



**MRV** SERIES WORM GEARED MOTORS AND WORM GEAR UNITS

**UDL** SERIES STEPLESS SPEED VARIATOR



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# SUMMARIZE

## 1. SUMMARIZE

### 1.1 Products characteristics

MRV series worm gear units is a new-generation of product developed by our company on the basis of perfecting WJ series products with a compromise of advanced technology both at home and abroad, its main features are as follows:

1. Made of high-quality aluminum alloy, light in weight and non-rusting.
2. Large in output torque.
3. Smooth in running and low in noise, can work long time in dreadful conditions.
4. High in radiating efficiency.
5. Good-looking in appearance, durable in service life and small in volume.
6. Suitable for omnibearing installation.

### 1.2 Main materials

1. Housing: die-cast aluminum alloy (frame size: 025 to 105); cast iron (frame size : 110 to 130).
2. Worm: 20Cr, carbonize & quencher heat treatment make the hardness of gear's surface up to 56~62 HRC, retain carburization layer's thickness between 0.3 and 0.5mm after precise grinding.
3. Worm wheel: wearable stannum bronze alloy.

### 1.3 Surface painting

Aluminum alloy housing:

1. Shot blasting and special antiseptic treatment on the aluminum alloy surface.
2. After phosphating, paint with RAL 5010 blue .

Cast iron housing :

First paint with red antirust paint, then paint with RAL 5010 blue .

PRODUCT  
STRUCTURE PICTURE



MRV025-130



NRV030-130



MRV - MRV..



NRV - MRV..



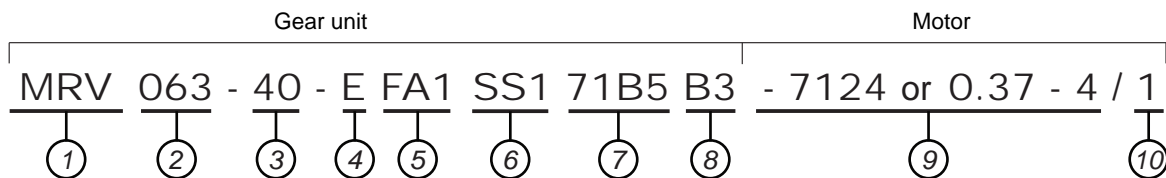
PC - MRV..



UDL - MRV..

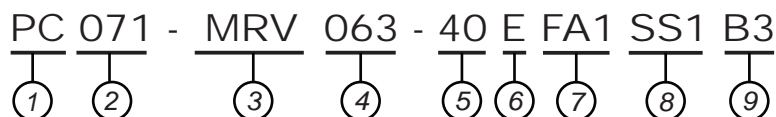
## 3. MODEL ILLUMINATE

### 3.1 MRV/NRV Worm geared motos and worm gear units



No	Comments	No	Comments
1	Model code 1). <b>MRV</b> : Hole input with flange 2). <b>NRV</b> : Shaft input without flange	6	1). No mark means hole output 2). <b>SS(1/2)</b> : Single output shaft and position 3). <b>DS</b> : Double output shaft
2	Central distance of worm gear units (spec)	7	Normalized form of input flange (without motor)
3	Speed ratio of reducer ( $i = 7.5; 10; 15; 20; 25; 30; 40; 50; 60; 80; 100$ )	8	Installation position code
4	1). No mark means single extension worm shaft 2). <b>E</b> : Double extension worm shaft	9	1). No mark means without motor 2). Model motos (poles of power)
5	1). No mark means without output flange 2). <b>FA,FB,FC,FD,FE(1/2)</b> : output Flange and position	10	Position diagram for motor terminal box default position 1 not to write out is ok

### 3.2 PC-MRV Worm gears with pre-stage helical units

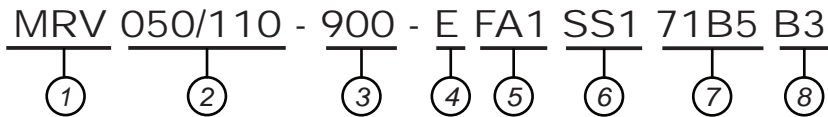


No	Comments	No	Comments
1	Helical Pre-stage unit	6	1). No mark means single extension worm shaft 2). <b>E</b> : Double extension worm shaft
2	Motor frame size	7	1). No mark means without output flange 2). <b>FA,FB,FC,FD,FE(1/2)</b> : output Flange and position
3	Model code 1). <b>MRV</b> : Hole input with flange 2). <b>NRV</b> : Shaft input without flange	8	1). No mark means hole output 2). <b>SS(1/2)</b> : Single output shaft and position 3). <b>DS</b> : Double output shaft
4	Central distance of worm gear units (spec)	9	Installation position code
5	Speed ratio of reducer ( $i = 7.5; 10; 15; 20; 25; 30; 40; 50; 60; 80; 100$ )		

When ordering, you should show whether the reducers are equipped with motors, otherwise reducers aren't supplied with motors.

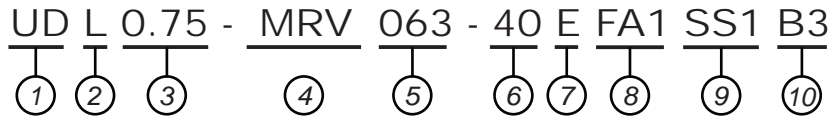


3.3 MRV-MRV / NRV-MRV **Combination worm gear units**



No	Comments	No	Comments
1	Model code 1). <b>MRV</b> : Hole input with flange 2). <b>NRV</b> : Shaft input without flange	5	1). No mark means without output flange 2). <b>FA,FB,FC,FD,FE(1/2)</b> : output Flange and position
2	Central distance of worm gear units (spec)	6	1). No mark means hole output 2). <b>SS(1/2)</b> : Single output shaft and position 3). <b>DS</b> : Double output shaft
3	Speed ratio of reducer	7	Normalized form of input flange
4	1). No mark means single extension worm shaft 2). <b>E</b> : Double extension worm shaft	8	Installation position code

3.4 UDL-MRV **Combination of stepless speed variator and worm gear units**



No	Comments	No	Comments
1	Code of stepless speed variator	6	Speed ratio of worm gear units
2	Aluminium alloy housing, and no mark means cast iron casing	7	1). No mark means single extension worm shaft 2). <b>E</b> : Double extension worm shaft
3	Relevant motor power	8	1). No mark means without output flange 2). <b>FA,FB,FC,FD,FE(1/2)</b> : Output Flange and position
4	Code of worm gear units	9	1). No mark means hole output 2). <b>SS(1/2)</b> : Single output shaft and position 3). <b>DS</b> : Double output shaft
5	Central distance of worm gear units (spec)	10	Installation position code

When ordering, you should show whether the reducers are equipped with motors, otherwise reducers aren't supplied with motors.

## 4. RELEVANT PARAMETER

### 4.1 Power P

$$P_1 = \frac{P_2}{\eta} \text{ [kW]}$$

$$P_{1n} \geq P_1 \cdot f_s \text{ [kW]}$$

$P_1$	Input power
$P_2$	Output power
$P_{1n}$	Rated input motor power
$f_s$	Service factor
$\eta$	Transmission efficiency

The parameter can be found in the NRV gearbox rating charts and represents the KW that can be safely transmitted to the gearbox, based on input speed  $n_1$  and service factor  $f_s=1$ .

Values of  $\eta_d$  are calculated for gearboxes after a sufficiently long running-in period. After the running-in period the surface temperature in operation reduces and finally stabilises. It may be worth highlighting that values of rated torque  $M_{2n}$  given in the catalogue take the transmission efficiency  $\eta_d$  into consideration.

### 4.2 Rotation speed n

$n_1$	Gear units input speed
$n_2$	Gear units output speed

If driven by the external gearing, 1400r/min or lower rotation speed is suggested so as to optimize the working conditions and prolong the service life.

### 4.3 Transmission ratio i

$$i = \frac{n_1}{n_2}$$

### 4.4 Torque M

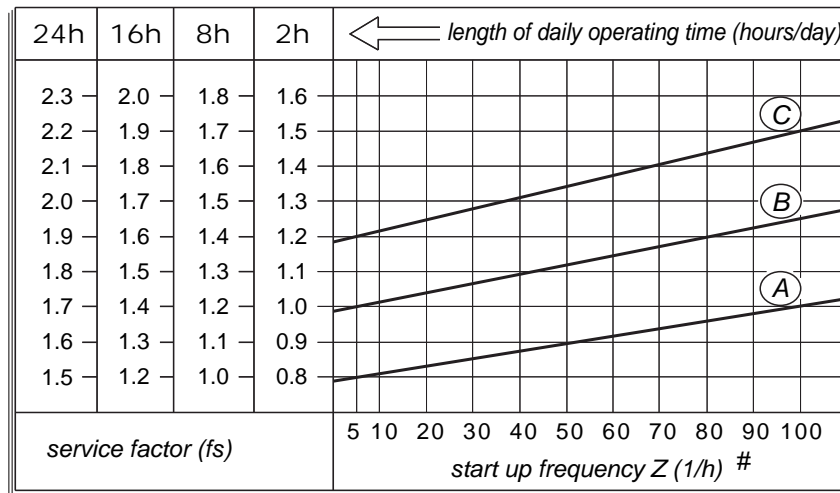
$$M_2 = \frac{9550 \cdot P_1 \cdot \eta}{n_2} \text{ [Nm]}$$

$$M_{2n} \geq M_2 \cdot f_s \text{ [Nm]}$$

$M_2$	Output torque
$M_{2n}$	Rated output torque
$P_1$	Input power
$\eta$	Transmission efficiency
$f_s$	Service factor

### 4.5 Service factor $f_s$

The effect of the driven machine on the gear unit is taken into account to a sufficient level of accuracy using the service factor  $f_s$ . The service factor is determined according to the daily operating time and the starting frequency Z. Three load classifications are considered depending on the mass acceleration factor. You can read off the service factor applicable to your application in following figure. The service factor selected using this diagram must be less than or equal to the service factor as given in the performance parameter table.



# Starting frequency Z: The cycles include all starting and braking procedures as well as change overs from low to high speed.

#### 4.5.1 Load classifications

Type of load:

- Ⓐ **Uniform**, permitted mass acceleration factor  $f_a \leq 0.3$
- Ⓑ **Moderate shock load**, permitted mass acceleration factor  $f_a \leq 3$
- Ⓒ **Heavy shock load**, permitted mass acceleration factor  $f_a \leq 10$

load classifications:

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

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

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

#### 4.5.2 Mass acceleration factor

The mass acceleration factor is calculated as follows:

$$f_a = \frac{J_c}{J_m}$$

- fa** Mass acceleration factor
- Jc** All external mass moments of inertia [kgm<sup>2</sup>]
- Jm** Mass moment of inertia on the motor end [kgm<sup>2</sup>]

If mass acceleration factors  $f_a > 10$ , please call our Technical Service.

Service factor  $f_s$  should be adjusted as followings:

- 1). ambient temperature is 30 ~ 40°C:  $f_s \times (1.1 \sim 1.2)$
- 2). ambient temperature is 40 ~ 50°C:  $f_s \times (1.3 \sim 1.4)$
- 3). ambient temperature is 50 ~ 60°C:  $f_s \times (1.5 \sim 1.6)$
- 4). ambient temperature >60°C, please call our Technical Service.



To keep the service-life of gear units, the use factor  $f_s$  selected from the catalogue must be equal or slightly higher than the calculated use factor  $f_s$ .

## 4.6 Radial loads $F_r$

When determining the resulting radial loads, the type of transmission elements, mounted on the shaft end must be considered. Various transmission elements are corresponding with following transmission element factors  $f_z$ :

Transmission element	Transmission element factor $F_z$	Comments
<b>Gears</b>	1.00	$\geq$ teeth
	1.15	$<$ teeth
<b>Chain sprockets</b>	1.00	$\geq$ teeth
	1.25	$<$ teeth
	1.40	$<$ teeth
<b>Narrow V-belt pulleys</b>	1.75	Influence of the tensile force
<b>Flat belt pulleys</b>	2.50	Influence of the tensile force
<b>Toothed belt pulleys</b>	2.50	Influence of the tensile force

The overhung loads exerted on the motor or gear shaft is then calculated as follows:

$$F_r = \frac{M \cdot 2000 \cdot f_z}{d_0} \text{ [N]}$$

- $F_r$**  Resulting radial load [N]
- $M$**  Torque on the shaft [Nm]
- $d_0$**  Mean diameter of the mounted transmission element in [mm]
- $f_z$**  Transmission element factor

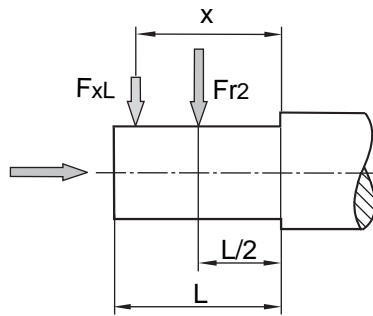
The allowed radial load force on the shaft is calculated with the following formula:

$$F_x L \leq \frac{Fr_2 \cdot a}{(b+x)} \text{ [N]}$$

- $Fr_2$**  Permitted overhung load ( $x = L/2$ ) for foot-mounted gear units according to the selection tables in [N]
- $a, b$**  Gear unit constant for overhung load conversion [mm]
- $x$**  Distance from the shaft shoulder to the force application point in (mm)

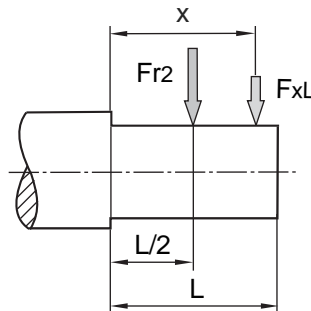
The values of  $a$ ,  $b$ ,  $Fr_2$  are given in the following tables:

Output shafts radial loads




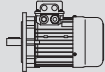
MRV	025	030	040	050	063	075	090	105	110	130
a	50	65	84	101	120	131	162	176	176	188
b	38	50	64	76	95	101	122	136	136	148
Fr2 max	1350	1830	3490	4840	6270	7380	8180	12000	12000	13500

Input shafts radial loads



NRV	030	040	050	063	075	090	105	110	130
a	86	106	129	159	192	227	266	266	314
b	76	94.5	114	139	167	202	236	236	274
Fr2 max	210	350	490	700	980	1270	1700	1700	2100

4.7 Selection tables comments

$P_{1n}$ [kW]	$n_2$ [r/min]	$M_{2n}$ [Nm]	$i$	$Fr_2$ [N]	$f_s$			Page
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$P_{1n}$  Rated power driving motor [kW];

$n_2$  Output speed [r/min];

$M_{2n}$  Rated output torque [Nm];

$Fr_2$  Permissible overhung load [N];

$i$  Gear unit ratio;

$f_s$  Service factor;



Gear unit type;



Motor type;

page Dimension sheet page no;

\* Finite gear unit reduction ratio.

## 5. SELECTION EXAMPLE

### 5.1 Gear motor

Example: The input power of driver machine is 1.5KW,  $n_1=1400\text{r/min}$ , heavy load, continuous running for 24 hours, the ambient temperature is  $+32^\circ\text{C}$ , then choose the service factor,  $f_s=1.7 \times 1.2=1.904$ ,  $n_2=93.3\text{r/min}$ , B3 mounted so:

$$i = \frac{n_1}{n_2} = \frac{1400}{93.3} = 15$$

$$P_{1n} \geq P_1 \cdot f_s = 0.5 \times 1.904 = 0.952 \text{ [kW]}$$

Choose type:

**MRV075 - 15 - B3 - 1.1 - 4**

Count output torque:

$$M_2 = \frac{9550 \cdot P_1 \cdot \eta_d}{n_2} = \frac{9550 \times 0.5 \times 0.84}{93.3} = 43 \text{ [Nm]}$$

$$M_{2n} = 95 \geq M_2 \cdot f_s = 43 \times 1.904 = 81.9 \text{ [Nm]}$$

### 5.2 Gear units

Example: Required torque 300Nm on driven machine, continuous running for 8 hours, uniform load, the ambient temperature is  $30^\circ\text{C}$ , then choose the service factor  $f_s=1.2 \times 1.1=1.32$ ,  $n_1=900\text{r/min}$ ,  $n_2=22.5\text{r/min}$ .

$$M_{2n} \geq M_2 \cdot f_s = 300 \times 1.32 = 396 \text{ [Nm]}$$

$$i = \frac{n_1}{n_2} = \frac{900}{22.5} = 40$$

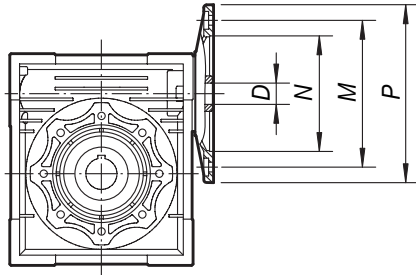
Choose type:

**NRV090 - 40**



6. RELEVANT DATA

6.1 Ratio and IEC motor adapters

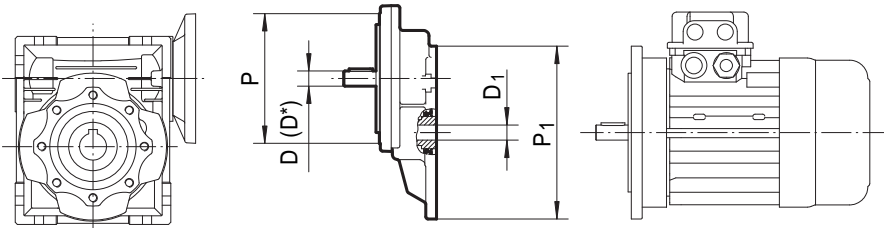


(\*) If you want special key , please call our Technical Service

	IEC motor adapters				D The hole diameter of input shaft											
	IEC	P	M	N	i Transmission ratio											
					7.5	10	15	20	25	30	40	50	60	80	100	
<b>MRV025</b>	56B14	80	65	50	9	9	9	9	9	9	9	9	9			
<b>MRV030</b>	56B5	120	100	80	9	9	9	9	9	9	9	9	9	9		
	63B14	80	65	50												
	63B5	140	115	95	11	11	11	11	11	11	11	11				
	63B14	90	75	60												
<b>MRV040</b>	56B5	120	100	80									9	9	9	9
	63B5	140	115	95	11	11	11	11	11	11	11	11	11	11	11	11
	63B14	90	75	60												
	71B5	160	130	110	14	14	14	14	14	14	14					
<b>MRV050</b>	71B14	105	85	70												
	63B5	140	115	95									11	11	11	11
	71B5	160	130	110	14	14	14	14	14	14	14	14	14	14		
	80B5	200	165	130	19	19	19	19	19	19						
<b>MRV063</b>	80B14	120	100	80												
	71B5	160	130	110								14	14	14	14	14
	71B14	105	85	70												
	80B5	200	165	130	19	19	19	19	19	19	19	19	19	19		
	90B5	200	165	130	24	24	24	24	24	24	24					
<b>MRV075</b>	90B14	140	115	95												
	71B5	160	130	110								14	14	14	14	
	80B5	200	165	130				19	19	19	19	19	19	19	19	19
	80B14	120	100	80												
	90B5	200	165	130	24	24	24	24	24	24	24					
	100 / 112B5	250	215	180	28	28	28									
<b>MRV090</b>	100 / 112B14	160	130	110												
	80B5	200	165	130								19	19	19	19	19
	80B14	120	100	80												
	90B5	200	165	130	24	24	24	24	24	24	24	24	24			
	90B14	140	115	95												
<b>MRV105</b>	100 / 112B5	250	215	180	28	28	28	28	28	28	28	28	28			
	132B5	300	265	230	38*	38*	38*	38*								
	80B5	200	165	130											19	19
	90B5	200	165	130					24	24	24	24	24	24	24	24
<b>MRV110</b>	100 / 112B5	250	215	180	28	28	28	28	28	28	28	28	28			
	132B5	300	265	230	38*	38*	38*	38*								
	90B5	200	165	130											24	24
<b>MRV130</b>	100 / 112B5	250	215	180					28	28	28	28	28	28	28	28
	132B5	300	265	230	38*	38*	38*	38*	38*	38*	38*					

6.2 PC-MRV PC-MRV Combinations

	<i>i</i>	PC 063		PC 071		PC 080			PC 090		
		105 / 11 <i>i</i> = 3	105 / 14* <i>i</i> = 3	120 / 14 <i>i</i> = 3	120 / 19* <i>i</i> = 3	160 / 19 <i>i</i> = 3	160 / 24* <i>i</i> = 3	160 / 28* <i>i</i> = 3	160 / 19* <i>i</i> = 2.42	160 / 24 <i>i</i> = 2.42	160 / 28* <i>i</i> = 2.42
<b>MRV040</b>	25										
	30										
	40										
	50										
	60										
	80										
<b>MRV050</b>	100										
	25										
	30										
	40										
	50										
	60										
<b>MRV063</b>	80										
	100										
	25										
	30										
	40										
	50										
<b>MRV075</b>	60										
	80										
	100										
	25										
	30										
	40										
<b>MRV090</b>	50										
	60										
	80										
	100										
	25										
	30										
<b>MRV105</b>	40										
	50										
	60										
	80										
	100										
	25										
<b>MRV110</b>	30										
	40										
	50										
	60										
	80										
	100										
<b>MRV130</b>	25										
	30										
	40										
	50										
	60										
	80										
100											



	<i>P</i>	<i>D</i>	<i>D</i> *	<i>P</i> <sub>1</sub>	<i>D</i> <sub>1</sub>
PC 063	105	11	14	140 (63B5)	11
PC 071	120	14	19	160 (71B5)	14
PC 080	160	19	24 28	200 (80B5)	19
PC 090	160	24	19 28	200 (90B5)	24

\* Only on request

## RELEVANT DATA

### 6.3 MRV - MRV / NRV - MRV Assignment table of combination ratio

$n_1=1400r/min$		MRV025/030			MRV025/040			MRV030/040			MRV030/050			MRV030/063		
$i$	$n_2$	$P_1$ [kW]	$i_{025}$	$i_{030}$	$P_1$ [kW]	$i_{025}$	$i_{040}$	$P_1$ [kW]	$i_{030}$	$i_{040}$	$P_1$ [kW]	$i_{030}$	$i_{050}$	$P_1$ [kW]	$i_{030}$	$i_{063}$
100	14	0.09	10	10	—	—	—	—	—	—	—	—	—	—	—	—
150	9.3	0.06	10	15	—	—	—	—	—	—	—	—	—	—	—	—
200	7	0.06	10	20	—	—	—	—	—	—	—	—	—	—	—	—
250	5.6	0.06	10	25	—	—	—	—	—	—	—	—	—	—	—	—
300	4.7	0.06	10	30	0.06	10	30	0.09	10	30	0.18	10	30	0.22	10	30
400	3.5	0.06	20	20	0.06	10	40	0.06	10	40	0.12	10	40	0.18	10	40
500	2.8	0.06	20	25	0.06	20	25	0.06	20	25	0.09	10	50	0.18	10	50
600	2.3	0.06	20	30	0.06	20	30	0.06	20	30	0.09	20	30	0.12	20	30
750	1.9	0.06	30	25	0.06	25	30	0.06	25	30	0.09	25	30	0.12	25	30
900	1.6	0.06	30	30	0.06	30	30	0.06	30	30	0.06	30	30	0.09	30	30
1200	1.2	0.06	40	30	0.06	40	30	0.06	40	30	0.06	40	30	0.09	40	30
1500	0.93	0.06	50	30	0.06	50	30	0.06	50	30	0.06	50	30	0.06	50	30
1800	0.78	0.06	60	30	0.06	60	30	0.06	60	30	0.06	60	30	0.06	60	30
2400	0.58	0.06	60	40	0.06	60	40	0.06	60	40	0.06	60	40	0.06	60	40
3000	0.47	0.06	60	50	0.06	60	50	0.06	—	—	0.06	60	50	0.06	60	50
3200	0.44	—	—	—	—	—	—	—	80	40	—	—	—	—	—	—
4000	0.35	—	—	—	0.06	50	80	0.06	80	50	0.06	80	50	0.06	80	50
4800	0.29	—	—	—	—	—	—	—	—	—	0.06	80	60	—	—	—
5000	0.28	—	—	—	0.06	50	100	0.06	50	100	—	—	—	0.06	100	50

$n_1=1400r/min$		MRV040/075			MRV040/090			MRV050/105			MRV050/110			MRV063/130		
$i$	$n_2$	$P_1$ [kW]	$i_{040}$	$i_{075}$	$P_1$ [kW]	$i_{040}$	$i_{090}$	$P_1$ [kW]	$i_{050}$	$i_{105}$	$P_1$ [kW]	$i_{050}$	$i_{110}$	$P_1$ [kW]	$i_{063}$	$i_{130}$
300	4.7	0.37	10	30	0.37	10	30	0.75	10	30	0.75	10	30	1.5	10	30
400	3.5	0.25	10	40	0.37	10	40	0.75	10	40	0.75	10	40	1	10	40
500	2.8	0.25	10	50	0.37	10	50	0.55	20	25	0.55	20	25	1	10	50
600	2.3	0.18	20	30	0.37	20	30	0.55	20	30	0.55	20	30	0.75	15	40
750	1.9	0.18	25	30	0.25	25	30	0.55	25	30	0.55	25	30	0.75	25	30
900	1.6	0.12	30	30	0.25	30	30	0.37	30	30	0.37	30	30	0.75	30	30
1200	1.2	0.12	40	30	0.18	40	30	0.25	40	30	0.25	40	30	0.55	40	30
1500	0.93	0.09	50	30	0.18	50	30	0.25	50	30	0.25	50	30	0.37	50	30
1800	0.78	0.09	60	30	0.12	60	30	0.25	60	30	0.25	60	30	0.37	60	30
2400	0.58	0.06	60	40	0.12	60	40	0.18	60	40	0.18	60	40	0.25	60	40
3000	0.47	0.06	60	50	0.09	60	50	0.12	60	50	0.12	60	50	0.25	60	50
4000	0.35	0.06	80	50	0.06	80	50	0.12	80	50	0.12	80	50	0.25	80	50
5000	0.28	0.06	100	50	0.06	100	50	0.12	100	50	0.12	100	50	0.25	100	50

You can choose 025, 030, 040, 050, 063, 075, 090, 105, 110, 130 as combination unit to combine according to the fact your special needs.



**6.4 Efficiency & Irreversibility character**

Efficiency is an important parameter of reducer, Efficiency  $\eta$  depends on the following parameters: 1) helix angle of gearing, 2) driving speed, 3) running-in of gearing, 4) The performance of oil, oil seal and bearing. The mesh data table on page 15 shows dynamic efficiency ( $\eta_1=1400$ ) and static efficiency values. Remember that these values are only achieved after the unit has been run in. Torque values  $Mn_2$  indicated in the catalogue are calculated by considering the steady-state performance of the gearboxes. The actual values mentioned above may be have deflection.

**6.4.1 Dynamic irreversibility**


Dynamic irreversibility is achieved when the output shaft stops instantly when drive is no longer transmitted through the worm shaft. This condition requires a dynamic efficiency of  $\eta_d < 0.4$  (see table on page 15).

**6.4.2 Static irreversibility**

Static irreversibility is achieved when the gear reducer at a standstill, the application of a load to the output shaft can't drive the worm shaft. This condition requires a static efficiency of  $\eta_s < 0.5$  (see table on page 15).

$\eta_d$	>0.6	0.5 ~ 0.6	0.4 ~ 0.5	<0.4
<b>DYNAMIC IRREVERSIBILITY</b>	dynamic reversibility	low dynamic reversibility	good dynamic irreversibility	dynamic irreversibility

$\eta_s$	>0.55	0.5 ~ 0.55	<0.5
<b>STATIC IRREVERSIBILITY</b>	Static reversibility	low static reversibility	static irreversibility

 The table shows approximate irreversibility classes. Vibrations and shocks can affect a gear reducer's irreversibility. As it is virtually impossible to provide and guarantee total non reversing, we recommend the use of an external brake with sufficient capability to prevent vibrations in duced starting, where these circumstances are required. For the irreversibility conditions of a combined geared unit one must consider that the efficiency of the group is given by the product of the efficiencies of each single reducer, i.e.:  $\eta_{tot} = \eta_1 \times \eta_2$ .

## RELEVANT DATA

### 6.4.3 Mesh Data

	<i>i</i>	7.5	10	15	20	25	30	40	50	60	80	100
<b>MRV025</b>	$z_1$	4	3	2	2	2	1	1	1	1		
	$m_n$	1.18	1.23	1.27	0.98	0.79	1.29	0.99	0.80	0.67		
	$\gamma$	25°18'	19°31'	13°18'	11°2'	9°5'	6°44'	5°34'	4°34'	3°55'		
	$\eta_d$	0.85	0.83	0.79	0.76	0.73	0.68	0.64	0.59	0.56		
	$\eta_s$	0.71	0.67	0.60	0.56	0.52	0.45	0.41	0.36	0.33		
<b>MRV030</b>	$z_1$	4	3	2	2	1	1	1	1	1	1	
	$m_n$	1.36	1.39	1.42	1.09	1.69	1.43	1.10	0.89	0.74	0.56	
	$\gamma$	18°55'	14°25'	9°44'	7°50'	5°33'	4°54'	3°56'	3°17'	2°43'	2°7'	
	$\eta_d$	0.84	0.81	0.76	0.72	0.66	0.64	0.59	0.54	0.50	0.44	
	$\eta_s$	0.66	0.62	0.54	0.49	0.41	0.38	0.33	0.29	0.26	0.21	
<b>MRV040</b>	$z_1$	4	3	2	2	2	1	1	1	1	1	1
	$m_n$	1.87	1.95	2.00	1.54	1.26	2.04	1.55	1.27	1.06	0.80	0.65
	$\gamma$	23°54'	18°23'	12°30'	10°3'	8°45'	6°19'	5°4'	4°24'	3°42'	2°52'	2°29'
	$\eta_d$	0.86	0.84	0.80	0.77	0.74	0.69	0.65	0.61	0.57	0.51	0.47
	$\eta_s$	0.70	0.66	0.59	0.54	0.51	0.44	0.39	0.36	0.32	0.27	0.24
<b>MRV050</b>	$z_1$	4	3	2	2	2	1	1	1	1	1	1
	$m_n$	2.34	2.43	2.50	1.92	1.56	2.54	1.94	1.58	1.32	1.00	0.80
	$\gamma$	23°49'	18°19'	12°27'	10°3'	8°33'	6°18'	5°4'	4°18'	3°38'	2°52'	2°17'
	$\eta_d$	0.87	0.85	0.81	0.78	0.75	0.71	0.67	0.63	0.59	0.53	0.48
	$\eta_s$	0.70	0.66	0.59	0.54	0.51	0.44	0.39	0.36	0.32	0.27	0.24
<b>MRV063</b>	$z_1$	4	3	2	2	2	1	1	1	1	1	1
	$m_n$	2.96	3.08	3.17	2.44	1.98	3.23	2.47	1.99	1.68	1.27	1.02
	$\gamma$	24°31'	18°53'	12°51'	10°29'	8°45'	6°30'	5°17'	4°24'	3°49'	2°59'	2°26'
	$\eta_d$	0.88	0.86	0.82	0.80	0.77	0.73	0.69	0.65	0.62	0.56	0.51
	$\eta_s$	0.70	0.66	0.59	0.55	0.51	0.44	0.40	0.36	0.33	0.28	0.24
<b>MRV075</b>	$z_1$	4	3	2	2	2	1	1	1	1	1	1
	$m_n$	3.53	3.70	3.83	2.94	2.39	3.92	2.99	2.41	2.02	1.54	1.24
	$\gamma$	26°38'	20°37'	14°5'	11°19'	9°29'	7°9'	5°43'	4°46'	4°1'	3°17'	2°44'
	$\eta_d$	0.88	0.87	0.84	0.81	0.79	0.76	0.72	0.68	0.64	0.59	0.55
	$\eta_s$	0.71	0.68	0.61	0.57	0.53	0.47	0.41	0.37	0.34	0.29	0.26
<b>MRV090</b>	$z_1$	4	3	2	2	2	1	1	1	1	1	1
	$m_n$	4.23	4.47	4.66	3.60	2.93	4.79	3.67	2.97	2.49	1.89	1.52
	$\gamma$	29°5'	22°39'	15°33'	12°50'	10°53'	7°55'	6°30'	5°29'	4°46'	3°45'	3°6'
	$\eta_d$	0.89	0.88	0.85	0.83	0.81	0.78	0.74	0.71	0.68	0.63	0.59
	$\eta_s$	0.72	0.69	0.63	0.59	0.56	0.49	0.44	0.41	0.37	0.32	0.28
<b>MRV105</b>	$z_1$	4	3	2	2	2	1	1	1	1	1	1
	$m_n$	5.18	5.45	5.67	4.47	3.64	5.82	4.58	3.71	3.12	2.36	1.91
	$\gamma$	28°15'	21°57'	15°2'	14°42'	12°33'	7°39'	7°29'	6°21'	5°33'	4°27'	3°46'
	$\eta_d$	0.89	0.88	0.86	0.85	0.83	0.79	0.77	0.74	0.72	0.67	0.63
	$\eta_s$	0.72	0.69	0.62	0.62	0.59	0.48	0.48	0.44	0.41	0.36	0.32
<b>MRV110</b>	$z_1$	4	3	2	2	2	1	1	1	1	1	1
	$m_n$	5.18	5.45	5.67	4.47	3.64	5.82	4.58	3.71	3.12	2.36	1.91
	$\gamma$	28°15'	21°57'	15°2'	14°42'	12°33'	7°39'	7°29'	6°21'	5°33'	4°27'	3°46'
	$\eta_d$	0.89	0.88	0.86	0.85	0.83	0.79	0.77	0.74	0.72	0.67	0.63
	$\eta_s$	0.72	0.69	0.62	0.62	0.59	0.48	0.48	0.44	0.41	0.36	0.32
<b>MRV130</b>	$z_1$	4	3	2	2	2	1	1	1	1	1	1
	$m_n$	6.11	6.45	6.72	5.24	4.28	6.91	5.36	4.35	3.65	2.76	2.23
	$\gamma$	28°43'	22°20'	15°19'	13°47'	11°54'	7°48'	6°60'	6°1'	5°16'	4°8'	3°27'
	$\eta_d$	0.90	0.89	0.87	0.85	0.84	0.80	0.78	0.75	0.73	0.68	0.64
	$\eta_s$	0.72	0.69	0.63	0.61	0.58	0.49	0.46	0.43	0.40	0.34	0.30

## 6.5 Prestage helical geared units ( PC )

The PC construction is modular and therefore it can be as a separate unit mounted on any type of fitted geared motor (PAM), whose the various possibilities of flange/output shafts can be found on page 11.

Fitting the pre-stage helical module on the main reduction unit is easily done as for any motor of type B14. The prestage unit cannot be used by itself, but only coupled with another reduction unit.

### 6.5.1 Materials

Case in aluminium alloy.

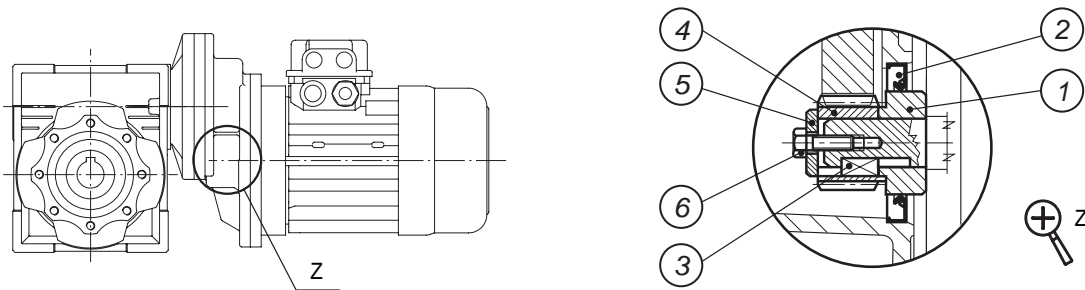
Gears : 20CrMo, machined accurately base on the accurate involute.

