


VARVEL®
MOTION CONTROL SINCE 1955


technology made in Italy



RN/RO/RV



Technology Made in Italy

Since 1955 Varvel has been making speed reducers and variators for light industry applications. Reliable partner in power transmission equipment offers also customized solutions always according to a socially responsible company values. Modularity and flexibility lead Varvel products by a unique kit form, common to all gearbox series. This feature allows distributors an easier job to set up required products in few minutes.

RN-RO-RV

PARALLEL SHAFT
AND BEVEL/HELICAL GEARBOXES



RN-RO-RV Gearboxes

Description

The gearboxes, series RN, RO, RV are manufactured with a common housing that allows the same footprint for the three versions and are designed according to latest ISO engineering specifications with the help of computer aided structural analysis for displacement and stress field.

The monolithic framework does not deflect under the effect of torque and external loads with effective results on sealing surfaces.

The gearboxes of series RN, RO, RV are manufactured of pressure die cast for the first 3 sizes and of cast iron for the others.

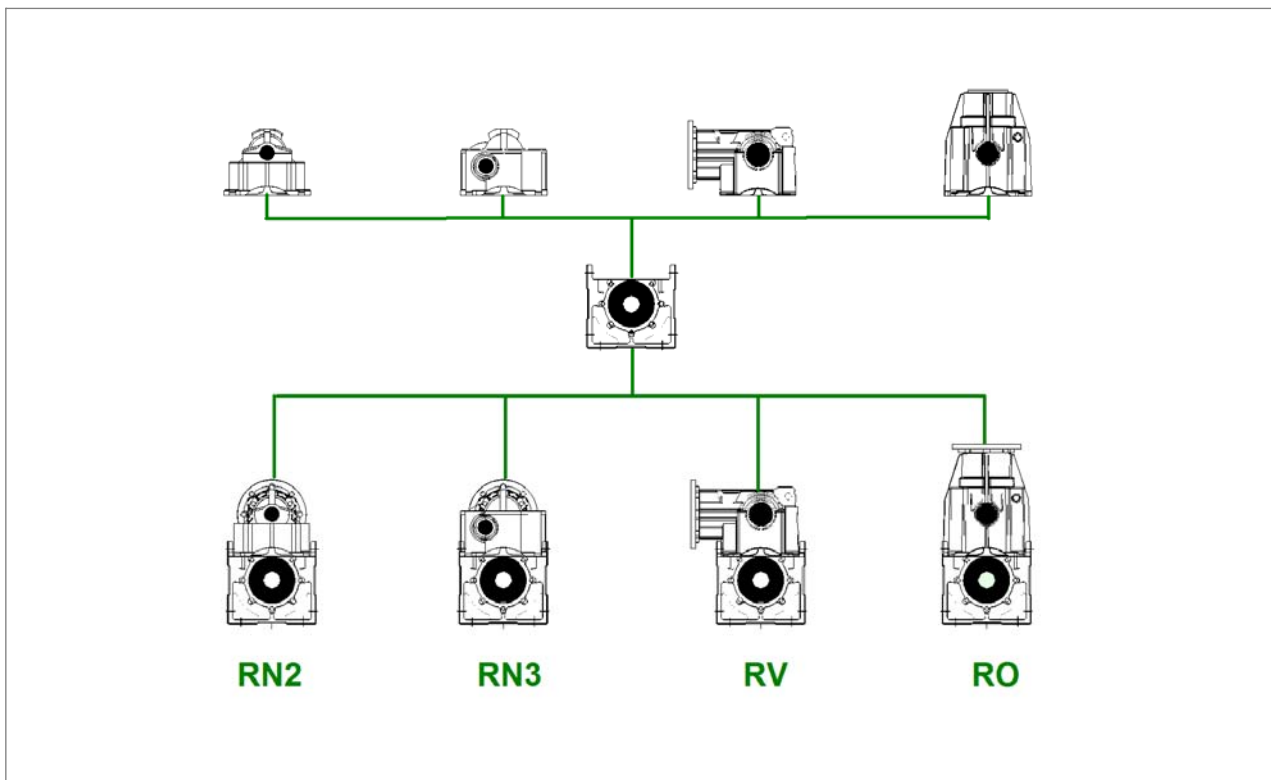
The shaft mount version, common to the three types, allows the flange mount B5 conversion by simply fitting one of the many output flanges available.

Various dimensions and types of output shafts (hollow with through keyway, hollow with shrink disk and solid with single or double end) are available for the majority of applications.

The series RN, RO, RV are made in 6 sizes for each type of gearboxes, 30 reduction ratios and output torques between 100 and 3400 Nm.

The gearbox series RN-RO-RV is made of a common housing that allows same footprint for the three versions:

- **RN** - parallel shaft gearboxes, hollow output shaft, two- and three-stage execution.
- **RO** - bevel/helical gearboxes, in-line input, hollow output shaft, three-stage execution.
- **RV** - bevel/helical gearboxes, right angle input, hollow output shaft, three-stage execution.



Gearboxes RN-RO-RV

Description

Parallel Shaft Gearboxes - Series RN

Multipurpose Housing
Foot & Foot/Flange Mountings
One housing for 2- & 3-stages

Housing & Covers

Aluminium die cast (3 sizes);
Grey cast iron (3 sizes).

Gearing

20MnCr5 alloy steel;
Case hardened.
Profile ground or shaved.

Bearings

Ball or roller types;
according to sizes
and technical requirements.



Input
NEMA and IEC motor adapters
with universal elastic coupling
or customary bore and keyway.

Oil seals
NBR - Nitrile Butadiene Rubber
as standard;
Viton and Silicone on request.

Output
Solid shafts,
metric and imperial.

Lubrication
Synthetic long-life oil; Grade ISO VG 320.
No oil/vent plugs.
In-house filling.

Bevel/Helical Gearboxes, In-line Input -Series RO

Multipurpose Housing
Foot & Foot/Flange Mountings
One housing for 3-stages

Housing & Covers

Aluminium die cast (3 sizes);
Grey cast iron (3 sizes).

Gearing

20MnCr5 alloy steel;
Case hardened.
Profile ground or shaved.

Bearings

Ball or roller types;
according to sizes
and technical requirements.



Input
NEMA and IEC motor adapters
with universal elastic coupling
or customary bore and keyway.

Oil seals
NBR - Nitrile Butadiene Rubber
as standard;
Viton and Silicone on request.

Output
Solid shafts,
metric and imperial.

Lubrication
Synthetic long-life oil; Grade ISO VG 320.
No oil/vent plugs.
In-house filling.

RN-RO-RV Gearboxes

Description

Bevel/Helical Gearboxes, 90 Degree Input -Series RO

Multipurpose Housing

Foot & Foot/Flange Mountings
One housing for 3-stages

Housing & Covers

Aluminium die cast (3 sizes);
Grey cast iron (3 sizes).

Gearing

20MnCr5 alloy steel;
Case hardened.
Profile ground or shaved.

Bearings

Ball or roller types;
according to sizes
and technical requirements.



Input

NEMA and IEC motor adapters
with universal elastic coupling
or customary bore and keyway.

Oil seals

NBR - Nitrile Butadiene Rubber
as standard;
Viton and Silicone on request.

Output

Solid shafts,
metric and imperial.

Lubrication

Synthetic long-life oil; Grade ISO VG 320.
No oil/vent plugs.
In-house filling.

GENERAL SPECIFICATIONS

Range	6 sizes; 30 ratios in 2 and 3 stages; 3400 Nm max. output torque
Sizing	According to ISO6336/DIN3990. 15,000 hrs average lifetime with service factor SF1
Housing, Covers	Pressure die cast aluminium AISi12Cu2Fe up to size 3 and cast iron G25 from size 4
Coupling G input	Pressure die cast aluminium AISi12Cu2Fe for sizes 3, 5, 6 and alloyed steel from size 8
Toothed parts	Steel 20MnCr5 case hardened. Tooth profile ground or shaved. Run-in bevel gears
Shafts & Keys	Steel 39NiCrMo3; Shafts h6 - Bores E8; Keys according to DIN6885 B1
Bearings	Ball- or roller-types according to sizes and technical requirements
Oil seals	Type NB - nitril-butadiene with additional anti-dust lip according to DIN 3760
Lubricant	Synthetic long-life oil; Grade ISO VG 320
Powder coating	Aluminium until size 3 and Epoxy powder paint Standard colour RAL 7012 from size 4

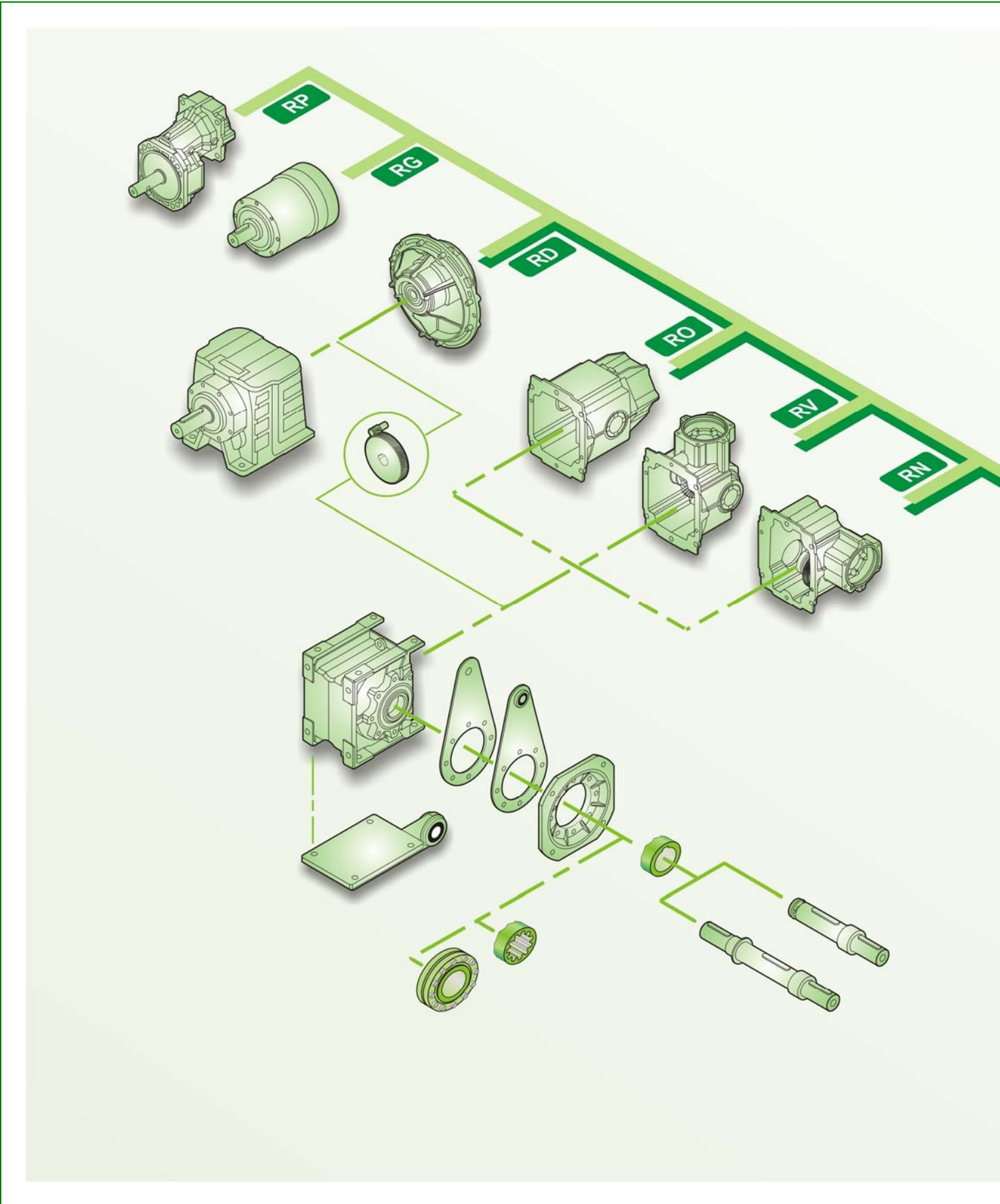
Gearboxes RN-RO-RV

Symbols

D	[mm]	PCD of transmission element $k_{(t)}$	
F_r	[N]	Application radial load	
F_{r1}	[N]	Catalogue radial load (input)	
F_{r2}	[N]	Catalogue radial load (output)	
$F_{r2b(x)}$	[N]	Permissible radial load at position "X" on output shaft. Based on bearing lifetime.	
$F_{r2s(x)}$	[N]	Permissible radial load same as $F_{r2b(x)}$. Based on shaft bending and torsional stress.	
FS		Service factor	$FS = \frac{M_2}{M_{(app)}}$
i_n		Nominal reduction ratio	
i_r		Actual reduction ratio	
J_1	[kgm ²]	Moment of inertia of the gearbox at gearbox input shaft	
J_2	[kgm ²]	Moment of inertia of the application	
J_m	[kgm ²]	Moment of inertia of the motor	
$k_{(a)}$		Mass acceleration factor	
$k_{(t)}$		Transmission element factor	
Lub H / V	[l]	Lubricant (litres) H - In-line mounting / V - 90 degree mounting	
M_2	[Nm]	Gearbox maximum output torque	$M_2 = \frac{9550 * P_1 * \eta}{n_2}$
$M_{(app)}$	[Nm]	Application torque	
n_1	[min ⁻¹]	Input speed	
n_2	[min ⁻¹]	Output speed	
P_1	[kW]	Input power	$P_1 = \frac{M_2 * n_2}{9550 * \eta}$
$P_{(kg)}$	[kg]	Weight: for mounting B3H and average reduction ratio	
η		$\eta = 0.96$ - 2 stages $\eta = 0.94$ - 3 stages	

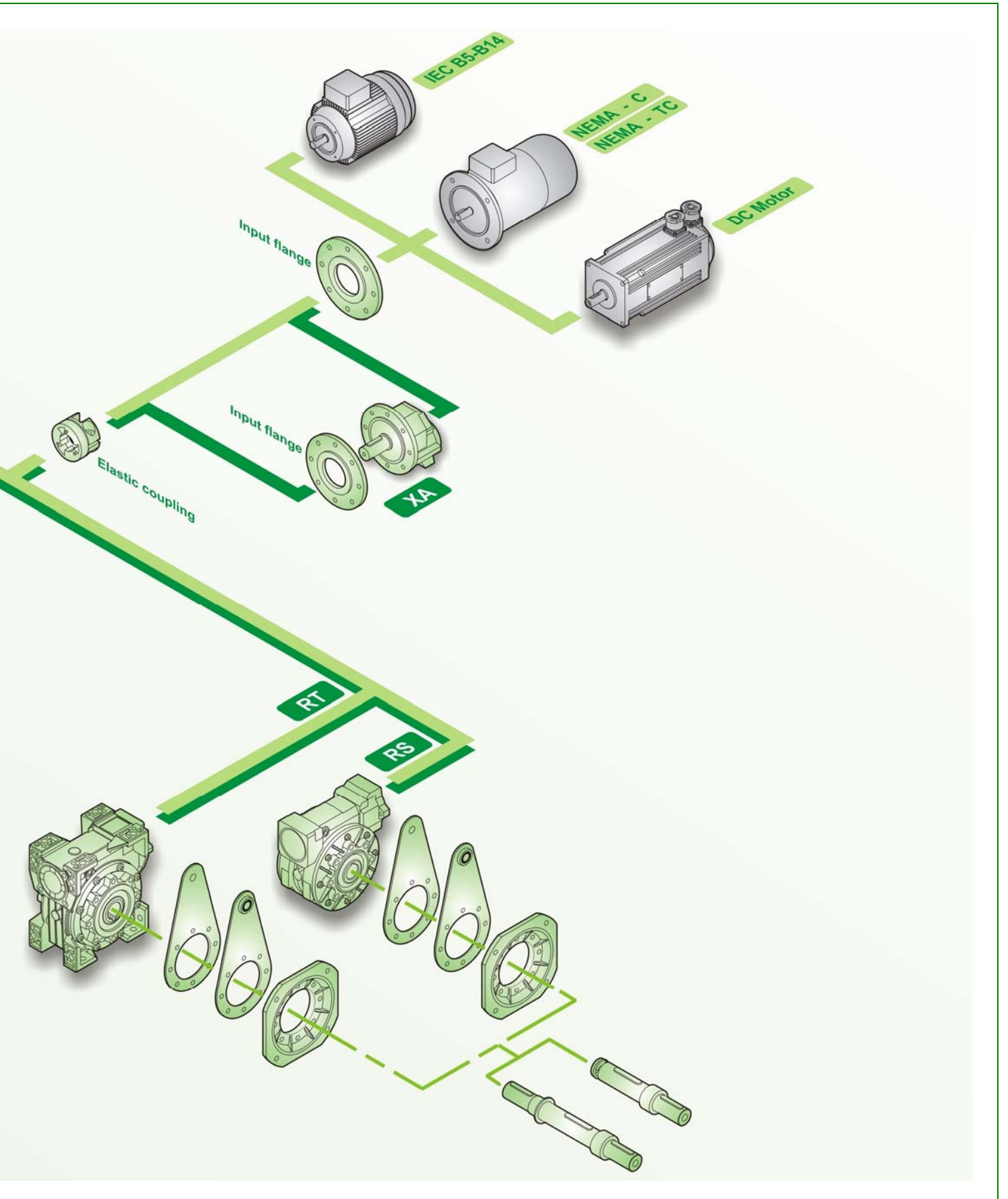
RN-RO-RV Gearboxes

Modular System



Gearboxes RN-RO-RV

Modular System



RN-RO-RV Gearboxes

Coupling "G" Description

Reducer Half-coupling

- Material: Alloy 20MnCr5l
- Input shaft built-in
- Two bearing setting
- Unchanged casing dimensions

Spider

- External tooth connection
- Material: Thermoplastic Elastomer:
 - Elastollan[®] TPU - Polyurethanic
 - Hytrel[®] TPE - Polyester
- Hardness
 - TPU 98 Shore A
 - TPE 72 Shore D
- Temperature range
 - TPU -20/+75°C (-4 / +167°F)
 - TPE -30/+100°C (-22 / +212°F)

Motor Half-coupling

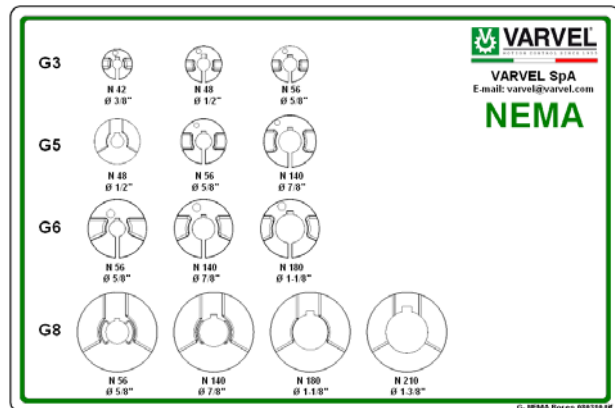
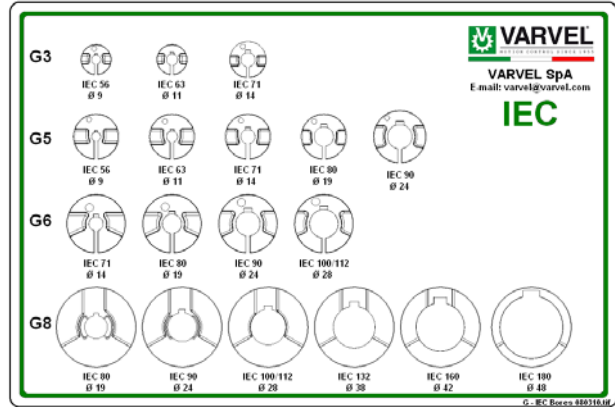
- Material:
 - Alu pressure die cast (G3, G5, G6)
 - Steel 36SMnPb14 (GS8)
 - Steel C43 on demand (GS3, GS5, GS6)
- Dynamic balancing
- Fitting:
 - Clamp (G3, G5, G6)
 - Key (GS3, GS5, GS6, GS8)
- Bores:
 - IEC 72/DIN42948
 - NEMA C and TC

Advantages:

- One gearbox only for each ratio
- Greater flexibility
- Increased stock rotation
- Elimination of fretting corrosion between key and keyway
- Gearbox / motor connection with zero backlash
- Allowed angular misalignment 1° max.
- High torsional rigidity
- High vibration damping

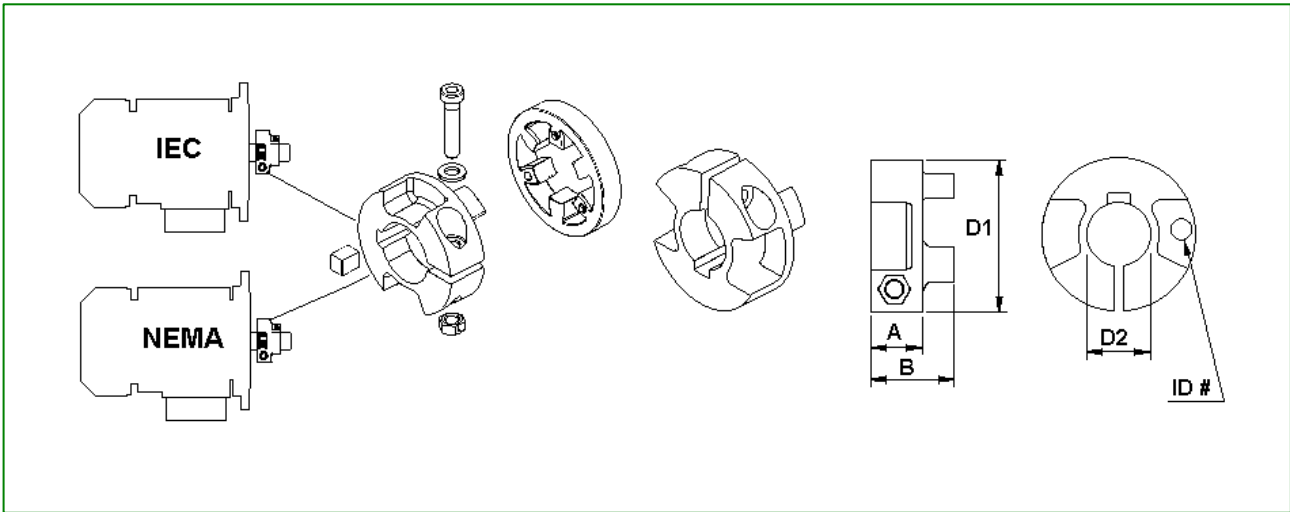
Input flanges:

- Material:
 - Aluminium to IEC112 & NEMA C180
 - Cast iron from IEC 132 & NEMA C200



Gearboxes RN-RO-RV

“G” Elastic Coupling Selection



Tipo	IEC NEMA	Kit Part No.	RN	RO - RV	Mt [Nm]	Mt1 [Nm]	Mt2 [Nm]	A [mm]	B [mm]	D1 [mm/ inch]	D2 [mm/ inch]	ID#
G5	IEC	KG5.009	RN12-13	RO-RV13	10	14	10	14.5	23	45	9	509
		KG5.011	RN12-13	RO-RV13		15	10			45	11	511
KG5.014		RN12-13	RO-RV13	30		17	45			14	514	
KG5.019		RN12-13	RO-RV13	40		25	45			19	519	
KG5.024		RN12-13	RO-RV13	70		40	52			24	524	
	NEMA	KG5.N56 KG5.N140	RN12-13 RN12	RO-RV13 RO-RV13		45 60	35 45			1.77 2.05	5/8" 7/8"	5N56 5N140
G6	IEC	KG6.014	RN22-23-32-33-42-43	RO-RV23-33-43	18	60	40	19.5	31.5	58	14	614
		KG6.019	RN22-23-32-33-42-43	RO-RV23-33-43		90	65				19	619
KG6.024		RN22-32-33-42-43	RO-RV23-33-43	130		100	24				624	
KG6.028		RN22-32-42-43	RO-RV23-33-43	180		120	28				628	
		NEMA	KG6.N56 KG6.N140 KG6.N180	RN22-23-32-33-42-43 RN22-32-33-42-43 RN42-43		RO-RV23-33-43 RO-RV23-33-43 RO-RV43					50 85 200	--- --- ---
G8	IEC	* KGS8.19	RN52-53-62-63	RO-RV53-63	15	150	---	35	51	79		
		* KGS8.24	RN52-53-62-63	RO-RV53-63		250	---					
* KGS8.28		RN52-53-62-63	RO-RV53-63	350		---						
* KGS8.38		RN52-53-62-63	RO-RV53-63	500		---						
* KGS8.42		RN62-63	RO-RV53-63	500		---						
	NEMA	* KGS8.N056 * KGS8.N140 * KGS8.N180 * KGS8.N210 * KGS8.N250	RN52-53-62-63 RN52-53-62-63 RN52-53-62-63 RN62-63 RN62	RO-RV53-63 RO-RV53-63 RO-RV53-63 RO-RV53-63 RO-RV63		140 200 300 500 500	--- --- --- --- ---			3.11		

Mt - Screw locking torque
 Mt1 - Transmissible torque with key
 Mt2 - Transmissible torque without key
 * - Coupling GS8: steel made, key fit and grub screw
 Note - Coupling GS8: any ID# marked on

RN-RO-RV Gearboxes

IEC Flange & Coupling Selection

RN - RO - RV	Flange Type	IEC Frame	Kit Part No.		G Coupling	
			B5 Flange	B14 Flange	Type	Kit Part No.
RN12 RO-RV13	FM 50	IEC56 IEC63 IEC71 IEC80 IEC90	K532.206.120 K532.206.140 K532.206.160 K532.206.200 K532.206.200	--- K532.206.090 K532.206.105 K532.206.120 K532.206.140	G5 ø9 G5 ø11 G5 ø14 G5 ø19 G5 ø24	KG5.009 KG5.011 KG5.014 KG5.019 KG5.024
RN13	FM 50	IEC56 IEC63 IEC71	K532.206.120 K532.206.140 K532.206.160	--- K532.206.090 K532.206.105	G5 ø9 G5 ø11 G5 ø14	KG5.009 KG5.011 KG5.014
RN22 RO-RV23	FM 70	IEC71 IEC80 IEC90 IEC 100/112	K533.206.160 K533.206.200 K533.206.200 K533.206.250	K533.206.105 K533.206.120 K533.206.140 K533.206.160	G6 ø14 G6 ø19 G6 ø24 G6 ø28	KG6.014 KG6.019 KG6.024 KG6.028
RN23	FM 70	IEC71 IEC80	K533.206.160 K533.206.200	K533.206.105 K533.206.120	G5 ø14 G5 ø19	KG5.014 KG5.019
RN32 RN33	FM 70	IEC71 IEC80 IEC90 * IEC 100/112	K533.206.160 K533.206.200 K533.206.200 K533.206.250	K533.206.105 K533.206.120 K533.206.140 K533.206.160	G6 ø14 G6 ø19 G6 ø24 G6 ø28	KG6.014 KG6.019 KG6.024 KG6.028
RO-RV33	FM 85	IEC71 IEC80 IEC90 IEC 100/112	K534.206.160 K534.206.200 K534.206.200 K534.206.250	--- K534.206.120 K534.206.140 K534.206.160	G6 ø14 G6 ø19 G6 ø24 G6 ø28	KG6.014 KG6.019 KG6.024 KG6.028
RN42 RN43	FM 85	IEC71 IEC80 IEC90 IEC 100/112	K534.206.160 K534.206.200 K534.206.200 K534.206.250	--- K534.206.120 K534.206.140 K534.206.160	G6 ø14 G6 ø19 G6 ø24 G6 ø28	KG6.014 KG6.019 KG6.024 KG6.028
RO-RV43	FM 110	IEC71 IEC80 IEC90 IEC 100/112	K535.206.160 K535.206.200 K535.206.200 K535.206.250	--- --- --- K535.206.160	G6 ø14 G6 ø19 G6 ø24 G6 ø28	KG6.014 KG6.019 KG6.024 KG6.028
RN52 RO-RV53	FM 130 & FM 150	IEC 80 IEC 90 IEC 100/112 IEC 132 IEC 160 IEC 180	K536.206.200 K536.206.200 K536.206.250 K537.206.300 K565.206.350 K565.206.350	--- --- --- K536.206.200 --- ---	** GS8 ø19 ** GS8 ø24 ** GS8 ø28 ** GS8 ø38 ** GS8 ø42 ** GS8 ø48	KGS8.019 KGS8.024 KGS8.028 KGS8.038 KGS8.042 KGS8.048
RN53	FM 130	IEC 80 IEC 90 IEC 100/112 IEC132	K536.206.200 K536.206.200 K536.206.250 K537.206.300	--- --- --- K536.206.200	** GS8 ø19 ** GS8 ø24 ** GS8 ø28 ** GS8 ø38	KGS8.019 KGS8.024 KGS8.028 KGS8.038
RN62 RO-RV63	FM 130 & FM 150	IEC 80 IEC 90 IEC 100/112 IEC 132 IEC 160 IEC 180	K536.206.200 K536.206.200 K536.206.250 K537.206.300 K565.206.350 K565.206.350	--- --- --- K536.206.200 --- ---	** GS8 ø19 ** GS8 ø24 ** GS8 ø28 ** GS8 ø38 ** GS8 ø42 ** GS8 ø48	KGS8.019 KGS8.024 KGS8.028 KGS8.038 KGS8.042 KGS8.048
RN63	FM 130 & FM 150	IEC 80 IEC 90 IEC 100/112 IEC 132 IEC160	K536.206.200 K536.206.200 K536.206.250 K537.206.300 K565.206.350	--- --- --- K536.206.200 K536.206.250	** GS8 ø19 ** GS8 ø24 ** GS8 ø28 ** GS8 ø38 ** GS8 ø42	KGS8.019 KGS8.024 KGS8.028 KGS8.038 KGS8.042

* - IEC100/112: not for RN33

** - Coupling GS8: key fitting and axial locking grub screw

Gearboxes RN-RO-RV

NEMA Flange & Coupling Selection

RN - RO - RV	Flange Type	NEMA Frame	Flange Kit Part No.	G Coupling	
				Type	Kit Part No.
RN12 RO-RV13	FM 50	56 C 140 TC	K532.227.N56 K532.227.N56	G5 ø 5/8" G5 ø 7/8"	KG5.N56 KG5.N140
RN13		56 C	K532.227.N56	G5 ø 5/8"	KG5.N56
RN22 RO-RV23	FM 70	56 C 140 C	K533.227.N56 K533.227.N56	G6 ø 5/8" G6 ø 7/8"	KG6.N56 KG6.N140
RN23		56 C	K533.227.N56	G5 ø 5/8"	KG5.N56
RN32	FM 70	56 C 140 TC	K533.227.N56 K533.227.N56	G6 ø 5/8" G6 ø 7/8"	KG6.N56 KG6.N140
RO-RV33	FM 85	56 C 140 TC	K534.227.N56 K534.227.N56	G6 ø 5/8" G6 ø 7/8"	KG6.N56 KG6.N140
RN42 RN43	FM 85	56 C 140 TC 180 TC	K534.227.N56 K534.227.N56 K534.227.N180	G6 ø 5/8" G6 ø 7/8" G6 ø 1-1/8"	KG6.N56 KG6.N140 KG6.N180
RO-RV43	FM 110	56 C 140 TC 180 TC	K535.227.N56 K535.227.N56 K535.227.N180	G6 ø 5/8" G6 ø 7/8" G6 ø 1-1/8"	KG6.N56 KG6.N140 KG6.N180
RN52 RN53	FM 150	56 C 140 TC 180 TC 210 TC	K537.227.N56 K537.227.N56 K537.227.N180 K537.227.N180	* GS8 ø 5/8" * GS8 ø 7/8" * GS8 ø 1-1/8" * GS8 ø 1-3/8"	KGS8.N56 KGS8.N140 KGS8.N180 KGS8.N210
RO-RV53		56 C 140 TC 180 TC	K537.227.N56 K537.227.N56 K537.227.N180	* GS8 ø 5/8" * GS8 ø 7/8" * GS8 ø 1-1/8"	KGS8.N56 KGS8.N140 KGS8.N180
RN62 RN63	FM 150	56 C 140 TC 180 TC 210 TC 250 TC	K537.227.N56 K537.227.N56 K537.227.N180 K537.227.N180 K537.227.N180	* GS8 ø 5/8" * GS8 ø 7/8" * GS8 ø 1-1/8" * GS8 ø 1-3/8" * GS8 ø 1-5/8"	KGS8.N56 KGS8.N140 KGS8.N180 KGS8.N210 KGS8.N250
RO-RV63		56 C 140 TC 180 TC 210 TC	K537.227.N56 K537.227.N56 K537.227.N180 K537.227.N180	* GS8 ø 5/8" * GS8 ø 7/8" * GS8 ø 1-1/8" * GS8 ø 1-3/8"	KGS8.N56 KGS8.N140 KGS8.N180 KGS8.N210

* - Coupling GS8: key fitting and axial locking grub screw

RN-RO-RV Gearboxes

Service factors

SERVICE FACTOR of the gearbox

Service factor FS1.0 is meant as typical of 8 hours/day operation, with uniform load and mass acceleration factor $k_{(a)} \leq 0.2$, starts/ stops lower than 300 per hour and ambient temperature between 15 and 35 Celsius.

