

# RN•RO•RV CATALOGUE



 **VARVEL**<sup>®</sup>  
KNOW-HOW TO DO IT

technology  
made in Italy 



### Experience at the service of innovation

EN

The Varvel Group has been designing and producing power transmission systems for numerous areas of industry since 1955. "Know-how to do it": Varvel has the know-how needed to satisfy customers' requests in the best way possible. Thanks to over sixty years of accumulated experience, Varvel can offer customers a vast range of standard solutions and customise products for specific needs. The entire product range is designed and made in Italy and sold worldwide through two subsidiaries (in the USA and India) and a global network of over 100 commercial partners.

UNI EN ISO 9001:2015  
UNI EN ISO 14001:2015  
BS OHSAS 18001:2007



EC DIRECTIVE 2014/34/EC (ATEX)



# RN

## PARALLEL SHAFT GEARBOXES

two and three helical stages  
aluminium / cast iron housing and covers

# RO - RV

## BEVEL HELICAL GEARBOXES

one bevel and two helical stages  
in-line and right-angle versions  
aluminium / cast iron housing and covers



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## Gearboxes - Series RN-RO-RV

### Description



The gearboxes - RN, RO and RV Series - 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 are manufactured of aluminium 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 B5 flange mount conversion by simply fitting one of the many available output flanges.

Various dimensions and types of output shafts (hollow with through keyway, hollow spline and shrink disk versions, 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 885 and 30100 in-lb.

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.


#### Directive ATEX

The gearboxes VARVEL-ATEX, supplied on demand, are designed and manufactured according to Directive 94/9/CE "ATEX" and therefore, they are qualified for installation in potentially explosive environment:

- Zones of Group II,
- Category 2 (or 3),
- Explosion hazard with gas presence (Zone 1 or 2),
- Explosion hazard with combustible dust presence (Zone 21 or 22),

whenever installation is operative inside the EC territory.

The units VARVEL-ATEX are identified by the additional marking:

 II 2 GD ck IP66 CE T<sub>max</sub>=135 °C

## Gearboxes - Series RN-RO-RV

Description

### Parallel shaft gearboxes - RN Series

**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**

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 bore and keyway fitting

**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 RO and right-angle RV Series

**Multipurpose housing**  
Foot & Foot/flange mountings  
One housing for 3-stages

**Housing & Covers**

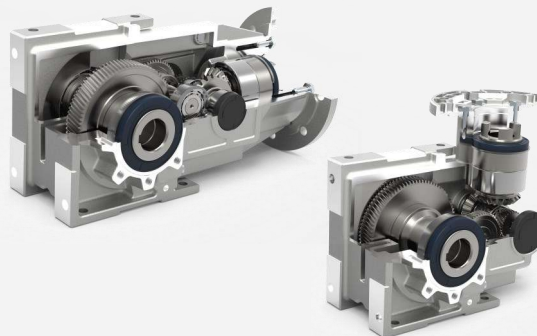
Aluminium die cast (3 sizes)  
Grey cast iron (3 sizes)

**Gearing**

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 bore and keyway fitting

**Oil seals**

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

**Output**

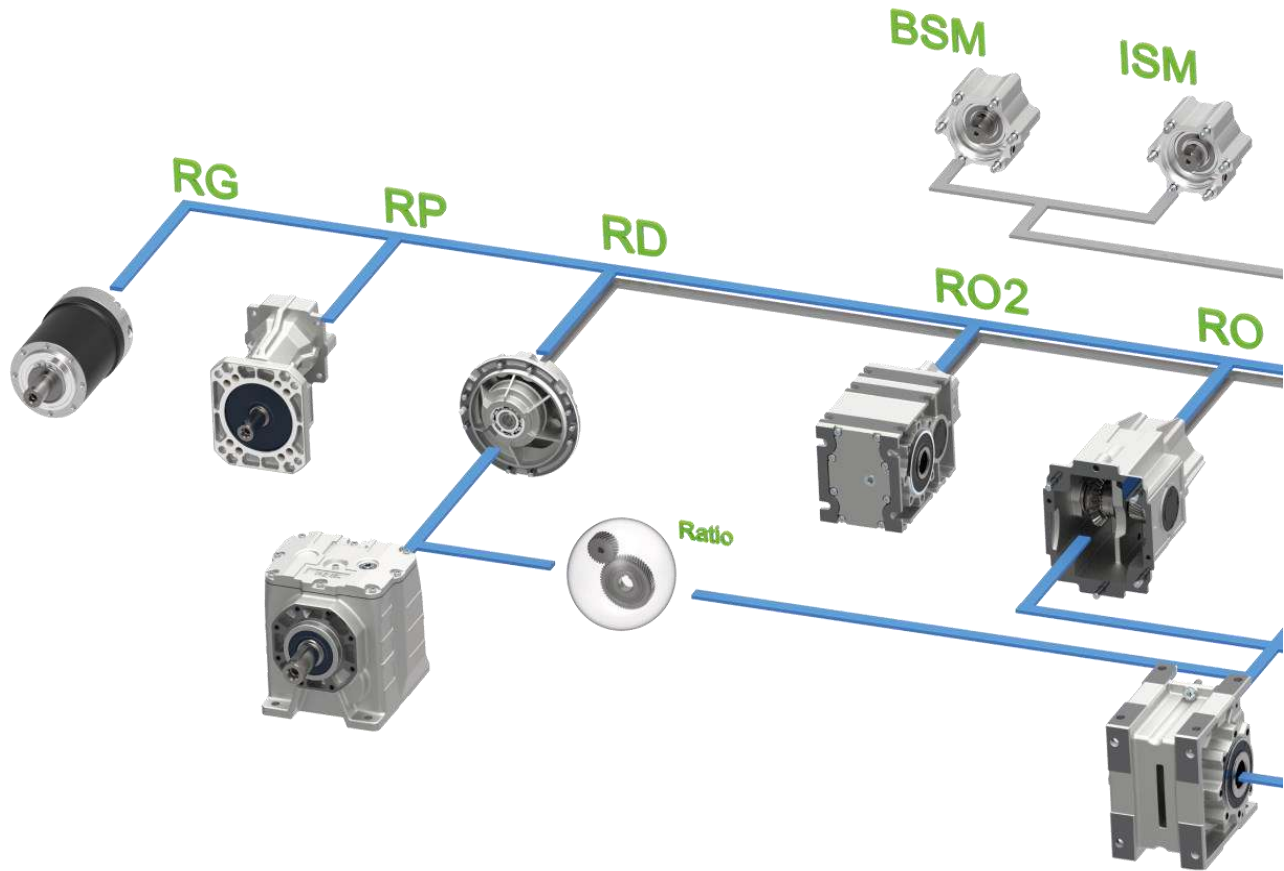
solid shafts,  
metric and imperial

**Lubrication**

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

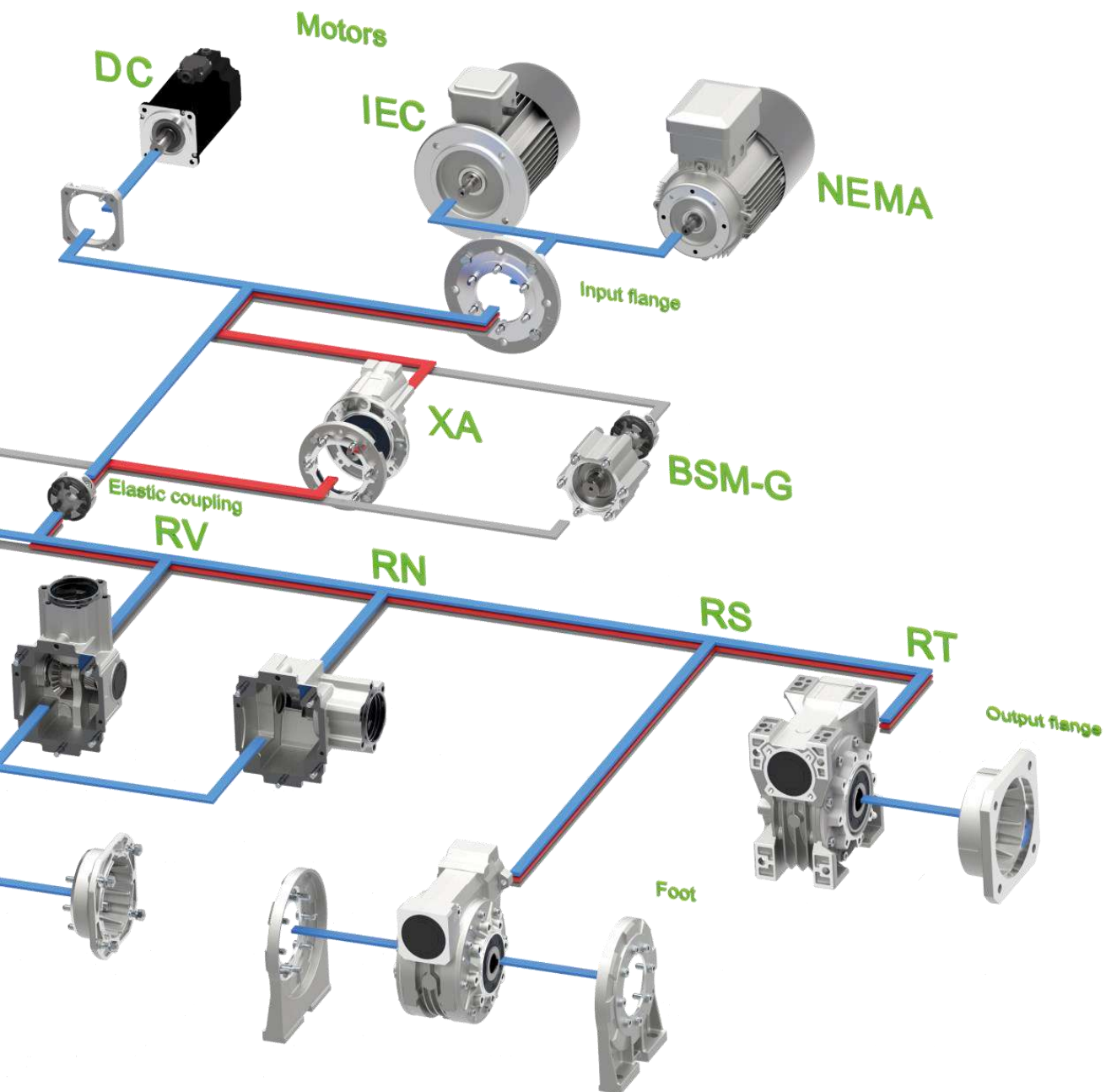
# Gearboxes - Series RN-RO-RV

Modular system



# Gearboxes - Series RN-RO-RV

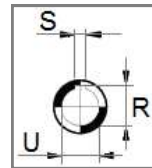
Modular system



# Gearboxes - Series RN-RO-RV

## Description - General specifications

GENERAL SPECIFICATIONS																																																				
Range	6 sizes; 30 ratios in 2 and 3 stages; 3400 Nm max. output torque																																																			
Sizing	According to ISO6336/DIN3990. 10,000 hrs average lifetime with service factor SF1.0																																																			
Housing, Covers	Pressure die cast aluminium up to size 3; cast iron from size 4																																																			
Coupling G input	Pressure die cast aluminium for sizes Steel for sizes G3, G5, G6 (n demand), and G8 (standard)																																																			
Toothed parts	Steel case hardened. Tooth profile ground or shaved. Run-in bevel gears																																																			
Keys	According to DIN6885 B1																																																			
Bearings	Ball- or roller-types according to sizes																																																			
Oil seals	Type NBR - nitril-butadiene rubber type with additional anti-dust lip according to DIN 3760 Type FKM - fluoroelastomer Viton type on demand																																																			
Lubricant	Synthetic long-life oil: Grade ISO VG 320																																																			
Powder coating	Natural aluminium until size 3 and Epoxy powder paint RAL 7012 from size 4																																																			
ATEX Version	On demand																																																			
Tolerances	<table border="1"> <thead> <tr> <th rowspan="2"></th> <th colspan="2">Diameter</th> <th colspan="2">Tolerance</th> </tr> <tr> <th>[in]</th> <th>[mm]</th> <th>[in]</th> <th>[mm]</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Solid shaft</td> <td>U <math>\varnothing 0.5 \dots \varnothing 1.5</math></td> <td></td> <td>0 / -0.0005</td> <td></td> </tr> <tr> <td><math>\varnothing &gt; 1.5 \dots \varnothing 2.75</math></td> <td></td> <td>0 / -0.0010</td> <td>ISO g6</td> </tr> <tr> <td rowspan="5">Hollow shaft</td> <td>U <math>\varnothing 0.625</math></td> <td></td> <td>+0.0007 / 0</td> <td></td> </tr> <tr> <td><math>\varnothing 0.75 \dots \varnothing 1.0</math></td> <td></td> <td>+0.0008 / 0</td> <td></td> </tr> <tr> <td><math>\varnothing 1.25 \dots \varnothing 1.625</math></td> <td></td> <td>+0.0010 / 0</td> <td>ISO H7</td> </tr> <tr> <td><math>\varnothing 2.0 \dots \varnothing 2.75</math></td> <td></td> <td>+0.0012 / 0</td> <td></td> </tr> <tr> <td>R <math>\varnothing 0.625 \dots \varnothing 2.75</math></td> <td></td> <td>+0.0079 / 0</td> <td>+0.2 / 0</td> </tr> <tr> <td>S <math>\varnothing 0.625 \dots \varnothing 0.75</math></td> <td></td> <td>+0.0012 / 0</td> <td></td> </tr> <tr> <td><math>\varnothing 1.0 \dots \varnothing 1.625</math></td> <td></td> <td>+0.0014 / 0</td> <td></td> </tr> <tr> <td><math>\varnothing 2.0 \dots \varnothing 2.75</math></td> <td></td> <td>+0.0017 / 0</td> <td>ISO H9</td> </tr> </tbody> </table>		Diameter		Tolerance		[in]	[mm]	[in]	[mm]	Solid shaft	U $\varnothing 0.5 \dots \varnothing 1.5$		0 / -0.0005		$\varnothing > 1.5 \dots \varnothing 2.75$		0 / -0.0010	ISO g6	Hollow shaft	U $\varnothing 0.625$		+0.0007 / 0		$\varnothing 0.75 \dots \varnothing 1.0$		+0.0008 / 0		$\varnothing 1.25 \dots \varnothing 1.625$		+0.0010 / 0	ISO H7	$\varnothing 2.0 \dots \varnothing 2.75$		+0.0012 / 0		R $\varnothing 0.625 \dots \varnothing 2.75$		+0.0079 / 0	+0.2 / 0	S $\varnothing 0.625 \dots \varnothing 0.75$		+0.0012 / 0		$\varnothing 1.0 \dots \varnothing 1.625$		+0.0014 / 0		$\varnothing 2.0 \dots \varnothing 2.75$		+0.0017 / 0	ISO H9
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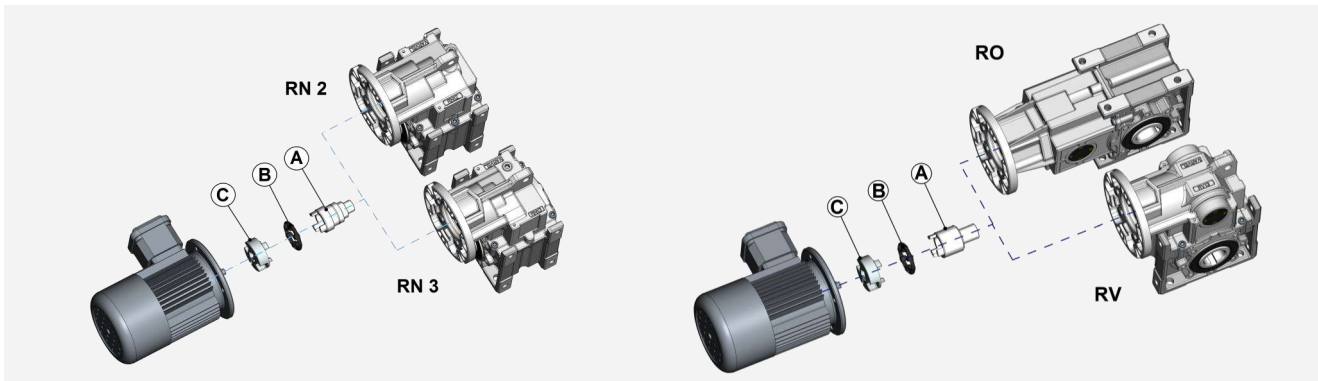
## Gearboxes - Series RN-RO-RV

### Symbols

Symbol	Description	Formula
D / R [in]	Diameter / radius of transmission element ( $k_T$ of page 19)	
$F_r$ [lb]	Application radial load	
$F_{r1}$ [lb]	Catalogue radial load (input)	
$F_{r2}$ [lb]	Catalogue OHL (radial output load)	
FS	Service factor	$M_2 / M_{(app)}$
$i_n$	Nominal reduction ratio	
$i_r$	Actual reduction ratio	
$J_1$ [ft <sup>2</sup> -lb]	Moment of inertia of the gearbox at gearbox input shaft	
$J_2$ [ft <sup>2</sup> -lb]	Moment of inertia of the application	
$J_m$ [ft <sup>2</sup> -lb]	Moment of inertia of the motor	
k	Motor pole number (2, 4, 6, 8)	
$k_{(a)}$	Mass acceleration factor	
$k_{(t)}$	Transmission element factor	
Lub [qt]	Lubricant (US quart)	
$M_2$ [in-lb]	Gearbox maximum output torque	$in-lb = 63025 * HP * eff. / rpm$
$M_{(app)}$ [in-lb]	Application torque	
$n_1$ [rpm]	Input speed	
$n_2$ [rpm]	Output speed	
$P_1$ [HP]	Input power	$HP = in-lb * rpm / (63025 * eff.)$
$P_{(kg)}$ [lb]	Weight: as average of B3H mounting and reduction ratio	
Efficiency (eff.)	2 stages = 0.96 3 stages = 0.94	

# Gearboxes - Series RN-RO-RV

## Flexible coupling



### Flexible coupling system

#### **A) Gearbox-side coupling hub**

- Material: steel
- One-piece machined with input pinion shaft
- Two bearing setting
- Not altered gearbox casing dimensions

#### **B) Spider**

- Material: Polyarylamide Thermoplastic Elastomer
- External tooth connection
- Hardness 90 Shore D
- Temperature range -22/+275°F (-30/+135°C)

#### **C) Motor-side coupling hub**

- Material: Aluminium die cast (G3, G5, G6) Steel (GS3, GS5, GS6, GS8)
- Dynamic balancing
- Fitting: Clamp (G3, G5, G6) Key (GS3, GS5, GS6, GS8)

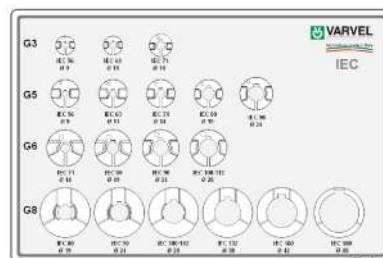
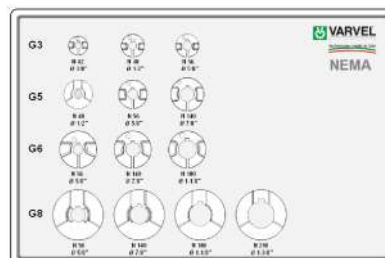
### Modular input flange system

- Material Aluminium up to NEMA TC180 & IEC112 Cast iron from NEMA TC200 & IEC132
- Flanges according to NEMA C and TC IEC 72 / DIN42948 Square shape for brushless and DC motor mount

### Advantages of unique integrated elastomer jaw coupling

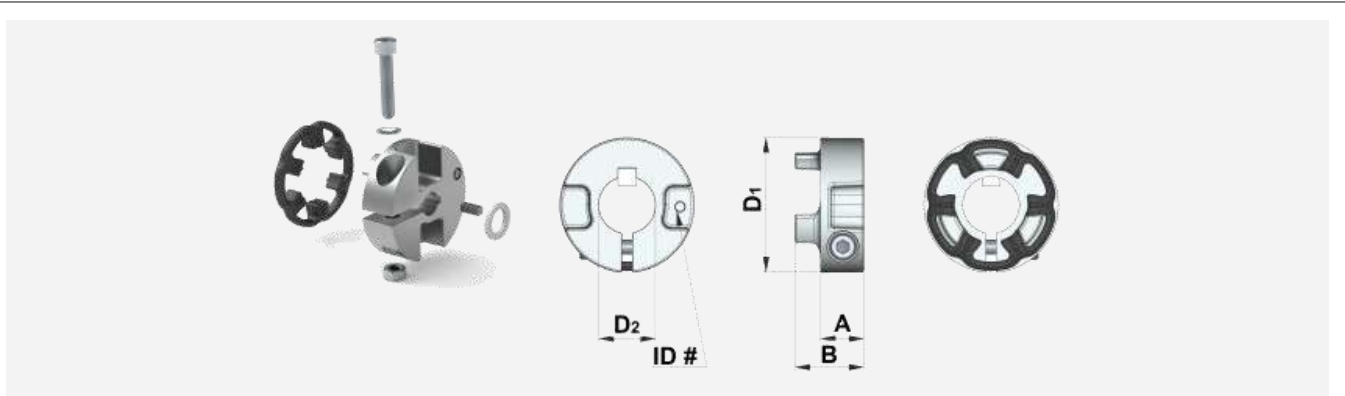
- One gearbox for multiple motor frame sizes and convertible into NEMA, IEC, Brushless, DC motor input with specific adapter/coupling kits and modular input flange system
- Greater flexibility and increased stock rotation
- Elimination of fretting corrosion common to quill mount
- Elimination of key/keyway wear in dynamic applications
- Zero backlash on motor-to-reducer connection
- Reduction of efficiency losses due to motor mounting misalignment
- High torsional rigidity
- High vibration damping

### Flexible coupling program



## Gearboxes - Series RN-RO-RV

Flexible coupling selection



Type	NEMA	Kit Part No.	RN size	RO - RV size	Mt [in-lb]	Mt <sub>1</sub> [in-lb]	Mt <sub>2</sub> [in-lb]	A [in]	B [in]	D <sub>1</sub> [in]	D <sub>2</sub> [in]	ID#
G5	NEMA	KG5.N56 KG5.N140	RN12-13 RN12	RO-RV13 RO-RV13	90	45 60	35 45	0.57	0.91	1.77" 2.05"	5/8" 7/8"	5N56 5N140
G6	NEMA	KG6.N56/X KG6.N140/X KG6.N180/X	RN22-23-32-33-42-43 RN22-32-33-42-43 RN42-43	RO-RV23-33-43 RO-RV23-33-43 RO-RV43	160	50 85 200	--- --- ---	0.77	1.24	2.28"	5/8" 7/8" 1-1/8"	6N56 6N140 6N180
G8	NEMA	* KGS8.N056/X * KGS8.N140/X * KGS8.N180/X * KGS8.N210/X	RN52-53-62-63 RN52-53-62-63 RN52-53-62-63 RN62-63	RO-RV53-63 RO-RV53-63 RO-RV53-63 RO-RV53-63	180	140 200 300 500	--- --- --- ---	1.38	2.01	3.11"	5/8" 7/8" 1-1/8" 1-3/8"	--- --- --- ---

Type	IEC	Kit Part No.	RN size	RO - RV size	Mt [Nm]	Mt <sub>1</sub> [Nm]	Mt <sub>2</sub> [Nm]	A [mm]	B [mm]	D <sub>1</sub> [mm]	D <sub>2</sub> [mm]	ID#
G5	IEC	KG5.009/X KG5.011/X KG5.014/X KG5.019/X KG5.024/X	RN12-13 RN12-13 RN12-13 RN12-13 RN12-13	RO-RV13 RO-RV13 RO-RV13 RO-RV13 RO-RV13	10	14 15 30 40 70	10 10 17 25 40	14.5	23	45 45 45 52	9 11 14 19 24	509 511 514 519 524
G6	IEC	KG6.014/X KG6.019/X KG6.024/X KG6.028/X KGS6.038/X	RN22-23-32-33-42-43 RN22-23-32-33-42-43 RN22-32-33-42-43 RN22-32-42-43 ---	RO-RV23-33-43 RO-RV23-33-43 RO-RV23-33-43 RO-RV23-33-43 RO-RV43	18	60 90 130 180 500	40 65 100 120 ---	19.5	31.5	58	14 19 24 28 38	614 619 624 628 ---
G8	IEC	* KGS8.19/X * KGS8.24/X * KGS8.28/X * KGS8.38/X * KGS8.42/X * KGS8.48/X	RN52-53-62-63 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-RV53-63 RO-RV53-63	20	150 250 350 500 500 500	--- --- --- --- --- ---	35	51	79	19 24 28 38 42 48	--- --- --- --- --- ---

Mt - Tightening torque  
Mt<sub>1</sub> - Transmissible torque with key  
Mt<sub>2</sub> - Transmissible torque without key

\* - GS8 coupling: steel, key fit and grub screw  
./X - Code of coupling with IXEF black-spider  
**Note** - No ID# marked on GS8 coupling

# Gearboxes - Series RN-RO-RV

## NEMA Flange s& Coupling selection

RN - RO - RV	Adapter			Coupling	
	Type	NEMA frame	Kit Part No.	Type	Kit Part No.
RN12 RO13-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 RO23 RV23	FM 70	56 C 140 TC	K533.227.N56 K533.227.N56	G6 ø 5/8" G6 ø 7/8"	KG6.N56/X KG6.N140/X
RN23		56 C	K533.227.N56	G5 ø 5/8"	KG5.N56/X
RN32 RN33	FM 70	56 C 140 TC	K533.227.N56 K533.227.N56	G6 ø 5/8" G6 ø 7/8"	KG6.N56/X KG6.N140/X
RO33 RV33	FM 85	56 C 140 TC	K534.227.N56 K534.227.N56	G6 ø 5/8" G6 ø 7/8"	KG6.N56/X KG6.N140/X
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/X KG6.N140/X KG6.N180/X
RO43 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/X KG6.N140/X KG6.N180/X
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/X KGS8.N140/X KGS8.N180/X KGS8.N210/X
RO53 RV53		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/X KGS8.N140/X KGS8.N180/X KGS8.N210/X
RN62 RN63	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/X KGS8.N140/X KGS8.N180/X KGS8.N210/X
RO63 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/X KGS8.N140/X KGS8.N180/X KGS8.N210/X

\* - GS8 coupling: key fitting and locking grub screw  
 ../X - Code of coupling with IXEF black-spider

## Gearboxes - Series RN-RO-RV

### IEC Flanges & Coupling selection

RN - RO - RV	Adapter				Coupling	
	Type	IEC frame	B5 Kit Part No	B14 Kit Part No	Type	Kit Part No.
RN12 RO13 RV13	FM 50	IEC56	K532.206.120	---	G5 ø9	KG5.009/X
		IEC63	K532.206.140	K532.206.090	G5 ø11	KG5.011/X
		IEC71	K532.206.160	K532.206.105	G5 ø14	KG5.014/X
		IEC80	K532.206.200	K532.206.120	G5 ø19	KG5.019/X
		IEC90	K532.206.200	K532.206.140	G5 ø24	KG5.024/X
RN13	FM 50	IEC56	K532.206.120	---	G5 ø9	KG5.009/X
		IEC63	K532.206.140	K532.206.090	G5 ø11	KG5.011/X
		IEC71	K532.206.160	K532.206.105	G5 ø14	KG5.014/X
RN22 RO23 RV23	FM 70	IEC71	K533.206.160	K533.206.105	G6 ø14	KG6.014/X
		IEC80	K533.206.200	K533.206.120	G6 ø19	KG6.019/X
		IEC90	K533.206.200	K533.206.140	G6 ø24	KG6.024/X
		IEC 100/112	K533.206.250	K533.206.160	G6 ø28	KG6.028/X
RN23	FM 70	IEC71	K533.206.160	K533.206.105	G5 ø14	KG5.014/X
		IEC80	K533.206.200	K533.206.120	G5 ø19	KG5.019/X
RN32 RN33	FM 70	IEC71	K533.206.160	K533.206.105	G6 ø14	KG6.014/X
		IEC80	K533.206.200	K533.206.120	G6 ø19	KG6.019/X
		IEC90	K533.206.200	K533.206.140	G6 ø24	KG6.024/X
		* IEC 100/112	K533.206.250	K533.206.160	G6 ø28	KG6.028/X
RO33 RV33	FM 85	IEC71	K534.206.160	---	G6 ø14	KG6.014/X
		IEC80	K534.206.200	K534.206.120	G6 ø19	KG6.019/X
		IEC90	K534.206.200	K534.206.140	G6 ø24	KG6.024/X
		IEC 100/112	K534.206.250	K534.206.160	G6 ø28	KG6.028/X
RN42 RN43	FM 85	IEC71	K534.206.160	---	G6 ø14	KG6.014/X
		IEC80	K534.206.200	K534.206.120	G6 ø19	KG6.019/X
		IEC90	K534.206.200	K534.206.140	G6 ø24	KG6.024/X
		IEC 100/112	K534.206.250	K534.206.160	G6 ø28	KG6.028/X
RO43 RV43	FM 110	IEC71	K535.206.160	---	G6 ø14	KG6.014/X
		IEC80	K535.206.200	---	G6 ø19	KG6.019/X
		IEC90	K535.206.200	---	G6 ø24	KG6.024/X
		IEC 100/112	K535.206.250	K535.206.160	G6 ø28	KG6.028/X
RN52 RO53 RV53	FM 130 & FM 150	IEC 80	K536.206.200	---	** GS8 ø19	KGS8.019/X
		IEC 90	K536.206.200	---	** GS8 ø24	KGS8.024/X
		IEC 100/112	K536.206.250	---	** GS8 ø28	KGS8.028/X
		IEC 132	K537.206.300	K536.206.200	** GS8 ø38	KGS8.038/X
		IEC 160	K565.206.350	---	** GS8 ø42	KGS8.042/X
		IEC 180	K565.206.350	---	** GS8 ø48	KGS8.048/X
RN53	FM 130	IEC 80	K536.206.200	---	** GS8 ø19	KGS8.019/X
		IEC 90	K536.206.200	---	** GS8 ø24	KGS8.024/X
		IEC 100/112	K536.206.250	---	** GS8 ø28	KGS8.028/X
		IEC132	K537.206.300	K536.206.200	** GS8 ø38	KGS8.038/X
RN62 RO63 RV63	FM 130 & FM 150	IEC 80	K536.206.200	---	** GS8 ø19	KGS8.019/X
		IEC 90	K536.206.200	---	** GS8 ø24	KGS8.024/X
		IEC 100/112	K536.206.250	---	** GS8 ø28	KGS8.028/X
		IEC 132	K537.206.300	K536.206.200	** GS8 ø38	KGS8.038/X
		IEC 160	K565.206.350	---	** GS8 ø42	KGS8.042/X
	IEC 180	K565.206.350	---	** GS8 ø48	KGS8.048/X	
RN63	FM 130 & FM 150	IEC 80	K536.206.200	---	** GS8 ø19	KGS8.019/X
		IEC 90	K536.206.200	---	** GS8 ø24	KGS8.024/X
		IEC 100/112	K536.206.250	---	** GS8 ø28	KGS8.028/X
		IEC 132	K537.206.300	K536.206.200	** GS8 ø38	KGS8.038/X
		IEC160	K565.206.350	K536.206.250	** GS8 ø42	KGS8.042/X

\* - IEC100/112: not for RN33

\*\* - GS8 coupling : key fitting and locking grub screw

.X - Code of coupling with IXEF black-spider

# Gearboxes - Series RN-RO-RV

## VARsize electronic configuration



### Modularity and flexibility

have been leading the design of VARVEL products since the years 2000: this way, the kit-concept gearbox 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/en/varsize](http://www.varvel.com/en/varsize)

allows a friendly sizing of VARVEL product range.

### 2D/3D Drawings

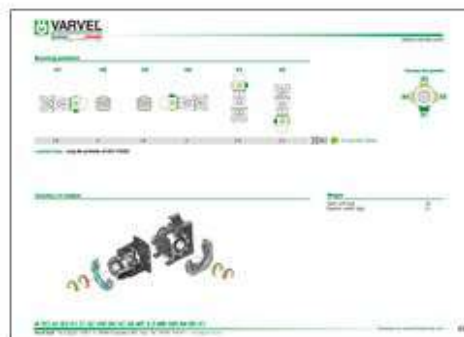
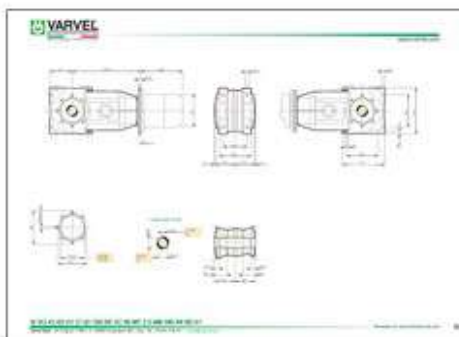
A guided selection lets 2D/3D models downloaded for the most popular CAD systems.