### 6.5.1 Coupling to electric motor

Correctly fitting the pinion on the electric motor shaft requires you keep to the following instructions:


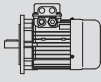
- a). Thoroughly clean the electric motor shaft.
- b). Remove the motor key from its seat.
- c). Fit the bush ① to the drive shaft as shown in the diagram. To make this easier, you can heat the bush to approximately 70/80°C.
- d). Fit the new key ③ provided in place of the one removed beforehand.
- e). Fit the pinion ④ taking the same precautions as described in point c).
- f). Fit the washer ⑤ and tighten with the screw ⑥.
- g). Remove the rubber cap mounted on the seat of the oil seal, taking care since the pre-stage unit is already complete with lubricant.
- h). Fit the oil seal ② and then the motor assembly, taking care not to damage the lip of the oil seal.


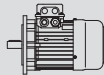
N.B. For correct operation, with no vibration or noise, it is recommended to use good quality motors.




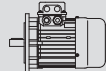
7. GEAR UNIT SELECTION TABLES


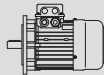
7.1 MRV..(IEC).. Performance parameter


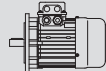
$P_{1n}$ [kW]	$n_2$ [r/min]	$M_{2n}$ [Nm]	$i$	$F_2$ [N]	$f_s$			Page				
0.06	186.7	2.6	7.5	503	4.2	<b>MRV025 56/B14</b>	<b>5614</b>	55				
	140	3.4	10	553	3.5							
	93.3	4.9	15	633	2.5							
	70	6.2	20	697	1.9							
	56	7.5	25	751	1.7							
	46.7	8.3	30	798	1.6							
	35	10	40	878	1.2							
	28	12	50	946	0.9							
	23.3	14	60	1006	0.7							
	0.06	186.7	2.6	7.5	683				7.0	<b>MRV030 56B5/B14</b>	<b>5614</b>	56
		140	3.3	10	752				5.4			
		93.3	4.7	15	861				3.9			
		70	5.9	20	948				3.1			
		56	6.8	25	1021				3.1			
		46.7	7.9	30	1085				2.5			
35		9.7	40	1194	1.9							
28		11	50	1286	1.5							
23.3		12	60	1367	1.3							
17.5		14	80	1504	0.9							
0.09		373.3	2.0	7.5	399	3.9	<b>MRV025 56/B14</b>	<b>5612</b>	55			
		280	2.6	10	439	3.4						
		186.7	3.8	15	503	2.4						
		140	4.9	20	553	1.8						
		112	5.9	25	590	1.5						
	93.3	6.7	30	633	1.3							
	70	8.5	40	697	1.1							
	56	10	50	751	0.9							
	0.09	186.7	3.9	7.5	503	2.8				<b>MRV025 56/B14</b>	<b>5624</b>	55
		140	5.1	10	553	2.4						
		93.3	7.3	15	633	1.6						
		70	9.3	20	697	1.3						
		56	11	25	751	1.2						
		46.7	13	30	798	1.0						
		35	16	40	878	0.8						
0.09		373.3	2.0	7.5	542	6.5	<b>MRV030 56B5/B14</b>	<b>5612</b>	56			
		280	2.6	10	597	5.0						
		186.7	3.7	15	683	3.5						
		140	4.7	20	752	2.5						
		112	5.5	25	810	2.9						
		93.3	6.4	30	861	2.3						
		70	8.0	40	948	1.8						
		56	9.4	50	1021	1.4						
	46.7	10	60	1085	1.1							
	35	13	80	1194	0.9							


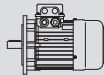
$P_{1n}$ [kW]	$n_2$ [r/min]	$M_{2n}$ [Nm]	$i$	$F_{12}$ [N]	$f_s$			Page	
0.09	186.7	3.9	7.5	683	4.7	<b>MRV030 56B5/B14</b>	<b>5624</b>	56	
	140	5.0	10	752	3.6				
	93.3	7.0	15	861	2.6				
	70	8.8	20	948	2.0				
	56	10	25	1021	2.1				
	46.7	12	30	1085	1.7				
	35	14	40	1194	1.2				
	28	17	50	1286	1.0				
	23.3	18	60	1367	0.9				
	28	19	50	2475	2.1				
	23.3	21	60	2630	1.7				
	17.5	25	80	2895	1.3				
	14	29	100	3118	1.0				
	0.12	373.3	2.7	7.5	399				3.0
280		3.5	10	439	2.6				
186.7		5.1	15	503	1.8				
140		6.5	20	553	1.4				
112		7.9	25	590	1.1				
93.3		9.0	30	633	1.0				
70		11	40	697	0.8				
186.7		5.2	7.5	683	3.5				
140		6.6	10	752	2.7				
93.3		9.3	15	861	1.9				
70		12	20	948	1.5				
56		14	25	1021	1.6				
46.7		16	30	1085	1.3				
35		19	40	1194	0.9				
28		22	50	1286	0.8				
46.7		17	30	2087	2.7				
35		21	40	2298	1.9				
28		25	50	2475	1.6				
23.3		28	60	2630	1.3				
17.5		33	80	2895	1.0				
14		38	100	3118	0.8				
23.3		29	60	3610	2.3				
17.5		35	80	3973	1.9				
14		39	100	4280	1.4				
0.18		373.3	4.0	7.5	542	3.2	<b>MRV030 63B5/B14</b>	<b>6312</b>	56
		280	5.2	10	597	2.5			
		186.7	7.4	15	683	1.8			
		140	9.5	20	752	1.3			
	112	11	25	810	1.4				
	93.3	13	30	861	1.2				
	70	16	40	948	0.9				
	186.7	7.7	7.5	683	2.3				
	140	10	10	752	1.8				
	93.3	14	15	861	1.3				
	70	18	20	948	1.0				
	56	20	25	1021	1.0				
	46.7	24	30	1085	0.8				






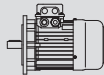
$P_{1n}$ [kW]	$n_2$ [r/min]	$M_{2n}$ [Nm]	$i$	$F_2$ [N]	$f_s$			Page	
0.18	93.3	14	30	1657	2.5	<b>MRV040 63B5/B14</b>	<b>6312</b>	57	
	70	17	40	1824	1.8				
	56	21	50	1964	1.4				
	0.18	70	19	20	1824	2.1	<b>MRV040 63B5/B14</b>	<b>6324</b>	57
		56	23	25	1964	1.7			
		46.7	25	30	2087	1.8			
		35	32	40	2298	1.3			
		28	37	50	2475	1.0			
		23.3	42	60	2630	0.9			
	0.18	45	28	20	2113	1.6	<b>MRV040 71B5/B14</b>	<b>7116</b>	57
		36	34	25	2276	1.3			
		30	38	30	2419	1.3			
		22.5	47	40	2662	1.0			
	0.18	46.7	24	60	2865	2.1	<b>MRV050 63B5</b>	<b>6312</b>	58
		35	30	80	3153	1.5			
		28	34	100	3397	1.2			
	0.18	35	33	40	3153	2.3	<b>MRV050 63B5</b>	<b>6324</b>	58
		28	39	50	3397	1.9			
		23.3	43	60	3610	1.6			
		17.5	52	80	3973	1.2			
		14	59	100	4280	0.9			
0.18	18	56	50	3936	1.4	<b>MRV050 71B5/B14</b>	<b>7116</b>	58	
	15	63	60	4183	1.1				
	11.3	75	80	4604	0.9				
0.18	15	66	60	5467	2.1	<b>MRV063 71B5/B14</b>	<b>7116</b>	59	
	11.3	79	80	6018	1.6				
	9	90	100	6270	1.4				
0.25	373.3	5.6	7.5	542	2.3	<b>MRV030 63B5/B14</b>	<b>6322</b>	56	
	280	7.2	10	597	1.8				
	186.7	10	15	683	1.3				
	140	13	20	752	0.9				
	112	15	25	810	1.0				
	93.3	18	30	861	0.8				
	0.25	186.7	11	7.5	1315	3.6	<b>MRV040 71B5/B14</b>	<b>7114</b>	57
		140	14	10	1447	2.8			
		93.3	20	15	1657	2.0			
		70	26	20	1824	1.5			
		56	32	25	1964	1.2			
		46.7	35	30	2087	1.3			
		35	44	40	2298	0.9			
	0.25	120	17	7.5	1524	2.6	<b>MRV040 71B5/B14</b>	<b>7126</b>	57
		90	22	10	1677	2.0			
		60	31	15	1920	1.4			
		45	39	20	2113	1.1			
		36	48	25	2276	0.9			
		30	53	30	2419	0.9			

$P_{1n}$ [kW]	$n_2$ [r/min]	$M_{2n}$ [Nm]	$i$	$F_{12}$ [N]	$f_s$			Page
0.25	35	42	80	3153	1.1	<b>MRV050 63B5/B14</b>	<b>6322</b>	58
	28	48	100	3397	0.8			
	70	27	20	2503	2.7	<b>MRV050 71B5/B14</b>	<b>7114</b>	58
	56	32	25	2696	2.2			
	46.7	36	30	2865	2.3			
	35	46	40	3153	1.7			
	28	54	50	3397	1.4			
	23.3	60	60	3610	1.1			
	17.5	72	80	3973	0.9			
	45	40	20	2900	1.9	<b>MRV050 71B5/B14</b>	<b>7126</b>	58
	36	48	25	3124	1.5			
	30	54	30	3320	1.7			
	22.5	67	40	3654	1.2			
	18	78	50	3936	1.0			
	15	88	60	4183	0.8			
	28	55	50	4440	2.4	<b>MRV063 71B5/B14</b>	<b>7114</b>	59
	23.3	63	60	4719	2.0			
	17.5	76	80	5193	1.6			
	14	87	100	5595	1.4			
	18	81	50	5145	1.8	<b>MRV063 71B5/B14</b>	<b>7126</b>	59
15	92	60	5467	1.5				
11.3	110	80	6018	1.2				
9	125	100	6270	1.0				
17.5	80	80	6130	2.4	<b>MRV075 71B5</b>	<b>7114</b>	60	
14	94	100	6603	1.9				
11.3	117	80	7103	1.7	<b>MRV075 71B5</b>	<b>7126</b>	60	
9	133	100	7380	1.4				
0.37	373.3	8.3	7.5	1044	3.4	<b>MRV040 71B5/B14</b>	<b>7112</b>	57
	280	11	10	1149	2.6			
	186.7	16	15	1315	1.9			
	140	20	20	1447	1.4			
	112	25	25	1559	1.1			
	186.7	16	7.5	1315	2.5	<b>MRV040 71B5/B14</b>	<b>7124</b>	57
	140	21	10	1447	1.9			
	93.3	30	15	1657	1.3			
	70	39	20	1824	1.0			
	56	47	25	1964	0.8			
	46.7	52	30	2087	0.9			
	112	25	25	2140	2.0	<b>MRV050 71B5/B14</b>	<b>7112</b>	58
	93.3	29	30	2274	2.2			
	70	37	40	2503	1.6			
	56	44	50	2696	1.2			
	46.7	50	60	2865	1.0			
	35	62	80	3153	0.7			
	140	21	10	1987	3.4			
	93.3	31	15	2274	2.4			
	70	39	20	2503	1.9			


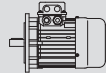
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0.37	56	47	25	2696	1.5	<b>MRV050 71B5/B14</b>	<b>7124</b>	58
	46.7	54	30	2865	1.6			
	35	68	40	3153	1.1			
	28	80	50	3397	0.9			
	23.3	89	60	3610	0.8			
	120	25	7.5	2091	3.4	<b>MRV050 80B5/B14</b>	<b>8016</b>	58
	90	33	10	2302	2.6			
	60	47	15	2635	1.8			
	45	59	20	2900	1.3			
	36	72	25	3124	1.0			
	30	80	30	3320	1.1			
	35	70	40	4122	2.1	<b>MRV063 71B5/B14</b>	<b>7124</b>	59
	28	82	50	4440	1.6			
	23.3	94	60	4719	1.4			
	17.5	113	80	5193	1.1			
	14	129	100	5595	0.9			
	45	60	20	3791	2.4	<b>MRV063 80B5/B14</b>	<b>8016</b>	59
	36	73	25	4084	1.9			
	30	82	30	4339	2.1			
	22.5	102	40	4776	1.6			
18	120	50	5145	1.2				
15	137	60	5467	1.0				
23.3	97	60	5569	2.1	<b>MRV075 71B5</b>	<b>7124</b>	60	
17.5	119	80	6130	1.6				
14	139	100	6603	1.3				
18	124	50	6073	1.8	<b>MRV075 80B5/B14</b>	<b>8016</b>	60	
15	141	60	6453	1.5				
11.3	173	80	7103	1.2				
9	196	100	7380	1.0				
11.3	185	80	7859	1.7	<b>MRV090 80B5/B14</b>	<b>8016</b>	61	
9	212	100	8180	1.3				
0.55	373.3	12	7.5	1044	2.3	<b>MRV040 71B5/B14</b>	<b>7122</b>	57
	280	16	10	1149	1.8			
	186.7	24	15	1315	1.3			
	140	30	20	1447	1.0			
	112	37	25	1559	0.8			
	140	31	20	1987	1.7	<b>MRV050 71B5/B14</b>	<b>7122</b>	58
	112	38	25	2140	1.4			
	93.3	43	30	2274	1.5			
	70	55	40	2503	1.1			
	56	65	50	2696	0.8			
	46.7	74	60	2865	0.7			
	186.7	24	7.5	1805	2.9	<b>MRV050 80B5/B14</b>	<b>8014</b>	58
	140	32	10	1987	2.3			
	93.3	46	15	2274	1.6			
	70	59	20	2503	1.2			
	56	70	25	2696	1.0			
	46.7	80	30	2865	1.1			


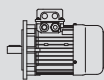

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0.55	120	37	7.5	2091	2.3	<b>MRV050</b>	<b>80B5/B14</b>	<b>8026</b>	58
	90	48	10	2302	1.7				
	60	69	15	2635	1.2				
	45	88	20	2900	0.9				
	70	56	40	3272	1.9	<b>MRV063</b>	<b>71B5/B14</b>	<b>7122</b>	59
	56	68	50	3524	1.5				
	46.7	78	60	3745	1.2				
	35	96	80	4122	0.9				
	28	111	100	4440	0.7				
	70	60	20	3272	2.2	<b>MRV063</b>	<b>80B5/B14</b>	<b>8014</b>	59
	56	72	25	3524	1.8				
	46.7	82	30	3745	1.9				
	35	104	40	4122	1.4				
	28	122	50	4440	1.1				
	23.3	140	60	4719	0.9				
	60	70	15	3444	2.2	<b>MRV063</b>	<b>80B5/B14</b>	<b>8026</b>	59
45	90	20	3791	1.6					
36	108	25	4084	1.3					
30	123	30	4339	1.4					
22.5	152	40	4776	1.1					
35	99	80	4865	1.3	<b>MRV075</b>	<b>71B5</b>	<b>7122</b>	60	
28	116	100	5241	1.0					
35	108	40	4865	2.0	<b>MRV075</b>	<b>80B5/B14</b>	<b>8014</b>	60	
28	128	50	5241	1.6					
23.3	144	60	5569	1.4					
17.5	177	80	6130	1.1					
14	206	100	6603	0.9					
30	124	30	5122	2.1	<b>MRV075</b>	<b>80B5/B14</b>	<b>8026</b>	60	
22.5	156	40	5637	1.5					
18	184	50	6073	1.2					
15	210	60	6453	1.0					
17.5	189	80	6783	1.5	<b>MRV090</b>	<b>80B5/B14</b>	<b>8014</b>	61	
14	221	100	7306	1.2					
18	196	50	6719	2.0	<b>MRV090</b>	<b>80B5/B14</b>	<b>8026</b>	61	
15	224	60	7140	1.6					
11.3	275	80	7859	1.1					
9	315	100	8180	0.9					
17.5	201	80	8571	2.4	<b>MRV105</b>	<b>80B5</b>	<b>8014</b>	62	
14	236	100	9232	1.9					
11.3	294	80	9931	1.8	<b>MRV105</b>	<b>80B5</b>	<b>8026</b>	62	
9	344	100	10320	1.4					
17.5	201	80	8571	2.6	<b>MRV110</b>	<b>80B5</b>	<b>8014</b>	63	
14	236	100	9232	2.0					
11.3	294	80	9931	1.9	<b>MRV110</b>	<b>80B5</b>	<b>8026</b>	63	
9	344	100	10320	1.5					


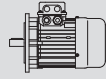

$P_{1n}$ [kW]	$n_2$ [r/min]	$M_{2n}$ [Nm]	$i$	$F_2$ [N]	$f_s$			Page
0.75	373.3	17	7.5	1433	3.0	<b>MRV050 80B5/B14</b>	<b>8012</b>	58
	280	22	10	1577	2.4			
	186.7	31	15	1805	1.7			
	140	41	20	1987	1.3			
	112	49	25	2140	1.0			
	93.3	56	30	2274	1.1			
	186.7	33	7.5	1805	2.1	<b>MRV050 80B5/B14</b>	<b>8024</b>	58
	140	43	10	1987	1.7			
	93.3	62	15	2274	1.2			
	70	80	20	2503	0.9			
	140	43	20	2597	2.3	<b>MRV063 80B5/B14</b>	<b>8012</b>	59
	112	52	25	2797	1.8			
	93.3	60	30	2973	2.0			
	70	77	40	3272	1.4			
	56	92	50	3524	1.1			
	46.7	106	60	3745	0.9			
	93.3	63	15	2973	2.2	<b>MRV063 80B5/B14</b>	<b>8024</b>	59
	70	82	20	3272	1.6			
	56	98	25	3524	1.3			
	46.7	112	30	3745	1.4			
	35	141	40	4122	1.0			
	120	51	7.5	2734	2.9	<b>MRV063 90B5/B14</b>	<b>90S6</b>	59
	90	67	10	3009	2.3			
	60	96	15	3444	1.6			
	45	123	20	3791	1.2			
	36	147	25	4084	0.9			
	30	167	30	4339	1.0			
	46.7	107	60	4421	1.3	<b>MRV075 80B5/B14</b>	<b>8012</b>	60
35	135	80	4865	1.0				
28	159	100	5241	0.8				
56	101	25	4160	2.0	<b>MRV075 80B5/B14</b>	<b>8024</b>	60	
46.7	117	30	4421	2.0				
35	147	40	4865	1.5				
28	174	50	5241	1.2				
23.3	196	60	5569	1.0				
60	97	15	4065	2.4	<b>MRV075 90B5/B14</b>	<b>90S6</b>	60	
45	124	20	4474	1.9				
36	149	25	4820	1.4				
30	170	30	5122	1.5				
22.5	213	40	5637	1.1				
35	143	80	5383	1.6	<b>MRV090 80B5/B14</b>	<b>8012</b>	61	
28	169	100	5799	1.2				
28	182	50	5799	1.9	<b>MRV090 80B5/B14</b>	<b>8024</b>	61	
23.3	209	60	6163	1.5				
17.5	258	80	6783	1.1				
14	302	100	7306	0.9				


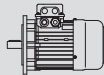
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0.75	30	179	30	5667	2.6	<b>MRV090</b>	<b>90B5/B14</b>	<b>90S6</b>	61	
	22.5	226	40	6238	1.8					
	18	267	50	6719	1.5					
	15	306	60	7140	1.1					
	17.5	274	80	8571	1.8	<b>MRV105</b>	<b>80B5</b>	<b>8024</b>	62	
	14	322	100	9232	1.4					
	15	325	60	9023	1.9	<b>MRV105</b>	<b>90B5</b>	<b>90S6</b>	62	
	11.3	401	80	9931	1.3					
	9	470	100	10320	1.0					
	17.5	274	80	8571	1.9	<b>MRV110</b>	<b>80B5</b>	<b>8024</b>	63	
	14	322	100	9232	1.5					
	15	325	60	9023	2.1	<b>MRV110</b>	<b>90B5</b>	<b>90S6</b>	63	
	11.3	401	80	9931	1.4					
	9	470	100	10320	1.1					
	11.3	401	80	12989	2.1	<b>MRV130</b>	<b>90B5</b>	<b>90S6</b>	64	
	9	470	100	13500	1.7					
	1.1	373.3	25	7.5	1433	2.1	<b>MRV050</b>	<b>80B5/B14</b>	<b>8022</b>	58
		280	33	10	1577	1.7				
		186.7	48	15	1805	1.2				
		140	62	20	1987	0.9				
		186.7	46	15	2359	2.1	<b>MRV063</b>	<b>80B5/B14</b>	<b>8022</b>	59
		140	60	20	2597	1.6				
		112	72	25	2797	1.2				
		93.3	82	30	2973	1.4				
70		104	40	3272	1.0					
120		75	7.5	2734	2.0	<b>MRV063</b>	<b>90B5/B14</b>	<b>90L6</b>	59	
90		98	10	3009	1.6					
60		140	15	3444	1.1					
45		180	20	3791	0.8					
186.7		50	7.5	2359	2.6	<b>MRV063</b>	<b>90B5/B14</b>	<b>90S4</b>	59	
140		65	10	2597	2.0					
93.3		92	15	2973	1.5					
70		120	20	3272	1.1					
56		144	25	3524	0.9					
46.7		164	30	3745	1.0					
112		77	25	3302	2.0	<b>MRV075</b>	<b>80B5/B14</b>	<b>8022</b>	60	
93.3		89	30	3509	1.9					
70		114	40	3862	1.4					
56		137	50	4160	1.1					
46.7		158	60	4421	0.9					
90		98	10	3551	2.3	<b>MRV075</b>	<b>90B5/B14</b>	<b>90L6</b>	60	
60		142	15	4065	1.7					
45		182	20	4474	1.3					
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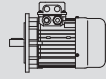



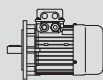
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1.1	93.3	95	15	3509	2.1	<b>MRV075 90B5/B14</b>	<b>90S4</b>	60
	70	122	20	3862	1.7			
	56	148	25	4160	1.3			
	46.7	171	30	4421	1.3			
	35	216	40	4865	1.0			
	35	210	80	5383	1.1	<b>MRV090 80B5/B14</b>	<b>8022</b>	61
	28	248	100	5799	0.8			
	36	228	25	5333	1.6	<b>MRV090 90B5/B14</b>	<b>90L6</b>	61
	30	263	30	5667	1.8			
	22.5	331	40	6238	1.2			
	18	391	50	6719	1.0			
	15	448	60	7140	0.8			
	35	222	40	5383	1.6	<b>MRV090 90B5/B14</b>	<b>90S4</b>	61
	28	266	50	5799	1.3			
	23.3	306	60	6163	1.0			
	22.5	345	40	7882	2.0	<b>MRV105 90B5</b>	<b>90L6</b>	62
	18	414	50	8491	1.6			
	15	476	60	9023	1.3			
	11.3	588	80	9931	0.9			
	28	278	50	7328	2.2	<b>MRV105 90B5</b>	<b>90S4</b>	62
23.3	324	60	7787	1.7				
17.5	402	80	8571	1.2				
14	473	100	9232	1.0				
22.5	345	40	7882	2.3	<b>MRV110 90B5</b>	<b>90L6</b>	63	
18	414	50	8491	1.8				
15	476	60	9023	1.4				
11.3	588	80	9931	1.0				
28	278	50	7328	2.4	<b>MRV110 90B5</b>	<b>90S4</b>	63	
23.3	324	60	7787	1.9				
17.5	402	80	8571	1.3				
14	473	100	9232	1.0				
11.3	588	80	12989	1.5	<b>MRV130 90B5</b>	<b>90L6</b>	64	
9	689	100	13500	1.1				
17.5	408	80	11210	2.1	<b>MRV130 90B5</b>	<b>90S4</b>	64	
14	480	100	12076	1.5				
1.5	373.3	34	7.5	1433	1.5	<b>MRV050 80B5/B14</b>	<b>80C2</b>	58
	280	45	10	1577	1.2			
	186.7	65	15	1805	0.9			
	186.7	68	7.5	2359	1.9	<b>MRV063 90B5/B14</b>	<b>90L4</b>	59
	140	88	10	2597	1.5			
	93.3	126	15	2973	1.1			
	70	164	20	3272	0.8			
	373.3	35	7.5	1873	2.7	<b>MRV063 90B5/B14</b>	<b>90S2</b>	59
	280	45	10	2061	2.2			


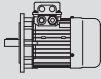
$P_{1n}$ [kW]	$n_2$ [r/min]	$M_{2n}$ [Nm]	$i$	$F_{12}$ [N]	$f_s$			$R_{ag}$ 	
1.5	186.7	66	15	2359	1.6	<b>MRV063</b>	<b>90B5/B14</b>	<b>90S2</b>	59
	140	86	20	2597	1.2				
	112	105	25	2797	0.9				
	93.3	120	30	2973	1.0				
	120	103	7.5	3227	2.1	<b>MRV075</b>	<b>100B5/B14</b>	<b>100L6</b>	60
	90	134	10	3551	1.7				
	60	193	15	4065	1.2				
	56	187	50	4160	1.3	<b>MRV075</b>	<b>90B5/B14</b>	<b>90S2</b>	60
	46.7	215	60	4421	1.1				
	140	89	10	3065	2.2	<b>MRV075</b>	<b>90B5/B14</b>	<b>90L4</b>	60
	93.3	129	15	3509	1.6				
	70	166	20	3862	1.3				
	56	202	25	4160	1.0				
	46.7	233	30	4421	1.0				
	280	45	10	2433	3.2				
	186.7	66	15	2785	2.3	<b>MRV075</b>	<b>90B5/B14</b>	<b>90S2</b>	60
	140	86	20	3065	1.9				
	112	105	25	3302	1.4				
	93.3	121	30	3509	1.4				
	70	156	40	3862	1.1				
	90	137	10	3929	2.7	<b>MRV090</b>	<b>100B5/B14</b>	<b>100L6</b>	61
	60	198	15	4498	2.1				
	45	258	20	4951	1.5				
	36	310	25	5333	1.2				
	30	358	30	5667	1.3				
	70	170	20	4273	2.1	<b>MRV090</b>	<b>90B5/B14</b>	<b>90L4</b>	61
	56	207	25	4603	1.6				
	46.7	239	30	4891	1.7				
35	303	40	5383	1.2					
28	363	50	5799	0.9					
23.3	417	60	6163	0.8					
56	197	50	4603	1.3	<b>MRV090</b>	<b>90B5/B14</b>	<b>90S2</b>	61	
46.7	227	60	4891	1.1					
45	264	20	6256	2.4	<b>MRV105</b>	<b>100B5</b>	<b>100L6</b>	62	
36	322	25	6739	2.0					
30	363	30	7161	2.0					
22.5	471	40	7882	1.5					
18	565	50	8491	1.2					
15	649	60	9023	1.0					
35	315	40	6803	1.9	<b>MRV105</b>	<b>90B5</b>	<b>90L4</b>	62	
28	379	50	7328	1.6					
23.3	442	60	7787	1.3					
17.5	548	80	8571	0.9					
46.7	236	60	6181	1.8	<b>MRV105</b>	<b>90B5</b>	<b>90S2</b>	62	
35	299	80	6803	1.3					
28	358	100	7328	1.0					

$P_{1n}$ [kW]	$n_2$ [r/min]	$M_{2n}$ [Nm]	$i$	$F_2$ [N]	$f_s$				Page	
1.5	45	264	20	6256	2.7	<b>MRV110 100B5</b>		<b>100L6</b>	63	
	36	322	25	6739	2.4					
	30	363	30	7161	2.3					
	22.5	471	40	7882	1.7					
	18	565	50	8491	1.3					
	15	649	60	9023	1.1					
		35	315	40	6803	2.2	<b>MRV110 90B5</b>		<b>90L4</b>	63
		28	379	50	7328	1.7				
		23.3	442	60	7787	1.4				
		46.7	236	60	6181	2.0	<b>MRV110 90B5</b>		<b>90S2</b>	63
		35	299	80	6803	1.3				
		28	358	100	7328	1.0				
		22.5	471	40	10309	2.3	<b>MRV130 100B5</b>		<b>100L6</b>	64
		18	565	50	11105	1.9				
		15	659	60	11801	1.4				
11.3		802	80	12989	1.1					
17.5		557	80	11210	1.5					
2.2	14	655	100	12076	1.1	<b>MRV130 90B5</b>		<b>90L4</b>	64	
	373.3	51	7.5	1873	1.8					<b>MRV063 90B5/B14</b>
	280	66	10	2061	1.5					
	186.7	97	15	2359	1.1					
		186.7	99	7.5	2785	1.9	<b>MRV075 100B5/B14</b>		<b>100LA4</b>	60
		140	131	10	3065	1.5				
		93.3	189	15	3509	1.1				
		373.3	50	7.5	2210	2.6	<b>MRV075 90B5/B14</b>		<b>90L2</b>	60
		280	66	10	2433	2.2				
		186.7	97	15	2785	1.5				
		140	126	20	3065	1.3				
		112	154	25	3302	1.0				
		93.3	178	30	3509	1.0				
		186.7	100	7.5	3081	2.9	<b>MRV090 100B5/B14</b>		<b>100LA4</b>	61
		140	132	10	3391	2.3				
93.3		191	15	3882	1.9					
70		249	20	4273	1.4					
56		304	25	4603	1.1					
46.7		351	30	4891	1.2					
120		154	7.5	3570	2.2	<b>MRV090 112B5/B14</b>				
90	201	10	3929	1.8						
60	291	15	4498	1.4						
45	378	20	4951	1.0						
	140	129	20	3391	2.0	<b>MRV090 90B5/B14</b>		<b>90L2</b>	61	
	112	159	25	3653	1.6					
	93.3	185	30	3882	1.7					
	70	237	40	4273	1.2					
	56	289	50	4603	0.9					

$P_{1n}$ [kW]	$n_2$ [r/min]	$M_{2n}$ [Nm]	$i$	$F_{12}$ [N]	$f_s$			Page
2.2	70	255	20	5399	2.2	<b>MRV105 100B5</b>	<b>100LA4</b>	62
	56	311	25	5816	1.9			
	46.7	356	30	6181	1.8			
	35	462	40	6803	1.3			
	28	555	50	7328	1.1			
	23.3	648	60	7787	0.9			
	90	203	10	4965	3.1	<b>MRV105 112B5</b>	<b>112M6</b>	62
	60	294	15	5684	2.2			
	45	388	20	6256	1.6			
	36	473	25	6739	1.4			
	30	532	30	7161	1.4			
	112	161	25	4616	2.7	<b>MRV105 90B5</b>	<b>90L2</b>	62
	93.3	187	30	4905	2.6			
	70	243	40	5399	1.9			
	56	296	50	5816	1.5			
	46.7	347	60	6181	1.2			
	70	255	20	5399	2.5	<b>MRV110 100B5</b>	<b>100LA4</b>	63
	56	311	25	5816	2.2			
46.7	356	30	6181	2.0				
35	462	40	6803	1.5				
28	555	50	7328	1.2				
23.3	648	60	7787	1.0				
90	203	10	4965	3.5	<b>MRV110 112B5</b>	<b>112M6</b>	63	
60	294	15	5684	2.6				
45	388	20	6256	1.9				
36	473	25	6739	1.6				
30	532	30	7161	1.6				
112	161	25	4616	3.1	<b>MRV110 90B5</b>	<b>90L2</b>	63	
93.3	187	30	4905	3.0				
70	243	40	5399	2.2				
56	296	50	5816	1.7				
46.7	347	60	6181	1.4				
35	468	40	8897	2.2	<b>MRV130 100B5</b>	<b>100LA4</b>	64	
28	563	50	9584	1.7				
23.3	657	60	10185	1.4				
17.5	816	80	11210	1.0				
36	473	25	8814	2.2	<b>MRV130 112B5</b>	<b>112M6</b>	64	
30	539	30	9366	2.2				
22.5	691	40	10309	1.6				
18	829	50	11105	1.3				
15	966	60	11801	1.0				
35	444	80	8897	1.3	<b>MRV130 90B5</b>	<b>90L2</b>	64	
28	525	100	9584	1.0				


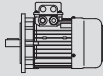
$P_{1n}$ [kW]	$n_2$ [r/min]	$M_{2n}$ [Nm]	$i$	$F_2$ [N]	$f_s$			Page	
3.0	373.3	68	7.5	2210	1.9	<b>MRV075</b>	<b>100B5/B14</b>	<b>100L2</b>	60
	280	90	10	2433	1.6				
	186.7	135	7.5	2785	1.4	<b>MRV075</b>	<b>100B5/B14</b>	<b>100LB4</b>	60
	140	178	10	3065	1.1				
	93.3	258	15	3509	0.8				
	373.3	70	7.5	2446	3.0	<b>MRV090</b>	<b>100B5/B14</b>	<b>100L2</b>	61
	280	92	10	2692	2.6				
	186.7	137	7.5	3081	2.1	<b>MRV090</b>	<b>100B5/B14</b>	<b>100LB4</b>	61
	140	180	10	3391	1.7				
	93.3	261	15	3882	1.4				
	70	340	20	4273	1.0				
	56	414	25	4603	0.8				
	46.7	479	30	4891	0.9				
	93.3	264	15	4905	2.2				
70	348	20	5399	1.6					
56	425	25	5816	1.4					
46.7	485	30	6181	1.3					
35	630	40	6803	1.0					
28	757	50	7328	0.8					
	120	210	7.5	4511	2.7	<b>MRV105</b>	<b>132B5</b>	<b>132S6</b>	62
	90	277	10	4965	2.2				
	60	401	15	5684	1.6				
	45	528	20	6256	1.2				
	93.3	264	15	4905	2.5	<b>MRV110</b>	<b>100B5</b>	<b>100LB4</b>	63
	70	348	20	5399	1.9				
	56	425	25	5816	1.6				
	46.7	485	30	6181	1.5				
	35	630	40	6803	1.1				
	28	757	50	7328	0.9				
	120	210	7.5	4511	3.1	<b>MRV110</b>	<b>132B5</b>	<b>132S6</b>	63
	90	277	10	4965	2.6				
	60	401	15	5684	1.9				
	45	528	20	6256	1.4				
	56	430	25	7607	2.2	<b>MRV130</b>	<b>100B5</b>	<b>100LB4</b>	64
	46.7	491	30	8084	2.1				
	35	638	40	8897	1.6				
	28	767	50	9584	1.3				
	23.3	896	60	10185	1.0				
	17.5	1113	80	11210	0.8				
	90	277	10	6494	3.5	<b>MRV130</b>	<b>132B5</b>	<b>132S6</b>	64
	60	406	15	7434	2.6				
	45	528	20	8182	2.0				
	36	645	25	8814	1.6				
	30	735	30	9366	1.6				
	22.5	942	40	10309	1.2				