The performance shown in the tables gives the service factor calculation as a ratio between gearbox maximum output torque M_2 and application torque $M_{(app)}$.

Mass acceleration factor

$$k_{(a)} = \frac{\frac{J_2}{i r^2} + J_1}{J_m}$$

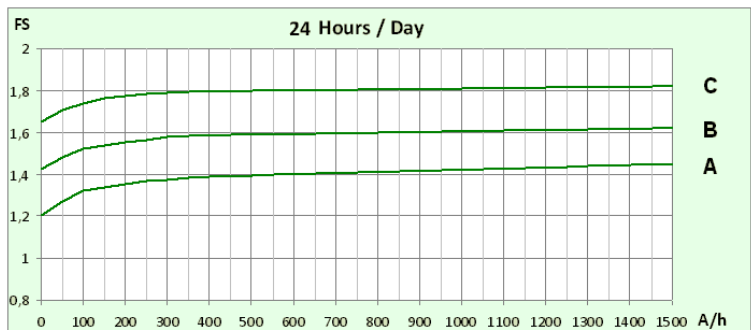
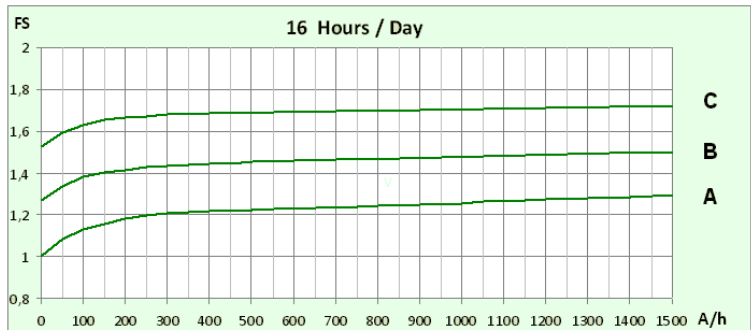
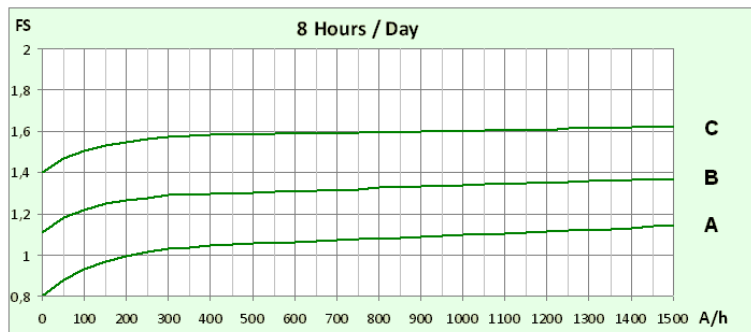
Load Class

A - Uniform load
 $k_{(a)} \leq 0,2$

B - Moderate shock load
 $0,2 < k_{(a)} \leq 3$

C - Severe shock load
 $3 < k_{(a)} \leq 10$

A/h - Number of starts/stops per hour



Gearboxes RN-RO-RV

Service factors

DUTY TYPE of the motor

The specifications of various duty types are defined by the Standard CEI EN 60034-1 / IEC34-1.

S1 - Continuous duty

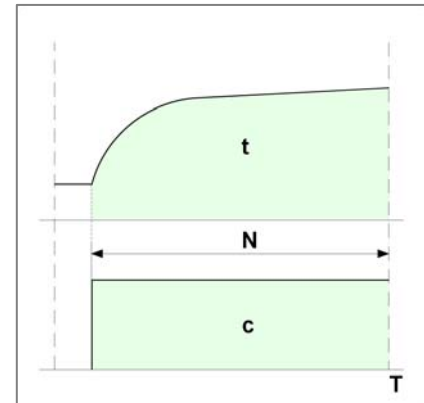
Steady load operation for an indefinite period (N), but long enough to achieve thermal balancing.

$$f_s = 1.0$$

N = Operation time

c = Load

t = Temperature



S3 - Periodic intermittent duty

Operation according to cycle (C) including steady load time (N) and rest time (R).

Starts/stops do not affect temperature. The reference cycle (C) is up to a total of 10 minutes.

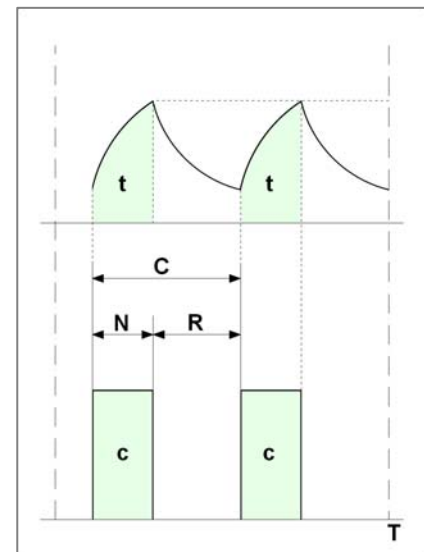
Intermittence ratio is calculated as follows

$$\frac{N}{(N+R)} * 100 = \begin{matrix} 60\% & \mathbf{Sf = 0.90} \\ 40\% & \mathbf{Sf = 0.85} \\ 25\% & \mathbf{Sf = 0.75} \\ 15\% & \mathbf{Sf = 0.70} \end{matrix}$$

N = Operation time

R = Rest time

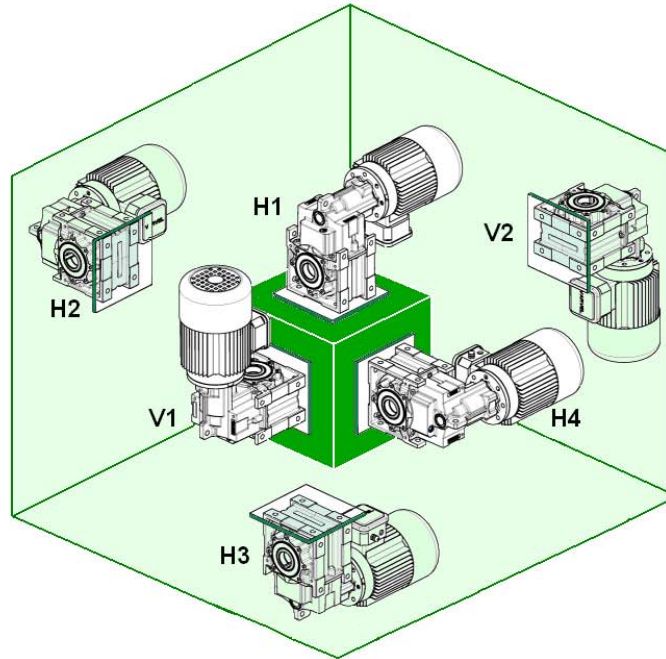
C = Duty cycle



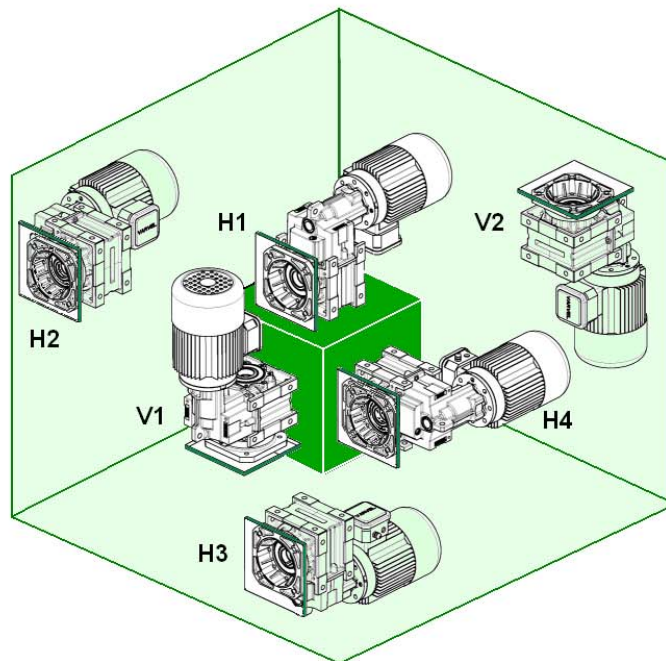
RN-RO-RV Gearboxes

Mounting positions

RN



B3
Foot mounting



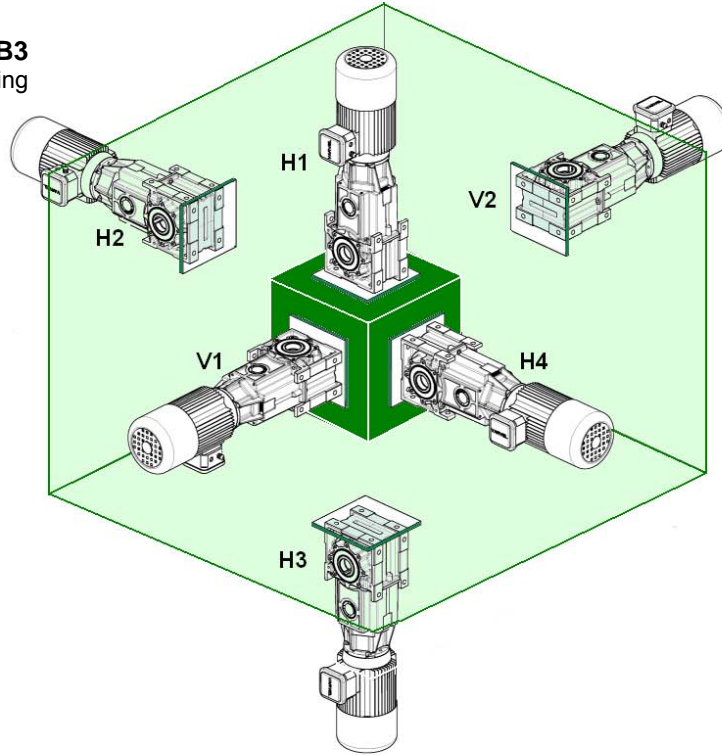
B5
Flange mounting

Gearboxes RN-RO-RV

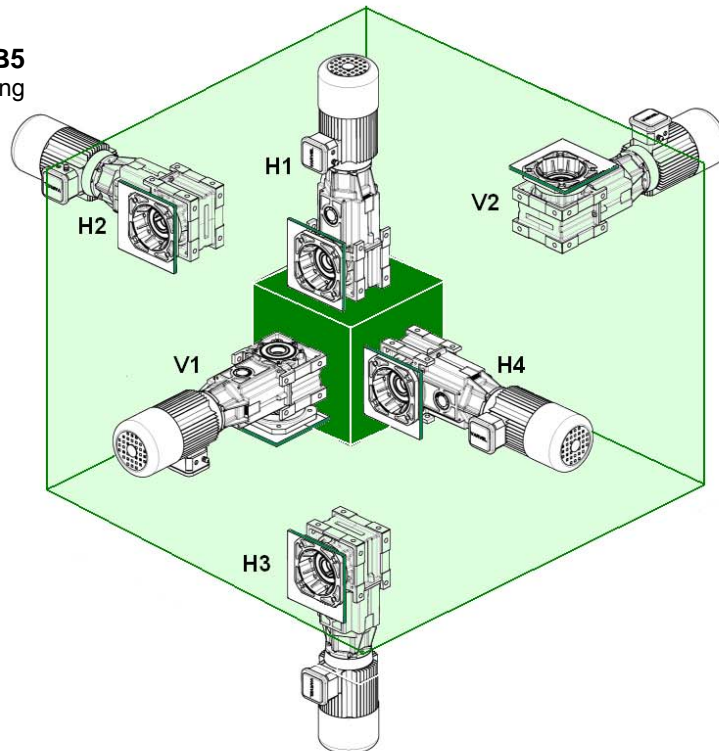
Mounting positions

RO

B3
Foot mounting



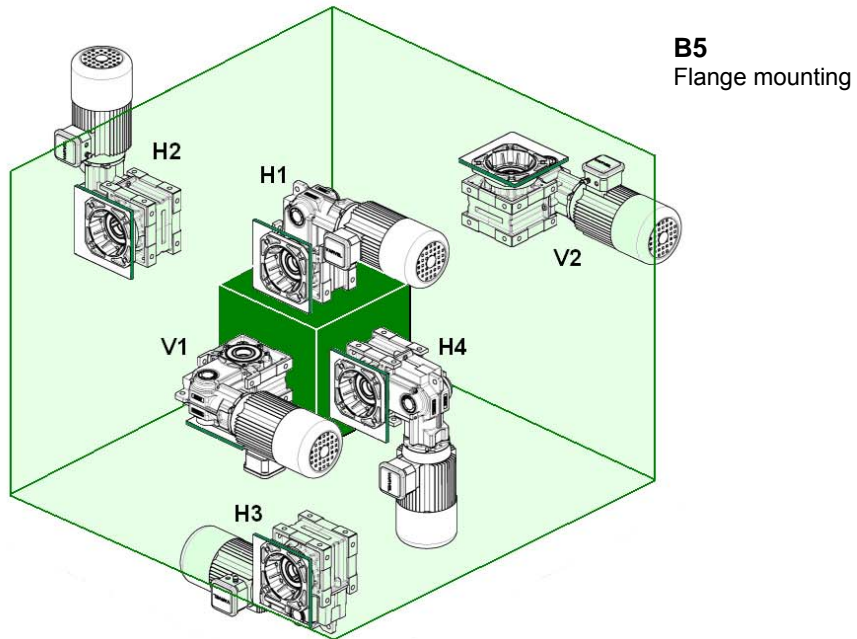
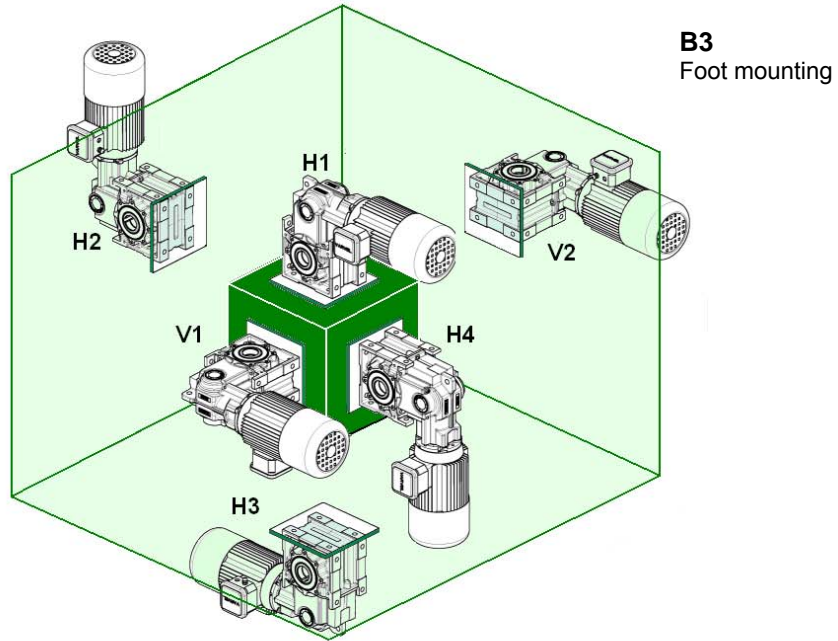
B5
Flange mounting



RN-RO-RV Gearboxes

Mounting positions

RV



Gearboxes RN-RO-RV

Designation

GEARBOX DESIGNATION

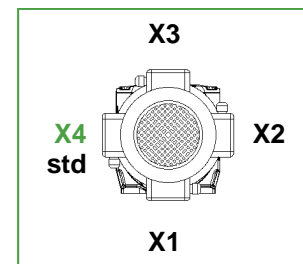
F	RN	32	/B3	H	31.5	IEC71	-B14	AU30	DFU200
									Output flange ø ...
									Output shaft ø ...
									B5, B14 = Motor form
									Electric motor frame
									Reduction ratio
									H, V = Gearbox mounting position
									B3, B5, B3/B5 = Gearbox form
									Gearbox size and stages
									Tipo del riduttore (RN, RO, RV)

M = Geared motor
 F = Gearbox with input flange
 S = Gearbox without input flange
 ... = (nothing) Gearbox with input free shaft

MOTOR DESIGNATION

MT	0.37 kW	71 B	4	B14	230/400/50	IP55	F	X4
								Terminal box position
								Class F (std) = Insulation class
								IP55 (std) = Protection class
								Voltage / Frequency
								B5 o B14 = Mounting form
								Number of poles
								IEC motor frame
								Motor power

MT = Three-phase motor
 MM = Single-phase motor
 MA = Brake motor



RN-RO-RV Gearboxes

External Loads

OUTPUT RADIAL LOADS

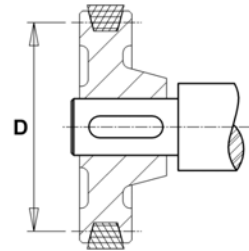
Radial (overhung) loads have to be checked with the rating factor given in the gearbox selection tables.

The $k_{(t)}$ rating factor will vary according to the transmission element fitted on the gearbox output shaft according to the below table.

- Application radial load

$k_{(t)}$	Transmission element
1,15	Gear - Tooth No. < 17
1,40	Chain sprocket - Tooth No. < 13
1,25	Chain sprocket - Tooth No. < 20
1,00	Chain sprocket - Tooth No. > 20
2,50	V-belt pulley
1,25	Toothed-belt pulley

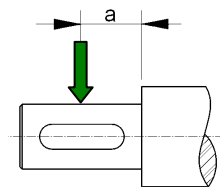
$$F_r = \frac{2000 * M_2}{D} * k_{(t)}$$



- Catalogue radial load at shaft centre

[mm]	0	1	2	3	4	5	6
a	17.5	20	25	30	35	40	50

$$F_{r2} \geq F_r$$



- Radial load offset from centre

[mm]	0	1	2	3	4	5	6
a	17.5	20	25	30	35	40	50
b	15.5	23	24	27	31	37	39
c	33	43	49	57	66	77	89

Check both (*) and (**) comparisons

(*)

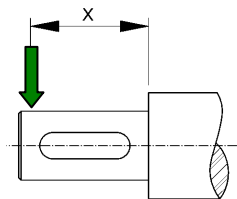
$$F_{r2b(x)} \geq F_r$$

$$F_{r2b(x)} = F_{r2} * \frac{c}{x + b}$$

$$F_{r2s(x)} \geq F_r$$

(**)

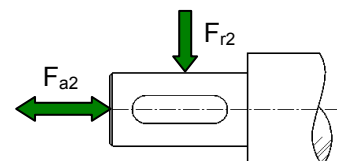
$$F_{r2s(x)} = F_{r2} * \frac{a}{x}$$



OUTPUT AXIAL LOADS

Axial load value, both on tensile and compressive stress, and with radial load:

$$F_{a2} = F_{r2} * 0.2$$



Gearboxes RN-RO-RV

Guided Selection



Modularity and flexibility have been leading the design of VARVEL products since the years 2000: this way, the gear-box-kit concept was carried out allowing anyone to assemble the unit in few minutes with standard tooling.

This feature provides the highest flexibility to VARVEL's distributors and resellers who - thanks to a limited kit selection - are able to immediately configure the required product.

VARsize® selection program, available from our web-site www.varvel.com

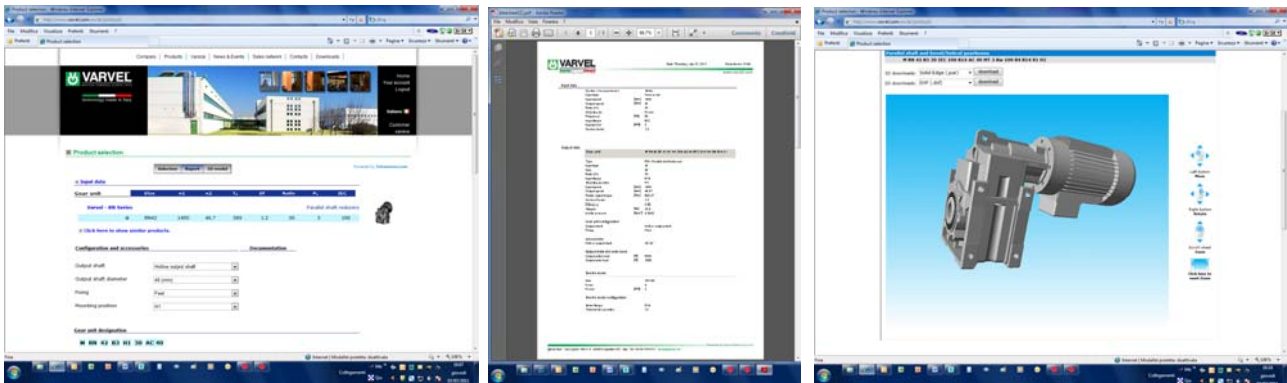
allows a friendly sizing of VARVEL product range.

2D/3D Drawings

A guided selection lets 2D/3D models downloaded for the most popular CAD systems.

Guided selection

This option returns a list of applicable product configurations upon a given sequence of application parameters (power, output torque, rpm, service factor etc.); a PDF data sheet featuring performance data and dimensional drawings is generated for each configuration, as well as the 3D model and 2D drawings.



RN-RO-RV Gearboxes

RN1 - 180 Nm

Speed Reducer Selection

1400 min⁻¹

FRN	i _n	i _r	n ₂ [min ⁻¹]	M ₂ [Nm]	P ₁ [kW]	F _{r1} [N]	F _{r2} [N]	J ₁ (x 10 ⁻⁴) [kgm ²]	56 B5	63 B*	71 B*	80 B*	90 B14
12 2c	7,1	6,59	212	125	2,9	1050	3350	0,8414	⊙	⊙	⊙	⊙	⊙
	8,0	7,95	176	130	2,5	1100	3470	0,7600	⊙	⊙	⊙	⊙	⊙
	9,0	8,32	168	140	2,6	1030	3580	0,6786	⊙	⊙	⊙	⊙	⊙
	10,0	10,11	138	150	2,3	1010	3490	0,5849	⊙	⊙	⊙	⊙	⊙
	12,5	12,19	115	130	1,6	1110	3470	0,5416	⊙	⊙	⊙	⊙	⊙
	14,0	13,17	106	165	1,9	1000	3450	0,4982	⊙	⊙	⊙	⊙	⊙
	16,0	15,87	88,2	140	1,3	1110	3450	0,4722	⊙	⊙	⊙	⊙	⊙
	18,0	16,65	84,1	165	1,5	1060	3560	0,4462	⊙	⊙	⊙	⊙	⊙
	20,0	20,29	69	170	1,3	1110	3710	0,4149	⊙	⊙	⊙	⊙	⊙
	22,4	25,37	55,2	170	1,0	1130	3850	0,3892	⊙	⊙	⊙	⊙	⊙
	31,5	30,59	45,8	140	0,70	1270	4070	0,3789	⊙	⊙	⊙	⊙	⊙
	33,0	33,00	42,4	160	0,74	1230	4290	0,3685	⊙	⊙	⊙	⊙	⊙
	35,5	36,47	38,4	140	0,59	1330	4700	0,3626	⊙	⊙	⊙	⊙	⊙
	40	39,78	35,2	140	0,54	1420	4870	0,3635	⊙	⊙	⊙	⊙	⊙
	45	43,96	31,8	140	0,49	1420	4900	0,3585	⊙	⊙	⊙	⊙	⊙
	50	48,98	28,6	140	0,44	1420	4900	0,3539	⊙	⊙	⊙	⊙	⊙
56	52,07	26,9	110	0,32	1420	5150	0,3499	⊙	⊙	⊙	⊙	⊙	
60	62,78	22,3	120	0,29	1470	5400	0,3459	⊙	⊙	⊙	⊙	⊙	
13 3c	40	39,52	35,4	145	0,57	850	4762	0,2554	⊙	⊙	⊙	⊙	⊙
	50	48,04	29,1	155	0,50	950	4600	0,2512	⊙	⊙	⊙	⊙	⊙
	63	62,54	22,4	170	0,42	1070	4300	0,2474	⊙	⊙	⊙	⊙	⊙
	80	79,10	17,7	180	0,35	1140	4000	0,2451	⊙	⊙	⊙	⊙	⊙
	100	96,36	14,5	180	0,29	1200	4000	0,2437	⊙	⊙	⊙	⊙	⊙
	125	120,51	11,6	180	0,23	1250	4000	0,2426	⊙	⊙	⊙	⊙	⊙
	160	156,75	8,93	175	0,17	1300	4100	0,2416	⊙	⊙	⊙	⊙	⊙
	180	173,22	8,08	150	0,14	1340	4800	0,2414	⊙	⊙	⊙	⊙	⊙
	200	203,91	6,87	150	0,11	1320	4800	0,2326	⊙	⊙	⊙	⊙	⊙
	250	265,22	5,28	150	0,09	1350	4800	0,2322	⊙	⊙	⊙	⊙	⊙
	280	293,09	4,78	150	0,08	1360	4800	0,2321	⊙	⊙	⊙	⊙	⊙
	315	326,53	4,29	150	0,07	1360	4800	0,2320	⊙	⊙	⊙	⊙	⊙
400	418,50	3,35	120	0,04	1440	5300	0,2318	⊙	⊙	⊙	⊙	⊙	

2c & 3c - Number of reduction stages
B* = B5 & B14

	Oil [litres]						Weight [kg]	
	H1	H2	H3	H4	V1	V2		
FRN12	0.5	0.6	0.4	0.6	0.6	0.6	5.4	
FRN13	0.5	0.4	0.3	0.3	0.6	0.4	5.5	

RO1/RV1 - 180 Nm

Gearboxes RN-RO-RV

1400 min⁻¹

Speed Reducer Selection

FRO FRV	i _n	i _r	n ₂ [min ⁻¹]	M ₂ [Nm]	P ₁ [kW]	F _{r1} [N]	F _{r2} [N]	J ₁ (x 10 ⁻⁴) [kgm ²]	56 B5	63 B*	71 B*	80 B*	90 B14
13 3c	7,1	7,58	185	130	2,7	1550	3310	1,1700	⊙	⊙	⊙	⊙	⊙
	9,0	9,14	153	130	2,2	1580	3740	1,0754	⊙	⊙	⊙	⊙	⊙
	10,0	9,57	146	140	2,3	1580	3600	1,0469	⊙	⊙	⊙	⊙	⊙
	11,2	11,63	120	150	2,0	1590	3570	0,9761	⊙	⊙	⊙	⊙	⊙
	14,0	14,02	100	130	1,5	1600	4040	0,9358	⊙	⊙	⊙	⊙	⊙
	16,0	15,14	92,5	165	1,7	1600	3550	0,9105	⊙	⊙	⊙	⊙	⊙
	18,0	18,25	76,7	135	1,2	1610	4240	0,8868	⊙	⊙	⊙	⊙	⊙
	20,0	19,15	73,1	170	1,4	1610	3670	0,8712	⊙	⊙	⊙	⊙	⊙
	22,4	23,33	60,0	170	1,1	1610	3820	0,8476	⊙	⊙	⊙	⊙	⊙
	25,0	24,44	57,3	150	0,96	1600	4150	0,3567	⊙	⊙	⊙	⊙	⊙
	28,0	29,18	48,0	170	0,91	1610	3960	0,8281	⊙	⊙	⊙	⊙	⊙
	31,5	31,82	44,0	165	0,81	1600	4120	0,3418	⊙	⊙	⊙	⊙	⊙
	35,5	37,95	36,9	160	0,66	1610	4430	0,8125	⊙	⊙	⊙	⊙	⊙
	40	40,25	34,8	175	0,68	1610	4100	0,3329	⊙	⊙	⊙	⊙	⊙
	45	47,88	29,2	170	0,55	1600	4300	0,2717	⊙	⊙	⊙	⊙	⊙
	50	49,02	28,6	175	0,56	1610	4100	0,3276	⊙	⊙	⊙	⊙	⊙
	56	59,10	23,7	140	0,37	1610	4820	0,3253	⊙	⊙	⊙	⊙	⊙
	63	61,31	22,8	170	0,43	1610	4000	0,3231	⊙	⊙	⊙	⊙	⊙
	71	73,77	19,0	170	0,36	1610	4000	0,2654	⊙	⊙	⊙	⊙	⊙
	80	84,93	16,5	165	0,30	1610	4400	0,2441	⊙	⊙	⊙	⊙	⊙
	90	92,26	15,2	180	0,30	1610	4000	0,2634	⊙	⊙	⊙	⊙	⊙
	100	103,46	13,5	180	0,27	1610	4000	0,2429	⊙	⊙	⊙	⊙	⊙
	112	111,22	12,6	150	0,21	1610	4800	0,2628	⊙	⊙	⊙	⊙	⊙
	125	129,39	10,8	180	0,22	1610	4000	0,2419	⊙	⊙	⊙	⊙	⊙
	140	132,61	10,6	150	0,18	1610	4700	0,2614	⊙	⊙	⊙	⊙	⊙
	160	168,30	8,32	175	0,16	1610	4100	0,2411	⊙	⊙	⊙	⊙	⊙
	180	185,98	7,53	150	0,13	1610	4700	0,2409	⊙	⊙	⊙	⊙	⊙
	200	202,90	6,90	150	0,12	1610	4800	0,2408	⊙	⊙	⊙	⊙	⊙
	224	224,22	6,24	150	0,10	1610	4800	0,2407	⊙	⊙	⊙	⊙	⊙
	250	249,80	5,60	150	0,09	1610	4800	0,2405	⊙	⊙	⊙	⊙	⊙
315	326,53	4,29	150	0,07	1360	4800	0,2320	⊙	⊙	⊙	⊙	⊙	

2c & 3c - Number of reduction stages
B* = B5 & B14

	Oil [litres]						Weight [kg]	
	H1	H2	H3	H4	V1	V2		
FRO13	0,5	0,45	0,4	0,45	0,45	0,45	6,4	
FRV13	0,5	0,35	0,25	0,35	0,4	0,4	6,1	

