6	S	D Ø k6	D1 Ø	D2 Ø	D3 Ø	Q	I2	E	L1	L2
iC 27...F	**F212**	120	80	8	25	30	56	66	3	50	50	2	6
	F214	140	95	9	25	30	56	80	3	50	50	2	6
	F216	160	110	10	25	30	56	94	3,5	50	50	2,6	6,5
iC 37...F	**F312**	120	80	8	25	35	63	68	3	50	50	5	7
	F314	140	95	10	25	35	11	83	3	50	50	5	7
	F316	160	110	10	25	35	61	96	3,5	50	50	2	7,5
	F320	200	130	12	25	35	61	118	3,5	50	50	1	7,5
iC 47...F	**F414**	140	95	10	30	35	77	82	3	60	60	4	6
	F416	160	110	10	30	35	75	96	3,5	60	60	1	6,5
	F420	200	130	12	30	35	75	116	3,5	60	60	1	6,5
iC 57...F	**F516**	160	110	10	35	40	82	97	3,5	70	70	4	6,5
	F520	200	130	12	35	40	78	116	3,5	70	70	-0,5	6,5
	F525	250	180	15	35	40	78	160	4	70	70	0	7
iC 67...F	**F620**	200	130	12	35	50	96	120	3,5	70	70	3,5	7
	F625	250	180	15	35	50	92	162	4	70	70	0,5	7,5
iC 77...F	**F725**	250	180	15	40	52	94	160	4	80	80	0,5	7
	F730	300	230	18,5	40	52	113	210	4	80	80	0,5	7
iC 87...F	**F830**	300	230	18,5	50	62	119	214	4	100	100	0	8
	F835	350	250 h6	18	50	62	138	225	5	100	100	0	8
iC 97,,,F	**F935**	350	250 h6	18	60 m6	72	146	234	5	120	120	1	9
	F945	450	350 h6	22	60 m6	72	156	320	5	120	120	1	9

8.5

Dimensional tolerances

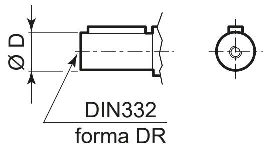
Shaft height of foot mounted design iC...P...

h ≤ 250 mm ⟶ tolerance -0,5 ÷ 0 mm



Attention!
Always check that the motor does not protrude from the foot mounting surface.

Low speed shaft end



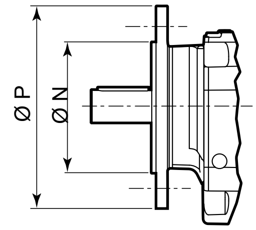
External diameter:
Ø D ≤ 50 mm ⟶ tolerance ISO k6
Ø D > 50 mm ⟶ tolerance ISO m6

Tapped butt-end hole:
Ø D ≤ 24 mm ⟶ M8
Ø D > 24 ÷ 30 mm ⟶ M10
Ø D > 30 ÷ 38 mm ⟶ M12
Ø D > 38 ÷ 50 mm ⟶ M16
Ø D > 50 mm ⟶ M20

Key and keyway:
key to DIN 6885
keyway width ISO N9

Flange

Spigot:
Ø N ≤ 230 mm (Ø P 120 ÷ 300 mm) ⟶ tolerance ISO j6
Ø N > 230 mm (Ø P 350 ÷ 450 mm) ⟶ tolerance ISO h6

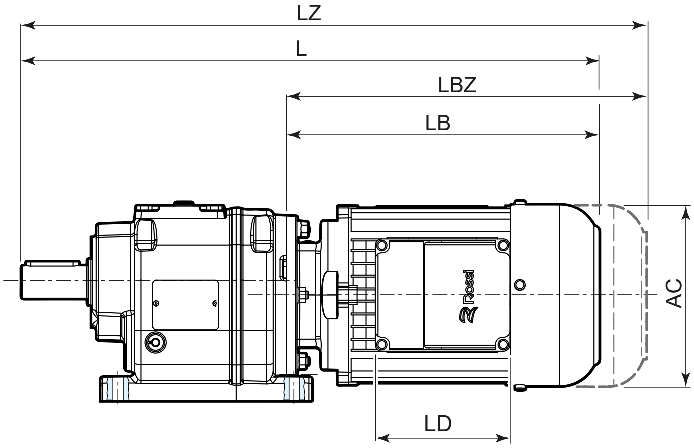


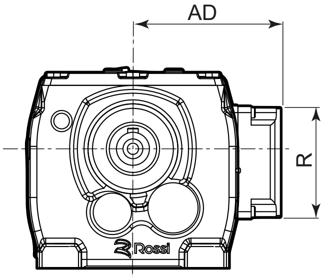
8.6

Overall dimensional remarks

8.6.1 Overall dimension details of HB and HBZ motors

The meaning of the total dimensions shown in the drawings in ch.10 is explained below:





where:

L	total length of gearmotor
LZ	total length of gearmotor with brake
LB	total length of motor
LBZ	total length of motor with brake
AC	diameter of motor fan cover
LD	length of motor terminal box
LBZ	radial dimensions of motor terminal box
R	width of motor terminal box

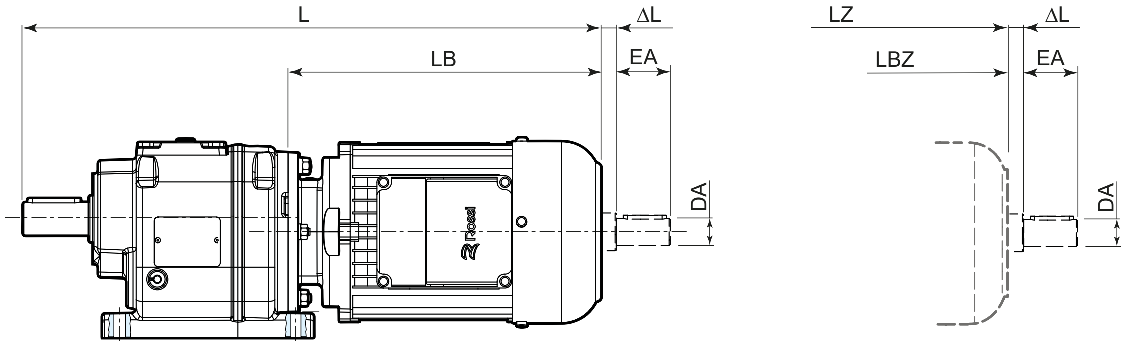
Motor length and terminal box dimension can slightly change according to specific motor options; if necessary, refer to cat. TX. or contact Rossi S.p.A.

Eyelets and eyebolts for lifting

Sizes ≤ iC 57… are equipped with lifting eyelet for transport. Larger sizes are equipped with eyebolts.

Breather plugs:
Dimensional drawings indicated at ch. 10 do not indicate the dimensions of breather plug as its position depends on mounting position.
Total overall dimensions can slightly differ from the stated ones.

8.6.2 Dimension details of second motor shaft end



Motor size	DA Ø	EA	ΔL ≈
63	11	23	5
71	11	23	6
80	14	30	7
90	14	30	7
100	14	30	8
112MA	14	30	9
112M	19	40	9
132S, M	19	40	9
132MB	28	60	9

9

Selection tables

Section contents

9.1

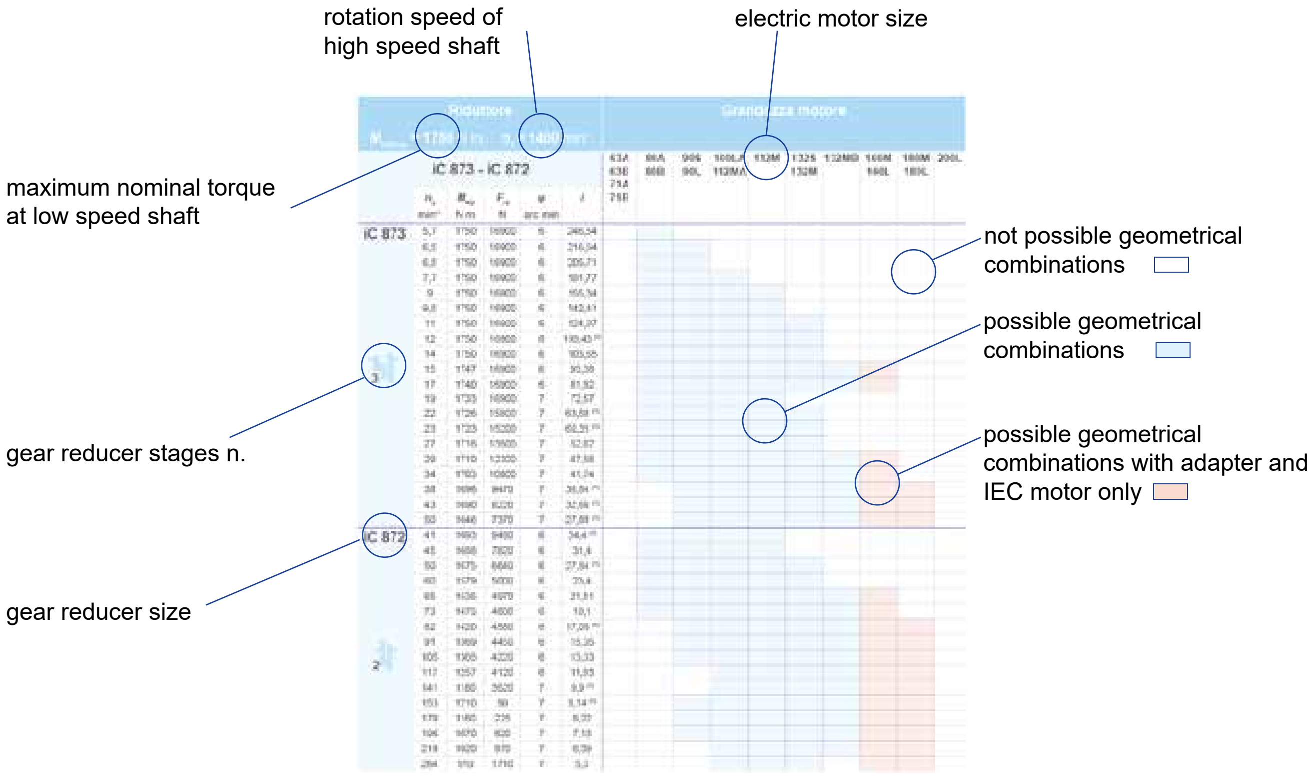
Possible geometrical combinations

9.1.1 General

The tables in the following pages show the geometrical coupling possibilities with HB 4 poles motors, according to train of gears (2 or 3 stages) and transmission ratio.
Also the low speed shaft rotation speed $n_{2,}$ calculated according to a nominal input speed equal to n_1 = 1400 min^{-1}, are shown. The values of the nominal torque at the low speed shaft M_{N2} and of the permissible radial load F_{r2} acting on the center line are also referred to this speed.

At the time of selection, it is necessary to evaluate the actual operating conditions in relation to the actual power of the applied motor as indicated in ch. 6.

9.1.2 Key



where

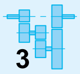
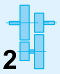
- n_2 low speed shaft rotation speed
- M_{N2} nominal torque at low speed shaft
- F_{r2} permissible radial load acting on center line of low speed shaft
  (at speed n_2 and with torque M_{N2} indicated in the table - valid only for foot mounted gearmotor design)
- φ reduced backlash, referred to low speed shaft
  (tolerance ± 2 arc min - if value is not specified, the reduced backlash option is not available)
- i transmission ratio

Geometrical coupling tables

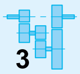
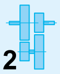
Gear reducer M_{N2max} = 145 N m n_1 = 1400 min^{-1}						Motor size									
iC 273 - iC 272	n_2 min^{-1}	M_{N2} N m	F_{r2} N	φ arc min	i	63A 63B 71A 71B	80A 80B	90S 90L	100LA 112MA	112M	132S 132M	132MB	160M 160L	180M 180L	200L
iC 273	10	145	4230	-	135,09	▨									
	11	145	4230	-	123,91	▨									
	13	144	4230	-	105,49	▨	▨								
	15	143	4230	-	90,96	▨	▨	▨							
	17	143	4230	-	84,78	▨	▨	▨							
	19	142	4230	-	74,11	▨	▨	▨	▨						
	20	142	4180	-	69,47	▨	▨	▨							
	23	142	3980	-	61,3	▨	▨	▨	▨						
3	25	141	3840	-	55,87	▨	▨								
	29	141	3630	-	48,17	▨	▨	▨							
	31	140	3530	-	44,9	▨	▨	▨							
	36	140	3350	-	39,25	▨	▨	▨	▨						
	38	139	3260	-	36,79	▨	▨	▨							
	43	139	3100	-	32,47	▨	▨	▨	▨						
	49	138	2950	-	28,78	▨	▨	▨	▨						
	57	138	2760	-	24,47	▨	▨	▨	▨						
iC 272	49	138	2940	-	28,37	▨									
	54	138	2840	-	26,09	▨									
	63	137	2660	-	22,32	▨	▨								
	72	137	2510	-	19,35	▨	▨	▨							
	77	136	2440	-	18,08	▨	▨	▨							
	90	136	2290	-	15,63	▨	▨	▨	▨						
	105	135	2140	-	13,28 (1)	▨	▨	▨	▨						
	118	134	1980	-	11,86	▨	▨	▨	▨						
	138	134	1890	-	10,13	▨	▨	▨	▨						
2	149	130	900	-	9,41	▨	▨								
	172	123	870	-	8,16	▨	▨	▨							
	183	120	900	-	7,63 (1)	▨	▨	▨							
	212	110	880	-	6,59	▨	▨	▨	▨						
	250	102	880	-	5,6 (1)	▨	▨	▨	▨						
	280	96	860	-	5 (1)	▨	▨	▨	▨						
	328	87	920	-	4,27	▨	▨	▨	▨						
	350	85	900	-	4 (1)	▨	▨	▨	▨						
	415	79	900	-	3,37	▨	▨	▨	▨						

(1) Finite transmission ratio *i*

Gear reducer M_{N2max} = 224 N m n_1 = 1400 min^{-1}						Motor size									
iC 373 - iC 372						63A 63B 71A 71B	80A 80B	90S 90L	100LA 112MA	112M	132S 132M	132MB	160M 160L	180M 180L	200L
	n_2 min^{-1}	M_{N2} N m	F_{r2} N	φ arc min	i										
iC 373	10	217	4940	8	134,82	▨									
	11	214	4940	8	123,66	▨									
	13	213	4940	8	105,28	▨	▨								
	15	212	4940	8	90,77	▨	▨	▨							
	17	212	4940	8	84,61	▨	▨	▨							
	19	211	4940	8	73,96	▨	▨	▨	▨						
	20	211	4940	8	69,33	▨	▨	▨							
	23	210	4940	9	61,18	▨	▨	▨	▨						
3	25	209	4940	9	55,76	▨	▨								
	29	208	4940	9	48,08	▨	▨	▨							
	31	208	4940	9	44,81	▨	▨	▨							
	36	207	4760	9	39,17	▨	▨	▨	▨						
	38	206	4540	9	36,72	▨	▨	▨							
	43	206	4120	9	32,4	▨	▨	▨	▨						
	49	205	3740	9	28,73	▨	▨	▨	▨						
	57	204	3240	9	24,42	▨	▨	▨	▨						
iC 372	49	205	3690	8	28,32	▨									
	54	204	3860	8	26,03	▨									
	63	203	2970	8	22,27	▨	▨								
	73	202	2570	8	19,31	▨	▨	▨							
	78	202	2390	8	18,05	▨	▨	▨							
	90	201	2010	8	15,6	▨	▨	▨	▨						
	106	198	1880	8	13,25	▨	▨	▨	▨						
	118	189	1810	8	11,83	▨	▨	▨	▨						
2	138	177	1820	9	10,11	▨	▨	▨	▨						
	148	172	1760	9	9,47	▨	▨	▨	▨						
	176	160	1720	9	7,97	▨	▨	▨	▨						
	210	145	1000	13	6,67	▨	▨	▨	▨						
	247	142	760	13	5,67	▨	▨	▨	▨						
	277	135	790	13	5,06	▨	▨	▨	▨						
	324	126	820	13	4,32	▨	▨	▨	▨						
	346	122	840	14	4,05	▨	▨	▨	▨						
	411	112	900	14	3,41	▨	▨	▨	▨						

Gear reducer M_{N2max} = 335 N m n_1 = 1400 min^{-1}						Motor size									
iC 473 - iC 472						63A 63B 71A 71B	80A 80B	90S 90L	100LA 112MA	112M	132S 132M	132MB	160M 160L	180M 180L	200L
	n_2 min^{-1}	M_{N2} N m	F_{r2} N	φ arc min	i										
iC 473	7,9	335	5420	7	176,88	▨									
	8,6	335	5420	7	162,94	▨									
	10	335	5420	7	139,99	▨	▨								
	11	335	5420	7	121,87	▨	▨	▨							
	12	335	5420	7	114,17	▨	▨	▨							
	14	335	5420	7	100,86	▨	▨	▨							
	15	335	5420	7	93,68	▨	▨	▨							
	16	335	5420	7	84,9	▨	▨	▨							
	18	335	5420	7	76,23	▨	▨	▨							
 3	20	335	5420	8	68,54	▨	▨	▨							
	22	335	5420	8	64,21	▨	▨	▨							
	25	335	5420	8	56,73	▨	▨	▨	▨						
	27	335	5350	8	52,69	▨	▨	▨							
	29	335	5140	8	47,75	▨	▨	▨	▨	▨					
	33	335	4930	8	42,87	▨	▨	▨	▨	▨					
	38	335	4630	8	36,93	▨	▨	▨	▨	▨					
	40	335	4520	8	34,73	▨	▨	▨	▨	▨					
	47	335	4240	8	29,88	▨	▨	▨	▨	▨					
	52	335	4050	8	26,7		▨	▨	▨	▨	▨				
	59	335	3840	8	23,59		▨	▨	▨	▨	▨				
iC 472	41	272	4680	7	33,79	▨									
	45	243	4610	7	31,12	▨									
	52	335	4050	7	26,74	▨	▨								
	60	335	3820	7	23,28	▨	▨	▨							
	64	335	3710	7	21,81	▨	▨	▨							
	73	324	3530	7	19,27	▨	▨	▨	▨						
	78	315	3390	7	17,89	▨	▨	▨							
	86	304	3350	7	16,22	▨	▨	▨	▨	▨					
	96	292	3230	7	14,56	▨	▨	▨	▨	▨					
	112	275	3080	8	12,54	▨	▨	▨	▨	▨	▨				
	119	268	3020	8	11,79	▨	▨	▨	▨	▨	▨				
 2	138	252	2880	8	10,15	▨	▨	▨	▨	▨	▨				
	154	239	2780	8	9,07		▨	▨	▨	▨	▨				
	175	228	2690	8	8,01		▨	▨	▨	▨	▨				
	180	185	2720	10	7,76 (1)	▨	▨	▨	▨	▨					
	201	180	2620	10	6,96	▨	▨	▨	▨	▨					
	233	175	2470	10	6	▨	▨	▨	▨	▨	▨				
	248	175	2410	10	5,64 (1)	▨	▨	▨	▨	▨	▨				
	289	170	2280	11	4,85	▨	▨	▨	▨	▨					
	323	165	2190	12	4,34		▨	▨	▨	▨	▨				
	366	160	2080	12	3,83		▨	▨	▨	▨	▨				

(1) Finite transmission ratio *i*

Gear reducer M_{N2max} = 500 N m n_1 = 1400 min^{-1}						Motor size									
iC 573 - iC 572						63A 63B 71A 71B	80A 80B	90S 90L	100LA 112MA	112M	132S 132M	132MB	160M 160L	180M 180L	200L
	n_2 min^{-1}	M_{N2} N m	F_{r2} N	φ arc min	i										
iC 573	7,5	500	7100	7	186,89	▨									
	8,1	500	7100	7	172,17	▨									
	9,5	500	7100	7	147,92	▨	▨								
	11	496	7100	7	128,77	▨	▨	▨							
	12	492	7100	7	120,63	▨	▨	▨							
	13	490	7100	7	106,58	▨	▨	▨	▨						
	14	488	7100	7	98,99	▨	▨	▨							
	16	487	7100	7	89,71	▨	▨	▨	▨	▨					
	17	485	7100	7	80,55	▨	▨	▨	▨	▨					
	20	483	7100	8	69,23	▨	▨	▨							
	22	482	6980	8	64,85	▨	▨	▨							
	24	480	6630	8	57,29	▨	▨	▨	▨						
	26	479	6430	8	53,22	▨	▨	▨							
	29	478	6170	8	48,23	▨	▨	▨	▨	▨					
	32	476	5900	8	43,3	▨	▨	▨	▨	▨					
	38	474	5530	8	37,3 (1)	▨	▨	▨	▨	▨	▨				
	40	473	5390	8	35,07	▨	▨	▨	▨	▨	▨				
	46	471	5040	8	30,18	▨	▨	▨	▨	▨	▨				
	52	469	4800	8	26,97		▨	▨	▨	▨	▨				
iC 572	53	469	4750	7	26,31	▨	▨	▨							
	56	468	4640	7	24,99 (1)	▨	▨	▨							
	64	466	4370	7	21,93	▨	▨	▨	▨						
	75	463	4050	7	18,6 (1)	▨	▨	▨	▨	▨					
	83	462	3860	7	16,79	▨	▨	▨	▨	▨					
	95	460	3690	7	14,77 (1)	▨	▨	▨	▨	▨	▨				
	100	459	3610	7	13,95 (1)	▨	▨	▨	▨	▨	▨				
	118	450	3430	7	11,88	▨	▨	▨	▨	▨	▨				
	130	437	3330	8	10,79		▨	▨	▨	▨	▨				
	150	412	3180	8	9,35		▨	▨	▨	▨	▨				
	155	387	2010	9	9,06	▨	▨	▨	▨	▨					
	176	366	2020	9	7,97	▨	▨	▨	▨	▨	▨				
	186	355	1950	9	7,53	▨	▨	▨	▨	▨	▨				
	218	335	1770	9	6,41	▨	▨	▨	▨	▨	▨				
	241	320	1820	10	5,82		▨	▨	▨	▨	▨				
	277	305	1730	10	5,05		▨	▨	▨	▨	▨				
	319	280	1900	11	4,39			▨	▨	▨	▨				

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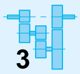
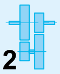
(1) Finite transmission ratio *i*

Gear reducer M_{N2max} = 670 N m n_1 = 1400 min^{-1} iC 673 - iC 672						Motor size									
	n_2 min^{-1}	M_{N2} N m	F_{r2} N	φ arc min	i	63A 63B 71A 71B	80A 80B	90S 90L	100LA 112MA	112M	132S 132M	132MB	160M 160L	180M 180L	200L
iC 673	7	670	7560	7	199,81	▨									
	7,6	670	7560	7	184,07	▨									
	8,9	670	7560	7	158,14	▨	▨								
	10	670	7560	7	137,67	▨	▨	▨							
	11	670	7560	7	128,97	▨	▨	▨							
	12	670	7560	7	113,94	▨	▨	▨	▨						
	13	670	7560	7	105,83	▨	▨	▨							
	15	670	7560	7	95,91	▨	▨	▨	▨	▨					
	16	670	7560	7	86,11	▨	▨	▨	▨	▨					
 3	19	670	7560	7	74,17	▨	▨	▨	▨	▨	▨				
	20	670	7560	7	69,75	▨	▨	▨	▨	▨	▨				
	23	670	7560	7	61,26	▨	▨	▨	▨						
	25	670	7560	7	56,89	▨	▨	▨							
	27	668	7560	8	51,56	▨	▨	▨	▨	▨					
	30	643	7560	8	46,29	▨	▨	▨	▨	▨					
	35	611	7790	8	39,88 (1)	▨	▨	▨	▨	▨	▨				
	37	598	7900	8	37,5	▨	▨	▨	▨	▨	▨				
	43	567	8210	8	32,27	▨	▨	▨	▨	▨	▨				
	49	545	8400	8	28,83		▨	▨	▨	▨	▨				
iC 672	50	600	8210	6	28,13	▨	▨	▨							
	52	600	8210	6	26,72	▨	▨	▨							
	60	630	8010	7	23,44	▨	▨	▨	▨						
	70	655	7560	7	19,89	▨	▨	▨	▨	▨					
	78	633	7330	7	17,95	▨	▨	▨	▨	▨					
	89	606	7130	7	15,79	▨	▨	▨	▨	▨	▨				
	94	590	6980	7	14,91	▨	▨	▨	▨	▨	▨				
	110	541	6640	7	12,7	▨	▨	▨	▨	▨	▨				
	121	515	6500	7	11,54		▨	▨	▨	▨	▨				
	140	477	6220	7	10		▨	▨	▨	▨	▨				
	161	442	5960	7	8,7 (1)			▨	▨	▨	▨				
 2	180	380	5830	9	7,79	▨	▨	▨	▨	▨	▨				
	190	370	5790	9	7,36 (1)	▨	▨	▨	▨	▨	▨				
	223	330	5590	9	6,27	▨	▨	▨	▨	▨	▨				
	246	310	5450	10	5,7		▨	▨	▨	▨	▨				
	284	290	5210	10	4,93		▨	▨	▨	▨	▨				
	326	270	5000	10	4,29			▨	▨	▨	▨				

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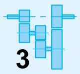
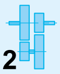
(1) Finite transmission ratio *i*

Gear reducer M_{N2max} = 925 N m n_1 = 1400 min^{-1}						Motor size									
iC 773 - iC 772	n_2 min^{-1}	M_{N2} N m	F_{r2} N	φ arc min	i	63A 63B 71A 71B	80A 80B	90S 90L	100LA 112MA	112M	132S 132M	132MB	160M 160L	180M 180L	200L
iC 773	7.2	925	9920	7	195,24 (1)	🟦									
	8.4	925	9920	7	166,59	🟦	🟦								
	9.6	925	9920	7	145,67	🟦	🟦	🟦							
	10	925	9920	7	138,39	🟦	🟦	🟦							
	12	916	9920	7	121,42	🟦	🟦	🟦	🟦						
	14	911	9920	7	102,99	🟦	🟦	🟦	🟦	🟦					
	15	908	9920	7	92,97	🟦	🟦	🟦	🟦	🟦					
	17	905	9920	7	81,8	🟦	🟦	🟦	🟦	🟦	🟦				
	18	903	9920	7	77,24	🟦	🟦	🟦	🟦	🟦	🟦				
3	21	899	9920	7	65,77	🟦	🟦	🟦	🟦	🟦	🟦				
	24	895	9920	8	57,68	🟦	🟦	🟦	🟦	🟦					
	27	892	9920	8	52,07	🟦	🟦	🟦	🟦	🟦					
	31	888	9920	8	45,81	🟦	🟦	🟦	🟦	🟦	🟦				
	32	887	9920	8	43,26	🟦	🟦	🟦	🟦	🟦	🟦				
	38	876	9920	8	36,83	🟦	🟦	🟦	🟦	🟦	🟦				
	42	849	9920	8	33,47		🟦	🟦	🟦	🟦	🟦	🟦	🟥		
	48	820	9920	8	29		🟦	🟦	🟦	🟦	🟦	🟦	🟥		
	55	780	10100	8	25,23			🟦	🟦	🟦	🟦	🟦	🟥		
iC 772	60	820	8870	7	23.37	🟦	🟦	🟦	🟦	🟦					
	65	820	8250	7	21.43	🟦	🟦	🟦	🟦	🟦					
	74	780	7980	7	18.8	🟦	🟦	🟦	🟦	🟦	🟦				
	79	780	7620	7	17.82 (1)	🟦	🟦	🟦	🟦	🟦	🟦				
	90	740	7390	7	15.6	🟦	🟦	🟦	🟦	🟦	🟦				
	100	720	7050	7	14.05		🟦	🟦	🟦	🟦	🟦	🟦	🟥		
	114	690	6740	7	12.33		🟦	🟦	🟦	🟦	🟦	🟦	🟥		
2	129	660	6490	7	10.88			🟦	🟦	🟦	🟦	🟦	🟥		
	145	630	6300	7	9.64			🟦	🟦	🟦	🟦	🟦	🟥		
	163	630	4110	8	8.59	🟦	🟦	🟦	🟦	🟦	🟦				
	181	610	3940	8	7.74		🟦	🟦	🟦	🟦	🟦	🟦	🟥		
	206	580	3850	8	6.79		🟦	🟦	🟦	🟦	🟦	🟦	🟥		
	234	540	3990	8	5.99 (1)			🟦	🟦	🟦	🟦	🟦	🟥		
	264	510	3990	9	5.31 (1)			🟦	🟦	🟦	🟦	🟦	🟥		

(1) Finite transmission ratio *i*

Gear reducer M_{N2max} = 1750 N m n_1 = 1400 min^{-1}						Motor size									
iC 873 - iC 872						63A 63B 71A 71B	80A 80B	90S 90L	100LA 112MA	112M	132S 132M	132MB	160M 160L	180M 180L	200L
	n_2 min^{-1}	M_{N2} N m	F_{r2} N	φ arc min	i										
iC 873  3	5,7	1750	16900	6	246,54		🟦								
	6,5	1750	16900	6	216,54		🟦	🟦							
	6,8	1750	16900	6	205,71		🟦	🟦							
	7,7	1750	16900	6	181,77		🟦	🟦	🟦						
	9	1750	16900	6	155,34		🟦	🟦	🟦	🟦					
	9,8	1750	16900	6	142,41		🟦	🟦	🟦	🟦					
	11	1750	16900	6	124,97		🟦	🟦	🟦	🟦	🟦				
	12	1750	16900	6	118,43 (1)		🟦	🟦	🟦	🟦	🟦				
	14	1750	16900	6	103,65		🟦	🟦	🟦	🟦	🟦				
	15	1747	16900	6	93,38		🟦	🟦	🟦	🟦	🟦	🟦	🟥		
	17	1740	16900	6	81,92		🟦	🟦	🟦	🟦	🟦	🟦	🟥		
	19	1733	16900	7	72,57		🟦	🟦	🟦	🟦					
	22	1726	15800	7	63,68 (1)		🟦	🟦	🟦	🟦	🟦				
	23	1723	15200	7	60,35 (1)		🟦	🟦	🟦	🟦	🟦				
	27	1716	13500	7	52,82		🟦	🟦	🟦	🟦	🟦				
	29	1710	12300	7	47,58		🟦	🟦	🟦	🟦	🟦	🟦	🟥		
	34	1703	10800	7	41,74		🟦	🟦	🟦	🟦	🟦	🟦	🟥		
	38	1696	9470	7	36,84 (1)			🟦	🟦	🟦	🟦	🟦	🟥	🟥	
	43	1690	8220	7	32,66 (1)			🟦	🟦	🟦	🟦	🟦	🟥	🟥	
	50	1646	7370	7	27,88			🟦	🟦	🟦	🟦	🟦	🟥	🟥	
iC 872  2	41	1693	9480	6	34,4 (1)		🟦	🟦	🟦	🟦					
	45	1688	7820	6	31,4		🟦	🟦	🟦	🟦					
	50	1675	6640	6	27,84 (1)		🟦	🟦	🟦	🟦	🟦				
	60	1579	5000	6	23,4		🟦	🟦	🟦	🟦	🟦				
	65	1535	4970	6	21,51		🟦	🟦	🟦	🟦	🟦	🟦	🟥		
	73	1475	4800	6	19,1		🟦	🟦	🟦	🟦	🟦	🟦	🟥		
	82	1420	4580	6	17,08 (1)			🟦	🟦	🟦	🟦	🟦	🟥	🟥	
	91	1369	4450	6	15,35			🟦	🟦	🟦	🟦	🟦	🟥	🟥	
	105	1305	4220	6	13,33			🟦	🟦	🟦	🟦	🟦	🟥	🟥	
	117	1257	4120	6	11,93				🟦	🟦	🟦	🟦	🟥	🟥	
	141	1180	3520	7	9,9 (1)				🟦	🟦	🟦	🟦	🟥	🟥	
	153	1210	99	7	9,14 (1)			🟦	🟦	🟦	🟦	🟦	🟥	🟥	
	170	1160	225	7	8,22			🟦	🟦	🟦	🟦	🟦	🟥	🟥	
	196	1070	820	7	7,13			🟦	🟦	🟦	🟦	🟦	🟥	🟥	
	219	1020	970	7	6,39				🟦	🟦	🟦	🟦	🟥	🟥	
	264	910	1710	7	5,3 (1)				🟦	🟦	🟦		🟥	🟥	

