

Bonfiglioli **Riduttori**

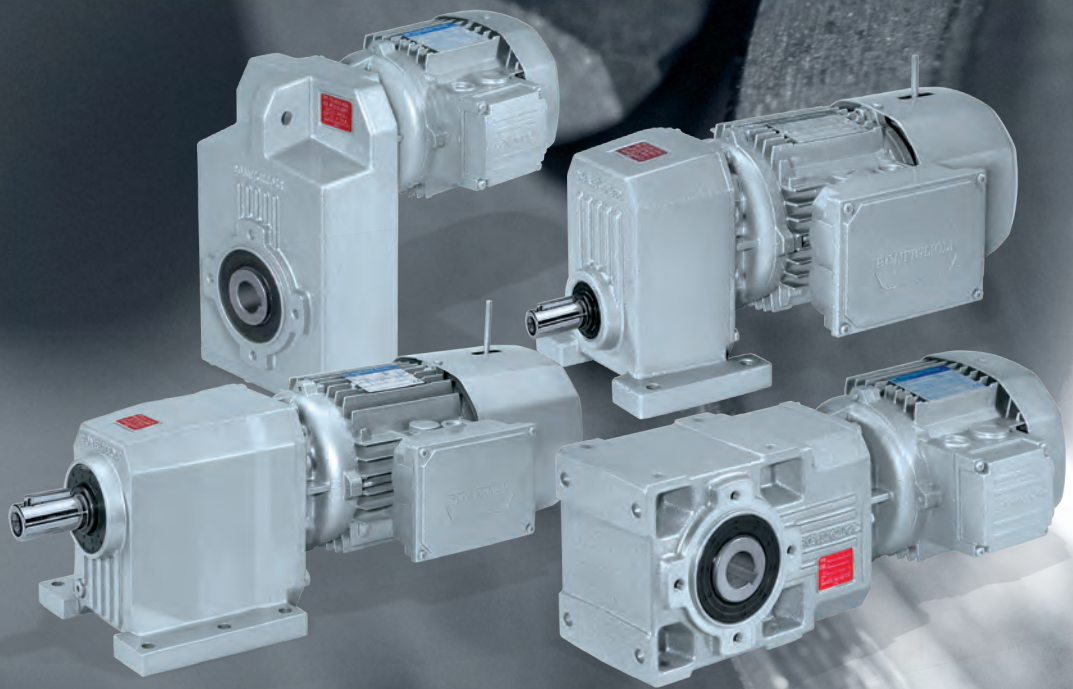
C-A-F-S series

Helical gear units C

Helical bevel gear units A

Shaft mounted gear units F

Single stage gearboxes S



PRODUCT

 **Bonfiglioli**
Forever Forward

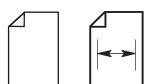


GENERAL INFORMATION

1 SYMBOLS AND UNITS OF MEASURE

Symbols	Units of Measure	Description	Symbols	Units of Measure	Description
$A_{N 1,2}$	[N]	Permissible axial force	$P_{1,2}$	[kW]	Power
f_s	–	Service factor	$P_{N 1,2}$	[kW]	Rated power
f_T	–	Thermal factor	$P_{R 1,2}$	[kW]	Power demand
f_{TP}	–	Temperature factor	$R_{C 1,2}$	[N]	Calculated radial force
i	–	Gear ratio	$R_{N 1,2}$	[N]	Permissible overhung load
l	–	Cyclic duration factor	S	–	Safety factor
J_C	[Kgm ²]	Mass moment of inertia to be driven	t_a	[°C]	Ambient temperature
J_M	[Kgm ²]	Motor mass moment of inertia	t_s	[°C]	Surface temperature
J_R	[Kgm ²]	Mass moment of inertia for the gear unit	t_o	[°C]	Oil temperature
K	–	Mass acceleration factor	t_f	[min]	Work time under constant load
K_r	–	Transmission element factor	t_r	[min]	Rest time
$M_{1,2}$	[Nm]	Torque	η_d	–	Dynamic efficiency
$M_{c 1,2}$	[Nm]	Calculated torque	η_s	–	Static efficiency
$M_{n 1,2}$	[Nm]	Rated torque	φ	[']	Output shaft angular backlash (with locked input shaft)
$M_{r 1,2}$	[Nm]	Torque demand			
$n_{1,2}$	[min ⁻¹]	Speed			

₁ value applies to input shaft
₂ value applies to output shaft



The symbol shows the page the information can be sorted from.



This symbol refers to the angle the overhung load applies (viewing from drive end).



DANGER - WARNING
This symbol indicates situations of danger, which if ignored, may result in serious injury to the operator.



Symbol refers to weight of gearmotors and speed reducers.
Figure for gearmotors incorporates the weight of the 4-pole motor and for life lubricated units, where applicable, the weight of the oil.



IMPORTANT
This symbol indicates important technical information.



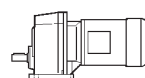
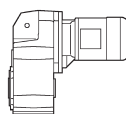
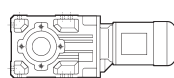
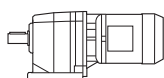
Apply to equipment complying with "ATEX" Directive.

Series C

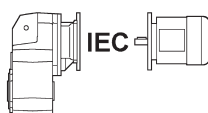
Series A

Series F

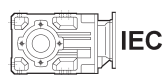
Series S



Gearmotor with compact motor.



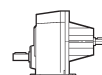
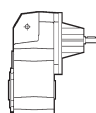
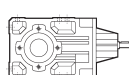
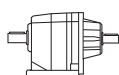
Gearmotor with IEC motor.



Gear unit with IEC motor interface.



Gear unit with servomotor input adapter.




Speed reducer with solid input shaft.




2 ALLOWED TEMPERATURE LIMITS

Symbols	Description / Condition	Value (*)	
		Synthetic Oil	Mineral Oil
t_a	Ambient temperature		
$t_{au \text{ min}}$	Minimum operating ambient temperature	-30°C	-10°C
$t_{au \text{ Max}}$	Maximum operating ambient temperature	+50°C	+40°C
$t_{as \text{ min}}$	Minimum storage ambient temperature	-40°C	-10°C
$t_{as \text{ Max}}$	Maximum storage ambient temperature	+50°C	+50°C
t_s	Surface temperature		
$t_{s \text{ min}}$	Minimum gearbox surface temperature starting with partial load (#)	-25°C	-10°C
$t_{sc \text{ min}}$	Minimum gearbox surface temperature starting with full load	-10°C	-5°C
$t_{s \text{ Max}}$	Maximum casing surface temperature during continuous operation (measured next to the gearbox input)	+100°C	+100°C (@)
t_o	Oil temperature		
$t_{o \text{ Max}}$	Maximum oil temperature during continuous operation	+95°C	+95°C (@)

(*) = Refer to the table "Selection of the optimal oil viscosity" for further information about minimum and maximum values of different oil viscosity. For values of $t_a < -20^\circ\text{C}$ and $t_s, t_o > 80^\circ\text{C}$, choose (as permitted in the product configuration stage) the sealing type of the most suitable material to the type of application. If needed contact Bonfiglioli Technical Service. 

(@) = Continuous operation it is not advised if t_s and t_o range is 80°C to 95°C .

(#) = For full load start-up it is recommended to ramp-up and provide for greater absorption of the motor. If needed, contact Bonfiglioli Technical Service. 



3 TORQUE

3.1 Rated torque M_{n2} [Nm]

The torque that can be transmitted continuously through the output shaft, with the gear unit operated under a service factor $f_s = 1$.
Rating is speed sensitive.

3.2 Required torque M_{r2} [Nm]

The torque demand based on application requirement.
It must always be equal to or less than torque M_{n2} the gearbox under study is rated for.

3.3 Calculated torque M_{c2} [Nm]

Computational torque value to be used when selecting the gearbox. It is calculated considering the required torque M_{r2} and service factor f_s , as per the equation here after:

$$M_{c2} = M_{r2} \cdot f_s < M_{n2} \quad (1)$$

4 POWER

4.1 Rated power P_{n1} [kW]

In the gearbox selection charts this is the power applicable to input shaft, based on input speed n_1 and corresponding to service factor $f_s = 1$.

5 THERMAL CAPACITY P_t [kW]

P_t is the power that can be transmitted through the gear unit, under a continuous duty and an ambient temperature of 20 °C, without resulting into damage of the inner parts or degradation of the lubricant properties. Refer to chart (A1) for specific kW ratings.


In case of intermittent duty, or an operating ambient temperature other than the rated 20°C, the P_t value should be adjusted through the factor f_t , obtained from chart (A2), as per the following equation:


$$P_t' = P_t \times f_t$$





Gear units featuring more than 2 reductions and/or a gear ratio greater than $i = 45$ do not normally require the thermal limit to be checked as in these cases the thermal rating usually exceeds the mechanical rating.

(A 1)

P_t [kW] 20 °C		
	$n_1 = 1400 \text{ min}^{-1}$	$n_1 = 2800 \text{ min}^{-1}$
C 05 2	—	—
C 12 2	—	—
C 22 2	—	—
C 32 2	—	4.5
C 36 2	6.5	5.0
C 41 2	8.0	6.0
C 51 2	11.0	7.8
C 61 2	14.0	10.0
C 70 2	21	16.0
C 80 2	32	24
C 90 2	43	32
C 100 2	59	42

P_t [kW] 20 °C		
	$n_1 = 1400 \text{ min}^{-1}$	$n_1 = 2800 \text{ min}^{-1}$
A 05 2	2.0	1.5
A 10 2	2.1	1.5
A 20 2	6.0	5.4
A 30 2	8.0	6.6
A 35 2	9.5	8.2
A 41 2	11.5	9.6
A 50 2	20	18.0
A 55 2	21	18.0
A 60 2	27	23
A 70 3	31	24
A 80 3	44	33
A 90 3	64	48

P_t [kW] 20 °C		
	$n_1 = 1400 \text{ min}^{-1}$	$n_1 = 2800 \text{ min}^{-1}$
F 10 2	3.8	2.7
F 20 2	9.1	6.5
F 25 2	10.2	7.4
F 31 2	11.7	8.5
F 41 2	14.3	10.4
F 51 2	21.5	15.0
F 60 3	26.0	18.9
F 70 3	36.4	26.0
F 80 3	52	36
F 90 3	75	53

P_t [kW] 20 °C		
	$n_1 = 1400 \text{ min}^{-1}$	$n_1 = 2800 \text{ min}^{-1}$
S 10 1	5.5	4.9
S 20 1	7.8	7.2
S 30 1	10.0	9.1
S 40 1	15.6	14.3
S 50 1	21	18.9



(A 2)

		f_t			
t_a [°C]	Continuous duty	Intermittent duty			
		Degree of intermittence [I]			
		80%	60%	40%	20%
40	0.80	1.1	1.3	1.5	1.6
30	0.85	1.3	1.5	1.6	1.8
20	1.0	1.5	1.6	1.8	2.0
10	1.15	1.6	1.8	2.0	2.3

Where cyclic duration factor (I)% is the relationship of operating time under load t_f to total time ($t_f + t_r$) expressed as a percentage.

$$I = \frac{t_f}{t_f + t_r} \cdot 100 \quad (2)$$

The condition to be verified is:

$$P_{r1} \leq P_t \times f_t \quad (3)$$















6 EFFICIENCY

6.1 Dynamic efficiency η_d

Obtained from the relationship of delivered power P_2 to input power P_1 , according to the following equation:

$$\eta_d = \frac{P_2}{P_1} \cdot 100 \quad [\%] \quad (4)$$

(A 3)

	2 x 	3 x 	4 x 		2 x 	3 x 	4 x 
η_d	95%	93%	90%	η_d	94%	91%	89%
	2 x 	3 x 	4 x 		1 x 		
η_d	95%	93%	90%	η_d	98%		



7 GEAR RATIO i

The value for the gear ratio is referred to with the letter [i] and calculated through the relationship of the input speed n_1 to the output speed n_2 :

$$i = \frac{n_1}{n_2} \quad (5)$$

The gear ratio is usually a decimal number which in this catalogue is truncated at one digit after the comma (no decimals for $i > 1000$).

If interested in knowing the exact value see also chapters "EXACT RATIOS".

8 ANGULAR VELOCITY

8.1 Input speed n_1 [min^{-1}]

The speed is related to the prime mover selected. Catalogue values refer to speed of either single or double speed motors that are common in the industry.

If the gearbox is driven by an external transmission it is recommended to operate it with a speed of 1400 min^{-1} , or lower, in order to optimise operating conditions and lifetime.

Higher input speeds are permitted, however in this case consider that torque rating M_{n2} is affected adversely.

Please consult a Bonfiglioli representative.

8.2 Output speed n_2 [min^{-1}]

The output speed value n_2 is calculated from the relationship of input speed n_1 to the gear ratio i , as per the following equation:

$$n_2 = \frac{n_1}{i} \quad (6)$$

9 MOMENT OF INERTIA J_r [Kgm^2]

Moments of inertia specified in the catalogue refer to the gear unit input axis.

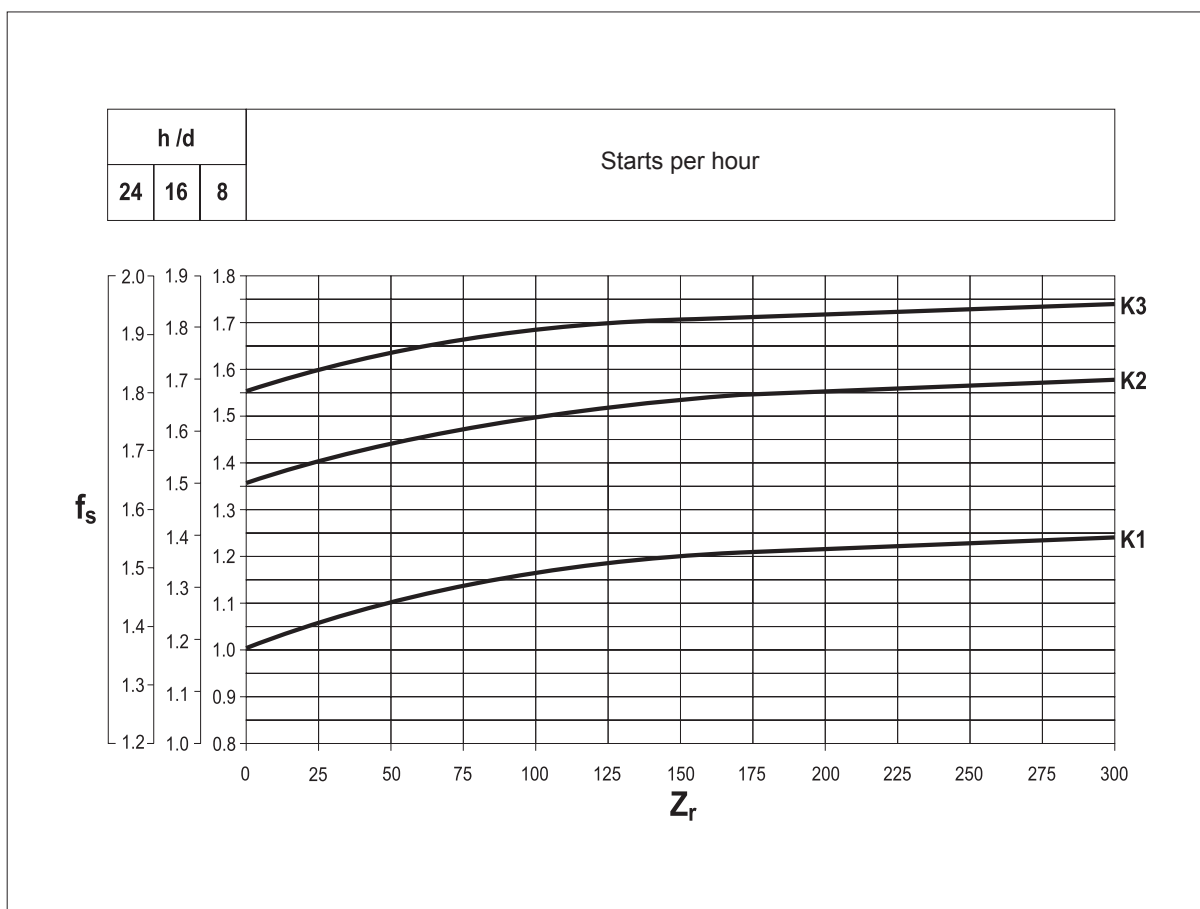
They are therefore related to motor speed, in the case of direct motor mounting.



10 SERVICE FACTOR f_s

This factor is the numeric value describing reducer service duty. It takes into consideration, with unavoidable approximation, daily operating conditions, load variations and overloads connected with reducer application. In the graph (A4) below, after selecting proper “daily working hours” column, the service factor is given by intersecting the number of starts per hour and one of the K1, K2 or K3 curves. K_ curves are linked with the service nature (approximately: uniform, medium and heavy) through the acceleration factor of masses K, connected to the ratio between driven masses and motor inertia values. Regardless of the value given for the service factor, we would like to remind that in some applications, which for example involve lifting of parts, failure of the reducer may expose the operators to the risk of injuries. If in doubt, please contact our Technical Service Department.

(A 4)



10.1 Acceleration factor of masses K

This parameter serves for selecting the right curve for the type of load. The value is given by the following ratio:

(A 5)

$K = \frac{J_c}{J_m}$	\rightarrow	$J_c =$ Moment of inertia of driven masses referred to motor drive shaft	$K \leq 0,25$	\rightarrow K1	Uniform load
		$J_m =$ Motor moment of inertia	$0,25 < K \leq 3$	\rightarrow K2	Moderate shock load
			$3 < K \leq 10$	\rightarrow K3	Heavy shock load
			$K > 10$	\rightarrow	Please consult Bonfiglioli Technical Service



11 LUBRICATION

Life lubricated gearboxes do not require any periodical oil changes.

Refer to the User's Manual available at www.bonfiglioli.com for indications about checking the oil level and its replacement for other types of gearboxes.

Do not mix mineral oils with synthetic oils and/or different brands.

However, oil level should be checked at regular intervals and topped up as required.

Check monthly if unit operates under intermittent duty, more frequently if duty is continuous.

11.1 Selection of the optimal oil viscosity (data relating to Shell Oils)

(A 6)

		Operating ambient temperature [C°]																			
		-40	-35	-30	-25	-20	-15	-10	-5	0	+5	+10	+15	+20	+25	+30	+35	+40	+45	+50	
		suitability seals check				standard seals provided in the catalog															
Splash lubrication	Mineral oil	150 VG							*												
		220 VG	⊘						*											☎	
		320 VG		⊘						*											
		460 VG			⊘						*										
	Synthetic oil (PAG)	150 VG			*															☎	
		220 VG	⊘			*															
		320 VG		⊘			*														
	Synthetic oil (PAO)	150 VG				*														☎	
		220 VG	⊘				*														
		320 VG		⊘				*													

Recommended operating limits

Allowed operating limits. ☎

Forbidden operating limits.

* = It is recommended to ramp-up and to provide for greater absorption of the motor.

If needed and in the event of impulse loads, contact Bonfiglioli Technical Service. ☎



11.2 Lubrication for C, A, F, S series gearboxes

The inner parts of Bonfiglioli gear units are oil-bath and splash lubricated.

Frame sizes C 05...C 41, A 05...A 41, F 10...F 41, S 10...S 40 are supplied by the factory, or by the authorized dealers, already filled with oil.

Unless otherwise specified, units size C 51, A 50, F 51, S 50 and larger are usually supplied unlubricated at it will be the customer care to fill them with oil prior to putting them into operation. In both cases, depending on the version, prior to putting the gear unit into operation may need to replace the closed plug used for transportation purposes with breather plug supplied with.

For the reference charts of oil plugs placement and quantity of lubricant, refer to the Installation, Operation and Maintenance Manual (available on www.bonfiglioli.com).

The “long life” polyglycol-based lubricant supplied by the factory, in the absence of contamination, does not require periodical oil changes throughout the lifetime of the gear unit.

11.3 Lubrication for A-EX (Atex) gearboxes

The inner parts of Bonfiglioli gear units are oil-bath and splash lubricated.

The ATEX version gear unit (with some exceptions see Table below) are factory-charged with “long-life” lubricant SHELL OMALA S4 WE 320 in the quantity suitable for the mounting position specified in the order.

(A 7)

A 05	A 10	A 20	A 30	A 35	A 41	A 50	A 55 ¹⁾	A 60 2 ²⁾	A 60 3 ¹⁾	A 60 4 ¹⁾	A 70 ¹⁾	A 80 ¹⁾	A 90 ¹⁾
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 Gearbox pre-filled with a synthetic “for life” lubricant

 Gearbox pre-filled with a synthetic lubricant

⁽¹⁾ Without lubricant for mounting positions B6 and B7

⁽²⁾ Without lubricant for mounting positions B6, B7 and VB

Gearboxes are fitted with sealed filler plugs for transport purposes. Depending on version, they may be supplied with a vented plug which the user must fit before putting the gearbox into service. Refer to the installation, operation and maintenance manual to replace the filler plug correctly. (These manuals are available in a number of languages and can be downloaded in pdf format from the website www.bonfiglioli.com.)

When a gearbox is supplied with no lubricant, it is recommended to fill it with a lubricant of a similar type, selected from those listed in its installation, operation and maintenance manual.



12 SELECTION

Some fundamental data are necessary to assist the correct selection of a gearbox or gearmotor. The table below (A7) briefly sums up this information.

To simplify selection, fill in the table and send a copy to our Technical Service which will select the most suitable drive unit for your application.

(A 8)

Type of application	A_{c1} Thrust load on input shaft (+/-)(^{***})	N
P_{r2} Output power at n_2 max	J_c Moment of inertia of the load	Kgm ²
P_{r2}' Output power at n_2 min	t_a Ambient temperature	C°
M_{r2} Output torque at n_2 max	Altitude above sea level	m
n₂ Max.output speed	Duty type to IEC norms S...../.....%	
n₂' Min.output speed	Z Starting frequency	1/h
n₁ Max.input speed	Motor voltage	V
n₁' Min.input speed	Brake voltage	V
R_{c2} Radial load on output shaft	Frequency	Hz
x₂ Load application distance (*)	M_b Brake torque	Nm
Load orientation at output	Motor protection degree IP.....	
Output shaft rotation direction (CW-CCW) (**)	Insulation class	
R_{c1} Radial load on input shaft		
x₁ Load application distance (*)		
Load orientation at input		
Input shaft rotation direction (CW-CCW) (**)		
A_{c2} Thrust load on output shaft (+/-)(^{***})		N

(*) Distance x1-2 is between force application point and shaft shoulder (if not indicated the force acting at mid-point of the shaft extension will be considered).

(**) CW = clockwise;
CCW = counterclockwise

(***) + = push
- = pull



For the selection of Series A gear units in ATEX configuration, see also the specific chapter on page 322.

12.1 Selection of a gearmotor

a) Determine service factor f_s according to type of duty (factor K), number of starts per hour Z_r and hours of operation.

$$P_{r1} = \frac{M_{r2} \cdot n_2}{9550 \cdot \eta_d} \text{ [kW]} \quad (7)$$

b) From values of torque M_{r2} , speed n_2 and efficiency η_d the required input power can be calculated from the equation:

Value of η_d for the captioned gear unit can be sorted out from paragraph 6.

$$P_n \geq P_{r1} \quad (8)$$

c) Consult the gearmotor selection charts and locate the table corresponding to normalised power P_n :

Unless otherwise specified, power P_n of motors indicated in the catalogue refers to continuous duty S1. For motors used in conditions other than S1, the type of duty required by reference to CEI 2-3/IEC 34-1 Standards must be mentioned.

For duties from S2 to S8 in particular and for motor frame 132 or smaller, extra power output can be obtained with respect to continuous duty.

Accordingly the following condition must be satisfied:

$$P_n \geq \frac{P_{r1}}{f_m} \quad (9)$$

The adjusting factor f_m can be obtained from table (A9).

12.2 Intermittence ratio

$$I = \frac{t_f}{t_f + t_r} \cdot 100 \quad (10)$$

t_f = work time at constant load

t_r = rest time



(A 9)

	DUTY						Please contact us
	S2			S3*			
	Cycle duration [min]			Cyclic duration factor (I)			
	10	30	60	25%	40%	60%	
f_m	1.35	1.15	1.05	1.25	1.15	1.1	

* Cycle duration, in any event, must be 10 minutes or less. If it is longer, please contact our Technical Service.

Next, refer to the appropriate P_n section within the gearmotor selection charts and locate the unit that features the desired output speed n_2 , or closest to, along with a safety factor S that meets or exceeds the applicable service factor f_s .

The safety factor is so defined:

$$S = \frac{M_{n2}}{M_2} = \frac{P_{n1}}{P_1} \quad (11)$$

As standard, gear and motor combinations are implemented with 2, 4 and 6 pole motors, 50 Hz supplied.

Should the drive speed be different from 2800, 1400 or 900 min⁻¹, base the selection on the gear unit nominal rating.

12.3 Selection of speed reducer and gearbox with IEC motor adapter

a) Determine service factor f_s .

b) Assuming the required output torque for the application M_{r2} is known, the calculation torque can be then defined as:

$$M_{c2} = M_{r2} \cdot f_s \quad (12)$$

c) The gear ratio is calculated according to requested output speed n_2 and drive speed n_1 :

$$i = \frac{n_1}{n_2} \quad (13)$$



Once values for M_{c2} and i are known consult the rating charts under the appropriate input speed n_1 and locate the gear unit that features the gear ratio closest to $[i]$ and at same time offers a rated torque value M_{n2} so that:

$$M_{n2} \geq M_{c2} \quad (14)$$

If a IEC normalized motor must be fitted check geometrical compatibility with the gear unit at paragraph "MOTOR AVAILABILITY".

13 VERIFICATION

After the selection of the speed reducer, or gearmotor, is complete it is recommended that the following verifications are conducted:

a) Thermal capacity

Make sure that the thermal capacity of the gearbox is equal to or greater than the power required by the application according to equation (3) on page 7.

If this condition is not verified, select a larger gearbox or apply a forced cooling system.

b) Maximum torque

The maximum torque (intended as instantaneous peak load) applicable to the gearbox must not, in general, exceed 200% of rated torque M_{n2} . Therefore, check that this limit is not exceeded, using suitable torque limiting devices, if necessary.

For three-phase double speed motors, it is important to pay attention to the switching torque which is generated when switching from high to low speed, because it could be significantly higher than maximum torque.

A simple, economical way to minimize overloading is to power only two phases of the motor during switch-over (power-up time on two phases can be controlled with a time-relay):

$$M_{g2} = 0.5 \cdot M_{g3}$$

M_{g2} = Switching torque with two-phase power-up

M_{g3} = Switching torque with three-phase power-up

We recommend, in any event, to contact our Technical Service.

c) Radial loads

Make sure that radial forces applying on input and/or output shaft are within permittend catalogue values.

If they were higher consider designing a different bearing arrangement before switching to a larger gear unit.

Catalogue values for rated overhung loads refer to mid-point of shaft under study.

Should application point of the overhung load be localised further out the revised loading capability must be adjusted as per instructions given in this manual.

Please refer to the paragraphs relating to radial loads.



d) Thrust loads

Actual thrust load must be found within 20% of the equivalent overhung load capacity.

Should an extremely high, or a combination of radial and axial load apply, consult Bonfiglioli Technical Service.

e) Starts per hour

For duties featuring a high number of switches the actual starting capability in loaded condition [Z] must be calculated.

Actual number of starts per hour must be lower than value so calculated.

14 INSTALLATION

The following installation instructions must be observed:

a) Make sure that the gearbox is correctly secured to avoid vibrations.

If shocks or overloads are expected, install hydraulic couplings, clutches, torque limiters, etc.

b) Before being paint coated, the machined surfaces and the outer face of the oil seals must be protected to prevent paint drying out the rubber and jeopardising the sealing function.

c) Parts fitted on the gearbox output shaft must be machined to ISO H7 tolerance to prevent interference fits that could damage the gearbox itself.