### 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.

1. Pick a configuration identifying inch or metric units
2. Enter your application information or requirements
3. The program selects a range of appropriate solutions
4. Pick the one you want and download 2D/3D drawings
5. Print out a technical data sheet with all specifications of the selected unit



## Gearboxes - Series RN-RO-RV

### Product designation

Example: **FRN-G32/B3-H4 31.5 N56 AC1.375**

F RN -G	32		B3-H4	31.5		N56	
Input configuration	Gearbox size		Mounting	Reduction ratio		Motor adapter	
M - motorized unit F - with input flange S - no input flange nil - solid input shaft	2-stages	3-stages	See pages 16 - 17	RN (a) 6.3 ... 63	RN (b) 40 ... 560	NEMA 56C 140TC 180TC 210TC	IEC 56 ... 180
<b>Gearbox Type</b> RN - parallel shaft RO - bevel/helical, in-line RV - bevel/helical, right-angle	RN 12 22 32 42 52 62 ---	RN 13 23 33 43 53 63 RO 13 23 33 43 53 63 RV 13 23 33 43 53 63		---	RO b) 6.3 ... 315	RV b) 6.3 ... 315	
<b>Motor fitting</b> -G - flexible coupling nil - quill fitting	---	---					

Refer to selection tables :  
(a) - two stages  
(b) - three stages

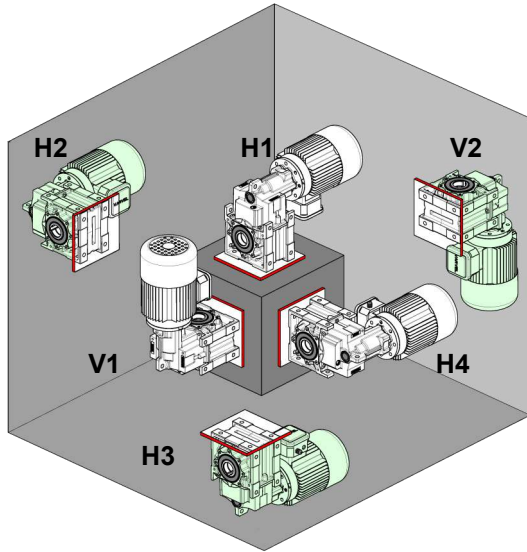
AC1.375		
Hollow output shaft diameter		
Gearbox size	in	mm
RN12, RN13 RO13, RV13	1.0 ... 1.125	25 ... 30
RN22, RN23 RO23, RV23	1.25 ... 1.375	30 ... 35
RN32, RN33 RO33, RV33	1.375 ... 1.5	35 ... 40
RN42, RN43 RO43, RV43	1.5 ... 1.625	40 ... 50
RN52, RN53 RO53, RV53	2.0 ... 2.375	50 ... 60
RN62, RN63 RO63, RV63	2.0 ... 2.75	60 ... 70

DFU	
Output flange diameter	
Gearbox size	mm
RN12, RN13 RO13, RV13	160 ... 250
RN22, RN23 RO23, RV23	160 ... 250
RN32, RN33 RO33, RV33	160 ... 300
RN42, RN43 RO43, RV43	250 ... 350
RN52, RN53 RO53, RV53	300 ... 400
RN62, RN63 RO63, RV63	300 ... 400

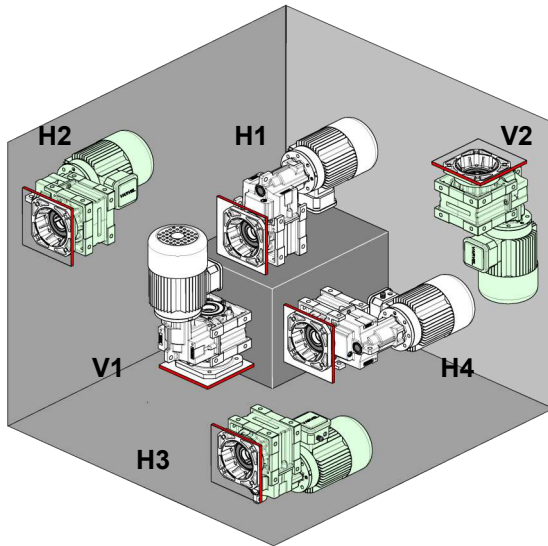
# Gearboxes - Series RN-RO-RV

## Mounting positions

**RN** - Parallel shaft gearboxes, two and three stages



**B3**  
Foot mounting



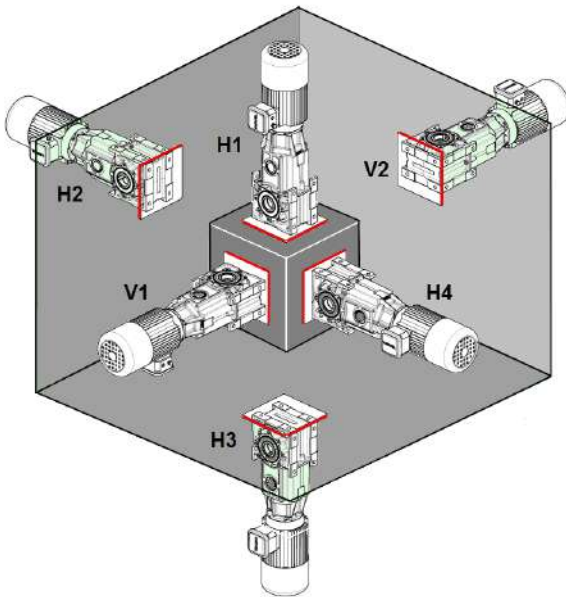
**B5**  
Flange mounting



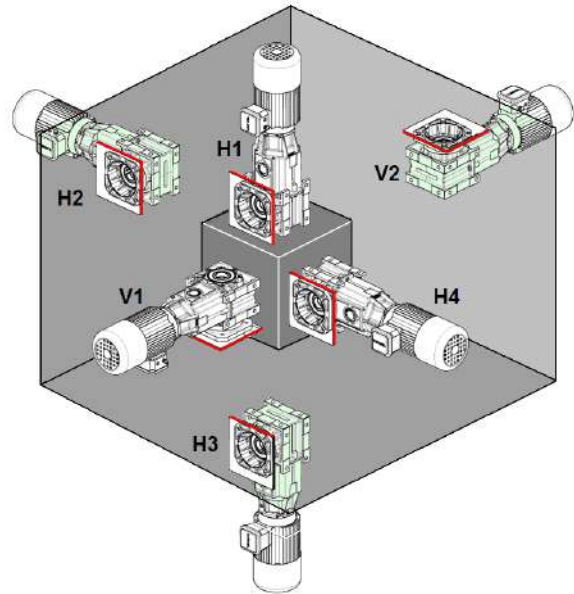
# Gearboxes - Series RN-RO-RV

## Mounting positions

Bevel helical gearboxes, in-line version, three stages - **RO**

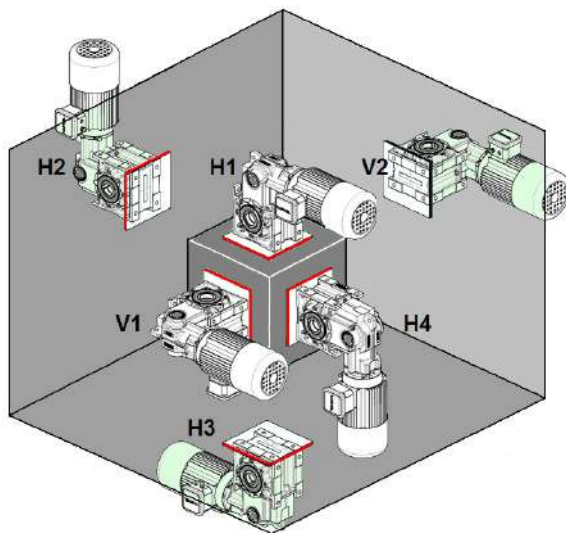


**B3**  
Foot mounting

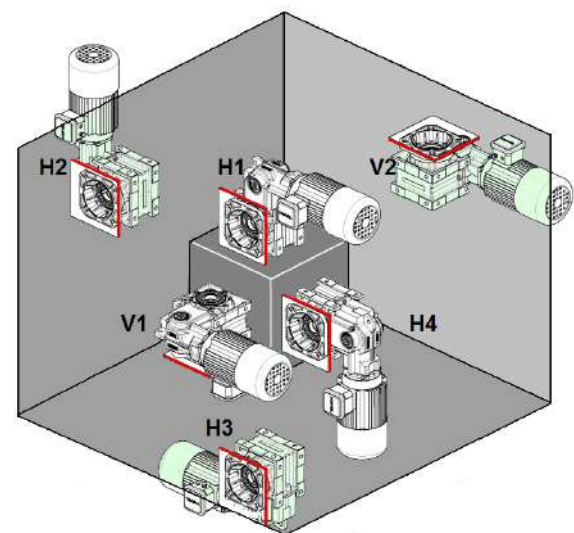


**B5**  
Flange mounting

Bevel helical gearboxes, right-angle version, three stages - **RV**



**B3**  
Foot mounting



**B5**  
Flange mounting

Mounting position is referred to output shaft position and not to foot or flange fixing.

# Gearboxes - Series RN-RO-RV

## Service factors

### GEARBOX SERVICE FACTOR

Service factor is the ratio between  $M_2$  gearbox maximum output torque and  $M_{(app)}$  application torque, and it must be bigger than the Application factor.

Service factor SF1.0 is meant as typical of 16 hours/day operation, with uniform load, max. 6 start/stops per hour and ambient temperature between 60 and 95 °F (15 and 35 °C).

For ambient temperature exceeding 104 °F (40 °C) or below 32 °F (0 °C), please ask Customer Service.

Application	Load duration (hrs/day)			Application	Load duration (hrs/day)		
	3 -	3 - 10	10 +		3 -	3 - 10	10 +
Agitators (mixers)				Elevators			
Pure liquids	1.00	1.00	1.25	Bucket	1.00	1.25	1.50
Liquids and solids	1.00	1.00	1.50	Centrifugal discharge	1.00	1.00	1.25
Liquids - variable density	1.00	1.25	1.50	Escalators	1.00	1.00	1.25
Blowers				Freight	1.00	1.25	1.50
Centrifugal	1.00	1.00	1.25	Gravity discharge	1.00	1.00	1.25
Lobe	1.00	1.25	1.50	Extruders			
Vane	1.00	1.25	1.50	General	1.50	1.50	1.50
Brewing and distilling				Plastics			
Bottling machinery	1.00	1.25	1.25	Variable speed drive	1.50	1.50	1.50
Brew kettles - continuous duty	1.25	1.25	1.25	Fixed speed drive	1.75	1.75	1.75
Cookers - continuous duty	1.25	1.25	1.25	Rubber			
Mash tubs - continuous duty	1.25	1.25	1.25	Continuous screw operation	1.75	1.75	1.75
Scale hopper - frequent starts	1.25	1.25	1.25	Intermittent screw operation	1.75	1.75	1.75
Can filling machine	1.00	1.00	1.25	Fans			
Car dumpers	1.50	1.75	2.00	Centrifugal	1.00	1.00	1.25
Car pullers	1.00	1.25	1.50	Cooling towers	2.00	2.00	2.00
Clarifiers	1.00	1.00	1.25	Forced draft	1.25	1.25	1.25
Classifiers	1.00	1.25	1.50	Induced draft	1.50	1.50	1.50
Clay working machinery				Industrial and mine	1.50	1.50	1.50
Brick press	1.50	1.75	2.00	Feeders			
Briquette machine	1.50	1.75	2.00	Apron	1.00	1.25	1.50
Pug mill	1.00	1.25	1.50	Belt	1.00	1.25	1.50
Compactors	2.00	2.00	2.00	Disc	1.00	1.00	1.25
Compressors				Reciprocating	1.50	1.75	2.00
Centrifugal	1.00	1.00	1.25	Screw	1.00	1.25	1.50
Lobe	1.00	1.25	1.50	Food industry			
Reciprocating, multi-cylinder	1.50	1.50	1.75	Cereal cooker	1.00	1.00	1.25
Reciprocating, single-cylinder	1.75	1.75	2.00	Dough mixer	1.25	1.25	1.50
Conveyors				Meat grinders	1.25	1.25	1.50
- General purpose				Slicers	1.25	1.25	1.50
Uniformly loaded or fed	1.00	1.00	1.25	Generators and excitors	1.00	1.00	1.25
- Heavy duty				Hammer mills	1.75	1.75	2.00
Not uniformly fed	1.00	1.25	1.50	Hoists			
- Reciprocating or shaker	1.50	1.75	2.00	Heavy duty	1.25	1.75	2.00
Crusher				Medium duty	1.25	1.25	1.50
Stone or ore	1.75	1.75	2.00	Skip hoist	1.25	1.25	1.50
Dredges				Laundry			
Cable reels	1.25	1.25	1.50	Tumblers	1.25	1.25	1.50
Conveyors	1.25	1.25	1.50	Washers	1.50	1.50	2.00
Cutter head drives	2.00	2.00	2.00	Lumber industry			
Pumps	2.00	2.00	2.00	Barkers			
Screen drives	1.75	1.75	2.00	Spindle feed	1.25	1.25	1.50
Stackers	1.25	1.25	1.50	Main drive	1.75	1.75	1.75
Winches	1.25	1.25	1.50	Conveyors			
				Burner	1.25	1.25	1.50
				Main or heavy duty	1.50	1.50	1.50
				Main log	1.75	1.75	2.00
				Re-saw, merry-go-round	1.25	1.25	1.50

## Gearboxes - Series RN-RO-RV

### Service factors

Application	Load duration (hrs/day)			Application	Load duration (hrs/day)		
	3 -	3 - 10	10 +		3 -	3 - 10	10 +
Conveyors				Mixers			
Slab	1.75	1.75	2.00	Concrete	1.25	1.25	1.50
Transfer	1.25	1.25	1.50	Paper mills			
Chains				Agitator (mixer)	1.50	1.50	1.50
Floor	1.50	1.50	1.50	Agitator for pure liquors	1.25	1.25	1.25
Green	1.50	1.50	1.75	Barking drums	2.00	2.00	2.00
Cut-off saws				Barkers -mechanical	2.00	2.00	2.00
Chain	1.50	1.50	1.75	Beater	1.50	1.50	1.50
Drag	1.50	1.50	1.75	Breaker stack	1.25	1.25	1.25
Debarking drums	1.75	1.75	2.00	Calendar	1.25	1.25	1.25
Feeds				Chipper	2.00	2.00	2.00
Edger	1.25	1.25	1.50	Chip feeder	1.50	1.50	1.50
Gang	1.75	1.75	1.75	Coating rolls	1.25	1.25	1.25
Trimmer	1.25	1.25	1.50	Conveyors			
Log deck	1.75	1.75	1.75	Chip, bark, chemical	1.25	1.25	1.25
Log hauls - incline - well type	1.75	1.75	1.75	Log (including slab)	2.00	2.00	2.00
Log turning devices	1.75	1.75	1.75	Couch rolls	1.25	1.25	1.25
Planer feed	1.25	1.25	1.50	Cutter	2.00	2.00	2.00
Planer tilting hoists	1.50	1.50	1.50	Cylinder moulds	1.25	1.25	1.25
Rolls -live-off bearings - roll cases	1.75	1.75	1.75	Dryers			
Sorting table	1.25	1.25	1.50	Paper machine	1.25	1.25	1.25
Tipple hoist	1.25	1.25	1.50	Conveyor type	1.25	1.25	1.25
Transfers				Embossor	1.25	1.25	1.25
Chain	1.50	1.50	1.75	Extruder	1.50	1.50	1.50
Crane way	1.50	1.50	1.75	Fourdrinier rolls (includes lump			
Tray drives	1.25	1.25	1.50	breaker, dandy roll, wire turning,			
Veneer lathe drives	1.25	1.25	1.50	and return rolls)	1.25	1.25	1.25
Metal mills				Jordan	1.50	1.50	1.50
Draw bench carriage and main drive	1.25	1.25	1.50	Kiln drive	1.50	1.25	1.50
Runout table				Mt Hope roll	1.25	1.50	1.25
Non-reversing				Paper rolls	1.25	1.25	1.25
Group drives	1.50	1.50	1.50	Platter	1.50	1.50	1.50
Individual drives	2.00	2.00	2.00	Presses - felt and suction	1.25	1.25	1.25
Reversing	2.00	2.00	2.00	Pulper	2.00	2.00	2.00
Slab pushers	1.50	1.50	1.50	Pumps - vacuum	1.50	1.50	1.50
Shears	2.00	2.00	2.00	Reel (surface type)	1.25	1.25	1.25
Wire drawing machine	1.25	1.25	1.50	Screens			
Wire winding machine	1.25	1.50	1.50	Chip	1.50	1.50	1.50
Metal strip processing machinery				Rotary	1.50	1.50	1.50
Bridles	1.25	1.25	1.50	Vibrating	2.00	2.00	2.00
Coilers and uncoilers	1.00	1.00	1.25	Size press	1.25	1.25	1.25
Edge trimmers	1.00	1.25	1.50	Super calendar	1.25	1.25	1.25
Flatteners	1.25	1.25	1.50	Thickener (AC motor)	1.50	1.50	1.50
Loopers (accumulators)	1.00	1.00	1.25	(DC motor)	1.25	1.25	1.25
Pinch rolls	1.25	1.25	1.50	Washer (AC motor)	1.50	1.50	1.50
Scrap choppers	1.25	1.25	1.50	(DC motor)	1.25	1.25	1.25
Shears	2.00	2.00	2.00	Wind and unwind stand	1.00	1.00	1.25
Slitters	1.00	1.25	1.50	Winders (surface type)	1.25	1.25	1.25
Mills, rotary type				Yankee dryers	1.25	1.25	1.25
Ball and rod	2.00	2.00	2.00	Plastics industry			
Spur ring gear	2.00	2.00	2.00	Primary processing			
Helical ring gear	1.50	1.50	1.50	Intensive internal mixers			
Direct connected	2.00	2.00	2.00	Batch mixers	1.75	1.75	1.75
Cement kilns	1.50	1.50	1.50	Continuous mixers	1.50	1.50	1.50
Dryers and coolers	1.50	1.50	1.50	Batch drop mill - two smooth	1.25	1.25	1.25
				rolls			
				Continuous feed, holding	1.25	1.25	1.50
				and blend mill			
				Compounding mill	1.25	1.25	1.25
				Calendars	1.50	1.50	1.25

# Gearboxes - Series RN-RO-RV

## Service factors

Application	Load duration (hrs/day)			Application	Load duration (hrs/day)		
	3 -	3 - 10	10 +		3 -	3 - 10	10 +
Plastics industry				Sand miller	1.25	1.25	1.50
Secondary processing				Sewage disposal equipment			
Blow moulders	1.50	1.50	1.50	Bar screens	1.25	1.25	1.25
Coating	1.25	1.25	1.25	Chemical feeders	1.25	1.25	1.25
Film	1.25	1.25	1.25	Dewatering screens	1.50	1.50	1.50
Pipe	1.25	1.25	1.25	Scum breakers	1.50	1.50	1.50
Pre-plasticizers	1.50	1.50	1.50	Slow or rapid mixers	1.50	1.50	1.50
Rods	1.25	1.25	1.25	Sludge collectors	1.25	1.25	1.25
Sheet	1.25	1.25	1.25	Thickeners	1.50	1.50	1.50
Tubing	1.25	1.25	1.50	Vacuum filters	1.50	1.50	1.50
Pullers -barge haul	1.25	1.25	1.50	Screens			
Pumps				Air washing	1.00	1.00	1.25
Centrifugal	1.00	1.00	1.25	Rotary - stone or gravel	1.25	1.25	1.50
Proportioning	1.25	1.25	1.00	Travelling water intake	1.00	1.00	1.25
Reciprocating				Sugar industry			
Single acting,	1.25	1.25	1.50	Beet slicer	2.00	2.00	2.00
three or more cylinders				Cane knives	1.50	1.50	1.50
Double acting,	1.25	1.25	1.50	Crushers	1.50	1.50	1.50
two or more cylinders				Mills (low speed end)	1.75	1.75	1.75
Rotary				Textile industry			
Gear type	1.00	1.00	1.25	Batchers	1.25	1.25	1.50
Lobe	1.00	1.00	1.25	Calendars	1.25	1.25	1.50
Vane	1.00	1.00	1.25	Cards	1.25	1.25	1.50
Rubber industry				Dry cans	1.25	1.25	1.50
Intensive internal mixers				Dryers	1.25	1.25	1.50
Batch mixers	1.75	1.75	1.75	Dyeing machinery	1.25	1.25	1.50
Continuous mixers	1.50	1.50	1.50	Looms	1.25	1.25	1.50
Mixing mill - two smooth rolls (if cor- rugated rolls are used, then use the same selection factors that are used for a cracker warmer).	1.50	1.50	1.50	Mangles	1.25	1.25	1.50
Batch drop mill - two smooth rolls	1.50	1.50	1.50	Nappers	1.25	1.25	1.50
Cracker warmer - two rolls; one corrugated roll	1.75	1.75	1.75	Pads	1.25	1.25	1.50
Cracker - two corrugated rolls.				Slashers	1.25	1.25	1.50
Holding, feed and blend mill - two rolls	2.00	2.00	2.00	Soapers	1.25	1.25	1.50
Refiner - two rolls	1.25	1.25	1.25	Spinners	1.25	1.25	1.50
Calendars	1.50	1.50	1.50	Tenter frames	1.25	1.25	1.50
	1.50	1.50	1.50	Washers	1.25	1.25	1.50
				Winders	1.25	1.25	1.50

This application guide is given by way of an example and therefore, may not include all the possible cases.

Should the application not be referable to any of the listed cases, the table below gives two service factors -  $F_1$  referred to both load type and work duration, and  $F_2$  to starts and stops of duty cycle - of which the product is the gearbox oversizing coefficient to have a torque good enough for the required work.

Application: Conveyor 1000 in-lb @ 84 rpm - uniform load - 24 hrs/day give  $F_1=1.4$ ; 6 start/stops per hour gives  $F_2= 1.0$ ;

Required torque  $1000 \times 1.4 (F_1) \times 1.0 (F_2) = 1400$  in-lb

Gearbox to select FRD22 1/20 (84 rpm) 1682 in-lb; i.e. the gearbox size with torque greater than 1400 in-lb

Gearbox service factor:  $SF1.7 = 1682$  in-lb : 1000 in-lb

### SERVICE FACTOR

$$SF = F_1 \times F_2$$

$F_1$  = Load & Operation factor

$F_2$  = Start/stop factor

	$F_1$	Uniform load	Variable load	Shock load	Start/stops per hour	$F_2$
8 hrs		0.8	1.1	1.4	6	1.0
16 hrs		1.0	1.3	1.5	600	1.2
24 hrs		1.2	1.4	1.6	1200	1.3

# Gearboxes - Series RN-RO-RV

External loads

## OUTPUT RADIAL LOADS

### OUTPUT RADIAL LOADS (OHL)

Overhung (radial) loads ( $F_r$ ) should be checked according to output speed, mounting position (A) and type of the transmission element (B) fitted on the gearbox output shaft and rectified when applicable by the appropriate  $k_T$  rating factor.

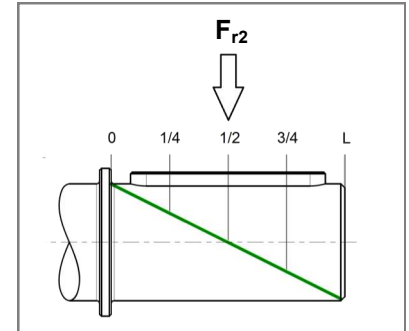
#### Application point of radial load

OHL is considered as applied at the output shaft mid-point.

Other positions origin loads to be adjusted with the appropriate factor  $k_L$ .

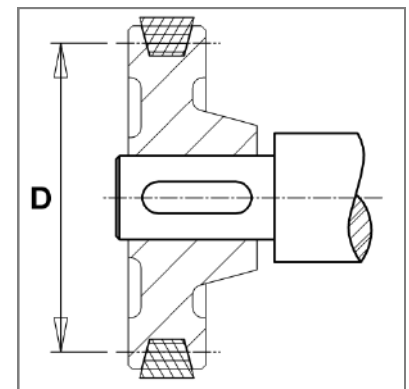
Examples of load distance from the shaft shoulder:

$k_L$	L
1.1	$1/4 * L$
1.0	$1/2 * L$
0.9	$3/4 * L$
0.8	L



#### Transmission element

$k_T$	Type of transmission element
1,15	Gear tooth No. < 17
1,40	Chain sprocket tooth No. < 13
1,25	tooth No. < 20
1,00	tooth No. > 20
2,50	Pulley for V-belt
1,25	toothed-belt



#### Overhung (radial) load - $F_{r2}$

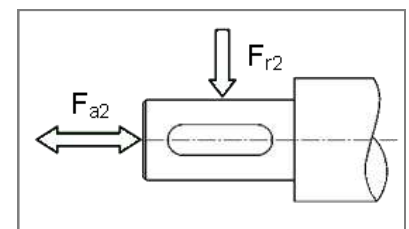
$$F_{r2} = \frac{2000 * M_2}{D} \times k_L \times k_T$$

## OUTPUT AXIAL LOADS

### Axial load - $F_{a2}$

$$F_{a2} = F_{r2} \times 0.2$$

Axial load value is included within the catalogue radial load figures and is valid on both tensile and compressive stress.

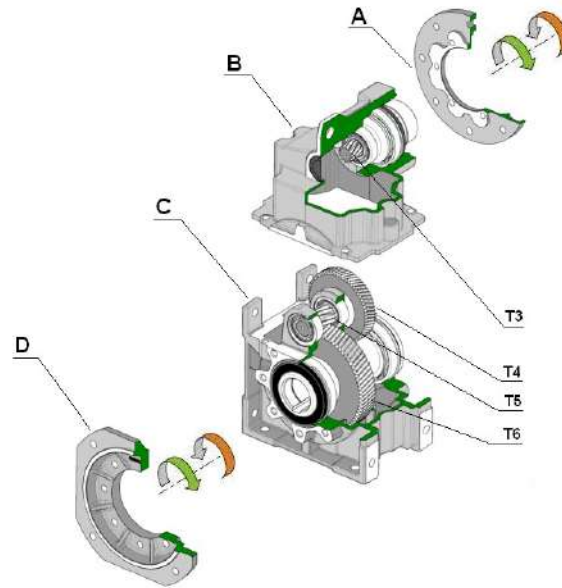
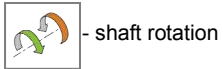


# Gearboxes - Series RN-RO-RV

## Component kits and Direction of rotation - RN

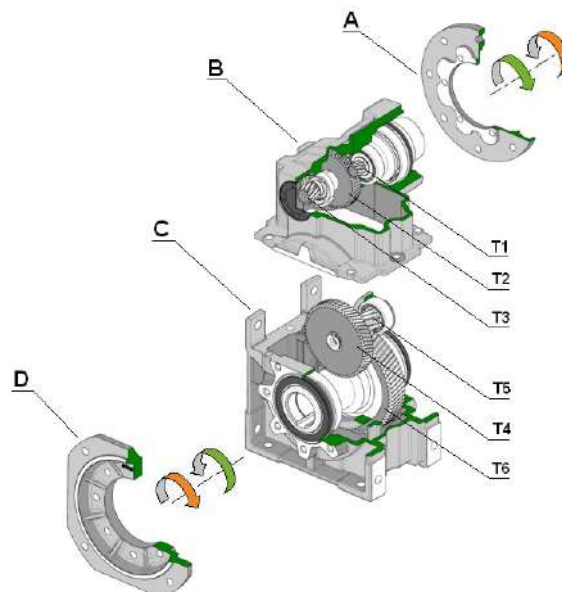
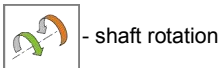
### Two stage parallel shaft gearbox - RN 2

- A - NEMA / IEC motor adapter
- B - 2-stage input cover with T3 gear
- C - Housing with T4, T5, T6 gears
- D - Output flange



### Three stage parallel shaft gearbox - RN 3

- A - NEMA / IEC motor adapter
- B - 3-stage input cover with T1, T2, T3 gears
- C - Housing with T4, T5, T6 gears
- D - Output flange

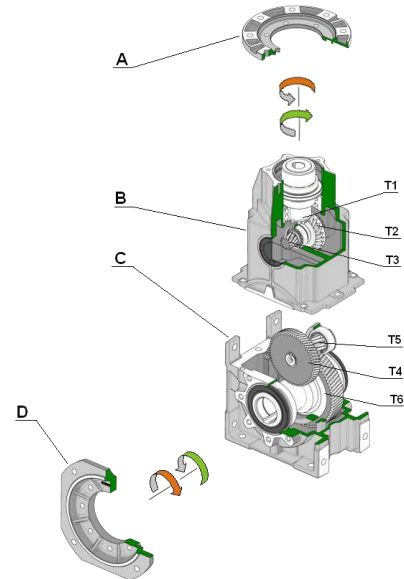
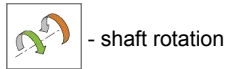


## Gearboxes - Series RN-RO-RV

RO-RV - Component kits and Direction of rotation

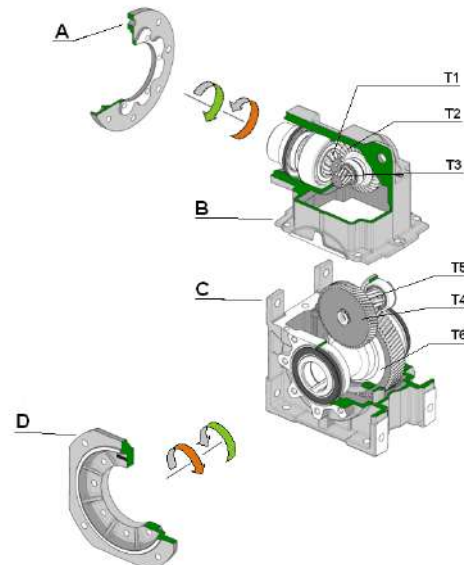
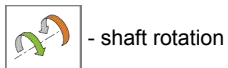
### Three stage bevel helical gearbox, in-line input - RO 3

- A - NEMA / IEC motor adapter
- B - 3-stage input cover with T1, T2, T3 gears
- C - Housing with T4, T5, T6 gears
- D - Output flange



### Three stage bevel helical gearbox, right-angle input - RV 3

- A - NEMA / IEC motor adapter
- B - 3-stage input cover with T1, T2, T3 gears
- C - Housing with T4, T5, T6 gears
- D - Output flange



## Gearboxes - Series RN-RO-RV

### RN Versions - Parallel shaft gearbox

#### MRN17,5

Geared motors with two and three stages  
Powers: 0.33 HP to 10 HP, 4 poles  
Output speed: 250 rpm to 2.5 rpm

#### FRN

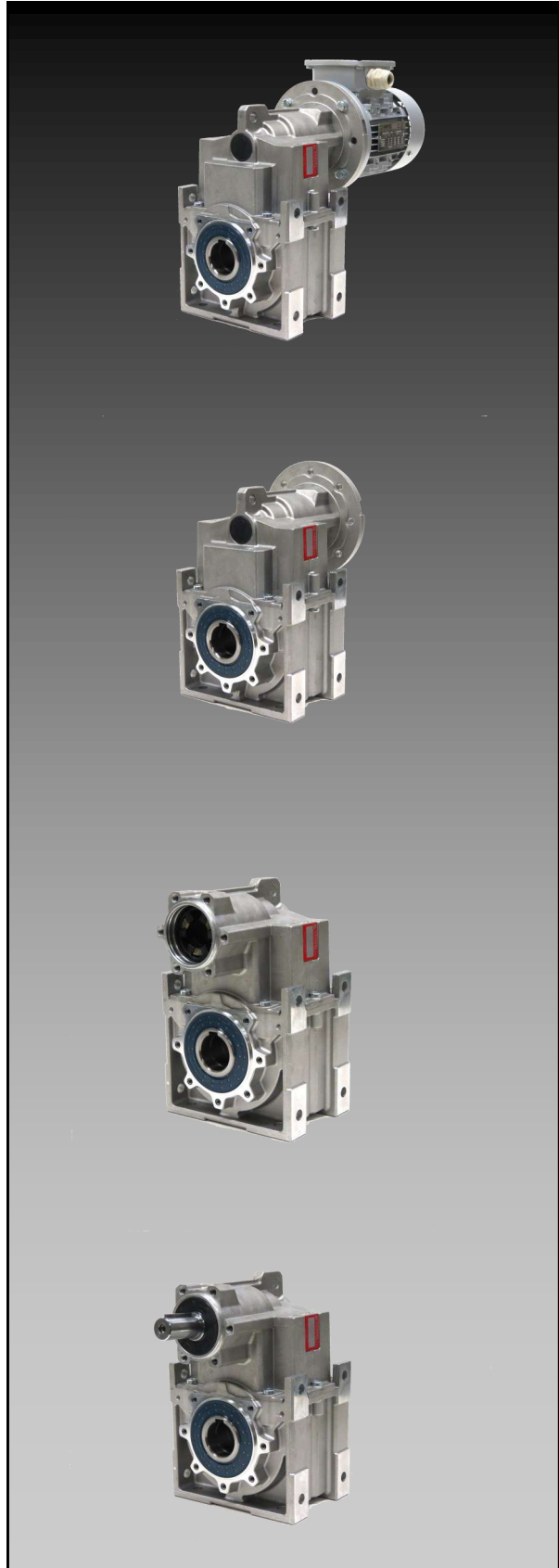
Gearboxes with two and three stages - input motor flange, input quill and flexible coupling  
Motor flanges: NEMA 56C to NEMA 210TC and IEC 56 to IEC 180  
Output torque: 1060 in-lb [120 Nm ] to 30100 in-lb [3400 Nm]  
Reduction ratios: 6.3:1 to 710:1

#### SRN

Gearboxes with two and three stages -input quill and flexible coupling but without input motor flange  
Output torque: 1060 in-lb [120 Nm ] to 30100 in-lb [3400 Nm]  
Reduction ratios: 6.3:1 to 710:1

#### RN

Gearboxes with two and three stages with input solid shaft  
Output torque: 1060 in-lb [120 Nm ] to 30100 in-lb [3400 Nm]  
Reduction ratios: 6.3:1 to 710:1





## Gearboxes - Series RN-RO-RV

Bevel helical gearbox - RO-RV Versions

**MRO - in-line version**  
**MRV - right-angle version**

Geared motors with three gear stages  
Powers: 0.33 HP to 10 HP, 4 poles  
Output speed: 215 rpm to 4.0 rpm



**FRO - in-line version**  
**FRV - right-angle version**

Gearboxes with three stages - input motor flange, input quill and flexible coupling  
Motor flanges: NEMA 56C to NEMA 210TC and IEC 56 to IEC 180  
Output torque: 1060 in-lb [120 Nm ] to 30100 in-lb [3400 Nm]  
Reduction ratios: 6.3:1 to 315:1



**SRO - In-line version**  
**SRV - right-angle version**

Gearboxes with three stages - input quill and flexible coupling but without input motor flange  
Output torque: 1060 in-lb [120 Nm ] to 30100 in-lb [3400 Nm]  
Reduction ratios: 6.3:1 to 315:1



**RO - In-line version**  
**RV - right-angle version**

Gearboxes with three stages with input solid shaft  
Output torque: 1060 in-lb [120 Nm ] to 30100 in-lb [3400 Nm]  
Reduction ratios: 6.3:1 to 710:1





## Gearboxes - Series RN-RO-RV

1800 rpm

RO-RV - Thermal power

### Thermal power

**Rated power ( $P_1$ )** is the power that can be applied at the gearbox input, on continuous operation, max. temperature of 104 °F, max. altitude 3280 ft, air speed of 410 ft/s, without exceeding the oil temperature of about 185 °F.

