Transmax

WORM GEAR SPEED REDUCER

Worm gear hollow shaft

Variable speed gear

CONTENTS

1. SUMMARIZE

1.1 Products characteristics

MHR 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 or silvery white paint.

Cast iron housing :

First paint with red antirust paint, then paint with RAL 5010 blue or silvery white paint.

TNRV025～150

TRV030～150

TNRV - TNRV..

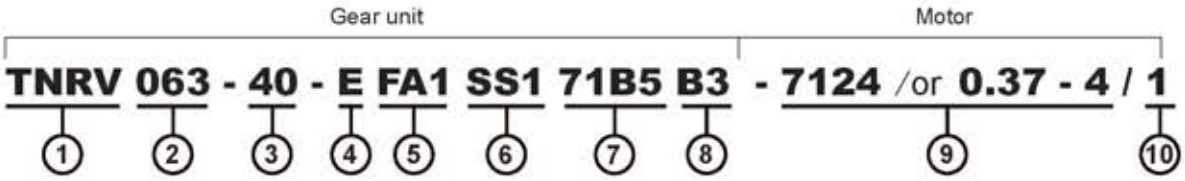
TRV - TNRV..

PC - TNRV..

UDL - TNRV..

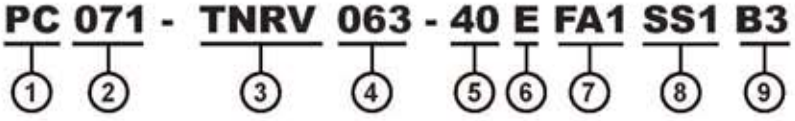
3. MODEL ILLUMINATE

3.1 TNRV / TRV Worm geared motos and worm gear units



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

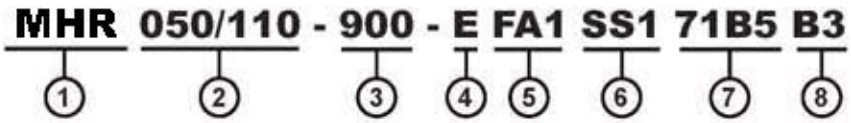
3.2 PC-TNRV Worm gears with pre-stage helical units



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

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

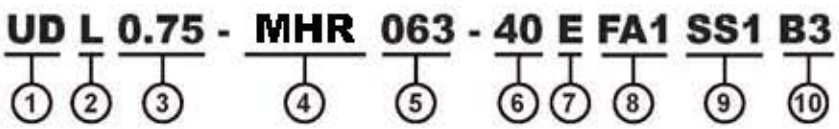
3.3 MHR-MHR / TRV-MHR Combination worm gear units



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

3.4 UDL-MHR

Combination of stepless speed variator and worm gear units



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

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

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

P_1	Input power
P_2	Output power
P_{1n}	Rated input motor power
f_S	Service factor
η	Transmission efficiency

The parameter can be found in the TRV gearbox rating charts and represents the kW that can be safely transmitted to the gearbox, based on input speed n_1 and service factor fs=1.

Values of η_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 η_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

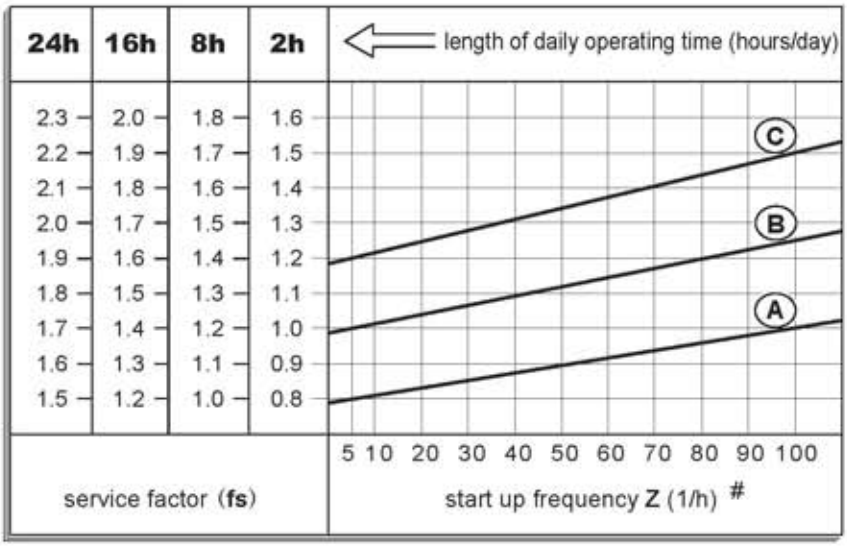
$$M_2 = \frac{9550 \cdot P_1 \cdot \eta}{n_2} \text{ [Nm]}$$

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

M_2	Output torque
M_{2n}	Rated output torque
P_1	Input power
η	Transmission efficiency
f_S	Service factor

4.5 Service factor fs

The effect of the driven machine on the gear unit is taken into account to a sufficient level of accuracy using the service factor **fs**. 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 $f_a \leqslant 0.3$

Ⓑ Moderate shock load, permitted mass acceleration factor $f_a \leqslant 3$

Ⓒ Heavy shock load, permitted mass acceleration factor $f_a \leqslant 10$

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:

$$fa = \frac{Jc}{Jm}$$

fa Mass acceleration factor
Jc All external mass moments of inertia [kgm²]
Jm Mass moment of inertia on the motor end [kgm²]

If mass acceleration factors **fa** > 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 Fr

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
Gears	1.00	⩾ 17 teeth
	1.15	< 17 teeth
Chain sprockets	1.00	⩾ 20 teeth
	1.25	< 20 teeth
	1.40	< 13 teeth
Narrow V-belt pulleys	1.75	Influence of the tensile force
Flat belt pulleys	2.50	Influence of the tensile force
Toothed belt pulleys	2.50	Influence of the tensile force

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

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

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

Fr Resulting radial load [N]
M Torque on the shaft [Nm]
d_0 Mean diameter of the mounted transmis sion element in [mm]
f_z Transmission element factor

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

$$FxL \leq \frac{Fr2 \cdot a}{(b+x)} \text{ [N]}$$

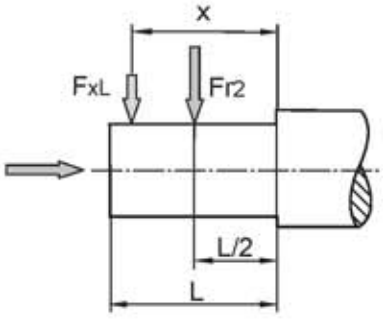
Fr2 Permitted overhung load (x = L/2) for foot-mounted gear units according to the selection tables in [N]

a, b Gear unit constant for overhung load conversion [mm]

x Distance from the shaft shoulder to the force application point in [mm]

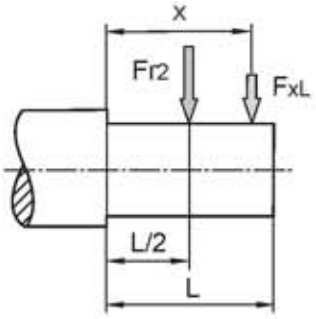
The values of a , b , Fr2 are given in the following tables:

Output shafts radial loads



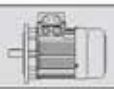
TNRV	25	30	40	50	63	75	90	105	110	130	150
a	50	65	84	101	120	131	162	176	176	188	215
b	38	50	64	76	95	101	122	136	136	148	174
Fr2 max	1350	1830	3490	4840	6270	7380	8180	12000	12000	13500	18000

Input shafts radial loads



TRV	30	40	50	63	75	90	105	110	130	150
a	86	106	129	159	192	227	266	266	314	350
b	76	94.5	114	139	167	202	236	236	274	310
Fr1 max	210	350	490	700	980	1270	1700	1700	2100	2800

4.7 Selection tables comments

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	M_{2n} [Nm]	fs			Page

P_{1n} Rated power driving motor **[kW]**;

n_2 Output speed **[r/min]**;

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

$M_{2\,max}$ Permissible output torque **[Nm]**;

i Gear unit ratio;

f_S Service factor;

 Gear unit type;

 Motor type;

page Dimension sheet page no.

5. SELECTION EXAMPLE

5.1 Gear motor

Example: The input power of driver machine is 0.5KW, n_1=1400r/min, uniform, start up frequency 20(1/h),continuous running for 24 hours, the ambient temperature is +32°C, n_2=93.3r/min, B3 mounted SO:

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

Check mash table on P14, estimate when the i=15, $\eta_d \approx 0.82$

Check and adjust the service factor ,will get $f_S = 1.53 \times 1.12 = 1.714$

$$P_{1n} \geq \frac{P_2}{\eta_d} \cdot f_s = \frac{0.5}{0.82} \times 1.714 = 1.045\ [kW]$$

Choose type:

MHR 075 - 15 - B3 - 1.1 - 4

Count output torque:

$$M_2 = \frac{9550 \cdot P_2}{n_2} = \frac{9550 \times 0.5}{93.3}$$

$$= 51.18[Nm]$$

$$M_{2n} = 95 \geqslant M_2 \cdot f_s = 51.18 \times 1.714 = 87.72[Nm]$$

5.2 Gear units

Example: Required torque 300Nm on driven machine, continuous running for 8 hours, uniform loda, the ambient temperature is 30°C, then choose the service factor fs=1.2x1.1=1.32, n_1=900r/min, n_2=22.5r/min.

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

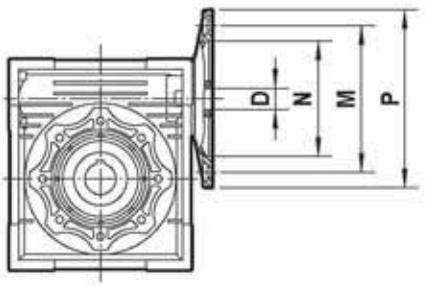
$$i = \frac{n_1}{n_2} = \frac{900}{22.5} = 40$$

Choose type:

TRV090 - 40

6. RELEVANT DATA

6.1 Ratio and IEC motor adapters



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

MHR	IEC 接口 / IEC motor adapters				D 输入轴直径 / THE HOLE DIAMETER OF INPUT SHAFT										
	IEC	P	M	N	i 传动比 / TRANSMISSION RATIO										
					7.5	10	15	20	25	30	40	50	60	80	100
MHR025	56B14	80	65	50	9	9	9	9	9	9	9	9	9		
MHR030	56B5	120	100	80	9	9	9	9	9	9	9	9	9	9	
	56B14	80	65	50											
	63B5	140	115	95	11	11	11	11	11	11	11	11			
	63B14	90	75	60											
MHR040	56B5	120	100	80								9	9	9	9
	63B5	140	115	95	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				
	71B14	105	85	70											
MHR050	63B5	140	115	95							11	11	11	11	11
	71B5	160	130	110	14	14	14	14	14	14	14	14	14	14	
	71B14	105	85	70											
	80B5	200	165	130	19	19	19	19	19	19					
	80B14	120	100	80											
MHR063	71B5	160	130	110	14	14	14	14	14	14	14	14	14	14	14
	71B14	105	85	70											
	80B5	200	165	130	19	19	19	19	19	19	19	19	19	19	
	80B14	120	100	80											
	90B5	200	165	130	24	24	24	24	24	24	24				
	90B14	140	115	95											
MHR075	71B5	160	130	110	14	14	14	14	14	14	14	14	14	14	14
	80B5	200	165	130	19	19	19	19	19	19	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											
	100/112B5	250	215	180	28	28	28	28	28	28					
	100/112B14	160	130	110											
MHR090	80B5	200	165	130	19	19	19	19	19	19	19	19	19	19	19
	80B14	120	100	80											
	90B5	200	165	130	24	24	24	24	24	24	24	24	24	24	
	90B14	140	115	95											
	100/112B5	250	215	180	28	28	28	28	28	28	28				
	100/112B14	160	130	110											
MHR105	80B5	200	165	130	19	19	19	19	19	19	19	19	19	19	19
	90B5	200	165	130	24	24	24	24	24	24	24	24	24	24	24
	100/112B5	250	215	180	28	28	28	28	28	28	28	28	28		
	132B5	300	265	230	38*	38*	38*	38*	38*	38*	38*				
MHR110	80B5	200	165	130	19	19	19	19	19	19	19	19	19	19	19
	90B5	200	165	130	24	24	24	24	24	24	24	24	24	24	24
	100/112B5	250	215	180	28	28	28	28	28	28	28	28	28		
	132B5	300	265	230	38*	38*	38*	38*	38*	38*	38*				
MHR130	90B5	200	165	130										24	24
	100/112B5	250	215	180					28	28	28	28	28	28	28
	132B5	300	265	230	38*	38*	38*	38*	38*	38*	38*				
MHR150	100/112B5	250	215	180								28	28	28	28
	132B5	300	265	230				38	38	38	38	38	38		
	160B5	350	300	250	42	42	42	42	42						

6.2 PC-MHR PC-MHR Combinations

	i	PC 063		PC 071		PC 080			PC 090		
		105 / 11 i = 3	105 / 14 i = 3	120 / 14 i = 3	120 / 19 i = 3	160 / 19 i = 3	160 / 24 i = 3	160 / 28 i = 3	160 / 19 i = 2.42	160 / 24 i = 2.42	160 / 28 i = 2.42
MHR040	25										
	30										
	40										
	50										
	60										
	80										
	100										
MHR050	25										
	30										
	40										
	50										
	60										
	80										
	100										
MHR063	25										
	30										
	40										
	50										
	60										
	80										
	100										
MHR075	25										
	30										
	40										
	50										
	60										
	80										
	100										
MHR090	25										
	30										
	40										
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	80										
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MHR105	25										
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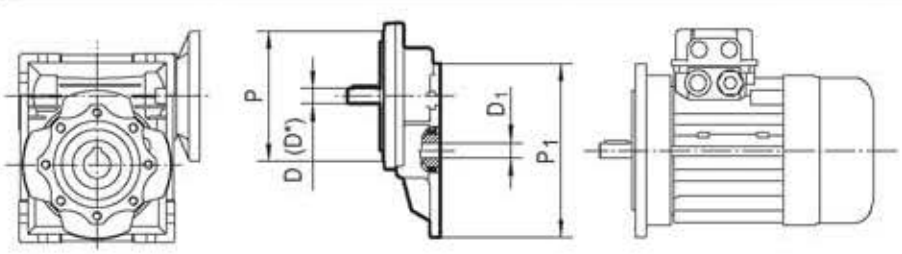
	40										
	50										
	60										
	80										
	100										
MHR110	25										
	30										
	40										
	50										
	60										
	80										
	100										
MHR130	25										
	30										
	40										
	50										
	60										
	80										
	100										



	P	D	D*	P_1	D_1
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

6.3 MHR - MHR / HR - MHR Assignment Table Of Combination Ratio

n1=1400r/min		MHR025/030			MHR025/040			MHR030/040			MHR030/050			MHR030/063		
i	n2	P1 [kW]	i025	i030	P1 [kW]	i025	i040	P1 [kW]	i030	i040	P1 [kW]	i030	i050	P1 [kW]	i030	i063
100	14	0.09	10	10	0.09	10	10	0.09	10	10	0.18	10	10	0.18	10	10
150	9.3	0.09	10	15	0.09	10	15	0.09	10	15	0.18	10	15	0.18	10	15
200	7	0.09	10	20	0.09	10	20	0.09	10	20	0.18	10	20	0.18	10	20
250	5.6	0.09	10	25	0.09	10	25	0.09	10	25	0.18	10	25	0.18	10	25
300	4.7	0.06	10	30	0.06	10	30	0.09	10	30	0.18	10	30	0.18	10	30
400	3.5	0.06	20	20	0.06	10	40	0.06	10	40	0.12	10	40	0.12	10	40
500	2.8	0.06	20	25	0.06	20	25	—	—	—	0.09	10	50	0.12	10	50
600	2.3	0.06	20	30	0.06	20	30	—	—	—	0.09	20	30	0.09	20	30
750	1.9	0.06	30	25	0.06	25	30	—	—	—	0.09	25	30	0.09	25	30
900	1.6	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
1500	0.93	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
2400	0.58	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	60	50
4000	0.35	—	—	—	0.06	50	80	—	—	—	—	—	—	—	—	—
5000	0.28	—	—	—	0.06	50	100	—	—	—	—	—	—	—	—	—

n1=1400r/min		MHR040/050			MHR040/063			MHR040/075			MHR040/090			MHR050/090		
i	n2	P1 [kW]	i040	i050	P1 [kW]	i040	i063	P1 [kW]	i040	i075	P1 [kW]	i040	i090	P1 [kW]	i050	i090
100	14	0.37	10	10	0.37	10	10	0.37	10	10	0.37	10	10	0.75	10	10
150	9.3	0.25	10	15	0.37	10	15	0.37	10	15	0.37	10	15	0.75	10	15
200	7	0.18	10	20	0.37	10	20	0.37	10	20	0.37	10	20	0.75	10	20
250	5.6	0.12	10	25	0.25	10	25	0.37	10	25	0.37	10	25	0.75	10	25
300	4.7	0.18	10	30	0.25	10	30	0.37	10	30	0.37	10	30	0.75	10	30
400	3.5	0.12	10	40	0.25	10	40	0.37	10	40	0.37	10	40	0.55	10	40
500	2.8	0.09	10	50	0.18	10	50	0.25	10	50	0.37	10	50	0.37	10	50
600	2.3	—	—	—	0.18	20	30	0.25	20	30	0.37	20	30	0.37	20	30
750	1.9	—	—	—	0.12	25	30	0.25	25	30	0.25	25	30	0.37	25	30
900	1.6	0.06	30	30	0.12	30	30	0.18	30	30	0.25	30	30	0.25	30	30
1200	1.2	—	—	—	—	—	—	0.18	40	30	0.25	40	30	0.25	40	30
1500	0.93	—	—	—	0.09	50	30	0.12	50	30	0.18	50	30	0.18	50	30
1800	0.78	—	—	—	0.06	60	30	0.12	60	30	0.18	60	30	0.18	60	30
2400	0.58	—	—	—	0.06	60	40	0.09	60	40	0.12	60	40	0.12	60	40
3000	0.47	—	—	—	—	—	—	0.06	60	50	0.09	60	50	—	—	—
4000	0.35	—	—	—	—	—	—	0.06	80	50	0.09	80	50	—	—	—
5000	0.28	—	—	—	—	—	—	0.06	100	50	0.06	100	50	—	—	—

n1=1400r/min		MHR050/105 (110)			MHR063/105 (110)			MHR063/130			MHR063/150		
i	n2	P1 [kW]	i050	i105 i110	P1 [kW]	i063	i105 i110	P1 [kW]	i063	i130	P1 [kW]	i063	i150
100	14	0.75	10	10	1.5	10	10	1.5	10	10	–	–	–
150	9.3	0.75	10	15	1.5	10	15	1.5	10	15	1.5	7.5	20
200	7	0.75	10	20	1.5	10	20	1.5	10	20	1.5	10	20
250	5.6	0.75	10	25	1.5	10	25	1.5	10	25	1.5	10	25
300	4.7	0.75	10	30	1.5	10	30	1.5	10	30	1.5	15	20
400	3.5	0.75	10	40	0.75	10	40	1.5	10	40	1.5	10	40
500	2.8	0.75	20	25	0.75	20	25	0.75	10	50	1.5	10	50
600	2.3	0.55	20	30	0.75	20	30	0.75	20	30	1.5	15	40
750	1.9	0.55	25	30	0.55	25	30	0.75	25	30	1.1	15	50
900	1.6	0.55	30	30	0.55	30	30	0.75	30	30	0.75	30	30
1200	1.2	0.37	40	30	0.37	40	30	0.55	40	30	0.55	30	40
1500	0.93	0.37	50	30	0.37	50	30	0.37	50	30	–	–	–
1800	0.78	0.25	60	30	0.25	60	30	0.37	60	30	0.55	60	30
2400	0.58	0.25	60	40	0.25	60	40	0.25	60	40	0.37	60	40
3000	0.47	0.18	60	50	–	–	–	0.25	60	50	0.37	60	50
4000	0.35	0.12	80	50	–	–	–	0.25	80	50	0.25	80	50
5000	0.28	0.12	100	50	–	–	–	0.25	100	50	0.25	100	50

You can choose 025,030, 040,050,063,075, 090,105,110,130,150 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 η 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 (n_1=1400) and static efficiency values. Remember that these values are only achieved after the unit has been run in.Torque values Mn2 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 14).

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 14).

η_d	>0.6	0.5 ~ 0.6	0.4 ~ 0.5	<0.4
DYNAMIC IRREVERSIBILITY	dynamic reversibility	low dynamic reversibility	good dynamic irreversiblity	dynamic irreversibility

η_s	>0.55	0.5 ~ 0.55	<0.5
STATIC IRREVERSIBILITY	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.: $\eta_{tot} = \eta_1 \times \eta_2$.

6.4.3 Mesh Data

	i	7.5	10	15	20	25	30	40	50	60	80	100
MHR025	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	0.8	0.67		
	γ	25°18′	19°31′	13°18′	11°2′	9°5′	6°44′	5°34′	4°34′	3°55′		
	$\eta_{d\,(n_1=1400r/min)}$	0.85	0.83	0.79	0.76	0.73	0.68	0.64	0.59	0.56		
	η_s	0.71	0.67	0.60	0.56	0.52	0.45	0.41	0.36	0.33		
MHR030	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	1.1	0.89	0.74	0.56	
	γ	18°55′	14°25′	9°44′	7°50′	5°33′	4°54′	3°56′	3°17′	2°43′	2°7′	
	$\eta_{d\,(n_1=1400r/min)}$	0.84	0.81	0.76	0.72	0.66	0.64	0.59	0.54	0.50	0.44	
	η_s	0.66	0.62	0.54	0.49	0.41	0.38	0.33	0.29	0.26	0.21	
MHR040	z_1	4	3	2	2	2	1	1	1	1	1	1
	m_n	1.87	1.95	2	1.54	1.26	2.04	1.55	1.27	1.06	0.8	0.65
	γ	23°54′	18°23′	12°30′	10°3′	8°45′	6°19′	5°4′	4°24′	3°42′	2°52′	2°29′
	$\eta_{d\,(n_1=1400r/min)}$	0.86	0.84	0.80	0.77	0.74	0.69	0.65	0.61	0.57	0.51	0.47
	η_s	0.70	0.66	0.59	0.54	0.51	0.44	0.39	0.36	0.32	0.27	0.24
MHR050	z_1	4	3	2	2	2	1	1	1	1	1	1
	m_n	2.34	2.43	2.5	1.92	1.56	2.54	1.94	1.58	1.32	1	0.8
	γ	23°49′	18°19′	12°27′	10°3′	8°33′	6°18′	5°4′	4°18′	3°38′	2°52′	2°17′
	$\eta_{d\,(n_1=1400r/min)}$	0.87	0.85	0.81	0.78	0.75	0.71	0.67	0.63	0.59	0.53	0.48
	η_s	0.70	0.66	0.59	0.54	0.51	0.44	0.39	0.36	0.32	0.27	0.24
MHR063	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
	γ	24°31′	18°53′	12°51′	10°29′	8°45′	6°30′	5°17′	4°24′	3°49′	2°59′	2°26′
	$\eta_{d\,(n_1=1400r/min)}$	0.88	0.86	0.82	0.80	0.77	0.73	0.69	0.65	0.62	0.56	0.51
	η_s	0.70	0.66	0.59	0.55	0.51	0.44	0.40	0.36	0.33	0.28	0.24
MHR075	z_1	4	3	2	2	2	1	1	1	1	1	1
	m_n	3.53	3.7	3.83	2.94	2.39	3.92	2.99	2.41	2.02	1.54	1.24
	γ	26°38′	20°37′	14°5′	11°19′	9°29′	7°9′	5°43′	4°46′	4°1′	3°17′	2°44′
	$\eta_{d\,(n_1=1400r/min)}$	0.88	0.87	0.84	0.81	0.79	0.76	0.72	0.68	0.64	0.59	0.55
	η_s	0.71	0.68	0.61	0.57	0.53	0.47	0.41	0.37	0.34	0.29	0.26
MHR090	z_1	4	3	2	2	2	1	1	1	1	1	1
	m_n	4.23	4.47	4.66	3.6	2.93	4.79	3.67	2.97	2.49	1.89	1.52
	γ	29°5′	22°39′	15°33′	12°50′	10°53′	7°55′	6°30′	5°29′	4°46′	3°45′	3°6′
	$\eta_{d\,(n_1=1400r/min)}$	0.89	0.88	0.85	0.83	0.81	0.78	0.74	0.71	0.68	0.63	0.59
	η_s	0.72	0.69	0.63	0.59	0.56	0.49	0.44	0.41	0.37	0.32	0.28
MHR105	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
	γ	28°15′	21°57′	15°2′	14°42′	12°33′	7°39′	7°29′	6°21′	5°33′	4°27′	3°46′
	$\eta_{d\,(n_1=1400r/min)}$	0.89	0.88	0.86	0.85	0.83	0.79	0.77	0.74	0.72	0.67	0.63
	η_s	0.72	0.69	0.62	0.62	0.59	0.48	0.48	0.44	0.41	0.36	0.32
MHR110	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
	γ	28°15′	21°57′	15°2′	14°42′	12°33′	7°39′	7°29′	6°21′	5°33′	4°27′	3°46′
	$\eta_{d\,(n_1=1400r/min)}$	0.89	0.88	0.86	0.85	0.83	0.79	0.77	0.74	0.72	0.67	0.63
	η_s	0.72	0.69	0.62	0.62	0.59	0.48	0.48	0.44	0.41	0.36	0.32
MHR130	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
	γ	28°43′	22°20′	15°19′	13°47′	11°54′	7°48′	6°60′	6°1′	5°16′	4°8′	3°27′
	$\eta_{d\,(n_1=1400r/min)}$	0.90	0.89	0.87	0.85	0.84	0.80	0.78	0.75	0.73	0.68	0.64
	η_s	0.72	0.69	0.63	0.61	0.58	0.49	0.46	0.43	0.40	0.34	0.30
MHR150	z_1	6	4	3	2	2	2	1	1	1	1	1
	m_n	5.5	6.155	5.5	6.155	5	4.193	6.155	5	4.193	3.17	2.55
	γ	32°09′	24°35′	17°27′	12°53′	11°19′	9°50′	6°32′	5°43′	4°57′	3°55′	3°14′
	$\eta_{d\,(n_1=1400r/min)}$	0.91	0.90	0.88	0.86	0.84	0.83	0.78	0.76	0.73	0.68	0.64
	η_s	0.73	0.71	0.66	0.60	0.57	0.54	0.45	0.42	0.39	0.33	0.29

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.