Further, to mount or remove such parts, use suitable pullers or extraction devices using the tapped hole located at the top of the shaft extension.

d) Mating surfaces must be cleaned and treated with suitable protective products before mounting to avoid oxidation and, as a result, seizure of parts.

e) Prior to putting the gear unit into operation make sure that the equipment that incorporates the same complies with the current revision of the Machines Directive 2006/42/EC.

f) Before starting up the machine, make sure that oil level conforms to the mounting position specified for the gear unit and the viscosity is adequate (refer to the User's Manual available at www.bonfiglioli.com).

g) For outdoor installation provide adequate guards in order to protect the drive from rainfalls as well as direct sun radiation.



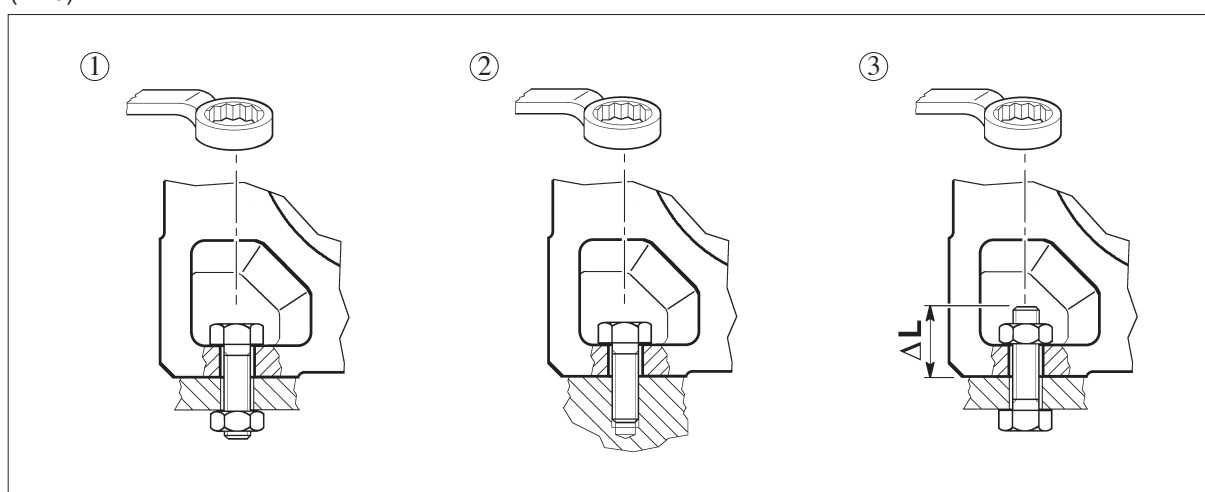
14.1 Fitting servomotors to gear heads featuring a clamping device (adapter type SC)

Turn the clamping device until its slot is aligned to those that are milled on the reducer input shaft. If the motor shaft features a key, this must be removed and the relevant keyway must also be aligned with the slots of clamping device and gear head input shaft, prior to inserting the servomotor into site. The keyway must be sitting on the same side as the locking screw. Tighten the bolts that hold the servomotor to the gear head, insert a torque wrench through the hole on the side of the flange and tighten the locking screw of the clamping device to the torque that is specified in the drawing section for the given adapter.

15 INSTALLATION INSTRUCTIONS

Schemes in table (A10) show the 3 possible installation patterns for A gear units to the machine frame. For each of these circumstances, table (A11) indicates exagonal head screw sizes to be used. Besides, to facilitate the installation, we suggest to use a wrench of the type shown in table (A10).

(A 10)



(A 11)

	Bolt type			
	①	②	③	ΔL (mm)
A 05	M8x22	M8x20	M8x ...	22
A 10	M8x25	M8x20	M8x ...	20
A 20	M8x25	M8x20	M8x ...	20
A 30	M10x30	M10x25	M10x ...	25
A 35	M10x30	M10x25	M10x ...	25
A 41	M12x35	M12x30	M12x ...	30

	Bolt type			
	①	②	③	ΔL (mm)
A 50	M14x45	M14x40	M14x ...	35
A 55	M14x40	M14x40	M14x ...	35
A 60	M16x50	M16x45	M16x ...	40
A 70	M20x60	M20x55	M20x ...	45
A 80	M24x70	M24x65	M24x ...	55
A 90	M24x90	M24x80	M24x ...	65



16 STORAGE

Observe the following instructions to ensure correct storage of the products:

- a) Do not store outdoors, in areas exposed to weather or with excessive humidity.
- b) Always place boards, wood or other material between the products and the floor. The gearboxes should not have direct contact with the floor.
- c) In case of long-term storage all machined surfaces such as flanges, shafts and couplings must be coated with a suitable rust inhibiting product (Mobilarma 248 or equivalent).

Furthermore gear units must be placed with the fill plug in the highest position and filled up with oil. Before putting the units into operation the appropriate quantity, and type, of oil must be restored (refer to the User's Manual available at www.bonfiglioli.com).

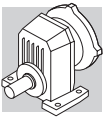
17 CONDITIONS OF SUPPLY

Gear units are supplied as follows:

- a) configured for installation in the mounting position specified when ordering;
- b) tested to manufacturer specifications;
- c) mating machined surfaces come unpainted;
- d) nuts and bolts for mounting motors are provided;
- e) shafts are protected during transportation by plastic caps;
- f) supplied with lifting lug (where applicable).

18 PAINT SPECIFICATIONS

Specifications for paint applied to gearboxes (where applicable) may be obtained from the branches or dealers that supplied the units.



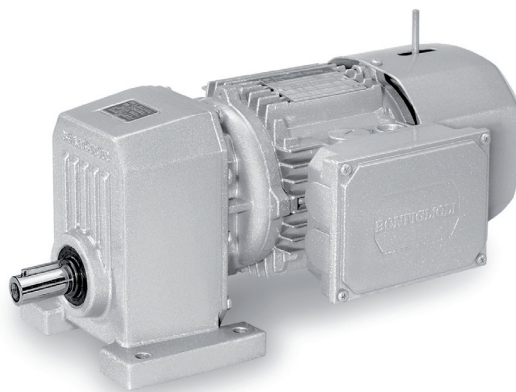
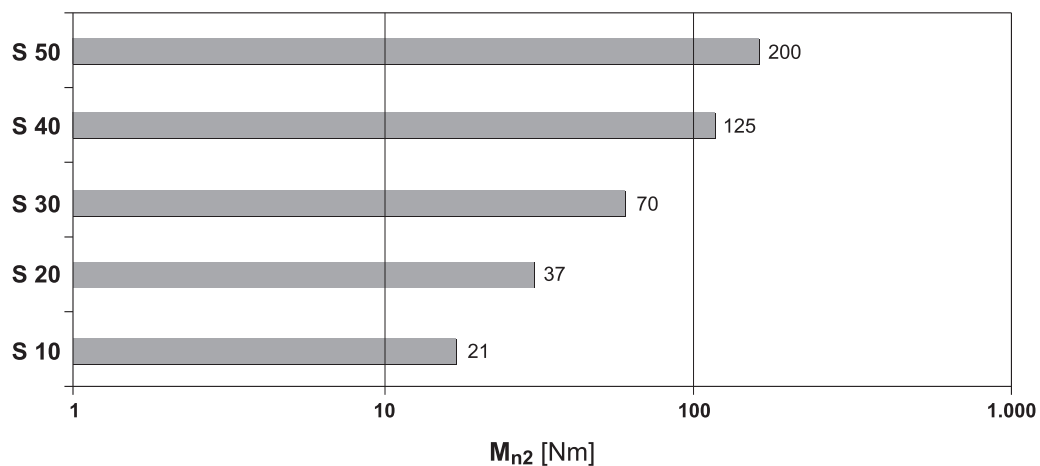
SINGLE STAGE GEARBOXES SERIES S

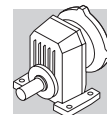
67 DESIGN FEATURES

The main design characteristics are:

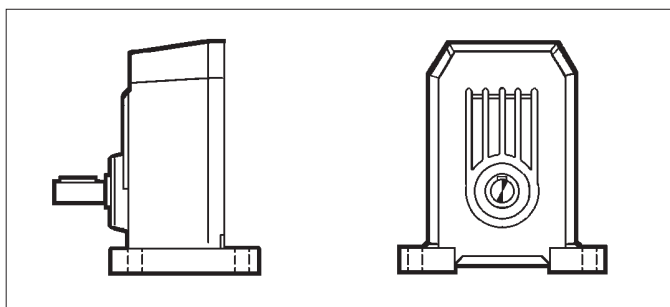
- modularity
- space effective
- high efficiency
- quiet operation
- gears in hardened and case-hardened steel
- bare aluminium housing for sizes 10, 20, 30, unpainted high strength painted cast-iron housings for larger frame sizes
- input and output shafts from high grade steel.

(E 60)





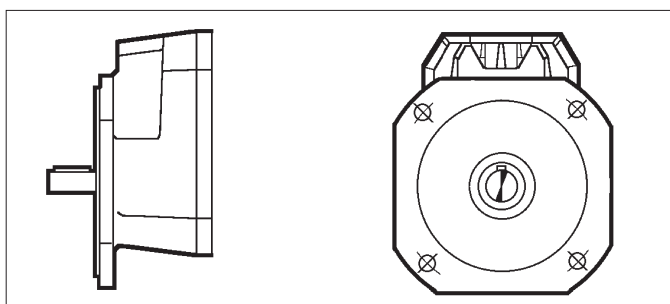
68 VERSIONS



P

Foot mount

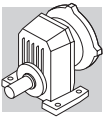
S 10 ... S 50



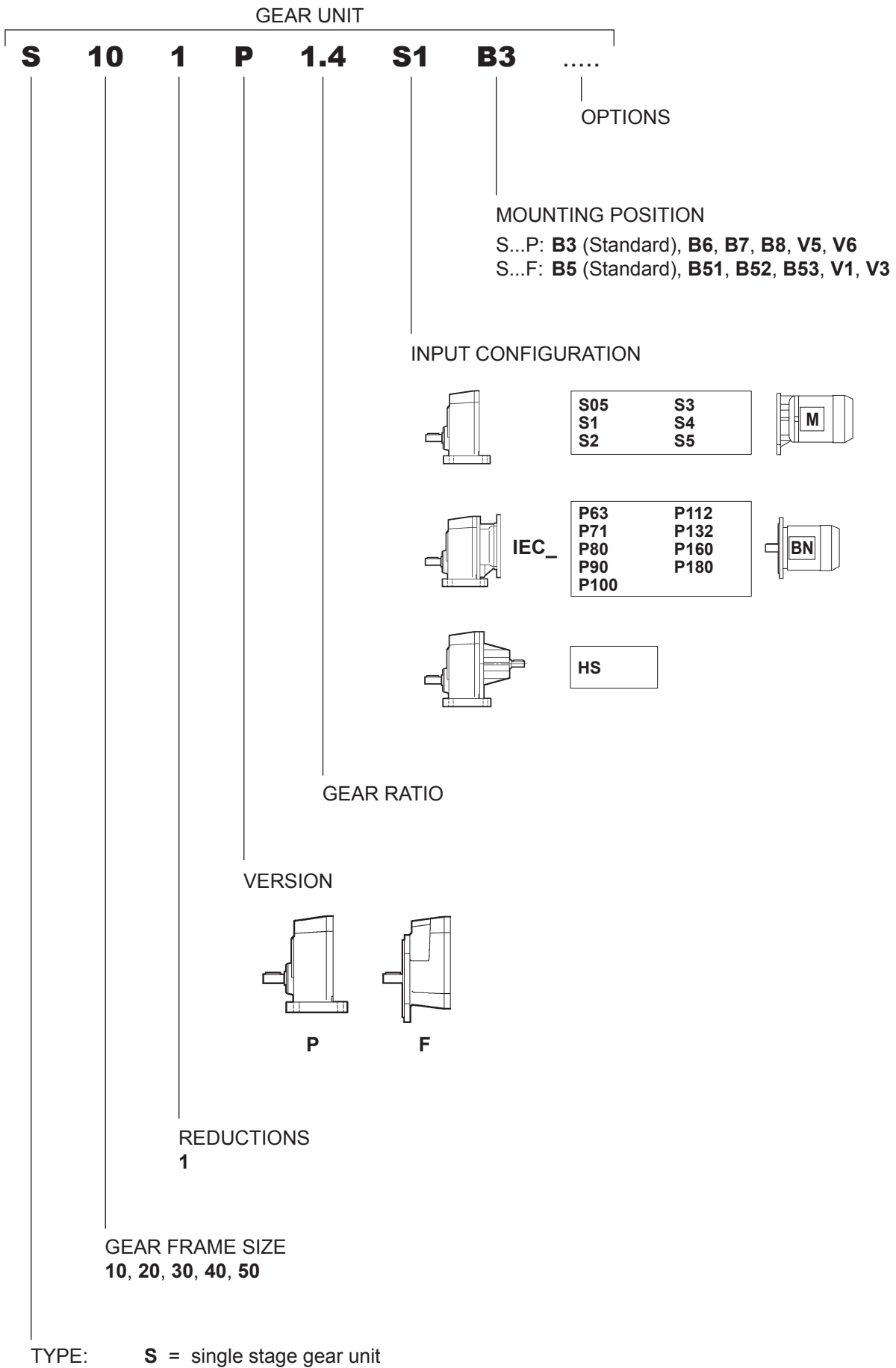
F

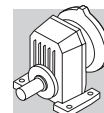
Flange mount

S 10 ... S 50



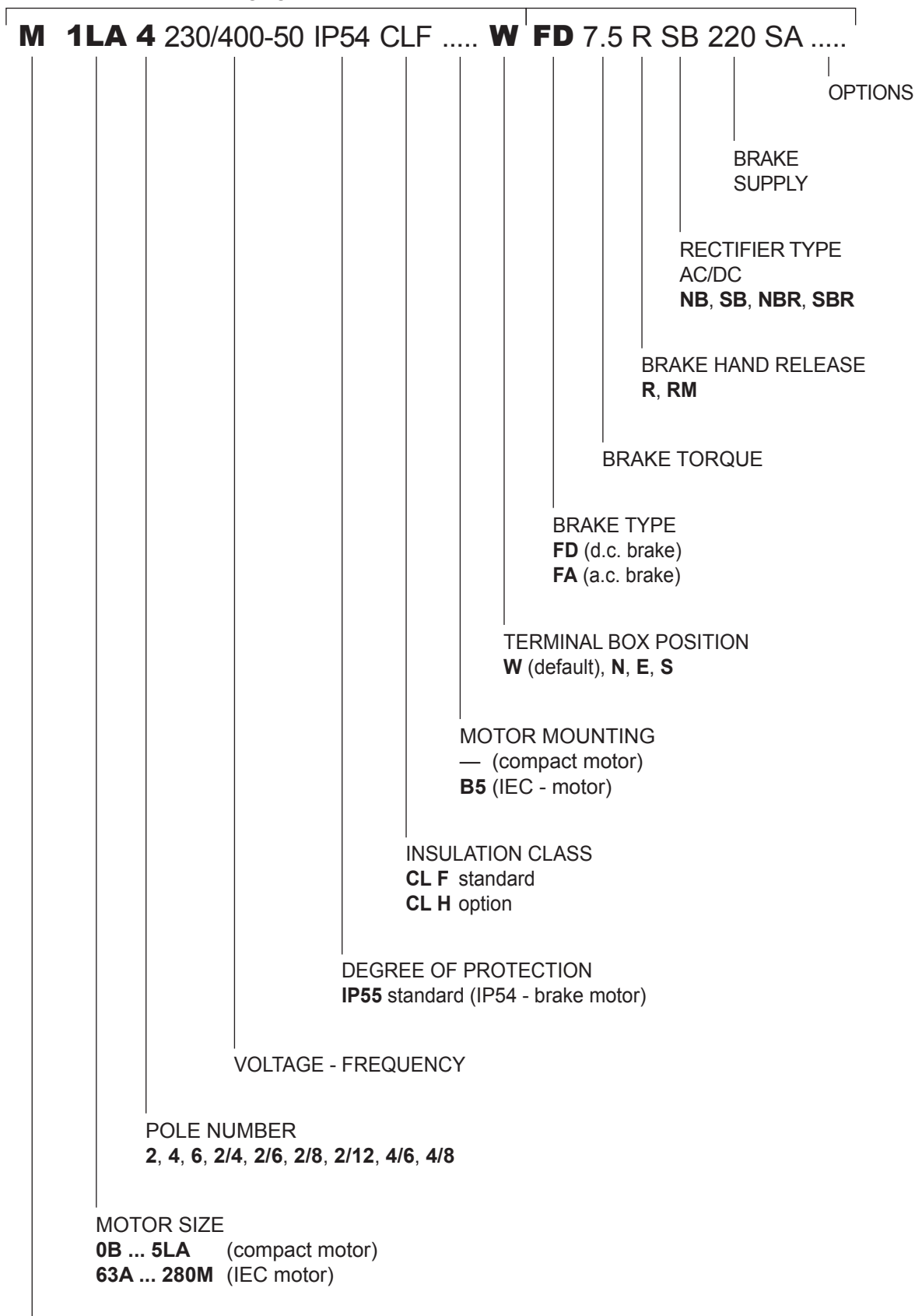
69 DESIGNATION



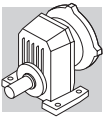


MOTOR

BRAKE



MOTOR TYPE
M = compact 3-phase
BN = IEC 3-phase



69.1 Gearbox options

SO

Gear units S10, S20, S30, S40, usually factory filled with oil, to be supplied unlubricated.

LO

Gearbox S50, usually supplied without oil, to be supplied with synthetic oil currently used by BONFIGLIOLI RIDUTTORI and filled according to requested mounting position.

DV

Dual oil seals on input shaft. (Available only for compact gearmotors).

VV

Fluoro elastomer oil seal on input shaft.

PV

All oil seals in Fluoro elastomer.

SURFACE PROTECTION

When no specific protection class is requested, the painted (ferrous) surfaces of gearboxes are protected to at least corrosivity class C2 (UNI EN ISO 12944-2). For improved resistance to atmospheric corrosion, gearboxes can be delivered with **C3** and **C4** surface protection, obtained by painting the complete gearbox.

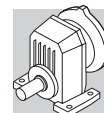
(E 61)

SURFACE PROTECTION	Typical environments	Maximum surface temperature	Corrosivity class according to UNI EN ISO 12944-2
C3	Urban and industrial environments with up to 100% relative humidity (medium air pollution)	120°C	C3
C4	Industrial areas, coastal areas, chemical plant, with up to 100% relative humidity (high air pollution)	120°C	C4

Gearboxes with optional protection to class **C3** or **C4** are available in a choice of colours.

If no specific colour is requested (see the "PAINTING" option) gearboxes are finished in RAL 7042.

Gearboxes can also be supplied with surface protection for corrosivity class **C5** according to UNI EN ISO 12944-2. Contact our Technical Service for further details.



PAINTING

Gearboxes with optional protection to class C3 or C4 are available in the colours listed in the following table.

(E 62)

PAINTING	Colour	RAL number
RAL7042*	Traffic Grey A	7042
RAL5010	Gentian Blue	5010
RAL9005	Jet Black	9005
RAL9006	White Aluminium	9006
RAL9010	Pure White	9010

* Gearboxes are supplied in this standard colour if no other colour is specified.

NOTE – “PAINTING” options can only be specified in conjunction with “SURFACE PROTECTION” options.

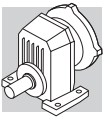
CERTIFICATES

AC - Certificate of compliance

The document certifies the compliance of the product with the purchase order and the construction in conformity with the applicable procedures of the Bonfiglioli Quality System.

CC - Inspection certificate

The document entails checking on order compliance, the visual inspection of external conditions and of mating dimensions. Checking on main functional parameters in unloaded conditions is also performed along with oil seal proofing, both in static and in running conditions. Units inspected are sampled within the shipping batch and marked individually.

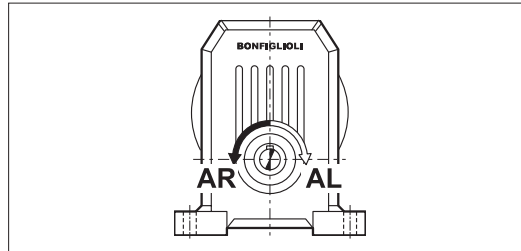


69.2 Motor options

AL, AR

A backstop device on the motor itself, as described in the electric motors section of this catalogue, is available for gearmotors with integral M Series motors. The following table shows the direction of free rotation of the gearbox, on the basis of which the correct option must be selected.

(E 64)



For further information on options, consult the electric motors section.

70 MOUNTING POSITION AND TERMINAL BOX ANGULAR LOCATION

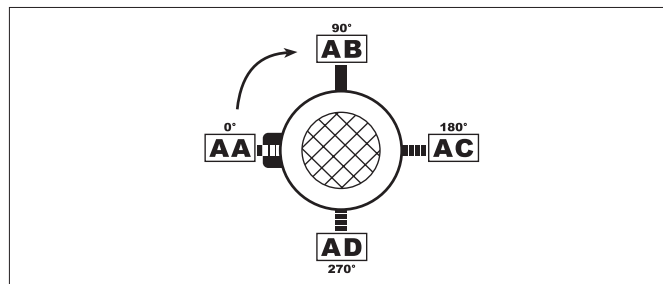
Location of motor terminal box can be specified by viewing the motor from the fan side; standard location is shown in black (W).

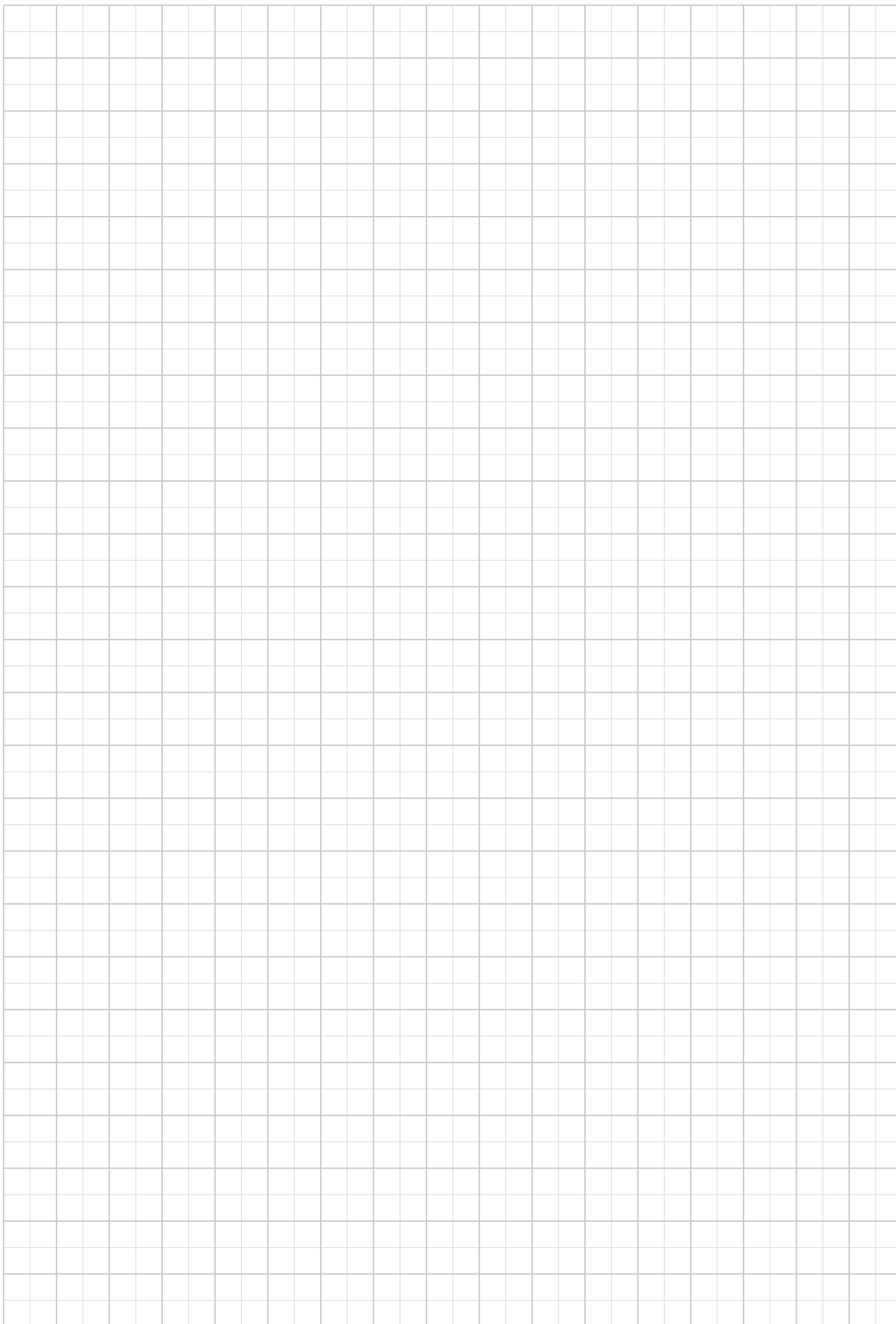
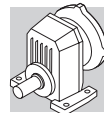
Angular position of the brake release lever.

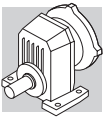
Unless otherwise specified, brake motors have the manual device side located, 90° apart from terminal box.

Different angles can be specified through the relevant options available.

