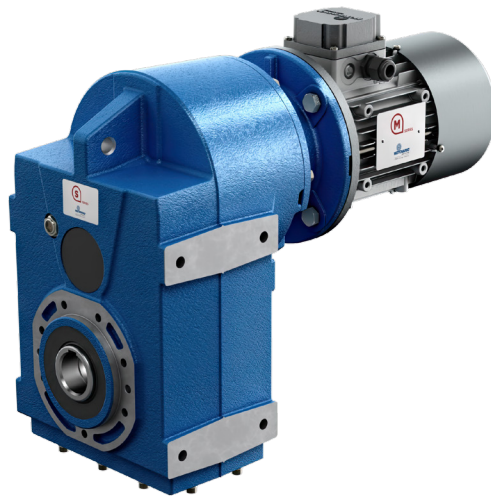


TECHNICAL CATALOGUE



SN

SHAFT MOUNTED GEARED MOTORS

IEC STANDARD

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Motovario® corporate philosophy aims to promote the company's brand and products at an international level with determination and transparency, while constantly striving to offer innovative solutions for satisfying and anticipating the demand of the market. Motovario® provides technologically advanced solutions in the transmission components field for industrial and civil applications worldwide.

The company

At Formigine, the heart of Modena's industrial district, Motovario® boasts a production plant spanning 50,000 m that employs 500 people.

1965 Foundation of Motovario

1998 Acquisition of Spaggiari Trasmissioni, an important brand in the mechanical technology sector.

2006 Motovario acquisition by a private investment fund managed by Synergo SGR, in order to guarantee its development and support its expansion throughout the world.

2014 Acquisition of Pujol.

2015 Acquisition by TECO.

At the core of Motovario® lies an evolved production process based on technological solutions that convert power into movement. Motovario® is at the heart of the production processes that drive industries worldwide. Quality and reliability are the company's fundamental assets. Motovario® is present throughout the world with branches in France, Spain, Germany, England, China, the United States and India. The sales network and customer service guarantee immediate and high-quality support to all customers. Qualified assembly centres are present, in Italy, Australia, Benelux, Bulgaria, China, Finland, France, India, Ireland, Israel, Malaysia, Poland, Portugal, South Korea, Spain, Sweden, Turkey, United Kingdom, Ukraine and USA. The company is able to offer a wide range of products: speed variators, right-angle, helical bevel, shaft-mounted, worm gear reducers and geared motors, electric motors, inverter and inverter drives. Maximum quality and precision are ensured by the cutting-edge technologies implemented in the production process. 170 numerical control machines, served by LGV lines for storage in automated warehouses, ensure a high standard of efficiency for the Motovario® production department. The highly automated assembly lines are supported by a specific computerised system. The process statistical control system manages the production process to avoid rejects, by enabling the operator to monitor all the processing phases. The annealing, tempering, hardening and carburizing treatments are carried out inside the plant. The plant operates on a 24-hour basis, including holidays. Reliability, resilience and versatility are the distinctive features of Motovario® products, the most qualified solution to any power transmission requirement.

Main fields OF APPLICATIONS

- Mechanical-electromechanical industry (car washing, pumps, barriers & automatic doors, circuit breakers)
- Ceramic industry (ovens, press feeding systems)
- Food, farming, oenology industry
- Wood, marble, glass industry
- Packaging & bottling industry
- Textile, shoes, leather industry
- Transport, logistic industry
- Construction industry
- Milling, animal husbandry, flower industry
- Machine tools and steel industry
- Mining, quarry, cement industry
- Energy industry (solar, nuclear, biomass, wind)
- Amusement industry (theatres, leisure parks, kiddy rides)
- Chemical & pharmaceuticals industry
- Paper & printing industry
- Plastic & rubber industry
- Telecommunications industry (satellite orientation systems, military radar)
- Engineering and consultant companies

Certifications

Our products can be manufactured to conform with the ATEX Directive 2014/34/UE. In addition, the safety and quality of our motors, geared motors and motovariators is guaranteed by the EAC (EurAsian Conformity) certification, an essential requirement for products exported to the Russian Federation. Our motors are UL certified, which guarantees their safety and quality requirements for the North American market.

Quality CONCEPT

Motovario® has obtained the quality certification renewal of its production system in conformity to the UNI EN ISO 9001:2008 standard. This internationally recognised certification acknowledges the company's commitment and drive geared towards constantly improving products, projects and services offered. Moreover, the company has obtained the OHSAS 18001:2007 (Occupational Health and Safety Assessment Series) certification, which defines the requirements of the workplace safety and health management system.

Research & DEVELOPMENT

Technological innovation: a crucial factor for competing in the market. In the company's 50-year history, research and change have been the pivotal factors in guaranteeing competitiveness at a global level, thanks to increasingly advanced products in terms of performance and reliability. Each year the company invests an increasing amount of its turnover in research and development, geared towards promoting the constant study and analysis of products, control processes and performance certification. In order to ensure that customers receive products that comply with the requested performance levels, the company carries out simulations on all new products, including NVH (Noise, Vibration, Harshness) tests effected in the advanced semi-anechoic room.

Customer CARE

Innovative instruments and software applications supporting the technical and logistic requirements of our partners worldwide guarantee a timely and customised service. The experience acquired by Motovario® has led to the creation of the new online portal MyMotovario 4.0, which allows for selecting products and exporting their 3D file. As a result, designers and engineering departments can download the three-dimensional model of the requested product and implement it directly in their own layout. In order to maximise customer service and quality, Motovario® orders all its customers the following online services: Order Tracking, which allows for monitoring the progress of an order in real time, and the Stock Availability service, through which users may check the availability (stock) of our products, both in the Italian plant and in the various branches.

Motovario chooses technological evolution.

Motovario® has chosen technological evolution and actively collaborates with the Faculty of Engineering of the University of Modena and Reggio Emilia and of the University of Bologna.

Reliability, sturdiness, versatility

These are the distinctive traits of Motovario products. A broad range of transmission products that provide a competent, innovative solution to each and every power application need. Cutting-edge tools, unrelenting research efforts and ongoing commitment to upgrading manufacturing equipment to the latest state-of-the-art enable us to offer high quality and performance standards to cater to industry requirements and the broadest variety of applications. Motovario ranks among the leading, well-reputed companies in Italy engaged in the design, manufacture and sales of transmission products for industrial and civil applications. The entire manufacturing process takes place in Formigine and Ubersetto plants, in Modena area, with an overall surface area of over 50,000 sq m. and a workforce of about 500 people, 170 numerically controlled machines and cutting-edge handling, storage and assembly automated systems ensure that all products meet high quality standards. The network includes more than 40 Motovario-certified assembly centres, with the capability to supply products in a broad range of versions, including customised versions, high service capacity and fast response. As a result, our product offering can cater to the needs of all plant engineering sectors, in all industries and for different applications, and includes: speed variators, helical, bevel-helical, parallel helical, worm gear reducers and geared motors, electric motors and inverter motors. All of the products we manufacture share such common features as reliability, sturdiness and versatility, topped with a high innovation content. At the heart of a company's technological innovation is the ability to develop integrated tools for computer-aided calculation simulation and management of different processes as part of product development. When simulating operating, setup and process conditions, it is also necessary to analyse and optimize the overall functional design of a product using a synergistic approach. This is achieved by implementing an exhaustive experimental plan, without using interpolation or approximation, as they frequently allow criticalities or any oversizing which is not conducive to maximising quality/cost ratio to go unnoticed.

High-efficiency method for calculation according to standards

A set of specific functions have been developed to this end, a few significant examples include functions to:

- Optimise individual reduction ratios and the combinations of the different reduction stages based on parametrisable target normal series;
- Calculate torque values and maximum permissible external forces for gear reducer units, using iterative numeric algorithms to confirm target life/safety values of components;
- Create databases for loading a finite element structural analysis model by automatically writing all reaction components of bearings under all load conditions to a specific file, with automatic selection of critical cases that need to be verified.

Another goal of the method is to create synergy between calculation according to standards and FEM structural calculation and the implementation of FEM model loading procedures, so as to simplify input data, meshing and constraint criteria.

Competitiveness and operational benefits of the new method

This method offers many practical advantages over traditional calculation procedures within the company, namely:

- Iterative optimisation of project since setup stage;
- Accurate assessment of the various service factors and reliability levels for the entire gear reducer unit and for all operating conditions as per catalogue rating or customer specific requirements;
- Faster support to customers in analysing tailored product configurations; Integrated corporate databases that can be updated in real-time.

Range extension and ongoing evolution

The steady, significant growth of Motovario Group is achieved thanks to an ongoing search for new calculation and design tools, as well as to customer service. The new tools identified have led to innovation, improved product reliability as well as positive developments in market management. The following software products are used for design, calculation and management:

- Solidworks;
- Kissoft;
- Kissys;
- Ansys;
- FEM modelling analysis software;
- Circuit design and simulation software;
- Specific spreadsheets;
- SAP.

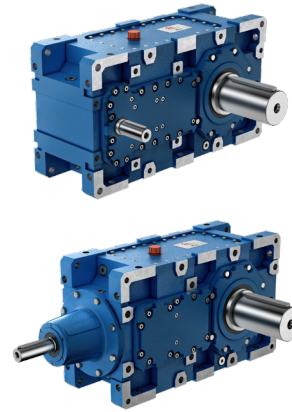
In MyMotovario 4.0 portal, PRODUCT SELECTION includes a section named APPLICATIONS where customers can enter application data and find out which gear reducer suits them best in a matter of minutes.

MOTOVARIO Products

<p>HELICAL GEAR REDUCERS</p> <p>Cast iron or aluminium casing Output shaft up to 90 mm Mn2 up to 8.600 Nm Reduction stages 1, 2, 3 Ratios up to 354 ATEX units</p>	
<p>HELICAL BEVEL GEAR REDUCERS</p> <p>Cast iron or aluminium casing Output shaft up to 110 mm Mn2 up to 14.000 Nm Reduction stages 2, 3 Ratios up to 443 ATEX units</p>	
<p>SHAFT MOUNTED GEAR REDUCERS</p> <p>Cast iron casing Output shaft up to 90 mm Mn2 up to 10.250 Nm Reduction stages 2, 3 Ratios up to 395 ATEX units</p>	
<p>WORM GEAR REDUCERS</p> <p>Cast iron or aluminium casing Output shaft up to 50 mm Mn2 up to 2.700 Nm Ratios up to 1083 ATEX units</p>	
<p>PLANETARY GEAR REDUCERS</p> <p>Cast iron casing Output shaft up to 80 mm Mn2 up to 10000 Nm Reduction stages 1, 2, 3, 4 Ratios up to 2700</p>	

**PARALLEL HELICAL AND BEVEL
HELICAL GEAR REDUCERS FOR
MID-HEAVY DUTY INDUSTRY**

Cast iron casing
Output shaft up to 180 mm
Mn2 up to 110.000 Nm
Reduction stages 2, 3, 4
Ratios up to 431
ATEX units



**MOTOVARIATORS AND
MOTOVARIATORS-GEAR
REDUCERS**

Cast iron or aluminium casing
Mn2 up to 5.000 Nm
ATEX units



ELECTRIC MOTORS

Power ratings up to 90 kW
2, 4, 6 poles
Three-phase and single-phase, self-
braking, double polarity
Protection grade up to IP66



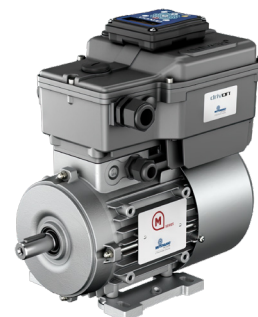
**SELF POWER® SELF-STARTING
SYNCHRONOUS ELECTRIC
MOTORS**

Power ratings up to 7,5 kW
4 poles
Three-phase, self-braking
Protection grade up to IP6



**DRIVES
DRIVON – inverter motor**

Three-phase and single-phase
power supply High dynamics
sensorless vectorial control
Power ratings up to 5,5 kW
Standard integrated STO
Integrated field bus
Optional field bus



1.3.1 Symbols

Physical dimensions	Symbol	Symbol unit of measurement	Input	Output
Power	P	[kW]	P_1	P_2
Requested power	P_r	[kW]	P_{r1}	P_{r2}
Nominal power	P_n	[kW]	P_{n1}	P_{n2}
Torque	M	[Nm]	M_1	M_2
Nominal torque	M_n	[Nm]		M_{n2}
Requested torque	M_r	[Nm]	M_{r1}	M_{r2}
Speed	n	[rpm]	n_1	n_2
Load	F	[N]		
Radial load	F_r	[N]	F_{r1}	F_{r2}
Axial load	F_a	[N]	F_{a1}	F_{a2}
Reduction ratio	i			
Service factor	s.f.			
Static	s			
Dynamic	d			
Calculated	c			
Maximum	max			
Minimum	min			
Moment of inertia	J	[kgm ²]	J_1	J_2
Ambient temperature	T_{amb}	[°C]		
Dimension		[mm]		

1.3.2 Formulas

GEAR REDUCER		
Starting or stopping time	$t = v / a$	[s]
Velocity in rotary motion	$v = \pi * d * n / 60$ $v = \omega * r$	[m/s]
Speed velocity	$n = 60 * v / (\pi * d)$ $\omega = v / r$	[rpm] [rad/s]
Acceleration or deceleration	$a = v / t$	[m/s ²]
Angular acceleration	$\alpha = n / (9,55 * t)$ $\alpha = \omega / t$	[rad/s ²]
Starting or stopping distance (according to acceleration or an initial or final speed)	$s = a * t^2 / 2$ $s = v * t / 2$	[m]
Horizontal translation force	$F = \mu * m * g$	[N]
Vertical translation force (lifting)	$F = m * g$	
Inclined plane translation force	$F = m * g (\mu * \cos\beta + \sin\beta)$	
m= mass [kg]; g= gravity acceleration [m/s ²]; μ = friction coefficient; β = angle of inclination		
Moment of inertia	$J = m * v^2 / \omega^2$	[kgm ²]
Torque	$M = F * d / 2$ $M = J * \omega / t$	[Nm]

MOTOR and GEARED MOTOR		
Acceleration time	$t_a = (J_{ext} + J_m) * n_n / 9,55 + (M_{spunto} - M_r)$	[s]
Braking time	$t_s = (J_{ext} + J_m) * n_n / 9,55 + (M_{spunto} + M_r)$	[s]
Motor rotation angle during starting	$\phi = n_n * t_a / 19,1$	[rad]
Motor rotation angle during braking	$\phi = n_n * t_s / 19,1$	[rad]
Power available at the shaft of single-phase motor	$P = V * I * \eta * \cos\omega$	[W]
Power available at the shaft of three-phase motor	$P = 1,73 * V * I * \eta * \cos\omega$	[W]

RUNNING at 60Hz		
Speed velocity at 60Hz	$n_{60Hz} = 1,2 * n_{50Hz}$	[rpm]
Power at 60Hz	$P_{1\ 60Hz} = P_{1\ 50Hz} * V_{60Hz} / V_{50Hz}$	[kW]
If supply voltage at 60 Hz (V _{60Hz}) corresponds to winding voltage at 50 Hz (V _{50Hz}), power doesn't change P _{1\ 60Hz} = P _{1\ 50Hz} If supply voltage at 60 Hz (V _{60Hz}) is 20% higher than winding voltage at 50 Hz (V _{50Hz}), power increases by 20% i.e. P _{1\ 60Hz} = 1,2 P _{1\ 50Hz}		
Torque at 60Hz	$M_{60Hz} = M_{50Hz} * P_{1\ 60Hz} / (1,2 * P_{1\ 50Hz})$	[Nm]
Service factor at 60Hz	$f.s_{60Hz} = f.s_{50Hz} * 1,175 * P_{1\ 50Hz} / P_{1\ 60Hz}$	-

For correctly selecting a gear reducer or geared motor, several essential pieces of data are required:

1. The input speed velocity to the gear reducer (n_1) and the output speed velocity (n_2). Through these two values it is possible to calculate the reduction ratio (i) of the gear reducer using the following formula: $i=n_1/n_2$
2. The torque required by the application (M_{r_2})

The geared motor or gear reducer can be selected once this data is known. This guide helps you to select the right product in just a few steps:

Geared motor selection

3. Determine the application's actual service factor (**s.f.**). This parameter depends on the type of load of the powered machine, the number of starts per hour and the hours of operation (refer to the "Service factor" paragraph).
4. Calculate the input power P_{r_1} using the required torque value M_{r_2} , the speed n_2 and dynamic efficiency value. $P_{r_1}=(M_{r_2} \cdot n_2)/(9550 \cdot \eta_d)$. The dynamic efficiency value depends on the type of gear reducer and on the number of gear reduction stages. (To calculate the efficiency value see its page).
5. Consult the geared motor performance tables and identify a nominal power value P_{n_1} exceeding the required power P_{r_1} , such that: $P_{n_1} \geq P_{r_1}$
6. Once the suitable nominal power has been identified, select the geared motor capable of generating the speed velocity closest to the desired n_2 value and with service factor **s.f.** greater or equal to that required by the application. In the geared motor selection tables the combinations include 2-pole, 4-pole and 6-pole motors powered at 50Hz.

Gear reducer selection:

7. Determine the application's service factor (**s.f.**) (refer to the "Service factor" paragraph).
8. Calculate the reduction ratio (i) from the required output speed n_2 and input speed n_1 using the ratio $i=n_1/n_2$
9. Calculate the torque M_{c_2} to select the gear reducer using the torque required by the application M_{r_2} and the service factor **s.f.**: $M_{c_2}=M_{r_2} \cdot (\text{s.f.})$
10. Consult the Gear Reducer Performance tables looking for the gear reducer that, with the reduction ratio closer to the calculated one, has a nominal torque M_{n_2} so that: $M_{n_2} \geq M_{c_2}$

Verifications

Once the gear reducer or geared motor has been selected, the following checks should be performed:

A. Thermal Power

The gear reducer's thermal power must be equal to or greater than the installed mechanical power, or the power required by the application according to the indications contained in the section (refer to the "Thermal power" paragraph).

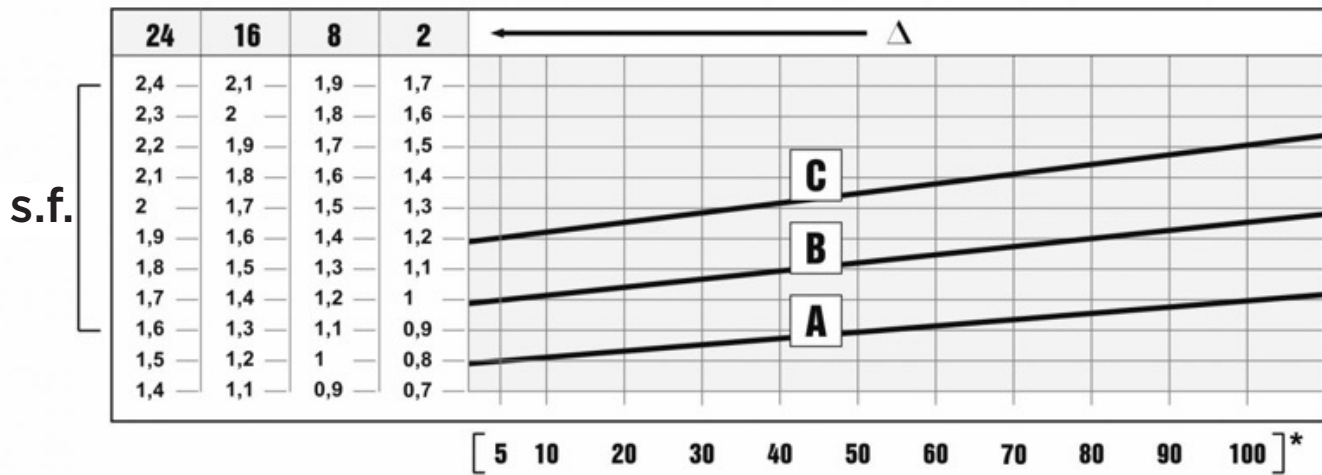
B. Maximum Torque

Generally, the maximum torque (peak instantaneous load) that can be applied to the gear reducer must not exceed 200% of the nominal torque M_{n_2} (ATEX - M 2max).

C. Radial Loads

1. Verify that the radial loads acting on the input and/or output shafts are within the values indicated in the catalogue. If they exceed these values, increase the size of the gear reducer or modify the external load capacity. During the checking phase, it is important to remember that the values indicated in the catalogue refer to loads acting on the mid-point of the shaft protrusion, therefore, if the load is applied to a different position, appropriate formulas must be used to calculate the admissible load in the desired position (refer to the "Radial loads" paragraph).
2. If accessory output shafts are present, make sure that the applied load is compatible with shaft size. In case of need please contact MOTOVARIO TECHNICAL SERVICE.

D. If an electric motor is going to be fitted to the selected gear reducer, check for its applicability by referring to the configuration table (see paragraph "Available motor mounting flanges"). For motors larger than IEC 180, check whether the motor needs to be supported with feet. In case of need please contact MOTOVARIO TECHNICAL SERVICE.



The service factor (s.f.) depends on the operating conditions the gear reducer is subjected to. The parameters that need to be taken into consideration to select the most adequate service factor correctly comprise:

- type of load of the operated machine: A - B - C
- length of daily operating time: hours/day (Δ)
- start-up frequency: starts/hour (*)

LOAD:

- A - uniform = $f_a \leq 0,3$
- B - moderate = $f_a \leq 3$
- C - heavy = $f_a \leq 10$

$$f_a = J_e/J_m$$

- J_e [kgm²] moment of reduced external inertia at the drive-shaft
- J_m [kgm²] moment of inertia of motor

If $f_a > 10$ call MOTOVARIO TECHNICAL SERVICE.