(1) Finite transmission ratio *i*

Gear reducer M_{N2max} = 3350 N m n_1 = 1400 min^{-1}						Motor size									
iC 973 - iC 972						63A 63B 71A 71B	80A 80B	90S 90L	100LA 112MA	112M	132S 132M	132MB	160M 160L	180M 180L	200L
	n_2 min^{-1}	M_{N2} N m	F_{r2} N	φ arc min	i										
iC 973	4,8	3350	19800	6	289,74		🟦								
	5,5	3350	19800	6	255,71		🟦	🟦							
	5,8	3350	19800	6	241,25		🟦	🟦							
	6,5	3350	19800	6	216,28		🟦	🟦	🟦						
	7,5	3350	19800	6	186,3		🟦	🟦	🟦	🟦					
	8,2	3350	19800	6	170,02		🟦	🟦	🟦	🟦					
	9,3	3350	19800	6	150,78		🟦	🟦	🟦	🟦	🟦				
	11	3316	19800	6	126,75		🟦	🟦	🟦	🟦	🟦				
	12	3274	19800	6	116,48		🟦	🟦	🟦	🟦	🟦	🟦	🟥		
3	14	3261	19800	6	103,44		🟦	🟦	🟦	🟦	🟦	🟦	🟥		
	15	3249	19800	6	92,48			🟦	🟦	🟦	🟦	🟦	🟥	🟥	
	17	3239	19800	6	83,15			🟦	🟦	🟦	🟦	🟦	🟥	🟥	
	19	3224	18000	6	72,17			🟦	🟦	🟦	🟦	🟦	🟥	🟥	🟥
	21	3214	16300	7	65,21			🟦	🟦	🟦	🟦				
	23	3205	14800	7	59,92			🟦	🟦	🟦	🟦	🟦	🟥		
	26	3193	12900	7	53,21			🟦	🟦	🟦	🟦	🟦	🟥		
	29	3182	11100	7	47,58			🟦	🟦	🟦	🟦	🟦	🟥	🟥	
	33	3171	9480	7	42,78			🟦	🟦	🟦	🟦	🟦	🟥	🟥	
	38	3088	7410	7	37,13			🟦	🟦	🟦	🟦	🟦	🟥	🟥	🟥
	42	2972	7160	7	33,25				🟦	🟦	🟦	🟦	🟥	🟥	🟥
	51	2783	7260	7	27,58				🟦	🟦	🟦	🟦	🟥	🟥	🟥
iC 972	44	2900	10600	6	32,05		🟦	🟦	🟦	🟦	🟦				
	51	2900	8380	6	27,19		🟦	🟦	🟦	🟦	🟦				
	56	2927	4140	6	25,03		🟦	🟦	🟦	🟦	🟦	🟦	🟥		
	63	2822	4060	6	22,37		🟦	🟦	🟦	🟦	🟦	🟦	🟥		
	70	2728	4110	6	20,14			🟦	🟦	🟦	🟦	🟦	🟥	🟥	
	77	2642	4270	6	18,24			🟦	🟦	🟦	🟦	🟦	🟥	🟥	
	87	2541	4130	6	16,17			🟦	🟦	🟦	🟦	🟦	🟥	🟥	🟥
	96	2461	4240	6	14,62				🟦	🟦	🟦	🟦	🟥	🟥	🟥
2	113	2335	3850	6	12,39				🟦	🟦	🟦	🟦	🟥	🟥	🟥
	129	2237	3720	6	10,83						🟦	🟦	🟥	🟥	🟥
	151	2184	-	6	9,29			🟦	🟦	🟦	🟦	🟦	🟥	🟥	🟥
	167	2081	-	6	8,39				🟦	🟦	🟦	🟦	🟥	🟥	🟥
	197	2000	-	6	7,12				🟦	🟦	🟦	🟦	🟥	🟥	🟥
	225	1890	-	6	6,21						🟦	🟦	🟥	🟥	🟥
	269	1780	-	7	5,2						🟦	🟦	🟥	🟥	🟥
	311	1630	-	7	4,5 (1)						🟦	🟦	🟥	🟥	🟥

(1) Finite transmission ratio *i*

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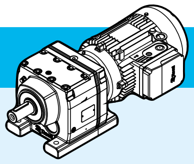
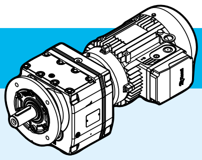
9.3

Selection tables [kW]

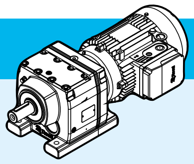
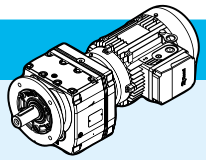




P_1 = 0,12 kW											
n_2	M_2	i	F_{r2}	fs			kg				p.
							foot		flange		
min^{-1}	N m		N				HB	HBZ	HB	HBZ	
4,7	246	195,24 (1)	12900	3,8	**iC 773 – HB2 63 B 6 B20B**	3	45	47	52	54	134
5,5	210	166,59	13000	4,4							
6,2	183	145,67	13000	5							
4,6	252	199,81	10000	2,7	**iC 673 – HB2 63 B 6 B16B**	3	36	38	39	41	132
4,9	232	184,07	10100	2,9							
5,8	199	158,14	10200	3,4							
6,6	173	137,67	10300	3,9							
7,1	162	128,97	10300	4,1							
8,0	143	113,94	10400	4,7							
6,9	167	199,81	10300	4	**iC 673 – HB2 63 A 4 B16B**	3	36	38	39	41	132
7,4	154	184,07	10400	4,4							
4,9	235	186,89	7760	2,1	**iC 573 – HB2 63 B 6 B16B**	3	28	29	31	33	130
5,3	217	172,17	7800	2,3							
6,2	186	147,92	7860	2,7							
7,1	162	128,77	7900	3,1							
7,5	152	120,63	7920	3,3							
8,5	134	106,58	7940	3,7							
9,2	125	98,99	7950	4							
7,3	156	186,89	7920	3,2	**iC 573 – HB2 63 A 4 B16B**	3	27	29	30	32	130
8,0	144	172,17	7940	3,5							
9,3	124	147,92	7960	4							
11	108	128,77	7980	4,6							
5,1	223	176,88	5730	1,5	**iC 473 – HB2 63 B 6 B16B**	3	21	23	22	24	128
5,6	205	162,94	5800	1,65							
6,5	176	139,99	5900	1,9							
7,5	153	121,87	5970	2,2							
7,7	148	176,88	6000	2,3	**iC 473 – HB2 63 A 4 B16B**	3	21	23	22	24	128
8,4	136	162,94	6030	2,5							
9,8	117	139,99	6070	2,9							
11	102	121,87	6100	3,3							
12	96	114,17	6100	3,5							
14	84	100,86	6120	4							
15	78	93,68	6130	4,3							
6,7	170	134,82	4870	1,3	**iC 373 – HB2 63 B 6 B12B**	3	15	17	17	19	126
7,4	156	123,66	5290	1,45							
8,6	133	105,28	5560	1,7							
10	114	90,77	5700	1,9							
11	107	84,61	5750	2							
12	93	73,96	5830	2,3							

(1) Finite transmission ratio *i*

P_1 = 0,12 kW

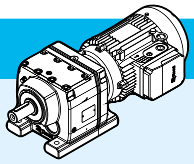
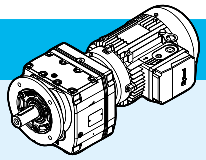
n_2	M_2	i	F_{r2}	fs	 		kg				p.
							foot		flange		
min^{-1}	N m		N				HB	HBZ	HB	HBZ	
10	113	134,82	5750	1,95	**iC 373 – HB2 63 A 4 B12B**	3	14	16	16	18	126
11	103	123,66	5800	2,1							
13	88	105,28	5880	2,4							
15	76	90,77	5930	2,8							
16	71	84,61	5950	3							
19	62	73,96	5980	3,4							
7,3	156	123,91	2660	0,95	**iC 273 – HB2 63 B 6 B12B**	3	14	16	16	18	124
8,6	133	105,49	3300	1,1							
10	115	90,96	3800	1,25							
11	107	84,78	3990	1,35							
12	93	74,11	4060	1,55							
10	113	135,09	3990	1,3	**iC 273 – HB2 63 A 4 B12B**	3	13	15	13	15	124
11	104	123,91	4040	1,4							
13	88	105,49	4110	1,65							
15	76	90,96	4170	1,9							
16	71	84,78	4200	2							
18	62	74,11	4240	2,3							
20	58	69,47	4260	2,4							
22	51	61,3	4290	2,8							
25	47	55,87	4280	3							
28	40	48,17	4090	3,5							
31	38	44,9	4000	3,7							

P_1 = 0,18 kW

4,7	369	195,24 (1)	12600	2,5	**iC 773 – HB2 71 A 6 B20B**	3	45	47	51	54	134
5,5	315	166,59	12800	2,9							
6,2	275	145,67	12900	3,4							
6,6	261	138,39	12900	3,5							
7,5	229	121,42	13000	4							
7,0	247	195,24 (1)	12900	3,7	**iC 773 – HB2 63 B 4 B20B**	3	45	47	51	54	134
8,2	211	166,59	13000	4,4							
9,3	184	145,67	13000	5							
9,8	175	138,39	13000	5,3							
4,6	377	199,81	9490	1,8	**iC 673 – HB2 71 A 6 B16B**	3	38	40	40	43	132
4,9	348	184,07	9660	1,95							
5,8	299	158,14	9900	2,2							
6,6	260	137,67	10100	2,6							
7,1	244	128,97	10100	2,8							
8,0	215	113,94	10200	3,1							
8,6	200	105,83	10300	3,4							
9,5	181	95,91	10300	3,7							
11	163	86,11	10400	4,1							
12	140	74,17	10400	4,8							
13	132	69,75	10400	5,1							

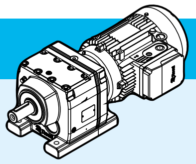
(1) Finite transmission ratio *i*

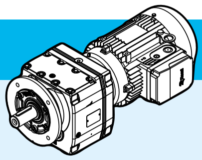
P_1 = 0,18 kW

n_2	M_2	i	F_{r2}	fs	 		kg foot		kg flange		p.
min^{-1}	N m		N				HB	HBZ	HB	HBZ	
6,8	253	199,81	10100	2,7	**iC 673 – HB2 63 B 4 B16B**	3	36	38	39	40	132
7,4	233	184,07	10200	2,9							
8,6	200	158,14	10300	3,4							
9,9	174	137,67	10300	3,9							
11	163	128,97	10400	4,1							
12	144	113,94	10400	4,7							
13	134	105,83	10400	5							
4,9	353	186,89	7480	1,4	**iC 573 – HB2 71 A 6 B16B**	3	29	32	32	35	130
5,3	325	172,17	7560	1,55							
6,2	279	147,92	7690	1,8							
7,1	243	128,77	7770	2,1							
7,5	228	120,63	7800	2,2							
7,3	236	186,89	7790	2,1	**iC 573 – HB2 63 B 4 B16B**	3	28	29	31	33	130
7,9	218	172,17	7820	2,3							
9,2	187	147,92	7880	2,7							
11	163	128,77	7910	3							
11	152	120,63	7930	3,2							
13	135	106,58	7950	3,6							
14	125	98,99	7960	3,9							
15	113	89,71	7970	4,3							
7,7	224	176,88	5780	1,5	**iC 473 – HB2 63 B 4 B16B**	3	21	23	22	24	128
8,3	206	162,94	5840	1,65							
9,7	177	139,99	5930	1,9							
11	154	121,87	5990	2,2							
12	144	114,17	6010	2,3							
13	127	100,86	6050	2,6							
15	118	93,68	6070	2,8							
16	107	84,9	6090	3,1							
18	96	76,23	6100	3,5							
7,4	234	123,66	3330	0,95	**iC 373 – HB2 71 A 6 B12B**	3	16	19	18	21	126
8,6	199	105,28	4300	1,15							
10	171	90,77	5070	1,3							
11	160	84,61	5390	1,35							
10	170	134,82	5130	1,3	**iC 373 – HB2 63 B 4 B12B**	3	15	17	17	19	126
11	156	123,66	5430	1,35							
13	133	105,28	5620	1,6							
15	115	90,77	5740	1,85							
16	107	84,61	5780	2							
18	93	73,96	5860	2,3							
20	88	69,33	5880	2,4							
22	77	61,18	5930	2,7							
24	70	55,76	5950	3							
28	61	48,08	5890	3,4							

(1) Finite transmission ratio *i*

P_1 = 0,18 kW





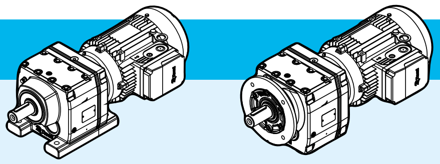
n_2 min^{-1}	M_2 N m	i	F_{r2} N	fs			kg foot HB	kg foot HBZ	kg flange HB	kg flange HBZ	p.
11	157	123,91	2880	0,9	**iC 273 – HB2 63 B 4 B12B**	3	14	15	14	16	124
13	133	105,49	3490	1,1							
15	115	90,96	3960	1,25							
16	107	84,78	4020	1,35							
18	94	74,11	4090	1,5							
20	88	69,47	4110	1,6							
22	77	61,3	4160	1,85							
24	71	55,87	4170	2							
28	61	48,17	4000	2,3							
30	57	44,9	3920	2,5							
35	50	39,25	3770	2,8							
37	47	36,79	3700	3							
42	41	32,47	3560	3,4							
47	36	28,78	3440	3,8							
56	31	24,47	3270	4,4							
48	36	28,37	3420	3,9	**iC 272 – HB2 63 B 4 B12B**	2	14	15	14	16	124
52	33	26,09	3340	4,2							
61	28	22,32	3180	4,9							
70	24	19,35	3050	5,6							
75	23	18,08	2980	6							
87	20	15,63	2850	6,9							
102	17	13,28 (1)	2710	8							

P_1 = 0,25 kW

4,6	518	195,24 (1)	12000	1,8	**iC 773 – HB2 71 B 6 B20B**	3	46	48	52	55	134
5,4	442	166,59	12400	2,1							
6,2	386	145,67	12600	2,4							
7,2	333	195,24 (1)	12700	2,8	**iC 773 – HB2 71 A 4 B20B**	3	44	47	51	54	134
8,4	284	166,59	12800	3,3							
9,6	248	145,67	12900	3,7							
10	236	138,39	13000	3,9							
12	207	121,42	13000	4,4							
4,5	530	199,81	8390	1,25	**iC 673 – HB2 71 B 6 B16B**	3	38	41	41	44	132
4,9	488	184,07	8750	1,35							
5,7	420	158,14	9250	1,6							
6,5	365	137,67	9580	1,85							
7,0	342	128,97	9700	1,95							
7,9	302	113,94	9900	2,2							
8,5	281	105,83	9990	2,4							
7,0	341	199,81	9690	1,95	**iC 673 – HB2 71 A 4 B16B**	3	37	40	40	43	132
7,6	314	184,07	9820	2,1							
8,9	270	158,14	10000	2,5							

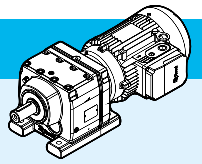
(1) Finite transmission ratio *i*

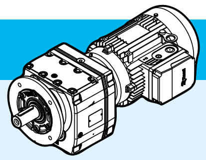
P_1 = 0,25 kW

n_2	M_2	i	F_{r2}	fs			kg foot		flange		p.
min^{-1}	N m		N				HB	HBZ	HB	HBZ	
10	235	137,67	10100	2,9	**iC 673 – HB2 71 A 4 B16B**	3	37	40	40	43	132
11	220	128,97	10200	3							
12	194	113,94	10300	3,4							
13	180	105,83	10300	3,7							
15	164	95,91	10400	4,1							
16	147	86,11	10400	4,6							
4,8	496	186,89	6390	1	**iC 573 – HB2 71 B 6 B16B**	3	30	32	33	36	130
5,2	457	172,17	7110	1,1							
6,1	392	147,92	7360	1,25							
7,0	342	128,77	7520	1,45							
7,5	320	120,63	7590	1,55							
8,4	283	106,58	7690	1,75							
9,1	263	98,99	7730	1,9							
7,5	319	186,89	7580	1,55	**iC 573 – HB2 71 A 4 B16B**	3	29	31	32	35	130
8,1	294	172,17	7650	1,7							
9,5	252	147,92	7750	2							
11	220	128,77	7820	2,3							
12	206	120,63	7840	2,4							
13	182	106,58	7880	2,7							
14	169	98,99	7900	2,9							
16	153	89,71	7920	3,2							
17	137	80,55	7940	3,5							
20	118	69,23	7960	4,1							
7,9	302	176,88	4980	1,1	**iC 473 – HB2 71 A 4 B16B**	3	22	25	23	26	128
8,6	278	162,94	5540	1,2							
10	239	139,99	5710	1,4							
11	208	121,87	5830	1,6							
12	195	114,17	5870	1,7							
14	172	100,86	5940	1,95							
15	160	93,68	5970	2,1							
16	145	84,9	6010	2,3							
18	130	76,23	6040	2,6							
20	117	68,54	6070	2,9							
22	110	64,21	6080	3,1							
25	97	56,73	6100	3,5							
27	90	52,69	6110	3,7							
29	81	47,75	5940	4,1							
10	230	134,82	3420	0,95	**iC 373 – HB2 71 A 4 B12B**	3	16	19	18	21	126
11	211	123,66	3950	1							
13	180	105,28	4840	1,2							
15	155	90,77	5430	1,35							
17	144	84,61	5520	1,45							
19	126	73,96	5660	1,65							
20	118	69,33	5710	1,8							

(1) Finite transmission ratio *i*

P_1 = 0,25 kW

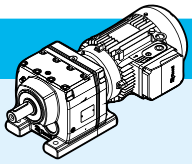


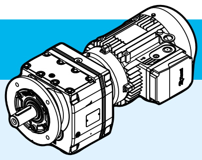


n_2 min^{-1}	M_2 N m	i	F_{r2} N	fs			kg foot HB	foot HBZ	flange HB	flange HBZ	p.
23	104	61,18	5800	2	**iC 373 – HB2 71 A 4 B12B**	3	16	19	18	21	126
25	95	55,76	5840	2,2							
29	82	48,08	5740	2,5							
31	76	44,81	5630	2,7							
36	67	39,17	5410	3,1							
38	63	36,72	5310	3,3							
43	55	32,4	5110	3,7							
17	145	84,78	3160	1	**iC 273 – HB2 71 A 4 B12B**	3	15	17	15	18	124
19	126	74,11	3640	1,15							
20	118	69,47	3850	1,2							
23	105	61,3	4030	1,35							
25	95	55,87	4010	1,5							
29	82	48,17	3860	1,7							
31	77	44,9	3790	1,85							
36	67	39,25	3650	2,1							
38	63	36,79	3590	2,2							
43	55	32,47	3460	2,5							
49	49	28,78	3350	2,8							
57	42	24,47	3200	3,3							
49	48	28,37	3340	2,9	**iC 272 – HB2 71 A 4 B12B**	2	15	17	15	18	124
54	44	26,09	3260	3,1							
63	38	22,32	3110	3,6							
72	33	19,35	2980	4,1							
77	31	18,08	2920	4,4							
90	27	15,63	2800	5,1							
105	23	13,28 (1)	2660	6							
118	20	11,86	2570	6,6							
138	17	10,13	2450	7,7							
149	16	9,41	2380	7,6							
172	14	8,16	2280	8,9							
184	13	7,63 (1)	2230	9,2							
212	11	6,59	2130	9,8							
250	10	5,6 (1)	2020	11							
280	9	5 (1)	1950	11							
328	7	4,27	1860	12							
350	6,8	4 (1)	1820	13							
415	6	3,37	1720	14							

(1) Finite transmission ratio *i*

P_1 = 0,37 kW

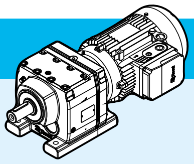
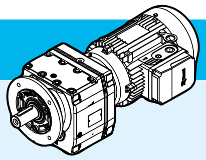




n_2 min^{-1}	M_2 N m	i	F_{r2} N	fs			kg foot HB	 foot HBZ	 flange HB	 flange HBZ	p.
3,2	1101	289,74	28100	3	**iC 973 – HB2 80 A 6 B30C**	3	134	138	150	154	138
3,6	972	255,71	28300	3,4							
3,9	917	241,25	28300	3,7							
4,3	822	216,28	28400	4,1							
3,8	937	246,54	20000	1,85	**iC 873 – HB2 80 A 6 B25C**	3	81	85	89	93	136
4,3	823	216,54	20000	2,1							
4,5	782	205,71	20000	2,2							
5,1	691	181,77	20000	2,5							
6,0	590	155,34	20000	3							
6,5	541	142,41	20000	3,2							
5,6	633	166,59	11400	1,45	**iC 773 – HB2 80 A 6 B20C**	3	47	51	53	57	134
6,4	553	145,67	11800	1,65							
6,7	526	138,39	12000	1,75							
7,2	493	195,24 (1)	12100	1,9	**iC 773 – HB2 71 B 4 B20B**	3	45	48	52	55	134
8,4	420	166,59	12400	2,2							
9,6	368	145,67	12600	2,5							
10	349	138,39	12700	2,6							
12	306	121,42	12800	3							
14	260	102,99	12900	3,5							
15	235	92,97	13000	3,9							
5,9	601	158,14	7590	1,1	**iC 673 – HB2 80 A 6 B16C**	3	40	44	42	46	132
6,8	523	137,67	8400	1,3							
7,2	490	128,97	8690	1,35							
8,2	433	113,94	9130	1,55							
7,0	504	199,81	8590	1,35	**iC 673 – HB2 71 B 4 B16B**	3	38	41	41	44	132
7,6	465	184,07	8910	1,45							
8,9	399	158,14	9370	1,7							
10	347	137,67	9670	1,95							
11	326	128,97	9780	2,1							
12	288	113,94	9950	2,3							
13	267	105,83	10000	2,5							
15	242	95,91	10100	2,8							
16	217	86,11	10200	3,1							
19	187	74,17	10300	3,6							
20	176	69,75	10300	3,8							
23	155	61,26	10400	4,3							
25	144	56,89	10400	4,7							
7,2	489	128,77	6410	1	**iC 573 – HB2 80 A 6 B16C**	3	31	35	34	38	130
7,7	458	120,63	7000	1,1							
8,7	405	106,58	7300	1,25							
9,4	376	98,99	7400	1,35							
7,5	472	186,89	6790	1,05	**iC 573 – HB2 71 B 4 B16B**	3	30	32	33	35	130
8,1	435	172,17	7190	1,15							
9,5	373	147,92	7420	1,35							

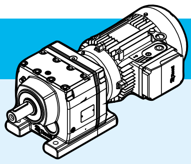
(1) Finite transmission ratio *i*

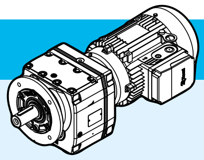
P_1 = 0,37 kW

n_2 min^{-1}	M_2 N m	i	F_{r2} N	fs	 		kg				p.
							foot		flange		
							HB	HBZ	HB	HBZ	
11	325	128,77	7570	1,55	**iC 573 – HB2 71 B 4 B16B**	3	30	32	33	35	130
12	304	120,63	7630	1,6							
13	269	106,58	7720	1,8							
14	250	98,99	7760	1,95							
16	226	89,71	7810	2,2							
17	203	80,55	7850	2,4							
20	175	69,23	7900	2,8							
22	164	64,85	7910	2,9							
24	145	57,29	7700	3,3							
26	134	53,22	7540	3,6							
29	122	48,23	7320	3,9							
10	353	139,99	3770	0,95	**iC 473 – HB2 71 B 4 B16B**	3	23	26	24	27	128
11	308	121,87	4880	1,1							
12	288	114,17	5360	1,15							
14	255	100,86	5650	1,3							
15	236	93,68	5730	1,4							
16	214	84,9	5810	1,55							
18	192	76,23	5880	1,75							
20	173	68,54	5940	1,95							
22	162	64,21	5970	2,1							
25	143	56,73	6020	2,3							
27	133	52,69	5940	2,5							
29	121	47,75	5780	2,8							
33	108	42,87	5610	3,1							
38	93	36,93	5370	3,6							
40	88	34,73	5280	3,8							
41	85	33,79	5230	3,2	**iC 472 – HB2 71 B 4 B16B**	2	23	26	24	27	128
45	79	31,12	5110	3,1							
52	67	26,74	4880	5							
60	59	23,28	4680	5,7							
64	55	21,81	4590	6,1							
15	229	90,77	3480	0,95	**iC 373 – HB2 71 B 4 B12B**	3	17	19	19	21	126
17	214	84,61	3920	1							
19	187	73,96	4670	1,15							
20	175	69,33	5000	1,2							
23	154	61,18	5450	1,35							
25	141	55,76	5560	1,5							
29	121	48,08	5550	1,7							
31	113	44,81	5440	1,85							
36	99	39,17	5250	2,1							
38	93	36,72	5160	2,2							
43	82	32,4	4980	2,5							
49	73	28,73	4810	2,8							
57	62	24,42	4590	3,3							

(1) Finite transmission ratio i

P_1 = 0,37 kW





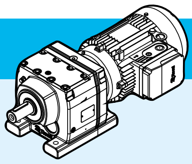
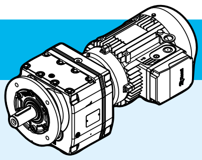
n_2	M_2	i	F_{r2}	fs			kg				p.
min^{-1}	N m		N				foot		flange		
							HB	HBZ	HB	HBZ	
49	71	28,32	4790	2,9	**iC 372 – HB2 71 B 4 B12B**	**2**	17	19	19	21	126
54	66	26,03	4680	3,1							
63	56	22,27	4470	3,6							
73	49	19,31	4280	4,2							
78	46	18,05	4200	4,4							
90	39	15,6	4020	5,1							
106	33	13,25	3820	5,9							
118	30	11,83	3690	6,3							
23	155	61,3	2930	0,9	**iC 273 – HB2 71 B 4 B12B**	**3**	16	18	16	19	124
25	141	55,87	3280	1							
29	122	48,17	3660	1,15							
31	113	44,9	3600	1,25							
36	99	39,25	3490	1,4							
38	93	36,79	3430	1,5							
43	82	32,47	3330	1,7							
49	73	28,78	3230	1,9							
57	62	24,47	3090	2,2							
49	72	28,37	3220	1,95	**iC 272 – HB2 71 B 4 B12B**	**2**	16	18	16	19	124
54	66	26,09	3140	2,1							
63	56	22,32	3020	2,4							
72	49	19,35	2900	2,8							
77	46	18,08	2840	3							
90	39	15,63	2730	3,4							
105	34	13,28 (1)	2600	4							

P_1 = 0,55 kW

3,2	1654	289,74	27500	2	**iC 973 – HB2 80 B 6 B30C**	**3**	136	140	152	156	138
3,6	1460	255,71	27800	2,3							
3,8	1377	241,25	27900	2,4							
4,3	1235	216,28	28000	2,7							
4,8	1083	289,74	28200	3,1	**iC 973 – HB2 80 A 4 B30C**	**3**	134	138	150	154	138
5,5	956	255,71	28300	3,5							
5,8	902	241,25	28300	3,7							
6,5	809	216,28	28400	4,1							
3,7	1408	246,54	15600	1,25	**iC 873 – HB2 80 B 6 B25C**	**3**	83	87	91	95	136
4,2	1236	216,54	17900	1,4							
4,5	1174	205,71	18800	1,5							
5,1	1038	181,77	19900	1,7							
5,9	887	155,34	20000	1,95							
5,7	922	246,54	20000	1,9	**iC 873 – HB2 80 A 4 B25C**	**3**	81	85	89	93	136
6,5	810	216,54	20000	2,2							
6,8	769	205,71	20000	2,3							
7,7	680	181,77	20000	2,6							