RN-RO-RV Gearboxes

RN2 - 310 Nm

Speed Reducer Selection
1400 min⁻¹

FRN	i _n	i _r	n ₂ [min ⁻¹]	M ₂ [Nm]	P ₁ [kW]	F _{r1} [N]	F _{r2} [N]	J ₁ (x 10 ⁻⁴) [kgm ²]	71 B*	80 B*	90 B*	100 B*	112 B*
22 2c	6,3	5,76	243	190	5,1	2900	3200	2,5855	⊙	⊙	⊙	⊙	⊙
	7,1	7,37	190	215	4,6	2900	3450	2,1881	⊙	⊙	⊙	⊙	⊙
	8,0	7,80	179	220	4,4	2900	3530	2,2972	⊙	⊙	⊙	⊙	⊙
	9,0	9,07	154	240	4,1	2900	3690	1,9599	⊙	⊙	⊙	⊙	⊙
	10,0	9,98	140	230	3,6	3000	3850	2,0120	⊙	⊙	⊙	⊙	⊙
	11,2	11,33	124	260	3,6	2900	3890	1,7848	⊙	⊙	⊙	⊙	⊙
	12,5	12,29	114	230	2,9	3000	4140	1,8436	⊙	⊙	⊙	⊙	⊙
	14,0	14,51	96,5	300	3,2	3000	3720	1,6479	⊙	⊙	⊙	⊙	⊙
	16,0	15,36	91,2	230	2,3	3000	4480	1,7103	⊙	⊙	⊙	⊙	⊙
	18,0	17,87	78,4	310	2,7	3000	3590	1,5647	⊙	⊙	⊙	⊙	⊙
	20,0	19,66	71,2	230	1,8	3000	4810	1,6024	⊙	⊙	⊙	⊙	⊙
	22,4	22,67	61,8	310	2,1	3000	3800	1,4958	⊙	⊙	⊙	⊙	⊙
	25,0	24,21	57,8	240	1,5	3000	4970	1,5348	⊙	⊙	⊙	⊙	⊙
	28,0	29,32	47,8	265	1,4	3000	4770	1,4440	⊙	⊙	⊙	⊙	⊙
	31,5	30,71	45,6	240	1,2	3000	5180	1,4772	⊙	⊙	⊙	⊙	⊙
	35,5	34,52	40,6	220	0,99	3000	5420	1,4202	⊙	⊙	⊙	⊙	⊙
23 3c	40	39,72	35,2	240	0,94	3000	5380	1,4329	⊙	⊙	⊙	⊙	⊙
	45	46,78	29,9	245	0,82	3000	5550	1,4122	⊙	⊙	⊙	⊙	⊙
	50	51,19	27,3	245	0,75	3000	5650	1,4027	⊙	⊙	⊙	⊙	⊙
	63	62,66	22,3	250	0,62	3000	6040	1,3859	⊙	⊙	⊙	⊙	⊙
	40	36,34	38,5	250	1,07	-	5130	0,9994	⊙	⊙	⊙	⊙	⊙
	45	44,73	31,3	270	0,94	-	5070	0,9900	⊙	⊙	⊙	⊙	⊙
	56	55,91	25,0	310	0,86	1070	4970	0,9828	⊙	⊙	⊙	⊙	⊙
	71	71,57	19,6	310	0,68	1210	5100	0,9772	⊙	⊙	⊙	⊙	⊙
	80	79,01	17,7	140	0,28	1390	7160	0,9250	⊙	⊙	⊙	⊙	⊙
	90	88,14	15,9	310	0,55	1370	5200	0,9738	⊙	⊙	⊙	⊙	⊙
	100	101,07	13,9	180	0,28	1390	7190	0,9223	⊙	⊙	⊙	⊙	⊙
	112	111,82	12,5	310	0,43	1480	5200	0,9710	⊙	⊙	⊙	⊙	⊙
	125	124,39	11,3	220	0,28	1390	6700	0,9206	⊙	⊙	⊙	⊙	⊙
	140	144,62	9,68	265	0,29	1550	6100	0,9688	⊙	⊙	⊙	⊙	⊙
	160	155,49	9,00	260	0,26	1450	6200	0,9193	⊙	⊙	⊙	⊙	⊙
	180	186,37	7,51	200	0,17	1570	7000	0,9674	⊙	⊙	⊙	⊙	⊙
200	199,03	7,03	260	0,20	1500	6200	0,9183	⊙	⊙	⊙	⊙	⊙	
224	228,12	6,14	170	0,12	1580	7400	0,9666	⊙	⊙	⊙	⊙	⊙	
250	245,13	5,71	260	0,17	1540	6200	0,9176	⊙	⊙	⊙	⊙	⊙	
315	310,98	4,50	260	0,13	1560	6200	0,9170	⊙	⊙	⊙	⊙	⊙	
400	402,20	3,48	260	0,10	1570	6200	0,9166	⊙	⊙	⊙	⊙	⊙	
450	473,65	2,96	260	0,09	1570	6200	0,9164	⊙	⊙	⊙	⊙	⊙	
500	518,30	2,70	260	0,08	1580	6200	0,9163	⊙	⊙	⊙	⊙	⊙	
630	634,40	2,21	230	0,06	1580	6700	0,9161	⊙	⊙	⊙	⊙	⊙	

2c & 3c - Number of reduction stages
 B* = B5 & B14

⊙ - Max, available power ≤ P₁

	Oil [litres]						Weight [kg]
	H1	H2	H3	H4	V1	V2	
FRN22	0,7	0,8	0,5	0,8	0,7	0,7	8,6
FRN23	0,7	0,6	0,4	0,6	0,7	0,7	9,1

RO2/RV2 - 310 Nm

Gearboxes RN-RO-RV

1400 min⁻¹

Speed Reducer Selection

FRO FRV	i_n	i_r	n_2 [min ⁻¹]	M_2 [Nm]	P_1 [kW]	F_{r1} [N]	F_{r2} [N]	J_1 (x 10 ⁻⁴) [kgm ²]	71 B*	80 B*	90 B*	100 B*	112 B*
23 3c	6,3	6,62	211,4	200	4,7	2900	3350	3,7230	⊙	⊙	⊙	⊙	⊙
	8,0	8,47	165,3	220	4,1	2900	3620	3,4225	⊙	⊙	⊙	⊙	⊙
	9,0	8,97	156,0	225	3,9	2900	3710	3,4623	⊙	⊙	⊙	⊙	
	10,0	10,43	134,3	245	3,7	2900	3870	3,2499	⊙	⊙	⊙	⊙	
	11,2	11,48	122,0	230	3,1	3000	4040	3,2632	⊙	⊙	⊙	⊙	
	12,5	13,03	107,4	275	3,3	3000	3920	3,1175	⊙	⊙	⊙	⊙	
	14,0	14,13	99,1	230	2,5	3000	4340	3,1448	⊙	⊙	⊙	⊙	
	16,0	16,68	83,9	305	2,9	3000	3620	3,0140	⊙	⊙	⊙	⊙	
	18,0	17,80	78,6	250	2,2	3000	4480	1,3623	⊙	⊙	⊙	⊙	
	20,0	20,55	68,1	310	2,4	3000	3720	2,9511	⊙	⊙	⊙	⊙	
	22,4	21,91	63,9	270	1,9	3000	4420	1,3232	⊙	⊙	⊙		
	25,0	26,07	53,7	310	1,9	3000	3930	2,8990	⊙	⊙	⊙		
	28,0	27,39	51,1	310	1,8	3000	4180	1,2932	⊙	⊙	⊙		
	31,5	32,97	42,5	260	1,2	3000	4960	1,0795	⊙	⊙	⊙		
	35,5	35,06	39,9	310	1,4	3000	4220	1,2698	⊙	⊙	⊙		
	40	41,21	34,0	310	1,2	3000	4600	1,0662	⊙	⊙	⊙		
	45	43,18	32,4	310	1,1	3000	4450	1,2555	⊙	⊙	⊙		
	50	52,75	26,5	310	0,92	3000	4680	1,0559	⊙	⊙			
	56	54,78	25,6	310	0,88	3000	4720	1,2437	⊙	⊙			
	63	64,97	21,5	310	0,74	3000	4930	1,0496	⊙	⊙			
	71	73,98	18,9	285	0,60	3000	5510	0,9764	⊙	⊙			
	80	82,42	17,0	310	0,59	3000	5100	1,0444	⊙	⊙			
	90	91,12	15,4	310	0,53	3000	5100	0,9732	⊙				
	100	106,60	13,1	270	0,39	3000	6000	1,0405	⊙				
	112	115,60	12,1	310	0,42	3000	5100	0,9706	⊙				
	125	123,47	11,34	260	0,33	3000	6200	0,9721	⊙				
	140	149,51	9,36	270	0,28	3000	6000	0,9686	⊙				
	160	156,64	8,94	260	0,26	3000	6200	0,9699	⊙				
	180	170,11	8,23	260	0,24	3000	6200	1,0381	(⊙)				
	200	202,59	6,91	260	0,20	3000	6200	0,9682	(⊙)				
	224	238,58	5,87	260	0,17	3000	6200	0,9674	(⊙)				
250	261,07	5,363	260	0,16	3000	6200	0,9670	(⊙)					
315	319,55	4,381	260	0,13	3000	6200	0,9664	(⊙)					

3c - Number of reduction stages
B* = B5 & B14

(⊙) - Max, available power ≤ P₁

	Oil [litres]						Weight [kg]	
	H1	H2	H3	H4	V1	V2		
FRO23	0,8	0,7	0,8	0,7	0,9	0,9	10,6	
FRV23	0,7	0,6	0,5	0,6	0,7	0,6	10,1	

RN-RO-RV Gearboxes

RN3 - 580 Nm

Speed Reducer Selection
1400 min⁻¹

FRN	i_n	i_r	n_2 [min ⁻¹]	M_2 [Nm]	P_1 [kW]	F_{r1} [N]	F_{r2} [N]	J_1 (x 10 ⁻⁴) [kgm ²]	71 B*	80 B*	90 B*	100 B*	112 B*
32 2c	6,3	5,59	250	400	10,9	1780	4760	4,8684	⊙	⊙	⊙	⊙	⊙
	7,1	7,17	195	430	9,2	1890	5180	3,8232	⊙	⊙	⊙	⊙	⊙
	8,0	7,90	177	370	7,1	2100	5410	3,9288	⊙	⊙	⊙	⊙	⊙
	9,0	8,84	158	480	8,3	1790	5180	3,2176	⊙	⊙	⊙	⊙	⊙
	10,0	10,13	138	380	5,7	2170	5890	3,2515	⊙	⊙	⊙	⊙	⊙
	11,2	11,06	127	530	7,3	-	4550	2,7466	⊙	⊙	⊙	⊙	⊙
	12,5	12,49	112	380	4,6	2180	6330	2,8412	⊙	⊙	⊙	⊙	⊙
	14,0	14,18	98,8	540	5,8	1870	4700	2,3720	⊙	⊙	⊙	⊙	⊙
	16,0	15,63	89,6	390	3,8	2180	6830	2,5063	⊙	⊙	⊙	⊙	⊙
	18,0	18,84	74,3	550	4,5	2020	4860	2,0717	⊙	⊙	⊙	⊙	⊙
	20,0	20,03	69,9	390	3,0	2180	7400	2,2256	⊙	⊙	⊙	⊙	⊙
	22,4	22,18	63,1	550	3,8	-	5000	1,9456	⊙	⊙	⊙	⊙	⊙
	25,0	26,62	52,6	400	2,3	2180	7750	1,9888	⊙	⊙	⊙	⊙	⊙
	28,0	28,93	48,4	540	2,9	1610	5550	1,7952	⊙	⊙	⊙	⊙	⊙
	31,5	31,33	44,7	400	1,9	2180	7920	1,8858	⊙	⊙	⊙	⊙	⊙
	35,5	34,50	40,6	450	2,0	2020	7320	1,7221	⊙	⊙	⊙	⊙	⊙
	40	40,87	34,3	420	1,6	2180	8250	1,7600	⊙	⊙	⊙	⊙	⊙
	45	47,50	29,5	320	1,0	2180	9440	1,6310	⊙	⊙	⊙	⊙	⊙
50	48,74	28,7	420	1,3	2180	8530	1,6974	⊙	⊙	⊙	⊙	⊙	
56	53,75	26,0	420	1,2	2180	8640	1,6689	⊙	⊙	⊙	⊙	⊙	
63	67,10	20,9	420	0,96	2180	9030	1,6180	⊙	⊙	⊙	⊙	⊙	
33 3c	40	35,86	39,0	490	2,1	1610	6840	1,2294	⊙	⊙	⊙	⊙	⊙
	45	44,20	31,7	550	1,9	-	5900	1,2052	⊙	⊙	⊙	⊙	⊙
	56	55,31	25,3	580	1,6	1640	5500	1,1864	⊙	⊙	⊙	⊙	⊙
	71	70,88	19,8	580	1,3	1950	5500	1,1714	⊙	⊙	⊙	⊙	⊙
	80	80,62	17,4	265	0,51	2160	10880	1,0679	⊙	⊙	⊙	⊙	⊙
	90	94,22	14,9	580	0,96	2160	5500	1,1594	⊙	⊙	⊙	⊙	⊙
	100	103,34	13,5	340	0,51	2170	10730	1,0614	⊙	⊙	⊙	⊙	⊙
	112	110,89	12,6	580	0,82	2230	5500	1,1543	⊙	⊙	⊙	⊙	⊙
	125	127,37	11,0	420	0,51	2160	9700	1,0575	⊙	⊙	⊙	⊙	⊙
	140	144,64	9,68	580	0,63	2300	5500	1,1483	⊙	⊙	⊙	⊙	⊙
	160	159,41	8,78	430	0,42	2240	9400	1,0542	⊙	⊙	⊙	⊙	⊙
	180	172,50	8,12	480	0,43	2300	8600	1,1454	⊙	⊙	⊙	⊙	⊙
	200	204,26	6,85	430	0,33	2300	9400	1,0515	⊙	⊙	⊙	⊙	⊙
	224	237,50	5,89	320	0,21	2300	11100	1,1417	⊙	⊙	⊙	⊙	⊙
	280	271,53	5,16	430	0,25	2300	9400	1,0493	⊙	⊙	⊙	⊙	⊙
	315	319,58	4,38	430	0,21	2300	9400	1,0483	⊙	⊙	⊙	⊙	⊙
	400	416,85	3,36	430	0,16	2300	9400	1,0471	⊙	⊙	⊙	⊙	⊙
500	497,13	2,82	430	0,13	2300	9400	1,0465	⊙	⊙	⊙	⊙	⊙	
560	548,22	2,55	430	0,12	2300	9400	1,0462	⊙	⊙	⊙	⊙	⊙	
710	684,45	2,05	430	0,10	2300	9400	1,0457	⊙	⊙	⊙	⊙	⊙	

2c & 3c - Number of reduction stages
B* = B5 & B14

(⊙) - Max, available power ≤ P₁

	Oil [litres]						Weight [kg]	
	H1	H2	H3	H4	V1	V2		
FRN32	1,1	1,3	0,8	1,3	1,2	1,2	12,5	
FRN33	1,2	1,0	0,6	1,0	1,2	1,0	13,0	

RO3/RV3 - 580 Nm

Gearboxes RN-RO-RV

1400 min⁻¹

Speed Reducer Selection

FRO FRV	i _n	i _r	n ₂ [min ⁻¹]	M ₂ [Nm]	P ₁ [kW]	F _{r1} [N]	F _{r2} [N]	J ₁ (x 10 ⁻⁴) [kgm ²]	71 B*	80 B*	90 B*	100 B*	112 B*
33 3c	6,3	6,43	217,6	420	10,2	4550	4990	7,8449	⊙	⊙	⊙	⊙	⊙
	8,0	8,25	169,7	450	8,5	5540	5430	7,0546	⊙	⊙	⊙	⊙	⊙
	9,0	9,09	154,0	380	6,5	5710	5680	7,1141	⊙	⊙	⊙	⊙	⊙
	10,0	10,17	137,7	500	7,7	5630	4980	6,5966	⊙	⊙	⊙	⊙	⊙
	11,2	11,65	120,2	380	5,1	5730	6180	6,6099	⊙	⊙	⊙	⊙	⊙
	12,5	12,72	110,0	540	6,6	5710	4640	6,2405	⊙	⊙	⊙	⊙	⊙
	14,0	13,52	103,5	460	5,3	5520	5970	2,2602	⊙	⊙	⊙	⊙	⊙
	16,0	16,30	85,9	540	5,2	5730	4800	5,9573	⊙	⊙	⊙	⊙	⊙
	18,0	17,33	80,8	510	4,6	5680	5460	2,0812	⊙	⊙	⊙	⊙	⊙
	20,0	19,10	73,3	390	3,2	5730	7310	2,0993	⊙	⊙	⊙	⊙	⊙
	22,4	21,67	64,6	550	4,0	5740	4970	5,7302	⊙	⊙	⊙	⊙	⊙
	25,0	26,73	52,4	560	3,3	5730	5130	1,8969	⊙	⊙	⊙	⊙	⊙
	28,0	28,74	48,7	400	2,2	5740	7800	1,4638	⊙	⊙	⊙	⊙	⊙
	31,5	33,27	42,1	550	2,6	5740	4800	5,5211	⊙	⊙	⊙	⊙	⊙
	35,5	34,26	40,9	560	2,5	5740	5370	1,8327	⊙	⊙	⊙	⊙	⊙
	40	40,23	34,8	570	2,2	5740	5500	1,3744	⊙	⊙	⊙	⊙	⊙
	45	45,54	30,7	570	2,0	5740	5580	1,7813	⊙	⊙	⊙	⊙	⊙
	50	51,55	27,2	580	1,8	5740	5600	1,3460	⊙	⊙	⊙	⊙	⊙
	56	53,60	26,1	580	1,7	5740	5600	1,7597	⊙	⊙	⊙	⊙	⊙
	63	64,33	21,8	410	1,0	5740	8950	1,7667	⊙	⊙	⊙	⊙	⊙
	71	68,52	20,4	580	1,3	5740	5500	1,3233	⊙	⊙	⊙	⊙	⊙
	80	80,65	17,4	580	1,1	5740	5500	1,3138	⊙	⊙	⊙	⊙	⊙
	90	91,94	15,2	410	0,70	5740	9580	1,7158	⊙	⊙	⊙	⊙	⊙
	100	105,20	13,3	580	0,86	5750	5500	1,3024	⊙	⊙	⊙	⊙	⊙
	112	113,11	12,4	580	0,80	5740	5500	1,1546	⊙	⊙	⊙	⊙	⊙
	125	125,46	11,16	480	0,60	5740	8500	1,2969	⊙	⊙	⊙	⊙	⊙
	140	147,54	9,49	580	0,61	5740	5500	1,1488	⊙	⊙	⊙	⊙	⊙
	160	162,17	8,63	430	0,41	5740	9400	1,7036	⊙	⊙	⊙	⊙	⊙
	180	175,95	7,96	490	0,43	5740	8200	1,1460	⊙	⊙	⊙	⊙	⊙
	200	208,42	6,72	430	0,32	5740	9400	1,1474	⊙	⊙	⊙	⊙	⊙
	250	248,56	5,63	430	0,27	5740	9400	1,1450	⊙	⊙	⊙	⊙	⊙
	280	274,11	5,107	430	0,25	5740	9400	1,1439	⊙	⊙	⊙	⊙	⊙
	315	342,23	4,091	430	0,20	5740	9400	1,1420	⊙	⊙	⊙	⊙	⊙

3c - Number of reduction stages
B* = B5 & B14

⊙ - Max, available power ≤ P₁

	Oil [litres]						Weight [kg]	
	H1	H2	H3	H4	V1	V2		
FRO33	1,1	1,3	0,8	1,3	1,2	1,2	12,5	
FRV33	1,2	1,0	0,6	1,0	1,2	1,0	13,0	

RN-RO-RV Gearboxes

RN4 - 1000 Nm

Speed Reducer Selection
1400 min⁻¹

FRN	i_n	i_r	n_2 [min ⁻¹]	M_2 [Nm]	P_1 [kW]	F_{r1} [N]	F_{r2} [N]	J_1 (x 10 ⁻⁴) [kgm ²]	71 B5	80 B*	90 B*	100 B*	112 B*
42 2c	6,3	5,74	244	680	18,1	-	5030	13,0943	⊙	⊙	⊙	⊙	⊙
	7,1	7,26	193	790	16,6	-	5190	10,7969	⊙	⊙	⊙	⊙	⊙
	8,0	7,59	185	690	13,9	2020	5680	11,2674	⊙	⊙	⊙	⊙	⊙
	9,0	9,08	154	890	15,0	-	5660	9,2579	⊙	⊙	⊙	⊙	⊙
	10,0	9,60	146	690	11,0	2400	6200	9,6555	⊙	⊙	⊙	⊙	⊙
	11,2	11,55	121	910	12,0	-	6170	8,0995	⊙	⊙	⊙	⊙	⊙
	12,5	12,00	117	700	8,9	2610	6720	8,5274	⊙	⊙	⊙	⊙	⊙
	14,0	14,09	99,3	920	10,0	2440	6810	7,4107	⊙	⊙	⊙	⊙	⊙
	16,0	15,27	91,7	710	7,1	2720	7330	7,6485	⊙	⊙	⊙	⊙	⊙
	18,0	17,59	79,6	930	8,1	-	7410	6,8426	⊙	⊙	⊙	⊙	⊙
	22,4	22,69	61,7	940	6,3	2090	8160	6,4129	⊙	⊙	⊙	⊙	⊙
	28,0	28,28	49,5	890	4,8	2450	8920	6,1008	⊙	⊙	⊙	⊙	⊙
	31,5	30,00	46,7	730	3,7	2850	9290	6,2602	⊙	⊙	⊙	⊙	
	35,5	37,39	37,4	740	3,0	2860	10030	6,0256	⊙	⊙	⊙	⊙	
	40	38,12	36,7	650	2,6	2800	10140	5,8382	⊙	⊙	⊙	⊙	
	45	45,27	30,9	750	2,5	2900	10720	5,8675	⊙	⊙	⊙	⊙	
	50	50,40	27,8	750	2,3	2870	11110	5,7968	⊙	⊙	⊙	⊙	
56	56,67	24,7	700	1,9	2880	11600	5,7318	⊙	⊙	⊙			
43 3c	40	34,07	41,1	730	3,3	-	9670	4,3102	⊙	⊙	⊙	⊙	
	45	42,59	32,9	910	3,3	-	10030	4,2058	⊙	⊙	⊙	⊙	
	56	54,21	25,8	980	2,8	2030	9830	4,1359	⊙	⊙	⊙	⊙	
	63	66,13	21,2	990	2,3	2270	10110	4,0833	⊙	⊙	⊙	⊙	
	71	70,82	19,8	410	0,90	3020	12640	4,0520	⊙	⊙			
	80	82,52	17,0	1000	1,9	2720	10510	3,7956	⊙	⊙	⊙		
	90	89,60	15,6	510	0,89	3020	13650	4,0262	⊙	⊙			
	100	106,48	13,1	1010	1,5	3060	10930	3,7770	⊙	⊙	⊙		
	140	132,69	10,6	950	1,1	3270	12260	4,0051	⊙	⊙	⊙		
	160	160,69	8,71	760	0,74	3370	14590	3,9942	⊙	⊙			
	180	173,90	8,05	800	0,72	3170	14570	3,9843	⊙	⊙			
	200	201,13	6,96	550	0,43	3370	16680	3,7478	⊙				
	224	217,00	6,45	800	0,57	3300	15210	3,9773	⊙	⊙			
	280	280,00	5,00	800	0,45	3370	16030	3,7425	⊙				
	355	348,92	4,01	800	0,36	3370	16500	3,7381	⊙				
	450	422,55	3,31	800	0,30	3370	16500	3,7354	⊙				
	500	470,40	2,98	800	0,27	3370	16500	3,7336	⊙				
560	528,89	2,65	800	0,24	3370	17000	3,7328	⊙					

2c & 3c - Number of reduction stages
 B* = B5 & B14

(⊙) - Max, available power ≤ P₁

	Oil [litres]						Weight [kg]	
	H1	H2	H3	H4	V1	V2		
FRN42	2,8	1,8	1,2	1,8	2,7	2,7	33,5	
FRN43	2,5	1,5	0,9	1,5	2,2	1,9	36,0	

RO4/RV4 - 1000 Nm

Gearboxes RN-RO-RV

1400 min⁻¹

Speed Reducer Selection

FRO FRV	i _n	i _r	n ₂ [min ⁻¹]	M ₂ [Nm]	P ₁ [kW]	F _{r1} [N]	F _{r2} [N]	J ₁ (x 10 ⁻⁴) [kgm ²]	71 B5	80 B5	90 B*	100 B*	112 B*
43 3c	6,3	6,60	212,1	470	11,1	5670	5570	18,0401	⊙	⊙	⊙	⊙	⊙
	8,0	8,35	167,6	530	9,9	5740	6000	16,3029	⊙	⊙	⊙	⊙	⊙
	9,0	8,72	160,6	650	11,6	5560	5980	16,5334	⊙	⊙	⊙	⊙	⊙
	10,0	10,43	134,2	610	9,1	5770	6430	15,1392	⊙	⊙	⊙	⊙	⊙
	11,2	11,04	126,8	650	9,2	5740	6520	15,3615	⊙	⊙	⊙	⊙	⊙
	12,5	13,29	105,4	670	7,9	5780	6950	14,2633	⊙	⊙	⊙	⊙	⊙
	14,0	13,87	100,9	515	5,8	5630	7190	6,3637	⊙	⊙	⊙	⊙	⊙
	16,0	16,21	86,4	730	7,0	5780	7420	13,7425	⊙	⊙	⊙	⊙	⊙
	18,0	17,55	79,8	610	5,4	5700	7740	5,9704	⊙	⊙	⊙	⊙	⊙
	20,0	20,22	69,2	780	6,0	5780	7980	13,3129	⊙	⊙	⊙	⊙	⊙
	22,4	21,94	63,8	690	4,9	5740	8310	5,7069	⊙	⊙	⊙	⊙	⊙
	25,0	26,10	53,6	840	5,0	5780	8690	12,9609	⊙	⊙	⊙	⊙	⊙
	28,0	27,92	50,1	770	4,3	5780	8990	5,5085	⊙	⊙	⊙	⊙	⊙
	31,5	32,52	43,1	890	4,3	5790	9390	12,7520	⊙	⊙	⊙	⊙	⊙
	35,5	34,06	41,1	840	3,9	5780	9580	5,3906	⊙	⊙	⊙	⊙	⊙
	45	42,50	32,9	840	3,1	5780	10020	5,2933	⊙	⊙	⊙	⊙	⊙
	50	51,25	27,3	980	3,0	5780	9720	4,3723	⊙	⊙	⊙	⊙	⊙
	56	54,84	25,5	980	2,8	5790	9800	5,2136	⊙	⊙	⊙	⊙	⊙
	63	63,95	21,9	990	2,4	5780	10090	4,3293	⊙	⊙	⊙	⊙	⊙
	71	68,34	20,5	920	2,1	5790	10970	5,1663	⊙	⊙	⊙	⊙	⊙
	80	82,52	17,0	1000	1,9	5790	10510	4,2941	⊙	⊙	⊙	⊙	⊙
	90	89,69	15,6	890	1,6	5790	11880	3,9791	⊙	⊙	⊙	⊙	⊙
	100	102,83	13,6	940	1,4	5790	11740	4,2732	⊙	⊙	⊙	⊙	⊙
	112	115,73	12,1	1020	1,4	5790	11130	3,9612	⊙	⊙	⊙	⊙	⊙
	125	121,80	11,5	780	1,0	5790	13730	5,1136	⊙	⊙	⊙	⊙	⊙
	140	144,22	9,71	950	1,0	5790	12410	3,9506	⊙	⊙	⊙	⊙	⊙
	160	164,63	8,50	750	0,71	5790	14400	4,2552	⊙	⊙	⊙	⊙	⊙
	180	183,27	7,64	790	0,67	5790	14710	4,2500	⊙	⊙	⊙	⊙	⊙
200	190,66	7,34	750	0,61	5790	14830	3,9474	⊙	⊙	⊙	⊙	⊙	
224	230,89	6,06	750	0,51	5790	15400	3,9414	⊙	⊙	⊙	⊙	⊙	
250	257,04	5,45	750	0,46	5790	16500	3,9388	⊙	⊙	⊙	⊙	⊙	
280	289,000	4,844	750	0,41	5790	16470	3,9363	⊙	⊙	⊙	⊙	⊙	

3c - Number of reduction stages
B* = B5 & B14

	Oil [litres]						Weight [kg]	
	H1	H2	H3	H4	V1	V2		
FRO43	2,8	2,0	1,6	2,0	2,5	2,5	39,0	
FRV43	2,9	1,9	1,2	1,8	2,6	2,6	36,5	

RN-RO-RV Gearboxes

RN5 - 1800 Nm

Speed Reducer Selection
1400 min⁻¹

FRN	i_n	i_r	n_2 [min ⁻¹]	M_2 [Nm]	P_1 [kW]	F_{r1} [N]	F_{r2} [N]	J_1 (x 10 ⁻⁴) [kgm ²]	80 90 B5	100 112 B5	132 B*	160 B*	180 B*
52 2c	6,3	5,64	248	1100	29,8	-	7550	37,6347	⊙	⊙	⊙	⊙	⊙
	7,1	7,46	188	1260	25,8	-	8250	31,2885	⊙	⊙	⊙	⊙	⊙
	8,0	7,66	183	1140	22,7	-	8410	31,9539	⊙	⊙	⊙	⊙	⊙
	9,0	9,46	148	1400	22,6	-	8900	27,6749	⊙	⊙	⊙	⊙	⊙
	10,0	10,13	138	1150	17,3	-	9280	28,0395	⊙	⊙	⊙	⊙	⊙
	11,2	11,45	122	1550	20,7	-	8400	25,5151	⊙	⊙	⊙	⊙	⊙
	12,5	12,85	109	1170	13,9	-	10080	25,6545	⊙	⊙	⊙	⊙	
	14,0	14,12	99,2	1610	17,4	-	8470	23,7029	⊙	⊙	⊙	⊙	⊙
	16,0	15,56	90,0	1180	11,6	-	10780	24,1384	⊙	⊙	⊙	⊙	
	18,0	17,85	78,4	1630	13,9	-	8680	22,1741	⊙	⊙	⊙	⊙	
	20,0	19,19	73,0	1190	9,5	-	11580	22,7969	⊙	⊙	⊙		
	22,4	23,45	59,7	1650	10,7	-	8020	20,8963	⊙	⊙	⊙		
	25,0	24,26	57,7	1200	7,6	-	12560	21,6073	⊙	⊙	⊙		
	28,0	27,55	50,8	1670	9,3	-	8090	20,3546	⊙	⊙	⊙		
	31,5	30,02	46,6	1590	8,1	-	9610	20,1029	⊙	⊙	⊙		
	35,5	36,31	38,6	1300	5,5	-	13530	19,6654	⊙	⊙	⊙		
	40	40,79	34,3	1250	4,7	3370	14620	19,9025	⊙	⊙			
	45	45,38	30,8	1100	3,7	-	15630	19,2544	⊙	⊙			
50	49,33	28,4	1300	4,0	3410	15030	19,5092	⊙	⊙				
63	61,67	22,7	1300	3,2	3440	15530	19,1667	⊙	⊙				
53 3c	40	37,28	37,6	1650	6,9	-	9220	13,8553	⊙	⊙	⊙		
	45	47,28	29,6	1710	5,6	-	8610	13,7108	⊙	⊙	⊙		
	56	57,27	24,4	1750	4,8	3470	8800	13,6244	⊙	⊙			
	71	70,60	19,8	1750	3,9	3930	9010	13,5519	⊙	⊙			
	90	89,26	15,7	1770	3,1	4280	8500	13,4907	⊙	⊙			
	100	95,68	14,6	1160	1,9	4190	17820	12,7382	⊙				
	112	117,24	11,9	1790	2,4	4560	7200	13,4396	⊙	⊙			
	125	121,33	11,5	1310	1,7	4350	17330	12,7114	⊙				
	140	137,77	10,2	1800	2,0	4680	7200	13,4179	⊙				
	160	150,12	9,33	1700	1,8	4790	12400	13,4079	⊙				
	180	181,54	7,71	1360	1,2	4960	18220	13,3896	⊙				
	224	229,08	6,11	1350	0,92	4830	19100	12,6660	⊙				
	315	300,91	4,65	1350	0,70	4950	19100	12,6544	⊙				
	355	353,60	3,96	1350	0,60	5000	19100	12,6493	⊙				
	400	385,28	3,63	1350	0,55	5030	19100	12,6469	⊙				
450	465,93	3,00	1350	0,45	5070	19100	12,6425	(⊙)					
560	582,41	2,40	1350	0,36	5110	19100	12,6387	(⊙)					

2c & 3c - Number of reduction stages
 B* = B5 & B14

(⊙) - Max, available power ≤ P₁

	Oil [litres]						Weight [kg]	
	H1	H2	H3	H4	V1	V2		
FRN52	5,1	3,2	2,1	3,2	4,9	4,9	62	
FRN53	5,0	2,8	1,6	2,8	4,0	3,4	67	