(E 63)

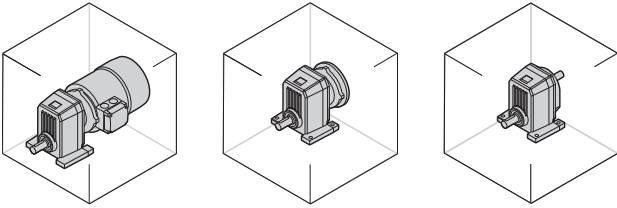






S ... P

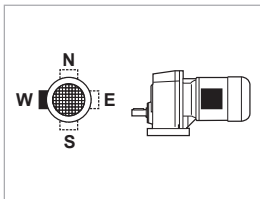
B3



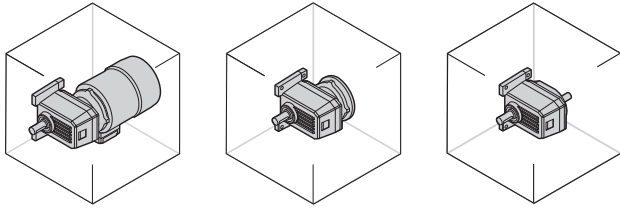
_S

_P(IEC)

_HS



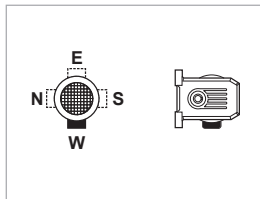
B6



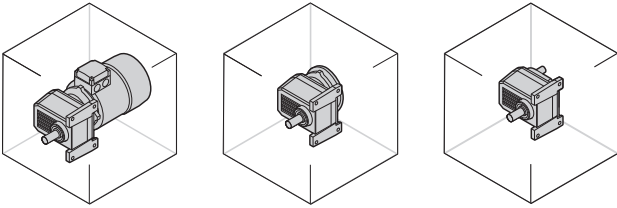
_S

_P(IEC)

_HS



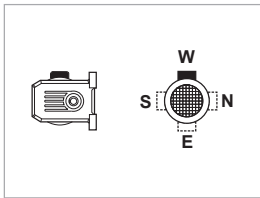
B7



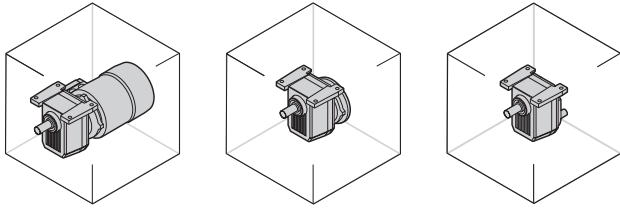
_S

_P(IEC)

_HS



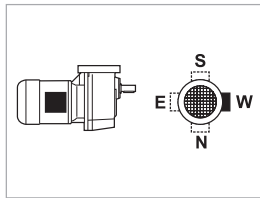
B8



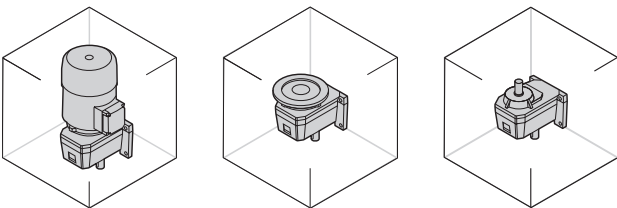
_S

_P(IEC)

_HS



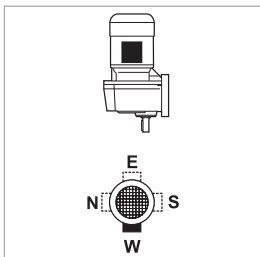
V5



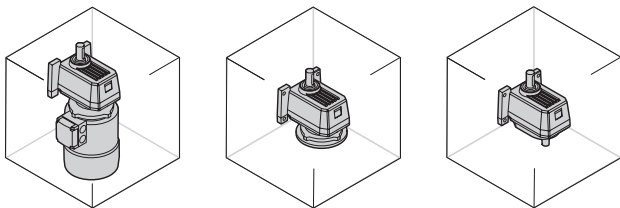
_S

_P(IEC)

_HS



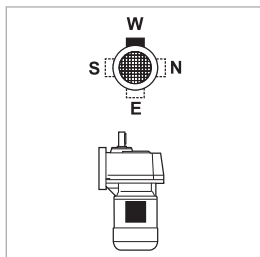
V6



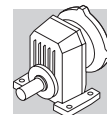
_S

_P(IEC)

_HS

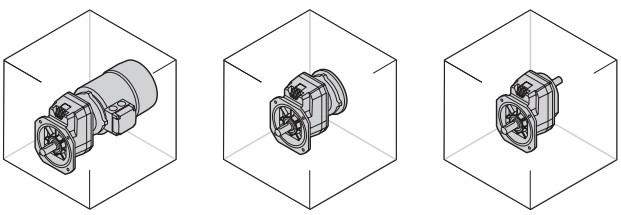


W = Default



S ... F

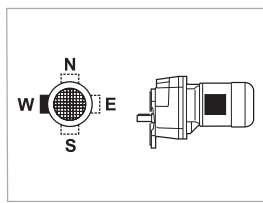
B5



_S

_P(IEC)

_HS



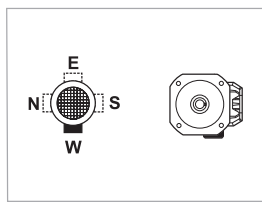
B51



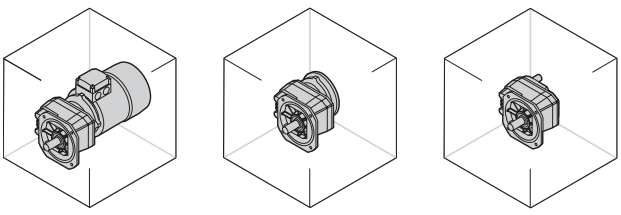
_S

_P(IEC)

_HS



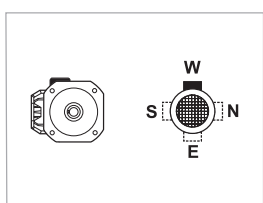
B53



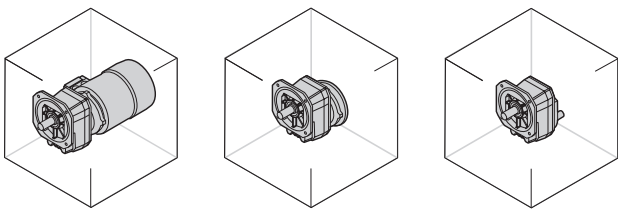
_S

_P(IEC)

_HS



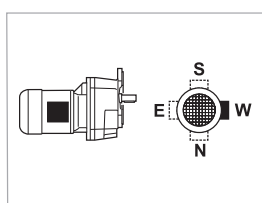
B52



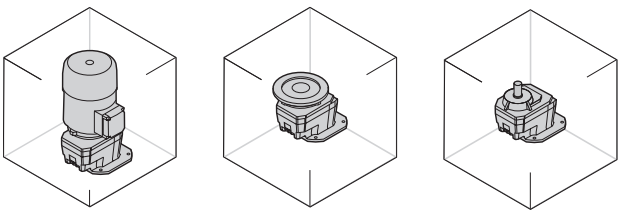
_S

_P(IEC)

_HS



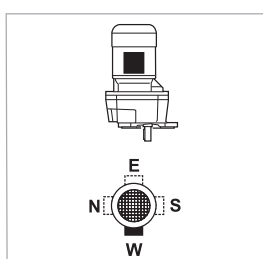
V1



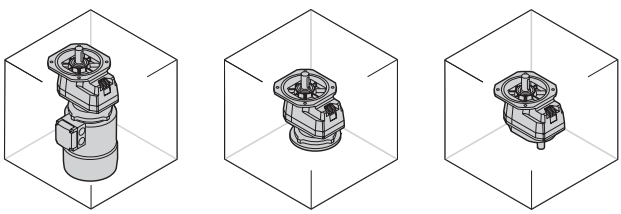
_S

_P(IEC)

_HS



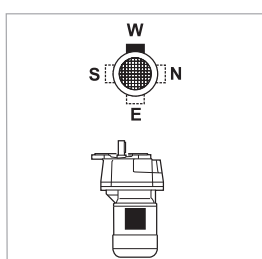
V3



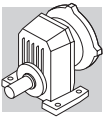
_S

_P(IEC)

_HS



W = Default



71 OVERHUNG LOADS

External transmissions keyed onto input and/or output shaft generate loads that act radially onto same shaft.

Resulting shaft loading must be compatible with both the bearing and the shaft capacity. Namely shaft loading (R_{c1} for input shaft, R_{c2} for output shaft), must be equal or lower than admissible overhung load capacity for shaft under study (R_{n1} for input shaft, R_{n2} for output shaft). OHL capability listed in the rating chart section.

In the formulas given below, index (1) applies to parameters relating to input shaft, whereas index (2) refers to output shaft.

The load generated by an external transmission can be calculated with close approximation by the following equations:

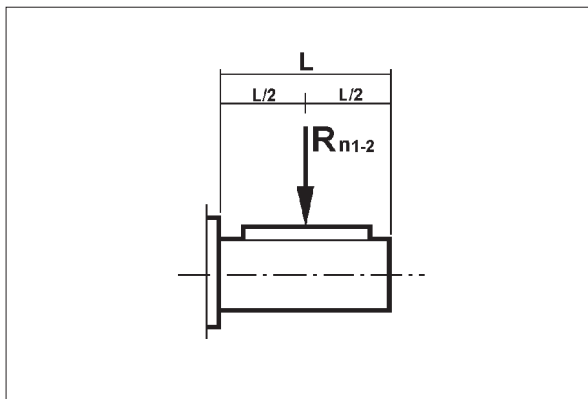
$$R_{c1} [N] = \frac{2000 \cdot M_1 [Nm] \cdot K_r}{d [mm]} \quad ; \quad R_{c2} [N] = \frac{2000 \cdot M_2 [Nm] \cdot K_r}{d [mm]} \quad (44)$$

(E 65)

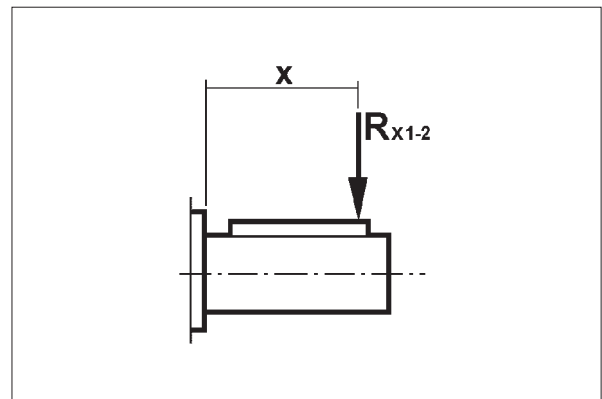
M_1 [Nm]	Torque applied to input shaft	$K_r = 1,25$	Gear transmission
M_2 [Nm]	Torque drawn at output shaft	$K_r = 1,5$	V-belt transmission
d [mm]	Pitch diameter of element keyed onto shaft	$K_r = 2,0$	Flat belt transmission
$K_r = 1$	Chain transmission		

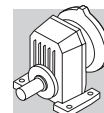
Verification of OHL capability varies depending on whether load applies at midpoint of shaft or it is shifted further out:

(E 66)



(E 67)





a) Load applied at midpoint of shaft, tab. (E66)

A comparison of shaft loading with catalogue OHL ratings should verify the following condition:

$$R_{c1} \leq R_{n1} \quad [\text{input shaft}]$$

or

$$R_{c2} \leq R_{n2} \quad [\text{output shaft}]$$

b) Load off the midpoint tab. (E67)

When load is shifted at an “x” distance from shaft shoulder, permissible load must be calculated for that distance.

Revised permissible overhung loads R_{x1} (input) and R_{x2} (output) are calculated respectively from original rated values R_{n1} and R_{n2} through factor:

$$\frac{a}{b+x} \quad (45)$$

(E 68)

	Load location factors					
	Output shaft			Input shaft		
	a	b	c	a	b	c
S 10 1	61	46	200	21	1	300
S 20 1	73.5	53.5	270	40	20	350
S 30 1	91.5	66.5	380	38.5	18.5	350
S 40 1	126.5	96.5	600	49.5	24.5	450
S 50 1	153.5	113.5	680	49.5	24.5	450

Verification procedure is described here after.

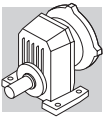
INPUT SHAFT

1. Calculate:

$$R_{x1} = R_{n1} \cdot \frac{a}{b+x} \quad (46)$$

N.B. Subject to condition:

$$\frac{L}{2} \leq x \leq c \quad (47)$$



Finally, the following condition must be verified:

$$R_{c1} \leq R_{x1} \quad (48)$$

OUTPUT SHAFT

1. Calculate:

$$R_{x2} = R_{n2} \cdot \frac{a}{b+x} \quad (49)$$

N.B. Subject to condition:

$$\frac{L}{2} \leq x \leq c \quad (50)$$

Finally, the following condition must be verified:

$$R_{c2} \leq R_{x2} \quad (51)$$

72 THRUST LOADS, A_{n1} , A_{n2}

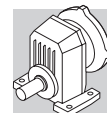
Permissible thrust loads on input [A_{n1}] and output [A_{n2}] shafts are obtained from the radial loading for the shaft under consideration [R_{n1}] and [R_{n2}] through the following equation:




$$\begin{aligned} A_{n1} &= R_{n1} \cdot 0.2 \\ A_{n2} &= R_{n2} \cdot 0.2 \end{aligned} \quad (52)$$

The thrust loads calculated through these formulas apply to thrust forces occurring at the same time as rated radial loads.




In the only case that no overhung load acts on the shaft the value of the admissible thrust load [A_n] amounts to 50% of rated OHL [R_n] on same shaft.

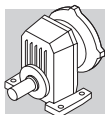
Where thrust loads exceed permissible value or largely prevail over radial loads, contact Bonfiglioli Riduttori for an in-depth analysis of the application.


73 GEARMOTOR RATING CHARTS
0.09 kW

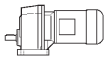



n₂ min ⁻¹	M₂ Nm	S	i	R_{n2} N				
69	12.1	2.9	13.1	2400			S301_13.1 P63 BN63A6	507
73	11.5	1.7	12.4	1500	S201_12.4 S05 M05A6	504	S201_12.4 P63 BN63A6	505
74	11.4	1.1	12.3	1160	S101_12.3 S05 M05A6	502	S101_12.3 P63 BN63A6	503
85	10.0	2.0	10.8	1500	S201_10.8 S05 M05A6	504	S201_10.8 P63 BN63A6	505
88	9.5	1.3	10.3	1100	S101_10.3 S05 M05A6	502	S101_10.3 P63 BN63A6	503
103	8.2	1.5	8.9	1060	S101_8.9 S05 M05A6	502	S101_8.9 P63 BN63A6	503
107	7.9	2.5	8.5	1500	S201_8.5 S05 M05A6	504	S201_8.5 P63 BN63A6	505
132	6.4	2.7	6.9	990	S101_6.9 S05 M05A6	502	S101_6.9 P63 BN63A6	503
149	5.7	3.0	6.1	960	S101_6.1 S05 M05A6	502	S101_6.1 P63 BN63A6	503
193	4.4	3.2	4.7	890	S101_4.7 S05 M05A6	502	S101_4.7 P63 BN63A6	503
237	3.6	3.9	3.8	830	S101_3.8 S05 M05A6	502	S101_3.8 P63 BN63A6	503
284	3.0	4.7	3.2	790	S101_3.2 S05 M05A6	502	S101_3.2 P63 BN63A6	503
364	2.3	5.2	2.5	730	S101_2.5 S05 M05A6	502	S101_2.5 P63 BN63A6	503
485	1.7	6.9	1.9	670	S101_1.9 S05 M05A6	502	S101_1.9 P63 BN63A6	503
640	1.3	9.1	1.4	610	S101_1.4 S05 M05A6	502	S101_1.4 P63 BN63A6	503

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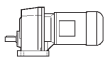

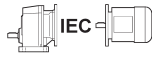

n₂ min ⁻¹	M₂ Nm	S	i	R_{n2} N				
69	16.2	2.2	13.1	2400			S301_13.1 P63 BN63A4	507
73	15.3	1.3	12.4	1500	S201_12.4 S05 M05B6	504	S201_12.4 P63 BN63B6	505
85	13.3	1.5	10.8	1500	S201_10.8 S05 M05B6	504	S201_10.8 P63 BN63B6	505
88	12.7	2.8	10.3	2400			S301_10.3 P63 BN63B6	507
88	12.7	0.9	10.3	1060	S101_10.3 S05 M05B6	502	S101_10.3 P63 BN63B6	503
102	11.0	3.2	8.9	2400			S301_8.9 P63 BN63B6	507
103	11.0	1.1	8.9	1030	S101_8.9 S05 M05B6	502	S101_8.9 P63 BN63B6	503
107	10.5	2.8	13.1	2400			S301_13.1 P63 BN63B6	507
107	10.5	1.9	8.5	1500	S201_8.5 S05 M05B6	504	S201_8.5 P63 BN63B6	505
113	10.0	1.7	12.4	1500	S201_12.4 S05 M05A4	504	S201_12.4 P63 BN63A4	505
114	9.9	1.0	12.3	1000	S101_12.3 S05 M05A4	502	S101_12.3 P63 BN63A4	503
126	8.9	3.4	7.2	1500	S201_7.2 S05 M05B6	504	S201_7.2 P63 BN63B6	505
130	8.6	2.0	10.8	1500	S201_10.8 S05 M05A4	504	S201_10.8 P63 BN63A4	505
132	8.5	2.0	6.9	960	S101_6.9 S05 M05B6	502	S101_6.9 P63 BN63B6	503
136	8.3	1.2	10.3	960	S101_10.3 S05 M05A4	502	S101_10.3 P63 BN63A4	503
149	7.5	2.3	6.1	940	S101_6.1 S05 M05B6	502	S101_6.1 P63 BN63B6	503
158	7.1	1.4	8.9	920	S101_8.9 S05 M05A4	502	S101_8.9 P63 BN63A4	503
165	6.8	2.5	8.5	1500	S201_8.5 S05 M05A4	504	S201_8.5 P63 BN63A4	505
193	5.8	2.4	4.7	870	S101_4.7 S05 M05B6	502	S101_4.7 P63 BN63B6	503
203	5.5	2.7	6.9	860	S101_6.9 S05 M05A4	502	S101_6.9 P63 BN63A4	503
229	4.9	3.1	6.1	830	S101_6.1 S05 M05A4	502	S101_6.1 P63 BN63A4	503
237	4.7	2.9	3.8	820	S101_3.8 S05 M05B6	502	S101_3.8 P63 BN63B6	503
284	3.9	3.5	3.2	780	S101_3.2 S05 M05B6	502	S101_3.2 P63 BN63B6	503
296	3.8	3.2	4.7	770	S101_4.7 S05 M05A4	502	S101_4.7 P63 BN63A4	503
364	3.1	3.9	3.8	720	S101_3.8 S05 M05A4	502	S101_3.8 P63 BN63A4	503
364	3.1	3.9	2.5	720	S101_2.5 S05 M05B6	502	S101_2.5 P63 BN63B6	503
438	2.6	4.7	3.2	680	S101_3.2 S05 M05A4	502	S101_3.2 P63 BN63A4	503

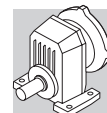


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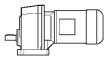



n₂ min ⁻¹	M₂ Nm	S	i	R_{n2} N				
485	2.3	5.2	1.9	660	S101_1.9 S05 M05B6	502	S101_1.9 P63 BN63B6	503
560	2.0	5.0	2.5	630	S101_2.5 S05 M05A4	502	S101_2.5 P63 BN63A4	503
640	1.8	6.8	1.4	600	S101_1.4 S05 M05B6	502	S101_1.4 P63 BN63B6	503
747	1.5	6.6	1.9	580	S101_1.9 S05 M05A4	502	S101_1.9 P63 BN63A4	503
985	1.1	8.8	1.4	530	S101_1.4 S05 M05A4	502	S101_1.4 P63 BN63A4	503

0.18 kW

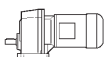



n₂ min ⁻¹	M₂ Nm	S	i	R_{n2} N				
69	24.6	1.4	13.1	2400			S301_13.1 P71 BN71A6	507
73	23.2	2.5	12.4	3800	S401_12.4 S1 M1SC6	508	S401_12.4 P71 BN71A6	500
84	20.1	1.0	10.8	1500			S201_10.8 P71 BN71A6	505
84	20.0	2.9	10.7	3800	S401_10.7 S1 M1SC6	508	S401_10.7 P71 BN71A6	500
87	19.3	1.8	10.3	2400	S301_10.3 S1 M1SC6	506	S301_10.3 P71 BN71A6	507
101	16.6	2.1	8.9	2400	S301_8.9 S1 M1SC6	506	S301_8.9 P71 BN71A6	507
106	15.9	1.3	8.5	1500	S201_8.5 S1 M1SC6	504	S201_8.5 P71 BN71A6	505
106	15.9	1.9	13.1	2400			S301_13.1 P63 BN63B4	507
112	15.1	1.1	12.4	1500	S201_12.4 S05 M05B4	504	S201_12.4 P63 BN63B4	505
112	15.0	3.3	12.4	3800			S401_12.4 P63 BN63B4	509
125	13.5	2.2	7.2	1500	S201_7.2 S1 M1SC6	504	S201_7.2 P71 BN71A6	505
129	13.0	1.3	10.8	1500	S201_10.8 S05 M05B4	504	S201_10.8 P63 BN63B4	505
130	12.9	1.3	6.9	910	S101_6.9 S1 M1SC6	502	S101_6.9 P71 BN71A6	503
135	12.5	2.4	10.3	2330			S301_10.3 P63 BN63B4	507
147	11.4	1.5	6.1	890	S101_6.1 S1 M1SC6	502	S101_6.1 P71 BN71A6	503
155	10.9	2.8	5.8	1500	S201_5.8 S1 M1SC6	504	S201_5.8 P71 BN71A6	505
156	10.8	2.8	8.9	2230			S301_8.9 P63 BN63B4	507
157	10.8	0.9	8.9	880	S101_8.9 S05 M05B4	502	S101_8.9 P63 BN63B4	503
164	10.3	1.7	8.5	1500	S201_8.5 S05 M05B4	504	S201_8.5 P63 BN63B4	505
189	8.9	3.4	4.8	1500	S201_4.8 S1 M1SC6	504	S201_4.8 P71 BN71A6	505
190	8.8	1.6	4.7	830	S101_4.7 S1 M1SC6	502	S101_4.7 P71 BN71A6	503
192	8.8	3.0	7.2	1500	S201_7.2 S05 M05B4	504	S201_7.2 P63 BN63B4	505
201	8.4	1.8	6.9	820	S101_6.9 S05 M05B4	502	S101_6.9 P63 BN63B4	503
214	7.9	3.1	13.1	2020			S301_13.1 P63 BN63A2	507
226	7.5	1.7	12.4	1480	S201_12.4 S05 M05A2	504	S201_12.4 P63 BN63A2	505
227	7.4	2.0	6.1	800	S101_6.1 S05 M05B4	502	S101_6.1 P63 BN63B4	503
228	7.4	1.1	12.3	800	S101_12.3 S05 M05A2	502	S101_12.3 P63 BN63A2	503
234	7.2	1.9	3.8	790	S101_3.8 S1 M1SC6	502	S101_3.8 P71 BN71A6	503
261	6.4	2.0	10.8	1420	S201_10.8 S05 M05A2	504	S201_10.8 P63 BN63A2	505
273	6.2	1.3	10.3	760	S101_10.3 S05 M05A2	502	S101_10.3 P63 BN63A2	503
281	6.0	2.3	3.2	750	S101_3.2 S1 M1SC6	502	S101_3.2 P71 BN71A6	503
294	5.7	2.1	4.7	750	S101_4.7 S05 M05B4	502	S101_4.7 P63 BN63B4	503
317	5.3	1.5	8.9	730	S101_8.9 S05 M05A2	502	S101_8.9 P63 BN63A2	503
331	5.1	2.6	8.5	1320	S201_8.5 S05 M05A2	504	S201_8.5 P63 BN63A2	505
360	4.7	2.6	2.5	700	S101_2.5 S1 M1SC6	502	S101_2.5 P71 BN71A6	503
361	4.7	2.6	3.8	700	S101_3.8 S05 M05B4	502	S101_3.8 P63 BN63B4	503
407	4.1	2.9	6.9	680	S101_6.9 S05 M05A2	502	S101_6.9 P63 BN63A2	503
434	3.9	3.1	3.2	670	S101_3.2 S05 M05B4	502	S101_3.2 P63 BN63B4	503
460	3.7	3.3	6.1	660	S101_6.1 S05 M05A2	502	S101_6.1 P63 BN63A2	503

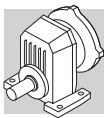


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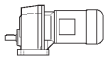


n ₂ min ⁻¹	M ₂ Nm	S	i	R _{n2} N				
480	3.5	3.4	1.9	640	S101_1.9 S1 M1SC6	502	S101_1.9 P71 BN71A6	503
556	3.0	3.3	2.5	620	S101_2.5 S05 M05B4	502	S101_2.5 P63 BN63B4	503
594	2.8	3.5	4.7	610	S101_4.7 S05 M05A2	502	S101_4.7 P63 BN63A2	503
633	2.7	4.5	1.4	590	S101_1.4 S1 M1SC6	502	S101_1.4 P71 BN71A6	503
731	2.3	4.3	3.8	570	S101_3.8 S05 M05A2	502	S101_3.8 P63 BN63A2	503
741	2.3	4.4	1.9	570	S101_1.9 S05 M05B4	502	S101_1.9 P63 BN63B4	503
878	1.9	5.2	3.2	540	S101_3.2 S05 M05A2	502	S101_3.2 P63 BN63A2	503
978	1.7	5.8	1.4	520	S101_1.4 S05 M05B4	502	S101_1.4 P63 BN63B4	503
1124	1.5	5.3	2.5	500	S101_2.5 S05 M05A2	502	S101_2.5 P63 BN63A2	503
1499	1.1	7.1	1.9	460	S101_1.9 S05 M05A2	502	S101_1.9 P63 BN63A2	503
1977	0.9	9.4	1.4	420	S101_1.4 S05 M05A2	502	S101_1.4 P63 BN63A2	503

0.25 kW




n ₂ min ⁻¹	M ₂ Nm	S	i	R _{n2} N				
69	34.1	1.0	13.1	2400			S301_13.1 P71 BN71B6	507
70	33.5	3.0	12.9	6520	S501_12.9 S1 M1SD6	510	S501_12.9 P71 BN71B6	511
73	32.2	1.8	12.4	3800	S401_12.4 S1 M1SD6	508	S401_12.4 P71 BN71B6	509
84	27.7	2.1	10.7	3800	S401_10.7 S1 M1SD6	508	S401_10.7 P71 BN71B6	509
87	26.8	1.3	10.3	2400	S301_10.3 S1 M1SD6	506	S301_10.3 P71 BN71B6	507
101	23.1	1.5	8.9	2400	S301_8.9 S1 M1SD6	506	S301_8.9 P71 BN71B6	507
104	22.5	3.1	8.6	3800	S401_8.6 S1 M1SD6	508	S401_8.6 P71 BN71B6	509
105	22.3	1.3	13.1	2400			S301_13.1 P71 BN71A4	507
106	22.1	0.9	8.5	1500	S201_8.5 S1 M1SD6	504	S201_8.5 P71 BN71B6	505
111	21.1	2.4	12.4	3800			S401_12.4 P71 BN71A4	509
125	18.8	1.6	7.2	1500	S201_7.2 S1 M1SD6	504	S201_7.2 P71 BN71B6	505
127	18.4	3.1	7.1	2340	S301_7.1 S1 M1SD6	506	S301_7.1 P71 BN71B6	507
128	18.3	0.9	10.8	1500	S201_10.8 S05 M05C4	504	S201_10.8 P71 BN71A4	505
129	18.2	2.8	10.7	3800			S401_10.7 P71 BN71A4	509
130	17.9	0.9	6.9	850	S101_6.9 S1 M1SD6	502	S101_6.9 P71 BN71B6	503
133	17.5	1.7	10.3	2300			S301_10.3 P71 BN71A4	507
147	15.9	1.1	6.1	840	S101_6.1 S1 M1SD6	502	S101_6.1 P71 BN71B6	503
155	15.1	2.0	5.8	1500	S201_5.8 S1 M1SD6	504	S201_5.8 P71 BN71B6	505
155	15.1	2.0	8.9	2200			S301_8.9 P71 BN71A4	507
162	14.5	1.2	8.5	1500	S201_8.5 S05 M05C4	504	S201_8.5 P71 BN71A4	505
189	12.4	2.4	4.8	1500	S201_4.8 S1 M1SD6	504	S201_4.8 P71 BN71B6	505
190	12.3	1.1	4.7	790	S101_4.7 S1 M1SD6	502	S101_4.7 P71 BN71B6	503
190	12.3	2.1	7.2	1500	S201_7.2 S05 M05C4	504	S201_7.2 P71 BN71A4	505
199	11.7	1.3	6.9	780	S101_6.9 S05 M05C4	502	S101_6.9 P71 BN71A4	503
214	10.9	2.2	13.1	2000			S301_13.1 P63 BN63B2	507
225	10.4	1.4	6.1	770	S101_6.1 S05 M05C4	502	S101_6.1 P71 BN71A4	503
226	10.3	1.3	12.4	1450	S201_12.4 S05 M05B2	504	S201_12.4 P63 BN63B2	505
229	10.2	2.9	3.9	1440	S201_3.9 S1 M1SD6	504	S201_3.9 P71 BN71B6	505
234	10.0	1.4	3.8	750	S101_3.8 S1 M1SD6	502	S101_3.8 P71 BN71B6	503
236	9.9	2.6	5.8	1430	S201_5.8 S05 M05C4	504	S201_5.8 P71 BN71A4	505
261	9.0	1.5	10.8	1390	S201_10.8 S05 M05B2	504	S201_10.8 P63 BN63B2	505
273	8.6	2.8	10.3	1860			S301_10.3 P63 BN63B2	507
273	8.6	0.9	10.3	730	S101_10.3 S05 M05B2	502	S101_10.3 P63 BN63B2	503