6.5.2 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.

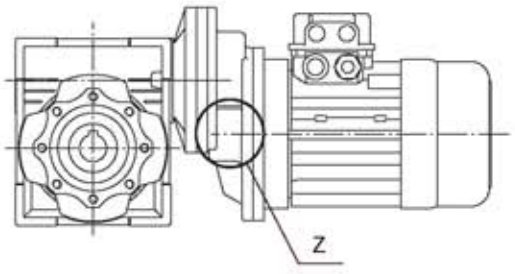
e). Fit the pinion ④ taking the same precautions as described in point c).

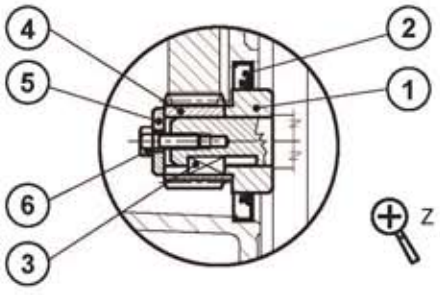
f). Fit the washer ⑤ and tighten with the screw ⑥.

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.

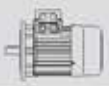
N.B. For correct operation, with no vibration or noise, it is recommended to use good quality motors.

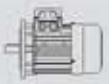




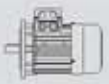
7. GEAR UNIT SELECTION TABLES

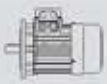
7.1 MHR..(IEC).. Performance parameter

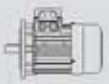
P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	f_s			Page
0.06	186.7	2.6	7.5	503	4.2	**MHR025**	**56B14**	**5614**	78
	140	3.4	10	553	3.5				
	93.3	4.9	15	633	2.5				
	70	6.2	20	697	1.9				
	56	7.5	25	751	1.7				
	46.7	8.3	30	798	1.6				
	35	10	40	878	1.2				
	28	12	50	946	0.9				
	23.3	14	60	1006	0.7				
	186.7	2.6	7.5	683	7.0	**MHR030**	**56B5/B14**	**5614**	79
	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				
	28	13	50	2475	3.3	**MHR040**	**56B5**	**5614**	80
	23.3	14	60	2630	2.6				
	17.5	17	80	2895	1.9				
	14	20	100	3118	1.5				
0.09	373.3	2.0	7.5	399	3.9	**MHR025**	**56B14**	**5612**	78
	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				
	46.7	11	60	798	0.7				
	186.7	3.9	7.5	503	2.8	**MHR025**	**56B14**	**5624**	78
	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				
	373.3	2.0	7.5	542	6.5	**MHR030**	**56B5/B14**	**5612**	79
	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				
	186.7	3.9	7.5	683	4.7	**MHR030**	**56B5/B14**	**5624**	79
	140	5.0	10	752	3.6				
	93.3	7.0	15	861	2.6				
	70	8.8	20	948	2.0				

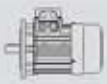
P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	fs			Page
0.09	56	10	25	1021	2.1	**MHR030**	**56B5/B14**	**5624**	79
	46.7	12	30	1085	1.7			
	35	14	40	1194	1.2			
	28	17	50	1286	1.0			
	23.3	18	60	1367	0.9			
	120	6.0	7,5	792	3.5	**MHR030**	**63B5/B14**	**6316**	79
	90	8.0	10	871	2.7			
	60	11	15	997	2.0			
	45	14	20	1098	1.5			
	36	16	25	1183	1.5			
	30	18	30	1257	1.2			
	22.5	21	40	1383	1.0			
	18	25	50	1490	0.8			
	56	11	50	1964	2.8	**MHR040**	**56B5**	**5612**	80
	46.7	12	60	2087	2.3			
	35	15	80	2298	1.7			
	28	17	100	2475	1.4			
	28	19	50	2475	2.1	**MHR040**	**56B5**	**5624**	80
	23.3	21	60	2630	1.7			
	17.5	25	80	2895	1.3			
	14	29	100	3118	1.0			
	45	15	20	2113	3.3	**MHR040**	**63B5/B14**	**6316**	80
	36	17	25	2276	2.6			
	30	19	30	2419	2.8			
	22.5	24	40	2662	2.1			
	18	28	50	2868	1.7			
	15	32	60	3047	1.3			
	11.3	37	80	3354	0.9			
	9	42	100	3490	0.8			
	18	29	50	3936	2.8	**MHR050**	**63B5**	**6316**	81
	15	32	60	4183	2.4			
	11.3	38	80	4604	1.8			
	9	43	100	4840	1.3			
0.12	373.3	2.7	7.5	399	3.0	**MHR025**	**56B14**	**5622**	78
	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	5.0	15	683	2.6	**MHR030**	**56B5/B14**	**5622**	79
	140	6.0	20	752	1.9			
	112	8.0	25	810	2.1			
	93.3	9.0	30	861	1.7			
	70	11	40	948	1.3			
	56	13	50	1021	1.0			
	46.7	14	60	1085	0.8			
	186.7	5.2	7.5	683	3.5	**MHR030**	**63B5/B14**	**6314**	79
	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			
	120	8.0	792	7,5	2.6	**MHR030**	**63B5/B14**	**6326**	79
	90	10	871	10	2.0			

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	fs				Page
0.12	60	14	997	15	1.5	MHR030	63B5/B14	6326	79
	45	18	1098	20	1.1				
	36	21	1183	25	1.2				
	30	24	1257	30	0.9				
	22.5	29	1383	40	0.7				
	5	14	1964	50	2.1	MHR040	56B5	5622	80
	46.7	16	2087	60	1.7				
	35	20	2298	80	1.3				
	28	23	2475	100	1.0				
	70	13	20	1824	3.3	MHR040	63B5/B14	6314	80
	56	16	25	1964	2.5				
	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				
	60	15	15	1920	3.3	MHR040	63B5/B14	6326	80
	45	19	20	2113	2.5				
	36	23	25	2276	1.9				
	30	26	30	2419	2.1				
	22.5	32	40	2662	1.6				
	18	37	50	2868	1.2				
	15	42	60	3047	1.0				
	11.3	50	80	3354	0.7				
	28	26	50	3397	2.9	MHR050	63B5	6314	81
	23.3	29	60	3610	2.3				
	17.5	35	80	3973	1.9				
	14	39	100	4280	1.4				
	22.5	33	40	3654	2.7	MHR050	63B5	6326	81
	18	38	50	3936	2.1				
	15	43	60	4183	1.8				
	11.3	51	80	4604	1.3				
	9	57	100	4840	1.0				
0.18	373.3	4.0	7.5	542	3.2	MHR030	63B5/B14	6312	79
	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	MHR030	63B5/B14	6324	79
	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				
	140	10	20	1447	2.8	MHR040	63B5/B14	6312	80
	112	12	25	1559	2.3				
	93.3	14	30	1657	2.5				
	70	17	40	1824	1.8				
	56	21	50	1964	1.4				
	46.7	24	60	2087	1.2				
	35	29	80	2298	0.8				
	93.3	15	15	1657	2.9	MHR040	63B5/B14	6324	80
	70	19	20	1824	2.1				
	56	23	25	1964	1.7				

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	fs			Page
0.18	46.7	25	30	2087	1.8	**MHR040**	**63B5/B14**	**6324**	80
	35	32	40	2298	1.3				
	28	37	50	2475	1.0				
	23.3	42	60	2630	0.9				
	90	16	10	1677	3.0	**MHR040**	**71B5/B14**	**7116**	80
	60	23	15	1920	2.2				
	45	28	20	2113	1.6				
	36	34	25	2276	1.3				
	30	38	30	2419	1.3				
	22.5	47	40	2662	1.0				
	70	18	40	2503	3.2	**MHR050**	**63B5**	**6312**	81
	56	21	50	2696	2.5				
	46.7	24	60	2865	2.1				
	35	30	80	3153	1.5				
	28	34	100	3397	1.2				
	35	33	40	3153	2.3	**MHR050**	**63B5**	**6324**	81
	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				
	45	29	20	2900	2.8	**MHR050**	**71B5/B14**	**7116**	81
	36	35	25	3124	2.1				
	30	40	30	3320	2.4				
	22.5	49	40	3654	1.8				
	18	56	50	3936	1.4				
	15	63	60	4183	1.1				
	11.3	75	80	4604	0.9				
	22.5	50	40	4776	3.4	**MHR063**	**71B5/B14**	**7116**	82
	18	59	50	5145	2.7				
	15	66	60	5467	2.1				
	11.3	79	80	6018	1.6				
	9	90	100	6270	1.4				
	15	66	60	5467	2.1	**MHR075**	**71B5**	**7116**	83
	11.3	79	80	6018	1.6				
	9	90	100	6270	1.4				
0.25	373.3	5.6	7.5	542	2.3	**MHR030**	**63B5/B14**	**6322**	79
	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				
	186.7	11	15	1315	2.9	**MHR040**	**63B5/B14**	**6322**	80
	140	14	20	1447	2.0				
	112	17	25	1559	1.6				
	93.3	20	30	1657	1.7				
	70	25	40	1824	1.2				
	56	29	50	1964	1.0				
	46.7	34	60	2087	0.8				
	186.7	11	7.5	1315	3.6	**MHR040**	**71B5/B14**	**7114**	80
	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				

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	fs			Page
0.25	120	17	7.5	1524	2.6	**MHR040**	**71B5/B14**	**7126**	80
	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				
	22.5	67	40	2662	0.7				
	70	25	40	2503	2.3	**MHR050**	**63B5/B14**	**6322**	81
	56	30	50	2696	1.8				
	46.7	34	60	2865	1.5				
	35	42	80	3153	1.1				
	28	48	100	3397	0.8				
	70	27	20	2503	2.7	**MHR050**	**71B5/B14**	**7114**	81
	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				
	60	32	15	2635	2.9	**MHR050**	**71B5/B14**	**7126**	81
	45	40	20	2900	1.9				
	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				
	35	48	40	4122	3.1	**MHR063**	**71B5/B14**	**7114**	82
	28	55	50	4440	2.4				
	23.3	63	60	4719	2.0				
	17.5	76	80	5193	1.6				
	14	87	100	5595	1.4				
	36	50	25	4084	3.0	**MHR063**	**71B5/B14**	**7126**	82
	30	57	30	4339	3.1				
	22.5	70	40	4776	2.4				
	18	81	50	5145	1.8				
	15	92	60	5467	1.5				
	11.3	110	80	6018	1.2				
	9	125	100	6270	1.0				
	23.3	68	60	5569	3.2	**MHR075**	**71B5**	**7114**	83
	17.5	80	80	6130	2.4				
	14	94	100	6603	1.9				
	18	85	50	6073	3.0	**MHR075**	**71B5**	**7126**	83
	15	99	60	6453	2.5				
	11.3	117	80	7103	1.7				
	9	133	100	7380	1.4				
0.37	373.3	8.3	7.5	1044	3.4	**MHR040**	**71B5/B14**	**7112**	80
	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				
	93.3	29	30	1657	1.2				
	70	37	40	1824	0.8				
	186.7	16	7.5	1315	2.5	**MHR040**	**71B5/B14**	**7124**	80
	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				

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	fs			Page
0.37	112	25	25	2140	2.0	MHR050	71B5/B14	7112	81
	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	MHR050	71B5/B14	7124	81
	93.3	31	15	2274	2.4				
	70	39	20	2503	1.9				
	56	47	25	2696	1.5	MHR050	71B5/B14	7124	81
	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	MHR050	80B5/B14	8016	81
	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				
	70	38	40	3272	2.9	MHR063	71B5/B14	7112	82
	56	45	50	3524	2.3				
	46.7	52	60	3745	1.9				
	35	65	80	4122	1.4				
	28	74	100	4440	1.1				
	56	50	25	3524	2.7	MHR063	71B5/B14	7124	82
	46.7	57	30	3745	2.8				
	35	70	40	4122	2.1				
	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	MHR063	80B5/B14	8016	82
	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				
	11.3	167	80	6018	0.8				
	56	47	50	4160	3.5	MHR075	71B5	7112	83
	46.7	55	60	4421	2.9				
	35	68	80	4865	2.1				
	28	78	100	5241	1.7				
	35	74	40	4865	3.3	MHR075	71B5	7124	83
	28	88	50	5241	2.5				
	23.3	97	60	5569	2.1				
	17.5	119	80	6130	1.6				
	14	139	100	6603	1.3				
	36	77	25	4820	3.1	MHR075	80B5/B14	8016	83
	30	87	30	5122	3.3				
	22.5	108	40	5637	2.6				
	18	124	50	6073	1.8				
	15	141	60	6453	1.5				
	11.3	173	80	7103	1.2				
	9	196	100	7380	1.0				

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	fs			Page
0.37	18	136	50	6719	3.2	MHR090	80B5/B14	8016	84
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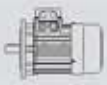
	11.3	185	80	7859	1.7			
	9	212	100	8180	1.3			
	11.3	201	80	9931	2.5	MHR105	80B5	8016	83
	9	232	100	10320	2.0			
	11.3	201	80	9931	2.8	MHR110	80B5	8016	84
	9	232	100	10320	2.2			
0.55	373.3	12	7.5	1044	2.3	MHR040	71B5/B14	7122	80
	280	16	10	1149	1.8			
	186.7	24	15	1315	1.3			
	140	30	20	1447	1.0			
	112	37	25	1559	0.8			
	93.3	43	30	1657	0.8			
	280	17	10	1577	3.2	MHR050	71B5/B14	7122	81
	186.7	24	15	18.5	2.4			
	140	31	20	1987	1.7			
	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	MHR050	80B5/B14	8014	81
	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			
	120	37	7.5	2091	2.3	MHR050	80B5/B14	8026	81
	90	48	10	2302	1.7			
	60	69	15	2635	1.2			
	45	88	20	2900	0.9			
	36	108	25	3124	0.7			
	30	121	30	3320	0.8			
	140	32	20	2597	3.3	MHR063	71B5/B14	7122	82
	112	39	25	2797	2.5			
	93.3	44	30	2973	2.7			
	70	56	40	3272	1.9			
	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			
	93.3	47	15	2973	3.2	MHR063	80B5/B14	8014	82
	70	60	20	3272	2.2			
	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			
	17.5	174	80	5193	0.7			
	90	50	10	3009	3.1	MHR063	80B5/B14	8026	82
	60	70	15	3444	2.2			
	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			
	18	181	50	5145	0.9			
	15	207	60	5467	0.7			

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	fs				Page
0.55	70	59	40	3862	3.1	MHR075	71B5	7122	83
	56	70	50	4160	2.3				
	46.7	81	60	4421	2.0				
	35	99	80	4865	1.3				
	28	116	100	5241	1.0				
	56	76	25	4160	2.8	MHR075	80B5/B14	8014	83
	46.7	87	30	4421	2.9				
	35	108	40	4865	2.0				
	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				
	45	93	20	4474	2.9	MHR075	80B5/B14	8026	83
	36	124	25	4820	2.1				
	30	124	30	5122	2.1				
	22.5	156	40	5637	1.5				
	18	184	50	6073	1.2				
	15	210	60	6453	1.0				
	11.3	262	80	7103	0.8				
	35	114	40	5383	3.5	MHR090	80B5/B14	8014	84
	28	137	50	5799	2.7				
	23.3	158	60	6163	2.2				
	17.5	189	80	6783	1.5				
	14	221	100	7306	1.2				
	36	117	25	5333	3.5	MHR090	80B5/B14	8026	84
	22.5	168	40	6238	2.7				
	18	196	50	6719	2.0				
	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	MHR105	80B5	8014	85
	14	236	100	9232	1.9				
	11.3	294	80	9931	1.8	MHR105	80B5	8026	85
	9	344	100	10320	1.4				
	17.5	201	80	8571	2.6	MHR110	80B5	8014	86
	14	236	100	9232	2.0				
	15	242	60	9023	2.8	MHR110	80B5	8026	86
	11.3	294	80	9931	1.9				
	9	344	100	10320	1.5				
0.75	373.3	17	7.5	1433	3.0	MHR050	80B5/B14	8012	81
	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	MHR050	80B5/B14	8024	81
	140	43	10	1987	1.7				
	93.3	62	15	2274	1.2				
	70	80	20	2503	0.9				
	56	99	25	2696	0.7				
	46.7	112	30	2865	0.8				
	186.7	33	15	2359	3.3	MHR063	80B5/B14	8012	82
	140	43	20	2597	2.3				
	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				

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	fs				Page
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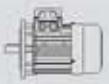
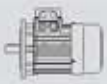
	70	82	20	3272	1.6				
	56	98	25	3524	1.3				
	46.7	112	30	3745	1.4				
	35	141	40	4122	1.0				
	28	171	50	4440	0.8				
	120	51	7.5	2734	2.9	MHR063	90B5/B14	90S6	82
	90	67	10	3009	2.3				
	60	96	15	3444	1.6				
	45	123	20	3791	1.2				
	36	147	25	4084	0.9				
	30	167	30	4339	1.0				
	22.5	210	40	4776	0.8				
	112	54	25	3302	2.9	MHR075	80B5/B14	8012	83
	93.3	62	30	3509	3.0				
	70	80	40	3862	2.3				
	56	96	50	4160	1.7				
	46.7	107	60	4421	1.3				
	35	135	80	4865	1.0				
	28	159	100	5241	0.8				
	93.3	66	15	3509	3.5	MHR075	80B5/B14	8024	83
	70	85	20	3862	2.8				
	56	101	25	4160	2.0				
	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				
	17.5	250	80	6130	0.8				
	90	68	10	3551	3.4	MHR075	90B5/B14	90S6	83
	60	97	15	4065	2.4				
	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				
	18	255	50	6073	1.0				
	15	296	60	6453	0.8				
	70	82	40	4273	3.4	MHR090	80B5/B14	8012	84
	56	99	50	4603	2.7				
	46.7	115	60	4891	2.1				
	35	143	80	5383	1.6				
	28	169	100	5799	1.2				
	35	156	40	5383	2.5	MHR090	80B5/B14	8024	84
	28	182	50	5799	1.9				
	23.3	209	60	6163	1.5				
	17.5	258	80	6783	1.1				
	14	302	100	7306	0.9				
	45	131	20	4951	3.3	MHR090	90B5/B14	90S6	84
	36	159	25	5333	2.6				
	30	179	30	5667	2.6				
	22.5	226	40	6238	1.8				
	18	267	50	6719	1.5				
	15	306	60	7140	1.1				
	35	152	80	6803	2.6	MHR105	80B5	8012	85
	28	179	100	7328	2.1				
	28	194	50	7328	3.1	MHR105	80B5	8024	85
	23.3	227	60	7787	2.5				

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	fs			Page
0.75	17.5	274	80	8571	1.8	MHR105	80B5	8024	85
	14	322	100	9232	1.4				
	22.5	239	40	7882	3.0	MHR105	90B5	90S6	85
	18	287	50	8491	2.4				
	15	325	60	9023	1.7				
	11.3	401	80	9931	1.2				
	9	470	100	10320	0.9				
	35	152	80	6803	2.6	MHR110	80B5	8012	86
	28	179	100	7328	2.1				
	28	194	50	7328	3.4	MHR110	80B5	8024	86
	23.3	227	60	7787	2.7				
	17.5	274	80	8571	1.9				
	14	322	100	9232	1.5				
	22.5	239	40	7882	3.3	MHR110	90B5	90S6	86
	18	287	50	8491	2.6				
	15	325	60	9023	1.9				
	11.3	401	80	9931	1.3				
	9	470	100	10320	1.0				
	11.3	401	80	12989	2.1	MHR130	90B5	90S6	87
	9	470	100	13500	1.7				
1.1	373.3	25	7.5	1433	2.1	MHR050	80B5/B14	8022	81
	280	33	10	1577	1.7				
	186.7	48	15	1805	1.2				
	140	62	20	1987	0.9				
	93.3	87	30	2274	0.7				
	280	33	10	2061	3.0	MHR063	80B5/B14	8022	82
	186.7	46	15	2359	2.1				
	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	MHR063	90B5/B14	90L6	82
	90	98	10	3009	1.6				
	60	140	15	3444	1.1				
	45	180	20	3791	0.8				
	30	249	30	4339	0.7				
	186.7	50	7.5	2359	2.6	MHR063	90B5/B14	90S4	82
	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				
	186.7	50	15	2785	3.3	MHR075	80B5/B14	8022	83
	140	65	20	3065	2.7				
	112	77	25	3302	2.0				
	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				
	35	201	80	4865	0.7				
	120	77	7.5	3227	2.8	MHR075	90B5/B14	90L6	83
	90	98	10	3551	2.3				
	60	142	15	4065	1.7				
	45	182	20	4474	1.3				
	36	219	25	4820	1.0				
	30	249	30	5122	1.0				
	22.5	322	40	5637	0.9				

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	fs			Page
1.1	140	66	10	3065	3.0	MHR075	90B5/B14	90S4	83
	93.3	95	15	3509	2.1			
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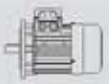
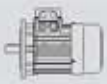
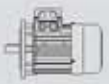
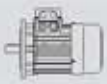
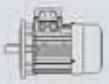
	56	148	25	4160	1.3			
	46.7	171	30	4421	1.3			
	35	216	40	4865	1.0			
	28	263	50	5241	0.9			
	23.3	297	60	5569	0.7			
	112	81	25	3653	3.1	MHR090	80B5/B14	8022	84
	93.3	93	30	3882	3.3			
	70	120	40	4273	2.3			
	56	145	50	4603	1.8			
	46.7	169	60	4891	1.5			
	35	210	80	5383	1.1			
	28	248	100	5799	0.8			
	60	149	15	4498	3.1	MHR090	90B5/B14	90L6	84
	45	192	20	4951	2.2			
	36	228	25	5333	1.6			
	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			
	70	128	20	4273	3.1	MHR090	90B5/B14	90S4	84
	56	156	25	4603	2.4			
	46.7	178	30	4891	2.4			
	35	222	40	5383	1.6			
	28	266	50	5799	1.3			
	23.3	306	60	6163	1.0			
	17.5	384	80	6783	0.7			
	56	150	50	5816	3.0	MHR105	80B5	8022	85
	46.7	176	60	6181	2.4			
	35	222	80	6803	1.7			
	28	263	100	7328	1.3			
	36	239	25	6739	3.0	MHR105	90B5	90L6	85
	22.5	345	40	7882	2.0			
	18	414	50	8491	1.6			
	15	476	60	9023	1.3			
	11.3	588	80	9931	0.9			
	9	689	100	10320	0.7			
	35	237	40	6803	2.8	MHR105	90B5	90S4	85
	28	278	50	7328	2.0			
	23.3	324	60	7787	1.6			
	17.5	402	80	8571	1.1			
	14	473	100	9232	1.0			
	56	150	50	5816	3.3	MHR110	80B5	8022	86
	46.7	176	60	6181	2.7			
	35	222	80	6803	1.8			
	28	263	100	7328	1.4			
	36	239	25	6739	3.2	MHR110	90B5	90L6	86
	30	270	30	7161	3.1			
	22.5	345	40	7882	2.3			
	18	414	50	8491	1.8			
	15	476	60	9023	1.4			
	11.3	588	80	9931	1.0			
	9	689	100	10320	0.7			

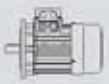
P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	fs			Page
1.1	35	237	40	6803	3.0	MHR110	90B5	90S4	86
	28	278	50	7328	2.4				
	23.3	324	60	7787	1.9				
	17.5	402	80	8571	1.3				
	14	473	100	9232	1.0				
	11.3	588	80	12989	1.5	MHR130	90B5	90L6	87
	9	689	100	13500	1.1				
	17.5	408	80	11210	2.1	MHR130	90B5	90S4	87
	14	480	100	12076	1.5				
1.5	373.3	34	7.5	1433	1.5	MHR050	80B5/B14	80C2	81
	280	45	10	1577	1.2				
	186.7	65	15	1805	0.9				
	186.7	68	7.5	2359	1.9	MHR063	90B5/B14	90L4	82
	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	MHR063	90B5/B14	90S2	82
	280	45	10	2061	2.2				
	186.7	66	15	2359	1.6	MHR063	90B5/B14	90S2	82
	140	86	20	2597	1.2				
	112	105	25	2797	0.9				
	93.3	120	30	2973	1.0				
	70	156	40	3272	0.7				
	120	103	7.5	3227	2.1	MHR075	100B5/B14	100L6	83
	90	134	10	3551	1.7				
	60	193	15	4065	1.2				
	45	255	20	4474	1.1				
	36	311	25	4820	0.8				
	30	354	30	5122	0.8				
	280	45	10	2433	3.2	MHR075	90B5/B14	90S2	83
	186.7	66	15	2785	2.3				
	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				
	56	187	50	4160	1.3				
	46.7	215	60	4421	1.1				
	186.7	68	7.5	2785	2.7	MHR075	90B5/B14	90L4	83
	140	89	10	3065	2.2				
	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				
	35	299	0.8	4865	0.8				
	90	137	10	3929	2.7	MHR090	100B5/B14	100L6	84
	60	198	15	4498	2.1				
	45	258	20	4951	1.5				
	36	310	25	5333	1.2				
	30	358	30	5667	1.3				
	22.5	459	40	6238	1.0				
	93.3	134	15	3882	3.0	MHR090	90B5/B14	90L4	84
	70	170	20	4273	2.1				
	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				