RO5/RV5 - 1800 Nm

Gearboxes RN-RO-RV

1400 min⁻¹

Speed Reducer Selection

FRO FRV	i _n	i _r	n ₂ [min ⁻¹]	M ₂ [Nm]	P ₁ [kW]	F _{r1} [N]	F _{r2} [N]	J ₁ (x 10 ⁻⁴) [kgm ²]	80 90 B5	100 112 B5	132 B*	160 B*	180 B*
53 3c	6,3	6,48	215,9	930	22,4	8200	8020	57,2158	⊙				
	8,0	8,57	163,3	1100	20,0	8290	8770	52,4172	⊙				
	10,0	10,87	128,8	1230	17,6	8350	9470	49,6847	⊙				
	12,5	13,17	106,3	1400	16,6	8350	10050	48,0516	⊙				
	14,0	13,63	102,7	1050	12,0	8110	10340	20,5375	⊙				
	16,0	16,24	86,2	1470	14,1	8360	10150	46,6813	⊙				
	18,0	18,02	77,7	1250	10,8	8260	11300	19,4509	⊙				
	20,0	20,53	68,2	1600	12,2	8360	8650	45,5253	⊙				
	22,4	22,85	61,3	1420	9,7	8310	11180	18,8321	⊙				
	25,0	26,97	51,9	1670	9,7	8360	8140	44,5592	⊙				
	28,0	27,68	50,6	1560	8,8	8350	9800	18,4623	⊙				
	31,5	31,69	44,2	1680	8,3	8360	8230	44,1495	⊙				
	35,5	34,12	41,0	1690	7,7	8360	8340	18,1520	⊙				
	40	41,65	33,6	1700	6,4	8330	8510	14,8941	⊙				
	45	43,14	32,5	1700	6,2	8360	8540	17,8902	⊙				
	50	51,34	27,3	1720	5,2	8360	8720	14,7570	⊙				
	56	56,67	24,7	1730	4,8	8360	8820	17,6715	⊙				
	63	64,91	21,6	1740	4,2	8360	8950	14,6414	⊙				
	71	72,56	19,3	1660	3,6	8360	10800	17,5356	⊙				
	80	79,37	17,6	1280	2,5	8360	16160	13,5189	⊙				
	90	91,04	15,4	1770	3,0	8360	8400	13,4434	⊙				
	100	100,20	14,0	1780	2,8	8360	8000	14,5038	⊙				
	112	109,18	12,8	1700	2,4	8360	11200	14,4848	⊙				
	125	119,59	11,7	1790	2,3	8360	7200	13,3942	⊙				
	140	140,53	10,0	1790	2,0	8360	7200	13,3734	⊙				
	160	153,12	9,14	1720	1,8	8360	10100	13,3637	⊙				
	180	185,17	7,56	1420	1,2	8360	17640	13,3462	⊙				
	200	208,05	6,73	1330	1,0	8360	19060	13,3560	⊙				
224	224,24	6,24	1330	0,92	8360	19100	14,4140	⊙					
250	251,60	5,56	1330	0,82	8360	19100	13,3409	⊙					
315	314,50	4,45	1330	0,66	8360	19100	13,3277	⊙					

3c - Number of reduction stages

B* = B5 & B14

	Oil [litres]						Weight [kg]	
	H1	H2	H3	H4	V1	V2		
FRO53	5,1	3,6	2,9	3,6	5,0	5,0	73	
FRV53	5,2	3,4	2,1	3,2	4,7	4,7	68	

RN-RO-RV Gearboxes

RN6 - 3300 Nm

Speed Reducer Selection

1400 min⁻¹

FRN	i _n	i _r	n ₂ [min ⁻¹]	M ₂ [Nm]	P ₁ [kW]	F _{r1} [N]	F _{r2} [N]	J ₁ (x 10 ⁻⁴) [kgm ²]	80 90 B5	100 112 B5	132 B*	160 B*	180 B*
62 2c	6,3	5,59	250	2200	60,1	-	10060	84,0612	⊙	⊙	⊙	⊙	⊙
	7,1	7,39	189	2600	53,7	-	9540	68,0211	⊙	⊙	⊙	⊙	⊙
	8,0	7,97	176	2200	42,1	-	11380	68,6806	⊙	⊙	⊙	⊙	⊙
	9,0	9,38	149	2900	47,2	-	9030	56,8499	⊙	⊙	⊙	⊙	⊙
	10,0	10,54	133	2200	31,9	-	12550	58,6662	⊙	⊙	⊙	⊙	⊙
	11,2	11,36	123	3100	41,7	-	5620	50,1639	⊙	⊙	⊙	⊙	⊙
	14,0	14,00	100	3160	34,5	-	5450	44,5468	⊙	⊙	⊙	⊙	⊙
	16,0	16,19	86,4	2250	21,2	3800	11630	46,1997	⊙	⊙	⊙	⊙	⊙
	18,0	17,70	79,1	3200	27,6	-	3100	39,8027	⊙	⊙	⊙	⊙	⊙
	20,0	19,96	70,1	2270	17,4	4020	15790	41,9382	⊙	⊙	⊙	⊙	⊙
	22,4	23,25	60,2	3250	21,3	-	8000	35,8331	⊙	⊙	⊙	⊙	⊙
	25,0	25,24	55,5	3000	18,2	4200	16780	38,1707	⊙	⊙	⊙	⊙	⊙
	28,0	27,69	50,6	3270	18,0	-	6000	34,0539	⊙	⊙	⊙	⊙	⊙
	31,5	30,38	46,1	3105	15,6	-	7160	33,2259	⊙	⊙	⊙	⊙	⊙
	35,5	37,35	37,5	2515	10,3	-	16090	31,7360	⊙	⊙	⊙	⊙	⊙
	40	39,49	35,5	3245	12,5	4440	18170	33,3872	⊙	⊙	⊙	⊙	⊙
	45	43,31	32,3	2360	8,3	4470	18380	32,6717	⊙	⊙	⊙	⊙	⊙
	50	53,26	26,3	2380	6,8	4520	18970	31,3694	⊙	⊙	⊙	⊙	⊙
	56	59,89	23,4	2400	6,1	4540	19310	30,7868	⊙	⊙	⊙	⊙	⊙
	63 3c	40	38,20	36,7	3250	13,3	-	7350	22,6869	⊙	⊙	⊙	⊙
50		48,44	28,9	3400	10,9	-	7670	22,2684	⊙	⊙	⊙	⊙	⊙
56		58,68	23,9	3400	9,0	-	7800	22,0179	⊙	⊙	⊙	⊙	⊙
71		72,33	19,4	3400	7,3	3670	7800	21,8075	⊙	⊙	⊙	⊙	⊙
80		79,72	17,6	1780	3,5	2870	25090	19,9592	⊙	⊙	⊙	⊙	⊙
90		91,45	15,3	3400	5,8	3030	7800	21,6298	⊙	⊙	⊙	⊙	⊙
100		105,42	13,3	2350	3,5	2870	22430	19,8591	⊙	⊙	⊙	⊙	⊙
125		120,13	11,7	3400	4,4	3840	7800	21,4811	⊙	⊙	⊙	⊙	⊙
140		143,08	9,78	3400	3,7	4160	7800	21,4145	⊙	⊙	⊙	⊙	⊙
160		156,94	8,92	3300	3,3	4330	7900	21,3834	⊙	⊙	⊙	⊙	⊙
200		192,98	7,25	2700	2,2	4720	21200	21,3276	⊙	⊙	⊙	⊙	⊙
224		217,00	6,45	2300	1,7	4880	26700	21,3029	⊙	⊙	⊙	⊙	⊙
250		252,39	5,55	2600	1,6	4490	22500	19,6541	⊙	⊙	⊙	⊙	⊙
315		331,53	4,22	2600	1,2	4720	22500	19,6213	⊙	⊙	⊙	⊙	⊙
400		394,87	3,55	2600	1,0	4820	22500	19,6063	⊙	⊙	⊙	⊙	⊙
450		433,13	3,23	2600	0,94	4870	22500	19,5991	⊙	⊙	⊙	⊙	⊙
500	532,58	2,63	2600	0,76	4960	22500	19,5861	⊙	⊙	⊙	⊙	⊙	
560	598,89	2,34	2600	0,68	4990	22500	19,5803	⊙	⊙	⊙	⊙	⊙	

2c & 3c - Number of reduction stages
 B* = B5 & B14

	Oil [litres]						Weight [kg]	
	H1	H2	H3	H4	V1	V2		
FRN62	9,2	5,8	3,8	5,8	8,8	8,8	109	
FRN63	9,0	5,0	2,9	5,0	7,2	6,1	116	

RO6/RV6 - 3300 Nm

Gearboxes RN-RO-RV

1400 min⁻¹

Speed Reducer Selection

FRO FRV	i _n	i _r	n ₂ [min ⁻¹]	M ₂ [Nm]	P ₁ [kW]	F _{r1} [N]	F _{r2} [N]	J ₁ (x 10 ⁻⁴) [kgm ²]	80 90 B5	100 112 B5	132 B*	160 B*	180 B*
63 3c	6,3	6,43	217,7	1660	40,3	6670	10740	102,1187	⊙	⊙	⊙	⊙	⊙
	8,0	8,50	164,7	1740	31,9	7570	11850	89,9906	⊙	⊙	⊙	⊙	⊙
	10,0	10,78	129,9	1970	28,5	7820	12750	81,543	⊙	⊙	⊙	⊙	⊙
	12,5	13,06	107,2	2150	25,7	8010	13550	76,4873	⊙	⊙	⊙	⊙	⊙
	14,0	13,51	103,6	1640	18,9	7530	14110	40,9607	⊙	⊙	⊙	⊙	⊙
	16,0	16,10	87,0	2330	22,6	8190	14450	72,2401	⊙	⊙	⊙	⊙	⊙
	18,0	17,87	78,4	1950	17,0	7880	15380	38,2144	⊙	⊙	⊙	⊙	⊙
	20,0	20,36	68,8	2530	19,4	8310	14100	68,6529	⊙	⊙	⊙	⊙	⊙
	22,4	22,66	61,8	2230	15,4	8090	16460	36,3014	⊙	⊙	⊙	⊙	⊙
	25,0	25,48	55,0	2300	14,1	8230	16820	36,6126	⊙	⊙	⊙	⊙	⊙
	28,0	27,45	51,0	2450	13,9	8240	15700	35,1566	⊙	⊙	⊙	⊙	⊙
	31,5	31,85	44,0	2860	14,0	8360	11540	64,3060	⊙	⊙	⊙	⊙	⊙
	35,5	33,83	41,4	2690	12,4	8310	13920	34,1949	⊙	⊙	⊙	⊙	⊙
	40	42,78	32,7	2950	10,8	8360	11390	33,3825	⊙	⊙	⊙	⊙	⊙
	45	42,95	32,6	2540	9,2	8360	16450	62,5533	⊙	⊙	⊙	⊙	⊙
	50	50,91	27,5	3360	10,3	8120	9810	25,1536	⊙	⊙	⊙	⊙	⊙
	56	56,19	24,9	3360	9,3	8360	9970	32,7029	⊙	⊙	⊙	⊙	⊙
	63	64,36	21,8	3360	8,1	8330	10200	24,7949	⊙	⊙	⊙	⊙	⊙
	71	73,41	19,1	3250	6,9	8360	11430	32,2564	⊙	⊙	⊙	⊙	⊙
	80	84,55	16,6	3360	6,2	8360	11400	24,4947	⊙	⊙	⊙	⊙	⊙
	90	90,27	15,5	3360	5,8	8340	11400	21,7196	⊙	⊙	⊙	⊙	⊙
	100	100,70	13,9	3360	5,2	8360	9800	24,3601	⊙	⊙	⊙	⊙	⊙
	112	118,58	11,8	3360	4,4	8360	9800	21,5670	⊙	⊙	⊙	⊙	⊙
	125	128,72	10,9	2490	3,0	8360	22060	21,6569	⊙	⊙	⊙	⊙	⊙
	140	141,23	9,9	3360	3,7	8360	9800	21,4986	⊙	⊙	⊙	⊙	⊙
	160	154,91	9,04	3360	3,4	8360	9800	21,4668	⊙	⊙	⊙	⊙	⊙
	180	190,49	7,35	2730	2,2	8360	19400	21,4095	⊙	⊙	⊙	⊙	⊙
	224	220,89	6,34	2550	1,8	8360	22500	21,4455	⊙	⊙	⊙	⊙	⊙
280	271,62	5,15	2550	1,5	8360	22500	21,3954	⊙	⊙	⊙	⊙	⊙	
315	305,43	4,58	2550	1,3	8360	22500	21,3730	⊙	⊙	⊙	⊙	⊙	

3c - Number of reduction stages

B* = B5 & B14

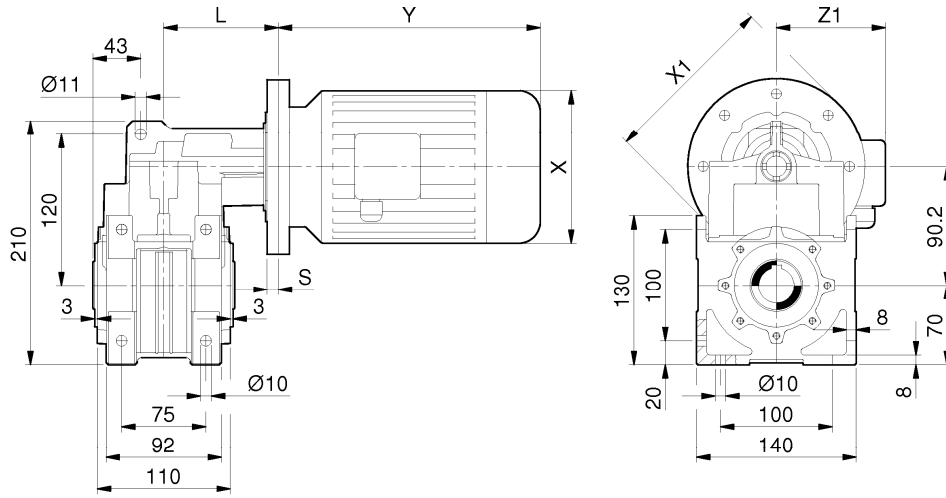
	Oil [litres]						Weight [kg]	
	H1	H2	H3	H4	V1	V2		
FRO63	9,2	6,5	5,2	6,5	9,0	9,0	121	
FRV63	9,4	6,1	3,8	5,8	8,5	8,5	117	

RN-RO-RV Gearboxes

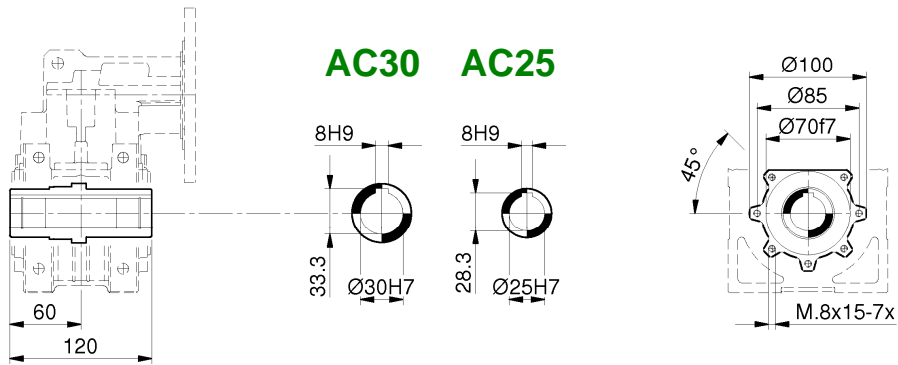
RN12-13

Dimensions

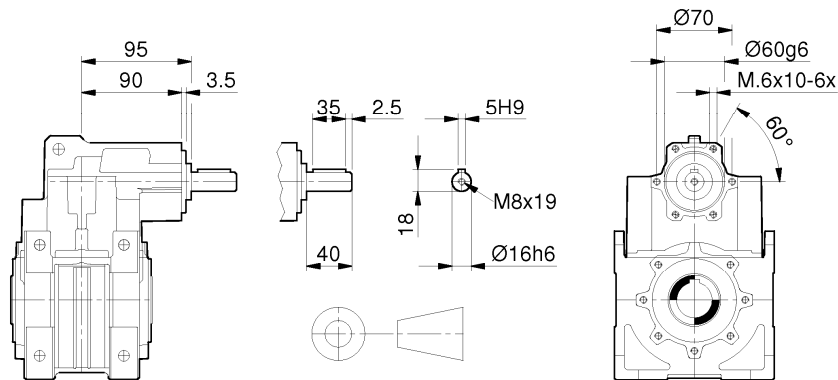
MRN



AC30 AC25



RN



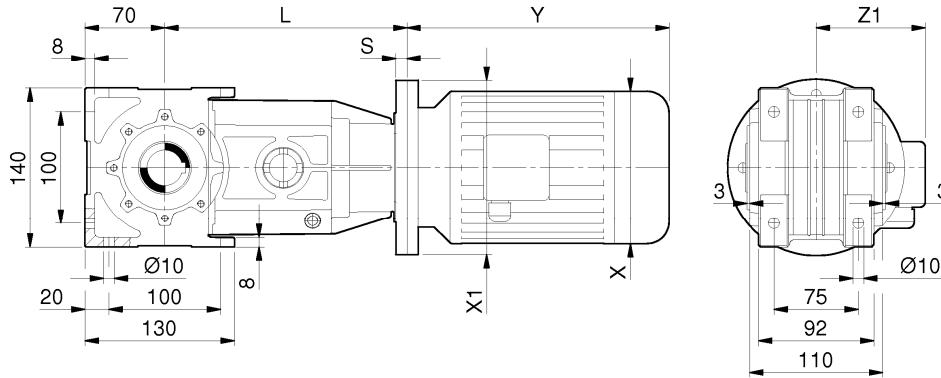
RN	12 / 13	12 / 13	12 / 13	12	12	12	
IEC	56	63	71	80	90 S	90 L	
X / Y / Z1	110/168/108	123/185/110	140/220/121	159/238/138	176/255/149	176/280/149	
X1 (B5) / S	120/13	140/13	160/13,5	200/13,5	---	---	
X1 (B14) / S	---	90/13	105/18,5	120/13,5	140/13,5	140/13,5	
L (RN12)	103	103	103,5 (108,5)	103,5	103,5	103,5	
L (RN13)	103	103	103,5 (108,5)	---	---	---	

RO13

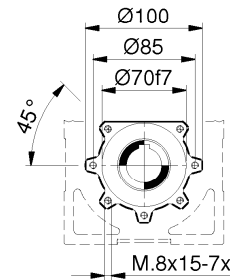
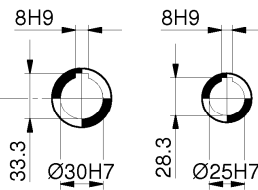
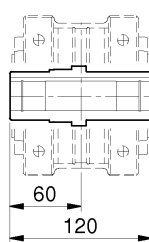
Gearboxes RN-RO-RV

Dimensions

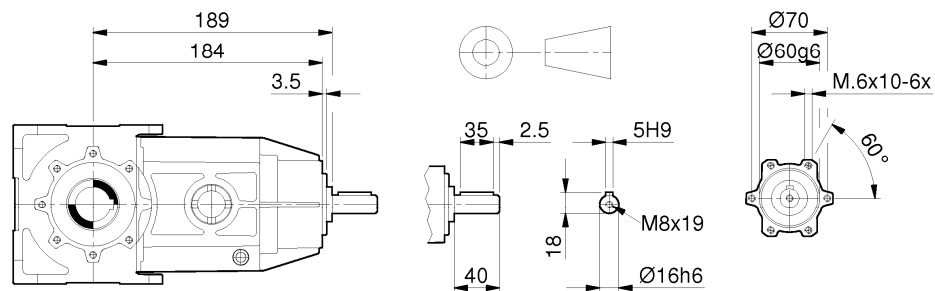
MRO



AC30 AC25



RO



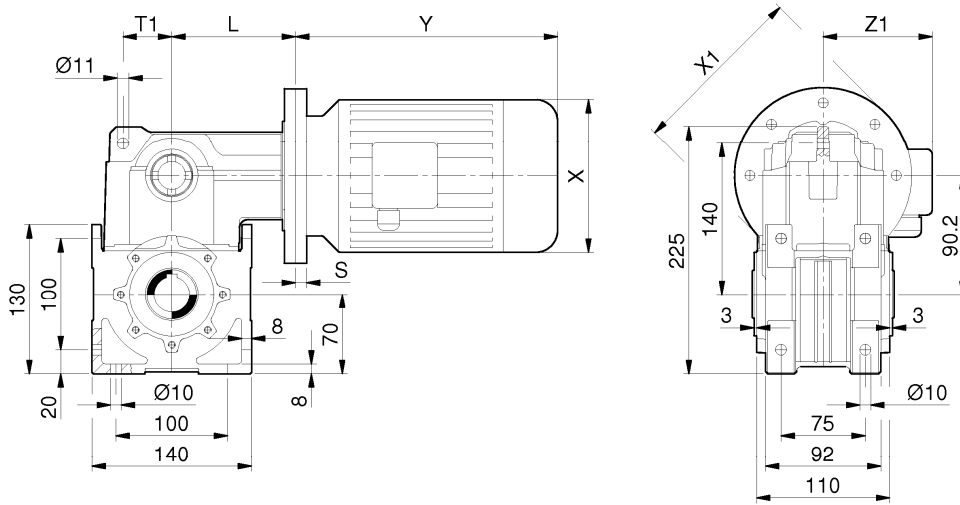
RO	13	13	13	13	13	13	
IEC	56	63	71	80	90 S	90 L	
X / Y / Z1	110/168/108	123/185/110	140/220/121	159/238/138	176/255/149	176/280/149	
X1 (B5) / S	120/13	140/13	160/13,5	200/13,5	---	---	
X1 (B14) / S	---	90/13	105/18,5	120/13,5	140/13,5	140/13,5	
L (RO13)	197	197	197,5 (202,5)	197,5	197,5	197,5	

RN-RO-RV Gearboxes

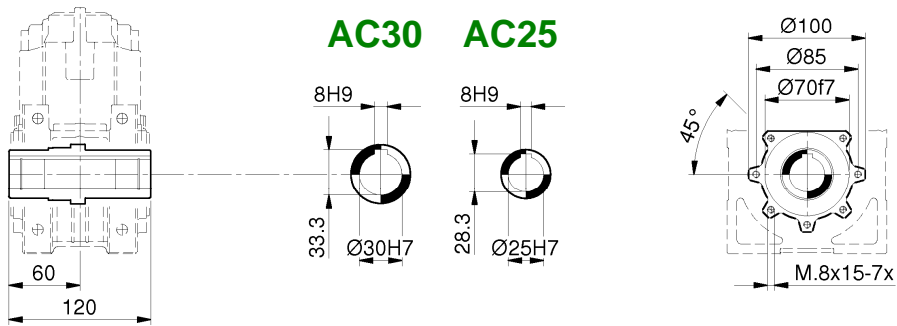
RV13

Dimensions

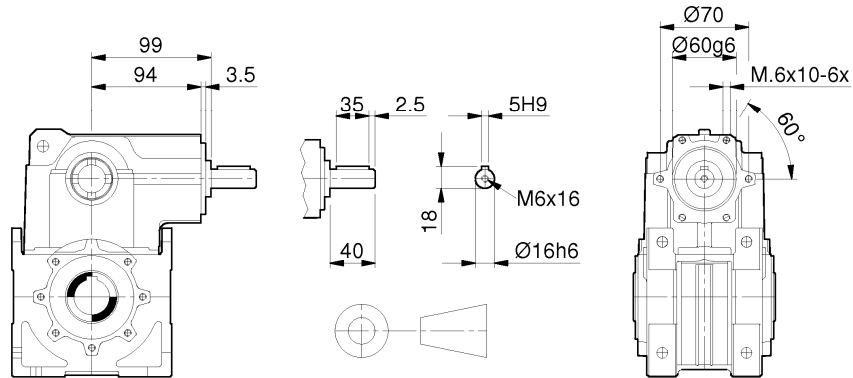
MRV



AC30 AC25



RV



RV	13	13	13	13	13	13	
IEC	56	63	71	80	90 S	90 L	
X / Y / Z1	110/168/108	123/185/110	140/220/121	159/238/138	176/255/149	176/280/149	
X1 (B5) / S	120/13	140/13	160/13,5	200/13,5	---	---	
X1 (B14) / S	---	90/13	105/18,5	120/13,5	140/13,5	140/13,5	
L (RV13)	107	107	107,5 (112,5)	107,5	107,5	107,5	

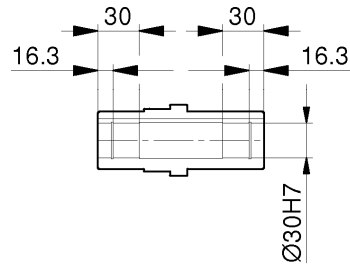
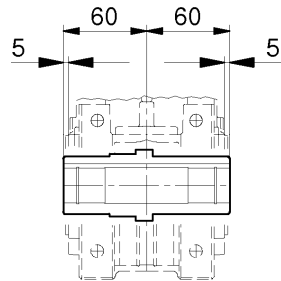
R1

Gearboxes RN-RO-RV

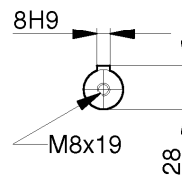
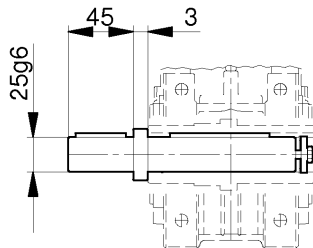
RN12-13 / RO13 / RV13

Dimensions

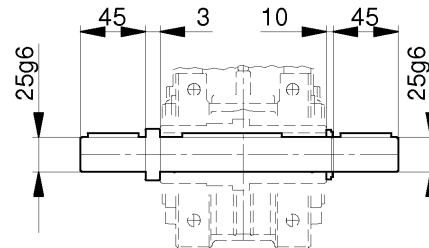
AC



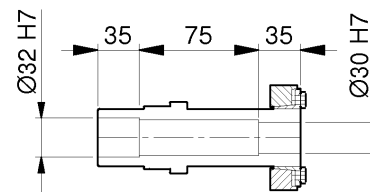
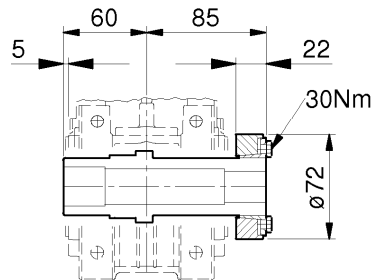
AS



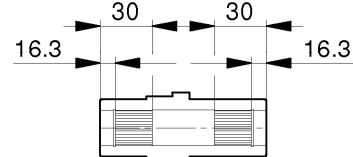
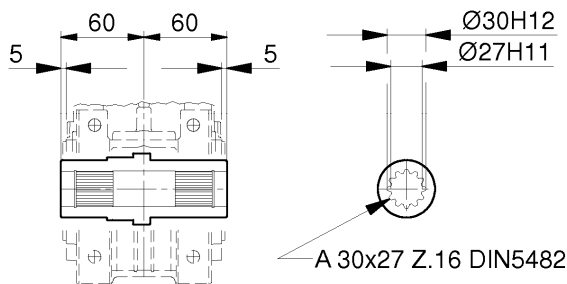
AD



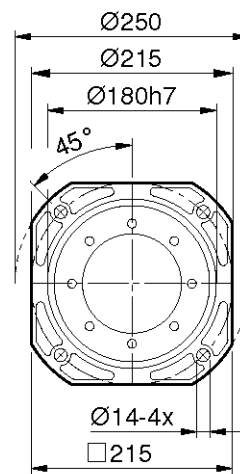
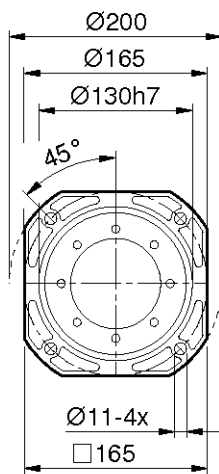
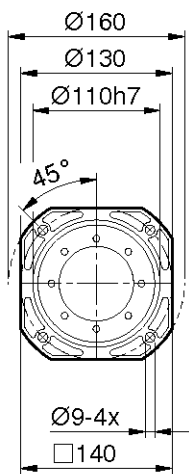
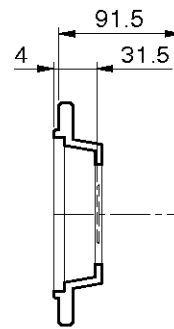
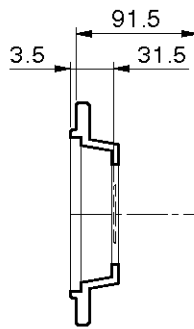
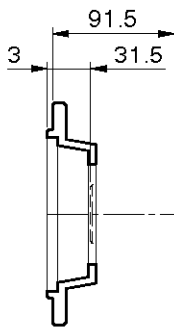
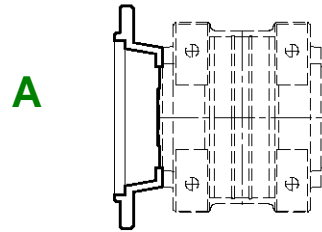
ACC