**Thermal power ( $P_{t1}$ )** may limit the rated power (shaded area) depending on input speed, ambient temperature, service factor and cooling system.

	FRO13-FRV13			FRO23-FRV23			FRO33-FRV33			FRO43-FRV43			FRO53-FRV53			FRO63-FRV63		
	$i_n$	$P_1$ [HP]	$P_{t1}$ [HP]	$i_n$	$P_1$ [HP]	$P_{t1}$ [HP]	$i_n$	$P_1$ [HP]	$P_{t1}$ [HP]	$i_n$	$P_1$ [HP]	$P_{t1}$ [HP]	$i_n$	$P_1$ [HP]	$P_{t1}$ [HP]	$i_n$	$P_1$ [HP]	$P_{t1}$ [HP]
3c	7.1	4.34	5.26	6.3	7.56	2.73	6.3	16.40	7.99	6.3	17.85	14.44	6.3	36.02	22.03	6.3	64.80	19.54
	9.0	3.54	4.97	8.0	6.59	2.78	8.0	13.67	7.91	8.0	15.92	13.84	8.0	32.16	21.23	8.0	51.30	20.60
	10.0	3.70	5.18	9.0	6.27	2.59	9.0	10.45	7.46	9.0	18.65	12.51	10.0	28.30	20.08	10.0	45.83	20.57
	11.2	3.22	4.98	10.0	5.95	2.77	10.0	12.38	7.67	10.0	14.63	13.15	12.5	26.69	18.94	12.5	41.33	19.91
	14.0	2.41	4.70	11.2	4.98	2.64	11.2	8.20	7.32	11.2	14.79	11.34	14.0	19.30	17.54	14.0	30.39	19.68
	16.0	2.73	4.63	12.5	5.31	2.73	12.5	10.61	7.45	12.5	12.70	11.66	16.0	22.67	17.96	16.0	36.34	18.86
	18.0	1.93	4.37	14.0	4.02	2.62	14.0	8.52	6.29	14.0	9.33	11.00	18.0	17.37	17.00	18.0	27.34	19.28
	20.0	2.25	4.28	16.0	4.66	2.62	16.0	8.36	7.01	16.0	11.26	10.73	20.0	19.62	16.40	20.0	31.20	17.66
	22.4	1.77	3.89	18.0	3.54	4.49	18.0	7.40	6.14	18.0	8.68	10.61	22.4	15.60	16.34	22.4	24.76	18.88
	25.0	1.54	3.76	20.0	3.86	2.54	20.0	5.15	5.95	20.0	9.65	9.54	25.0	15.60	14.63	25.0	22.67	18.04
	28.0	1.46	3.54	22.4	3.06	4.33	22.4	6.43	6.24	22.4	7.88	10.05	28.0	14.15	15.66	28.0	22.35	18.25
	31.5	1.30	3.54	25.0	3.06	2.24	25.0	5.31	5.76	25.0	8.04	8.89	31.5	13.35	14.60	31.5	22.51	15.42
	35.5	1.06	2.97	28.0	2.89	4.16	28.0	3.54	5.00	28.0	6.91	9.57	35.5	12.38	14.86	35.5	19.94	17.38
	40	1.09	3.33	31.5	1.93	4.13	31.5	4.18	5.32	31.5	6.91	8.97	40	10.29	13.48	40	17.37	16.14
	45	0.88	3.07	35.5	2.25	3.94	35.5	4.02	5.42	35.5	6.27	7.69	45	9.97	13.67	45	14.79	13.11
	50	0.90	3.10	40	1.93	3.97	40	3.54	4.86	45	4.98	6.30	50	8.36	12.90	50	16.56	15.31
	56	0.59	2.96	45	1.77	3.79	45	3.22	4.98	50	4.82	6.61	56	7.72	12.45	56	14.95	14.52
	63	0.69	2.86	50	1.48	3.78	50	2.89	4.61	56	4.50	6.24	63	6.75	12.03	63	13.02	14.39
	71	0.58	2.72	56	1.42	3.39	56	2.73	4.70	63	3.86	5.84	71	5.79	12.03	71	11.10	13.70
	80	0.48	2.56	63	1.19	3.65	63	1.61	4.76	71	3.38	5.52	80	4.02	11.55	80	9.97	13.12
	90	0.48	2.52	71	0.96	3.47	71	2.09	4.28	80	3.06	5.26	90	4.82	9.92	90	9.33	12.69
	100	0.43	2.41	80	0.95	3.30	80	1.77	4.05	90	2.57	4.87	100	4.50	11.11	100	8.36	12.91
	112	0.34	2.41	90	0.85	3.38	90	1.13	3.94	100	2.25	5.08	112	3.86	10.69	112	7.08	11.67
	125	0.35	2.25	100	0.63	3.17	100	1.38	3.88	112	2.25	4.76	125	3.70	9.68	125	4.82	11.98
	140	0.29	2.11	112	0.68	3.07	112	1.29	3.54	125	1.61	4.44	140	3.22	9.73	140	5.95	12.46
	160	0.26	1.98	125	0.53	3.18	125	0.96	3.60	140	1.61	4.21	160	2.89	9.41	160	5.47	11.95
	180	0.21	1.91	140	0.45	2.94	140	0.98	3.39	160	1.14	3.57	180	1.93	8.83	180	3.54	10.42
	200	0.19	1.91	160	0.42	2.91	160	0.66	3.38	180	1.08	3.81	200	1.61	8.97	224	2.89	10.26
	224	0.16	1.85	180	0.39	2.75	180	0.69	3.17	200	0.98	3.47	224	1.48	8.55	280	2.41	9.49
	250	0.14	1.77	200	0.32	2.80	200	0.51	3.25	224	0.82	3.57	250	1.32	8.41	315	2.09	9.20
	315	0.10	1.58	224	0.27	2.59	250	0.43	3.06	250	0.74	3.23	315	1.06	7.67			
			250	0.26	2.46	280	0.40	2.94	280	0.66	3.17							
			315	0.21	2.32	315	0.32	2.69										

3c - Number of reduction stages

# Gearboxes - Series RN-RO-RV

Selection RN12 - RN13

1800 rpm

SF1.0 - 4 poles

	$i_n$	$i_r$	$n_2$	$M_2$	$P_1$	$F_{r1}$	$F_{r2}$	$J_1 (x 10^{-4})$	NEMA frame	
	nominal	actual	[rpm]	[in-lb]	[HP]	[lb]	[lb]	[lb × ft <sup>2</sup> ]	56	140
<b>RN12</b> 2c	7.1	6.59	272.6	1106	5.0	236	753	19.9667	G5	G5
	8	7.95	226.3	1151	4.3	247	780	18.0351	G5	G5
	9	8.32	216.0	1239	4.5	232	805	16.1034	G5	G5
	10	10.11	177.4	1328	4.0	227	785	13.8799	G5	G5
	12.5	12.19	147.9	1151	2.8	250	780	12.8524	G5	G5
	14	13.17	136.3	1460	3.3	225	776	11.8225	G5	G5
	16	15.87	113.4	1239	2.2	250	776	11.2055	G5	G5
	18	16.65	108.1	1460	2.6	238	800	10.5885	G5	G5
	20	20.29	88.7	1505	2.2	250	834	9.8457	G5	G5
	22.4	25.37	71.0	1505	1.7	254	866	9.2359	G5	---
	31.5	30.59	58.9	1239	1.2	286	915	8.9914	G5	---
	33	33	54.5	1416	1.3	277	964	8.7446	G5	---
	35.5	36.47	49.4	1239	1.02	299	1057	8.6046	G5	---
	40	39.78	45.3	1239	0.93	319	1095	8.6260	G5	---
	45	43.96	40.9	1239	0.84	319	1102	8.5073	G5	---
	50	48.98	36.8	1239	0.76	319	1102	8.3982	G5	---
56	52.07	34.6	974	0.55	319	1158	8.3033	G5	---	
60	62.78	28.7	1062	0.50	330	1214	8.2083	G5	---	
<b>RN13</b> 3c	40	39.52	45.5	1283	0.98	191	1071	6.0607	G5	---
	50	48.04	37.4	1372	0.86	214	1034	5.9611	G5	---
	63	62.54	28.8	1505	0.72	241	967	5.8709	G5	---
	80	79.1	22.8	1593	0.60	256	899	5.8163	G5	---
	100	96.36	18.6	1593	0.50	270	899	5.7831	G5	---
	125	120.51	14.9	1593	0.40	281	899	5.7570	G5	---
	160	156.75	11.5	1549	0.29	292	922	5.7333	G5	---
	180	173.22	10.4	1328	0.24	301	1079	5.7285	G5	---
	200	203.91	8.8	1328	0.19	297	1079	5.5197	G5	---
	250	265.22	6.8	1328	0.16	304	1079	5.5102	G5	---
	280	293.09	6.1	1328	0.14	306	1079	5.5078	G5	---
	315	326.53	5.5	1328	0.12	306	1079	5.5054	G5	---
	400	418.5	4.3	1062	0.07	324	1192	5.5007	G5	---

**2c & 3c** - Number of stages  
G5 - Coupling size

	Oil [ US qt / litres ]						Weight [ lb / kg ]
	H1	H2	H3	H4	V1	V2	
FRN12	0.6 / 0.5	0.7 / 0.6	0.5 / 0.4	0.7 / 0.6	0.7 / 0.6	0.7 / 0.6	11.9 / 5.4
FRN13	0.6 / 0.5	0.5 / 0.4	0.3 / 0.3	0.3 / 0.3	0.7 / 0.6	0.5 / 0.4	12.1 / 5.5

## Gearboxes - Series RN-RO-RV

SF1.0 - 4 poles

1800 rpm

Selection RO 13 - RV 13

	$i_n$	$i_r$	$n_2$	$M_2$	$P_1$	$F_{r1}$	$F_{r2}$	$J_1 (x 10^{-4})$	NEMA frame	
	nominal	actual	[rpm]	[in-lb]	[HP]	[lb]	[lb]	[lb × ft <sup>2</sup> ]	56	140
<b>RO13</b> <b>RV13</b> 3c	7.1	7.58	237.9	1151	4.7	348	744	27.7645	G5	G5
	9	9.14	196.7	1151	3.8	355	841	25.5196	G5	G5
	10	9.57	187.7	1239	4.0	355	809	24.8433	G5	G5
	11.2	11.63	154.3	1328	3.4	357	803	23.1632	G5	G5
	14	14.02	128.6	1151	2.6	360	908	22.2069	G5	G5
	16	15.14	118.9	1460	2.9	360	798	21.6065	G5	G5
	18	18.25	98.6	1195	2.1	362	953	21.0441	G5	G5
	20	19.15	94.0	1505	2.4	362	825	20.6739	G5	G5
	22.4	23.33	77.1	1505	1.9	362	859	20.1139	G5	G5
	25	24.44	73.7	1328	1.7	360	933	8.4646	G5	G5
	28	29.18	61.7	1505	1.6	362	890	19.6511	G5	G5
	31.5	31.82	56.6	1460	1.4	360	926	8.1110	G5	---
	35.5	37.95	47.4	1416	1.14	362	996	19.2809	G5	---
	40	40.25	44.7	1549	1.17	362	922	7.8998	G5	---
	45	47.88	37.5	1505	0.95	360	967	6.4475	G5	---
	50	49.02	36.8	1549	0.97	362	922	7.7741	G5	---
	56	59.1	30.5	1239	0.64	362	1084	7.7195	G5	---
	63	61.31	29.3	1505	0.74	362	899	7.6673	G5	---
	71	73.77	24.4	1505	0.62	362	899	6.2980	G5	---
	80	84.93	21.2	1460	0.52	362	989	5.7926	G5	---
	90	92.26	19.5	1593	0.52	362	899	6.2506	G5	---
	100	103.46	17.4	1593	0.47	362	899	5.7641	G5	---
	112	111.22	16.2	1328	0.36	362	1079	6.2363	G5	---
	125	129.39	13.9	1593	0.38	362	899	5.7404	G5	---
	140	132.61	13.6	1328	0.31	362	1057	6.2031	G5	---
	160	168.3	10.7	1549	0.28	362	922	5.7214	G5	---
	180	185.98	9.7	1328	0.22	362	1057	5.7166	G5	---
	200	202.9	8.9	1328	0.21	362	1079	5.7143	G5	---
	224	224.22	8.0	1328	0.17	362	1079	5.7119	G5	---
	250	249.8	7.2	1328	0.16	362	1079	5.7072	G5	---
315	320.513	5.6	1151	0.10	306	1079	5.5054	G5	---	

3c - Number of stages

G5 - Coupling size

	Oil [ US qt / litres ]						Weight [ lb / kg ]
	H1	H2	H3	H4	V1	V2	
FRO13	0,6 / 0,5	0,5 / 0,4	0,5 / 0,4	0,5 / 0,4	0,5 / 0,4	0,5 / 0,4	14,1 / 6,4
FRV13	0,6 / 0,5	0,4 / 0,3	0,3 / 0,2	0,4 / 0,3	0,5 / 0,4	0,5 / 0,4	13,4 / 6,1

# Gearboxes - Series RN-RO-RV

Selection RN22 - RN23

1800 rpm

SF1.0 - 4 poles

	$i_n$	$i_r$	$n_2$	$M_2$	$P_1$	$F_{r1}$	$F_{r2}$	$J_1 (x 10^{-4})$	NEMA frame	
	nominal	actual	[rpm]	[in-lb]	[HP]	[lb]	[lb]	[lb × ft <sup>2</sup> ]	56	140
<b>RN22</b> 2c	7.1	6.59	272.6	1106	5.0	236	753	19.9667	G5	G5
	8	7.95	226.3	1151	4.3	247	780	18.0351	G5	G5
	9	8.32	216.0	1239	4.5	232	805	16.1034	G5	G5
	10	10.11	177.4	1328	4.0	227	785	13.8799	G5	G5
	12.5	12.19	147.9	1151	2.8	250	780	12.8524	G5	G5
	14	13.17	136.3	1460	3.3	225	776	11.8225	G5	G5
	16	15.87	113.4	1239	2.2	250	776	11.2055	G5	G5
	18	16.65	108.1	1460	2.6	238	800	10.5885	G5	G5
	20	20.29	88.7	1505	2.2	250	834	9.8457	G5	G5
	22.4	25.37	71.0	1505	1.7	254	866	9.2359	G5	---
	31.5	30.59	58.9	1239	1.2	286	915	8.9914	G5	---
	33	33	54.5	1416	1.3	277	964	8.7446	G5	---
	35.5	36.47	49.4	1239	1.02	299	1057	8.6046	G5	---
	40	39.78	45.3	1239	0.93	319	1095	8.6260	G5	---
	45	43.96	40.9	1239	0.84	319	1102	8.5073	G5	---
	50	48.98	36.8	1239	0.76	319	1102	8.3982	G5	---
56	52.07	34.6	974	0.55	319	1158	8.3033	G5	---	
60	62.78	28.7	1062	0.50	330	1214	8.2083	G5	---	
<b>RN23</b> 3c	40	39.52	45.5	1283	0.98	191	1071	6.0607	G5	---
	50	48.04	37.4	1372	0.86	214	1034	5.9611	G5	---
	63	62.54	28.8	1505	0.72	241	967	5.8709	G5	---
	80	79.1	22.8	1593	0.60	256	899	5.8163	G5	---
	100	96.36	18.6	1593	0.50	270	899	5.7831	G5	---
	125	120.51	14.9	1593	0.40	281	899	5.7570	G5	---
	160	156.75	11.5	1549	0.29	292	922	5.7333	G5	---
	180	173.22	10.4	1328	0.24	301	1079	5.7285	G5	---
	200	203.91	8.8	1328	0.19	297	1079	5.5197	G5	---
	250	265.22	6.8	1328	0.16	304	1079	5.5102	G5	---
	280	293.09	6.1	1328	0.14	306	1079	5.5078	G5	---
	315	326.53	5.5	1328	0.12	306	1079	5.5054	G5	---
	400	418.5	4.3	1062	0.07	324	1192	5.5007	G5	---

2c & 3c - Number of stages  
G5 - Coupling size

	Oil [ US qt / litres ]						Weight [ lb / kg ]
	H1	H2	H3	H4	V1	V2	
FRN22	0.5 / 0.5	0.6 / 0.6	0.4 / 0.4	0.6 / 0.6	0.6 / 0.6	0.6 / 0.6	11.9 / 5.4
FRN23	0.5 / 0.5	0.4 / 0.4	0.3 / 0.3	0.3 / 0.3	0.6 / 0.6	0.4 / 0.4	12.1 / 5.5

## Gearboxes - Series RN-RO-RV

SF1.0 - 4 poles

1800 rpm

Selection RO 23 - RV 23

	$i_n$	$i_r$	$n_2$	$M_2$	$P_1$	$F_{r1}$	$F_{r2}$	$J_1 (x 10^{-4})$	NEMA frame	
	nominal	actual	[rpm]	[in-lb]	[HP]	[lb]	[lb]	[lb × ft <sup>2</sup> ]	56	140
<b>RO23</b> <b>RV23</b> 3c	6.3	6.62	271.8	1770	8.1	652	753	88.3481	G6	G6
	8	8.47	212.5	1947	7.1	652	814	81.2172	G6	G6
	9	8.97	200.6	1991	6.7	652	834	82.1616	G6	G6
	10	10.43	172.7	2168	6.4	652	870	77.1213	G6	G6
	11.2	11.48	156.9	2036	5.3	674	908	77.4369	G6	G6
	12.5	13.03	138.1	2434	5.7	674	881	73.9794	G6	G6
	14	14.13	127.4	2036	4.3	674	976	74.6272	G6	G6
	16	16.68	107.9	2699	5.0	674	814	71.5233	G6	G6
	18	17.8	101.1	2213	3.8	674	1007	32.3279	G6	G6
	20	20.55	87.6	2744	4.1	674	836	70.0307	G6	---
	22.4	21.91	82.2	2390	3.3	674	994	31.4000	G6	---
	25	26.07	69.0	2744	3.3	674	884	68.7943	G6	---
	28	27.39	65.7	2744	3.10	674	940	30.6881	G6	---
	31.5	32.97	54.6	2301	2.07	674	1115	25.6169	G6	---
	35.5	35.06	51.3	2744	2.41	674	949	30.1328	G6	---
	40	41.21	43.7	2744	2.07	674	1034	25.3013	G6	---
	45	43.18	41.7	2744	1.90	674	1000	29.7935	G6	---
	50	52.75	34.1	2744	1.59	674	1052	25.0569	G6	---
	56	54.78	32.9	2744	1.52	674	1061	29.5134	G6	---
	63	64.97	27.6	2744	1.28	674	1108	24.9074	G6	---
	71	73.98	24.3	2522	1.03	674	1239	23.1703	G6	---
	80	82.42	21.9	2744	1.02	674	1147	24.7840	G6	---
	90	91.12	19.8	2744	0.91	674	1147	23.0944	G6	---
	100	106.6	16.8	2390	0.67	674	1349	24.6914	G6	---
	112	115.6	15.6	2744	0.72	674	1147	23.0327	G6	---
	125	123.47	14.6	2301	0.57	674	1394	23.0683	G6	---
	140	149.51	12.0	2390	0.48	674	1349	22.9852	G6	---
	160	156.64	11.5	2301	0.45	674	1394	23.0161	G6	---
	180	170.11	10.6	2301	0.41	674	1394	24.6345	G6	---
	200	202.59	8.9	2301	0.34	674	1394	22.9757	G6	---
	224	238.58	7.5	2301	0.29	674	1394	22.9568	G6	---
250	261.07	6.9	2301	0.28	674	1394	22.9473	G6	---	
315	319.55	5.6	2301	0.22	674	1394	22.9330	G6	---	

3c - Number of stages

G6 - Coupling size

	Oil [ US qt / litres ]						Weight [ lb / kg ]
	H1	H2	H3	H4	V1	V2	
FRO23	0.8 / 0.7	0.9 / 0.8	0.6 / 0.5	0.9 / 0.8	0.8 / 0.7	0.8 / 0.7	19.0 / 8.6
FRV23	0.8 / 0.7	0.7 / 0.6	0.5 / 0.4	0.7 / 0.6	0.8 / 0.7	0.8 / 0.7	20.1 / 9.1

# Gearboxes - Series RN-RO-RV

Selection RN32 - RN33

1800 rpm

SF1.0 - 4 poles

	$i_n$	$i_r$	$n_2$	$M_2$	$P_1$	$F_{r1}$	$F_{r2}$	$J_1 (x 10^{-4})$	NEMA frame	
	nominal	actual	[rpm]	[in-lb]	[HP]	[lb]	[lb]	[lb × ft <sup>2</sup> ]	56	140
<b>RN32</b> 2c	6.3	5.59	321.4	3540	18.8	400	1070	115.5289	G6	G6
	7.1	7.17	250.7	3806	15.9	425	1165	90.7259	G6	G6
	8	7.9	227.6	3275	12.2	472	1216	93.2318	G6	G6
	9	8.84	203.1	4248	14.3	402	1165	76.3548	G6	G6
	10	10.13	177.4	3363	9.8	488	1324	77.1593	G6	G6
	11.2	11.06	163.3	4691	12.6	---	1023	65.1778	G6	G6
	12.5	12.49	144.0	3363	7.9	490	1423	67.4227	G6	G6
	14	14.18	127.0	4779	10.0	420	1057	56.2884	G6	G6
	16	15.63	115.2	3452	6.6	490	1536	59.4754	G6	G6
	18	18.84	95.5	4868	7.8	454	1093	49.1622	G6	G6
	20	20.03	89.9	3452	5.2	490	1664	52.8143	G6	G6
	22.4	22.18	81.1	4868	6.6	---	1124	46.1698	G6	G6
	25	26.62	67.6	3540	3.97	490	1742	47.1949	G6	G6
	28	28.93	62.2	4779	5.00	362	1248	42.6007	G6	G6
	31.5	31.33	57.5	3540	3.28	490	1781	44.7507	G6	---
	35.5	34.5	52.2	3983	3.45	454	1646	40.8661	G6	---
40	40.87	44.1	3717	2.76	490	1855	41.7654	G6	---	
45	47.5	37.9	2832	1.72	490	2122	38.7042	G6	---	
<b>RN33</b> 3c	50	48.74	36.9	3717	2.24	490	1918	40.2799	G6	---
	56	53.75	33.4	3717	2.07	490	1942	39.6036	G6	---
	63	67.1	26.9	3717	1.72	490	2030	38.3957	G6	---
	40	35.86	50.1	4337	3.62	362	1538	29.1741	G6	---
	45	44.2	40.8	4868	3.28	---	1326	28.5998	G6	---
	56	55.31	32.5	5133	2.76	369	1237	28.1537	G6	---
	71	70.88	25.5	5133	2.24	438	1237	27.7977	G6	---
	80	80.62	22.4	2345	0.88	486	2446	25.3417	G6	---
	90	94.22	19.2	5133	1.66	486	1237	27.5130	G6	---
	100	103.34	17.4	3009	0.88	488	2412	25.1874	G6	---
	112	110.89	16.2	5133	1.41	501	1237	27.3920	G6	---
	125	127.37	14.1	3717	0.88	486	2181	25.0949	G6	---
	140	144.64	12.5	5133	1.09	517	1237	27.2496	G6	---
	160	159.41	11.3	3806	0.72	504	2113	25.0165	G6	---
	180	172.5	10.4	4248	0.74	517	1933	27.1808	G6	---
	200	204.26	8.9	3806	0.57	517	2113	24.9525	G6	---
	224	237.5	7.6	2832	0.36	517	2496	27.0930	G6	---
	280	271.53	6.7	3806	0.43	517	2113	24.9003	G6	---
315	319.58	5.7	3806	0.36	517	2113	24.8765	G6	---	
400	416.85	4.4	3806	0.28	517	2113	24.8481	G6	---	
500	497.13	3.6	3806	0.22	517	2113	24.8338	G6	---	
560	548.22	3.3	3806	0.21	517	2113	24.8267	G6	---	
710	684.45	2.7	3806	0.17	517	2113	24.8148	G6	---	

2c & 3c - Number of stages

G6 - Coupling size

	Oil [ US qt / litres ]						Weight [ lb / kg ]
	H1	H2	H3	H4	V1	V2	
FRN32	1.2 / 1.1	1.4 / 1.3	0.9 / 0.8	1.4 / 1.3	1.3 / 1.2	1.3 / 1.2	27.6 / 12.5
FRN33	1.3 / 1.2	1.1 / 1.0	0.6 / 0.6	1.1 / 1.0	1.3 / 1.2	1.1 / 1.0	28.7 / 13.0



## Gearboxes - Series RN-RO-RV

SF1.0 - 4 poles

1800 rpm

Selection RO 33 - RV 33

	$i_n$	$i_r$	$n_2$	$M_2$	$P_1$	$F_{r1}$	$F_{r2}$	$J_1 (x 10^{-4})$	NEMA frame	
	nominal	actual	[rpm]	[in-lb]	[HP]	[lb]	[lb]	[lb × ft <sup>2</sup> ]	56	140
<b>RO33</b> <b>RV33</b> 3c	6.3	6.43	279.8	3717	17.6	1023	1122	186.1623	G6	G6
	8	8.25	218.2	3983	14.7	1246	1221	167.4082	G6	G6
	9	9.09	198.0	3363	11.2	1284	1277	168.8202	G6	G6
	10	10.17	177.0	4425	13.3	1266	1120	156.5397	G6	G6
	11.2	11.65	154.5	3363	8.8	1288	1389	156.8553	G6	G6
	12.5	12.72	141.4	4779	11.4	1284	1043	148.0893	G6	G6
	14	13.52	133.1	4071	9.1	1241	1342	53.6354	G6	G6
	16	16.3	110.4	4779	9.0	1288	1079	141.3689	G6	G6
	18	17.33	103.9	4514	7.9	1277	1228	49.3876	G6	G6
	20	19.1	94.2	3452	5.5	1288	1643	49.8171	G6	G6
	22.4	21.67	83.1	4868	6.9	1290	1117	135.9797	G6	G6
	25	26.73	67.4	4956	5.7	1288	1153	45.0141	G6	G6
	28	28.74	62.6	3540	3.79	1290	1754	34.7365	G6	G6
	31.5	33.27	54.1	4868	4.48	1290	1079	131.0177	G6	G6
	35.5	34.26	52.6	4956	4.31	1290	1207	43.4906	G6	G6
	40	40.23	44.7	5045	3.79	1290	1237	32.6150	G6	G6
	45	45.54	39.5	5045	3.45	1290	1254	42.2709	G6	G6
	50	51.55	35.0	5133	3.10	1290	1259	31.9411	G6	G6
	56	53.6	33.6	5133	2.93	1290	1259	41.7583	G6	G6
	63	64.33	28.0	3629	1.72	1290	2012	41.9244	G6	G6
	71	68.52	26.2	5133	2.24	1290	1237	31.4024	G6	G6
	80	80.65	22.4	5133	1.90	1290	1237	31.1769	G6	G6
	90	91.94	19.5	3629	1.21	1290	2154	40.7166	G6	---
	100	105.2	17.1	5133	1.48	1293	1237	30.9064	G6	---
	112	113.11	15.9	5133	1.38	1290	1237	27.3991	G6	---
	125	125.46	14.3	4248	1.03	1290	1911	30.7759	G6	---
	140	147.54	12.2	5133	1.05	1290	1237	27.2614	G6	---
	160	162.17	11.1	3806	0.71	1290	2113	40.4270	G6	---
	180	175.95	10.2	4337	0.74	1290	1844	27.1950	G6	---
	200	208.42	8.6	3806	0.55	1290	2113	27.2282	G6	---
	250	248.56	7.2	3806	0.47	1290	2113	27.1713	G6	---
	280	274.11	6.6	3806	0.43	1290	2113	27.1452	G6	---
	315	342.23	5.3	3806	0.34	1290	2113	27.1001	G6	---

3c - Number of stages  
G6 - Coupling size

	Oil [ US qt / litres ]						Weight [ lb / kg ]
	H1	H2	H3	H4	V1	V2	
FRO33	1.2 / 1.1	1.4 / 1.3	0.8 / 0.8	1.4 / 1.3	1.3 / 1.2	1.3 / 1.2	27.6 / 12.5
FRV33	1.3 / 1.2	1.1 / 1	0.6 / 0.6	1.1 / 1	1.3 / 1.2	1.1 / 1	28.7 / 13.0

# Gearboxes - Series RN-RO-RV

Selection RN42 - RN43

1800 rpm

SF1.0 - 4 poles

	$i_n$	$i_r$	$n_2$	$M_2$	$P_1$	$F_{r1}$	$F_{r2}$	$J_1 (x 10^{-4})$	NEMA frame		
	nominal	actual	[rpm]	[in-lb]	[HP]	[lb]	[lb]	[lb × ft <sup>2</sup> ]	56	140	180
<b>RN42</b> 2c	6.3	5.74	313.7	6019	31.0	---	1131	310.7325	G6	G6	G6
	7.1	7.26	248.1	6992	29.3	---	1167	256.2143	G6	G6	G6
	8	7.59	237.9	6107	24.1	454	1277	267.3795	G6	G6	G6
	9	9.08	198.0	7877	25.9	---	1272	219.6933	G6	G6	G6
	10	9.6	187.7	6107	19.0	540	1394	229.1285	G6	G6	G6
	11.2	11.55	155.6	8054	20.7	---	1387	192.2041	G6	G6	G6
	12.5	12	150.4	6196	15.5	587	1511	202.3583	G6	G6	G6
	14	14.09	127.7	8143	17.2	549	1531	175.8586	G6	G6	G6
	16	15.27	117.9	6284	12.2	612	1648	181.5017	G6	G6	G6
	18	17.59	102.3	8231	14.0	---	1666	162.3774	G6	G6	G6
	22.4	22.69	79.3	8320	10.9	470	1835	152.1804	G6	G6	G6
	28	28.28	63.6	7877	8.3	551	2005	144.7742	G6	G6	G6
	31.5	30	60.0	6461	6.38	641	2089	148.5568	G6	G6	---
	35.5	37.39	48.1	6550	5.17	643	2255	142.9897	G6	G6	---
	40	38.12	47.2	5753	4.48	629	2280	138.5426	G6	G6	---
	45	45.27	39.7	6638	4.31	652	2410	139.2379	G6	G6	---
50	50.4	35.7	6638	3.97	645	2498	137.5602	G6	G6	---	
56	56.67	31.8	6196	3.28	647	2608	136.0177	G6	G6	---	
<b>RN43</b> 3c	40	34.07	52.8	6461	5.69	---	2174	102.2826	G6	G6	---
	45	42.59	42.3	8054	5.69	---	2255	99.8051	G6	G6	---
	56	54.21	33.2	8674	4.83	456	2210	98.1464	G6	G6	---
	63	66.13	27.3	8762	3.97	510	2273	96.8982	G6	G6	---
	71	70.82	25.5	3629	1.55	679	2842	96.1554	G6	---	---
	80	82.52	21.9	8851	3.28	612	2363	90.0710	G6	---	---
	90	89.6	20.1	4514	1.55	679	3069	95.5432	G6	---	---
	100	106.48	16.8	8939	2.59	688	2457	89.6296	G6	---	---
	140	132.69	13.6	8408	1.90	735	2756	95.0425	G6	---	---
	160	160.69	11.2	6727	1.28	758	3280	94.7838	G6	---	---
	180	173.9	10.4	7081	1.24	713	3276	94.5489	G6	---	---
	200	201.13	9.0	4868	0.74	758	3750	88.9366	G6	---	---
	224	217	8.4	7081	0.98	742	3420	94.3828	G6	---	---
	280	280	6.4	7081	0.78	758	3604	88.8109	G6	---	---
	355	348.92	5.2	7081	0.62	758	3710	88.7065	G6	---	---
	450	422.55	4.3	7081	0.52	758	3710	88.6424	G6	---	---
500	470.4	3.8	7081	0.47	758	3710	88.5997	G6	---	---	
560	528.89	3.4	7081	0.41	758	3822	88.5807	G6	---	---	

2c & 3c - Number of stages  
G6 - Coupling size

	Oil [ US qt / litres ]						Weight
	H1	H2	H3	H4	V1	V2	[ lb / kg ]
FRN42	3.0 / 2.8	1.9 / 1.8	1.3 / 1.2	1.9 / 1.8	2.9 / 2.7	2.9 / 2.7	74.0 / 33.5
FRN43	2.6 / 2.5	1.6 / 1.5	1.0 / 0.9	1.69 / 1.5	2.3 / 2.2	2.0 / 1.9	79.4 / 36.0