(1) Finite transmission ratio *i*

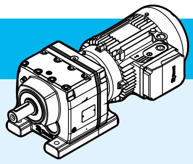
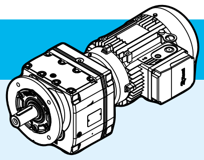
P_1 = 0,55 kW

n_2 min^{-1}	M_2 N m	i	F_{r2} N	fs			kg foot HB	 foot HBZ	 flange HB	 flange HBZ	p.
9,0	581	155,34	20000	3	**iC 873 – HB2 80 A 4 B25C**	3	81	85	89	93	136
9,9	532	142,41	20000	3,3							
11	467	124,97	20000	3,7							
12	443	118,43 (1)	20000	4							
14	387	103,65	20000	4,5							
8,4	623	166,59	11500	1,5	**iC 773 – HB2 80 A 4 B20C**	3	46	50	53	57	134
9,6	545	145,67	11900	1,7							
10	517	138,39	12000	1,8							
12	454	121,42	12300	2							
14	385	102,99	12600	2,4							
15	348	92,97	12700	2,6							
17	306	81,8	12800	3							
18	289	77,24	12800	3,1							
21	246	65,77	12900	3,7							
8,9	591	158,14	7800	1,15	**iC 673 – HB2 80 A 4 B16C**	3	39	43	42	46	132
10	515	137,67	8550	1,3							
11	482	128,97	8820	1,4							
12	426	113,94	9220	1,55							
13	396	105,83	9420	1,7							
15	359	95,91	9630	1,85							
16	322	86,11	9810	2,1							
19	277	74,17	10000	2,4							
20	261	69,75	10100	2,6							
23	229	61,26	10200	2,9							
25	213	56,89	10200	3,2							
12	451	120,63	7140	1,1	**iC 573 – HB2 80 A 4 B16C**	3	31	34	34	38	130
13	398	106,58	7340	1,25							
14	370	98,99	7440	1,3							
16	335	89,71	7550	1,45							
17	301	80,55	7640	1,6							
20	259	69,23	7740	1,85							
22	242	64,85	7670	2							
25	214	57,29	7420	2,2							
26	199	53,22	7280	2,4							
29	180	48,23	7090	2,6							
32	162	43,3	6880	2,9							
38	139	37,3 (1)	6600	3,4							
40	131	35,07	6480	3,6							
53	98	26,31	5960	4,8	**iC 572 – HB2 80 A 4 B16C**	2	30	33	33	37	130
56	93	24,99 (1)	5870	5							
64	82	21,93	5650	5,7							
76	70	18,6 (1)	5380	6,7							
15	350	93,68	3940	0,95	**iC 473 – HB2 80 A 4 B16C**	3	24	28	25	29	128
17	317	84,9	4730	1,05							

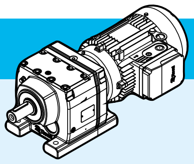
(1) Finite transmission ratio *i*

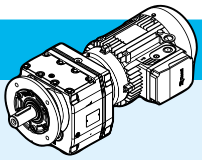
P_1 = 0,55 kW

n_2	M_2	i	F_{r2}	fs	 		kg				p.
min^{-1}	N m		N				foot		flange		
							HB	HBZ	HB	HBZ	
18	285	76,23	5510	1,2	**iC 473 – HB2 80 A 4 B16C**	**3**	24	28	25	29	128
20	256	68,54	5660	1,3							
22	240	64,21	5720	1,4							
25	212	56,73	5800	1,6							
27	197	52,69	5690	1,7							
29	179	47,75	5550	1,9							
33	160	42,87	5400	2,1							
38	138	36,93	5190	2,4							
40	130	34,73	5100	2,6							
47	112	29,88	4890	3							
53	100	26,74	4740	3,4	**iC 472 – HB2 80 A 4 B16C**	**2**	24	28	25	29	128
60	87	23,28	4560	3,8							
64	82	21,81	4470	4,1							
23	229	61,18	3560	0,9	**iC 373 – HB2 80 A 4 B12C**	**3**	18	22	20	24	126
25	208	55,76	4120	1							
29	180	48,08	4920	1,15							
31	168	44,81	5170	1,25							
36	146	39,17	5010	1,4							
38	137	36,72	4930	1,5							
43	121	32,4	4780	1,7							
49	107	28,73	4630	1,9							
58	91	24,42	4430	2,2							
63	83	22,27	4320	2,5	**iC 372 – HB2 80 A 4 B12C**	**2**	18	22	20	24	126
73	72	19,31	4160	2,8							
78	67	18,05	4080	3							
90	58	15,6	3910	3,5							
106	50	13,25	3730	4							
119	44	11,83	3610	4,3							
36	147	39,25	3180	0,95	**iC 273 – HB2 80 A 4 B12C**	**3**	17	20	17	21	124
38	138	36,79	3210	1							
43	121	32,47	3130	1,15							
49	108	28,78	3050	1,3							
57	91	24,47	2940	1,5							
63	83	22,32	2870	1,65	**iC 272 – HB2 80 A 4 B12C**	**2**	17	20	17	21	124
73	72	19,35	2770	1,9							
78	68	18,08	2730	2							
90	58	15,63	2630	2,3							
106	50	13,28 (1)	2520	2,7							
118	44	11,86	2440	3							
139	38	10,13	2330	3,5							
149	35	9,41	2260	3,5							
172	30	8,16	2170	4							

(1) Finite transmission ratio *i*

P_1 = 0,55 kW





n_2	M_2	i	F_{r2}	fs			kg foot		kg flange		p.
min^{-1}	N m		N				HB	HBZ	HB	HBZ	
184	29	7,63 (1)	2130	4,2	**iC 272 – HB2 80 A 4 B12C**	2	17	20	17	21	124
213	25	6,59	2040	4,5							
251	21	5,6 (1)	1950	4,9							
281	19	5 (1)	1880	5,2							
329	16	4,27	1800	5,6							
351	15	4 (1)	1760	5,8							
417	13	3,37	1670	6,4							

P_1 = 0,75 kW

n_2	M_2	i	F_{r2}	fs			kg foot		kg flange		p.
min^{-1}	N m		N				HB	HBZ	HB	HBZ	
3,6	1969	255,71	25900	1,7	**iC 973 – HB3 90 S 6 B30D**	3	142	146	158	162	138
3,9	1858	241,25	27100	1,8							
4,3	1666	216,28	27500	2							
4,9	1472	289,74	27700	2,3	**iC 973 – HB3 80 B 4 B30C**	3	138	142	154	158	138
5,5	1299	255,71	27900	2,6							
5,8	1226	241,25	28000	2,7							
6,5	1099	216,28	28200	3							
7,6	946	186,3	28300	3,5							
8,3	864	170,02	28400	3,9							
4,3	1668	216,54	11500	1,05	**iC 873 – HB3 90 S 6 B25D**	3	89	93	97	101	136
4,5	1584	205,71	12700	1,1							
5,1	1400	181,77	15300	1,25							
6,0	1196	155,34	18100	1,45							
6,5	1097	142,41	19500	1,6							
5,7	1252	246,54	18800	1,4	**iC 873 – HB3 80 B 4 B25C**	3	85	89	93	97	136
6,5	1100	216,54	19500	1,6							
6,9	1045	205,71	19700	1,65							
7,8	923	181,77	20000	1,9							
9,1	789	155,34	20000	2,2							
9,9	723	142,41	20000	2,4							
11	635	124,97	20000	2,8							
12	602	118,43 (1)	20000	2,9							
14	527	103,65	20000	3,3							
15	474	93,38	20000	3,7							
8,5	846	166,59	9840	1,1	**iC 773 – HB3 80 B 4 B20C**	3	51	55	57	61	134
9,7	740	145,67	10700	1,25							
10	703	138,39	11000	1,3							
12	617	121,42	11500	1,5							
14	523	102,99	12000	1,75							
15	472	92,97	12200	1,9							
17	416	81,8	12500	2,2							
18	392	77,24	12500	2,3							
21	334	65,77	12700	2,7							

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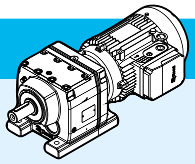
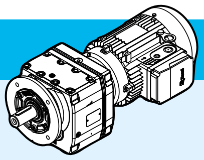
(1) Finite transmission ratio *i*

P_1 = 0,75 kW

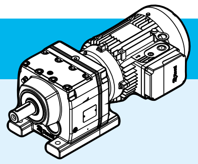


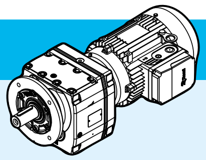


n_2	M_2	i	F_{r2}	fs			kg				p.
min^{-1}	N m		N				foot		flange		
							HB	HBZ	HB	HBZ	
24	293	57,68	12800	3,1	**iC 773 – HB3 80 B 4 B20C**	3	51	55	57	61	134
27	265	52,07	12900	3,4							
31	233	45,81	13000	3,8							
33	220	43,26	13000	4							
11	655	128,97	7030	1	**iC 673 – HB3 80 B 4 B16C**	3	44	48	46	50	132
12	579	113,94	7940	1,15							
13	538	105,83	8340	1,25							
15	487	95,91	8780	1,4							
16	437	86,11	9150	1,55							
19	377	74,17	9530	1,8							
20	354	69,75	9650	1,9							
23	311	61,26	9860	2,2							
25	289	56,89	9960	2,3							
27	262	51,56	10100	2,5							
30	235	46,29	10200	2,7							
13	541	106,58	5570	0,9	**iC 573 – HB3 80 B 4 B16C**	3	35	39	38	42	130
14	503	98,99	6910	0,95							
16	456	89,71	7120	1,05							
18	409	80,55	7300	1,2							
20	352	69,23	7460	1,35							
22	329	64,85	7360	1,45							
25	291	57,29	7150	1,65							
26	270	53,22	7020	1,75							
29	245	48,23	6850	1,95							
33	220	43,3	6670	2,2							
38	189	37,3 (1)	6410	2,5							
40	178	35,07	6310	2,7							
47	153	30,18	6060	3,1							
52	137	26,97	5870	3,4							
54	134	26,31	5830	3,5	**iC 572 – HB3 80 B 4 B16C**	2	34	38	37	41	130
56	127	24,99 (1)	5750	3,7							
64	111	21,93	5540	4,2							
76	94	18,6 (1)	5280	4,9							
21	348	68,54	4530	0,95	**iC 473 – HB3 80 B 4 B16C**	3	29	33	30	34	128
22	326	64,21	5310	1,05							
25	288	56,73	5510	1,15							
27	268	52,69	5430	1,25							
30	243	47,75	5320	1,4							
33	218	42,87	5180	1,55							
38	188	36,93	5000	1,8							
41	176	34,73	4930	1,9							
47	152	29,88	4740	2,2							
53	136	26,7	4610	2,5							
60	120	23,59	4460	2,8							

(1) Finite transmission ratio *i*

P_1 = 0,75 kW

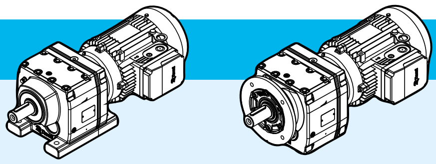




n_2	M_2	i		F_{r2}	fs			kg foot		kg flange		p.
min^{-1}	N m			N				HB	HBZ	HB	HBZ	
53	136	26,74		4610	2,5	**iC 472 – HB3 80 B 4 B16C**	**2**	29	33	30	34	128
61	118	23,28		4440	2,8							
65	111	21,81		4360	3							
73	98	19,27		4220	3,3							
79	91	17,89		4130	3,5							
87	82	16,22		4020	3,7							
29	244	48,08		3630	0,85	**iC 373 – HB3 80 B 4 B12C**	**3**	22	26	24	28	126
31	228	44,81		4490	0,9							
36	199	39,17		4760	1,05							
38	187	36,72		4690	1,1							
44	165	32,4		4570	1,25							
49	146	28,73		4440	1,4							
58	124	24,42		4280	1,65							
63	113	22,27		4180	1,8	**iC 372 – HB3 80 B 4 B12C**	**2**	22	26	24	28	126
73	98	19,31		4030	2,1							
78	92	18,05		3960	2,2							
90	79	15,6		3810	2,6							
106	67	13,25		3640	2,9							
119	60	11,83		3530	3,1							
139	51	10,11		3380	3,4							
149	48	9,47		3310	3,6							
49	146	28,78		2860	0,95	**iC 273 – HB3 80 B 4 B12C**	**3**	21	25	21	25	124
58	124	24,47		2770	1,1							
63	113	22,32		2720	1,2	**iC 272 – HB3 80 B 4 B12C**	**2**	21	25	21	25	124
73	98	19,35		2640	1,4							
78	92	18,08		2610	1,5							
90	79	15,63		2520	1,7							
106	67	13,28	(1)	2430	2							
119	60	11,86		2360	2,2							
139	51	10,13		2260	2,6							
150	48	9,41		2180	2,6							
173	41	8,16		2110	3							
185	39	7,63	(1)	2070	3,1							
214	33	6,59		1990	3,3							
252	28	5,6	(1)	1900	3,6							
282	25	5	(1)	1840	3,8							

(1) Finite transmission ratio *i*

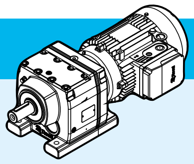
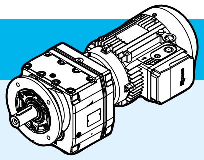
P_1 = 1,1 kW



n_2	M_2	*i*	F_{r2}	*fs*			kg foot		kg flange		p.
min^{-1}	N m		N				HB	HBZ	HB	HBZ	
4,3	2443	216,28	20500	1,35	**iC 973 – HB3 90 L 6 B30D**	3	146	152	162	168	138
5,0	2104	186,3	24300	1,6							
5,6	1892	255,71	27000	1,75	**iC 973 – HB3 90 S 4 B30D**	3	145	149	161	165	138
5,9	1785	241,25	27300	1,9							
6,6	1600	216,28	27600	2,1							
7,6	1378	186,3	27900	2,4							
8,4	1258	170,02	28000	2,7							
9,4	1115	150,78	28100	3							
11	938	126,75	28300	3,5							
12	862	116,48	28400	3,8							
6,6	1602	216,54	16800	1,1	**iC 873 – HB3 90 S 4 B25D**	3	92	96	100	104	136
6,9	1522	205,71	17400	1,15							
7,8	1345	181,77	18400	1,3							
9,1	1149	155,34	19300	1,5							
10,0	1054	142,41	19700	1,65							
11	924	124,97	20000	1,9							
12	876	118,43 (1)	20000	2							
14	767	103,65	20000	2,3							
15	691	93,38	20000	2,5							
17	606	81,92	20000	2,9							
20	537	72,57	20000	3,2							
22	471	63,68 (1)	20000	3,7							
24	446	60,35 (1)	20000	3,9							
27	391	52,82	20000	4,4							
12	898	121,42	9360	1	**iC 773 – HB3 90 S 4 B20D**	3	57	61	64	68	134
14	762	102,99	10600	1,2							
15	688	92,97	11100	1,3							
17	605	81,8	11600	1,5							
18	571	77,24	11800	1,6							
22	487	65,77	12200	1,85							
25	427	57,68	12400	2,1							
27	385	52,07	12600	2,3							
31	339	45,81	12700	2,6							
33	320	43,26	12800	2,8							
39	272	36,83	12900	3,2							
42	248	33,47	12900	3,4							
16	637	86,11	7290	1,05	**iC 673 – HB3 90 S 4 B16D**	3	50	54	53	57	132
19	549	74,17	8260	1,2							
20	516	69,75	8550	1,3							
23	453	61,26	9050	1,5							
25	421	56,89	9270	1,6							
28	381	51,56	9510	1,75							
31	342	46,29	9720	1,9							
36	295	39,88 (1)	9940	2,1							

(1) Finite transmission ratio *i*

P_1 = 1,1 kW

n_2	M_2	i	F_{r2}	fs			kg				p.
min^{-1}	N m		N				foot		flange		
							HB	HBZ	HB	HBZ	
38	277	37,5	10000	2,2	**iC 673 – HB3 90 S 4 B16D**	3	50	54	53	57	132
44	239	32,27	10200	2,4							
49	213	28,83	10200	2,6							
50	208	28,13	10100	2,8	**iC 672 – HB3 90 S 4 B16D**	2	49	53	52	56	132
53	198	26,72	10000	2,8							
61	173	23,44	9620	3,6							
71	147	19,89	9160	4,5							
21	512	69,23	6720	0,95	**iC 573 – HB3 90 S 4 B16D**	3	42	46	45	49	130
22	480	64,85	6800	1							
25	424	57,29	6660	1,15							
27	394	53,22	6560	1,2							
29	357	48,23	6440	1,35							
33	320	43,3	6290	1,5							
38	276	37,3 (1)	6090	1,7							
40	259	35,07	6000	1,8							
47	223	30,18	5790	2,1							
53	199	26,97	5630	2,4							
54	195	26,31	5600	2,4	**iC 572 – HB3 90 S 4 B16D**	2	41	45	44	48	130
57	185	24,99 (1)	5530	2,5							
65	162	21,93	5340	2,9							
76	138	18,6 (1)	5110	3,4							
85	124	16,79	4970	3,7							
30	353	47,75	4310	0,95	**iC 473 – HB3 90 S 4 B16D**	3	35	39	36	40	128
33	317	42,87	4810	1,05							
38	273	36,93	4680	1,25							
41	257	34,73	4620	1,3							
48	221	29,88	4480	1,5							
53	198	26,7	4370	1,7							
60	175	23,59	4250	1,9							
61	172	23,28	4240	1,95	**iC 472 – HB3 90 S 4 B16D**	2	35	39	36	40	128
65	161	21,81	4170	2,1							
74	143	19,27	4040	2,3							
79	132	17,89	3970	2,4							
88	120	16,22	3870	2,5							
98	108	14,56	3760	2,7							
113	93	12,54	3620	3							
120	87	11,79	3550	3,1							
140	75	10,15	3410	3,4							
157	67	9,07	3300	3,6							
44	240	32,4	3040	0,85	**iC 373 – HB3 90 S 4 B12D**	3	29	33	31	35	126
49	213	28,73	3410	0,95							
58	181	24,42	3800	1,15							

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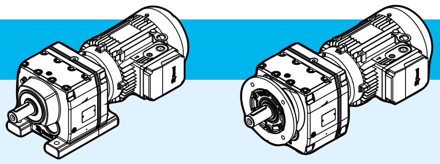
(1) Finite transmission ratio *i*

P_1 = 1,1 kW



n_2	M_2	i	F_{r2}	fs			kg				p.
min^{-1}	N m		N				foot		flange		
							HB	HBZ	HB	HBZ	
74	143	19,31	3810	1,45	**iC 372 – HB3 90 S 4 B12D**	**2**	28	32	30	34	126
79	134	18,05	3750	1,55							
91	115	15,6	3630	1,8							
107	98	13,25	3490	2							
120	88	11,83	3390	2,2							
140	75	10,11	3260	2,4							
150	70	9,47	3200	2,5							
178	59	7,97	3060	2,7							
213	49	6,67	2890	3							
251	42	5,67	2760	3,5							
281	37	5,06	2670	3,7							
73	143	19,35	2420	0,95	**iC 272 – HB3 90 S 4 B12D**	**2**	27	31	28	32	124
79	134	18,08	2400	1							
91	116	15,63	2340	1,15							
107	98	13,28 (1)	2270	1,35							
120	88	11,86	2220	1,55							
140	75	10,13	2140	1,8							
174	60	8,16	1990	2							
186	56	7,63 (1)	1960	2,1							
215	49	6,59	1900	2,3							
254	41	5,6 (1)	1820	2,5							
284	37	5 (1)	1770	2,6							
332	32	4,27	1700	2,8							
355	30	4 (1)	1670	2,9							
421	25	3,37	1600	3,2							
216	49	13,28 (1)	1950	2,7	**iC 272 – HB3 80 B 2 B12C**	**2**	21	24	21	25	124
242	43	11,86	1890	3							
284	37	10,13	1820	3,3							
305	34	9,41	1750	3,5							
352	30	8,16	1690	3,9							
377	28	7,63 (1)	1660	4							
436	24	6,59	1590	4,4							
513	20	5,6 (1)	1520	4,8							
575	18	5 (1)	1480	5,2							
673	16	4,27	1410	5,6							
719	15	4 (1)	1380	5,8							
853	12	3,37	1320	6,4							

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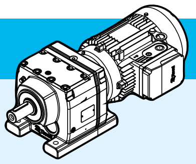
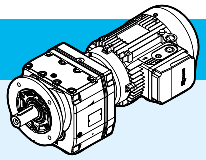
(1) Finite transmission ratio *i*

P_1 = 1,5 kW

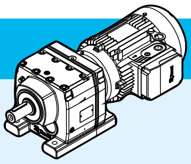
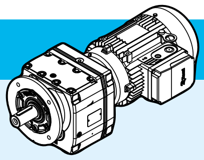




n_2	M_2	i	F_{r2}	fs			kg foot HB	kg foot HBZ	kg flange HB	kg flange HBZ	p.
min^{-1}	N m		N				HB	HBZ	HB	HBZ	
5,6	2562	255,71	24000	1,3	**iC 973 – HB3 90 L 4 B30D**	3	145	151	161	167	138
5,9	2417	241,25	24800	1,4							
6,6	2167	216,28	25900	1,55							
7,7	1866	186,3	27000	1,8							
8,4	1703	170,02	27400	1,95							
9,5	1510	150,78	27700	2,2							
11	1270	126,75	28000	2,6							
12	1167	116,48	28100	2,8							
14	1036	103,44	28200	3,1							
15	926	92,48	28300	3,5							
7,9	1821	181,77	15100	0,95	**iC 873 – HB3 90 L 4 B25D**	3	92	98	100	106	136
9,2	1556	155,34	17100	1,1							
10	1427	142,41	17900	1,25							
11	1252	124,97	18800	1,4							
12	1186	118,43 (1)	19200	1,5							
14	1038	103,65	19800	1,7							
15	935	93,38	20000	1,85							
17	821	81,92	20000	2,1							
20	727	72,57	20000	2,4							
22	638	63,68 (1)	20000	2,7							
24	605	60,35 (1)	20000	2,9							
27	529	52,82	20000	3,2							
30	477	47,58	20000	3,6							
34	418	41,74	20000	4,1							
39	369	36,84 (1)	19400	4,6							
15	931	92,97	8980	1	**iC 773 – HB3 90 L 4 B20D**	3	58	64	64	70	134
17	819	81,8	10100	1,1							
19	774	77,24	10500	1,15							
22	659	65,77	11300	1,35							
25	578	57,68	11700	1,55							
27	522	52,07	12000	1,7							
31	459	45,81	12300	1,95							
33	433	43,26	12400	2							
39	369	36,83	12600	2,4							
43	335	33,47	12700	2,5							
49	290	29	12400	2,9							
57	253	25,23	11900	3,1							
61	234	23,37	11600	3,6	**iC 772 – HB3 90 L 4 B20D**	2	56	62	63	69	134
67	215	21,43	11400	3,9							
76	188	18,8	10900	4,2							
23	614	61,26	7550	1,1	**iC 673 – HB3 90 L 4 B16D**	3	51	57	53	59	132
25	570	56,89	8030	1,2							
28	517	51,56	8530	1,3							
31	464	46,29	8960	1,4							

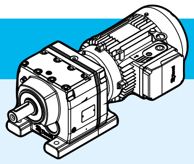
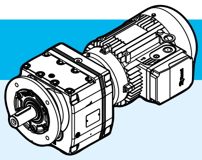
(1) Finite transmission ratio *i*

P_1 = 1,5 kW

n_2	M_2	i	F_{r2}	fs	 		kg				p.
							foot		flange		
min^{-1}	N m		N				HB	HBZ	HB	HBZ	
36	399	39,88 (1)	9390	1,55	**iC 673 – HB3 90 L 4 B16D**	3	51	57	53	59	132
38	376	37,5	9530	1,6							
44	323	32,27	9810	1,75							
50	289	28,83	9960	1,9							
51	282	28,13	9890	2,1	**iC 672 – HB3 90 L 4 B16D**	2	50	56	53	59	132
54	268	26,72	9760	2,1							
61	235	23,44	9410	2,7							
72	199	19,89	8980	3,3							
80	180	17,95	8720	3,5							
27	533	53,22	5900	0,9	**iC 573 – HB3 90 L 4 B16D**	3	42	48	45	51	130
30	483	48,23	5980	1							
33	434	43,3	5880	1,1							
38	374	37,3 (1)	5730	1,25							
41	351	35,07	5670	1,35							
47	302	30,18	5500	1,55							
53	270	26,97	5380	1,75							
54	264	26,31	5350	1,8	**iC 572 – HB3 90 L 4 B16D**	2	41	47	44	50	130
57	250	24,99 (1)	5290	1,85							
65	220	21,93	5130	2,1							
77	186	18,6 (1)	4930	2,5							
85	168	16,79	4810	2,7							
97	148	14,77 (1)	4650	3,1							
103	140	13,95 (1)	4580	3,3							
120	119	11,88	4390	3,8							
39	370	36,93	3260	0,9	**iC 473 – HB3 90 L 4 B16D**	3	36	42	37	43	128
41	348	34,73	4290	0,95							
48	299	29,88	4190	1,1							
54	267	26,7	4110	1,25							
61	236	23,59	4020	1,4							
61	233	23,28	4010	1,45	**iC 472 – HB3 90 L 4 B16D**	2	36	42	37	43	128
66	218	21,81	3960	1,55							
74	193	19,27	3860	1,7							
80	179	17,89	3800	1,75							
88	162	16,22	3710	1,85							
98	146	14,56	3620	2							
114	126	12,54	3490	2,2							
121	118	11,79	3440	2,3							
141	102	10,15	3310	2,5							
158	91	9,07	3210	2,6							
178	80	8,01	3110	2,8			35	41	36	42	
184	78	7,76 (1)	3040	2,4							
205	70	6,96	2950	2,6							
238	60	6	2830	2,9							
254	56	5,64 (1)	2780	3,1							

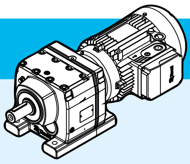
(1) Finite transmission ratio *i*

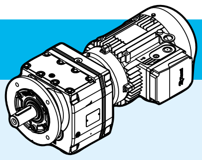
P_1 = 1,5 kW

n_2 min^{-1}	M_2 N m	i	F_{r2} N	fs	 		kg foot		flange		p.
							HB	HBZ	HB	HBZ	
295	49	4,85	2670	3,5	**iC 472 – HB3 90 L 4 B16D**	2	35	41	36	42	128
330	43	4,34	2590	3,8							
373	38	3,83	2500	4,2							
74	193	19,31	2760	1,05	**iC 372 – HB3 90 L 4 B12D**	2	29	35	31	37	126
79	181	18,05	2930	1,15							
92	156	15,6	3230	1,3							
108	133	13,25	3320	1,5							
121	119	11,83	3240	1,6							
141	101	10,11	3130	1,75							
151	95	9,47	3080	1,8							
179	80	7,97	2950	2							
214	67	6,67	2800	2,2							
252	57	5,67	2680	2,6							
283	51	5,06	2600	2,7							
331	43	4,32	2490	3							
353	41	4,05	2450	3,1							
419	34	3,41	2330	3,4							
218	66	13,25	2830	2,9	**iC 372 – HB3 90 S 2 B12D**	2	26	30	28	32	126
244	59	11,83	2740	3,1							
286	50	10,11	2630	3,4							
305	47	9,47	2580	3,6							
362	40	7,97	2460	3,9							
91	157	15,63	1780	0,85	**iC 272 – HB3 90 L 4 B12D**	2	28	34	28	34	124
108	133	13,28 (1)	2080	1							
121	119	11,86	2060	1,15							
141	101	10,13	2010	1,3							
175	82	8,16	1870	1,5							
188	76	7,63 (1)	1850	1,55							
217	66	6,59	1800	1,65							
255	56	5,6 (1)	1740	1,8							
286	50	5 (1)	1700	1,95							
335	43	4,27	1640	2,1							
358	40	4 (1)	1610	2,2							
424	34	3,37	1540	2,4							
244	59	11,86	1810	2,2	**iC 272 – HB3 90 S 2 B12D**	2	25	29	25	29	124
285	50	10,13	1750	2,4							
354	40	8,16	1620	2,9							
379	38	7,63 (1)	1600	3							
438	33	6,59	1540	3,2							
516	28	5,6 (1)	1480	3,6							
578	25	5 (1)	1430	3,8							
677	21	4,27	1370	4,1							
723	20	4 (1)	1350	4,3							
858	17	3,37	1290	4,7							

(1) Finite transmission ratio *i*

P_1 = 2,2 kW

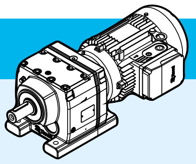


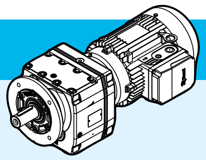


n_2	M_2	i	F_{r2}	fs			kg				p.
							foot		flange		
min^{-1}	N m		N				HB	HBZ	HB	HBZ	
6,7	3156	216,28	13800	1,05	**iC 973 – HB3 100 LA 4 B30E**	3	153	159	169	175	138
7,7	2718	186,3	22900	1,25							
8,5	2481	170,02	24300	1,35							
9,6	2200	150,78	25600	1,5							
11	1849	126,75	27000	1,8							
12	1699	116,48	27400	1,95							
14	1509	103,44	27600	2,2							
16	1349	92,48	27900	2,4							
17	1213	83,15	28000	2,7							
20	1053	72,17	28200	3,1							
22	951	65,21	27500	3,4							
24	874	59,92	26800	3,7							
27	776	53,21	25900	4,1							
30	694	47,58	25000	4,6							
12	1823	124,97	13900	0,95	**iC 873 – HB3 100 LA 4 B25E**	3	102	108	110	116	136
12	1728	118,43 (1)	15700	1							
14	1512	103,65	17300	1,15							
15	1362	93,38	18200	1,3							
18	1195	81,92	19000	1,45							
20	1059	72,57	19600	1,65							
23	929	63,68 (1)	20000	1,85							
24	881	60,35 (1)	20000	1,95							
27	771	52,82	20000	2,2							
30	694	47,58	20000	2,5							
34	609	41,74	19700	2,8							
39	537	36,84 (1)	19000	3,2							
44	476	32,66 (1)	18400	3,5							
42	502	34,4 (1)	18700	3,4	**iC 872 – HB3 100 LA 4 B25E**	2	100	106	108	114	136
46	458	31,4	18200	3,7							
52	406	27,84 (1)	17500	4,1							
62	341	23,4	16700	4,6							
67	314	21,51	16200	4,9							
22	960	65,77	7900	0,95	**iC 773 – HB3 100 LA 4 B20E**	3	67	73	74	80	134
25	842	57,68	9770	1,05							
28	760	52,07	10500	1,15							
31	668	45,81	11200	1,35							
33	631	43,26	11400	1,4							
39	537	36,83	11900	1,65							
43	488	33,47	12100	1,75							
50	423	29	12000	1,95							
57	368	25,23	11600	2,1							
62	341	23,37	11400	2,4	**iC 772 – HB3 100 LA 4 B20E**	2	66	72	73	79	134
67	313	21,43	11100	2,6							
77	274	18,8	10700	2,9							