ACS



- Dimensioni del perno macchina: pag. 68-69

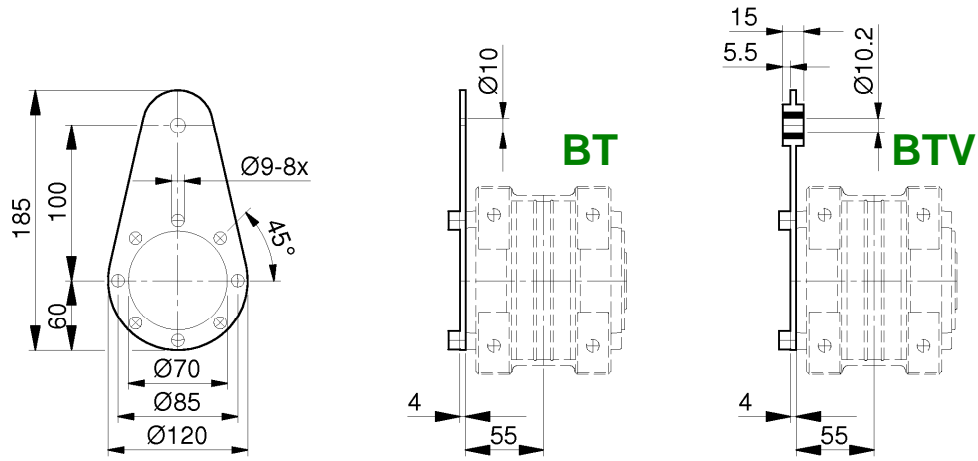


R1

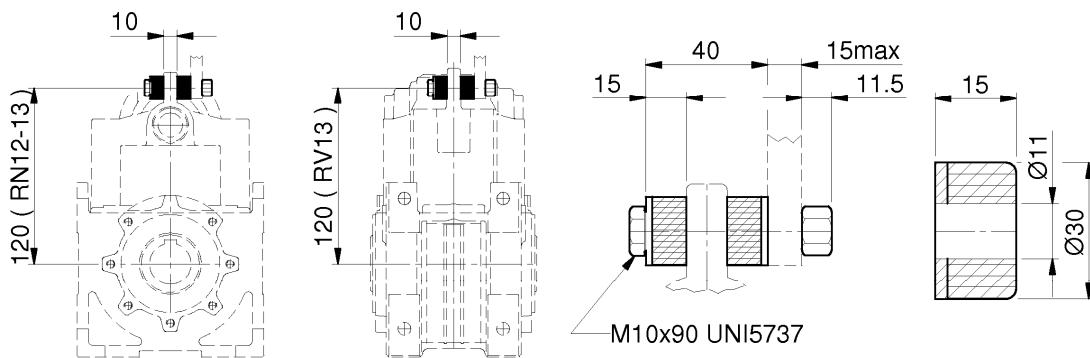
Gearboxes RN-RO-RV

RN12-13 / RO13 / RV13

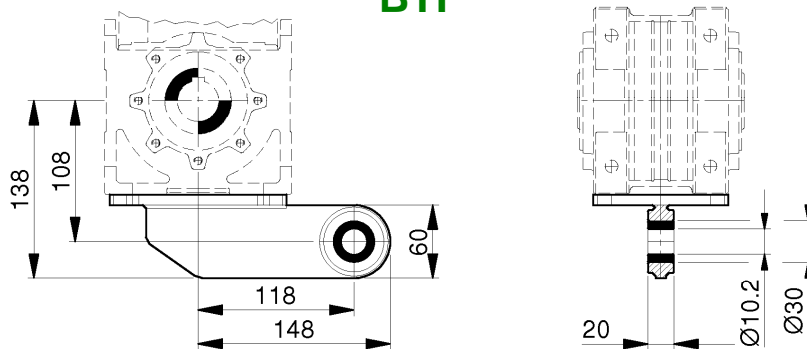
Dimensions



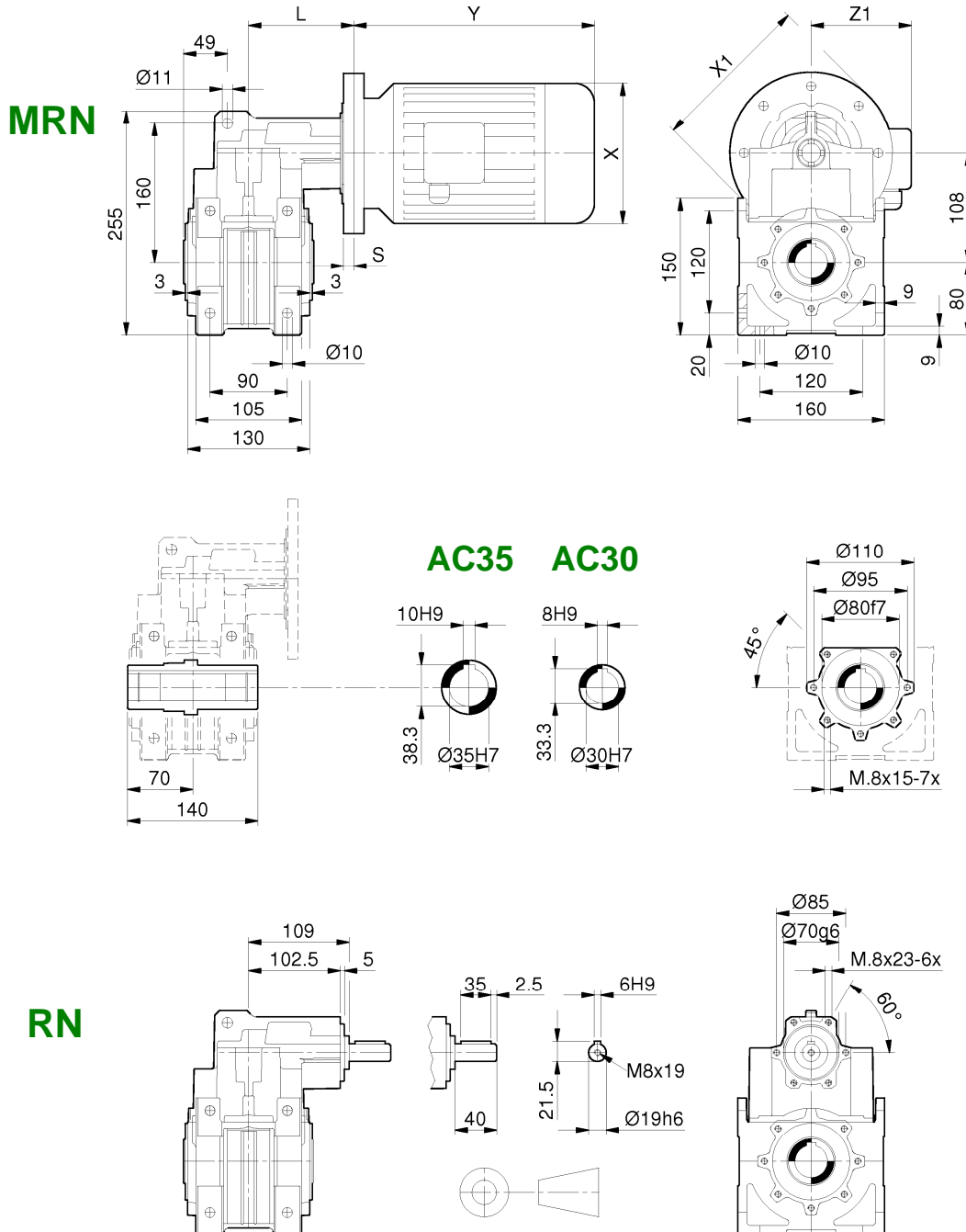
BTA



BTF



Dimensions



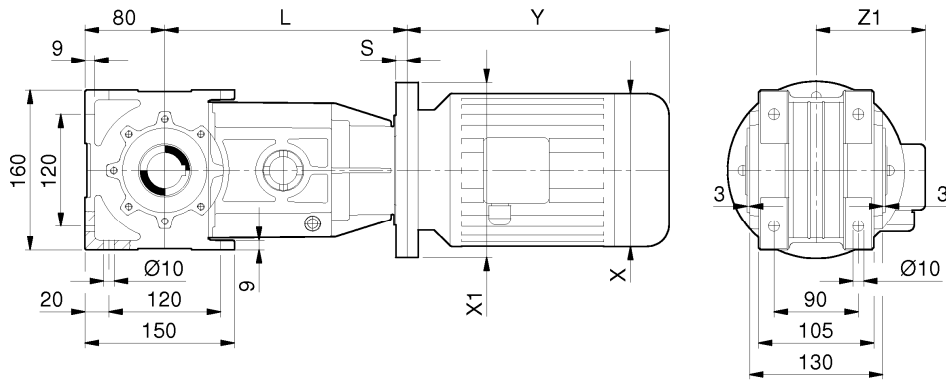
RN	22 / 23	22 / 23	22	22	22	22	
IEC	71	80	90 S	90 L	100	112	
X / Y / Z1	140/220/121	159/238/138	176/255/149	176/280/149	195/314/160	219/328/172	
X1 (B5) / S	160/15,5	200/15,5	200/15,5	200/15,5	250/16,5	250/16,5	
X1 (B14) / S	105/15,5	120/17,5	140/17,5	140/17,5	160/15,5	160/15,5	
L (RN22)	118	118 (120)	118 (120)	118 (120)	119 (118)	119 (118)	
L (RN23)	118	118 (120)	---	---	---	---	

RO23

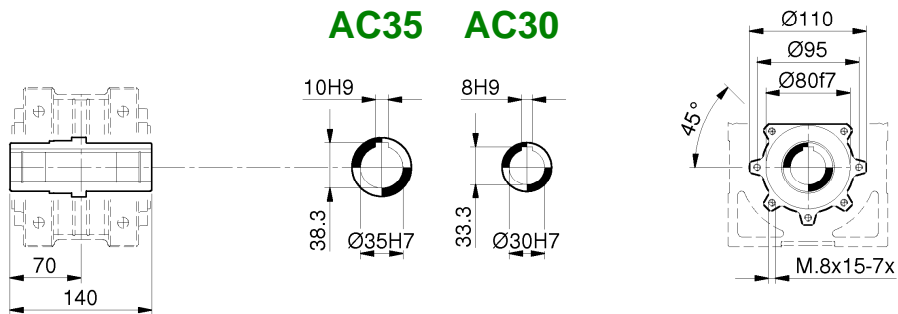
Gearboxes RN-RO-RV

Dimensions

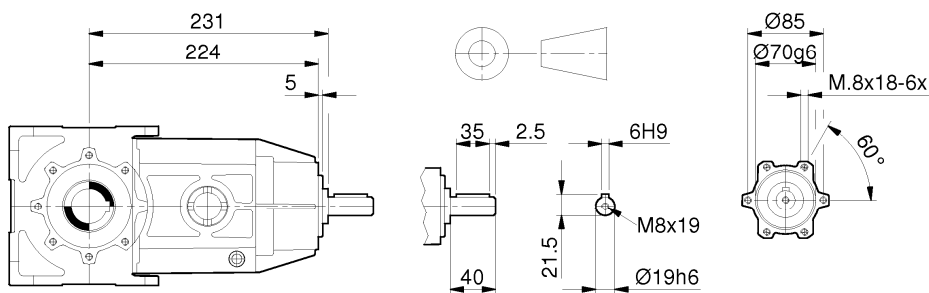
MRO



AC35 AC30



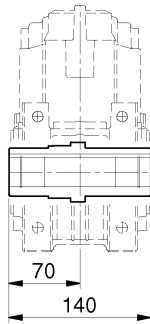
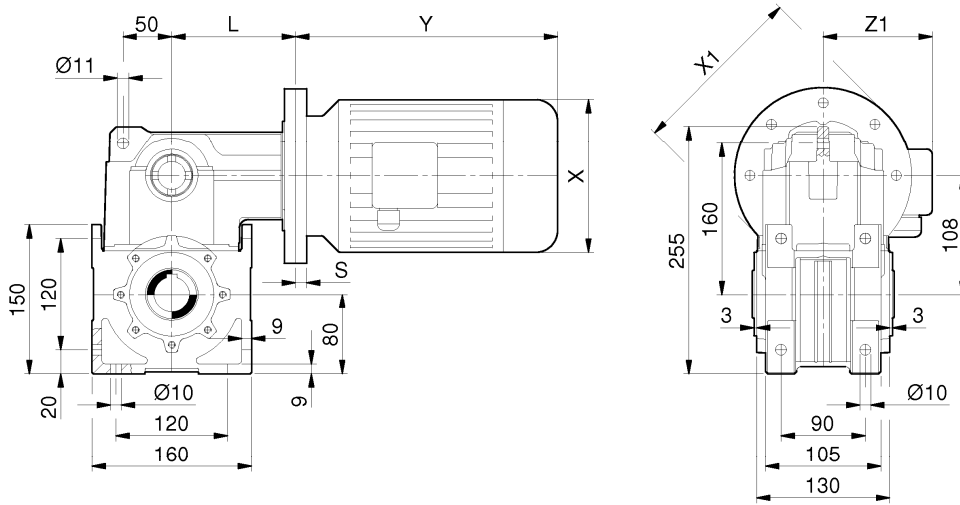
RO



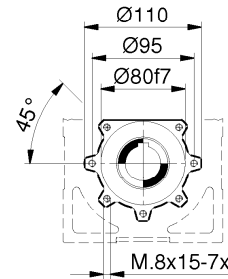
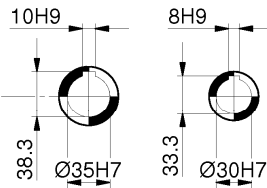
RO	23	23	23	23	23	23	
IEC	71	80	90 S	90 L	100	112	
X / Y / Z1	140/220/121	159/238/138	176/255/149	176/280/149	195/314/160	219/328/172	
X1 (B5) / S	160/15,5	200/15,5	200/15,5	200/15,5	250/16,5	250/16,5	
X1 (B14) / S	105/15,5	120/17,5	140/17,5	140/17,5	160/15,5	160/15,5	
L (RO23)	239,5	239,5 (241,5)	239,5 (241,5)	239,5 (241,5)	240,5 (239,5)	240,5 (239,5)	

Dimensions

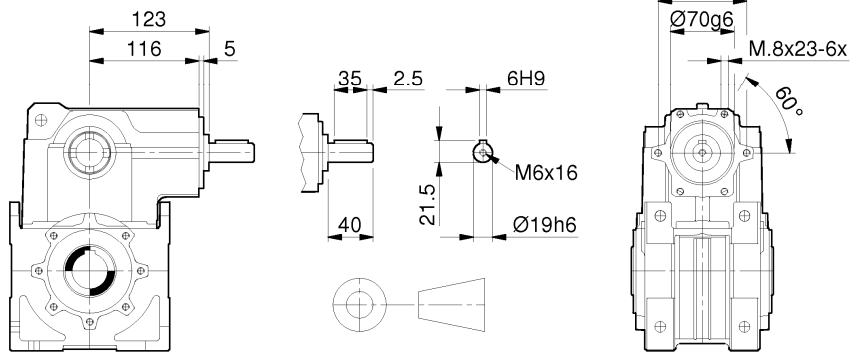
MRV



AC35 AC30



RV



RV	23	23	23	23	23	23	
IEC	71	80	90 S	90 L	100	112	
X / Y / Z1	140/220/121	159/238/138	176/255/149	176/280/149	195/314/160	219/328/172	
X1 (B5) / S	160/15,5	200/15,5	200/15,5	200/15,5	250/16,5	250/16,5	
X1 (B14) / S	105/15,5	120/17,5	140/17,5	140/17,5	160/15,5	160/15,5	
L (RV23)	131,5	131,5 (133,5)	131,5 (133,5)	131,5 (133,5)	132,5 (131,5)	132,5 (131,5)	

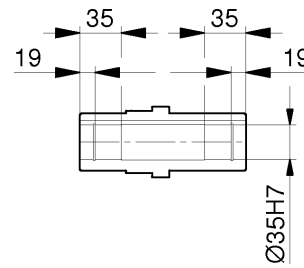
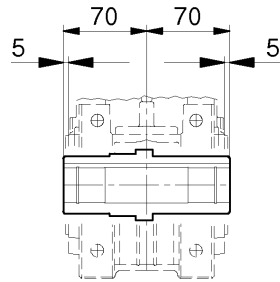
R2

Gearboxes RN-RO-RV

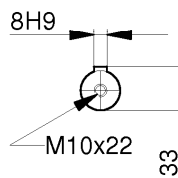
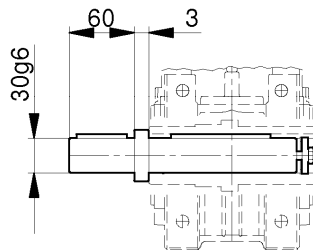
RN22-23 / RO23 / RV23

Dimensions

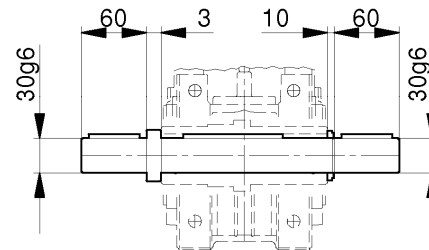
AC



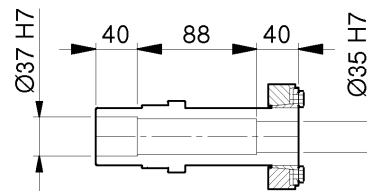
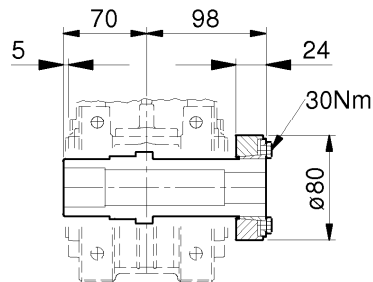
AS



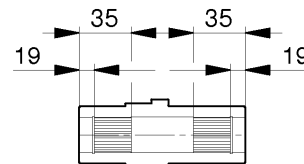
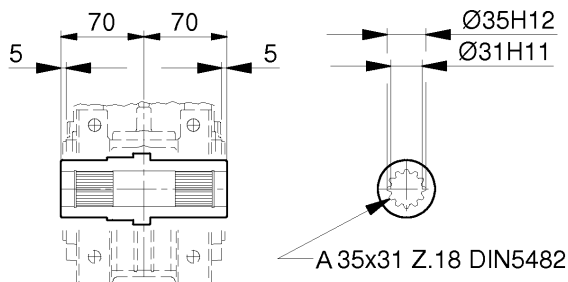
AD



ACC



ACS



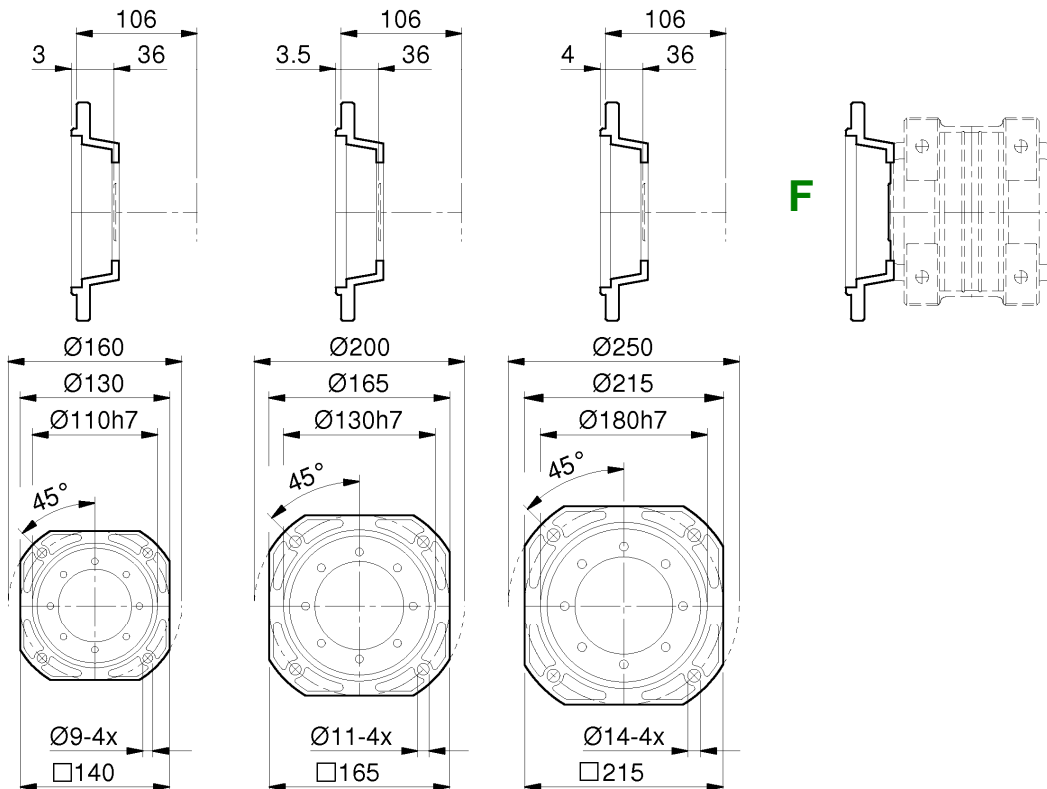
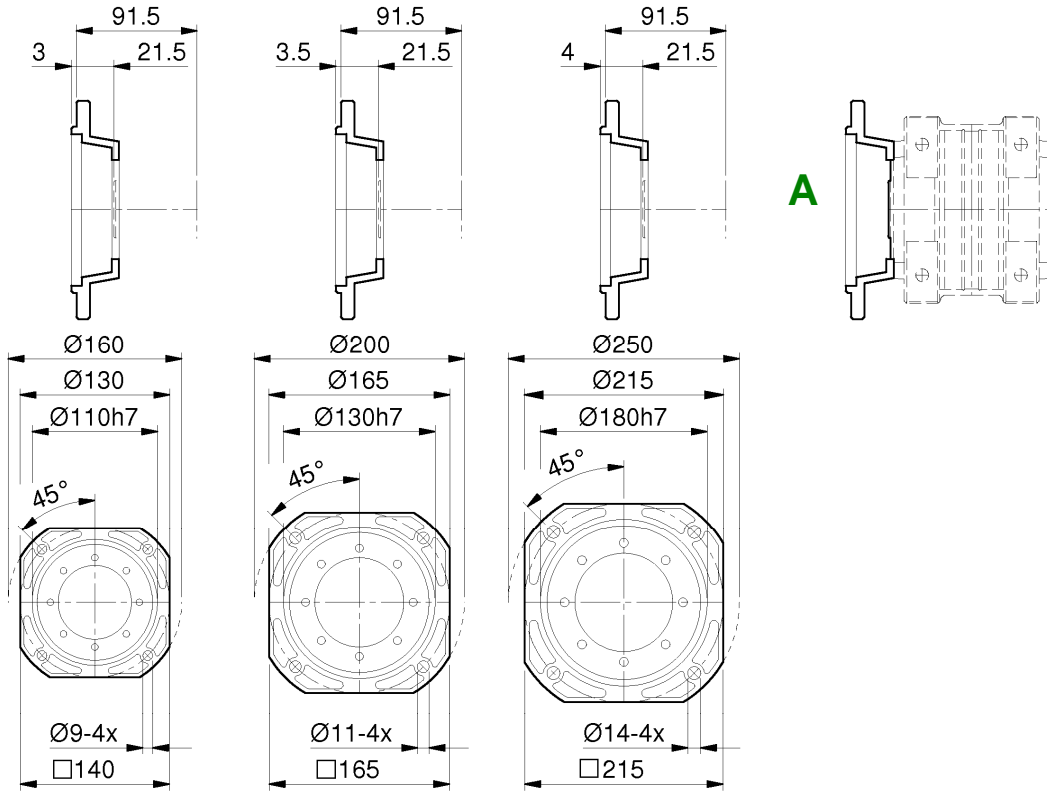
- Dimensioni del perno macchina: pag. 68-69

RN-RO-RV Gearboxes

R2

Dimensions

RN22-23 / RO23 / RV23

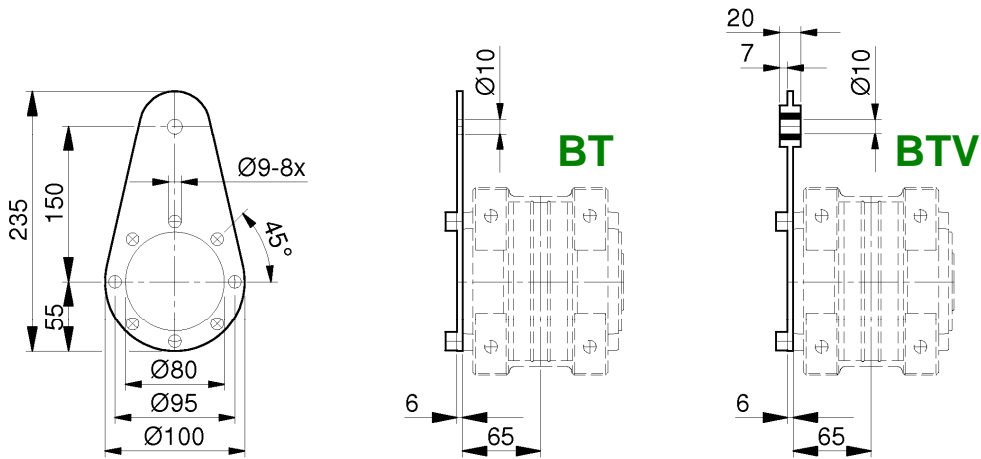


R2

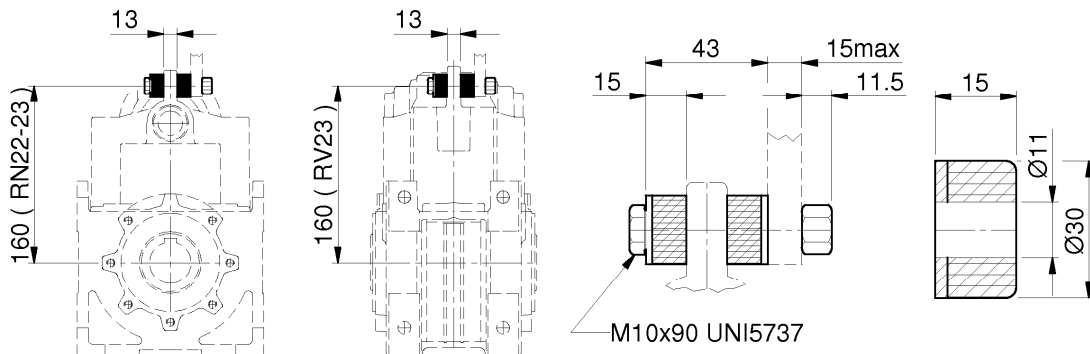
Gearboxes RN-RO-RV

RN22-23 / RO23 / RV23

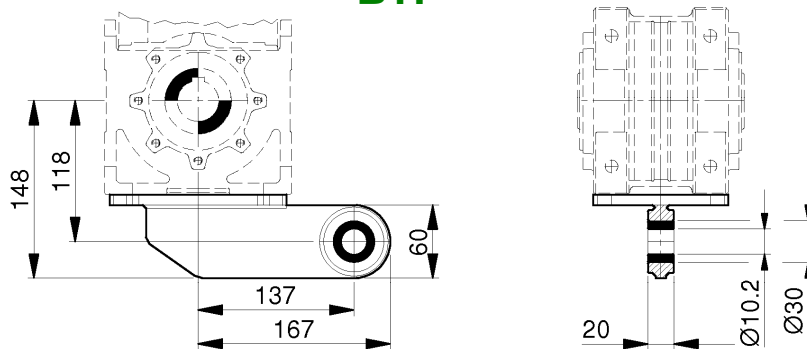
Dimensions



BTA



BTF

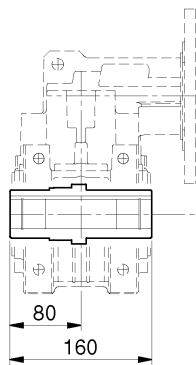
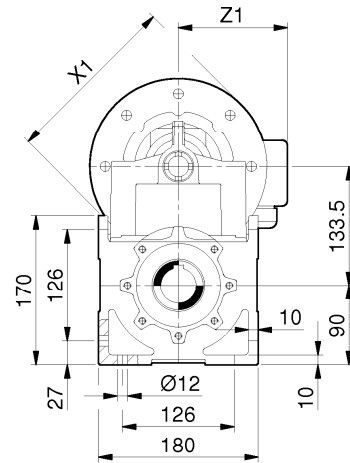
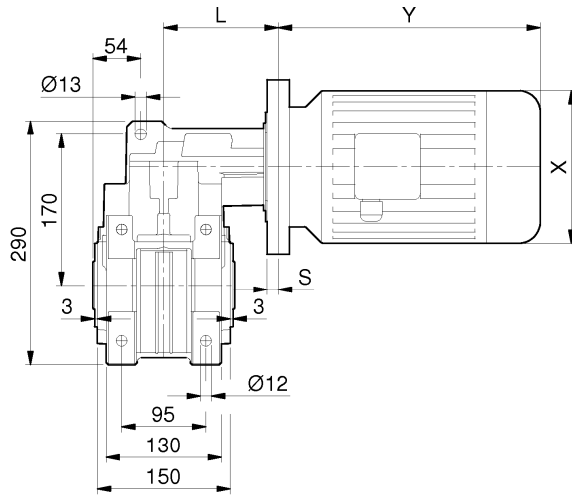


RN-RO-RV Gearboxes

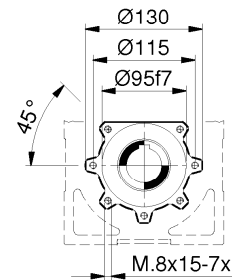
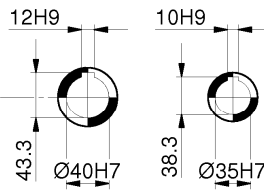
RN32-33

Dimensions

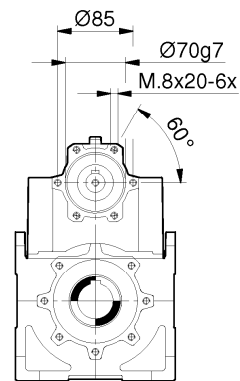
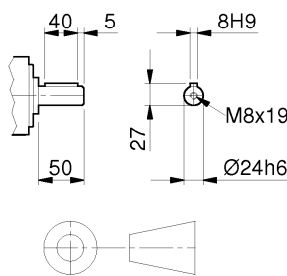
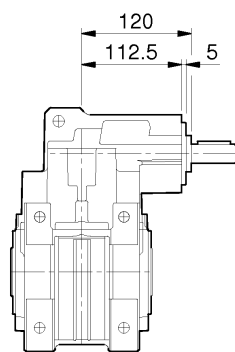
MRN



AC40 AC35



RN

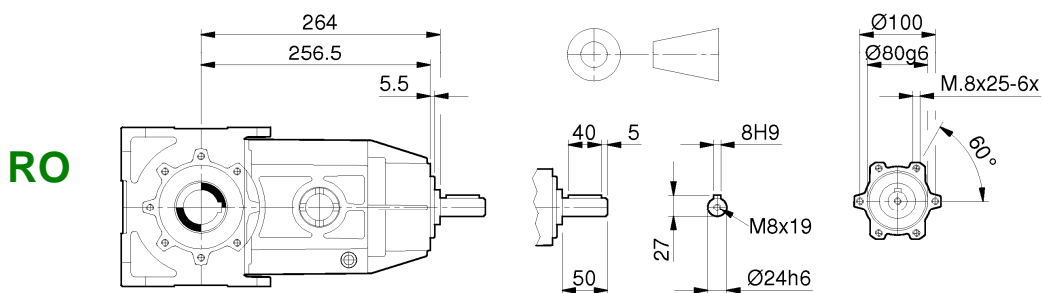
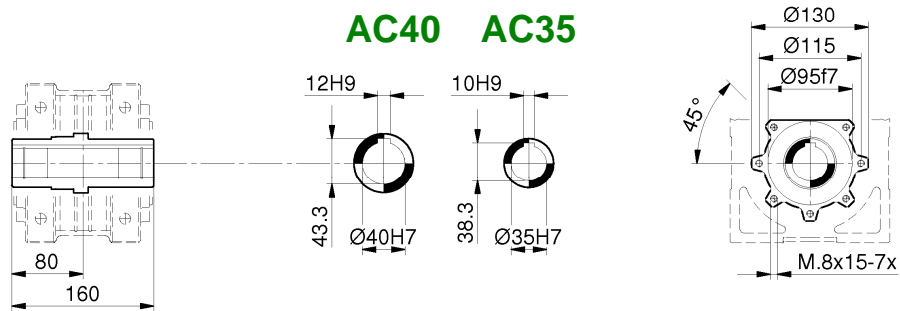
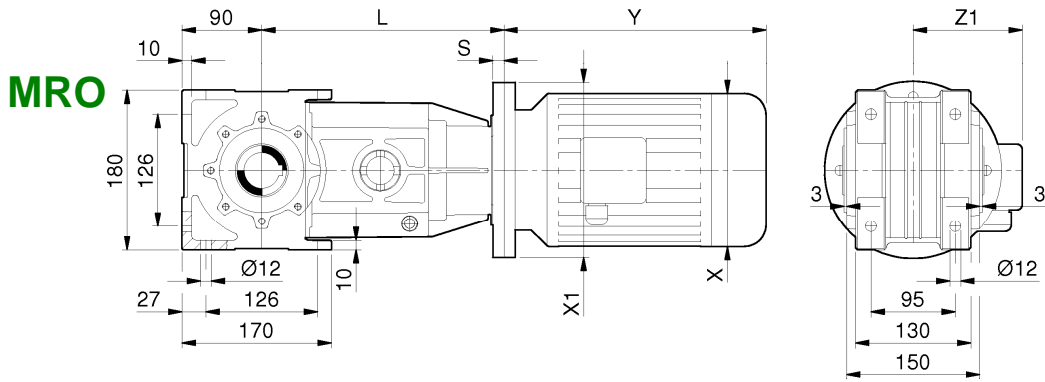


RN	32 / 33	32 / 33	32 / 33	32 / 33	32	32	
IEC	71	80	90 S	90 L	100	112	
X / Y / Z1	140/220/121	159/238/138	176/255/149	176/280/149	195/314/160	219/328/172	
X1 (B5) / S	160/15,5	200/15,5	200/15,5	200/15,5	250/16,5	250/16,5	
X1 (B14) / S	105/15,5	120/17,5	140/17,5	140/17,5	160/15,5	160/15,5	
L (RN32)	128	128 (130)	128 (130)	128 (130)	129 (128)	129 (128)	
L (RN33)	128	128 (130)	128 (130)	128 (130)	---	---	

RO33

Gearboxes RN-RO-RV

Dimensions



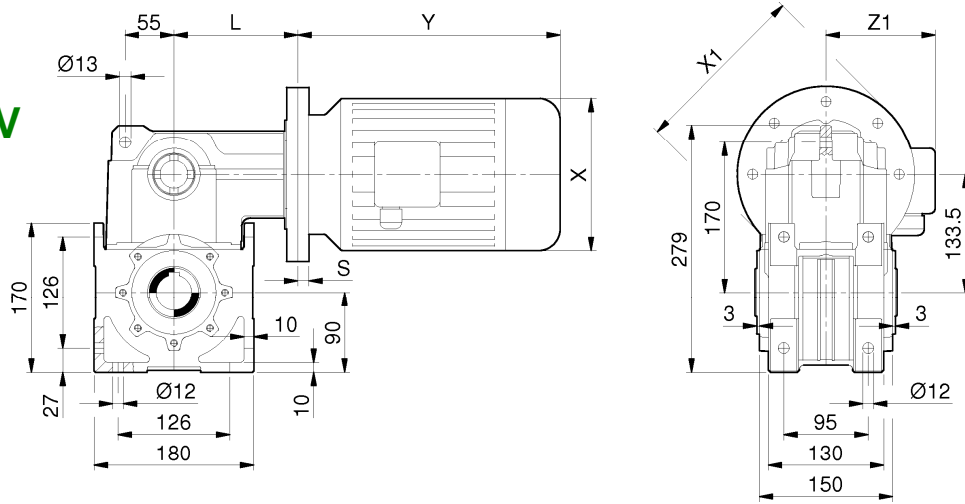
RO	33	33	33	33	33	33	
IEC	71	80	90 S	90 L	100	112	
X / Y / Z1	140/220/121	159/238/138	176/255/149	176/280/149	195/314/160	219/328/172	
X1 (B5) / S	160/15,5	200/15,5	200/18,5	200/18,5	250/16,5	250/16,5	
X1 (B14) / S	---	120/15,5	140/15,5	140/15,5	160/15,5	160/15,5	
L (RO33)	272	272	275 (272)	275 (272)	273 (272)	273 (272)	