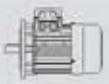
P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	fs				Page
1.5	140	90	20	3391	2.9	MHR090	90B5/B14	90S2	84
	112	110	25	3653	2.3				
	93.3	127	30	3882	2.4				
	70	164	40	4273	1.7				
	56	197	50	4603	1.3				
	46.7	227	60	4891	1.1				
	35	287	80	5383	0.8				
	45	264	20	6256	2.4	MHR105	100B5	100L6	85
	36	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				
	56	218	25	5816	2.8	MHR105	90B5	90L4	85
	46.7	246	30	6181	2.7				
	35	315	40	6803	1.7				
	28	379	50	7328	1.5				
	23.3	442	60	7787	1.2				
	17.5	548	80	8571	0.9				
	14	655	100	9232	0.7				
	70	170	40	5399	2.8	MHR105	90B5	90S2	85
	56	205	50	5816	2.2				
	46.7	236	60	6181	1.6				
	35	299	80	6803	1.2				
	28	358	100	7328	1.0				
	45	264	20	6256	2.7	MHR110	100B5	100L6	86
	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				
	56	218	25	5816	3.1	MHR110	90B5	90L4	86
	46.7	246	30	6181	3.0				
	35	315	40	6803	2.2				
	28	379	50	7328	1.7				
	23.3	442	60	7787	1.4				
	17.5	548	80	8571	0.9				
	14	655	100	9232	0.7				
	70	170	40	5399	3.1	MHR110	90B5	90S2	86
	56	205	50	5816	2.4				
	46.7	236	60	6181	2.0				
	35	299	80	6803	1.3				
	28	358	100	7328	1.0				
	36	330	25	8814	3.2	MHR130	100B5	100L6	87
	30	377	30	9366	3.1				
	22.5	471	40	10309	2.3				
	18	565	50	11105	1.9				
	15	659	60	11801	1.4				
	11.3	802	80	12989	1.1				
	9	955	100	13500	0.8				
	17.5	557	80	11210	1.5	MHR130	90B5	90L4	87
	14	655	100	12076	1.1				
	18	589	50	15182	2.7	MHR150	100/112B5	100L6	88
	15	678	60	16133	2.1				
	11.3	841	80	17757	1.5				
	9	971	100	18000	1.2				

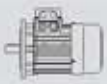
P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	fs			Page
2.2	373.3	51	7.5	1873	1.8	**MHR063**	**90B5/B14**	**90L2**	82
	280	66	10	2061	1.5			
	186.7	97	15	2359	1.1			
	140	128	20	2597	0.8			
	186.7	99	7.5	2785	1.9	**MHR075**	**100B5/B14**	**100LA4**	83
	140	131	10	3065	1.5			
	93.3	189	15	3509	1.1			
	70	249	20	3862	0.9			
	56	304	25	4160	0.7			
	46.7	347	30	4421	0.7			
	120	154	7,5	3227	1.4	**MHR075**	**112B5/B14**	**112M6**	83
	90	201	10	3551	1.1			
	60	291	15	4065	0.9			
	45	374	20	4474	0.7			
	373.3	50	7.5	2210	2.6	**MHR075**	**90B5/B14**	**90L2**	83
	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			
	70	234	40	3862	0.8			
	186.7	100	7.5	3081	2.9	**MHR090**	**100B5/B14**	**100LA4**	84
	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			
	30	456	40	5383	0.9			
	120	154	7.5	3570	2.2	**MHR090**	**112B5/B14**	**112M6**	84
	90	201	10	3929	1.8			
	60	291	15	4498	1.4			
	45	378	20	4951	1.0			
	36	467	25	5333	0.9			
	45	532	30	5667	0.9			
	280	68	10	2692	3.5	**MHR090**	**90B5/B14**	**90L2**	84
	186.7	100	15	3081	2.7			
	140	129	20	3391	2.0			
	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			
	93.3	196	15	49.5	3.0	**MHR105**	**100B5**	**100LA4**	85
	70	255	20	5399	2.0			
	56	311	25	5816	1.7			
	46.7	356	30	6181	1.6			
	35	462	40	6803	1.2			
	28	555	50	7328	1.1			
	23.3	648	60	7787	0.9			
	90	203	10	4965	3.1	**MHR105**	**112B5**	**112M6**	85
	60	294	15	5684	2.2			
	45	388	20	6256	1.6			
	36	473	25	6739	1.4			
	30	532	30	7161	1.4			
	22.5	701	40	7882	1.1			
	18	841	50	8491	0.9			
	15	967	60	9023	0.7			

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	fs			Page
2.2	112	161	25	4616	2.7	**MHR105**	**90B5**	**90L2**	85
	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			
	35	444	80	6803	0.9			
	28	525	100	7328	0.7			
	93.3	196	15	49.5	3.3	**MHR110**	**100B5**	**100LA4**	86
	70	255	20	5399	2.2			
	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	**MHR110**	**112B5**	**112M6**	86
	60	294	15	5684	2.6			
	45	388	20	6256	1.9			
	36	473	25	6739	1.6			
	30	532	30	7161	1.6			
	22.5	701	40	7882	1.1			
	18	841	50	8491	0.9			
	15	967	60	9023	0.7			
	112	161	25	4616	3.1	**MHR110**	**90B5**	**90L2**	86
	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	444	80	6803	0.9			
	28	525	100	7328	0.7			
	56	319	25	7607	2.9	**MHR130**	**100B5**	**100LA4**	87
	46.7	365	30	8084	2.9			
	35	468	40	8897	2.2			
	28	563	50	9584	1.7			
	23.3	657	60	10185	1.4			
	17.5	816	80	11210	1.0			
	14	976	100	12076	0.8			
	36	473	25	8814	2.2	**MHR130**	**112B5**	**112M6**	87
	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			
	11.3	1214	80	12989	0.7			
	35	444	80	8897	1.3	**MHR130**	**90B5**	**90L2**	87
	28	525	100	9584	1.0			
	28	578	50	13103	2.4	**MHR150**	**100B5**	**100LA4**	88
	23.3	667	60	13924	1.9			
	17.5	829	80	15325	1.4			
	14	976	100	16508	1.0			
	18	864	50	15182	1.9	**MHR150**	**112B5**	**112M6**	88
	15	995	60	16133	1.4			
	11.3	1233	80	17757	1.1			
	9	1425	100	18000	0.8			
3.0	373.3	68	7.5	2210	1.9	**MHR075**	**100B5/B14**	**100L2**	83
	280	90	10	2433	1.6			
	186.7	135	15	2785	1.2			
	140	176	20	3065	1.0			
	112	215	25	3302	0.7			
	93.3	249	30	3509	0.7			

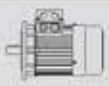
P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	fs			Page
3.0	186.7	135	7.5	2785	1.4	**MHR075**	**100B5/B14**	**100LB4**	83
	140	178	10	3065	1.1			
	93.3	258	15	3509	0.8			
	373.3	70	7.5	2446	3.0	**MHR090**	**100B5/B14**	**100L2**	84
	280	92	10	2692	2.6			
	186.7	137	15	3081	2.0			
	140	180	20	3391	1.4			
	112	220	25	3653	1.1			
	93.3	255	30	3882	1.2			
	70	328	40	4273	0.8			
	186.7	137	7.5	3081	2.1	**MHR090**	**100B5/B14**	**100LB4**	84
	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			
	140	182	20	4285	2.5	**MHR105**	**100B5**	**100L2**	85
	112	225	25	4616	2.0			
	93.3	258	30	4905	1.9			
	70	340	40	5399	1.5			
	56	409	50	5816	1.2			
	46.7	479	60	6181	1.0			
	140	182	10	4285	3.0	**MHR105**	**100B5**	**100LB4**	85
	93.3	264	15	4905	2.0			
	70	348	20	5399	1.5			
	56	425	25	5816	1.3			
	46.7	485	30	6181	1.2			
	35	630	40	6803	1.0			
	28	757	50	7328	0.8			
	120	210	7.5	4511	2.7	**MHR105**	**132B5**	**132S6**	85
	90	277	10	4965	2.2			
	60	401	15	5684	1.6			
	45	528	20	6256	1.2			
	36	653	25	6739	1.2			
	30	736	30	7161	1.1			
	22.5	955	40	7882	0.8			
	140	182	20	4285	2.7	**MHR110**	**100B5**	**100L2**	86
	112	225	25	4616	2.2			
	93.3	258	30	4905	2.1			
	70	340	40	5399	1.6			
	56	409	50	5816	1.2			
	46.7	479	60	6181	1.0			
	140	182	10	4285	3.3	**MHR110**	**100B5**	**100LB4**	86
	93.3	264	15	4905	2.5			
	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	**MHR110**	**132B5**	**132S6**	86
	90	277	10	4965	2.6			
	60	401	15	5684	1.9			
	45	528	20	6256	1.4			
	36	653	25	6739	1.2			
	30	736	30	7161	1.1			
	22.5	955	40	7882	0.8			

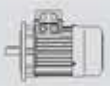
P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	fs			Page
3.0	56	430	25	7607	2.2	MHR130	100B5	100LB4	87
	46.7	491	30	8084	2.1			
	35	638	40	8897	1.6			
	28	767	50	9584	1.3			
	23.3	896	60	10185	1.0			
	17.5	1113	80	11210	0.8			
	90	277	10	6494	3.5	MHR130	132B5	132S6	87
	60	406	15	7434	2.6			
	45	528	20	8182	2.0			
	36	645	25	8814	1.6			
	30	735	30	9366	1.6			
	22.5	942	40	10309	1.2			
	28	788	50	13103	1.8	MHR150	100B5	100LB4	88
	23.3	909	60	13924	1.4			
	17.5	1130	80	15325	1.0			
	14	1331	100	16508	0.8			
	45	541	20	11186	2.8	MHR150	132B5	132S6	88
	36	669	25	12050	2.1			
	30	783	30	12805	1.8			
	22.5	968	40	14094	1.9			
	18	1178	50	15182	1.4			
	15	1357	60	16133	1.1			
4.0	373.3	91	7.5	2210	1.4	MHR075	112B5/B14	112M2	83
	280	120	10	2433	1.2			
	186.7	180	15	2785	0.9			
	140	235	20	3065	0.7			
	186.7	180	7.5	2785	1.0	MHR075	112B5/B14	112M4	83
	140	237	10	3065	0.8			
	373.3	93	7.5	2446	2.3	MHR090	112B5/B14	112M2	84
	280	123	10	2692	1.9			
	186.7	182	15	3081	1.5			
	140	240	20	3391	1.1			
	112	293	25	3653	0.9			
	93.3	340	30	3882	0.9			
	186.7	182	7.5	3081	1.6	MHR090	112B5	112M4	84
	140	240	10	3391	1.3			
	93.3	348	15	3882	1.0			
	70	453	20	4273	0.8			
	186.7	184	7.5	3893	2.8	MHR105	112B5	112M4	85
	140	240	10	4285	2.0			
	93.3	352	15	4905	1.5			
	70	464	20	5399	1.1			
	56	566	25	5816	1.0			
	46.7	647	30	6181	1.0			
	35	863	40	6803	0.8			
	120	280	7.5	4511	2.0	MHR105	132B5	132MA6	85
	90	369	10	4965	1.7			
	60	535	15	5684	1.2			
	56	580	25	5816	1.2			
	46.7	655	30	6181	1.1			
	35	863	40	6803	0.8			
	186.7	184	7.5	3893	3.0	MHR110	112B5	112M4	86
	140	240	10	4285	2.5			
	93.3	352	15	4905	1.9			
	70	464	20	5399	1.4			
	56	566	25	5816	1.2			

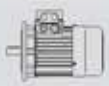
P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	fs			Page
4.0	46.7	647	30	6181	1.1	**MHR110**	**112B5**	**112M4**	86
	35	863	40	6803	0.8				
	120	280	7.5	4511	2.3	**MHR110**	**132B5**	**132MA6**	86
	90	369	10	4965	1.9				
	60	535	15	5684	1.4				
	56	580	25	5816	1.2				
	46.7	655	30	6181	1.1				
	35	863	40	6803	0.8				
	56	573	25	7607	1.6	**MHR130**	**112B5**	**112M4**	87
	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	**MHR130**	**132B5**	**132MA6**	87
	90	369	10	6494	2.6				
	60	541	15	7434	2.0				
	45	705	20	8182	1.5				
	36	860	25	8814	1.2				
	30	1006	30	9366	1.2				
	22.5	1291	40	10309	0.9				
	28	1051	50	13103	1.3	**MHR150**	**112B5**	**112M4**	88
	23.3	1212	60	13924	1.0				
	17.5	1507	80	15325	0.8				
	45	722	20	11186	2.1	**MHR150**	**132B5**	**132MA6**	88
	36	892	25	12050	1.5				
	30	1045	30	12805	1.3				
	22.5	1291	40	14094	1.4				
	18	1571	50	15182	1.0				
	15	1809	60	16133	0.8				
5.5	186.7	250	7.5	3893	1.9	**MHR105**	**132B5**	**132S4**	85
	140	330	10	4285	1.6				
	93.3	484	15	4905	1.2				
	70	638	20	5399	0.9				
	56	798	25	5816	0.9				
	46.7	901	30	6181	0.8				
	186.7	250	7.5	3893	2.2	**MHR110**	**132B5**	**132S4**	86
	140	330	10	4285	1.8				
	93.3	484	15	4905	1.4				
	70	638	20	5399	1.0				
	56	798	25	5816	0.9				
	46.7	901	30	6181	0.8				
	140	334	10	5605	2.5	**MHR130**	**132B5**	**132S4**	87
	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				
	70	653	20	9654	2.0	**MHR150**	**132B5**	**132S4**	88
	56	798	25	10400	1.5				
	46.7	946	30	11051	1.3				
	35	1186	40	12163	1.3				
	28	1445	50	13103	1.0				
	23.3	1667	60	13924	0.8				
7.5	186.7	341	7.5	3893	1.4	**MHR105**	**132B5**	**132M4**	85
	140	450	10	4285	1.2				
	93.3	660	15	4905	0.9				
	70	880	20	5399	0.7				

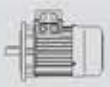
P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	fs			Page
7.5	186.7	341	7.5	3893	1.6	MHR110	132B5	132M4	86
	140	450	10	4285	1.3			
	93.3	660	15	4905	1.0			
	70	880	20	5399	0.7			
	186.7	345	7.5	5092	2.2	MHR130	132B5	132M4	87
	140	455	10	5605	1.8			
	93.3	668	15	6416	1.4			
	70	870	20	7062	1.0			
	56	1074	25	7607	0.9			
	46.7	1228	30	8084	0.8			
	35	1596	40	8897	0.7			
	70	891	20	9654	1.5	MHR150	132B5	132M4	88
	56	1088	25	10400	1.1			
	46.7	1290	30	11051	0.9			
	35	1617	40	12163	1.0			
	28	1971	50	13103	0.7			
11	186.7	512	7,5	6962	2.3	MHR150	160B5	160M4	88
	140	676	10	7663	1.8			
	93.3	991	15	8771	1.3			
	70	1306	20	9654	1.0			
	56	1595	25	10400	0.8			
15	186.7	699	7,5	6962	1.7	MHR150	160B5	160L4	88
	140	921	10	7663	1.3			
	93.3	1351	15	8771	0.9			
	70	1781	20	9654	0.7			

7.2 PC.. - MHR.. PERFORMANCE PARAMETER

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	fs			Page
0.09	12,0	48	75	3283	1,3	**PC063 - MHR040**	**6316**	90
	10,0	52	90	3488	1,4			
	7,5	63	120	3490	1,1			
	6,0	73	150	3490	0,9			
	5,0	80	180	3490	0,7			
	12,0	48	75	4506	2,4	**PC063 - MHR050**	**6316**	90
	10,0	53	90	4788	2,8			
	7,5	64	120	4840	2,0			
	6,0	74	150	4840	1,7			
	5,0	82	180	4840	1,3			
	3,8	95	240	4840	0,9			
	3,0	107	300	4840	0,8			
0.12	18.7	42	75	2833	1.2	**PC063 - MHR040**	**6314**	90
	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			
	18,7	42	75	3889	2,2	**PC063 - MHR050**	**6314**	90
	15,6	47	90	4132	2,4			
	11,7	58	120	4548	1,8			
	9.3	68	150	4840	1.3			
	7.8	75	180	4840	1.1			
	5.8	88	240	4840	0.8			
	5.8	92	240	6270	1.5	**PC063 - MHR063**	**6314**	90
	4.7	103	300	6270	1.2			
0.18	18.7	64	75	2833	0.8	**PC063 - MHR040**	**6324**	90
	15.6	70	90	3011	0.8			
	11.7	85	120	3314	0.6			
	18.7	64	75	3889	1.4	**PC063 - MHR050**	**6324**	90
	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	**PC063 - MHR063**	**6324**	90
	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	**PC071 - MHR050**	**7116**	91
	10.0	105	90	4788	1.4			
	7.5	126	120	4840	1.0			
	6.0	148	150	4840	0.8			
	12.0	97	75	5889	2.2	**PC071 - MHR063**	**7116**	91
	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	**PC071 - MHR075**	**7116**	91
	3.8	211	240	7380	1.2			
	3.0	235	300	7380	1.0			
0.25	18.7	88	75	3889	1.0	**PC071 - MHR050**	**7114**	91
	15.6	98	90	4132	1.1			
	11.7	121	120	4548	0.8			

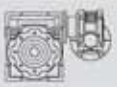
P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	fs			Page
0.25	18.7	91	75	5083	1.8	PC071 - MHR063	7114	91
	15.6	100	90	5401	2.0			
	11.7	125	120	5945	1.5			
	9.3	143	150	6270	1.2			
	7.8	163	180	6270	1.0	PC071 - MHR063	7114	91
	5.8	192	240	6270	0.7			
	4.7	215	300	6270	0.6			
	12.0	135	75	5889	1.6	PC071 - MHR063	7126	91
	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	PC071 - MHR075	7114	91
	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	PC071 - MHR075	7126	91
	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	PC071 - MHR090	7126	92
	3.8	318	240	8180	1.4			
	3.0	358	300	8180	1.1			
	18.7	134	75	5083	1.2	PC071 - MHR063	7124	91
	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	PC071 - MHR075	7124	91
	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	PC080 - MHR075	8016	92
	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	PC071 - MHR090	7124	92
	5.8	321	240	8180	1.1			
	4.7	371	300	8180	0.9			
	6.0	347	150	8180	1.6	PC080 - MHR090	8016	92
	5.0	389	180	8180	1.3			
	3.8	471	240	8180	1.0			
	3.8	509	240	10320	1.5	PC080 - MHR105	8016	93
	3.0	577	300	10320	1.2			
	3.8	509	240	10320	1.6	PC080 - MHR110	8016	93
	3.0	577	300	10320	1.3			
0.55	18.7	205	75	6000	1.2	PC080 - MHR075	8014	92
	15.6	230	90	6375	1.3			
	11.7	284	120	7017	1.0			
	9.3	332	150	7380	0.8			
	12.0	306	75	6952	1.1	PC080 - MHR075	8026	92
	10.0	341	90	7380	1.1			
	15.6	240	90	7054	2.3	PC080 - MHR090	8014	92
	11.7	297	120	7764	1.6			
	9.3	355	150	8180	1.3			
	7.8	398	180	8180	1.0			

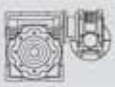
P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	fs			Page
0.55	10.0	357	90	8174	2.0	**PC080 - MHR090**	**8026**	92
	7.5	441	120	8180	1.4			
	6.0	516	150	8180	1.1			
	5.0	578	180	8180	0.9			
	7.8	425	180	10320	1.7	**PC080 - MHR105**	**8014**	93
	5.8	513	240	10320	1.2			
	4.7	597	300	10320	1.0			
	7.5	462	120	10320	2.2	**PC080 - MHR105**	**8026**	93
	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	**PC080 - MHR110**	**8014**	93
	5.8	513	240	10320	1.3			
	4.7	597	300	10320	1.0			
	7.5	462	120	10320	2.6	**PC080 - MHR110**	**8026**	93
	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	**PC080 - MHR130**	**8026**	93
	3.0	858	300	13500	1.3			
0.75	18.7	280	75	6000	0.9	**PC080 - MHR075**	**8024**	92
	15.6	313	90	6375	1.0			
	15.6	327	90	7054	1.7	**PC080 - MHR090**	**8024**	92
	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	**PC080 - MHR105**	**8024**	93
	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	**PC090 - MHR105**	**90S6**	93
	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	**PC080 - MHR110**	**8024**	93
	9.3	506	150	10320	1.7			
	7.8	580	180	10320	1.3			
	5.8	700	240	10320	0.9			
	12.4	393	73	9614	3.2	**PC090 - MHR110**	**90S6**	93
	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	**PC080 - MHR130**	**8024**	93
	4.7	813	300	13500	1.1			
	12.4	399	73	12575	4.4	**PC090 - MHR130**	**90S6**	93
	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	**PC090 - MHR105**	**90L6**	93
	9.3	746	96.8	10320	1.4			
	7.4	890	121	10320	1.1			
	6.2	1000	145.2	10320	0.9			

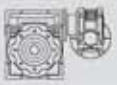
P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	fs			Page
1.5	19.3	392	73	8298	2.2	PC090 - MHR105	90S4	93
	14.5	508	96.8	9133	1.6			
	11.6	599	121	9838	1.3			
	9.6	686	145.2	10320	1.0			
	7.2	828	193.6	10320	0.8			
	12.4	576	73	9614	2.2	PC090 - MHR110	90L6	93
	9.3	746	96.8	10320	1.6			
	7.4	890	121	10320	1.2			
	6.2	1000	145.2	10320	1.0			
	19.3	392	73	8298	2.5	PC090 - MHR110	90S4	93
	14.5	508	96.8	9133	1.8			
	11.6	599	121	9838	1.5	PC090 - MHR110	90S4	93
	9.6	686	145.2	10320	1.1			
	7.2	828	193.6	10320	0.8			
	12.4	585	73	12575	3.0	PC090 - MHR130	90L6	93
	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	PC090 - MHR130	90S4	93
	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			
	19.3	535	73	8298	1.6	PC090 - MHR105	90L4	93
	14.5	693	96.8	9133	1.2			
	11.6	817	121	9838	1.0			
	9.6	936	145.2	10320	0.8			
	19.3	535	73	8298	1.9	PC090 - MHR110	90L4	93
	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	PC090 - MHR130	90L4	93
	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	PC090 - MHR105	90L2	93
	28.9	516	96.8	7249	1.3			
	23.1	617	121	7809	1.1			
2.2	38.6	398	73	6586	2.1	PC090 - MHR110	90L2	93
	28.9	516	96.8	7249	1.5			
	23.1	617	121	7809	1.2			
	38.6	409	73	8614	2.9	PC090 - MHR130	90L2	93
	28.9	545	96.8	9481	2.0			
	23.1	654	121	10213	1.6			
	19.3	752	145.2	10853	1.3			

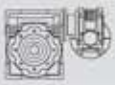
7.3 MHR.. - MHR.. PERFORMANCE PARAMETER

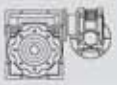
P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	fs			Page
0.06	14.0	25	100	1620	1.3	MHR025/030	5614	94
	9.3	33	150	1830	0.9			
	7.0	41	200	1830	0.7			
	5.6	45	250	1830	0.8			
	4.7	56	300	3490	1.2	MHR025/040	5614	94
	3.5	69	400	3490	0.9			
	2.8	94	500	3490	0.7			
	2.3	100	600	3490	0.6			
	1.9	115	750	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			
	14.0	26	100	2769	2.7	MHR030/040	5614	94
	9.3	37	150	3169	1.9			
	7.0	47	200	3488	1.4			
	5.6	55	250	3490	1.1			
	4.7	60	300	3490	1.2			
	3.5	72	400	3490	0.9			
	7.0	47	200	4788	2.6	MHR030/050	5614	95
	5.6	55	250	4840	2.0			
	4.7	61	300	4840	2.4			
	3.5	73	400	4840	1.7			
	2.8	85	500	4840	1.4			
	2.3	109	600	4840	1.3			
	1.9	127	750	4840	1.1			
	1.6	146	900	4840	1.0			
	1.2	177	1200	4840	0.8			
	0.9	206	1500	4840	0.7			
	3.5	76	400	6270	3.4	MHR030/063	5614	95
	2.8	88	500	6270	2.7			
	2.3	111	600	6270	2.4			
	1.9	129	750	6270	2.1			
	1.6	148	900	6270	1.8			
	1.2	180	1200	6270	1.5			
	0.9	210	1500	6270	1.3			
	0.8	234	1800	6270	1.2			
	0.6	286	2400	6270	0.9			
	0.5	332	3000	6270	0.7			
	2.8	102	500	3800	1.3	MHR040/050	5614	95
	1.6	159	900	4350	0.9			
	0.9	236	1500	6270	1.1	MHR040/063	5614	96
	0.8	265	1800	6270	1.0			
	0.6	325	2400	6270	0.8			
	0.9	248	1500	7380	1.8	MHR040/075	5614	96
	0.8	278	1800	7380	1.6			
	0.6	267	2400	7380	1.1			
	0.5	305	3000	7380	0.8			
	0.4	360	4000	7380	0.7			
	0.3	409	5000	7380	0.5			