(1) Finite transmission ratio *i*

P_1 = 2,2 kW

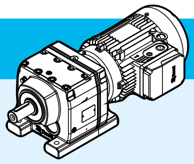
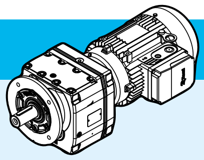




n_2	M_2	i	F_{r2}	fs			kg foot		flange		p.
min^{-1}	N m		N				HB	HBZ	HB	HBZ	
81	260	17,82 (1)	10500	3	**iC 772 – HB3 100 LA 4 B20E**	2	66	72	73	79	134
92	228	15,6	10100	3,3							
102	205	14,05	9830	3,5							
36	582	39,88 (1)	7820	1,05	**iC 673 – HB3 100 LA 4 B16E**	3	60	66	63	69	132
38	547	37,5	8180	1,1							
45	471	32,27	8850	1,2							
50	421	28,83	9220	1,3							
61	342	23,44	9070	1,85	**iC 672 – HB3 100 LA 4 B16E**	2	59	65	62	68	132
72	290	19,89	8700	2,3							
80	262	17,95	8470	2,4							
91	230	15,79	8180	2,6							
97	218	14,91	8050	2,7							
113	185	12,7	7700	2,9							
125	168	11,54	7500	3,1							
144	146	10	7190	3,3							
166	127	8,7 (1)	6910	3,5							
185	114	7,79	6700	3,4			57	63	60	66	
39	544	37,3 (1)	5120	0,85	**iC 573 – HB3 100 LA 4 B16E**	3	52	58	55	61	130
41	512	35,07	5100	0,9							
48	440	30,18	5010	1,05							
53	393	26,97	4940	1,2							
66	320	21,93	4780	1,45	**iC 572 – HB3 100 LA 4 B16E**	2	51	57	54	60	130
77	271	18,6 (1)	4630	1,7							
86	245	16,79	4540	1,9							
97	216	14,77 (1)	4420	2,1							
103	204	13,95 (1)	4360	2,3							
121	173	11,88	4210	2,6							
133	157	10,79	4110	2,8							
154	136	9,35	3970	3							
159	132	9,06	3950	2,9			49	55	52	58	
181	116	7,97	3820	3,1							
132	159	21,93	4120	2,9	**iC 572 – HB3 90 LA 2 B16D**	2	40	46	43	49	130
155	135	18,6 (1)	3960	3,4							
172	122	16,79	3860	3,7							
196	107	14,77 (1)	3730	4,1							
207	101	13,95 (1)	3680	4,3							
75	281	19,27	3540	1,15	**iC 472 – HB3 100 LA 4 B16E**	2	45	51	46	52	128
89	237	16,22	3450	1,3							
99	212	14,56	3380	1,35							
115	183	12,54	3290	1,5							
122	172	11,79	3250	1,55							
142	148	10,15	3140	1,7							
159	132	9,07	3070	1,8							
180	117	8,01	2980	1,95							

(1) Finite transmission ratio *i*

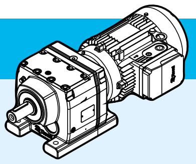
P_1 = 2,2 kW

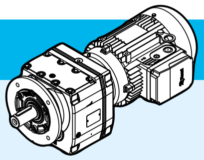



n_2	M_2	i	F_{r2}	fs			kg foot		flange		p.
min^{-1}	N m		N				HB	HBZ	HB	HBZ	
186	113	7,76 (1)	2890	1,65	**iC 472 – HB3 100 LA 4 B16E**	**2**	45	51	46	52	128
207	102	6,96	2820	1,75							
240	88	6	2720	2							
255	82	5,64 (1)	2680	2,1							
297	71	4,85	2580	2,4							
332	63	4,34	2510	2,6							
376	56	3,83	2430	2,9							
150	140	19,27	3110	2,1	**iC 472 – HB3 90 LA 2 B16D**	**2**	35	41	36	42	128
178	118	16,22	2980	2,3							
198	106	14,56	2910	2,5							
230	91	12,54	2800	2,8							
245	86	11,79	2760	2,9							
285	74	10,15	2650	3,1							
319	66	9,07	2570	3,4							
361	58	8,01	2490	3,5			34	40	35	41	
92	228	15,6	1180	0,9	**iC 372 – HB3 100 LA 4 B12E**	**2**	37	43	39	45	126
109	193	13,25	1740	1							
122	173	11,83	2060	1,1							
142	147	10,11	2410	1,2							
152	138	9,47	2530	1,25							
181	116	7,97	2790	1,35							
216	97	6,67	2500	1,5							
254	83	5,67	2550	1,75							
285	74	5,06	2490	1,85							
333	63	4,32	2400	2							
356	59	4,05	2360	2,1							
422	50	3,41	2260	2,3							
185	113	15,6	2770	1,75	**iC 372 – HB3 90 LA 2 B12D**	**2**	28	34	30	36	126
218	96	13,25	2680	2							
244	86	11,83	2610	2,1							
286	73	10,11	2520	2,3							
305	69	9,47	2480	2,4							
362	58	7,97	2370	2,7							
433	48	6,67	2240	3							
510	41	5,67	2150	3,5							
571	37	5,06	2080	3,7							
669	31	4,32	1990	4							
714	29	4,05	1960	4,2							
848	25	3,41	1860	4,5							
142	148	10,13	1180	0,9	**iC 272 – HB3 100 LA 4 B12E**	**2**	36	42	37	43	124
218	96	6,59	1180	1,15							
257	82	5,6 (1)	1430	1,25							
288	73	5 (1)	1570	1,3							

(1) Finite transmission ratio *i*

P_1 = 2,2 kW





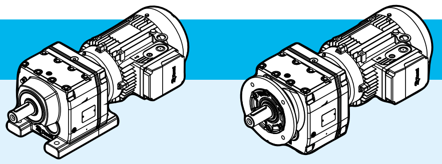
n_2	M_2	i	F_{r2}	fs			kg				p.
							foot		flange		
min^{-1}	N m		N				HB	HBZ	HB	HBZ	
337	62	4,27	1530	1,4	**iC 272 – HB3 100 LA 4 B12E**	2	36	42	37	43	124
360	58	4 (1)	1510	1,45							
427	49	3,37	1460	1,6							
218	97	13,28 (1)	1700	1,35	**iC 272 – HB3 90 LA 2 B12D**	2	27	33	27	33	124
244	86	11,86	1680	1,5							
285	74	10,13	1630	1,65							
438	48	6,59	1450	2,2							
516	41	5,6 (1)	1400	2,4							
578	36	5 (1)	1360	2,6							
677	31	4,27	1320	2,8							
723	29	4 (1)	1290	2,9							
858	24	3.37	1240	3.2							

P_1 = 3 kW

9,6	2979	150,78	21000	1,1	**iC 973 – HB3 112 MA 4 B30E**	3	160	166	176	182	138
11	2504	126,75	24100	1,3							
12	2301	116,48	25100	1,4							
14	2044	103,44	26200	1,6							
16	1827	92,48	27100	1,8							
17	1643	83,15	27400	1,95							
20	1426	72,17	27500	2,3							
22	1288	65,21	26700	2,5							
24	1184	59,92	26100	2,7							
27	1051	53,21	25300	3							
30	940	47,58	24500	3,4							
34	845	42,78	23800	3,8							
39	734	37,13	22800	4,2							
44	657	33,25	22100	4,5							
16	1845	93,38	12100	0,95	**iC 873 – HB3 112 MA 4 B25E**	3	110	116	118	124	136
18	1619	81,92	16500	1,05							
20	1434	72,57	17700	1,2							
23	1258	63,68 (1)	18700	1,35							
24	1192	60,35 (1)	19000	1,45							
27	1044	52,82	19700	1,65							
30	940	47,58	19800	1,8							
35	825	41,74	19200	2,1							
39	728	36,84 (1)	18500	2,3							
44	645	32,66 (1)	17900	2,6							
52	551	27,88	17200	3							
42	680	34,4 (1)	18200	2,5	**iC 872 – HB3 112 MA 4 B25E**	2	108	114	116	122	136
46	620	31,4	17700	2,7							
52	550	27,84 (1)	17200	3							
62	462	23,4	16300	3,4							

(1) Finite transmission ratio *i*

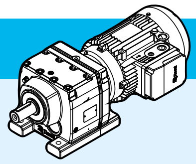
P_1 = 3 kW

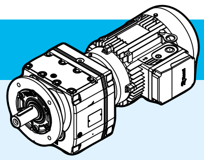


n_2	M_2	i	F_{r2}	fs			kg foot		flange		p.
min^{-1}	N m		N				HB	HBZ	HB	HBZ	
67	425	21,51	15900	3,6	**iC 872 – HB3 112 MA 4 B25E**	2	108	114	116	122	136
76	377	19,1	15400	3,9							
85	337	17,08 (1)	14900	4,2							
94	303	15,35	14400	4,5							
32	905	45,81	9090	1	**iC 773 – HB3 112 MA 4 B20E**	3	76	82	83	89	134
34	855	43,26	9620	1,05							
39	728	36,83	10700	1,2							
43	661	33,47	11200	1,3							
50	573	29	11600	1,45							
57	499	25,23	11200	1,55							
62	462	23,37	11000	1,8	**iC 772 – HB3 112 MA 4 B20E**	2	75	81	82	88	134
68	423	21,43	10700	1,95							
77	372	18,8	10400	2,1							
81	352	17,82 (1)	10200	2,2							
93	308	15,6	9870	2,4							
103	278	14,05	9600	2,6							
118	244	12,33	9250	2,9							
133	215	10,88	8930	3,1							
150	191	9,64	8620	3,3			72	78	78	84	
169	170	8,59	8400	3,7							
187	153	7,74	8140	4							
214	134	6,79	7830	4,3							
62	463	23,44	8660	1,35	**iC 672 – HB3 112 MA 4 B16E**	2	67	73	69	75	132
73	393	19,89	8350	1,65							
81	355	17,95	8150	1,8							
92	312	15,79	7900	1,95							
97	295	14,91	7790	2							
114	251	12,7	7470	2,2							
126	228	11,54	7290	2,3							
145	198	10	7010	2,4							
54	533	26,97	4430	0,9	**iC 573 – HB3 112 MA 4 B16E**	3	59	65	62	68	130
66	433	21,93	4360	1,1	**iC 572 – HB3 112 MA 4 B16E**	2	58	64	61	67	130
78	368	18,6 (1)	4280	1,25							
86	332	16,79	4220	1,4							
98	292	14,77 (1)	4140	1,6							
104	276	13,95 (1)	4100	1,65							
122	235	11,88	3980	1,9							
134	213	10,79	3900	2							
155	185	9,35	3790	2,2							
160	179	9,06	3780	2,2			56	62	60	66	
182	158	7,97	3670	2,3							
193	149	7,53	3620	2,4							
226	127	6,41	3480	2,7							

(1) Finite transmission ratio *i*

P_1 = 3 kW

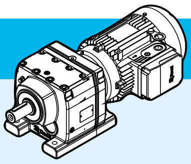


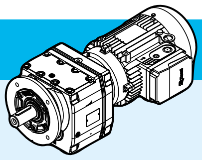


n_2	M_2	i	F_{r2}	*fs*			kg foot		kg flange		p.
min^{-1}	N m		N				HB	HBZ	HB	HBZ	
249	115	5,82	3400	2,8	**iC 572 – HB3 112 MA 4 B16E**	2	56	62	60	66	130
287	100	5,05	3270	3,1							
330	87	4,39	3160	3,2							
134	214	21,93	3920	2,1	**iC 572 – HB3 100 LA 2 B16E**	2	49	55	52	58	130
158	182	18,6 (1)	3790	2,5							
174	164	16,79	3700	2,7							
198	144	14,77 (1)	3600	3							
210	136	13,95 (1)	3550	3,2							
247	116	11,88	3410	3,5							
271	106	10,79	3330	3,7							
89	320	16,22	2210	0,95	**iC 472 – HB3 112 MA 4 B16E**	2	53	59	54	60	128
100	288	14,56	2650	1							
116	248	12,54	3040	1,1							
123	233	11,79	3020	1,15							
143	201	10,15	2950	1,25							
160	179	9,07	2890	1,35							
181	158	8,01	2820	1,45			52	58	53	59	
187	153	7,76 (1)	2720	1,2							
208	138	6,96	2660	1,3							
242	119	6	2590	1,5							
257	111	5,64 (1)	2550	1,55							
299	96	4,85	2470	1,75							
334	86	4,34	2410	1,95							
378	76	3,83	2340	2,1							
248	115	11,79	2650	2,1	**iC 472 – HB3 100 LA 2 B16E**	2	43	49	44	50	128
289	99	10,15	2560	2,3							
323	89	9,07	2490	2,5							
366	78	8,01	2410	2,6							
378	76	7,76 (1)	2350	2,3							
421	68	6,96	2290	2,5							
489	59	6	2200	2,7							
520	55	5,64 (1)	2170	2,8							
604	47	4,85	2080	3,2							
676	42	4,34	2020	3,4							
765	37	3,83	1950	3,8							
143	200	10,11	920	0,9	**iC 372 – HB3 112 MA 4 B12E**	2	46	52	48	54	126
153	187	9,47	1140	0,9							
182	158	7,97	1610	1							
217	132	6,67	1350	1,1			45	51	47	53	
256	112	5,67	1700	1,25							
287	100	5,06	1900	1,35							
336	85	4,32	2110	1,5							
358	80	4,05	2180	1,55							
425	67	3,41	2160	1,65							

(1) Finite transmission ratio *i*

P_1 = 3 kW





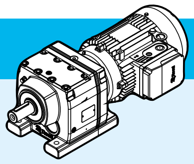
n_2	M_2	i		F_{r2}	fs			foot		flange		p.
min^{-1}	N m			N				HB	HBZ	HB	HBZ	
290	99	10,11		2380	1,7	**iC 372 – HB3 100 LA 2 B12E**	2	35	41	37	43	126
310	93	9,47		2360	1,8							
367	78	7,97		2270	2							
439	65	6,67		2150	2,2							
517	55	5,67		2070	2,6							
579	49	5,06		2020	2,7							
678	42	4,32		1940	3							
724	40	4,05		1900	3,1							
859	33	3,41		1820	3,4							
259	111	5,6	(1)	455	0,9	**iC 272 – HB3 112 MA 4 B12E**	2	45	51	45	51	124
290	99	5	(1)	695	0,95							
340	84	4,27		970	1,05							
363	79	4	(1)	1070	1,1							
430	67	3,37		1280	1,2							
445	64	6,59		1290	1,65	**iC 272 – HB3 100 LA 2 B12E**	2	34	40	35	41	124
523	55	5,6	(1)	1320	1,8							
586	49	5	(1)	1290	1,95							
686	42	4,27		1250	2,1							
733	39	4	(1)	1240	2,2							
870	33	3,37		1190	2,4							

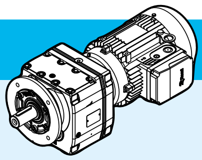
P_1 = 4 kW

12	3069	116,48		18300	1,05	**iC 973 – HB3 112 M 4 B30F**	3	162	171	178	187	138
14	2725	103,44		22900	1,2							
16	2436	92,48		24500	1,35							
17	2191	83,15		25700	1,5							
20	1901	72,17		26500	1,7							
22	1718	65,21		25800	1,85							
24	1579	59,92		25300	2							
27	1402	53,21		24600	2,3							
30	1253	47,58		23800	2,5							
34	1127	42,78		23200	2,8							
39	978	37,13		22300	3,2							
44	876	33,25		21600	3,4							
45	844	32,05		21400	3,4	**iC 972 – HB3 112 M 4 B30F**	2	158	167	174	183	138
53	716	27,19		20400	4							
58	659	25,03		20000	4,4							
65	589	22,37		19300	4,8							
72	531	20,14		18700	5,1							
23	1678	63,68	(1)	13700	1,05	**iC 873 – HB3 112 M 4 B25F**	3	112	121	120	129	136
24	1590	60,35	(1)	14300	1,1							
27	1391	52,82		15500	1,25							
30	1254	47,58		16300	1,35							

(1) Finite transmission ratio *i*

P_1 = 4 kW

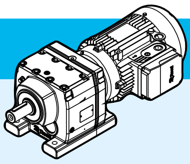
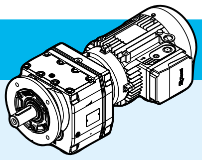




n_2	M_2	i	F_{r2}	fs			foot		flange		p.
min^{-1}	N m		N				HB	HBZ	HB	HBZ	
35	1100	41,74	17000	1,55	**iC 873 – HB3 112 M 4 B25F**	3	112	121	120	129	136
39	970	36,84 (1)	17500	1,75							
44	860	32,66 (1)	17400	1,95							
52	735	27,88	16700	2,2							
42	906	34,4 (1)	17600	1,85	**iC 872 – HB3 112 M 4 B25F**	2	110	119	118	127	136
46	827	31,4	17200	2							
52	734	27,84 (1)	16700	2,3							
62	617	23,4	15900	2,6							
67	567	21,51	15600	2,7							
76	503	19,1	15100	2,9							
85	450	17,08 (1)	14600	3,2							
94	405	15,35	14200	3,4							
109	351	13,33	13600	3,7							
122	314	11,93	13200	4							
39	970	36,83	7260	0,9	**iC 773 – HB3 112 M 4 B20F**	3	78	87	85	94	134
43	882	33,47	9400	0,95							
50	764	29	10500	1,1							
57	665	25,23	10700	1,2							
62	616	23,37	10500	1,35	**iC 772 – HB3 112 M 4 B20F**	2	77	86	84	93	134
68	565	21,43	10300	1,45							
77	495	18,8	10000	1,6							
81	469	17,82 (1)	9880	1,7							
93	411	15,6	9560	1,8							
103	370	14,05	9310	1,95							
118	325	12,33	9000	2,1							
133	287	10,88	8700	2,3							
150	254	9,64	8420	2,5			74	83	80	89	
169	226	8,59	8240	2,8							
187	204	7,74	8000	3							
214	179	6,79	7700	3,3							
242	158	5,99 (1)	7420	3,5							
273	140	5,31 (1)	7160	3,7							
73	524	19,89	7910	1,25	**iC 672 – HB3 112 M 4 B16F**	2	69	78	71	80	132
81	473	17,95	7750	1,35							
92	416	15,79	7550	1,45							
97	393	14,91	7460	1,5							
114	335	12,7	7190	1,6							
126	304	11,54	7030	1,7							
145	263	10	6790	1,8							
167	229	8,7 (1)	6550	1,95							
186	205	7,79	6390	1,85			67	76	70	79	
197	194	7,36 (1)	6290	1,95							
231	165	6,27	6020	2							
255	150	5,7	5860	2,1							

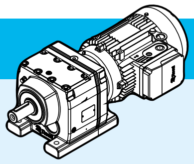
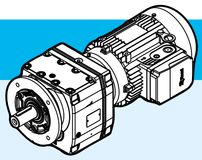
(1) Finite transmission ratio *i*

$P_1 = 4$ kW

n_2	M_2	i	F_{r2}	fs	 		kg				p.
min^{-1}	N m		N				foot		flange		
							HB	HBZ	HB	HBZ	
294	130	4,93	5630	2,2	**iC 672 – HB3 112 M 4 B16F**	2	67	76	70	79	132
338	113	4,29	5410	2,4							
78	490	18,6 (1)	3680	0,95	**iC 572 – HB3 112 M 4 B16F**	2	60	69	63	72	130
86	442	16,79	3820	1,05							
98	389	14,77 (1)	3790	1,2							
104	368	13,95 (1)	3770	1,25							
122	313	11,88	3700	1,45							
134	284	10,79	3650	1,55							
155	246	9,35	3560	1,65							
160	239	9,06	3570	1,6			58	67	62	71	
182	210	7,97	3480	1,75							
193	198	7,53	3440	1,8							
226	169	6,41	3330	2							
249	153	5,82	3260	2,1							
287	133	5,05	3160	2,3							
330	116	4,39	3050	2,4							
143	267	10,15	2070	0,95	**iC 472 – HB3 112 M 4 B16F**	2	55	64	56	65	128
160	239	9,07	2450	1							
181	211	8,01	2630	1,1			54	63	55	64	
208	183	6,96	2470	1							
242	158	6	2420	1,1							
257	149	5,64 (1)	2400	1,2							
299	128	4,85	2340	1,35							
334	114	4,34	2290	1,45							
378	101	3,83	2230	1,6							
181	211	16,22	2630	1,3	**iC 472 – HB3 112 M 2 B16F**	2	53	59	54	60	128
202	189	14,56	2590	1,4							
234	163	12,54	2520	1,55							
249	153	11,79	2500	1,6							
290	132	10,15	2430	1,75							
324	118	9,07	2370	1,85							
367	104	8,01	2310	1,95			52	58	53	59	
379	101	7,76 (1)	2230	1,75							
422	90	6,96	2180	1,85							
490	78	6	2110	2							
521	73	5,64 (1)	2080	2,1							
606	63	4,85	2010	2,4							
678	56	4,34	1950	2,6							
767	50	3,83	1890	2,9							

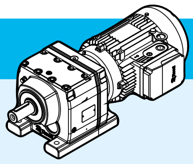
(1) Finite transmission ratio *i*

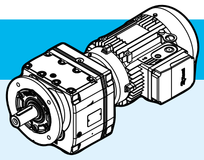
P_1 = 5,5 kW

n_2	M_2	i	F_{r2}	fs	 		kg foot		kg flange		p.
min^{-1}	N m		N				HB	HBZ	HB	HBZ	
18	2971	83,15	20000	1,1	**iC 973 – HB3 132 S 4 B30G**	3	186	197	202	213	138
20	2579	72,17	22100	1,25							
23	2330	65,21	24600	1,4							
25	2141	59,92	24100	1,5							
28	1901	53,21	23500	1,7							
31	1700	47,58	22900	1,85							
34	1528	42,78	22400	2,1							
40	1327	37,13	21600	2,3							
44	1188	33,25	21000	2,5							
53	986	27,58	20000	2,8							
46	1145	32,05	20800	2,5	**iC 972 – HB3 132 S 4 B30G**	2	182	193	198	209	138
54	971	27,19	19900	3							
59	894	25,03	19500	3,3							
66	799	22,37	18900	3,5							
73	720	20,14	18300	3,8							
81	652	18,24	17800	4,1							
91	578	16,17	17200	4,4							
31	1700	47,58	15700	1	**iC 873 – HB3 132 S 4 B25G**	3	137	148	144	155	136
35	1492	41,74	17300	1,15							
40	1316	36,84 (1)	17100	1,3							
45	1167	32,66 (1)	16600	1,45							
53	996	27,88	16100	1,65							
53	995	27,84 (1)	16000	1,7	**iC 872 – HB3 132 S 4 B25G**	2	135	146	143	154	136
63	836	23,4	15400	1,9							
68	769	21,51	15100	2							
77	682	19,1	14600	2,2							
86	610	17,08 (1)	14200	2,3							
96	549	15,35	13800	2,5							
110	476	13,33	13300	2,7							
123	426	11,93	12900	2,9							
148	354	9,9 (1)	12200	3,3							
161	327	9,14 (1)	12100	3,7			127	138	135	146	
179	294	8,22	11700	3,9							
206	255	7,13	11200	4,2							
78	672	18,8	9320	1,15	**iC 772 – HB3 132 S 4 B20G**	2	100	111	106	117	134
82	637	17,82 (1)	9360	1,25							
94	557	15,6	9110	1,35							
105	502	14,05	8910	1,45							
119	440	12,33	8650	1,55							
135	389	10,88	8390	1,7							
152	345	9,64	8150	1,85			96	107	103	114	
171	307	8,59	8030	2,1							
190	277	7,74	7810	2,2							
216	243	6,79	7530	2,4							

(1) Finite transmission ratio *i*

P_1 = 5,5 kW

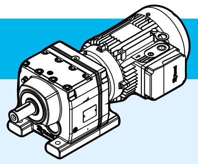


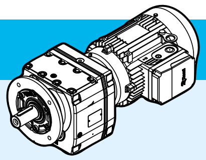


n_2	M_2	i	F_{r2}	fs			kg				p.
							foot		flange		
min^{-1}	N m		N				HB	HBZ	HB	HBZ	
245	214	5,99 (1)	7270	2,5	**iC 772 – HB3 132 S 4 B20G**	2	96	107	103	114	134
277	190	5,31 (1)	7030	2,7							
93	564	15,79	6720	1,05	**iC 672 – HB3 132 S 4 B16G**	2	92	103	95	106	132
99	533	14,91	6980	1,1							
116	454	12,7	6790	1,2							
127	412	11,54	6660	1,25							
147	357	10	6470	1,35							
169	311	8,7 (1)	6280	1,4							
189	279	7,79	6150	1,35			90	101	93	104	
200	263	7,36 (1)	6070	1,4							
235	224	6,27	5830	1,45							
258	203	5,7	5690	1,5							
298	176	4,93	5480	1,65							
342	153	4,29	5280	1,75							
340	154	8,7 (1)	5280	2,9	**iC 672 – HB3 132 S 2 B16G**	2	87	98	90	101	132
380	138	7,79	5140	2,7			85	96	88	99	
402	131	7,36 (1)	5060	2,8							
472	111	6,27	4830	3							
520	101	5,7	4700	3,1							
600	88	4,93	4510	3,3							
689	76	4,29	4330	3,5							
100	528	14,77 (1)	1860	0,85	**iC 572 – HB3 132 S 4 B16G**	2	84	95	87	98	130
105	498	13,95 (1)	2200	0,9							
124	424	11,88	3000	1,05							
136	386	10,79	3270	1,15							
157	334	9,35	3240	1,25							
184	285	7,97	3210	1,3			82	93	85	96	
195	269	7,53	3190	1,3							
229	229	6,41	3110	1,45							
252	208	5,82	3060	1,55							
291	180	5,05	2980	1,7							
335	157	4,39	2900	1,8							
317	166	9,35	2920	2,2	**iC 572 – HB3 132 S 2 B16G**	2	79	90	82	93	130
371	141	7,97	2840	2,5			77	88	80	91	
393	134	7,53	2800	2,6							
462	114	6,41	2700	2,9							
508	103	5,82	2640	3,1							
587	90	5,05	2550	3,4							
674	78	4,39	2460	3,6							
303	173	4,85	1920	1	**iC 472 – HB3 132 S 4 B16G**	2	78	89	79	90	128
339	155	4,34	2110	1,05							
384	137	3,83	2070	1,15							

(1) Finite transmission ratio *i*

P_1 = 5,5 kW





n_2 min^{-1}	M_2 N m	i	F_{r2} N	fs			kg foot HB	 HBZ	 flange HB	 HBZ	p.
236	223	12,54	1780	1,1	**iC 472 – HB3 132 S 2 B16G**	**2**	73	84	74	85	128
251	209	11,79	1970	1,15							
292	180	10,15	2250	1,3							
326	161	9,07	2210	1,35							
369	142	8,01	2170	1,45							
494	106	6	1990	1,5							
525	100	5,64 (1)	1970	1,55							
610	86	4,85	1910	1,75							
683	77	4,34	1860	1,9							
773	68	3,83	1810	2,1							

P_1 = 7,5 kW

n_2 min^{-1}	M_2 N m	i	F_{r2} N	fs			kg foot HB	 HBZ	 flange HB	 HBZ	p.
24	2940	59,92	21500	1,1	**iC 973 – HB3 132 M 4 B30G**	**3**	194	205	210	221	138
27	2611	53,21	22100	1,2							
31	2334	47,58	21600	1,35							
34	2099	42,78	21200	1,5							
39	1821	37,13	20600	1,7							
44	1631	33,25	20100	1,8							
53	1353	27,58	19200	2,1							
46	1572	32,05	19900	1,85	**iC 972 – HB3 132 M 4 B30G**	**2**	190	201	206	217	138
54	1334	27,19	19200	2,2							
58	1228	25,03	18800	2,4							
65	1098	22,37	18300	2,6							
72	988	20,14	17800	2,8							
80	895	18,24	17300	3							
40	1807	36,84 (1)	14700	0,95	**iC 873 – HB3 132 M 4 B25G**	**3**	145	156	152	163	136
45	1602	32,66 (1)	15600	1,05							
52	1368	27,88	15200	1,2							
52	1366	27,84 (1)	15200	1,25	**iC 872 – HB3 132 M 4 B25G**	**2**	143	154	151	162	136
62	1148	23,4	14600	1,4							
68	1055	21,51	14400	1,45							
76	937	19,1	14000	1,55							
85	838	17,08 (1)	13700	1,7							
95	753	15,35	12600	1,8							
110	654	13,33	12900	2							
122	585	11,93	12500	2,1							
147	486	9,9 (1)	11900	2,4			135	146	143	154	
160	449	9,14 (1)	11800	2,7							
178	403	8,22	11500	2,9							
205	350	7,13	11000	3,1							
229	313	6,39	10700	3,3							
275	260	5,3 (1)	10100	3,5							

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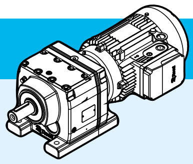
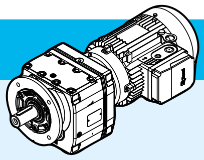
(1) Finite transmission ratio *i*

P_1 = 7,5 kW

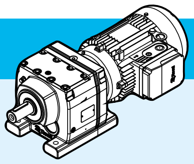
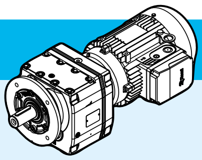




n_2	M_2	i		F_{r2}	fs			kg foot		flange		p.
min^{-1}	N m			N				HB	HBZ	HB	HBZ	
78	922	18,8		5520	0,85	**iC 772 – HB3 132 M 4 B20G**	2	108	119	114	125	134
82	874	17,82	(1)	5910	0,9							
94	765	15,6		6760	0,95							
104	689	14,05		7300	1,05							
118	605	12,33		7850	1,15							
134	534	10,88		7960	1,25							
151	473	9,64		7770	1,35			104	115	111	122	
170	422	8,59		7690	1,5							
189	380	7,74		7540	1,6							
215	333	6,79		7300	1,75							
244	294	5,99	(1)	7060	1,85							
275	261	5,31	(1)	6840	1,95							
115	623	12,7		4420	0,85	**iC 672 – HB3 132 M 4 B16G**	2	100	111	103	114	132
127	566	11,54		5010	0,9							
146	490	10		5740	0,95							
168	427	8,7	(1)	5900	1,05							
187	382	7,79		5600	1			98	109	101	112	
198	361	7,36	(1)	5760	1,05							
233	307	6,27		5570	1,1							
256	279	5,7		5450	1,1							
296	242	4,93		5270	1,2							
340	211	4,29		5100	1,3							
183	391	7,97		1120	0,95	**iC 572 – HB3 132 M 4 B16G**	2	90	101	93	104	130
194	369	7,53		1410	0,95							
228	314	6,41		2120	1,05							
251	286	5,82		2470	1,15							
289	248	5,05		2750	1,25							
333	215	4,39		2700	1,3							
200	357	14,77	(1)	2620	1,2	**iC 572 – HB3 132 SB 2 B16G**	2	87	98	90	101	
212	338	13,95	(1)	2800	1,25							
249	287	11,88		2770	1,4							
274	261	10,79		2750	1,5							
317	226	9,35		2700	1,65							
371	193	7,97		2660	1,85			86	97	89	100	130
393	182	7,53		2630	1,9							
462	155	6,41		2560	2,2							
508	141	5,82		2510	2,3							
587	122	5,05		2440	2,5							
674	106	4,39		2360	2,6							