RN-RO-RV Gearboxes

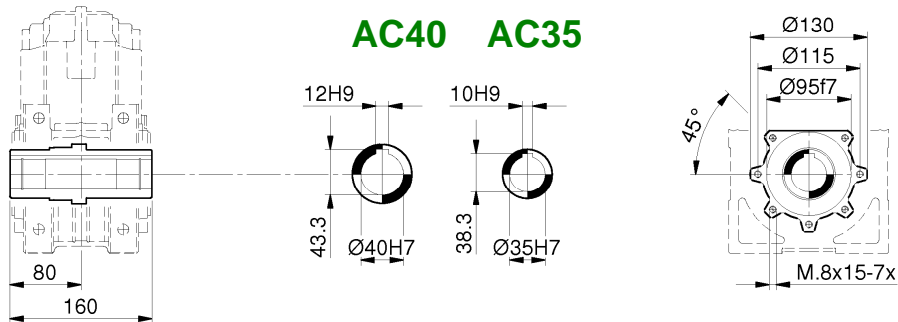
RV33

Dimensions

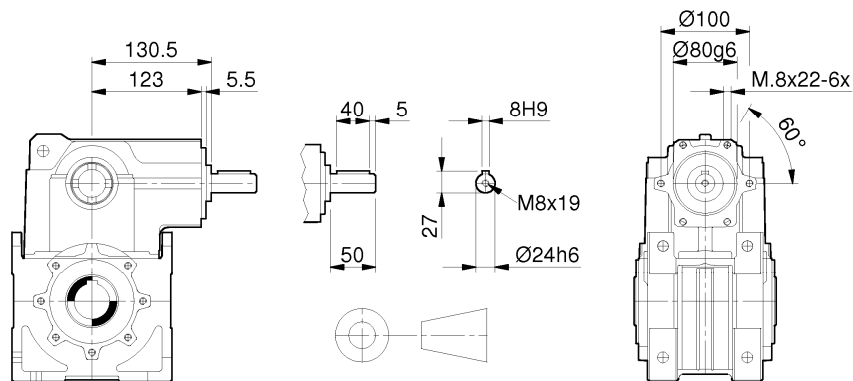
MRV



AC40 AC35



RV



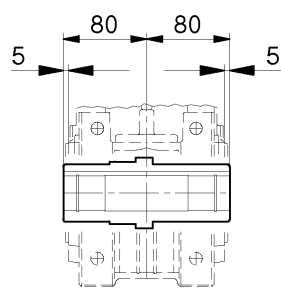
RV	33	33	33	33	33	33	
IEC	71	80	90 S	90 L	100	112	
X / Y / Z1	140/220/121	159/238/138	176/255/149	176/280/149	195/314/160	219/328/172	
X1 (B5) / S	160/15,5	200/15,5	200/15,5	200/15,5	250/16,5	250/16,5	
X1 (B14) / S	---	120/15,5	140/17,5	140/17,5	160/15,5	160/15,5	
L (RV33)	138,5	144,5	138,5 (141,5)	138,5 (141,5)	139,5 (138,5)	139,5 (138,5)	

R3

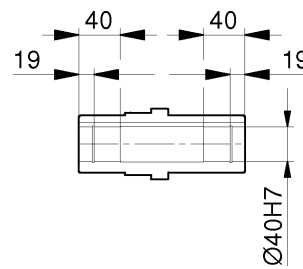
Gearboxes RN-RO-RV

RN32-33 / RO33 / RV33

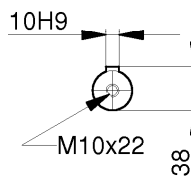
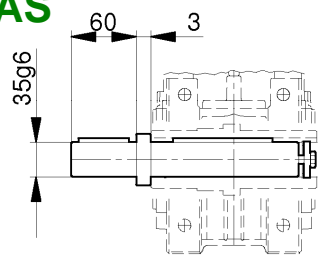
Dimensions



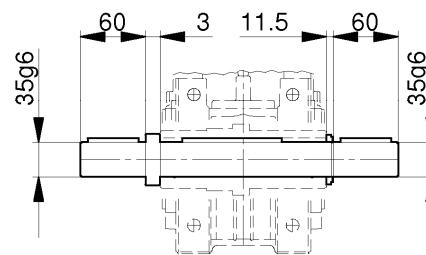
AC



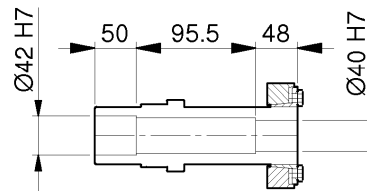
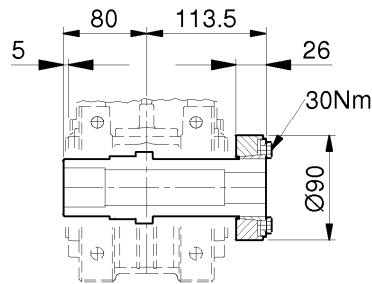
AS



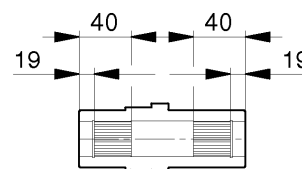
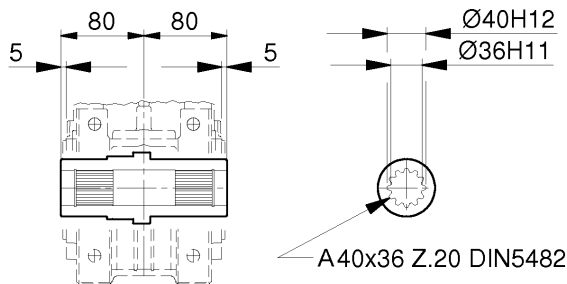
AD



ACC



ACS



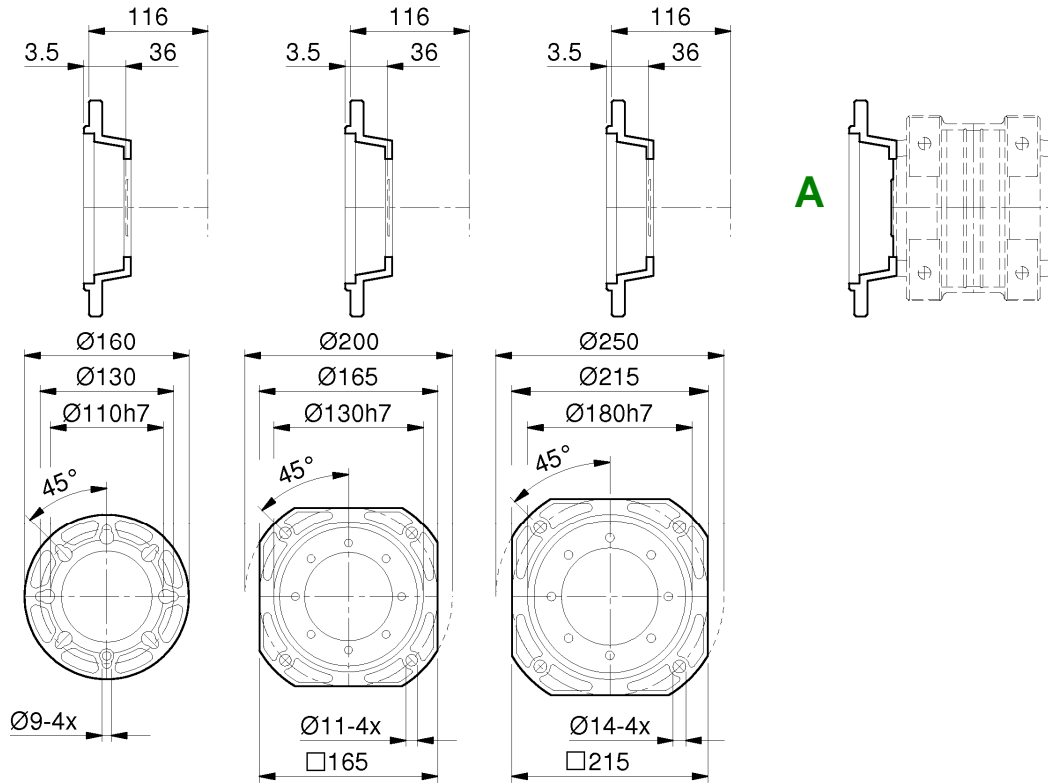
- Dimensioni del perno macchina: pag. 68-69

RN-RO-RV Gearboxes

R3

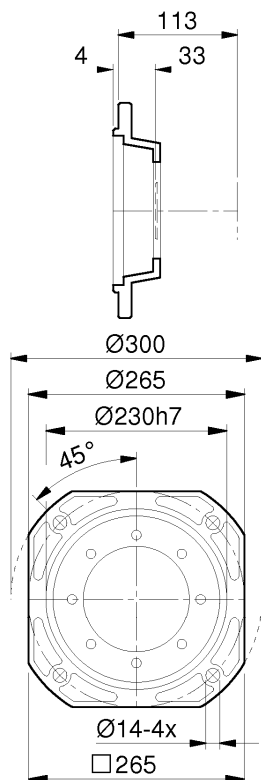
Dimensions

RN32-33 / RO33 / RV33



A

F

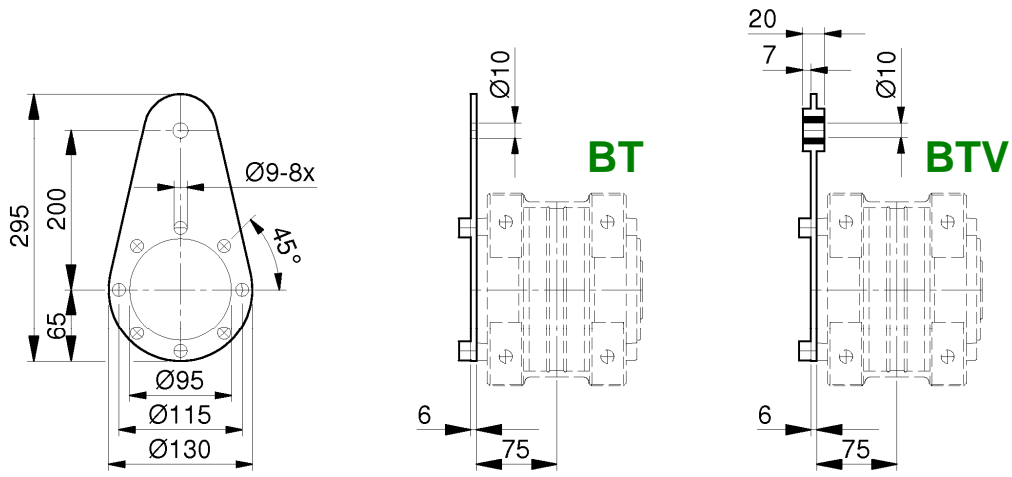


R3

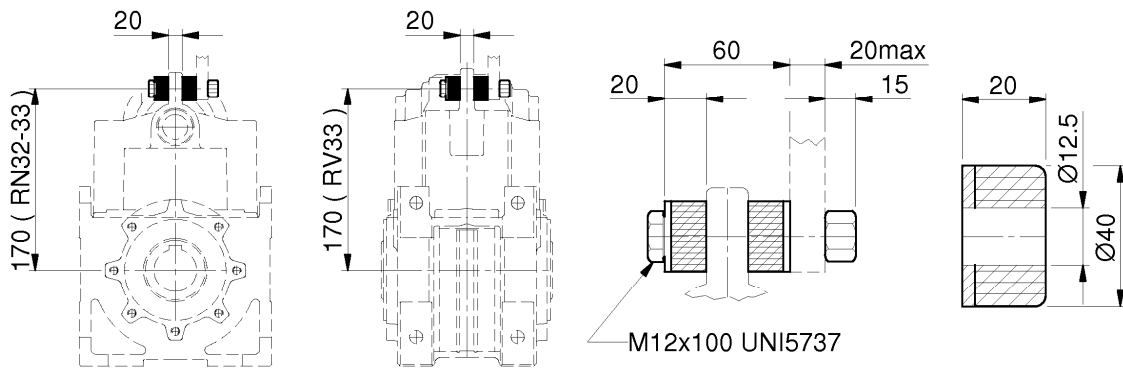
Gearboxes RN-RO-RV

RN32-33 / RO33 / RV33

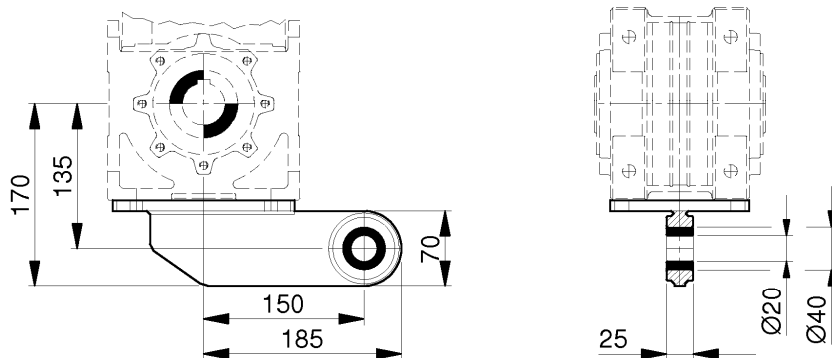
Dimensions



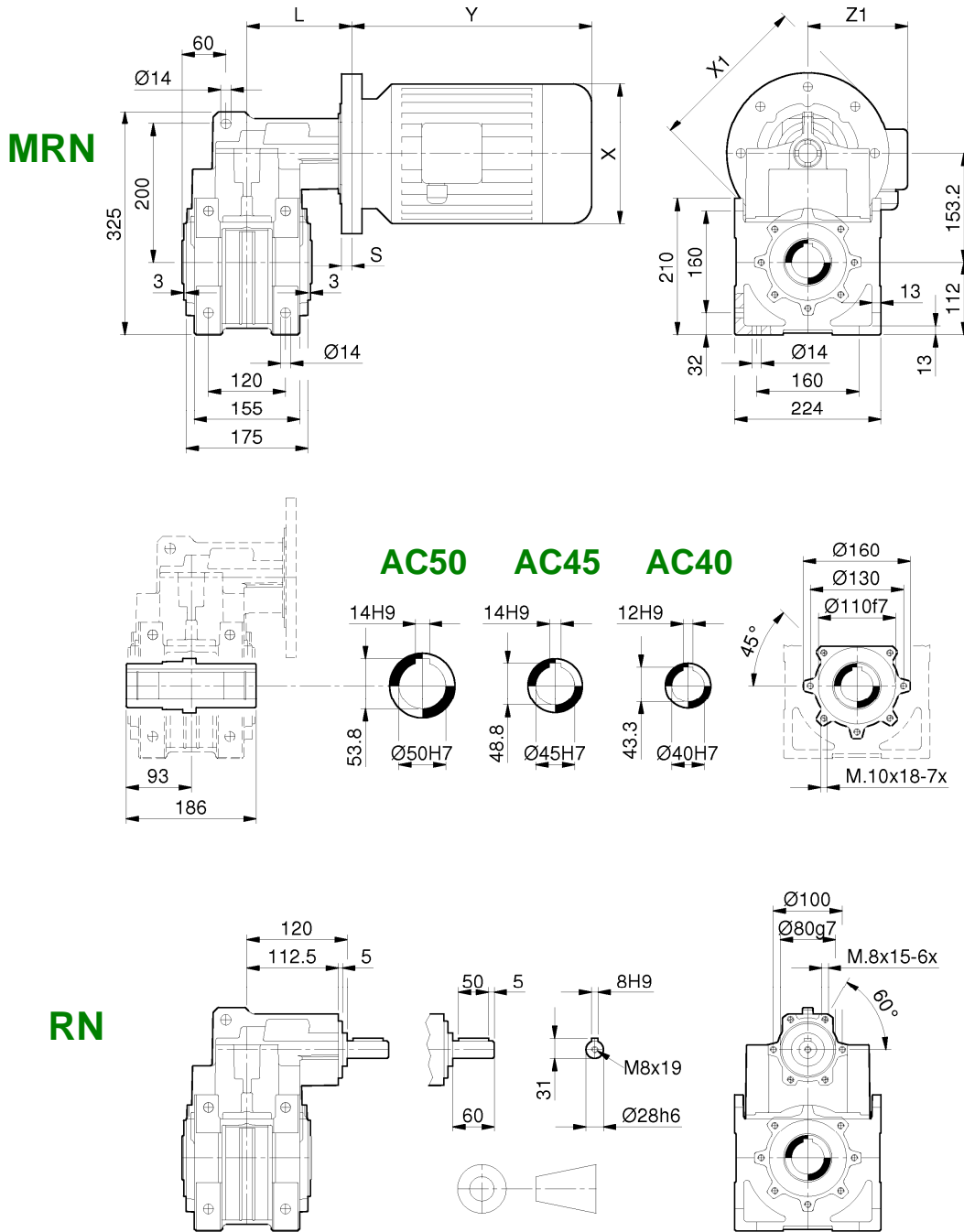
BTA



BTF



Dimensions



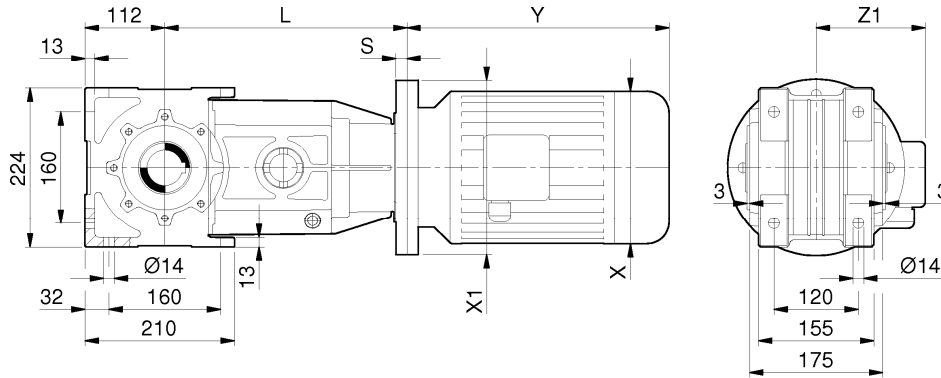
RN	42 / 43	42 / 43	42 / 43	42 / 43	42 / 43	42	
IEC	71	80	90 S	90 L	100	112	
X / Y / Z1	140/220/121	159/238/138	176/255/149	176/280/149	195/314/160	219/328/172	
X1 (B5) / S	160/15,5	200/15,5	200/15,5	200/15,5	250/16,5	250/16,5	
X1 (B14) / S	---	120/15,5	140/18,5	140/18,5	160/15,5	160/15,5	
L (RN42)	148	148	148 (151)	148 (151)	149 (148)	149 (148)	
L (RN43)	148	148	148 (151)	148 (151)	149 (148)	---	

RO43

Gearboxes RN-RO-RV

Dimensions

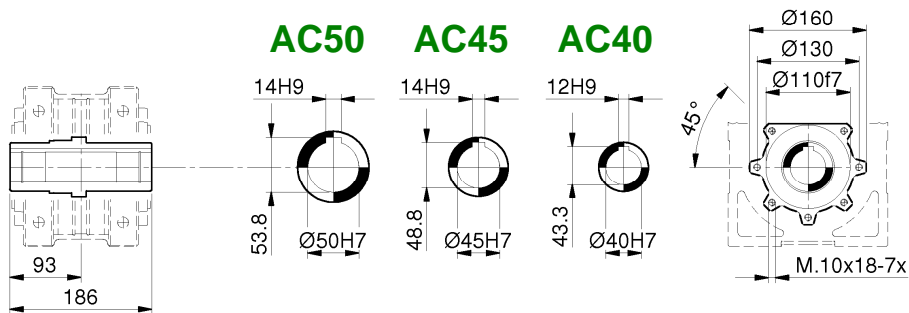
MRO



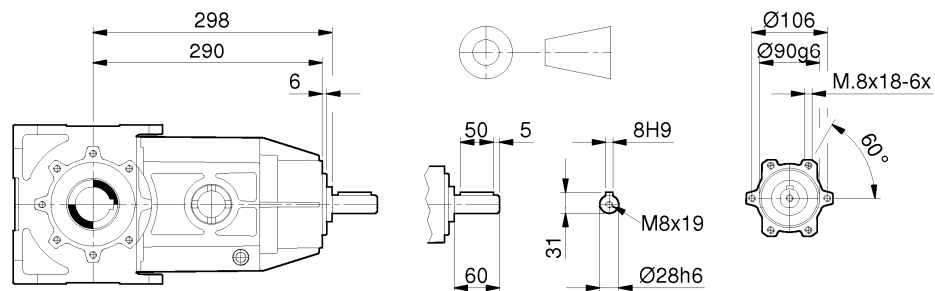
AC50

AC45

AC40



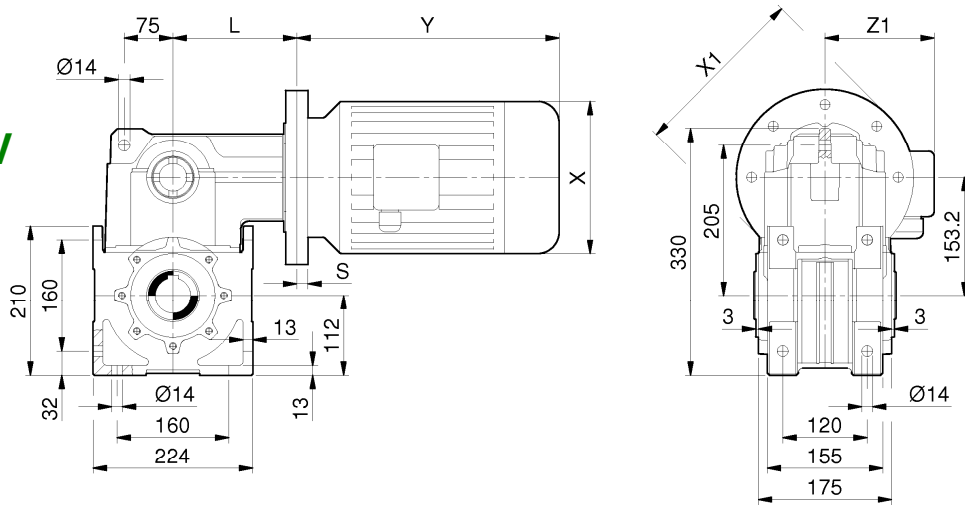
RO



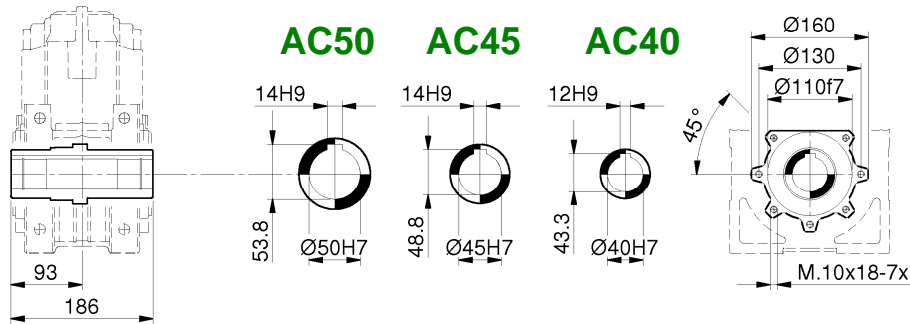
RO	43	43	43	43	43	43	
IEC	71	80	90 S	90 L	100	112	
X / Y / Z1	140/220/121	159/238/138	176/255/149	176/280/149	195/314/160	219/328/172	
X1 (B5) / S	160/18	200/18	200/18	200/18	250/18,5	250/18,5	
X1 (B14) / S	---	---	---	---	160/18	160/18	
L (RO43)	308	308	308 (310)	308 (310)	308,5 (308)	308,5 (308)	

Dimensions

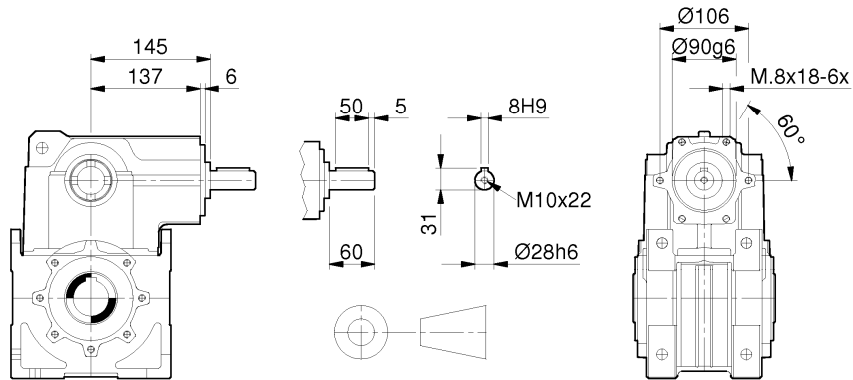
MRV



AC50 AC45 AC40



RV



RV	43	43	43	43	43	43	
IEC	71	80	90 S	90 L	100	112	
X / Y / Z1	140/220/121	159/238/138	176/255/149	176/280/149	195/314/160	219/328/172	
X1 (B5) / S	160/18	200/18	200/18	200/18	250/18,5	250/18,5	
X1 (B14) / S	---	---	---	---	160/18	160/18	
L (RV43)	155	155	155 (157)	155 (157)	155,5 (155)	155,5 (155)	

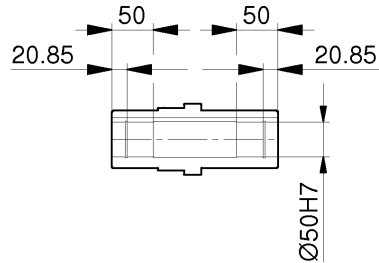
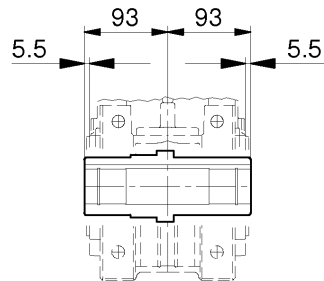
R4

Gearboxes RN-RO-RV

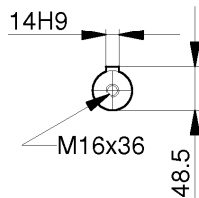
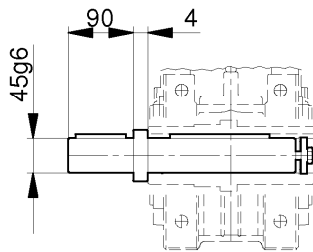
RN42-43 / RO43 / RV43

Dimensions

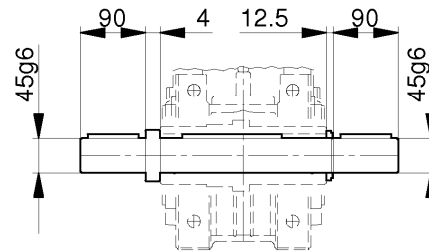
AC



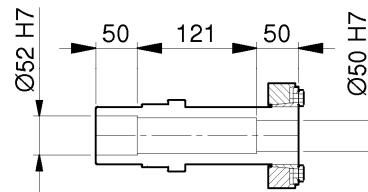
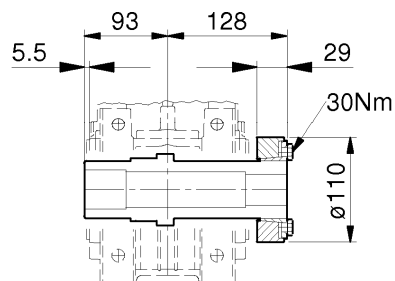
AS



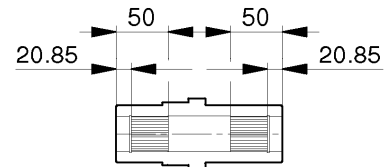
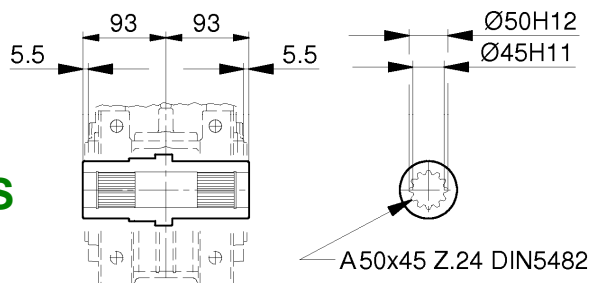
AD



ACC

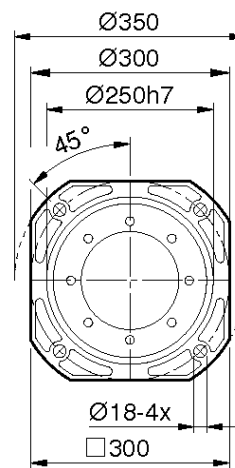
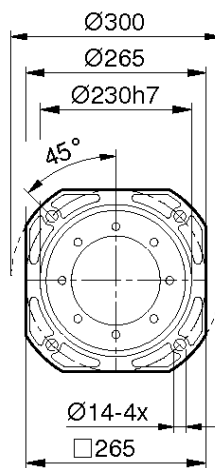
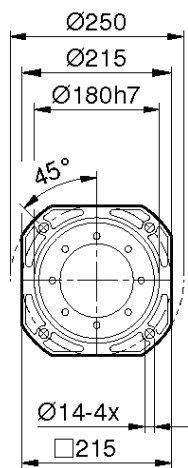
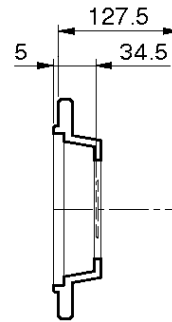
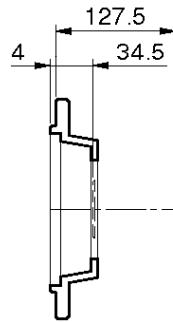
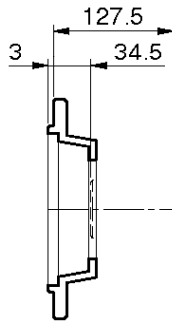
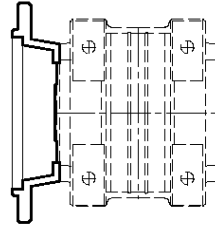