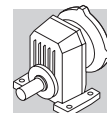


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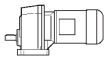



n₂ min ⁻¹	M₂ Nm	S	i	R_{n2} N				
281	8.3	1.7	3.2	720	S101_3.2 S1 M1SD6	502	S101_3.2 P71 BN71B6	503
288	8.1	3.2	4.8	1350	S201_4.8 S05 M05C4	504	S201_4.8 P71 BN71A4	505
291	8.0	1.5	4.7	720	S101_4.7 S05 M05C4	502	S101_4.7 P71 BN71A4	503
316	7.4	3.2	8.9	1770			S301_8.9 P63 BN63B2	507
317	7.4	1.1	8.9	710	S101_8.9 S05 M05B2	502	S101_8.9 P63 BN63B2	503
331	7.1	1.8	8.5	1300	S201_8.5 S05 M05B2	504	S201_8.5 P63 BN63B2	505
358	6.5	1.8	3.8	680	S101_3.8 S05 M05C4	502	S101_3.8 P71 BN71A4	503
360	6.5	1.8	2.5	680	S101_2.5 S1 M1SD6	502	S101_2.5 P71 BN71B6	503
389	6.0	3.5	7.2	1240	S201_7.2 S05 M05B2	504	S201_7.2 P63 BN63B2	505
407	5.7	2.1	6.9	660	S101_6.9 S05 M05B2	502	S101_6.9 P63 BN63B2	503
430	5.4	2.2	3.2	650	S101_3.2 S05 M05C4	502	S101_3.2 P71 BN71A4	503
460	5.1	2.4	6.1	640	S101_6.1 S05 M05B2	502	S101_6.1 P63 BN63B2	503
480	4.9	2.5	1.9	620	S101_1.9 S1 M1SD6	502	S101_1.9 P71 BN71B6	503
550	4.3	2.4	2.5	610	S101_2.5 S05 M05C4	502	S101_2.5 P71 BN71A4	503
594	3.9	2.5	4.7	600	S101_4.7 S05 M05B2	502	S101_4.7 P63 BN63B2	503
633	3.7	3.2	1.4	580	S101_1.4 S1 M1SD6	502	S101_1.4 P71 BN71B6	503
731	3.2	3.1	3.8	560	S101_3.8 S05 M05B2	502	S101_3.8 P63 BN63B2	503
733	3.2	3.1	1.9	560	S101_1.9 S05 M05C4	502	S101_1.9 P71 BN71A4	503
878	2.7	3.8	3.2	530	S101_3.2 S05 M05B2	502	S101_3.2 P63 BN63B2	503
968	2.4	4.1	1.4	510	S101_1.4 S05 M05C4	502	S101_1.4 P71 BN71A4	503
1124	2.1	3.8	2.5	500	S101_2.5 S05 M05B2	502	S101_2.5 P63 BN63B2	503
1499	1.6	5.1	1.9	450	S101_1.9 S05 M05B2	502	S101_1.9 P63 BN63B2	503
1977	1.2	6.8	1.4	420	S101_1.4 S05 M05B2	502	S101_1.4 P63 BN63B2	503

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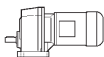



n₂ min ⁻¹	M₂ Nm	S	i	R_{n2} N				
71	49.0	2.0	12.9	6420	S501_12.9 S1 M1LA6	510	S501_12.9 P80 BN80A6	511
73	47.2	1.2	12.4	3800	S401_12.4 S1 M1LA6	508	S401_12.4 P80 BN80A6	509
85	40.6	1.4	10.7	3800	S401_10.7 S1 M1LA6	508	S401_10.7 P80 BN80A6	509
87	39.8	2.9	10.5	6020	S501_10.5 S1 M1LA6	510	S501_10.5 P80 BN80A6	511
102	33.8	1.0	8.9	2400	S301_8.9 S1 M1LA6	506	S301_8.9 P80 BN80A6	507
104	33.2	0.9	13.1	2390			S301_13.1 P71 BN71B4	507
105	32.9	2.1	8.6	3800	S401_8.6 S1 M1LA6	508	S401_8.6 P80 BN80A6	509
106	32.6	3.1	12.9	5650	S501_12.9 S1 M1SD4	510	S501_12.9 P71 BN71B4	511
110	31.3	1.6	12.4	3800	S401_12.4 S1 M1SD4	508	S401_12.4 P71 BN71B4	509
126	27.5	1.1	7.2	1500	S201_7.2 S1 M1LA6	504	S201_7.2 P80 BN80A6	505
127	27.2	3.3	7.2	3800	S401_7.2 S1 M1LA6	508	S401_7.2 P80 BN80A6	509
128	27.0	2.1	7.1	2260	S301_7.1 S1 M1LA6	506	S301_7.1 P80 BN80A6	507
128	27.0	1.9	10.7	3800	S401_10.7 S1 M1SD4	508	S401_10.7 P71 BN71B4	509
133	26.0	1.2	10.3	2240	S301_10.3 S1 M1SD4	506	S301_10.3 P71 BN71B4	507
154	22.5	1.3	8.9	2150	S301_8.9 S1 M1SD4	506	S301_8.9 P71 BN71B4	507
156	22.2	2.6	5.8	2140	S301_5.8 S1 M1LA6	506	S301_5.8 P80 BN80A6	507
156	22.1	1.4	5.8	1500	S201_5.8 S1 M1LA6	504	S201_5.8 P80 BN80A6	505
159	21.8	2.7	8.6	3610	S401_8.6 S1 M1SD4	508	S401_8.6 P71 BN71B4	509
184	18.8	3.1	4.9	2040	S301_4.9 S1 M1LA6	506	S301_4.9 P80 BN80A6	507
190	18.3	1.4	7.2	1460	S201_7.2 S1 M1SD4	504	S201_7.2 P71 BN71B4	505
191	18.1	1.7	4.8	1460	S201_4.8 S1 M1LA6	504	S201_4.8 P80 BN80A6	505

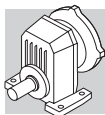


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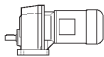



n₂ min ⁻¹	M₂ Nm	S	i	R_{n2} N				
193	17.9	2.8	7.1	2020	S301_7.1 S1 M1SD4	506	S301_7.1 P71 BN71B4	507
214	16.2	1.5	13.1	1960			S301_13.1 P71 BN71A2	507
224	15.4	1.0	6.1	710	S101_6.1 S1 M1SD4	502	S101_6.1 P71 BN71B4	503
227	15.3	2.6	12.4	3230			S401_12.4 P71 BN71A2	509
231	15.0	2.0	3.9	1380	S201_3.9 S1 M1LA6	504	S201_3.9 P80 BN80A6	505
234	14.8	3.4	5.8	1900	S301_5.8 S1 M1SD4	506	S301_5.8 P71 BN71B4	507
235	14.7	1.8	5.8	1390	S201_5.8 S1 M1SD4	504	S201_5.8 P71 BN71B4	505
237	14.6	1.0	3.8	690	S101_3.8 S1 M1LA6	502	S101_3.8 P80 BN80A6	503
261	13.2	1.0	10.8	1350	S201_10.8 S05 M05C2	504	S201_10.8 P71 BN71A2	505
263	13.1	3.0	10.7	3080			S401_10.7 P71 BN71A2	509
273	12.7	1.9	10.3	1820			S301_10.3 P71 BN71A2	507
284	12.2	1.1	3.2	670	S101_3.2 S1 M1LA6	502	S101_3.2 P80 BN80A6	503
287	12.1	2.2	4.8	1310	S201_4.8 S1 M1SD4	504	S201_4.8 P71 BN71B4	505
290	11.9	1.0	4.7	670	S101_4.7 S1 M1SD4	502	S101_4.7 P71 BN71B4	503
293	11.8	2.5	3.1	1300	S201_3.1 S1 M1LA6	504	S201_3.1 P80 BN80A6	505
316	11.0	2.2	8.9	1740			S301_8.9 P71 BN71A2	507
331	10.5	1.2	8.5	1270	S201_8.5 S05 M05C2	504	S201_8.5 P71 BN71A2	505
348	9.9	2.6	3.9	1240	S201_3.9 S1 M1SD4	504	S201_3.9 P71 BN71B4	505
356	9.7	1.2	3.8	640	S101_3.8 S1 M1SD4	502	S101_3.8 P71 BN71B4	503
364	9.5	1.3	2.5	630	S101_2.5 S1 M1LA6	502	S101_2.5 P80 BN80A6	503
373	9.3	3.2	2.4	1210	S201_2.4 S1 M1LA6	504	S201_2.4 P80 BN80A6	505
389	8.9	2.4	7.2	1210	S201_7.2 S05 M05C2	504	S201_7.2 P71 BN71A2	505
407	8.5	1.4	6.9	630	S101_6.9 S05 M05C2	502	S101_6.9 P71 BN71A2	503
428	8.1	1.5	3.2	620	S101_3.2 S1 M1SD4	502	S101_3.2 P71 BN71B4	503
440	7.9	3.3	3.1	1160	S201_3.1 S1 M1SD4	504	S201_3.1 P71 BN71B4	505
460	7.5	1.6	6.1	610	S101_6.1 S05 M05C2	502	S101_6.1 P71 BN71A2	503
480	7.2	2.8	1.9	1130	S201_1.9 S1 M1LA6	504	S201_1.9 P80 BN80A6	505
483	7.2	2.9	5.8	1130	S201_5.8 S05 M05C2	504	S201_5.8 P71 BN71A2	505
485	7.1	1.7	1.9	590	S101_1.9 S1 M1LA6	502	S101_1.9 P80 BN80A6	503
548	6.3	1.6	2.5	580	S101_2.5 S1 M1SD4	502	S101_2.5 P71 BN71B4	503
594	5.8	1.7	4.7	570	S101_4.7 S05 M05C2	502	S101_4.7 P71 BN71A2	503
640	5.4	2.2	1.4	550	S101_1.4 S1 M1LA6	502	S101_1.4 P80 BN80A6	503
731	4.7	2.1	3.8	540	S101_3.8 S05 M05C2	502	S101_3.8 P71 BN71A2	503
731	4.7	2.1	1.9	540	S101_1.9 S1 M1SD4	502	S101_1.9 P71 BN71B4	503
878	3.9	2.5	3.2	520	S101_3.2 S05 M05C2	502	S101_3.2 P71 BN71A2	503
964	3.6	2.8	1.4	500	S101_1.4 S1 M1SD4	502	S101_1.4 P71 BN71B4	503
1124	3.1	2.6	2.5	480	S101_2.5 S05 M05C2	502	S101_2.5 P71 BN71A2	503
1499	2.3	3.5	1.9	440	S101_1.9 S05 M05C2	502	S101_1.9 P71 BN71A2	503
1977	1.8	4.6	1.4	410	S101_1.4 S05 M05C2	502	S101_1.4 P71 BN71A2	503

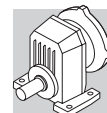
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n₂ min ⁻¹	M₂ Nm	S	i	R_{n2} N				
71	72.1	1.4	12.9	6290	S501_12.9 S2 M2SA6	510	S501_12.9 P80 BN80B6	511
86	59.7	1.0	10.7	3800	S401_10.7 S2 M2SA6	508	S401_10.7 P80 BN80B6	509
88	58.5	2.0	10.5	5910	S501_10.5 S2 M2SA6	510	S501_10.5 P80 BN80B6	511
105	49.1	2.5	8.8	5600	S501_8.8 S2 M2SA6	510	S501_8.8 P80 BN80B6	511
107	48.3	1.4	8.6	3800	S401_8.6 S2 M2SA6	508	S401_8.6 P80 BN80B6	509

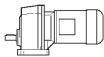





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n ₂ min ⁻¹	M ₂ Nm	S	i	R _{n2} N				
107	48.1	2.1	12.9	5560	S501_12.9 S1 M1LA4	510	S501_12.9 P80 BN80A4	511
111	46.3	1.1	12.4	3800	S401_12.4 S1 M1LA4	508	S401_12.4 P80 BN80A4	509
124	41.4	3.4	7.4	5310	S501_7.4 S2 M2SA6	510	S501_7.4 P80 BN80B6	511
129	40.0	2.2	7.2	3780	S401_7.2 S2 M2SA6	508	S401_7.2 P80 BN80B6	509
129	39.8	1.3	10.7	3770	S401_10.7 S1 M1LA4	508	S401_10.7 P80 BN80A4	509
130	39.7	1.5	7.1	2150	S301_7.1 S2 M2SA6	506	S301_7.1 P80 BN80B6	507
132	39.0	2.8	10.5	5220	S501_10.5 S1 M1LA4	510	S501_10.5 P80 BN80A4	511
152	33.9	3.1	6.1	3600	S401_6.1 S2 M2SA6	508	S401_6.1 P80 BN80B6	509
155	33.2	0.9	8.9	2060	S301_8.9 S1 M1LA4	506	S301_8.9 P80 BN80A4	507
157	32.7	1.8	5.8	2050	S301_5.8 S2 M2SA6	506	S301_5.8 P80 BN80B6	507
157	32.7	3.4	8.8	4940	S501_8.8 S1 M1LA4	510	S501_8.8 P80 BN80A4	511
158	32.6	0.9	5.8	1420	S201_5.8 S2 M2SA6	504	S201_5.8 P80 BN80B6	505
160	32.2	1.9	8.6	3540	S401_8.6 S1 M1LA4	508	S401_8.6 P80 BN80A4	509
186	27.6	2.1	4.9	1960	S301_4.9 S2 M2SA6	506	S301_4.9 P80 BN80B6	507
191	26.9	1.0	7.2	1370	S201_7.2 S1 M1LA4	504	S201_7.2 P80 BN80A4	505
193	26.7	1.1	4.8	1370	S201_4.8 S2 M2SA6	504	S201_4.8 P80 BN80B6	505
193	26.7	3.0	7.2	3350	S401_7.2 S1 M1LA4	508	S401_7.2 P80 BN80A4	509
195	26.4	1.9	7.1	1940	S301_7.1 S1 M1LA4	506	S301_7.1 P80 BN80A4	507
214	24.0	1.0	13.1	1900			S301_13.1 P71 BN71B2	507
218	23.6	3.4	12.9	4460	S501_12.9 S1 M1SD2	510	S501_12.9 P71 BN71B2	511
227	22.7	1.8	12.4	3190	S401_12.4 S1 M1SD2	508	S401_12.4 P71 BN71B2	509
233	22.1	2.6	3.9	1850	S301_3.9 S2 M2SA6	506	S301_3.9 P80 BN80B6	507
234	22.0	1.4	3.9	1300	S201_3.9 S2 M2SA6	504	S201_3.9 P80 BN80B6	505
236	21.8	2.3	5.8	1840	S301_5.8 S1 M1LA4	506	S301_5.8 P80 BN80A4	507
237	21.7	1.2	5.8	1310	S201_5.8 S1 M1LA4	504	S201_5.8 P80 BN80A4	505
263	19.5	2.0	10.7	3040	S401_10.7 S1 M1SD2	508	S401_10.7 P71 BN71B2	509
273	18.9	1.3	10.3	1780	S301_10.3 S1 M1SD2	506	S301_10.3 P71 BN71B2	507
280	18.4	2.7	4.9	1760	S301_4.9 S1 M1LA4	506	S301_4.9 P80 BN80A4	507
289	17.8	1.5	4.8	1250	S201_4.8 S1 M1LA4	504	S201_4.8 P80 BN80A4	505
296	17.4	1.7	3.1	1230	S201_3.1 S2 M2SA6	504	S201_3.1 P80 BN80B6	505
300	17.1	3.4	3.1	1720	S301_3.1 S2 M2SA6	506	S301_3.1 P80 BN80B6	507
316	16.3	1.5	8.9	1700	S301_8.9 S1 M1SD2	506	S301_8.9 P71 BN71B2	507
325	15.8	3.0	8.6	2850	S401_8.6 S1 M1SD2	508	S401_8.6 P71 BN71B2	509
350	14.7	3.4	3.9	1650	S301_3.9 S1 M1LA4	506	S301_3.9 P80 BN80A4	507
351	14.7	1.8	3.9	1190	S201_3.9 S1 M1LA4	504	S201_3.9 P80 BN80A4	505
377	13.6	2.2	2.4	1160	S201_2.4 S2 M2SA6	504	S201_2.4 P80 BN80B6	505
389	13.2	1.6	7.2	1160	S201_7.2 S1 M1SD2	504	S201_7.2 P71 BN71B2	505
396	13.0	3.1	7.1	1600	S301_7.1 S1 M1SD2	506	S301_7.1 P71 BN71B2	507
407	12.6	0.9	6.9	570	S101_6.9 S1 M1SD2	502	S101_6.9 P71 BN71B2	503
431	11.9	1.0	3.2	560	S101_3.2 S1 M1LA4	502	S101_3.2 P80 BN80A4	503
444	11.6	2.2	3.1	1120	S201_3.1 S1 M1LA4	504	S201_3.1 P80 BN80A4	505
460	11.2	1.1	6.1	570	S101_6.1 S1 M1SD2	502	S101_6.1 P71 BN71B2	503
483	10.7	2.0	5.8	1100	S201_5.8 S1 M1SD2	504	S201_5.8 P71 BN71B2	505
486	10.6	1.9	1.9	1080	S201_1.9 S2 M2SA6	504	S201_1.9 P80 BN80B6	505
491	10.5	1.1	1.9	540	S101_1.9 S2 M2SA6	502	S101_1.9 P80 BN80B6	503
504	10.2	3.4	1.8	1470	S301_1.8 S2 M2SA6	506	S301_1.8 P80 BN80B6	507
552	9.3	1.1	2.5	540	S101_2.5 S1 M1LA4	502	S101_2.5 P80 BN80A4	503
566	9.1	2.9	2.4	1050	S201_2.4 S1 M1LA4	504	S201_2.4 P80 BN80A4	505
589	8.7	2.4	4.8	1040	S201_4.8 S1 M1SD2	504	S201_4.8 P71 BN71B2	505
594	8.7	1.2	4.7	540	S101_4.7 S1 M1SD2	502	S101_4.7 P71 BN71B2	503
647	8.0	1.5	1.4	510	S101_1.4 S2 M2SA6	502	S101_1.4 P80 BN80B6	503

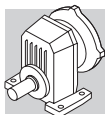


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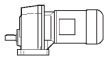



n ₂ min ⁻¹	M ₂ Nm	S	i	R _{n2} N				
661	7.8	2.6	1.4	990	S201_1.4 S2 M2SA6	504	S201_1.4 P80 BN80B6	505
714	7.2	2.9	3.9	980	S201_3.9 S1 M1SD2	504	S201_3.9 P71 BN71B2	505
728	7.1	2.4	1.9	970	S201_1.9 S1 M1LA4	504	S201_1.9 P80 BN80A4	505
731	7.0	1.4	3.8	510	S101_3.8 S1 M1SD2	502	S101_3.8 P71 BN71B2	503
736	7.0	1.4	1.9	500	S101_1.9 S1 M1LA4	502	S101_1.9 P80 BN80A4	503
878	5.9	1.7	3.2	490	S101_3.2 S1 M1SD2	502	S101_3.2 P71 BN71B2	503
971	5.3	1.9	1.4	470	S101_1.4 S1 M1LA4	502	S101_1.4 P80 BN80A4	503
992	5.2	3.3	1.4	890			S201_1.4 P80 BN80A4	505
1124	4.6	1.7	2.5	460	S101_2.5 S1 M1SD2	502	S101_2.5 P71 BN71B2	503
1499	3.4	2.3	1.9	430	S101_1.9 S1 M1SD2	502	S101_1.9 P71 BN71B2	503
1977	2.6	3.1	1.4	390	S101_1.4 S1 M1SD2	502	S101_1.4 P71 BN71B2	503

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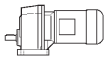



n ₂ min ⁻¹	M ₂ Nm	S	i	R _{n2} N				
71	98.3	1.0	12.9	6170	S501_12.9 S2 M2SB6	510	S501_12.9 P90 BN90S6	511
88	79.8	1.4	10.5	5810	S501_10.5 S2 M2SB6	510	S501_10.5 P90 BN90S6	511
105	66.9	1.9	8.8	5520	S501_8.8 S2 M2SB6	510	S501_8.8 P90 BN90S6	511
107	65.9	1.1	8.6	3800	S401_8.6 S2 M2SB6	508	S401_8.6 P90 BN90S6	509
109	64.6	1.5	12.9	5460	S501_12.9 S2 M2SA4	510	S501_12.9 P80 BN80B4	511
124	56.5	2.5	7.4	5240	S501_7.4 S2 M2SB6	510	S501_7.4 P90 BN90S6	511
129	54.6	1.6	7.2	3700	S401_7.2 S2 M2SB6	508	S401_7.2 P90 BN90S6	509
130	54.1	1.1	7.1	2040	S301_7.1 S2 M2SB6	506	S301_7.1 P90 BN90S6	507
131	53.5	0.9	10.7	3670	S401_10.7 S2 M2SA4	508	S401_10.7 P80 BN80B4	509
134	52.4	2.1	10.5	5130	S501_10.5 S2 M2SA4	510	S501_10.5 P80 BN80B4	511
152	46.3	2.3	6.1	3530	S401_6.1 S2 M2SB6	508	S401_6.1 P90 BN90S6	509
152	46.2	3.2	6.1	4940	S501_6.1 S2 M2SB6	510	S501_6.1 P90 BN90S6	511
157	44.6	1.3	5.8	1960	S301_5.8 S2 M2SB6	506	S301_5.8 P90 BN90S6	507
160	44.0	2.5	8.8	4870	S501_8.8 S2 M2SA4	510	S501_8.8 P80 BN80B4	511
162	43.3	1.4	8.6	3460	S401_8.6 S2 M2SA4	508	S401_8.6 P80 BN80B4	509
186	37.6	1.5	4.9	1880	S301_4.9 S2 M2SB6	506	S301_4.9 P90 BN90S6	507
190	36.9	2.8	4.8	3300	S401_4.8 S2 M2SB6	508	S401_4.8 P90 BN90S6	509
196	35.9	2.2	7.2	3280	S401_7.2 S2 M2SA4	508	S401_7.2 P80 BN80B4	509
197	35.6	1.4	7.1	1860	S301_7.1 S2 M2SA4	506	S301_7.1 P80 BN80B4	507
217	32.3	2.5	12.9	4420	S501_12.9 S1 M1LA2	510	S501_12.9 P80 BN80A2	511
226	31.1	1.3	12.4	3150	S401_12.4 S1 M1LA2	508	S401_12.4 P80 BN80A2	509
231	30.4	3.0	6.1	3120	S401_6.1 S2 M2SA4	508	S401_6.1 P80 BN80B4	509
233	30.1	1.9	3.9	1780	S301_3.9 S2 M2SB6	506	S301_3.9 P90 BN90S6	507
234	30.0	1.0	3.9	1220	S201_3.9 S2 M2SB6	504	S201_3.9 P90 BN90S6	505
239	29.3	1.7	5.8	1780	S301_5.8 S2 M2SA4	506	S301_5.8 P80 BN80B4	507
263	26.7	1.5	10.7	3000	S401_10.7 S1 M1LA2	508	S401_10.7 P80 BN80A2	509
268	26.2	3.2	10.5	4140	S501_10.5 S1 M1LA2	510	S501_10.5 P80 BN80A2	511
272	25.8	0.9	10.3	1730	S301_10.3 S1 M1LA2	506	S301_10.3 P80 BN80A2	507
284	24.7	2.0	4.9	1700	S301_4.9 S2 M2SA4	506	S301_4.9 P80 BN80B4	507
294	23.9	1.1	4.8	1180	S201_4.8 S2 M2SA4	504	S201_4.8 P80 BN80B4	505
296	23.7	1.3	3.1	1160	S201_3.1 S2 M2SB6	504	S201_3.1 P90 BN90S6	505
300	23.4	2.5	3.1	1670	S301_3.1 S2 M2SB6	506	S301_3.1 P90 BN90S6	507
315	22.3	1.1	8.9	1660	S301_8.9 S1 M1LA2	506	S301_8.9 P80 BN80A2	507

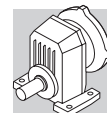


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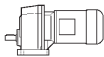



n₂ min ⁻¹	M₂ Nm	S	i	R_{n2} N				
324	21.7	2.2	8.6	2820	S401_8.6 S1 M1LA2	508	S401_8.6 P80 BN80A2	509
355	19.8	2.5	3.9	1600	S301_3.9 S2 M2SA4	506	S301_3.9 P80 BN80B4	507
356	19.7	1.3	3.9	1130	S201_3.9 S2 M2SA4	504	S201_3.9 P80 BN80B4	505
377	18.6	1.6	2.4	1110	S201_2.4 S2 M2SB6	504	S201_2.4 P90 BN90S6	505
380	18.5	3.1	2.4	1560	S301_2.4 S2 M2SB6	506	S301_2.4 P90 BN90S6	507
388	18.1	1.2	7.2	1120	S201_7.2 S1 M1LA2	504	S201_7.2 P80 BN80A2	505
395	17.8	2.3	7.1	1560	S301_7.1 S1 M1LA2	506	S301_7.1 P80 BN80A2	507
450	15.6	1.7	3.1	1070	S201_3.1 S2 M2SA4	504	S201_3.1 P80 BN80B4	505
457	15.4	3.3	3.1	1490	S301_3.1 S2 M2SA4	506	S301_3.1 P80 BN80B4	507
479	14.7	2.7	5.8	1480	S301_5.8 S1 M1LA2	506	S301_5.8 P80 BN80A2	507
481	14.6	1.4	5.8	1060	S201_5.8 S1 M1LA2	504	S201_5.8 P80 BN80A2	505
486	14.5	1.4	1.9	1040	S201_1.9 S2 M2SB6	504	S201_1.9 P90 BN90S6	505
504	13.9	2.5	1.8	1440	S301_1.8 S2 M2SB6	506	S301_1.8 P90 BN90S6	507
568	12.4	3.2	4.9	1410	S301_4.9 S1 M1LA2	506	S301_4.9 P80 BN80A2	507
574	12.2	2.1	2.4	1010	S201_2.4 S2 M2SA4	504	S201_2.4 P80 BN80B4	505
587	12.0	1.8	4.8	1010	S201_4.8 S1 M1LA2	504	S201_4.8 P80 BN80A2	505
647	10.8	1.1	1.4	460	S101_1.4 S2 M2SB6	502	S101_1.4 P90 BN90S6	503
654	10.7	3.3	1.4	1330	S301_1.4 S2 M2SB6	506	S301_1.4 P90 BN90S6	507
661	10.6	1.9	1.4	960	S201_1.4 S2 M2SB6	504	S201_1.4 P90 BN90S6	505
712	9.9	2.1	3.9	960	S201_3.9 S1 M1LA2	504	S201_3.9 P80 BN80A2	505
728	9.6	1.0	3.8	480	S101_3.8 S1 M1LA2	502	S101_3.8 P80 BN80A2	503
739	9.5	1.8	1.9	940	S201_1.9 S2 M2SA4	504	S201_1.9 P80 BN80B4	505
747	9.4	1.1	1.9	460	S101_1.9 S2 M2SA4	502	S101_1.9 P80 BN80B4	503
767	9.2	3.3	1.8	1280	S301_1.8 S2 M2SA4	506	S301_1.8 P80 BN80B4	507
875	8.0	1.2	3.2	460	S101_3.2 S1 M1LA2	502	S101_3.2 P80 BN80A2	503
900	7.8	2.7	3.1	900	S201_3.1 S1 M1LA2	504	S201_3.1 P80 BN80A2	505
985	7.1	1.4	1.4	440	S101_1.4 S2 M2SA4	502	S101_1.4 P80 BN80B4	503
1006	7.0	2.4	1.4	860	S201_1.4 S2 M2SA4	504	S201_1.4 P80 BN80B4	505
1120	6.3	1.3	2.5	440	S101_2.5 S1 M1LA2	502	S101_2.5 P80 BN80A2	503
1149	6.1	3.4	2.4	840	S201_2.4 S1 M1LA2	504	S201_2.4 P80 BN80A2	505
1478	4.7	2.7	1.9	780	S201_1.9 S1 M1LA2	504	S201_1.9 P80 BN80A2	505
1493	4.7	1.7	1.9	410	S101_1.9 S1 M1LA2	502	S101_1.9 P80 BN80A2	503
1970	3.6	2.2	1.4	380	S101_1.4 S1 M1LA2	502	S101_1.4 P80 BN80A2	503