For a motovariator-gear reducer, once the service factor of the application has been determined, it is necessary to compare this value with the S gear reducer safety factor given in the selection tables, checking the condition $S \geq s.f.$ The maximum number of admissible starts depends on the type of application. Approximately, the figure must not exceed 5-10 per minute. For higher values contact MOTOVARIO TECHNICAL SERVICE.

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

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

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

1.6.1 Installation

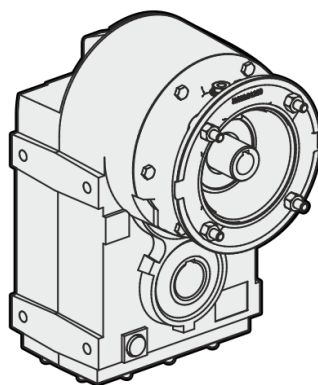
To install the gear reducer it is necessary to note the following recommendations:

- Fixing to the structure of the machine must be stable to prevent any vibrations.
- Check the correct direction of rotation of the gear reducer output shaft before fitting the unit to the machine.
- In the case of particularly lengthy periods of storage (4/6 months), if the oil seal is not immersed in the lubricant inside the unit, it is recommended to change it since the rubber could stick to the shaft or may even have lost the elasticity it needs to function properly.
- Whenever possible, protect the gear reducer against solar radiation and bad weather.
- Ensure the motor cools correctly by ensuring good passage of air from the fan side. In the case of ambient temperatures $< -5^{\circ}\text{C}$ or $> +40^{\circ}\text{C}$ call MOTOVARIO TECHNICAL SERVICE.
- The various parts (pulleys, gear wheels, couplings, shafts, etc.) must be mounted on the solid or hollow shafts using special threaded holes or other systems that anyhow ensure correct operation without risking damage to the bearings or external parts of the units.
- Lubricate the surfaces in contact to avoid seizure or oxidation.
- Painting must definitely not go over rubber parts and the holes on the breather plugs, if any.
- For units equipped with oil plugs, replace the closed plug used for shipping with the specific breather plug.
- Check the correct level of the lubricant through the indicator, if there is one.
- Starting must take place gradually, without immediately applying the maximum load. When there are parts, objects or materials under the motor drive that can be damaged by even limited spillage of oil, special protection should be fitted.

Assembling motor on PAM flange

When the unit is supplied without motor, to ensure the correct assembly of the electric motor, it is necessary to follow recommendations below. Check that the tolerances for the motor shaft and flange correspond at least to a “normal” quality class. Carefully clean the shaft, spigot and surface of the flange from traces of paint or dirt. Mount the half coupling/sleeve (see figure) onto the electric motor shaft without forcing it, otherwise check the tolerance of the motor key and ensure that it is in the correct position; in any case, use appropriate systems that ensure it is mounted properly without damaging the motor bearings. For the version with half coupling, mount the motor, with half coupling, aligning the tooth drive of the half coupling on motor side with that of the elastic element on the fixed half coupling on the gear reducer side. Motor key adjustment is not provided.

Motor connections sleeve



Motovario products are supplied with the following surface treatment features.

Units with grey cast-iron cases (SN140-SN150) and spheroidal cast iron cases (SN160-SN180):

Die-cast materials are always painted.

Units with grey cast-iron cover (SN140-SN150) and spheroidal cast iron cover (SN160-SN180):

SN... series gear reducers with 2, 3 stages size 140, 150 are supplied with steel cover and a metal nameplate printed.

SN... series gear reducers with 2, 3 stages sizes 160, 180 are supplied with steel cover and a metal nameplate printed.



Paint coating specifications:

- RAL5010 blue textured finish. Product used: Two-component primer and acrylic layer 80 are supplied with steel cover and a metal nameplate printed.

Performance:

- Loading capacity in accordance with DIN 3990, ISO 6336, AGMA 2101, ISO 10300, DIN 3991, ISO 281, DIN 743.

Efficiency η :

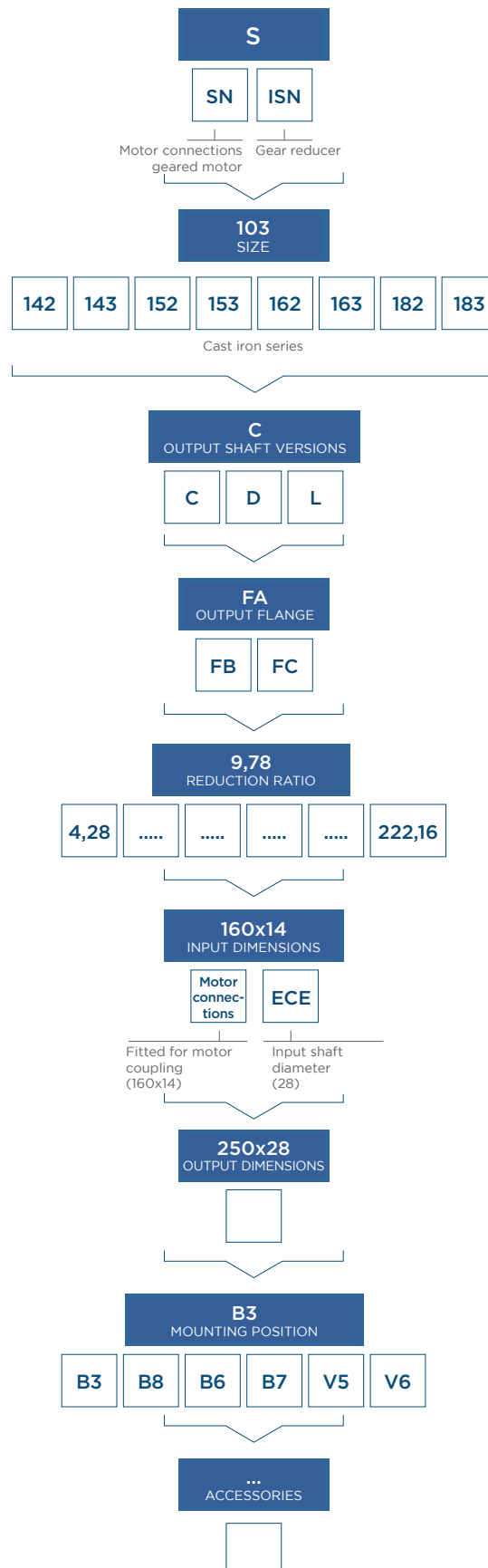
The efficiency is the ratio between the output power P2 and the power absorbed by the gear reducer P1: $\eta = P2/P1$.

S series shaft-mounted gear reducers have an average value equal to:

SN...2 stages = 0,98

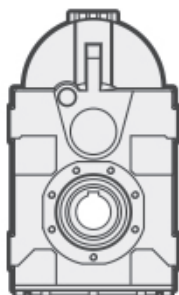
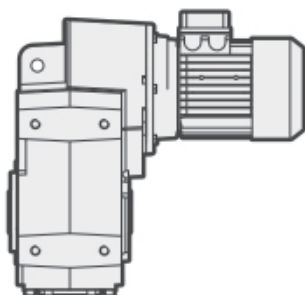
SN...3 stages = 0,96

2.2.1 Designation

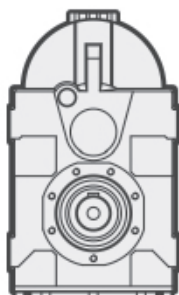
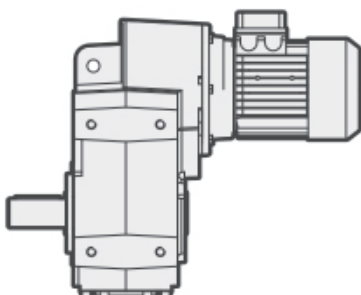


2.2.2 Versions

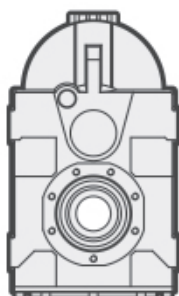
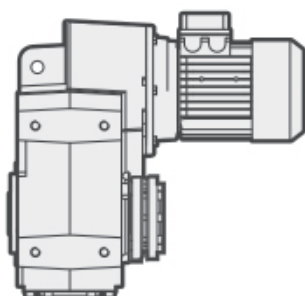
SN...C - SN...D - SN...L



SN.. C FOOT-FLANGE / HOLLOW SHAFT FIXING



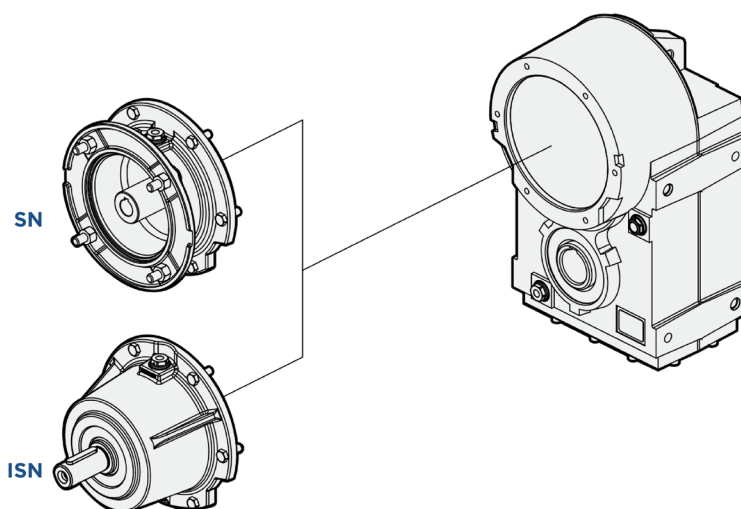
SN.. D FOOT-FLANGE / SOLID SHAFT FIXING D



SN.. L FOOT-FLANGE / SHRINK DISC SHAFT FIXING

2.2.3 Modularity

S SERIES IN GREY AND SPHEROIDAL CAST IRON



SN

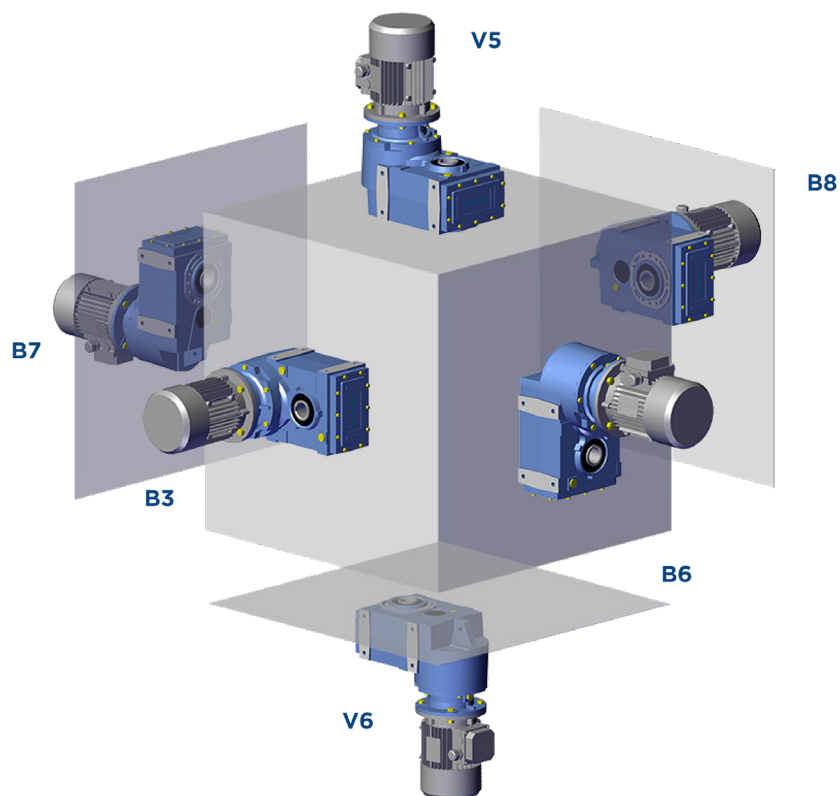
Version with setup for motor coupling (motor connections)

ISN

Version with input solid shaft

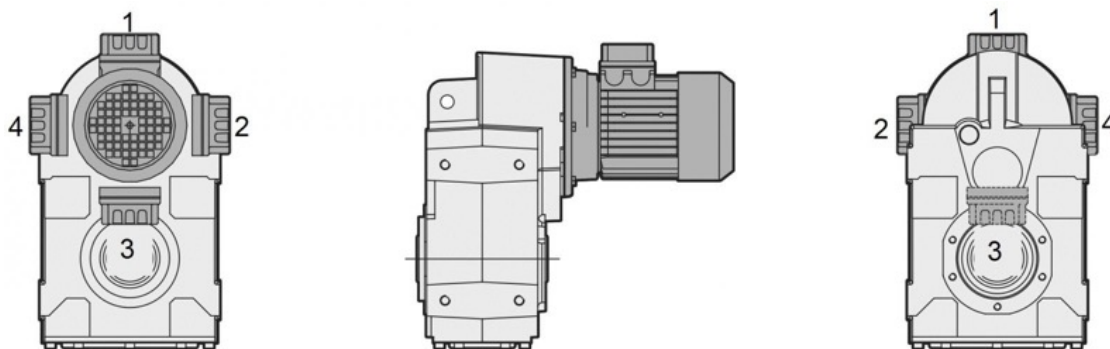
2.3.1 Assembly positions

The mounting position of the gear reducer identifies its space orientation. B3 mounting position, as from a technical point of view, ensures lower oil splash, better lubrication and less heating.



2.3.2 Position of terminal block

Unless otherwise specified in the order, the unit is supplied with terminal block in position 1.



2.5.1 Critical applications

SN	140	150	160	180
1500 < n1 < 3000	B	B	B	B

Verified application

A Application not recommended

B Check the application and/or call MOTOVARIO TECHNICAL SERVICE.

(*) The shrink disc is designed only to transmit the output torque.

In case of mounting position with radial and/or axial loads, please contact MOTOVARIO TECHNICAL SERVICE.

2.5.2 Information

The performance given in the catalogue correspond to mounting position B3 or similar, i.e. when the first stage is not entirely immersed in oil. For other mounting positions and/or particular input speeds, refer to the tables that highlight different critical situations for each size of gear reducer. It is also necessary to take due consideration of and carefully assess the following applications by contacting MOTOVARIO TECHNICAL ASSISTANCE:

- Use in services that could be hazardous for people in case of gear reducer failure. Avoid use as multiplier.
- Applications with especially high inertia. Use as a lifting winch.
- Applications with high dynamic strain on the case of the gear reducer. In places with Tamb under -5°C or over 40°C. Use in chemically-aggressive environments.
- Use in a brackish environments.
- Mounting positions not envisaged in the catalogue. Use in radioactive environments.
- Use in environments with pressures other than atmospheric pressure.
- For $i < 20$ in V5, use of an expansion tank.

Avoid applications where even partial immersion of the gear reducer is required.

In the presence of overloading due to full load, braking, shocks or other static and dynamic causes, please verify that the peak torque is less than $2 \cdot Mn_2$.

The tables show available coupling configurations and the matching motors. Check the service factor.

SN142				
i	132	160	180	200
4,28			B5	B5
4,92			B5	B5
5,68			B5	B5
5,89			B5	B5
6,61			B5	B5
7,45			B5	B5
7,75			B5	B5
8,91			B5	B5
10,29		B5	B5	B5
10,67		B5	B5	B5
11,96		B5	B5	B5
13,48		B5	B5	B5
15,30		B5	B5	B5
17,49		B5	B5	B5
20,20		B5	B5	B5
23,36	B5	B5	B5	
26,11	B5	B5	B5	

SN143					
i	100	112	132	160	180
30,04				B5	B5
34,02			B5	B5	B5
38,70			B5	B5	B5
44,27			B5	B5	B5
51,01			B5	B5	
59,34			B5	B5	
60,82			B5	B5	
69,18			B5	B5	
79,14			B5		
91,19			B5		
106,08			B5		
124,53	B5	B5	B5		
139,76	B5	B5	B5		
167,96	B5	B5	B5		
197,01	B5	B5			
221,47	B5	B5			

SN152			
i	180	200	225
4,47		B5	B5
5,06		B5	B5
5,75		B5	B5
6,58		B5	B5
6,97		B5	B5
7,76		B5	B5
8,70		B5	B5
9,00		B5	B5
10,23		B5	B5
11,71		B5	B5
12,40		B5	B5
13,81	B5	B5	B5
15,46	B5	B5	B5
17,44	B5	B5	
19,82	B5	B5	
22,77	B5	B5	

SN153							
i	100	112	132	160	180	200	225
17,95							B5
18,61							B5
20,87							B5
24,06				B5	B5	B5	B5
27,65				B5	B5	B5	B5
31,92				B5	B5	B5	B5
33,10				B5	B5	B5	B5
37,12				B5	B5	B5	
41,85				B5	B5	B5	
46,99				B5	B5		
53,99				B5	B5		
62,33				B5	B5		
64,64				B5	B5		
72,50			B5	B5	B5		
81,72			B5	B5	B5		
92,70			B5	B5			
105,99			B5	B5			
122,41			B5	B5			
141,55	B5	B5	B5	B5			
158,23	B5	B5	B5				
190,20	B5	B5	B5				
222,16	B5	B5	B5				

SN162			
i	225	250	280
5,66	B5	B5	B5
6,35	B5	B5	B5
7,16	B5	B5	B5
8,12	B5	B5	B5
8,75	B5	B5	B5
9,78	B5	B5	B5
10,97	B5	B5	B5
12,36	B5	B5	B5
14,02	B5	B5	B5

SN163							
i	132	160	180	200	225	250	280
13,58				B5	B5	B5	B5
15,45				B5	B5	B5	B5
17,67				B5	B5	B5	B5
23,44			B5	B5	B5	B5	B5
26,66			B5	B5	B5	B5	B5
30,50			B5	B5	B5	B5	
35,24		B5	B5	B5	B5	B5	
39,92		B5	B5	B5	B5		
45,41		B5	B5	B5	B5		
51,94		B5	B5	B5	B5		
55,01		B5	B5	B5	B5		
61,27		B5	B5	B5			
68,62		B5	B5	B5			
77,36	B5	B5	B5				
87,95	B5	B5	B5				
101,03	B5	B5	B5				
115,03	B5	B5	B5				
128,20	B5	B5	B5				

SN182				
i	225	250	280	315
7,08			B5	B5
7,88			B5	B5
8,82			B5	B5
9,94			B5	B5
11,85		B5	B5	B5
13,19		B5	B5	B5
14,77		B5	B5	B5
16,64	B5	B5	B5	B5
14,02	B5	B5	B5	

SN183							
i	160	180	200	225	250	280	315
20,27				B5	B5	B5	B5
22,85				B5	B5	B5	B5
25,92			B5	B5	B5	B5	B5
33,93		B5	B5	B5	B5	B5	
38,24		B5	B5	B5	B5	B5	
43,38		B5	B5	B5	B5		
50,12		B5	B5	B5	B5		
56,21	B5	B5	B5	B5			
63,36	B5	B5	B5	B5			
71,87	B5	B5	B5	B5			
84,31	B5	B5	B5				
93,91	B5	B5	B5				
105,33	B5	B5					
119,15	B5	B5					
136,23	B5	B5					
153,87	B5	B5					
171,00	B5	B5					
191,74	B5						

SN	142/143	152/153	162/163	182/183
Version	Standard	Standard	Standard	Standard
C	2	2	2	2
D	2	2	2	2
L	2	2	2	2

1 - Ball Bearings

2 - Conical roller bearings

/ - Not Available

2.8.1 Information

The value of the admissible radial load [N] is given in the tables relating to the performance of the gear reducer at issue. It is related to the load applied on the centre line of the shaft and in the most unfavourable conditions of angle of application and direction of rotation. The maximum admissible axial loads are 1/5 of the value of the given radial load when they are applied in combination with the radial load. The tables relating to the output shafts give the admissible maximum value. This value must never be exceeded since it relates to the strength of the case. Particular conditions of radial load higher than the limits of the catalogue may occur. In this case, call our Technical Service and provide details on the application: direction of the load, direction of rotation of the shaft, type of service. In case of double extension shafts with radial load applied on both ends, the max. admissible radial loads must be defined according to the specific running conditions, in this case call our Technical Service. The radial load on the shaft is calculated with the following formula: $Fr_e = (2000 \cdot M \cdot fz) / D \leq Fr_1$ or Fr_2

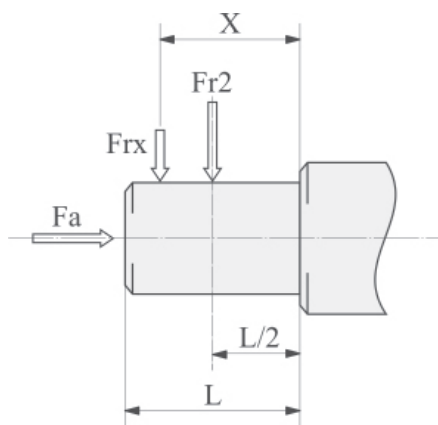
- Fr_e (N) Resultant radial load
- M [Nm] Torque on the shaft
- D [mm] Diameter of the transmission member mounted on the shaft
- Fr_1 - Fr_2 [N] Maximum admissible radial loading (see relevant tables)
- $fz = 1,1$ gear pinion - $1,4$ chain wheel - $1,7$ v-pulley - $2,5$ flat pulley

2.8.2 Input

When the resultant radial load is not on the centre line of the shaft, it is necessary to adjust the admissible radial load Fr_1 with the following formula:

$$Fr_x = (Fr_1 \cdot a) / (b + x)$$

- a, b = values given in the tables
- x = distance from the point of application of the load to the shaft



ISN	142/143	152/153	162/163	182/183
a	215,5	179,5	220,5	261,5
b	160,5	129,5	165,5	206,5
Fr_1 max(**)	3515	3590	5218	26012

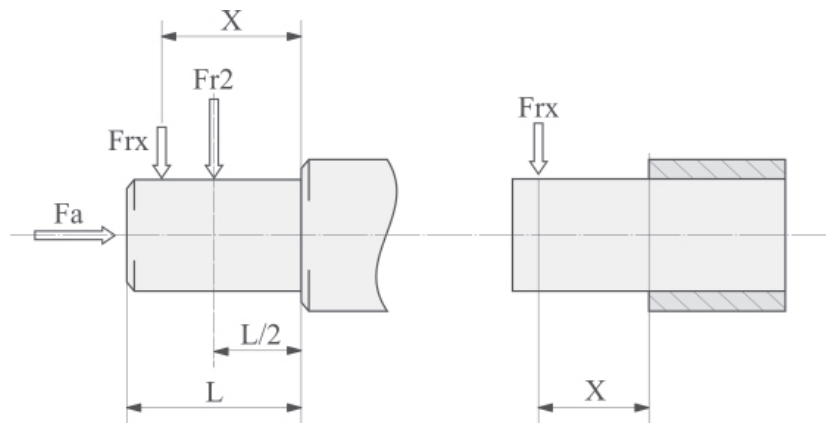
(** Fr_1) Admissible maximum value for gear reducer under static conditions and/or for short periods of duty. For continuous-duty radial loading, please verify the values given in the performance tables calculated according to casing, shaft and bearings.