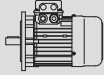
$P_{1n}$ [kW]	$n_2$ [r/min]	$M_{2n}$ [Nm]	$i$	$F_{12}$ [N]	$f_s$			Page	
4.0	373.3	91	7.5	2210	1.4	<b>MRV075</b>	<b>112B5/B14</b>	<b>112M2</b>	60
	280	120	10	2433	1.2				
	186.7	180	7.5	2785	1.0	<b>MRV075</b>	<b>112B5/B14</b>	<b>112M4</b>	60
	140	237	10	3065	0.8				
	373.3	93	7.5	2446	2.3	<b>MRV090</b>	<b>112B5/B14</b>	<b>112M2</b>	61
	280	123	10	2692	1.9				
	186.7	182	7.5	3081	1.6	<b>MRV090</b>	<b>112B5</b>	<b>112M4</b>	61
	140	240	10	3391	1.3				
	93.3	348	15	3882	1.0				
	70	453	20	4273	0.8				
	140	240	10	4285	2.2	<b>MRV105</b>	<b>112B5</b>	<b>112M4</b>	62
	93.3	352	15	4905	1.6				
	70	464	20	5399	1.2				
	56	566	25	5816	1.0				
46.7	647	30	6181	1.0					
120	280	7.5	4511	2.0	<b>MRV105</b>	<b>132B5</b>	<b>132MA6</b>	62	
90	369	10	4965	1.7					
60	535	15	5684	1.2					
140	240	10	4285	2.5	<b>MRV110</b>	<b>112B5</b>	<b>112M4</b>	63	
93.3	352	15	4905	1.9					
70	464	20	5399	1.4					
56	566	25	5816	1.2					
46.7	647	30	6181	1.1					
120	280	7.5	4511	2.3	<b>MRV110</b>	<b>132B5</b>	<b>132MA6</b>	63	
90	369	10	4965	1.9					
60	535	15	5684	1.4					
56	573	25	7607	1.6	<b>MRV130</b>	<b>112B5</b>	<b>112M4</b>	64	
46.7	655	30	8084	1.6					
35	851	40	8897	1.2					
28	1023	50	9584	1.0					
23.3	1195	60	10185	0.8					
120	283	7.5	5901	3.1	<b>MRV130</b>	<b>132B5</b>	<b>132MA6</b>	64	
90	369	10	6494	2.6					
60	541	15	7434	2.0					
45	705	20	8182	1.5					
36	860	25	8814	1.2					
5.5	186.7	250	7.5	3893	1.9	<b>MRV105</b>	<b>132B5</b>	<b>132S4</b>	62
	140	330	10	4285	1.6				
	93.3	484	15	4905	1.2				
	70	638	20	5399	0.9				
	186.7	250	7.5	3893	2.2	<b>MRV110</b>	<b>132B5</b>	<b>132S4</b>	63
	140	330	10	4285	1.8				
	93.3	484	15	4905	1.4				
	70	638	20	5399	1.0				


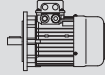
$P_{1n}$ [kW]	$n_2$ [r/min]	$M_{2n}$ [Nm]	$i$	$F_2$ [N]	$f_s$			Page	
5.5	140	334	10	5605	2.5	<b>MRV130 132B5</b>	<b>132S4</b>	64	
	93.3	490	15	6416	1.9				
	70	638	20	7062	1.4				
	56	788	25	7607	1.2				
	46.7	900	30	8084	1.2				
	35	1171	40	8897	0.9				
7.5	186.7	341	7.5	3893	1.4	<b>MRV105 132B5</b>	<b>132M4</b>	62	
	140	450	10	4285	1.2				
	93.3	660	15	4905	0.9				
	186.7	341	7.5	3893	1.6	<b>MRV110 132B5</b>	<b>132M4</b>	63	
		140	450	10	4285				1.3
		93.3	660	15	4905				1.0
	186.7	345	7.5	5092	2.2	<b>MRV130 132B5</b>	<b>132M4</b>	64	
		140	455	10	5605				1.8
		93.3	668	15	6416				1.4
		70	870	20	7062				1.0
		56	1074	25	7607				0.9
		46.7	1228	30	8084				0.8
35		1596	40	8897	0.7				


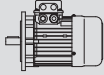



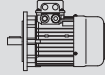
## 7.2 PC .. - MRV.. Performance parameter

$P_{1n}$ [kW]	$n_2$ [r/min]	$M_{2n}$ [Nm]	$i$	$F_{r2}$ [N]	$f_s$			Page
0.12	18.7	42	75	2833	1.2	<b>PC063 - MRV040</b>	<b>6314</b>	66
	15.6	46	90	3011	1.2			
	11.7	57	120	3314	0.9			
	9.3	66	150	3490	0.7			
	7.8	74	180	3490	0.6			
	9.3	68	150	4840	1.3	<b>PC063 - MRV050</b>	<b>6314</b>	66
	7.8	75	180	4840	1.1			
	5.8	88	240	4840	0.8			
	4.7	98	300	4840	0.7			
	5.8	92	240	6270	1.5	<b>PC063 - MRV063</b>	<b>6314</b>	66
	4.7	103	300	6270	1.2			
	0.18	18.7	64	75	2833	0.8	<b>PC063 - MRV040</b>	<b>6324</b>
15.6		70	90	3011	0.8			
11.7		85	120	3314	0.6			
18.7		64	75	3889	1.4	<b>PC063 - MRV050</b>	<b>6324</b>	66
15.6		71	90	4132	1.5			
11.7		87	120	4548	1.1			
9.3		101	150	4840	0.9			
7.8		113	180	4840	0.7			
5.8		133	240	4840	0.6			
9.3		103	150	6270	1.7	<b>PC063 - MRV063</b>	<b>6324</b>	66
7.8		117	180	6270	1.4			
5.8		139	240	6270	1.0			
4.7		155	300	6270	0.8			
12.0		95	75	4506	1.2	<b>PC071 - MRV050</b>	<b>7116</b>	67
10.0		105	90	4788	1.4			
7.5		126	120	4840	1.0			
12.0		97	75	5889	2.2	<b>PC071 - MRV063</b>	<b>7116</b>	67
10.0		107	90	6259	2.4			
7.5		131	120	6270	1.8			
6.0		152	150	6270	1.4			
5.0		168	180	6270	1.2			
3.8	197	240	6270	0.9				
3.0	218	300	6270	0.7				
5.0	179	180	7380	1.7				
3.8	211	240	7380	1.2				
3.0	235	300	7380	1.0				
0.25	18.7	88	75	3889	1.0	<b>PC071 - MRV050</b>	<b>7114</b>	67
	15.6	98	90	4132	1.1			
	11.7	121	120	4548	0.8			
	18.7	91	75	5083	1.8	<b>PC071 - MRV063</b>	<b>7114</b>	67
	15.6	100	90	5401	2.0			
	11.7	125	120	5945	1.5			
	9.3	143	150	6270	1.2			

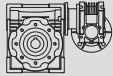
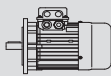
$P_{1n}$ [kW]	$n_2$ [r/min]	$M_{2n}$ [Nm]	$i$	$F_{R2}$ [N]	$f_s$			Page
0.25	7.8	163	180	6270	1.0	<b>PC071 - MRV063</b>	<b>7114</b>	67
	5.8	192	240	6270	0.7			
	4.7	215	300	6270	0.6			
	12.0	135	75	5889	1.6	<b>PC071 - MRV063</b>	<b>7126</b>	67
	10.0	148	90	6259	1.8			
	7.5	181	120	6270	1.3			
	6.0	211	150	6270	1.0			
	9.3	151	150	7380	1.7	<b>PC071 - MRV075</b>	<b>7114</b>	67
	7.8	172	180	7380	1.4			
	5.8	201	240	7380	1.1			
	4.7	230	300	7380	0.9			
	12.0	139	75	6952	2.4	<b>PC071 - MRV075</b>	<b>7126</b>	67
	10.0	155	90	7380	2.5			
	7.5	191	120	7380	1.9			
	6.0	219	150	7380	1.5			
	5.0	248	180	7380	1.2			
	5.0	263	180	8180	1.9	<b>PC071 - MRV090</b>	<b>7126</b>	68
	3.8	318	240	8180	1.4			
3.0	358	300	8180	1.1				
18.7	134	75	5083	1.2	<b>PC071 - MRV063</b>	<b>7124</b>	67	
15.6	148	90	5401	1.4				
11.7	185	120	5945	1.0				
9.3	212	150	6270	0.8				
0.37	18.7	138	75	6000	1.8	<b>PC071 - MRV075</b>	<b>7124</b>	67
	15.6	154	90	6375	1.9			
	11.7	191	120	7017	1.5			
	9.3	223	150	7380	1.1			
	7.8	254	180	7380	0.9			
	12.0	206	75	6952	1.6	<b>PC080 - MRV075</b>	<b>8016</b>	68
	10.0	230	90	7380	1.7			
	7.5	283	120	7380	1.3			
	6.0	324	150	7380	1.0			
	7.8	268	180	8180	1.5	<b>PC071 - MRV090</b>	<b>7124</b>	68
	5.8	321	240	8180	1.1			
	4.7	371	300	8180	0.9			
	6.0	347	150	8180	1.6	<b>PC080 - MRV090</b>	<b>8016</b>	68
	5.0	389	180	8180	1.3			
	3.8	471	240	8180	1.0			
	3.8	509	240	10320	1.5	<b>PC080 - MRV105</b>	<b>8016</b>	69
	3.0	577	300	10320	1.2			
	3.8	509	240	10320	1.6	<b>PC080 - MRV110</b>	<b>8016</b>	69
3.0	577	300	10320	1.3				
0.55	18.7	205	75	6000	1.2	<b>PC080 - MRV075</b>	<b>8014</b>	68
	15.6	230	90	6375	1.3			
	11.7	284	120	7017	1.0			
	9.3	332	150	7380	0.8			

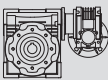
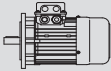
$P_{1n}$ [kW]	$n_2$ [r/min]	$M_{2n}$ [Nm]	$i$	$F_{r2}$ [N]	$f_s$			Page
0.55	12.0	306	75	6952	1.1	<b>PC080 - MRV075</b>	<b>8026</b>	68
	10.0	341	90	7380	1.1			
	15.6	240	90	7054	2.3	<b>PC080 - MRV090</b>	<b>8014</b>	68
	11.7	297	120	7764	1.6			
	9.3	355	150	8180	1.3			
	7.8	398	180	8180	1.0			
	10.0	357	90	8174	2.0	<b>PC080 - MRV090</b>	<b>8026</b>	68
	7.5	441	120	8180	1.4			
	6.0	516	150	8180	1.1			
	5.0	578	180	8180	0.9			
	7.8	425	180	10320	1.7	<b>PC080 - MRV105</b>	<b>8014</b>	69
	5.8	513	240	10320	1.2			
	4.7	597	300	10320	1.0			
	7.5	462	120	10320	2.2	<b>PC080 - MRV105</b>	<b>8026</b>	69
	6.0	552	150	10320	1.8			
	5.0	620	180	10320	1.5			
	3.8	756	240	10320	1.0			
	7.8	425	180	10320	1.8	<b>PC080 -MRV110</b>	<b>8014</b>	69
5.8	513	240	10320	1.3				
4.7	597	300	10320	1.0				
7.5	462	120	10320	2.6	<b>PC080 - MRV110</b>	<b>8026</b>	69	
6.0	552	150	10320	2.0				
5.0	620	180	10320	1.6				
3.8	756	240	10320	1.1				
3.8	756	240	13500	1.6	<b>PC080 - MRV130</b>	<b>8026</b>	69	
3.0	858	300	13500	1.3				
0.75	18.7	280	75	6000	0.9	<b>PC080 - MRV075</b>	<b>8024</b>	68
	15.6	313	90	6375	1.0			
	15.6	327	90	7054	1.7	<b>PC080 - MRV090</b>	<b>8024</b>	68
	11.7	405	120	7764	1.2			
	9.3	483	150	8180	0.9			
	7.8	543	180	8180	0.7			
	11.7	430	120	9811	1.9	<b>PC080 - MRV105</b>	<b>8024</b>	69
	9.3	506	150	10320	1.6			
	7.8	580	180	10320	1.2			
	5.8	700	240	10320	0.9			
	12.4	393	73	9614	2.8	<b>PC090 - MRV105</b>	<b>90S6</b>	69
	9.3	508	96.8	10320	2.0			
	7.4	607	121	10320	1.6			
	6.2	682	145.2	10320	1.3			
	4.6	832	193.6	10320	0.9			
	11.7	430	120	9811	2.2			
	9.3	506	150	10320	1.7			
	7.8	580	180	10320	1.3			
5.8	700	240	10320	0.9				

$P_{1n}$ [kW]	$n_2$ [r/min]	$M_{2n}$ [Nm]	$i$	$F_{R2}$ [N]	$f_s$			Page	
0.75	12.4	393	73	9614	3.2	<b>PC090 - MRV110</b>	<b>90S6</b>	69	
	9.3	508	96.8	10320	2.3				
	7.4	607	121	10320	1.8				
	6.2	682	145.2	10320	1.5				
	4.6	832	193.6	10320	1.0				
	5.8	712	240	13500	1.4	<b>PC080 - MRV130</b>	<b>8024</b>	69	
	4.7	813	300	13500	1.1				
	12.4	399	73	12575	4.4	<b>PC090 - MRV130</b>	<b>90S6</b>	69	
	9.3	508	96.8	13500	3.2				
	7.4	607	121	13500	2.6				
	6.2	682	145.2	13500	2.1				
	4.6	832	193.6	13500	1.5				
	3.7	944	242	13500	1.2				
	1.1	12.4	576	73	9614	1.9	<b>PC090 - MRV105</b>	<b>90L6</b>	69
		9.3	746	96.8	10320	1.4			
7.4		890	121	10320	1.1				
6.2		1000	145.2	10320	0.9				
19.3		392	73	8298	2.2	<b>PC090 - MRV105</b>	<b>90S4</b>	69	
14.5		508	96.8	9133	1.6				
11.6		599	121	9838	1.3				
9.6		686	145.2	10320	1.0				
7.2		828	193.6	10320	0.8				
12.4		576	73	9614	2.2	<b>PC090 - MRV110</b>	<b>90L6</b>	69	
9.3		746	96.8	10320	1.6				
7.4		890	121	10320	1.2				
6.2		1000	145.2	10320	1.0				
19.3		392	73	8298	2.5	<b>PC090 - MRV110</b>	<b>90S4</b>	69	
14.5		508	96.8	9133	1.8				
11.6		599	121	9838	1.5	<b>PC090 - MRV110</b>	<b>90S4</b>	69	
9.6		686	145.2	10320	1.1				
7.2		828	193.6	10320	0.8				
12.4		585	73	12575	3.0	<b>PC090 - MRV130</b>	<b>90L6</b>	69	
9.3		746	96.8	13500	2.2				
7.4		890	121	13500	1.7				
6.2		1000	145.2	13500	1.4				
4.6		1220	193.6	13500	1.0				
19.3		398	73	10853	3.5	<b>PC090 - MRV130</b>	<b>90S4</b>	69	
14.5		508	96.8	11945	2.6				
11.6		608	121	12868	2.0				
9.6		686	145.2	13500	1.6				
7.2	843	193.6	13500	1.2					
5.8	962	242	13500	0.9					
1.5	19.3	535	73	8298	1.6	<b>PC090 - MRV105</b>	<b>90L4</b>	69	
	14.5	693	96.8	9133	1.2				
	11.6	817	121	9838	1.0				
	9.6	936	145.2	10320	0.8				

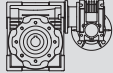
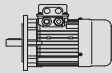
$P_{1n}$ [kW]	$n_2$ [r/min]	$M_{2n}$ [Nm]	$i$	$F_{r2}$ [N]	$f_s$			Page	
1.5	19.3	535	73	8298	1.9	<b>PC090 - MRV110</b>	<b>90L4</b>	69	
	14.5	693	96.8	9133	1.3				
	11.6	817	121	9838	1.1				
	9.6	936	145.2	10320	0.8				
	19.3	542	73	10853	2.6	<b>PC090 - MRV130</b>	<b>90L4</b>	69	
		14.5	693	96.8	11945				1.9
		11.6	830	121	12868				1.5
		9.6	936	145.2	13500				1.1
		7.2	1149	194	13500				0.8
	38.6	398	73	6586	1.8	<b>PC090 - MRV105</b>	<b>90L2</b>	69	
		28.9	516	96.8	7249				1.3
		23.1	617	121	7809				1.1
2.2	38.6	398	73	6586	2.1	<b>PC090 - MRV110</b>	<b>90L2</b>	69	
	28.9	516	96.8	7249	1.5				
	23.1	617	121	7809	1.2				
	38.6	409	73	8614	2.9	<b>PC090 - MRV130</b>	<b>90L2</b>	69	
		28.9	545	96.8	9481				2.0
		23.1	654	121	10213				1.6
		19.3	752	145.2	10853				1.3

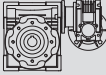
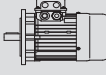
## 7.3 MRV .. / MRV.. Performance parameter

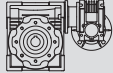
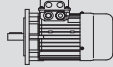
$P_{1n}$ [kW]	$n_2$ [r/min]	$M_{2n}$ [Nm]	$i$	$F_{r2}$ [N]	$f_s$			Page
0.06	14.0	25	100	1620	1.3	<b>MRV025/030</b>	<b>5614</b>	70
	9.3	33	150	1830	0.9			
	7.0	41	200	1830	0.7			
	5.6	45	250	1830	0.8			
	4.7	56	300	3490	1.2	<b>MRV025/040</b>	<b>5614</b>	70
	3.5	69	400	3490	0.9			
	2.8	94	500	3490	0.7			
	2.3	100	600	3490	0.6			
	1.9	115	750	3490	0.5			
	1.6	125	900	3490	0.5			
	1.2	153	1200	3490	0.4			
	0.9	185	1500	3490	0.3			
	0.8	198	1800	3490	0.3			
	0.6	247	2400	3490	0.2			
	0.5	280	3000	3490	0.2			
	0.4	295	4000	3490	0.1			
	0.3	348	5000	3490	0.1			
	4.7	55	300	3490	1.3	<b>MRV030/040</b>	<b>5614</b>	70
	3.5	67	400	3490	0.9			
	2.8	88	500	3490	0.6			
	2.3	95	600	3490	0.7			
	1.9	103	750	3490	0.6			
	1.6	118	900	3490	0.5			
	1.2	143	1200	3490	0.4			
	0.9	166	1500	3490	0.4			
	0.8	184	1800	3490	0.3			
	0.6	217	2400	3490	0.2			
	0.4	247	3200	3490	0.2			
	0.4	278	4000	3490	0.1			
	0.3	327	5000	3490	0.1			
	1.6	118	900	4840	1.0	<b>MRV030/050</b>	<b>5614</b>	71
	1.2	143	1200	4840	0.7			
	0.9	166	1500	4840	0.7			
	0.8	184	1800	4840	0.7			
	0.6	227	2400	4840	0.5			
	0.5	256	3000	4840	0.4			
	0.4	278	4000	4840	0.3			
	0.3	316	4800	4840	0.3			
	0.9	173	1500	6270	1.1	<b>MRV030/063</b>	<b>5614</b>	71
0.8	191	1800	6270	0.9				
0.6	227	2400	6270	0.8				
0.5	256	3000	6270	0.7				
0.4	295	4000	6270	0.6				
0.3	327	5000	6270	0.4				
0.6	267	2400	7380	1.1	<b>MRV040/075</b>	<b>5614</b>	71	
0.5	305	3000	7380	0.8				
0.4	360	4000	7380	0.7				
0.3	409	5000	7380	0.5				
0.5	329	3000	8180	1.4	<b>MRV040/090</b>	<b>5614</b>	72	
0.4	393	4000	8180	1.3				
0.3	430	5000	8180	1.0				

$P_{1n}$ [kW]	$n_2$ [r/min]	$M_{2n}$ [Nm]	$i$	$F_{r2}$ [N]	$f_s$			Page	
0.09	28.0	18	100	1286	1.6	<b>MRV025/030</b>	<b>5612</b>	70	
	18.7	25	150	1472	1.1				
	14.0	31	200	1620	0.9				
		14.0	37	100	1620	0.8	<b>MRV025/030</b>	<b>5624</b>	70
		9.3	50	150	1830	0.6			
		7.0	61	200	1830	0.5			
		5.6	68	250	1830	0.5			
		4.7	77	300	1830	0.4			
		3.5	106	400	1830	0.3			
		2.8	117	500	1830	0.3			
		2.3	135	600	1830	0.2			
		1.9	149	750	1830	0.2			
		1.6	167	900	1830	0.2			
		1.2	201	1200	1830	0.1			
		0.9	231	1500	1830	0.1			
0.8		264	1800	1830	0.1				
0.6		311	2400	1830	0.1				
0.5	347	3000	1830	0.1					
	9.3	43	300	3490	1.6	<b>MRV025/040</b>	<b>5612</b>	70	
	7.0	52	400	3490	1.2				
	5.6	71	500	3490	0.8				
	4.7	82	300	3490	0.8	<b>MRV030/040</b>	<b>5624</b>	70	
	3.5	103	400	4840	1.2	<b>MRV030/050</b>	<b>5624</b>	71	
	2.8	120	500	4840	1.0				
	2.3	146	600	4840	0.9				
	1.9	158	750	4840	0.8				
	1.6	177	900	4840	0.7				
	1.6	188	900	6270	1.0	<b>MRV030/063</b>	<b>5624</b>	71	
	1.2	222	1200	6270	0.9				
	0.9	259	1500	6270	0.7				
	0.9	305	1500	7380	1.1	<b>MRV040/075</b>	<b>5624</b>	71	
	0.8	331	1800	7380	1.0				
	0.6	400	2400	7380	0.7				
	0.5	494	3000	8180	0.9	<b>MRV040/090</b>	<b>5624</b>	72	
	0.4	589	4000	8180	0.8				
0.12	4.7	112	300	4840	1.2	<b>MRV030/050</b>	<b>6314</b>	71	
	3.5	138	400	4840	0.9				
	2.8	160	500	4840	0.7				
		2.8	168	500	6270	1.3	<b>MRV030/063</b>	<b>6314</b>	71
		2.3	199	600	6270	1.1			
		1.9	217	750	6270	0.9			
		1.6	279	900	7380	1.2	<b>MRV040/075</b>	<b>6314</b>	71
		1.2	344	1200	7380	0.9			
		0.8	470	1800	8180	0.9	<b>MRV040/090</b>	<b>6314</b>	72
		0.6	593	2400	8180	0.9			






$P_{1n}$ [kW]	$n_2$ [r/min]	$M_{2n}$ [Nm]	$i$	$F_{r2}$ [N]	$f_s$			Page	
0.12	0.5	731	3000	10320	1.1	<b>MRV050/105</b>	<b>6314</b>	72	
	0.4	884	4000	10320	1.0				
	0.3	1023	5000	10320	0.8				
	0.5	731	3000	10320	1.2	<b>MRV050/110</b>	<b>6314</b>	72	
		0.4	884	4000	10320				1.0
		0.3	1023	5000	10320				0.8
0.18	3.5	216	400	6270	1.0	<b>MRV030/063</b>	<b>6324</b>	71	
	2.8	252	500	6270	0.8				
	2.3	336	600	7380	1.1	<b>MRV040/075</b>	<b>6324</b>	71	
		1.9	371	750	7380				0.9
		1.6	419	900	7380				0.8
	1.2	544	1200	8180	1.0	<b>MRV040/090</b>	<b>6324</b>	72	
		0.9	647	1500	8180				0.8
	0.8	727	1800	10320	1.3	<b>MRV050/105</b>	<b>6324</b>	72	
		0.6	948	2400	10320				0.9
	0.8	727	1800	10320	1.5	<b>MRV050/110</b>	<b>6324</b>	72	
		0.6	948	2400	10320				1.1
	7.0	150	400	6270	1.4	<b>MRV030/063</b>	<b>6322</b>	71	
		5.6	175	500	6270				1.2
	3.5	321	400	7380	1.1	<b>MRV040/075</b>	<b>7114</b>	71	
		2.8	375	500	7380				0.8
	2.3	488	600	8180	1.2	<b>MRV040/090</b>	<b>7114</b>	72	
		1.9	553	750	8180				0.9
		1.6	612	900	8180				0.8
	1.2	776	1200	10320	1.1	<b>MRV050/105</b>	<b>7114</b>	72	
		0.9	924	1500	10320				1.0
		0.8	1010	1800	10320				0.9
	1.2	776	1200	10320	1.3	<b>MRV050/110</b>	<b>7114</b>	72	
		0.9	924	1500	10320				1.2
		0.8	1010	1800	10320				1.1
	0.6	1358	2400	13500	1.0	<b>MRV063/130</b>	<b>7114</b>	73	
		0.5	1626	3000	13500				0.8
		0.4	1910	4000	13500				0.6
0.3		2132	5000	13500	0.5				
0.37	9.3	182	300	6270	1.3	<b>MRV030/063</b>	<b>7112</b>	71	
	7.0	222	400	6270	1.0				
	4.7	383	300	7380	1.0	<b>MRV040/075</b>	<b>7124</b>	71	
		3.5	474	400	7380				0.7
	4.7	406	300	8180	1.5	<b>MRV040/090</b>	<b>7124</b>	72	
		3.5	505	400	8180				1.2
		2.8	593	500	8180				0.9
		2.3	722	600	8180				0.8



$P_{1n}$ [kW]	$n_2$ [r/min]	$M_{2n}$ [Nm]	$i$	$F_{r2}$ [N]	$f_s$			Page		
0.37	1.9	837	750	10320	1.2	<b>MRV050/105</b>	<b>7124</b>	72		
	1.6	928	900	10320	1.0					
	1.2	1148	1200	10320	0.7					
	0.55	1.9	837	750	10320	1.3	<b>MRV050/110</b>	<b>7124</b>	72	
		1.6	928	900	10320	1.2				
		1.2	1148	1200	10320	0.8				
		0.9	1444	1500	13500	1.1	<b>MRV063/130</b>	<b>7124</b>	73	
			0.8	1586	1800	13500				0.9
0.75	9.3	305	300	8180	2.0	<b>MRV040/090</b>	<b>7122</b>	72		
	7.0	375	400	8180	1.5					
	5.6	441	500	8180	1.2					
	0.55	4.7	615	300	10320	1.7	<b>MRV050/105</b>	<b>8014</b>	72	
		3.5	810	400	10320	1.2				
		2.8	938	500	10320	1.0				
		2.3	1096	600	10320	0.9				
		1.9	1244	750	10320	0.8				
		0.4	4.7	615	300	10320	2.0	<b>MRV050/110</b>	<b>8014</b>	72
	3.5		810	400	10320	1.4				
	2.8		938	500	10320	1.1				
	2.3		1096	600	10320	1.0				
	1.9		1244	750	10320	0.9				
	0.3		2.8	957	500	13500	1.6	<b>MRV063/130</b>	<b>8014</b>	73
		1.9	1382	750	13500	1.2				
		1.2	2057	1200	13500	0.8				
	0.75	7.0	512	400	8180	1.1	<b>MRV040/090</b>	<b>8012</b>	72	
		5.6	601	500	8180	0.9				
0.55		9.3	424	300	10320	2.5	<b>MRV050/105</b>	<b>8012</b>	72	
		7.0	553	400	10320	1.8				
		5.6	640	500	10320	1.5				
0.4		4.7	838	300	10320	1.3	<b>MRV050/105</b>	<b>8024</b>	72	
		3.5	1105	400	10320	0.9				
0.3		9.3	424	300	10320	2.8	<b>MRV050/110</b>	<b>8012</b>	72	
		7.0	553	400	10320	2.1				
		5.6	640	500	10320	1.6				
0.4		4.7	838	300	10320	1.5	<b>MRV050/110</b>	<b>8024</b>	72	
		3.5	1105	400	10320	1.1				
0.3		2.8	1305	500	13500	1.1	<b>MRV063/130</b>	<b>8024</b>	73	
		2.3	1557	600	13500	1.0				
		1.9	1772	750	13500	0.9				
		1.6	2014	900	13500	0.8				


$P_{1n}$ [kW]	$n_2$ [r/min]	$M_{2n}$ [Nm]	$i$	$F_{r2}$ [N]	$f_s$			Page	
1.1	9.3	621	300	10320	1.7	<b>MRV050/105</b>	<b>8022</b>	72	
	7.0	810	400	10320	1.2				
	5.6	938	500	10320	1.0				
	9.3	621	300	10320	1.9	<b>MRV050/110</b>	<b>8022</b>	72	
		7.0	810	400	10320				1.4
		5.6	938	500	10320				1.1
	4.7	1274	300	13500	1.3	<b>MRV063/130</b>	<b>90S4</b>	73	
		3.5	1621	400	13500				1.0
		2.8	1913	500	13500				0.8
1.5	9.3	847	300	10320	1.2	<b>MRV050/105</b>	<b>90S2</b>	72	
	7.0	1105	400	10320	0.9				
	5.6	1279	500	10320	0.7				
	9.3	847	300	10320	1.4	<b>MRV050/110</b>	<b>90S2</b>	72	
		7.0	1105	400	10320				1.0
		5.6	1279	500	10320				0.8
	9.3	878	300	13500	1.9	<b>MRV063/130</b>	<b>90S2</b>	73	
		7.0	1105	400	13500				1.4
		5.6	1305	500	13500				1.1
	4.7	1737	300	13500	1.0	<b>MRV063/130</b>	<b>90L4</b>	73	
		3.5	2210	400	13500				0.7

## 7.4 NRV.. Performance parameter



$M_{2n}$ [Nm]	$n_1$ [r/min]	$i$	$P_{1n}$ [kW]	$n_2$ [r/min]	$F_{r2}$ [N]	$F_{r1}$ [N]		Page 		
13	2800	7.5	0.58	373.3	542	125	<b>NRV030</b>	65		
13	2800	10	0.45	280	597	140				
13	2800	15	0.32	186.7	683	140				
12	2800	20	0.23	140	752	146				
16	2800	25	0.26	112	810	210				
15	2800	30	0.21	93.3	861	210				
14	2800	40	0.16	70	948	127				
13	2800	50	0.12	56	1021	128				
12	2800	60	0.10	46.7	1085	126				
11	2800	80	0.08	35	1194	130				
28	2800	7.5	1.2	373.3	1044	233	<b>NRV040</b>	65		
29	2800	10	1.0	280	1149	272				
31	2800	15	0.72	186.7	1315	291				
29	2800	20	0.52	140	1447	204				
28	2800	25	0.42	112	1559	236				
34	2800	30	0.44	93.3	1657	350				
31	2800	40	0.32	70	1824	350				
30	2800	50	0.26	56	1964	350				
28	2800	60	0.21	46.7	2087	350				
25	2800	80	0.16	35	2298	350				
23	2800	100	0.12	28	2475	350				
52	2800	7.5	2.3	373.3	1433	324			<b>NRV050</b>	65
54	2800	10	1.8	280	1577	378				
57	2800	15	1.3	186.7	1805	399				
53	2800	20	0.95	140	1987	417				
51	2800	25	0.75	112	2140	482				
64	2800	30	0.81	93.3	2274	490				
59	2800	40	0.59	70	2503	490				
53	2800	50	0.45	56	2696	490				
50	2800	60	0.37	46.7	2865	490				
45	2800	80	0.27	35	3153	490				
40	2800	100	0.21	28	3397	490				
93	2800	7.5	4.0	373.3	1873	395	<b>NRV063</b>	65		
97	2800	10	3.2	280	2061	463				
103	2800	15	2.3	186.7	2359	492				
100	2800	20	1.7	140	2597	538				
92	2800	25	1.3	112	2797	593				
120	2800	30	1.5	93.3	2973	700				
108	2800	40	1.1	70	3272	700				
100	2800	50	0.81	56	3524	700				
95	2800	60	0.67	46.7	3745	700				
85	2800	80	0.49	35	4122	700				
74	2800	100	0.37	28	4440	700				
130	2800	7.5	5.7	373.3	2210	560			<b>NRV075</b>	65
145	2800	10	4.8	280	2433	703				
150	2800	15	3.4	186.7	2785	727				
160	2800	20	2.8	140	3065	872				
150	2800	25	2.1	112	3302	980				



$M_{2n}$ [Nm]	$n_1$ [r/min]	$i$	$P_{1n}$ [kW]	$n_2$ [r/min]	$F_{r2}$ [N]	$F_{r1}$ [N]		Page ↔		
170	2800	30	2.1	93.3	3509	980	<b>NRV075</b>	65		
165	2800	40	1.6	70	3862	980				
150	2800	50	1.2	56	4160	980				
145	2800	60	1.0	46.7	4421	980				
130	2800	80	0.72	35	4865	980				
120	2800	100	0.57	28	5241	980				
210	2800	7.5	9.0	373.3	2446	715	<b>NRV090</b>	65		
235	2800	10	7.7	280	2692	900				
270	2800	15	6.0	186.7	3081	1034				
260	2800	20	4.4	140	3391	1120				
250	2800	25	3.4	112	3653	1270				
310	2800	30	3.7	93.3	3882	1270				
275	2800	40	2.6	70	4273	1270				
265	2800	50	2.0	56	4603	1270				
245	2800	60	1.6	46.7	4891	1270				
225	2800	80	1.2	35	5383	1270				
200	2800	100	0.9	28	5799	1270				
340	2800	7.5	14.6	373.3	3090	950			<b>NRV105</b>	65
380	2800	10	12.4	280	3401	1194				
425	2800	15	9.4	186.7	3893	1337				
420	2800	20	7.1	140	4285	1485				
440	2800	25	6.0	112	4616	1700				
480	2800	30	5.6	93.3	4905	1700				
460	2800	40	4.2	70	5399	1700				
450	2800	50	3.3	56	5816	1700				
430	2800	60	2.7	46.7	6181	1700				
380	2800	80	1.9	35	6803	1700				
350	2800	100	1.5	28	7328	1700				
391	2800	7.5	16.8	373.3	3090	950	<b>NRV110</b>	65		
437	2800	10	14.2	280	3401	1194				
489	2800	15	10.9	186.7	3893	1337				
483	2800	20	8.1	140	4285	1485				
506	2800	25	6.9	112	4616	1700				
552	2800	30	6.5	93.3	4905	1700				
529	2800	40	4.8	70	5399	1700				
495	2800	50	3.7	56	5816	1700				
473	2800	60	3.0	46.7	6181	1700				
399	2800	80	2.0	35	6803	1700				
368	2800	100	1.5	28	7328	1700				
520	2800	7.5	22.3	373.3	4042	1190			<b>NRV130</b>	65
580	2800	10	18.9	280	4449	1493				
670	2800	15	14.7	186.7	5092	1725				
660	2800	20	11.0	140	5605	1912				
670	2800	25	9.1	112	6038	2100				
770	2800	30	9.0	93.3	6416	2100				
730	2800	40	6.5	70	7062	2100				
700	2800	50	5.1	56	7607	2100				
640	2800	60	4.0	46.7	8084	2100				
590	2800	80	2.9	35	8897	2100				
520	2800	100	2.2	28	9584	2100				



$M_{2n}$ [Nm]	$n_1$ [r/min]	$i$	$P_{1n}$ [kW]	$n_2$ [r/min]	$F_{r2}$ [N]	$F_{r1}$ [N]		Page 
18	1400	7.5	0.4	186.7	683	150	<b>NRV030</b>	65
18	1400	10	0.3	140	752	169		
18	1400	15	0.2	93.3	861	169		
18	1400	20	0.2	70	948	190		
21	1400	25	0.2	56	1021	210		
20	1400	30	0.2	46.7	1085	210		
18	1400	40	0.1	35	1194	210		
17	1400	50	0.1	28	1286	210		
16	1400	60	0.1	23.3	1367	210		
13	1400	80	0.1	17.5	1504	210		
40	1400	7.5	0.9	186.7	1315	294	<b>NRV040</b>	65
40	1400	10	0.7	140	1447	331		
40	1400	15	0.5	93.3	1657	331		
39	1400	20	0.4	70	1824	350		
38	1400	25	0.3	56	1964	350		
45	1400	30	0.3	46.7	2087	350		
41	1400	40	0.2	35	2298	350		
39	1400	50	0.2	28	2475	350		
36	1400	60	0.2	23.3	2630	350		
33	1400	80	0.1	17.5	2895	350		
29	1400	100	0.1	14	3118	350		
71	1400	7.5	1.6	186.7	1805	401	<b>NRV050</b>	65
72	1400	10	1.2	140	1987	490		
74	1400	15	0.9	93.3	2274	490		
73	1400	20	0.7	70	2503	490		
70	1400	25	0.5	56	2696	490		
84	1400	30	0.6	46.7	2865	490		
76	1400	40	0.4	35	3153	490		
73	1400	50	0.3	28	3397	490		
68	1400	60	0.3	23.3	3610	490		
65	1400	80	0.2	17.5	3973	490		
55	1400	100	0.2	14	4280	490		
128	1400	7.5	2.8	186.7	2359	500	<b>NRV063</b>	65
130	1400	10	2.2	140	2597	571		
140	1400	15	1.7	93.3	2973	615		
135	1400	20	1.2	70	3272	667		
130	1400	25	1.0	56	3524	700		
160	1400	30	1.1	46.7	3745	700		
145	1400	40	0.8	35	4122	700		
135	1400	50	0.6	28	4440	700		
130	1400	60	0.5	23.3	4719	700		
122	1400	80	0.4	17.5	5193	700		
118	1400	100	0.3	14	5595	700		
185	1400	7.5	4.1	186.7	2785	700	<b>NRV075</b>	65
195	1400	10	3.3	140	3065	830		
200	1400	15	2.3	93.3	3509	851		
210	1400	20	1.9	70	3862	980		
200	1400	25	1.5	56	4160	980		
230	1400	30	1.5	46.7	4421	980		