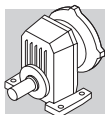
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n₂ min ⁻¹	M₂ Nm	S	i	R_{n2} N				
88	117.0	1.0	10.5	5650	S501_10.5 S3 M3SA6	510	S501_10.5 P90 BN90L6	511
105	98.1	1.3	8.8	5380	S501_8.8 S3 M3SA6	510	S501_8.8 P90 BN90L6	511
109	94.8	1.1	12.9	5320	S501_12.9 S2 M2SB4	510	S501_12.9 P90 BN90S4	511
124	82.8	1.7	7.4	5120	S501_7.4 S3 M3SA6	510	S501_7.4 P90 BN90L6	511
129	80.1	1.1	7.2	3550	S401_7.2 S3 M3SA6	508	S401_7.2 P90 BN90L6	509
134	76.9	1.4	10.5	5020	S501_10.5 S2 M2SB4	510	S501_10.5 P90 BN90S4	511
152	67.9	1.5	6.1	3400	S401_6.1 S3 M3SA6	508	S401_6.1 P90 BN90L6	509
152	67.8	2.2	6.1	4840	S501_6.1 S3 M3SA6	510	S501_6.1 P90 BN90L6	511
160	64.5	1.7	8.8	4770	S501_8.8 S2 M2SB4	510	S501_8.8 P90 BN90S4	511
162	63.5	0.9	8.6	3350	S401_8.6 S2 M2SB4	508	S401_8.6 P90 BN90S4	509
186	55.2	1.1	4.9	1740	S301_4.9 S3 M3SA6	506	S301_4.9 P90 BN90L6	507



1.1 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	R _{n2} N				
189	54.4	2.4	7.4	4530	S501_7.4 S2 M2SB4	510	S501_7.4 P90 BN90S4	511
190	54.1	1.9	4.8	3200	S401_4.8 S3 M3SA6	508	S401_4.8 P90 BN90L6	509
194	53.2	3.3	4.8	4500	S501_4.8 S3 M3SA6	510	S501_4.8 P90 BN90L6	511
196	52.6	1.5	7.2	3180	S401_7.2 S2 M2SB4	508	S401_7.2 P90 BN90S4	509
197	52.1	1.0	7.1	1730	S301_7.1 S2 M2SB4	506	S301_7.1 P90 BN90S4	507
217	47.4	1.7	12.9	4350	S501_12.9 S2 M2SA2	510	S501_12.9 P80 BN80B2	511
231	44.6	2.0	6.1	3040	S401_6.1 S2 M2SB4	508	S401_6.1 P90 BN90S4	509
231	44.5	2.9	6.1	4270	S501_6.1 S2 M2SB4	510	S501_6.1 P90 BN90S4	511
233	44.1	1.3	3.9	1670	S301_3.9 S3 M3SA6	506	S301_3.9 P90 BN90L6	507
239	43.0	1.2	5.8	1670	S301_5.8 S2 M2SB4	506	S301_5.8 P90 BN90S4	507
241	42.7	2.5	3.8	2990	S401_3.8 S3 M3SA6	508	S401_3.8 P90 BN90L6	509
263	39.2	1.0	10.7	2930	S401_10.7 S2 M2SA2	508	S401_10.7 P80 BN80B2	509
268	38.4	2.2	10.5	4090	S501_10.5 S2 M2SA2	510	S501_10.5 P80 BN80B2	511
284	36.3	1.4	4.9	1610	S301_4.9 S2 M2SB4	506	S301_4.9 P90 BN90S4	507
290	35.5	2.5	4.8	2850	S401_4.8 S2 M2SB4	508	S401_4.8 P90 BN90S4	509
300	34.3	1.7	3.1	1580	S301_3.1 S3 M3SA6	506	S301_3.1 P90 BN90L6	507
301	34.2	3.1	3.1	2810	S401_3.1 S3 M3SA6	508	S401_3.1 P90 BN90L6	509
319	32.2	2.6	8.8	3870	S501_8.8 S2 M2SA2	510	S501_8.8 P80 BN80B2	511
324	31.8	1.5	8.6	2760	S401_8.6 S2 M2SA2	508	S401_8.6 P80 BN80B2	509
355	29.0	1.7	3.9	1530	S301_3.9 S2 M2SB4	506	S301_3.9 P90 BN90S4	507
367	28.0	3.2	3.8	2650	S401_3.8 S2 M2SB4	508	S401_3.8 P90 BN90S4	509
377	27.3	1.1	2.4	1010	S201_2.4 S3 M3SA6	504	S201_2.4 P90 BN90L6	505
380	27.1	2.1	2.4	1490	S301_2.4 S3 M3SA6	506	S301_2.4 P90 BN90L6	507
391	26.3	2.4	7.2	2610	S401_7.2 S2 M2SA2	508	S401_7.2 P80 BN80B2	509
395	26.1	1.5	7.1	1500	S301_7.1 S2 M2SA2	506	S301_7.1 P80 BN80B2	507
450	22.9	1.1	3.1	990	S201_3.1 S2 M2SB4	504	S201_3.1 P90 BN90S4	505
457	22.5	2.2	3.1	1430	S301_3.1 S2 M2SB4	506	S301_3.1 P90 BN90S4	507
462	22.3	3.1	6.1	2490	S401_6.1 S2 M2SA2	508	S401_6.1 P80 BN80B2	509
479	21.5	1.9	5.8	1420	S301_5.8 S2 M2SA2	506	S301_5.8 P80 BN80B2	507
481	21.4	1.0	5.8	990	S201_5.8 S2 M2SA2	504	S201_5.8 P80 BN80B2	505
486	21.2	0.9	1.9	960	S201_1.9 S3 M3SA6	504	S201_1.9 P90 BN90L6	505
497	20.7	3.4	1.9	2420	S401_1.9 S3 M3SA6	508	S401_1.9 P90 BN90L6	509
504	20.4	1.7	1.8	1380	S301_1.8 S3 M3SA6	506	S301_1.8 P90 BN90L6	507
568	18.1	2.2	4.9	1360	S301_4.9 S2 M2SA2	506	S301_4.9 P80 BN80B2	507
574	17.9	1.5	2.4	940	S201_2.4 S2 M2SB4	504	S201_2.4 P90 BN90S4	505
578	17.8	2.8	2.4	1340	S301_2.4 S2 M2SB4	506	S301_2.4 P90 BN90S4	507
587	17.5	1.2	4.8	950	S201_4.8 S2 M2SA2	504	S201_4.8 P80 BN80B2	505
654	15.7	2.2	1.4	1290	S301_1.4 S3 M3SA6	506	S301_1.4 P90 BN90L6	507
661	15.6	1.3	1.4	900	S201_1.4 S3 M3SA6	504	S201_1.4 P90 BN90L6	505
710	14.5	2.8	3.9	1280	S301_3.9 S2 M2SA2	506	S301_3.9 P80 BN80B2	507
712	14.5	1.5	3.9	910	S201_3.9 S2 M2SA2	504	S201_3.9 P80 BN80B2	505
739	13.9	1.2	1.9	890	S201_1.9 S2 M2SB4	504	S201_1.9 P90 BN90S4	505
767	13.4	2.2	1.8	1240	S301_1.8 S2 M2SB4	506	S301_1.8 P90 BN90S4	507
900	11.4	1.8	3.1	860	S201_3.1 S2 M2SA2	504	S201_3.1 P80 BN80B2	505
985	10.4	1.0	1.4	390	S101_1.4 S2 M2SB4	502	S101_1.4 P90 BN90S4	503
995	10.3	2.9	1.4	1150	S301_1.4 S2 M2SB4	506	S301_1.4 P90 BN90S4	507
1006	10.2	1.7	1.4	820	S201_1.4 S2 M2SB4	504	S201_1.4 P90 BN90S4	505
1149	9.0	2.3	2.4	810	S201_2.4 S2 M2SA2	504	S201_2.4 P80 BN80B2	505
1478	7.0	1.9	1.9	750	S201_1.9 S2 M2SA2	504	S201_1.9 P80 BN80B2	505
1493	6.9	1.2	1.9	380	S101_1.9 S2 M2SA2	502	S101_1.9 P80 BN80B2	503
1970	5.2	1.5	1.4	350	S101_1.4 S2 M2SA2	502	S101_1.4 P80 BN80B2	503

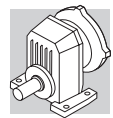


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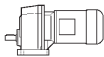



n ₂ min ⁻¹	M ₂ Nm	S	i	R _{n2} N				
2013	5.1	2.5	1.4	690	S201_1.4 S2 M2SA2	504	S201_1.4 P80 BN80B2	505

1.5 kW

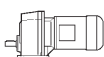



n ₂ min ⁻¹	M ₂ Nm	S	i	R _{n2} N				
88	117.0	1.0	10.5	5650	S501_10.5 S3 M3SA6	510	S501_10.5 P90 BN90L6	511
105	98.1	1.3	8.8	5380	S501_8.8 S3 M3SA6	510	S501_8.8 P90 BN90L6	511
109	94.8	1.1	12.9	5320	S501_12.9 S3 M3SA4	510	S501_12.9 P90 BN90S4	511
124	82.8	1.7	7.4	5120	S501_7.4 S3 M3SA6	510	S501_7.4 P90 BN90L6	511
129	80.1	1.1	7.2	3550	S401_7.2 S3 M3SA6	508	S401_7.2 P90 BN90L6	509
134	76.9	1.4	10.5	5020	S501_10.5 S3 M3SA4	510	S501_10.5 P90 BN90S4	511
152	67.9	1.5	6.1	3400	S401_6.1 S3 M3SA6	508	S401_6.1 P90 BN90L6	509
152	67.8	2.2	6.1	4840	S501_6.1 S3 M3SA6	510	S501_6.1 P90 BN90L6	511
160	64.5	1.7	8.8	4770	S501_8.8 S3 M3SA4	510	S501_8.8 P90 BN90S4	511
162	63.5	0.9	8.6	3350	S401_8.6 S3 M3SA4	508	S401_8.6 P90 BN90S4	509
186	55.2	1.1	4.9	1740	S301_4.9 S3 M3SA6	506	S301_4.9 P90 BN90L6	507
189	54.4	2.4	7.4	4530	S501_7.4 S3 M3SA4	510	S501_7.4 P90 BN90S4	511
190	54.1	1.9	4.8	3200	S401_4.8 S3 M3SA6	508	S401_4.8 P90 BN90L6	509
194	53.2	3.3	4.8	4500	S501_4.8 S3 M3SA6	510	S501_4.8 P90 BN90L6	511
196	52.6	1.5	7.2	3180	S401_7.2 S3 M3SA4	508	S401_7.2 P90 BN90S4	509
197	52.1	1.0	7.1	1730	S301_7.1 S3 M3SA4	506	S301_7.1 P90 BN90S4	507
217	47.4	1.7	12.9	4350	S501_12.9 S2 M2SA2	510	S501_12.9 P80 BN80B2	511
231	44.6	2.0	6.1	3040	S401_6.1 S3 M3SA4	508	S401_6.1 P90 BN90S4	509
231	44.5	2.9	6.1	4270	S501_6.1 S3 M3SA4	510	S501_6.1 P90 BN90S4	511
233	44.1	1.3	3.9	1670	S301_3.9 S3 M3SA6	506	S301_3.9 P90 BN90L6	507
239	43.0	1.2	5.8	1670	S301_5.8 S3 M3SA4	506	S301_5.8 P90 BN90S4	507
241	42.7	2.5	3.8	2990	S401_3.8 S3 M3SA6	508	S401_3.8 P90 BN90L6	509
263	39.2	1.0	10.7	2930	S401_10.7 S2 M2SA2	508	S401_10.7 P80 BN80B2	509
268	38.4	2.2	10.5	4090	S501_10.5 S2 M2SA2	510	S501_10.5 P80 BN80B2	511
284	36.3	1.4	4.9	1610	S301_4.9 S3 M3SA4	506	S301_4.9 P90 BN90S4	507
290	35.5	2.5	4.8	2850	S401_4.8 S3 M3SA4	508	S401_4.8 P90 BN90S4	509
300	34.3	1.7	3.1	1580	S301_3.1 S3 M3SA6	506	S301_3.1 P90 BN90L6	507
301	34.2	3.1	3.1	2810	S401_3.1 S3 M3SA6	508	S401_3.1 P90 BN90L6	509
319	32.2	2.6	8.8	3870	S501_8.8 S2 M2SA2	510	S501_8.8 P80 BN80B2	511
324	31.8	1.5	8.6	2760	S401_8.6 S2 M2SA2	508	S401_8.6 P80 BN80B2	509
355	29.0	1.7	3.9	1530	S301_3.9 S3 M3SA4	506	S301_3.9 P90 BN90S4	507
367	28.0	3.2	3.8	2650	S401_3.8 S3 M3SA4	508	S401_3.8 P90 BN90S4	509
377	27.3	1.1	2.4	1010	S201_2.4 S3 M3SA6	504	S201_2.4 P90 BN90L6	505
380	27.1	2.1	2.4	1490	S301_2.4 S3 M3SA6	506	S301_2.4 P90 BN90L6	507
391	26.3	2.4	7.2	2610	S401_7.2 S2 M2SA2	508	S401_7.2 P80 BN80B2	509
395	26.1	1.5	7.1	1500	S301_7.1 S2 M2SA2	506	S301_7.1 P80 BN80B2	507
450	22.9	1.1	3.1	990	S201_3.1 S3 M3SA4	504	S201_3.1 P90 BN90S4	505
457	22.5	2.2	3.1	1430	S301_3.1 S3 M3SA4	506	S301_3.1 P90 BN90S4	507
462	22.3	3.1	6.1	2490	S401_6.1 S2 M2SA2	508	S401_6.1 P80 BN80B2	509
479	21.5	1.9	5.8	1420	S301_5.8 S2 M2SA2	506	S301_5.8 P80 BN80B2	507
481	21.4	1.0	5.8	990	S201_5.8 S2 M2SA2	504	S201_5.8 P80 BN80B2	505
486	21.2	0.9	1.9	960	S201_1.9 S3 M3SA6	504	S201_1.9 P90 BN90L6	505
497	20.7	3.4	1.9	2420	S401_1.9 S3 M3SA6	508	S401_1.9 P90 BN90L6	509

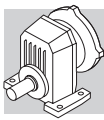


1.5 kW

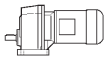



n₂ min ⁻¹	M₂ Nm	S	i	R_{n2} N				
504	20.4	1.7	1.8	1380	S301_1.8 S3 M3SA6	506	S301_1.8 P90 BN90L6	507
568	18.1	2.2	4.9	1360	S301_4.9 S2 M2SA2	506	S301_4.9 P80 BN80B2	507
574	17.9	1.5	2.4	940	S201_2.4 S3 M3SA4	504	S201_2.4 P90 BN90S4	505
578	17.8	2.8	2.4	1340	S301_2.4 S3 M3SA4	506	S301_2.4 P90 BN90S4	507
587	17.5	1.2	4.8	950	S201_4.8 S2 M2SA2	504	S201_4.8 P80 BN80B2	505
654	15.7	2.2	1.4	1290	S301_1.4 S3 M3SA6	506	S301_1.4 P90 BN90L6	507
661	15.6	1.3	1.4	900	S201_1.4 S3 M3SA6	504	S201_1.4 P90 BN90L6	505
710	14.5	2.8	3.9	1280	S301_3.9 S2 M2SA2	506	S301_3.9 P80 BN80B2	507
712	14.5	1.5	3.9	910	S201_3.9 S2 M2SA2	504	S201_3.9 P80 BN80B2	505
739	13.9	1.2	1.9	890	S201_1.9 S3 M3SA4	504	S201_1.9 P90 BN90S4	505
767	13.4	2.2	1.8	1240	S301_1.8 S3 M3SA4	506	S301_1.8 P90 BN90S4	507
900	11.4	1.8	3.1	860	S201_3.1 S2 M2SA2	504	S201_3.1 P80 BN80B2	505
985	10.4	1.0	1.4	390	S101_1.4 S3 M3SA4	502	S101_1.4 P90 BN90S4	503
995	10.3	2.9	1.4	1150	S301_1.4 S3 M3SA4	506	S301_1.4 P90 BN90S4	507
1006	10.2	1.7	1.4	820	S201_1.4 S3 M3SA4	504	S201_1.4 P90 BN90S4	505
1149	9.0	2.3	2.4	810	S201_2.4 S2 M2SA2	504	S201_2.4 P80 BN80B2	505
1478	7.0	1.9	1.9	750	S201_1.9 S2 M2SA2	504	S201_1.9 P80 BN80B2	505
1493	6.9	1.2	1.9	380	S101_1.9 S2 M2SA2	502	S101_1.9 P80 BN80B2	503
1970	5.2	1.5	1.4	350	S101_1.4 S2 M2SA2	502	S101_1.4 P80 BN80B2	503
2013	5.1	2.5	1.4	690	S201_1.4 S2 M2SA2	504	S201_1.4 P80 BN80B2	505

2.2 kW

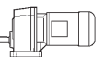



n₂ min ⁻¹	M₂ Nm	S	i	R_{n2} N				
154	134.1	1.1	6.1	4520	S501_6.1 S3 M3LC6	510	S501_6.1 P112 BN112M6	511
191	108.1	1.2	7.4	4280	S501_7.4 S3 M3LA4	510	S501_7.4 P100 BN100LA4	511
192	107.0	1.0	4.8	2880	S401_4.8 S3 M3LC6	508	S401_4.8 P112 BN112M6	509
196	105.2	1.7	4.8	4230	S501_4.8 S3 M3LC6	510	S501_4.8 P112 BN112M6	511
232	88.6	1.0	6.1	2790	S401_6.1 S3 M3LA4	508	S401_6.1 P100 BN100LA4	509
233	88.4	1.5	6.1	4060	S501_6.1 S3 M3LA4	510	S501_6.1 P100 BN100LA4	511
242	85.1	2.1	3.8	4000	S501_3.8 S3 M3LC6	510	S501_3.8 P112 BN112M6	511
244	84.4	1.2	3.8	2730	S401_3.8 S3 M3LC6	508	S401_3.8 P112 BN112M6	509
269	76.6	1.1	10.5	3910	S501_10.5 S3 M3SA2	510	S501_10.5 P90 BN90L2	511
292	70.6	1.3	4.8	2640	S401_4.8 S3 M3LA4	508	S401_4.8 P100 BN100LA4	509
297	69.4	2.2	4.8	3790	S501_4.8 S3 M3LA4	510	S501_4.8 P100 BN100LA4	511
305	67.6	1.6	3.1	2590	S401_3.1 S3 M3LC6	508	S401_3.1 P112 BN112M6	509
306	67.4	2.4	3.0	3750	S501_3.0 S3 M3LC6	510	S501_3.0 P112 BN112M6	511
320	64.3	1.3	8.8	3730	S501_8.8 S3 M3SA2	510	S501_8.8 P90 BN90L2	511
367	56.1	2.7	3.8	3570	S501_3.8 S3 M3LA4	510	S501_3.8 P100 BN100LA4	511
370	55.7	1.6	3.8	2490	S401_3.8 S3 M3LA4	508	S401_3.8 P100 BN100LA4	509
380	54.2	1.8	7.4	3540	S501_7.4 S3 M3SA2	510	S501_7.4 P90 BN90L2	511
384	53.6	1.1	2.4	1260	S301_2.4 S3 M3LC6	506	S301_2.4 P112 BN112M6	507
386	53.3	2.8	2.4	3500	S501_2.4 S3 M3LC6	510	S501_2.4 P112 BN112M6	511
389	52.9	2.0	2.4	2450	S401_2.4 S3 M3LC6	508	S401_2.4 P112 BN112M6	509
393	52.4	1.2	7.2	2460	S401_7.2 S3 M3SA2	508	S401_7.2 P90 BN90L2	509
460	44.7	1.1	3.1	1240	S301_3.1 S3 M3LA4	506	S301_3.1 P100 BN100LA4	507
462	44.6	2.0	3.1	2340	S401_3.1 S3 M3LA4	508	S401_3.1 P100 BN100LA4	509
463	44.5	1.6	6.1	2360	S401_6.1 S3 M3SA2	508	S401_6.1 P90 BN90L2	509

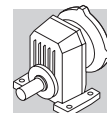


2.2 kW

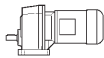



n₂ min ⁻¹	M₂ Nm	S	i	R_{n2} N				
463	44.4	3.2	3.0	3340	S501_3.0 S3 M3LA4	510	S501_3.0 P100 BN100LA4	511
464	44.4	2.3	6.1	3340	S501_6.1 S3 M3SA2	510	S501_6.1 P90 BN90L2	511
481	42.8	0.9	5.8	1250	S301_5.8 S3 M3SA2	506	S301_5.8 P90 BN90L2	507
502	41.0	1.7	1.9	2280	S401_1.9 S3 M3LC6	508	S401_1.9 P112 BN112M6	509
520	39.6	3.2	1.8	3210	S501_1.8 S3 M3LC6	510	S501_1.8 P112 BN112M6	511
570	36.1	1.1	4.9	1220	S301_4.9 S3 M3SA2	506	S301_4.9 P90 BN90L2	507
581	35.4	2.0	4.8	2210	S401_4.8 S3 M3SA2	508	S401_4.8 P90 BN90L2	509
582	35.4	1.4	2.4	1190	S301_2.4 S3 M3LA4	506	S301_2.4 P100 BN100LA4	507
590	34.9	2.6	2.4	2200	S401_2.4 S3 M3LA4	508	S401_2.4 P100 BN100LA4	509
592	34.8	3.4	4.8	3110	S501_4.8 S3 M3SA2	510	S501_4.8 P90 BN90L2	511
661	31.2	1.1	1.4	1140	S301_1.4 S3 M3LC6	506	S301_1.4 P112 BN112M6	507
682	30.2	2.3	1.4	2090	S401_1.4 S3 M3LC6	508	S401_1.4 P112 BN112M6	509
712	28.9	1.4	3.9	1160	S301_3.9 S3 M3SA2	506	S301_3.9 P90 BN90L2	507
737	27.9	2.5	3.8	2070	S401_3.8 S3 M3SA2	508	S401_3.8 P90 BN90L2	509
761	27.0	2.2	1.9	2040	S401_1.9 S3 M3LA4	508	S401_1.9 P100 BN100LA4	509
772	26.7	1.1	1.8	1120	S301_1.8 S3 M3LA4	506	S301_1.8 P100 BN100LA4	507
903	22.8	0.9	3.1	730	S201_3.1 S3 M3SA2	504	S201_3.1 P90 BN90L2	505
918	22.4	1.8	3.1	1100	S301_3.1 S3 M3SA2	506	S301_3.1 P90 BN90L2	507
921	22.4	3.1	3.1	1940	S401_3.1 S3 M3SA2	508	S401_3.1 P90 BN90L2	509
1002	20.6	1.5	1.4	1050	S301_1.4 S3 M3LA4	506	S301_1.4 P100 BN100LA4	507
1034	19.9	3.0	1.4	1860	S401_1.4 S3 M3LA4	508	S401_1.4 P100 BN100LA4	509
1153	17.9	1.2	2.4	710	S201_2.4 S3 M3SA2	504	S201_2.4 P90 BN90L2	505
1161	17.7	2.3	2.4	1030	S301_2.4 S3 M3SA2	506	S301_2.4 P90 BN90L2	507
1483	13.9	0.9	1.9	670	S201_1.9 S3 M3SA2	504	S201_1.9 P90 BN90L2	505
1539	13.4	1.8	1.8	960	S301_1.8 S3 M3SA2	506	S301_1.8 P90 BN90L2	507
1997	10.3	2.3	1.4	890	S301_1.4 S3 M3SA2	506	S301_1.4 P90 BN90L2	507
2020	10.2	1.3	1.4	630	S201_1.4 S3 M3SA2	504	S201_1.4 P90 BN90L2	505

3.0 kW





n₂ min ⁻¹	M₂ Nm	S	i	R_{n2} N				
198	141.9	1.2	4.8	4040	S501_4.8 S4 M4SA6	510	S501_4.8 P132 BN132S6	511
233	120.6	1.1	6.1	3910	S501_6.1 S3 M3LB4	510	S501_6.1 P100 BN100LB4	511
245	114.8	1.5	3.8	3840	S501_3.8 S4 M4SA6	510	S501_3.8 P132 BN132S6	511
247	113.9	0.9	3.8	2550	S401_3.8 S4 M4SA6	508	S401_3.8 P132 BN132S6	509
292	96.2	0.9	4.8	2490	S401_4.8 S3 M3LB4	508	S401_4.8 P100 BN100LB4	509
297	94.6	1.6	4.8	3670	S501_4.8 S3 M3LB4	510	S501_4.8 P100 BN100LB4	511
308	91.2	1.2	3.1	2440	S401_3.1 S4 M4SA6	508	S401_3.1 P132 BN132S6	509
309	90.9	1.8	3.0	3630	S501_3.0 S4 M4SA6	510	S501_3.0 P132 BN132S6	511
326	86.1	1.0	8.8	3600	S501_8.8 S3 M3LA2	510	S501_8.8 P100 BN100L2	511
367	76.5	2.0	3.8	3470	S501_3.8 S3 M3LB4	510	S501_3.8 P100 BN100LB4	511
370	75.9	1.2	3.8	2370	S401_3.8 S3 M3LB4	508	S401_3.8 P100 BN100LB4	509
386	72.6	1.4	7.4	3440	S501_7.4 S3 M3LA2	510	S501_7.4 P100 BN100L2	511
390	71.9	2.1	2.4	3390	S501_2.4 S4 M4SA6	510	S501_2.4 P132 BN132S6	511
393	71.4	1.5	2.4	2320	S401_2.4 S4 M4SA6	508	S401_2.4 P132 BN132S6	509
462	60.8	1.5	3.1	2250	S401_3.1 S3 M3LB4	508	S401_3.1 P100 BN100LB4	509
463	60.6	2.3	3.0	3260	S501_3.0 S3 M3LB4	510	S501_3.0 P100 BN100LB4	511
471	59.6	1.2	6.1	2260	S401_6.1 S3 M3LA2	508	S401_6.1 P100 BN100L2	509