2.8.3 Output

When the resultant radial load is not on the centre line of the shaft, it is necessary to adjust the admissible radial load Fr_2 with the following formula:

$$Fr_x = (Fr_2 \cdot a) / (b + x)$$

- a, b = values given in the tables
- x = distance from the point of application of the load to the shaft



SN	142/143	152/153	162/163	182/183
a	344	407,5	485	556
b	274	322,5	380	451
Fr_2 max(**)	38694	55500	76000	100000

(** Fr_2) Admissible maximum value for gear reducer under static conditions and/or for short periods of duty. For continuous-duty radial loading, please verify the values given in the performance tables calculated according to casing, shaft and bearings.

2.9.1 Information

In cases of ambient temperatures not envisaged in the table, call our Technical Service. In the case of temperatures under -30°C or over 60°C it is necessary to use oil seals with special compound. For operating ranges with temperatures under 0°C it is necessary to consider the following:

1. The motors need to be suitable for operation at the envisaged ambient temperature.
2. The power of the electric motor needs to be adequate for exceeding the higher starting torques required.
3. In case of cast-iron gear reducers, pay attention to impact loads since cast iron may have problems of fragility at temperatures under -15°C .
4. During the early stages of service, problems of lubrication may arise due to the high level of viscosity taken on by the oil and so it is wise to have a few minutes of rotation under no load.

Oil (NON ATEX products) must be changed after approx. 10000 hours/2 years of operation; this time varies based on the type of service and on the environment inside which the gear reducer is installed. For units supplied without oil plugs, lubrication is permanent and so they need no servicing.

2.9.2 Lubricants

Specifications of lubricants recommended by Motovario.
The units SN142/3 - 182/3 are supplied without lubricant.

	SN142/3 - 182/3	
	Mineral oil	
Tamb $^{\circ}\text{C}$ ISO	(-5) - (+40) ISO VG220	(-15) - (+25) ISO VG150
LAND OIL	GEAR POWER 220	-
ENI	BLASIA 220	BLASIA 150
SHELL	OMALA S2 G 220	OMALA S2 G 150
KLUBER	Kluberoil GEM 1-220N	Kluberoil GEM 1-150N
MOBIL	MOBILGEAR 600 XP220	MOBILGEAR 600 XP150
CASTROL	ALPHA SP 220	ALPHA SP 150
BP	ENERGOL GR-XP220	ENERGOL GR-XP150
PETRONAS	GEAR MEP 220	GEAR MEP 150

2.9.3 Special lubricants

	Tamb C	Polyglycol synthetic oil
ENI	(-30)- (+30)	Blasia S 150 (ISO VG150)
	(-20)- (+40)	Blasia S 220 (ISO VG220)
MOBIL	(-45)- (+0)	SHC 624 (ISO VG32)
	(-40)- (+5)	SHC 626 (ISO VG68)
KLUBER	(-40)- (+5)	Klubersynth GH 6-32 (ISO VG32)
	(-35)- (+10)	Klubersynth GH 6-80 (ISO VG80)
	(-30)- (+40)	Klubersynth GH 6-150 (ISO VG150)
	(-25)- (+40)	Klubersynth GH 6-220 (ISO VG220)
	(-15)- (+50)	Klubersynth GH 6-460 (ISO VG460)
	(-10)- (+70)	Klubersynth GH 6-680 (ISO VG680)

	Tamb C	Polyglycol synthetic oil for food grade
KLUBER	(-30)- (+15)	Klubersynth UH1-6 100 (ISO VG100)
	(-25)- (+40)	Klubersynth UH1-6 220 (ISO VG220)
	(-15)- (+40)	Klubersynth UH1-6 320 (ISO VG320)
	(-15)- (+50)	Klubersynth UH1-6 460 (ISO VG460)
	(-10)- (+50)	Klubersynth UH1-6 680 (ISO VG680)

If 'special' lubricant is required please contact MOTOVARIO TECHNICAL SERVICE.

2.9.4 Quantity

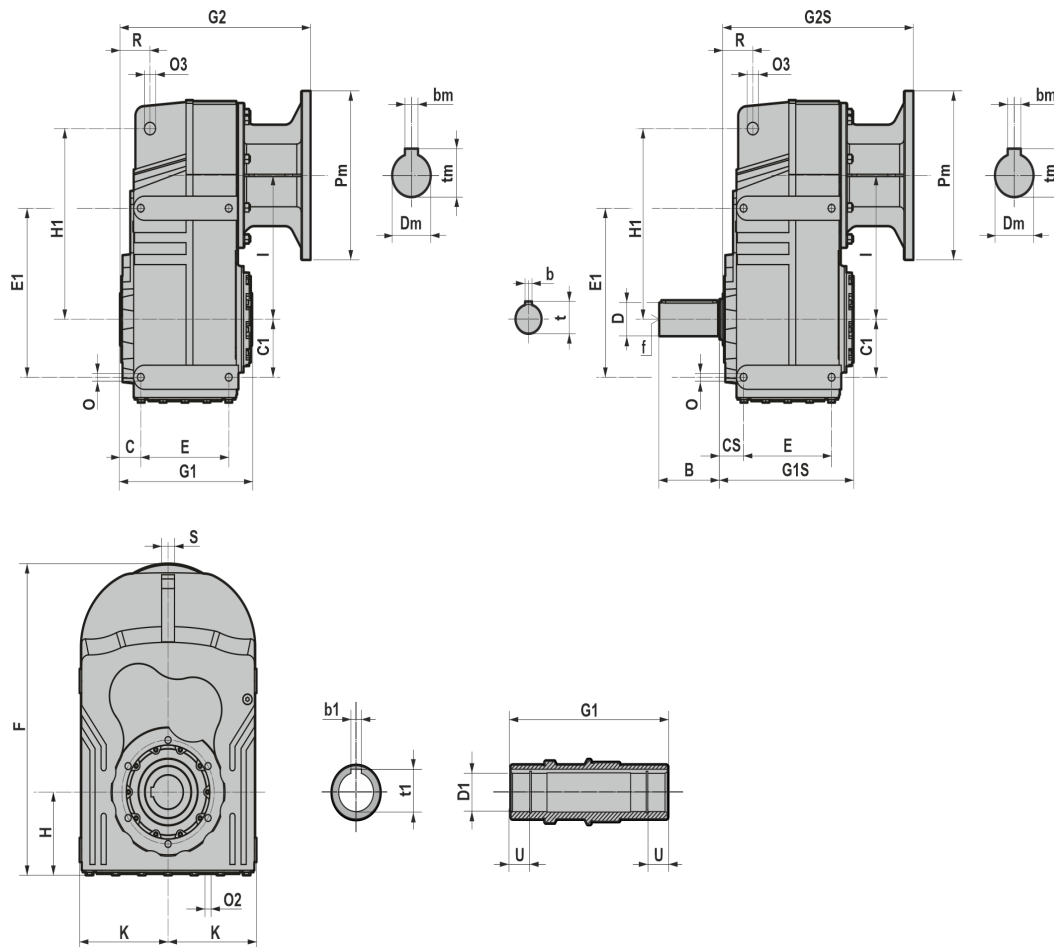
- For all SN... series gear reducers with 2, 3 stages it is always necessary to specify the envisaged mounting position.
- SN... series gear reducers with 2, 3 stages sizes 140, 150, 160, 180 have no lubricant and are fitted with oil plugs to suit any mounting position included in the catalogue. The oil filling can be done on request, in this case it is recommended, after installation, to replace the closed plug used for transportation with the supplied breather plug. When the gear reducer is supplied without lubricant, it is provided with a label to be filled in.

Oil quantity in the table (litres ~) is indicative; for a proper use you will have to refer to the level plug or the dipstick. Any level difference could depend on construction tolerances, but also on the mounting position of the unit or on the mounting surface at the customer's premises. For this reason it is appropriate that the customer checks and, if necessary, restores the level when the unit are installed.

SN	142	143	152	153	162	163	182	183
B3	22,8	21,5	35	33	55	50	97	93
B8	22,5	21	34,5	32,5	54	49	95	89
B6	22	21	34	32	53	48,5	87	84
B7	16	14	26	21	43	39	80,5	77
V5	27	26,5	44	40	67	61	117	112
V6	27	25,2	37	35	58	53	113	110

For $i < 20$ in V5, use of an expansion tank.

3.1.1 SN 142...183



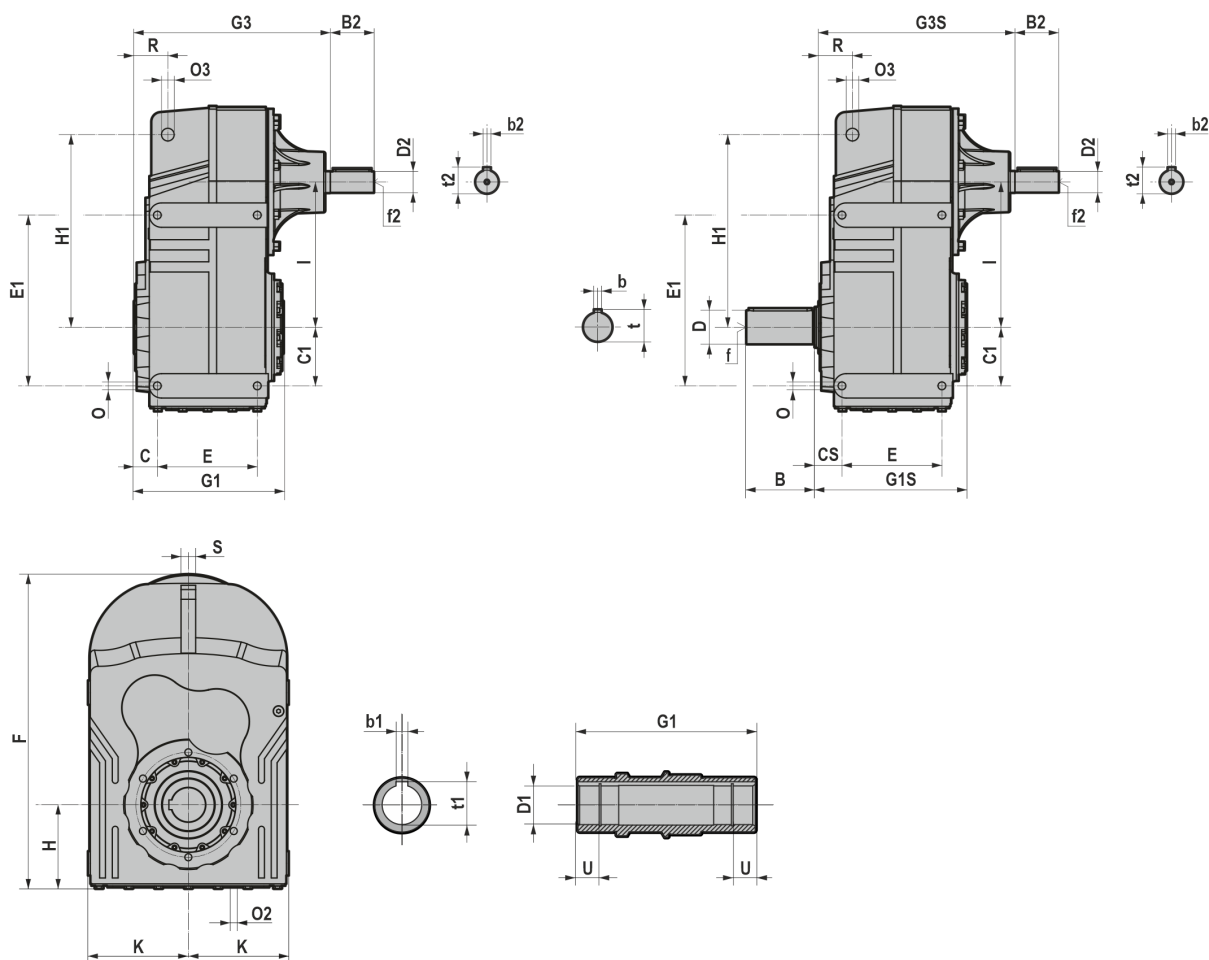
	C	CS	C1	E	E1	F	G1	G1S	H	H1	I	K	O	O2	O3	S	S
SN142/SN143	48,5	56,5	120	205	350	630	308	316	176	395	298	206	M16	M16	26	70	30
SN152/SN153	70	79,5	125	235	400	727	363	373	202	485	343	232	M24	M20	26	88	36
SN162/SN163	79	89	142	280	450	863	428	438	233	550	400	265	M24	M24	33	110	40
SN182/SN183	118	130	170	310	540	1049	500	512	271	660	455	330	M30	M30	33	150	45

	D1	b1	t1	U	B	D	b	t	f
SN142/SN143	70 ^{+0,03/0}	20	70	38	140	70 ^{+0,03/+0,01}	20	74,5	M20
SN152/SN153	90 ^{+0,04/0}	25	95,4	50	170	90 ^{+0,04/+0,01}	25	95	M24
SN162/SN163	110 ^{+0,04/0}	28	116,4	55	210	110 ^{+0,04/+0,01}	28	116	M24
SN182/SN183	120 ^{+0,04/0}	32	127,4	40	210	120 ^{+0,04/+0,01}	32	127	M24

IEC	Pm x Dm	SN142/SN143		SN152/SN153		SN162/SN163		SN182/SN183	
		G2	G2S	G2	G2S	G2	G2S	G2	G2S
100-112	250x28	348	356	390	400	/	/	/	/
132	300x38	369	377	405	415	457	467	/	/
160	350x42	444	452	480	490	602	612	591	603
180	350x48	444	452	480	490	602	612	591	603
200	400x55	464	472	500	510	602	612	615	627
225	450x60	/	/	533	563	602	612	657	669
250	550x65	/	/	/	/	602	612	709	721
280	550x75	/	/	/	/	602	612	709	721
315	660x80	/	/	/	/	/	/	759	771

B5	Pm	Dm	bm	tm
100	250	28	8	31,3
112	250	28	8	31,3
132	300	38	10	41,3
160	350	42	12	45,3
180	350	48	14	51,8
200	400	55	16	59,3
225	450	60	18	64,4
250	550	65	18	69,4
280	550	75	20	79,9
315	660	80	22	85

3.1.2 ISN 142...183



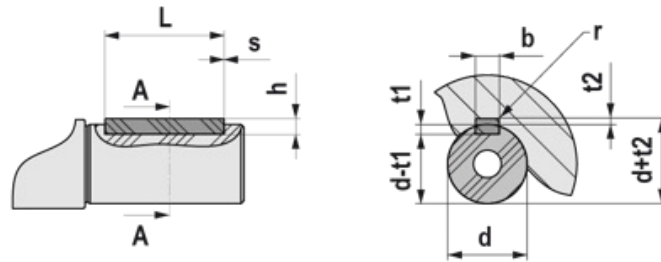
	C	CS	C1	E	E1	F	G1	G1S	H	H1	I	K	O	O2	O3	S	S
ISN142/ISN143	48,5	56,5	120	205	350	630	308	316	176	395	298	206	M16	M16	26	70	30
ISN152/ISN153	70	79,5	125	235	400	727	363	373	202	485	343	232	M24	M20	26	88	36
ISN162/ISN163	79	89	142	280	450	863	428	438	233	550	400	265	M24	M24	33	110	40
ISN182/ISN183	118	130	170	310	540	1049	500	512	271	660	455	330	M30	M30	33	150	45

	D1	b1	t1	U	B	D	b	t	f
ISN142/ISN143	70 ^{+0,03/0}	20	70	38	140	70 ^{+0,03/+0,01}	20	74,5	M20
ISN152/ISN153	90 ^{+0,04/0}	25	95,4	50	170	90 ^{+0,04/+0,01}	25	95	M24
ISN162/ISN163	110 ^{+0,04/0}	28	116,4	55	210	110 ^{+0,04/+0,01}	28	116	M24
ISN182/ISN183	120 ^{+0,04/0}	32	127,4	40	210	120 ^{+0,04/+0,01}	32	127	M24

	G3	G3S	B2	D2	b2	t2	f2
ISN142/ISN143	404	411	44 ^{+0,02/0}	90	12	47	M16
ISN152/ISN153	468	478	48 ^{+0,02/0}	100	14	51,5	M16
ISN162/ISN163	561	571	55 ^{+0,03/+0,01}	120	16	59	M20
ISN182/ISN183	646	658	55 ^{+0,03/+0,01}	120	16	59	M20

The table shows the approximate weights of the gear reducers.
*Weight without motor.