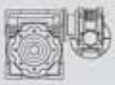
P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	fs			Page
0.06	0.9	259	1500	8180	2.7	MHR040/090	5614	96
	0.8	291	1800	8180	2.4			
	0.6	359	2400	8180	1.7			
	0.5	329	3000	8180	1.4			
	0.4	393	4000	8180	1.3			
	0.3	430	5000	8180	1.0			
0.09	28.0	18	100	1286	1.6	MHR025/030	5612	94
	18.7	25	150	1472	1.1			
	14.0	31	200	1620	0.9			
	14.0	37	100	1620	0.8	MHR025/030	5624	94
	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			
	14.0	39	100	2769	1.8	MHR025/040	5612	94
	9.3	54	150	3488	1.2			
	7.0	70	200	3488	0.9			
	5.6	83	250	3490	0.7			
	9.3	43	300	3490	1.6			
	7.0	52	400	3490	1.2			
	5.6	71	500	3490	0.8			
	14.0	39	100	2769	1.8	MHR030/040	5624	94
	9.3	56	150	3169	1.3			
	7.0	70	200	3488	0.9			
	5.6	83	250	3490	0.7			
	4.7	82	300	3490	0.8			
	14.0	40	100	3800	3.4	MHR030/050	5624	95
	9.3	56	150	4350	2.4			
	7.0	70	200	4788	1.7			
	5.6	83	250	4840	1.3			
	4.7	92	300	4840	1.6			
	3.5	103	400	4840	1.2			
	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			
	5.6	85	250	6270	2.7	MHR030/063	5624	95
	4.7	88	300	6270	2.9			
	3.5	114	400	6270	2.2			
	2.8	132	500	6270	1.8			
	2.3	166	600	6270	1.6			
	1.9	194	750	6270	1.4			
	1.6	188	900	6270	1.0			
	1.2	222	1200	6270	0.9			
	0.9	259	1500	6270	0.7			
	0.8	351	1800	6270	0.8			

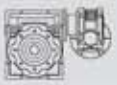
P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	fs			Page
0.09	2.8	153	500	3800	0.9	**MHR040/050**	**5624**	95
	0.9	354	1500	6270	0.8	**MHR040/063**	**5624**	96
	0.9	305	1500	7380	1.1	**MHR040/075**	**5624**	96
	0.8	331	1800	7380	1.0			
	0.6	400	2400	7380	0.7			
	0.5	494	3000	8180	0.9	**MHR040/090**	**5624**	96
	0.4	589	4000	8180	0.8			
0.12	14.0	52	100	2769	1.4	**MHR030/040**	**6314**	94
	9.3	74	150	3169	1.0			
	14.0	54	100	3800	2.6	**MHR030/050**	**6314**	95
	9.3	74	150	4350	1.8			
	7.0	94	200	4788	1.3			
	5.6	110	250	4840	1.0			
	4.7	112	300	4840	1.2			
	3.5	138	400	4840	0.9			
	2.8	160	500	4840	0.7			
	14.0	54	100	4967	2.8	**MHR030/063**	**6314**	95
	9.3	75	150	5686	2.8			
	7.0	95	200	6259	2.7			
	5.6	114	250	6270	2.0			
	4.7	117	300	6270	2.2			
	3.5	152	400	6270	1.7			
	2.8	168	500	6270	1.3			
	2.3	199	600	6270	1.1			
	1.9	217	750	6270	0.9			
	1.6	297	900	6270	0.9			
	1.2	360	1200	6270	0.8			
	14.0	55	100	3800	2.5	**MHR040/050**	**6314**	95
	9.3	76	150	4350	1.8			
	7.0	96	200	4788	1.2			
	5.6	113	250	4840	1.0			
	4.7	125	300	4840	1.2			
	3.5	150	400	4840	0.8			
	9.3	77	150	5686	3.4	**MHR040/063**	**6314**	96
	7.0	97	200	6259	2.6			
	5.6	117	250	6270	2.0			
	4.7	127	300	6270	2.1			
	3.5	156	400	6270	1.6			
	2.8	217	500	6270	1.1			
	2.3	237	600	6270	1.1			
	1.9	285	750	6270	1.0			
	1.6	319	900	6270	0.8			
	5.6	120	250	7380	3.2	**MHR040/075**	**6314**	96
	4.7	134	300	7380	3.3			
	3.5	164	400	7380	2.5			
	2.8	188	500	7380	2.0			
	2.3	248	600	7380	1.8			
	1.9	299	750	7380	1.5			
	1.6	335	900	7380	1.3			
	1.2	415	1200	7380	1.1			
	0.9	495	1500	7380	0.9			
	0.8	556	1800	7380	0.8			
	2.8	202	500	8180	2.8	**MHR040/090**	**6314**	96
	2.3	260	600	8180	2.7			
	1.9	313	750	8180	2.2			
	1.6	350	900	8180	2.0			

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	fs			Page
0.12	1.2	434	1200	8180	1.6	MHR040/090	6314	96
	0.9	518	1500	8180	1.4			
	0.8	470	1800	8180	0.9			
	0.6	593	2400	8180	0.9			
	1.2	448	1200	8180	1.6	MHR050/090	6314	97
	0.9	527	1500	8180	1.3			
	0.8	592	1800	8180	1.2			
	0.6	731	2400	8180	0.8			
	1.2	448	1200	10320	2.8	MHR050/105	6314	97
	0.9	527	1500	10320	2.4			
	0.8	592	1800	10320	2.1			
	0.6	766	2400	10320	1.5			
	0.5	731	3000	10320	1.1			
	0.4	884	4000	10320	1.0			
	0.3	1023	5000	10320	0.8			
	1.2	448	1200	10320	2.8	MHR050/110	6314	97
	0.9	527	1500	10320	2.4			
	0.8	592	1800	10320	2.1			
	0.6	766	2400	10320	1.5			
	0.5	731	3000	10320	1.2			
	0.4	884	4000	10320	1.0			
	0.3	1023	5000	10320	0.8			
0.18	14.0	78	100	2769	0.9	MHR030/040	6324	94
	14.0	81	100	3800	1.7	MHR030/050	6324	95
	9.3	112	150	4350	1.2			
	7.0	141	200	4788	0.9			
	4.7	183	300	4840	0.8			
	14.0	81	100	4967	1.9	MHR030/063	6324	95
	9.3	113	150	5686	1.9			
	7.0	143	200	6259	1.8			
	5.6	171	250	6270	1.4			
	4.7	175	300	6270	1.5			
	3.5	216	400	6270	1.0			
	2.8	252	500	6270	0.8			
	2.3	333	600	6270	0.8			
	14.0	82	100	3800	1.7	MHR040/050	6324	95
	9.3	114	150	4350	1.2			
	7.0	144	200	4788	0.8			
	4.7	188	300	4840	0.8			
	14.0	82	100	4967	3.1	MHR040/063	6324	96
	9.3	116	150	5686	2.2			
	7.0	146	200	6259	1.7			
	5.6	175	250	6270	1.3			
	4.7	191	300	6270	1.4			
	3.5	234	400	6270	1.1			
	2.8	325	500	6270	0.7			
	2.3	355	600	6270	0.8			
	7.0	150	200	7380	2.8	MHR040/075	6324	96
	5.6	180	250	7380	2.1			
	4.7	200	300	7380	2.2			
	3.5	246	400	7380	1.7			
	2.8	282	500	7380	1.3			
	2.3	336	600	7380	1.1			
	1.9	371	750	7380	0.9			
	1.6	419	900	7380	0.8			
	1.2	622	1200	7380	0.7			

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	fs			Page
0.18	5.6	188	250	8180	3.0	**MHR040/090**	**6324**	96
	4.7	210	300	8180	3.3			
	3.5	259	400	8180	2.4			
	2.8	303	500	8180	1.9			
	2.3	390	600	8180	1.8			
	1.9	469	750	8180	1.5			
	1.6	526	900	8180	1.3			
	1.2	544	1200	8180	1.0			
	0.9	647	1500	8180	0.8			
	0.8	874	1800	8180	0.8			
	1.2	671	1200	8180	1.0	**MHR050/090**	**6324**	97
	0.9	790	1500	8180	0.9			
	0.8	888	1800	8180	0.8			
	1.2	671	1200	10320	1.9	**MHR050/105**	**6324**	97
	0.9	790	1500	10320	1.6			
	0.8	727	1800	10320	1.3			
	0.6	948	2400	10320	0.9			
	0.5	1370	3000	10320	0.8			
	1.2	671	1200	10320	1.9	**MHR050/110**	**6324**	97
	0.9	790	1500	10320	1.6			
	0.8	727	1800	10320	1.5			
	0.6	948	2400	10320	1.1			
	0.5	1370	3000	10320	0.8			
	7.0	150	400	6270	1.4	**MHR030/063**	**6322**	95
	5.6	175	500	6270	1.2			
0.25	14.0	115	100	3800	1.2	**MHR040/050**	**7114**	95
	9.3	159	150	4350	0.9			
	14.0	115	100	4967	2.2	**MHR040/063**	**7114**	96
	9.3	161	150	5686	1.6			
	7.0	203	200	6259	1.2			
	5.6	243	250	6270	1.0			
	4.7	265	300	6270	1.0			
	3.5	325	400	6270	0.8			
	14.0	116	100	5863	3.0	**MHR040/075**	**7114**	96
	9.3	165	150	6712	2.6			
	7.0	209	200	7380	2.0			
	5.6	250	250	7380	1.5			
	4.7	278	300	7380	1.6			
	3.5	321	400	7380	1.1			
	2.8	375	500	7380	0.8			
	2.3	517	600	7380	0.9			
	1.9	622	750	7380	0.7			
	14.0	119	100	6487	3.0	**MHR040/090**	**7114**	96
	9.3	170	150	7426	3.0			
	7.0	217	200	8174	2.8			
	5.6	261	250	8180	2.2			
	4.7	291	300	8180	2.4			
	3.5	359	400	8180	1.7			
	2.8	420	500	8180	1.3			
	2.3	488	600	8180	1.2			
	1.9	553	750	8180	0.9			
	1.6	612	900	8180	0.8			
	1.2	905	1200	8180	0.8			
	7.0	223	200	8174	2.7	**MHR050/090**	**7114**	97
	5.6	267	250	8180	2.1			
	4.7	298	300	8180	2.3			

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	fs			Page
0.25	3.5	368	400	8180	1.7	MHR050/090	7114	97
	2.8	491	500	8180	1.2			
	2.3	548	600	8180	1.3			
	1.9	660	750	8180	1.1			
	1.6	751	900	8180	0.9			
	1.2	932	1200	8180	0.8			
	3.5	386	400	10320	3.1	MHR050/105	7114	97
	2.8	512	500	10320	2.3			
	2.3	548	600	10320	2.3			
	1.9	660	750	10320	1.9			
	1.6	751	900	10320	1.7			
	1.2	776	1200	10320	1.1			
	0.9	924	1500	10320	1.0			
	0.8	1010	1800	10320	0.9			
	0.6	1596	2400	10320	0.7			
	3.5	386	400	10320	3.1	MHR050/110	7114	97
	2.8	512	500	10320	2.3			
	2.3	548	600	10320	2.3			
	1.9	660	750	10320	1.9			
	1.6	751	900	10320	1.7			
	1.2	776	1200	10320	1.3			
	0.9	924	1500	10320	1.2			
	0.8	1010	1800	10320	1.1			
	0.6	1596	2400	10320	0.7			
	3.5	386	400	10320	2.7	MHR063/105	7114	98
	2.8	524	500	10320	1.9			
	2.3	562	600	10320	2.0			
	1.9	677	750	10320	1.7			
	1.6	771	900	10320	1.4			
	1.2	973	1200	10320	1.1			
	0.9	1148	1500	10320	1.0			
	0.8	1296	1800	10320	0.9			
	0.6	1676	2400	10320	0.6			
	3.5	386	400	10320	3.1	MHR063/110	7114	98
	2.8	524	500	10320	2.2			
	2.3	562	600	10320	2.3			
	1.9	677	750	10320	1.9			
	1.6	771	900	10320	1.6			
	1.2	973	1200	10320	1.3			
	0.9	1148	1500	10320	1.1			
	0.8	1296	1800	10320	1.0			
	0.6	1676	2400	10320	0.7			
	2.8	460	500	13500	3.4	MHR063/130	7114	98
	2.3	571	600	13500	3.1			
	1.9	687	750	13500	2.6			
	1.6	783	900	13500	2.2			
	1.2	988	1200	13500	1.8			
	0.9	1165	1500	13500	1.5			
	0.8	1315	1800	13500	1.3			
	0.6	1358	2400	13500	1.0			
	0.5	1626	3000	13500	0.8			
	0.4	1910	4000	13500	0.6			
	0.3	2132	5000	13500	0.5			
	1.9	666	750	18000	3.5	MHR063/150	7114	99
	1.6	840	900	18000	2.5			
	1.2	1013	1200	18000	2.6			
	0.8	1412	1800	18000	1.5			

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	fs			Page
0.25	0.6	1702	2400	18000	1.6	**MHR063/150**	**7114**	99
	0.5	1998	3000	18000	1.2			
	0.4	2453	4000	18000	0.9			
	0.3	2749	5000	18000	0.8			
0.37	9.3	182	300	6270	1.3	**MHR030/063**	**7112**	95
	7.0	222	400	6270	1.0			
	14.0	169	100	3800	0.8	**MHR040/050**	**7124**	95
	14.0	169	100	4967	1.5	**MHR040/063**	**7124**	96
	9.3	238	150	5686	1.1			
	7.0	300	200	6259	0.8			
	14.0	172	100	5863	2.1	**MHR040/075**	**7124**	96
	9.3	245	150	6712	1.7			
	7.0	309	200	7380	1.4			
	5.6	370	250	7380	1.0			
	4.7	383	300	7380	1.0			
	3.5	474	400	7380	0.7			
	14.0	176	100	6487	2.1	**MHR040/090**	**7124**	96
	9.3	251	150	7426	2.1			
	7.0	322	200	8174	1.9			
	5.6	386	250	8180	1.5			
	4.7	406	300	8180	1.5			
	3.5	505	400	8180	1.2			
	2.8	593	500	8180	0.9			
	2.3	722	600	8180	0.8			
	2.3	722	600	8180	0.8			
	14.0	180	100	6487	3.3	**MHR050/090**	**7124**	97
	9.3	257	150	7426	2.6			
	7.0	329	200	8174	1.9			
	5.6	395	250	8180	1.4			
	4.7	441	300	8180	1.6			
	3.5	545	400	8180	1.1			
	2.8	727	500	8180	0.8			
	2.3	812	600	8180	0.9			
	1.9	977	750	8180	0.7			
	7.0	338	200	10320	3.4	**MHR050/105**	**7124**	97
	5.6	412	250	10320	2.8			
	4.7	441	300	10320	2.9			
	3.5	571	400	10320	2.1			
	2.8	757	500	10320	1.5			
	2.3	812	600	10320	1.6			
	1.9	837	750	10320	1.2			
	1.6	928	900	10320	1.0			
	1.2	1148	1200	10320	0.7			
	0.9	1623	1500	10320	0.8			
	7.0	338	200	10320	3.4	**MHR050/110**	**7124**	97
	5.6	412	250	10320	2.8			
	4.7	441	300	10320	2.9			
	3.5	571	400	10320	2.1			
	2.8	757	500	10320	1.5			
	2.3	812	600	10320	1.6			
	1.9	837	750	10320	1.2			
	1.6	928	900	10320	1.0			
	1.2	1148	1200	10320	0.7			
	0.9	1623	1500	10320	0.8			
	7.0	338	200	10320	3.0	**MHR063/105**	**7124**	98
	5.6	412	250	10320	2.5			

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	fs			Page
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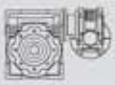
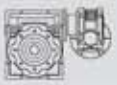
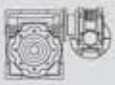
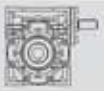
	3.5	571	400	10320	1.8			
	2.8	776	500	10320	1.3			
	2.3	832	600	10320	1.3			
	1.9	1002	750	10320	1.1			
	1.6	1141	900	10320	1.0			
	1.2	1441	1200	10320	0.8			
	0.9	1699	1500	10320	0.6			
	7.0	338	200	10320	3.4	MHR063/110	7124	98
	5.6	412	250	10320	2.8			
	4.7	441	300	10320	2.9			
	3.5	571	400	10320	2.1			
	2.8	776	500	10320	1.5			
	2.3	832	600	10320	1.5			
	1.9	1002	750	10320	1.3			
	1.6	1141	900	10320	1.1			
	1.2	1441	1200	10320	0.9			
	0.9	1699	1500	10320	0.7			
	3.5	571	400	13500	2.9	MHR063/130	7124	98
	2.8	681	500	13500	2.3			
	2.3	844	600	13500	2.1			
	1.9	1017	750	13500	1.7			
	1.6	1158	900	13500	1.5			
	1.2	1462	1200	13500	1.2			
	0.9	1725	1500	13500	1.0			
	0.8	1946	1800	13500	0.9			
	2.8	681	500	18000	3.4	MHR063/150	7124	99
	2.3	840	600	18000	3.2			
	1.9	986	750	18000	2.4			
	1.6	1244	900	18000	1.7			
	1.2	1499	1200	18000	1.8			
	0.8	2089	1800	18000	1.0			
	0.6	2519	2400	18000	1.1			
	0.5	2958	3000	18000	0.8			
0.55	9.3	305	300	8180	2.0	MHR040/090	7122	96
	7.0	375	400	8180	1.5			
	5.6	441	500	8180	1.2			
	14.0	268	100	6487	2.2	MHR050/090	8014	97
	9.3	382	150	7426	1.7			
	7.0	490	200	8174	1.2			
	5.6	588	250	8180	1.0			
	4.7	656	300	8180	1.1			
	3.5	809	400	8180	0.8			
	14.0	268	100	8198	2.4	MHR050/105	8014	97
	9.3	387	150	9384	2.4			
	7.0	503	200	10320	2.3			
	5.6	612	250	10320	1.9			
	4.7	615	300	10320	1.7			
	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			
	1.6	1651	900	10320	0.8			
	14.0	268	100	8198	2.4	MHR050/110	8014	97
	9.3	387	150	9384	2.4			
	7.0	503	200	10320	2.3			
	5.6	612	250	10320	1.9			

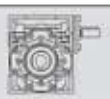
P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	fs			Page
0.55	4.7	615	300	10320	1.7	**MHR050/110**	**8014**	97
	3.5	810	400	10320	1.2			
	2.8	938	500	10320	1.0			
	2.3	1096	600	10320	0.9			
	1.9	1244	750	10320	0.8			
	1.6	1651	900	10320	0.8			
	9.3	387	150	9384	2.7	**MHR063/105**	**8014**	98
	7.0	503	200	10320	2.0			
	5.6	612	250	10320	1.7			
	4.7	656	300	10320	1.7			
	3.5	849	400	10320	1.2			
	2.8	1154	500	10320	0.9			
	2.3	1237	600	10320	0.9			
	1.9	1489	750	10320	0.7			
	1.6	1697	900	10320	0.6			
	9.3	387	150	9384	3.1	**MHR063/110**	**8014**	98
	7.0	503	200	10320	2.3			
	5.6	612	250	10320	1.9			
	4.7	656	300	10320	1.9			
	3.5	849	400	10320	1.4			
	2.8	1154	500	10320	1.0			
	2.3	1237	600	10320	1.0			
	1.9	1489	750	10320	0.8			
	1.6	1697	900	10320	0.7			
	7.0	503	200	13500	3.2	**MHR063/130**	**8014**	98
	5.6	612	250	13500	2.5			
	4.7	666	300	13500	2.6	**MHR063/130**	**8014**	98
	3.5	849	400	13500	1.9			
	2.8	957	500	13500	1.6			
	1.9	1382	750	13500	1.2			
	1.2	2057	1200	13500	0.8			
	5.6	612	250	18000	3.3	**MHR063/130**	**8014**	99
	4.7	728	300	18000	3.2			
	3.5	862	400	18000	3.1			
	2.8	1012	500	18000	2.3			
	2.3	1248	600	18000	2.1			
	1.9	1465	750	18000	1.6			
	1.6	1849	900	18000	1.1			
	1.2	2229	1200	18000	1.2			
	0.6	3744	2400	18000	0.7			
0.75	7.0	512	400	8180	1.1	**MHR040/090**	**8012**	96
	5.6	601	500	8180	0.9			
	14.0	365	100	6487	1.6	**MHR050/090**	**8024**	97
	9.3	521	150	7426	1.3			
	7.0	668	200	8174	0.9			
	5.6	801	250	8180	0.7			
	4.7	895	300	8180	0.8			
	9.3	424	300	10320	2.5	**MHR050/105**	**8012**	97
	7.0	553	400	10320	1.8			
	5.6	640	500	10320	1.5			
	14.0	365	100	8198	1.8	**MHR050/105**	**8024**	97
	9.3	527	150	9384	1.8			
	7.0	685	200	10320	1.7			
	5.6	835	250	10320	1.4			
	4.7	838	300	10320	1.3			
	3.5	1105	400	10320	0.9			
	2.8	1535	500	10320	0.8			
	2.3	1645	600	10320	0.8			

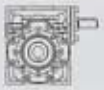
P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	fs			Page
0.75	9.3	424	300	10320	2.8	MHR050/110	8012	97
	7.0	553	400	10320	2.1			
	5.6	640	500	10320	1.6			
	14.0	365	100	8198	1.8	MHR050/110	8024	97
	9.3	527	150	9384	1.8			
	7.0	685	200	10320	1.7			
	5.6	835	250	10320	1.4			
	4.7	838	300	10320	1.3			
	3.5	1105	400	10320	0.9			
	2.8	1535	500	10320	0.8			
	2.3	1645	600	10320	0.8			
	14.0	365	100	8198	2.6	MHR063/105	8024	98
	9.3	527	150	9384	2.0			
	7.0	685	200	10320	1.5			
	5.6	835	250	10320	1.2			
	4.7	895	300	10320	1.2			
	3.5	1157	400	10320	0.9			
	2.8	1573	500	10320	0.6			
	2.3	1686	600	10320	0.7			
	14.0	365	100	8198	3.0	MHR063/110	8024	98
	9.3	527	150	9384	2.3			
	7.0	685	200	10320	1.7			
	5.6	835	250	10320	1.4			
	4.7	895	300	10320	1.4			
	3.5	1157	400	10320	1.0			
	2.8	1573	500	10320	0.7			
	2.3	1686	600	10320	0.8			
	14.0	369	100	10722	3.0	MHR063/130	8024	98
	9.3	521	150	12274	3.0			
	7.0	685	200	13500	2.3			
	5.6	835	250	13500	1.8			
	4.7	908	300	13500	1.9			
	3.5	1157	400	13500	1.4	MHR063/130	8024	98
	2.8	1305	500	13500	1.1			
	2.3	1557	600	13500	1.0			
	1.9	1772	750	13500	0.9			
	1.6	2014	900	13500	0.8			
	7.0	685	200	18000	3.0	MHR063/150	8024	99
	5.6	835	250	18000	2.5			
	4.7	993	300	18000	2.3			
	3.5	1175	400	18000	2.3			
	2.8	1380	500	18000	1.7			
	2.3	1702	600	18000	1.6			
	1.9	1998	750	18000	1.2			
	1.6	2521	900	18000	0.8			
	1.2	3039	1200	18000	0.9			
1.1	9.3	621	300	10320	1.7	MHR050/105	8022	97
	7.0	810	400	10320	1.2			
	5.6	938	500	10320	1.0			
	9.3	621	300	10320	1.9	MHR050/110	8022	97
	7.0	810	400	10320	1.4			
	5.6	938	500	10320	1.1			
	14.0	535	100	8198	1.8	MHR063/105	90S4	98
	9.3	774	150	9384	1.3			
	7.0	1005	200	10320	1.0			
	5.6	1224	250	10320	0.9			
	4.7	1312	300	10320	0.9			

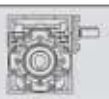
P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	fs			Page
1.1	14.0	535	100	8198	2.1	**MHR063/110**	**90S4**	98
	9.3	774	150	9384	1.5			
	7.0	1005	200	10320	1.1			
	5.6	1224	250	10320	1.0			
	4.7	1312	300	10320	1.0			
	14.0	542	100	10722	2.1	**MHR063/130**	**90S4**	98
	9.3	764	150	12274	2.1			
	7.0	1005	200	13500	1.6			
	5.6	1224	250	13500	1.2			
	4.7	1274	300	13500	1.3			
	3.5	1621	400	13500	1.0			
	2.8	1913	500	13500	0.8			
	2.3	2510	600	13500	0.7			
	9.3	771	150	18000	2.6	**MHR063/150**	**90S4**	99
	7.0	1005	200	18000	2.1			
	5.6	1224	250	18000	1.7			
	4.7	1456	300	18000	1.6			
	3.5	1723	400	18000	1.5			
	2.8	2024	500	18000	1.2			
	2.3	2496	600	18000	1.1			
	1.9	2931	750	18000	0.8			
1.5	9.3	847	300	10320	1.2	**MHR050/105**	**90S2**	97
	7.0	1105	400	10320	0.9			
	5.6	1279	500	10320	0.7			
	9.3	847	300	10320	1.4	**MHR050/110**	**90S2**	97
	7.0	1105	400	10320	1.0			
	5.6	1279	500	10320	0.8			
	14.0	730	100	8198	1.3	**MHR063/105**	**90L4**	98
	9.3	1055	150	9384	1.0			
	7.0	1371	200	10320	0.7			
	5.6	1669	250	10320	0.6			
	4.7	1789	300	10320	0.6			
	14.0	730	100	8198	1.5	**MHR063/110**	**90L4**	98
	9.3	1055	150	9384	1.1			
	7.0	1371	200	10320	0.8			
	5.6	1669	250	10320	0.7			
	4.7	1789	300	10320	0.7			
	9.3	878	300	13500	1.9	**MHR063/130**	**90S2**	98
	7.0	1105	400	13500	1.4			
	5.6	1305	500	13500	1.1			
	14.0	739	100	10722	1.5	**MHR063/130**	**90L4**	98
	9.3	1042	150	12274	1.5			
	7.0	1371	200	13500	1.2			
	5.6	1669	250	13500	0.9			
	4.7	1737	300	13500	1.0			
	3.5	2210	400	13500	0.7			
	9.3	1052	150	18000	1.9	**MHR063/150**	**90L4**	99
	7.0	1371	200	18000	1.5			
	5.6	1669	250	18000	1.2			
	4.7	1985	300	18000	1.2			
	3.5	2350	400	18000	1.1			
	2.8	2760	500	18000	0.8			
	2.3	3404	600	18000	0.8			