## Gearboxes - Series RN-RO-RV

SF1.0 - 4 poles

1800 rpm

Selection RO 43 - RV 43

	$i_n$	$i_r$	$n_2$	$M_2$	$P_1$	$F_{r1}$	$F_{r2}$	$J_1 (x 10^{-4})$	NEMA frame		
	nominal	actual	[rpm]	[in-lb]	[HP]	[lb]	[lb]	[lb × ft <sup>2</sup> ]	56	140	180
<b>RO43</b> <b>RV43</b> 3c	6.3	6.6	272.7	4160	19.1	1275	1252	428.0981	G6	G6	G6
	8	8.35	215.5	4691	17.1	1290	1349	386.8737	G6	G6	G6
	9	8.72	206.5	5753	20.0	1250	1344	392.3435	G6	G6	G6
	10	10.43	172.5	5399	15.7	1297	1446	359.2587	G6	G6	G6
	11.2	11.04	163.0	5753	15.9	1290	1466	364.5339	G6	G6	G6
	12.5	13.29	135.5	5930	13.6	1299	1562	338.4732	G6	G6	G6
	14	13.87	129.7	4558	10.0	1266	1616	151.0129	G6	G6	G6
	16	16.21	111.1	6461	12.1	1299	1668	326.1145	G6	G6	G6
	18	17.55	102.6	5399	9.3	1281	1740	141.6797	G6	G6	G6
	20	20.22	89.0	6904	10.3	1299	1794	315.9199	G6	G6	G6
	22.4	21.94	82.0	6107	8.4	1290	1868	135.4268	G6	G6	G6
	25	26.1	68.9	7435	8.6	1299	1954	307.5668	G6	G6	G6
	28	27.92	64.4	6815	7.41	1299	2021	130.7187	G6	G6	G6
	31.5	32.52	55.4	7877	7.41	1302	2111	302.6096	G6	G6	G6
	35.5	34.06	52.8	7435	6.72	1299	2154	127.9209	G6	G6	---
	45	42.5	42.3	7435	5.34	1299	2253	125.6119	G6	G6	---
	50	51.25	35.1	8674	5.17	1299	2185	103.7563	G6	G6	---
	56	54.84	32.8	8674	4.83	1302	2203	123.7206	G6	G6	---
	63	63.95	28.2	8762	4.14	1299	2268	102.7358	G6	G6	---
	71	68.34	26.4	8143	3.62	1302	2466	122.5982	G6	G6	---
	80	82.52	21.9	8851	3.28	1302	2363	101.9005	G6	G6	---
	90	89.69	20.1	7877	2.76	1302	2671	94.4255	G6	G6	---
	100	102.83	17.5	8320	2.41	1302	2639	101.4046	G6	G6	---
	112	115.73	15.6	9028	2.41	1302	2502	94.0007	G6	G6	---
	125	121.8	14.8	6904	1.72	1302	3087	121.3476	G6	---	---
	140	144.22	12.5	8408	1.72	1302	2790	93.7492	G6	---	---
	160	164.63	10.9	6638	1.22	1302	3237	100.9774	G6	---	---
	180	183.27	9.8	6992	1.16	1302	3307	100.8540	G6	---	---
200	190.66	9.4	6638	1.05	1302	3334	93.6732	G6	---	---	
224	230.89	7.8	6638	0.88	1302	3462	93.5308	G6	---	---	
250	257.04	7.0	6638	0.79	1302	3710	93.4691	G6	---	---	
280	289	6.2	6638	0.71	1302	3703	93.4098	G6	---	---	

3c - Number of stages

G6 - Coupling size

	Oil [ US qt / litres ]						Weight [ lb / kg ]
	H1	H2	H3	H4	V1	V2	
FRO43	3.0 / 2.8	2.1 / 2	1.7 / 1.6	2.1 / 2.0	2.6 / 2.5	2.6 / 2.5	86.0 / 39.0
FRV43	3.1 / 2.9	2.0 / 1.9	1.3 / 1.2	1.9 / 1.8	2.7 / 2.6	2.7 / 2.6	80.5 / 36.5

# Gearboxes - Series RN-RO-RV

Selection RN52 - RN53

1800 rpm

SF1.0 - 4 poles

	$i_n$	$i_r$	$n_2$	$M_2$	$P_1$	$F_{r1}$	$F_{r2}$	$J_1 (x 10^{-4})$	NEMA frame			
	nominal	actual	[rpm]	[in-lb]	[HP]	[lb]	[lb]	[lb × ft <sup>2</sup> ]	56	140	180	210
<b>RN52</b> 2c	6.3	5.64	318.9	9736	51.7	---	1697	893.0850	G8	G8	G8	G8
	7.1	7.46	241.7	11152	44.8	---	1855	742.4874	G8	G8	G8	G8
	8	7.66	235.3	10090	39.7	---	1891	758.2776	G8	G8	G8	G8
	9	9.46	190.3	12391	39.7	---	2001	656.7353	G8	G8	G8	G8
	10	10.13	177.4	10178	29.3	---	2086	665.3874	G8	G8	G8	G8
	11.2	11.45	156.9	13719	36.2	---	1888	605.4825	G8	G8	G8	G8
	12.5	12.85	140.1	10355	24.1	---	2266	608.7905	G8	G8	G8	G8
	14	14.12	127.5	14250	29.3	---	1904	562.4784	G8	G8	G8	G8
	16	15.56	115.7	10444	20.7	---	2424	572.8129	G8	G8	G8	---
	18	17.85	100.8	14427	24.1	---	1951	526.1994	G8	G8	G8	---
	20	19.19	93.9	10532	17.2	-	2603	540.9786	G8	G8	G8	---
	22.4	23.45	76.8	14604	19.0	---	1803	495.8767	G8	G8	G8	---
	25	24.26	74.2	10621	13.10	---	2824	512.7490	G8	G8	G8	---
	28	27.55	65.3	14781	16.03	---	1819	483.0220	G8	G8	G8	---
	31.5	30.02	59.9	14073	13.97	---	2161	477.0491	G8	G8	G8	---
	35.5	36.31	49.6	11506	9.48	---	3042	466.6670	G8	G8	G8	---
	40	40.79	44.1	11064	8.10	758	3287	472.2935	G8	G8	G8	---
45	45.38	39.6	9736	6.38	-	3514	456.9138	G8	G8	G8	---	
<b>RN53</b> 3c	50	49.33	36.5	11506	6.90	767	3379	462.9603	G8	G8	G8	---
	63	61.67	29.2	11506	5.52	773	3491	454.8327	G8	G8	G8	---
	40	37.28	48.3	14604	11.90	-	2073	328.7913	G8	G8	G8	---
	45	47.28	38.1	15135	9.66	---	1936	325.3622	G8	G8	G8	---
	56	57.27	31.4	15489	8.28	780	1978	323.3119	G8	G8	G8	---
	71	70.6	25.5	15489	6.72	884	2026	321.5915	G8	G8	G8	---
	90	89.26	20.2	15666	5.34	962	1911	320.1392	G8	G8	G8	---
	100	95.68	18.8	10267	3.28	942	4006	302.2821	G8	G8	G8	---
	112	117.24	15.3	15843	4.14	1025	1619	318.9265	G8	G8	G8	---
	125	121.33	14.8	11595	2.93	978	3896	301.6461	G8	G8	---	---
	140	137.77	13.1	15931	3.45	1052	1619	318.4116	G8	G8	---	---
	160	150.12	12.0	15046	3.10	1077	2788	318.1743	G8	G8	---	---
	180	181.54	9.9	12037	2.07	1115	4096	317.7400	G8	G8	---	---
	224	229.08	7.9	11949	1.59	1086	4294	300.5687	G8	G8	---	---
	315	300.91	6.0	11949	1.21	1113	4294	300.2935	G8	G8	---	---
	355	353.6	5.1	11949	1.03	1124	4294	300.1724	G8	G8	---	---
	400	385.28	4.7	11949	0.95	1131	4294	300.1155	G8	G8	---	---
450	465.93	3.9	11949	0.78	1140	4294	300.0111	G8	G8	---	---	
560	582.41	3.1	11949	0.62	1149	4294	299.9209	G8	G8	---	---	

2c & 3c - Number of stages  
G8 - Coupling size

	Oil [ US qt / litres ]						Weight
	H1	H2	H3	H4	V1	V2	[ lb / kg ]
FRN52	5.4 / 5.1	3.4 / 3.2	2.2 / 2.1	3.4 / 3.2	5.2 / 4.9	5.2 / 4.9	136.7 / 62.0
FRN53	5.3 / 5	3.0 / 2.8	1.7 / 1.6	3.0 / 2.8	4.2 / 4.0	3.6 / 3.4	147.7 / 67.0

## Gearboxes - Series RN-RO-RV

SF1.0 - 4 poles

1800 rpm

Selection RO 53 - RV 53

	$i_n$	$i_r$	$n_2$	$M_2$	$P_1$	$F_{r1}$	$F_{r2}$	$J_1 (x 10^{-4})$	NEMA frame			
	nominal	actual	[rpm]	[in-lb]	[HP]	[lb]	[lb]	[lb × ft <sup>2</sup> ]	56	140	180	210
<b>RO53</b> <b>RV53</b> 3c	6.3	6.48	277.6	8231	38.6	1844	1803	1357.7515	GS8	GS8	GS8	GS8
	8	8.57	210.0	9736	34.5	1864	1972	1243.8790	GS8	GS8	GS8	GS8
	10	10.87	165.6	10886	30.3	1877	2129	1179.0358	GS8	GS8	GS8	GS8
	12.5	13.17	136.7	12391	28.6	1877	2259	1140.2818	GS8	GS8	GS8	GS8
	14	13.63	132.0	9293	20.7	1823	2325	487.3623	GS8	GS8	GS8	---
	16	16.24	110.8	13011	24.3	1879	2282	1107.7641	GS8	GS8	GS8	---
	18	18.02	99.9	11064	18.6	1857	2540	461.5769	GS8	GS8	GS8	---
	20	20.53	87.7	14161	21.0	1879	1945	1080.3318	GS8	GS8	GS8	---
	22.4	22.85	78.8	12568	16.7	1868	2513	446.8925	GS8	GS8	---	---
	25	26.97	66.7	14781	16.7	1879	1830	1057.4059	GS8	GS8	---	---
	28	27.68	65.1	13807	15.2	1877	2203	438.1170	GS8	GS8	---	---
	31.5	31.69	56.8	14869	14.3	1879	1850	1047.6835	GS8	GS8	---	---
	35.5	34.12	52.7	14958	13.28	1879	1875	430.7535	GS8	GS8	---	---
	40	41.65	43.2	15046	11.03	1873	1913	353.4424	GS8	GS8	---	---
	45	43.14	41.8	15046	10.69	1879	1920	424.5409	GS8	GS8	---	---
	50	51.34	35.1	15223	8.97	1879	1960	350.1889	GS8	GS8	---	---
	56	56.67	31.8	15312	8.28	1879	1983	419.3511	GS8	GS8	---	---
	63	64.91	27.8	15400	7.24	1879	2012	347.4457	GS8	GS8	---	---
	71	72.56	24.8	14692	6.21	1879	2428	416.1261	GS8	GS8	---	---
	80	79.37	22.6	11329	4.31	1879	3633	320.8084	GS8	GS8	---	---
	90	91.04	19.8	15666	5.17	1879	1888	319.0167	GS8	GS8	---	---
	100	100.2	18.0	15754	4.83	1879	1799	344.1804	GS8	GS8	---	---
	112	109.18	16.5	15046	4.14	1879	2518	343.7295	GS8	GS8	---	---
	125	119.59	15.0	15843	3.97	1879	1619	317.8492	GS8	GS8	---	---
	140	140.53	12.9	15843	3.45	1879	1619	317.3556	GS8	---	---	---
	160	153.12	11.8	15223	3.10	1879	2271	317.1254	GS8	---	---	---
	180	185.17	9.7	12568	2.07	1879	3966	316.7101	GS8	---	---	---
	200	208.05	8.7	11772	1.72	1879	4285	316.9427	GS8	---	---	---
	224	224.24	8.0	11772	1.59	1879	4294	342.0494	GS8	---	---	---
	250	251.6	7.1	11772	1.41	1879	4294	316.5844	GS8	---	---	---
315	314.5	5.7	11772	1.14	1879	4294	316.2711	GS8	---	---	---	

3c - Number of stages

G8 - Coupling size

	Oil [ US qt / litres ]						Weight [ lb / kg ]
	H1	H2	H3	H4	V1	V2	
FRO53	5.4 / 5.1	3.8 / 3.6	3.1 / 2.9	3.8 / 3.6	5.3 / 5	5.3 / 5	160.9 / 73.0
FRV53	5.5 / 5.2	3.6 / 3.4	2.2 / 2.1	3.4 / 3.2	5.0 / 4.7	5.0 / 4.7	149.9 / 68.0

# Gearboxes - Series RN-RO-RV

Selection RN62 - RN63

1800 rpm

SF1.0 - 4 poles

	$i_n$	$i_r$	$n_2$	$M_2$	$P_1$	$F_{r1}$	$F_{r2}$	$J_1 (x 10^{-4})$	NEMA frame			
	nominal	actual	[rpm]	[in-lb]	[HP]	[lb]	[lb]	[lb × ft <sup>2</sup> ]	56	140	180	210
<b>RN62</b> 2c	6.3	5.77	321.4	19472	103.4	---	2262	1994.802	G8	G8	G8	G8
	7.1	7.39	243.0	23012	93.1	---	2145	1614.165	G8	G8	G8	G8
	8	7.97	226.3	19472	72.4	---	2558	1629.815	G8	G8	G8	G8
	9	9.38	191.6	25667	81.0	-	2030	1349.068	G8	G8	G8	G8
	10	10.54	171.0	19472	55.2	---	2821	1392.170	G8	G8	G8	G8
	11.2	11.36	158.1	27437	72.4	-	1263	1190.407	G8	G8	G8	G8
	14	14	128.6	27969	60.3	---	1225	1057.111	G8	G8	G8	G8
	16	16.19	111.1	19914	36.2	854	2615	1096.335	G8	G8	G8	G8
	18	17.7	101.7	28323	48.3	---	697	944.5324	G8	G8	G8	G8
	20	19.96	90.1	20091	29.3	904	3550	995.2086	G8	G8	G8	G8
	22.4	23.25	77.4	28765	36.2	---	1799	850.3324	G8	G8	G8	G8
	25	25.24	71.4	26552	31.0	944	3772	905.8045	G8	G8	G8	G8
	28	27.69	65.1	28942	31.03	---	1349	808.1113	G8	G8	G8	G8
	31.5	30.38	59.3	27482	27.59	---	1610	788.4626	G8	G8	G8	G8
	35.5	37.35	48.2	22260	17.24	---	3617	753.1067	G8	G8	G8	G8
	40	39.49	45.6	28721	22.41	998	4085	792.2903	G8	G8	G8	---
45	43.31	41.5	20888	14.31	1005	4132	775.3112	G8	G8	G8	---	
50	53.26	33.8	21065	11.72	1016	4265	744.4072	G8	G8	G8	---	
<b>RN63</b> 3c	56	59.89	30.1	21242	10.52	1021	4341	730.5818	G8	G8	G8	---
	40	38.2	47.2	28765	22.41	-	1652	538.3683	G8	G8	G8	---
	50	48.44	37.2	30093	18.97	---	1724	528.4371	G8	G8	G8	---
	56	58.68	30.7	30093	15.52	---	1754	522.4927	G8	G8	G8	---
	71	72.33	24.9	30093	12.59	825	1754	517.4998	G8	G8	G8	---
	80	79.72	22.6	15754	6.03	645	5641	473.6390	G8	G8	G8	---
	90	91.45	19.7	30093	10.00	681	1754	513.2829	G8	G8	G8	---
	100	105.42	17.1	20799	6.03	645	5043	471.2636	G8	G8	---	---
	125	120.13	15.0	30093	7.59	863	1754	509.7542	G8	G8	---	---
	140	143.08	12.6	30093	6.38	935	1754	508.1738	G8	G8	---	---
	160	156.94	11.5	29208	5.69	973	1776	507.4358	G8	G8	---	---
	200	192.98	9.3	23897	3.79	1061	4766	506.1116	G8	G8	---	---
	224	217	8.3	20357	2.93	1097	6003	505.5255	G8	G8	---	---
	250	252.39	7.1	23012	2.76	1009	5058	466.3989	G8	G8	---	---
	315	331.53	5.4	23012	2.07	1061	5058	465.6205	G8	G8	---	---
	400	394.87	4.6	23012	1.72	1084	5058	465.2646	G8	G8	---	---
450	433.13	4.2	23012	1.62	1095	5058	465.0937	G8	G8	---	---	
500	532.58	3.4	23012	1.31	1115	5058	464.7852	G8	G8	---	---	
560	598.89	3.0	23012	1.17	1122	5058	464.6476	G8	G8	---	---	

2c & 3c - Number of stages  
G8 - Coupling size

	Oil [ US qt / litres ]						Weight [ lb / kg ]
	H1	H2	H3	H4	V1	V2	
FRN62	9.7 / 9.2	6.1 / 5.8	4.0 / 3.8	6.1 / 5.8	9.3 / 8.8	9.3 / 8.8	240 / 109
FRN63	9.5 / 9.0	5.3 / 5	3.1 / 2.9	5.3 / 5	7.6 / 7.2	6.5 / 6.1	256 / 116

## Gearboxes - Series RN-RO-RV

SF1.0 - 4 poles

1800 rpm

Selection RO 63 - RV 63

	$i_n$	$i_r$	$n_2$	$M_2$	$P_1$	$F_{r1}$	$F_{r2}$	$J_1 (x 10^{-4})$	NEMA frame			
	nominal	actual	[rpm]	[in-lb]	[HP]	[lb]	[lb]	[lb × ft <sup>2</sup> ]	56	140	180	210
<b>RO63</b> <b>RV63</b> 3c	6.3	6.43	279.9	14692	69.5	1500	2415	2423.3135	GS8	GS8	GS8	GS8
	8	8.5	211.8	15400	55.0	1702	2664	2135.5093	GS8	GS8	GS8	GS8
	10	10.78	167.0	17436	49.1	1758	2866	1935.0447	GS8	GS8	GS8	GS8
	12.5	13.06	137.8	19029	44.3	1801	3046	1815.0712	GS8	GS8	GS8	GS8
	14	13.51	133.2	14515	32.6	1693	3172	972.0122	GS8	GS8	GS8	GS8
	16	16.1	111.9	20622	39.0	1841	3249	1714.2836	GS8	GS8	GS8	GS8
	18	17.87	100.8	17259	29.3	1772	3458	906.8415	GS8	GS8	GS8	GS8
	20	20.36	88.5	22393	33.4	1868	3170	1629.1580	GS8	GS8	GS8	GS8
	22.4	22.66	79.5	19737	26.6	1819	3701	861.4453	GS8	GS8	GS8	GS8
	25	25.48	70.7	20357	24.3	1850	3781	868.8302	GS8	GS8	GS8	---
	28	27.45	65.6	21684	24.0	1853	3530	834.2788	GS8	GS8	GS8	---
	31.5	31.85	56.6	25313	24.1	1879	2594	1526.0045	GS8	GS8	GS8	---
	35.5	33.83	53.2	23809	21.38	1868	3129	811.4573	GS8	GS8	GS8	---
	40	42.78	42.0	26110	18.62	1879	2561	792.1787	GS8	GS8	---	---
	45	42.95	41.9	22481	15.86	1879	3698	1484.4123	GS8	GS8	---	---
	50	50.91	35.4	29739	17.76	1826	2205	596.9040	GS8	GS8	---	---
	56	56.19	32.0	29739	16.03	1879	2241	776.0516	GS8	GS8	---	---
	63	64.36	28.0	29739	13.97	1873	2293	588.3919	GS8	GS8	---	---
	71	73.41	24.6	28765	11.90	1879	2570	765.4560	GS8	GS8	---	---
	80	84.55	21.3	29739	10.69	1879	2563	581.2680	GS8	GS8	---	---
	90	90.27	19.9	29739	10.00	1875	2563	515.4139	GS8	GS8	---	---
	100	100.7	17.9	29739	8.97	1879	2203	578.0739	GS8	GS8	---	---
	112	118.58	15.2	29739	7.59	1879	2203	511.7927	GS8	GS8	---	---
	125	128.72	14.0	22038	5.17	1879	4960	513.9260	GS8	GS8	---	---
	140	141.23	12.7	29739	6.38	1879	2203	510.1695	GS8	GS8	---	---
	160	154.91	11.6	29739	5.86	1879	2203	509.4149	GS8	GS8	---	---
	180	190.49	9.5	24163	3.79	1879	4362	508.0551	GS8	GS8	---	---
	224	220.89	8.2	22570	3.10	1879	5058	508.9094	GS8	---	---	---
	280	271.62	6.6	22570	2.59	1879	5058	507.7205	GS8	---	---	---
	315	305.43	5.9	22570	2.24	1879	5058	507.1890	GS8	---	---	---

3c - Number of stages

G8 - Coupling size

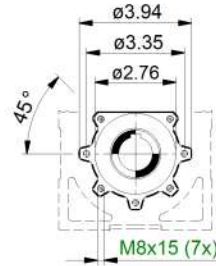
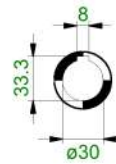
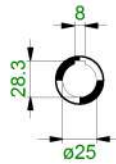
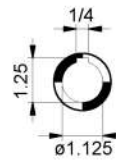
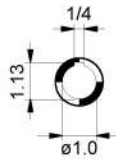
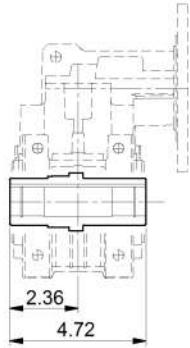
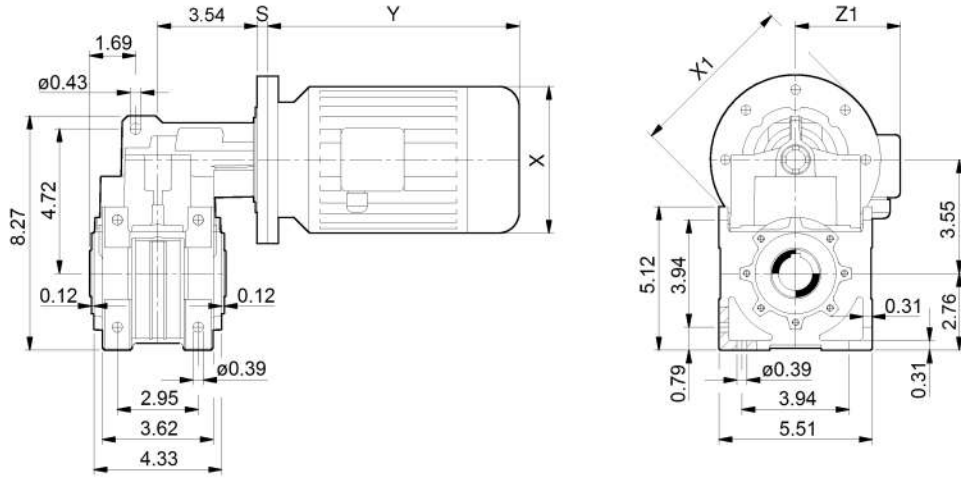
	Oil [ US qt / litres ]						Weight [ lb / kg ]
	H1	H2	H3	H4	V1	V2	
FRO63	9.7 / 9.2	6.9 / 6.5	5.5 / 5.2	6.9 / 6.5	9.5 / 9.0	9.5 / 9.0	267 / 121
FRV63	9.9 / 9.4	6.4 / 6.1	4.0 / 3.8	6.1 / 5.8	9.0 / 8.5	9.0 / 8.5	258 / 117

# Gearboxes - Series RN-RO-RV

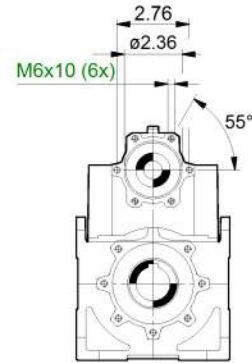
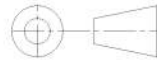
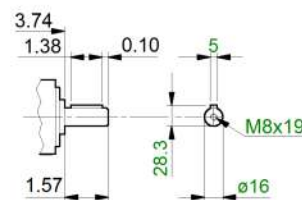
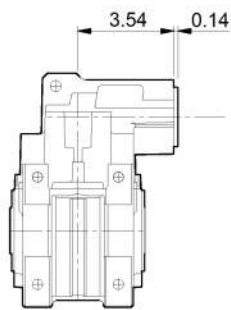
Dimensions

RN12 - RN13

**MRN  
FRN**



**RN**



NEMA	RN12 - RN13	RN12	180TC	210TC			
S-adapter	1.16	1.16					
Adapter part #	K533.227.N56 + K533.217.N56	K533.227.N56 + K533.217.N56					
Coupling part #	KG5.N56/X	KG5.N56/X					

Dimensions X, X1, Y and Z: according to motor manufacturer

Dimensions: inches (black) and mm (green). Not binding dimensions and weights.

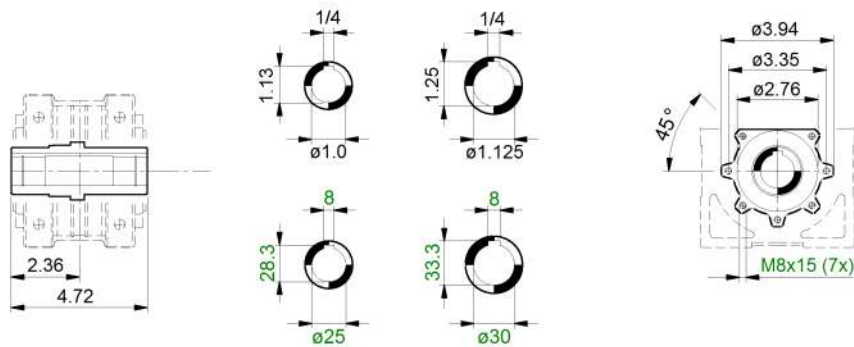
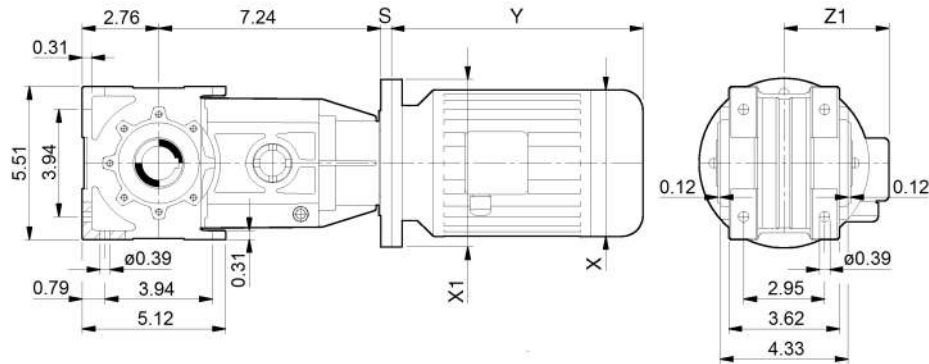


# Gearboxes - Series RN-RO-RV

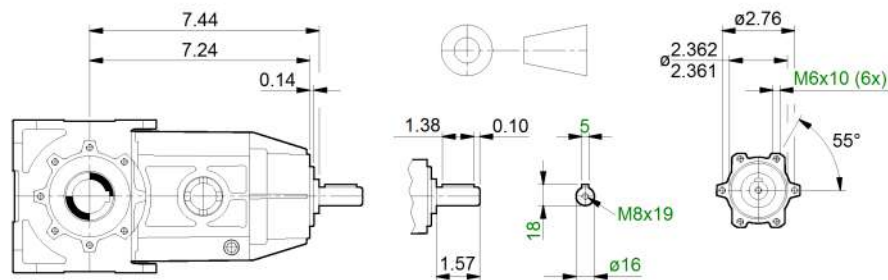
RO13

Dimensions

**MRO  
FRO**



**RO**



NEMA	RO13 56C	RO13 140TC	180TC	210TC			
S-adapter	1.16	1.16					
Adapter part #	K532.227.N56 + K532.217.N56	K532.227.N56 + K532.217.N56					
Coupling part #	KG5.N56/X	KG5.N56/X					

Dimensions X, X1, Y and Z: according to motor manufacturer

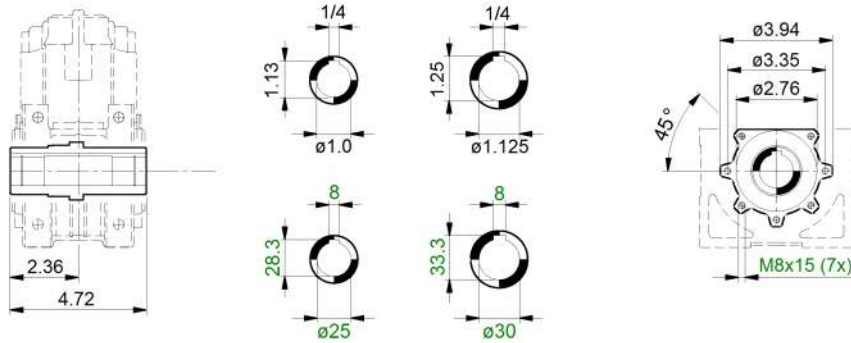
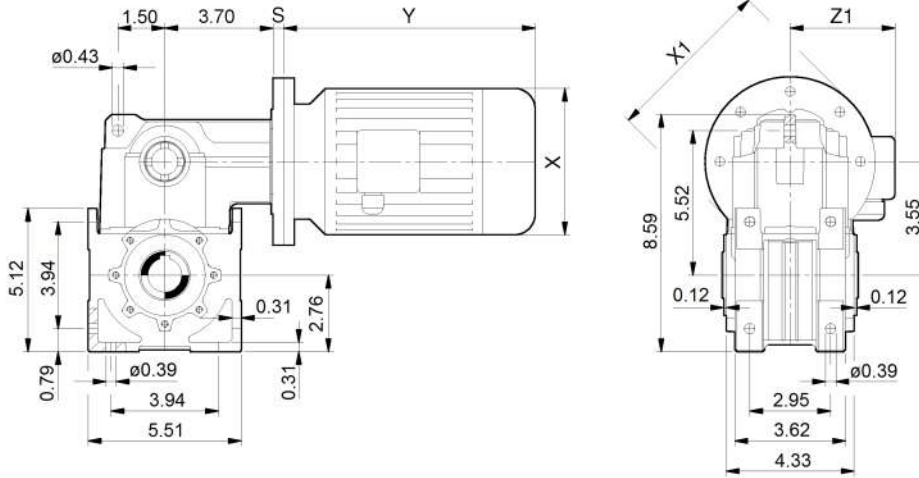
Dimensions: inches (black) and mm (green). Not binding dimensions and weights.

# Gearboxes - Series RN-RO-RV

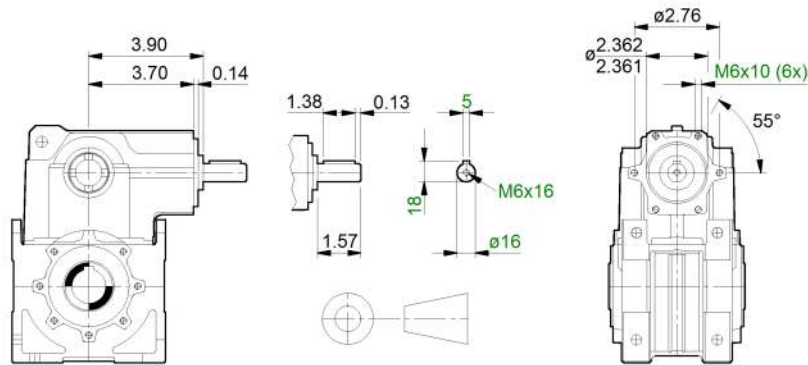
Dimensions

RV13

**MRV  
FRV**



**RV**



NEMA	RV13 56C	RV13 140TC	180TC	210TC			
S-adapter	1.16	1.16					
Adapter part #	K532.227.N56 + K532.217.N56	K532.227.N56 + K532.217.N56					
Coupling part #	KG5.N56/X	KG5.N56/X					

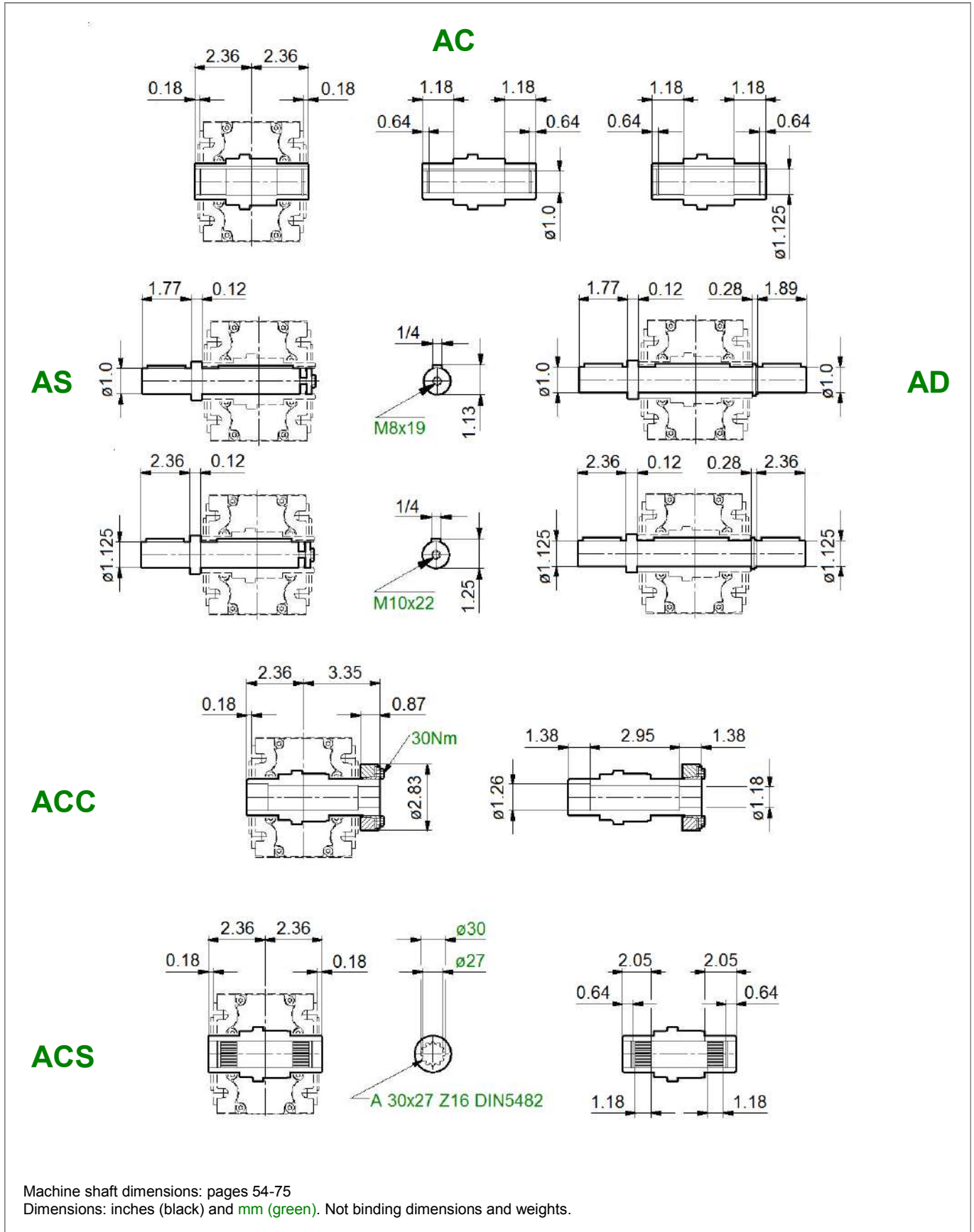
Dimensions X, X1, Y and Z: according to motor manufacturer

Dimensions: inches (black) and mm (green). Not binding dimensions and weights.