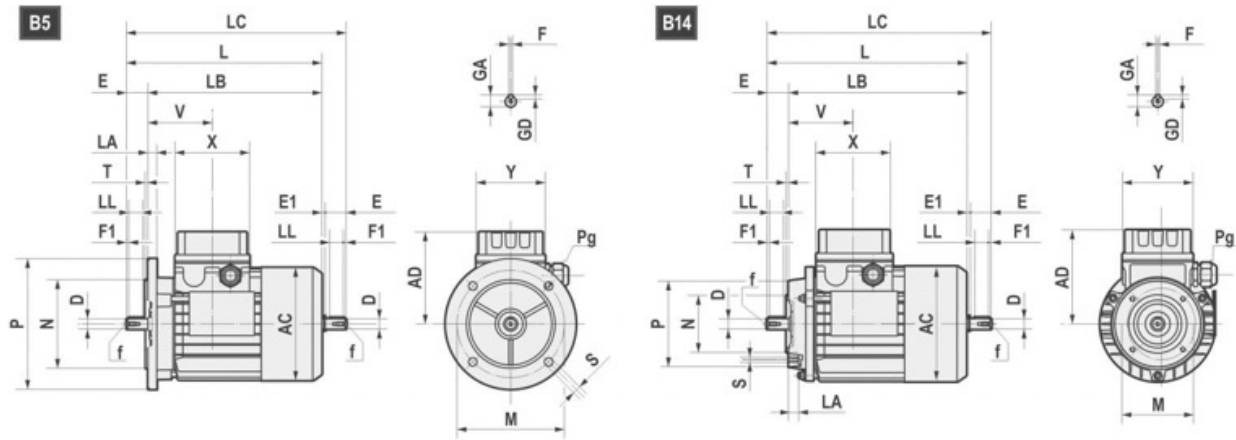
ISN	~ kg
142	201
143	204
152	275
153	276
162	390
163	394
182	570
183	575



UNI 6604 - DIN 6885

d		b x h			Tol. b / h	L		s min / max	b	t1	t2	Tol. t1 / t2	r max
6	8	2	x	2	h9 / h9	6	20	0,16 0,25	2	1,2	1	0,1 0	0,08 0,16
8	10	3	x	3		6	36		3	1,8	1,4		
10	12	4	x	4		8	45		4	2,5	1,8		
12	17	5	x	5		10	56	5	3	2,3			
17	22	6	x	6	h9 / h11	14	70	0,25 0,4	6	3	2,8	0,2 0	0,16 0,25
22	30	8	x	7		18	90		8	4	3,3		
30	38	10	x	8		22	110	10	5	3,3			
>	38	44	12	x		8	28	140	12	5	3,3		0,25 0,4
>	44	50	14	x		9	36	160	14	5,5	3,8		
>	50	58	16	x		10	45	180	16	6	4,3		
>	58	65	18	x		11	50	200	18	7	4,4		
>	65	75	20	x		12	56	110	20	7,5	4,9		0,4 0,6
>	75	85	22	x		14	63	140	22	9	5,4		
>	85	95	25	x		14	70	160	25	9	5,4		
>	95	110	28	x	16	80	180	28	10	6,4			
>	110	130	32	x	18	90	200	32	11	7,4	0,3 0	0,7 1	
>	130	150	36	x	20	100	160	36	12	8,4			
>	150	170	40	x	22	110	180	40	13	9,4			
>	170	200	45	x	25	125	200	45	14	10,4			

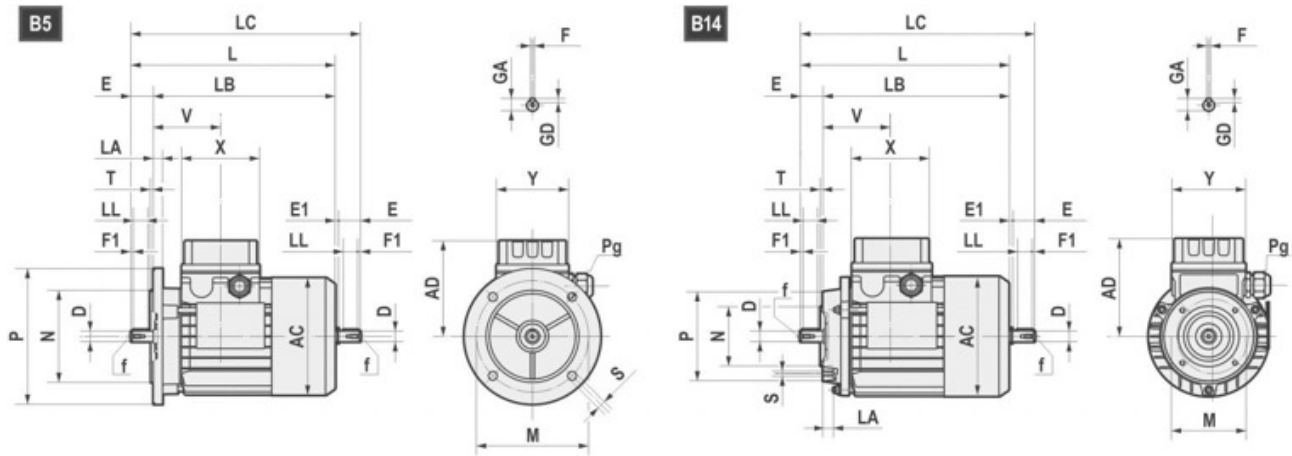
3.4.1 Electric motors



	AC	AD	L	LB	LC	X	Y	V	D	E	E1	f	F1	GA	F	GD
63	121	104	211	188	235,5	80	74	69	11 j6	23	1,5	M4x10	2,5	12,5	4	4
71	139	112	238,5	208,5	271	80	74	74,5	14 j6	30	2,5	M5x12.5	3	16	5	5
80	158	122	272,5 *296	232,5 *256	314 *337	80	74	78	19 j6	40	1,5	M6x16	5	21,5	6	6
90S	173	148	298 *331	248 *281	349,5 *381	98	98	89,5	24 j6	50	1,5	M8x19	5	27	8	7
90L	173	148	323 *356	273 *306	374,5 *408	98	98	89,5	24 j6	50	1,5	M8x19	5	27	8	7
100	191	156	368	308	431,5	98	98	97,5	28 j6	60	3,5	M10x22	7,5	31	8	7
112	211	171	382,5 *408	322,5 *348	447 *472	98	98	100	28 j6	60	3,5	M10x22	7,5	31	8	7
132S	249	195	452	372	536,5	118	118	115,5	38 k6	80	4	M12x28	10	41	10	8
132L	249	195	490	410	574,5	118	118	115,5	38 k6	80	4	M12x28	10	41	10	8
160S	249	195	520	410	/	118	118	115,5	42k6	100	/	M16x36	10	45	12	8

*TP80B4, SH80B4, HSH80B4, TP90S4, SH90S4, HSH90S4, TP90L4, SH90L4, HSH90L4, TP90S6, TP112M4, TP112M6

B5	M	N	P	LA	S	T	B14	M	N	P	LA	S	T
63	115	95	140	10	9	3	63	75	60	90	10	M5	2,5
71	130	110	160	10	9,5	3,5	71	85	70	105	10,5	M6	2,5
80	165	130	200	12	11	3,5	80	100	80	120	10,5	M6	3
90	165	130	200	12	11	3,5	90	115	95	140	11,5	M8	3
100	215	180	250	15	14	4	100	130	110	160	15	M8	3,5
112	215	180	250	14,5	14	4	112	130	110	160	11,5	M8	3,5
132	265	230	300	20	14	3,5	132	165	130	200	20,5	M10	3,5
160	300	250	350	13	18,5	3,5	160	215	180	250	-	M12	4



		AC	AD	L	LB	X	D	E	f	GA	F	GD	LL	Pg	
160M	2-4-6	314	251	600	490	158	42	110	M16	45	12	8	90	2-M40x1,5	1-M16x1,5
160L	2-4-6	314	251	645	535	158	42	110	M16	45	12	8	90	2-M40x1,5	1-M16x1,5
180M	2-4	355	267	680	570	158	48	110	M16	51,5	14	9	100	2-M40x1,5	1-M16x1,5
180L	4-6	355	267	720	610	158	48	110	M16	51,5	14	9	100	2-M40x1,5	1-M16x1,5
200L	2-4-6	397	300	785	675	187	55	110	M20	59	16	10	100	2-M50x1,5	1-M16x1,5
225S	4	446	325	820	680	187	60	140	M20	64	18	11	125	2-M50x1,5	1-M16x1,5
225M	2	446	325	815	705	187	55	110	M20	59	16	10	100	2-M50x1,5	1-M16x1,5
225M	4-6	446	325	845	705	187	60	140	M20	64	18	11	125	2-M50x1,5	1-M16x1,5
250M	2-4-6	485	360	910	770	238	60	140	M20	64	18	11	125	2-M63x1,5	1-M16x1,5
250M	2-4-6	485	360	910	770	238	65	140	M20	69	18	11	125	2-M63x1,5	1-M16x1,5
280S	2-4-6	547	390	970	830	238	65	140	M20	69	18	11	125	2-M63x1,5	1-M16x1,5
280S	2-4-6	547	390	970	830	238	75	140	M20	79,5	20	12	125	2-M63x1,5	1-M16x1,5
280M	2-4-6	547	390	1025	885	238	65	140	M20	69	18	11	125	2-M63x1,5	1-M16x1,5
280M	2-4-6	547	390	1025	885	238	75	140	M20	79,5	20	12	125	2-M63x1,5	1-M16x1,5

B5	M	N	P	LA	S	T
160	300	250	350	13	19	5
180	300	250	350	15	19	5
200	350	300	400	17	19	5
225	400	350	450	20	19	5
250	500	450	550	22	19	5
280	500	450	550	22	19	5

3.4.2 Standard high efficiency (TS), high (TH, SH, HSH) and premium (TP) motors

Motovario, three-phase, single polarity motors are available in three different versions (IE1-IE2-IE3) in compliance with standard 60034-30-1. The efficiency value is calculated according to the method set forth in standard IEC 60034-2-1.

1. IE1: TS series (standard efficiency) for nominal power less than 0,12 kW;
2. IE2: TH series (high efficiency) for nominal power greater than or equal to 0,12 kW and less than 0,75 kW;
3. IE3: TP series (premium efficiency) (*) 4 poles for nominal power greater than or equal to 0,12 kW, 2 and 6 poles for nominal power greater than or equal to 0,75 kW.

Motovario single-phase, single-polarity motors are available in IE2 efficiency class according to IEC 60034-30-1 for nominal power ratings higher than or equal to 0,12 kW and lower than or equal to 2,2 kW. The efficiency value is calculated according to the method set forth in standard IEC 60034-2-1.

Table of Motovario commercial availability

NOMINAL POWER [kW]	EFFICIENCY LEVEL		
	IE1	IE2	IE3
$P_n < 0,12$	TS-TBS	-	-
$0,12 \leq P_n < 0,75$	-	TH-TBH SH-HSH	TP-TBP (**)
$P_n \geq 0,75$	-	SH-HSH	TP-TBP

(*) Motor TP100LA4 2.2 kW and all TP 6 poles motors are available at 60Hz only upon request. As a consequence, these motors are in IE3 efficiency level at 50 Hz and IE2 at 60 Hz in case of bifrequency electrical design (standard 230/400-265/460V 50-60Hz and optional 200/346-220/380V 50-60Hz, 290/500-330/575V 50-60Hz and 400/690-460/800V 50-60Hz, see chapter on input voltage and frequency).

(**) Only 4 poles.

3.4.3 Nominal power - [kW]

P.	63A			63B		63C	63D	71A		71B		71C
	TS	TH	TP	TH	TP	TH	TH	TH	TP	TH	TP	TH
2	-	0,18	-	0,25	-	0,37	-	0,37	-	0,55	-	-
4	-	0,12	0,12	0,18	0,18	-	0,25	0,25	0,25	0,37	0,37	0,55
6	0,09	-	-	0,12	-	-	-	0,18	-	0,25	-	0,37

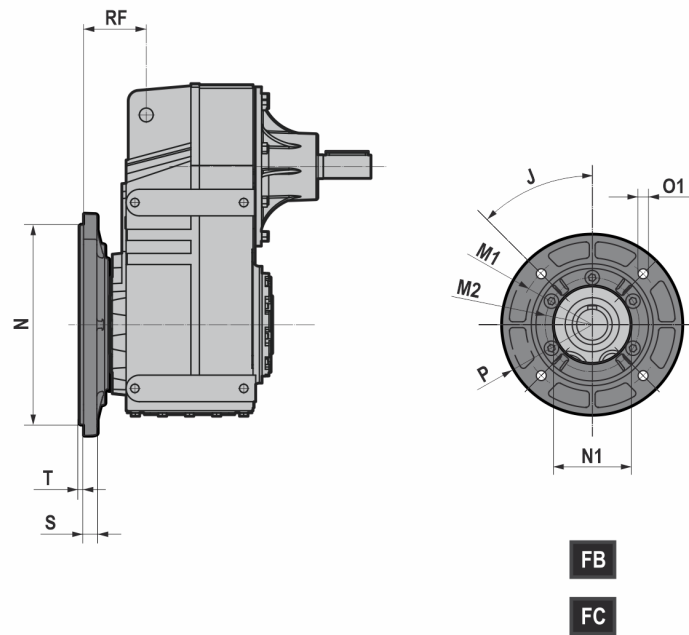
P.	80A		80B		90S	90L	100LR	100LA	100L	112MR	112MS	112M
	TH	TP	TH	TP	TP	TP	TP	TP	TP	TP	TP	TP
2	-	0,75	-	1,1	1,5	2,2	-	-	3	-	-	4
4	0,55	0,55	-	0,75	1,1	1,5	-	2,2	-	2,2	3	4
6	0,37	-	0,55	-	0,75	-	1,1	-	1,5	-	-	2,2

P.	132S	132MS	132MA	132MB	132M
	TP	TP	TP	TP	TP
2	5,5	-	-	-	7,5
4	-	5,5	-	-	7,5
6	3	-	4	5,5	-

P.	160M	160MA	160MB	160L	160LA	180M	180L
	TP	TP	TP	TP	TP	TP	TP
2	-	11	15	18,5	-	22	-
4	-	11	-	-	15	18,5	22
6	7,5	-	-	11	-	-	15

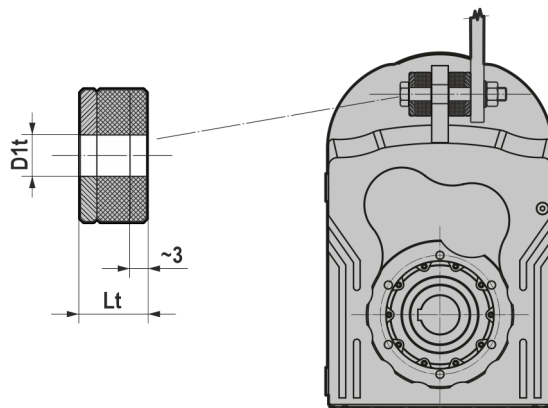
P.	200L	200LA	200LB	225S	225M	250M	280S	280M
	TP	TP	TP	TP	TP	TP	TP	TP
2	-	30	37	-	-	-	-	-
4	30	-	-	37	45	55	75	90
6	-	18,5	22	-	-	-	-	-

4.2 OUTPUT FLANGE



		J	M1	N	O1	P	S	T	RF
SN142/SN143	FB	45°	400	350-0,04/-0,02	18	450	20	5	126
	FC	22,5°	350	300-0,05/-0,02	18	400	20	5	126
SN152/SN153	FB	22,5°	400	350-0,05/-0,02	18	450	24	5	157
SN162/SN163	FB	22,5°	500	450-0,06/-0,02	18	550	26	5	200
SN182/SN183	FB	22,5°	600	550-0,06/-0,02	22	660	26	6	206

4.3.1 Reaction bolt

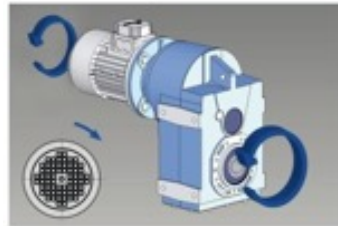


	D1t	Lt
SN142/SN143	26	40
SN152/SN153	26	40
SN162/SN163	32	60
SN182/SN183	32	60

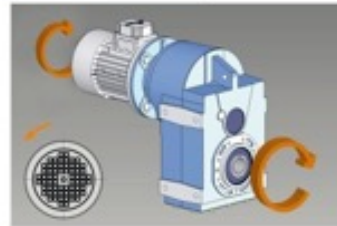
Gear reducers may be equipped with a backstop device. The backstop device allows shafts to rotate in one direction only. It is essential that while ordering you specify the direction of rotation required.

DIRECTION OF ROTATION AVAILABLE

S... 2/C-D-L

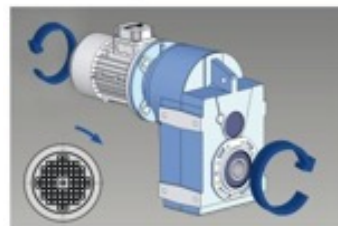


CLOCKWISE IN RELATION
TO THE INPUT SHAFT

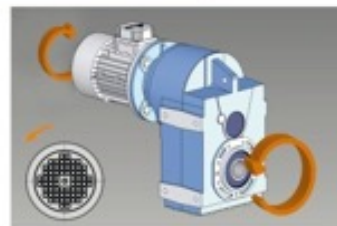


ANTI-CLOCKWISE IN RELATION
TO THE INPUT SHAFT

S... 3/C-D-L



CLOCKWISE IN RELATION
TO THE INPUT SHAFT

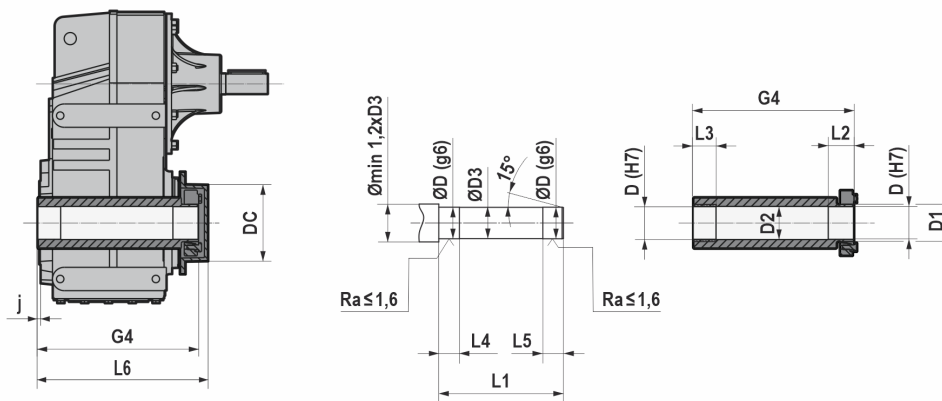


ANTI-CLOCKWISE IN RELATION
TO THE INPUT SHAFT

Clean and degrease the surfaces of the shaft to be coupled to. Comply with the indicated tightening torque of screws (M_T).

The shrink disc is designed only to transmit the output torque.

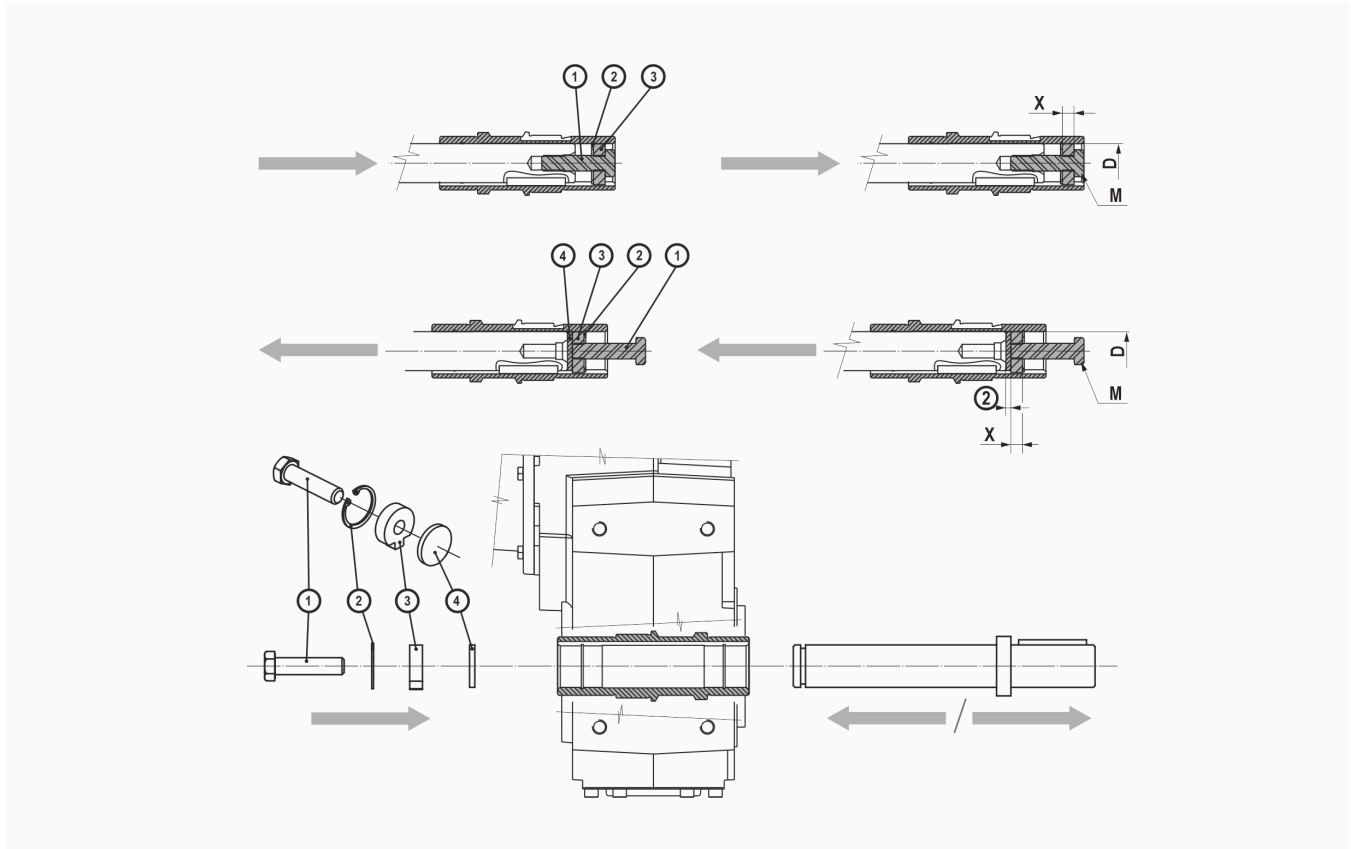
In case of radial and/or axial loads or V5-V6 mounting positions, please contact the technical support.



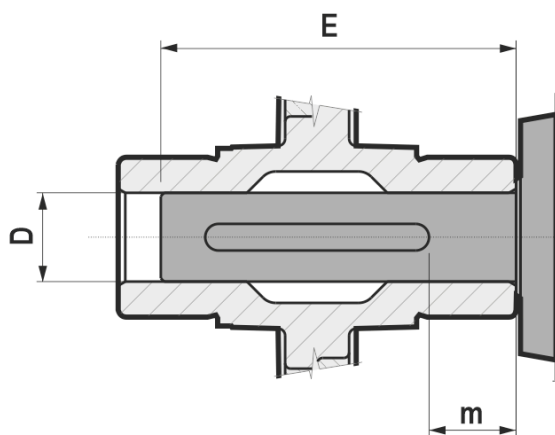
	DC	D	D1	D2	D3	G4	L1	L2	L3	L4	L5	L6	j	M_T 10.9 [Nm]
SN142/SN143	164	70	80	71	69	345	348	55	50	55	63	366	6	30
SN152/SN153	204	90	110	91	89	418	421	70	60	70	83	440	7,5	59
SN162/SN163	252	110	140	111	109	492	495	80	70	80	93	519	9	100
SN182/SN183	288	120	155	121	119	570	573	90	80	90	103	593	10	100

Assembly/disassembly kit for hollow shaft gear reducers with key that includes:

1. Fixing screw
2. Circlip
3. Fixed nut
4. Forcing washer



	D	X	M
SN142/SN143	70	16	M24
SN152/SN153	90	20	M30
SN162/SN163	110	20	M30
SN182/SN183	120	20	M30



	D h6	E*	m*
SN142/SN143	70	248	5
SN152/SN153	90	287	5
SN162/SN163	110	347	5
SN182/SN183	120	434	5

(*) Suggested values.