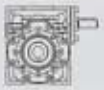
7.4 HSR.. PERFORMANCE PARAMETER

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	HSR030	89
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	HSR040	89
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	HSR050	89
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	HSR063	89
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	HSR075	89
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		
170	2800	30	2.1	93.3	3509	980		
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		

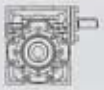
M_{2n} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]	F_{r2} [N]	F_{r1} [N]		Page
210	2800	7.5	9.0	373.3	2446	715	**HSR090**	89
235	2800	10	7.7	280	2692	900		
270	2800	15	6.0	186.7	3081	1034		
260	2800	20	4.4	140	3391	1120		
250	2800	25	3.4	112	3653	1270		
310	2800	30	3.7	93.3	3882	1270		
275	2800	40	2.6	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	**HSR105**	89
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	**HSR110**	89
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	**HSR130**	89
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		
840	2800	7,5	35.7	373.3	5526	1550	**HSR150**	89
890	2800	10	28.4	280	6082	1848		
910	2800	15	19.8	186.7	6962	1889		
980	2800	20	16.0	140	7663	2289		
890	2800	25	11.9	112	8254	2494		
920	2800	30	10.3	93.3	8771	2800		
1200	2800	40	10.5	70	9654	2800		
1100	2800	50	8.0	56	10400	2800		
990	2800	60	6.1	46.7	11051	2800		
920	2800	80	4.5	35	12163	2800		
810	2800	100	3.3	28	13103	2800		

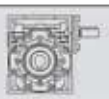
M_{2n} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]	F_{r2} [N]	F_{r1} [N]		Page
18	1400	7.5	0.4	186.7	683	150	HSR030	89
18	1400	10	0.3	140	752	169		
18	1400	15	0.2	93.3	861	169		
18	1400	20	0.2	70	948	190		
21	1400	25	0.2	56	1021	210		
20	1400	30	0.2	46.7	1085	210		
18	1400	40	0.1	35	1194	210		
17	1400	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	HSR040	89
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	HSR050	89
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	HSR063	89
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	HSR075	89
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		
220	1400	40	1.1	35	4865	980		
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		

M_{2n} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]	F_{r2} [N]	F_{r1} [N]		Page
290	1400	7.5	6.4	186.7	3081	900	**HSR090**	89
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	**HSR105**	89
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	**HSR110**	89
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	**HSR130**	89
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		
1200	1400	7,5	25.8	186.7	6962	1950	**HSR150**	89
1240	1400	10	20.2	140	7663	2267		
1250	1400	15	13.9	93.3	8771	2285		
1300	1400	20	11.0	70	9654	2674		
1200	1400	25	8.3	56	10400	2800		
1200	1400	30	7.0	46.7	11051	2800		
1550	1400	40	7.2	35	12163	2800		
1400	1400	50	5.3	28	13103	2800		
1260	1400	60	4.2	23.3	13924	2800		
1150	1400	80	3.1	17.5	15325	2800		
1000	1400	100	2.3	14	16508	2800		

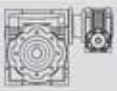
M_{2n} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]	F_{r2} [N]	F_{r1} [N]		Page
20	900	7.5	0.30	120	792	175	**HSR030**	89
20	900	10	0.24	90	871	197		
20	900	15	0.17	60	997	197		
20	900	20	0.13	45	1098	210		
23	900	25	0.14	36	1183	210		
21	900	30	0.11	30	1257	210		
20	900	40	0.09	22.5	1383	210		
18	900	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	**HSR040**	89
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	**HSR050**	89
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	**HSR063**	89
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	**HSR075**	89
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		
240	900	40	0.84	22.5	5637	980		
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		

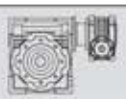
M_{2n} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]	F_{r2} [N]	F_{r1} [N]		Page
340	900	7.5	4.9	120	3570	1040	**HSR090**	89
370	900	10	4.1	90	3929	1270		
420	900	15	3.2	60	4498	1270		
390	900	20	2.3	45	4951	1270		
370	900	25	1.8	36	5333	1270		
460	900	30	1.9	30	5667	1270		
410	900	40	1.4	22.5	6238	1270		
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	**HSR105**	89
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	**HSR110**	89
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	**HSR130**	89
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		
1400	900	7,5	19.6	120	8067	2270	**HSR150**	89
1480	900	10	15.7	90	8878	2700		
1450	900	15	10.5	60	10163	2645		
1500	900	20	8.3	45	11186	2800		
1380	900	25	6.2	36	12050	2800		
1400	900	30	5.4	30	12805	2800		
1800	900	40	5.6	22.5	14094	2800		
1600	900	50	4.1	18	15182	2800		
1440	900	60	3.2	15	16133	2800		
1300	900	80	2.3	11.3	17757	2800		
1150	900	100	1.8	9	18000	2800		

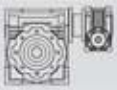
M_{2n} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]	F_{r2} [N]	F_{r1} [N]		Page
24	500	7.5	0.21	66.7	963	210	**HSR030**	89
24	500	10	0.16	50	1060	210		
24	500	15	0.12	33.3	1213	210		
23	500	20	0.09	25	1336	210		
29	500	25	0.10	20	1439	210		
26	500	30	0.08	16.7	1529	210		
23	500	40	0.06	12.5	1683	210		
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	**HSR040**	89
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		
36	500	100	0.05	5	3490	350		
103	500	7.5	0.87	66.7	2544	490	**HSR050**	89
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		
65	500	100	0.09	5	4840	490		
184	500	7.5	1.5	66.7	3325	700	**HSR063**	89
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		
128	500	100	0.16	5	6270	700		
260	500	7.5	2.2	66.7	3925	980	**HSR075**	89
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		
280	500	40	0.58	12.5	6858	980		
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		

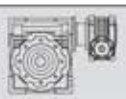
M_{2n} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]	F_{r2} [N]	F_{r1} [N]		Page
410	500	7.5	3.3	66.7	4343	1270	**HSR090**	89
435	500	10	2.7	50	4780	1270		
490	500	15	2.1	33.3	5472	1270		
470	500	20	1.6	25	6022	1270		
440	500	25	1.2	20	6487	1270		
550	500	30	1.4	16.7	6894	1270		
480	500	40	0.94	12.5	7588	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	**HSR105**	89
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	**HSR110**	89
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	**HSR130**	89
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		
1700	500	7,5	13.5	66.7	9812	2800	**HSR150**	89
1780	500	10	10.7	50	10800	2800		
1730	500	15	7.2	33.3	12363	2800		
1820	500	20	5.8	25	13607	2800		
1630	500	25	4.3	20	14658	2800		
1670	500	30	3.7	16.7	15576	2800		
2120	500	40	3.4	12.5	17144	2800		
1870	500	50	2.8	10	18000	2800		
1680	500	60	2.3	8.3	18000	2800		
1530	500	80	1.7	6.3	18000	2800		
1350	500	100	1.29	5	18000	2800		

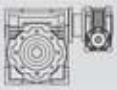
7.5 HSR.. / MHR.. Performance parameter

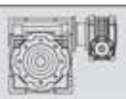
M_{2n} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]	F_{r2} [N]	F_{r1} [N]		Page
71	2800	100	0.31	28.0	2769	140	**HSR030/040**	99
72	2800	150	0.22	18.7	3169	140		
65	2800	200	0.16	14.0	3488	140		
61	2800	250	0.13	11.2	3490	140		
73	2800	300	0.14	9.3	3490	140		
65	2800	400	0.10	7.0	3490	140		
61	2800	500	0.07	5.6	3490	146		
73	2800	600	0.08	4.7	3490	146		
73	2800	750	0.06	3.7	3490	210		
73	2800	900	0.06	3.1	3490	210		
73	2800	1200	0.05	2.3	3490	127		
73	2800	1500	0.04	1.9	3490	128		
73	2800	1800	0.03	1.6	3490	126		
65	2800	2400	0.03	1.2	3490	126		
60	2800	3000	0.02	0.9	3490	126		
48	2800	4000	0.01	0.7	3490	128		
43	2800	5000	0.01	0.6	3490	128		
103	2800	100	0.44	28.0	3800	140	**HSR030/050**	99
135	2800	150	0.42	18.7	4350	140		
120	2800	200	0.30	14.0	4788	140		
110	2800	250	0.23	11.2	4840	140		
145	2800	300	0.27	9.3	4840	140		
124	2800	400	0.20	7.0	4840	140		
120	2800	500	0.16	5.6	4840	140		
145	2800	600	0.15	4.7	4840	146		
145	2800	750	0.13	3.7	4840	210		
145	2800	900	0.11	3.1	4840	210		
145	2800	1200	0.09	2.3	4840	127		
145	2800	1500	0.07	1.9	4840	128		
145	2800	1800	0.07	1.6	4840	126		
124	2800	2400	0.05	1.2	4840	126		
120	2800	3000	0.04	0.9	4840	126		
82	2800	4000	0.02	0.7	4840	128		
79	2800	5000	0.02	0.6	4840	128		
103	2800	100	0.44	28.0	4967	140	**HSR030/063**	99
144	2800	150	0.44	18.7	5686	140		
182	2800	200	0.44	14.0	6259	140		
218	2800	250	0.44	11.2	6270	140		
255	2800	300	0.51	9.3	6270	125		
255	2800	400	0.39	7.0	6270	140		
236	2800	500	0.31	5.6	6270	140		
220	2800	600	0.22	4.7	6270	146		
271	2800	750	0.23	3.7	6270	210		
271	2800	900	0.20	3.1	6270	210		
256	2800	1200	0.15	2.3	6270	127		
238	2800	1500	0.12	1.9	6270	128		
220	2800	1800	0.10	1.6	6270	126		
255	2800	2400	0.09	1.2	6270	126		
236	2800	3000	0.08	0.9	6270	126		
236	2800	4000	0.06	0.7	6270	130		
150	2800	5000	0.04	0.6	6270	128		

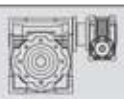
M_{2n} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]	F_{r2} [N]	F_{r1} [N]		Page
137	2800	100	0.58	28.0	3800	272	**HSR040/050**	99
135	2800	150	0.41	18.7	4350	272		
120	2800	200	0.29	14.0	4788	272		
110	2800	250	0.23	11.2	4840	272		
145	2800	300	0.27	9.3	4840	272		
124	2800	400	0.19	7.0	4840	272		
137	2800	500	0.15	5.6	3800	350		
145	2800	600	0.14	4.7	4840	204		
145	2800	750	0.12	3.7	4840	236		
135	2800	900	0.09	3.1	4350	350		
145	2800	1200	0.08	2.3	4840	350		
145	2800	1500	0.07	1.9	4840	350		
145	2800	1800	0.06	1.6	4840	350		
124	2800	2400	0.04	1.2	4840	350		
120	2800	3000	0.04	0.9	4840	350		
120	2800	4000	0.03	0.7	4840	350		
120	2800	5000	0.03	0.6	4840	350		
229	2800	100	0.97	28.0	4967	272	**HSR040/063**	99
260	2800	150	0.78	18.7	5686	272		
253	2800	200	0.60	14.0	6259	272		
231	2800	250	0.46	11.2	6270	272		
271	2800	300	0.49	9.3	6270	272		
255	2800	400	0.38	7.0	6270	272		
231	2800	500	0.24	5.6	6270	204		
271	2800	600	0.26	4.7	6270	204		
271	2800	750	0.22	3.7	6270	236		
271	2800	900	0.19	3.1	6270	350		
271	2800	1200	0.15	2.3	6270	350		
271	2800	1500	0.13	1.9	6270	350		
271	2800	1800	0.11	1.6	6270	350		
255	2800	2400	0.08	1.2	6270	350		
236	2800	3000	0.07	0.9	6270	350		
236	2800	4000	0.06	0.7	6270	350		
700	2800	300	1.15	9.3	8180	378	**HSR050/090**	99
610	2800	400	0.81	7.0	8180	378		
570	2800	500	0.56	5.6	8180	417		
700	2800	600	0.62	4.7	8180	417		
700	2800	750	0.50	3.7	8180	482		
700	2800	900	0.44	3.1	8180	490		
700	2800	1200	0.34	2.3	8180	490		
700	2800	1500	0.29	1.9	8180	490		
700	2800	1800	0.25	1.6	8180	490		
610	2800	2400	0.18	1.2	8180	490		
560	2800	3000	0.14	0.9	8180	490		
560	2800	4000	0.11	0.7	8180	490		
560	2800	5000	0.10	0.6	8180	490		
390	2800	100	1.57	28.0	8198	378	**HSR050/105**	99
563	2800	150	1.57	18.7	9384	378		
732	2800	200	1.57	14.0	10320	378		
891	2800	250	1.57	11.2	10320	378		
955	2800	300	1.57	9.3	10320	378		
1043	2800	400	1.32	7.0	10320	378		
875	2800	500	0.83	5.6	10320	417		
937	2800	600	0.83	4.7	10320	417		
902	2800	750	0.65	3.7	10320	482		
1113	2800	900	0.70	3.1	10320	490		

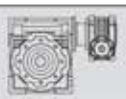
M_{2n} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]	F_{r2} [N]	F_{r1} [N]		Page
1044	2800	1200	0.51	2.3	10320	490	**HSR050/105**	99
937	2800	1500	0.39	1.9	10320	490		
884	2800	1800	0.32	1.6	10320	490		
1043	2800	2400	0.29	1.2	10320	490		
1034	2800	3000	0.24	0.9	10320	490		
1034	2800	4000	0.19	0.7	10320	490		
1034	2800	5000	0.17	0.6	10320	490		
443	2800	100	1.78	28.0	8198	378	**HSR050/110**	99
640	2800	150	1.78	18.7	9384	378		
832	2800	200	1.78	14.0	10320	378		
1013	2800	250	1.78	11.2	10320	378		
1085	2800	300	1.78	9.3	10320	378		
1185	2800	400	1.50	7.0	10320	378		
994	2800	500	0.94	5.6	10320	417		
1065	2800	600	0.94	4.7	10320	417		
1025	2800	750	0.74	3.7	10320	482		
1265	2800	900	0.80	3.1	10320	490		
1186	2800	1200	0.58	2.3	10320	490		
1065	2800	1500	0.44	1.9	10320	490		
1005	2800	1800	0.36	1.6	10320	490		
1185	2800	2400	0.33	1.2	10320	490		
1100	2800	3000	0.26	0.9	10320	490		
1100	2800	4000	0.21	0.7	10320	490		
1100	2800	5000	0.18	0.6	10320	490		
717	2800	100	2.88	28.0	8198	471	**HSR063/105**	99
1037	2800	150	2.88	18.7	9384	471		
1002	2800	200	2.15	14.0	10320	471		
1032	2800	250	1.81	11.2	10320	471		
1113	2800	300	1.82	9.3	10320	471		
1043	2800	400	1.32	7.0	10320	471		
1032	2800	500	0.95	5.6	10320	556		
1113	2800	600	0.96	4.7	10320	556		
1113	2800	750	0.78	3.7	10320	613		
1113	2800	900	0.69	3.1	10320	700		
1113	2800	1200	0.54	2.3	10320	700		
1113	2800	1500	0.45	1.9	10320	700		
1113	2800	1800	0.40	1.6	10320	700		
1043	2800	2400	0.30	1.2	10320	700		
1034	2800	3000	0.24	0.9	10320	700		
1034	2800	4000	0.19	0.7	10320	700		
1034	2800	5000	0.17	0.6	10320	700		
815	2800	100	3.27	28.0	8198	471	**HSR063/110**	99
1178	2800	150	3.27	18.7	9384	471		
1139	2800	200	2.44	14.0	10320	471		
1173	2800	250	2.06	11.2	10320	471		
1265	2800	300	2.07	9.3	10320	471		
1185	2800	400	1.50	7.0	10320	471		
1173	2800	500	1.08	5.6	10320	556		
1265	2800	600	1.09	4.7	10320	556		
1265	2800	750	0.89	3.7	10320	613		
1265	2800	900	0.78	3.1	10320	700		
1265	2800	1200	0.61	2.3	10320	700		
1265	2800	1500	0.51	1.9	10320	700		
1265	2800	1800	0.45	1.6	10320	700		

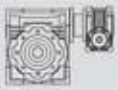
M_{2n} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]	F_{r2} [N]	F_{r1} [N]		Page
1185	2800	2400	0.32	1.2	10320	700	**HSR063/110**	99
1100	2800	3000	0.25	0.9	10320	700		
1100	2800	4000	0.20	0.7	10320	700		
1100	2800	5000	0.18	0.6	10320	700		
825	2800	100	3.27	28.0	10722	471	**HSR063/130**	99
1163	2800	150	3.27	18.7	12274	471		
1531	2800	200	3.27	14.0	13500	471		
1530	2800	250	2.69	11.2	13500	471		
1760	2800	300	2.84	9.3	13500	471		
1650	2800	400	2.09	7.0	13500	471		
1550	2800	500	1.65	5.6	13500	471		
1760	2800	600	1.49	4.7	13500	556		
1760	2800	750	1.22	3.7	13500	613		
1760	2800	900	1.07	3.1	13500	700		
1760	2800	1200	0.83	2.3	13500	700		
1760	2800	1500	0.70	1.9	13500	700		
1760	2800	1800	0.61	1.6	13500	700		
1650	2800	2400	0.45	1.2	13500	700		
1550	2800	3000	0.35	0.9	13500	700		
1550	2800	4000	0.28	0.7	13500	700		
1550	2800	5000	0.25	0.6	13500	700		
1444	2800	150	4.03	18.7	18000	395	**HSR063/150**	99
1531	2800	200	3.27	14.0	18000	471		
1864	2800	250	3.27	11.2	18000	471		
1678	2800	300	2.45	9.3	18000	516		
2624	2800	400	3.27	7.0	18000	471		
2330	2800	500	2.48	5.6	18000	471		
2670	2800	600	2.27	4.7	18000	516		
2330	2800	750	1.69	3.7	18000	516		
2100	2800	900	1.19	3.1	18000	700		
2670	2800	1200	1.25	2.3	18000	700		
2100	2800	1800	0.68	1.6	18000	700		
2610	2800	2400	0.70	1.2	18000	700		
2330	2800	3000	0.53	0.9	18000	700		
2330	2800	4000	0.43	0.7	18000	700		
2330	2800	5000	0.37	0.6	18000	700		

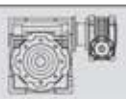
M_{2n} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]	F_{r2} [N]	F_{r1} [N]		Page
71	1400	100	0.16	14.0	2769	169	**HSR030/040**	99
72	1400	150	0.12	9.3	3169	169		
65	1400	200	0.08	7.0	3488	169		
61	1400	250	0.07	5.6	3490	169		
73	1400	300	0.07	4.7	3490	210		
65	1400	400	0.06	3.5	3490	210		
61	1400	500	0.04	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	0.6	3490	210		
60	1400	3200	0.01	0.5	3490	210		
48	1400	4000	0.01	0.4	3490	210		
43	1400	5000	0.01	0.3	3490	210		
137	1400	100	0.31	14.0	3800	169	**HSR030/050**	99
135	1400	150	0.22	9.3	4350	169		
120	1400	200	0.15	7.0	4788	169		
110	1400	250	0.12	5.6	4840	169		
145	1400	300	0.14	4.7	4840	169		
124	1400	400	0.10	3.5	4840	169		
120	1400	500	0.08	2.8	4840	169		
145	1400	600	0.08	2.3	4840	180		
145	1400	750	0.07	1.9	4840	210		
145	1400	900	0.06	1.6	4840	210		
145	1400	1200	0.05	1.2	4840	210		
145	1400	1500	0.04	0.9	4840	210		
145	1400	1800	0.04	0.8	4840	210		
124	1400	2400	0.03	0.6	4840	210		
120	1400	3000	0.02	0.5	4840	210		
82	1400	4000	0.01	0.4	4840	210		
79	1400	5000	0.01	0.3	4840	210		
137	1400	100	0.30	14.0	3800	344	**HSR040/050**	99
135	1400	150	0.21	9.3	4350	344		
120	1400	200	0.15	7.0	4788	344		
110	1400	250	0.12	5.6	4840	344		
145	1400	300	0.14	4.7	4840	344		
124	1400	400	0.10	3.5	4840	344		
137	1400	500	0.08	2.8	3800	350		
145	1400	600	0.07	2.3	4840	350		
145	1400	750	0.06	1.9	4840	350		
135	1400	900	0.05	1.6	4350	350		
145	1400	1200	0.04	1.2	4840	350		
145	1400	1500	0.04	0.9	4840	350		
145	1400	1800	0.03	0.8	4840	350		
124	1400	2400	0.02	0.6	4840	350		
120	1400	3000	0.02	0.5	4840	350		
120	1400	4000	0.02	0.4	4840	350		
120	1400	5000	0.01	0.3	4840	350		
150	1400	100	0.34	14.0	4967	169	**HSR030/063**	99
211	1400	150	0.34	9.3	5686	169		
253	1400	200	0.32	7.0	6259	169		
231	1400	250	0.24	5.6	6270	169		
255	1400	300	0.26	4.7	6270	150		

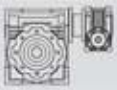
M_{2n} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]	F_{r2} [N]	F_{r1} [N]		Page
255	1400	400	0.20	3.5	6270	169	**HSR030/063**	99
236	1400	500	0.16	2.8	6270	169		
271	1400	600	0.15	2.3	6270	180		
271	1400	750	0.13	1.9	6270	210		
271	1400	900	0.11	1.6	6270	210		
271	1400	1200	0.09	1.2	6270	210		
271	1400	1500	0.08	0.9	6270	210		
271	1400	1800	0.07	0.8	6270	210		
255	1400	2400	0.05	0.6	6270	210		
236	1400	3000	0.04	0.5	6270	210		
236	1400	4000	0.04	0.4	6270	210		
150	1400	5000	0.02	0.3	6270	210		
257	1400	100	0.56	14.0	4967	344	**HSR040/063**	99
260	1400	150	0.40	9.3	5686	344		
253	1400	200	0.31	7.0	6259	344		
231	1400	250	0.24	5.6	6270	344		
271	1400	300	0.26	4.7	6270	344		
255	1400	400	0.20	3.5	6270	344		
231	1400	500	0.13	2.8	6270	350		
271	1400	600	0.14	2.3	6270	350		
271	1400	750	0.11	1.9	6270	350		
271	1400	900	0.10	1.6	6270	350		
271	1400	1200	0.08	1.2	6270	350		
271	1400	1500	0.07	0.9	6270	350		
271	1400	1800	0.06	0.8	6270	350		
255	1400	2400	0.05	0.6	6270	350		
236	1400	3000	0.04	0.5	6270	350		
236	1400	4000	0.03	0.4	6270	350		
390	1400	300	0.38	4.7	7380	350	**HSR040/075**	99
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	0.9	7380	350		
390	1400	1800	0.11	0.8	7380	350		
360	1400	2400	0.08	0.6	7380	350		
320	1400	3000	0.06	0.5	7380	350		
250	1400	4000	0.04	0.4	7380	350		
230	1400	5000	0.03	0.3	7380	350		
610	1400	300	0.56	4.7	8180	350	**HSR040/090**	99
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	0.9	8180	350		
505	1400	1800	0.13	0.8	8180	350		
610	1400	2400	0.12	0.6	8180	350		
560	1400	3000	0.10	0.5	8180	350		
460	1400	4000	0.07	0.4	8180	350		
410	1400	5000	0.05	0.3	8180	350		