(1) Finite transmission ratio *i*

P_1 = 9,2 kW

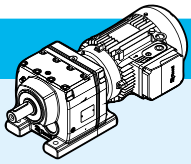
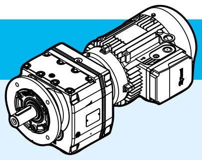
n_2	M_2	i		F_{r2}	fs	 		kg				p.
								foot		flange		
min^{-1}	N m			N				HB	HBZ	HB	HBZ	
27	3202	53,21		10800	1	**iC 973 – HB3 132 MB 4 B30H**	3	196	208	212	224	138
31	2863	47,58		20600	1,1							
34	2574	42,78		20200	1,25							
39	2234	37,13		19800	1,4							
44	2001	33,25		19300	1,5							
53	1660	27,58		18600	1,7							
58	1506	25,03		18200	1,95	**iC 972 – HB3 132 MB 4 B30H**	2	192	204	208	220	138
65	1346	22,37		17800	2,1							
72	1212	20,14		17300	2,3							
80	1098	18,24		16900	2,4							
90	973	16,17		16400	2,6							
100	880	14,62		16000	2,8							
118	746	12,39		15300	3,1							
68	1294	21,51		13800	1,2	**iC 872 – HB3 132 MB 4 B25H**	2	145	157	153	165	136
76	1149	19,1		13500	1,3							
85	1028	17,08	(1)	13200	1,4							
95	924	15,35		12900	1,5							
110	802	13,33		12500	1,65							
122	718	11,93		12200	1,75							
147	596	9,9	(1)	11600	2							
160	550	9,14	(1)	11600	2,2			138	150	146	158	
178	495	8,22		11300	2,4							
205	429	7,13		10900	2,5							
229	384	6,39		10500	2,7							
104	846	14,05		4880	0,85	**iC 772 – HB3 132 MB 4 B20H**	2	110	122	117	129	134
118	742	12,33		5730	0,95							
134	655	10,88		6380	1							
151	580	9,64		6880	1,1			107	119	113	125	
189	466	7,74		6370	1,3							
215	409	6,79		6770	1,45							
244	361	5,99	(1)	6890	1,5							
275	320	5,31	(1)	6690	1,6							

P_1 = 11 kW

34	3057	42,78	17800	1,05	**iC 973 – HB3 160 M 4 B30H**	3	144	-	160	-	138
40	2653	37,13	18900	1,15							
44	2376	33,25	18600	1,25							
53	1971	27,58	18000	1,4							
59	1789	25,03	17600	1,65	**iC 972 – HB3 160 M 4 B30H**	2	140	-	156	-	138
66	1599	22,37	17200	1,75							
73	1439	20,14	16900	1,9							
81	1303	18,24	16500	2							
91	1156	16,17	16000	2,2							

(1) Finite transmission ratio *i*

P_1 = 11 kW

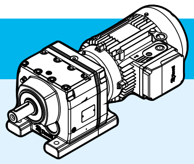
n_2 min^{-1}	M_2 N m	i	F_{r2} N	fs			kg foot HB	 foot HBZ	 flange HB	 flange HBZ	p.
101	1045	14,62	15600	2,4	**iC 972 – HB3 160 M 4 B30H**	**2**	140	-	156	-	138
119	886	12,39	15000	2,6							
136	774	10,83	14500	2,9							
158	664	9,29	14200	3,3			128	-	144	-	
175	600	8,39	13800	3,5							
207	508	7,12	13100	3,9							
237	444	6,21	12600	4,3							
68	1537	21,51	13200	1	**iC 872 – HB3 160 M 4 B25H**	**2**	91	-	99	-	136
77	1365	19,1	13000	1,1							
86	1220	17,08 (1)	12700	1,15							
96	1097	15,35	12500	1,25							
110	952	13,33	12100	1,35							
123	853	11,93	11800	1,45							
148	707	9,9 (1)	11300	1,65							
161	653	9,14 (1)	11400	1,85			83	-	91	-	
179	587	8,22	11100	2							
206	510	7,13	10700	2,1							
230	457	6,39	10400	2,2							
277	379	5,3 (1)	9850	2,4							
135	777	10,88	4400	0,85	**iC 772 – HB3 160 M 4 B20H**	**2**	54	-	61	-	134
152	689	9,64	5130	0,9			51	-	58	-	
190	553	7,74	4740	1,1							
216	485	6,79	5340	1,2							
245	428	5,99 (1)	5800	1,25							
277	380	5,31 (1)	6140	1,35							

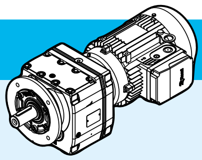
P_1 = 15 kW

53	2688	27.58	16500	1.05	**iC 973 – HB3 160 L 4 B30H**	**3**	144	-	160	-	138
59	2439	25,03	16300	1,2	**iC 972 – HB3 160 L 4 B30H**	**2**	140	-	156	-	138
66	2180	22,37	16100	1,3							
73	1963	20,14	15800	1,4							
81	1777	18,24	15500	1,5							
91	1576	16,17	15200	1,6							
101	1425	14,62	14900	1,75							
119	1208	12,39	14400	1,95							
136	1055	10,83	13900	2,1							
158	905	9,29	13800	2,4			128	-	144	-	
175	818	8,39	13400	2,5							
207	693	7,12	12800	2,9							
237	606	6,21	12300	3,1							
86	1664	17,08 (1)	11600	0,85	**iC 872 – HB3 160 L 4 B25H**	**2**	91	-	99	-	136
96	1496	15,35	11500	0,9							

(1) Finite transmission ratio *i*

P_1 = 15 kW





n_2 min^{-1}	M_2 N m	i	F_{r2} N	fs			kg foot HB	kg foot HBZ	kg flange HB	kg flange HBZ	p.
110	1299	13,33	11300	1	**iC 872 – HB3 160 L 4 B25H**	2	91	-	99	-	136
123	1163	11,93	11100	1,1							
148	965	9,9 (1)	10700	1,25							
161	891	9,14 (1)	10900	1,35			83	-	91	-	
179	801	8,22	10700	1,45							
206	695	7,13	10300	1,55							
230	623	6,39	10000	1,65							
277	516	5.3 (1)	9570	1.75							

P_1 = 18,5 kW

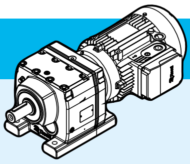
n_2 min^{-1}	M_2 N m	i	F_{r2} N	fs			kg foot HB	kg foot HBZ	kg flange HB	kg flange HBZ	p.
73	2429	20,14	14900	1,1	**iC 972 – HB3 180 M 4 B30L**	2	140	-	156	-	138
80	2200	18,24	14700	1,2							
91	1951	16,17	14400	1,3							
100	1764	14,62	14200	1,4							
118	1495	12,39	13800	1,55							
135	1306	10,83	13400	1,7							
158	1120	9,29	13400	1,95			128	-	144	-	
175	1012	8,39	13100	2,1							
206	858	7,12	12500	2,4							
236	749	6,21	12100	2,5							
282	627	5,2	11500	2,9							
326	543	4,5 (1)	11100	3							
110	1607	13,33	10500	0,8	**iC 872 – HB3 180 M 4 B25L**	2	91	-	99	-	136
123	1439	11,93	10400	0,85							
148	1194	9,9 (1)	10200	1							
160	1103	9,14 (1)	10500	1,1			83	-	91	-	
178	991	8,22	10300	1,2							
205	860	7,13	10000	1,25							
229	770	6,39	9750	1,35							
276	639	5,3 (1)	9330	1,45							

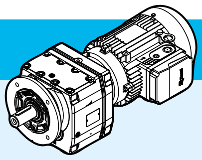
P_1 = 22 kW

n_2 min^{-1}	M_2 N m	i	F_{r2} N	fs			kg foot HB	kg foot HBZ	kg flange HB	kg flange HBZ	p.
73	2879	20,14	14000	0,95	**iC 972 – HB3 180 L 4 B30L**	2	140	-	156	-	138
81	2607	18,24	13900	1							
91	2312	16,17	13700	1,1							
101	2090	14,62	13500	1,2							
119	1772	12,39	13200	1,3							
136	1547	10,83	12900	1,45							
158	1327	9,29	13100	1,65			128	-	144	-	
175	1200	8,39	12800	1,75							
207	1017	7,12	12300	2							
237	888	6,21	11900	2,1							

(1) Finite transmission ratio *i*

P_1 = 22 kW





n_2	M_2	i	F_{r2}	fs			kg				p.
min^{-1}	N m		N				foot		flange		
							HB	HBZ	HB	HBZ	
283	743	5,2	11300	2,4	**iC 972 – HB3 180 L 4 B30L**	**2**	128	-	144	-	138
327	643	4,5 (1)	10900	2,5							
148	1415	9,9 (1)	9630	0,85	**iC 872 – HB3 180 L 4 B25L**	**2**	91	-	99	-	136
161	1307	9,14 (1)	10100	0,95			83	-	91	-	
179	1175	8,22	9940	1							
206	1020	7,13	9680	1,05							
230	913	6,39	9470	1,1							
277	758	5,3 (1)	9100	1,2							

P_1 = 30 kW

n_2	M_2	i	F_{r2}	fs			kg				p.
101	2850	14,62	12000	0,85	**iC 972 – HB3 200 L 4 B30M**	**2**	146	-	162	-	138
119	2416	12,39	11900	0,95							
136	2110	10,83	11800	1,05							
158	1810	9,29	12300	1,2			134	-	150	-	
175	1636	8,39	12000	1,25							
207	1387	7,12	11700	1,45							
237	1211	6,21	11300	1,55							
283	1013	5,2	10900	1,75							
327	877	4,5 (1)	10500	1,85							

(1) Finite transmission ratio *i*

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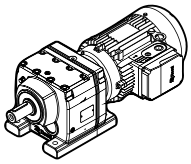
10

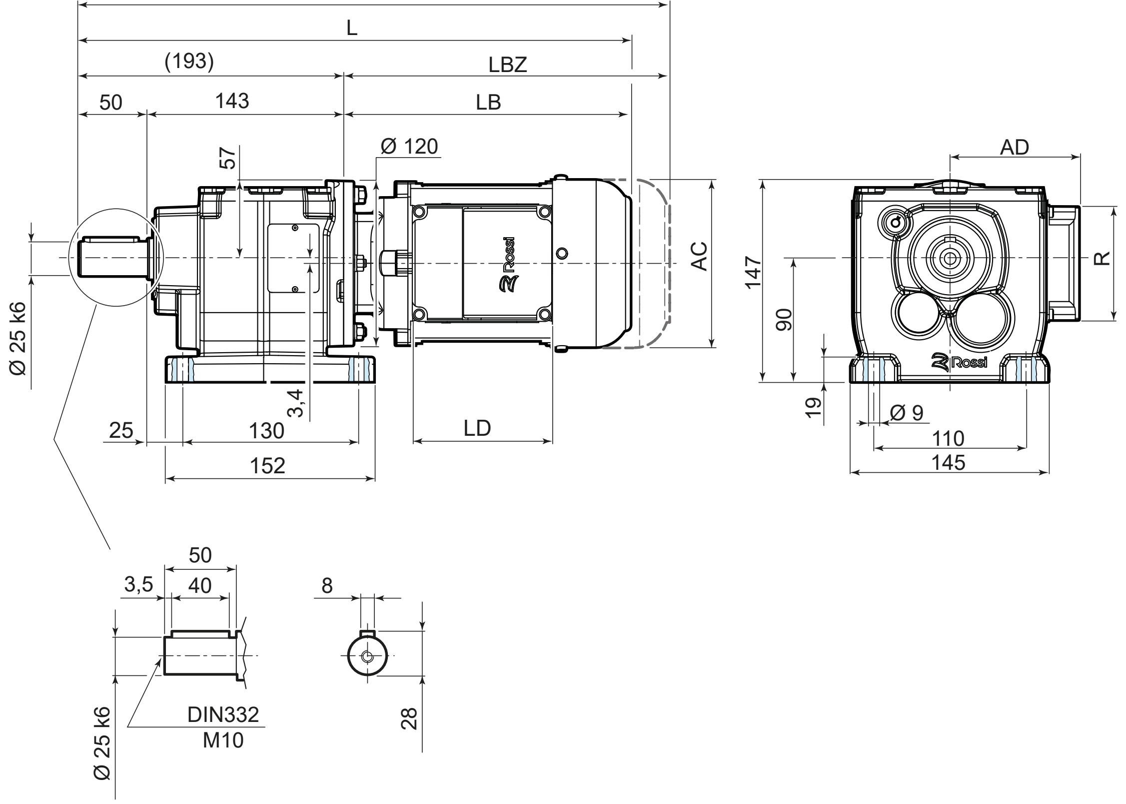
Dimensional drawings

Section contents

10.1

iC 272 / iC 273 PE





75
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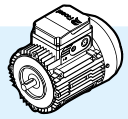
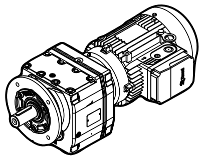
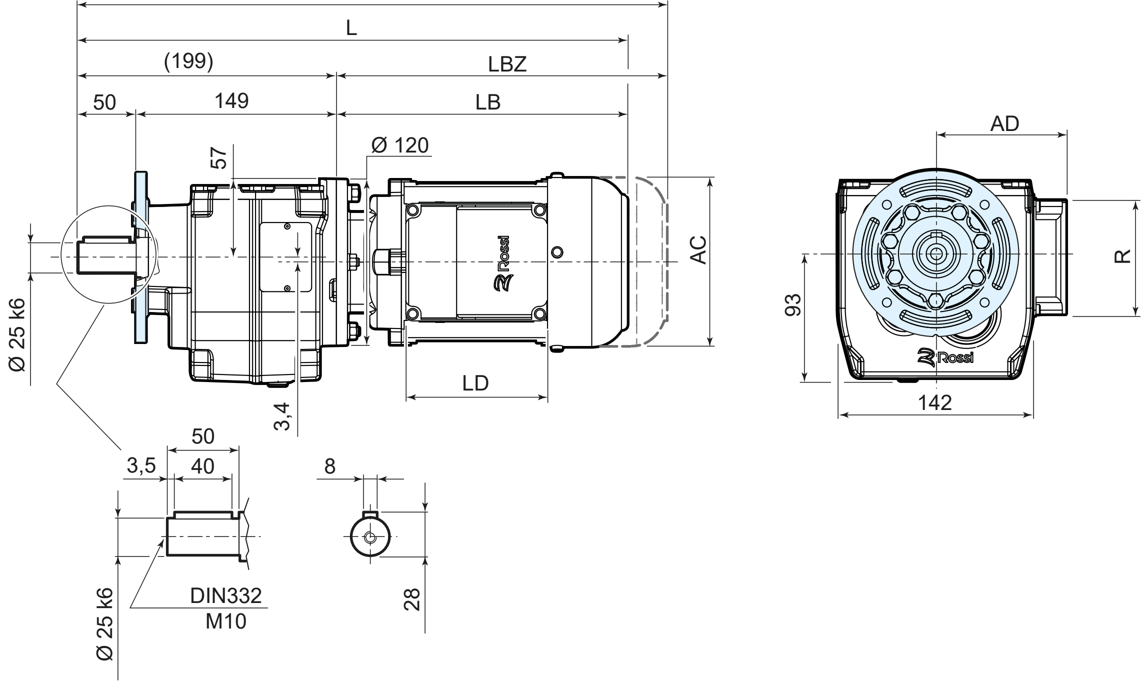
140

	63	71	80	90S	90L	100	112MA
AC	123	138	156	176	176	194	218
AD	95	112	121	141	141	151	163
LB	211	237	266	290	320	351	389
LBZ	266	299	335	369	399	446	488
L	404	430	459	483	513	544	582
LZ	459	492	528	562	592	639	681
LD	103	103	103	136	136	136	136
R	86	86	86	106	106	106	106

iC 272 / iC 273 FE





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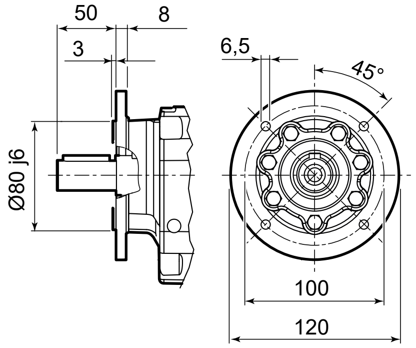
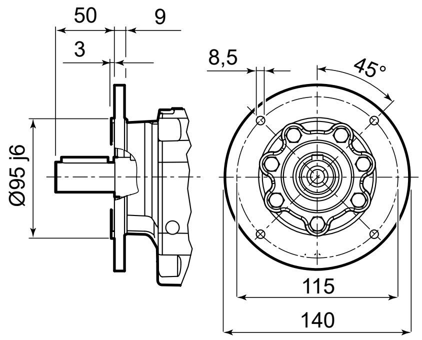
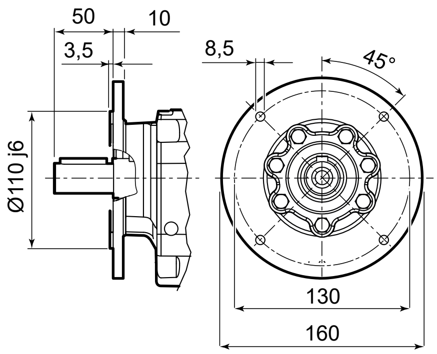


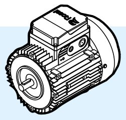
F214
Ø 140



F216
Ø 160



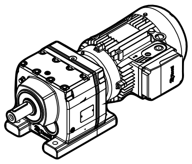
75 66 140

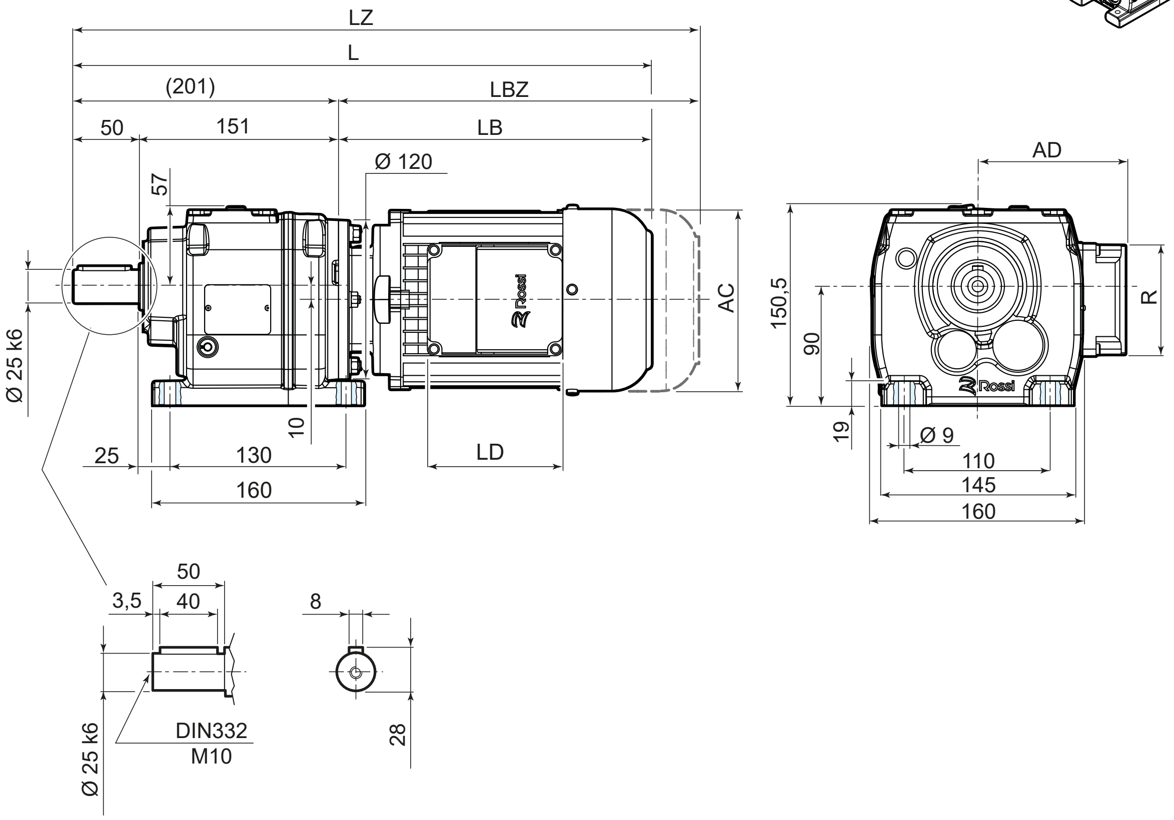
	63	71	80	90S	90L	100	112MA
AC	123	138	156	176	176	194	218
AD	95	112	121	141	141	151	163
LB	211	237	266	290	320	351	389
LBZ	266	299	335	369	399	446	488
L	404	430	459	483	513	544	582
LZ	459	492	528	562	592	639	681
LD	103	103	103	136	136	136	136
R	86	86	86	106	106	106	106

Dimensional drawings

10.2

iC 372 / iC 373 PE





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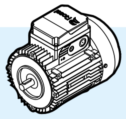
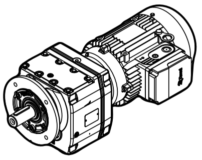
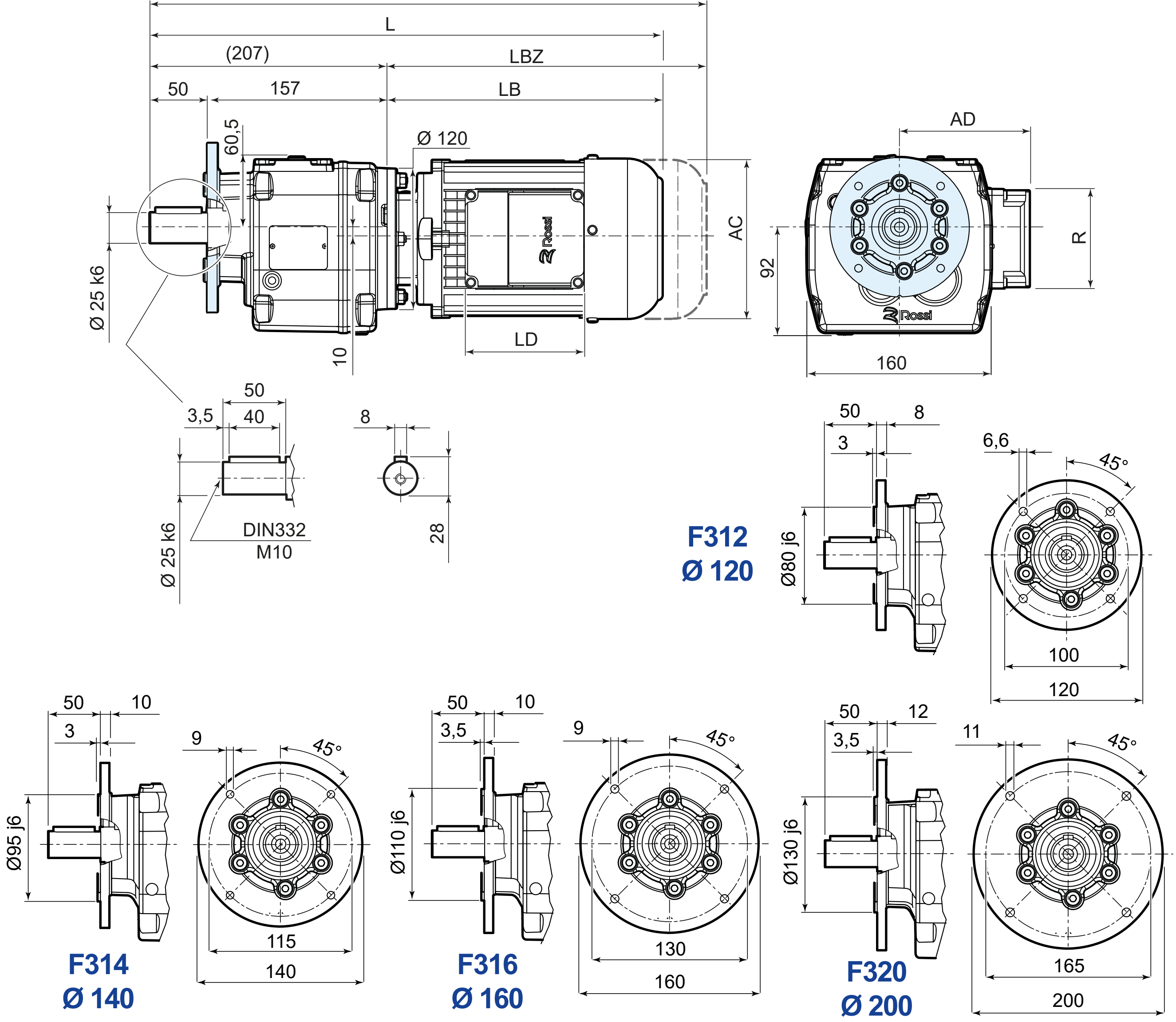
66
140

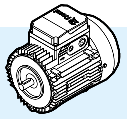
	63	71	80	90S	90L	100	112MA
AC	123	138	156	176	176	194	218
AD	95	112	121	141	141	151	163
LB	211	237	266	290	320	351	389
LBZ	266	299	335	369	399	446	488
L	412	438	467	491	521	552	590
LZ	467	500	536	570	600	647	689
LD	103	103	103	136	136	136	136
R	86	86	86	106	106	106	106

iC 372 / iC 373 FE



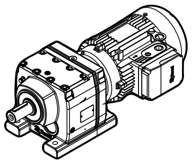


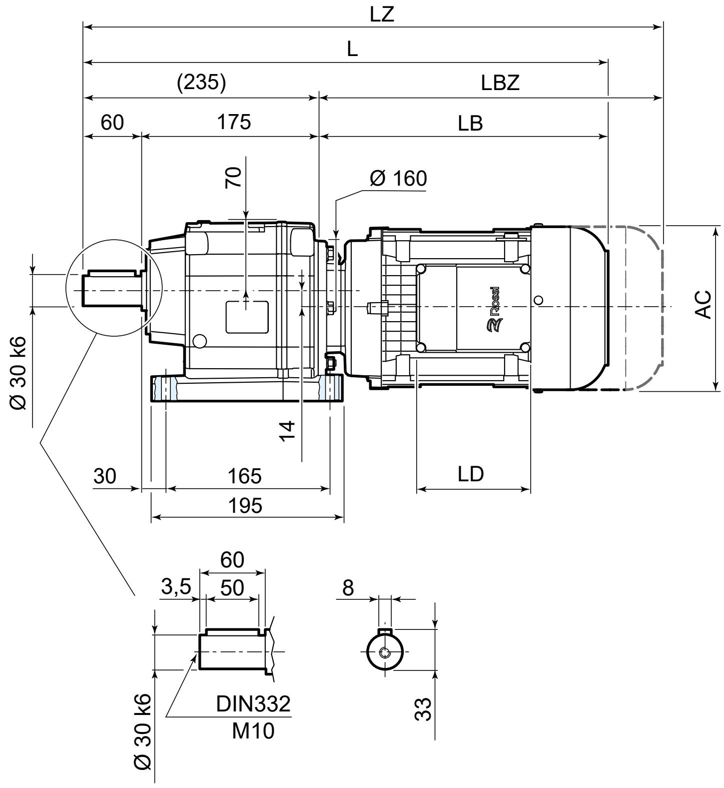
76 66 140

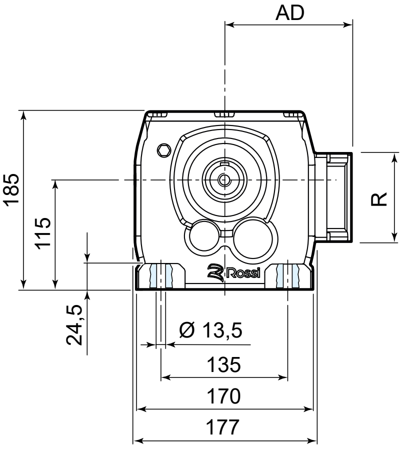
	63	71	80	90S	90L	100	112MA
AC	123	138	156	176	176	194	218
AD	95	112	121	141	141	151	163
LB	211	237	266	290	320	351	389
LBZ	266	299	335	369	399	446	488
L	412	438	467	491	521	552	590
LZ	467	500	536	570	600	647	689
LD	103	103	103	136	136	136	136
R	86	86	86	106	106	106	106