5.1 SN GEARED MOTORS (50Hz)

1,50 kW							
n_2 [rpm]	M_2 [Nm]	sf	i	Gear reduc- er	Motor Size/Poles	n_1 [rpm]	Fr_2 [N]
4,3	3111	1,4	221,47	SN143	100L/6	955	39600
4,8	2771	1,6	197,01	SN143	100L/6	955	41834
5,7	2365	1,8	167,96	SN143	100L/6	955	44147
6,8	1969	2,2	139,76	SN143	100L/6	955	46253
7,7	1756	2,4	124,53	SN143	100L/6	955	47295
7,7	1756	2,4	124,53	SN143	100L/6	955	47295
4,3	3124	2,6	222,16	SN153	100L/6	955	79856
5,0	2678	3,0	190,20	SN153	100L/6	955	81373
6,0	2228	3,6	158,23	SN153	100L/6	955	82813

2,20 kW							
n_2 [rpm]	M_2 [Nm]	sf	i	Gear reduc- er	Motor Size/Poles	n_1 [rpm]	Fr_2 [N]
6,5	3018	1,4	221,47	SN143	100L/4a	1450	40162
7,4	2688	1,6	197,01	SN143	100L/4a	1450	42343
8,6	2295	1,9	167,96	SN143	100L/4a	1450	44618
10,4	1910	2,3	139,76	SN143	100L/4a	1450	46564
11,6	1704	2,5	124,53	SN143	100L/4a	1450	47556
4,4	4522	1,0	221,47	SN143	112M/6	965	26935
4,9	4027	1,1	197,01	SN143	112M/6	965	32204
5,7	3438	1,3	167,96	SN143	112M/6	965	37227
6,5	3030	2,6	222,16	SN153	100L/4a	1450	80200
7,6	2598	3,1	190,20	SN153	100L/4a	1450	81650
9,2	2162	3,7	158,23	SN153	100L/4a	1450	83029
4,3	4540	1,8	222,16	SN153	112M/6	965	74383
5,1	3892	2,1	190,20	SN153	112M/6	965	77017
6,1	3239	2,5	158,23	SN153	112M/6	965	79451

3,00 kW							
n_2 [rpm]	M_2 [Nm]	sf	i	Gear reduc- er	Motor Size/Poles	n_1 [rpm]	Fr_2 [N]
6,5	4118	1,0	221,47	SN143	100L/4b	1450	31316
7,4	3668	1,2	197,01	SN143	100L/4b	1450	35396
8,6	3131	1,4	167,96	SN143	100L/4b	1450	39385
10,4	2607	1,6	139,76	SN143	100L/4b	1450	42832
11,6	2325	1,8	124,53	SN143	100L/4b	1450	44444
5,8	4660	0,9	167,96	SN143	132S/6	970	25164
14,0	1928	2,2	69,18	SN143	132S/6	970	46507
15,9	1697	2,5	60,82	SN143	132S/6	970	47615
16,3	1655	2,6	59,34	SN143	132S/6	970	47810
19,0	1425	3,0	51,01	SN143	132S/6	970	48832
21,9	1238	3,5	44,27	SN143	132S/6	970	49622

5.1 SN GEARED MOTORS (50Hz)

3,00 kW							
n_2 [rpm]	M_2 [Nm]	sf	i	Gear reduc- er	Motor Size/Poles	n_1 [rpm]	Fr_2 [N]
25,1	1084	4,0	38,70	SN143	132S/6	970	50245
6,5	4135	1,9	222,16	SN153	100L/4b	1450	76089
7,6	3545	2,3	190,20	SN153	100L/4b	1450	78360
9,2	2950	2,7	158,23	SN153	100L/4b	1450	80474
10,2	2642	3,0	141,55	SN153	100L/4b	1450	81498
4,4	6153	1,3	222,16	SN153	132S/6	970	66852
5,1	5275	1,5	190,20	SN153	132S/6	970	71217
6,1	4390	1,8	158,23	SN153	132S/6	970	75104

4,00 kW							
n_2 [rpm]	M_2 [Nm]	sf	i	Gear reduc- er	Motor Size/Poles	n_1 [rpm]	Fr_2 [N]
7,4	4858	0,9	197,01	SN143	112M/4	1460	22387
8,7	4148	1,0	167,96	SN143	112M/4	1460	31041
10,4	3453	1,2	139,76	SN143	112M/4	1460	37109
11,7	3080	1,4	124,53	SN143	112M/4	1460	39813
14,0	2573	1,7	69,18	SN143	132M/6a	970	43022
15,9	2265	1,9	60,82	SN143	132M/6a	970	44766
16,3	2209	1,9	59,34	SN143	132M/6a	970	45068
19,0	1902	2,3	51,01	SN143	132M/6a	970	46637
21,9	1653	2,6	44,27	SN143	132M/6a	970	47819
25,1	1447	3,0	38,70	SN143	132M/6a	970	48713
28,5	1273	3,4	34,02	SN143	132M/6a	970	49524
6,6	5477	1,5	222,16	SN153	112M/4	1460	70275
7,7	4696	1,7	190,20	SN153	112M/4	1460	73725
9,2	3908	2,0	158,23	SN153	112M/4	1460	76929
10,3	3500	2,3	141,55	SN153	112M/4	1460	78480
4,4	8212	1,0	222,16	SN153	132M/6a	970	53965
5,1	7040	1,1	190,20	SN153	132M/6a	970	61827
6,1	5859	1,4	158,23	SN153	132M/6a	970	68379
11,9	3038	2,6	81,72	SN153	132M/6a	970	80178
13,4	2698	3,0	72,50	SN153	132M/6a	970	81433
7,6	4757	2,7	128,20	SN163	132M/6a	970	108689
8,4	4273	3,0	115,03	SN163	132M/6a	970	109905
9,6	3749	3,5	101,03	SN163	132M/6a	970	111224
11,0	3269	4,0	87,95	SN163	132M/6a	970	112387

5,50 kW							
n_2 [rpm]	M_2 [Nm]	sf	i	Gear reduc- er	Motor Size/Poles	n_1 [rpm]	Fr_2 [N]
10,4	4749	0,9	139,76	SN143	132S/4	1460	23996
11,7	4236	1,0	124,53	SN143	132S/4	1460	30119
13,8	3606	1,2	106,08	SN143	132S/4	1460	35903
16,0	3105	1,4	91,19	SN143	132S/4	1460	39572
18,4	2698	1,6	79,14	SN143	132S/4	1460	42224
21,1	2362	1,8	69,18	SN143	132S/4	1460	44240
24,0	2079	2,1	60,82	SN143	132S/4	1460	45753
24,6	2027	2,1	59,34	SN143	132S/4	1460	46036
28,6	1746	2,5	51,01	SN143	132S/4	1460	47360
33,0	1517	2,8	44,27	SN143	132S/4	1460	48408
37,7	1328	3,2	38,70	SN143	132S/4	1460	49229
42,9	1169	3,7	34,02	SN143	132S/4	1460	49888
5,1	9687	0,8	190,20	SN153	132M/6b	970	40559
6,1	8062	1,0	158,23	SN153	132M/6b	970	55041
6,6	7531	1,1	222,16	SN153	132S/4	1460	58725
7,7	6457	1,2	190,20	SN153	132S/4	1460	65096
9,2	5375	1,5	158,23	SN153	132S/4	1460	70674
10,3	4813	1,7	141,55	SN153	132S/4	1460	73313
11,9	4159	1,9	122,41	SN153	132S/4	1460	76114
13,8	3607	2,2	105,99	SN153	132S/4	1460	78129
15,7	3159	2,5	92,70	SN153	132S/4	1460	79752
17,9	2788	2,9	81,72	SN153	132S/4	1460	81023
20,1	2476	3,2	72,50	SN153	132S/4	1460	82044
7,6	6545	2,0	128,20	SN163	132M/6b	970	103371
8,4	5880	2,2	115,03	SN163	132M/6b	970	105394
9,6	5160	2,5	101,03	SN163	132M/6b	970	107474
11,0	4499	2,9	87,95	SN163	132M/6b	970	109257
11,4	4365	3,0	128,20	SN163	132S/4	1460	109629
12,7	3921	3,3	115,03	SN163	132S/4	1460	110765
14,5	3441	3,8	101,03	SN163	132S/4	1460	111948

7,50 kW							
n_2 [rpm]	M_2 [Nm]	sf	i	Gear reduc- er	Motor Size/Poles	n_1 [rpm]	Fr_2 [N]
56,1	1233	3,5	26,11	SN142	132M/4	1465	49626
62,7	1104	3,9	23,36	SN142	132M/4	1465	50149
13,8	4902	0,9	106,08	SN143	132M/4	1465	21751
16,1	4221	1,0	91,19	SN143	132M/4	1465	30278
18,5	3668	1,2	79,14	SN143	132M/4	1465	35393
21,2	3211	1,3	69,18	SN143	132M/4	1465	38825
24,1	2826	1,5	60,82	SN143	132M/4	1465	41425
24,7	2756	1,6	59,34	SN143	132M/4	1465	41865
28,7	2373	1,8	51,01	SN143	132M/4	1465	44128
33,1	2063	2,1	44,27	SN143	132M/4	1465	45805
37,9	1806	2,4	38,70	SN143	132M/4	1465	47074
43,1	1590	2,7	34,02	SN143	132M/4	1465	48083
7,7	8778	0,9	190,20	SN153	132M/4	1465	49412
9,3	7306	1,1	158,23	SN153	132M/4	1465	60185
10,3	6543	1,2	141,55	SN153	132M/4	1465	64613
12,0	5654	1,4	122,41	SN153	132M/4	1465	69316
13,8	4903	1,6	105,99	SN153	132M/4	1465	72842
15,8	4294	1,9	92,70	SN153	132M/4	1465	75467
17,9	3790	2,1	81,72	SN153	132M/4	1465	77436
20,2	3366	2,4	72,50	SN153	132M/4	1465	79012
23,2	2938	2,7	41,85	SN153	160M/6	970	80447
26,1	2609	3,1	37,12	SN153	160M/6	970	81553
29,3	2329	3,4	33,10	SN153	160M/6	970	81723
30,4	2244	3,6	31,92	SN153	160M/6	970	80959
35,1	1947	4,0	27,65	SN153	160M/6	970	77981
11,4	5934	2,2	128,20	SN163	132M/4	1465	105268
12,7	5330	2,4	115,03	SN163	132M/4	1465	107010
14,5	4678	2,8	101,03	SN163	132M/4	1465	108802
16,7	4079	3,2	87,95	SN163	132M/4	1465	110365
18,9	3593	3,6	77,36	SN163	132M/4	1465	111578
7,6	8928	1,5	128,20	SN163	160M/6	970	95338
8,4	8020	1,6	115,03	SN163	160M/6	970	98632
9,6	7038	1,8	101,03	SN163	160M/6	970	101926
5,1	13330	1,4	191,74	SN183	160M/6	970	213157
5,7	11902	1,5	171,00	SN183	160M/6	970	216210
6,3	10721	1,7	153,87	SN183	160M/6	970	218856
7,1	9484	1,9	136,23	SN183	160M/6	970	221480
8,1	8307	2,2	119,15	SN183	160M/6	970	216491
9,2	7353	2,4	105,33	SN183	160M/6	970	209704
10,3	6563	2,7	93,91	SN183	160M/6	970	203492
11,5	5899	3,1	84,31	SN183	160M/6	970	197762
13,5	5030	3,6	71,87	SN183	160M/6	970	189465

11,00 kW							
n_2 [rpm]	M_2 [Nm]	sf	i	Gear reduc- er	Motor Size/Poles	n_1 [rpm]	Fr_2 [N]
56,3	1803	2,4	26,11	SN142	160M/4	1470	47106
62,9	1615	2,7	23,36	SN142	160M/4	1470	47994
72,8	1395	3,1	20,20	SN142	160M/4	1470	48964
84,0	1210	3,6	17,49	SN142	160M/4	1470	49740
21,2	4694	0,9	69,18	SN143	160M/4	1470	24752
24,2	4132	1,0	60,82	SN143	160M/4	1470	31197
24,8	4030	1,1	59,34	SN143	160M/4	1470	32186
28,8	3470	1,2	51,01	SN143	160M/4	1470	36977
33,2	3016	1,4	44,27	SN143	160M/4	1470	40245
38,0	2640	1,6	38,70	SN143	160M/4	1470	42628
43,2	2324	1,9	34,02	SN143	160M/4	1470	44445
48,9	2055	2,1	30,04	SN143	160M/4	1470	45809
10,4	9566	0,8	141,55	SN153	160M/4	1470	42043
12,0	8267	1,0	122,41	SN153	160M/4	1470	53529
13,9	7169	1,1	105,99	SN153	160M/4	1470	61044
15,9	6279	1,3	92,70	SN153	160M/4	1470	66194
18,0	5542	1,4	81,72	SN153	160M/4	1470	69958
20,3	4922	1,6	72,50	SN153	160M/4	1470	72832
22,7	4393	1,8	64,64	SN153	160M/4	1470	75095
23,6	4233	1,9	62,33	SN153	160M/4	1470	75673
27,2	3672	2,2	53,99	SN153	160M/4	1470	78025
31,3	3200	2,5	46,99	SN153	160M/4	1470	78160
35,1	2856	2,8	41,85	SN153	160M/4	1470	76007
39,6	2537	3,2	37,12	SN153	160M/4	1470	73800
44,4	2265	3,5	33,10	SN153	160M/4	1470	71706
46,1	2182	3,7	31,92	SN153	160M/4	1470	71048
7,6	13102	1,0	128,20	SN163	160L/6	970	76189
8,4	11769	1,1	115,03	SN163	160L/6	970	83159
9,6	10328	1,3	101,03	SN163	160L/6	970	89728
11,5	8675	1,5	128,20	SN163	160M/4	1470	96275
12,8	7793	1,7	115,03	SN163	160M/4	1470	99413
14,6	6839	1,9	101,03	SN163	160M/4	1470	102535
16,7	5964	2,2	87,95	SN163	160M/4	1470	105238
19,0	5253	2,5	77,36	SN163	160M/4	1470	107277
21,4	4665	2,8	68,62	SN163	160M/4	1470	108878
24,0	4171	3,1	61,27	SN163	160M/4	1470	110166
26,7	3749	3,5	55,01	SN163	160M/4	1470	111226
28,3	3537	3,7	51,94	SN163	160M/4	1470	111744
5,1	19562	0,9	191,74	SN183	160L/6	970	195964

5.1 SN GEARED MOTORS (50Hz)

11,00 kW							
n_2 [rpm]	M_2 [Nm]	sf	i	Gear reduc- er	Motor Size/Poles	n_1 [rpm]	Fr_2 [N]
5,7	17467	1,0	171,00	SN183	160L/6	970	201979
6,3	15733	1,1	153,87	SN183	160L/6	970	206831
7,1	13918	1,3	136,23	SN183	160L/6	970	211539
7,7	12950	1,4	191,74	SN183	160M/4	1470	213002
8,6	11564	1,6	171,00	SN183	160M/4	1470	207413
9,6	10417	1,7	153,87	SN183	160M/4	1470	202265
12,3	8073	2,2	119,15	SN183	160M/4	1470	189920
14,0	7146	2,5	105,33	SN183	160M/4	1470	184068
15,7	6379	2,8	93,91	SN183	160M/4	1470	178699
17,4	5733	3,1	84,31	SN183	160M/4	1470	173736
20,5	4889	3,7	71,87	SN183	160M/4	1470	166537

15,00 kW							
n_2 [rpm]	M_2 [Nm]	sf	i	Gear reduc- er	Motor Size/Poles	n_1 [rpm]	Fr_2 [N]
56,3	2460	1,7	26,11	SN142	160L/4	1470	43734
62,9	2203	2,0	23,36	SN142	160L/4	1470	45142
72,8	1903	2,3	20,20	SN142	160L/4	1470	46607
84,0	1650	2,6	17,49	SN142	160L/4	1470	47858
96,1	1445	3,0	15,30	SN142	160L/4	1470	48770
109,0	1275	3,3	13,48	SN142	160L/4	1470	49694
122,9	1132	3,6	11,96	SN142	160L/4	1470	51109
137,8	1010	3,8	10,67	SN142	160L/4	1470	50313
142,9	973	3,9	10,29	SN142	160L/4	1470	49831
28,8	4733	0,9	51,01	SN143	160L/4	1470	24222
33,2	4114	1,0	44,27	SN143	160L/4	1470	31358
38,0	3601	1,2	38,70	SN143	160L/4	1470	36035
43,2	3170	1,4	34,02	SN143	160L/4	1470	39262
48,9	2802	1,5	30,04	SN143	160L/4	1470	41693
13,9	9778	0,8	105,99	SN153	160L/4	1470	39792
15,9	8563	0,9	92,70	SN153	160L/4	1470	51192
18,0	7559	1,1	81,72	SN153	160L/4	1470	58545
20,3	6713	1,2	72,50	SN153	160L/4	1470	63899
22,7	5992	1,3	64,64	SN153	160L/4	1470	67809
23,6	5773	1,4	62,33	SN153	160L/4	1470	68915
27,2	5008	1,6	53,99	SN153	160L/4	1470	72524
31,3	4364	1,8	46,99	SN153	160L/4	1470	75276
35,1	3896	2,1	41,85	SN153	160L/4	1470	73747
39,6	3461	2,3	37,12	SN153	160L/4	1470	71803

5.1 SN GEARED MOTORS (50Hz)

15,00 kW							
n_2 [rpm]	M_2 [Nm]	sf	i	Gear reducer	Motor Size/Poles	n_1 [rpm]	Fr_2 [N]
44,4	3089	2,6	33,10	SN153	160L/4	1470	69933
46,1	2977	2,7	31,92	SN153	160L/4	1470	69340
53,2	2582	3,1	27,65	SN153	160L/4	1470	67002
61,1	2250	3,6	24,06	SN153	160L/4	1470	64756
11,5	11832	1,1	128,20	SN163	160L/4	1470	83040
12,8	10629	1,2	115,03	SN163	160L/4	1470	88576
14,6	9328	1,4	101,03	SN163	160L/4	1470	93920
16,7	8134	1,6	87,95	SN163	160L/4	1470	98325
19,0	7165	1,8	77,36	SN163	160L/4	1470	101590
21,4	6363	2,0	68,62	SN163	160L/4	1470	104135
24,0	5689	2,3	61,27	SN163	160L/4	1470	106096
26,7	5113	2,5	55,01	SN163	160L/4	1470	107712
28,3	4825	2,7	51,94	SN163	160L/4	1470	108496
32,4	4224	3,1	45,41	SN163	160L/4	1470	110068
36,8	3718	3,5	39,92	SN163	160L/4	1470	111333
41,7	3286	4,0	35,24	SN163	160L/4	1470	112372
7,7	17662	1,0	191,74	SN183	160L/4	1470	201861
8,6	15771	1,1	171,00	SN183	160L/4	1470	200345
9,6	14207	1,3	153,87	SN183	160L/4	1470	195935
10,8	12569	1,4	136,23	SN183	160L/4	1470	190782
12,3	11010	1,6	119,15	SN183	160L/4	1470	185067
14,0	9746	1,8	105,33	SN183	160L/4	1470	179796
15,7	8700	2,1	93,91	SN183	160L/4	1470	174905
17,4	7820	2,3	84,31	SN183	160L/4	1470	170340
20,5	6668	2,7	71,87	SN183	160L/4	1470	163654
23,2	5886	3,1	63,36	SN183	160L/4	1470	158457
26,2	5228	3,4	56,21	SN183	160L/4	1470	153599
6,3	21348	0,8	153,87	SN183	180L/6	975	190136
7,2	18885	1,0	136,23	SN183	180L/6	975	198061

18,50 kW							
n_2 [rpm]	M_2 [Nm]	sf	i	Gear reducer	Motor Size/Poles	n_1 [rpm]	Fr_2 [N]
56,5	3024	1,4	26,11	SN142	180M/4	1475	40194
63,1	2708	1,6	23,36	SN142	180M/4	1475	42220
73,0	2339	1,8	20,20	SN142	180M/4	1475	44361
84,3	2029	2,1	17,49	SN142	180M/4	1475	46006
96,4	1776	2,4	15,30	SN142	180M/4	1475	47287
109,4	1568	2,7	13,48	SN142	180M/4	1475	48429