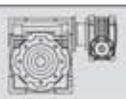
M_{2n} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]	F_{r2} [N]	F_{r1} [N]		Page
700	1400	300	0.59	4.7	8180	490	**HSR050/090**	99
610	1400	400	0.41	3.5	8180	490		
570	1400	500	0.29	2.8	8180	490		
700	1400	600	0.32	2.3	8180	490		
700	1400	750	0.27	1.9	8180	490		
700	1400	900	0.23	1.6	8180	490		
700	1400	1200	0.19	1.2	8180	490		
700	1400	1500	0.16	0.9	8180	490		
700	1400	1800	0.14	0.8	8180	490		
610	1400	2400	0.10	0.6	8180	490		
560	1400	3000	0.08	0.5	8180	490		
560	1400	4000	0.07	0.4	8180	490		
560	1400	5000	0.06	0.3	8180	490		
570	1400	100	1.17	14.0	8198	490	**HSR050/105**	99
824	1400	150	1.17	9.3	9384	490		
1002	1400	200	1.10	7.0	10320	490		
1032	1400	250	0.92	5.6	10320	490		
1113	1400	300	0.93	4.7	10320	490		
1043	1400	400	0.68	3.5	10320	490		
1032	1400	500	0.50	2.8	10320	490		
1113	1400	600	0.51	2.3	10320	490		
1113	1400	750	0.42	1.9	10320	490		
1113	1400	900	0.37	1.6	10320	490		
1113	1400	1200	0.30	1.2	10320	490		
1113	1400	1500	0.26	0.9	10320	490		
1113	1400	1800	0.23	0.8	10320	490		
1043	1400	2400	0.17	0.6	10320	490		
1034	1400	3000	0.13	0.5	10320	490		
1034	1400	4000	0.11	0.4	10320	490		
1034	1400	5000	0.09	0.3	10320	490		
648	1400	100	1.33	14.0	8198	490	**HSR050/110**	99
936	1400	150	1.33	9.3	9384	490		
1139	1400	200	1.25	7.0	10320	490		
1173	1400	250	1.05	5.6	10320	490		
1265	1400	300	1.06	4.7	10320	490		
1185	1400	400	0.77	3.5	10320	490		
1173	1400	500	0.57	2.8	10320	490		
1265	1400	600	0.58	2.3	10320	490		
1265	1400	750	0.48	1.9	10320	490		
1265	1400	900	0.42	1.6	10320	490		
1265	1400	1200	0.34	1.2	10320	490		
1265	1400	1500	0.29	0.9	10320	490		
1265	1400	1800	0.26	0.8	10320	490		
1185	1400	2400	0.19	0.6	10320	490		
1100	1400	3000	0.14	0.5	10320	490		
1100	1400	4000	0.12	0.4	10320	490		
1100	1400	5000	0.10	0.3	10320	490		
977	1400	100	2.01	14.0	8198	595	**HSR063/105**	99
1052	1400	150	1.50	9.3	9384	595		
1002	1400	200	1.10	7.0	10320	595		
1032	1400	250	0.92	5.6	10320	595		
1113	1400	300	0.93	4.7	10320	595		
1043	1400	400	0.68	3.5	10320	595		
1032	1400	500	0.49	2.8	10320	700		
1113	1400	600	0.49	2.3	10320	700		
1113	1400	750	0.41	1.9	10320	700		

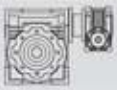
M_{2n} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]	F_{r2} [N]	F_{r1} [N]		Page
1113	1400	900	0.36	1.6	10320	700	**HSR063/105**	99
1113	1400	1200	0.28	1.2	10320	700		
1113	1400	1500	0.25	0.9	10320	700		
1113	1400	1800	0.21	0.8	10320	700		
1043	1400	2400	0.16	0.6	10320	700		
1034	1400	3000	0.13	0.5	10320	700		
1034	1400	4000	0.10	0.4	10320	700		
1034	1400	5000	0.09	0.3	10320	700		
1110	1400	100	2.28	14.0	8198	595	**HSR063/110**	99
1196	1400	150	1.70	9.3	9384	595		
1139	1400	200	1.25	7.0	10320	595		
1173	1400	250	1.05	5.6	10320	595		
1265	1400	300	1.06	4.7	10320	595		
1185	1400	400	0.77	3.5	10320	595		
1173	1400	500	0.56	2.8	10320	700		
1265	1400	600	0.56	2.3	10320	700		
1265	1400	750	0.47	1.9	10320	700		
1265	1400	900	0.41	1.6	10320	700		
1265	1400	1200	0.32	1.2	10320	700		
1265	1400	1500	0.28	0.9	10320	700		
1265	1400	1800	0.24	0.8	10320	700		
1185	1400	2400	0.18	0.6	10320	700		
1100	1400	3000	0.14	0.5	10320	700		
1100	1400	4000	0.11	0.4	10320	700		
1100	1400	5000	0.10	0.3	10320	700		
1123	1400	100	2.28	14.0	10722	595	**HSR063/130**	99
1584	1400	150	2.28	9.3	12274	595		
1600	1400	200	1.75	7.0	13500	595		
1530	1400	250	1.37	5.6	13500	595		
1760	1400	300	1.45	4.7	13500	595		
1650	1400	400	1.07	3.5	13500	595		
1550	1400	500	0.84	2.8	13500	595		
1760	1400	600	0.77	2.3	13500	700		
1760	1400	750	0.64	1.9	13500	700		
1760	1400	900	0.56	1.6	13500	700		
1760	1400	1200	0.45	1.2	13500	700		
1760	1400	1500	0.38	0.9	13500	700		
1760	1400	1800	0.33	0.8	13500	700		
1650	1400	2400	0.25	0.6	13500	700		
1550	1400	3000	0.19	0.5	13500	700		
1550	1400	4000	0.16	0.4	13500	700		
1550	1400	5000	0.14	0.3	13500	700		
1971	1400	150	2.81	9.3	18000	500	**HSR063/150**	99
2084	1400	200	2.28	7.0	18000	595		
2050	1400	250	1.84	5.6	18000	595		
2312	1400	300	1.75	4.7	18000	660		
2670	1400	400	1.70	3.5	18000	595		
2330	1400	500	1.27	2.8	18000	595		
2670	1400	600	1.18	2.3	18000	660		
2330	1400	750	0.87	1.9	18000	660		
2100	1400	900	0.62	1.6	18000	700		
2670	1400	1200	0.66	1.2	18000	700		
2100	1400	1800	0.37	0.8	18000	700		
2670	1400	2400	0.39	0.6	18000	700		
2330	1400	3000	0.29	0.5	18000	700		
2330	1400	4000	0.24	0.4	18000	700		
2330	1400	5000	0.21	0.3	18000	700		

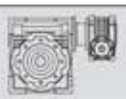
M_{2n} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]	F_{r2} [N]	F_{r1} [N]		Page
71	900	100	0.11	9.0	2769	197	**HSR030/040**	99
72	900	150	0.08	6.0	3169	197		
65	900	200	0.05	4.5	3488	197		
61	900	250	0.04	3.6	3490	197		
73	900	300	0.05	3.0	3490	197		
65	900	400	0.04	2.3	3490	197		
61	900	500	0.02	1.8	3490	210		
73	900	600	0.03	1.5	3490	210		
73	900	750	0.02	1.2	3490	210		
73	900	900	0.02	1.0	3490	210		
73	900	1200	0.02	0.8	3490	210		
73	900	1500	0.01	0.6	3490	210		
73	900	1800	0.01	0.5	3490	210		
65	900	2400	0.01	0.4	3490	210		
60	900	3000	0.01	0.3	3490	210		
48	900	4000	0.01	0.2	3490	210		
43	900	5000	0.00	0.2	3490	210		
137	900	100	0.20	9.0	3800	197	**HSR030/050**	99
135	900	150	0.14	6.0	4350	197		
120	900	200	0.10	4.5	4788	197		
110	900	250	0.08	3.6	4840	197		
145	900	300	0.09	3.0	4840	197		
124	900	400	0.07	2.3	4840	197		
120	900	500	0.06	1.8	4840	197		
145	900	600	0.05	1.5	4840	210		
145	900	750	0.05	1.2	4840	210		
145	900	900	0.04	1.0	4840	210		
145	900	1200	0.03	0.8	4840	210		
145	900	1500	0.03	0.6	4840	210		
145	900	1800	0.03	0.5	4840	210		
124	900	2400	0.02	0.4	4840	210		
120	900	3000	0.02	0.3	4840	210		
82	900	4000	0.01	0.2	4840	210		
79	900	5000	0.01	0.2	4840	210		
166	900	100	0.24	9.0	4967	197	**HSR030/063**	99
233	900	150	0.24	6.0	5686	197		
253	900	200	0.21	4.5	6259	197		
231	900	250	0.16	3.6	6270	197		
255	900	300	0.17	3.0	6270	175		
255	900	400	0.13	2.3	6270	197		
236	900	500	0.11	1.8	6270	197		
271	900	600	0.10	1.5	6270	210		
271	900	750	0.09	1.2	6270	210		
271	900	900	0.08	1.0	6270	210		
271	900	1200	0.06	0.8	6270	210		
271	900	1500	0.05	0.6	6270	210		
271	900	1800	0.05	0.5	6270	210		
255	900	2400	0.04	0.4	6270	210		
236	900	3000	0.03	0.3	6270	210		
236	900	4000	0.03	0.2	6270	210		
150	900	5000	0.01	0.2	6270	210		

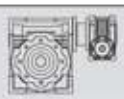
M_{2n} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]	F_{r2} [N]	F_{r1} [N]		Page
137	900	100	0.20	9.0	3800	350	**HSR040/050**	99
135	900	150	0.14	6.0	4350	350		
120	900	200	0.10	4.5	4788	350		
110	900	250	0.08	3.6	4840	350		
145	900	300	0.09	3.0	4840	350		
124	900	400	0.07	2.3	4840	350		
137	900	500	0.06	1.8	3800	350		
145	900	600	0.05	1.5	4840	350		
145	900	750	0.04	1.2	4840	350		
135	900	900	0.04	1.0	4350	350		
145	900	1200	0.03	0.8	4840	350		
145	900	1500	0.03	0.6	4840	350		
145	900	1800	0.02	0.5	4840	350		
124	900	2400	0.02	0.4	4840	350		
120	900	3000	0.01	0.3	4840	350		
120	900	4000	0.01	0.2	4840	350		
120	900	5000	0.01	0.2	4840	350		
257	900	100	0.37	9.0	4967	350	**HSR040/063**	99
260	900	150	0.27	6.0	5686	350		
253	900	200	0.21	4.5	6259	350		
231	900	250	0.16	3.6	6270	350		
271	900	300	0.17	3.0	6270	350		
255	900	400	0.13	2.3	6270	350		
231	900	500	0.09	1.8	6270	350		
271	900	600	0.09	1.5	6270	350		
271	900	750	0.08	1.2	6270	350		
271	900	900	0.07	1.0	6270	350		
271	900	1200	0.06	0.8	6270	350		
271	900	1500	0.05	0.6	6270	350		
271	900	1800	0.04	0.5	6270	350		
255	900	2400	0.03	0.4	6270	350		
236	900	3000	0.03	0.3	6270	350		
236	900	4000	0.02	0.2	6270	350		
700	900	300	0.39	3.0	8180	490	**HSR050/090**	99
610	900	400	0.27	2.3	8180	490		
570	900	500	0.19	1.8	8180	490		
700	900	600	0.21	1.5	8180	490		
700	900	750	0.18	1.2	8180	490		
700	900	900	0.16	1.0	8180	490		
700	900	1200	0.13	0.8	8180	490		
700	900	1500	0.11	0.6	8180	490		
700	900	1800	0.10	0.5	8180	490		
610	900	2400	0.07	0.4	8180	490		
560	900	3000	0.05	0.3	8180	490		
560	900	4000	0.05	0.2	8180	490		
560	900	5000	0.04	0.2	8180	490		
664	900	100	0.90	9.0	8198	490	**HSR050/105**	99
959	900	150	0.90	6.0	9384	490		
1002	900	200	0.72	4.5	10320	490		
1032	900	250	0.61	3.6	10320	490		
1113	900	300	0.62	3.0	10320	490		
1043	900	400	0.45	2.3	10320	490		
1032	900	500	0.33	1.8	10320	490		
1113	900	600	0.34	1.5	10320	490		
1113	900	750	0.28	1.2	10320	490		
1113	900	900	0.26	1.0	10320	490		

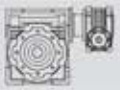
M_{2n} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]	F_{r2} [N]	F_{r1} [N]		Page
1113	900	1200	0.20	0.8	10320	490	**HSR050/105**	99
1113	900	1500	0.18	0.6	10320	490		
1113	900	1800	0.16	0.5	10320	490		
1043	900	2400	0.11	0.4	10320	490		
1034	900	3000	0.09	0.3	10320	490		
1034	900	4000	0.08	0.2	10320	490		
1034	900	5000	0.07	0.2	10320	490		
754	900	100	1.02	9.0	8198	490	**HSR050/110**	99
1090	900	150	1.02	6.0	9384	490		
1139	900	200	0.82	4.5	10320	490		
1173	900	250	0.69	3.6	10320	490		
1265	900	300	0.70	3.0	10320	490		
1185	900	400	0.51	2.3	10320	490		
1173	900	500	0.38	1.8	10320	490		
1265	900	600	0.39	1.5	10320	490		
1265	900	750	0.32	1.2	10320	490		
1265	900	900	0.29	1.0	10320	490		
1265	900	1200	0.23	0.8	10320	490		
1265	900	1500	0.20	0.6	10320	490		
1265	900	1800	0.18	0.5	10320	490		
1185	900	2400	0.13	0.4	10320	490		
1100	900	3000	0.10	0.3	10320	490		
1100	900	4000	0.08	0.2	10320	490		
1100	900	5000	0.07	0.2	10320	490		
992	900	100	1.34	9.0	8198	661	**HSR063/105**	99
1052	900	150	0.99	6.0	9384	661		
1002	900	200	0.72	4.5	10320	661		
1032	900	250	0.61	3.6	10320	661		
1113	900	300	0.62	3.0	10320	661		
1043	900	400	0.45	2.3	10320	661		
1032	900	500	0.33	1.8	10320	700		
1113	900	600	0.33	1.5	10320	700		
1113	900	750	0.27	1.2	10320	700		
1113	900	900	0.25	1.0	10320	700		
1113	900	1200	0.19	0.8	10320	700		
1113	900	1500	0.17	0.6	10320	700		
1113	900	1800	0.15	0.5	10320	700		
1043	900	2400	0.11	0.4	10320	700		
1034	900	3000	0.08	0.3	10320	700		
1034	900	4000	0.08	0.2	10320	700		
1034	900	5000	0.07	0.2	10320	700		
1127	900	100	1.52	9.0	8198	661	**HSR063/110**	99
1196	900	150	1.12	6.0	9384	661		
1139	900	200	0.82	4.5	10320	661		
1173	900	250	0.69	3.6	10320	661		
1265	900	300	0.70	3.0	10320	661		
1185	900	400	0.51	2.3	10320	661		
1173	900	500	0.38	1.8	10320	700		
1265	900	600	0.38	1.5	10320	700		
1265	900	750	0.31	1.2	10320	700		
1265	900	900	0.28	1.0	10320	700		
1265	900	1200	0.22	0.8	10320	700		
1265	900	1500	0.19	0.6	10320	700		
1265	900	1800	0.17	0.5	10320	700		

M_{2n} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]	F_{r2} [N]	F_{r1} [N]		Page
1185	900	2400	0.12	0.4	10320	700	**HSR063/110**	99
1100	900	3000	0.09	0.3	10320	700		
1100	900	4000	0.08	0.2	10320	700		
1100	900	5000	0.07	0.2	10320	700		
1270	900	100	1.70	9.0	10722	661	**HSR063/130**	99
1700	900	150	1.61	6.0	12274	661		
1600	900	200	1.15	4.5	13500	661		
1530	900	250	0.90	3.6	13500	661		
1760	900	300	0.96	3.0	13500	661		
1650	900	400	0.70	2.3	13500	661		
1550	900	500	0.55	1.8	13500	661		
1760	900	600	0.52	1.5	13500	700		
1760	900	750	0.43	1.2	13500	700		
1760	900	900	0.38	1.0	13500	700		
1760	900	1200	0.31	0.8	13500	700		
1760	900	1500	0.26	0.6	13500	700		
1760	900	1800	0.23	0.5	13500	700		
1650	900	2400	0.17	0.4	13500	700		
1550	900	3000	0.13	0.3	13500	700		
1550	900	4000	0.11	0.2	13500	700		
1550	900	5000	0.10	0.2	13500	700		
2325	900	150	2.16	6.0	18000	580	**HSR063/150**	99
2340	900	200	1.68	4.5	18000	661		
2050	900	250	1.21	3.6	18000	661		
2340	900	300	1.16	3.0	18000	700		
2670	900	400	1.12	2.3	18000	661		
2330	900	500	0.83	1.8	18000	661		
2670	900	600	0.77	1.5	18000	700		
2330	900	750	0.58	1.2	18000	700		
2100	900	900	0.42	1.0	18000	700		
2670	900	1200	0.45	0.8	18000	700		
2100	900	1800	0.26	0.5	18000	700		
2670	900	2400	0.27	0.4	18000	700		
2330	900	3000	0.20	0.3	18000	700		
2330	900	4000	0.17	0.2	18000	700		
2330	900	5000	0.15	0.2	18000	700		

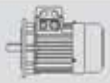
M_{2n} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]	F_{r2} [N]	F_{r1} [N]		Page
71	500	100	0.06	5.0	2769	210	**HSR030/040**	99
72	500	150	0.04	3.3	3169	210		
65	500	200	0.03	2.5	3488	210		
61	500	250	0.03	2.0	3490	210		
73	500	300	0.03	1.7	3490	210		
65	500	400	0.02	1.3	3490	210		
61	500	500	0.01	1.0	3490	210		
73	500	600	0.02	0.8	3490	210		
73	500	750	0.01	0.7	3490	210		
73	500	900	0.01	0.6	3490	210		
73	500	1200	0.01	0.4	3490	210		
73	500	1500	0.01	0.3	3490	210		
73	500	1800	0.01	0.3	3490	210		
65	500	2400	0.01	0.2	3490	210		
60	500	3000	0.00	0.2	3490	210		
48	500	4000	0.00	0.1	3490	210		
43	500	5000	0.00	0.1	3490	210		
137	500	100	0.12	5.0	3800	210	**HSR030/050**	99
135	500	150	0.08	3.3	4350	210		
120	500	200	0.06	2.5	4788	210		
110	500	250	0.05	2.0	4840	210		
145	500	300	0.05	1.7	4840	210		
124	500	400	0.04	1.3	4840	210		
120	500	500	0.03	1.0	4840	210		
145	500	600	0.03	0.8	4840	210		
145	500	750	0.03	0.7	4840	210		
145	500	900	0.02	0.6	4840	210		
145	500	1200	0.02	0.4	4840	210		
145	500	1500	0.02	0.3	4840	210		
145	500	1800	0.02	0.3	4840	210		
124	500	2400	0.01	0.2	4840	210		
120	500	3000	0.01	0.2	4840	210		
82	500	4000	0.01	0.1	4840	210		
79	500	5000	0.00	0.1	4840	210		
137	500	100	0.11	5.0	3800	350	**HSR040/050**	99
135	500	150	0.08	3.3	4350	350		
120	500	200	0.06	2.5	4788	350		
110	500	250	0.04	2.0	4840	350		
145	500	300	0.05	1.7	4840	350		
124	500	400	0.04	1.3	4840	350		
137	500	500	0.03	1.0	3800	350		
145	500	600	0.03	0.8	4840	350		
145	500	750	0.02	0.7	4840	350		
135	500	900	0.02	0.6	4350	350		
145	500	1200	0.02	0.4	4840	350		
145	500	1500	0.02	0.3	4840	350		
145	500	1800	0.01	0.3	4840	350		
124	500	2400	0.01	0.2	4840	350		
120	500	3000	0.01	0.2	4840	350		
120	500	4000	0.01	0.1	4840	350		
120	500	5000	0.01	0.1	4840	350		
198	500	100	0.17	5.0	4967	210	**HSR030/063**	99
260	500	150	0.16	3.3	5686	210		
253	500	200	0.12	2.5	6259	210		
231	500	250	0.09	2.0	6270	210		
255	500	300	0.10	1.7	6270	210		

M_{2n} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]	F_{r2} [N]	F_{r1} [N]		Page
255	500	400	0.08	1.3	6270	210	**HSR030/063**	99
236	500	500	0.06	1.0	6270	210		
271	500	600	0.06	0.8	6270	210		
271	500	750	0.05	0.7	6270	210		
271	500	900	0.04	0.6	6270	210		
271	500	1200	0.04	0.4	6270	210		
271	500	1500	0.03	0.3	6270	210		
271	500	1800	0.03	0.3	6270	210		
255	500	2400	0.02	0.2	6270	210		
236	500	3000	0.02	0.2	6270	210		
236	500	4000	0.02	0.1	6270	210		
150	500	5000	0.01	0.1	6270	210		
257	500	100	0.21	5.0	4967	350	**HSR040/063**	99
260	500	150	0.15	3.3	5686	350		
253	500	200	0.12	2.5	6259	350		
231	500	250	0.09	2.0	6270	350		
271	500	300	0.10	1.7	6270	350		
255	500	400	0.07	1.3	6270	350		
231	500	500	0.05	1.0	6270	350		
271	500	600	0.05	0.8	6270	350		
271	500	750	0.04	0.7	6270	350		
271	500	900	0.04	0.6	6270	350		
271	500	1200	0.03	0.4	6270	350		
271	500	1500	0.03	0.3	6270	350		
271	500	1800	0.03	0.3	6270	350		
255	500	2400	0.02	0.2	6270	350		
236	500	3000	0.02	0.2	6270	350		
236	500	4000	0.01	0.1	6270	350		
700	500	300	0.22	1.7	8180	490	**HSR050/090**	99
610	500	400	0.16	1.3	8180	490		
570	500	500	0.11	1.0	8180	490		
700	500	600	0.12	0.8	8180	490		
700	500	750	0.10	0.7	8180	490		
700	500	900	0.09	0.6	8180	490		
700	500	1200	0.08	0.4	8180	490		
700	500	1500	0.07	0.3	8180	490		
700	500	1800	0.06	0.3	8180	490		
610	500	2400	0.04	0.2	8180	490		
560	500	3000	0.03	0.2	8180	490		
560	500	4000	0.03	0.1	8180	490		
560	500	5000	0.02	0.1	8180	490		
816	500	100	0.63	5.0	8198	490	**HSR050/105**	99
1052	500	150	0.56	3.3	9384	490		
1002	500	200	0.41	2.5	10320	490		
1032	500	250	0.35	2.0	10320	490		
1113	500	300	0.35	1.7	10320	490		
1043	500	400	0.26	1.3	10320	490		
1032	500	500	0.19	1.0	10320	490		
1113	500	600	0.19	0.8	10320	490		
1113	500	750	0.17	0.7	10320	490		
1113	500	900	0.15	0.6	10320	490		
1113	500	1200	0.12	0.4	10320	490		
1113	500	1500	0.11	0.3	10320	490		

M_{2n} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]	F_{r2} [N]	F_{r1} [N]		Page
1113	500	1800	0.10	0.3	10320	490	**HSR050/105**	99
1043	500	2400	0.07	0.2	10320	490		
1034	500	3000	0.06	0.2	10320	490		
1034	500	4000	0.05	0.1	10320	490		
1034	500	5000	0.05	0.1	10320	490		
927	500	100	0.72	5.0	8198	490	**HSR050/110**	99
1196	500	150	0.64	3.3	9384	490		
1139	500	200	0.47	2.5	10320	490		
1173	500	250	0.40	2.0	10320	490		
1265	500	300	0.40	1.7	10320	490		
1185	500	400	0.29	1.3	10320	490		
1173	500	500	0.22	1.0	10320	490		
1265	500	600	0.22	0.8	10320	490		
1265	500	750	0.19	0.7	10320	490		
1265	500	900	0.17	0.6	10320	490		
1265	500	1200	0.14	0.4	10320	490		
1265	500	1500	0.12	0.3	10320	490		
1265	500	1800	0.11	0.3	10320	490		
1185	500	2400	0.08	0.2	10320	490		
1100	500	3000	0.06	0.2	10320	490		
1100	500	4000	0.05	0.1	10320	490		
1100	500	5000	0.05	0.1	10320	490		
992	500	100	0.77	5.0	8198	700	**HSR063/105**	99
1052	500	150	0.56	3.3	9384	700		
1002	500	200	0.41	2.5	10320	700		
1032	500	250	0.35	2.0	10320	700		
1113	500	300	0.35	1.7	10320	700		
1043	500	400	0.26	1.3	10320	700		
1032	500	500	0.19	1.0	10320	700		
1113	500	600	0.19	0.8	10320	700		
1113	500	750	0.16	0.7	10320	700		
1113	500	900	0.15	0.6	10320	700		
1113	500	1200	0.11	0.4	10320	700		
1113	500	1500	0.11	0.3	10320	700		
1113	500	1800	0.09	0.3	10320	700		
1043	500	2400	0.06	0.2	10320	700		
1034	500	3000	0.06	0.2	10320	700		
1034	500	4000	0.05	0.1	10320	700		
1034	500	5000	0.04	0.1	10320	700		
1127	500	100	0.88	5.0	8198	700	**HSR063/110**	99
1196	500	150	0.64	3.3	9384	700		
1139	500	200	0.47	2.5	10320	700		
1173	500	250	0.40	2.0	10320	700		
1265	500	300	0.40	1.7	10320	700		
1185	500	400	0.29	1.3	10320	700		
1173	500	500	0.22	1.0	10320	700		
1265	500	600	0.22	0.8	10320	700		
1265	500	750	0.18	0.7	10320	700		
1265	500	900	0.17	0.6	10320	700		
1265	500	1200	0.13	0.4	10320	700		
1265	500	1500	0.12	0.3	10320	700		
1265	500	1800	0.10	0.3	10320	700		
1185	500	2400	0.07	0.2	10320	700		
1100	500	3000	0.06	0.2	10320	700		
1100	500	4000	0.05	0.1	10320	700		
1100	500	5000	0.04	0.1	10320	700		