ACS



- Dimensioni del perno macchina: pag. 68-69

A

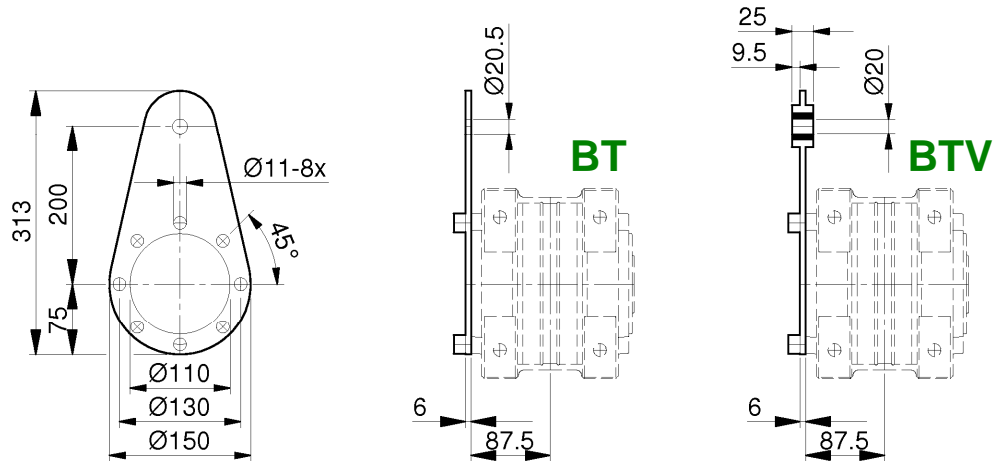


R4

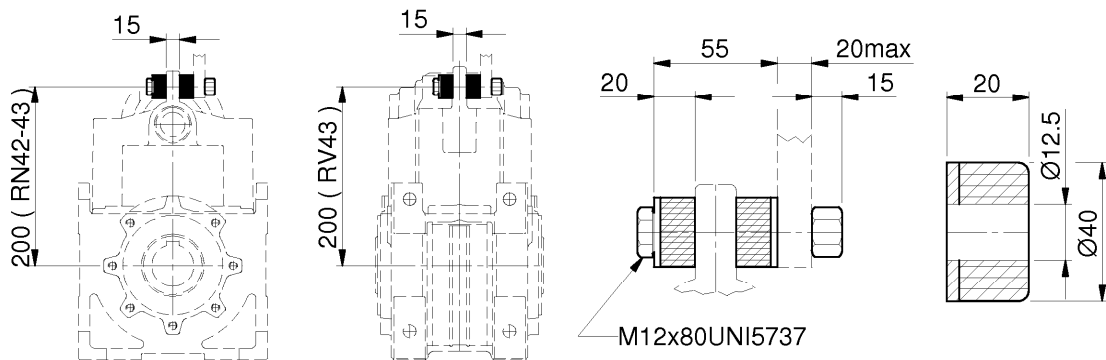
Gearboxes RN-RO-RV

RN42-43 / RO43 / RV43

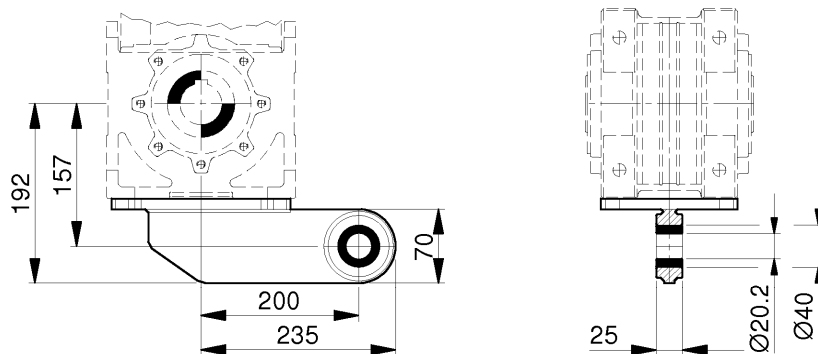
Dimensions



BTA

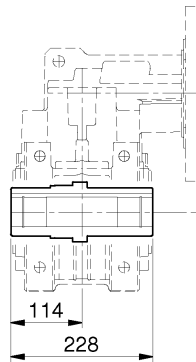
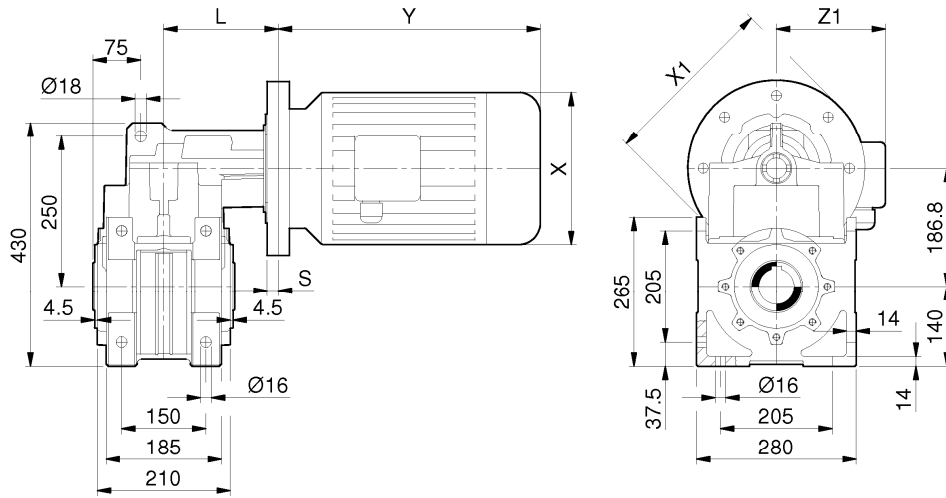


BTF



Dimensions

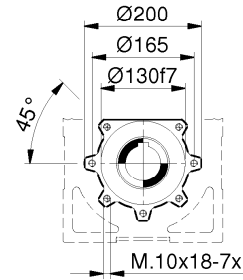
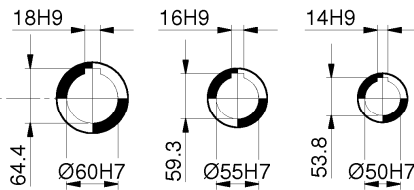
MRN



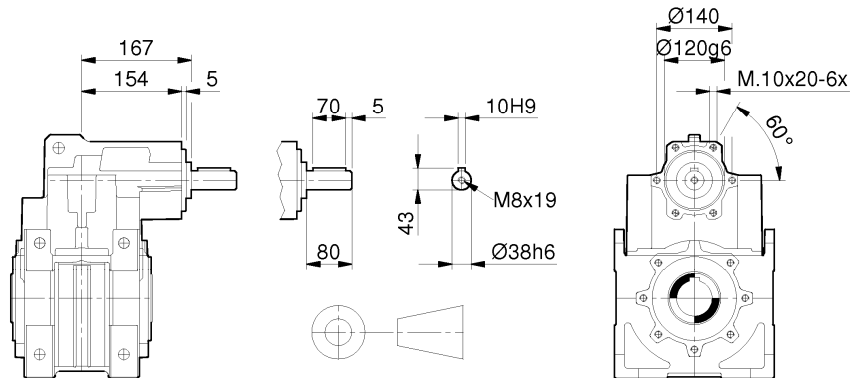
AC60

AC55

AC50



RN



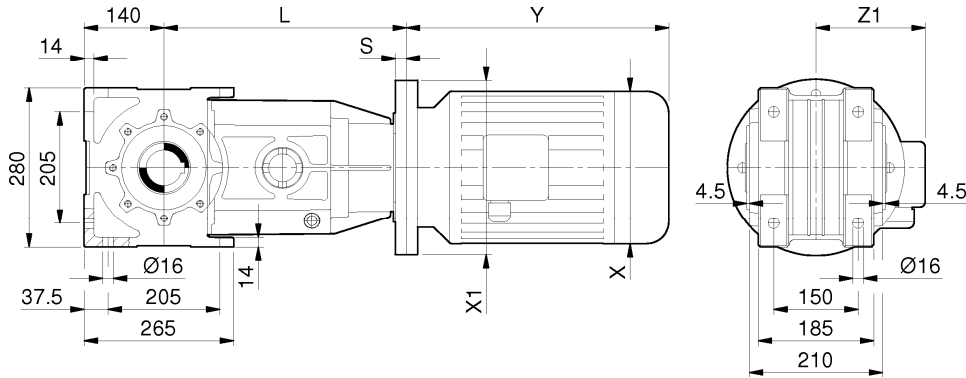
RN	52 / 53	52 / 53	52 / 53	52 / 53	52 / 53	52	52
IEC	80	90 S / L	100	112	132 S / M	160	180
X / Y / Z1	159/238/138	176/255-280/149	195/314/160	219/328/172	258/368-410/192	310/486/235	320/580/245
X1 (B5) / S	200/22	200/22	250/22	250/22	300/22	350/35	350/35
X1 (B14) / S	---	---	---	---	200/22	250/22	300/22
L (RN52)	176	176	176	176	176	189 (176)	189 (176)
L (RN53)	176	176	176	176	176	---	---

RO53

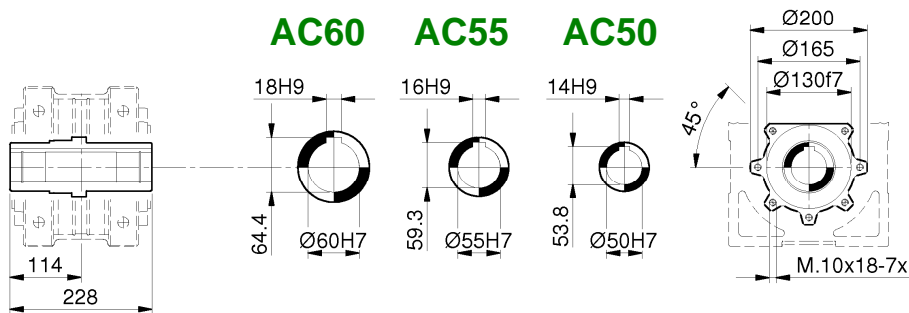
Gearboxes RN-RO-RV

Dimensions

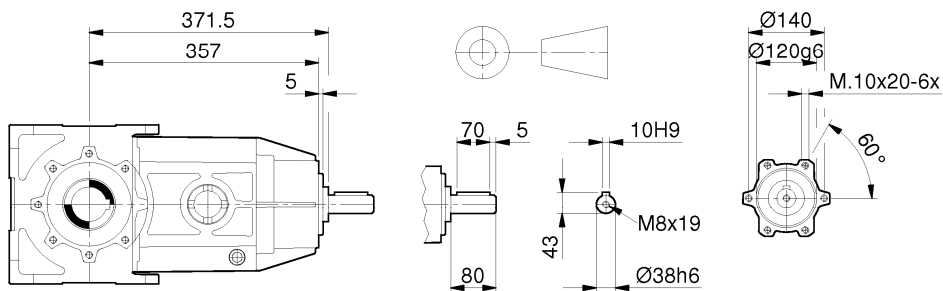
MRO



AC60 AC55 AC50



RO



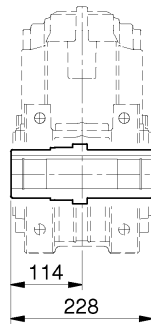
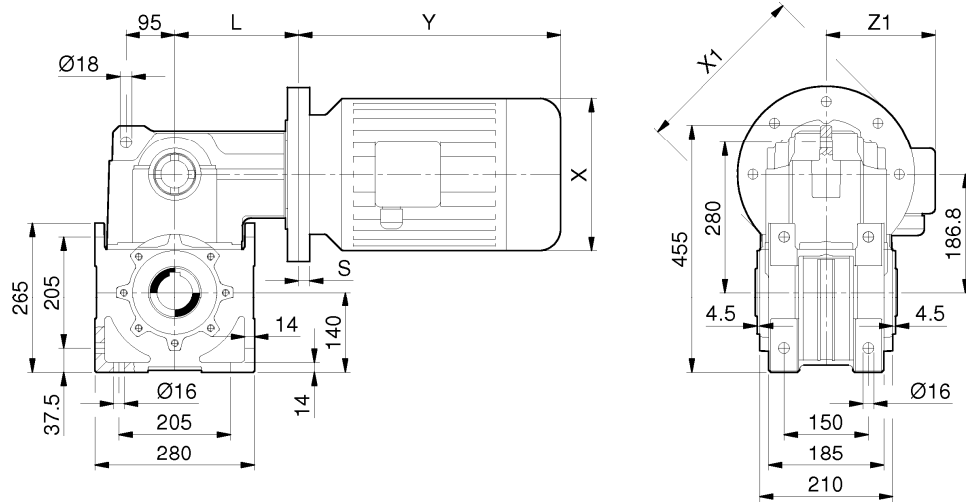
RO	53	53	53	53	53	53	53
IEC	80	90 S / L	100	112	132 S / M	160	180
X / Y / Z1	159/238/138	176/255-280/149	195/314/160	219/328/172	258/368-410/192	310/486/235	320/580/245
X1 (B5) / S	200/22	200/22	250/22	250/22	300/22	350/35	350/35
X1 (B14) / S	---	---	---	---	200/22	250/22	300/22
L (RO53)	379	379	379	379	379	392 (379)	392 (379)

RN-RO-RV Gearboxes

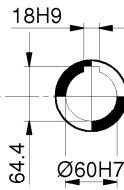
RV53

Dimensions

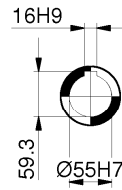
MRV



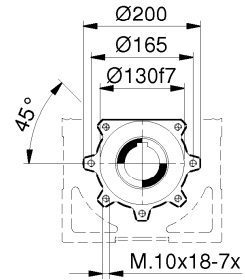
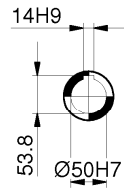
AC60



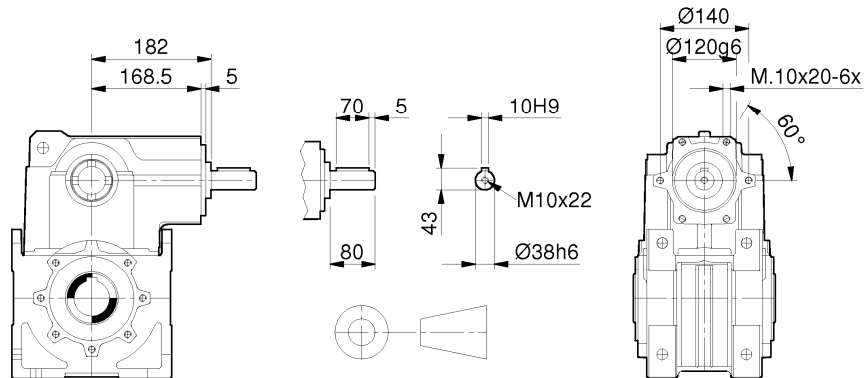
AC55



AC50



RV



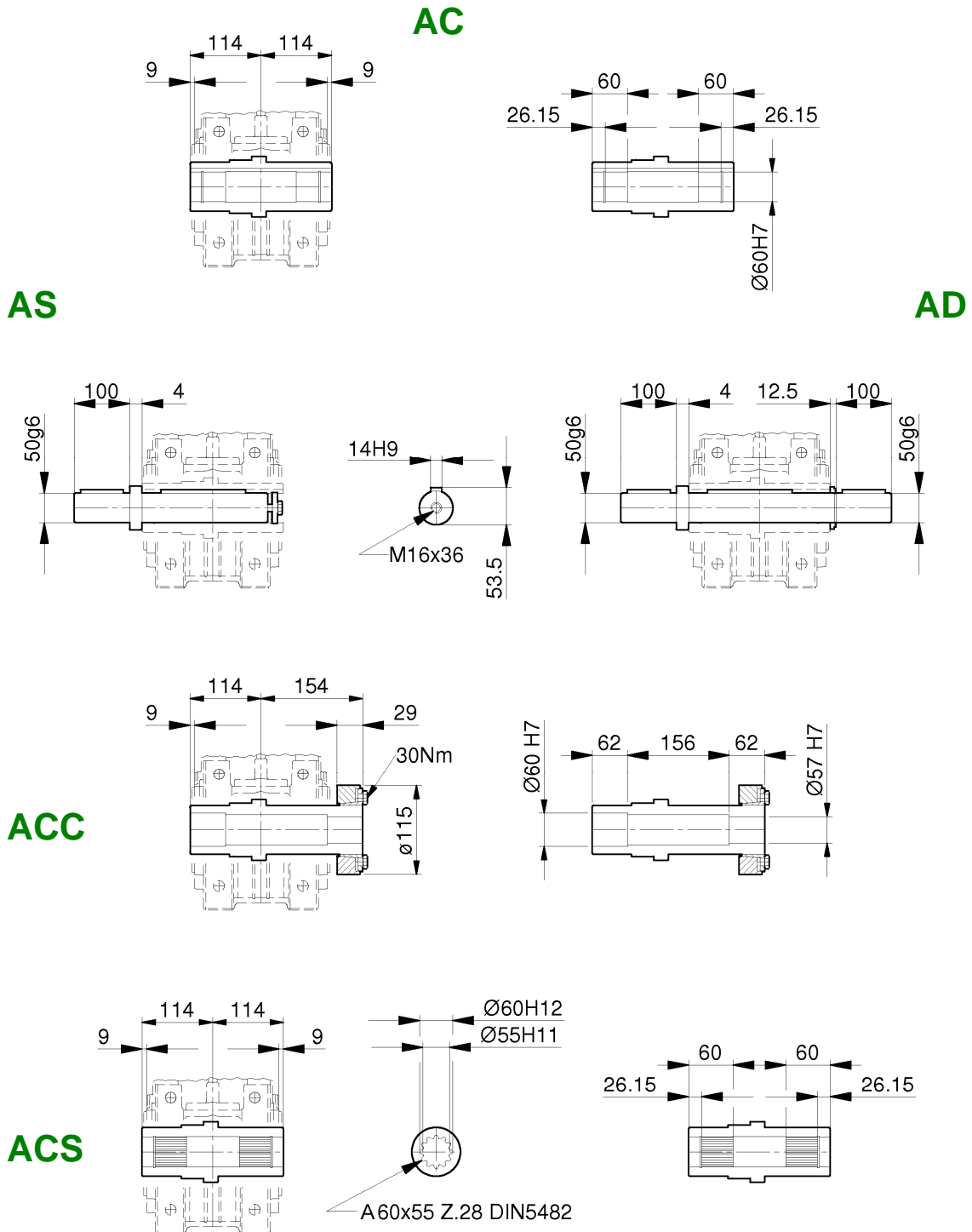
RV	53	53	53	53	53	53	53
IEC	80	90 S / L	100	112	132 S / M	160	180
X / Y / Z1	159/238/138	176/255-280/149	195/314/160	219/328/172	258/368-410/192	310/486/235	320/580/245
X1 (B5) / S	200/22	200/22	250/22	250/22	300/22	350/35	350/35
X1 (B14) / S	---	---	---	---	200/22	250/22	300/22
L (RV53)	190,5	190,5	190,5	190,5	190,5	203,5 (190,5)	203,5 (190,5)

R5

Gearboxes RN-RO-RV

RN52-53 / RO53 / RV53

Dimensions



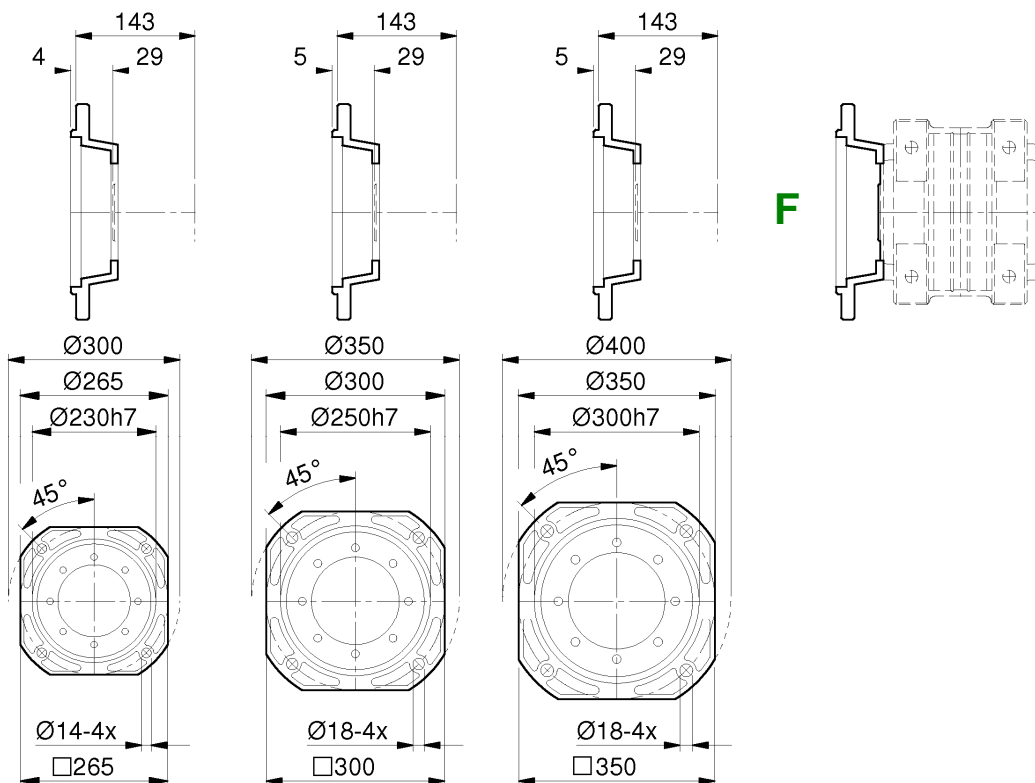
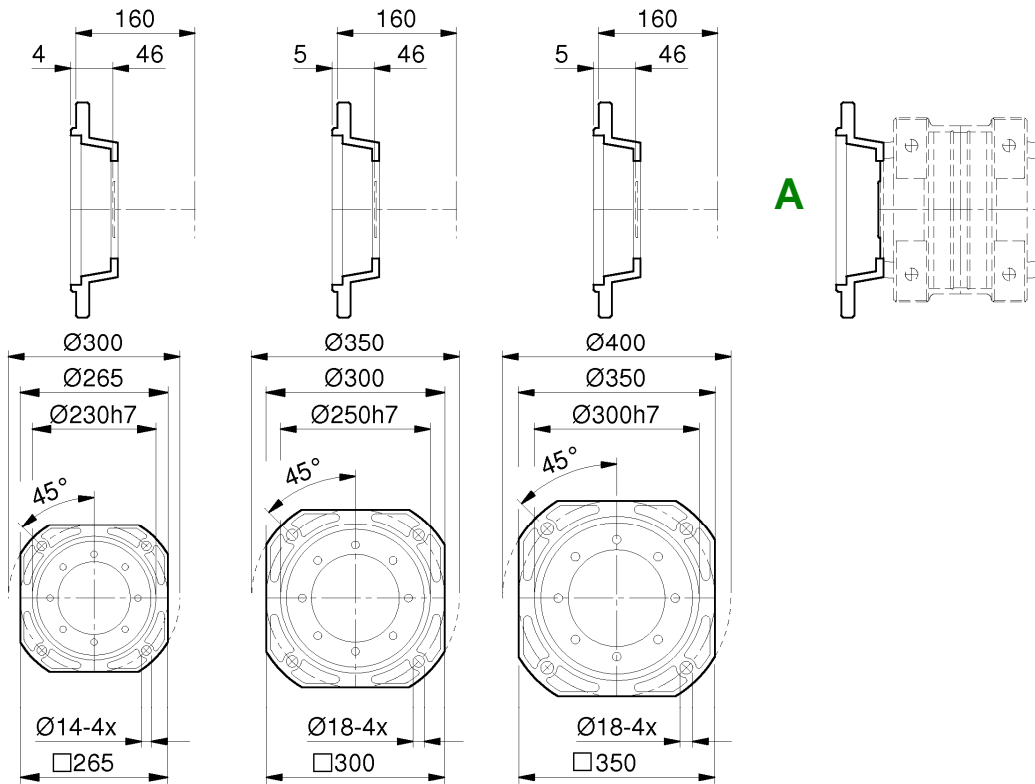
- Dimensioni del perno macchina: pag. 68-69

RN-RO-RV Gearboxes

R5

Dimensions

RN52-53 / RO53 / RV53

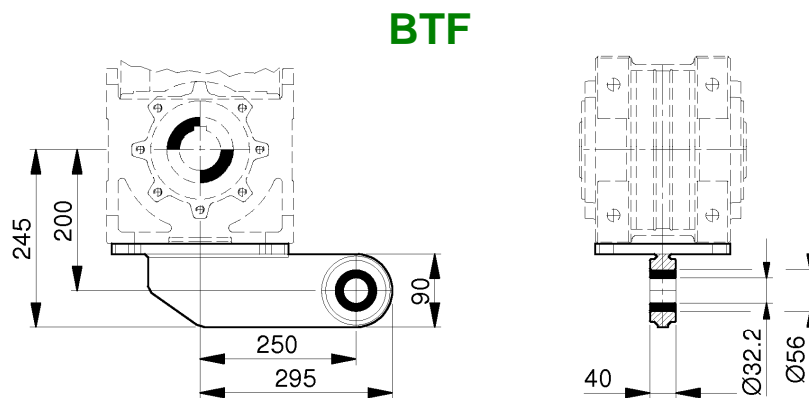
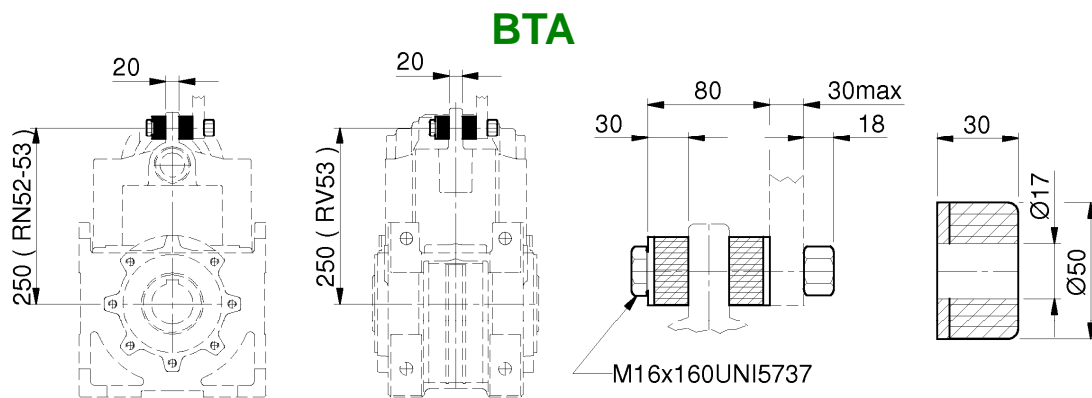
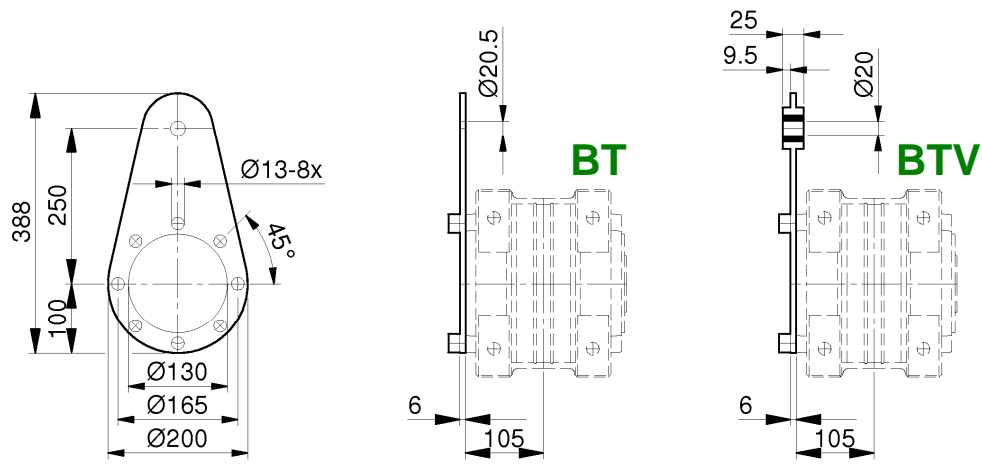


R5

Gearboxes RN-RO-RV

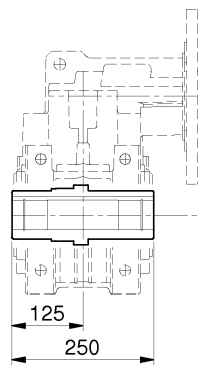
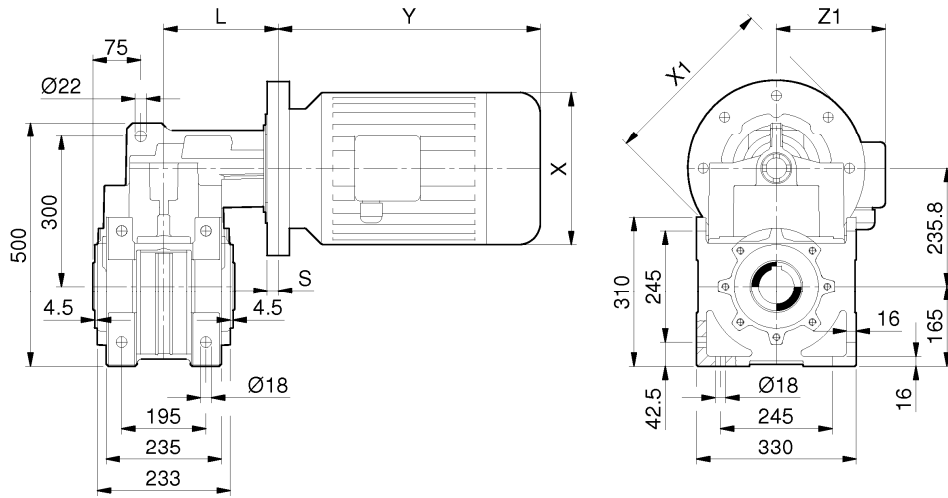
RN52-53 / RO53 / RV53

Dimensions



Dimensions

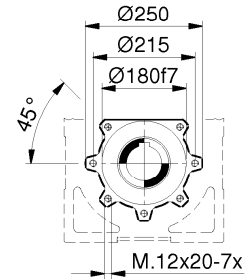
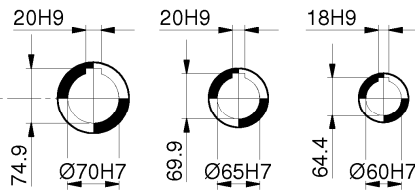
MRN



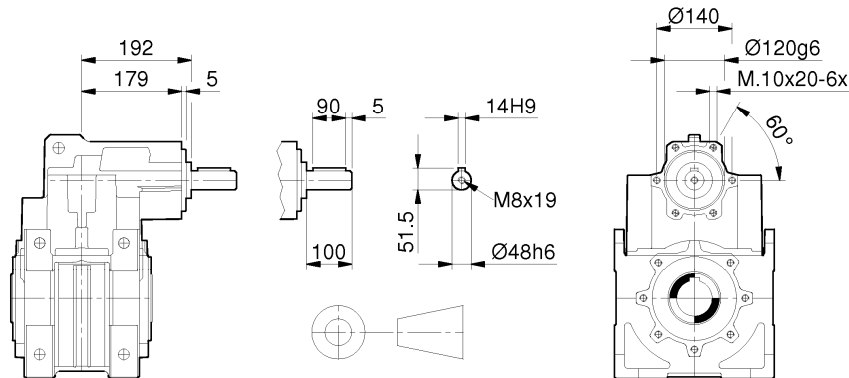
AC70

AC65

AC60



RN



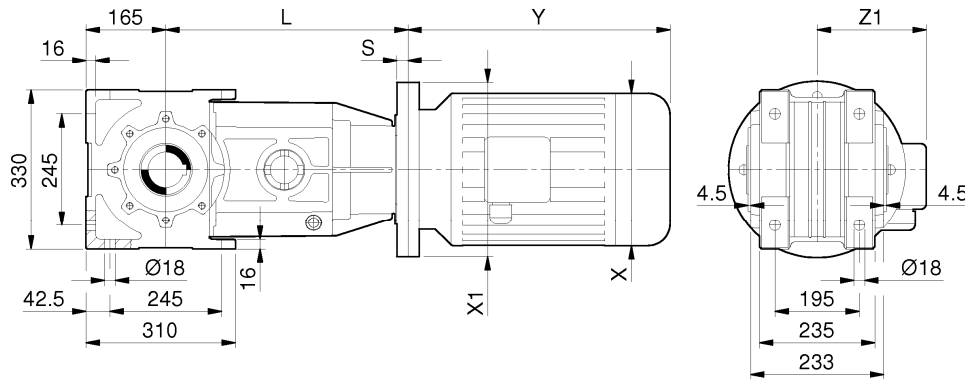
RN	62 / 63	62 / 63	62 / 63	62 / 63	62 / 63	62 / 63	62
IEC	80	90 S / L	100	112	132 S / M	160	180
X / Y / Z1	159/238/138	176/255-280/149	195/314/160	219/328/172	258/368-410/192	310/486/235	320/580/245
X1 (B5) / S	200/22	200/22	250/22	250/22	300/22	350/35	350/35
X1 (B14) / S	---	---	---	---	200/22	250/22	300/22
L (RN62)	201	201	201	201	201	214 (201)	214 (201)
L (RN63)	201	201	201	201	201	214 (201)	---