18,50 kW							
n_2 [rpm]	M_2 [Nm]	sf	i	Gear reduc- er	Motor Size/Poles	n_1 [rpm]	Fr_2 [N]
123,3	1392	2,9	11,96	SN142	180M/4	1475	50093
138,3	1242	3,1	10,67	SN142	180M/4	1475	49662
143,4	1197	3,2	10,29	SN142	180M/4	1475	49202
165,5	1038	3,4	8,91	SN142	180M/4	1475	47408
190,2	904	3,7	7,75	SN142	180M/4	1475	45708
198,1	868	3,3	7,45	SN142	180M/4	1475	45019
223,2	771	3,5	6,61	SN142	180M/4	1475	43618
250,4	688	3,7	5,89	SN142	180M/4	1475	42302
259,7	663	3,8	5,68	SN142	180M/4	1475	41890
33,3	5057	0,9	44,27	SN143	180M/4	1475	19234
38,1	4427	1,0	38,70	SN143	180M/4	1475	28011
43,4	3897	1,1	34,02	SN143	180M/4	1475	33413
49,1	3445	1,2	30,04	SN143	180M/4	1475	37171
64,8	2638	3,0	22,77	SN152	180M/4	1475	62824
74,4	2299	3,5	19,82	SN152	180M/4	1475	60757
84,6	2025	4,0	17,44	SN152	180M/4	1475	58860
18,0	9291	0,9	81,72	SN153	180M/4	1475	44784
20,3	8252	1,0	72,50	SN153	180M/4	1475	53639
22,8	7366	1,1	64,64	SN153	180M/4	1475	59799
23,7	7097	1,1	62,33	SN153	180M/4	1475	61486
27,3	6156	1,3	53,99	SN153	180M/4	1475	66847
31,4	5365	1,5	46,99	SN153	180M/4	1475	70804
35,2	4789	1,7	41,85	SN153	180M/4	1475	71691
39,7	4254	1,9	37,12	SN153	180M/4	1475	69983
44,6	3798	2,1	33,10	SN153	180M/4	1475	68311
46,2	3659	2,2	31,92	SN153	180M/4	1475	67776
53,3	3174	2,5	27,65	SN153	180M/4	1475	65647
61,3	2766	2,9	24,06	SN153	180M/4	1475	63576
11,5	14544	0,9	128,20	SN163	180M/4	1475	67406
12,8	13066	1,0	115,03	SN163	180M/4	1475	76391
14,6	11467	1,1	101,03	SN163	180M/4	1475	84605
16,8	9999	1,3	87,95	SN163	180M/4	1475	91103
19,1	8808	1,5	77,36	SN163	180M/4	1475	95782
21,5	7822	1,7	68,62	SN163	180M/4	1475	99313
24,1	6993	1,9	61,27	SN163	180M/4	1475	101922
26,8	6286	2,1	55,01	SN163	180M/4	1475	104319
28,4	5931	2,2	51,94	SN163	180M/4	1475	105467
32,5	5192	2,5	45,41	SN163	180M/4	1475	107447
36,9	4570	2,8	39,92	SN163	180M/4	1475	109130

5.1 SN GEARED MOTORS (50Hz)

18,50 kW							
n_2 [rpm]	M_2 [Nm]	sf	i	Gear reducer	Motor Size/Poles	n_1 [rpm]	Fr_2 [N]
41,9	4040	3,2	35,24	SN163	180M/4	1475	110499
48,4	3498	3,7	30,50	SN163	180M/4	1475	110047
8,6	19387	0,9	171,00	SN183	180M/4	1475	193925
9,6	17464	1,0	153,87	SN183	180M/4	1475	190175
10,8	15450	1,2	136,23	SN183	180M/4	1475	185696
12,4	13534	1,3	119,15	SN183	180M/4	1475	180628
14,0	11980	1,5	105,33	SN183	180M/4	1475	175876
15,7	10694	1,7	93,91	SN183	180M/4	1475	171410
17,5	9613	1,9	84,31	SN183	180M/4	1475	167201
20,5	8197	2,2	71,87	SN183	180M/4	1475	160973
23,3	7236	2,5	63,36	SN183	180M/4	1475	156087
26,2	6427	2,8	56,21	SN183	180M/4	1475	151490
34,0	4972	3,6	43,38	SN183	180M/4	1475	141753

22,00 kW							
n_2 [rpm]	M_2 [Nm]	sf	i	Gear reducer	Motor Size/Poles	n_1 [rpm]	Fr_2 [N]
56,5	3596	1,2	26,11	SN142	180L/4	1475	35981
63,1	3220	1,3	23,36	SN142	180L/4	1475	38832
73,0	2782	1,5	20,20	SN142	180L/4	1475	41759
84,3	2413	1,8	17,49	SN142	180L/4	1475	43953
96,4	2113	2,0	15,30	SN142	180L/4	1475	45575
109,4	1865	2,3	13,48	SN142	180L/4	1475	47008
123,3	1656	2,4	11,96	SN142	180L/4	1475	49004
138,3	1478	2,6	10,67	SN142	180L/4	1475	49051
143,4	1423	2,7	10,29	SN142	180L/4	1475	48614
165,5	1234	2,9	8,91	SN142	180L/4	1475	46901
190,2	1075	3,1	7,75	SN142	180L/4	1475	45268
198,1	1033	2,8	7,45	SN142	180L/4	1475	44556
223,2	917	3,0	6,61	SN142	180L/4	1475	43208
250,4	818	3,2	5,89	SN142	180L/4	1475	41937
259,7	788	3,2	5,68	SN142	180L/4	1475	41539
299,8	684	3,5	4,92	SN142	180L/4	1475	39988
344,4	595	3,7	4,28	SN142	180L/4	1475	38523
43,4	4635	0,9	34,02	SN143	180L/4	1475	25522
49,1	4097	1,0	30,04	SN143	180L/4	1475	31539
64,8	3137	2,6	22,77	SN152	180L/4	1475	61763
74,4	2735	2,9	19,82	SN152	180L/4	1475	59838
84,6	2409	3,3	17,44	SN152	180L/4	1475	58055

5.1 SN GEARED MOTORS (50Hz)

22,00 kW							
n_2 [rpm]	M_2 [Nm]	sf	i	Gear reduc- er	Motor Size/Poles	n_1 [rpm]	Fr_2 [N]
95,4	2139	3,6	15,46	SN152	180L/4	1475	56394
106,8	1911	3,8	13,81	SN152	180L/4	1475	54839
23,7	8440	0,9	62,33	SN153	180L/4	1475	52195
27,3	7322	1,1	53,99	SN153	180L/4	1475	60083
31,4	6380	1,3	46,99	SN153	180L/4	1475	65641
35,2	5696	1,4	41,85	SN153	180L/4	1475	69203
39,7	5060	1,6	37,12	SN153	180L/4	1475	68194
44,6	4517	1,8	33,10	SN153	180L/4	1475	66726
46,2	4352	1,8	31,92	SN153	180L/4	1475	66250
53,3	3775	2,1	27,65	SN153	180L/4	1475	64334
61,3	3290	2,4	24,06	SN153	180L/4	1475	62440
14,6	13637	1,0	101,03	SN163	180L/4	1475	73103
16,8	11891	1,1	87,95	SN163	180L/4	1475	82552
19,1	10475	1,2	77,36	SN163	180L/4	1475	89089
21,5	9303	1,4	68,62	SN163	180L/4	1475	93895
24,1	8317	1,6	61,27	SN163	180L/4	1475	97578
26,8	7476	1,7	55,01	SN163	180L/4	1475	100487
28,4	7054	1,8	51,94	SN163	180L/4	1475	101711
32,5	6175	2,1	45,41	SN163	180L/4	1475	104682
36,9	5435	2,4	39,92	SN163	180L/4	1475	106765
41,9	4805	2,7	35,24	SN163	180L/4	1475	108506
48,4	4161	3,1	30,50	SN163	180L/4	1475	108822
55,3	3642	3,6	26,66	SN163	180L/4	1475	105180
62,9	3206	4,0	23,44	SN163	180L/4	1475	101746
10,8	18374	1,0	136,23	SN183	180L/4	1475	180681
12,4	16096	1,1	119,15	SN183	180L/4	1475	176275
14,0	14248	1,3	105,33	SN183	180L/4	1475	172053
15,7	12719	1,4	93,91	SN183	180L/4	1475	168021
17,5	11432	1,6	84,31	SN183	180L/4	1475	164173
20,5	9748	1,8	71,87	SN183	180L/4	1475	158409
23,3	8605	2,1	63,36	SN183	180L/4	1475	153837
26,2	7643	2,4	56,21	SN183	180L/4	1475	149503
34,0	5913	3,0	43,38	SN183	180L/4	1475	140230
38,6	5220	3,4	38,24	SN183	180L/4	1475	135800
43,5	4637	3,9	33,93	SN183	180L/4	1475	131656

5.1 SN GEARED MOTORS (50Hz)

30,00 kW							
n_2 [rpm]	M_2 [Nm]	sf	i	Gear reduc- er	Motor Size/Poles	n_1 [rpm]	Fr_2 [N]
73,0	3795	1,1	20,20	SN142	200L/4	1475	34319
84,3	3290	1,3	17,49	SN142	200L/4	1475	38327
96,4	2881	1,5	15,30	SN142	200L/4	1475	41129
109,4	2543	1,7	13,48	SN142	200L/4	1475	43495
123,3	2258	1,8	11,96	SN142	200L/4	1475	46209
138,3	2015	1,9	10,67	SN142	200L/4	1475	47639
143,4	1941	2,0	10,29	SN142	200L/4	1475	47254
165,5	1684	2,1	8,91	SN142	200L/4	1475	45729
190,2	1467	2,3	7,75	SN142	200L/4	1475	44252
198,1	1409	2,0	7,45	SN142	200L/4	1475	43485
223,2	1251	2,2	6,61	SN142	200L/4	1475	42262
250,4	1117	2,3	5,89	SN142	200L/4	1475	41097
259,7	1076	2,4	5,68	SN142	200L/4	1475	40729
299,8	933	2,5	4,92	SN142	200L/4	1475	39289
344,4	812	2,7	4,28	SN142	200L/4	1475	37917
64,8	4278	1,9	22,77	SN152	200L/4	1475	59298
74,4	3730	2,1	19,82	SN152	200L/4	1475	57706
84,6	3285	2,4	17,44	SN152	200L/4	1475	56190
95,4	2917	2,6	15,46	SN152	200L/4	1475	54749
106,8	2607	2,8	13,81	SN152	200L/4	1475	53376
119,0	2343	3,0	12,40	SN152	200L/4	1475	52064
126,0	2210	3,1	11,71	SN152	200L/4	1475	51365
144,1	1934	3,3	10,23	SN152	200L/4	1475	49733
163,9	1702	3,6	9,00	SN152	200L/4	1475	48181
169,6	1645	3,2	8,70	SN152	200L/4	1475	47306
190,0	1470	3,4	7,76	SN152	200L/4	1475	46012
211,6	1321	3,6	6,97	SN152	200L/4	1475	44792
224,1	1246	3,7	6,58	SN152	200L/4	1475	44147
256,3	1091	4,0	5,75	SN152	200L/4	1475	42653
291,6	960	4,0	5,06	SN152	200L/4	1475	41246
330,3	848	4,0	4,47	SN152	200L/4	1475	39911
35,2	7768	1,0	41,85	SN153	200L/4	1475	57128
39,7	6900	1,2	37,12	SN153	200L/4	1475	62675
44,6	6160	1,3	33,10	SN153	200L/4	1475	63030
46,2	5935	1,3	31,92	SN153	200L/4	1475	62694
53,3	5149	1,6	27,65	SN153	200L/4	1475	61279
61,3	4487	1,8	24,06	SN153	200L/4	1475	59800
21,5	12687	1,0	68,62	SN163	200L/4	1475	78462
24,1	11342	1,1	61,27	SN163	200L/4	1475	85191

5.1 SN GEARED MOTORS (50Hz)

30,00 kW							
n_2 [rpm]	M_2 [Nm]	sf	i	Gear reduc- er	Motor Size/Poles	n_1 [rpm]	Fr_2 [N]
26,8	10195	1,3	55,01	SN163	200L/4	1475	90282
28,4	9619	1,4	51,94	SN163	200L/4	1475	92646
32,5	8421	1,5	45,41	SN163	200L/4	1475	97201
36,9	7413	1,8	39,92	SN163	200L/4	1475	100697
41,9	6552	2,0	35,24	SN163	200L/4	1475	103433
48,4	5674	2,3	30,50	SN163	200L/4	1475	105990
55,3	4968	2,6	26,66	SN163	200L/4	1475	102716
62,9	4373	3,0	23,44	SN163	200L/4	1475	99587
83,5	3297	3,3	17,67	SN163	200L/4	1475	92088
95,5	2886	3,7	15,45	SN163	200L/4	1475	89035
108,6	2541	4,0	13,58	SN163	200L/4	1475	86150
15,7	17345	1,0	93,91	SN183	200L/4	1475	160126
17,5	15590	1,2	84,31	SN183	200L/4	1475	157128
20,5	13294	1,4	71,87	SN183	200L/4	1475	152454
23,3	11735	1,5	63,36	SN183	200L/4	1475	148619
26,2	10424	1,7	56,21	SN183	200L/4	1475	144897
29,4	9305	1,9	50,12	SN183	200L/4	1475	141287
34,0	8064	2,2	43,38	SN183	200L/4	1475	136711
38,6	7119	2,5	38,24	SN183	200L/4	1475	132711
43,5	6323	2,8	33,93	SN183	200L/4	1475	128926
56,9	4831	3,7	25,92	SN183	200L/4	1475	119680

37,00 kW							
n_2 [rpm]	M_2 [Nm]	sf	i	Gear reduc- er	Motor Size/Poles	n_1 [rpm]	Fr_2 [N]
95,4	3598	2,1	15,46	SN152	225S/4	1475	53286
106,8	3216	2,3	13,81	SN152	225S/4	1475	52076
119,0	2890	2,4	12,40	SN152	225S/4	1475	50903
126,0	2726	2,5	11,71	SN152	225S/4	1475	50272
144,1	2386	2,7	10,23	SN152	225S/4	1475	48782
163,9	2099	2,9	9,00	SN152	225S/4	1475	47349
169,6	2029	2,6	8,70	SN152	225S/4	1475	46387
190,0	1814	2,8	7,76	SN152	225S/4	1475	45195
211,6	1630	2,9	6,97	SN152	225S/4	1475	44061
224,1	1537	3,0	6,58	SN152	225S/4	1475	43458
256,3	1345	3,2	5,75	SN152	225S/4	1475	42053
291,6	1184	3,4	5,06	SN152	225S/4	1475	40720
330,3	1046	3,6	4,47	SN152	225S/4	1475	39449
44,6	7597	1,1	33,10	SN153	225S/4	1475	58284

5.1 SN GEARED MOTORS (50Hz)

37,00 kW							
n_2 [rpm]	M_2 [Nm]	sf	i	Gear reducer	Motor Size/Poles	n_1 [rpm]	Fr_2 [N]
46,2	7320	1,1	31,92	SN153	225S/4	1475	59505
53,3	6351	1,3	27,65	SN153	225S/4	1475	58545
61,3	5534	1,4	24,06	SN153	225S/4	1475	57443
70,7	4800	1,2	20,87	SN153	225S/4	1475	54829
79,3	4285	1,3	18,61	SN153	225S/4	1475	53888
82,2	4128	1,3	17,95	SN153	225S/4	1475	53573
105,2	3265	3,4	14,02	SN162	225S/4	1475	86316
119,3	2881	3,7	12,36	SN162	225S/4	1475	83594
134,5	2558	4,0	10,97	SN162	225S/4	1475	81048
150,9	2283	4,0	9,78	SN162	225S/4	1475	78649
26,8	12575	1,0	55,01	SN163	225S/4	1475	79060
28,4	11865	1,1	51,94	SN163	225S/4	1475	82684
32,5	10387	1,3	45,41	SN163	225S/4	1475	89469
36,9	9143	1,4	39,92	SN163	225S/4	1475	94513
41,9	8082	1,6	35,24	SN163	225S/4	1475	98411
48,4	6999	1,9	30,50	SN163	225S/4	1475	101903
55,3	6127	2,1	26,66	SN163	225S/4	1475	100531
62,9	5394	2,4	23,44	SN163	225S/4	1475	97677
83,5	4067	2,7	17,67	SN163	225S/4	1475	90478
95,5	3560	3,0	15,45	SN163	225S/4	1475	87634
108,6	3134	3,2	13,58	SN163	225S/4	1475	84923
20,5	16397	1,1	71,87	SN183	225S/4	1475	147136
23,3	14474	1,2	63,36	SN183	225S/4	1475	143967
26,2	12857	1,4	56,21	SN183	225S/4	1475	140798
29,4	11477	1,6	50,12	SN183	225S/4	1475	137653
34,0	9946	1,8	43,38	SN183	225S/4	1475	133587
38,6	8780	2,1	38,24	SN183	225S/4	1475	129972
43,5	7799	2,3	33,93	SN183	225S/4	1475	126508
56,9	5959	3,0	25,92	SN183	225S/4	1475	117636
64,6	5261	3,3	22,85	SN183	225S/4	1475	114147
72,8	4673	3,6	20,27	SN183	225S/4	1475	110852

45,00 kW							
n_2 [rpm]	M_2 [Nm]	sf	i	Gear reducer	Motor Size/Poles	n_1 [rpm]	Fr_2 [N]
95,4	4376	1,8	15,46	SN152	225M/4	1475	51587
106,8	3911	1,9	13,81	SN152	225M/4	1475	50569
119,0	3515	2,0	12,40	SN152	225M/4	1475	49558
126,0	3316	2,1	11,71	SN152	225M/4	1475	49005

5.1 SN GEARED MOTORS (50Hz)

45,00 kW							
n_2 [rpm]	M_2 [Nm]	sf	i	Gear reduc- er	Motor Size/Poles	n_1 [rpm]	Fr_2 [N]
144,1	2902	2,2	10,23	SN152	225M/4	1475	47682
163,9	2554	2,4	9,00	SN152	225M/4	1475	46388
169,6	2468	2,1	8,70	SN152	225M/4	1475	45324
190,0	2206	2,3	7,76	SN152	225M/4	1475	44251
211,6	1983	2,4	6,97	SN152	225M/4	1475	43217
224,1	1870	2,5	6,58	SN152	225M/4	1475	42663
256,3	1637	2,7	5,75	SN152	225M/4	1475	41361
291,6	1440	2,8	5,06	SN152	225M/4	1475	40115
330,3	1272	3,0	4,47	SN152	225M/4	1475	38916
53,3	7724	1,0	27,65	SN153	225M/4	1475	55351
61,3	6732	1,2	24,06	SN153	225M/4	1475	54694
70,7	5838	1,0	20,87	SN153	225M/4	1475	52130
79,3	5212	1,1	18,61	SN153	225M/4	1475	51504
82,2	5022	1,1	17,95	SN153	225M/4	1475	51281
105,2	3971	2,8	14,02	SN162	225M/4	1475	85020
119,3	3504	3,0	12,36	SN162	225M/4	1475	82456
134,5	3112	3,3	10,97	SN162	225M/4	1475	80041
150,9	2777	3,5	9,78	SN162	225M/4	1475	77754
168,5	2488	3,7	8,75	SN162	225M/4	1475	75576
181,6	2307	3,4	8,12	SN162	225M/4	1475	73621
206,0	2036	3,7	7,16	SN162	225M/4	1475	71268
232,2	1808	3,9	6,35	SN162	225M/4	1475	69071
260,4	1613	4,0	5,66	SN162	225M/4	1475	67004
32,5	12633	1,0	45,41	SN163	225M/4	1475	78748
36,9	11121	1,2	39,92	SN163	225M/4	1475	86217
41,9	9830	1,3	35,24	SN163	225M/4	1475	91795
48,4	8512	1,5	30,50	SN163	225M/4	1475	96872
55,3	7453	1,7	26,66	SN163	225M/4	1475	98003
62,9	6560	2,0	23,44	SN163	225M/4	1475	95467
83,5	4946	2,2	17,67	SN163	225M/4	1475	88617
95,5	4331	2,4	15,45	SN163	225M/4	1475	86016
108,6	3812	2,7	13,58	SN163	225M/4	1475	83508
88,6	4713	3,8	16,64	SN182	225M/4	1475	104840
23,3	17605	1,0	63,36	SN183	225M/4	1475	138551
26,2	15638	1,2	56,21	SN183	225M/4	1475	136032
29,4	13959	1,3	50,12	SN183	225M/4	1475	133434
34,0	12097	1,5	43,38	SN183	225M/4	1475	129965
38,6	10680	1,7	38,24	SN183	225M/4	1475	126800
43,5	9487	1,9	33,93	SN183	225M/4	1475	123710

45,00 kW							
n_2 [rpm]	M_2 [Nm]	sf	i	Gear reduc- er	Motor Size/Poles	n_1 [rpm]	Fr_2 [N]
144,1	2902	2,2	10,23	SN152	225M/4	1475	47682
163,9	2554	2,4	9,00	SN152	225M/4	1475	46388
169,6	2468	2,1	8,70	SN152	225M/4	1475	45324
190,0	2206	2,3	7,76	SN152	225M/4	1475	44251
211,6	1983	2,4	6,97	SN152	225M/4	1475	43217
224,1	1870	2,5	6,58	SN152	225M/4	1475	42663
256,3	1637	2,7	5,75	SN152	225M/4	1475	41361
291,6	1440	2,8	5,06	SN152	225M/4	1475	40115
330,3	1272	3,0	4,47	SN152	225M/4	1475	38916
53,3	7724	1,0	27,65	SN153	225M/4	1475	55351
61,3	6732	1,2	24,06	SN153	225M/4	1475	54694
70,7	5838	1,0	20,87	SN153	225M/4	1475	52130
79,3	5212	1,1	18,61	SN153	225M/4	1475	51504
82,2	5022	1,1	17,95	SN153	225M/4	1475	51281
105,2	3971	2,8	14,02	SN162	225M/4	1475	85020
119,3	3504	3,0	12,36	SN162	225M/4	1475	82456
134,5	3112	3,3	10,97	SN162	225M/4	1475	80041
150,9	2777	3,5	9,78	SN162	225M/4	1475	77754
168,5	2488	3,7	8,75	SN162	225M/4	1475	75576
181,6	2307	3,4	8,12	SN162	225M/4	1475	73621
206,0	2036	3,7	7,16	SN162	225M/4	1475	71268
232,2	1808	3,9	6,35	SN162	225M/4	1475	69071
260,4	1613	4,0	5,66	SN162	225M/4	1475	67004
32,5	12633	1,0	45,41	SN163	225M/4	1475	78748
36,9	11121	1,2	39,92	SN163	225M/4	1475	86217
41,9	9830	1,3	35,24	SN163	225M/4	1475	91795
48,4	8512	1,5	30,50	SN163	225M/4	1475	96872
55,3	7453	1,7	26,66	SN163	225M/4	1475	98003
62,9	6560	2,0	23,44	SN163	225M/4	1475	95467
83,5	4946	2,2	17,67	SN163	225M/4	1475	88617
95,5	4331	2,4	15,45	SN163	225M/4	1475	86016
108,6	3812	2,7	13,58	SN163	225M/4	1475	83508
88,6	4713	3,8	16,64	SN182	225M/4	1475	104840
23,3	17605	1,0	63,36	SN183	225M/4	1475	138551
26,2	15638	1,2	56,21	SN183	225M/4	1475	136032
29,4	13959	1,3	50,12	SN183	225M/4	1475	133434
34,0	12097	1,5	43,38	SN183	225M/4	1475	129965
38,6	10680	1,7	38,24	SN183	225M/4	1475	126800
43,5	9487	1,9	33,93	SN183	225M/4	1475	123710