M_{2n} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]	F_{r2} [N]	F_{r1} [N]		Page
1530	500	100	1.18	5.0	10722	700	**HSR063/130**	99
1700	500	150	0.93	3.3	12274	700		
1600	500	200	0.66	2.5	13500	700		
1530	500	250	0.52	2.0	13500	700		
1760	500	300	0.55	1.7	13500	700		
1650	500	400	0.41	1.3	13500	700		
1550	500	500	0.32	1.0	13500	700		
1760	500	600	0.30	0.8	13500	700		
1760	500	750	0.25	0.7	13500	700		
1760	500	900	0.23	0.6	13500	700		
1760	500	1200	0.18	0.4	13500	700		
1760	500	1500	0.16	0.3	13500	700		
1760	500	1800	0.14	0.3	13500	700		
1650	500	2400	0.10	0.2	13500	700		
1550	500	3000	0.08	0.2	13500	700		
1550	500	4000	0.07	0.1	13500	700		
1550	500	5000	0.06	0.1	13500	700		
2340	500	150	1.23	3.3	18000	700	**HSR063/150**	99
2340	500	200	0.97	2.5	18000	700		
2050	500	250	0.70	2.0	18000	700		
2340	500	300	0.68	1.7	18000	700		
2670	500	400	0.65	1.3	18000	700		
2330	500	500	0.48	1.0	18000	700		
2670	500	600	0.45	0.8	18000	700		
2330	500	750	0.34	0.7	18000	700		
2100	500	900	0.25	0.6	18000	700		
2670	500	1200	0.27	0.4	18000	700		
2100	500	1800	0.15	0.3	18000	700		
2670	500	2400	0.16	0.2	18000	700		
2330	500	3000	0.12	0.2	18000	700		
2330	500	4000	0.10	0.1	18000	700		
2330	500	5000	0.09	0.1	18000	700		

7.6 VSA.. - MHR.. (n1=1400r/min) PERFORMANCE PARAMETER

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i			Page
002	117 ~ 22.5 88 ~ 17 58.7 ~ 11.3 44 ~ 8.5 35.2 ~ 6.8 29.3 ~ 5.7 22 ~ 4.3 17.6 ~ 3.4	9 ~ 18 12 ~ 23 17 ~ 32 22 ~ 40 27 ~ 47 30 ~ 51 37 ~ 62 43 ~ 60	12 ~ 61.5 16 ~ 82 24 ~ 123 32 ~ 164 40 ~ 205 48 ~ 246 64 ~ 328 80 ~ 410	VSA002-MHR040	6324	80 & 100
	22 ~ 4.3 17.6 ~ 3.4 14.7 ~ 2.8 11 ~ 2.1 8.8 ~ 1.7	38 ~ 63 44 ~ 73 50 ~ 80 59 ~ 82 66 ~ 79	64 ~ 328 80 ~ 410 96 ~ 492 128 ~ 656 160 ~ 820	VSA002-MHR050	6324	81 & 100
005	133 ~ 26.7 100 ~ 20 66.7 ~ 13.3 50 ~ 10 40 ~ 8 33.3 ~ 6.7 25 ~ 5 20 ~ 4	19 ~ 36 25 ~ 47 36 ~ 65 46 ~ 82 55 ~ 97 61 ~ 107 76 ~ 124 89 ~ 120	10.5 ~ 52.5 14 ~ 70 21 ~ 105 28 ~ 140 35 ~ 175 42 ~ 210 56 ~ 280 70 ~ 350	VSA005-MHR050	7124	81 & 100
	25 ~ 5 20 ~ 4 16.7 ~ 3.3 12.5 ~ 2.5 10 ~ 2	79 ~ 134 92 ~ 155 104 ~ 173 125 ~ 173 139 ~ 150	56 ~ 280 70 ~ 350 84 ~ 420 112 ~ 560 140 ~ 700	VSA005-MHR063	7124	82 & 100
010	133 ~ 26.7 100 ~ 20 66.7 ~ 13.3 50 ~ 10 40 ~ 8 33.3 ~ 6.7 25 ~ 5 20 ~ 4	26 ~ 49 34 ~ 63 48 ~ 88 62 ~ 112 75 ~ 133 81 ~ 146 105 ~ 179 123 ~ 207	10.5 ~ 52.5 14 ~ 70 21 ~ 105 28 ~ 140 35 ~ 175 42 ~ 210 56 ~ 280 70 ~ 350	VSA010-MHR063	8014	82 & 100
	20 ~ 4 16.7 ~ 3.3 12.5 ~ 2.5	129 ~ 216 146 ~ 242 176 ~ 250	70 ~ 350 84 ~ 420 112 ~ 560	VSA010-MHR075	8014	83 & 100
	12.5 ~ 2.5 10 ~ 2	189 ~ 309 218 ~ 350	112 ~ 560 140 ~ 700	VSA010-MHR090	8014	84 & 100

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i			Page
010	133 ~ 26.7 100 ~ 20 66.7 ~ 13.3 50 ~ 10 40 ~ 8 33.3 ~ 6.7 25 ~ 5 20 ~ 4	39 ~ 73 51 ~ 94 72 ~ 132 92 ~ 168 112 ~ 199 126 ~ 219 156 ~ 232 185 ~ 310	10.5 ~ 52.5 14 ~ 70 21 ~ 105 28 ~ 140 35 ~ 175 42 ~ 210 56 ~ 280 70 ~ 350	VSA010-MHR063	8024	82 & 100
	20 ~ 4 16.7 ~ 3.3	192 ~ 320 219 ~ 300	70 ~ 350 84 ~ 420	VSA010-MHR075	8024	83 & 100
	16.7 ~ 3.3 12.5 ~ 2.5 10 ~ 2	230 ~ 389 265 ~ 428 303 ~ 410	84 ~ 420 112 ~ 560 140 ~ 700	VSA010-MHR090	8024	84 & 100
	12.5 ~ 2.5 10 ~ 2	302 ~ 503 348 ~ 575	112 ~ 560 140 ~ 700	VSA010-MHR105	8024	85 & 100
	12.5 ~ 2.5 10 ~ 2	302 ~ 503 348 ~ 575	112 ~ 560 140 ~ 700	VSA010-MHR110	8024	86 & 100
020	133 ~ 26.7 100 ~ 20 66.7 ~ 13.3 50 ~ 10 40 ~ 8 33.3 ~ 6.7 25 ~ 5	59 ~ 111 77 ~ 144 110 ~ 203 142 ~ 258 172 ~ 308 195 ~ 340 245 ~ 360	10.5 ~ 52.5 14 ~ 70 21 ~ 105 28 ~ 140 35 ~ 175 42 ~ 210 56 ~ 280	VSF020-MHR075	90S4	83 & 100
	100 ~ 20 66.7 ~ 13.3 50 ~ 10 40 ~ 8 33.3 ~ 6.7 25 ~ 5 20 ~ 4	78 ~ 146 113 ~ 208 146 ~ 266 177 ~ 320 202 ~ 356 256 ~ 442 304 ~ 517	14 ~ 70 21 ~ 105 28 ~ 140 35 ~ 175 42 ~ 210 56 ~ 280 70 ~ 350	VSF020-MHR090	90S4	84 & 100
	20 ~ 4 16.7 ~ 3.3 12.5 ~ 2.5 10 ~ 2	320 ~ 550 368 ~ 625 455 ~ 754 522 ~ 710	70 ~ 350 84 ~ 420 112 ~ 560 140 ~ 700	VSF020-MHR105	90S4	85 & 100
	20 ~ 4 16.7 ~ 3.3 12.5 ~ 2.5 10 ~ 2	320 ~ 550 368 ~ 625 455 ~ 754 522 ~ 710	70 ~ 350 84 ~ 420 112 ~ 560 140 ~ 700	VSF020-MHR110	90S4	86 & 100
	16.7 ~ 3.3 12.5 ~ 2.5 10 ~ 2	373 ~ 623 460 ~ 749 531 ~ 868	84 ~ 420 112 ~ 560 140 ~ 700	VSF020-MHR130	90S4	87 & 100

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i			Page
020	133 ~ 26.7 100 ~ 20 66.7 ~ 13.3 50 ~ 10 40 ~ 8 33.3 ~ 6.7 25 ~ 5	78 ~ 148 102 ~ 192 147 ~ 270 190 ~ 344 229 ~ 330 260 ~ 390 327 ~ 360	10.5 ~ 52.5 14 ~ 70 21 ~ 105 28 ~ 140 35 ~ 175 42 ~ 210 56 ~ 280	VSF020-MHR075	90L4	83 & 100
	133 ~ 26.7 100 ~ 20 66.7 ~ 13.3 50 ~ 10 40 ~ 8 33.3 ~ 6.7 25 ~ 5 20 ~ 4	77 ~ 150 104 ~ 195 150 ~ 277 194 ~ 355 236 ~ 427 270 ~ 474 341 ~ 589 406 ~ 560	10.5 ~ 52.5 14 ~ 70 21 ~ 105 28 ~ 140 35 ~ 175 42 ~ 210 56 ~ 280 70 ~ 350	VSF020-MHR090	90L4	84 & 100
	20 ~ 4 16.7 ~ 3.3	426 ~ 733 490 ~ 833	70 ~ 350 84 ~ 420	VSF020-MHR105	90L4	85 & 100
	20 ~ 4 16.7 ~ 3.3	426 ~ 733 490 ~ 833	70 ~ 350 84 ~ 420	VSF020-MHR110	90L4	86 & 100
	16.7 ~ 3.3 12.5 ~ 2.5 10 ~ 2	498 ~ 831 614 ~ 999 696 ~ 1100	84 ~ 420 112 ~ 560 140 ~ 700	VSF020-MHR130	90L4	87 & 100
030	133 ~ 26.7 100 ~ 20 66.7 ~ 13.3 50 ~ 10 40 ~ 8 33.3 ~ 6.7 25 ~ 5	120 ~ 226 157 ~ 294 228 ~ 418 298 ~ 549 364 ~ 664 413 ~ 717 533 ~ 931	10.5 ~ 52.5 14 ~ 70 21 ~ 105 28 ~ 140 35 ~ 175 42 ~ 210 56 ~ 280	VSF030-MHR105	100LA4	85 & 100
	133 ~ 26.7 100 ~ 20 66.7 ~ 13.3 50 ~ 10 40 ~ 8 33.3 ~ 6.7 25 ~ 5	120 ~ 226 157 ~ 294 228 ~ 418 298 ~ 549 364 ~ 664 413 ~ 717 533 ~ 931	10.5 ~ 52.5 14 ~ 70 21 ~ 105 28 ~ 140 35 ~ 175 42 ~ 210 56 ~ 280	VSF030-MHR110	100LA4	86 & 100
	25 ~ 5 20 ~ 4 16.7 ~ 3.3 12.5 ~ 2.5 10 ~ 2	542 ~ 932 648 ~ 1097 746 ~ 1246 921 ~ 1499 1040 ~ 1690	56 ~ 280 70 ~ 350 84 ~ 420 112 ~ 560 140 ~ 700	VSF030-MHR130	100LA4	87 & 100

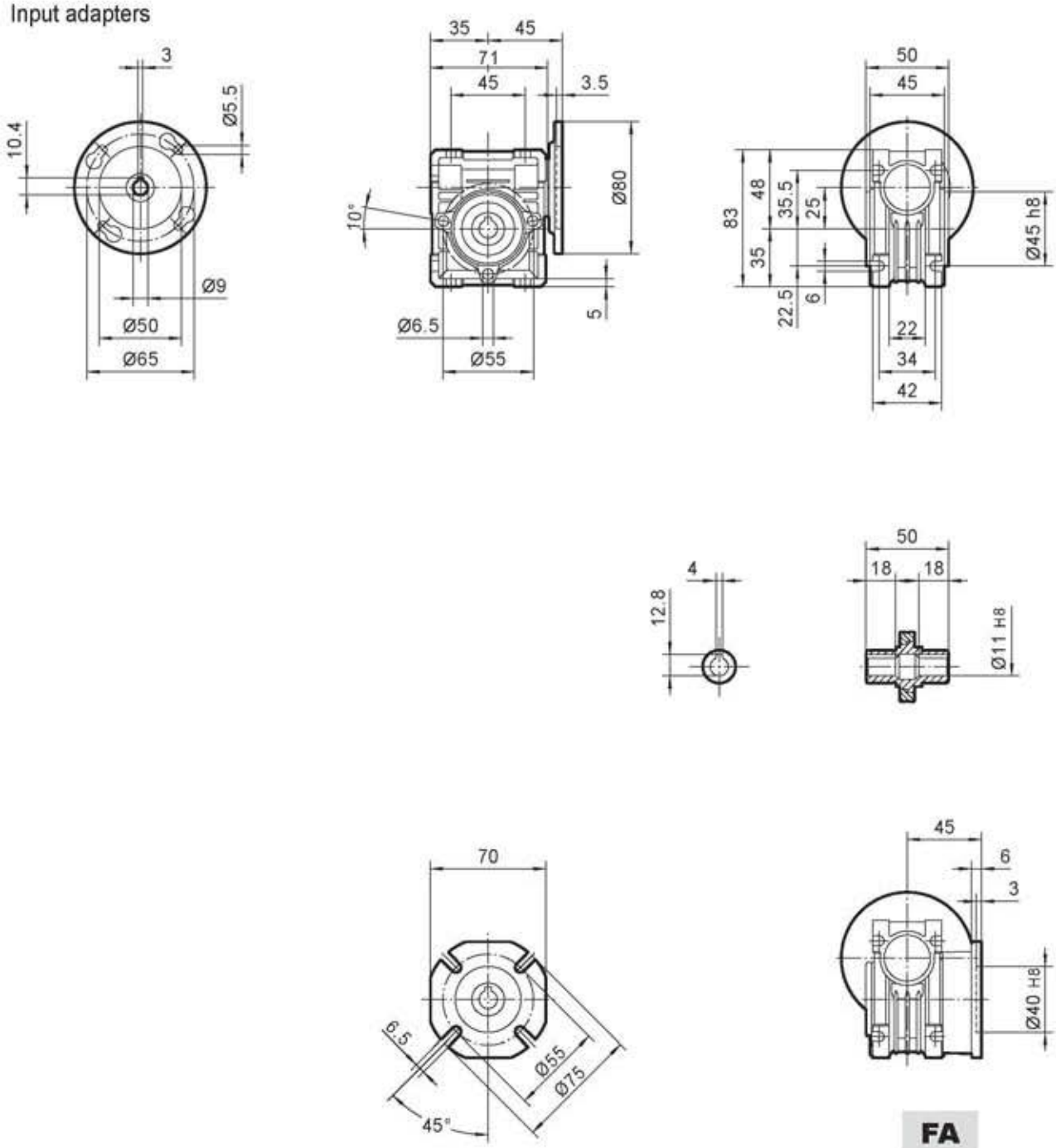
P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i			Page
030	133 ~ 26.7 100 ~ 20 66.7 ~ 13.3 50 ~ 10 40 ~ 8 33.3 ~ 6.7 25 ~ 5	160 ~ 302 210 ~ 392 304 ~ 558 398 ~ 732 485 ~ 885 547 ~ 956 711 ~ 1030	10.5 ~ 52.5 14 ~ 70 21 ~ 105 28 ~ 140 35 ~ 175 42 ~ 210 56 ~ 280	VSF 030-MHR105	100LB4	85 & 100
	133 ~ 26.7 100 ~ 20 66.7 ~ 13.3 50 ~ 10 40 ~ 8 33.3 ~ 6.7 25 ~ 5	160 ~ 302 210 ~ 392 304 ~ 558 398 ~ 732 485 ~ 885 547 ~ 956 711 ~ 1030	10.5 ~ 52.5 14 ~ 70 21 ~ 105 28 ~ 140 35 ~ 175 42 ~ 210 56 ~ 280	VSF 030-MHR110	100LB4	86 & 100
	133 ~ 26.7 100 ~ 20 66.7 ~ 13.3 50 ~ 10 40 ~ 8 33.3 ~ 6.7 25 ~ 5 20 ~ 4	160 ~ 301 211 ~ 395 307 ~ 563 402 ~ 733 490 ~ 885 562 ~ 973 720 ~ 1242 864 ~ 1463	10.5 ~ 52.5 14 ~ 70 21 ~ 105 28 ~ 140 35 ~ 175 42 ~ 210 56 ~ 280 70 ~ 350	VSF 030-MHR130	100LB4	87 & 100
050	133 ~ 26.7 100 ~ 20 66.7 ~ 13.3 50 ~ 10 40 ~ 8	213 ~ 402 279 ~ 523 405 ~ 744 530 ~ 975 647 ~ 1020	10.5 ~ 52.5 14 ~ 70 21 ~ 105 28 ~ 140 35 ~ 175	VSF 050-MHR105	112M4	85 & 100
	133 ~ 26.7 100 ~ 20 66.7 ~ 13.3 50 ~ 10 40 ~ 8	213 ~ 402 279 ~ 523 405 ~ 744 530 ~ 975 647 ~ 1020	10.5 ~ 52.5 14 ~ 70 21 ~ 105 28 ~ 140 35 ~ 175	VSF 050-MHR110	112M4	86 & 100
	133 ~ 26.7 100 ~ 20 66.7 ~ 13.3 50 ~ 10 40 ~ 8 33.3 ~ 6.7 25 ~ 5	214 ~ 401 281 ~ 527 410 ~ 751 536 ~ 978 653 ~ 1180 749 ~ 1298 960 ~ 1650	10.5 ~ 52.5 14 ~ 70 21 ~ 105 28 ~ 140 35 ~ 175 42 ~ 210 56 ~ 280	VSF 050-MHR130	112M4	87 & 100

8. OUTLINE DIMENSION SHEET

8.1 MHR.. Outline dimension

MHR025..(IEC)

Input adapters

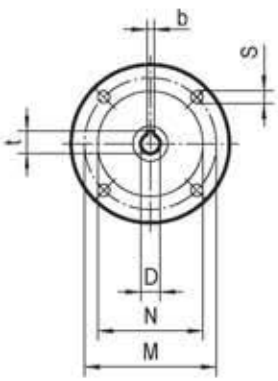


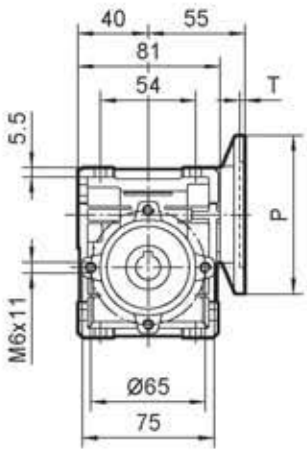
FA

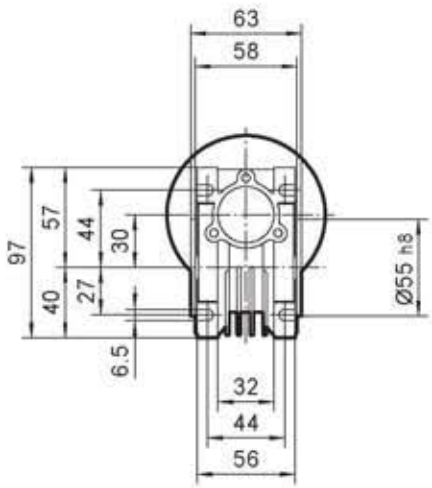
Weight without motor ≈ 0.7 kg

MHR030..(IEC)

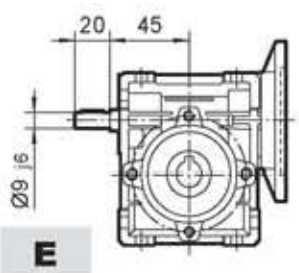
Input adapters

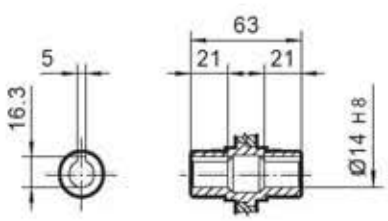


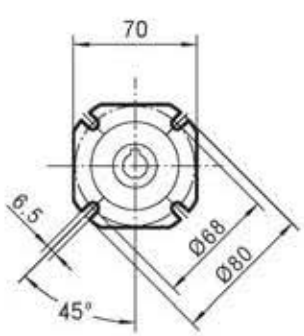


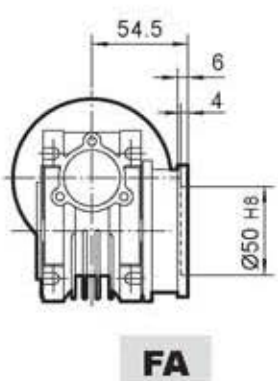


Worm output shaft







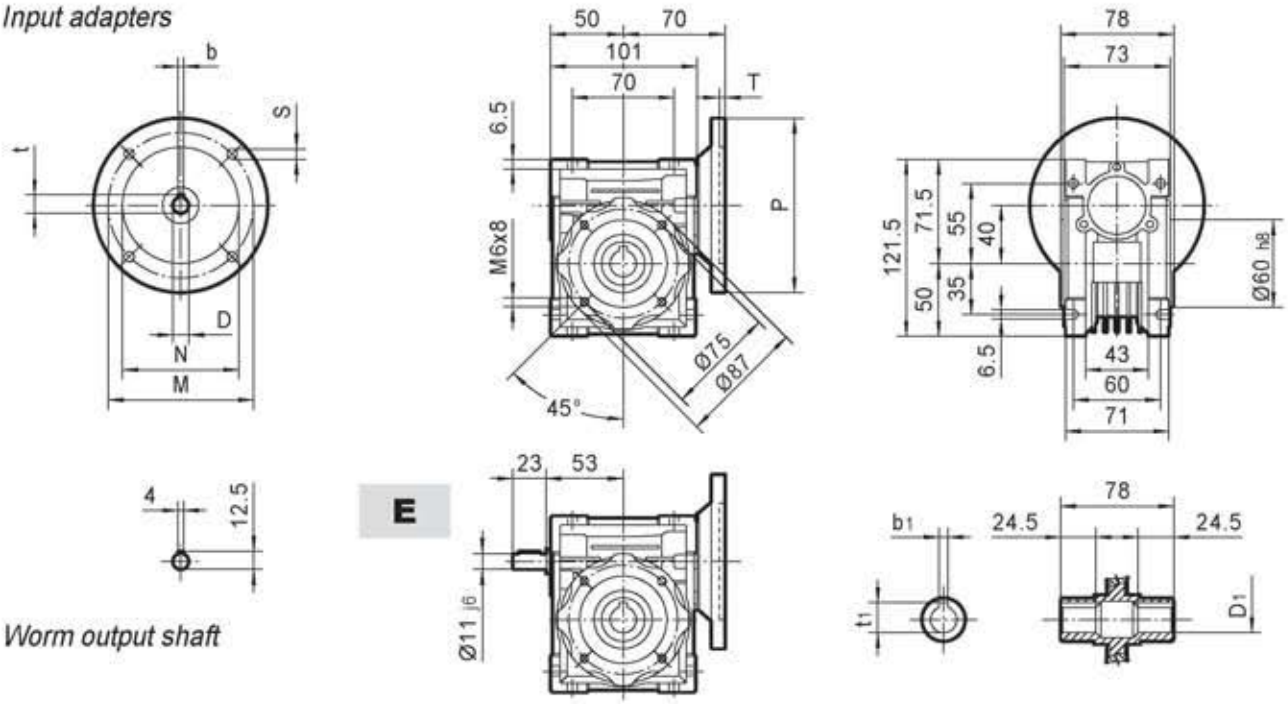


IEC	D_{E8}	b	t	P	M	N	S	T
56B5	9	3	10.4	120	100	80	7	4
56B14	9	3	10.4	80	65	50	5.5	4
63B5	11	4	12.8	140	115	95	9	4
63B14	11	4	12.8	90	75	60	5.5	4

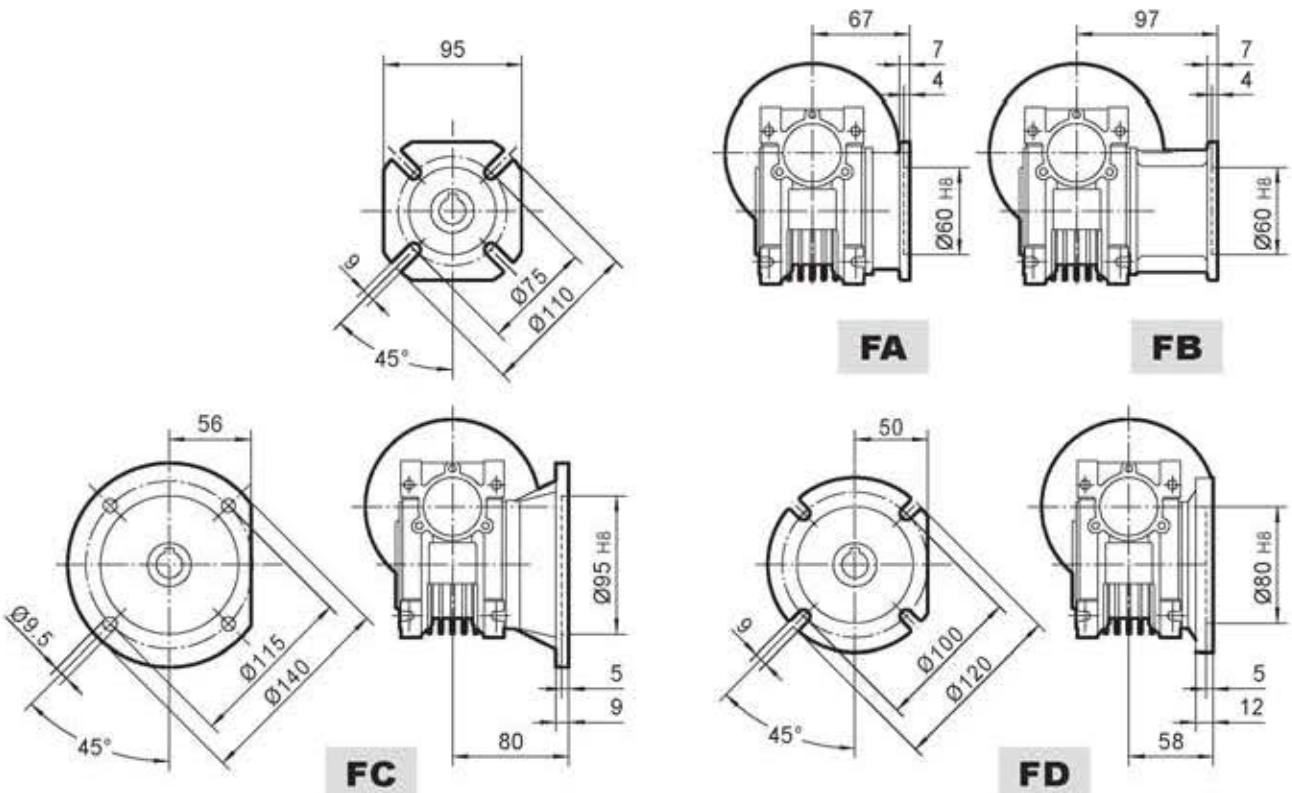
Weight without motor ≈ 1.2 kg

MHR040..(IEC)