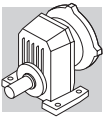


3.0 kW

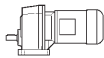


n ₂ min ⁻¹	M ₂ Nm	S	i	R _{n2} N				
472	59.4	1.7	6.1	3260	S501_6.1 S3 M3LA2	510	S501_6.1 P100 BN100L2	511
508	55.3	1.3	1.9	2170	S401_1.9 S4 M4SA6	508	S401_1.9 P132 BN132S6	509
526	53.4	2.3	1.8	3120	S501_1.8 S4 M4SA6	510	S501_1.8 P132 BN132S6	511
582	48.2	1.0	2.4	1080	S301_2.4 S3 M3LB4	506	S301_2.4 P100 BN100LB4	507
586	47.9	2.7	2.4	3040	S501_2.4 S3 M3LB4	510	S501_2.4 P100 BN100LB4	511
590	47.6	1.9	2.4	2120	S401_2.4 S3 M3LB4	508	S401_2.4 P100 BN100LB4	509
592	47.4	1.5	4.8	2130	S401_4.8 S3 M3LA2	508	S401_4.8 P100 BN100L2	509
602	46.6	2.6	4.8	3030	S501_4.8 S3 M3LA2	510	S501_4.8 P100 BN100L2	511
661	42.4	2.9	1.4	2920	S501_1.4 S4 M4SA6	510	S501_1.4 P132 BN132S6	511
689	40.7	1.7	1.4	2010	S401_1.4 S4 M4SA6	508	S401_1.4 P132 BN132S6	509
725	38.7	1.0	3.9	1070	S301_3.9 S3 M3LA2	506	S301_3.9 P100 BN100L2	507
744	37.7	3.2	3.8	2850	S501_3.8 S3 M3LA2	510	S501_3.8 P100 BN100L2	511
750	37.4	1.9	3.8	2000	S401_3.8 S3 M3LA2	508	S401_3.8 P100 BN100L2	509
761	36.9	1.6	1.9	1970	S401_1.9 S3 M3LB4	508	S401_1.9 P100 BN100LB4	509
789	35.6	3.1	1.8	2780	S501_1.8 S3 M3LB4	510	S501_1.8 P100 BN100LB4	511
934	30.1	1.3	3.1	1020	S301_3.1 S3 M3LA2	506	S301_3.1 P100 BN100L2	507
937	30.0	2.3	3.1	1880	S401_3.1 S3 M3LA2	508	S401_3.1 P100 BN100L2	509
1002	28.0	1.1	1.4	980	S301_1.4 S3 M3LB4	506	S301_1.4 P100 BN100LB4	507
1034	27.2	2.2	1.4	1820	S401_1.4 S3 M3LB4	508	S401_1.4 P100 BN100LB4	509
1181	23.8	1.7	2.4	980	S301_2.4 S3 M3LA2	506	S301_2.4 P100 BN100L2	507
1196	23.5	3.0	2.4	1760	S401_2.4 S3 M3LA2	508	S401_2.4 P100 BN100L2	509
1544	18.2	2.6	1.9	1630	S401_1.9 S3 M3LA2	508	S401_1.9 P100 BN100L2	509
1566	17.9	1.3	1.8	910	S301_1.8 S3 M3LA2	506	S301_1.8 P100 BN100L2	507
2032	13.8	1.7	1.4	850	S301_1.4 S3 M3LA2	506	S301_1.4 P100 BN100L2	507
2056	13.7	1.0	1.4	580	S201_1.4 S3 M3LA2	504	S201_1.4 P100 BN100L2	505

4.0 kW

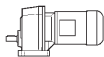


n ₂ min ⁻¹	M ₂ Nm	S	i	R _{n2} N				
200	187.2	0.9	4.8	3810	S501_4.8 S4 M4LA6	510	S501_4.8 P132 BN132MA6	511
247	151.4	1.2	3.8	3650	S501_3.8 S4 M4LA6	510	S501_3.8 P132 BN132MA6	511
293	127.9	1.2	4.8	3530	S501_4.8 S3 M3LC4	510	S501_4.8 P112 BN112M4	511
312	119.9	1.3	3.0	3470	S501_3.0 S4 M4LA6	510	S501_3.0 P132 BN132MA6	511
362	103.5	1.4	3.8	3360	S501_3.8 S3 M3LC4	510	S501_3.8 P112 BN112M4	511
388	96.5	1.0	7.4	3320	S501_7.4 S3 M3LB2	510	S501_7.4 P112 BN112M2	511
395	94.9	1.6	2.4	3270	S501_2.4 S4 M4LA6	510	S501_2.4 P132 BN132MA6	511
397	94.2	1.1	2.4	2180	S401_2.4 S4 M4LA6	508	S401_2.4 P132 BN132MA6	509
455	82.2	1.1	3.1	2130	S401_3.1 S3 M3LC4	508	S401_3.1 P112 BN112M4	509
457	82.0	1.7	3.0	3170	S501_3.0 S3 M3LC4	510	S501_3.0 P112 BN112M4	511
474	79.0	1.3	6.1	3160	S501_6.1 S3 M3LB2	510	S501_6.1 P112 BN112M2	511
513	73.0	1.0	1.9	2050	S401_1.9 S4 M4LA6	508	S401_1.9 P132 BN132MA6	509
531	70.5	1.8	1.8	3020	S501_1.8 S4 M4LA6	510	S501_1.8 P132 BN132MA6	511
577	64.8	2.0	2.4	2970	S501_2.4 S3 M3LC4	510	S501_2.4 P112 BN112M4	511
581	64.4	1.4	2.4	2030	S401_2.4 S3 M3LC4	508	S401_2.4 P112 BN112M4	509
594	63.0	1.1	4.8	2040	S401_4.8 S3 M3LB2	508	S401_4.8 P112 BN112M2	509
604	62.0	1.9	4.8	2960	S501_4.8 S3 M3LB2	510	S501_4.8 P112 BN112M2	511
669	56.0	2.2	1.4	2830	S501_1.4 S4 M4LA6	510	S501_1.4 P132 BN132MA6	511
697	53.7	1.3	1.4	1920	S401_1.4 S4 M4LA6	508	S401_1.4 P132 BN132MA6	509

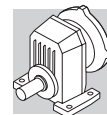


4.0 kW

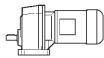


n₂ min ⁻¹	M₂ Nm	S	i	R_{n2} N				
747	50.1	2.4	3.8	2790	S501_3.8 S3 M3LB2	510	S501_3.8 P112 BN112M2	511
751	49.9	1.2	1.9	1900	S401_1.9 S3 M3LC4	508	S401_1.9 P112 BN112M4	509
753	49.7	1.4	3.8	1930	S401_3.8 S3 M3LB2	508	S401_3.8 P112 BN112M2	509
777	48.2	2.3	1.8	2730	S501_1.8 S3 M3LC4	510	S501_1.8 P112 BN112M4	511
937	39.9	1.0	3.1	940	S301_3.1 S3 M3LB2	506	S301_3.1 P112 BN112M2	507
940	39.8	1.8	3.1	1820	S401_3.1 S3 M3LB2	508	S401_3.1 P112 BN112M2	509
943	39.7	2.8	3.0	2610	S501_3.0 S3 M3LB2	510	S501_3.0 P112 BN112M2	511
978	38.3	2.9	1.4	2560	S501_1.4 S3 M3LC4	510	S501_1.4 P112 BN112M4	511
1019	36.7	1.6	1.4	1760	S401_1.4 S3 M3LC4	508	S401_1.4 P112 BN112M4	509
1185	31.6	1.3	2.4	910	S301_2.4 S3 M3LB2	506	S301_2.4 P112 BN112M2	507
1192	31.4	3.2	2.4	2430	S501_2.4 S3 M3LB2	510	S501_2.4 P112 BN112M2	511
1200	31.2	2.2	2.4	1710	S401_2.4 S3 M3LB2	508	S401_2.4 P112 BN112M2	509
1550	24.2	2.0	1.9	1590	S401_1.9 S3 M3LB2	508	S401_1.9 P112 BN112M2	509
1572	23.8	1.0	1.8	860	S301_1.8 S3 M3LB2	506	S301_1.8 P112 BN112M2	507
2039	18.4	1.3	1.4	810	S301_1.4 S3 M3LB2	506	S301_1.4 P112 BN112M2	507
2105	17.8	2.7	1.4	1460	S401_1.4 S3 M3LB2	508	S401_1.4 P112 BN112M2	509

5.5 kW




n₂ min ⁻¹	M₂ Nm	S	i	R_{n2} N				
311	165.8	1.0	3.0	3260	S501_3.0 S4 M4LB6	510	S501_3.0 P132 BN132MB6	511
375	137.3	1.1	3.8	3150	S501_3.8 S4 M4SA4	510	S501_3.8 P132 BN132S4	511
393	131.1	1.1	2.4	3090	S501_2.4 S4 M4LB6	510	S501_2.4 P132 BN132MB6	511
473	108.8	1.3	3.0	3000	S501_3.0 S4 M4SA4	510	S501_3.0 P132 BN132S4	511
477	107.9	0.9	6.1	3020	S501_6.1 S4 M4SA2	510	S501_6.1 P132 BN132SA2	511
529	97.4	1.3	1.8	2880	S501_1.8 S4 M4LB6	510	S501_1.8 P132 BN132MB6	511
598	86.1	1.5	2.4	2830	S501_2.4 S4 M4SA4	510	S501_2.4 P132 BN132S4	511
602	85.5	1.1	2.4	1870	S401_2.4 S4 M4SA4	508	S401_2.4 P132 BN132S4	509
608	84.6	1.4	4.8	2840	S501_4.8 S4 M4SA2	510	S501_4.8 P132 BN132SA2	511
665	77.4	1.6	1.4	2720	S501_1.4 S4 M4LB6	510	S501_1.4 P132 BN132MB6	511
693	74.3	0.9	1.4	1780	S401_1.4 S4 M4LB6	508	S401_1.4 P132 BN132MB6	509
752	68.4	1.8	3.8	2690	S501_3.8 S4 M4SA2	510	S501_3.8 P132 BN132SA2	511
758	67.9	1.0	3.8	1810	S401_3.8 S4 M4SA2	508	S401_3.8 P132 BN132SA2	509
778	66.2	0.9	1.9	1770	S401_1.9 S4 M4SA4	508	S401_1.9 P132 BN132S4	509
805	63.9	1.7	1.8	2610	S501_1.8 S4 M4SA4	510	S501_1.8 P132 BN132S4	511
947	54.4	1.3	3.1	1730	S401_3.1 S4 M4SA2	508	S401_3.1 P132 BN132SA2	509
950	54.2	2.0	3.0	2530	S501_3.0 S4 M4SA2	510	S501_3.0 P132 BN132SA2	511
1013	50.8	2.2	1.4	2450	S501_1.4 S4 M4SA4	510	S501_1.4 P132 BN132S4	511
1056	48.7	1.2	1.4	1660	S401_1.4 S4 M4SA4	508	S401_1.4 P132 BN132S4	509
1200	42.9	2.3	2.4	2370	S501_2.4 S4 M4SA2	510	S501_2.4 P132 BN132SA2	511
1209	42.6	1.6	2.4	1640	S401_2.4 S4 M4SA2	508	S401_2.4 P132 BN132SA2	509
1561	33.0	1.5	1.9	1530	S401_1.9 S4 M4SA2	508	S401_1.9 P132 BN132SA2	509
1616	31.8	2.7	1.8	2170	S501_1.8 S4 M4SA2	510	S501_1.8 P132 BN132SA2	511
2034	25.3	3.4	1.4	2030	S501_1.4 S4 M4SA2	510	S501_1.4 P132 BN132SA2	511
2119	24.3	2.0	1.4	1410	S401_1.4 S4 M4SA2	508	S401_1.4 P132 BN132SA2	509

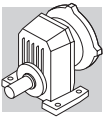


7.5 kW

n₂ min ⁻¹	M₂ Nm	S	i	R_{n2} N				
473	148.4	0.9	3.0	2810	S501_3.0 S4 M4LA4	510	S501_3.0 P132 BN132MA4	511
534	131.4	1.0	1.8	2690			S501_1.8 P160 BN160M6	511
598	117.3	1.1	2.4	2670	S501_2.4 S4 M4LA4	510	S501_2.4 P132 BN132MA4	511
611	115.0	1.0	4.8	2690	S501_4.8 S4 M4SB2	510	S501_4.8 P132 BN132SB2	511
672	104.4	1.2	1.4	2560			S501_1.4 P160 BN160M6	511
755	93.0	1.3	3.8	2570	S501_3.8 S4 M4SB2	510	S501_3.8 P132 BN132SB2	511
805	87.1	1.3	1.8	2490	S501_1.8 S4 M4LA4	510	S501_1.8 P132 BN132MA4	511
950	73.9	0.9	3.1	1610	S401_3.1 S4 M4SB2	508	S401_3.1 P132 BN132SB2	509
953	73.7	1.5	3.0	2440	S501_3.0 S4 M4SB2	510	S501_3.0 P132 BN132SB2	511
1013	69.3	1.6	1.4	2350	S501_1.4 S4 M4LA4	510	S501_1.4 P132 BN132MA4	511
1056	66.5	0.9	1.4	1540	S401_1.4 S4 M4LA4	508	S401_1.4 P132 BN132MA4	509
1205	58.3	1.7	2.4	2290	S501_2.4 S4 M4SB2	510	S501_2.4 P132 BN132SB2	511
1213	57.9	1.2	2.4	1540	S401_2.4 S4 M4SB2	508	S401_2.4 P132 BN132SB2	509
1566	44.8	1.1	1.9	1450	S401_1.9 S4 M4SB2	508	S401_1.9 P132 BN132SB2	509
1622	43.3	2.0	1.8	2110	S501_1.8 S4 M4SB2	510	S501_1.8 P132 BN132SB2	511
2041	34.4	2.5	1.4	1980	S501_1.4 S4 M4SB2	510	S501_1.4 P132 BN132SB2	511
2127	33.0	1.5	1.4	1350	S401_1.4 S4 M4SB2	508	S401_1.4 P132 BN132SB2	509

9.2 kW



n₂ min ⁻¹	M₂ Nm	S	i	R_{n2} N				
598	143.9	0.9	2.4	2530	S501_2.4 S4 M4LB4	510	S501_2.4 P132 BN132MB4	511
755	114.1	1.1	3.8	2470	S501_3.8 S4 M4LA2	510	S501_3.8 P132 BN132M2	511
805	106.9	1.0	1.8	2390	S501_1.8 S4 M4LB4	510	S501_1.8 P132 BN132MB4	511
953	90.4	1.2	3.0	2360	S501_3.0 S4 M4LA2	510	S501_3.0 P132 BN132M2	511
1013	85.0	1.3	1.4	2270	S501_1.4 S4 M4LB4	510	S501_1.4 P132 BN132MB4	511
1205	71.5	1.4	2.4	2220	S501_2.4 S4 M4LA2	510	S501_2.4 P132 BN132M2	511
1213	71.0	1.0	2.4	1460	S401_2.4 S4 M4LA2	508	S401_2.4 P132 BN132M2	509
1622	53.1	1.6	1.8	2060	S501_1.8 S4 M4LA2	510	S501_1.8 P132 BN132M2	511
2041	42.2	2.0	1.4	1930	S501_1.4 S4 M4LA2	510	S501_1.4 P132 BN132M2	511
2127	40.5	1.2	1.4	1300	S401_1.4 S4 M4LA2	508	S401_1.4 P132 BN132M2	509





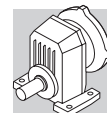
74 GEARBOX RATING CHARTS

S 10



21 Nm



	i	n ₁ = 2800 min ⁻¹					n ₁ = 1400 min ⁻¹					
		n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	
S 10 1_1.4	1.4	1972	8.0	1.7	800	310	986	10.0	1.1	800	390	503
S 10 1_1.9	1.9	1489	8.0	1.3	800	360	745	10.0	0.80	800	460	
S 10 1_2.5	2.5	1120	8.0	0.96	800	420	560	10.0	0.60	800	520	
S 10 1_3.2	3.2	875	10.0	0.93	800	440	438	12.0	0.56	800	560	
S 10 1_3.8	3.8	727	10.0	0.78	800	480	364	12.0	0.47	800	610	
S 10 1_4.7	4.7	592	10.0	0.63	800	520	296	12.0	0.38	800	660	
S 10 1_6.1	6.1	458	12.0	0.59	800	560	229	15.0	0.37	800	710	
S 10 1_6.9	6.9	406	12.0	0.52	800	580	203	15.0	0.33	800	740	
S 10 1_8.9	8.9	315	8.0	0.27	800	700	158	10.0	0.17	800	880	
S 10 1_10.3	10.3	272	8.0	0.23	800	740	136	10.0	0.15	800	930	
S 10 1_12.3	12.3	227	8.0	0.19	800	800	114	10.0	0.12	800	1000	

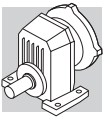
	i	n ₁ = 900 min ⁻¹					n ₁ = 500 min ⁻¹					
		n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	
S 10 1_1.4	1.4	634	12.0	0.81	800	450	352	14.0	0.53	800	560	503
S 10 1_1.9	1.9	479	12.0	0.61	800	520	266	14.0	0.40	800	640	
S 10 1_2.5	2.5	360	12.0	0.46	800	600	200	14.0	0.30	800	740	
S 10 1_3.2	3.2	281	14.0	0.42	800	650	156	17.0	0.28	800	790	
S 10 1_3.8	3.8	234	14.0	0.35	800	700	130	17.0	0.24	800	850	
S 10 1_4.7	4.7	190	14.0	0.28	800	770	106	17.0	0.19	800	930	
S 10 1_6.1	6.1	147	17.0	0.27	800	820	82	21	0.18	800	1000	
S 10 1_6.9	6.9	130	17.0	0.24	800	860	72	21	0.16	800	1040	
S 10 1_8.9	8.9	101	12.0	0.13	800	1020	56	14.0	0.08	800	1200	
S 10 1_10.3	10.3	87	12.0	0.11	800	1080	49	14.0	0.07	800	1200	
S 10 1_12.3	12.3	73	12.0	0.09	800	1160	41	14.0	0.06	800	1200	



S 20 37 Nm



	i	n ₁ = 2800 min ⁻¹					n ₁ = 1400 min ⁻¹					
		n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	
S 20 1_1.4	1.4	2014	13.0	2.8	1000	590	1007	17.0	1.8	1000	740	505
S 20 1_1.9	1.9	1481	13.0	2.1	1000	680	741	17.0	1.3	1000	860	
S 20 1_2.4	2.4	1148	21	2.6	640	680	574	26	1.6	850	860	
S 20 1_3.1	3.1	900	21	2.0	730	750	450	26	1.3	960	950	
S 20 1_3.9	3.9	712	21	1.6	820	840	356	26	0.99	1000	1060	
S 20 1_4.8	4.8	587	21	1.3	910	920	294	26	0.82	1000	1160	
S 20 1_5.8	5.8	481	21	1.1	960	1000	241	26	0.67	1000	1260	
S 20 1_7.2	7.2	388	21	0.87	980	1090	194	26	0.54	1000	1370	
S 20 1_8.5	8.5	329	13.0	0.46	1000	1240	165	17.0	0.30	1000	1500	
S 20 1_10.8	10.8	260	13.0	0.36	1000	1350	130	17.0	0.24	1000	1500	
S 20 1_12.4	12.4	225	13.0	0.31	1000	1430	113	17.0	0.20	1000	1500	



	i	n ₁ = 900 min ⁻¹					n ₁ = 500 min ⁻¹					
		n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	
S 20 1_1.4	1.4	647	20	1.4	1000	850	360	24	0.92	1000	1040	505
S 20 1_1.9	1.9	476	20	1.0	1000	990	265	24	0.68	1000	1210	
S 20 1_2.4	2.4	369	30	1.2	990	990	205	37	0.81	1000	1200	
S 20 1_3.1	3.1	289	30	0.93	1000	1110	161	37	0.64	1000	1340	
S 20 1_3.9	3.9	229	30	0.73	1000	1230	127	37	0.50	1000	1490	
S 20 1_4.8	4.8	189	30	0.60	1000	1350	105	37	0.41	1000	1500	
S 20 1_5.8	5.8	155	30	0.50	1000	1460	86	37	0.34	1000	1500	
S 20 1_7.2	7.2	125	30	0.40	1000	1500	69	37	0.27	1000	1500	
S 20 1_8.5	8.5	106	20	0.23	1000	1500	59	24	0.15	1000	1500	
S 20 1_10.8	10.8	84	20	0.18	1000	1500	47	24	0.12	1000	1500	
S 20 1_12.4	12.4	72	20	0.15	1000	1500	40	24	0.10	1000	1500	

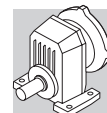


S 30

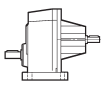

70 Nm

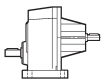

	i	n ₁ = 2800 min ⁻¹					n ₁ = 1400 min ⁻¹					
		n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	
S 30 1_1.4	1.4	1986	24	5.1	1500	770	993	30	3.2	1500	970	507
S 30 1_1.8	1.8	1530	24	3.9	1500	870	765	30	2.5	1500	1090	
S 30 1_2.4	2.4	1157	40	4.9	1270	850	579	50	3.1	1500	1070	
S 30 1_3.1	3.1	915	40	3.9	1470	950	458	50	2.4	1500	1200	
S 30 1_3.9	3.9	711	40	3.0	1500	1070	355	50	1.9	1500	1360	
S 30 1_4.9	4.9	568	40	2.4	1500	1190	284	50	1.5	1500	1500	
S 30 1_5.8	5.8	479	40	2.0	1500	1280	239	50	1.3	1500	1610	
S 30 1_7.1	7.1	395	40	1.7	1500	1390	197	50	1.1	1500	1750	
S 30 1_8.9	8.9	315	24	0.81	1500	1650	157	30	0.50	1500	2080	
S 30 1_10.3	10.3	272	24	0.70	1500	1740	136	30	0.44	1500	2190	
S 30 1_13.1	13.1	213	24	0.55	1500	1900	107	30	0.34	1500	2400	

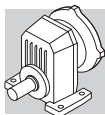
	i	n ₁ = 900 min ⁻¹					n ₁ = 500 min ⁻¹					
		n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	
S 30 1_1.4	1.4	638	35	2.4	1500	1120	355	42	1.6	1500	1360	507
S 30 1_1.8	1.8	492	35	1.8	1500	1260	273	42	1.2	1500	1540	
S 30 1_2.4	2.4	372	58	2.3	1500	1240	207	70	1.5	1500	1510	
S 30 1_3.1	3.1	294	58	1.8	1500	1390	163	70	1.2	1500	1700	
S 30 1_3.9	3.9	228	58	1.4	1500	1570	127	70	0.95	1500	1920	
S 30 1_4.9	4.9	183	58	1.1	1500	1740	101	70	0.76	1500	2120	
S 30 1_5.8	5.8	154	58	0.95	1500	1870	85	70	0.64	1500	2280	
S 30 1_7.1	7.1	127	58	0.79	1500	2030	71	62	0.47	1500	2400	
S 30 1_8.9	8.9	101	35	0.38	1500	2400	56	42	0.25	1500	2400	
S 30 1_10.3	10.3	87	35	0.33	1500	2400	49	42	0.22	1500	2400	
S 30 1_13.1	13.1	69	35	0.26	1500	2400	38	37	0.15	1500	2400	





S 40 125 Nm



	i	n ₁ = 2800 min ⁻¹					n ₁ = 1400 min ⁻¹					
		n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	
S 40 1_1.4	1.4	2059	48	10.6	2000	1270	1029	60	6.6	2000	1600	509
S 40 1_1.9	1.9	1514	48	7.8	2000	1450	757	60	4.9	2000	1830	
S 40 1_2.4	2.4	1172	70	8.8	1860	1490	586	90	5.6	2000	1870	
S 40 1_3.1	3.1	918	70	6.9	2000	1660	459	90	4.4	2000	2080	
S 40 1_3.8	3.8	735	70	5.5	2000	1830	367	90	3.5	2000	2290	
S 40 1_4.8	4.8	580	70	4.3	2000	2020	290	90	2.8	2000	2530	
S 40 1_6.1	6.1	461	70	3.5	2000	2220	231	90	2.2	2000	2790	
S 40 1_7.2	7.2	392	63	2.6	2000	2410	196	80	1.7	2000	3030	
S 40 1_8.6	8.6	324	48	1.7	2000	2670	162	60	1.0	2000	3370	
S 40 1_10.7	10.7	262	40	1.1	2000	2930	131	50	0.70	2000	3690	
S 40 1_12.4	12.4	226	40	1.0	2000	3100	113	50	0.60	2000	3800	

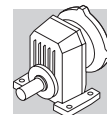
	i	n ₁ = 900 min ⁻¹					n ₁ = 500 min ⁻¹					
		n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	
S 40 1_1.4	1.4	662	70	4.9	2000	1850	368	85	3.3	2000	2250	509
S 40 1_1.9	1.9	486	70	3.6	2000	2120	270	85	2.5	2000	2580	
S 40 1_2.4	2.4	377	105	4.2	2000	2160	209	125	2.8	2000	2650	
S 40 1_3.1	3.1	295	105	3.3	2000	2400	164	125	2.2	2000	2940	
S 40 1_3.8	3.8	236	105	2.7	2000	2650	131	125	1.8	2000	3240	
S 40 1_4.8	4.8	186	105	2.1	2000	2930	104	125	1.4	2000	3580	
S 40 1_6.1	6.1	148	105	1.7	2000	3220	82	110	1.0	2000	3800	
S 40 1_7.2	7.2	126	90	1.2	2000	3530	70	90	0.67	2000	3800	
S 40 1_8.6	8.6	104	70	0.78	2000	3800	58	85	0.53	2000	3800	
S 40 1_10.7	10.7	84	58	0.52	2000	3800	47	70	0.35	2000	3800	
S 40 1_12.4	12.4	73	58	0.45	2000	3800	40	70	0.30	2000	3800	



S 50 200 Nm

	i	n ₁ = 2800 min ⁻¹					n ₁ = 1400 min ⁻¹					
		n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	
S 50 1_1.4	1.4	1972	85	17.9	730	1720	986	110	11.6	730	2150	511
S 50 1_1.8	1.8	1564	85	14.2	1220	1920	782	110	9.2	1370	2400	
S 50 1_2.4	2.4	1162	100	12.4	930	2110	581	130	8.1	970	2640	
S 50 1_3.0	3.0	921	110	10.8	860	2300	461	140	6.9	1020	2880	
S 50 1_3.8	3.8	729	120	9.3	640	2480	365	150	5.8	860	3130	
S 50 1_4.8	4.8	589	120	7.6	880	2710	295	150	4.7	1160	3420	
S 50 1_6.1	6.1	462	100	4.9	1980	3100	231	130	3.2	2330	3880	
S 50 1_7.4	7.4	378	100	4.0	2060	3340	189	130	2.6	2400	4190	
S 50 1_8.8	8.8	319	85	2.9	2400	3640	160	110	1.9	2400	4570	
S 50 1_10.5	10.5	268	85	2.4	2400	3880	134	110	1.6	2400	4870	
S 50 1_12.9	12.9	217	80	1.9	2400	4200	109	100	1.2	2400	5300	

	i	n ₁ = 900 min ⁻¹					n ₁ = 500 min ⁻¹					
		n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	
S 50 1_1.4	1.4	634	125	8.5	1010	2510	352	155	5.8	1040	3040	511
S 50 1_1.8	1.8	503	125	6.7	1730	2790	279	155	4.6	1940	3380	
S 50 1_2.4	2.4	373	150	6.0	1160	3060	207	180	4.0	1530	3730	
S 50 1_3.0	3.0	296	160	5.1	1290	3350	164	200	3.5	1310	4050	
S 50 1_3.8	3.8	234	175	4.4	940	3620	130	200	2.8	1740	4460	
S 50 1_4.8	4.8	189	175	3.5	1290	3960	105	180	2.0	2400	4970	
S 50 1_6.1	6.1	149	150	2.4	2400	4500	83	150	1.3	2400	5620	
S 50 1_7.4	7.4	122	140	1.8	2400	4900	68	140	1.0	2400	6100	
S 50 1_8.8	8.8	103	125	1.4	2400	5310	57	125	0.80	2400	6580	
S 50 1_10.5	10.5	86	115	1.1	2400	5700	48	115	0.60	2400	7050	
S 50 1_12.9	12.9	70	100	0.70	2400	6210	39	100	0.40	2400	7200	

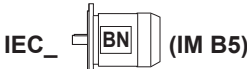


75 MOTOR AVAILABILITY

Please be aware that motor-gearbox combinations resulting from the following charts are purely based on geometrical compatibility.