$M_{2n}$ [Nm]	$n_1$ [r/min]	$i$	$P_{1n}$ [kW]	$n_2$ [r/min]	$F_{r2}$ [N]	$F_{r1}$ [N]		Page  -----		
220	1400	40	1.1	35	4865	980	<b>NRV075</b>	65		
210	1400	50	0.9	28	5241	980				
200	1400	60	0.8	23.3	5569	980				
190	1400	80	0.6	17.5	6130	980				
180	1400	100	0.5	14	6603	980				
290	1400	7.5	6.4	186.7	3081	900	<b>NRV090</b>	65		
310	1400	10	5.2	140	3391	1082				
360	1400	15	4.1	93.3	3882	1257				
355	1400	20	3.1	70	4273	1270				
340	1400	25	2.5	56	4603	1270				
410	1400	30	2.6	46.7	4891	1270				
360	1400	40	1.8	35	5383	1270				
340	1400	50	1.4	28	5799	1270				
320	1400	60	1.1	23.3	6163	1270				
285	1400	80	0.8	17.5	6783	1270				
270	1400	100	0.7	14	7306	1270				
480	1400	7.5	10.5	186.7	3893	1200			<b>NRV105</b>	65
520	1400	10	8.7	140	4285	1463				
570	1400	15	6.5	93.3	4905	1604				
560	1400	20	4.8	70	5399	1700				
590	1400	25	4.2	56	5816	1700				
630	1400	30	3.9	46.7	6181	1700				
610	1400	40	2.9	35	6803	1700				
600	1400	50	2.4	28	7328	1700				
560	1400	60	1.9	23.3	7787	1700				
490	1400	80	1.3	17.5	8571	1700				
460	1400	100	1.1	14	9232	1700				
552	1400	7.5	12.1	186.7	3893	1200	<b>NRV110</b>	65		
598	1400	10	10.0	140	4285	1463				
656	1400	15	7.5	93.3	4905	1604				
644	1400	20	5.6	70	5399	1700				
679	1400	25	4.8	56	5816	1700				
725	1400	30	4.5	46.7	6181	1700				
702	1400	40	3.3	35	6803	1700				
660	1400	50	2.6	28	7328	1700				
616	1400	60	2.1	23.3	7787	1700				
515	1400	80	1.4	17.5	8571	1700				
483	1400	100	1.1	14	9232	1700				
750	1400	7.5	16.3	186.7	5092	1500			<b>NRV130</b>	65
820	1400	10	13.5	140	5605	1845				
920	1400	15	10.3	93.3	6416	2070				
910	1400	20	7.8	70	7062	2100				
930	1400	25	6.5	56	7607	2100				
1040	1400	30	6.4	46.7	8084	2100				
1050	1400	40	4.9	35	8897	2100				
980	1400	50	3.8	28	9584	2100				
900	1400	60	3.0	23.3	10185	2100				
840	1400	80	2.3	17.5	11210	2100				
740	1400	100	1.7	14	12076	2100				



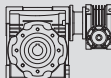

$M_{2n}$ [Nm]	$n_1$ [r/min]	$i$	$P_{1n}$ [kW]	$n_2$ [r/min]	$F_{R2}$ [N]	$F_{R1}$ [N]		Page 		
20	900	7.5	0.30	120	792	175	<b>NRV030</b>	65		
20	900	10	0.24	90	871	197				
20	900	15	0.17	60	997	197				
20	900	20	0.13	45	1098	210				
23	900	25	0.14	36	1183	210				
21	900	30	0.11	30	1257	210				
20	900	40	0.09	22.5	1383	210				
18	900	50	0.07	18	1490	210				
17	900	60	0.06	15	1583	210				
15	900	80	0.04	11.3	1743	210				
44	900	7.5	0.66	120	1524	319	<b>NRV040</b>	65		
44	900	10	0.51	90	1677	350				
45	900	15	0.36	60	1920	350				
44	900	20	0.28	45	2113	350				
43	900	25	0.23	36	2276	350				
49	900	30	0.23	30	2419	350				
45	900	40	0.17	22.5	2662	350				
42	900	50	0.14	18	2868	350				
39	900	60	0.11	15	3047	350				
35	900	80	0.09	11.3	3354	350				
32	900	100	0.07	9	3490	350				
84	900	7.5	1.2	120	2091	448			<b>NRV050</b>	65
84	900	10	0.95	90	2302	490				
84	900	15	0.67	60	2635	490				
77	900	20	0.48	45	2900	490				
75	900	25	0.39	36	3124	490				
90	900	30	0.42	30	3320	490				
82	900	40	0.31	22.5	3654	490				
77	900	50	0.25	18	3936	490				
72	900	60	0.21	15	4183	490				
68	900	80	0.16	11.3	4604	490				
56	900	100	0.12	9	4840	490				
151	900	7.5	2.2	120	2734	580	<b>NRV063</b>	65		
153	900	10	1.7	90	3009	661				
155	900	15	1.2	60	3444	670				
148	900	20	0.91	45	3791	700				
137	900	25	0.70	36	4084	700				
175	900	30	0.79	30	4339	700				
160	900	40	0.58	22.5	4776	700				
145	900	50	0.45	18	5145	700				
138	900	60	0.37	15	5467	700				
128	900	80	0.29	11.3	6018	700				
124	900	100	0.25	9	6270	700				
215	900	7.5	3.1	120	3227	810			<b>NRV075</b>	65
230	900	10	2.6	90	3551	975				
235	900	15	1.8	60	4065	980				
235	900	20	1.4	45	4474	980				
215	900	25	1.1	36	4820	980				
260	900	30	1.2	30	5122	980				

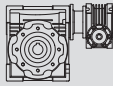

$M_{2n}$ [Nm]	$n_1$ [r/min]	$i$	$P_{1n}$ [kW]	$n_2$ [r/min]	$F_{r2}$ [N]	$F_{r1}$ [N]		Page 		
240	900	40	0.84	22.5	5637	980	<b>NRV075</b>	65		
220	900	50	0.66	18	6073	980				
210	900	60	0.55	15	6453	980				
200	900	80	0.43	11.3	7103	980				
190	900	100	0.36	9	7380	980				
340	900	7.5	4.9	120	3570	1040	<b>NRV090</b>	65		
370	900	10	4.1	90	3929	1270				
420	900	15	3.2	60	4498	1270				
390	900	20	2.3	45	4951	1270				
370	900	25	1.8	36	5333	1270				
460	900	30	1.9	30	5667	1270				
410	900	40	1.4	22.5	6238	1270				
390	900	50	1.1	18	6719	1270				
350	900	60	0.86	15	7140	1270				
315	900	80	0.63	11.3	7859	1270				
280	900	100	0.49	9	8180	1270				
565	900	7.5	8.1	120	4511	1390			<b>NRV105</b>	65
620	900	10	6.7	90	4965	1700				
660	900	15	4.9	60	5684	1700				
630	900	20	3.6	45	6256	1700				
660	900	25	3.1	36	6739	1700				
730	900	30	3.0	30	7161	1700				
690	900	40	2.2	22.5	7882	1700				
680	900	50	1.8	18	8491	1700				
620	900	60	1.4	15	9023	1700				
540	900	80	1.0	11.3	9931	1700				
490	900	100	0.78	9	10320	1700				
650	900	7.5	9.3	120	4511	1390	<b>NRV110</b>	65		
713	900	10	7.7	90	4965	1700				
759	900	15	5.7	60	5684	1700				
725	900	20	4.1	45	6256	1700				
759	900	25	3.5	36	6739	1700				
840	900	30	3.5	30	7161	1700				
794	900	40	2.5	22.5	7882	1700				
748	900	50	2.0	18	8491	1700				
682	900	60	1.6	15	9023	1700				
567	900	80	1.1	11.3	9931	1700				
515	900	100	0.82	9	10320	1700				
880	900	7.5	12.4	120	5901	1740			<b>NRV130</b>	65
960	900	10	10.4	90	6494	2100				
1060	900	15	7.8	60	7434	2100				
1040	900	20	5.9	45	8182	2100				
1050	900	25	4.9	36	8814	2100				
1170	900	30	4.8	30	9366	2100				
1100	900	40	3.5	22.5	10309	2100				
1050	900	50	2.8	18	11105	2100				
940	900	60	2.1	15	11801	2100				
860	900	80	1.6	11.3	12989	2100				
780	900	100	1.2	9	13500	2100				

$M_{2n}$ [Nm]	$n_1$ [r/min]	$i$	$P_{1n}$ [kW]	$n_2$ [r/min]	$F_{R2}$ [N]	$F_{R1}$ [N]		Page 
24	500	7.5	0.21	66.7	963	210	<b>NRV030</b>	65
24	500	10	0.16	50	1060	210		
24	500	15	0.12	33.3	1213	210		
23	500	20	0.09	25	1336	210		
29	500	25	0.10	20	1439	210		
26	500	30	0.08	16.7	1529	210		
23	500	40	0.06	12.5	1683	210		
21	500	50	0.05	10	1813	210		
19	500	60	0.04	8.3	1830	210		
17	500	80	0.03	6.3	1830	210		
54	500	7.5	0.45	66.7	1853	350	<b>NRV040</b>	65
54	500	10	0.35	50	2040	350		
55	500	15	0.26	33.3	2335	350		
52	500	20	0.19	25	2570	350		
49	500	25	0.15	20	2769	350		
58	500	30	0.16	16.7	2942	350		
53	500	40	0.12	12.5	3238	350		
49	500	50	0.10	10	3488	350		
46	500	60	0.08	8.3	3490	350		
40	500	80	0.06	6.3	3490	350		
103	500	7.5	0.87	66.7	2544	490	<b>NRV050</b>	65
103	500	10	0.67	50	2800	490		
103	500	15	0.47	33.3	3205	490		
93	500	20	0.33	25	3528	490		
91	500	25	0.27	20	3800	490		
108	500	30	0.30	16.7	4038	490		
98	500	40	0.22	12.5	4445	490		
91	500	50	0.17	10	4788	490		
83	500	60	0.14	8.3	4840	490		
75	500	80	0.11	6.3	4840	490		
184	500	7.5	1.5	66.7	3325	700	<b>NRV063</b>	65
185	500	10	1.2	50	3660	700		
187	500	15	0.85	33.3	4190	700		
178	500	20	0.63	25	4611	700		
164	500	25	0.48	20	4967	700		
200	500	30	0.53	16.7	5279	700		
185	500	40	0.40	12.5	5810	700		
173	500	50	0.32	10	6259	700		
160	500	60	0.26	8.3	6270	700		
137	500	80	0.19	6.3	6270	700		
260	500	7.5	2.2	66.7	3925	980	<b>NRV075</b>	65
270	500	10	1.7	50	4320	980		
280	500	15	1.3	33.3	4945	980		
285	500	20	0.99	25	5443	980		
255	500	25	0.74	20	5863	980		
300	500	30	0.77	16.7	6231	980		


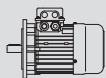

$M_{2n}$ [Nm]	$n_1$ [r/min]	$i$	$P_{1n}$ [kW]	$n_2$ [r/min]	$F_{r2}$ [N]	$F_{r1}$ [N]		Page 		
280	500	40	0.58	12.5	6858	980	<b>NRV075</b>	65		
250	500	50	0.44	10	7380	980				
240	500	60	0.38	8.3	7380	980				
215	500	80	0.28	6.3	7380	980				
210	500	100	0.24	5	7380	980				
410	500	7.5	3.3	66.7	4343	1270	<b>NRV090</b>	65		
435	500	10	2.7	50	4780	1270				
490	500	15	2.1	33.3	5472	1270				
470	500	20	1.6	25	6022	1270				
440	500	25	1.2	20	6487	1270				
550	500	30	1.4	16.7	6894	1270				
480	500	40	0.94	12.5	7588	1270				
450	500	50	0.75	10	8174	1270				
400	500	60	0.58	8.3	8180	1270				
365	500	80	0.45	6.3	8180	1270				
330	500	100	0.35	5	8180	1270				
690	500	7.5	5.6	66.7	5488	1700			<b>NRV105</b>	65
740	500	10	4.6	50	6040	1700				
790	500	15	3.4	33.3	6914	1700				
750	500	20	2.5	25	7610	1700				
790	500	25	2.1	20	8198	1700				
870	500	30	2.1	16.7	8711	1700				
810	500	40	1.5	12.5	9588	1700				
800	500	50	1.3	10	10320	1700				
710	500	60	0.96	8.3	10320	1700				
630	500	80	0.72	6.3	10320	1700				
570	500	100	0.55	5	10320	1700				
794	500	7.5	6.4	66.7	5488	1700	<b>NRV110</b>	65		
851	500	10	5.2	50	6040	1700				
909	500	15	3.9	33.3	6914	1700				
863	500	20	2.8	25	7610	1700				
909	500	25	2.4	20	8198	1700				
1000	500	30	2.4	16.7	8711	1700				
932	500	40	1.7	12.5	9588	1700				
880	500	50	1.4	10	10320	1700				
781	500	60	1.1	8.3	10320	1700				
662	500	80	0.75	6.3	10320	1700				
599	500	100	0.58	5	10320	1700				
1080	500	7.5	8.7	66.7	7178	2100			<b>NRV130</b>	65
1160	500	10	7.1	50	7900	2100				
1300	500	15	5.5	33.3	9043	2100				
1230	500	20	4.0	25	9953	2100				
1200	500	25	3.2	20	10722	2100				
1400	500	30	3.4	16.7	11394	2100				
1300	500	40	2.4	12.5	12540	2100				
1220	500	50	1.9	10	13500	2100				
1070	500	60	1.5	8.3	13500	2100				
970	500	80	1.1	6.3	13500	2100				
860	500	100	0.83	5	13500	2100				


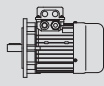

## 7.5 NRV.. / MRV.. Performance parameter

$M_{2n}$ [Nm]	$n_1$ [r/min]	$i$	$P_{1n}$ [kW]	$n_2$ [r/min]	$F_{r2}$ [N]	$F_{r1}$ [N]		Page 
73	1400	300	0.08	4.7	3490	210	<b>NRV030/040</b>	73
65	1400	400	0.06	3.5	3490	210		
61	1400	500	0.04	2.8	3490	210		
73	1400	600	0.05	2.3	3490	210		
73	1400	750	0.04	1.9	3490	210		
73	1400	900	0.04	1.6	3490	210		
65	1400	1200	0.03	1.2	3490	210		
73	1400	1500	0.03	0.9	3490	210		
73	1400	1800	0.02	0.8	3490	210		
65	1400	2400	0.02	0.58	3490	210		
65	1400	3200	0.01	0.4	3490	210		
33	1400	4000	0.01	0.4	3490	210		
29	1400	5000	0.01	0.28	3490	210		
145	1400	300	0.16	4.7	4840	210	<b>NRV030/050</b>	73
124	1400	400	0.11	3.5	4840	210		
120	1400	500	0.09	2.8	4840	210		
145	1400	600	0.09	2.3	4840	210		
145	1400	750	0.08	1.9	4840	210		
145	1400	900	0.07	1.6	4840	210		
124	1400	1200	0.05	1.2	4840	210		
145	1400	1500	0.05	0.93	4840	210		
145	1400	1800	0.05	0.78	4840	210		
124	1400	2400	0.03	0.6	4840	210		
120	1400	3000	0.03	0.5	4840	210		
82	1400	4000	0.02	0.35	4840	210		
82	1400	4800	0.02	0.29	4840	210		
230	1400	300	0.24	4.7	6270	210	<b>NRV030/063</b>	73
230	1400	400	0.19	3.5	6270	210		
216	1400	500	0.15	2.8	6270	210		
230	1400	600	0.14	2.3	6270	210		
216	1400	750	0.12	1.9	6270	210		
198	1400	900	0.09	1.6	6270	210		
230	1400	1200	0.09	1.2	6270	210		
216	1400	1500	0.08	0.93	6270	210		
198	1400	1800	0.06	0.78	6270	210		
230	1400	2400	0.06	0.58	6270	210		
216	1400	3000	0.05	0.47	6270	210		
172	1400	4000	0.04	0.35	6270	210		
150	1400	5000	0.03	0.28	6270	210		
390	1400	300	0.38	4.7	7380	350	<b>NRV040/075</b>	73
360	1400	400	0.28	3.5	7380	350		
320	1400	500	0.21	2.8	7380	350		
390	1400	600	0.21	2.3	7380	350		
390	1400	750	0.19	1.9	7380	350		
390	1400	900	0.17	1.6	7380	350		
360	1400	1200	0.13	1.2	7380	350		
390	1400	1500	0.12	0.93	7380	350		
390	1400	1800	0.11	0.78	7380	350		
360	1400	2400	0.08	0.58	7380	350		
320	1400	3000	0.06	0.47	7380	350		
250	1400	4000	0.04	0.35	7380	350		
230	1400	5000	0.03	0.28	7380	350		


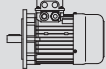

$M_{2n}$ [Nm]	$n_1$ [r/min]	$i$	$P_{1n}$ [kW]	$n_2$ [r/min]	$F_{r2}$ [N]	$F_{r1}$ [N]		Page 
610	1400	300	0.56	4.7	8180	350	<b>NRV040/090</b>	73
610	1400	400	0.45	3.5	8180	350		
560	1400	500	0.35	2.8	8180	350		
610	1400	600	0.31	2.3	8180	350		
560	1400	750	0.25	1.9	8180	350		
505	1400	900	0.21	1.6	8180	350		
610	1400	1200	0.20	1.2	8180	350		
560	1400	1500	0.16	0.93	8180	350		
505	1400	1800	0.13	0.78	8180	350		
610	1400	2400	0.12	0.58	8180	350		
560	1400	3000	0.10	0.47	8180	350		
460	1400	4000	0.07	0.35	8180	350		
410	1400	5000	0.05	0.28	8180	350		
1100	1400	300	1.0	4.7	10320	490		
1030	1400	400	0.70	3.5	10320	490		
1000	1400	500	0.49	2.8	10320	490		
1030	1400	600	0.52	2.3	10320	490		
1100	1400	750	0.49	1.9	10320	490		
1100	1400	900	0.44	1.6	10320	490		
1030	1400	1200	0.33	1.2	10320	490		
1100	1400	1500	0.30	0.93	10320	490		
1100	1400	1800	0.27	0.78	10320	490		
1030	1400	2400	0.20	0.58	10320	490		
1000	1400	3000	0.16	0.47	10320	490		
780	1400	4000	0.11	0.35	10320	490		
710	1400	5000	0.09	0.28	10320	490		
1265	1400	300	1.1	4.7	10320	490	<b>NRV050/110</b>	73
1185	1400	400	0.80	3.5	10320	490		
1100	1400	500	0.54	2.8	10320	490		
1185	1400	600	0.59	2.3	10320	490		
1265	1400	750	0.56	1.9	10320	490		
1265	1400	900	0.50	1.6	10320	490		
1185	1400	1200	0.38	1.2	10320	490		
1265	1400	1500	0.34	0.93	10320	490		
1265	1400	1800	0.31	0.78	10320	490		
1185	1400	2400	0.22	0.58	10320	490		
1100	1400	3000	0.18	0.47	10320	490		
819	1400	4000	0.11	0.35	10320	490		
746	1400	5000	0.09	0.28	10320	490		
1760	1400	300	1.5	4.7	13500	700		
1650	1400	400	1.1	3.5	13500	700		
1550	1400	500	0.89	2.8	13500	700		
1650	1400	600	0.79	2.3	13500	700		
1760	1400	750	0.75	1.9	13500	700		
1760	1400	900	0.66	1.6	13500	700		
1650	1400	1200	0.51	1.2	13500	700		
1760	1400	1500	0.45	0.93	13500	700		
1760	1400	1800	0.41	0.78	13500	700		
1650	1400	2400	0.30	0.58	13500	700		
1550	1400	3000	0.24	0.47	13500	700		
1220	1400	4000	0.16	0.35	13500	700		
1100	1400	5000	0.13	0.28	13500	700		


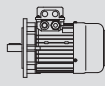

## 7.6 UDL.. - MRV.. (n1=1400r/min) Performance parameter

$P_{1n}$ [kW]	$n_2$ [r/min]	$M_{2n}$ [Nm]	$i$			Page 			
0.18	117 ~ 22.5	9 ~ 18	12 ~ 61.5	<b>UDL0.18-MRV040</b>	<b>6324</b>	57 & 74			
	88 ~ 17	12 ~ 23	16 ~ 82						
	58.7 ~ 11.3	17 ~ 32	24 ~ 123						
	44 ~ 8.5	22 ~ 40	32 ~ 164						
	35.2 ~ 6.8	27 ~ 47	40 ~ 205						
	29.3 ~ 5.7	30 ~ 51	48 ~ 246						
	22 ~ 4.3	37 ~ 62	64 ~ 328						
	17.6 ~ 3.4	43 ~ 60	80 ~ 410						
	22 ~ 4.3	38 ~ 63	64 ~ 328	<b>UDL0.18-MRV050</b>	<b>6324</b>	58 & 74			
	17.6 ~ 3.4	44 ~ 73	80 ~ 410						
	14.7 ~ 2.8	50 ~ 80	96 ~ 492						
	11 ~ 2.1	59 ~ 82	128 ~ 656						
	8.8 ~ 1.7	66 ~ 79	160 ~ 820						
0.37	133 ~ 26.7	19 ~ 36	10.5 ~ 52.5	<b>UDL0.37-MRV050</b>	<b>7124</b>	58 & 74			
	100 ~ 20	25 ~ 47	14 ~ 70						
	66.7 ~ 13.3	36 ~ 65	21 ~ 105						
	50 ~ 10	46 ~ 82	28 ~ 140						
	40 ~ 8	55 ~ 97	35 ~ 175						
	33.3 ~ 6.7	61 ~ 107	42 ~ 210						
	25 ~ 5	76 ~ 124	56 ~ 280						
	20 ~ 4	89 ~ 120	70 ~ 350						
	25 ~ 5	79 ~ 134	56 ~ 280	<b>UDL0.37-MRV063</b>	<b>7124</b>	59 & 74			
	20 ~ 4	92 ~ 155	70 ~ 350						
	16.7 ~ 3.3	104 ~ 173	84 ~ 420						
	12.5 ~ 2.5	125 ~ 173	112 ~ 560						
	10 ~ 2	139 ~ 150	140 ~ 700						
0.55	133 ~ 26.7	26 ~ 49	10.5 ~ 52.5	<b>UDL0.55-MRV063</b>	<b>8014</b>	59 & 74			
	100 ~ 20	34 ~ 63	14 ~ 70						
	66.7 ~ 13.3	48 ~ 88	21 ~ 105						
	50 ~ 10	62 ~ 112	28 ~ 140						
	40 ~ 8	75 ~ 133	35 ~ 175						
	33.3 ~ 6.7	81 ~ 146	42 ~ 210						
	25 ~ 5	105 ~ 179	56 ~ 280						
	20 ~ 4	123 ~ 207	70 ~ 350						
	20 ~ 4	129 ~ 216	70 ~ 350	<b>UDL0.55-MRV075</b>	<b>8014</b>	60 & 74			
	16.7 ~ 3.3	146 ~ 242	84 ~ 420						
	12.5 ~ 2.5	176 ~ 250	112 ~ 560						
	12.5 ~ 2.5	189 ~ 309	112 ~ 560				<b>UDL0.55-MRV090</b>	<b>8014</b>	61 & 74
	10 ~ 2	218 ~ 350	140 ~ 700						

$P_{1n}$ [kW]	$n_2$ [r/min]	$M_{2n}$ [Nm]	$i$			Page 
0.75	133 ~ 26.7	39 ~ 73	10.5 ~ 52.5	<b>UDL0.75-MRV063</b>	<b>8024</b>	59 & 74
	100 ~ 20	51 ~ 94	14 ~ 70			
	66.7 ~ 13.3	72 ~ 132	21 ~ 105			
	50 ~ 10	92 ~ 168	28 ~ 140			
	40 ~ 8	112 ~ 199	35 ~ 175			
	33.3 ~ 6.7	126 ~ 219	42 ~ 210			
	25 ~ 5	156 ~ 232	56 ~ 280			
	20 ~ 4	185 ~ 310	70 ~ 350			
	20 ~ 4	192 ~ 320	70 ~ 350	<b>UDL0.75-MRV075</b>	<b>8024</b>	60 & 74
	16.7 ~ 3.3	219 ~ 300	84 ~ 420			
	16.7 ~ 3.3	230 ~ 389	84 ~ 420	<b>UDL0.75-MRV090</b>	<b>8024</b>	61 & 74
	12.5 ~ 2.5	265 ~ 428	112 ~ 560			
	10 ~ 2	303 ~ 410	140 ~ 700			
	12.5 ~ 2.5	302 ~ 503	112 ~ 560	<b>UDL0.75-MRV105</b>	<b>8024</b>	62 & 74
	10 ~ 2	348 ~ 575	140 ~ 700			
12.5 ~ 2.5	302 ~ 503	112 ~ 560	<b>UDL0.75-MRV110</b>	<b>8024</b>	63 & 74	
10 ~ 2	348 ~ 575	140 ~ 700				
1.1	133 ~ 26.7	59 ~ 111	10.5 ~ 52.5	<b>UD1.1-MRV075</b>	<b>90S4</b>	60 & 74
	100 ~ 20	77 ~ 144	14 ~ 70			
	66.7 ~ 13.3	110 ~ 203	21 ~ 105			
	50 ~ 10	142 ~ 258	28 ~ 140			
	40 ~ 8	172 ~ 308	35 ~ 175			
	33.3 ~ 6.7	195 ~ 340	42 ~ 210			
	25 ~ 5	245 ~ 360	56 ~ 280			
	100 ~ 20	78 ~ 146	14 ~ 70	<b>UD1.1-MRV090</b>	<b>90S4</b>	61 & 74
	66.7 ~ 13.3	113 ~ 208	21 ~ 105			
	50 ~ 10	146 ~ 266	28 ~ 140			
	40 ~ 8	177 ~ 320	35 ~ 175			
	33.3 ~ 6.7	202 ~ 356	42 ~ 210			
	25 ~ 5	256 ~ 442	56 ~ 280			
	20 ~ 4	304 ~ 517	70 ~ 350			
	20 ~ 4	320 ~ 550	70 ~ 350	<b>UD1.1-MRV105</b>	<b>90S4</b>	62 & 74
	16.7 ~ 3.3	368 ~ 625	84 ~ 420			
	12.5 ~ 2.5	455 ~ 754	112 ~ 560			
	10 ~ 2	522 ~ 710	140 ~ 700			
	20 ~ 4	320 ~ 550	70 ~ 350	<b>UD1.1-MRV110</b>	<b>90S4</b>	63 & 74
	16.7 ~ 3.3	368 ~ 625	84 ~ 420			
	12.5 ~ 2.5	455 ~ 754	112 ~ 560			
10 ~ 2	522 ~ 710	140 ~ 700				
16.7 ~ 3.3	373 ~ 623	84 ~ 420	<b>UD1.1-MRV130</b>	<b>90S4</b>	64 & 74	
12.5 ~ 2.5	460 ~ 749	112 ~ 560				
10 ~ 2	531 ~ 868	140 ~ 700				



$P_{1n}$ [kW]	$n_2$ [r/min]	$M_{2n}$ [Nm]	$i$			Page 	
1.5	133 ~ 26.7	78 ~ 148	10.5 ~ 52.5	<b>UD1.5-MRV075</b>	<b>90L4</b>	60 & 74	
	100 ~ 20	102 ~ 192	14 ~ 70				
	66.7 ~ 13.3	147 ~ 270	21 ~ 105				
	50 ~ 10	190 ~ 344	28 ~ 140				
	40 ~ 8	229 ~ 330	35 ~ 175				
	33.3 ~ 6.7	260 ~ 390	42 ~ 210				
	25 ~ 5	327 ~ 360	56 ~ 280				
	1.5	133 ~ 26.7	77 ~ 150	10.5 ~ 52.5	<b>UD1.5-MRV090</b>	<b>90L4</b>	61 & 74
		100 ~ 20	104 ~ 195	14 ~ 70			
		66.7 ~ 13.3	150 ~ 277	21 ~ 105			
		50 ~ 10	194 ~ 355	28 ~ 140			
		40 ~ 8	236 ~ 427	35 ~ 175			
		33.3 ~ 6.7	270 ~ 474	42 ~ 210			
		25 ~ 5	341 ~ 589	56 ~ 280			
		20 ~ 4	406 ~ 560	70 ~ 350			
20 ~ 4		426 ~ 733	70 ~ 350	<b>UD1.5-MRV105</b>	<b>90L4</b>	62 & 74	
16.7 ~ 3.3		490 ~ 833	84 ~ 420				
20 ~ 4	426 ~ 733	70 ~ 350	<b>UD1.5-MRV110</b>	<b>90L4</b>	63 & 74		
16.7 ~ 3.3	490 ~ 833	84 ~ 420					
16.7 ~ 3.3	498 ~ 831	84 ~ 420	<b>UD1.5-MRV130</b>	<b>90L4</b>	64 & 74		
12.5 ~ 2.5	614 ~ 999	112 ~ 560					
10 ~ 2	696 ~ 1100	140 ~ 700					
2.2	133 ~ 26.7	120 ~ 226	10.5 ~ 52.5	<b>UD2.2-MRV105</b>	<b>100LA4</b>	62 & 74	
	100 ~ 20	157 ~ 294	14 ~ 70				
	66.7 ~ 13.3	228 ~ 418	21 ~ 105				
	50 ~ 10	298 ~ 549	28 ~ 140				
	40 ~ 8	364 ~ 664	35 ~ 175				
	33.3 ~ 6.7	413 ~ 717	42 ~ 210				
	25 ~ 5	533 ~ 931	56 ~ 280				
	2.2	133 ~ 26.7	120 ~ 226	10.5 ~ 52.5	<b>UD2.2-MRV110</b>	<b>100LA4</b>	63 & 74
		100 ~ 20	157 ~ 294	14 ~ 70			
		66.7 ~ 13.3	228 ~ 418	21 ~ 105			
		50 ~ 10	298 ~ 549	28 ~ 140			
		40 ~ 8	364 ~ 664	35 ~ 175			
		33.3 ~ 6.7	413 ~ 717	42 ~ 210			
		25 ~ 5	533 ~ 931	56 ~ 280			
		25 ~ 5	542 ~ 932	56 ~ 280	<b>UD2.2-MRV130</b>	<b>100LA4</b>	64 & 74
20 ~ 4		648 ~ 1097	70 ~ 350				
16.7 ~ 3.3		746 ~ 1246	84 ~ 420				
12.5 ~ 2.5	921 ~ 1499	112 ~ 560					
10 ~ 2	1040 ~ 1690	140 ~ 700					

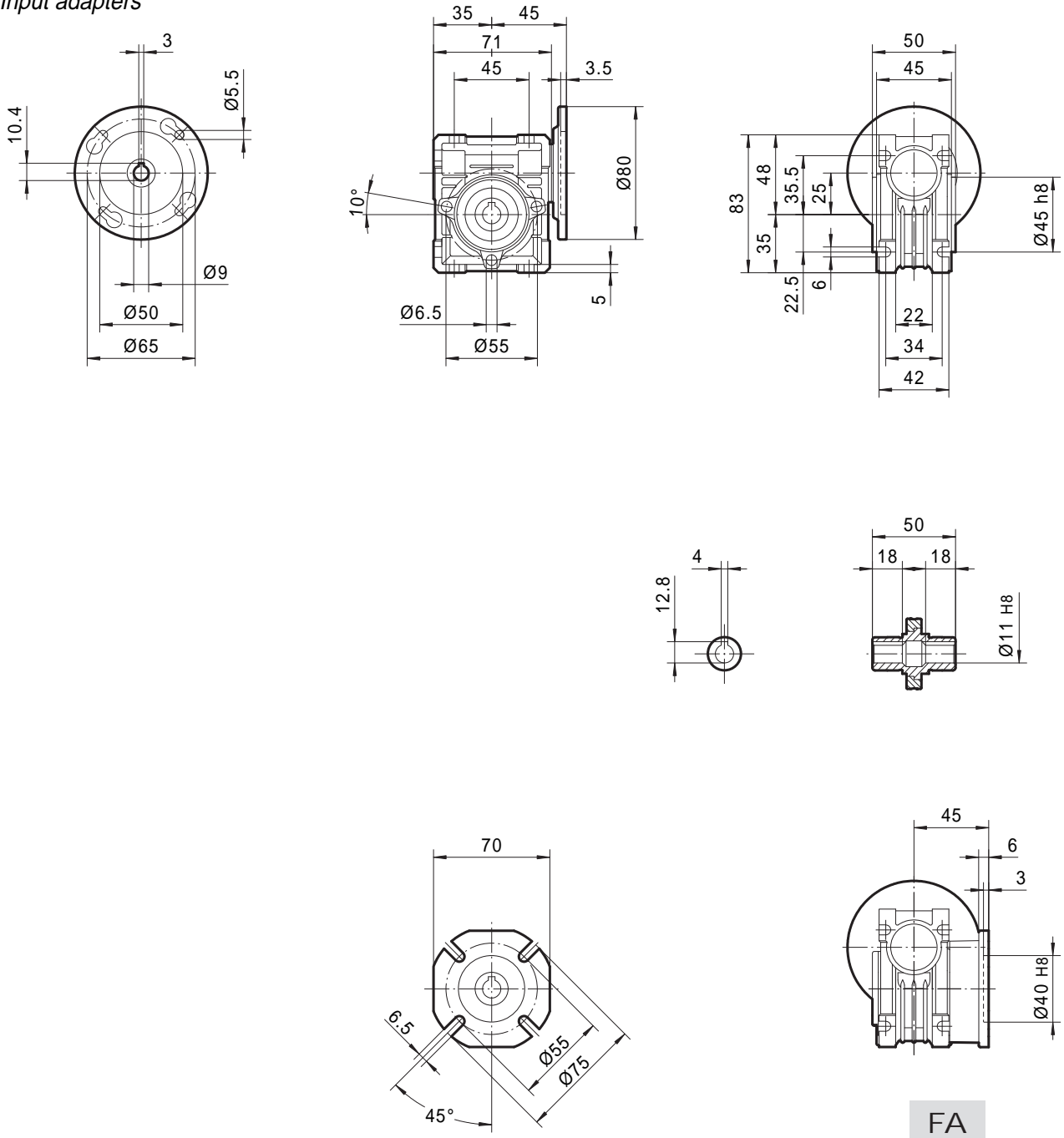
$P_{1n}$ [kW]	$n_2$ [r/min]	$M_{2n}$ [Nm]	$i$			Page 						
3.0	133 ~ 26.7	160 ~ 302	10.5 ~ 52.5	<b>UD3.0-MRV105</b>	<b>100LB4</b>	62 & 74						
	100 ~ 20	210 ~ 392	14 ~ 70									
	66.7 ~ 13.3	304 ~ 558	21 ~ 105									
	50 ~ 10	398 ~ 732	28 ~ 140									
	40 ~ 8	485 ~ 885	35 ~ 175									
	33.3 ~ 6.7	547 ~ 956	42 ~ 210									
	25 ~ 5	711 ~ 1030	56 ~ 280									
	133 ~ 26.7	160 ~ 302	10.5 ~ 52.5				<b>UD3.0-MRV110</b>	<b>100LB4</b>	63 & 74			
	100 ~ 20	210 ~ 392	14 ~ 70									
	66.7 ~ 13.3	304 ~ 558	21 ~ 105									
	50 ~ 10	398 ~ 732	28 ~ 140									
	40 ~ 8	485 ~ 885	35 ~ 175									
	33.3 ~ 6.7	547 ~ 956	42 ~ 210									
	25 ~ 5	711 ~ 1030	56 ~ 280									
	133 ~ 26.7	160 ~ 301	10.5 ~ 52.5							<b>UD3.0-MRV130</b>	<b>100LB4</b>	64 & 74
100 ~ 20	211 ~ 395	14 ~ 70										
66.7 ~ 13.3	307 ~ 563	21 ~ 105										
50 ~ 10	402 ~ 733	28 ~ 140										
40 ~ 8	490 ~ 885	35 ~ 175										
33.3 ~ 6.7	562 ~ 973	42 ~ 210										
25 ~ 5	720 ~ 1242	56 ~ 280										
20 ~ 4	864 ~ 1463	70 ~ 350										
4.0	133 ~ 26.7	213 ~ 402	10.5 ~ 52.5	<b>UD4.0-MRV105</b>	<b>112M4</b>	62 & 74						
	100 ~ 20	279 ~ 523	14 ~ 70									
	66.7 ~ 13.3	405 ~ 744	21 ~ 105									
	50 ~ 10	530 ~ 975	28 ~ 140									
	40 ~ 8	647 ~ 1020	35 ~ 175									
	133 ~ 26.7	213 ~ 402	10.5 ~ 52.5				<b>UD4.0-MRV110</b>	<b>112M4</b>	63 & 74			
	100 ~ 20	279 ~ 523	14 ~ 70									
	66.7 ~ 13.3	405 ~ 744	21 ~ 105									
	50 ~ 10	530 ~ 975	28 ~ 140									
	40 ~ 8	647 ~ 1020	35 ~ 175									
	133 ~ 26.7	214 ~ 401	10.5 ~ 52.5							<b>UD4.0-MRV130</b>	<b>112M4</b>	64 & 74
	100 ~ 20	281 ~ 527	14 ~ 70									
	66.7 ~ 13.3	410 ~ 751	21 ~ 105									
	50 ~ 10	536 ~ 978	28 ~ 140									
	40 ~ 8	653 ~ 1180	35 ~ 175									
33.3 ~ 6.7	749 ~ 1298	42 ~ 210										
25 ~ 5	960 ~ 1650	56 ~ 280										