# Gearboxes - Series RN-RO-RV

RN12 - RN13 / RO13 / RV13

Dimensions

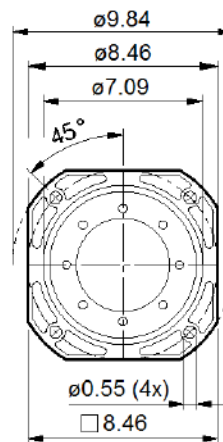
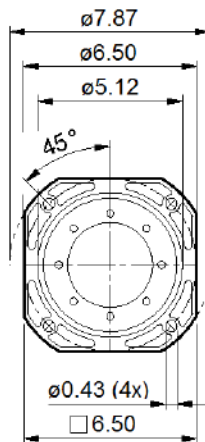
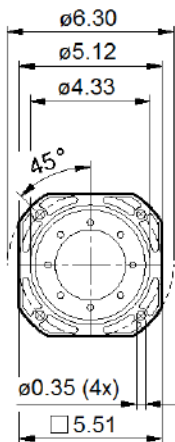
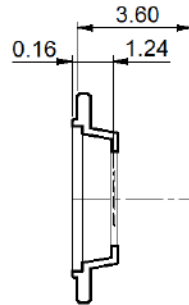
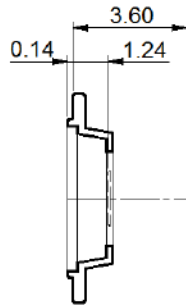
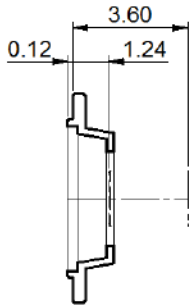
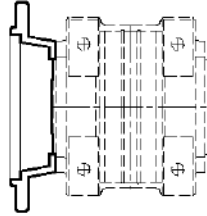


# Gearboxes - Series RN-RO-RV

Dimensions

RN12- 13 RN / RO13 / RV13

**A**

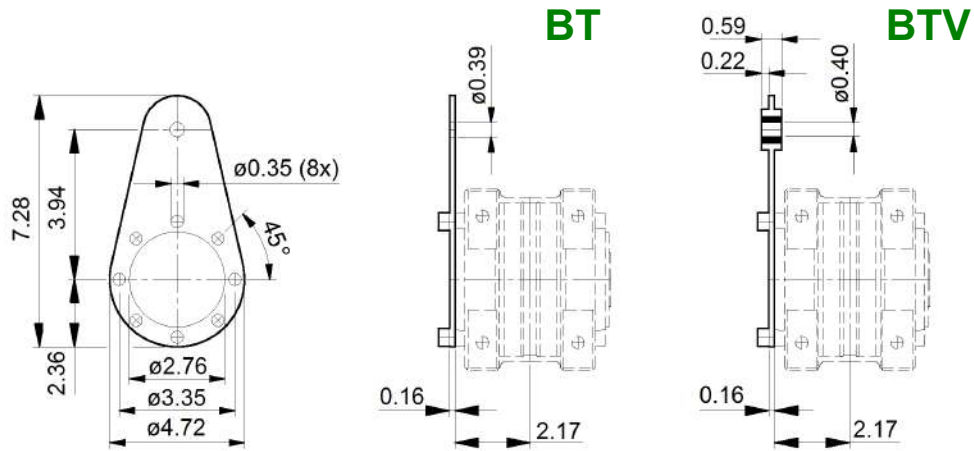


Dimensions: inches (black) and mm (green). Not binding dimensions and weights.

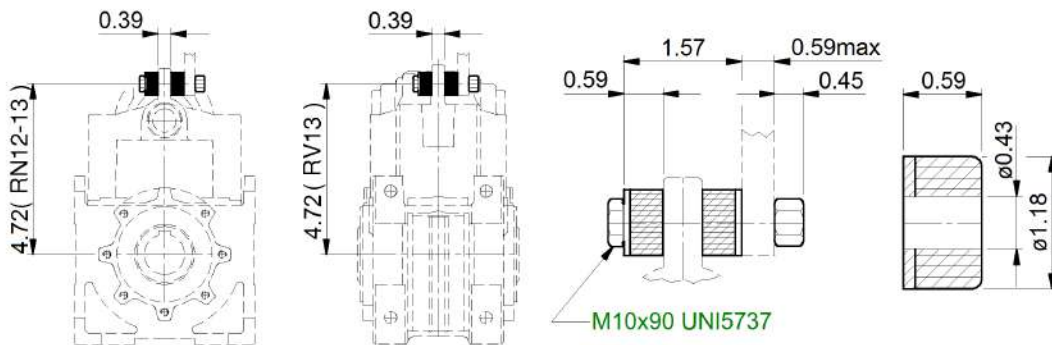
# Gearboxes - Series RN-RO-RV

RN12 - RN13 / RO13 / RV13

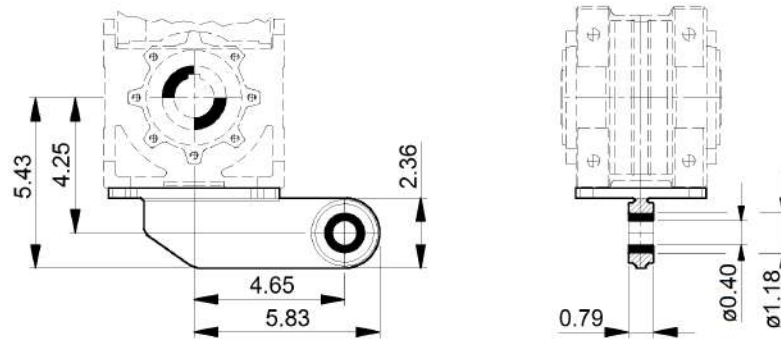
Dimensions



Max. allowed torque: 750 in-lb



**BTA**



**BTF**

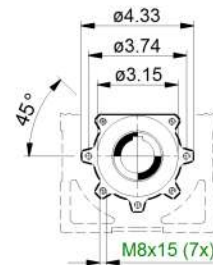
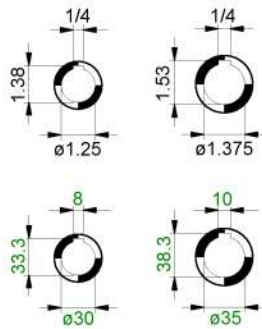
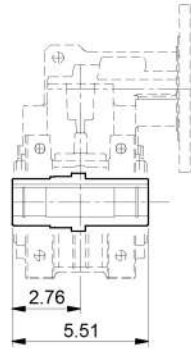
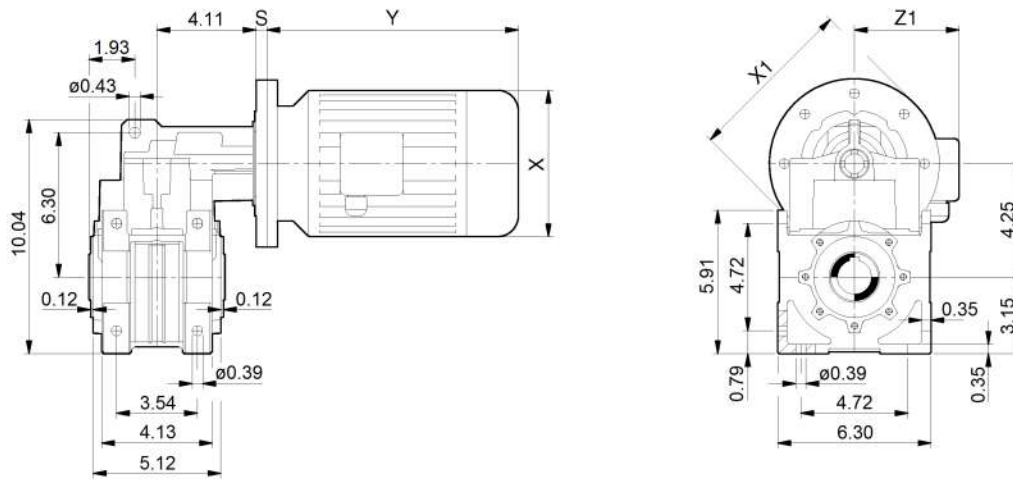
Dimensions: inches (black) and mm (green). Not binding dimensions and weights.

# Gearboxes - Series RN-RO-RV

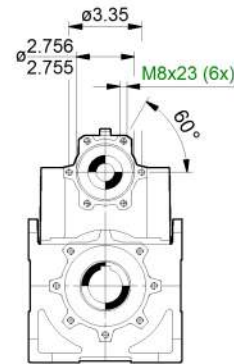
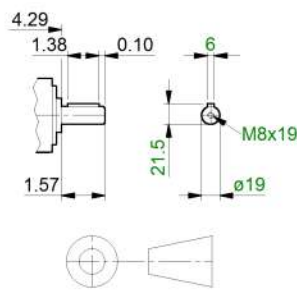
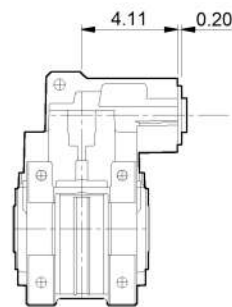
Dimensions

RN22 - RN23

**MRN  
FRN**



**RN**



NEMA	RN22 - RN23 56C	RN22 140TC	180TC	210TC			
S-adapter	1.59	1.59					
Adapter part #	K533.227.N56 + K533.217.N180	K533.227.N56 + K533.217.N180					
Coupling part #	KG5.N56/X	KG6.N140/X					

Dimensions X, X1, Y and Z: according to motor manufacturer

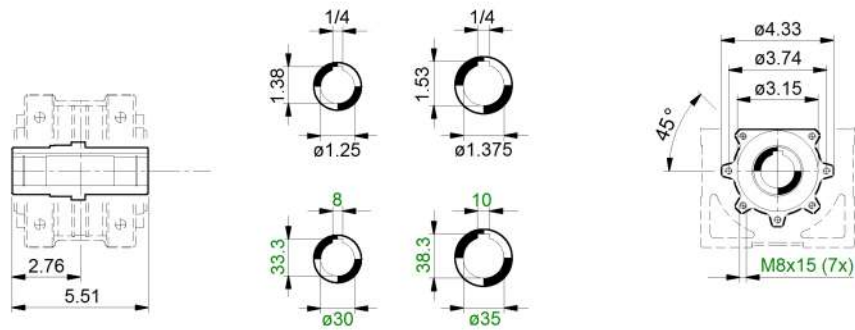
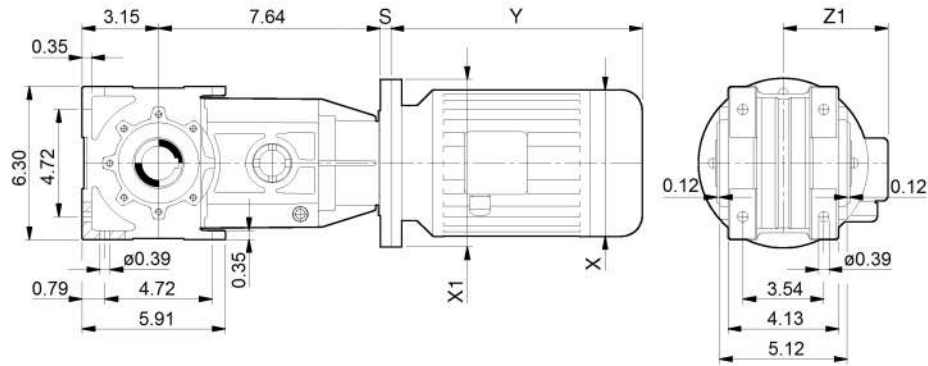
Dimensions: inches (black) and mm (green). Not binding dimensions and weights.

# Gearboxes - Series RN-RO-RV

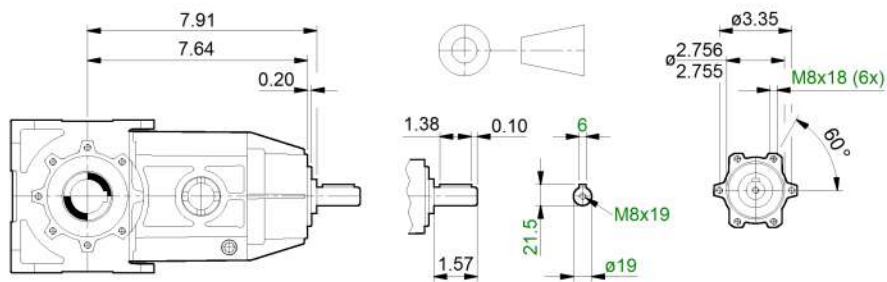
RO23

Dimensions

**MRO  
FRO**



**RO**



NEMA	RO23 56C	RO23 140TC	180TC	210TC			
S-adapter	1.59	1.59					
Adapter part #	K533.227.N56 + K533.217.N180	K533.227.N56 + K533.217.N180					
Coupling part #	KG5.N56/X	KG6.N140/X					

Dimensions X, X1, Y and Z: according to motor manufacturer

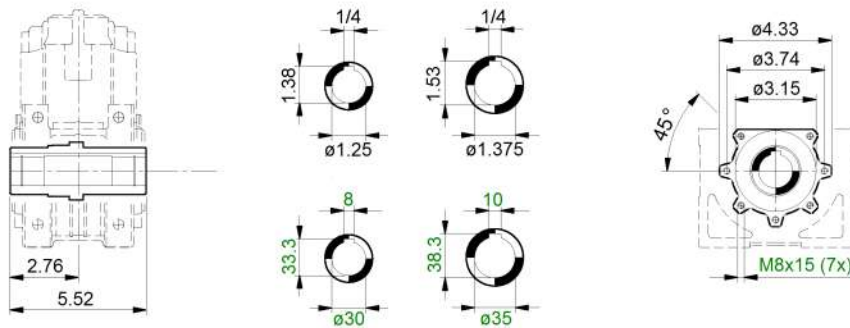
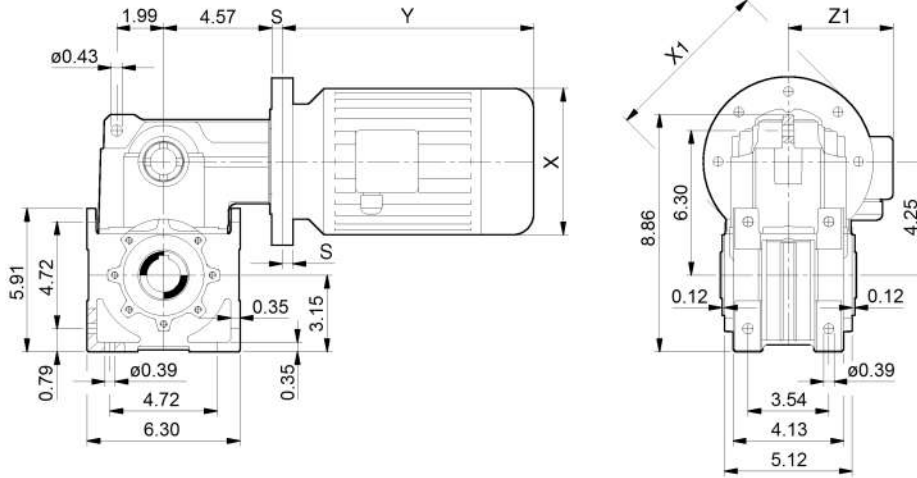
Dimensions: inches (black) and mm (green). Not binding dimensions and weights.

# Gearboxes - Series RN-RO-RV

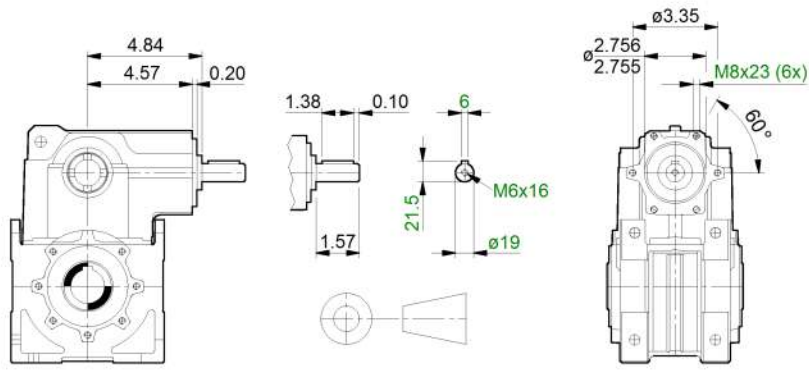
Dimensions

RV23

**MRV  
FRV**



**RV**



NEMA	RV23 56C	RV23 140TC	180TC	210TC			
S-adapter	1.59	1.59					
Adapter part #	K533.227.N56 + K533.217.N180	K533.227.N56 + K533.217.N180					
Coupling part #	KG5.N56/X	KG6.N140/X					

Dimensions X, X1, Y and Z: according to motor manufacturer

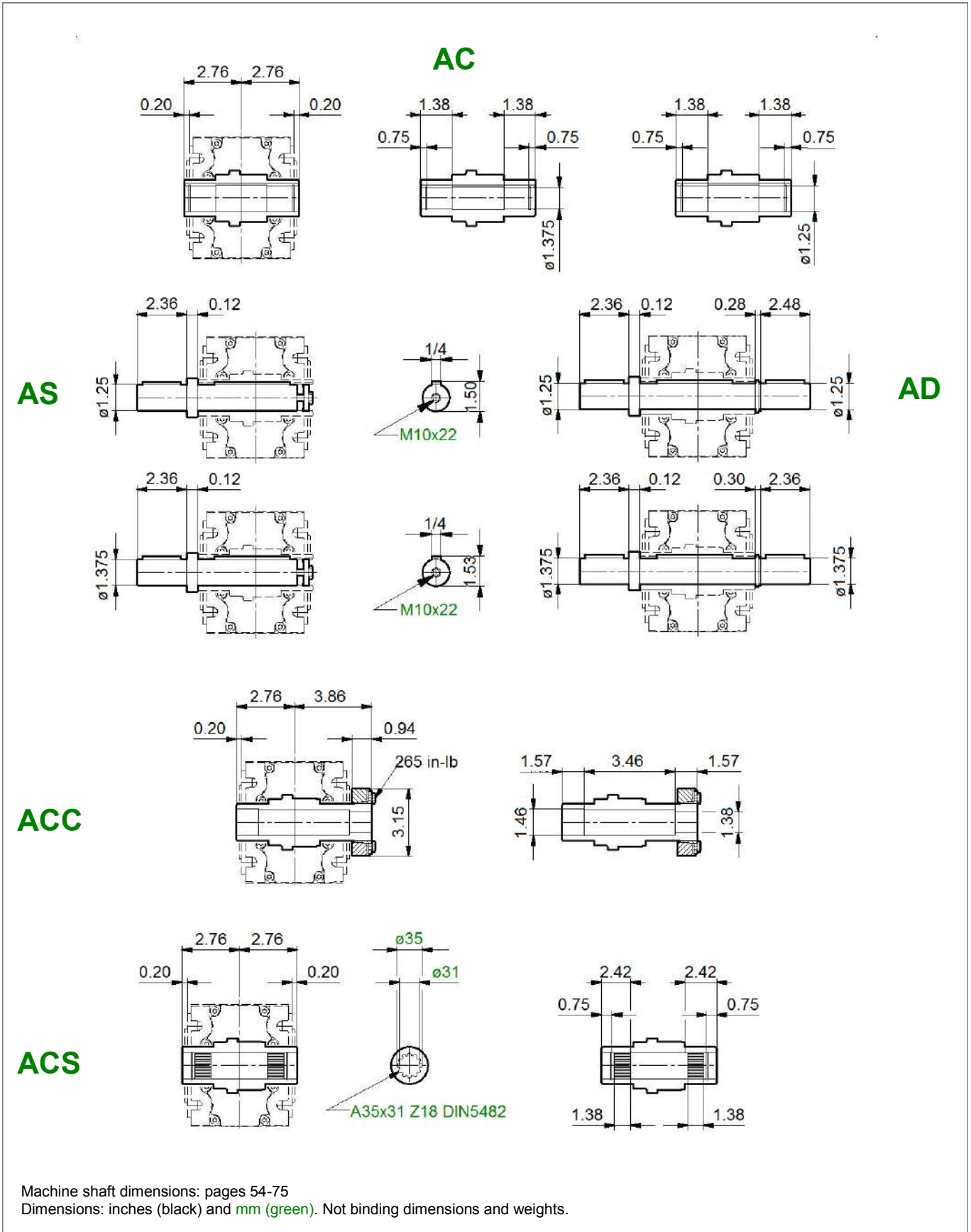
Dimensions: inches (black) and mm (green). Not binding dimensions and weights.



# Gearboxes - Series RN-RO-RV

RN22 - RN23 / RO23 / RV23

Dimensions



Machine shaft dimensions: pages 54-75

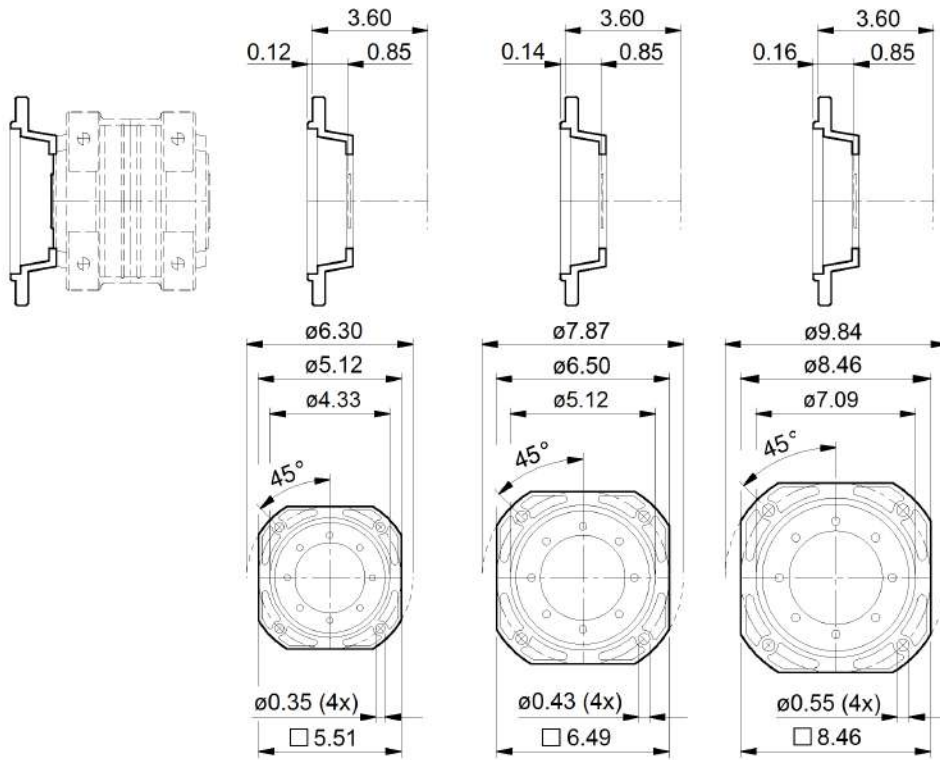
Dimensions: inches (black) and mm (green). Not binding dimensions and weights.

# Gearboxes - Series RN-RO-RV

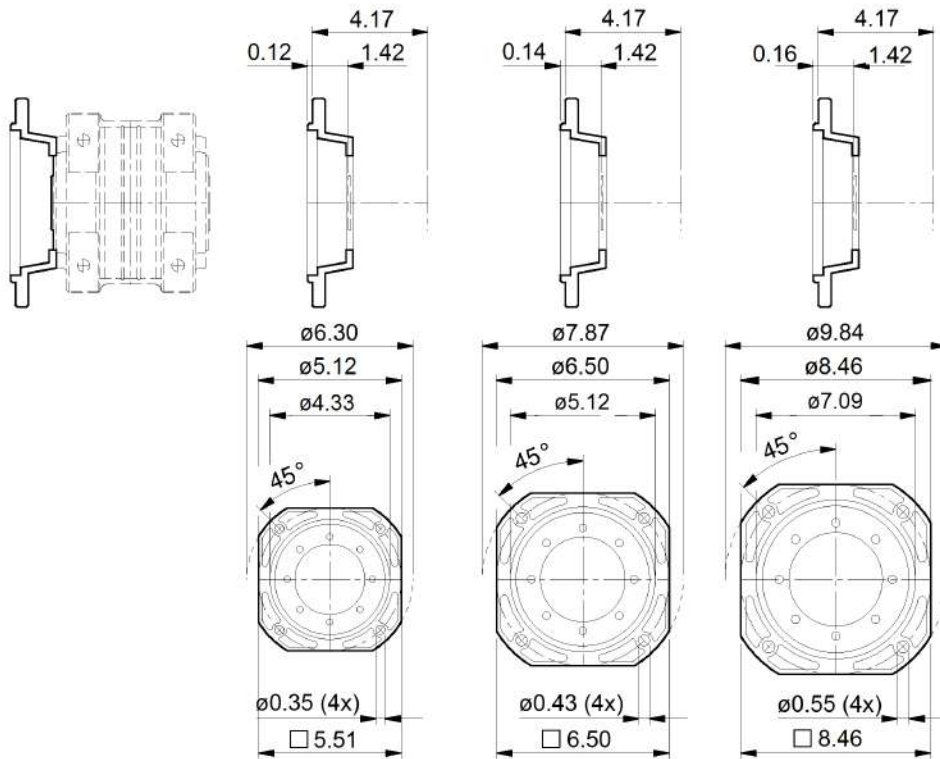
## Dimensions

RN22 - RN23 / RO23 / RV23

**A**



**F**

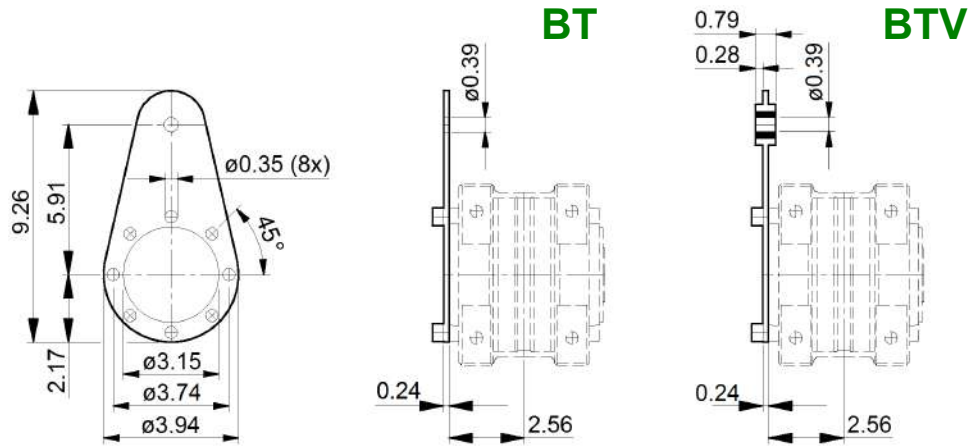


Dimensions: inches (black) and mm (green). Not binding dimensions and weights.

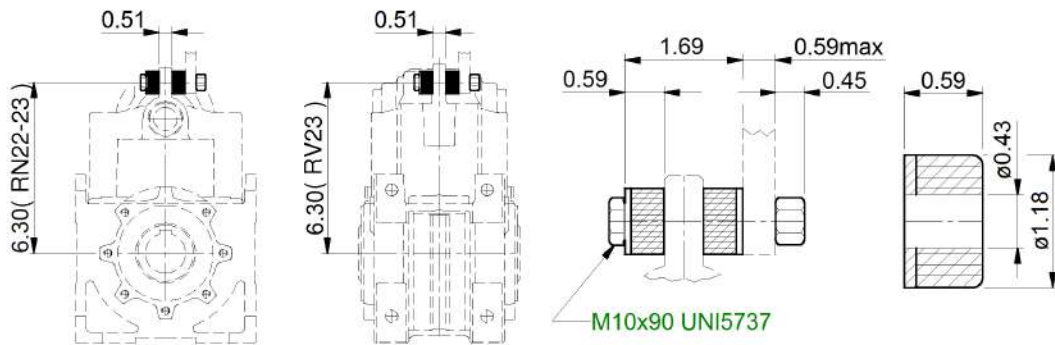
# Gearboxes - Series RN-RO-RV

RN22 - RN23 / RO23 / RV23

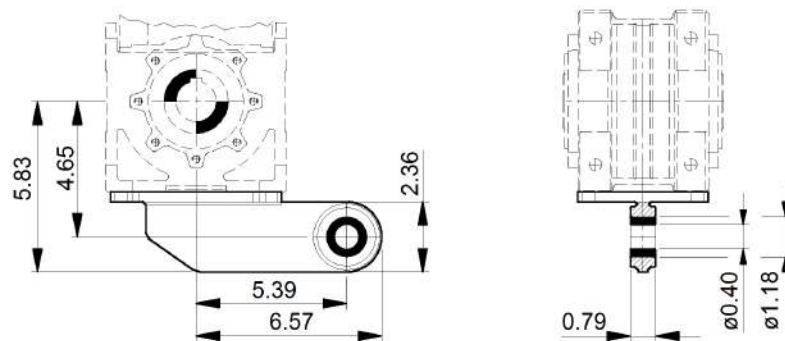
Dimensions



Max. allowed torque: 1250 in-lb



**BTA**



**BTF**

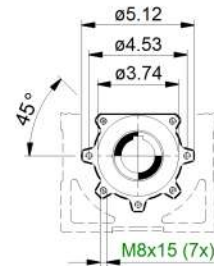
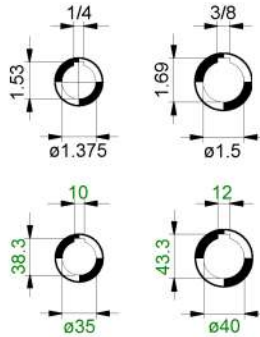
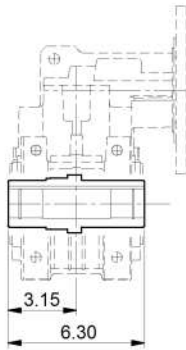
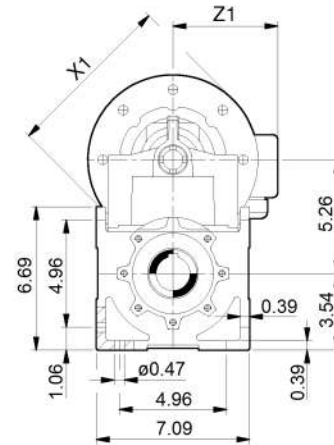
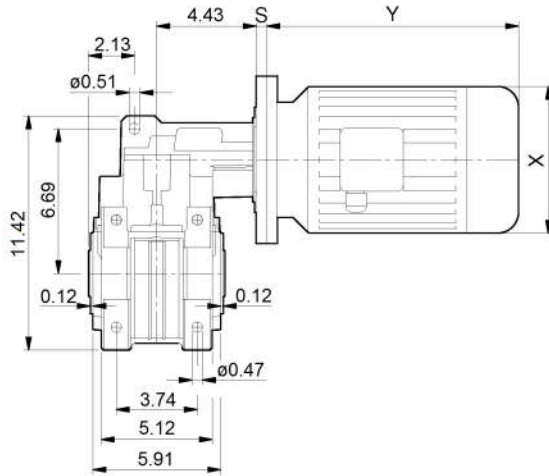
Dimensions: inches (black) and mm (green). Not binding dimensions and weights.