5.1 SN GEARED MOTORS (50Hz)

45,00 kW							
n_2 [rpm]	M_2 [Nm]	sf	i	Gear reducer	Motor Size/Poles	n_1 [rpm]	Fr_2 [N]
56,9	7248	2,5	25,92	SN183	225M/4	1475	115272
64,6	6399	2,7	22,85	SN183	225M/4	1475	112074
72,8	5684	3,0	20,27	SN183	225M/4	1475	109022

55,00 kW							
n_2 [rpm]	M_2 [Nm]	sf	i	Gear reducer	Motor Size/Poles	n_1 [rpm]	Fr_2 [N]
105,5	4837	2,3	14,02	SN162	250M/4	1480	83320
119,7	4269	2,5	12,36	SN162	250M/4	1480	80956
135,0	3791	2,7	10,97	SN162	250M/4	1480	78708
151,4	3383	2,8	9,78	SN162	250M/4	1480	76563
169,1	3031	3,0	8,75	SN162	250M/4	1480	74507
182,2	2811	2,8	8,12	SN162	250M/4	1480	72511
206,7	2481	3,0	7,16	SN162	250M/4	1480	70287
233,0	2203	3,2	6,35	SN162	250M/4	1480	68197
261,3	1965	3,4	5,66	SN162	250M/4	1480	66221
42,0	11974	1,1	35,24	SN163	250M/4	1480	82139
48,5	10369	1,3	30,50	SN163	250M/4	1480	89541
55,5	9078	1,4	26,66	SN163	250M/4	1480	94741
63,1	7992	1,6	23,44	SN163	250M/4	1480	92610
83,8	6025	1,8	17,67	SN163	250M/4	1480	86202
95,8	5275	2,0	15,45	SN163	250M/4	1480	83909
109,0	4644	2,2	13,58	SN163	250M/4	1480	81659
88,9	5742	3,1	16,64	SN182	250M/4	1480	103071
100,2	5100	3,5	14,77	SN182	250M/4	1480	100154
112,2	4560	3,9	13,19	SN182	250M/4	1480	97419
124,9	4100	4,0	11,85	SN182	250M/4	1480	94841
29,5	17004	1,1	50,12	SN183	250M/4	1480	128000
34,1	14736	1,2	43,38	SN183	250M/4	1480	125293
38,7	13009	1,4	38,24	SN183	250M/4	1480	122701
43,6	11556	1,6	33,93	SN183	250M/4	1480	120086
57,1	8829	2,0	25,92	SN183	250M/4	1480	112199
64,8	7795	2,2	22,85	SN183	250M/4	1480	109372
73,0	6924	2,4	20,27	SN183	250M/4	1480	106629

75,00 kW							
n_2 [rpm]	M_2 [Nm]	sf	i	Gear reducer	Motor Size/Poles	n_1 [rpm]	Fr_2 [N]
105,9	6575	1,7	14,02	SN162	280S/4	1485	79954
120,1	5803	1,8	12,36	SN162	280S/4	1485	77998

5.1 SN GEARED MOTORS (50Hz)

75,00 kW							
n_2 [rpm]	M_2 [Nm]	sf	i	Gear reduc- er	Motor Size/Poles	n_1 [rpm]	Fr_2 [N]
135,4	5153	2,0	10,97	SN162	280S/4	1485	76090
151,9	4598	2,1	9,78	SN162	280S/4	1485	74232
169,7	4120	2,2	8,75	SN162	280S/4	1485	72422
182,8	3821	2,1	8,12	SN162	280S/4	1485	70338
207,4	3372	2,2	7,16	SN162	280S/4	1485	68373
233,8	2994	2,4	6,35	SN162	280S/4	1485	66500
262,2	2672	2,5	5,66	SN162	280S/4	1485	64709
55,7	12339	1,1	26,66	SN163	280S/4	1485	80292
63,4	10862	1,2	23,44	SN163	280S/4	1485	86865
84,0	8190	1,3	17,67	SN163	280S/4	1485	81356
96,1	7170	1,5	15,45	SN163	280S/4	1485	79700
109,4	6312	1,6	13,58	SN163	280S/4	1485	77978
89,2	7804	2,3	16,64	SN182	280S/4	1485	99589
100,5	6932	2,6	14,77	SN182	280S/4	1485	97071
112,6	6198	2,9	13,19	SN182	280S/4	1485	94669
125,3	5573	3,2	11,85	SN182	280S/4	1485	92373
149,3	4677	3,2	9,94	SN182	280S/4	1485	87788
168,3	4154	3,4	8,82	SN182	280S/4	1485	85342
188,4	3714	3,6	7,88	SN182	280S/4	1485	83043
209,7	3339	3,9	7,08	SN182	280S/4	1485	80872
38,8	17681	1,0	38,24	SN183	280S/4	1485	114422
43,8	15706	1,1	33,93	SN183	280S/4	1485	112795
57,3	12000	1,5	25,92	SN183	280S/4	1485	106031
65,0	10595	1,6	22,85	SN183	280S/4	1485	103969
73,3	9411	1,8	20,27	SN183	280S/4	1485	101861

90,00 kW							
n_2 [rpm]	M_2 [Nm]	sf	i	Gear reduc- er	Motor Size/Poles	n_1 [rpm]	Fr_2 [N]
105,9	7891	1,4	14,02	SN162	280M/4	1485	77431
120,1	6964	1,5	12,36	SN162	280M/4	1485	75790
135,4	6184	1,6	10,97	SN162	280M/4	1485	74144
151,9	5518	1,7	9,78	SN162	280M/4	1485	72507
169,7	4944	1,8	8,75	SN162	280M/4	1485	70885
182,8	4585	1,7	8,12	SN162	280M/4	1485	68728
207,4	4047	1,8	7,16	SN162	280M/4	1485	66962
233,8	3593	2,0	6,35	SN162	280M/4	1485	65255
262,2	3206	2,1	5,66	SN162	280M/4	1485	63604
96,1	8605	1,2	15,45	SN163	280M/4	1485	76513

5.1 SN GEARED MOTORS (50Hz)

90,00 kW							
n_2 [rpm]	M_2 [Nm]	sf	i	Gear reducer	Motor Size/Poles	n_1 [rpm]	Fr_2 [N]
109,4	7575	1,3	13,58	SN163	280M/4	1485	75203
89,2	9365	1,9	16,64	SN182	280M/4	1485	96996
100,5	8319	2,2	14,77	SN182	280M/4	1485	94785
112,6	7439	2,4	13,19	SN182	280M/4	1485	92638
125,3	6688	2,7	11,85	SN182	280M/4	1485	90558
149,3	5612	2,7	9,94	SN182	280M/4	1485	86096
168,3	4985	2,8	8,82	SN182	280M/4	1485	83848
188,4	4457	3,0	7,88	SN182	280M/4	1485	81715
209,7	4007	3,2	7,08	SN182	280M/4	1485	79684
57,3	14401	1,2	25,92	SN183	280M/4	1485	101336
65,0	12714	1,4	22,85	SN183	280M/4	1485	99874
73,3	11294	1,5	20,27	SN183	280M/4	1485	98262

110,00 kW							
n_2 [rpm]	M_2 [Nm]	sf	i	Gear reducer	Motor Size/Poles	n_1 [rpm]	Fr_2 [N]
89,3	11431	1,6	16,64	SN182	315S/4	1487	93460
100,7	10154	1,8	14,77	SN182	315S/4	1487	91668
112,7	9079	2,0	13,19	SN182	315S/4	1487	89869
125,5	8163	2,2	11,85	SN182	315S/4	1487	88082
149,5	6850	2,2	9,94	SN182	315S/4	1487	83786
168,5	6085	2,3	8,82	SN182	315S/4	1487	81809
188,6	5441	2,5	7,88	SN182	315S/4	1487	79900
210,0	4891	2,6	7,08	SN182	315S/4	1487	78059
57,4	17577	1,0	25,92	SN183	315S/4	1487	94903
65,1	15518	1,1	22,85	SN183	315S/4	1487	94271
73,4	13786	1,2	20,27	SN183	315S/4	1487	93342

132,00 kW							
n_2 [rpm]	M_2 [Nm]	sf	i	Gear reducer	Motor Size/Poles	n_1 [rpm]	Fr_2 [N]
89,3	13718	1,3	16,64	SN182	315M/4a	1487	89520
100,7	12185	1,5	14,77	SN182	315M/4a	1487	88203
112,7	10896	1,7	13,19	SN182	315M/4a	1487	86799
125,5	9796	1,8	11,85	SN182	315M/4a	1487	85343
149,5	8221	1,8	9,94	SN182	315M/4a	1487	81230
168,5	7302	1,9	8,82	SN182	315M/4a	1487	79558
188,6	6529	2,1	7,88	SN182	315M/4a	1487	77903
210,0	5870	2,2	7,08	SN182	315M/4a	1487	76276

5.1 SN GEARED MOTORS (50Hz)

132,00 kW							
n_2 [rpm]	M_2 [Nm]	sf	i	Gear reducer	Motor Size/Poles	n_1 [rpm]	Fr_2 [N]
65,1	18623	0,9	22,85	SN183	315M/4a	1487	87944
73,4	16543	1,0	20,27	SN183	315M/4a	1487	87804

160,00 kW							
n_2 [rpm]	M_2 [Nm]	sf	i	Gear reducer	Motor Size/Poles	n_1 [rpm]	Fr_2 [N]
89,4	16617	1,1	16,64	SN182	315M/4b	1488	84381
100,8	14761	1,2	14,77	SN182	315M/4b	1488	83692
112,8	13199	1,4	13,19	SN182	315M/4b	1488	82805
125,6	11866	1,5	11,85	SN182	315M/4b	1488	81785
149,6	9959	1,5	9,94	SN182	315M/4b	1488	77906
168,6	8846	1,6	8,82	SN182	315M/4b	1488	76634
188,8	7910	1,7	7,88	SN182	315M/4b	1488	75310
210,2	7111	1,8	7,08	SN182	315M/4b	1488	73962

ISN142					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
2200	4,28	-	339	-	31593
2370	4,92	-	295	-	32632
2550	5,68	-	255	-	33765
2580	5,89	-	246	-	34127
2730	6,61	-	219	-	35083
2880	7,45	-	195	-	36165
3300	7,75	-	187	-	36215
3540	8,91	-	163	-	37392
3790	10,29	-	141	-	38694
3830	10,67	-	136	-	38291
4030	11,96	-	121	-	35135
4250	13,48	-	108	-	31078
4300	15,30	-	95	-	29600
4300	17,49	-	83	-	29600
4300	20,20	63	72	-	29600
4300	23,36	57	62	-	29600
4300	26,11	52	56	-	29600

ISN143					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
4300	30,04	-	48	370	29600
4300	34,02	-	43	849	29600
4300	38,70	-	37	1284	29600
4300	44,27	-	33	1681	29600
4300	51,01	-	28	2043	29600
4300	59,34	23	24	2374	29600
4300	60,82	-	24	3134	29600
4300	69,18	-	21	3197	29600
4300	79,14	-	18	3254	29600
4300	91,19	-	16	3305	29600
4300	106,08	13	14	3353	29600
4300	124,53	11	12	3414	29600
4300	139,76	10	10	3440	29600
4300	167,96	8	9	3473	29600
4300	197,01	7	7	3499	29600
4300	221,47	6	7	3515	29600

ISN152					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
3800	4,47	-	325	-	30034
4080	5,06	-	287	-	30748
4350	5,75	-	252	-	31612
4630	6,58	-	220	-	32592
4770	6,97	-	208	-	32969
5010	7,76	-	187	-	33787
5260	8,70	-	167	-	34710
6050	9,00	-	161	-	34844
6420	10,23	-	142	-	35845
6820	11,71	-	124	-	36936
7000	12,40	-	117	-	37404
7330	13,81	-	105	-	38349
7680	15,46	-	94	-	39400
8000	17,44	-	83	-	40735
8000	19,82	-	73	-	43221
8000	22,77	100	64	-	46018

ISN153					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
5560	17,95	-	81	-	46247
5620	18,61	-	78	-	46758
5820	20,87	-	69	-	48384
8000	24,06	-	60	-	47165
8000	27,65	-	52	-	50137
8000	31,92	-	45	-	53342
8000	33,10	-	44	-	54175
8000	37,12	-	39	-	55500
8000	41,85	-	35	-	55500
8000	46,99	-	31	2038	55500
8000	53,99	-	27	2582	55500
8000	62,33	-	23	3029	55500
8000	64,64	-	22	3039	55500
8000	72,50	-	20	3122	55500
8000	81,72	-	18	3199	55500
8000	92,70	-	16	3270	55500
8000	105,99	-	14	3335	55500
8000	122,41	21	12	3396	55500
8000	141,55	18	10	3469	55500

ISN153					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
8000	158,23	16	9	3504	55500
8000	190,20	13	8	3555	55500
8000	222,16	11	7	3590	55500

ISN162					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
6660	5,66	-	256	-	24062
7040	6,35	-	228	-	28406
7440	7,16	-	202	-	33157
7870	8,12	-	179	-	38380
9130	8,75	-	166	-	41694
9610	9,78	-	148	-	46426
10120	10,97	-	132	-	51518
10660	12,36	-	117	-	57074
11250	14,02	-	103	-	63142

ISN163					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
10150	13,58	-	107	-	60141
10550	15,45	-	94	-	66375
11000	17,67	-	82	-	69064
13000	23,44	-	62	-	76000
13000	26,66	-	54	-	76000
13000	30,50	-	48	-	76000
13000	35,24	-	41	-	76000
13000	39,92	-	36	1134	76000
13000	45,41	-	32	1938	76000
13000	51,94	-	28	2678	76000
13000	55,01	-	26	3038	76000
13000	61,27	-	24	3530	76000
13000	68,62	-	21	3992	76000
13000	77,36	-	19	4424	76000
13000	87,95	-	16	4829	76000
13000	101,03	40	14	5085	76000
13000	115,03	35	13	5167	76000
13000	128,20	32	11	5218	76000

ISN182					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
12860	7,08	-	205	-	56290
13490	7,88	-	184	-	57625
14170	8,82	-	164	-	59086
14900	9,94	-	146	-	60730
17920	11,85	-	122	-	63010
18000	13,19	-	110	-	66171
18000	14,77	-	98	-	69795
18000	16,64	-	87	-	73773

ISN183					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
16800	20,27	-	72	19858	79179
17400	22,85	-	63	19950	82111
18000	25,92	-	56	20039	85446
18000	33,93	-	43	22918	100000
18000	38,24	-	38	23163	100000
18000	43,38	-	33	23390	100000
18000	50,12	-	29	24913	100000
18000	56,21	-	26	25074	100000
18000	63,36	-	23	25222	100000
18000	71,87	-	20	25359	100000
18000	84,31	-	17	25531	100000
18000	93,91	-	15	25619	100000
18000	105,33	-	14	25702	100000
18000	119,15	-	12	25781	100000
18000	136,23	41	11	25856	100000
18000	153,87	37	9	25922	100000
18000	171,00	33	8	25968	100000
18000	191,74	29	8	26012	100000

ISN142					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
2200	4,28	80	339	-	31593
2370	4,92	75	295	-	32632
2550	5,68	70	255	-	33765
2580	5,89	68	246	-	34127
2730	6,61	64	219	-	35083
2880	7,45	60	195	-	36165
3300	7,75	66	187	-	36215
3540	8,91	62	163	-	37392
3790	10,29	58	141	-	38694
3830	10,67	56	136	-	38291
4030	11,96	53	121	-	35135
4250	13,48	49	108	-	31078
4300	15,30	44	95	-	29600
4300	17,49	39	83	-	29600
4300	20,20	33	72	-	29600
4300	23,36	29	62	-	29600
4300	26,11	26	56	-	29600

ISN143					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
4300	30,04	22	48	370	29600
4300	34,02	20	43	849	29600
4300	38,70	17	37	1284	29600
4300	44,27	15	33	1681	29600
4300	51,01	13	28	2043	29600
4300	59,34	11	24	2374	29600
4300	60,82	11	24	3134	29600
4300	69,18	10	21	3197	29600
4300	79,14	9	18	3254	29600
4300	91,19	7	16	3305	29600
4300	106,08	6	14	3353	29600
4300	124,53	5	12	3414	29600
4300	139,76	5	10	3440	29600
4300	167,96	4	9	3473	29600
4300	197,01	3	7	3499	29600
4300	221,47	3	7	3515	29600

ISN152					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
3800	4,47	132	325	-	30034
4080	5,06	125	287	-	30748
4350	5,75	118	252	-	31612
4630	6,58	110	220	-	32592
4770	6,97	107	208	-	32969
5010	7,76	101	187	-	33787
5260	8,70	94	167	-	34710
6050	9,00	105	161	-	34844
6420	10,23	98	142	-	35845
6820	11,71	91	124	-	36936
7000	12,40	88	117	-	37404
7330	13,81	83	105	-	38349
7680	15,46	78	94	-	39400
8000	17,44	72	83	-	40735
8000	19,82	63	73	-	43221
8000	22,77	55	64	-	46018
4300	26,11	26	56	-	29600

ISN153					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
5560	17,95	48	81	-	46247
5620	18,61	47	78	-	46758
5820	20,87	43	69	-	48384
8000	24,06	52	60	-	47165
8000	27,65	45	52	-	50137
8000	31,92	39	45	-	53342
8000	33,10	38	44	-	54175
8000	37,12	34	39	-	55500
8000	41,85	30	35	-	55500
8000	46,99	27	31	2038	55500
8000	53,99	23	27	2582	55500
8000	62,33	20	23	3029	55500
8000	64,64	19	22	3039	55500
8000	72,50	17	20	3122	55500
8000	81,72	15	18	3199	55500
8000	92,70	14	16	3270	55500
8000	105,99	12	14	3335	55500
8000	122,41	10	12	3396	55500

ISN153					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
8000	141,55	9	10	3469	55500
8000	158,23	8	9	3504	55500
8000	190,20	7	8	3555	55500
8000	222,16	6	7	3590	55500

ISN162					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
6660	5,66	183	256	-	24062
7040	6,35	172	228	-	28406
7440	7,16	162	202	-	33157
7870	8,12	151	179	-	38380
9130	8,75	162	166	-	41694
9610	9,78	153	148	-	46426
10120	10,97	144	132	-	51518
10660	12,36	135	117	-	57074
11250	14,02	125	103	-	63142

ISN163					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
6660	5,66	183	256	-	24062
10550	15,45	106	94	-	66375
11000	17,67	97	82	-	69064
13000	23,44	86	62	-	76000
13000	26,66	76	54	-	76000
13000	30,50	67	48	-	76000
13000	35,24	57	41	-	76000
13000	39,92	51	36	1134	76000
13000	45,41	45	32	1938	76000
13000	51,94	39	28	2678	76000
13000	55,01	37	26	3038	76000
13000	61,27	33	24	3530	76000
13000	68,62	30	21	3992	76000
13000	77,36	26	19	4424	76000
13000	87,95	23	16	4829	76000
13000	101,03	20	14	5085	76000
13000	115,03	18	13	5167	76000
13000	128,20	16	11	5218	76000

ISN182					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
6660	5,66	183	256	-	24062
13490	7,88	266	184	-	57625
14170	8,82	250	164	-	59086
14900	9,94	233	146	-	60730
17920	11,85	236	122	-	63010
18000	13,19	213	110	-	66171
18000	14,77	190	98	-	69795
18000	16,64	169	87	-	73773

ISN183					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
6660	5,66	183	256	-	24062
17400	22,85	118	63	19950	82111
18000	25,92	108	56	20039	85446
18000	33,93	83	43	22918	100000
18000	38,24	73	38	23163	100000
18000	43,38	65	33	23390	100000
18000	50,12	56	29	24913	100000
18000	56,21	50	26	25074	100000
18000	63,36	44	23	25222	100000
18000	71,87	39	20	25359	100000
18000	84,31	33	17	25531	100000
18000	93,91	30	15	25619	100000
18000	105,33	27	14	25702	100000
18000	119,15	24	12	25781	100000
18000	136,23	21	11	25856	100000
18000	153,87	18	9	25922	100000
18000	171,00	17	8	25968	100000
18000	191,74	15	8	26012	100000