**8. OUTLINE DIMENSION SHEET**

8.1 MRV.. Outline dimension

MRV025..(IEC)

Input adapters

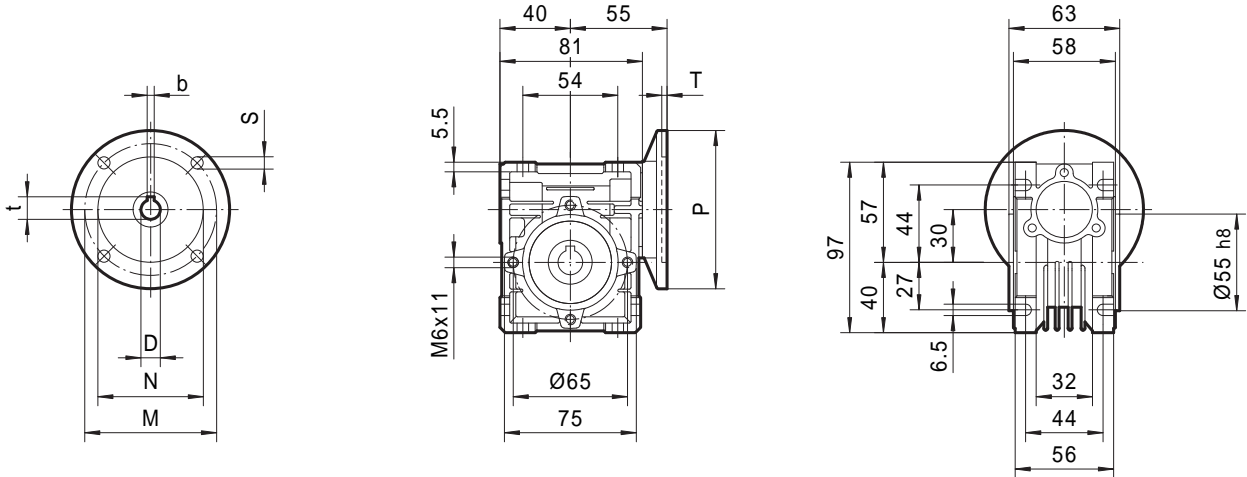


FA

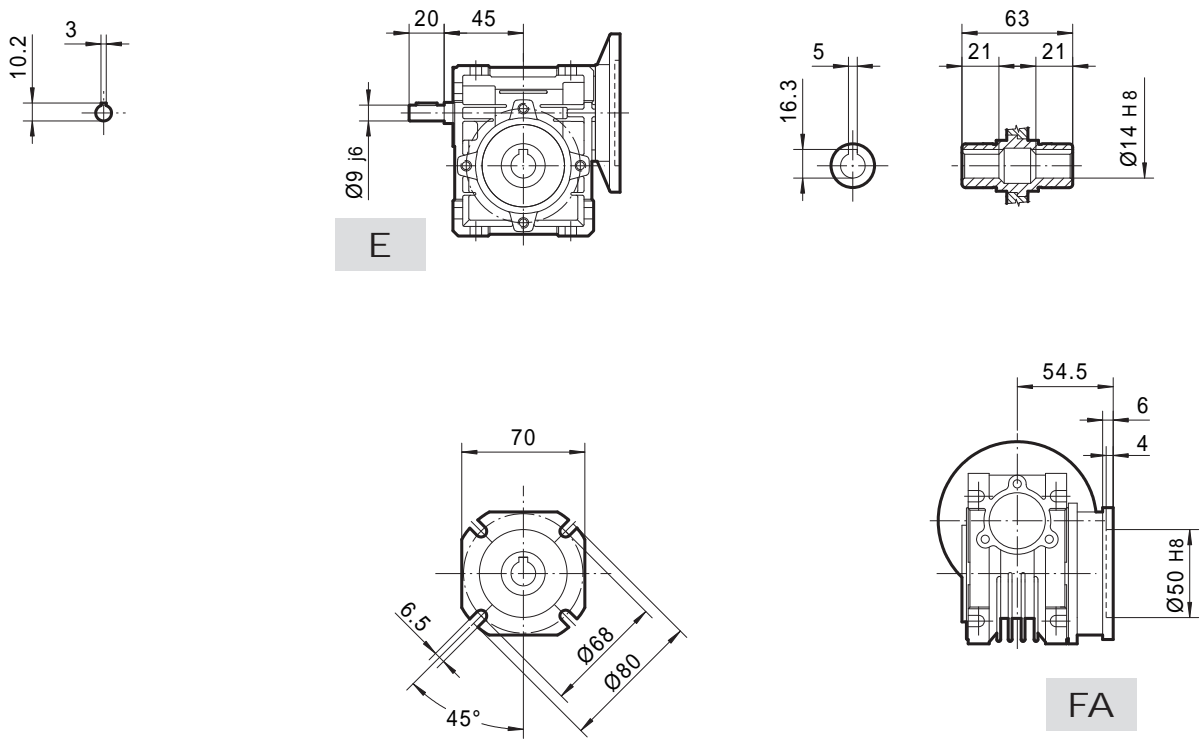
Weight without motor  $\approx 0.7$  kg

MRV030..(IEC)

Input adapters



Worm output shaft

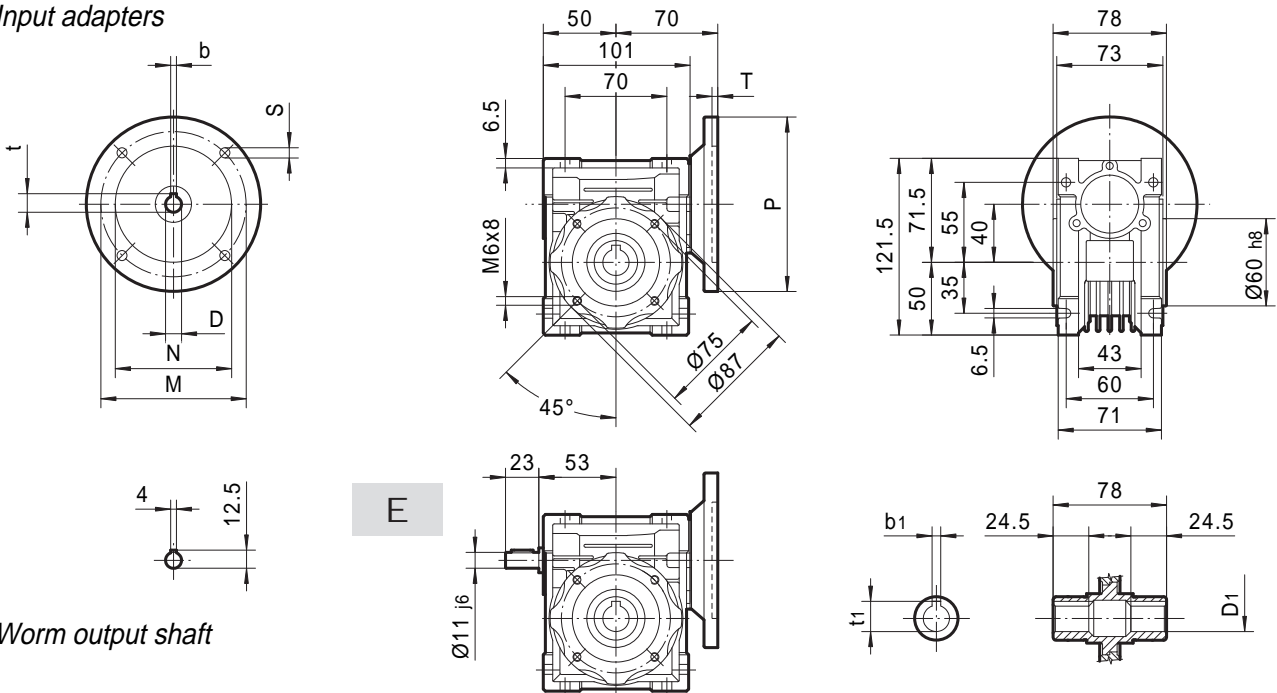


IEC	$D_{E8}$	$b$	$t$	$P$	$M$	$N$	$S$	$T$
56B5	9	10.4	3	120	100	80	7	5
56B14	9	10.4	3	80	65	50	5.5	4
63B5	11	12.8	4	140	115	95	9	5
63B14	11	12.8	4	90	75	60	5.5	4

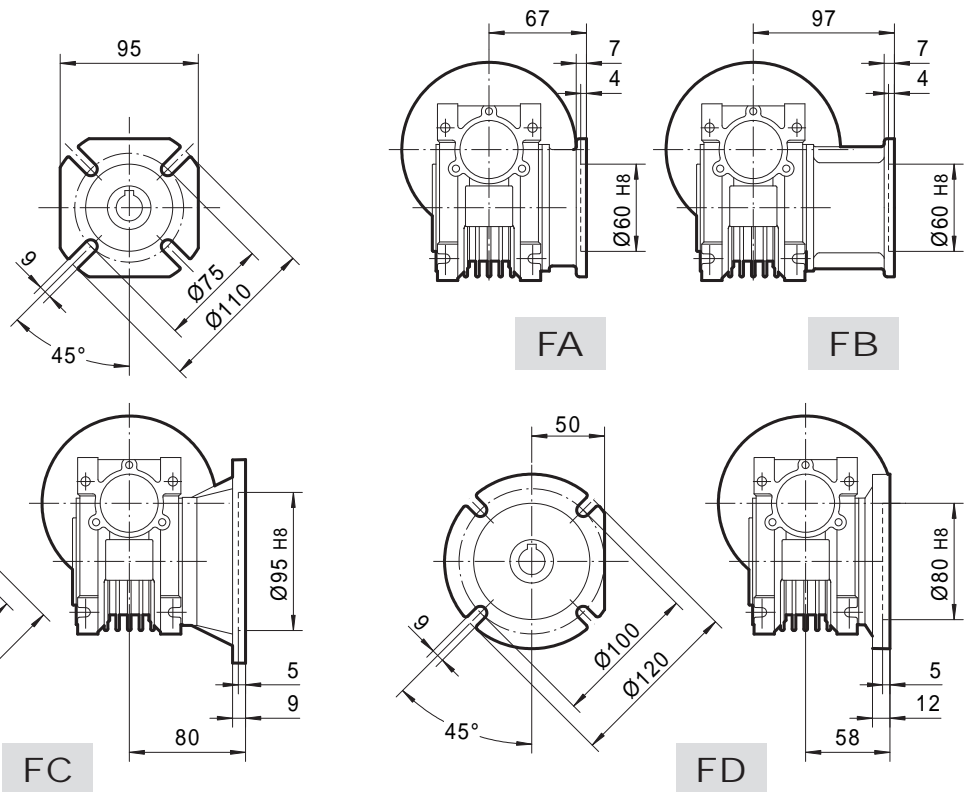
Weight without motor  $\approx 1.2 \text{ kg}$

MRV040..(IEC)

Input adapters



Worm output shaft

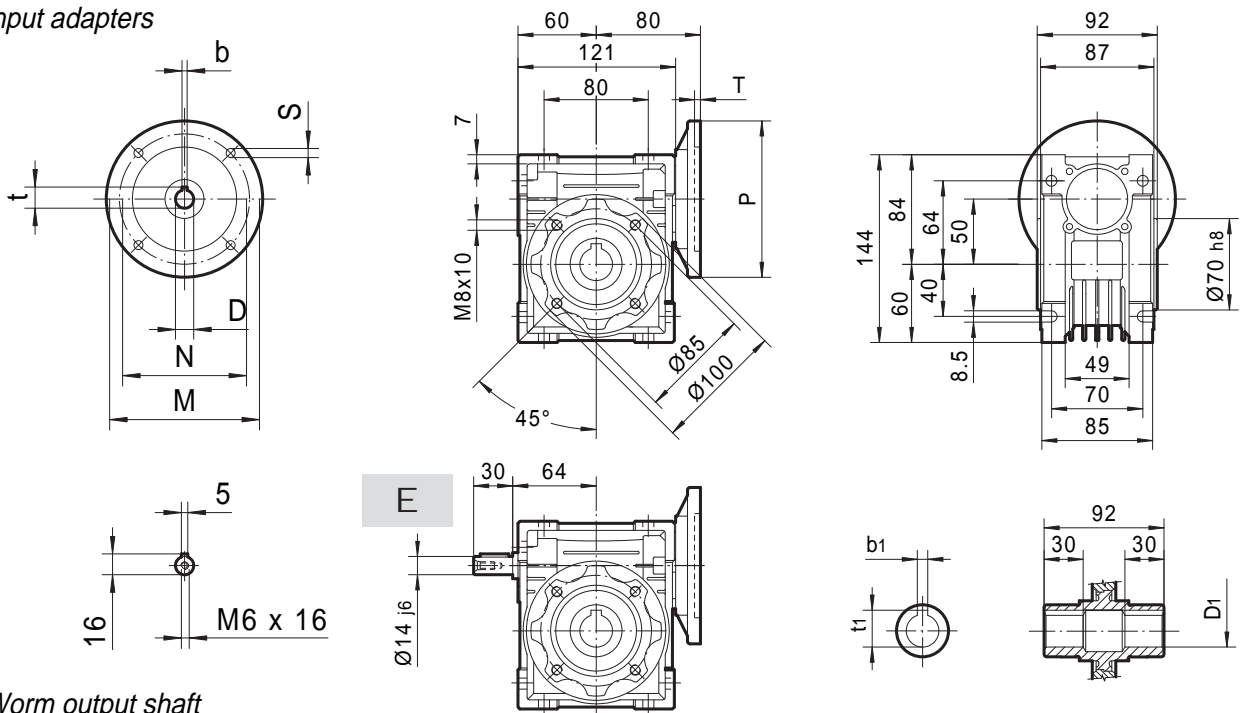


IEC	DE8	b	t	P	M	N	S	T	D1 H8	b1	t1
56B5	9	10.4	3	120	100	80	7	5	18	6	20.8
63B5	11	12.8	4	140	115	95	9	5	19*	6*	21.8*
63B14	11	12.8	4	90	75	60	5.5	4	* Only on request		
71B5	14	16.3	5	160	130	110	9	5			
71B14	14	16.3	5	105	85	70	7	5			

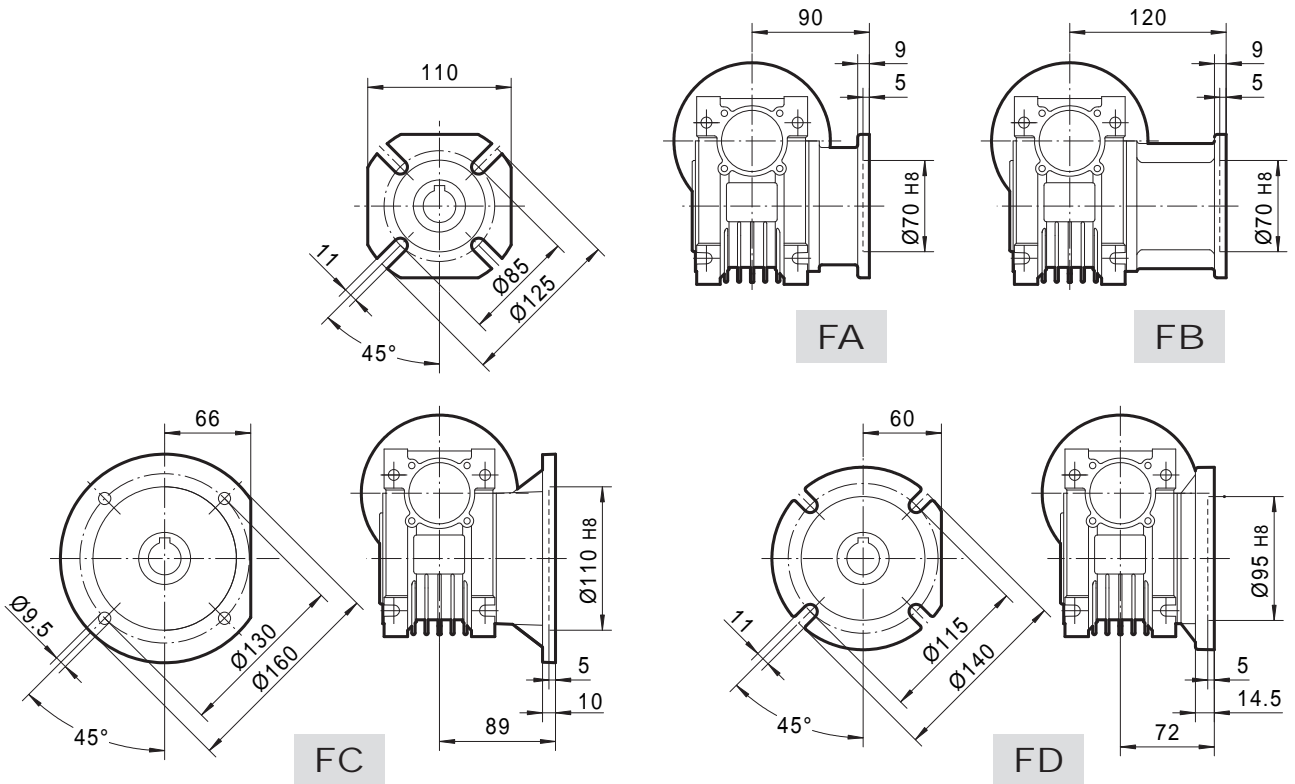
Weight without motor ≈ 2.3 kg

MRV050..(IEC)

Input adapters



Worm output shaft

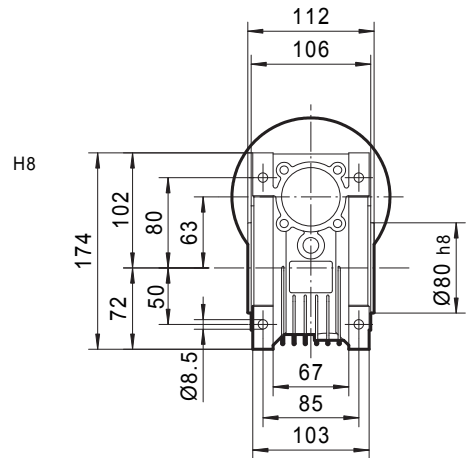
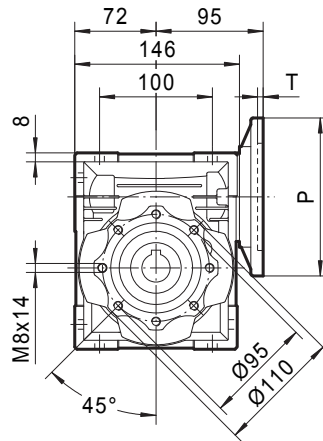
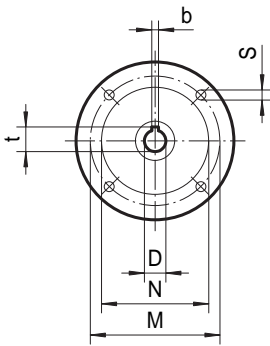


IEC	$D_{E8}$	$b$	$t$	$P$	$M$	$N$	$S$	$T$	$D1\ H8$	$b1$	$t1$
63B5	11	12.8	4	140	115	95	9	5	25	8	28.3
70B5	14	16.3	5	160	130	110	9	5	24*	8*	27.3*
71B14	14	16.3	5	105	85	70	7	5	* Only on request		
80B5	19	21.8	6	200	165	130	11	5			
80B14	19	21.8	6	120	100	80	7	5			

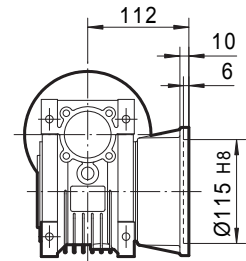
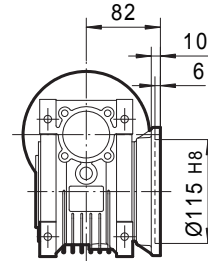
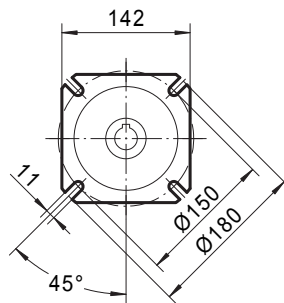
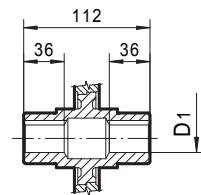
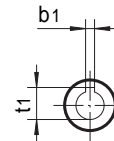
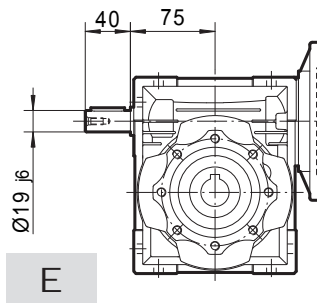
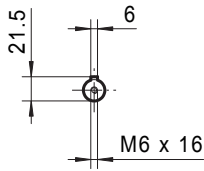
Weight without motor  $\approx$  3.5 kg

MRV063..(IEC)

Input adapters

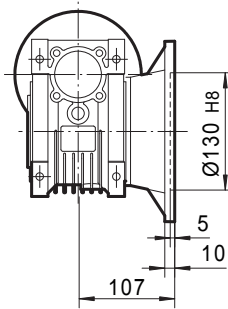
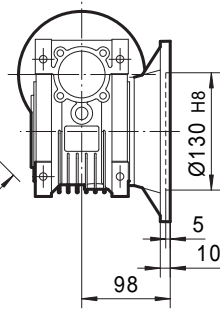
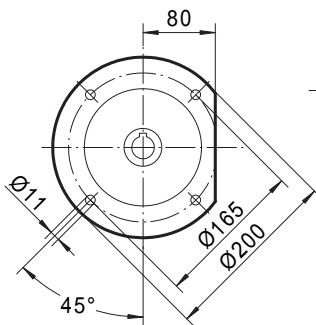


Worm output shaft



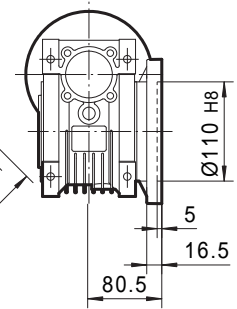
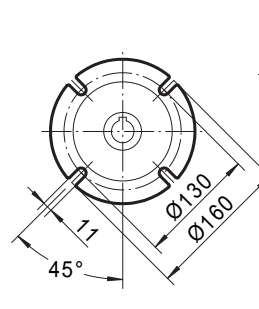
FA

FB



FC

FD



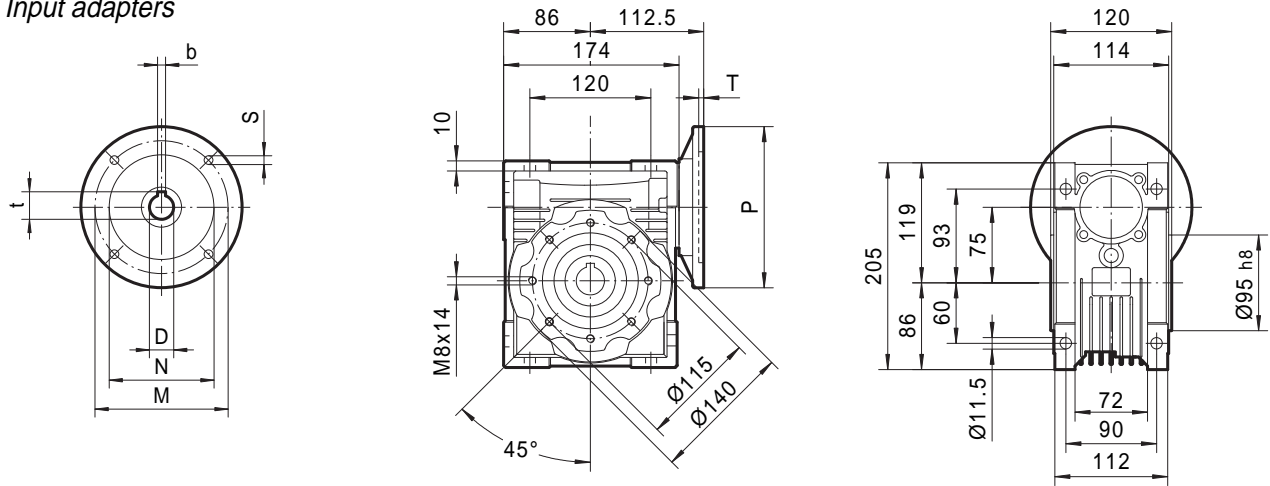
FE

IEC	DE8	b	t	P	M	N	S	T	D1 H8	b1	t1
70B5	14	16.3	5	160	130	110	9	5	25	8	28.3
71B14	14	16.3	5	105	85	70	7	5	28*	8*	31.3*
80B5	19	21.8	6	200	165	130	11	5	* Only on request		
80B14	19	21.8	6	120	100	80	7	5			
90B5	24	27.3	8	200	165	130	11	5			
90B14	24	27.3	8	140	115	95	9	5			

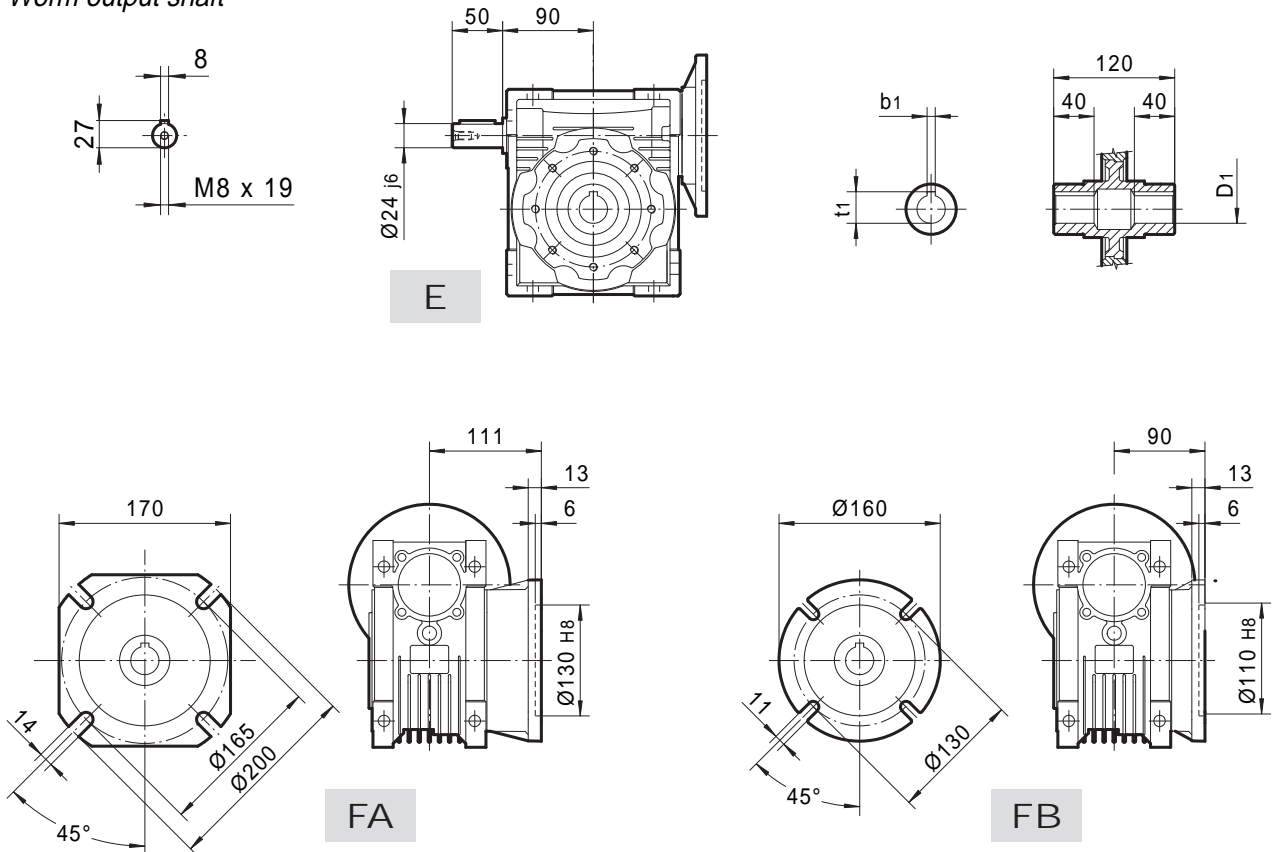
Weight without motor ≈ 6.2 kg

MRV075..(IEC)

Input adapters



Worm output shaft



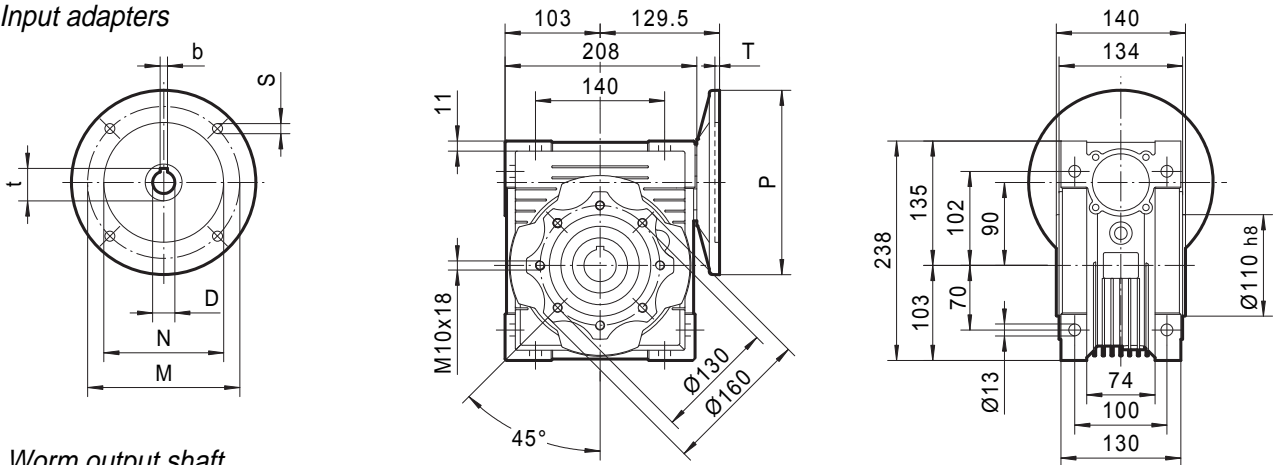
IEC	$DE_8$	$b$	$t$	$P$	$M$	$N$	$S$	$T$	$D_1 \text{ H8}$	$b_1$	$t_1$
71B5	14	16.3	5	160	130	110	9	5	28	8	31.3
80B5	19	21.8	6	200	165	130	11	5	35*	10*	38.3*
80B14	19	21.8	6	120	100	80	7	5	* Only on request		
90B5	24	27.3	8	200	165	130	11	5			
90B14	24	27.3	8	140	115	95	9	5			
100/112B5	28	31.3	8	250	215	180	13.5	5			
100/112B14	28	31.3	8	160	130	110	9	5			

Weight without motor  $\approx 9 \text{ kg}$

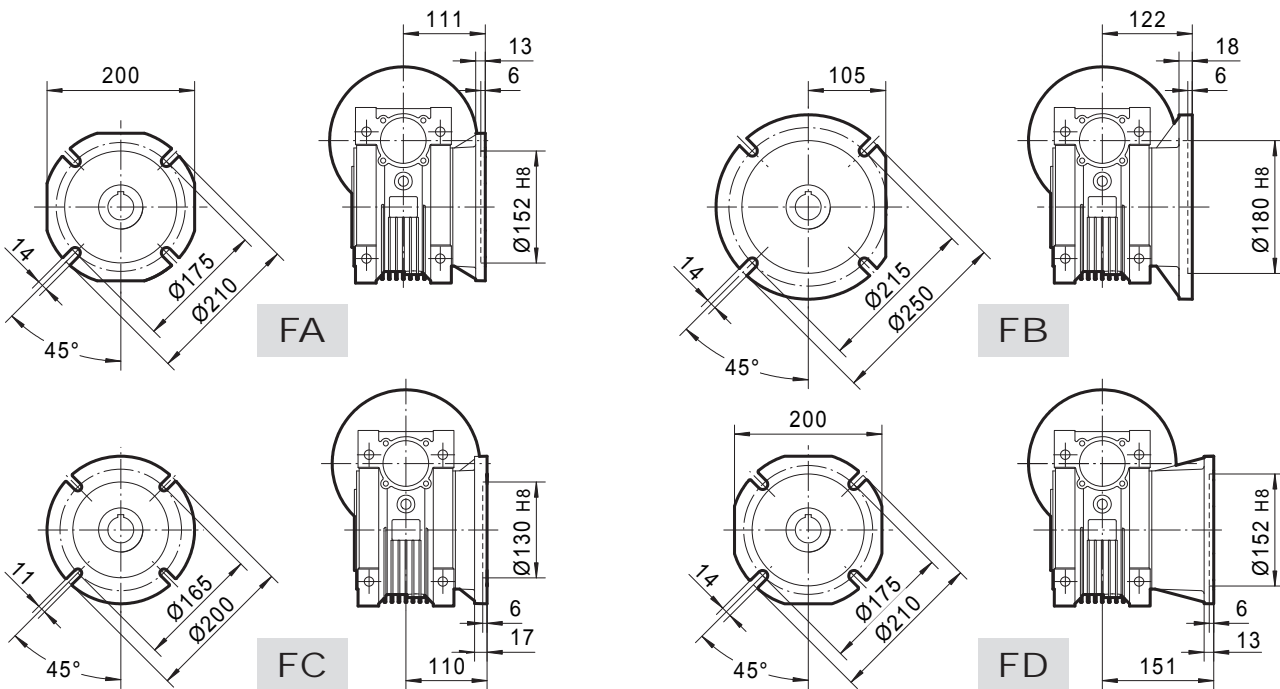
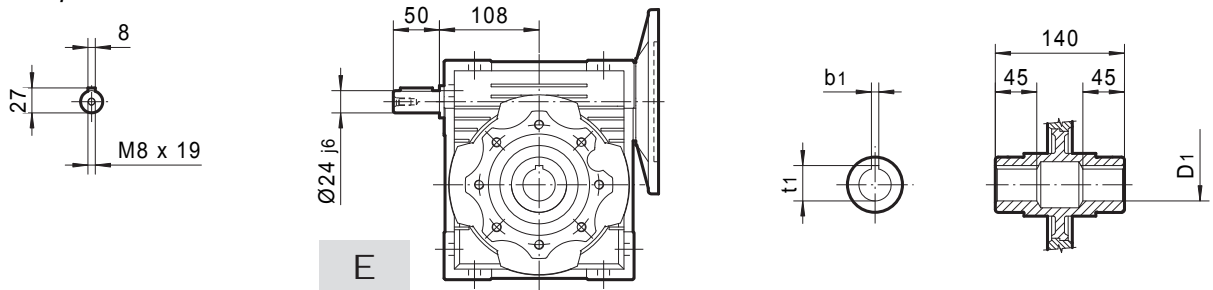