10.3

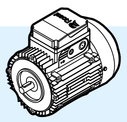
iC 472 / iC 473 PE

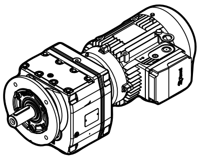




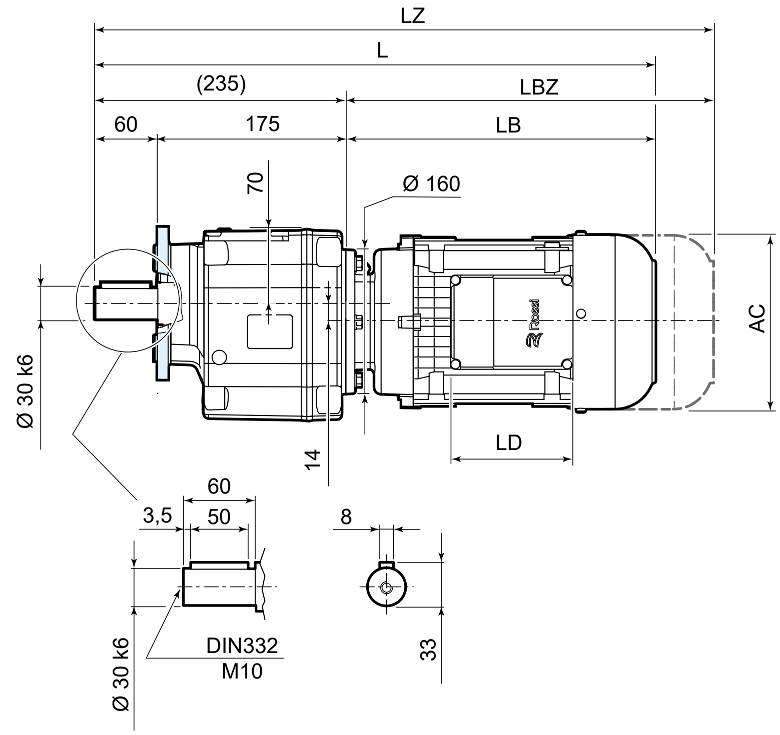


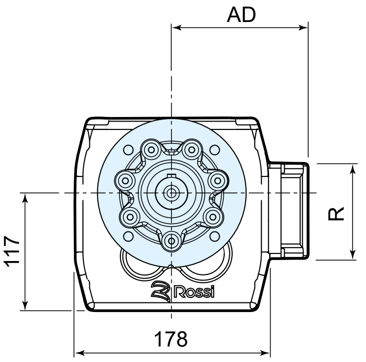
77
66
140

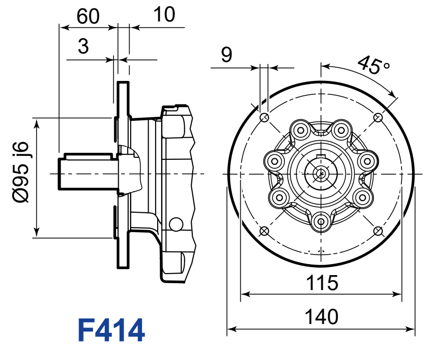
	63	71	80	90S	90L	100	112MA	112M	132S,M
AC	123	138	156	176	176	194	218	218	257
AD	95	112	121	141	141	151	163	163	194
LB	205	231	260	283	313	345	383	383	439
LBZ	260	293	329	362	392	440	482	482	547
L	440	466	495	518	548	580	618	618	674
LZ	495	528	564	597	627	675	717	717	782
LD	103	103	103	136	136	136	136	136	190
R	86	86	86	106	106	106	106	106	148



iC 472 / iC 473 FE







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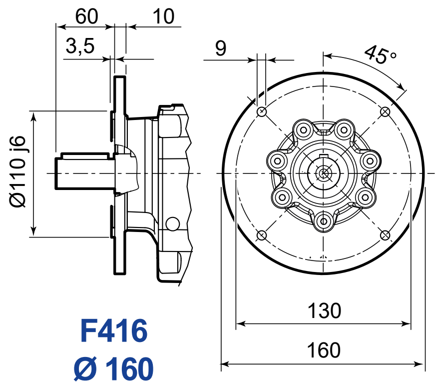

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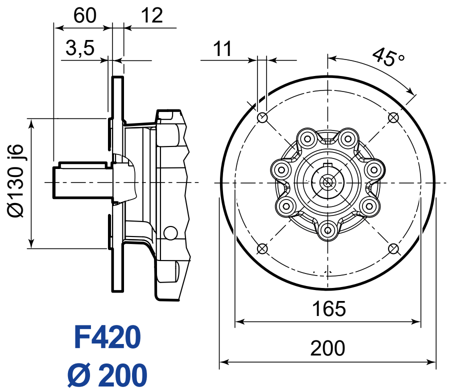

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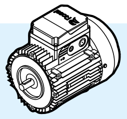	63	71	80	90S	90L	100	112MA	112M	132S,M
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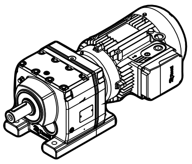
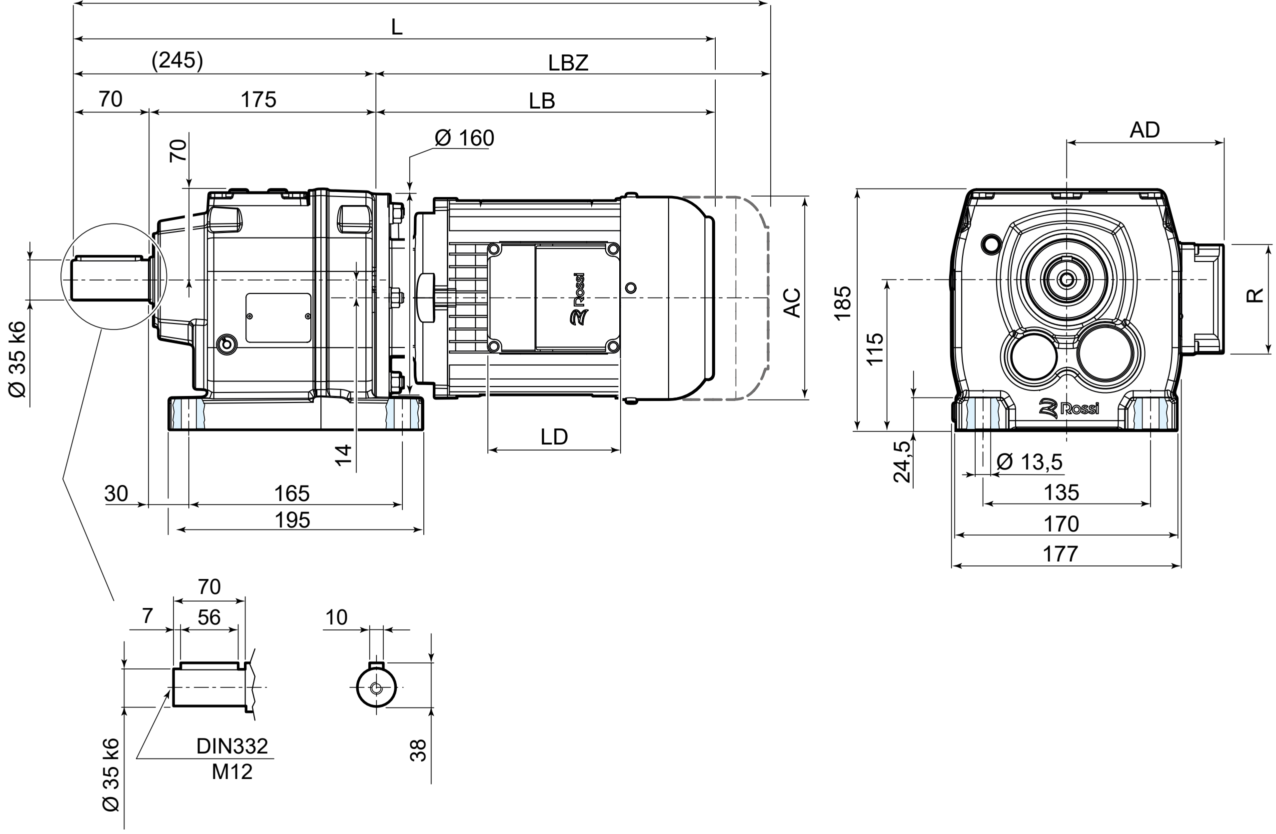
AD	95	112	121	141	141	151	163	163	194
LB	205	231	260	283	313	345	383	383	439
LBZ	260	293	329	362	392	440	482	482	547
L	440	466	495	518	548	580	618	618	674
LZ	495	528	564	597	627	675	717	717	782
LD	103	103	103	136	136	136	136	136	190
R	86	86	86	106	106	106	106	106	148

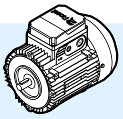
10.4

iC 572 / iC 573 PE





78 66 140

	63	71	80	90S	90L	100	112MA	112M	132S,M
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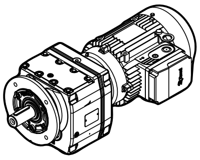
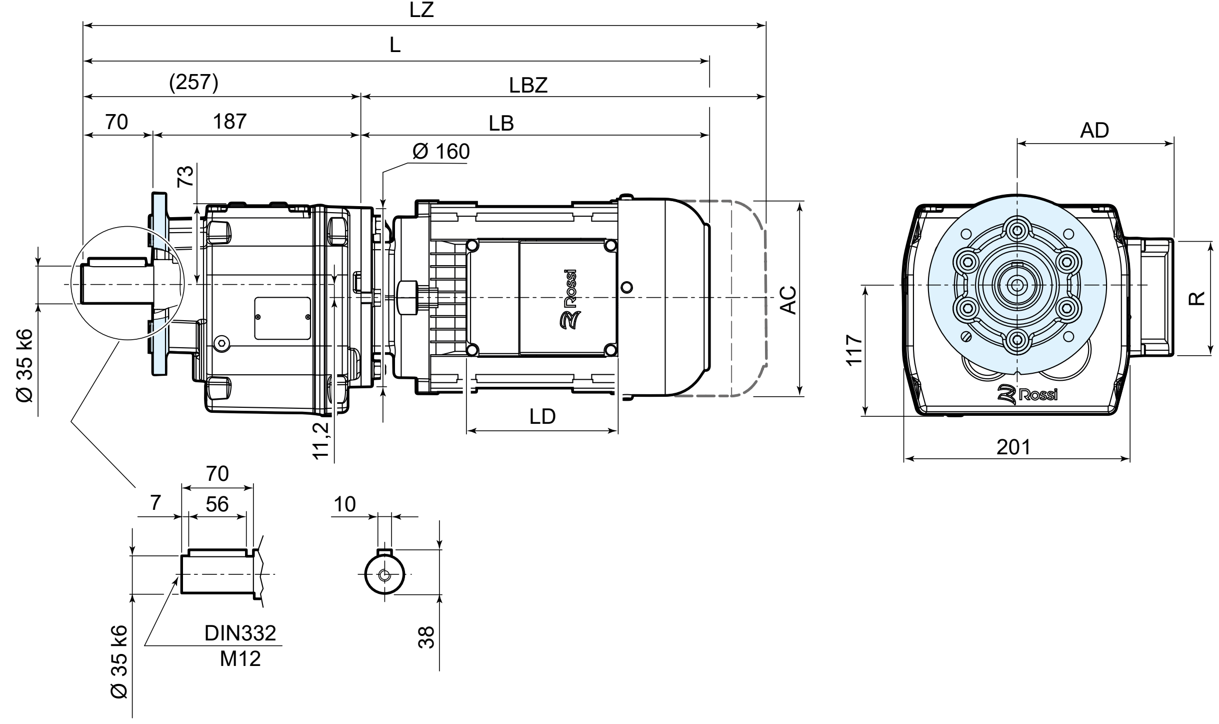
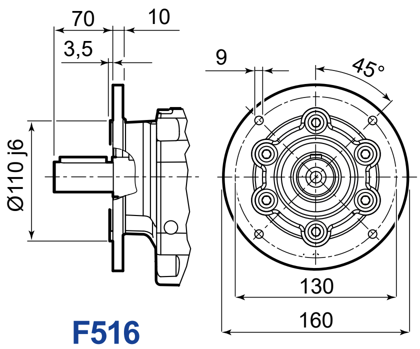
AD	95	112	121	141	141	151	163	163	194
LB	205	231	260	283	313	345	383	383	439
LBZ	260	293	329	362	392	440	482	482	547
L	450	476	505	528	558	590	628	628	684
LZ	505	538	574	607	637	685	727	727	792
LD	103	103	103	136	136	136	136	136	190
R	86	86	86	106	106	106	106	106	148

iC 572 / iC 573 FE







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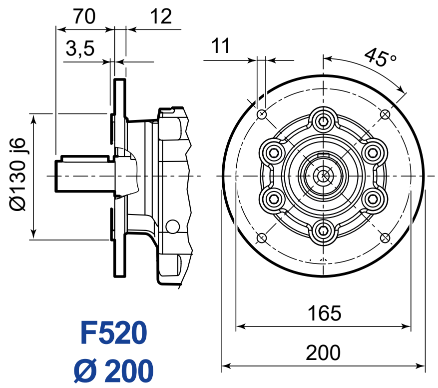

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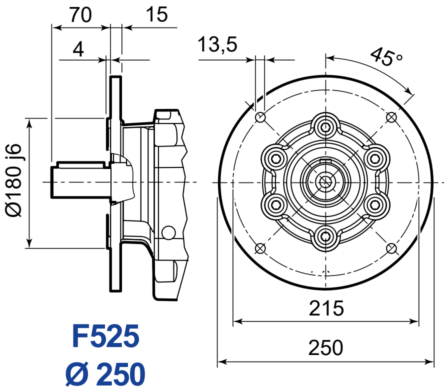

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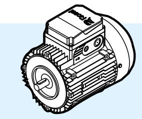
78 66 140

	63	71	80	90S	90L	100	112MA	112M	132S,M
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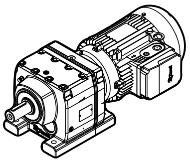
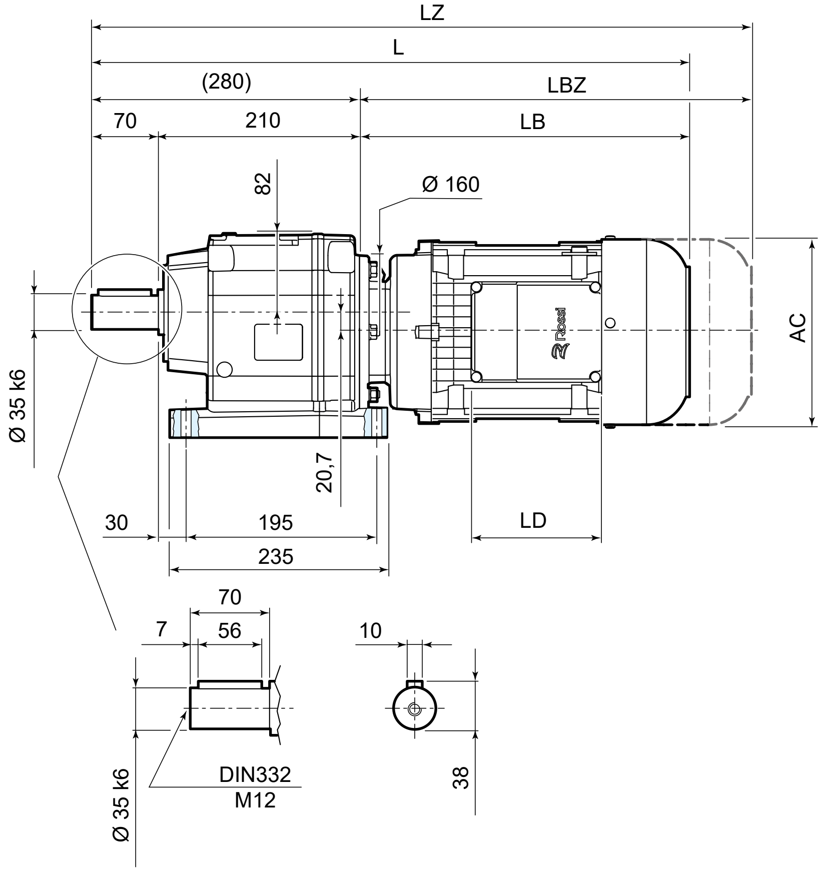
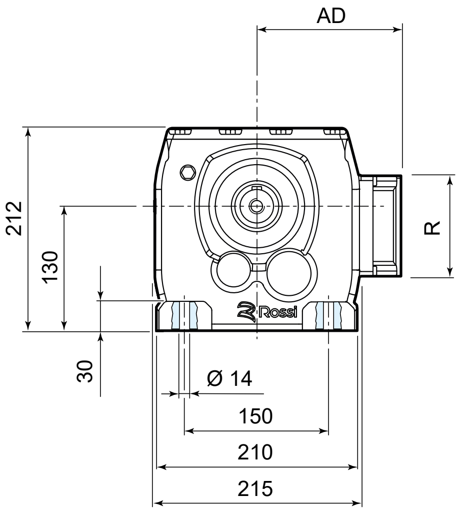
LB	205	231	260	283	313	345	383	383	439
LBZ	260	293	329	362	392	440	482	482	547
L	450	476	505	528	558	590	628	628	684
LZ	505	538	574	607	637	685	727	727	792
LD	103	103	103	136	136	136	136	136	190
R	86	86	86	106	106	106	106	106	148

10.5

iC 672 / iC 673 PE







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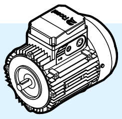	63	71	80	90S	90L	100	112MA	112M	132S,M
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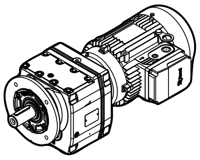
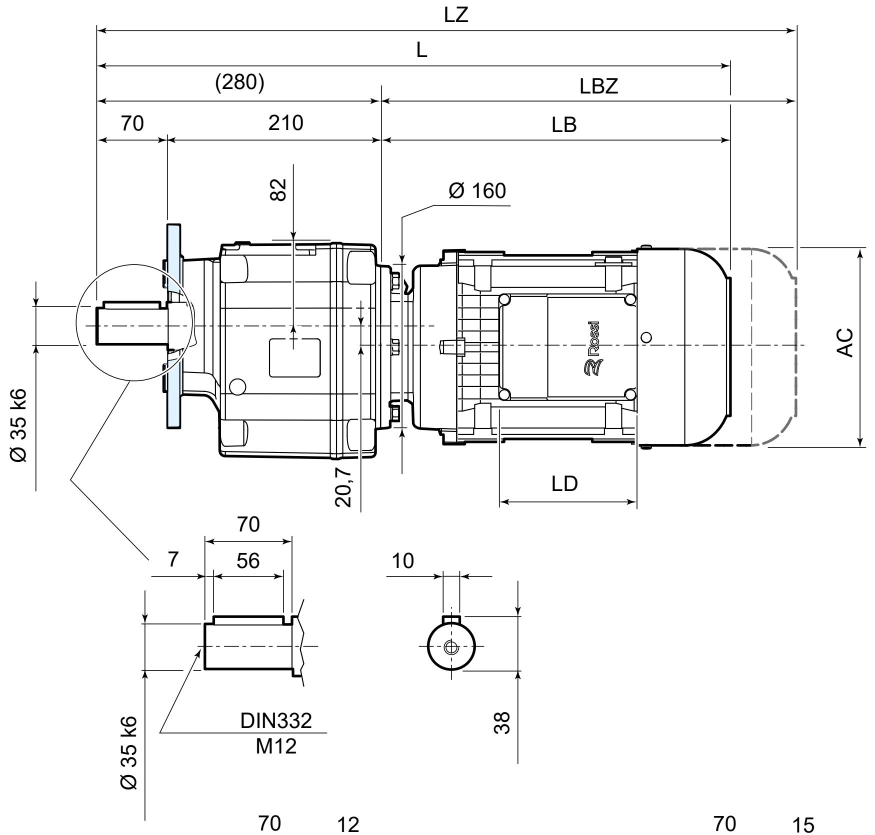
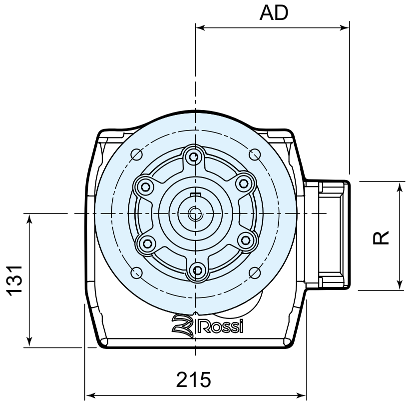
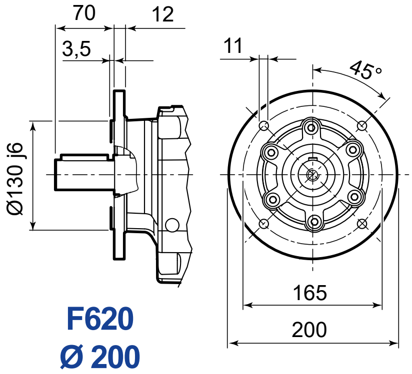
AD	95	112	121	141	141	151	163	163	194
LB	205	231	260	283	313	345	383	383	439
LBZ	260	293	329	362	392	440	482	482	547
L	485	511	540	563	593	625	663	663	719
LZ	540	573	609	642	672	720	762	762	827
LD	103	103	103	136	136	136	136	136	190
R	86	86	86	106	106	106	106	106	148

iC 672 / iC 673 FE









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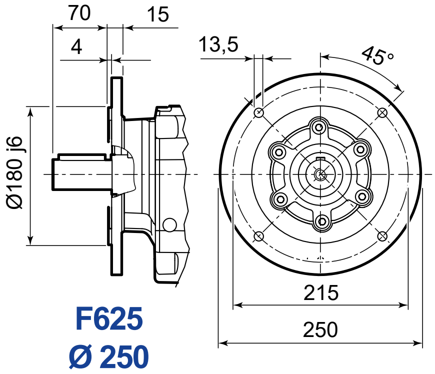

F625
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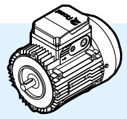	63	71	80	90S	90L	100	112MA	112M	132S,M
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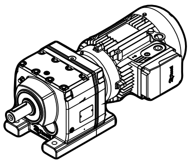
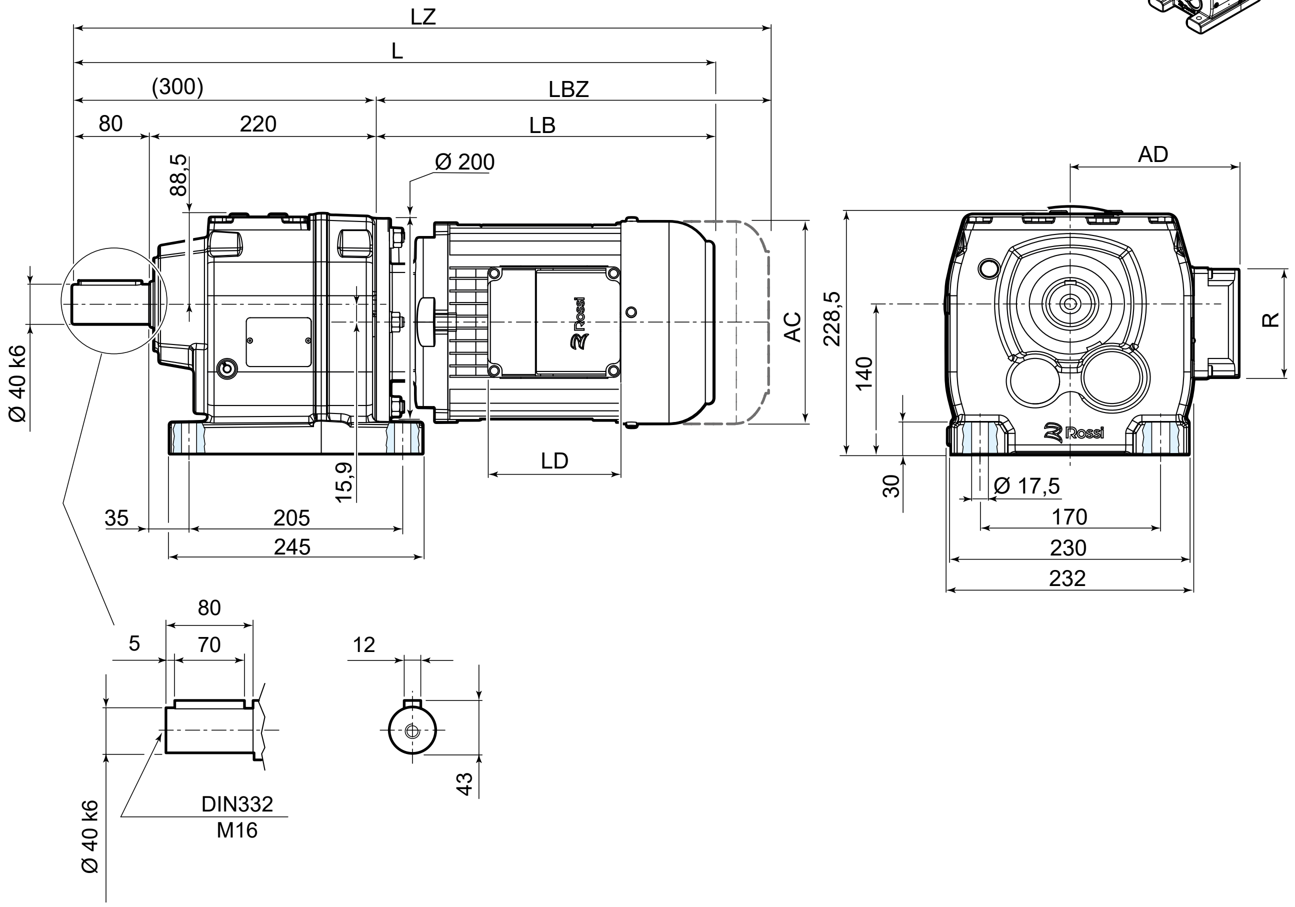
LB	205	231	260	283	313	345	383	383	439
LBZ	260	293	329	362	392	440	482	482	547
L	485	511	540	563	593	625	663	663	719
LZ	540	573	609	642	672	720	762	762	827
LD	103	103	103	136	136	136	136	136	190
R	86	86	86	106	106	106	106	106	148

10.6

iC 772 / iC 773 PE





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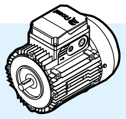	63	71	80	90S	90L	100	112MA	112M	132S,M	132MB
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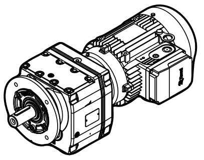
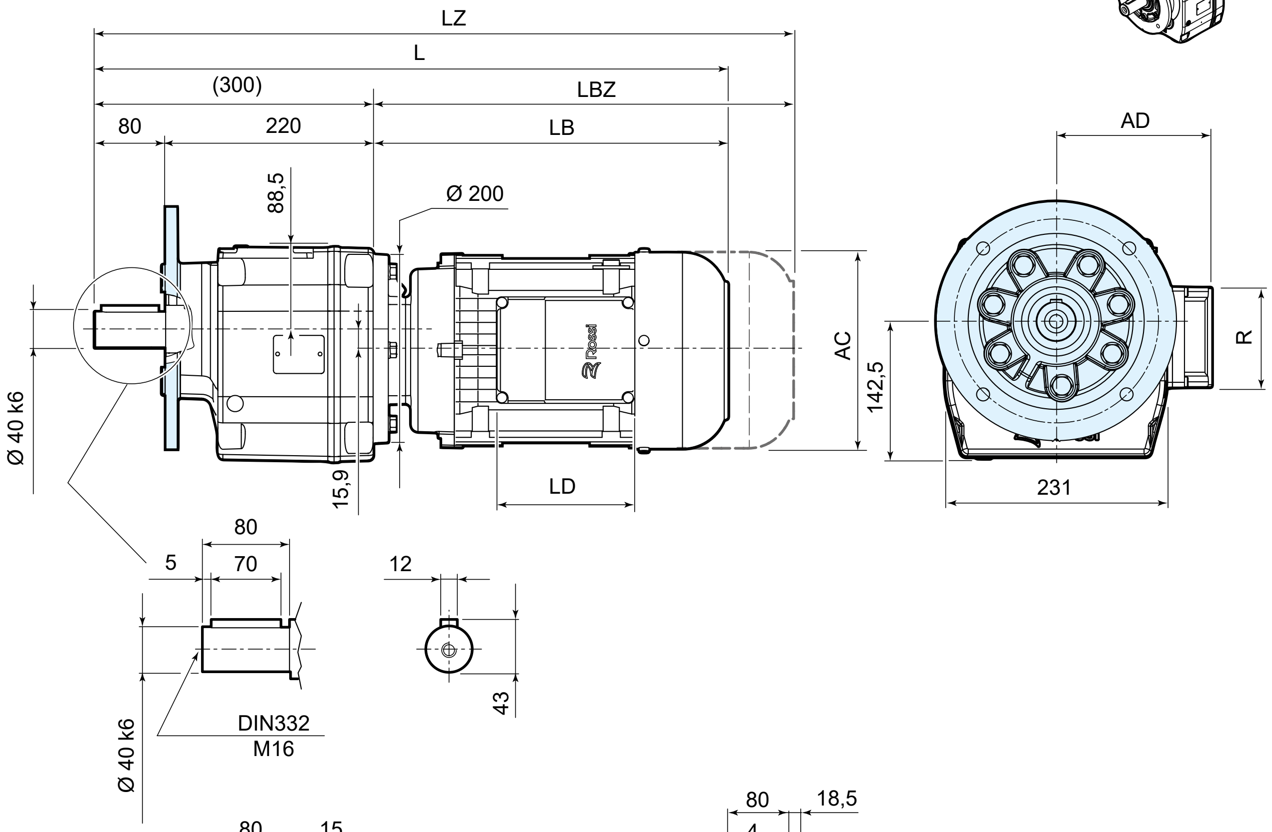
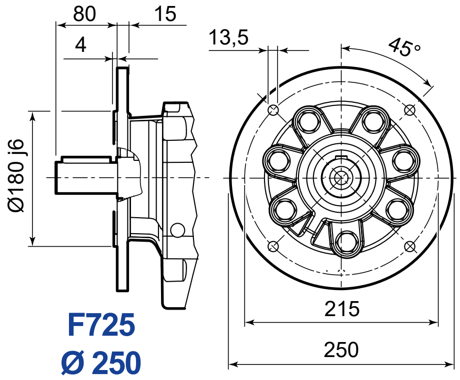
AD	95	112	121	141	141	151	163	163	194	194
LB	199	225	254	276	306	339	377	377	433	493
LBZ	254	287	323	355	385	434	476	476	541	601
L	499	525	554	576	606	639	677	677	733	793
LZ	554	587	623	655	685	734	776	776	841	901
LD	103	103	103	136	136	136	136	136	190	190
R	86	86	86	106	106	106	106	106	148	148



iC 772 / iC 773 FE





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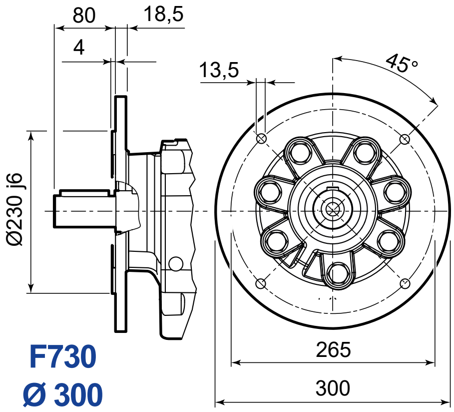

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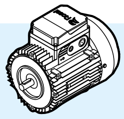
→ 80 → 66 → 140