# Gearboxes - Series RN-RO-RV

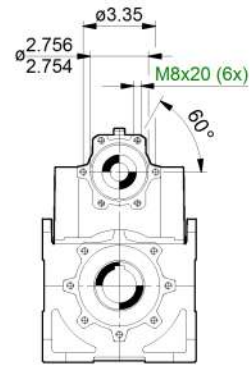
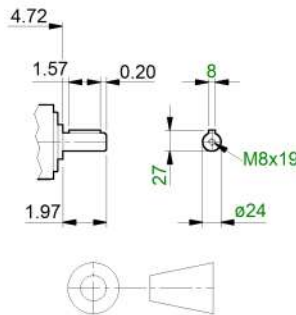
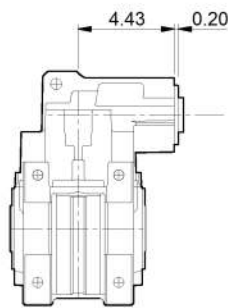
Dimensions

RN32 - RN33

**MRN  
FRN**



**RN**



NEMA	RN32 - RN33	RN32	180TC	210TC			
S-adapter	56C	140TC					
Adapter part #	K533.227.N56 + K533.217.N180	K533.227.N56 + K533.217.N180					
Coupling part #	KG6.N56/X	KG6.N140/X					

Dimensions X, X1, Y and Z: according to motor manufacturer

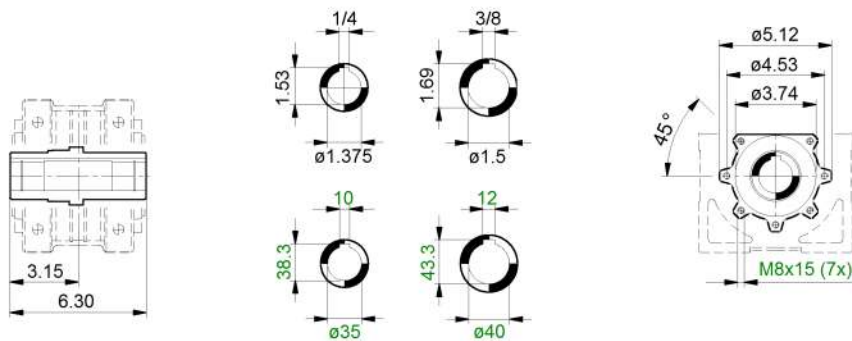
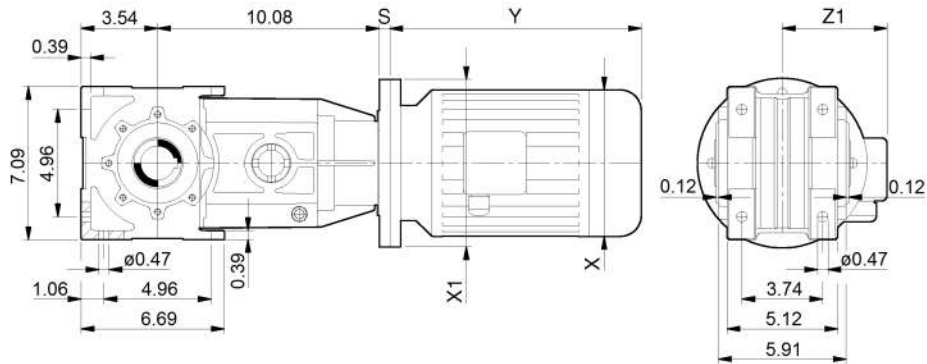
Dimensions: inches (black) and mm (green). Not binding dimensions and weights.

# Gearboxes - Series RN-RO-RV

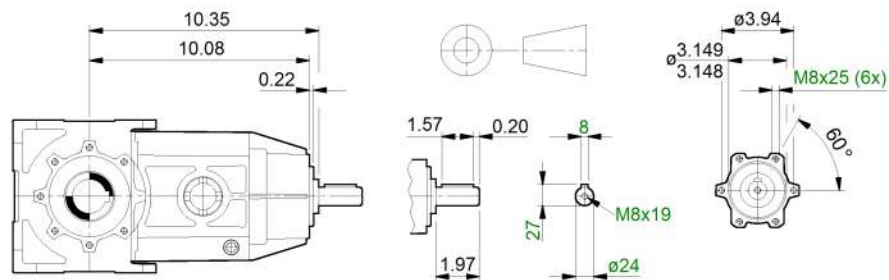
RO33

Dimensions

**MRO  
FRO**



**RO**



NEMA	RO33 56C	RO33 140TC	180TC	210TC			
S-adapter	1.65	1.65					
Adapter part #	K534.227.N56 + K534.217.N56	K534.227.N56 + K534.217.N56					
Coupling part #	KG6.N56/X	KG6.N140/X					

Dimensions X, X1, Y and Z: according to motor manufacturer

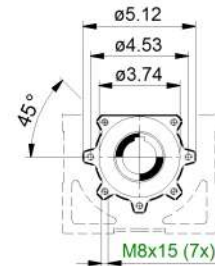
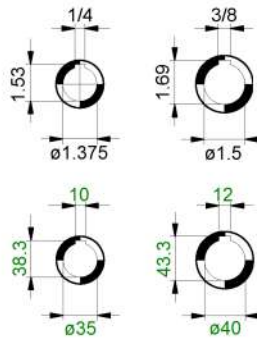
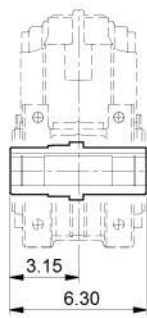
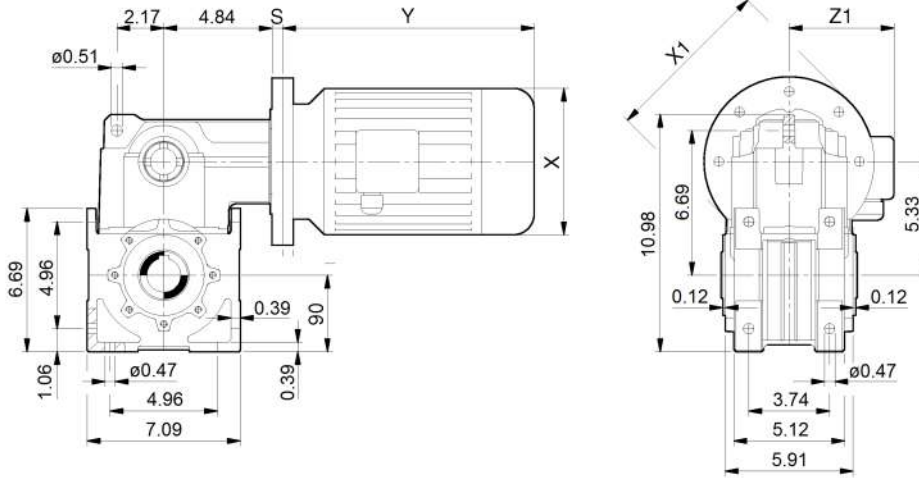
Dimensions: inches (black) and mm (green). Not binding dimensions and weights.

# Gearboxes - Series RN-RO-RV

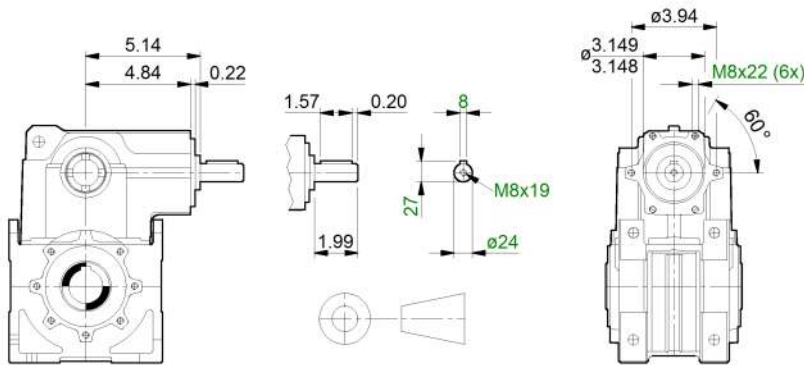
Dimensions

RV33

**MRV  
FRV**



**RV**



NEMA	RV33 56C	RV33 140TC	180TC	210TC			
S-adapter	1.65	1.65					
Adapter part #	K534.227.N56 + K534.217.N56	K534.227.N56 + K534.217.N56					
Coupling part #	KG6.N56/X	KG6.N140/X					

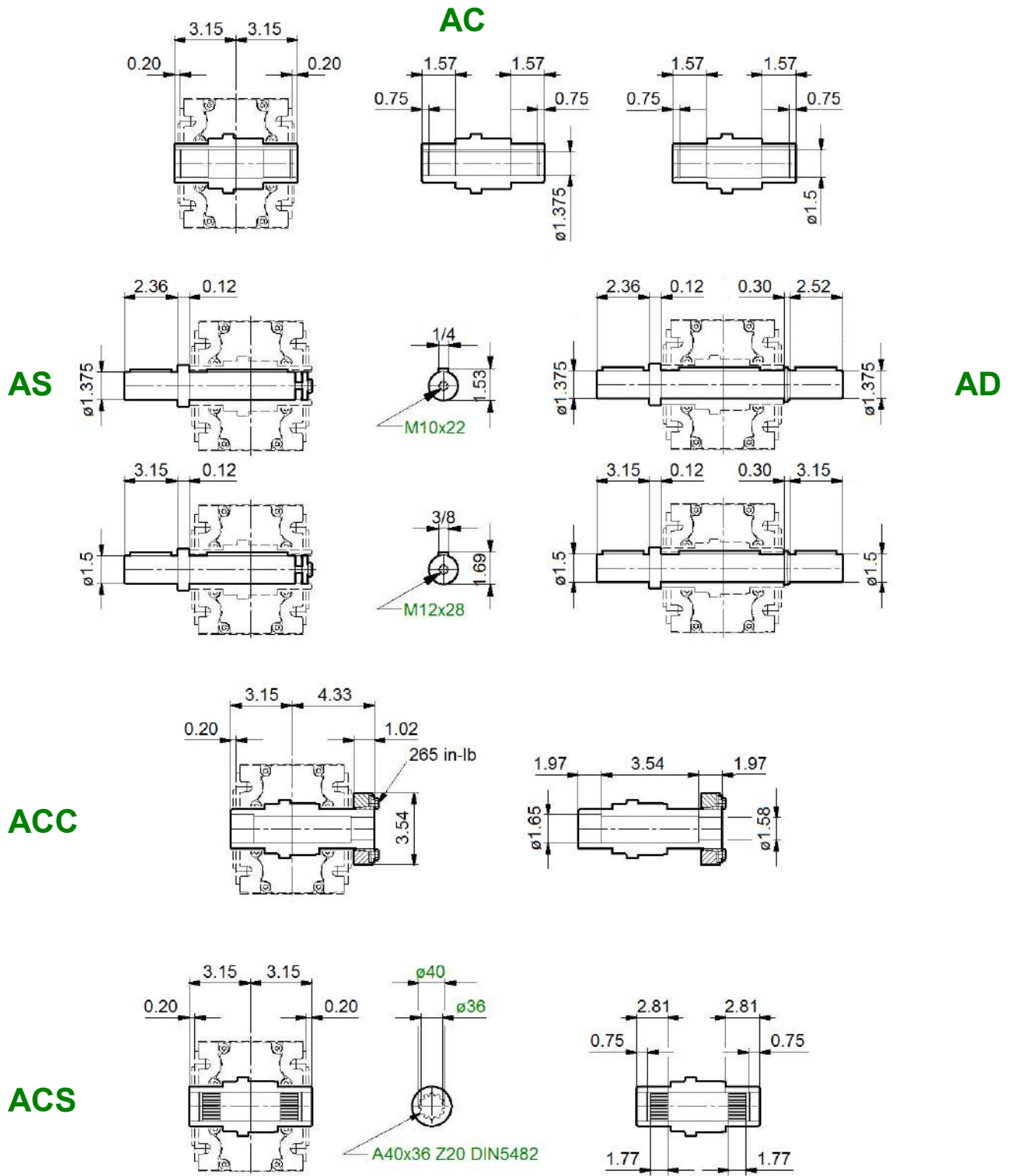
Dimensions X, X1, Y and Z: according to motor manufacturer

Dimensions: inches (black) and mm (green). Not binding dimensions and weights.

# Gearboxes - Series RN-RO-RV

RN32 - RN33 / RO33 / RV33

Dimensions



Machine shaft dimensions: pages 54-75

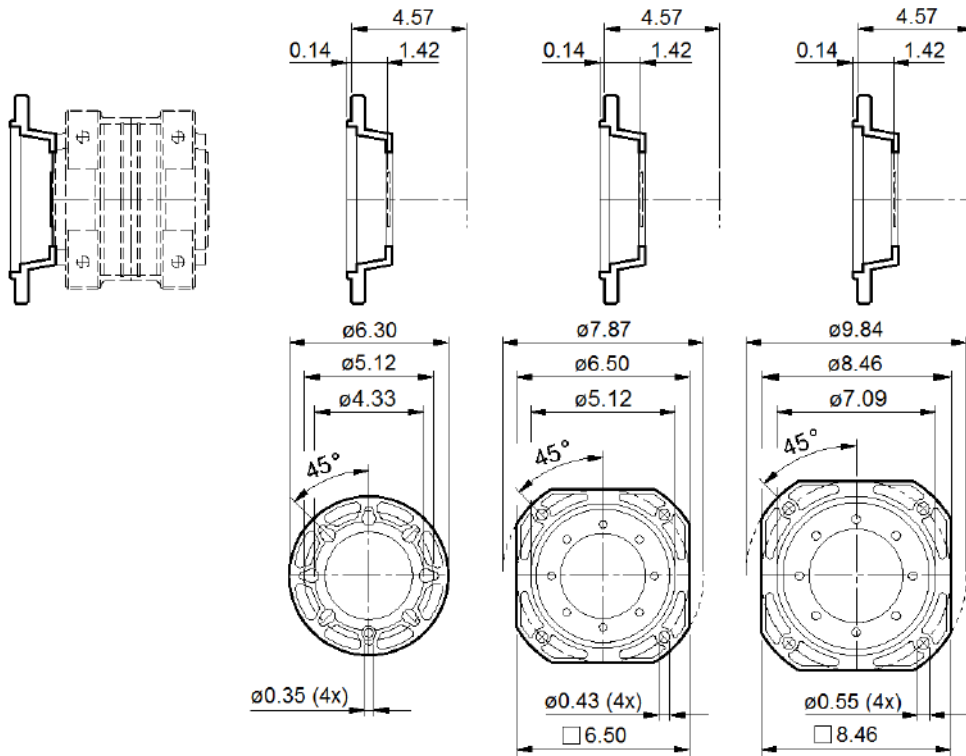
Dimensions: inches (black) and mm (green). Not binding dimensions and weights.

# Gearboxes - Series RN-RO-RV

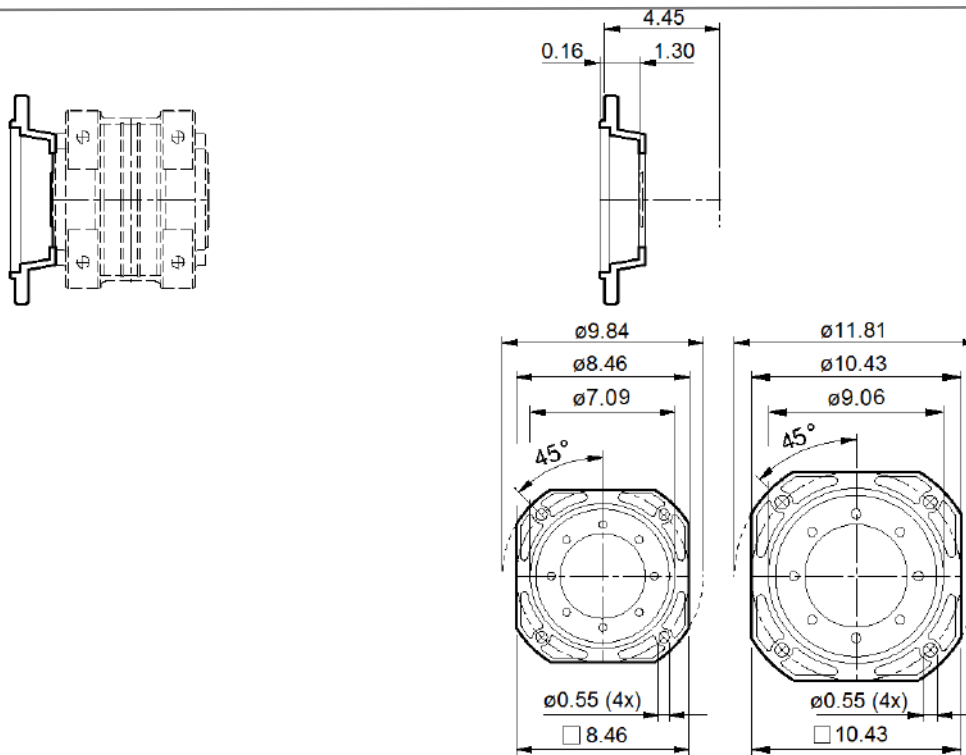
## Dimensions

RN32 - RN33 / RO33 / RV33

**A**



**F**



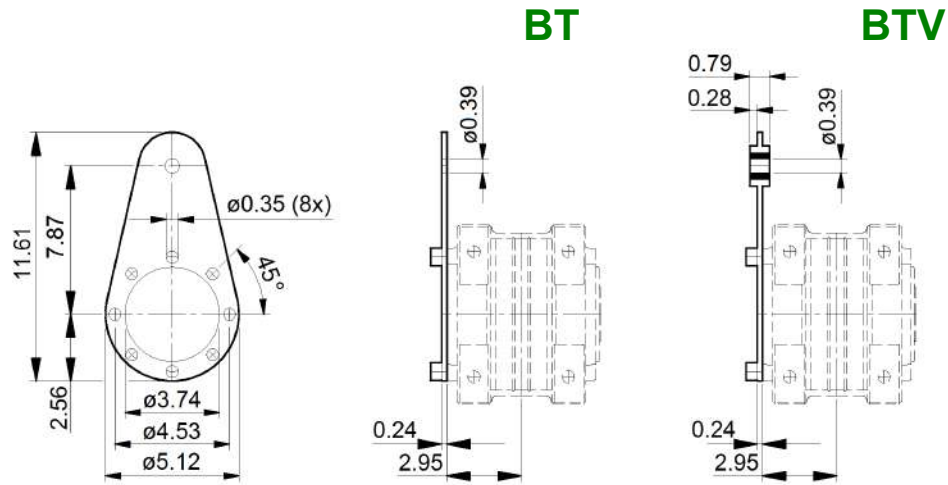
Dimensions: inches (black) and mm (green). Not binding dimensions and weights.



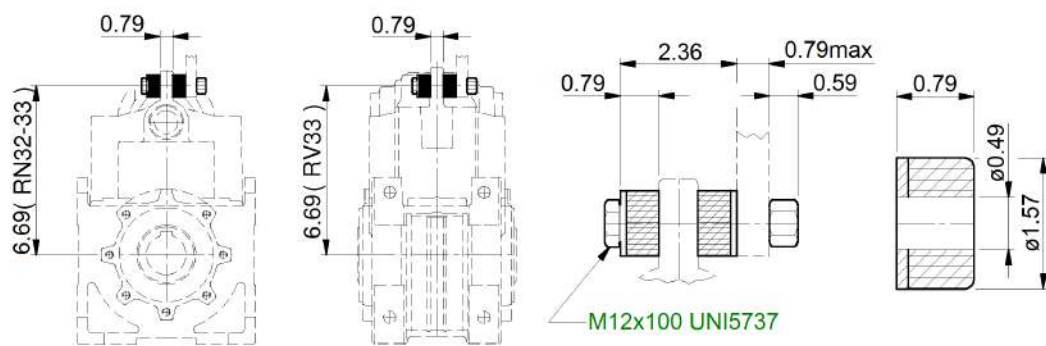
# Gearboxes - Series RN-RO-RV

RN32 - RN33 / RO33 / RV33

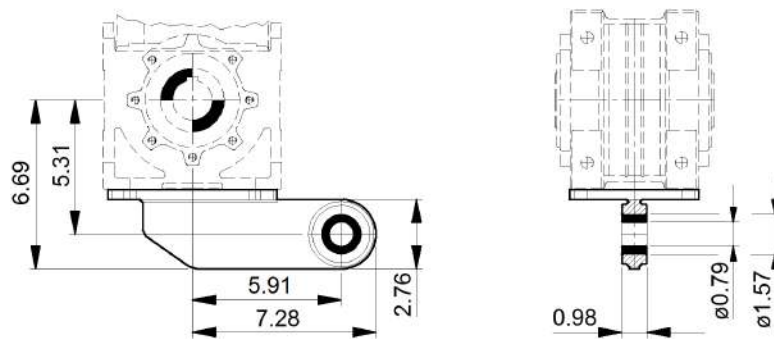
Dimensions



Max. allowed torque: 2125 in-lb



**BTA**



**BTF**

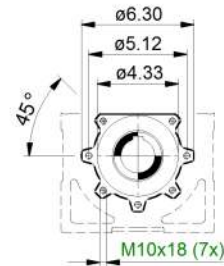
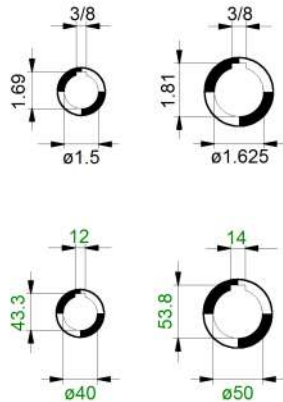
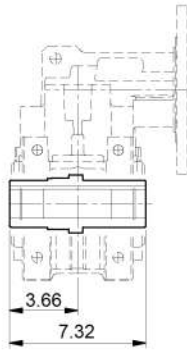
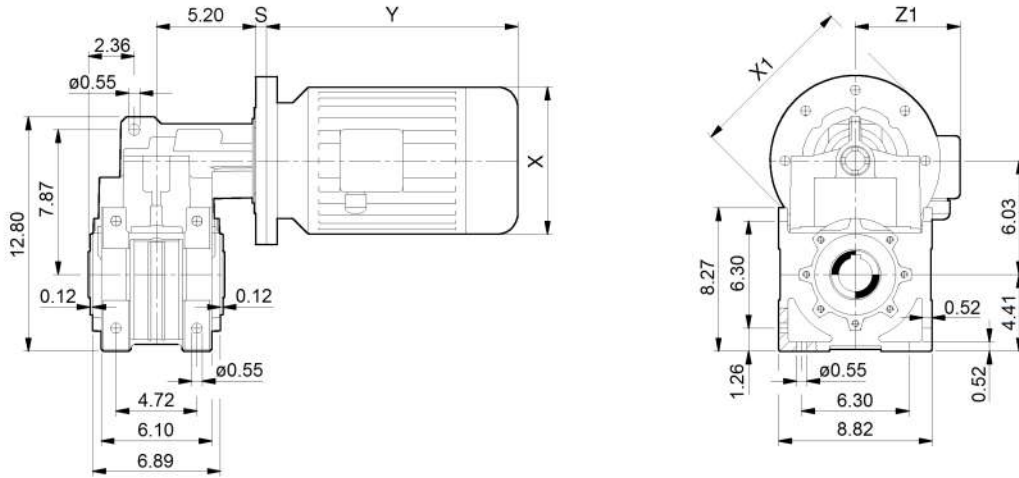
Dimensions: inches (black) and mm (green). Not binding dimensions and weights.

# Gearboxes - Series RN-RO-RV

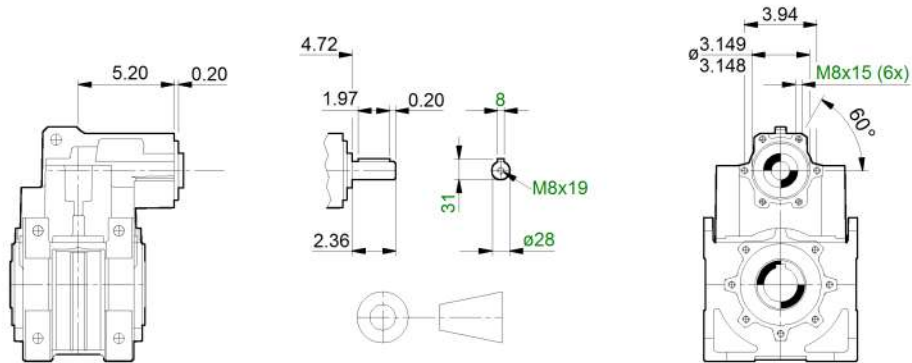
Dimensions

RN42 - RN43

**MRN  
FRN**



**RN**



NEMA	RN42 - RN43	RN42 - RN43	RN42				
	56C	140TC	180TC	210TC			
S-adapter	1.65	1.65	1.65				
Adapter part #	K534.227.N56 + K534.217.N56	K534.227.N56 + K534.217.N56	K534.227.N180 + K534.217.N180				
Coupling part #	KG6.N56/X	KG6.N140/X	KG6.N180/X				

Dimensions X, X1, Y and Z: according to motor manufacturer

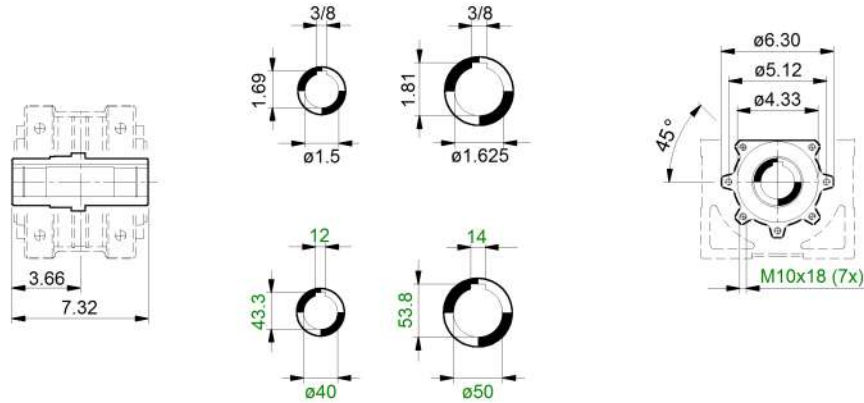
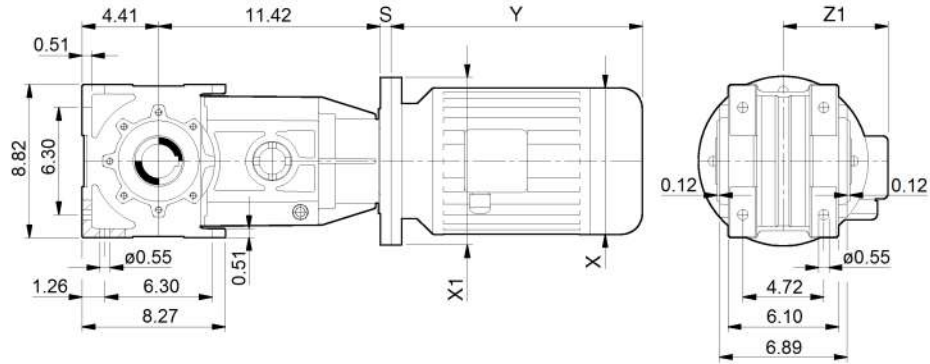
Dimensions: inches (black) and mm (green). Not binding dimensions and weights.

# Gearboxes - Series RN-RO-RV

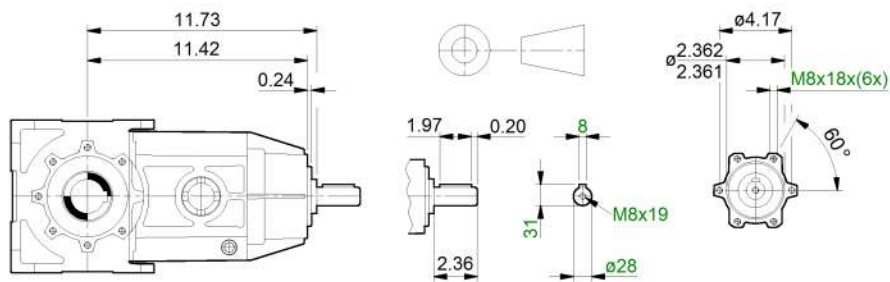
RO43

Dimensions

**MRO  
FRO**



**RO**



NEMA	RO43 56C	RO43 140TC	RO43 180TC	210TC			
S-adapter	0.87	0.87	0.87				
Adapter part #	K535.227.N56	K535.227.N56	K535.227.N180				
Coupling part #	KG6.N56/X	KG6.N140/X	KG6.N180/X				

Dimensions X, X1, Y and Z: according to motor manufacturer

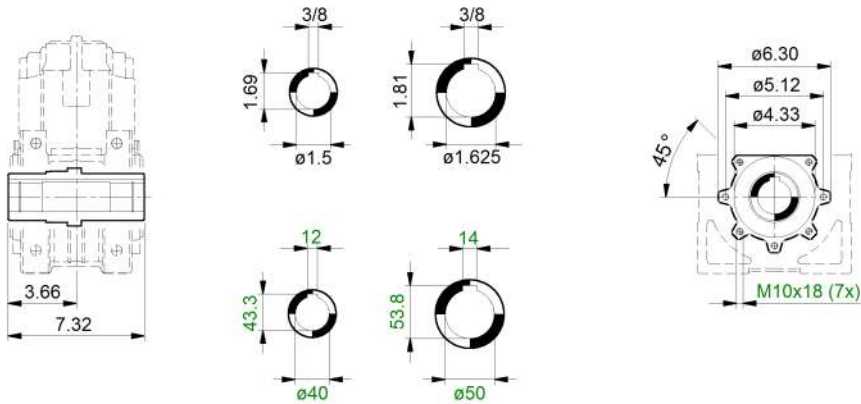
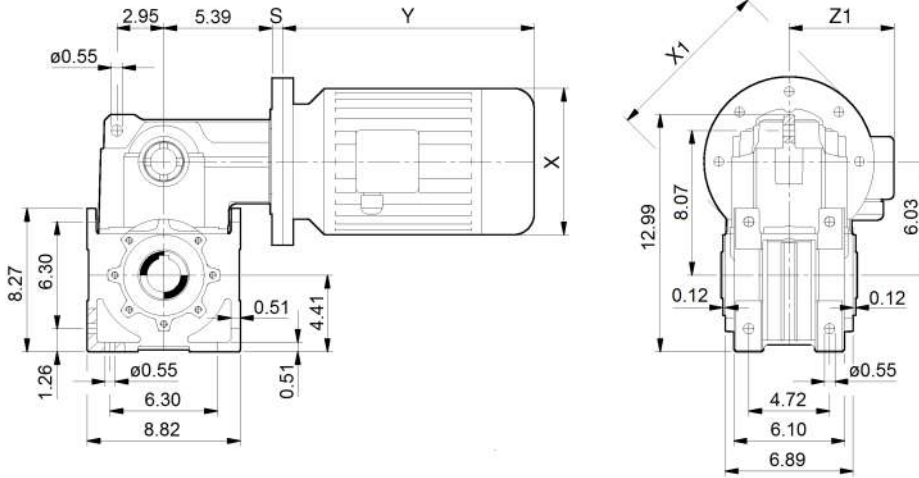
Dimensions: inches (black) and mm (green). Not binding dimensions and weights.