MRV090..(IEC)

Input adapters



Worm output shaft

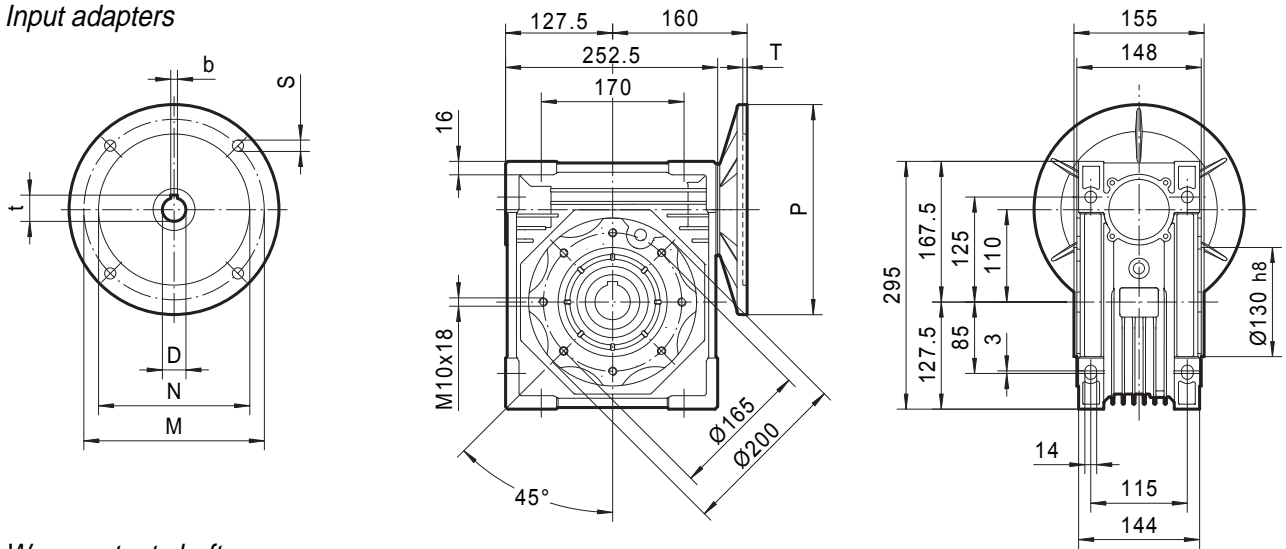


IEC	DE8	b	t	P	M	N	S	T	D1 H8	b1	t1
80B5	19	21.8	6	200	165	130	11	5	35	10	38.3
80B14	19	21.8	6	120	100	80	7	5	38*	10*	41.3*
90B5	24	27.3	8	200	165	130	11	5	* Only on request		
90B14	24	27.3	8	140	115	95	9	5			
100/112B5	28	31.3	8	250	215	180	13.5	5			
100/112B14	28	31.3	8	160	130	110	9	5			

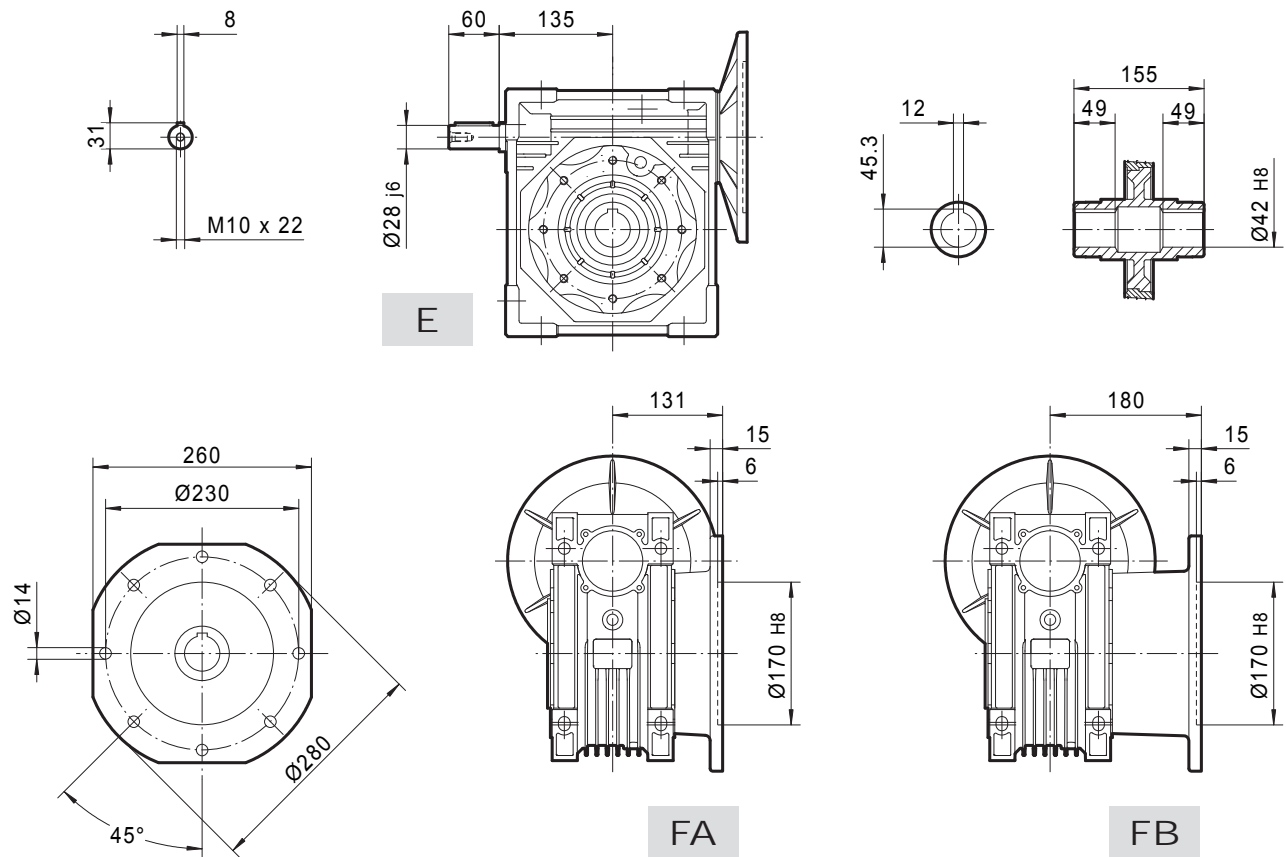
Weight without motor ≈ 13 kg

MRV105..(IEC)

Input adapters



Worm output shaft

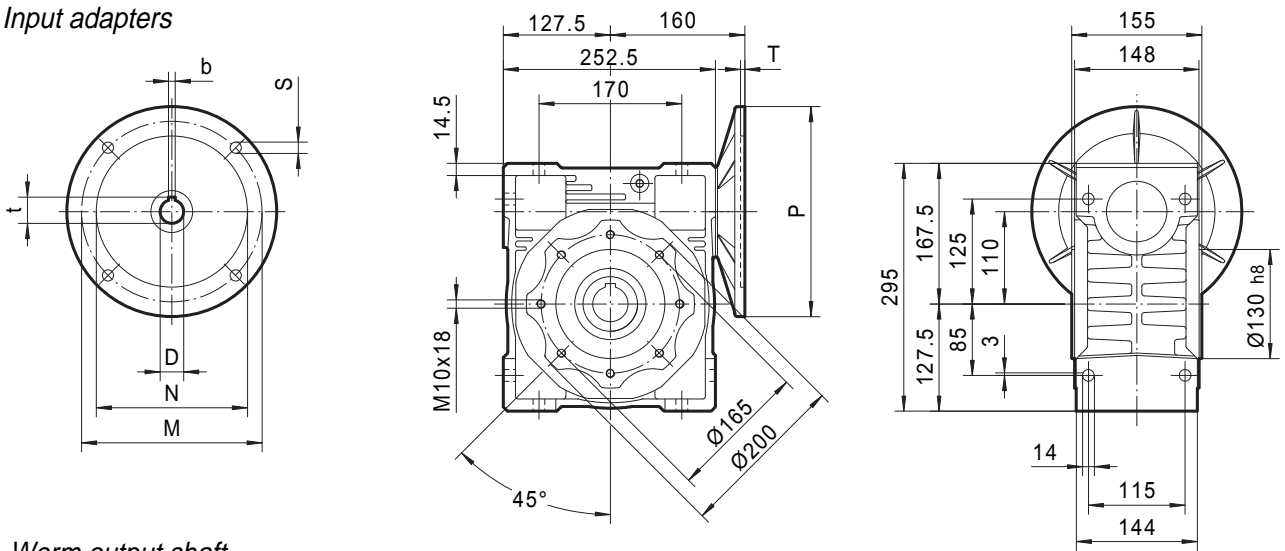


IEC	$D_{E8}$	$b$	$t$	$P$	$M$	$N$	$S$	$T$
80B5	19	21.8	6	200	165	130	11	5
90B5	24	27.3	8	200	165	130	11	5
100B5	28	31.3	8	250	215	180	14	8
112B5	28	31.3	8	250	215	180	14	8
132B5	38	41.3	10	300	265	230	14	8

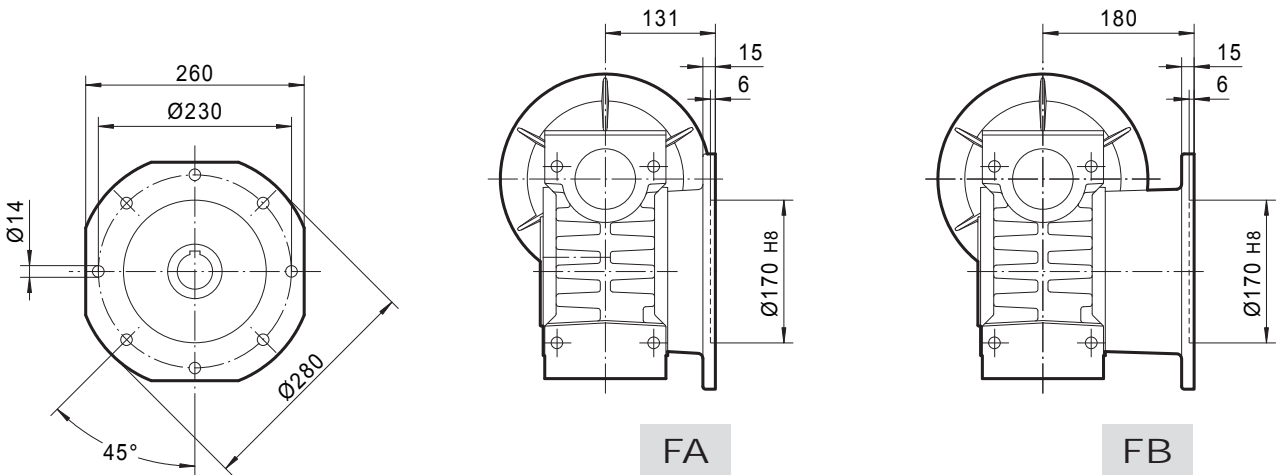
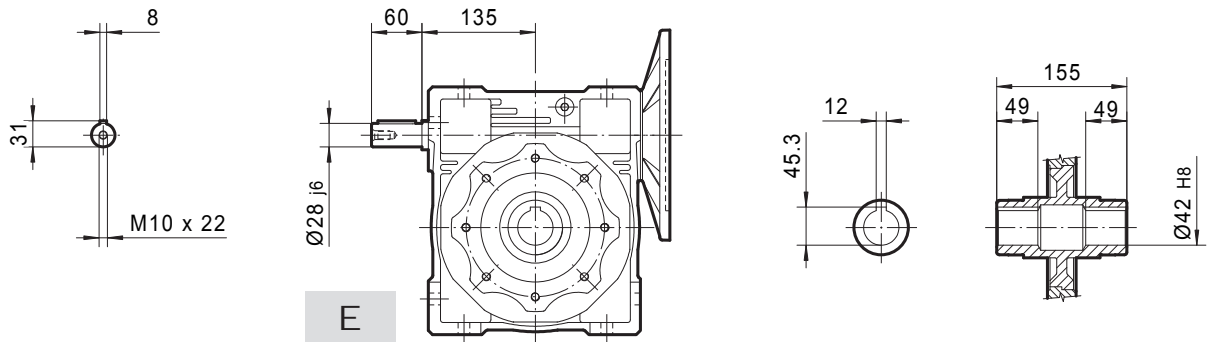
Weight without motor  $\approx 21$  kg

MRV110..(IEC)

Input adapters



Worm output shaft

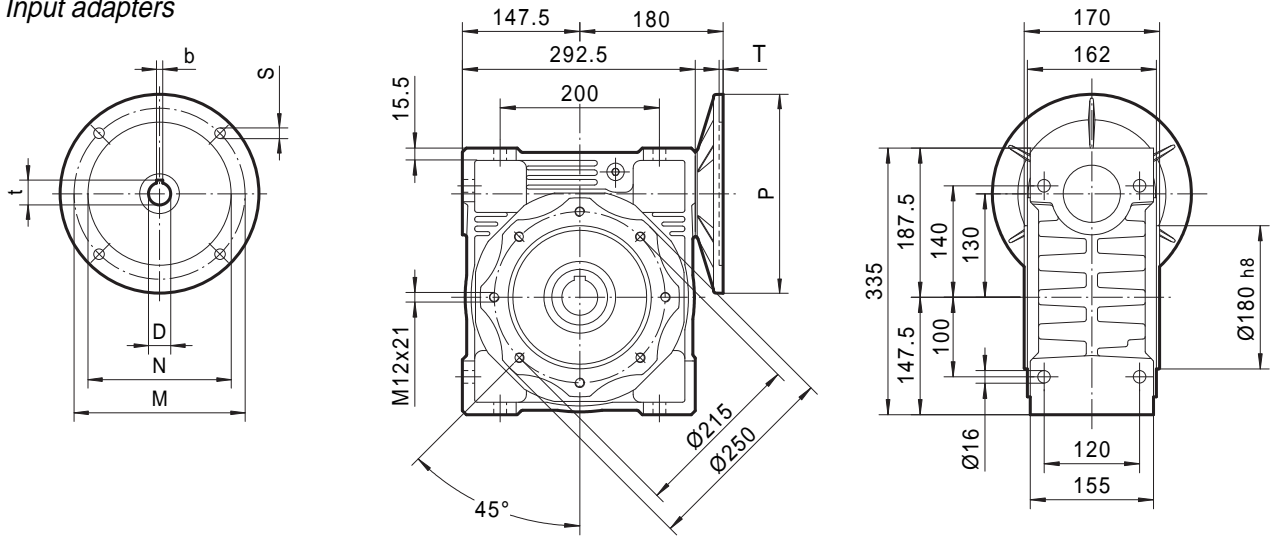


IEC	$D_{E8}$	$b$	$t$	$P$	$M$	$N$	$S$	$T$
80B5	19	21.8	6	200	165	130	11	5
90B5	24	27.3	8	200	165	130	11	5
100B5	28	31.3	8	250	215	180	14	8
112B5	28	31.3	8	250	215	180	14	8
132B5	38	41.3	10	300	265	230	14	8

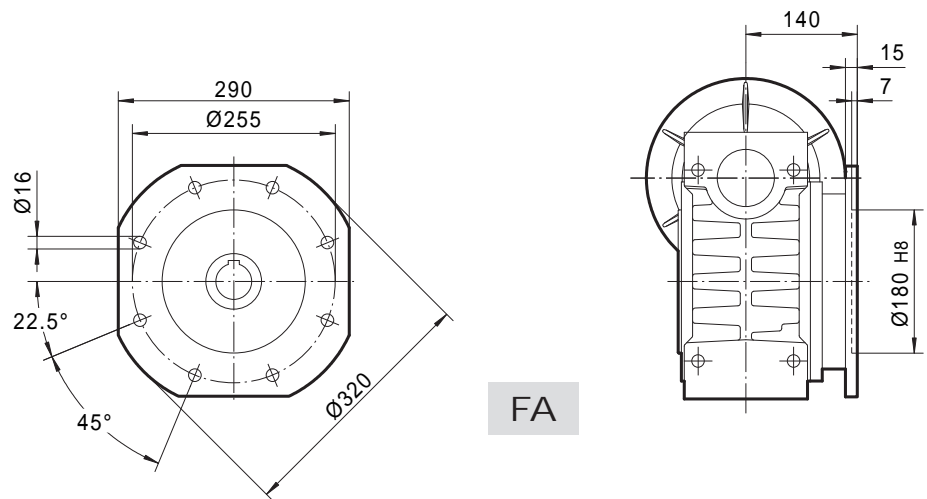
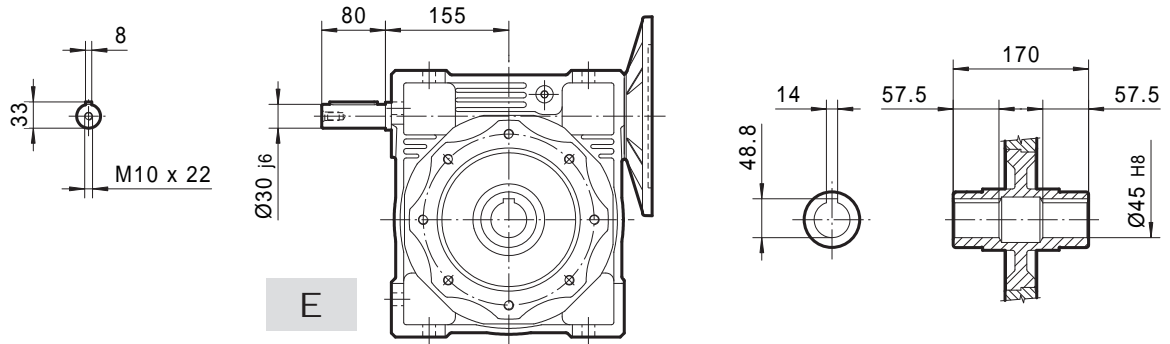
Weight without motor  $\approx 35$  kg

MRV130..(IEC)

Input adapters



Worm output shaft

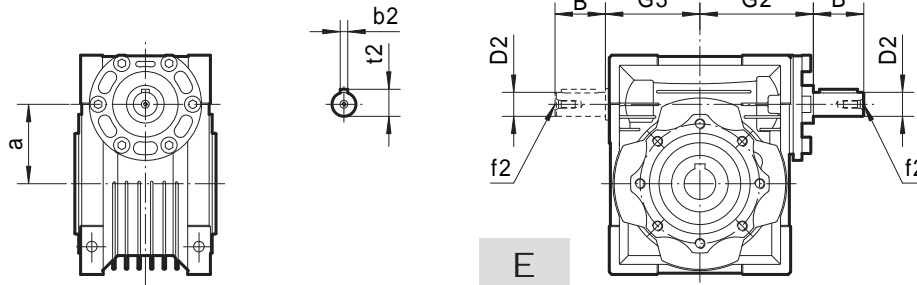


IEC	$D_{E8}$	$b$	$t$	$P$	$M$	$N$	$S$	$T$
90B5	24	27.3	8	200	165	130	11	5
100B5	28	31.3	8	250	215	180	14	8
112B5	28	31.3	8	250	215	180	14	8
132B5	38	41.3	10	300	265	230	14	8

Weight without motor  $\approx 48 \text{ kg}$

8.2 NRV.. Outline dimension

NRV WORM GEAR UNITS



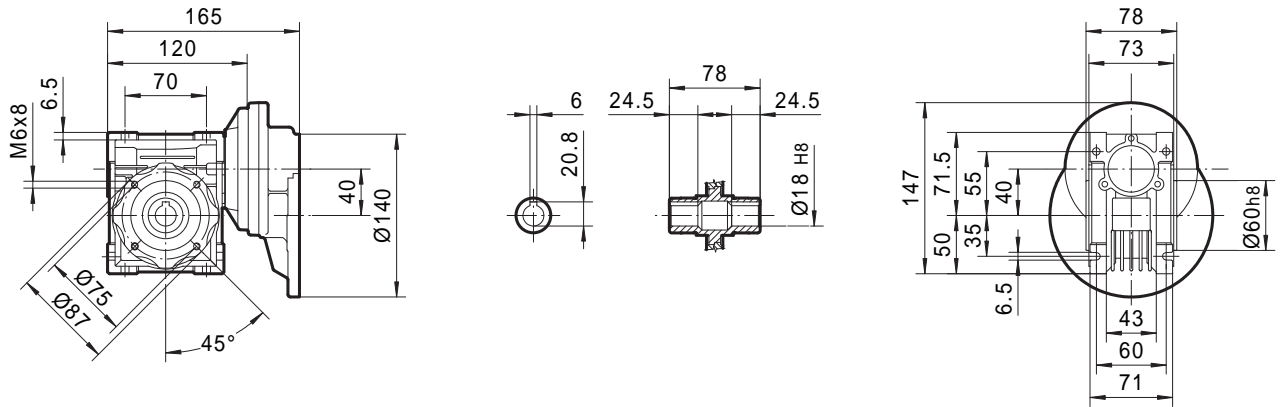
NRV	030	040	050	063	075	090	105	110	130
<i>B</i>	20	23	30	40	50	50	60	60	80
<i>D<sub>1</sub> j6</i>	9	11	14	19	24	24	28	28	30
<i>G<sub>2</sub></i>	51	60	74	90	105	125	142	142	162
<i>G<sub>3</sub></i>	45	53	64	75	90	108	135	135	155
<i>a</i>	30	40	50	63	75	90	110	110	130
<i>b<sub>2</sub></i>	3	4	5	6	8	8	8	8	8
<i>f<sub>2</sub></i>	-	-	M6	M6	M8	M8	M10	M10	M10
<i>t<sub>2</sub></i>	10.2	12.5	16	21.5	27	27	31	31	33

For the missing dimensions, please refer to page 55-64.

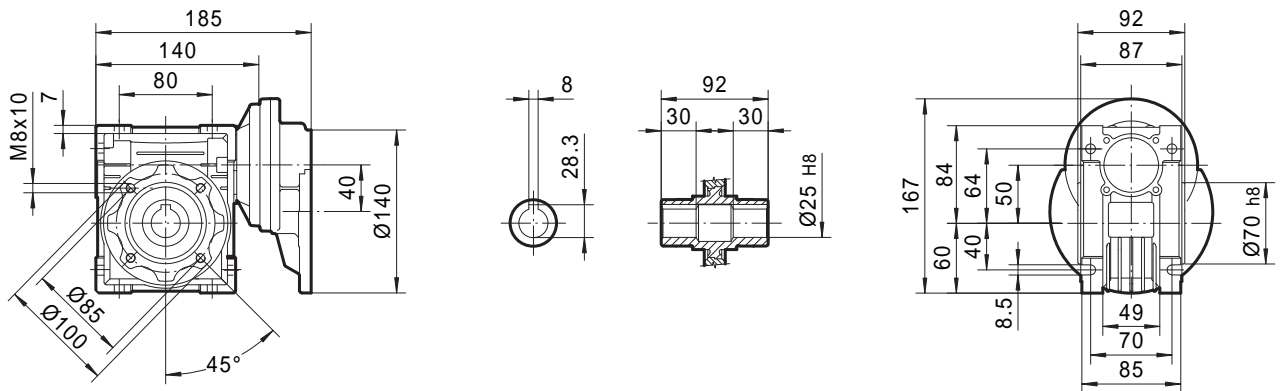
**8.3 PC - MRV.. Outline dimension**

- For the dimensions of the output flanges, please refer to pages 55-64.
- For the dimensions of the hollow shafts , please refer to pages 55-64.
- For the dimensions of the double extention warm shafts, please refer to page 75.