ISN142					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
6660	5,66	183	256	-	24062
2370	4,92	56	295	-	32632
2550	5,68	52	255	-	33765
2580	5,89	51	246	-	34127
2730	6,61	48	219	-	35083
2880	7,45	45	195	-	36165
3300	7,75	50	187	-	36215
3540	8,91	46	163	-	37392
3790	10,29	43	141	-	38694
3830	10,67	41	136	-	38291
4030	11,96	37	121	-	35135
4250	13,48	33	108	-	31078
4300	15,30	29	95	-	29600
4300	17,49	25	83	-	29600
4300	20,20	22	72	-	29600
4300	23,36	19	62	-	29600
4300	26,11	17	56	-	29600

ISN143					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
6660	5,66	183	256	-	24062
4300	34,02	13	43	849	29600
4300	38,70	11	37	1284	29600
4300	44,27	10	33	1681	29600
4300	51,01	9	28	2043	29600
4300	59,34	7	24	2374	29600
4300	60,82	7	24	3134	29600
4300	69,18	6	21	3197	29600
4300	79,14	6	18	3254	29600
4300	91,19	5	16	3305	29600
4300	106,08	4	14	3353	29600
4300	124,53	4	12	3414	29600
4300	139,76	3	10	3440	29600
4300	167,96	3	9	3473	29600
4300	197,01	2	7	3499	29600
4300	221,47	2	7	3515	29600

ISN152					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
6660	5,66	183	256	-	24062
4080	5,06	94	287	-	30748
4350	5,75	88	252	-	31612
4630	6,58	82	220	-	32592
4770	6,97	80	208	-	32969
5010	7,76	75	187	-	33787
5260	8,70	71	167	-	34710
6050	9,00	79	161	-	34844
6420	10,23	73	142	-	35845
6820	11,71	68	124	-	36936
7000	12,40	66	117	-	37404
7330	13,81	60	105	-	38349
7680	15,46	53	94	-	39400
8000	17,44	47	83	-	40735
8000	19,82	42	73	-	43221
8000	22,77	36	64	-	46018

ISN153					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
6660	5,66	183	256	-	24062
5620	18,61	35	78	-	46758
5820	20,87	33	69	-	48384
8000	24,06	34	60	-	47165
8000	27,65	30	52	-	50137
8000	31,92	26	45	-	53342
8000	33,10	25	44	-	54175
8000	37,12	22	39	-	55500
8000	41,85	20	35	-	55500
8000	46,99	17	31	2038	55500
8000	53,99	15	27	2582	55500
8000	62,33	13	23	3029	55500
8000	64,64	13	22	3039	55500
8000	72,50	11	20	3122	55500
8000	81,72	10	18	3199	55500
8000	92,70	9	16	3270	55500
8000	105,99	8	14	3335	55500
8000	122,41	7	12	3396	55500
8000	141,55	6	10	3469	55500

ISN153					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
8000	158,23	5	9	3504	55500
8000	190,20	4	8	3555	55500
8000	222,16	4	7	3590	55500

ISN162					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
6660	5,66	137	256	-	24062
7040	6,35	129	228	-	28406
7440	7,16	121	202	-	33157
7870	8,12	113	179	-	38380
9130	8,75	122	166	-	41694
9610	9,78	115	148	-	46426
10120	10,97	108	132	-	51518
10660	12,36	101	117	-	57074
11250	14,02	94	103	-	63142
10150	13,58	87	107	-	60141

ISN163					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
10550	15,45	80	94	-	66375
11000	17,67	73	82	-	69064
13000	23,44	57	62	-	76000
13000	26,66	50	54	-	76000
13000	30,50	44	48	-	76000
13000	35,24	38	41	-	76000
13000	39,92	33	36	1134	76000
13000	45,41	29	32	1938	76000
13000	51,94	26	28	2678	76000
13000	55,01	24	26	3038	76000
13000	61,27	22	24	3530	76000
13000	68,62	19	21	3992	76000
13000	77,36	17	19	4424	76000
13000	87,95	15	16	4829	76000
13000	101,03	13	14	5085	76000
13000	115,03	12	13	5167	76000
13000	128,20	10	11	5218	76000

ISN182					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
12860	7,08	211	205	-	56290
13490	7,88	199	184	-	57625
14170	8,82	187	164	-	59086
14900	9,94	175	146	-	60730
17920	11,85	156	122	-	63010
18000	13,19	140	110	-	66171
18000	14,77	125	98	-	69795
18000	16,64	111	87	-	73773

ISN183					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
16800	20,27	91	72	19858	79179
17400	22,85	81	63	19950	82111
18000	25,92	71	56	20039	85446
18000	33,93	54	43	22918	100000
18000	38,24	48	38	23163	100000
18000	43,38	43	33	23390	100000
18000	50,12	37	29	24913	100000
18000	56,21	33	26	25074	100000
18000	63,36	29	23	25222	100000
18000	71,87	26	20	25359	100000
18000	84,31	22	17	25531	100000
18000	93,91	20	15	25619	100000
18000	105,33	18	14	25702	100000
18000	119,15	16	12	25781	100000
18000	136,23	14	11	25856	100000
18000	153,87	12	9	25922	100000
18000	171,00	11	8	25968	100000
18000	191,74	10	8	26012	100000

ISN142					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
2200	4,28	48	339	-	31593
2370	4,92	45	295	-	32632
2550	5,68	42	255	-	33765
2580	5,89	41	246	-	34127
2730	6,61	39	219	-	35083
2880	7,45	37	195	-	36165
3300	7,75	40	187	-	36215
3540	8,91	38	163	-	37392
3790	10,29	33	141	-	38694
3830	10,67	32	136	-	38291
4030	11,96	28	121	-	35135
4250	13,48	25	108	-	31078
4300	15,30	22	95	-	29600
4300	17,49	19	83	-	29600
4300	20,20	17	72	-	29600
4300	23,36	15	62	-	29600
4300	26,11	13	56	-	29600

ISN143					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
4300	30,04	11	48	370	29600
4300	34,02	10	43	849	29600
4300	38,70	9	37	1284	29600
4300	44,27	8	33	1681	29600
4300	51,01	7	28	2043	29600
4300	59,34	6	24	2374	29600
4300	60,82	6	24	3134	29600
4300	69,18	5	21	3197	29600
4300	79,14	4	18	3254	29600
4300	91,19	4	16	3305	29600
4300	106,08	3	14	3353	29600
4300	124,53	3	12	3414	29600
4300	139,76	2	10	3440	29600
4300	167,96	2	9	3473	29600
4300	197,01	2	7	3499	29600
4300	221,47	2	7	3515	29600

ISN152					
Mn_2 [Nm]	i	Pn_1 [kW]	n_2 [rpm]	Fr_1 [N]	Fr_2 [N]
3800	4,47	80	325	-	30034
4080	5,06	76	287	-	30748
4350	5,75	71	252	-	31612
4630	6,58	66	220	-	32592
4770	6,97	64	208	-	32969
5010	7,76	61	187	-	33787
5260	8,70	57	167	-	34710
6050	9,00	63	161	-	34844
6420	10,23	59	142	-	35845
6820	11,71	54	124	-	36936
7000	12,40	51	117	-	37404
7330	13,81	46	105	-	38349
7680	15,46	41	94	-	39400
8000	17,44	36	83	-	40735
8000	19,82	32	73	-	43221
8000	22,77	28	64	-	46018

ISN153					
Mn_2 [Nm]	i	Pn_1 [kW]	n_2 [rpm]	Fr_1 [N]	Fr_2 [N]
5560	17,95	29	81	-	46247
5620	18,61	28	78	-	46758
5820	20,87	26	69	-	48384
8000	24,06	26	60	-	47165
8000	27,65	23	52	-	50137
8000	31,92	20	45	-	53342
8000	33,10	19	44	-	54175
8000	37,12	17	39	-	55500
8000	41,85	15	35	-	55500
8000	46,99	13	31	2038	55500
8000	53,99	12	27	2582	55500
8000	62,33	10	23	3029	55500
8000	64,64	10	22	3039	55500
8000	72,50	9	20	3122	55500
8000	81,72	8	18	3199	55500
8000	92,70	7	16	3270	55500
8000	105,99	6	14	3335	55500
8000	122,41	5	12	3396	55500
8000	141,55	4	10	3469	55500

ISN153					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
8000	158,23	4	9	3504	55500
8000	190,20	3	8	3555	55500
8000	222,16	3	7	3590	55500

ISN162					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
6660	5,66	110	256	-	24062
7040	6,35	104	228	-	28406
7440	7,16	98	202	-	33157
7870	8,12	91	179	-	38380
9130	8,75	98	166	-	41694
9610	9,78	93	148	-	46426
10120	10,97	87	132	-	51518
10660	12,36	81	117	-	57074
11250	14,02	73	103	-	63142

ISN163					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
10150	13,58	70	107	-	60141
10550	15,45	64	94	-	66375
11000	17,67	58	82	-	69064
13000	23,44	43	62	-	76000
13000	26,66	38	54	-	76000
13000	30,50	33	48	-	76000
13000	35,24	29	41	-	76000
13000	39,92	26	36	1134	76000
13000	45,41	22	32	1938	76000
13000	51,94	20	28	2678	76000
13000	55,01	19	26	3038	76000
13000	61,27	17	24	3530	76000
13000	68,62	15	21	3992	76000
13000	77,36	13	19	4424	76000
13000	87,95	12	16	4829	76000
13000	101,03	10	14	5085	76000
13000	115,03	9	13	5167	76000
13000	128,20	8	11	5218	76000

ISN182					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
12860	7,08	171	205	-	56290
13490	7,88	161	184	-	57625
14170	8,82	151	164	-	59086
14900	9,94	141	146	-	60730
17920	11,85	119	122	-	63010
18000	13,19	107	110	-	66171
18000	14,77	96	98	-	69795
18000	16,64	85	87	-	73773

ISN183					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
16800	20,27	69	72	19858	79179
17400	22,85	62	63	19950	82111
18000	25,92	54	56	20039	85446
18000	33,93	42	43	22918	100000
18000	38,24	37	38	23163	100000
18000	43,38	33	33	23390	100000
18000	50,12	28	29	24913	100000
18000	56,21	25	26	25074	100000
18000	63,36	22	23	25222	100000
18000	71,87	20	20	25359	100000
18000	84,31	17	17	25531	100000
18000	93,91	15	15	25619	100000
18000	105,33	13	14	25702	100000
18000	119,15	12	12	25781	100000
18000	136,23	10	11	25856	100000
18000	153,87	9	9	25922	100000
18000	171,00	8	8	25968	100000
18000	191,74	7	8	26012	100000

ISN142					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
2200	4,28	37	339	-	31593
2370	4,92	35	295	-	32632
2550	5,68	32	255	-	33765
2580	5,89	31	246	-	34127
2730	6,61	30	219	-	35083
2880	7,45	28	195	-	36165
3300	7,75	29	187	-	36215
3540	8,91	25	163	-	37392
3790	10,29	22	141	-	38694
3830	10,67	21	136	-	38291
4030	11,96	19	121	-	35135
4250	13,48	16	108	-	31078
4300	15,30	15	95	-	29600
4300	17,49	13	83	-	29600
4300	20,20	11	72	-	29600
4300	23,36	10	62	-	29600
4300	26,11	9	56	-	29600

ISN143					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
4300	30,04	7	48	370	29600
4300	34,02	7	43	849	29600
4300	38,70	6	37	1284	29600
4300	44,27	5	33	1681	29600
4300	51,01	4	28	2043	29600
4300	59,34	4	24	2374	29600
4300	60,82	4	24	3134	29600
4300	69,18	3	21	3197	29600
4300	79,14	3	18	3254	29600
4300	91,19	2	16	3305	29600
4300	106,08	2	14	3353	29600
4300	124,53	2	12	3414	29600
4300	139,76	2	10	3440	29600
4300	167,96	1	9	3473	29600
4300	197,01	1	7	3499	29600
4300	221,47	1	7	3515	29600

ISN152					
Mn_2 [Nm]	i	Pn_1 [kW]	n_2 [rpm]	Fr_1 [N]	Fr_2 [N]
3800	4,47	61	325	-	30034
4080	5,06	58	287	-	30748
4350	5,75	54	252	-	31612
4630	6,58	51	220	-	32592
4770	6,97	49	208	-	32969
5010	7,76	46	187	-	33787
5260	8,70	44	167	-	34710
6050	9,00	46	161	-	34844
6420	10,23	40	142	-	35845
6820	11,71	35	124	-	36936
7000	12,40	33	117	-	37404
7330	13,81	30	105	-	38349
7680	15,46	27	94	-	39400
8000	17,44	24	83	-	40735
8000	19,82	21	73	-	43221
8000	22,77	18	64	-	46018

ISN153					
Mn_2 [Nm]	i	Pn_1 [kW]	n_2 [rpm]	Fr_1 [N]	Fr_2 [N]
5560	17,95	22	81	-	46247
5620	18,61	22	78	-	46758
5820	20,87	20	69	-	48384
8000	24,06	17	60	-	47165
8000	27,65	15	52	-	50137
8000	31,92	13	45	-	53342
8000	33,10	12	44	-	54175
8000	37,12	11	39	-	55500
8000	41,85	10	35	-	55500
8000	46,99	9	31	2038	55500
8000	53,99	8	27	2582	55500
8000	62,33	7	23	3029	55500
8000	64,64	6	22	3039	55500
8000	72,50	6	20	3122	55500
8000	81,72	5	18	3199	55500
8000	92,70	4	16	3270	55500
8000	105,99	4	14	3335	55500
8000	122,41	3	12	3396	55500
8000	141,55	3	10	3469	55500

ISN153					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
8000	158,23	3	9	3504	55500
8000	190,20	2	8	3555	55500
8000	222,16	2	7	3590	55500

ISN162					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
6660	5,66	84	256	-	24062
7040	6,35	80	228	-	28406
7440	7,16	75	202	-	33157
7870	8,12	70	179	-	38380
9130	8,75	75	166	-	41694
9610	9,78	68	148	-	46426
10120	10,97	61	132	-	51518
10660	12,36	54	117	-	57074
11250	14,02	48	103	-	63142

ISN163					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
10150	13,58	49	107	-	60141
10550	15,45	43	94	-	66375
11000	17,67	38	82	-	69064
13000	23,44	29	62	-	76000
13000	26,66	25	54	-	76000
13000	30,50	22	48	-	76000
13000	35,24	19	41	-	76000
13000	39,92	17	36	1134	76000
13000	45,41	15	32	1938	76000
13000	51,94	13	28	2678	76000
13000	55,01	12	26	3038	76000
13000	61,27	11	24	3530	76000
13000	68,62	10	21	3992	76000
13000	77,36	9	19	4424	76000
13000	87,95	8	16	4829	76000
13000	101,03	7	14	5085	76000
13000	115,03	6	13	5167	76000
13000	128,20	5	11	5218	76000

ISN182					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
12860	7,08	130	205	-	56290
13490	7,88	117	184	-	57625
14170	8,82	105	164	-	59086
14900	9,94	93	146	-	60730
17920	11,85	78	122	-	63010
18000	13,19	70	110	-	66171
18000	14,77	63	98	-	69795
18000	16,64	56	87	-	73773

ISN183					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
16800	20,27	46	72	19858	79179
17400	22,85	40	63	19950	82111
18000	25,92	36	56	20039	85446
18000	33,93	27	43	22918	100000
18000	38,24	24	38	23163	100000
18000	43,38	21	33	23390	100000
18000	50,12	18	29	24913	100000
18000	56,21	16	26	25074	100000
18000	63,36	15	23	25222	100000
18000	71,87	13	20	25359	100000
18000	84,31	11	17	25531	100000
18000	93,91	10	15	25619	100000
18000	105,33	9	14	25702	100000
18000	119,15	8	12	25781	100000
18000	136,23	7	11	25856	100000
18000	153,87	6	9	25922	100000
18000	171,00	5	8	25968	100000
18000	191,74	5	8	26012	100000

ISN142					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
2200	4,28	30	339	-	31593
2370	4,92	28	295	-	32632
2550	5,68	26	255	-	33765
2580	5,89	26	246	-	34127
2730	6,61	24	219	-	35083
2880	7,45	23	195	-	36165
3300	7,75	22	187	-	36215
3540	8,91	19	163	-	37392
3790	10,29	16	141	-	38694
3830	10,67	16	136	-	38291
4030	11,96	14	121	-	35135
4250	13,48	13	108	-	31078
4300	15,30	11	95	-	29600
4300	17,49	10	83	-	29600
4300	20,20	8	72	-	29600
4300	23,36	7	62	-	29600
4300	26,11	6	56	-	29600

ISN143					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
4300	30,04	6	48	370	29600
4300	34,02	5	43	849	29600
4300	38,70	4	37	1284	29600
4300	44,27	4	33	1681	29600
4300	51,01	3	28	2043	29600
4300	59,34	3	24	2374	29600
4300	60,82	3	24	3134	29600
4300	69,18	2	21	3197	29600
4300	79,14	2	18	3254	29600
4300	91,19	2	16	3305	29600
4300	106,08	2	14	3353	29600
4300	124,53	1	12	3414	29600
4300	139,76	1	10	3440	29600
4300	167,96	1	9	3473	29600
4300	197,01	1	7	3499	29600
4300	221,47	1	7	3515	29600

ISN152					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
3800	4,47	50	325	-	30034
4080	5,06	47	287	-	30748
4350	5,75	44	252	-	31612
4630	6,58	41	220	-	32592
4770	6,97	40	208	-	32969
5010	7,76	37	187	-	33787
5260	8,70	36	167	-	34710
6050	9,00	35	161	-	34844
6420	10,23	31	142	-	35845
6820	11,71	27	124	-	36936
7000	12,40	25	117	-	37404
7330	13,81	23	105	-	38349
7680	15,46	20	94	-	39400
8000	17,44	18	83	-	40735
8000	19,82	16	73	-	43221
8000	22,77	14	64	-	46018

ISN153					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
5560	17,95	17	81	-	46247
5620	18,61	17	78	-	46758
5820	20,87	15	69	-	48384
8000	24,06	13	60	-	47165
8000	27,65	11	52	-	50137
8000	31,92	10	45	-	53342
8000	33,10	9	44	-	54175
8000	37,12	8	39	-	55500
8000	41,85	8	35	-	55500
8000	46,99	7	31	2038	55500
8000	53,99	6	27	2582	55500
8000	62,33	5	23	3029	55500
8000	64,64	5	22	3039	55500
8000	72,50	4	20	3122	55500
8000	81,72	4	18	3199	55500
8000	92,70	3	16	3270	55500
8000	105,99	3	14	3335	55500
8000	122,41	3	12	3396	55500
8000	141,55	2	10	3469	55500

ISN153					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
8000	158,23	2	9	3504	55500
8000	190,20	2	8	3555	55500
8000	222,16	1	7	3590	55500

ISN162					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
6660	5,66	69	256	-	24062
7040	6,35	65	228	-	28406
7440	7,16	61	202	-	33157
7870	8,12	57	179	-	38380
9130	8,75	58	166	-	41694
9610	9,78	52	148	-	46426
10120	10,97	46	132	-	51518
10660	12,36	41	117	-	57074
11250	14,02	36	103	-	63142

ISN163					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
10150	13,58	37	107	-	60141
10550	15,45	33	94	-	66375
11000	17,67	29	82	-	69064
13000	23,44	22	62	-	76000
13000	26,66	19	54	-	76000
13000	30,50	17	48	-	76000
13000	35,24	14	41	-	76000
13000	39,92	13	36	1134	76000
13000	45,41	11	32	1938	76000
13000	51,94	10	28	2678	76000
13000	55,01	9	26	3038	76000
13000	61,27	8	24	3530	76000
13000	68,62	7	21	3992	76000
13000	77,36	7	19	4424	76000
13000	87,95	6	16	4829	76000
13000	101,03	5	14	5085	76000
13000	115,03	4	13	5167	76000
13000	128,20	4	11	5218	76000

ISN182					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
12860	7,08	99	205	-	56290
13490	7,88	89	184	-	57625
14170	8,82	80	164	-	59086
14900	9,94	71	146	-	60730
17920	11,85	59	122	-	63010
18000	13,19	53	110	-	66171
18000	14,77	48	98	-	69795
18000	16,64	42	87	-	73773

ISN183					
Mn ₂ [Nm]	i	Pn ₁ [kW]	n ₂ [rpm]	Fr ₁ [N]	Fr ₂ [N]
16800	20,27	35	72	19858	79179
17400	22,85	31	63	19950	82111
18000	25,92	27	56	20039	85446
18000	33,93	21	43	22918	100000
18000	38,24	18	38	23163	100000
18000	43,38	16	33	23390	100000
18000	50,12	14	29	24913	100000
18000	56,21	13	26	25074	100000
18000	63,36	11	23	25222	100000
18000	71,87	10	20	25359	100000
18000	84,31	8	17	25531	100000
18000	93,91	8	15	25619	100000
18000	105,33	7	14	25702	100000
18000	119,15	6	12	25781	100000
18000	136,23	5	11	25856	100000
18000	153,87	5	9	25922	100000
18000	171,00	4	8	25968	100000
18000	191,74	4	8	26012	100000

ATTENTION!

The revised data and information, shown in this technical catalogue, replaces the data of the previous editions. Old data is now obsolete. All technical data, dimensions, weights in this catalogue are subject to changes without warning. Illustrations are not binding. You can find the above mentioned data and information on our site www.motovario.com; please periodically consult the technical documentation on the web site to be always updated about possible modifications of performances and characteristics of the product.

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