When selecting a gearmotor, refer to procedure specified at paragraph 12 and observe particularly the condition $S \geq f_s$.

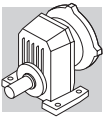
(E 69)

		 BN								
P _{n1} ^(#) [kW]	2p	0.37	0.75	1.5	2.2	4	4	9.2	18.5	22
	4p	0.25	0.55	1.1	1.85	3	4	9.2	15	22
	6p	0.12	0.37	0.75	1.1	1.85	2.2	5.5	11	15
		P63	P71	P80	P90	P100	P112	P132	P160	P180
S 10 1	i =	1.4_12.3	1.4_12.3	1.4_8.9	1.4_8.9	1.4_8.9	1.4_8.9			
S 20 1		1.9_12.4	1.9_12.4	1.4_10.8	1.4_10.8	1.4_10.8	1.4_10.8			
S 30 1		2.4_13.1	2.4_13.1	1.4_13.1	1.4_13.1	1.4_13.1	1.4_13.1	1.4_4.9		
S 40 1		3.1_12.4	3.1_12.4	1.4_12.4	1.4_12.4	1.4_12.4	1.4_12.4	1.4_6.1		
S 50 1		3.8_12.9	3.8_12.9	1.4_12.9	1.4_12.9	1.4_12.9	1.4_12.9	1.4_7.4	1.4_7.4	1.4_7.4

(#) P_{n1} = maximum installable power on input P₋

(E 70)

							
		M05	M1	M2	M3	M4	M5
S 10 1	i =	1.4_12.3	1.4_6.9	1.4_8.9	1.4_8.9		
S 20 1		1.9_12.4	1.9_8.5	1.4_10.8	1.4_10.8		
S 30 1			2.4_10.3	1.4_13.1	1.4_13.1	1.4_4.9	
S 40 1			3.1_12.4	1.4_12.4	1.4_12.4	1.4_6.1	
S 50 1			3.8_12.9	1.4_12.9	1.4_12.9	1.4_7.4	1.4_7.4



76 MOMENT OF INERTIA

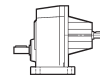
The following charts indicate moment of inertia values J_r [kgm²] referred to the gear unit high speed shaft. A key to the symbols used follows:



Values under this icon refer to compact gear units, without motor. To obtain the overall moment of inertia for the gearmotor just add the value of the inertia for the specific compact motor, given in the relevant rating chart.



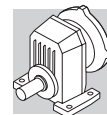
IEC Values under this symbol refer to gearboxes with IEC motor adaptor (IEC size...).






This symbol refers to gearbox values.

S 10




	i	J (•10 ⁻⁴) [kgm ²]							
			63	71	80	90	100	112	
S 10 1_1.4	1.4	0.33	1.8	1.8	3.2	3.1	4.4	4.4	1.2
S 10 1_1.9	1.9	0.22	1.7	1.7	3.1	3.0	4.3	4.3	1.1
S 10 1_2.5	2.5	0.16	1.6	1.6	3.0	2.9	4.2	4.2	1.0
S 10 1_3.2	3.2	0.10	1.6	1.6	3.0	2.9	4.2	4.2	0.97
S 10 1_3.9	3.9	0.08	1.5	1.5	2.9	2.9	4.2	4.2	0.95
S 10 1_4.7	4.7	0.06	1.5	1.5	2.9	2.8	4.1	4.1	0.93
S 10 1_6.1	6.1	0.04	1.5	1.5	2.9	2.8	4.1	4.1	0.92
S 10 1_6.9	6.9	0.03	1.5	1.5	2.9	2.8	4.1	4.1	0.91
S 10 1_8.9	8.9	0.02	1.5	1.5	2.9	2.8	4.1	4.1	0.90
S 10 1_10.3	10.3	0.02	1.5	1.5	—	—	—	—	0.89
S 10 1_12.3	12.3	0.01	1.5	1.5	—	—	—	—	0.89

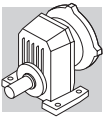


S 20



	i	J ($\cdot 10^{-4}$) [kgm ²]							
			IEC 						
			63	71	80	90	100	112	
S 20 1_1.4	1.4	0.73	—	—	3.6	3.5	4.8	4.8	2.7
S 20 1_1.9	1.9	0.48	1.9	1.9	3.3	3.3	4.6	4.6	2.4
S 20 1_2.4	2.4	0.34	1.8	1.8	3.2	3.1	4.4	4.4	2.3
S 20 1_3.1	3.1	0.20	1.7	1.7	3.0	3.0	4.3	4.3	2.1
S 20 1_3.9	3.9	0.14	1.6	1.6	3.0	2.9	4.2	4.2	2.1
S 20 1_4.8	4.8	0.12	1.6	1.6	3.0	2.9	4.2	4.2	2.0
S 20 1_5.8	5.8	0.08	1.6	1.5	2.9	2.9	4.2	4.2	2.0
S 20 1_7.2	7.2	0.06	1.5	1.5	2.9	2.8	4.1	4.1	2.0
S 20 1_8.5	8.5	0.05	1.5	1.5	2.9	2.8	4.1	4.1	2.0
S 20 1_10.8	10.8	0.03	1.5	1.5	2.9	2.8	4.1	4.1	1.9
S 20 1_12.4	12.4	0.02	1.5	1.5	—	—	—	—	1.9

S 30



	i	J ($\cdot 10^{-4}$) [kgm ²]								
			IEC 							
			63	71	80	90	100	112	132	
S 30 1_1.4	1.4	1.5	—	—	4.3	4.3	5.6	5.6	18	3.8
S 30 1_1.8	1.8	1.1	—	—	3.9	3.8	5.1	5.1	18	3.4
S 30 1_2.4	2.4	0.59	2.1	2.0	3.4	3.4	4.7	4.7	17	2.9
S 30 1_3.1	3.1	0.45	1.9	1.9	3.3	3.2	4.5	4.5	17	2.8
S 30 1_3.9	3.9	0.33	1.8	1.8	3.2	3.1	4.4	4.4	17	2.7
S 30 1_4.9	4.9	0.24	1.7	1.7	3.1	3.0	4.3	4.3	17	2.6
S 30 1_5.8	5.8	0.19	1.7	1.7	3.0	3.0	4.3	4.3	—	2.6
S 30 1_7.1	7.1	0.14	1.6	1.6	3.0	2.9	4.2	4.2	—	2.5
S 30 1_8.9	8.9	0.10	1.6	1.6	2.9	2.9	4.2	4.2	—	2.5
S 30 1_10.3	10.3	0.08	1.5	1.5	2.9	2.9	4.2	4.2	—	2.4
S 30 1_13.1	13.1	0.05	1.5	1.5	2.9	2.8	4.1	4.1	—	2.4

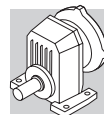


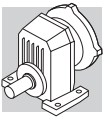
S 40

	i	J ($\cdot 10^{-4}$) [kgm ²]								
			IEC							
			63	71	80	90	100	112	132	
S 40 1_1.4	1.4	3.7	—	—	6.5	6.5	7.8	7.8	23	14
S 40 1_1.9	1.9	2.4	—	—	5.2	5.2	6.5	6.5	21	13
S 40 1_2.4	2.4	1.6	—	—	4.4	4.4	5.7	5.7	21	12
S 40 1_3.1	3.1	1.1	2.6	2.6	4.0	3.9	5.2	5.2	20	12
S 40 1_3.8	3.8	0.82	2.3	2.3	3.7	3.6	4.9	4.9	18	11
S 40 1_4.8	4.8	0.50	2.0	2.0	3.3	3.3	4.6	4.6	18	11
S 40 1_6.1	6.1	0.39	1.8	1.8	3.2	3.2	4.5	4.5	18	11
S 40 1_7.2	7.2	0.30	1.8	1.8	3.1	3.1	4.4	4.4	—	11
S 40 1_8.6	8.6	0.22	1.7	1.7	3.1	3.0	4.3	4.3	—	11
S 40 1_10.7	10.7	0.15	1.6	1.6	3.0	2.9	4.2	4.2	—	11
S 40 1_12.4	12.4	0.12	1.6	1.6	3.0	2.8	4.2	4.2	—	11

S 50

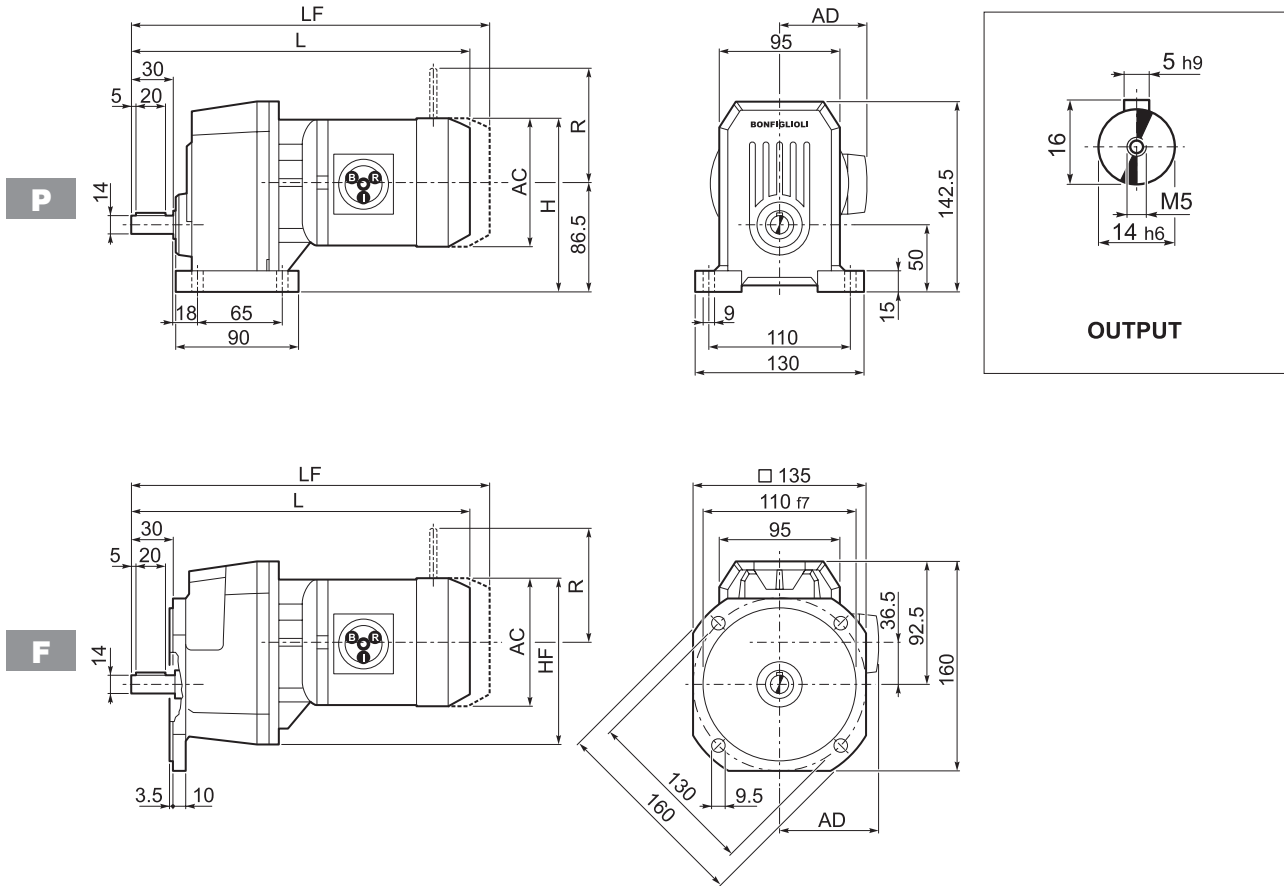
	i	J ($\cdot 10^{-4}$) [kgm ²]										
			IEC									
			63	71	80	90	100	112	132	160	180	
S 50 1_1.4	1.4	8.2	—	—	11	11	12	12	27	86	84	19
S 50 1_1.8	1.8	5.9	—	—	8.8	8.7	10	10	25	84	82	16
S 50 1_2.4	2.4	3.9	—	—	6.8	6.7	8.0	8.0	23	82	80	14
S 50 1_3.0	3.0	2.7	—	—	5.5	5.5	6.8	6.8	22	81	79	13
S 50 1_3.8	3.8	1.9	3.3	3.3	4.7	4.6	5.9	5.9	21	80	78	12
S 50 1_4.8	4.8	1.4	2.8	2.8	4.2	4.1	5.4	5.4	21	79	77	12
S 50 1_6.1	6.1	0.89	2.4	2.4	3.7	3.7	5.0	5.0	21	79	77	11
S 50 1_7.4	7.4	0.63	2.1	2.1	3.5	3.4	4.7	4.7	20	79	77	11
S 50 1_8.8	8.8	0.50	2.0	2.0	3.4	3.3	4.6	4.6	—	—	—	11
S 50 1_10.5	10.5	0.36	1.8	1.8	3.2	3.1	4.4	4.4	—	—	—	11
S 50 1_12.9	12.9	0.25	1.7	1.7	3.1	3.0	4.3	4.3	—	—	—	11



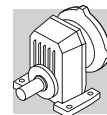


77 DIMENSIONS

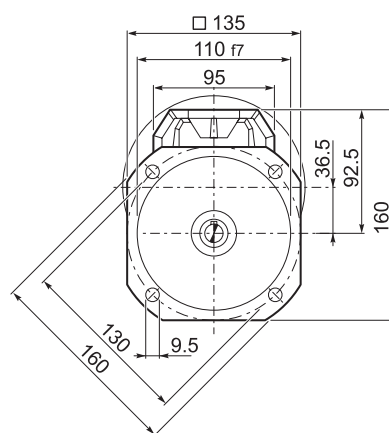
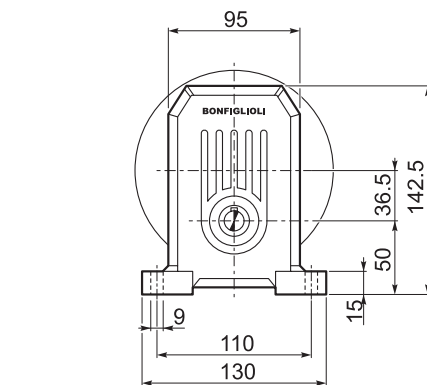
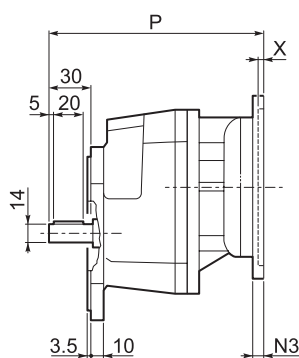
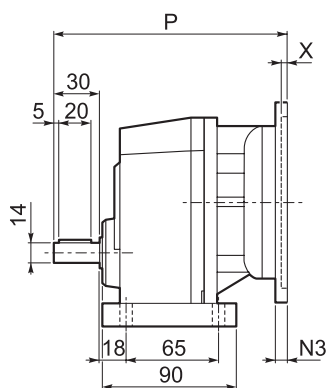
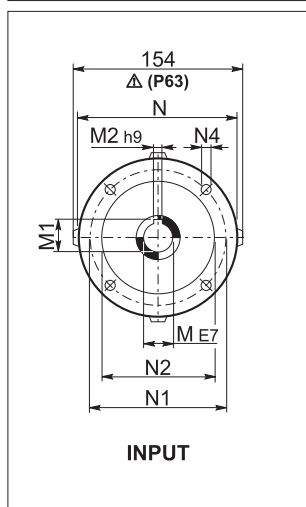
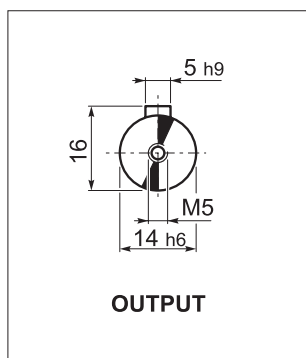
S 10...M



Motor Icon	S	M	AC	H	HF	L	AD	Kg	M...FD M...FA		M...FD		M...FA		
									LF	Kg	R	AD	R	AD	
	S 10 1	S05	M05	121	147	143	315	95	8	381	11	96	122	116	95
	S 10 1	S1	M1	137	155	151	344	102	10	405	13	103	135	124	108
	S 10 1	S2	M2S	156	164	160	367	111	13	443	17	129	146	134	119
	S 10 1	S3	M3S	195	184	180	416	135	19	512	24	160	158	160	142
	S 10 1	S3	M3L	195	184	180	448	135	21	539	26	160	158	160	142

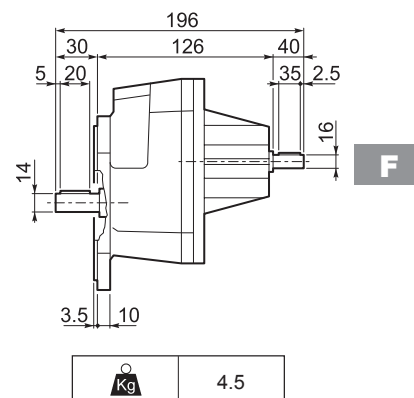
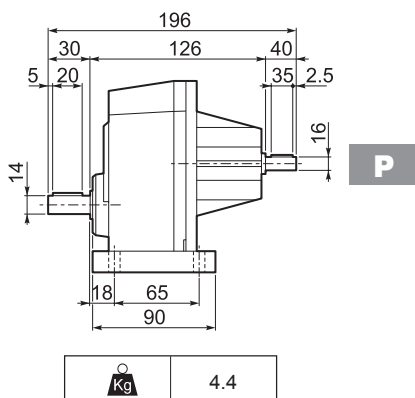
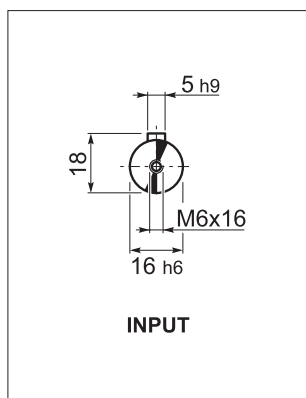


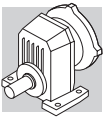
S 10...P (IEC)



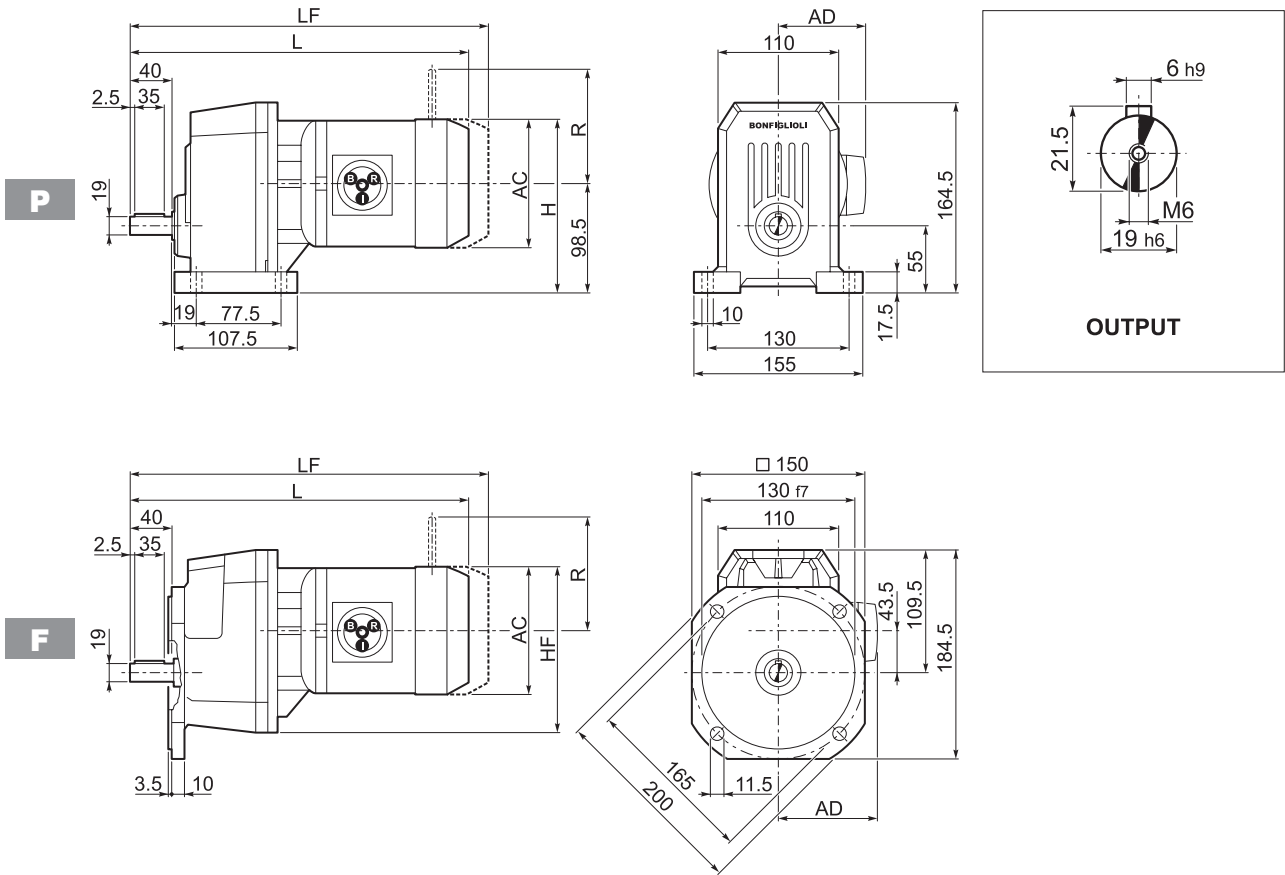
		M	M1	M2	N	N1	N2	N3	N4	P	X	Kg
S 10 1	P63	11	12.8	4	140	115	95	—	M8x10	189	4	5
S 10 1	P71	14	16.3	5	160	130	110	—	M8x10	189	4.5	5
S 10 1	P80	19	21.8	6	200	165	130	—	M10x14.5	208	4	6
S 10 1	P90	24	27.3	8	200	165	130	—	M10x14.5	208	4	6
S 10 1	P100	28	31.3	8	250	215	180	—	M12x16	218	4.5	10
S 10 1	P112	28	31.3	8	250	215	180	—	M12x16	218	4.5	10

S 10...HS

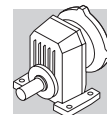




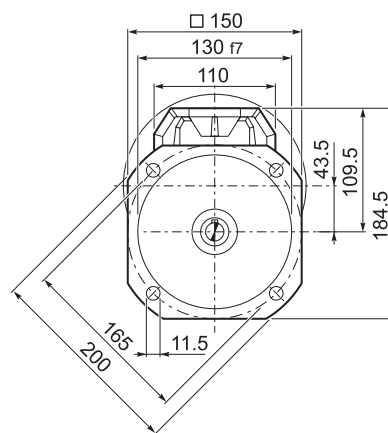
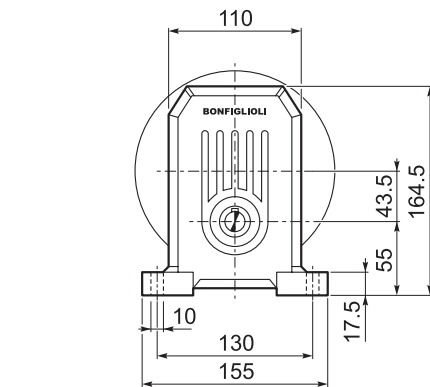
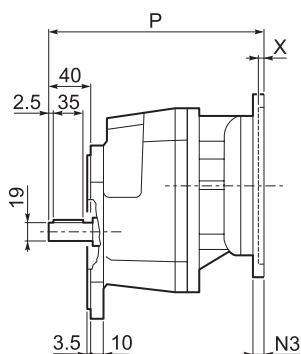
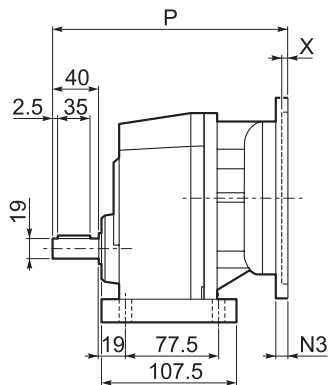
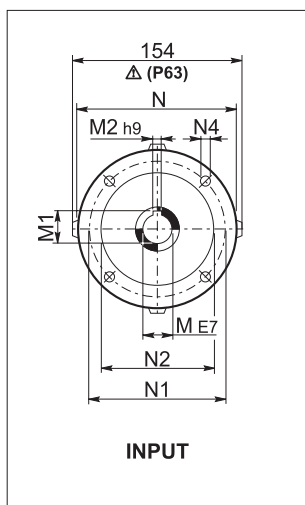
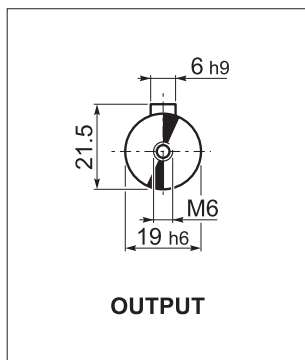
S 20...M



										M...FD M...FA		M...FD		M...FA	
			AC	H	HF	L	AD		LF		R	AD	R	AD	
S 20 1	S05	M05	121	159	153	333.5	95	10	399.5	12	96	122	116	95	
S 20 1	S1	M1	137	167	161	362.5	102	12	423.5	14	103	135	124	108	
S 20 1	S2	M2S	156	176	170	385.5	111	16	461.5	19	129	146	134	119	
S 20 1	S3	M3S	195	196	190	434.5	135	20	530.5	25	160	158	160	142	
S 20 1	S3	M3L	195	196	190	466.5	135	26	557.5	31	160	158	160	142	

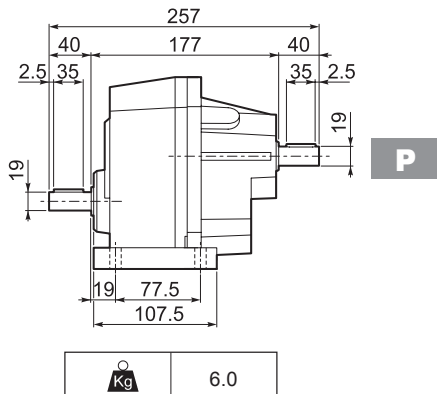
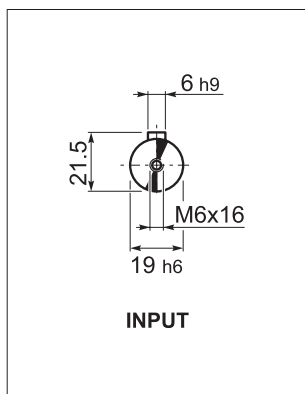


S 20...P(IEC)

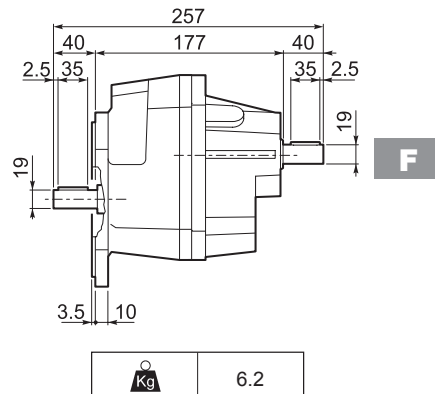


		M	M1	M2	N	N1	N2	N3	N4	P	X	kg
S 20 1	P63	11	12.8	4	140	115	95	—	M8x10	207	4	6
S 20 1	P71	14	16.3	5	160	130	110	—	M8x10	207	4.5	6
S 20 1	P80	19	21.8	6	200	165	130	—	M10x14.5	227	4	7
S 20 1	P90	24	27.3	8	200	165	130	—	M10x14.5	227	4	7
S 20 1	P100	28	31.3	8	250	215	180	—	M12x16	237	4.5	11
S 20 1	P112	28	31.3	8	250	215	180	—	M12x16	237	4.5	11