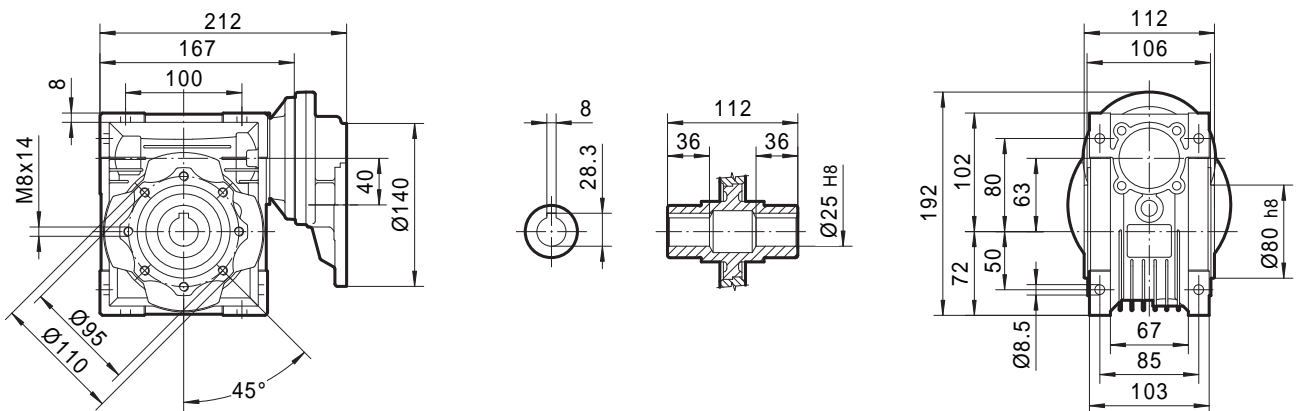
**PC063 - MRV040**



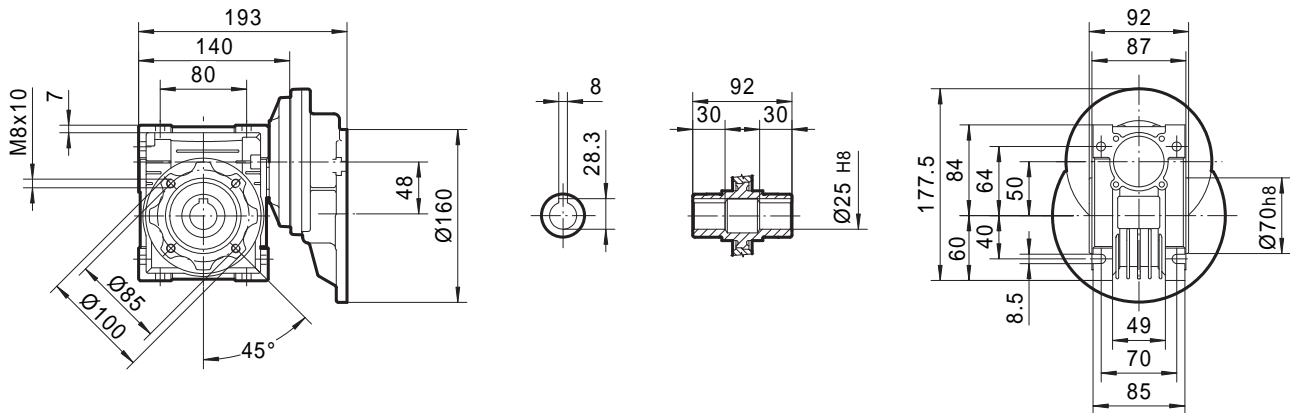
**PC063 - MRV050**



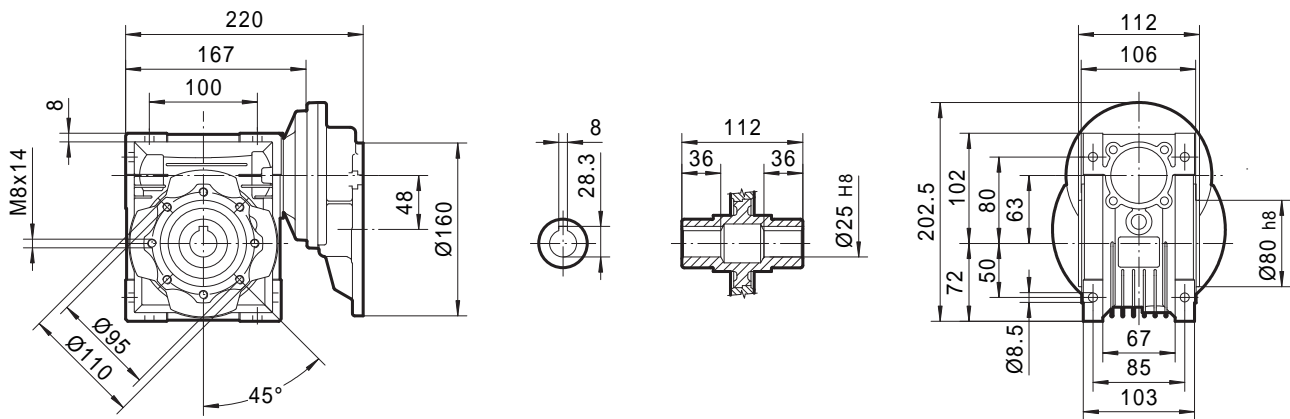
**PC063 - MRV063**



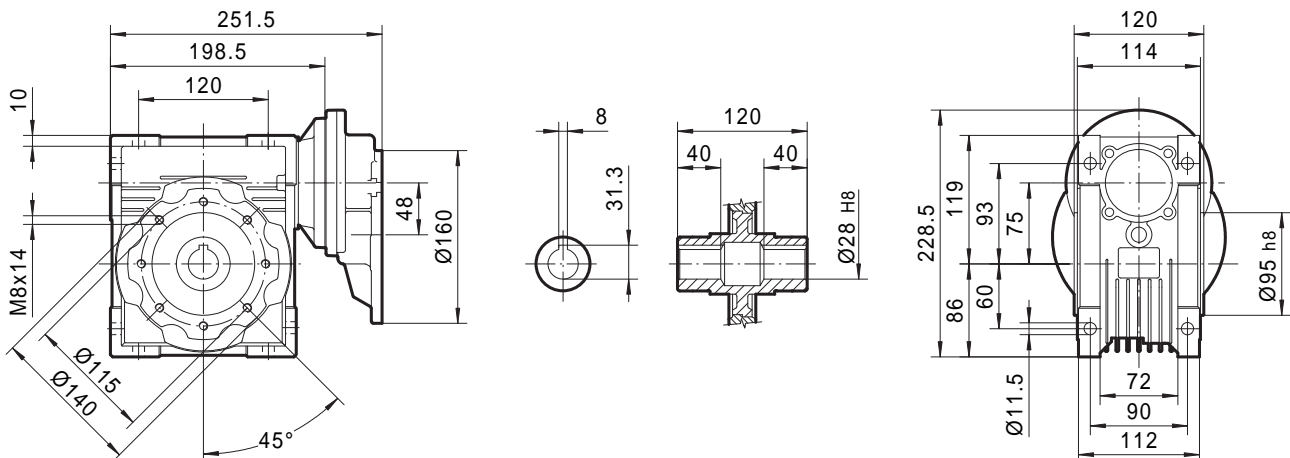
PC071 - MRV050



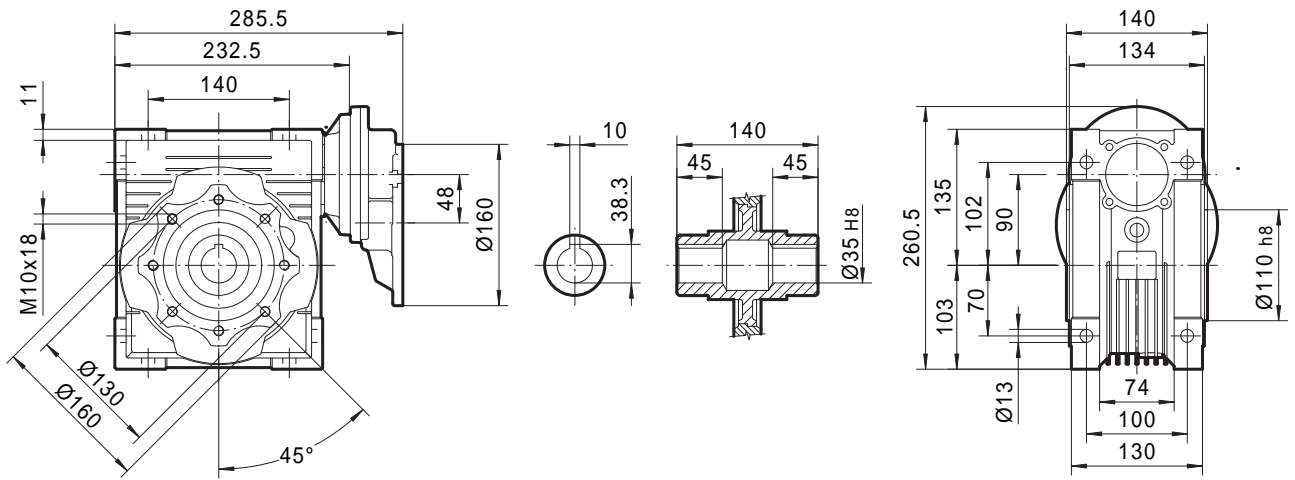
PC071 - MRV063



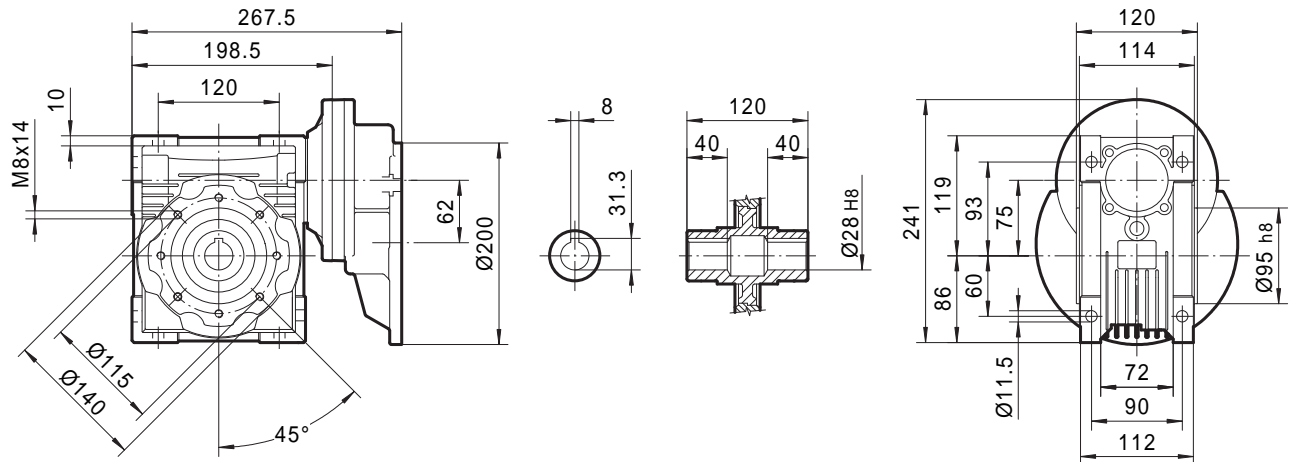
PC071 - MRV075



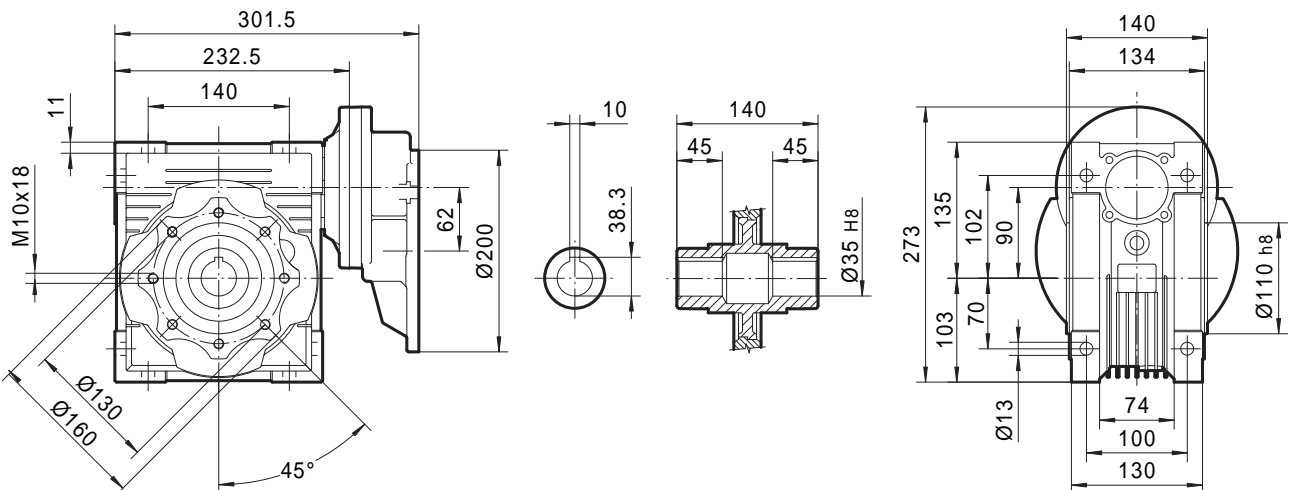
PC071 - MRV090



PC080 - MRV075

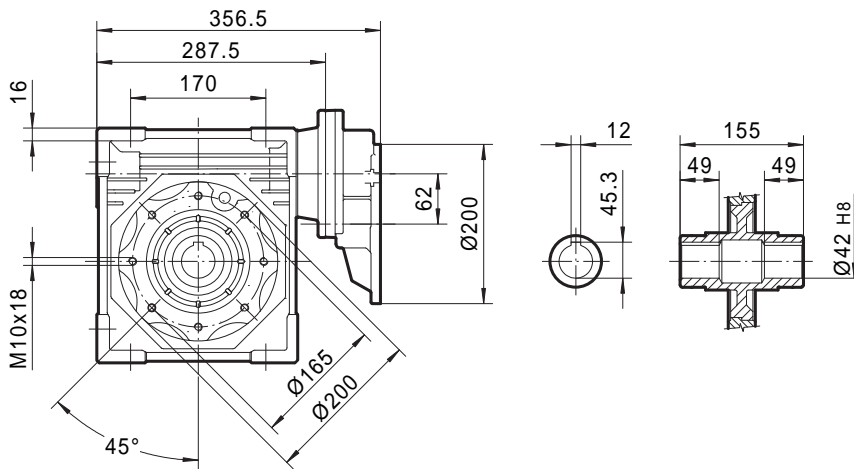


PC080 - MRV090

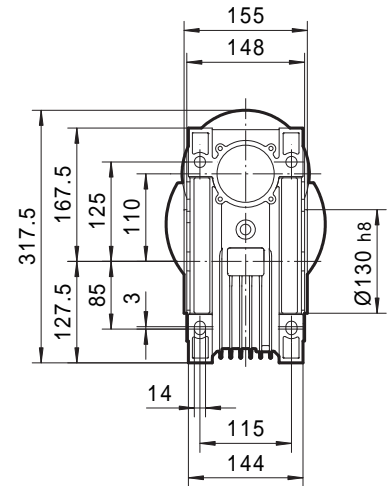




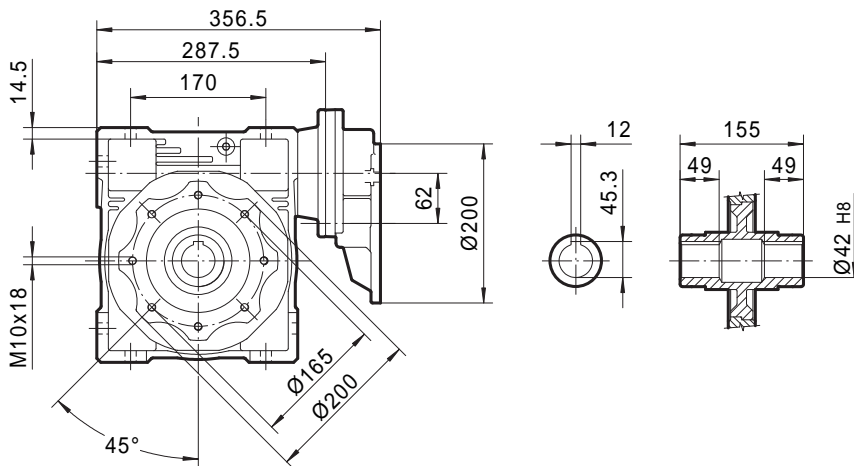
PC080 - MRV0105



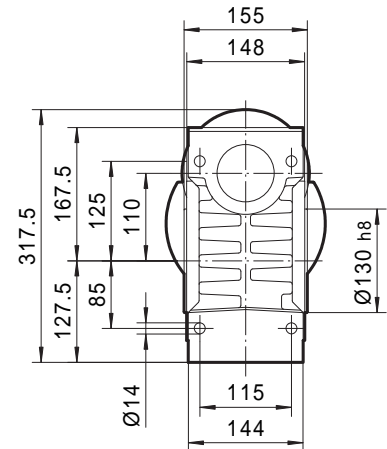
PC090 - MRV0105



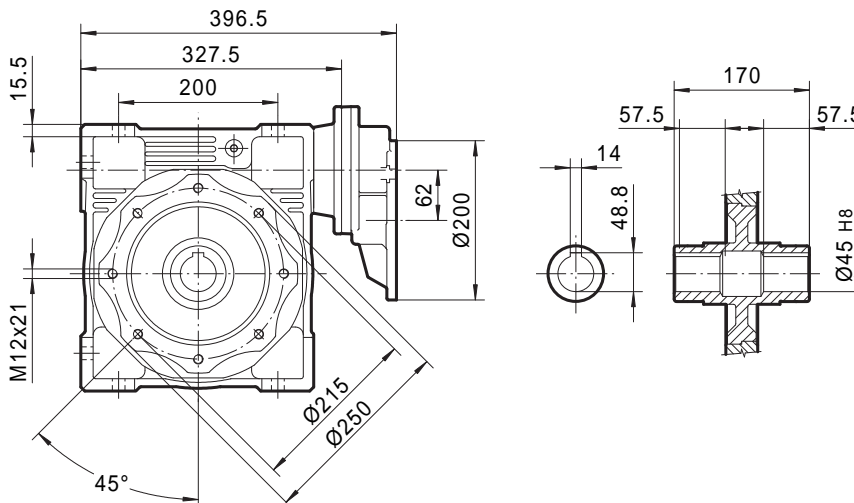
PC080 - MRV110



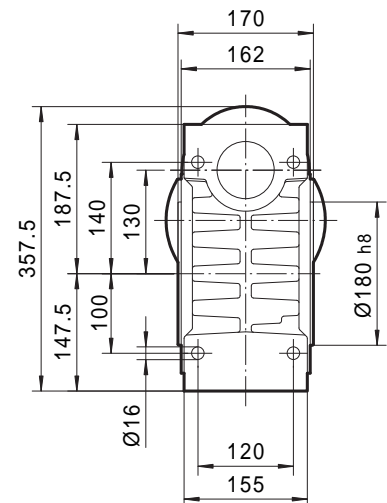
PC090 - MRV110



PC80 - MRV130



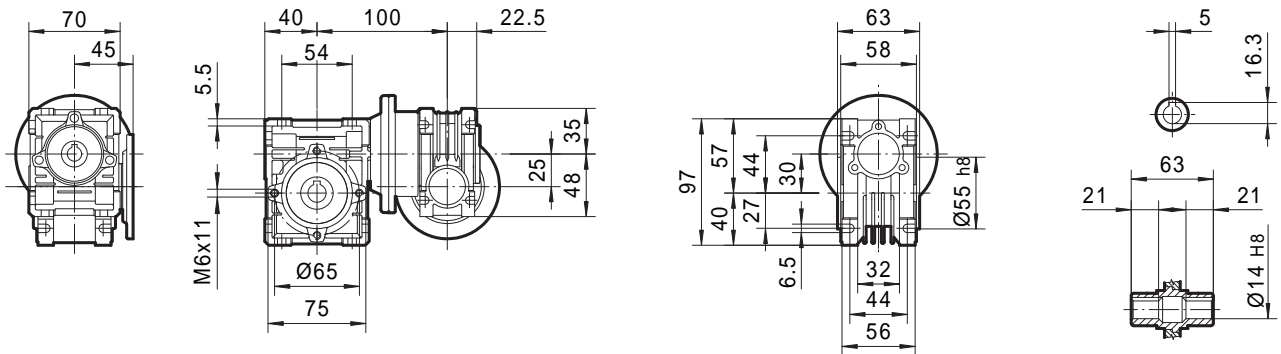
PC90 - MRV130



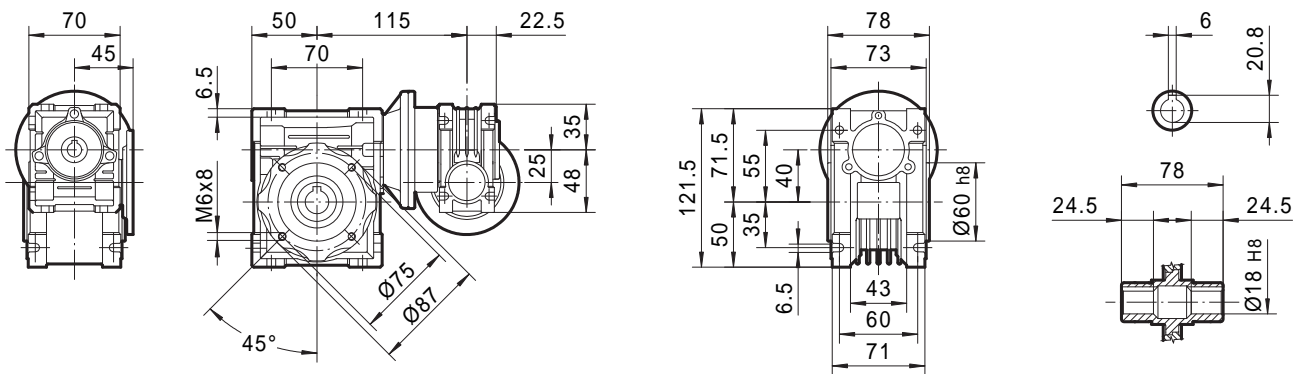
8.4 MRV / MRV.. Outline dimension

- For the dimensions of the output flanges, please refer to pages 55-64.
- For the dimensions of the hollow shafts, please refer to pages 55-64.
- For the dimensions of the double extension worm shafts, please refer to page 75.

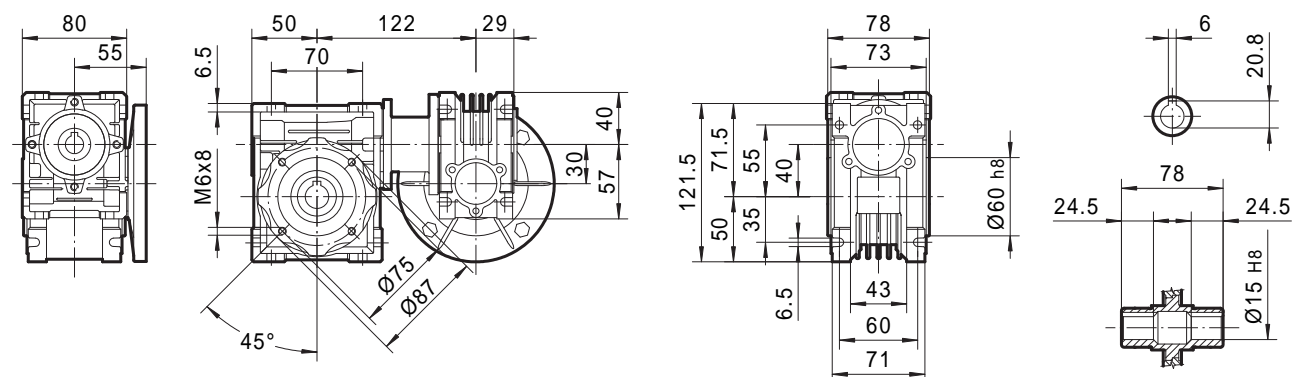
MRV025 / 030



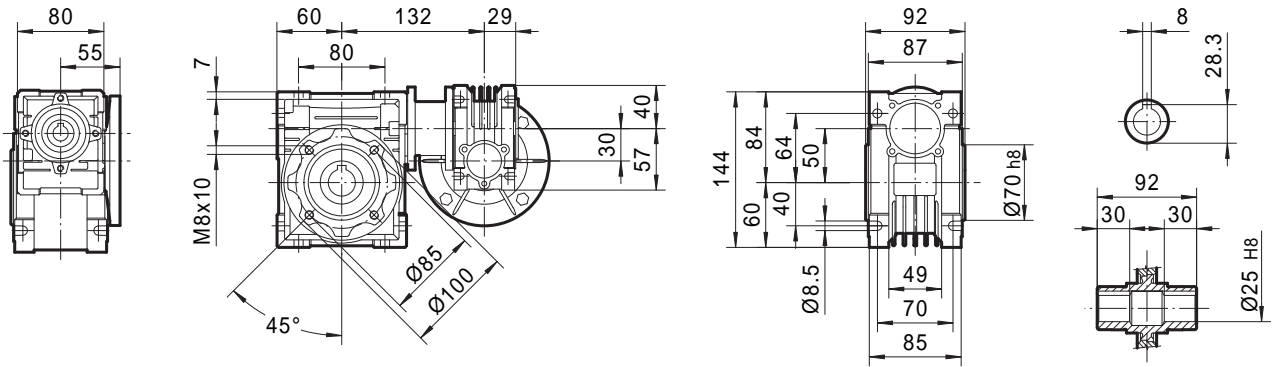
MRV025 / 040



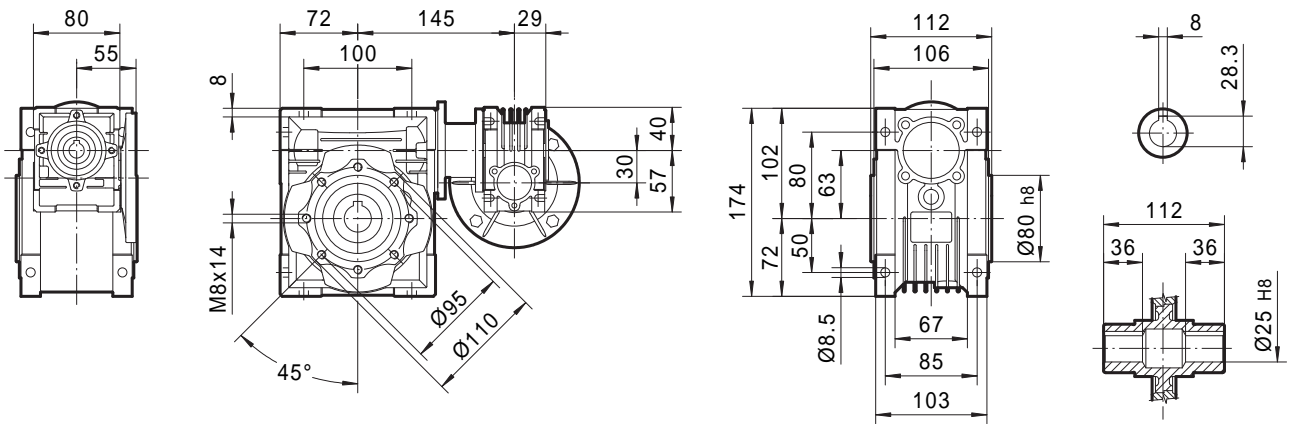
MRV030 / 040



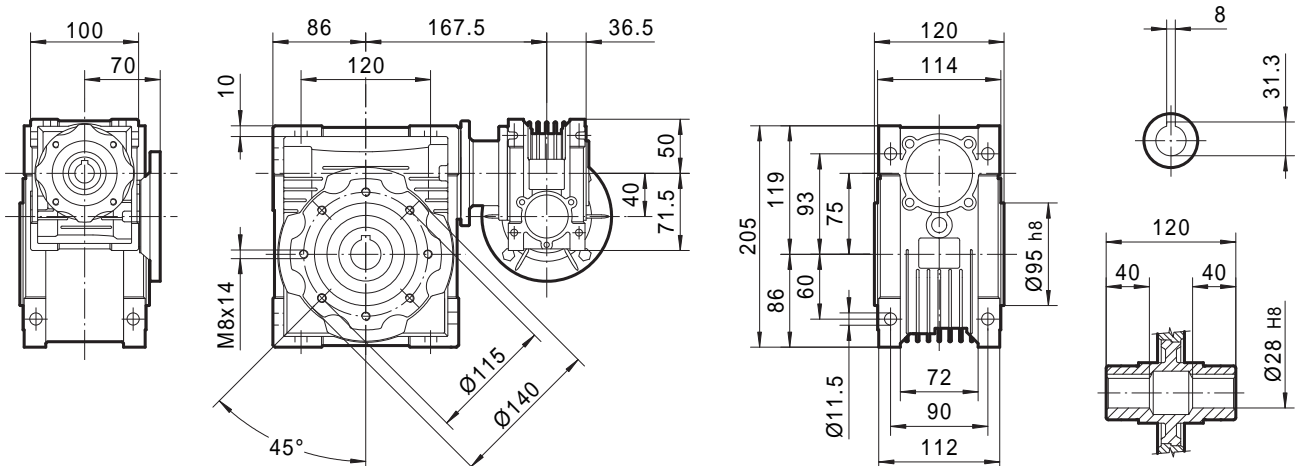
MRV030 / 050



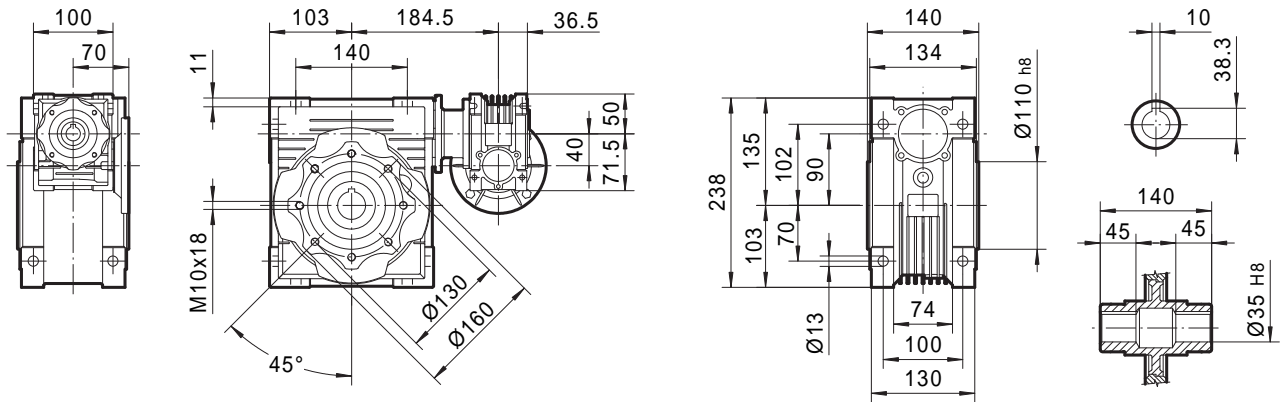
MRV030 / 063



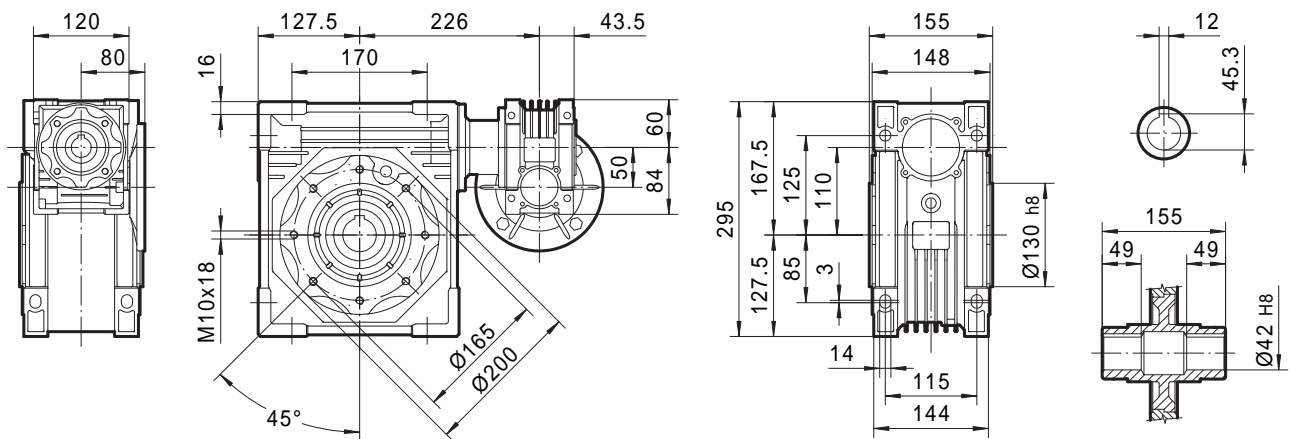
MRV040 / 075



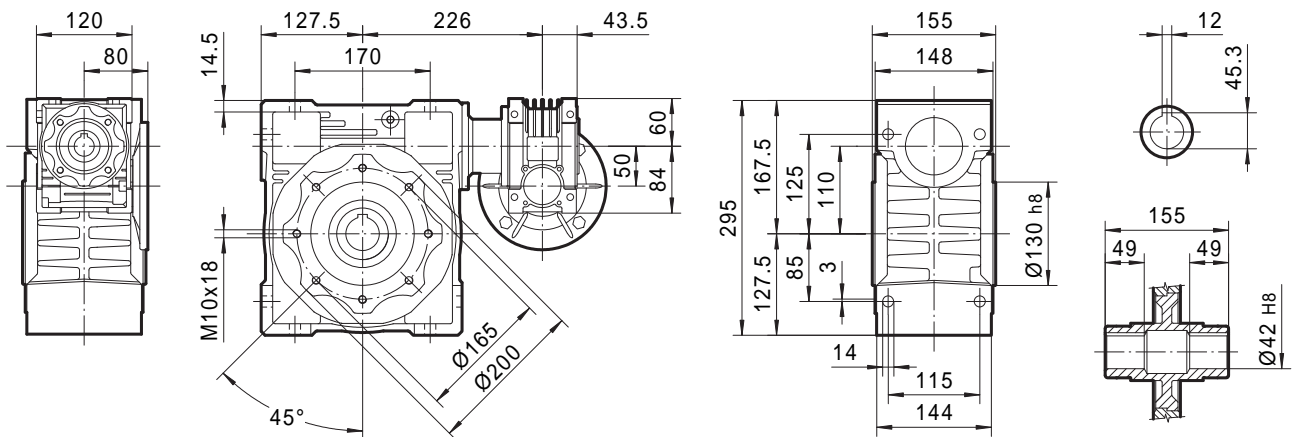
MRV040 / 090



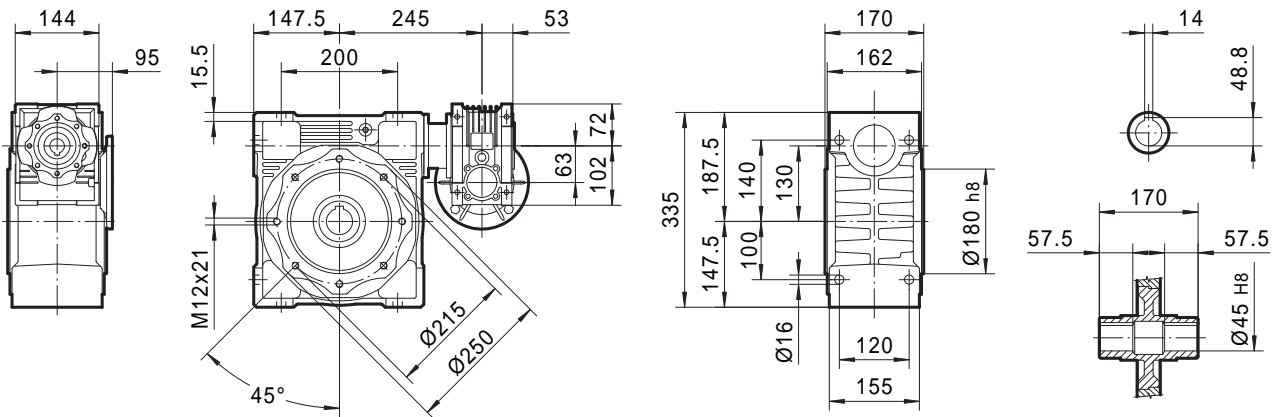
MRV050 / 105



MRV050 / 110

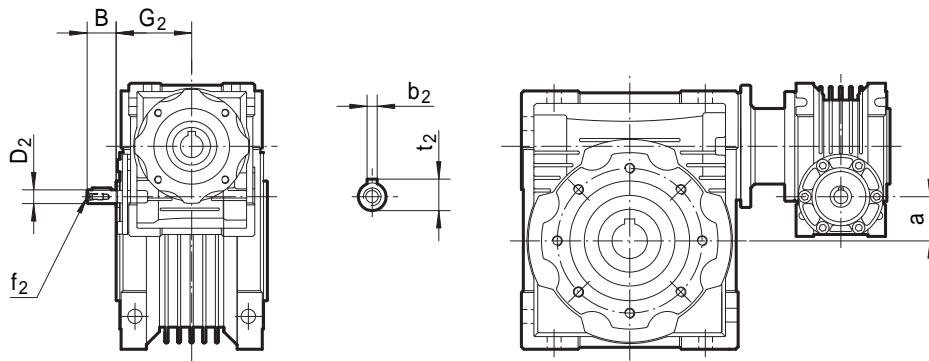


MRV063 / 130



8.5 NRV / MRV.. Outline dimension

NRV / MRV COMBINATION WORM GEAR UNITS

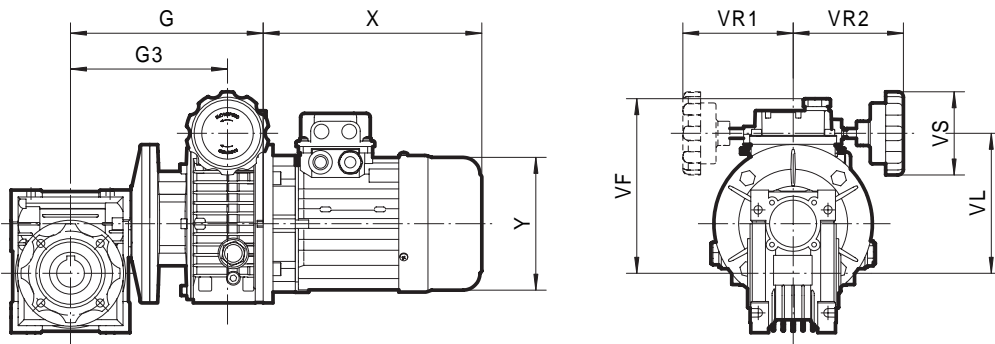


NRV - MRV	030 / 040	030 / 050	030 / 063	040 / 075	040 / 090	050 / 105	050 / 110	063 / 130
B	20	20	20	23	23	30	30	40
D <sub>1</sub> j6	9	9	9	11	11	14	14	19
G <sub>2</sub>	51	51	51	60	60	74	74	90
a	10	20	33	35	50	60	60	67
b <sub>2</sub>	3	3	3	4	4	5	5	6
f <sub>2</sub>	-	-	-	-	-	M6	M6	M6
t <sub>2</sub>	10.2	10.2	10.2	12.5	12.5	16	16	21.5

For the missing dimensions, please refer to page 55-64.

8.4 UDL - MRV.. Outline dimension

UDL-MRV COMBINATION OF SPEED VARIATOR AND WORM GEAR UNITS

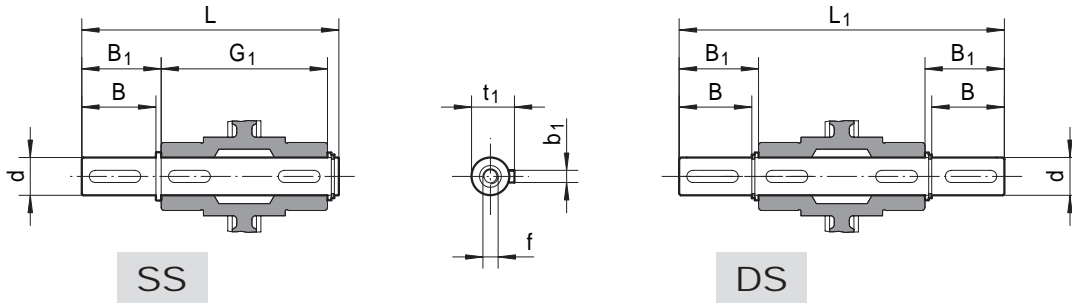


model	G	G3	VF	VL	VS	VR	VR1	base No. 4P n1=1400r/min	X	Y
<b>UDL0.18-MRV040</b>	183	135	151	118	85	110	110	63	200	120
<b>UDL0.18-MRV050</b>	193	145	161	128	85	110	110			
<b>UDL0.37-MRV050</b>	190	154	173	140	85	110	110	71	227	141
<b>UDL0.37-MRV063</b>	205	169	186	153	85	110	110			
<b>UDL0.55-MRV063</b>	234	181	203	170	110	120	120	80	268	160
<b>UDL0.75-MRV063</b>	234	181	203	170	110	120	120			
<b>UDL0.37-MRV075</b>	223	187	198	165	85	110	110	71	227	141
<b>UDL0.55-MRV075</b>	252	198	215	182	110	120	120			
<b>UDL0.75-MRV075</b>	252	198	215	182	110	120	120	80	268	160
<b>UD1.1-MRV075</b>	259.5	207.5	199	177	110	150	-			
<b>UD1.5-MRV075</b>	300.5	227.5	219	197	110	150	-	90L	290	195
<b>UDL0.55-MRV090</b>	269	215	230	197	110	120	120	80	268	160
<b>UDL0.75-MRV090</b>	269	215	230	197	110	120	120			
<b>UD1.1-MRV090</b>	276.5	224.5	214	192	110	150	-	90S	265	195
<b>UD1.5-MRV090</b>	317.5	244.5	234	212	110	150	-	90L	290	195
<b>UD1.1-MRV105</b>	307	255	234	212	110	120	-	90S	265	195
<b>UD1.5-MRV105</b>	348	275	254	232	110	150	-	90L	290	195
<b>UD2.2-MRV105</b>	368	291	298	260	110	160	-	100L	320	215
<b>UD3.0-MRV105</b>	368	291	298	260	110	160	-			
<b>UD4.0-MRV105</b>	368	291	298	260	110	160	-	112M	340	240
<b>UD1.1-MRV110</b>	307	255	234	212	110	120	-	90S	265	195
<b>UD1.5-MRV110</b>	348	275	254	232	110	150	-	90L	290	195
<b>UD2.2-MRV110</b>	368	291	298	260	110	160	-	100L	320	215
<b>UD3.0-MRV110</b>	368	291	298	260	110	160	-			
<b>UD4.0-MRV110</b>	368	291	298	260	110	160	-	112M	340	240
<b>UD1.5-MRV130</b>	368	295	274	252	110	150	-	90L	290	195
<b>UD2.2-MRV130</b>	388	311	318	280	110	160	-	100L	320	215
<b>UD3.0-MRV130</b>	388	311	318	280	110	160	-			
<b>UD4.0-MRV130</b>	388	311	318	280	110	160	-	112M	340	240

For the missing dimensions, please refer to page 55-64.

9. ACCESSORIES OUTLINE DIMENSION SHEET

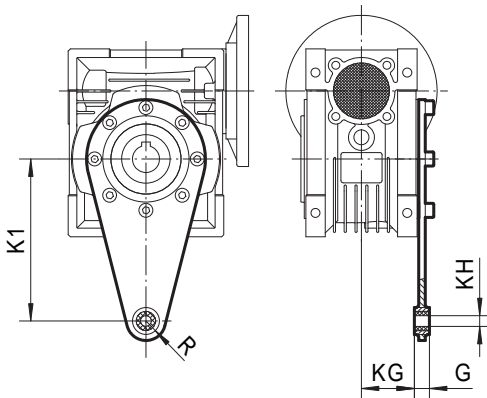
9.1 Output Shafts



Model	d h6	B	B1	G1	L	L1	f	b1	t1
MRV025	11 g6	23	25.5	50	81	101	—	4	12.5
	9 *	25 *	30 *	50	85.5 *	101	—	3 *	10.2 *
MRV030	14	30	32.5	63	102	128	M6	5	16
MRV040	18	40	43	78	128	164	M6	6	20.5
MRV050	25	50	53.5	92	153	199	M10	8	28
MRV063	25	50	53.5	112	173	219	M10	8	28
MRV075	28	60	63.5	120	192	247	M10	8	31
MRV090	35	80	84.5	140	234	309	M12	10	38
MRV105	42	80	84.5	155	249	324	M16	12	45
MRV110	42	80	84.5	155	249	324	M16	12	45
MRV130	45	80	85	170	265	340	M16	14	48.5

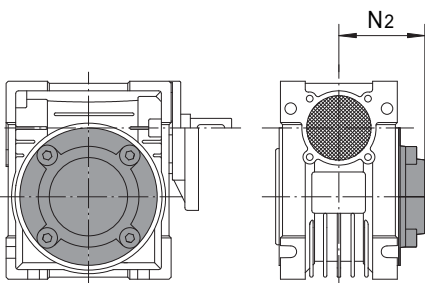
\* Only on request

9.2 Torque Arm



Model	K1	G	KG	KH	R
MRV025	70	14	17.5	8	15
MRV030	85	14	24	8	15
MRV040	100	14	31.5	10	18
MRV050	100	14	38.5	10	18
MRV063	150	14	49	10	18
MRV075	200	25	47.5	20	30
MRV090	200	25	57.5	20	30
MRV105	250	30	62	25	35
MRV110	250	30	62	25	35
MRV130	250	30	69	25	35

9.3 Cover



Model	N2	Model	N2
MRV030	47	MRV090	94
MRV040	55	MRV105	102
MRV050	63	MRV110	102
MRV063	73	MRV130	117
MRV075	79		

**10. INSTALLATION POSITIONS DIAGRAM**

**10.1 MRV.. or NRV.. Mounting Positions**

MRV...U - B3	B6	V5	V6
<p>1</p>			
B8	B7		
<p>3</p>	<p>1</p>		

**10.2 PC.. - MRV.. Mounting Positions**

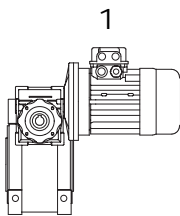
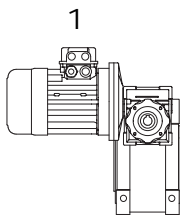
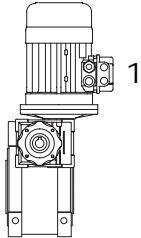
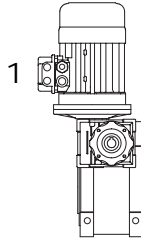
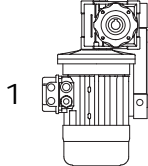
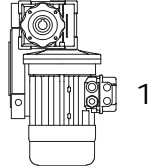
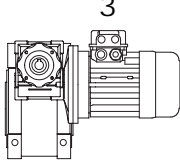
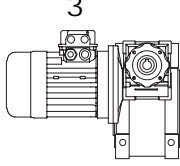
PC.. - MRV...U - B3	B6	V5	V6
<p>1</p>			
B8	B7		
<p>3</p>	<p>1</p>		

"U" version is related to sizes from MRV025-075 and NRV030-063. For these sizes it is not necessary to specify mounting position.