# Gearboxes - Series RN-RO-RV

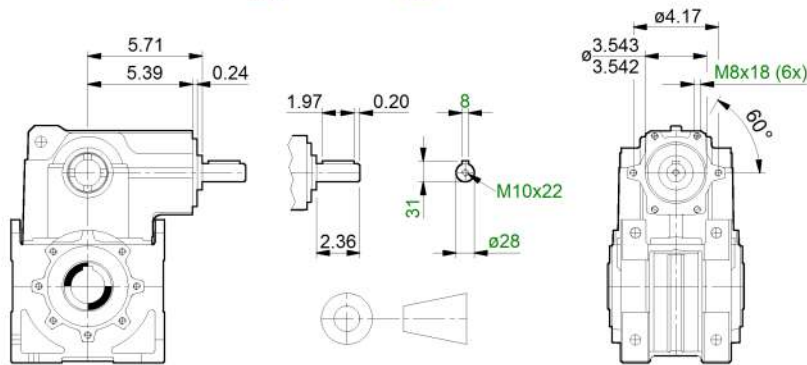
Dimensions

RV43

**MRV  
FRV**



**RV**



NEMA	RV43 56C	RV43 140TC	RV43 180TC	210TC	250TC		
S-adapter	0.87	0.87	0.87				
Adapter part #	K535.227.N56	K535.227.N56	K535.227.N180				
Coupling part #	KG6.N56/X	KG6.N140/X	KG6.N180/X				

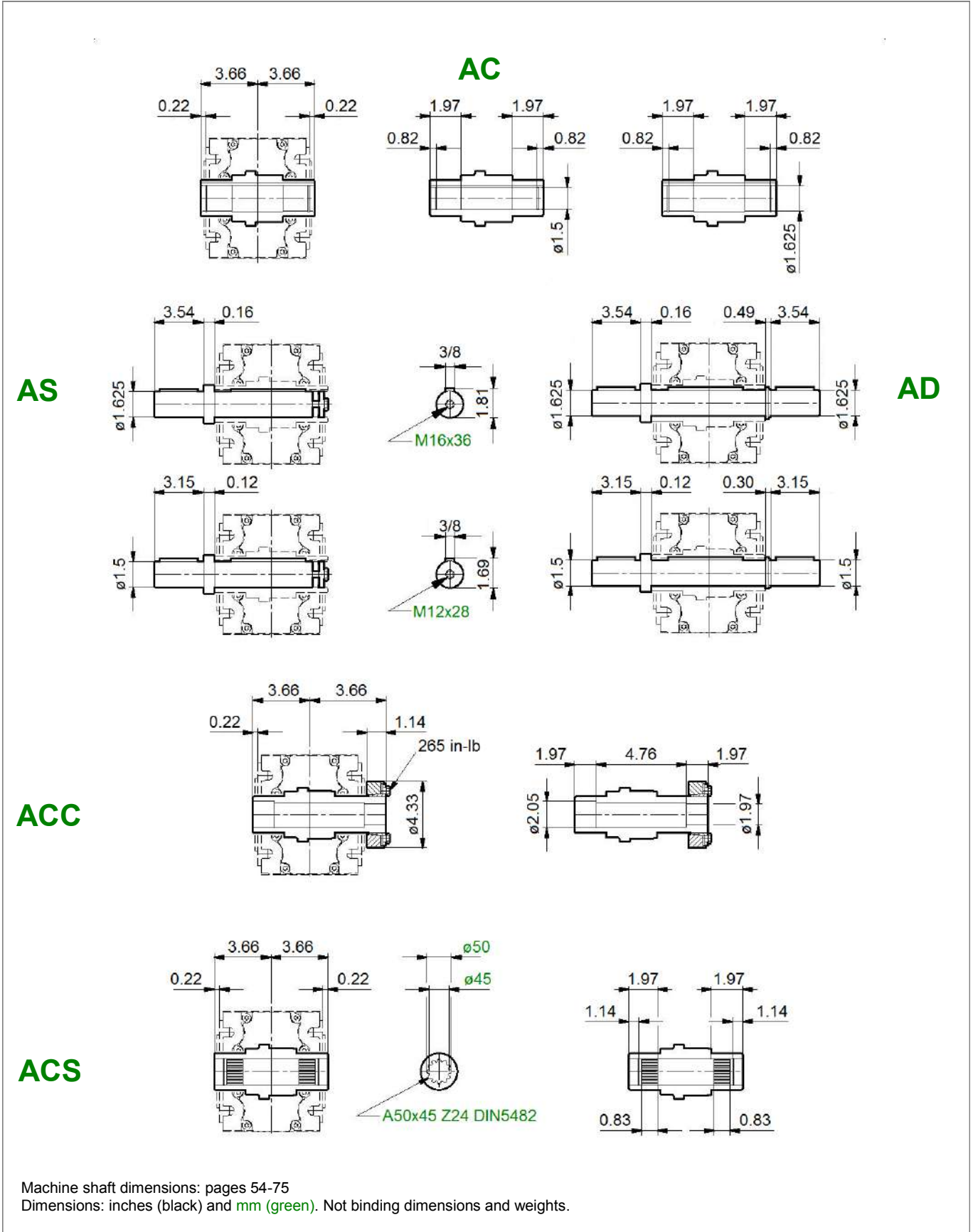
Dimensions X, X1, Y and Z: according to motor manufacturer

Dimensions: inches (black) and mm (green). Not binding dimensions and weights.

# Gearboxes - Series RN-RO-RV

RN42 - RN43 / RO43 / RV43

Dimensions

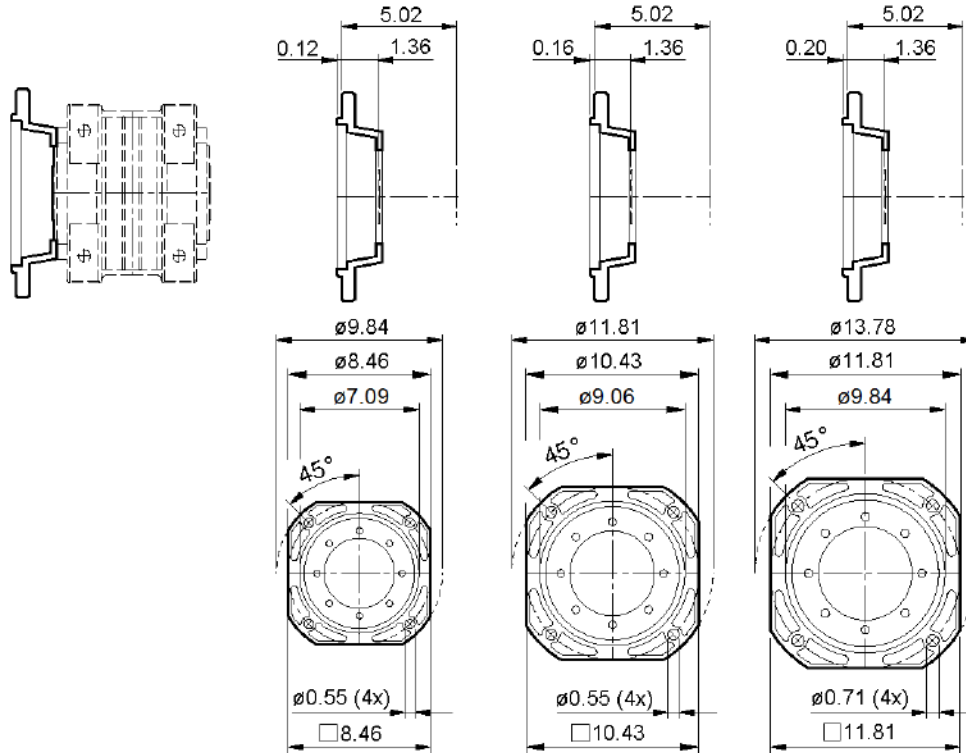


# Gearboxes - Series RN-RO-RV

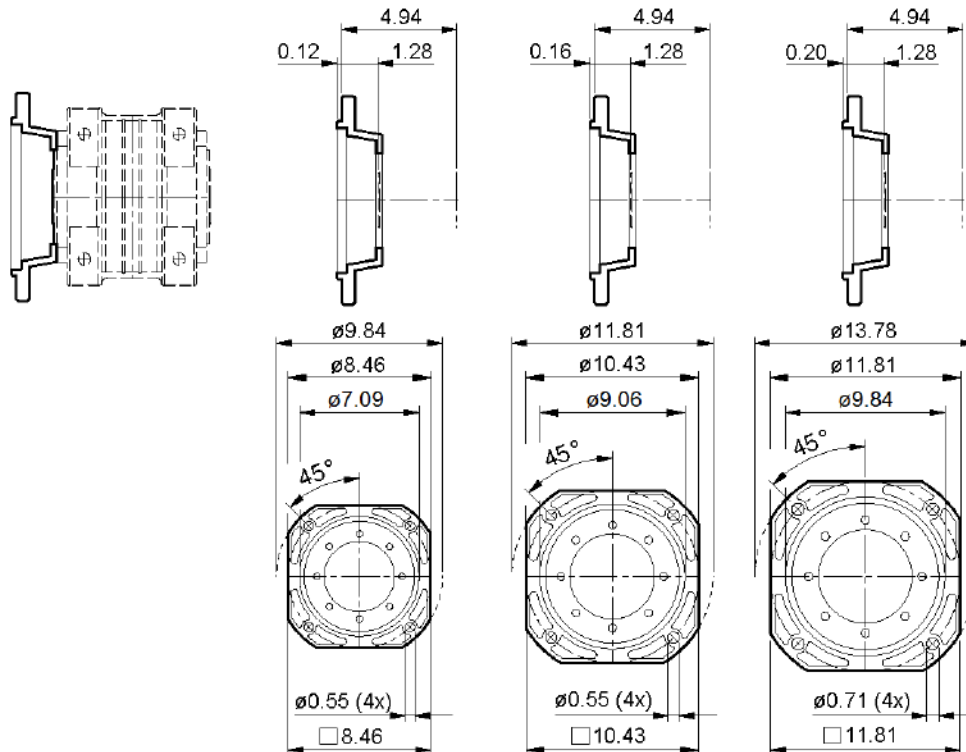
Dimensions

RN42 - RN43 / RO43 / RV43

**A**



**F**

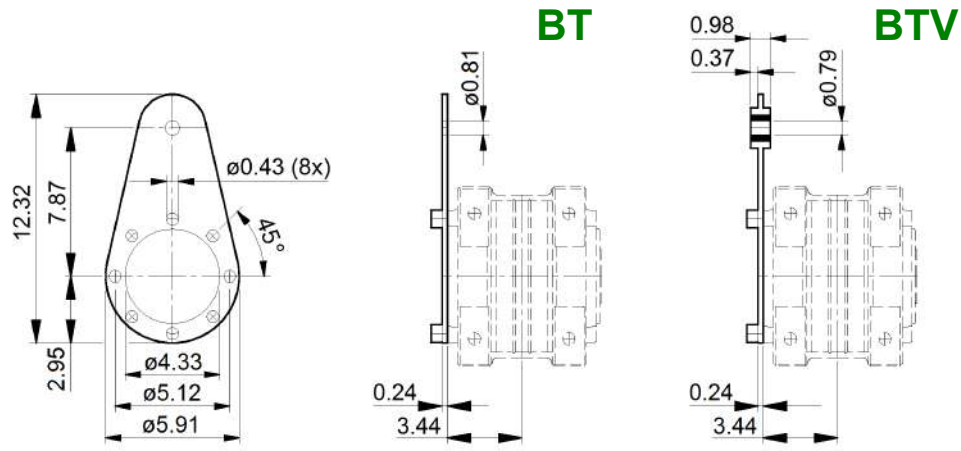


Dimensions: inches (black) and mm (green). Not binding dimensions and weights.

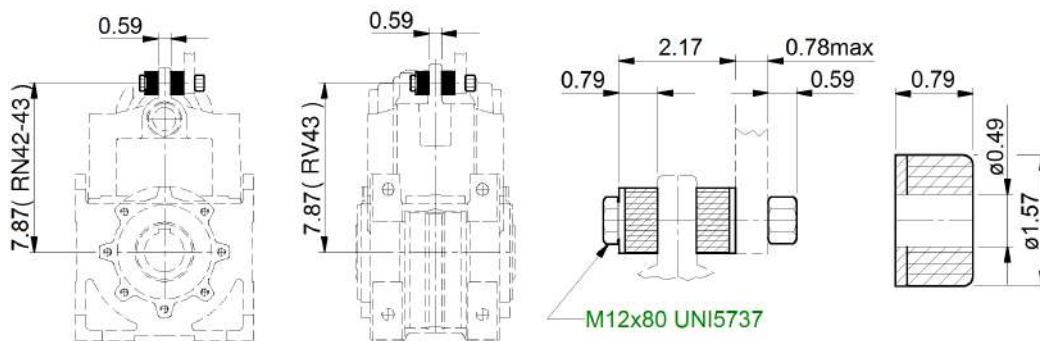
# Gearboxes - Series RN-RO-RV

RN42 - RN43 / RO43 / RV43

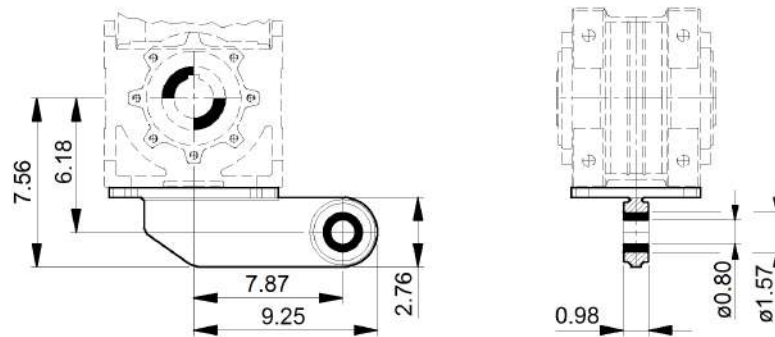
Dimensions



Max. allowed torque: 2900 in-lb



**BTA**



**BTF**

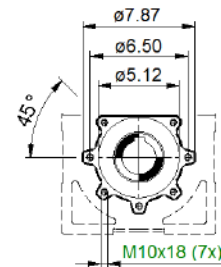
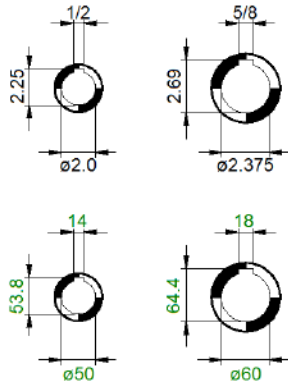
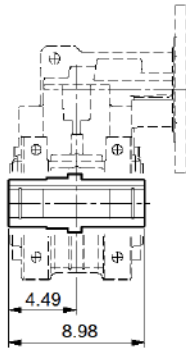
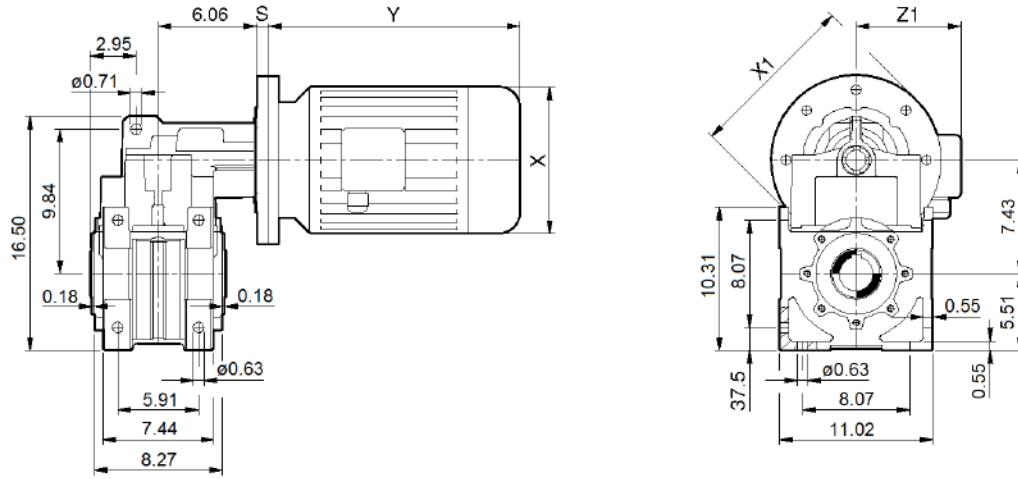
Dimensions: inches (black) and mm (green). Not binding dimensions and weights.

# Gearboxes - Series RN-RO-RV

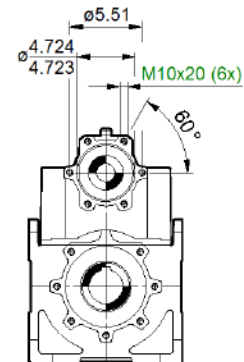
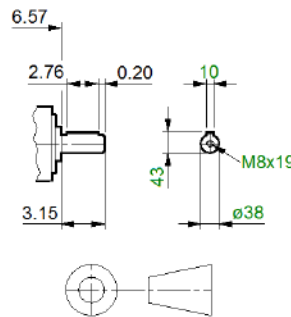
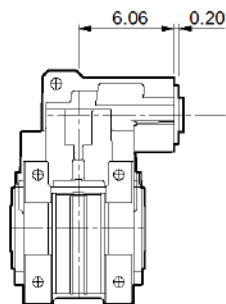
Dimensions

RN52 - RN53

**MRN  
FRN**



**RN**



NEMA	RN52 - RN53	RN52 - RN53	RN52 - RN53	RN52			
56C	56C	140TC	180TC	210TC			
S-adapter	1.69	1.69	1.89	1.89			
Adapter part #	K537.227.N56	K537.227.N56	K537.227.N180	K537.227.N180			
Coupling part #	KGS8.N56/X	KGS6.N140/X	KGS6.N180/X	KGS6.N210/X			

Dimensions X, X1, Y and Z: according to motor manufacturer

Dimensions: inches (black) and mm (green). Not binding dimensions and weights.

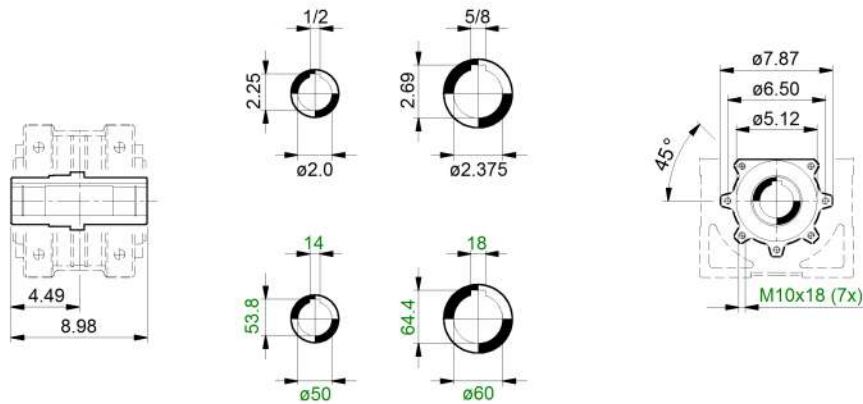
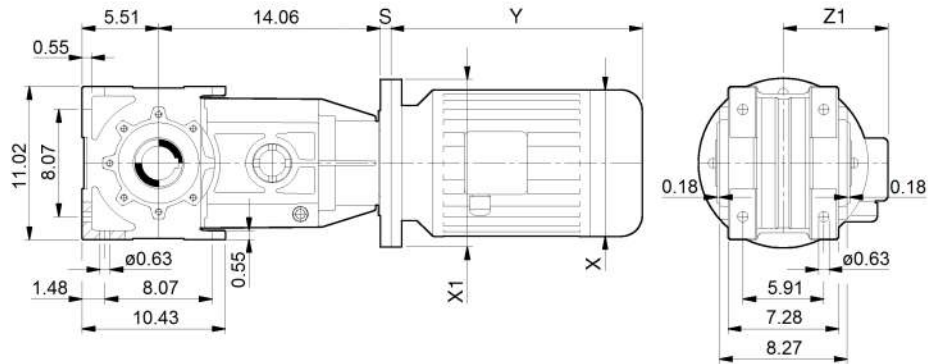


# Gearboxes - Series RN-RO-RV

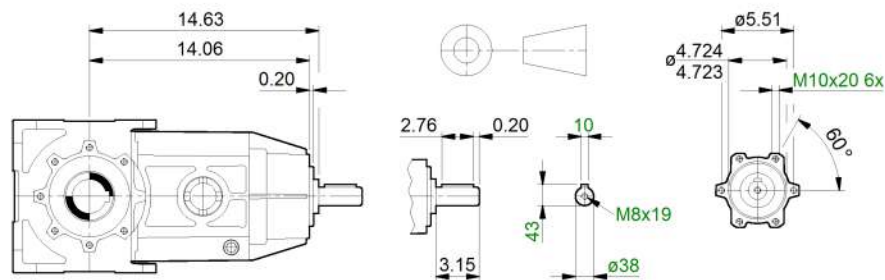
RO53

Dimensions

MRO  
FRO



RO



NEMA	RO53 56C	RO53 140TC	RO53 180TC	RO53 210TC			
S-adapter	1.69	1.69	1.89	1.89			
Adapter part #	K537.227.N56	K537.227.N56	K537.227.N180	K537.227.N180			
Coupling part #	KGS8.N56/X	KGS6.N140/X	KGS6.N180/X	KGS6.N210/X			

Dimensions X, X1, Y and Z: according to motor manufacturer

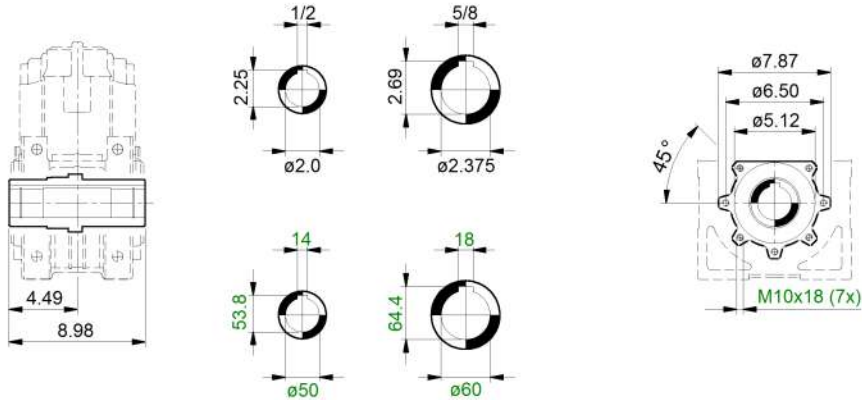
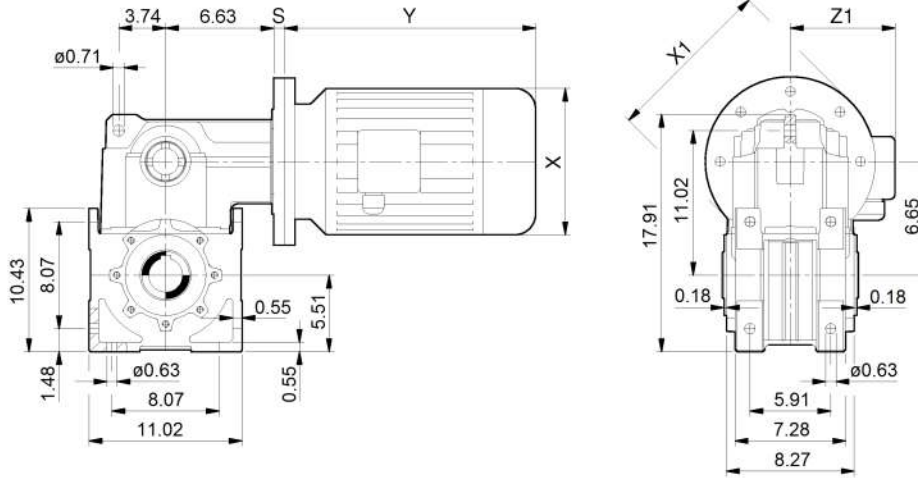
Dimensions: inches (black) and mm (green). Not binding dimensions and weights.

# Gearboxes - Series RN-RO-RV

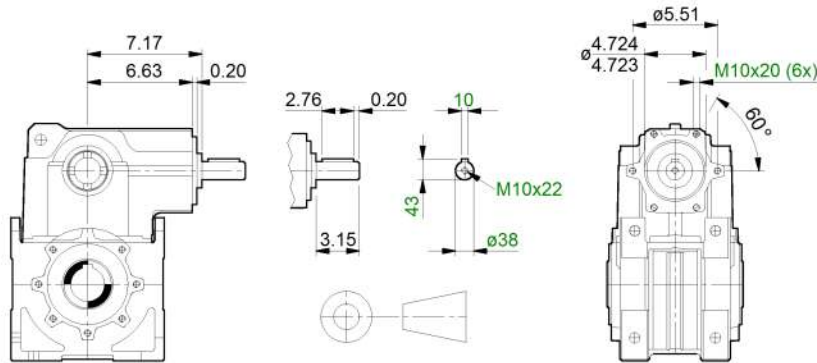
Dimensions

RV53

MRV  
FRV



RV



NEMA	RV53 56C	RV53 140TC	RV53 180TC	RV53 210TC			
S-adapter	1.69	1.69	1.89	1.89			
Adapter part #	K537.227.N56	K537.227.N56	K537.227.N180	K537.227.N180			
Coupling part #	KGS8.N56/X	KGS6.N140/X	KGS6.N180/X	KGS6.N210/X			

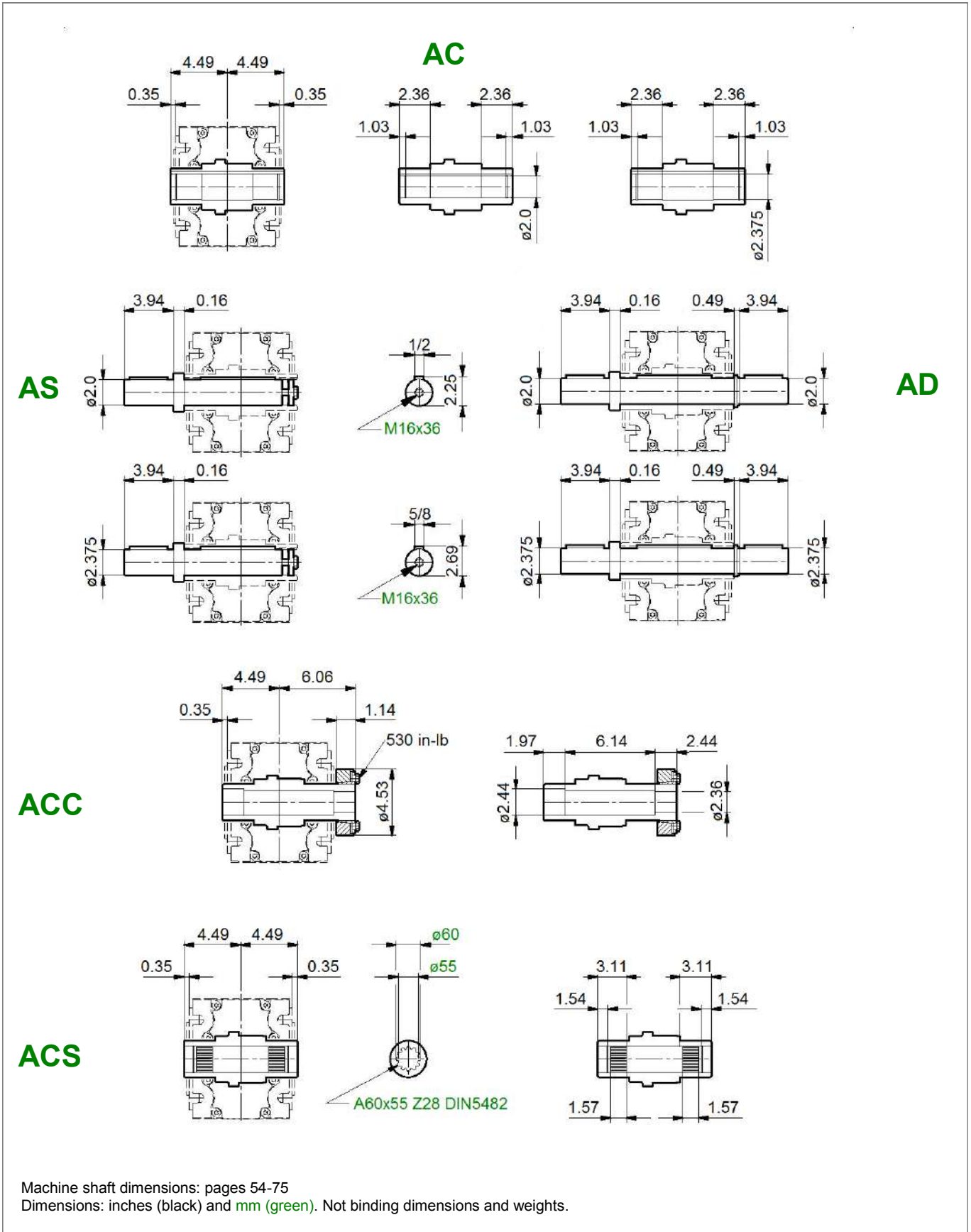
Dimensions X, X1, Y and Z: according to motor manufacturer

Dimensions: inches (black) and mm (green). Not binding dimensions and weights.

# Gearboxes - Series RN-RO-RV

RN52 - RN53 / RO53 / RV53

Dimensions

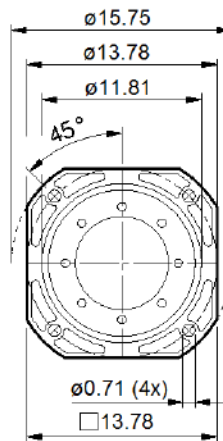
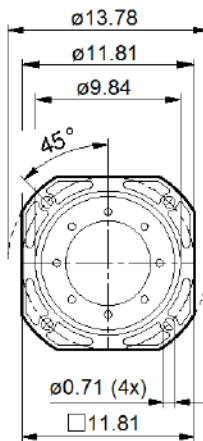
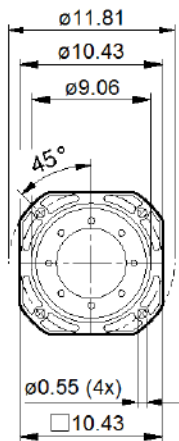
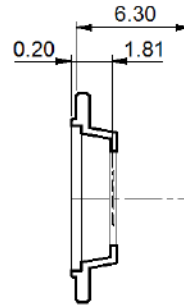
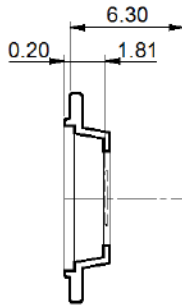
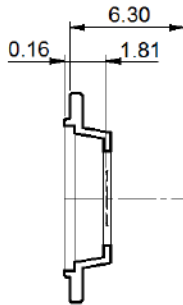
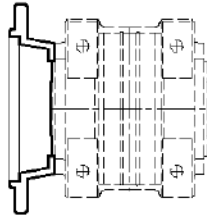


# Gearboxes - Series RN-RO-RV

Dimensions

RN52 - RN53 / RO53 / RV53

**A**

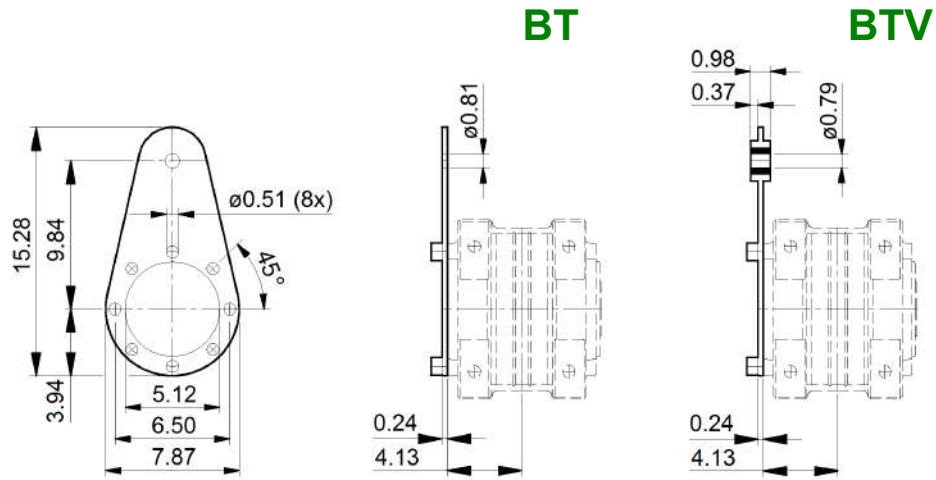


Dimensions: inches (black) and mm (green). Not binding dimensions and weights.

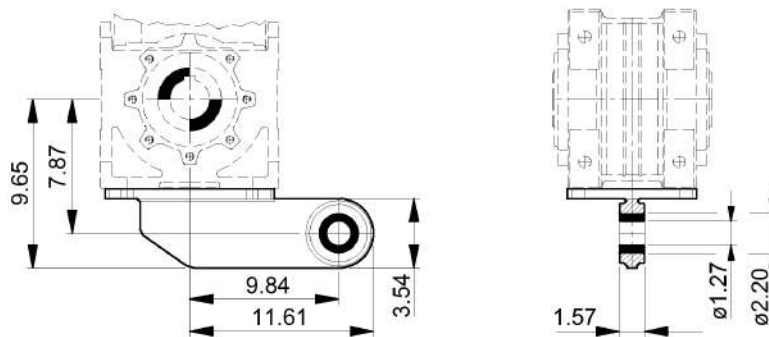
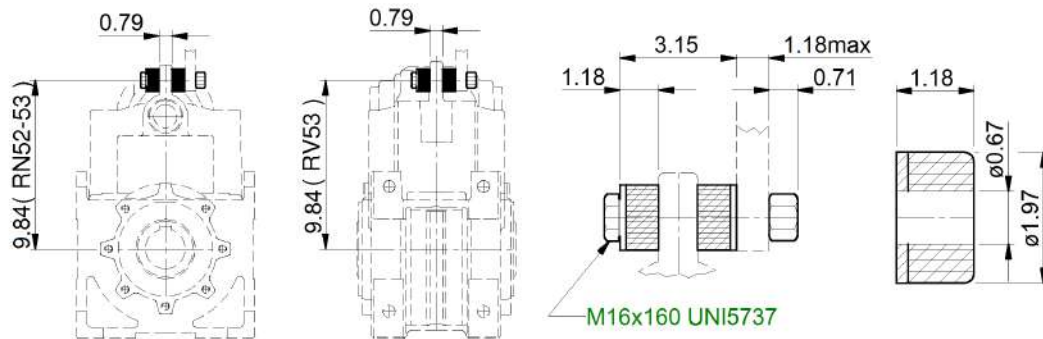
# Gearboxes - Series RN-RO-RV

RN52 - RN53 / RO53 / RV53

Dimensions



Max. allowed torque: 6200 in-lb



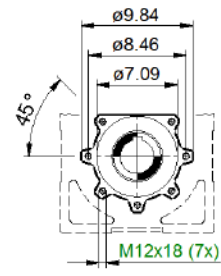
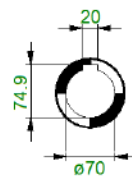
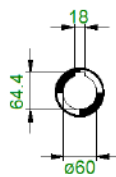
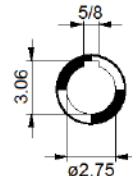
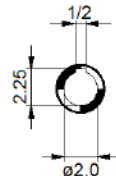
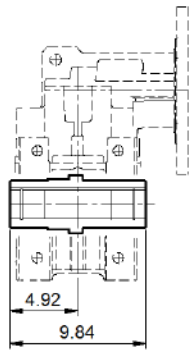
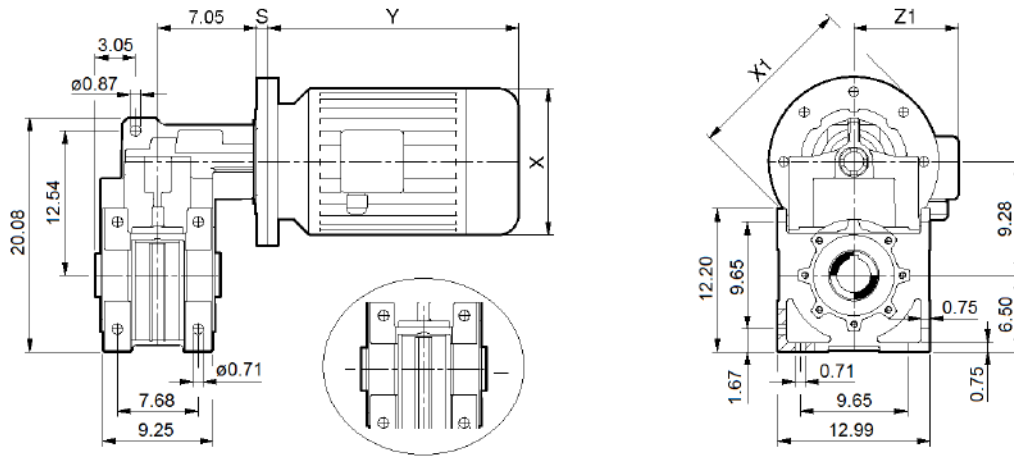
Dimensions: inches (black) and mm (green). Not binding dimensions and weights.