	63	71	80	90S	90L	100	112MA	112M	132S,M	132MB
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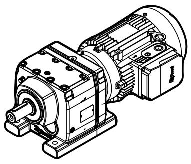
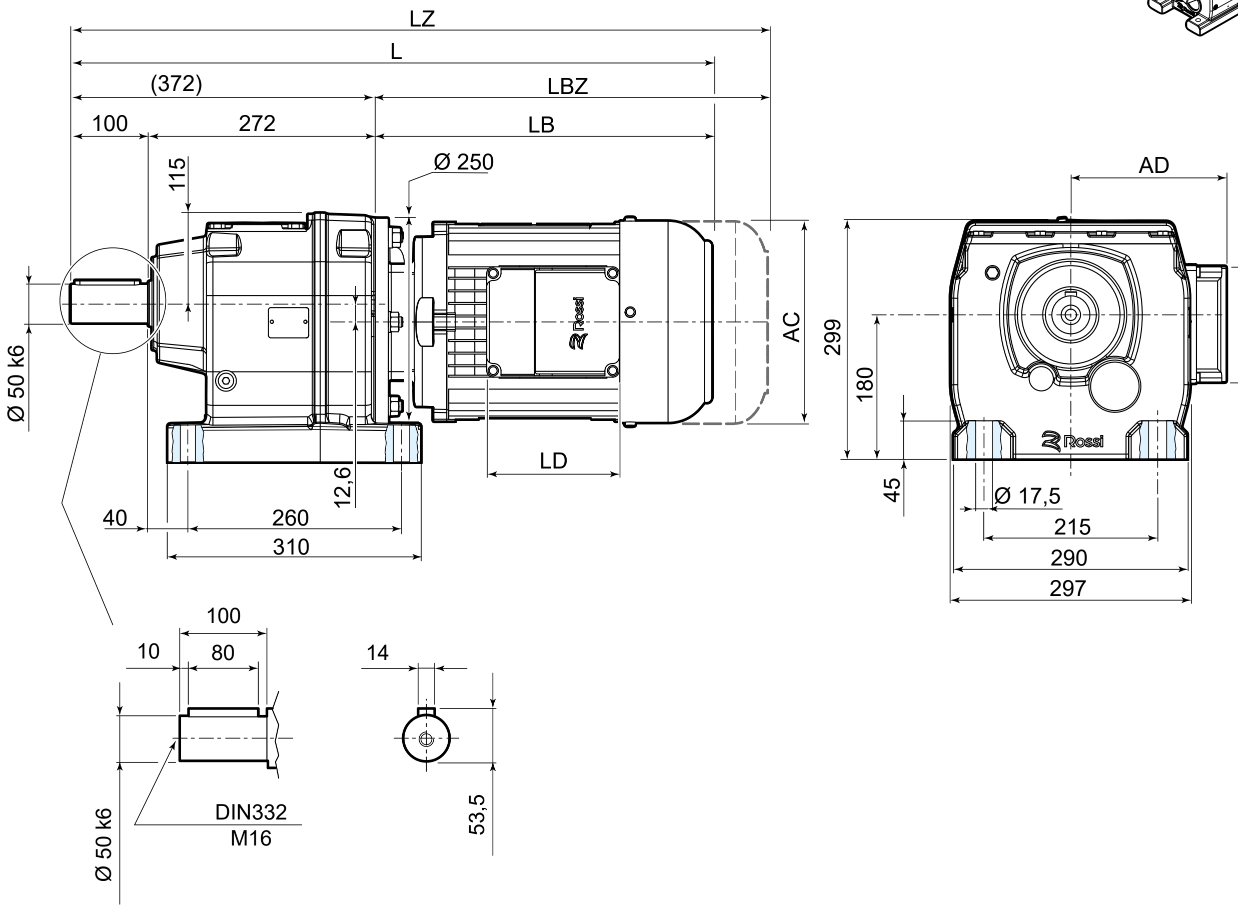
AD	95	112	121	141	141	151	163	163	194	194
LB	199	225	254	276	306	339	377	377	433	493
LBZ	254	287	323	355	385	434	476	476	541	601
L	499	525	554	576	606	639	677	677	733	793
LZ	554	587	623	655	685	734	776	776	841	901
LD	103	103	103	136	136	136	136	136	190	190
R	86	86	86	106	106	106	106	106	148	148

10.7

iC 872 / iC 873 PE





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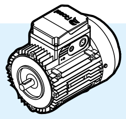	80	90S	90L	100	112MA	112M	132S,M	132MB
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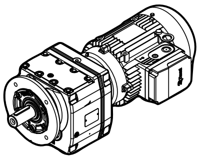
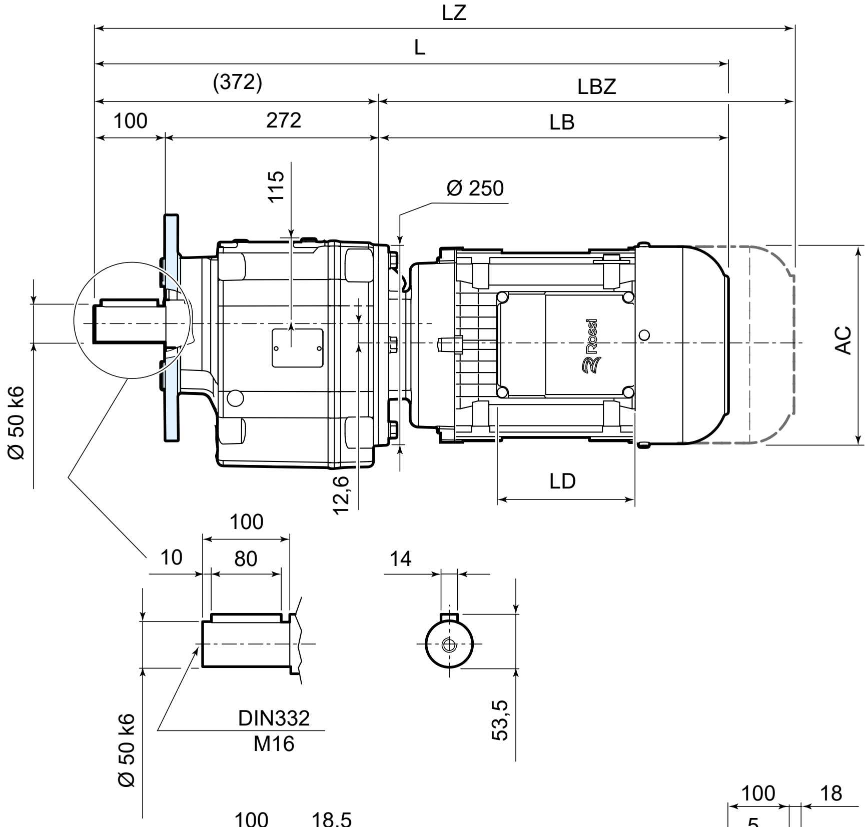
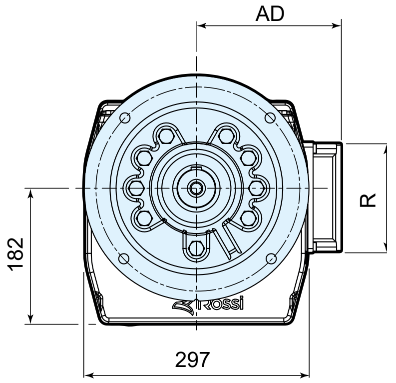
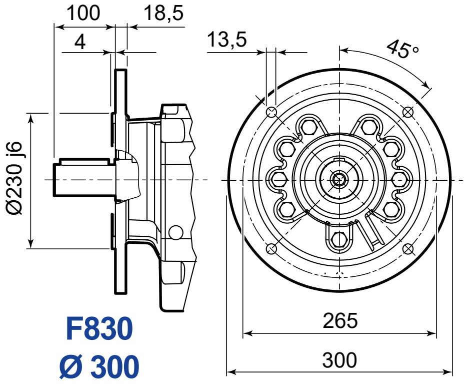
AD	121	141	141	151	163	163	194	194
LB	249	272	302	334	372	372	428	488
LBZ	318	351	381	429	471	471	536	596
L	621	644	674	706	744	744	800	860
LZ	690	723	753	801	843	843	908	968
LD	103	136	136	136	136	136	190	190
R	86	106	106	106	106	106	148	148

iC 872 / iC 873 FE









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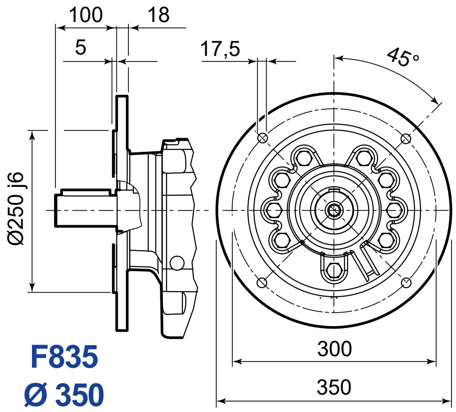

F835
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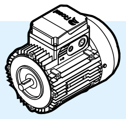	80	90S	90L	100	112MA	112M	132S,M	132MB
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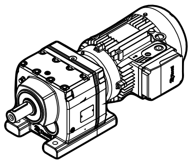
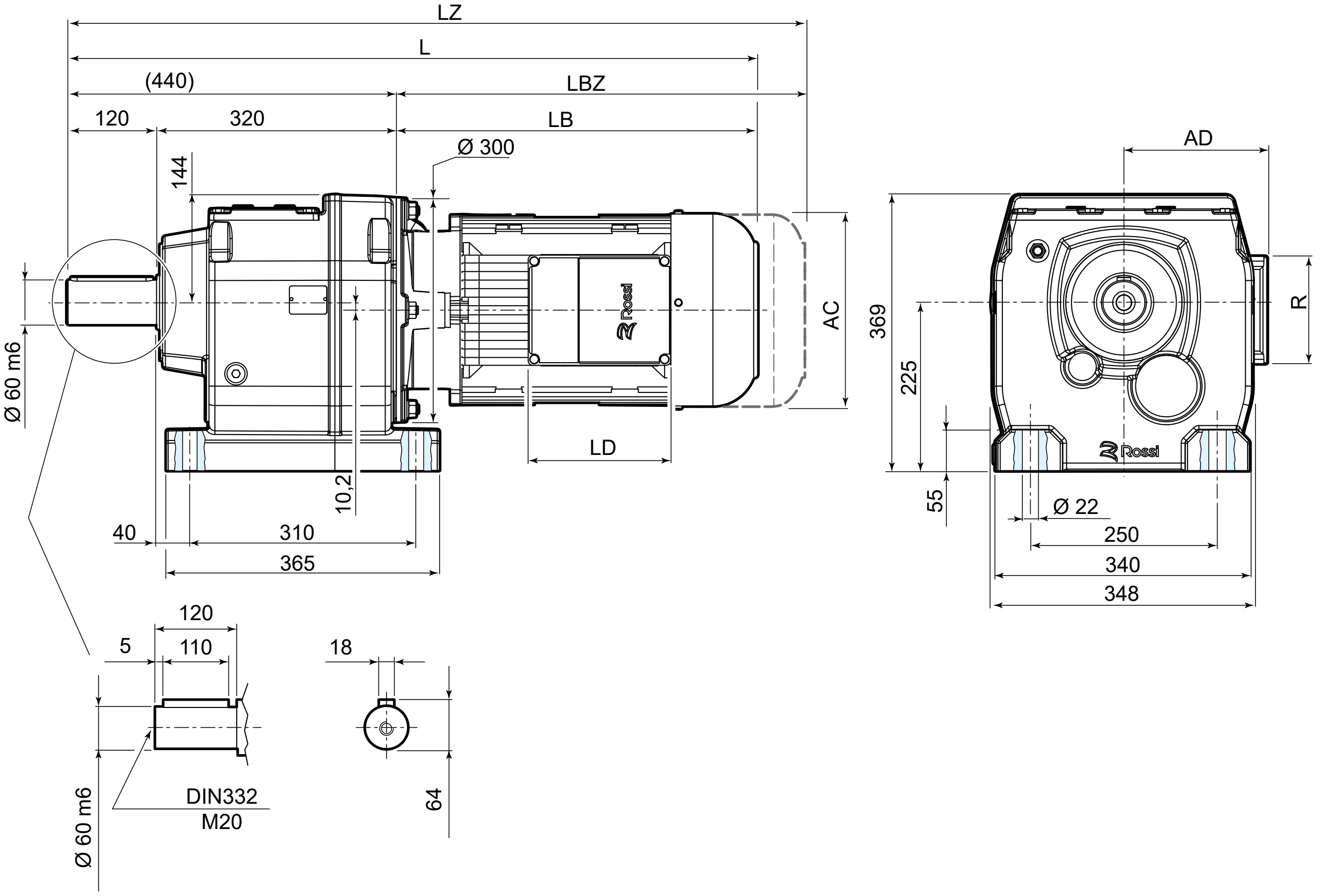
LB	249	272	302	334	372	372	428	488
LBZ	318	351	381	429	471	471	536	596
L	621	644	674	706	744	744	800	860
LZ	690	723	753	801	843	843	908	968
LD	103	136	136	136	136	136	190	190
R	86	106	106	106	106	106	148	148

10.8

iC 972 / iC 973 PE





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66
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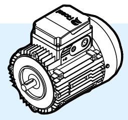	80	90S	90L	100	112MA	112M	132S,M	132MB
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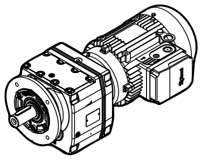
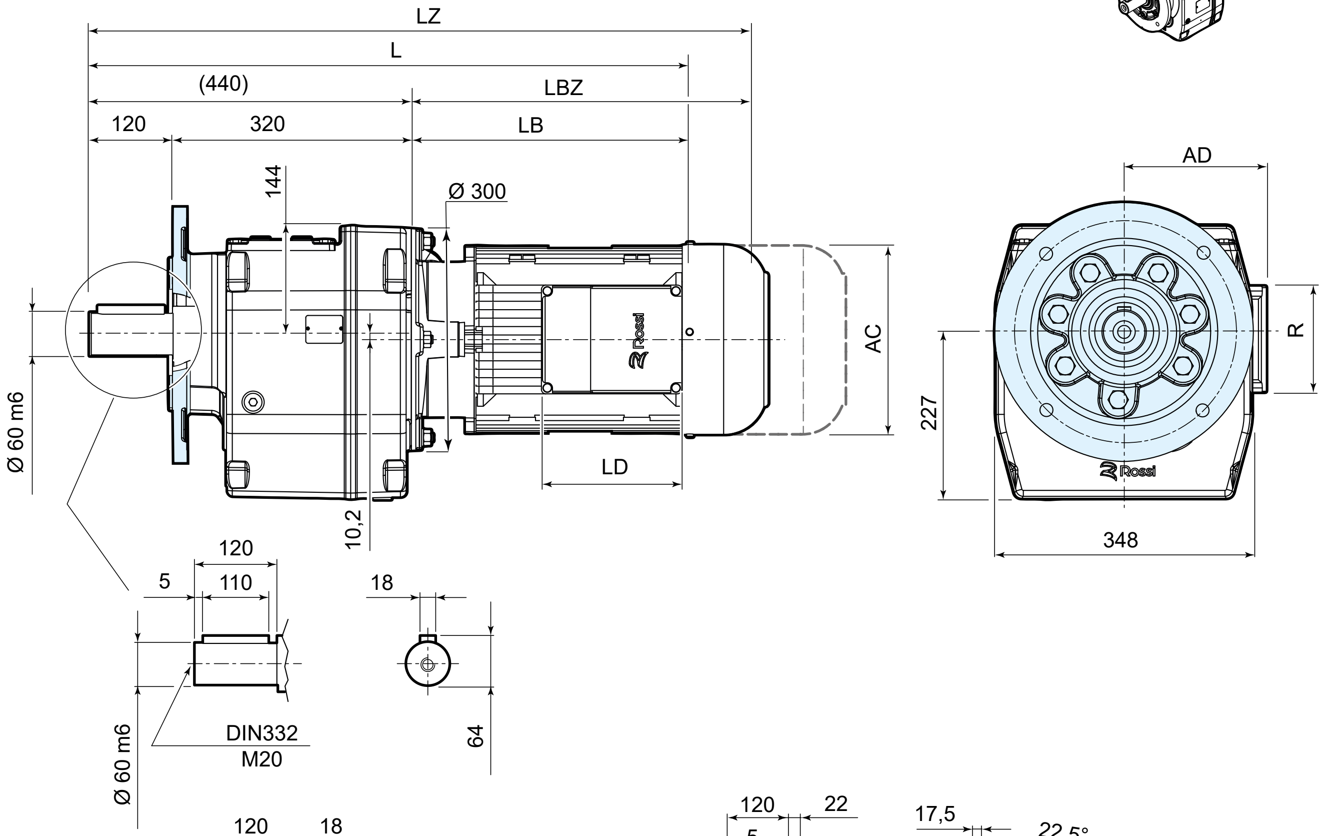
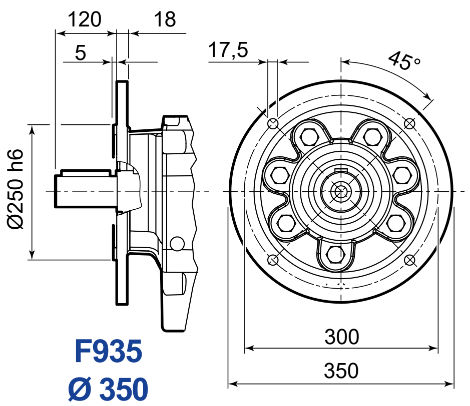
AD	121	141	141	151	163	163	194	194
LB	242	264	294	327	364	364	423	483
LBZ	311	343	373	422	463	463	531	591
L	682	704	734	767	804	804	863	923
LZ	751	783	813	862	903	903	971	1031
LD	103	136	136	136	136	136	190	190
R	86	106	106	106	106	106	148	148

iC 972 / iC 973 FE







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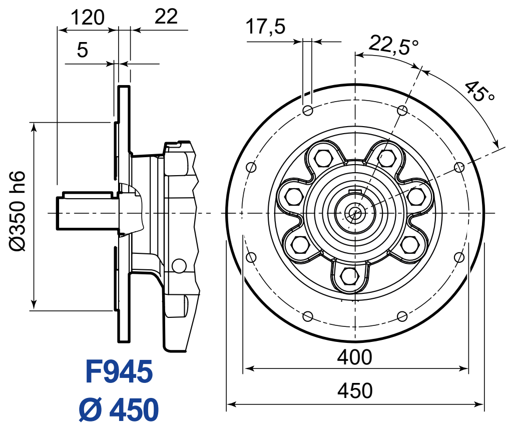

F945
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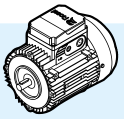
	80	90S	90L	100	112MA	112M	132S,M	132MB
AC	156	176	176	194	218	218	257	257
AD	121	141	141	151	163	163	194	194
LB	242	264	294	327	364	364	423	483
LBZ	311	343	373	422	463	463	531	591
L	682	704	734	767	804	804	863	923
LZ	751	783	813	862	903	903	971	1031
LD	103	136	136	136	136	136	190	190
R	86	106	106	106	106	106	148	148

11

Compact three-phase motor HB and brake motor HBZ

Section contents

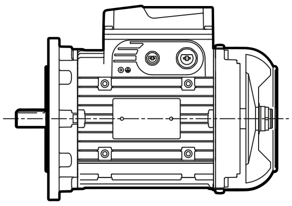
11.1

Compact asynchronous three-phase motor HB

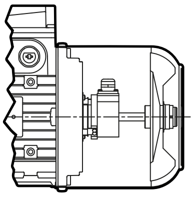
11.1.1 General specifications

- **insulation class F**, rise temperature B;
- **mating tolerances under «accuracy» rating;**
- **IP55 protection;**
- **suitable for operation with inverter;**
- asynchronous three-phase **electric motor** with rotor cage, total enclosed, externally ventilated (cooling system IC 411 with cooling fan keyed on motor shaft);
- **single-speed** 2, 4 or 6 poles **motor**;
- particularly strong **construction** (both electrical and mechanical); duly proportioned bearings;
- **«generous» electromagnetic sizing** having margins of safety, good acceleration capacity (high frequency of starting) and uniform starting (slightly «sagged» characteristic curves);
- **metallic terminal box;**
- **designs available** for every application need (independent cooling fan, independent cooling fan and encoder, protections higher than IP 55, etc.)

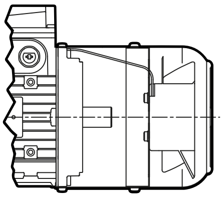
Standard



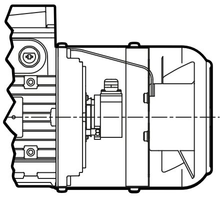
Encoder



Independent cooling fan



Independent cooling fan and encoder



Rated power delivered on continuous duty (S1) and referred to nominal voltage and frequency, ambient temperature -15 ÷ 40 °C and maximum altitude 1000 m.

Motor housing in pressure diecast light alloy.

Drive end and non-drive end end-shield in cast iron or light alloy.

«Supported» tightening attachments of **endshields and flanges** fitted on housing with «tight» coupling.

Ball bearings lubricated «for life» assuming pollution-free surroundings; preload spring.

Motor shaft axially fastened on drive end.

Rear threaded extraction hole as standard for sizes ≥ 90 ... 132.

Steel **fan cover**.

Thermoplastic **cooling fan** with radial vanes.

Terminal box made of light alloy (integral with housing with knockout cable openings on both sides, two holes, one for power cable and one for auxiliary equipment).

Left side position non drive end (pos. TB0 see page 37); on request other positions.

Pressure diecast light alloy **terminal box cover**.

Terminal block with 6 terminals (9 terminals for supply voltage YY230 Y460 60 Hz).

Earth terminal located inside terminal box; prearranged for the installation of further two external earth terminals on housing.

Rotor: pressure diecast cage rotor in aluminium.
Stator winding with class H copper conductor insulation, insulated with double coat, type of impregnation with resin of class H; other materials are of classes F and H for a class F insulation system.
Materials and type of impregnation allow use in tropical climates without further treatments.
Rotor dynamic balancing: vibration velocity under standard rating A. Motors are balanced with half key inserted into shaft extension.
Painting with bi-component water-based acrylic enamel, color blue RAL 5010 DIN 1843, suitable to resist to normal industrial environments (corrosivity class C3 ISO 12944-2).

For non-standard designs and accessories see page 38.

11.2

Technical data of compact asynchronous three-phase motor HB

2 poles - 3000 min^{-1}
IP 55
IC 411
Insulation class F
Temperature rise class B

IE3
400 V - 50Hz
ErP

P_N	Motor		n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	z_0	kg
kW			min^{-1}	N m	A 400 V		100%	75%	50%				kg m^2	start/h	
1,1	**HB3 80 B**	**2**	2875	3,7	2,3	0,84	82,7	83,2	81	3,9	3,9	7,7	0,0013	2500	11,6
1,5	**HB3 90 S**	**2**	2890	4,97	2,9	0,88	84,2	84,5	83,3	3,3	3,6	7,9	0,0019	1800	16
2,2	**HB3 90 LA**	**2**	2890	7,3	4,4	0,85	85,9	86,2	85,1	3,9	4,4	8,4	0,0023	1600	18
3	**HB3 100 LA**	**2**	2930	9,8	6,2	0,80	87,1	87,2	85,2	4,2	5,1	10,1	0,0044	1500	24
4	**HB3 112 M**	**2**	2940	13	7,6	0,87	88,1	88,2	86,7	2,8	4,2	9,8	0,0074	1400	33
5,5	**HB3 132 S**	**2**	2960	17,8	10,4	0,85	89,2	88,6	85,6	5,2	6,1	12,7	0,0174	710	53
7,5	**HB3 132 SB**	**2**	2960	24,3	14	0,85	90,1	89,9	87,3	5,7	6,5	13,6	0,0215	710	61,5

4 poles - 1500 min^{-1}
IP 55
IC 411
Insulation class F
Temperature rise class B

IE2
400 V - 50Hz
ErP

P_N	Motor	n_N	M_N	I_N	cos φ	η IE2 IEC 60034-2-1			M_S/M_N	M_{max}/M_N	I_S/I_N	J_0	z_0	kg
kW		min^{-1}	N m	A 400 V		100%	75%	50%				kg m^2	start/h	
0,12	**HB2 63 A 4**	1370	0,84	0,52	0,61	55	52,2	48,5	2,2	2,5	2,7	0,0002	12500	3,9
0,18	**HB2 63 B 4**	1360	1,26	0,7	0,63	58,9	56,1	50	2,1	2,3	2,8	0,0003	12500	4,5
0,25	**HB2 71 A 4**	1400	1,71	0,8	0,68	66,7	66	60,4	2,2	2,5	3,6	0,0007	10000	5,7
0,37	**HB2 71 B 4**	1400	2,52	1,1	0,68	71,4	70,9	67,8	2,5	2,8	4	0,0009	10000	6,6
0,55	**HB2 80 A 4**	1405	3,74	1,38	0,78	73,8	74	70,1	2,5	3,58	4,9	0,0019	8000	7,6

4 poles - 1500 min^{-1}
IP 55
IC 411
Insulation class F
Temperature rise class B

IE3
400 V - 50Hz
ErP

P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S/M_N	M_{max}/M_N	I_S/I_N	J_0	z_0	kg
kW		min^{-1}	N m	A 400 V		100%	75%	50%				kg m^2	start/h	
0,75	**HB3 80 B 4**	1410	5,1	2	0,67	82,5	82,2	80,1	3,2	3,3	5,3	0,0018	6800	12
1,1	**HB3 90 S 4**	1420	7,4	2,4	0,80	84,1	84,8	83,6	3,0	3,5	6,4	0,0041	3150	18,5
1,5	**HB3 90 L 4**	1430	10,1	3,3	0,78	85,3	86,1	85	3,1	3,7	6,7	0,0043	3000	19
2,2	**HB3 100 LA 4**	1440	14,6	4,8	0,76	86,7	87,2	85,5	3,5	4,4	7,4	0,0076	3000	26
3 (1)	**HB3 112 MA 4**	1450	19,8	6,1	0,80	88,7	88,6	87,3	3,5	4,4	8,8	0,013	2000	33
4	**HB3 112 M 4**	1450	26,3	8,5	0,77	88,6	89,2	88	3,7	4,6	9,0	0,014	1800	35
5,5	**HB3 132 S 4**	1470	35,8	12	0,74	89,6	89,5	87,6	4,5	5,0	9,1	0,0357	900	58
7,5	**HB3 132 M 4**	1460	49	15,2	0,79	90,4	90,4	89,6	3,9	4,2	8,4	0,0432	900	66
9,2 (1)	**HB3 132 MB 4**	1460	60,2	19,2	0,76	91	90,8	90,1	4,0	4,1	8,5	0,0448	800	68,5

(1) Power not according to standard for the relevant motor size

6 poles - 1000 min^{-1}
IP 55
IC 411
Insulation class F
Temperature rise class B

IE2
400 V - 50Hz
ErP

P_N	Motor			n_N	M_N	I_N	cos φ	η IE2 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	z_0	kg
kW				min^{-1}	N m	A 400 V		100%	75%	50%				kg m^2	start/h	
0,12	**HB2**	**63 B**	**6**	910	1,26	0,57	0,57	53,7	49,5	41,1	2,7	2,8	2,5	0,0005	12500	4,5
0,18	**HB2**	**71 A**	**6**	910	1,89	0,62	0,68	61,6	59,8	51,9	2,4	2,5	3,2	0,0009	12500	6
0,25	**HB2**	**71 B**	**6**	900	2,65	0,85	0,68	62,4	60,7	54	2,5	2,6	3,2	0,0012	11200	6,8
0,37	**HB2**	**80 A**	**6**	930	3,8	1,2	0,67	66,8	65,4	58,4	2,5	2,6	3,6	0,0019	9500	8
0,55	**HB2**	**80 B**	**6**	920	5,7	1,68	0,68	69,8	69,7	64,9	2,5	2,6	3,7	0,0025	9000	9,6

6 poles - 1000 min^{-1}
IP 55
IC 411
Insulation class F
Temperature rise class B

IE3
400 V - 50Hz
ErP

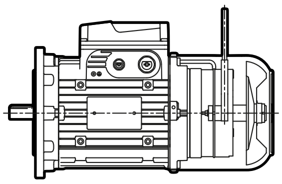
P_N	Motor			n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	z_0	kg
kW				min^{-1}	N m	A 400 V		100%	75%	50%				kg m^2	start/h	
0,75	**HB3**	**90 S**	**6**	930	7,7	2	0,72	78,9	76	73	2,1	2,9	4,9	0,0056	6000	15,5
1,1	**HB3**	**90 L**	**6**	930	11,3	2,8	0,72	81	79	77	2,6	3	5,1	0,0071	5600	19,5

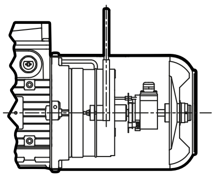
11.3

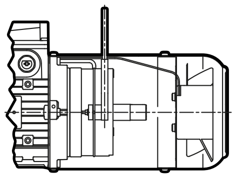
Compact asynchronous three-phase brake motor HBZ

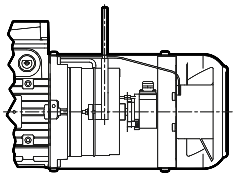
11.3.1 General specifications

- **Insulation class F**, rise temperature B;
- **mating tolerances under «accuracy» rating;**
- **IP55 protection;**
- **suitable for operation with inverter;**
- **electric asynchronous three-phase brake motor with d.c. brake** (braking in case of supply failure) with **double braking surface with braking torque proportioned to motor torque** (usually $M_f \approx 2\ M_N$);
- **single-speed** 2, 4 or 6, poles **motor**;
- **particularly strong construction** (both electrical and mechanical) to withstand alternating torsional and thermic stresses of starting and braking; duly proportioned bearings;
- **electromagnetic sizing especially studied** to allow high acceleration capacity (high frequency of starting) and uniform starting;
- **large metal terminal box**, multivoltage rectifier, one brake coil, for **voltage always coordinated** with the motor one (both Δ and Y);
- **maximum reduced noise level and operation progressivity** (both at starting and braking) thanks to a lower rapidity (typical of d.c. brake) of the anchor (which is lighter and less quick in the impact): motor starts slightly braked i.e. with greater progressivity; good release and braking rapidity; possibility to increase rapidity in braking, with supply opening on d.c. side;
- **high braking capacity;**
- **designs available** for every application need (independent cooling fan, independent cooling fan and encoder, protections higher than IP 55, etc.);
- **particularly suitable** for applications requiring **regular and low-noise starting and braking** and, at the same time, braking with good rapidity and precision and high number of starts.