- For vertical positions, please refer to the table on page 80.
- Unless specified otherwise, the standard positions are B3.
- For positions not envisaged, it is necessary to call our Technical Service.

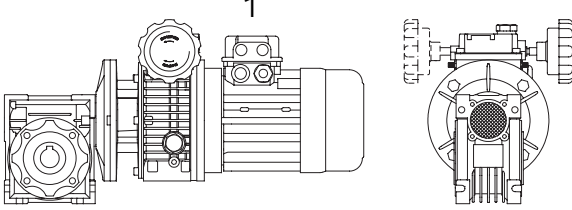
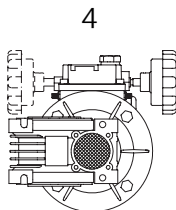
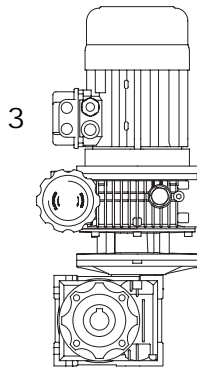
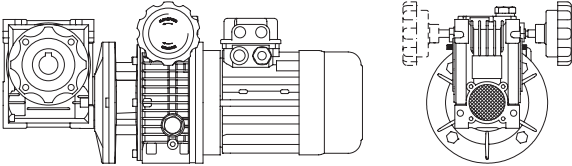
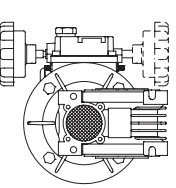


**10.3 MRV.. - MRV.. / NRV.. - MRV.. Mounting Positions**

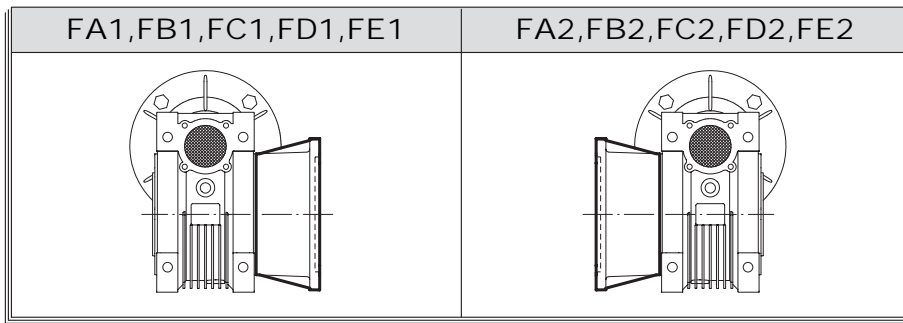
AS1	AS2	VS1	VS2
1 	1 	 1	 1
PS1	PS2	BS1	BS2
 1	 1	 3	 3

The position of the 1st reducer with respect to the 2nd gear reducer depends on the versions. Unless specified at the time of order, combination groups are supplied in version BS2. The specified mounting position refers to the 1st gear reducer, see page 76 for the possible mounting positions.

**10.4 UDL.. - MRV.. Mounting Positions**

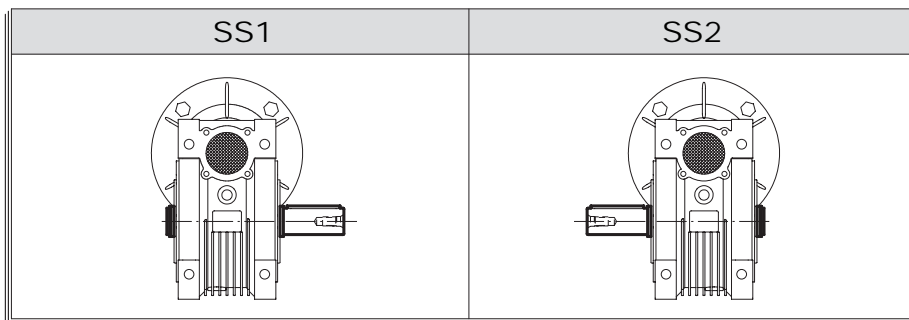
MRV...U - B3	B6	V5
1 	4 	 3
B8	B7	
3 	2 	

**10.5 Position diagram for output flange**

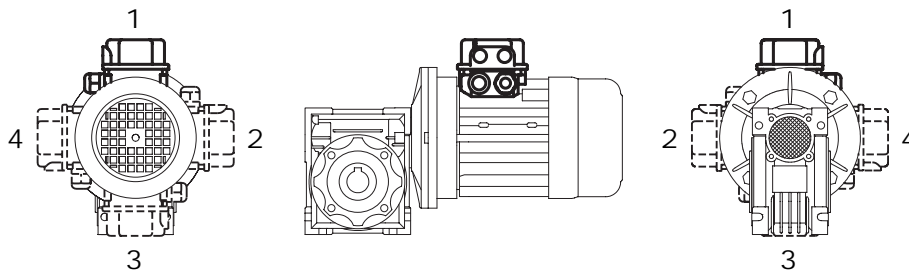


Unless specified otherwise, the reduction unit is supplied with the flange in pos. F.1 referred to position B3

**10.6 Position diagram for single output shaft**

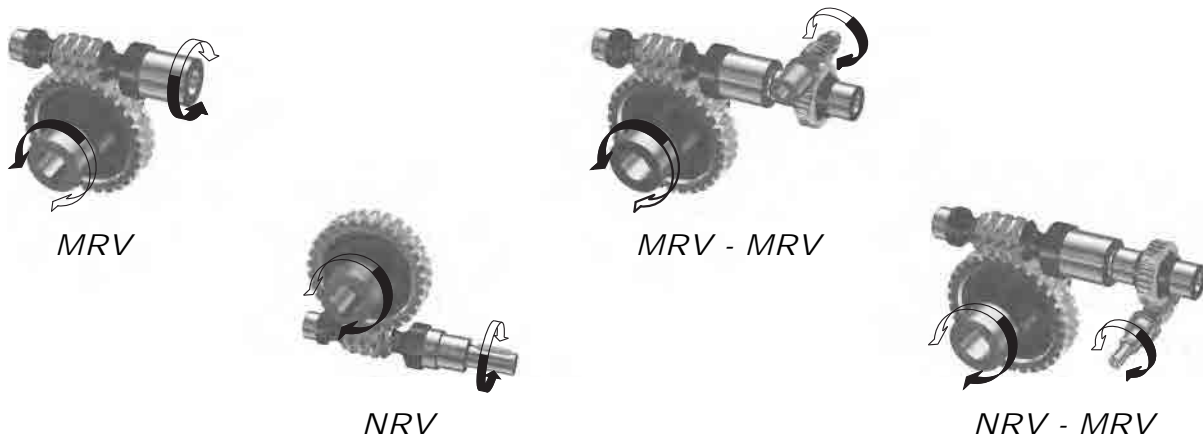


**10.7 Position of terminal box**



In the case of specific requirements, when ordering, specify the position of the terminal box as shown in the diagram.

**10.6 Direction of rotation**



## 11. INSTALLATION

### 11.1 Note recommendations

To install the reduction unit it is necessary to note the following recommendations:

1. Check the correct direction of rotation of the reduction unit output shaft before fitting the unit to the machine.
2. Before mount with the prime mover and device, please check the reducer's every axial diameter, aperture, key and key slot, to be sure their dimensions are not deviation, and avoid assembling too tight or too loose, unless it will influence the reducer's performance.
3. The mounting on the machine must be stable to avoid any vibration.
4. Whenever possible, protect the reduction unit against solar radiation and bad weather.
5. In the case of particularly lengthy periods of storage (4-6 months), if the oil seal is not immersed in the lubricant inside the unit, it is recommended to change it since the rubber could stick to the shaft or may even have lost the elasticity it needs to function properly.
6. Painting must definitely not go over rubber parts and the holes on the breather plugs, if any.
7. When connect with hollow or solid shaft, please grease the joint to avoid lock or oxidation.
8. Check the correct level of the lubricant through the indicator, if there is one.
9. Starting must take place gradually, without immediately applying the maximum load.
10. Supporting unit is required when using various of reducer matched with motor directly and the weight of motor is a little bigger than common.
11. Ensure the motor cools correctly by assuring good passage of air from the fan side.
12. In the case of ambient temperatures  $< -5^{\circ}\text{C}$  or  $> +40^{\circ}\text{C}$  call the Technical Service.

### 11.2 Critical applications

The performance given in the catalogue correspond to mounting position B3 or similar, when the first stage is not entirely immersed in oil. For other mounting positions and/or particular input speeds, refer to the tables that highlight different critical situations for each size of reduction unit. It is also necessary to take due consideration of and carefully assess the following applications by calling our Technical Service:

1. As a speed increasing.
2. Applications with especially high inertia.
3. Use as a lifting winch.
4. Use in services that could be hazardous for people if the reduction unit fails.
5. Applications with high dynamic strain on the case of the reduction unit.
6. In places with  $T^{\circ}$  under  $-5^{\circ}\text{C}$  or over  $40^{\circ}\text{C}$ .
7. Use in chemically aggressive environments.
8. Use in a salty environment.
9. Use in radioactive environments.
10. Use in environments pressures other than atmospheric pressure.
11. Mounting positions not envisaged in the catalogue.

Avoid applications where even partial immersion of the reduction unit is required.

The maximum torque that the gear reducer can support must not exceed two times the nominal torque ( $f_s = 1$ ) stated in the performance tables. Intended for momentary overloads due to starting at full load, braking, shocks or other causes, particularly those that are dynamic.

MRV	025	030	040	050	063	075	090	105	110	130
V5: $1500 < n_1 < 3000$	—	—	—	—	—	B	B	B	B	B
$n_1 > 3000$	B	B	B	B	B	A	A	A	A	A
V6	B	B	B	B	B	B	B	B	B	B

A Application not recommended

B Check the application and/or call our technical service

## 12. STEPLESS SPEED VARIATOR

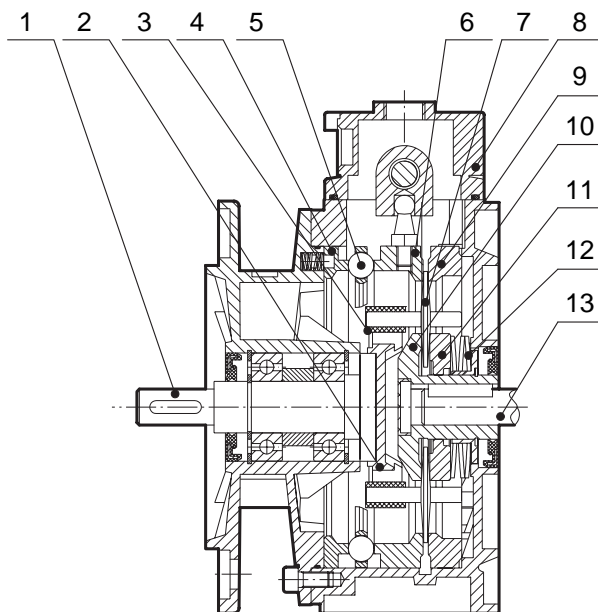
### 12.1 Brief introduction to stepless speed variator

The design of UDL series stepless speed variator comprises the advanced technology both at home and abroad. The products include the following main characteristics:

1. High speed-regulating precision: up to 0.5-1 rotation.
2. Large speed –changing range: The speed ratio ranges from 1:1.4 to 1:7 freely.
3. High in strength and long in service life.
4. Convenient to regulate the speed.
5. Continuous in running, front-to-back in running direction, smooth in driving, stable in performance and low in noise.
6. Full in sealing and suitable for any environment.
7. Compact in structure and small in volume.
8. Made of high-quality aluminium alloy diecast into forming, good-looking in appearance, light in weight and it never gets rusty.
9. Good in adaptation: UDL series stepless speed variators can be combined with all kinds of speed reducers, as to achieve low stepless speed-changing.

UDL series stepless speed variators are widely used for foodstuffs, ceramics, packing, chemicals, pharmacy, plastics, paper-making, machine-tools, communications, and all kinds of automatic lines, pipelines and assembly lines which need speed-regulation, It is a good companion for your production.

### 12.2 Structure



1. Output shaft
2. Planet carrier
3. Friction bearing - planet disk
4. Cam ring
5. Ball ring
6. Adjustable annulus ring
7. Planet disk
8. Control cover
9. Fixed annulus ring
10. Fixed sun race
11. Adjustable sun race
12. Belleville spring
13. Motor shaft

12.3 Product picture



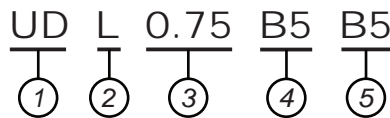
UDL..B3



UDL..B5

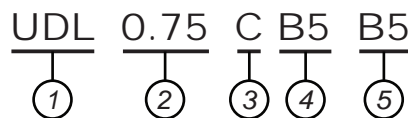
12.4 Model illuminate

12.4.1 Stepless speed variator



No	Comments	No	Comments
1	Code of stepless speed variator	4	1). <b>B3</b> : Foot-mounted model 2). <b>B5</b> : Flange-mounted model
2	1). <b>L</b> : Aluminium alloy casing 2). No mark means cast iron casing	5	Code of installation positon
3	Motor power		

12.4.2 Combination of stepless speed variator and gear speed reducer



No	Comments	No	Comments
1	Code of stepless speed variator with aluminium alloy casing	4	1). <b>B3</b> : Foot-mounted model 2). <b>B5</b> : Flange-mounted model
2	Motor power	5	Code of installation positon
3	Code of gear reducer		

12.5 Performance parameter

12.5.1 UDL Performance table for udl series speed variator

( $n_1 = 1400$  r/min)

Motor	Model	$i$	$n_2$ [r/min]	$M_2$ [Nm]
0.18KW	UDL0.18	1.6 ~ 8.2	880 ~ 170	1.5 ~ 3
0.37KW	UDL0.37	1.4 ~ 7	1000 ~ 200	3 ~ 6
0.55KW	UDL0.55	1.4 ~ 7	1000 ~ 200	4 ~ 8
0.75KW	UDL0.75	1.4 ~ 7	1000 ~ 200	6 ~ 12
1.1KW	UD1.1	1.4 ~ 7	1000 ~ 200	9 ~ 18
1.5KW	UD1.5	1.4 ~ 7	1000 ~ 200	12 ~ 24
2.2KW	UD2.2	1.4 ~ 7	1000 ~ 200	18 ~ 36
3.0KW	UD3.0	1.4 ~ 7	1000 ~ 200	24 ~ 48
4.0KW	UD4.0	1.4 ~ 7	1000 ~ 200	32 ~ 64
5.5KW	UD5.5	1.4 ~ 7	1000 ~ 200	45 ~ 90
7.5KW	UD7.5	1.4 ~ 7	1000 ~ 200	59 ~ 118

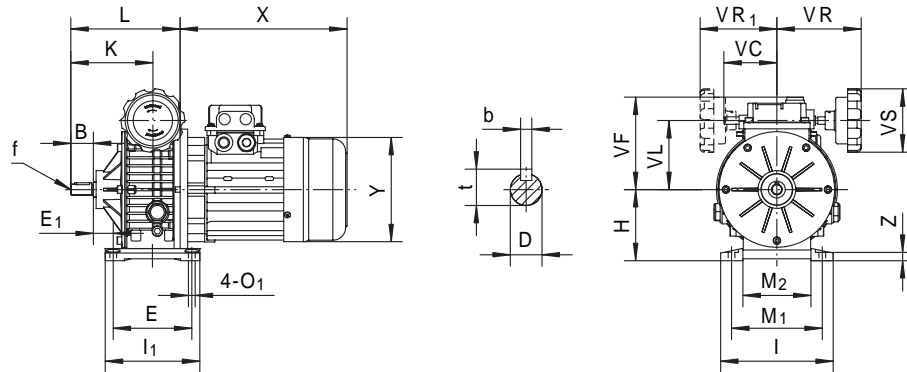
12.5.2 Performance table for stepless speed variator & gear speed reducer

( $n_1 = 1400$  r/min)

Model	$i$	$n_2$ [r/min]	$M_2$ [Nm]
UDL0.18-CB3	5	176 ~ 34	7 ~ 15
UDL0.37-CB3	5	200 ~ 40	15 ~ 30
UDL0.75-CB3	5	200 ~ 40	30 ~ 60

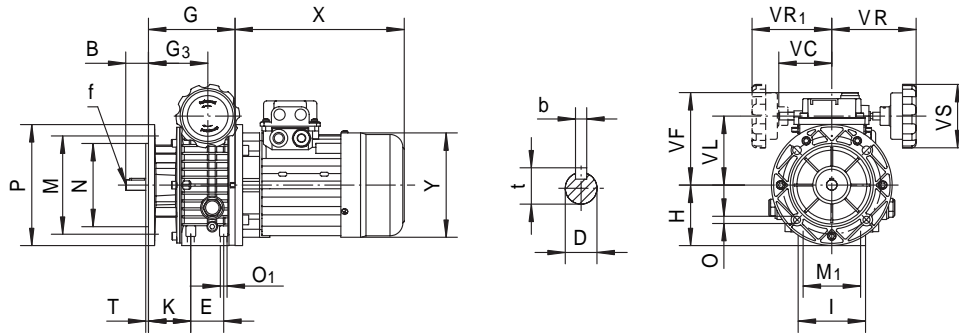
12.6 Outline dimension sheet

12.6.1 B3 Model



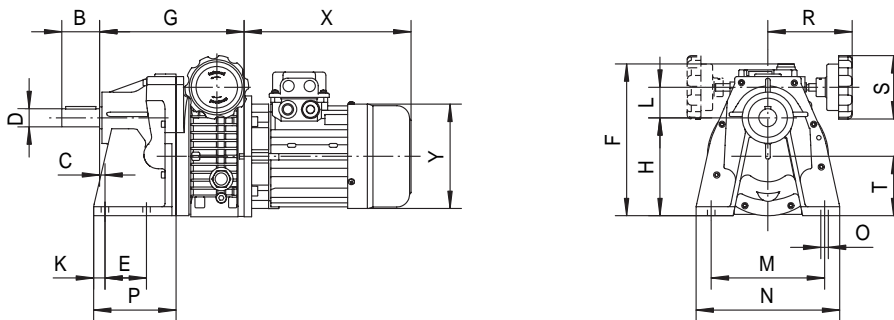
Model	B	$D_{j6}$	E	$E_1$	H	I	$I_1$	K	L	$M_1$	$M_2$	$O_1$	VC	VF	VL	VR	$VR_1$	VS	b	f	t	X	Y	Z
UDL0.18B3	23	11	105	18	80	145	120	88	136	110	71	9	71	111	78	110	110	85	4	-	12.5	200	120	10
UDL0.37B3	30	14	104	20	93	149	125	104	140	120	96	9	71	123	90	110	110	85	5	M6	16	227	141	10
UDL0.75B3	40	19	125	26	113	190	150	126	179	160	135	11	79	140	107	120	120	110	6	M6	21.5	268	160	15
UD1.1B3	40	24	105	35	100	207	130	136	187	160	115	13	-	124	102	150	-	110	8	M8	27	265	195	15
UD1.5B3	50	24	115	54	123	241	150	165	238	190	143	13	-	144	122	150	-	110	8	M8	27	290	195	18
UD2.2B3	60	28	230	25	150	300	270	191	268	245	190	14	-	188	150	150	-	110	8	M8	33	320	215	25
UD3.0B3	60	28	230	25	150	300	270	191	268	245	190	14	-	188	150	150	-	110	8	M8	33	320	215	25
UD4.0B3	60	28	230	25	150	300	270	191	268	245	190	14	-	188	150	150	-	110	8	M8	33	340	240	25
UD5.5B3	70	38	250	33	200	365	290	201	319	315	245	18	-	-	192	192	-	110	10	M10	38	395	275	30
UD7.5B3	70	38	250	33	200	365	290	201	319	315	245	18	-	-	192	192	-	110	10	M10	38	435	275	30

12.6.2 B5 Model



Model	B	D <sub>j6</sub>	E	G	G <sub>3</sub>	H	I	M	M1	N	O	O <sub>1</sub>	P	T	K	VC	VF	VL	VR	VR <sub>1</sub>	VS	b	f	t	X	Y
UDL0.18B5	23	11	50	113	64.5	70	72	115	60	95	9	M6	140	3.5	46	71	111	78	110	110	85	4	-	13	200	120
UDL0.37B5	30	14	40	110	74	80	90	130	77	110	9	M8	160	3.5	53	71	123	90	100	110	85	5	M6	16	227	141
UDL0.75B5	40	19	58	139	85.5	100	98	165	84	130	11	M8	200	3.5	60	79	140	107	120	120	110	6	M6	22	268	160
UD1.1B5	40	24	-	147	95	98	207	165	-	130	11	-	200	3.5	-	-	124	102	150	-	110	8	M8	27	265	195
UD1.5B5	50	24	-	188	115	126	241	165	-	130	11	-	200	3.5	-	-	144	122	150	-	110	8	M8	27	290	195
UD2.2B5	60	28	-	208	131	150	270	165	-	230	15	-	300	4	-	-	188	150	160	-	100	8	M8	33	320	215
UD3.0B5	60	28	-	208	131	150	270	265	-	230	15	-	300	4	-	-	188	150	160	-	100	8	M8	33	320	215
UD4.0B5	60	28	-	208	131	150	270	265	-	230	15	-	300	4	-	-	188	150	160	-	110	8	M8	33	340	240
UD5.5B5	70	38	-	244	131	200	-	300	-	250	19	-	350	5	-	-	-	192	194	-	110	10	M10	38	395	275
UD7.5B5	70	38	-	244	131	200	-	300	-	250	19	-	350	5	-	-	-	192	194	-	100	10	M10	38	435	275

12.6.3 Combined outline & installation sizes for stepless speed variator & gear speed reducer with foot screws



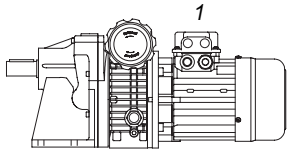
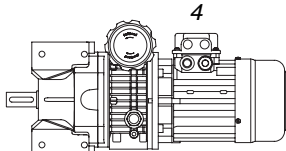
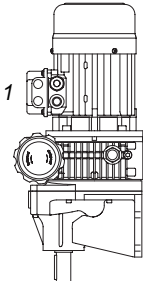
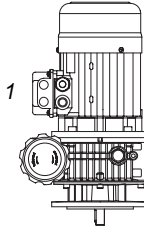
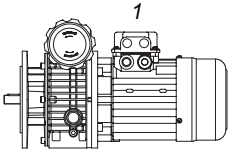
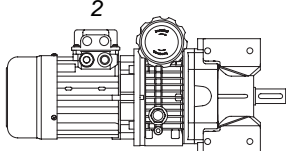
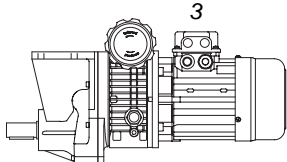
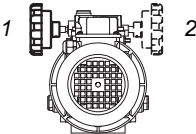
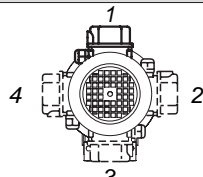
Model	B	C	D	E	F	G	H	Y	L	M	N	O	P	R	S	T	X	K
UDL0.18-CB3	40	18	19	45	162	189	108	120	33	115	130	9	80	110	85	66	200	16
UDL0.37-CB3	50	6	24	70	187	190	130	141	39	150	190	10	110	100	85	79	227	15
UDL0.75-CB3	60	7	28	70	228	225	160	160	46	165	210	12	130	130	110	99	268	25

12.7 Installation positions diagram

Explain:

- For special requirements, orders must specify the position of the terminal box with reference to the diagram. Unless otherwise specified the terminal box, the position of that will be mounted as shown in the diagram for the mounting position.
- Unless specified otherwise, the standard positions are B3 or B5.
- For positions not envisaged, it is necessary to call our Technical Service.



B3	B6S	V5	V1
			
B5	B6D		
			
B8	Pos.of hand wheel	Pos.of terminal box	
	Standard pos.=1 		

## 12.8 Operation & maintenance

- The shapes of shaft extension are all cylindrical. It is subject to GB1569-1990 Cylindrical shaft extension. The key joint refers to GB1095-2003 Ordinary flat key.
- The shaft lines should be kept concentric when the coupling is connected with a motor. The installation error should be no more than the tolerance value of the coupling.
- When the output shaft is installed with the coupling or belt wheel, they should be pressed into the screw hole on shaft end. Or assembled by heating. No hammering on it!
- The mechanical stepless speed variator is not used in such an occasion where overload or running-blockage happen to occur.
- Speed-regulation should be effected in running. Do not turn the hand wheel of speed-regulation when the machine stops!
- The limit screws of speed-regulation on two ends under the operating box are well adjusted, Please don't touch them!
- This set is not suited to work in the environment over 40°C, especially no more than 45°C when the temperature rises. In regard to its temperature rise, please read the explanation as follows:  
if a 4-pole motor is used for the speed variator, the temperature under running-in (empty running) is 40-50°C higher than that of normal working environment. After running-in up to 60-80 hours, the temperature rise will go down gradually. From that time on, it is 20°C higher than of environment; and the temperature will keep on rising stably. The high temperature rise in running will affect normal permissive working condition, but it won't bring any bad effects to the service life of parts.
- The liquid lubricating oil is used for the speed variator. Its trade mark is Ub-3x. Please check up the oil level before use.
- The machine is filled with lubricating oil before leaving factory. When it starts to work up to 2000 hours for the first time, its lubricating oil should be replaced, changing the lubricating oil every 5000 hours later.
- The lubricating oil level inside the speed variator should be kept at the height of two-third in the oil scale.  
Users should usually check the height of oil level. It is strictly prohibited to operate it when short of lubricating oil. The air screw nut on the operating box is screwed up for preventing from oil leakage in moving before leaving factory. It should be loosed when it starts to run. It is strictly forbidden to use it before losing!



### 13. LUBRICATION

In cases of ambient temperatures not envisaged in the table, call our Technical Service.

- In the case of temperatures under -30°C or over 60°C it is necessary to use oil seals with special material.
- For operating ranges with temperatures under 0°C it is necessary to consider the following:
  - The motors need to be suitable for operation at the envisaged ambient temperature.
  - The power of the electric motor needs to be adequate for exceeding the higher starting torques required.
  - In the case of reduction units with a cast-iron case, pay attention to impact loads since cast iron may have problems of fragility at temperatures under -15°C.
  - During the early stages of service, problems of lubrication may arise due to the high level of viscosity taken on by the oil and so it is wise to have a few minutes of rotation under no load.
- The oil needs to be changed after approximately 10,000 hours. This period depends on the type of service and the environment where the reduction unit works.
- The reduction units size 025-030-040-050-063-075-090-105 are supplied complete with lubricant for life, synthetic oil (SHELL TEVELA OIL 320), and can therefore be mounted in any position envisaged in the catalogue. V5/V6 for which you should call our Technical Service to assess the conditions of use.
- The reduction units size 110 and 130 are supplied complete with lubricant, mineral oil, (SHELL TEVELA OIL 320).
- The variator speed are supplied complete with lubricant, mineral oil (GUANGYAN Ub-3x).
- For sizes 110 and 130 it is necessary to specify the position, otherwise the reduction units are supplied with the quantity of oil relating to pos. B3.
- Only reduction units 110 and 130 are fitted with breather, level and oil drainage plugs. It is necessary, after installation, to replace the closed plug used for transportation with the breather plug supplied with the unit.
- PC is supplied complete with life-long lubricant, synthetic oil (SHELL TEVELA OIL 320), and can therefore be mounted in all the positions.

#### 13.1 Lubricants oil chosen table

	C -50 0 +50 +100	ISO	SHELL	AGIP	ESSO	MOBIL	CASTROL	BP	GEMET	
MRV025~105 PC063~090	-25 +50	VG320	Tivela OIL S320	Telium VSF320	S220	Glygoyle 30	Alphasyn PG320	Energol SG-XP320		Synthetic oil
MRV110~130	-5 +40	VG460	Omala OIL460	Blasia 460	Spartan EP460	Mobilgear 634	Alpha MAX 460	Energol GR-XP460	CKE460	Mineral oil
	-15 +25	VG220	Omala OIL220	Blasia 220	Spartan EP220	Mobilgear 630	Alpha MAX 220	Energol GR-XP220		
UDL	-25 +40	VG32	A.T.F.DXRON	A.T.F.DXRON	A.T.F.DXRON	A.T.F.220	TQ.DXRON II	Autran DX	Ub-3x	Mineral oil

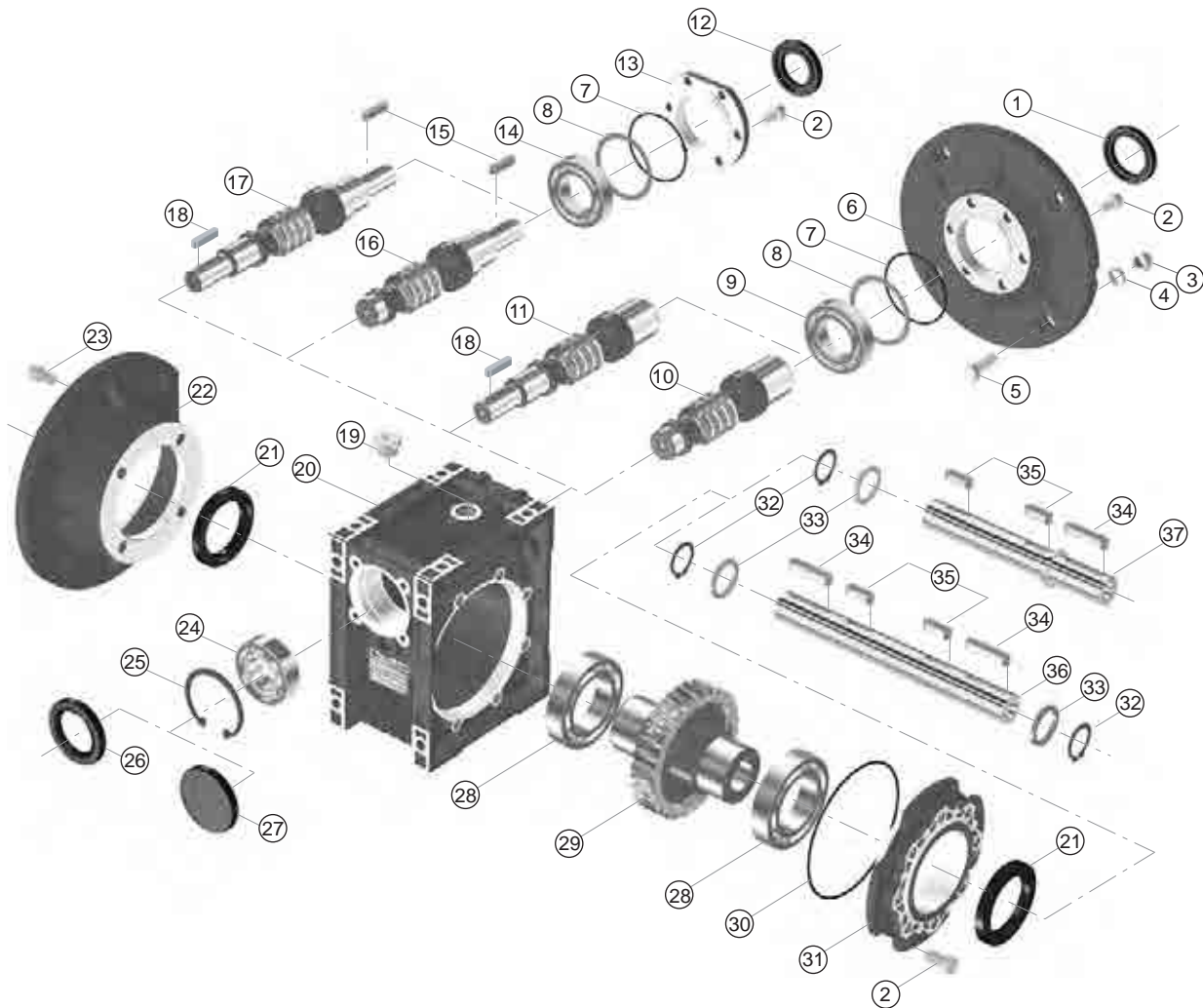
**13.2 Lubricant fill quantity****(L)**

	B3	B6	B7	B8	V5	V6
<b>MRV 025</b>						0.023
<b>MRV 030</b>						0.05
<b>MRV 040</b>						0.1
<b>MRV 050</b>						0.15
<b>MRV 063</b>						0.3
<b>MRV 075</b>						0.5
<b>MRV 090</b>						1
<b>MRV 105</b>						1.6
<b>MRV 110</b>	3	2.5	2.5	2.2	3	2.2
<b>MRV 130</b>	4.5	3.5	3.5	3.3	4.5	3.3
<b>PC063</b>						0.05
<b>PC071</b>						0.07
<b>PC080</b>						0.15
<b>PC090</b>						0.16
<b>UDL0.18</b>		0.13			0.2	
<b>UDL0.37</b>		0.15			0.25	
<b>UDL0.55</b>		0.33			0.45	
<b>UDL0.75</b>		0.33			0.45	
<b>UD1.1</b>		0.8			1	
<b>UD1.5</b>		0.8			1	
<b>UD2.2</b>		1.2			1.2	
<b>UD3.0</b>		1.2			1.2	
<b>UD4.0</b>		1.2			1.2	

**14. NOTICE FOR ORDERING**

1. Please refer to the sheet of performance parameter、MRV series dimensions、Mounting and operation positions diagram, make reasonable choice of model, and write down model mark to your required revolution scope ,output torque and structural form on ordering (when ordering, you should show whether the reducers are equipped with motors, otherwise reducers aren't supplied with motors).
2. Please make the best choice of standard products in this catalogue, and give an additional explanation for your special requirement and motors.

## EXPLODED VIEW & NAME OF PARTS



- |                                       |                         |
|---------------------------------------|-------------------------|
| 1. Oil seal                           | 20. Casing              |
| 2. Inner hex screw                    | 21. Oil seal            |
| 3. Nut                                | 22. Output flange       |
| 4. Spring washer                      | 23. Inner hex screw     |
| 5. Hex screw                          | 24. Bearing             |
| 6. Input flange                       | 25. Hole-circlip        |
| 7. O-ring                             | 26. Oil seal            |
| 8. Adjust spacer                      | 27. Cover               |
| 9. Bearing                            | 28. Bearing             |
| 10. Hole input worm                   | 29. Worm wheel          |
| 11. Hole input and shaft output worm  | 30. O-ring              |
| 12. Oil seal                          | 31. Output cover        |
| 13. Input cover                       | 32. Shaft-circlip       |
| 14. Bearing                           | 33. Spacer              |
| 15. Key                               | 34. Key                 |
| 16. Shaft input worm                  | 35. Key                 |
| 17. Shaft input and shaft output worm | 36. Double output shaft |
| 18. Key                               | 37. Single output shaft |
| 19. Oil plug                          |                         |