# Gearboxes - Series RN-RO-RV

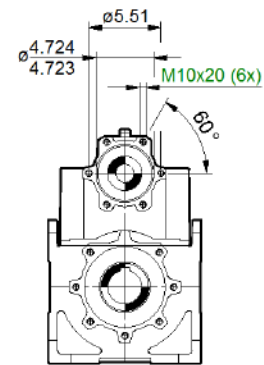
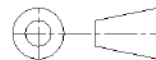
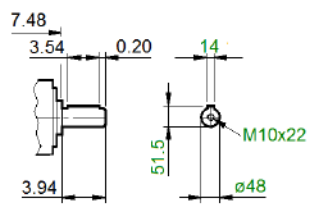
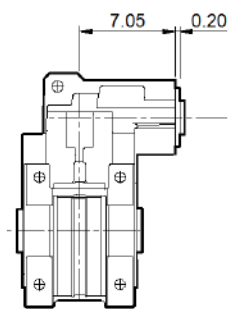
Dimensions

RN62 - RN63

MRN  
FRN



RN



NEMA	RN62 - RN63	RN62 - RN63	RN62 - RN63	RN52			
56C	56C	140TC	180TC	210TC			
S-adapter	1.69	1.69	1.89	1.89			
Adapter part #	K537.227.N56	K537.227.N56	K537.227.N180	K537.227.N180			
Coupling part #	KGS8.N56/X	KGS6.N140/X	KGS6.N180/X	KGS6.N210/X			

Dimensions X, X1, Y and Z: according to motor manufacturer

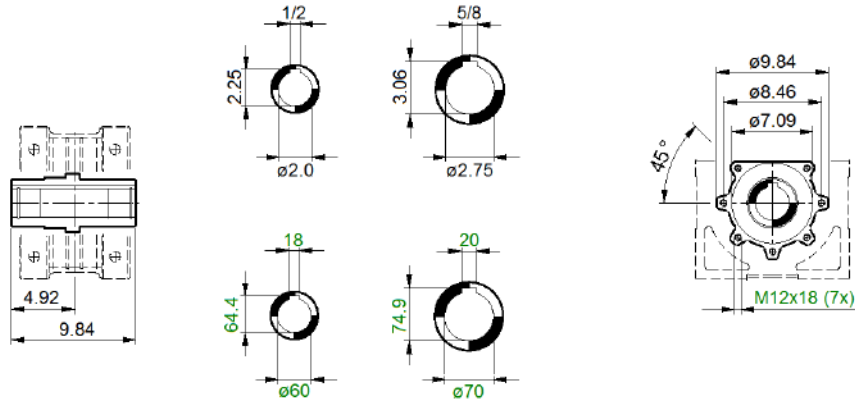
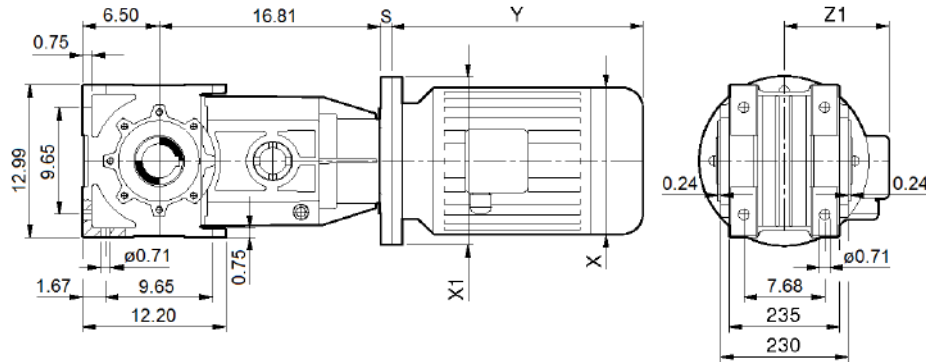
Dimensions: inches (black) and mm (green). Not binding dimensions and weights.

# Gearboxes - Series RN-RO-RV

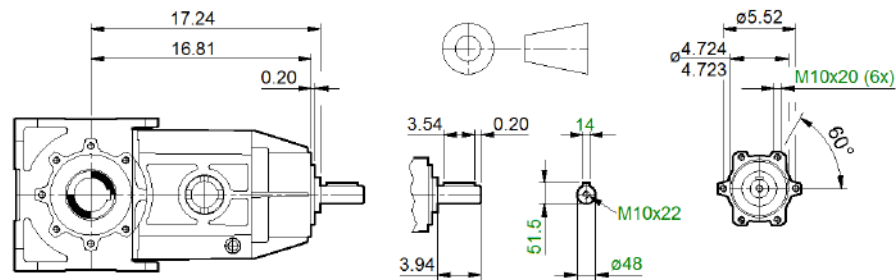
RO63

Dimensions

**MRO  
FRO**



**RO**



NEMA	RO63 56C	RO63 140TC	RO63 180TC	RO63 210TC			
S-adapter	1.69	1.69	1.89	1.89			
Adapter part #	K537.227.N56	K537.227.N56	K537.227.N180	K537.227.N180			
Coupling part #	KGS8.N56/X	KGS6.N140/X	KGS6.N180/X	KGS6.N210/X			

Dimensions X, X1, Y and Z: according to motor manufacturer

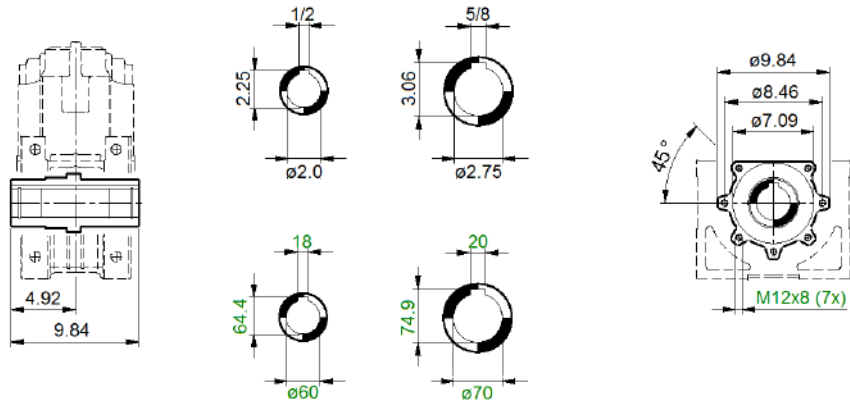
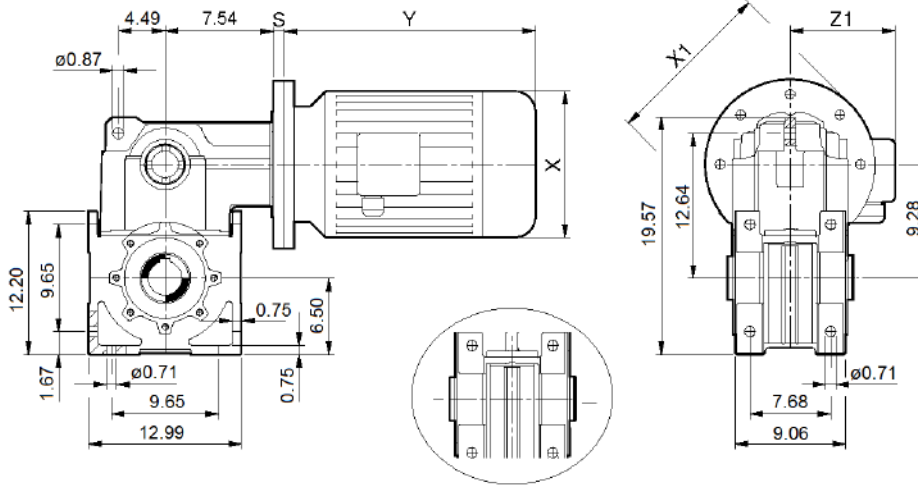
Dimensions: inches (black) and mm (green). Not binding dimensions and weights.

# Gearboxes - Series RN-RO-RV

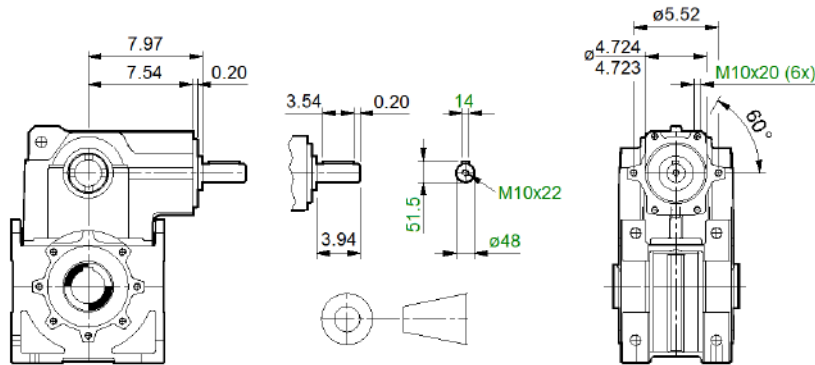
Dimensions

RV63

**MRV  
FRV**



**RV**



NEMA	RV63 56C	RV63 140TC	RV63 180TC	RV63 210TC			
S-adapter	1.69	1.69	1.89	1.89			
Adapter part #	K537.227.N56	K537.227.N56	K537.227.N180	K537.227.N180			
Coupling part #	KGS8.N56/X	KGS6.N140/X	KGS6.N180/X	KGS6.N210/X			

Dimensions X, X1, Y and Z: according to motor manufacturer

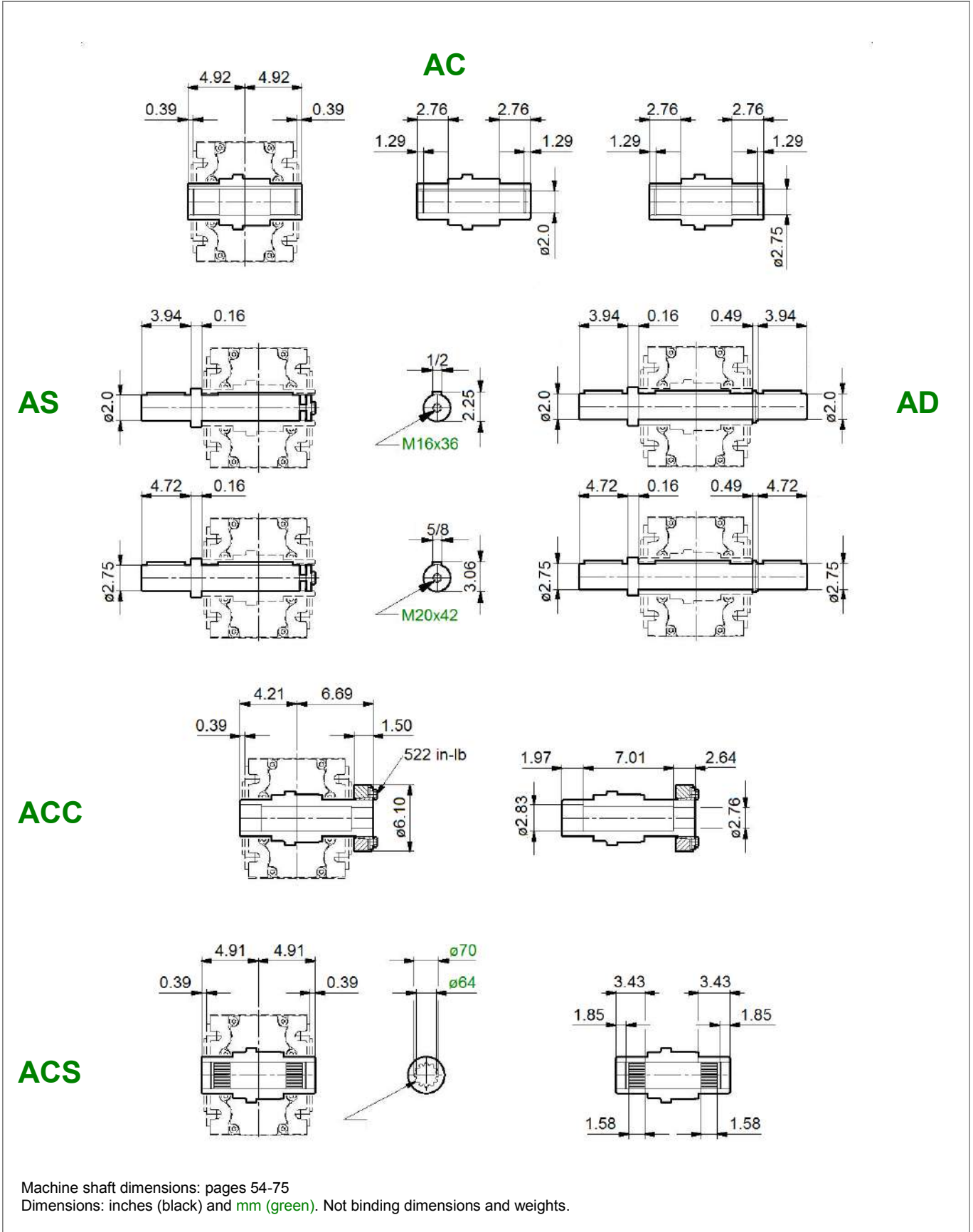
Dimensions: inches (black) and mm (green). Not binding dimensions and weights.



# Gearboxes - Series RN-RO-RV

RN62 - RN63 / RO63 / RV63

Dimensions

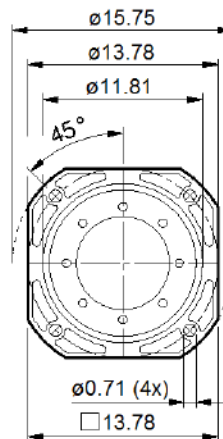
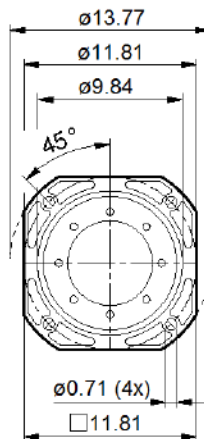
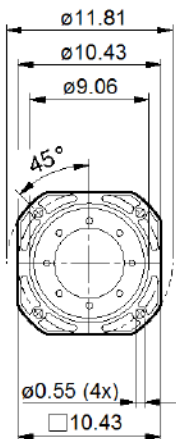
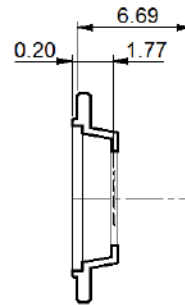
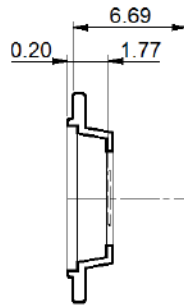
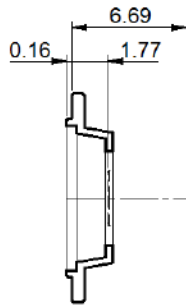
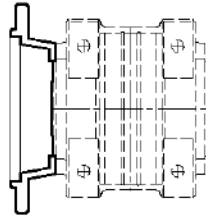


# Gearboxes - Series RN-RO-RV

Dimensions

RN62 - RN63 / RO63 / RV63

**A**



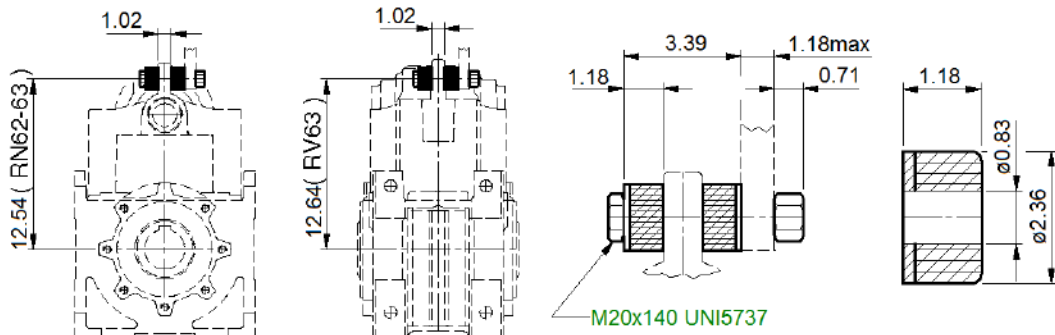
Dimensions: inches (black) and mm (green). Not binding dimensions and weights.

# Gearboxes - Series RN-RO-RV

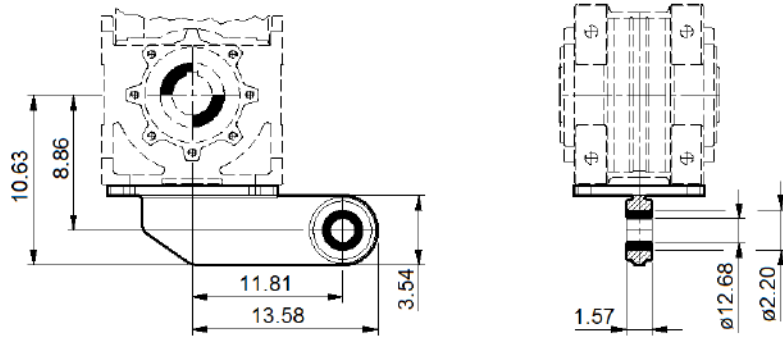
RN62 - RN63 / RO63 / RV63

Dimensions

**BTA**



**BTF**



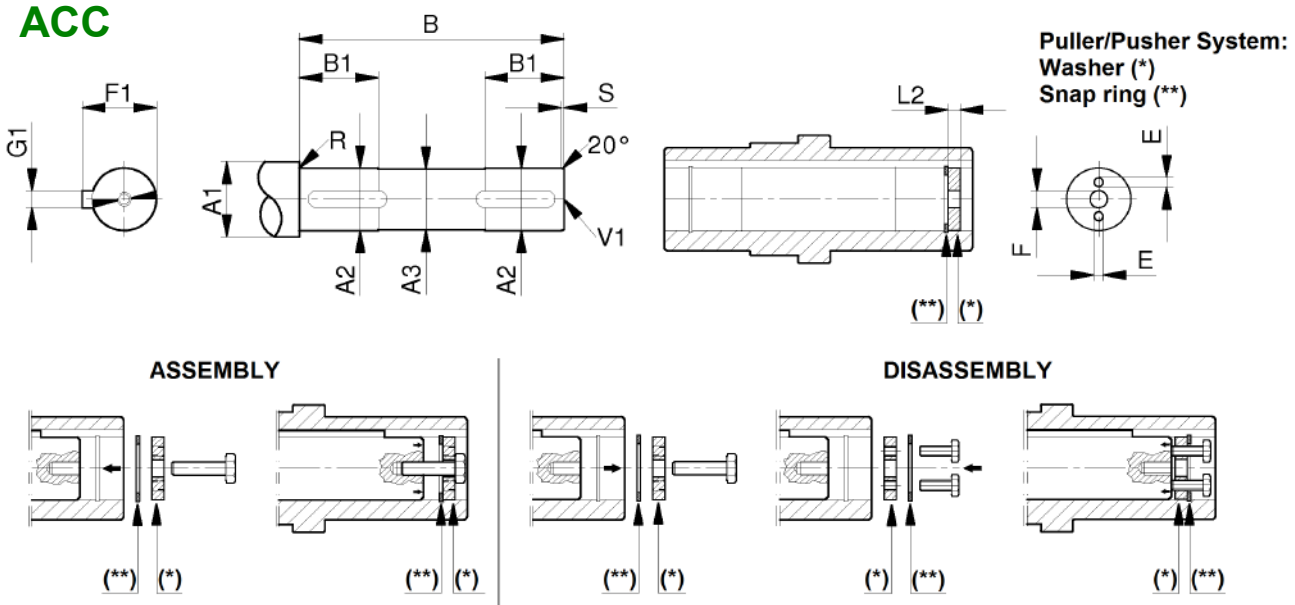
Dimensions: inches (black) and mm (green). Not binding dimensions and weights.

# Gearboxes - Series RN-RO-RV

Solid shaft dimensions

AC version

The table gives the machine shaft dimensions to fit into the AC hollow output shaft with standard key.  
Internal snap ring (\*\*) according to A2 diameter.



Size	A1	A2	A3	B	B1	E	F	F1	G1	L2	R	S	V1
RN12, RN13 RO13, RV13	1,38	<b>0,98</b>	0,94	3,86	1,38	M6	0,35	1,10	0,31	0,18	0,039	0,079	M8x19
	1,57	<b>1,18</b>	1,14	3,86	1,38	M6	0,43	1,30	0,31	0,22	0,039	0,079	M10x22
RN22, RN23 RO23, RV23	1,57	<b>1,18</b>	1,14	4,47	1,57	M6	0,43	1,30	0,31	0,28	0,039	0,079	M10x22
	1,77	<b>1,38</b>	1,34	4,47	1,57	M8	0,43	1,50	0,39	0,28	0,039	0,079	M10x22
RN32, RN33 RO33, RV33	1,77	<b>1,38</b>	1,34	5,26	1,77	M8	0,43	1,50	0,39	0,28	0,039	0,079	M10x22
	1,97	<b>1,57</b>	1,54	5,26	1,77	M8	0,51	1,69	0,47	0,28	0,039	0,079	M12x28
RN42, RN43 RO43, RV43	1,97	<b>1,57</b>	1,54	6,12	2,17	M8	0,51	1,69	0,47	0,31	0,059	0,118	M12x28
	2,36	<b>1,97</b>	1,93	6,12	2,17	M10	0,67	2,11	0,55	0,31	0,059	0,118	M16x36
RN52, RN53 RO53, RV53	2,56	<b>1,97</b>	1,93	7,28	2,56	M10	0,67	2,11	0,55	0,49	0,079	0,157	M16x36
	2,95	<b>2,36</b>	2,32	7,28	2,56	M12	0,67	2,52	0,71	0,49	0,079	0,157	M16x36
RN62, RN63 RO63, RV63	2,95	<b>2,36</b>	2,32	8,07	2,76	M12	0,83	2,52	0,71	0,49	0,079	0,157	M16x36
	3,35	<b>2,76</b>	2,72	8,07	2,76	M12	0,83	2,93	0,79	0,49	0,079	0,157	M20x42

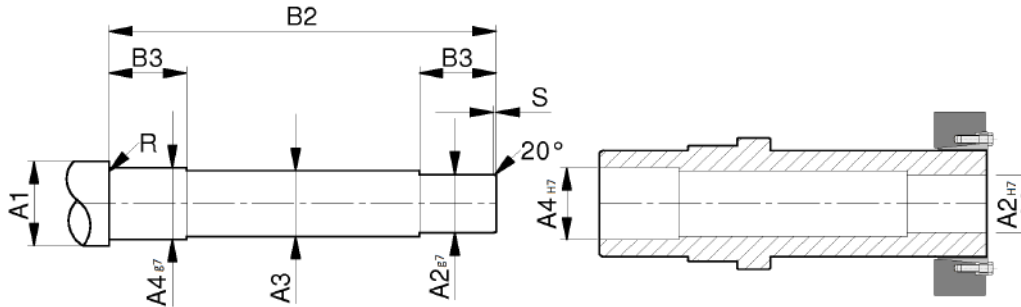
Dimensions: inch (black) and mm (green)  
Not binding dimensions and weights

# Gearboxes - Series RN-RO-RV

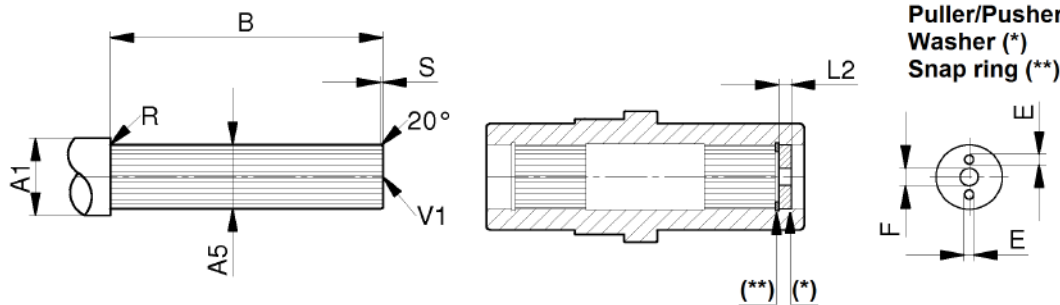
ACC & ACS versions

Solid shaft dimensions

The table gives the machine shaft dimensions to fit into a ACC Shrink Disk shaft and ACS Spline type hollow shaft.  
Internal snap ring (\*\*) according to A2 diameter.

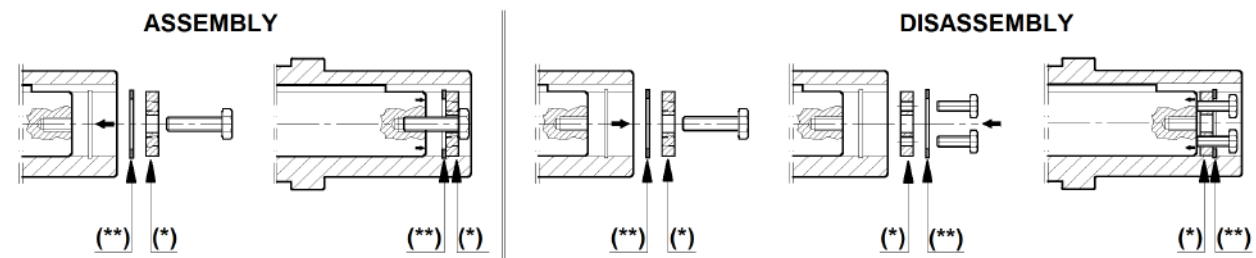


ACC



Puller/Pusher System: ACS

Washer (\*)  
Snap ring (\*\*)



Size	A1	A2	A3	A4	A5	B	B2	B3	E	F	L2	R	S	V1
RN12, RN13 RO13, RV13	1.57	1.18	1.14	1.26	30x27	3.86	5.67	1.34	M6	0.43	0.22	0.039	0.079	M8x19
RN22, RN23 RO23, RV23	1.77	<b>1,38</b>	1.34	1.46	35x31	4.47	6.57	1.54	M8	0.43	0,28	0,039	0,079	M10x22
RN32, RN33 RO33, RV33	1.97	<b>1,57</b>	1.54	1.65	40x36	5,26	7.44	1.93	M8	0,51	0,28	0,039	0,079	M10x22
RN42, RN43 RO43, RV43	2.36	<b>1,97</b>	1.93	2.05	50x45	6,12	8.66	1.93	M10	0,67	0,31	0,059	0,118	M16x36
RN52, RN53 RO53, RV53	2.95	<b>2,36</b>	2.32	2.44	60x55	2,56	10.51	1.93	M12	0,67	0,49	0,079	0,157	M16x36
RN62, RN63 RO63, RV63	3.35	<b>2,76</b>	2.72	2.83	70x64	8,07	11.57	1.93	M12	0,83	0,49	0,079	0,157	M20x42

Dimensions: inch (black) and mm (green)  
Not binding dimensions and weights

# Gearboxes - Series RN-RO-RV

Imperial	CONVERSION FACTORS	Metric
1 lb = 4.45 N 1 lb = 0.454 kg 1 oz = 0.028 kg	<b>Mass &amp; Force</b>	1 N = 0.225 lb 1 kg = 2.205 lb 1 kg = 35.27 oz
HP (60Hz) = kW (50Hz) × 1.341 × 1.2 HP (50Hz) = kW (50Hz) × 1.341 HP = in-lb × rpm : (63025 x eff.)	<b>Power</b>	kW (50Hz) = HP (60Hz) × 0.745 × 0.833 kW (50Hz) = HP (50Hz) × 0.745 kW = Nm × rpm / (9550 × eff.)
1 in-lb = 0.113 Nm 1 ft-lb = 1.355 Nm ft-lb = 108 × k × HP × eff. × ratio in-lb = 63025 × HP × eff. / rpm = 9 × k × HP × eff. × ratio = 8000 × k × HP × eff. / output speed (where k= motor pole number, i.e. 2, 4, 6, 8)	<b>Torque</b>	1 Nm = 8.851 in-lb 1 Nm = 0.738 ft-lb Nm = 9550 × kW × eff. / rpm
1 qt (US) = 0.946 litre	<b>Volume</b>	1 litre = 1.057 qt (US)

## Abstract of OPERATION AND MAINTENANCE INSTRUCTIONS

(complete manual on [www.varvel.com](http://www.varvel.com))

Under the terms of the Machine Directive 2006/42/EC and relevant Guidelines, the speed gearboxes and variators are considered as "machines" separate elements not having a specific application and meant for being incorporated onto the machine. The complete machine and equipped with such components must comply with the essential and relevant requisites for safety and health preservation" of the mentioned Directive.

### 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

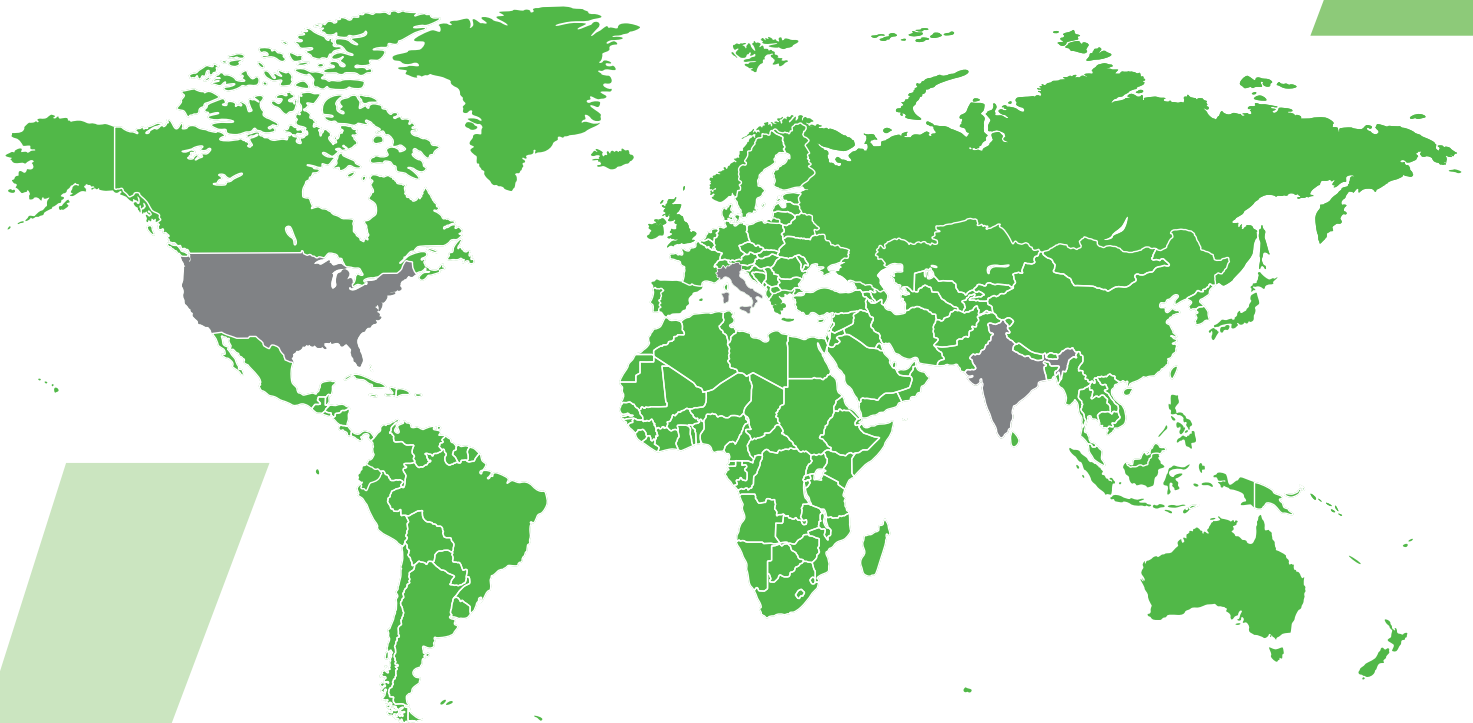
For storage longer than 3 months, apply anti-oxidants onto shafts and machined surfaces, and protective grease on oil seal lips.

### Product's Environmental Management

In conformity with Environmental Certification ISO 14001, we recommend the following to dispose 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.

D00-RNRORV-USA-EN-ED01-REV00



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