RO63

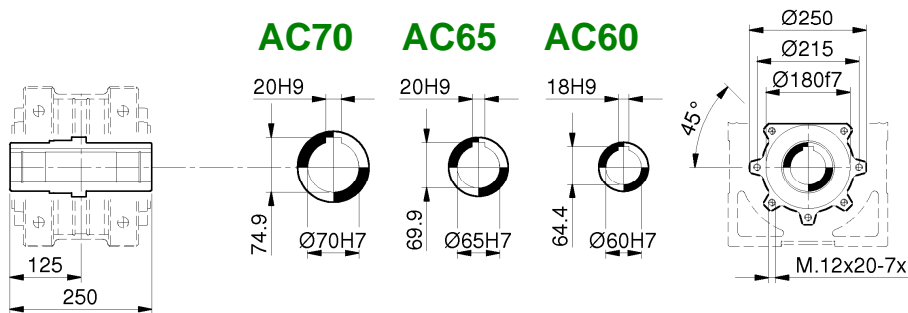
Gearboxes RN-RO-RV

Dimensions

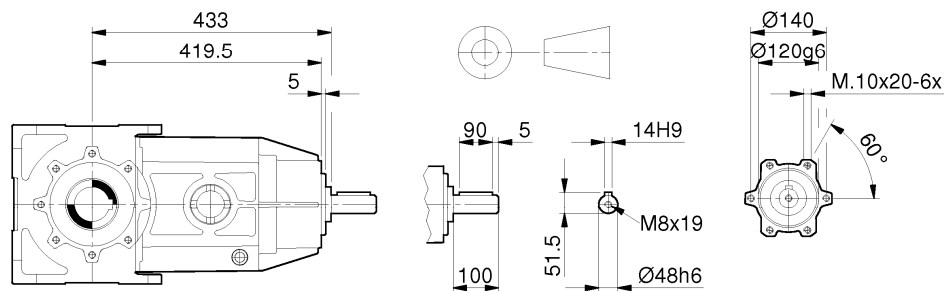
MRO



AC70 AC65 AC60



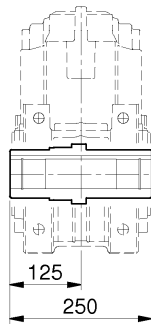
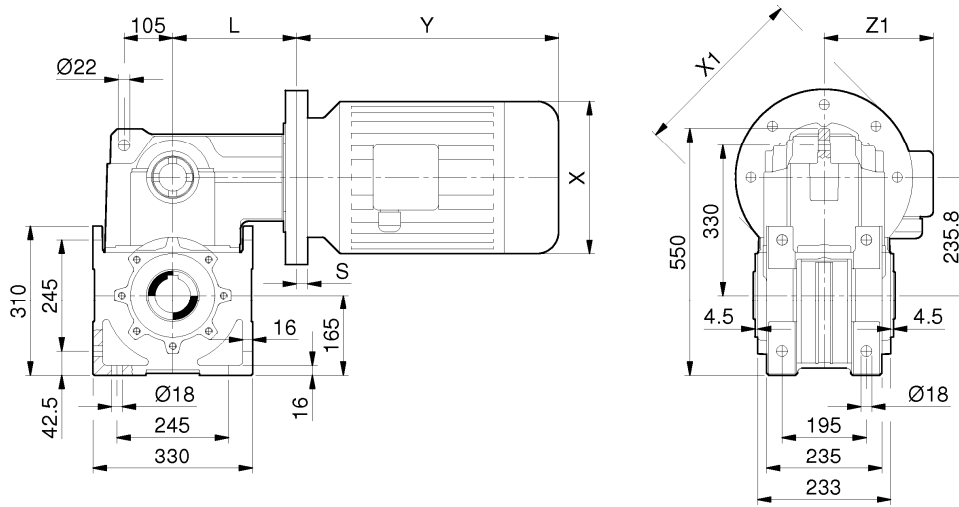
RO



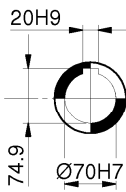
RO	63	63	63	63	63	63	63
IEC	80	90 S / L	100	112	132 S / M	160	180
X / Y / Z1	159/238/138	176/255-280/149	195/314/160	219/328/172	258/368-410/192	310/486/235	320/580/245
X1 (B5) / S	200/22	200/22	250/22	250/22	300/22	350/35	350/35
X1 (B14) / S	---	---	---	---	200/22	250/22	300/22
L (RO63)	421,5	421,5	421,5	421,5	421,5	434,5 (421,5)	434,5 (421,5)

Dimensions

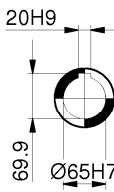
MRV



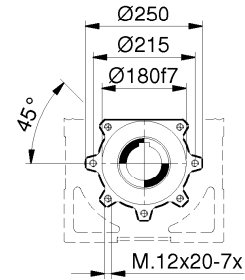
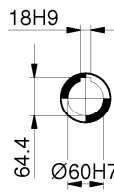
AC70



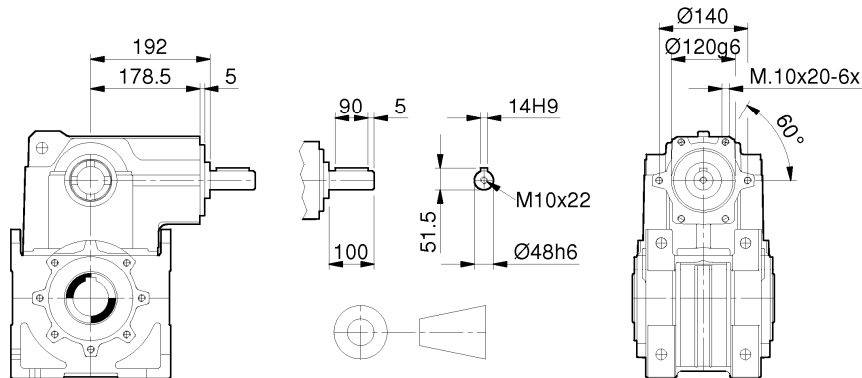
AC65



AC60



RV



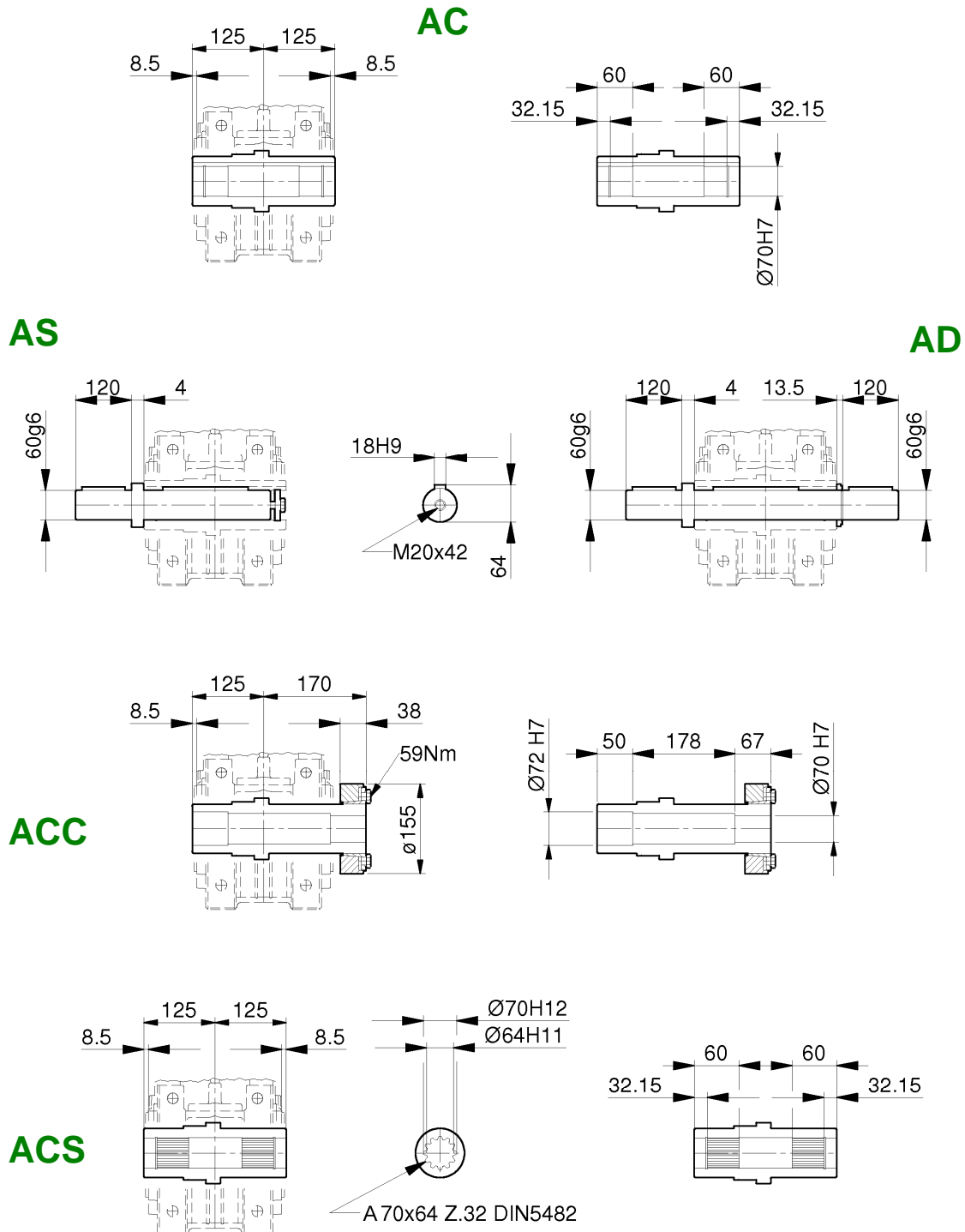
RV	63	63	63	63	63	63	63
IEC	80	90 S / L	100	112	132 S / M	160	180
X / Y / Z1	159/238/138	176/255-280/149	195/314/160	219/328/172	258/368-410/192	310/486/235	320/580/245
X1 (B5) / S	200/22	200/22	250/22	250/22	300/22	350/35	350/35
X1 (B14) / S	---	---	---	---	200/22	250/22	300/22
L (RV63)	205,5	205,5	205,5	205,5	205,5	218,5 (205,5)	218,5 (205,5)

R6

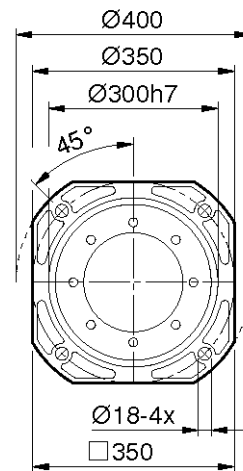
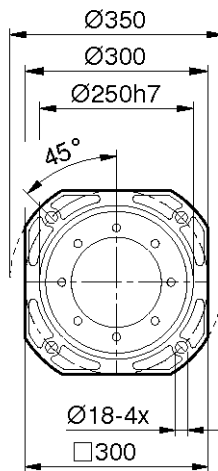
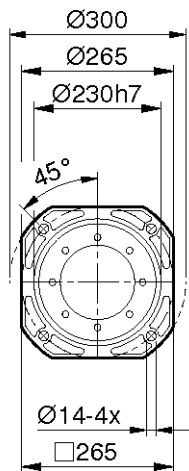
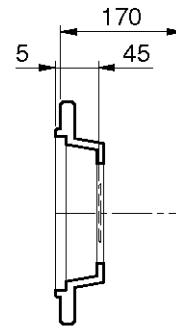
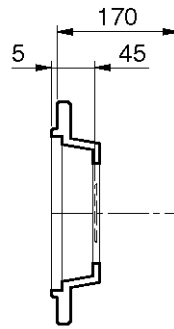
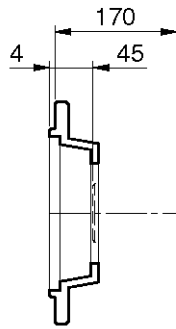
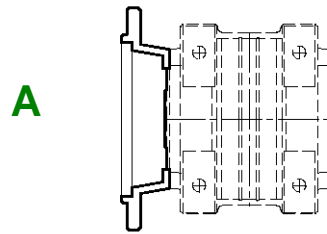
Gearboxes RN-RO-RV

RN62-63 / RO63 / RV63

Dimensions



- Dimensioni del perno macchina: pag. 68-69

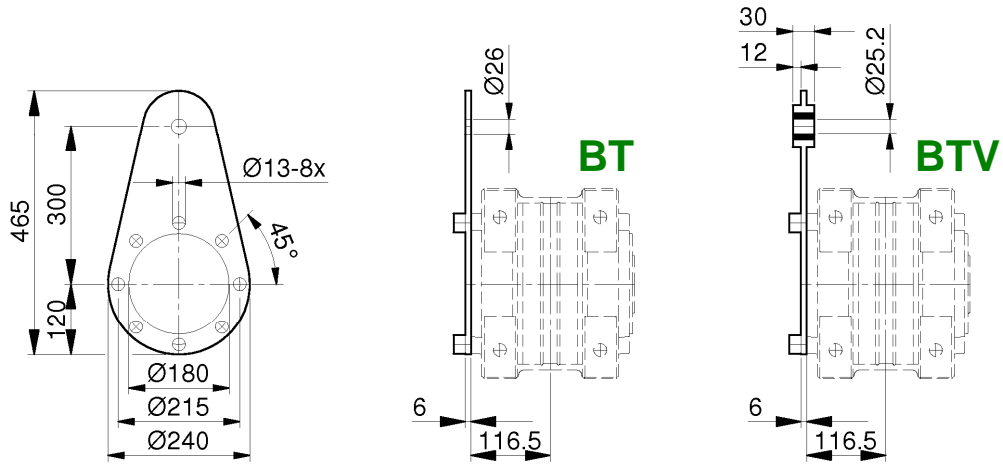


R6

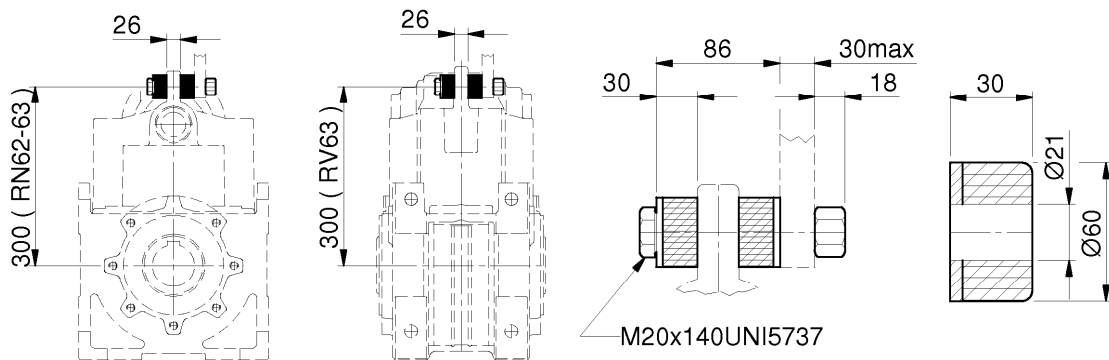
Gearboxes RN-RO-RV

RN62-63 / RO63 / RV63

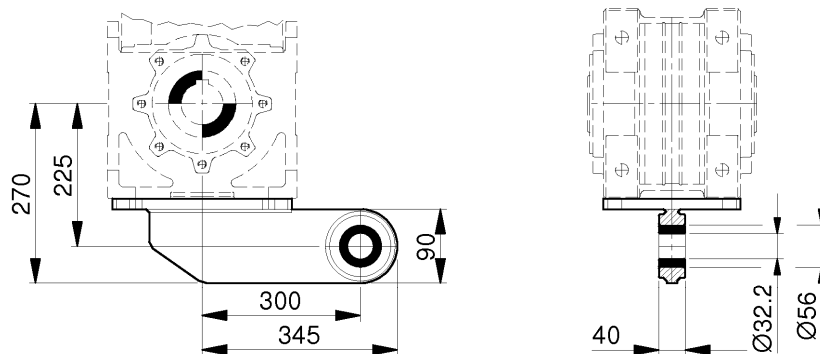
Dimensions



BTA



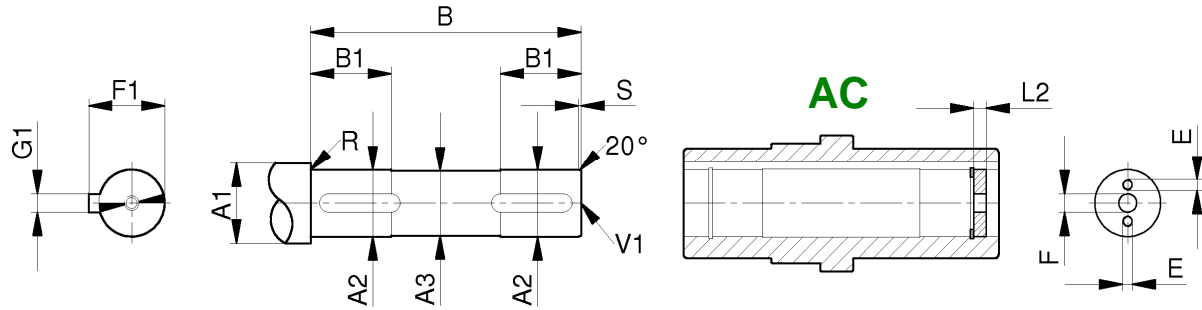
BTF



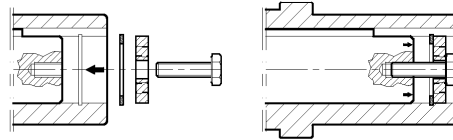
RN-RO-RV Gearboxes

R1-6

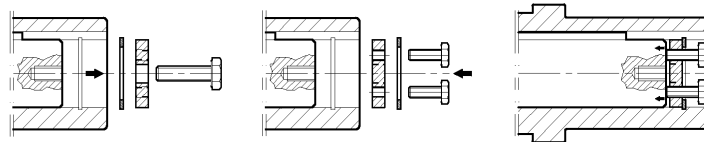
Machine Shaft Dimensions



- Mounting



- Disassembly

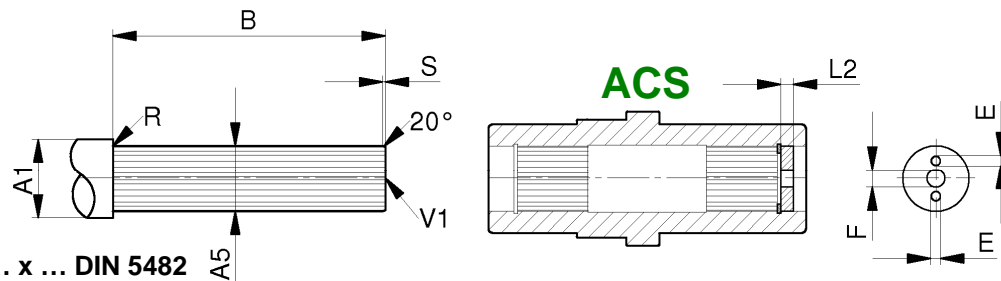
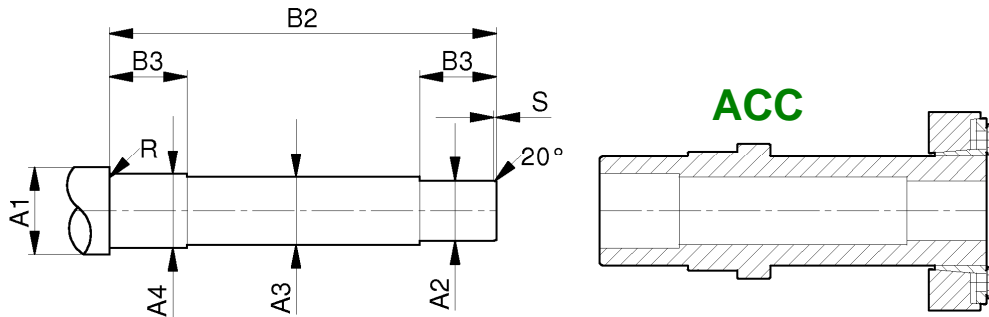


Size	A1	A2	A3	B	B1	E	F	F1	G1	L2	R	S	V1
Gr.1	40	30	29	98	35	M6	11	33	8	5,5	1	2	M10x22
	35	25	24	98	35	M6	9	28	8	5,5	1	2	M8x19
Gr.2	45	35	34	113,5	40	M8	11	38	10	7	1	2	M10x22
	40	30	29	113,5	40	M6	11	33	8	7	1	2	M10x22
Gr.3	50	40	39	133,5	45	M8	13	43	12	7	1	2	M12x28
	45	35	34	133,5	45	M8	11	38	10	7	1	2	M10x22
Gr.4	60	50	49	155,5	55	M10	17	53,5	14	8	1,5	3	M16x36
	55	45	44	155,5	55	M10	17	48,5	14	8	1,5	3	M16x36
	50	40	39	155,5	55	M8	13	43	12	8	1,5	3	M12x28
Gr.5	75	60	59	185	65	M12	17	64	18	12,5	2	4	M16x36
	70	55	54	185	65	M12	17	59	16	12,5	2	4	M16x36
	65	50	49	185	65	M10	17	53,5	14	12,5	2	4	M16x36
Gr.6	85	70	69	205	70	M12	21	74,5	20	12,5	2	4	M20x42
	80	65	64	205	70	M12	21	69	18	12,5	2	4	M20x42
	75	60	59	205	70	M12	21	64	18	12,5	2	4	M16x36

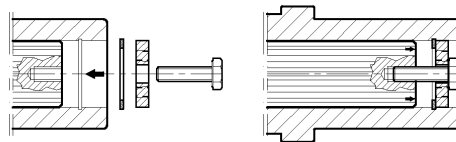
R1-6

Gearboxes RN-RO-RV

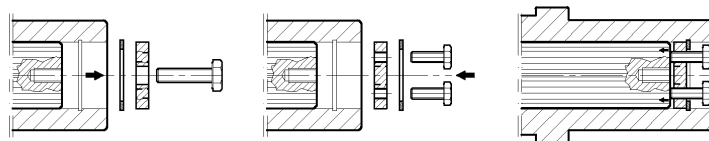
Machine Shaft Dimensions



- Mounting



- Disassembly

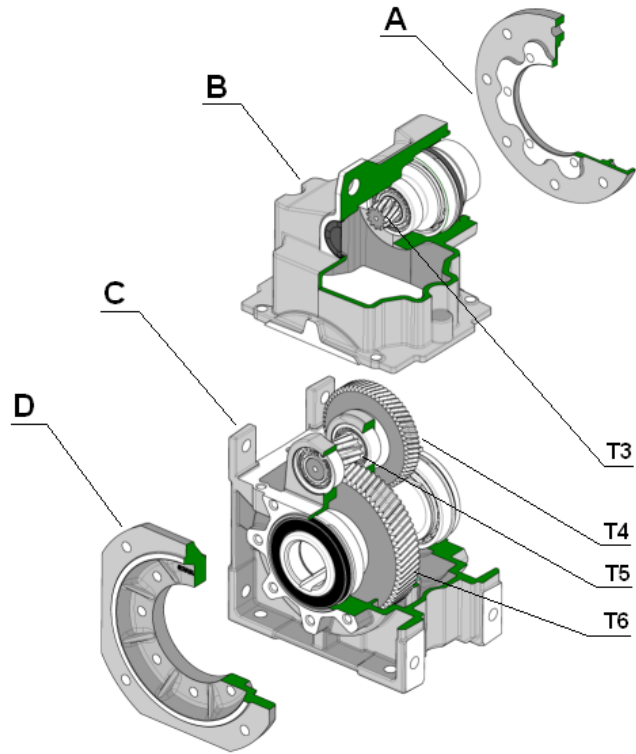


Size	A1	A2	A3	A4	A5	B	B2	B3	E	F	L2	R	S	V1
Gr.1	40	30	29	32	30x27	98	144	34	M6	11	5,5	1	2	M8x19
Gr.2	45	35	34	37	35x31	113,5	167	39	M8	11	7	1	2	M10x22
Gr.3	50	40	39	42	40x36	133,5	189	49	M8	13	7	1	2	M10x22
Gr.4	60	50	49	52	50x45	155,5	220	49	M10	17	8	1,5	3	M16x36
Gr.5	75	60	59	62	60x55	185	267	49	M12	17	12,5	2	4	M16x36
Gr.6	85	70	69	72	70x64	205	294	49	M12	21	12,5	2	4	M20x42

**Parallel Shaft Gearboxes
RN2**

TWO GEAR STAGE REDUCER

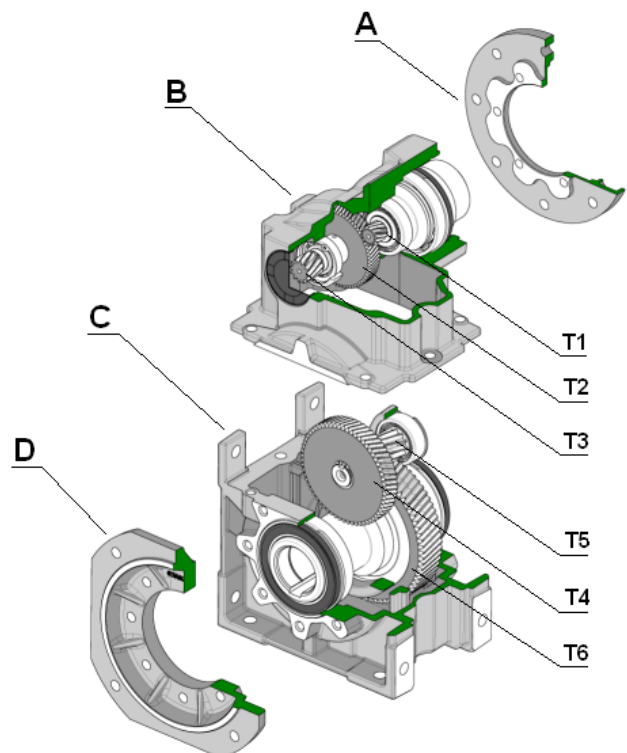
- A - IEC motor flange
- B - Two stage input cover + T3 gear
- C - Housing + T4, T5, T6 gears
- D - Output flange



**Parallel Shaft Gearboxes
RN3**

THREE GEAR STAGE REDUCER

- A - IEC motor flange
- B - Three stage input cover + T1, T2, T3 gears
- C - Housing + T4, T5, T6 gears
- D - Output flange



RN2-RN3

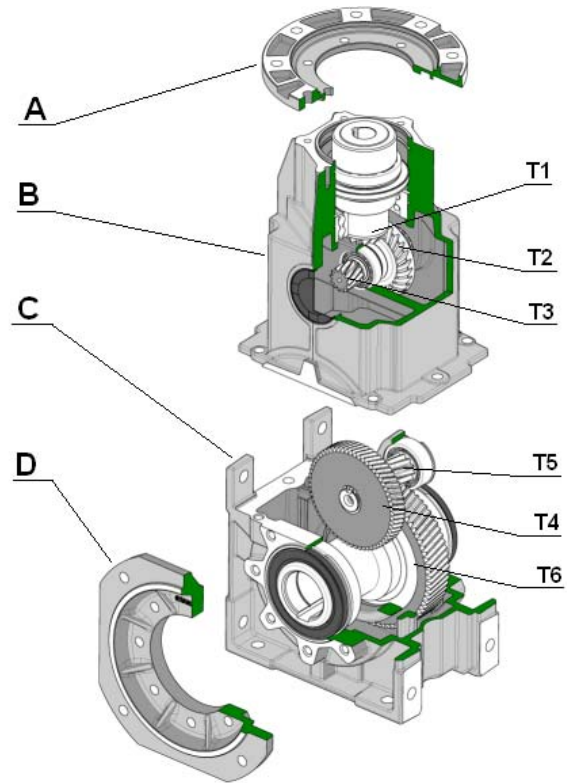
Gearboxes RN-RO-RV

Component Parts

Bevel/Helical Gearboxes, In-line RO3

THREE GEAR STAGE REDUCER

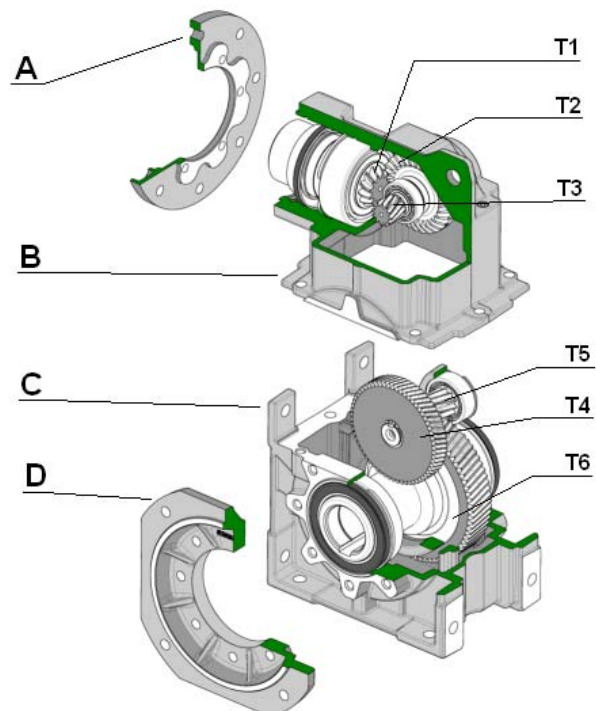
- A - IEC motor flange
- B - Three stage input cover + T1, T2, T3 gears
- C - Housing + T4, T5, T6 gears
- D - Output flange



Bevel/Helical Gearboxes, Right Angle RV3

THREE GEAR STAGE REDUCER

- A - IEC motor flange
- B - Three stage input cover + T1, T2, T3 gears
- C - Housing + T4, T5, T6 gears
- D - Output flange



RN-RO-RV Gearboxes

Abstract of OPERATION AND MAINTENANCE INSTRUCTIONS

(complete manual on www.varvel.com)

Variable speed and reduction gearboxes are not part of the field of application of the Machinery Directive, art,1(2), and they must not be put into service until the machinery into which they are to be incorporated, has been declared in conformity with the provision of art,4(2), annex II(B) of Machinery Directives 98/37/CEE/22,6,98 and for Italy only, of DL 459/24,7,96.

Installation

Check if the unit to be installed, is properly selected to perform the required function and that its mounting position complies with the order.

The nameplate reports such information.

Check mounting stability to ensure the unit runs without vibrations or overloads.

Running

The unit may be connected for clockwise or counter-clockwise rotation.

The unit must be stopped as soon as defective running or unexpected noise occur, remove the faulty part or return the unit to the factory for checking.

If the faulty part is not replaced, other parts can also be affected, causing more severe damage and making the identification of initial cause more difficult.

Maintenance

Although the units are no-load run tested in the factory before despatch, it is recommended not to run them at maximum load for the first 20-30 running hours to allow the proper running in.

The gearboxes are delivered already filled with long-life synthetic oil and, in case of replacement or topping, do not mix with mineral lubricants.

Handling

When hoisting, use relevant housing locations or eyebolts if provided, or foot or flange holes

Never hoist on any moving part.

Painting

Carefully protect oil seals, coupling faces and shafts when units are re-painted.

Long-term storage

For storage longer than three months, apply anti-oxidants onto shafts and machined surfaces, and protective grease on oil seal lips.

Product's Environmental Management

In conformity with Environmental Certification ISO 14001, we recommend the following to dis-pose of our products:

- scraped components of the units to be delivered to authorized centres for metal object collection;
- oils and lubricants drained from the units to be delivered to Exhausted Oil Unions;
- packages (pallets, carton boxes, paper, plastic, etc.) to lead into regeneration/recycling circuits as far as possible, by delivering separate waste classes to authorized companies.



A socially responsible company

To the scope of intensifying our commitment to society, Varvel since 2004 started an ongoing support programme with three non-profit institutions: UNICEF (United Nations Children's Fund), MSF (Médecins sans Frontières) and ANT (National Cancer Association). Environmental respect and protection are also part of Varvel's values and this is why Varvel certified in 2001 its Environmental System to standard UNI EN ISO 14001.



RN/RO/RV



RS/RT



RD



RG



RP



VR/VS



VARVEL®
MOTION CONTROL SINCE 1955

Varvel SpA

Via 2 Agosto 1980, 9
40056 Crespellano (BO) Italy

☎ +39 051 6721811

☎ +39 051 6721825

varvel@varvel.com

www.varvel.com