Standard


Encoder


Independent cooling units

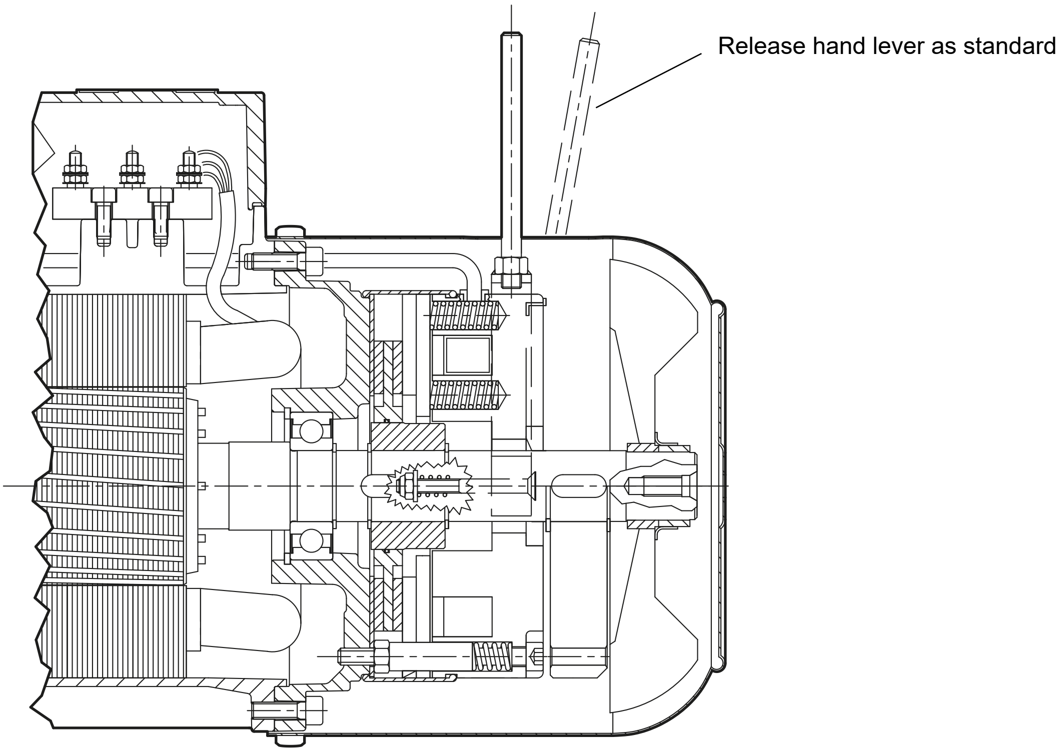

Independent cooling fan and encoder

«Torque-speed» **characteristic curves** duly optimized for handling (horizontal and vertical traverse movements, rotation), slightly «sagged», without peaks in the hipersynchronous area and with carefully proportioned mean value.
Rated power delivered on continuous duty (S1) and referred to nominal voltage and frequency, ambient temperature -15 ÷ +40 °C and maximum altitude 1 000 m.
Housing in pressure diecast light alloy.
Drive end flange and non-drive end endshield in cast iron or light alloy.
«Supported» tightening attachments of **endshields and flanges** fitted on housing with «tight» coupling.
Ball bearings lubricated «for life» assuming pollution-free surroundings; preload spring.
Motor shaft in steel axially fastened on drive end endshield.
Rear threaded extraction **hole.**
Steel **fan cover**.
Thermoplastic **cooling fan** with radial vanes.

Terminal box made of light alloy (integral with housing with knockout cable openings on both sides, two holes, one for power cable and one for auxiliary equipment). Left side position non drive end (pos. TB0 see page 37); on request other positions. Pressure diecast light alloy **terminal box cover**.
Terminal block with 6 terminals (9 terminals for supply voltage YY230 Y460 60 Hz).
Earth terminal located inside terminal box; prearranged for the installation of further two external earth terminals on housing.
Brake supply: with rectifier laying in terminal box having 2 terminals for cable connection for rectifier supply, 2 for rapid braking external contact; possible brake supply **directly from motor terminal block** or **separately** (to use for: motors supplied by inverter, separate drive needs of motor and brake, etc.). Brake can be supplied, also at motor standstill, with no time limitations.
Rotor: pressure diecast cage rotor in aluminium.
Stator winding with class H copper conductor insulation, insulated with double coat, type of impregnation with resin of class H; other materials are of classes F and H for a class F insulation system.
Rotor **dynamic balancing**: vibration velocity under standard rating A. Motors are balanced with half key inserted into shaft extension.
Painting with two-component water based acrylic enamel, color blue RAL 5010 DIN 1843, suitable for normal industrial environments (corrosivity class C3 ISO 12944-2)

For **non-standard designs** and accessories see page 38.

11.3.2 Brake specifications



Electromagnetic spring loaded brake (braking occurs automatically when it is not supplied), with **d.c.** toroidal coil and double braking surface, braking torque proportioned to motor torque (usually $M_f \approx 2\ M_N$).
Maximum reduced noise level and operation progressivity (both at starting and braking thanks to a lower rapidity, typical of d.c. brake, of the anchor, which is lighter and less quick in the impact: motor starts slightly braked i.e. with greater progressivity); **good release and braking rapidity**; possibility to increase rapidity, both in releasing (with rapid rectifier) and braking, with supply opening on d.c. side; high braking capacity.
Designs available for every application (encoder, independent cooling fan, independent cooling fan and encoder, second shaft end, etc.).

Particularly suitable for applications requiring regular and low-noise starting and braking and, at the same time, braking with good rapidity and precision and high number of starts.
When electromagnet is not supplied, the brake anchor pushed by springs, presses the brake disk on rear end-shield generating the braking torque on the same brake disk and consequentely on motor shaft it is keyed onto; by supplying the brake the electromagnet draws the brake anchor and releases brake disk and driving shaft.

Key features:

- **multivoltage rectifier** (as standard), specifically designed for the management of a **brake coil only** with supply voltage always coordinated with standard voltage of HBZ motor (Δ 230 Y400 V ± 5% 50 Hz and accordingly also Δ 277 Y480 V ± 5% 60 Hz); **other voltages** on request;
- **rectifier supply directly from motor terminal block** or indifferently from a separate line;
- **braking torque** adjustable by changing number of springs;
- **insulation class F**, temperature rise class B;
- **brake disk**, sliding on moving hub: with single steel coat and double friction surface with average friction coefficient for low wear;
- **brake anchor in two pieces** for greater rapidity of starting and reduced noise;
- **water-proof and dust-proof gaiter and V-ring** both to prevent polluting infiltrations from surroundings towards brake, and to avoid that wear dust of friction surface will be dispersed in the surroundings;
- **lever for manual release with automatic return (as standard)** and removable level rod; position of release lever corresponding to terminal box; on request, other possible positions. Contact Rossi S.p.A.;
- **for other running specifications** see following table.

For **non-standard designs** and accessories see page 38.

Motor is always **equipped with a high reliable rectifier** fixed on terminal box providing adequate connecting terminal (2 for rectifier supply directly from motor terminal block or separate; 2 for external contact of rapid braking).

Multivoltage rectifiers **RM1**(1) (supplied as standard for brakes 12 ... 14) and **RM2**(1) (supplied as standard for brakes 05 ... 07) are a.c./d.c. supply voltage devices with full-wave controlled bridge able to **supply output voltage value independently from input voltage.**

The DC brake is suitable for power supply

range 110 ÷ 440 V a.c. (for brake sizes 12 ÷ 15)
range 200 ÷ 440 V a.c. (for brake sizes 06S ... 07)

without having to change the coil and therefore is also always coordinated with both motor voltages.
In the supply range 200 ÷ 440 V a.c., the rectifier also has an integrated speed-up function (a higher voltage than the nominal voltage is supplied to the brake coil for approx. 400 ms at the start, allowing the brake to be released more quickly).
In addition, compared to a conventional rectifier, multi-voltage also offers the following advantages:

- greater constancy of the brake performance (the output voltage being at a constant predefined value independent of fluctuations in the supply voltage);
- lower brake holding voltage (75 V d.c.) in the released state (lower power consumption, less coil heating and shorter braking delay).

Both models of rectifiers (RM1, RM2) can be switched on and off either on the a.c. side (for maximum quiet operation), or on the a.c. and d.c. sides. (for faster braking), as they are equipped with varistors to protect the diodes, the electromagnet and the d.c. side opening contact.

Main functional brake specifications

Actual values may deviate slightly depending on the ambient temperature and humidity, the brake temperature and the wear condition of the friction linings.

Brake size		Motor size	M_f			Absorption			Delay of			Air-gap		W_1 (6)	C_{max} (7)	W_{max} (8)		
									release	braking								
			2 springs	4 springs	6 springs				t_1 (4)	t_2	t_2 (5) (d.c.)							
	(2)		N m	N m	N m	V a.c.	A a.c. max	W	ms	ms	ms	mm		MJ/mm	mm	brakings/h		
												min	max			10	100	1000
BZ 12	RM1	63 71	1,75	3,5	-	110 ÷ 440	0,09	9	20	100	10	0,25	0,40	70	5	4500	1120	160
BZ 53,13	RM1	71 80	2,5	5	7,5	110 ÷ 440	0,14	12	32	120	10	0,25	0,40	90	5	5600	1400	200
BZ 04, 14	RM1	80 90	5	11	16	110 ÷ 440	0,20	16	45	150	10	0,30	0,45	125	5	7500	1900	265
BZ 05, 15	RM2	90 100 112	13	27	40	110 ÷ 440	0,26	24	63	220	15	0,30	0,45	160	5	10000	2500	355
BZ 06 S	RM2	112	25	50	75	200 ÷ 440	0,28	30	90	300	30	0,35	0,55	220	5	14000	3550	500
BZ 56	RM2	132 S	37	75	-	200 ÷ 440	0,28	50	90	224	20	0,35	0,55	224	4,5	14000	3550	500
BZ 06	RM2	132 S, M	50	100	-	200 ÷ 440	0,28	50	90	224	20	0,35	0,55	224	4,5	14000	3550	500
BZ 07	RM2	132 M	50	100	150	200 ÷ 440	0,34	65	125	280	25	0,40	0,60	315	4,5	20000	5000	710

(1) The multivoltage rectifiers RM1 and RM2 are patented devices.
(2) Standard rectifier, supplied as standard; the rest time must be between 2.5 s ÷ 3.5 s. If necessary, please contact Rossi S.p.A.
(3) Values valid with M_{fmax}, mean air-gap, nominal value of supply voltage.
(4) Brake release time obtained with standard rectifier and, for RM1, with supply voltage 200 V c.a.
(5) Braking delay obtained with separate brake supply and disconnection on a.c. side of rectifier (t_2) or on a.c. and d.c. side. (t_2 *d.c*).
With direct supply from motor terminal block, the values of t_2 increase by approx. 2,5 times the ones stated in the table.
(6) Work of friction generating a brake disk wear of 1 mm. (minimum value for heavy application, real value is usually greater).
(7) Maximum brake disk wear.
(8) Maximum friction work for each braking.

11.4

Technical data of compact asynchronous three-phase brake motor HBZ

2 poles - 3000 min^{-1}
IP55
IC411
Insulation class F
Temperature rise class B

IE3
400 V - 50Hz
ErP

P_N	Motor		n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake	M_f	z_0	kg
kW			min^{-1}	N m	A 400V		100%	75%	50%				kg m^2		N m	start/h	
1,1	**HB3Z 80 B**	**2**	2875	3,7	2,3	0,84	82,7	83,2	81	3,9	3,9	7,7	0,0015	BZ04	11	2500	15,5
1,5	**HB3Z 90 S**	**2**	2890	4,97	2,9	0,88	84,2	84,5	83,3	3,3	3,6	7,9	0,0021	BZ14	11	1800	20
2,2	**HB3Z 90 LA**	**2**	2890	7,3	4,4	0,85	85,9	86,2	85,1	3,9	4,4	8,4	0,0027	BZ05	27	1600	24
3	**HB3Z 100 LA**	**2**	2930	9,8	6,2	0,80	87,1	87,2	85,2	4,2	5,1	10,1	0,0048	BZ15	27	1500	30
4	**HB3Z 112 M**	**2**	2940	13	7,6	0,87	88,1	88,2	86,7	2,8	4,2	9,8	0,0078	BZ15	27	1400	39
5,5	**HB3Z 132 S**	**2**	2960	17,8	10,4	0,85	89,2	88,6	85,6	5,2	6,1	12,7	0,0184	BZ06	50	710	64
7,5	**HB3Z 132 SB**	**2**	2960	24,3	14	0,85	90,1	89,9	87,3	5,7	6,5	13,6	0,0225	BZ06	50	710	72,5

4 poles - 1500 min^{-1}
IP55
IC411
Insulation class F
Temperature rise class B

IE2
400 V - 50Hz
ErP

P_N	Motor	n_N	M_N	I_N	cos φ	η IE2 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake	M_f	z_0	kg
kW		min^{-1}	N m	A 400V		100%	75%	50%				kg m^2		N m	start/h	
0,12	**HB2Z 63 A 4**	1370	0,84	0,52	0,61	55	52,2	48,5	2,2	2,5	2,7	0,0003	BZ12	1,75	12500	5,7
0,18	**HB2Z 63 B 4**	1360	1,26	0,7	0,63	58,9	56,1	50	2,1	2,3	2,8	0,0004	BZ12	3,5	12500	6,3
0,25	**HB2Z 71 A 4**	1400	1,71	0,8	0,68	66,7	66	60,4	2,2	2,5	3,6	0,0008	BZ53	5	10000	8,4
0,37	**HB2Z 71 B 4**	1400	2,52	1,1	0,68	71,4	70,9	67,8	2,5	2,8	4	0,0010	BZ53	5	10000	9,3
0,55	**HB2Z 80 A 4**	1405	3,74	1,38	0,78	73,8	74	70,1	2,5	3,58	4,9	0,0019	BZ04	11	8000	11,5

4 poles - 1500 min^{-1}
IP55
IC411
Insulation class F
Temperature rise class B

IE3
400 V - 50Hz
ErP

P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake	M_f	z_0	kg
kW		min^{-1}	N m	A 400V		100%	75%	50%				kg m^2		N m	start/h	
0,75	**HB3Z 80 B 4**	1410	5,1	2	0,67	82,5	82,2	80,1	3,2	3,3	5,3	0,0020	BZ04	11	6800	16
1,1 (1)	**HB3Z 90 S 4**	1420	7,4	2,4	0,80	84,1	84,8	83,6	3,0	3,5	6,4	0,0043	BZ14	16	3150	22,5
1,5 (1)	**HB3Z 90 L 4**	1430	10,1	3,3	0,78	85,3	86,1	85	3,1	3,7	6,7	0,0047	BZ05	27	3000	25
2,2 (1)	**HB3Z 100 LA 4**	1440	14,6	4,8	0,76	86,7	87,2	85,5	3,5	4,4	7,4	0,0080	BZ15	40	3000	32
3 (1)	**HB3Z 112 MA 4**	1450	19,8	6,1	0,80	88,7	88,6	87,3	3,5	4,4	8,8	0,0130	BZ15	40	2000	39
4	**HB3Z 112 M 4**	1450	26,3	8,5	0,77	88,6	89,2	88	3,7	4,6	9,0	0,0150	BZ06 S	75	1800	44
5,5	**HB3Z 132 S 4**	1470	35,8	12	0,74	89,6	89,5	87,6	4,5	5,0	9,1	0,0367	BZ56	75	900	69
7,5	**HB3Z 132 M 4**	1460	49	15,2	0,79	90,4	90,4	89,6	3,9	4,2	8,4	0,0442	BZ06	100	900	77
9,2 (1)	**HB3Z 132 MB 4**	1460	60,2	19,2	0,76	91	90,8	90,1	4,0	4,1	8,5	0,0470	BZ07	150	800	80,5

(1) Power not according to standard for the relevant motor size

6 poles - 1000 min^{-1}
IP55
IC411
Insulation class F
Temperature rise class B

IE2
400 V - 50Hz
ErP

P_N	Motor	n_N	M_N	I_N	$cos\ \varphi$	η IE2 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake	M_f	z_0	kg
kW		min^{-1}	N m	A 400V		100%	75%	50%				kg m^2		N m	start/h	
0,12	**HB2Z 63 B 6**	910	1,26	0,57	0,57	53,7	49,5	41,1	2,7	2,8	2,5	0,0005	BZ12	3,5	12500	6,3
0,18	**HB2Z 71 A 6**	910	1,89	0,62	0,68	61,6	59,8	51,9	2,4	2,5	3,2	0,0010	BZ53	5	11200	8,7
0,25	**HB2Z 71 B 6**	900	2,65	0,85	0,68	62,4	60,7	54	2,5	2,6	3,2	0,0013	BZ53	5	11200	9,5
0,37	**HB2Z 80 A 6**	930	3,8	1,2	0,67	66,8	65,4	58,4	2,5	2,6	3,6	0,0021	BZ04	11	9500	12
0,55	**HB2Z 80 B 6**	920	5,7	1,68	0,68	69,8	69,7	64,9	2,5	2,6	3,7	0,0027	BZ04	16	9000	13,5

6 poles - 1000 min^{-1}
IP55
IC411
Insulation class F
Temperature rise class B

IE3
400 V - 50Hz
ErP

P_N	Motor	n_N	M_N	I_N	$cos\ \varphi$	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake	M_f	z_0	kg
kW		min^{-1}	N m	A 400V		100%	75%	50%				kg m^2		N m	start/h	
0,75	**HB3Z 90 S 6**	930	7,7	2	0,72	78,9	76	73	2,1	2,9	4,9	0,0057	BZ14	16	7100	19,5
1,1	**HB3Z 90 L 6**	930	11,3	2,8	0,72	81	79	77	2,6	3	5,1	0,0071	BZ05	27	5300	26

12

Installation and maintenance

Section contents

Installation and maintenance 12

12.1

Safety

Important:
The gearmotors supplied by Rossi S.p.A. must be incorporated into machinery and **should not be commissioned before the machinery or system in which the components have been incorporated conforms to:**

- **Machinery directive 2006/42/EC and subsequent updatings; in particular, possible safety guards for shaft ends not being used and for eventually accessible fan cover passages (or other) are the Buyer's responsibility;**
- **«Electromagnetic compatibility (EMC)» 2004/108/EC and subsequent updatings.**

Attention!
It is recommended to pay attention to all instructions of present handbook, all existing safety laws and standards concerning correct installation. Whenever personal injury or property damage may occur, due to falling or projecting parts of gear reducer or of its parts, foresee adequate supplementary protection devices against loosening or breaking of the fastening screws.
If deviations from normal operation occur (temperature increase, vibrations, unusual noise, etc.) immediately switch off the machine.

Safety during installation
An incorrect installation, an improper use, the removing or disconnection of protection devices, the lack of inspections and maintenance, improper connections may cause severe personal injury or property damage.
Therefore the component must be moved, installed, commissioned, handled, controlled, serviced and re-paired **exclusively by responsible qualified personnel specifically instructed** and have the necessary experience to recognize any risks connected with present products avoiding any possible emergencies.

Gear reducers and gearmotors of present catalog are normally suitable for installations in industrial areas: additional protection measures, if necessary, must be adopted and assured by the personnel responsible for the installation.

Attention!
Motors in non-standard design or with constructive **variations** may differ in the details from the ones described here following and may require additional information.

Attention!
For the installation, use and maintenance of the electric motor of the possible motor-variator and/or the electric supply device (frequency converter, soft-start, etc.), and/or any optional electric devices (e.g.: independent cooling fan, etc.), consult the specific attached documentation. If necessary, require it.

Safety during maintenance
When operating on gear reducer or on components connected to it, the **machine must be at rest, disconnected from power supply and cold**: disconnect motor (including auxiliary equipments) from power supply, gear reducer from load, be sure that safety systems are on against any accidental starting and, if necessary, pre-arrange mechanical locking devices (to be removed before commissioning).

Attention!
During the running the gear reducers could have **hot surfaces**; Always wait that the gear reducer or the gearmotor to cool before carrying out any operations. Further technical documentation (e.g. catalogs) can be downloaded from our website **www.rossi.com**.

Be sure that the structure on which gearmotor is fitted is plane, levelled and sufficiently dimensioned in order to assure fitting stability and vibration absence, keeping in mind all transmitted forces due to the masses, to the torque, to the radial and axial loads.

Position the gearmotor so as to allow a free passage of air for cooling both gear reducer and motor (especially at motor fan side).

Avoid: any obstruction to the air-flow; heat sources near the gearmotor that might affect the temperature of cooling-air and of gearmotor for radiation; insufficient air recycle or any other factor hindering the steady dissipation of heat.
Mount the gearmotor so as not to receive vibrations.

When external loads are present use pins or locking blocks, if necessary.

When fitting gear reducer and machine and/or gear reducer and eventual flange B5 it is recommended to use **locking adhesives** such as LOCTITE on the fastening screws (also on flange mating surfaces).
For outdoor installation or in a hostile environment protect the gearmotor with anticorrosion paint. Added protection may be afforded by water-repellent grease (especially around the rotary seating of seal rings and the accessible zones of shaft end).

Gearmotors should be protected wherever possible, and by whatever appropriate means, from solar radiation and extremes of weather; weather protection **becomes essential** for **V5 and V6** mounting positions.

For ambient temperatures higher than 40 °C or lower than 0 °C, contact Rossi S.p.A.

Before wiring-up the gearmotor, make sure that motor voltage corresponds to input voltage.
If direction of rotation is not as desired, invert two phases at the terminals.

If overloads are imposed for long periods or if shocks or danger of jamming are envisaged, then motor-protection, electronic torque limiters, fluid couplings, safety couplings, control units or other similar devices should be fitted.
Where duty cycles involve a high number of starts on-load, it is advisable to utilize **thermal probes** (fitted on the wiring) for motor protection; a thermal overload relay is unsuitable since its threshold must be set higher than the motor's nominal current rating.

Use varistors to limit voltage peaks due to contactors.

⚠

Attention!
Bearing life and good shaft and coupling running depend on alignment precision between the shafts.
Carefully align the gearmotor with the driven machine (with the aid of shims if need be), interposing flexible couplings whenever possible.
Whenever a leakage of lubricant could cause heavy damages, increase the frequency of inspections and/or envisage appropriate control devices (e.g.: remote oil level gauge, lubricant for food industry, etc.).

In polluting surroundings, take suitable precautions against lubricant contamination through seal rings or other.

For brake or non-standard motors, consult us for specific information.

Fitting of components to low speed shaft ends

It is recommended that the bore of parts keyed to low speed shaft ends is machined to K7 tolerance (H7 when load is uniform and light).
Before mounting, thoroughly clean mating surfaces and lubricate against seizure and fretting corrosion. Installing and removal operations should be carried out with pullers and jacking screws using the tapped hole at the shaft butt-end.

Gear selection data sheet

1 Application conditions

Application / Industry sector

Type of machine to be driven

☐ new machine
☐ existing machine, running gear reducer currently applied

Ambient temperature [°C]

min standard max

Altitude [m above sea level]

Environment:

☐ normal (industrial) indoor
☐ normal (industrial) outdoor
☐ dusty
☐ corrosive / humid

Gear reducer position:

☐ small environment with limited air movement (v_{air} < 0,63 m/s)
☐ wide environment with free air movement (v_{air} > 1,25 m/s)
☐ open space, protected against extremes of weather and solar radiance

2 Load data

Required output speed [min^{-1}]

min nominal max

Torque required at low speed shaft [N m]

min nominal max

Required output power [kW]

min nominal max

Input speed (gear reducers) [min^{-1}]

min nominal max

Nature of load:

☐ uniform
☐ moderate overloads
☐ heavy overloads

Frequency of starting [starts/h]

Machine moment of inertia [kg m^2]

min standard max

Running time [h/d]

Total duration [h]

Duty cycle (S1 ... S10)

Load cycle attached

☐ yes
☐ no

3 Motor

Motor type:

☐ asynchronous three-phase (a.c.)
☐ asynchronous three-phase with inverter
☐ d.c. motor with relevant converter
☐ internal combustion motor (single-cylinder)
☐ internal combustion motor (multi-cylinder)

Power P_1 [kW]

min nominal max

Nominal speed n_1 [min^{-1}]

min nominal max

a.c. motor supply:

voltage [V] frequency [Hz]

IEC motor size (a.c. motor)

Type of a.c. motor starting:

☐ direct
☐ Y / Δ
☐ soft starter / inverter

Electromagnetic motor

☐ parking brake
☐ work
☐ safety

Braking torque [N m]

Starting torque [N m]

Moment of inertia [kg m^2]

Electric motor design (a.c. and d.c.):

☐ with independent cooling fan
☐ with encoder:
☐ with tacho-generator

System of motor-gear reducer mounting:

☐ with coupling
☐ with trapezoidal belts

section No. d_m [mm] d_1 [mm]

☐ with toothed belt drive

section No. d_m [mm]

Eventual limit to drive dimensions

4 Gear reducer

Mounting position

Direction of rotation of output shaft

☐ white arrow
☐ black arrow
☐ white and black arrow

Backstop device (if present)

☐ free rotation, white arrow
☐ free rotation, black arrow

Type of admitted cooling

☐ with fan
☐ with coil
☐ with internal exchanger
☐ with UR O/A unit
☐ with UR O/W unit

Type of machine coupling

☐ shaft mounting
☐ with fluid / flexible coupling
☐ with cardan joint
☐ with toothed belt drive

pitch d_m d_1 ϕ

☐ with chain

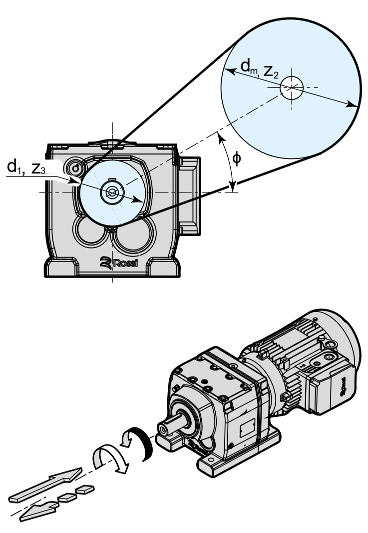
pitch No. z_2 z_3 overhang [mm] ϕ

☐ straight tooth cylindrical gear

pitch No. z_2 z_3 overhang [mm] ϕ

Eventual axial load F_a [N]

Eventual limit to drive dimensions



Technical formulae

Frame size	With Technical System units	With SI units
starting or stopping **time** as a function of an acceleration or deceleration, of a starting or braking torque	$t = \frac{v}{a}$ [s] $t = \frac{Gd^2 \cdot n}{375 \cdot M}$ [s]	$t = \frac{J \cdot \omega}{M}$ [s]
velocity in rotary motion	$v = \frac{\pi \cdot d \cdot n}{60} = \frac{d \cdot n}{19{,}1}$ [m/s]	$v = \omega \cdot r$ [m/s]
angular velocity	$n = \frac{60 \cdot v}{\pi \cdot d} = \frac{19{,}1 \cdot v}{d}$ [min^{-1}]	$\omega = \frac{v}{r}$ [rad/s]
acceleration or deceleration as a function of starting or stopping time	$a = \frac{v}{t}$ [m/s^2]	
angular **acceleration** or **deceleration** as a function of a starting or stopping time, of a starting or braking torque	$\alpha = \frac{n}{9{,}55 \cdot t}$ [rad/s^2] $\alpha = \frac{39{,}2 \cdot M}{Gd^2}$ [rad/s^2]	$\alpha = \frac{\omega}{t}$ [rad/s^2] $\alpha = \frac{M}{J}$ [rad/s^2]
starting or stopping distance as a function of an **acceleration** or deceleration, of a final or initial velocity	$s = \frac{a \cdot t^2}{2}$ [m] $s = \frac{v \cdot t}{2}$ [m] $w = \frac{\alpha \cdot t^2}{2}$ [rad]	
starting or stopping **angle** as a function of an angular acceleration or deceleration, of a final or initial angular velocity	$\varphi = \frac{n \cdot t}{19{,}1}$ [rad]	$\varphi = \frac{\omega \cdot t}{2}$ [rad]
mass	$m = \frac{G}{g}$ $[\frac{\text{kgf s}^2}{\text{m}}]$	m è l'unità di massa [kg]
weight (weight force)	G è l'unità di peso (forza peso) [kgf]	$G = m \cdot g$ [N]
force in vertical (lifting), horizontal, inclined motion of translation (μ = coefficient of friction; φ = angle of inclination)	$F = G$ [kgf] $F = \mu \cdot G$ [kgf] $F = G\ (\mu \cdot \cos\varphi + \text{sen}\ \varphi)$ [kgf]	$F = m \cdot g$ [N] $F = \mu \cdot m \cdot g$ [N] $F = m \cdot g\ (\mu \cdot \cos\varphi + \text{sen}\ \varphi)$ [N]
dynamic moment Gd², moment of inertia J due to a motion of translation (numerically $J = \frac{Gd^2}{4}$)	$Gd^2 = \frac{365 \cdot G \cdot v^2}{n^2}$ [kgf m^2]	$J = \frac{m \cdot v^2}{\omega^2}$ [kg m^2]
torque as a function of a force, of a dynamic moment or of a moment of inertia, of a power	$M = \frac{F \cdot d}{2}$ [kgf m] $M = \frac{Gd^2 \cdot n}{375 \cdot t}$ [kgf m] $M = \frac{716 \cdot P}{n}$ [kgf m]	$M = F \cdot r$ [N m] $M = \frac{J \cdot \omega}{t}$ [N m] $M = \frac{P}{\omega}$ [N m]
work, energy in motion of translation, in rotary motion	$W = \frac{G \cdot v^2}{19{,}6}$ [kgf m] $W = \frac{Gd^2 \cdot n^2}{7160}$ [kgf m]	$W = \frac{m \cdot v^2}{2}$ [J] $W = \frac{J \cdot \omega^2}{2}$ [J]
power in motion of translation, in rotary motion	$P = \frac{F \cdot v}{75}$ [CV] $P = \frac{M \cdot n}{716}$ [CV]	$P = F \cdot v$ [W] $P = M \cdot \omega$ [W]
power available at the shaft of a single-phase motor ($\cos\varphi$ = power factor)	$P = \frac{U \cdot I \cdot \eta \cdot \cos\varphi}{736}$ [CV]	$P = U \cdot I \cdot \eta \cdot \cos\varphi$ [W]
power available at the shaft of a three-phase motor	$P = \frac{U \cdot I \cdot \eta \cdot \cos\varphi}{425}$ [CV]	$P = 1{,}73 \cdot U \cdot I \cdot \eta \cdot \cos\varphi$ [W]

Note. Acceleration or deceleration are understood constant; motion of translation and rotary motion are understood rectilinear and circular respectively.

Notes

Rossi
Habasit Group

Solutions for
an evolving
industry

Rossi S.p.A.
Via Emilia Ovest 915/A
41123 Modena - Italy

Phone +39 059 33 02 88

info@rossi.com
www.rossi.com

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