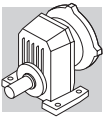
S 20...HS



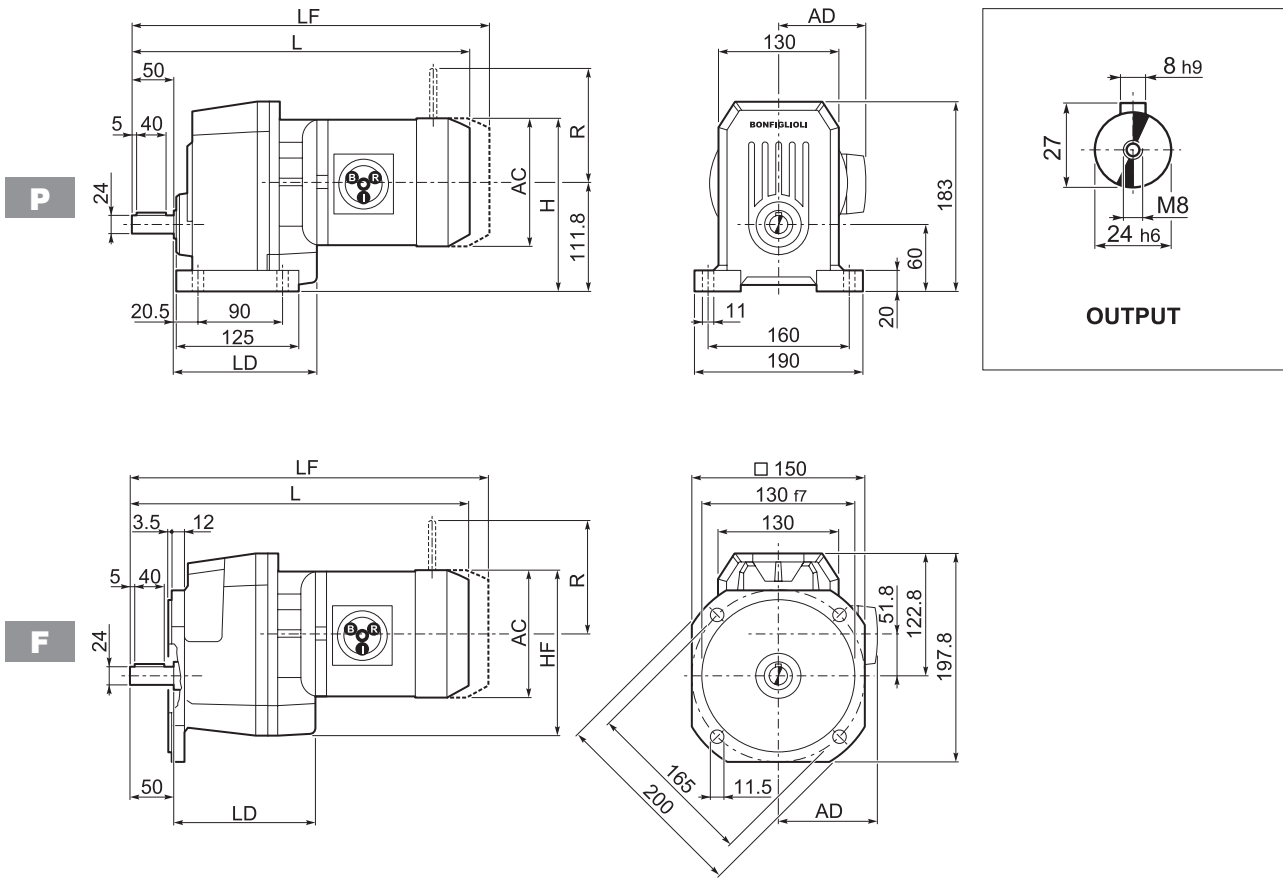
kg	6.0
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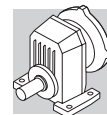
kg	6.2
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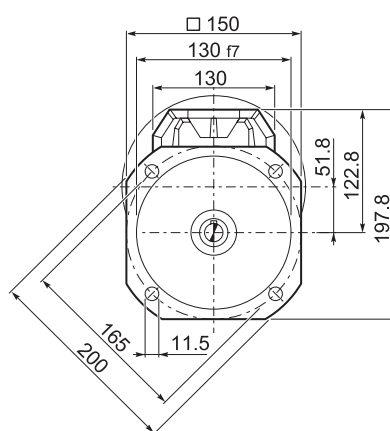
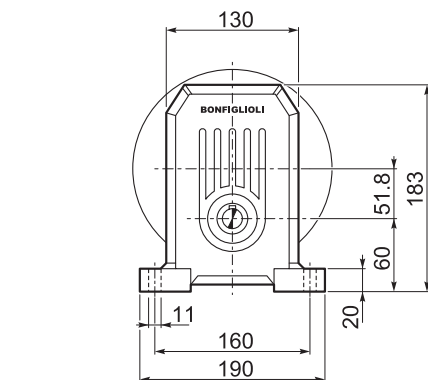
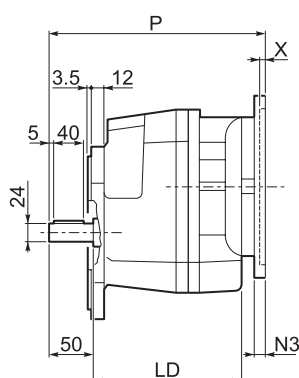
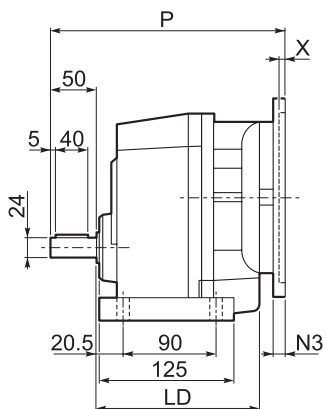
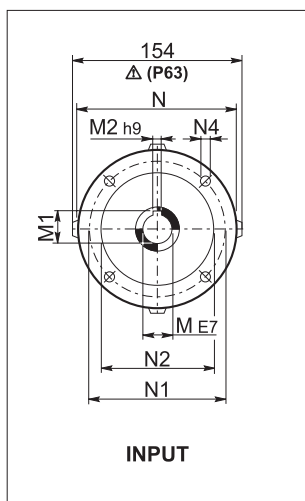
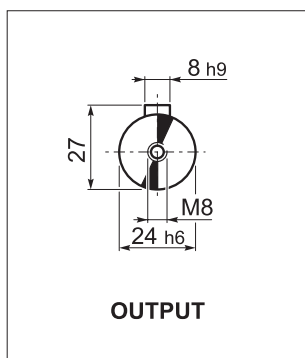
S 30...M



										M...FD M...FA		M...FD		M...FA	
			AC	H	HF	L	LD	AD		LF		R	AD	R	AD
S 30 1	S1	M1	137	180	177	387.5	140.5	102	14	448.5	16	103	135	124	108
S 30 1	S2	M2S	156	190	186	410.5	152.5	111	18	486.5	21	129	146	134	119
S 30 1	S3	M3S	195	209	206	459.5	162.5	135	23	555.5	28	160	158	160	142
S 30 1	S3	M3L	195	209	206	491.5	162.5	135	32	582.5	37	160	158	160	142
S 30 1	S4	M4	258	240.8	237	599.5	—	193	71	708.5	87	226	210	217	193
S 30 1	S4	M4LC	258	240.8	237	634.5	—	193	79	733.5	95	226	210	217	193

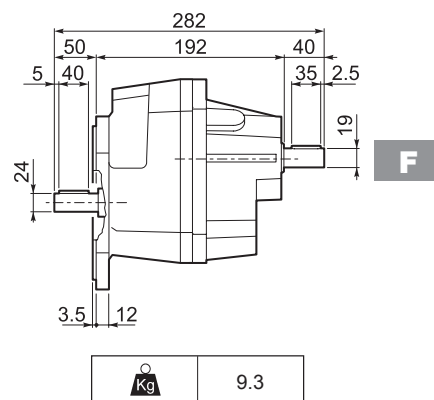
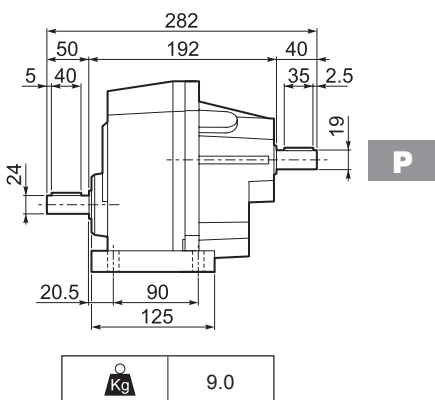
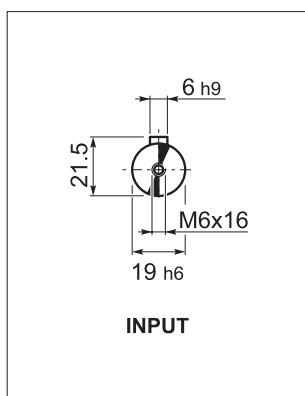


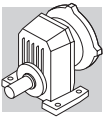
S 30...P(IEC)



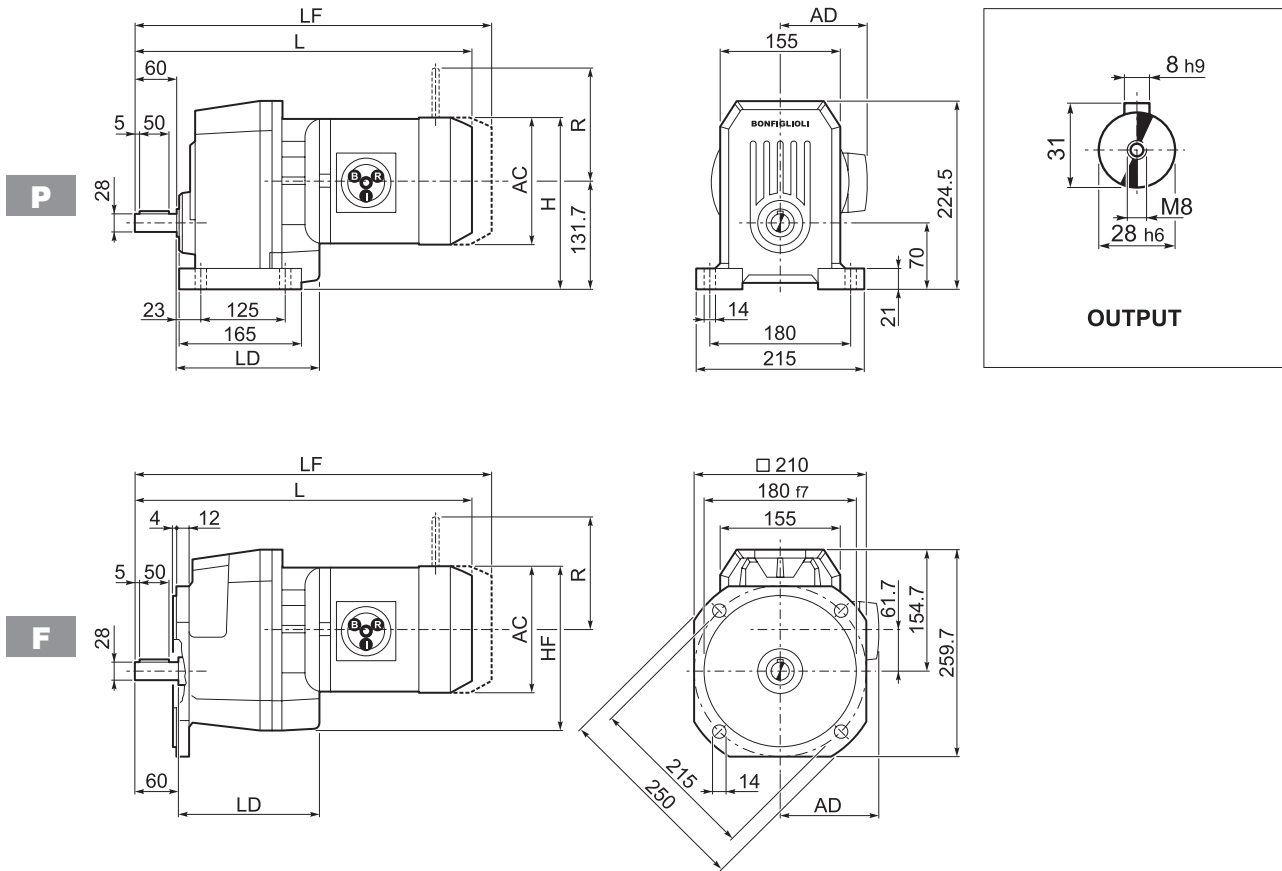
		LD	M	M1	M2	N	N1	N2	N3	N4	P	X	kg
S 30 1	P63	152.5	11	12.8	4	140	115	95	—	M8x10	232	4	8
S 30 1	P71	152.5	14	16.3	5	160	130	110	—	M8x10	232	4.5	8
S 30 1	P80	162.5	19	21.8	6	200	165	130	—	M10x14.5	252	4	9
S 30 1	P90	162.5	24	27.3	8	200	165	130	—	M10x14.5	252	4	9
S 30 1	P100	162.5	28	31.3	8	250	215	180	—	M12x16	262	4.5	13
S 30 1	P112	162.5	28	31.3	8	250	215	180	—	M12x16	262	4.5	13
S 30 1	P132	—	38	41.3	10	300	265	230	16	14	298.5	5	21

S 30...HS

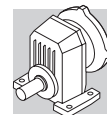




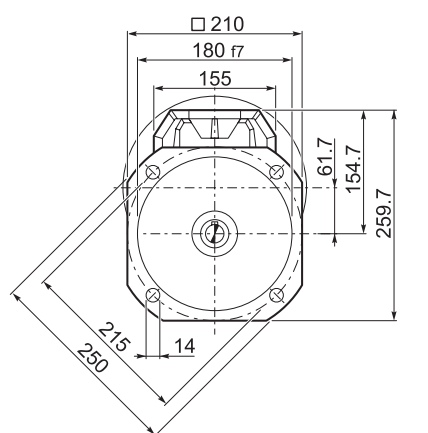
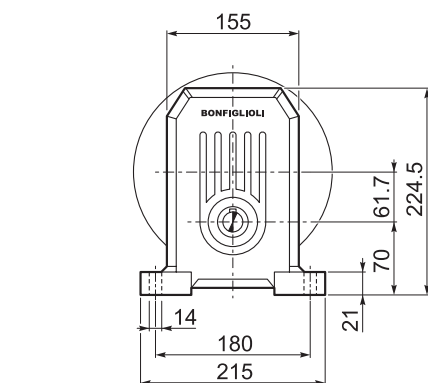
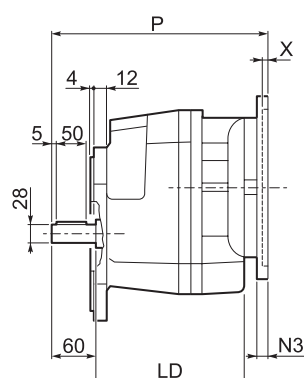
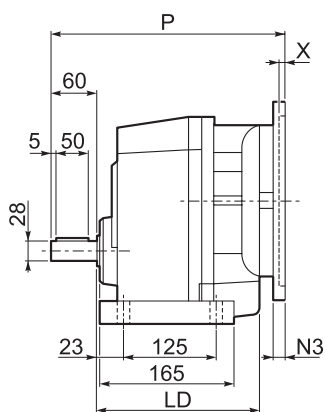
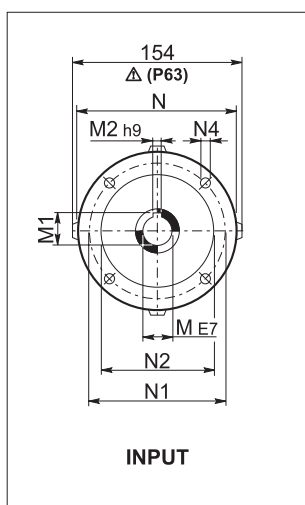
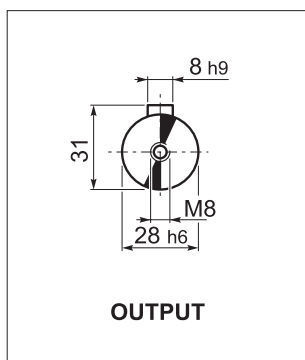
S 40...M



										M...FD M...FA		M...FD		M...FA	
			AC	H	HF	L	LD	AD		LF		R	AD	R	AD
S 40 1	S1	M1	137	200	197	429.5	168	102	28	490.5	31	103	135	124	108
S 40 1	S2	M2S	156	210	206	452.5	183.5	111	34	528.5	37	129	146	134	119
S 40 1	S3	M3S	195	229	226	501.5	199.5	135	39	597.5	44	160	158	160	142
S 40 1	S3	M3L	195	229	226	533.5	199.5	135	48	624.5	53	160	158	160	142
S 40 1	S4	M4	258	261	257	641.5	—	193	74	750.5	86	226	210	217	193
S 40 1	S4	M4LC	258	261	257	676.5	—	193	90	775.5	106	226	210	217	193

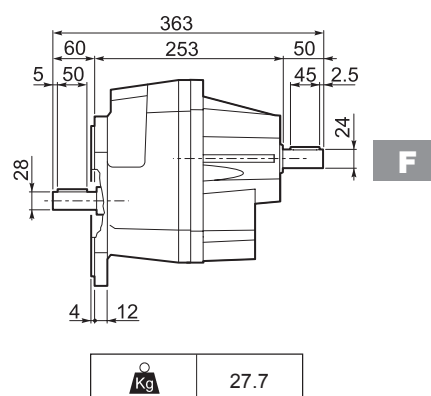
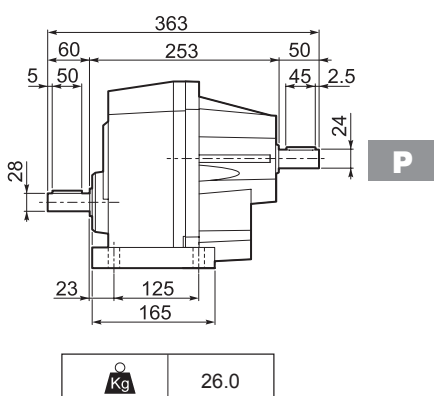
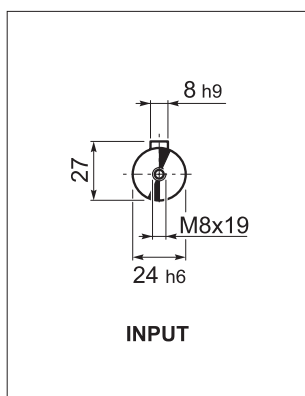


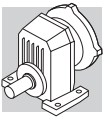
S 40...P(IEC)



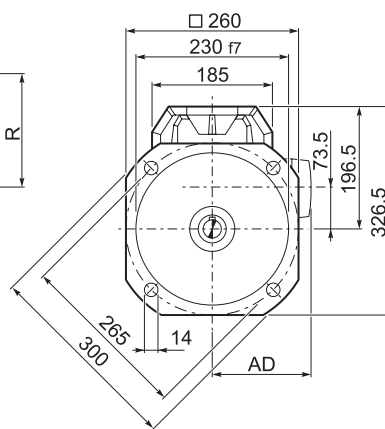
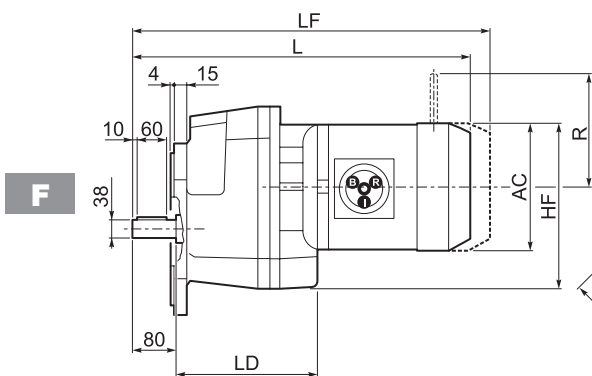
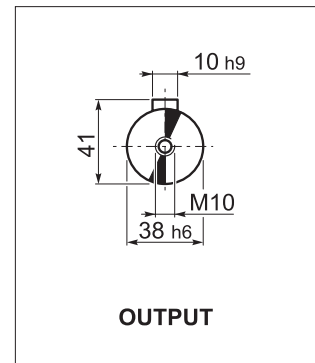
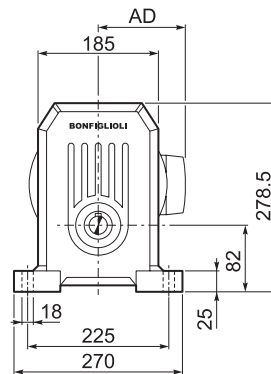
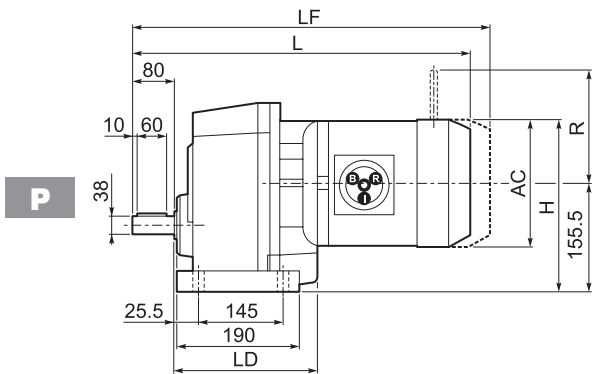
		LD	M	M1	M2	N	N1	N2	N3	N4	P	X	Kg
S 40 1	P63	183.5	11	12.8	4	140	115	95	—	M8x10	274	4	25
S 40 1	P71	183.5	14	16.3	5	160	130	110	—	M8x10	274	4.5	26
S 40 1	P80	199.5	19	21.8	6	200	165	130	—	M10x14.5	294	4	26
S 40 1	P90	199.5	24	27.3	8	200	165	130	—	M10x14.5	294	4	30
S 40 1	P100	—	28	31.3	8	250	215	180	—	M12x16	304	4.5	30
S 40 1	P112	—	28	31.3	8	250	215	180	—	M12x16	304	4.5	30
S 40 1	P132	—	38	41.3	10	300	265	230	16	14	340	5	32

S 40...HS

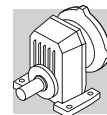




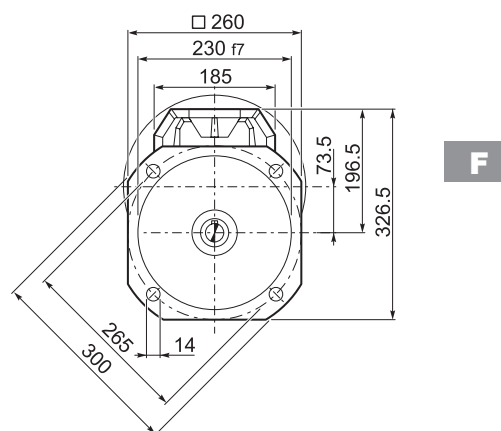
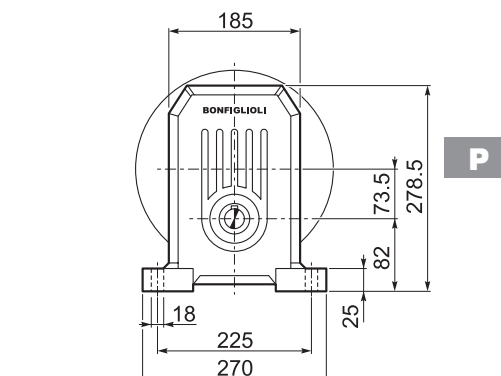
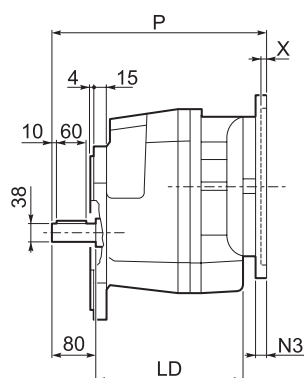
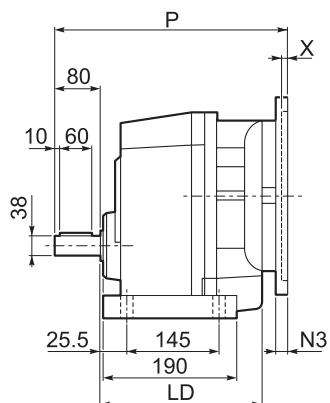
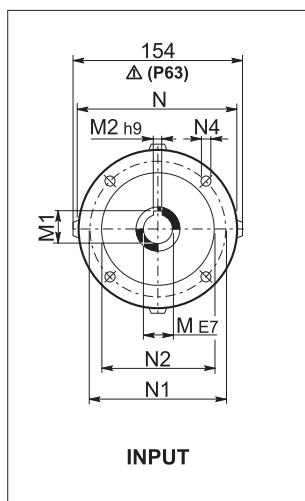
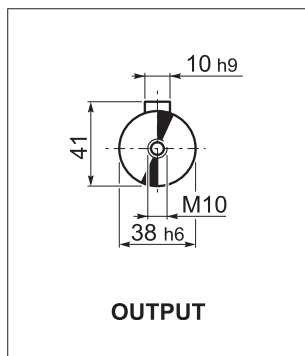
S 50...M



			AC	H	HF	L	LD	AD	Kg	M...FD M...FA		M...FD		M...FA	
										LF	Kg	R	AD	R	AD
S 50 1	S1	M1	137	225	222	469	—	102	40	530	42	103	135	124	108
S 50 1	S2	M2S	156	233	230	492.5	204.5	111	44	568.5	47	129	146	134	119
S 50 1	S3	M3S	195	253	250	541.5	219.5	135	51	637.5	56	160	158	160	142
S 50 1	S3	M3L	195	253	250	573.5	219.5	135	60	664.5	65	160	158	160	142
S 50 1	S4	M4	258	284	281	681.5	204.5	193	86	790.5	98	226	210	217	193
S 50 1	S4	M4LC	258	284	281	716.5	204.5	193	94	815.5	106	226	210	217	193
S 50 1	S5	M5S	310	310.5	307	768	—	245	114	908	138	266	245	247	245
S 50 1	S5	M5L	310	310.5	307	812	—	245	130	952	154	266	245	247	245



S 50...P(IEC)



		LD	M	M1	M2	N	N1	N2	N3	N4	P	X	kg
S 50 1	P63	204.5	11	12.8	4	140	115	95	—	M8x10	314	4	35
S 50 1	P71	204.5	14	12.8	4	160	130	110	—	M8x10	314	4.5	35
S 50 1	P80	219.5	19	16.3	5	200	165	130	—	M10x14.5	314	4	37
S 50 1	P90	219.5	24	21.8	6	200	165	130	—	M10x14.5	334	4	37
S 50 1	P100	204.5	28	27.3	8	250	215	180	—	M12x16	344	4.5	41
S 50 1	P112	204.5	28	31.3	8	250	215	180	—	M12x16	344	4.5	41
S 50 1	P132	204.5	38	41.3	10	300	265	230	16	14	380	5	44
S 50 1	P160	—	42	45.3	12	350	300	250	23	18	431	5.5	48
S 50 1	P180	—	48	51.8	14	350	300	250	23	18	431	5.5	48

S 50...HS