Input adapters



Worm output shaft

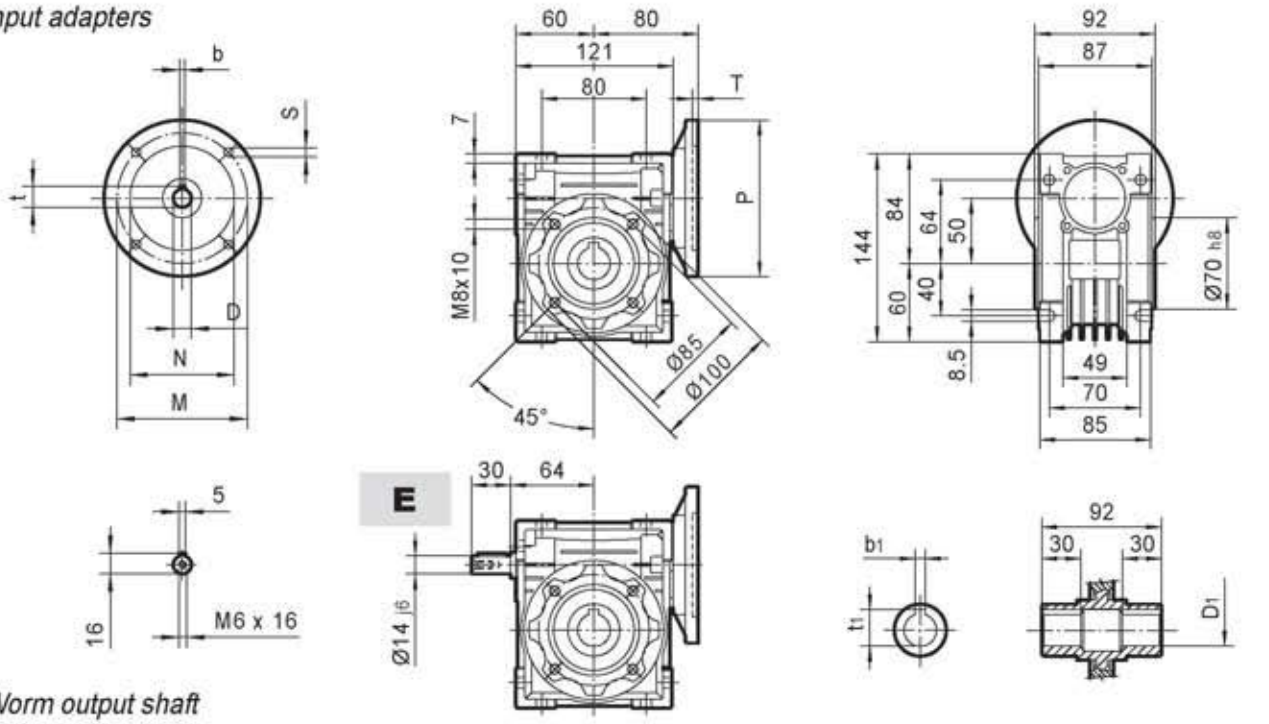


IEC	D_{E8}	b	t	P	M	N	S	T	$D_{1\ H8}$	b_1	t_1
56B5	9	3	10.4	120	100	80	7	4	18	6	20.8
63B5	11	4	12.8	140	115	95	9	4	19*	6*	21.8*
63B14	11	4	12.8	90	75	60	5.5	4			
71B5	14	5	16.3	160	130	110	9	4	* Only on request		
71B14	14	5	16.3	105	85	70	7	4			

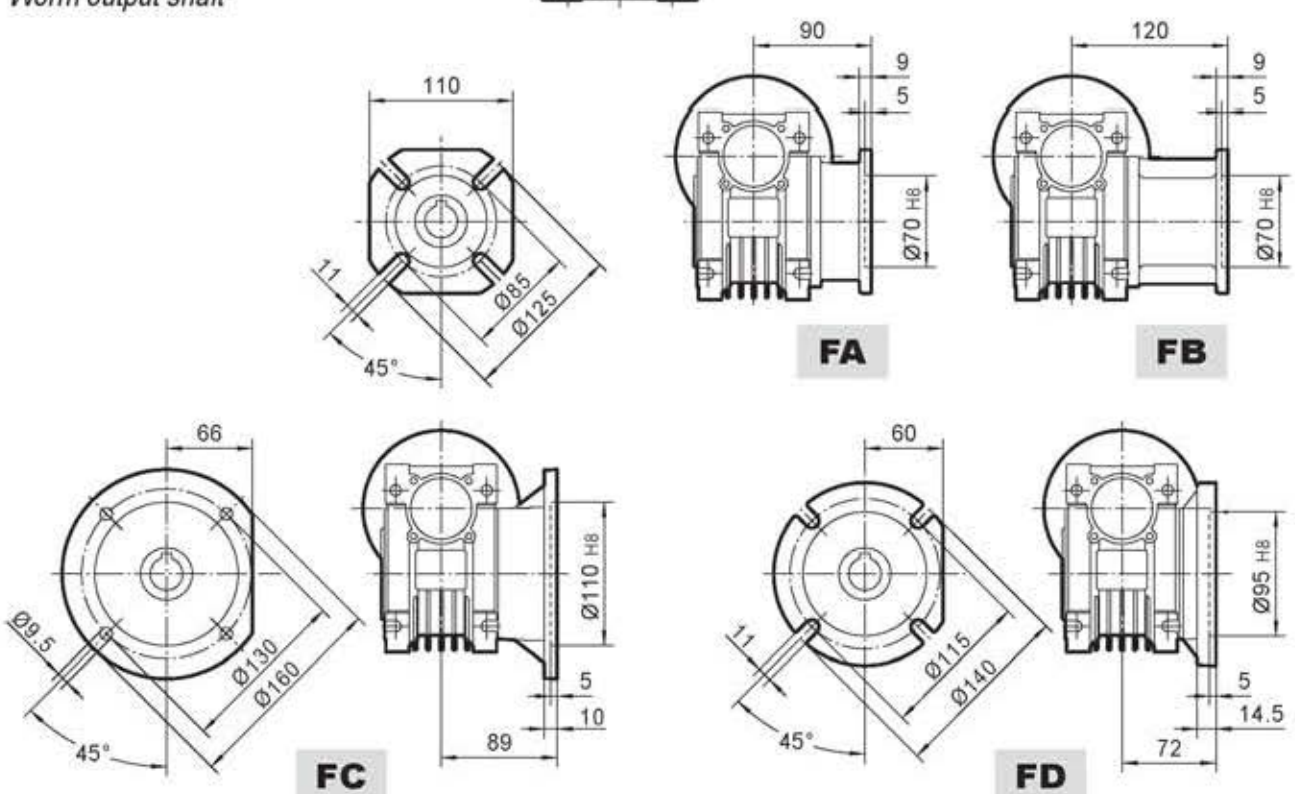
Weight without motor ≈ 2.3 kg

MHR050..(IEC)

Input adapters



Worm output shaft

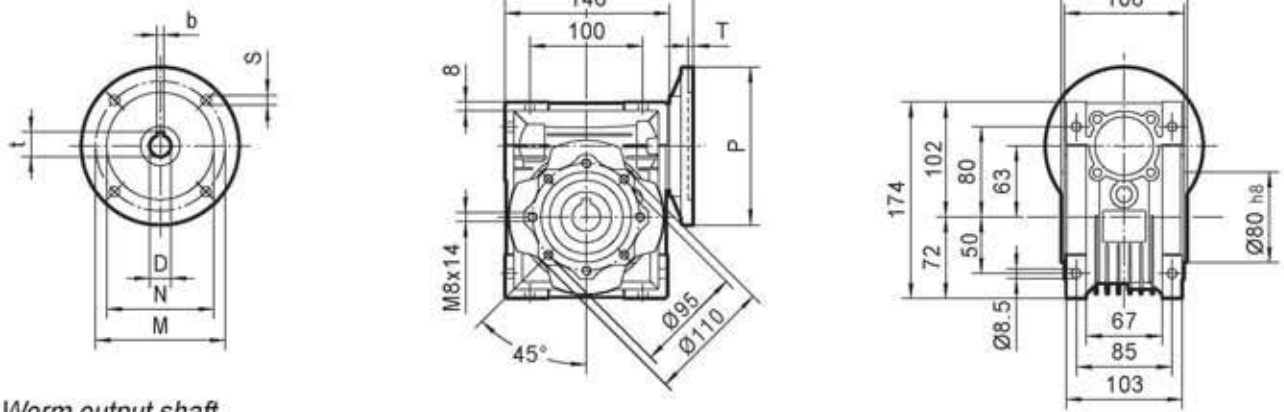


IEC	D_{E8}	b	t	P	M	N	S	T	$D_{1\ H8}$	b_1	t_1
63B5	11	4	12.8	140	115	95	9	4	25	8	28.3
71B5	14	5	16.3	160	130	110	9	4	24*	8*	27.3*
71B14	14	5	16.3	105	85	70	7	4	* Only on request		
80B5	19	6	21.8	200	165	130	11	4			
80B14	19	6	21.8	120	100	80	7	4			

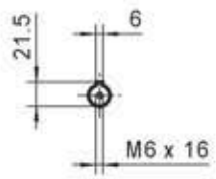
Weight without motor ≈ 3..5 kg

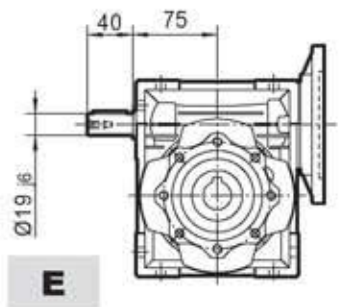
MHR063..(IEC)

Input adapters

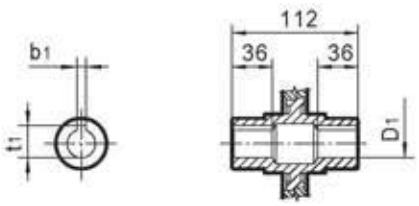


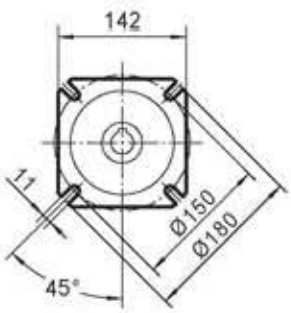
Worm output shaft

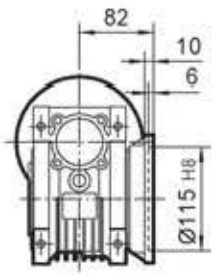




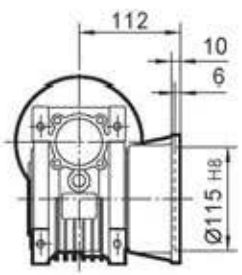
E



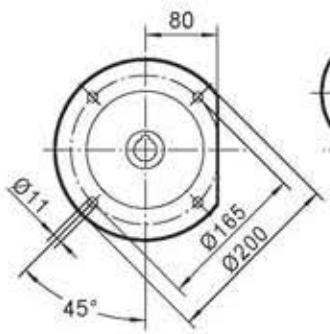


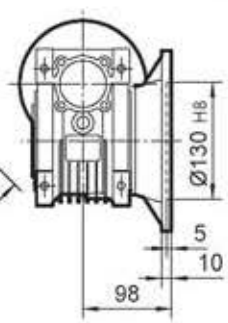


FA

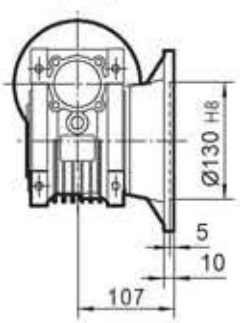


FB

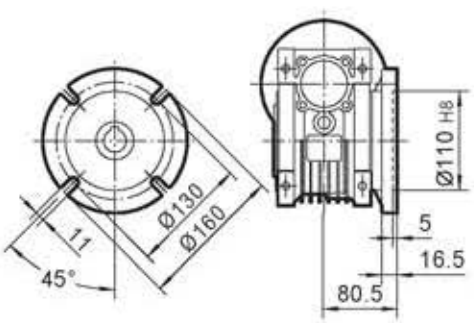




FC



FD



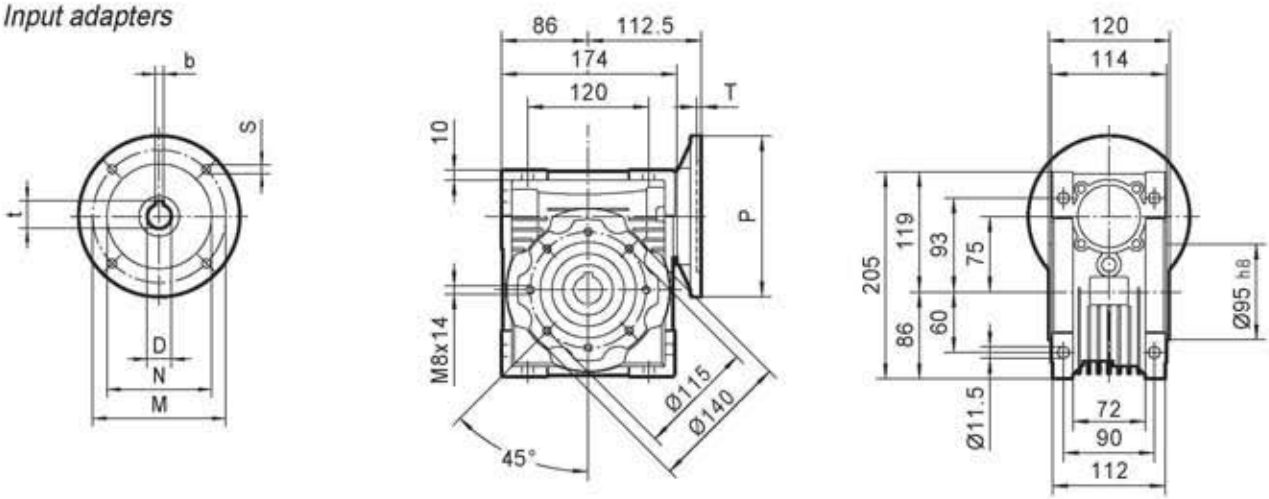
FE

IEC	D_{E8}	b	t	P	M	N	S	T	$D1_{H8}$	b1	t1
71B5	14	5	16.3	160	130	110	9	4	25	8	28.3
71B14	14	5	16.3	105	85	70	7	4	28*	8*	31.3*
80B5	19	6	21.8	200	165	130	11	4			
80B14	19	6	21.8	120	100	80	7	4	* Only on request		
90B5	24	8	27.3	200	165	130	11	4			
90B14	24	8	27.3	140	115	95	9	4			

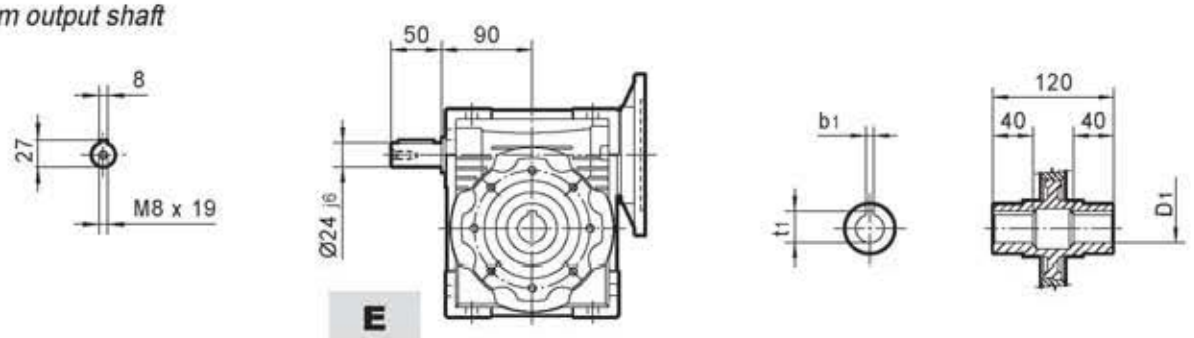
Weight without motor ≈ 6.2 kg

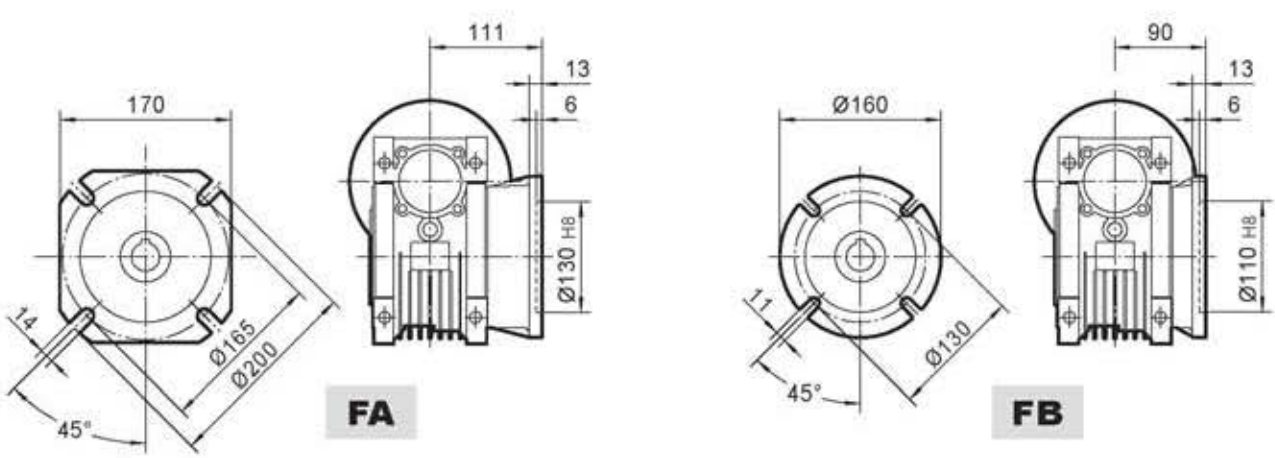
MHR075..(IEC)

Input adapters



Worm output shaft





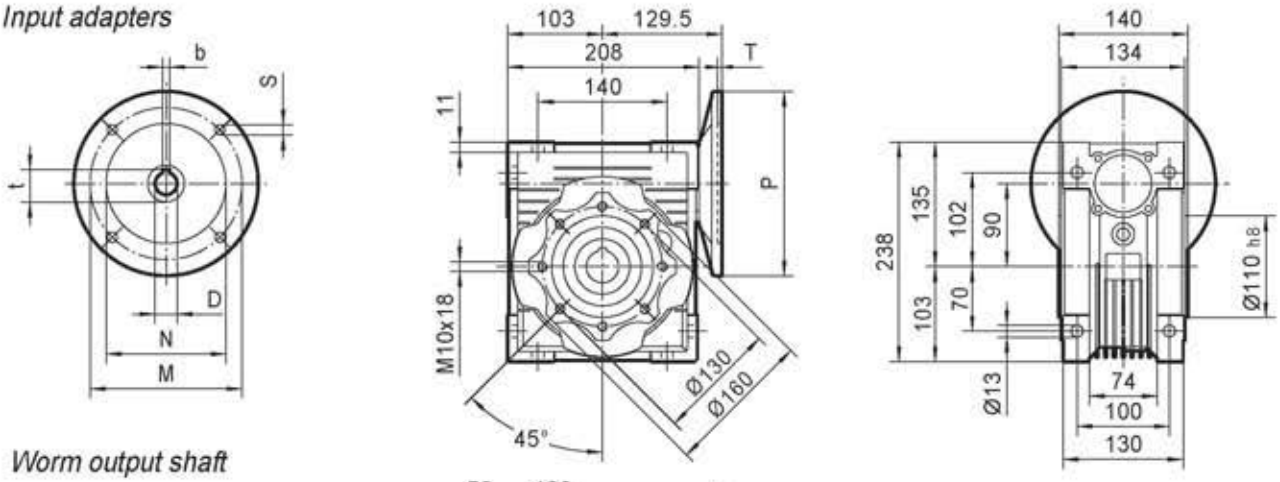
IEC	D_{E8}	b	t	P	M	N	S	T	$D_{1\ H8}$	b_1	t_1
71B5	14	5	16.3	160	130	110	9	4	28	8	31.3
80B5	19	6	21.8	200	165	130	11	4	35*	10*	38.3*
80B14	19	6	21.8	120	100	80	7	4			
90B5	24	8	27.3	200	165	130	11	4			
90B14	24	8	27.3	140	115	95	9	4			
100/112B5	28	8	31.3	250	215	180	13.5	4.5			
100/112B14	28	8	31.3	160	130	110	9	4.5			

* Only on request

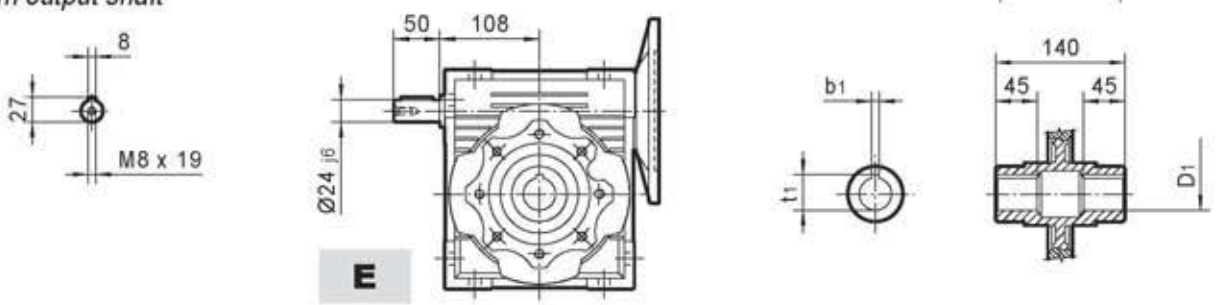
Weight without motor ≈ 9 kg

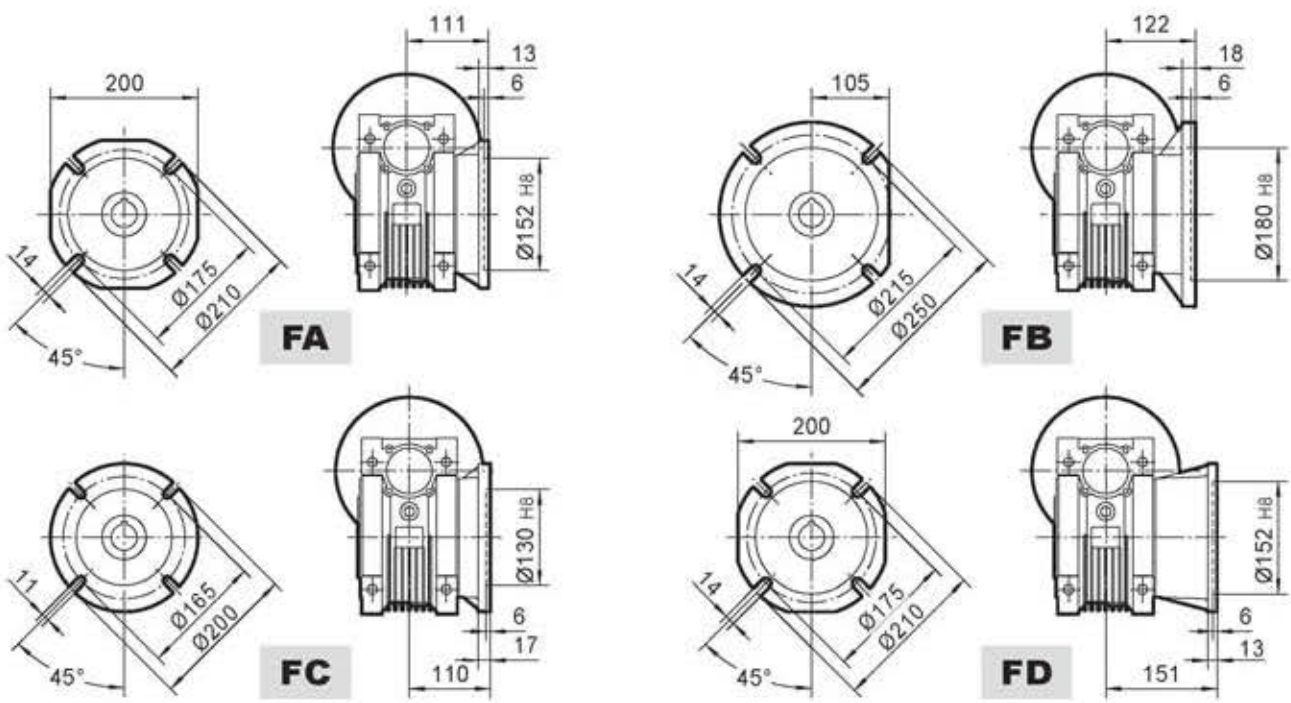
MHR090..(IEC)

Input adapters



Worm output shaft



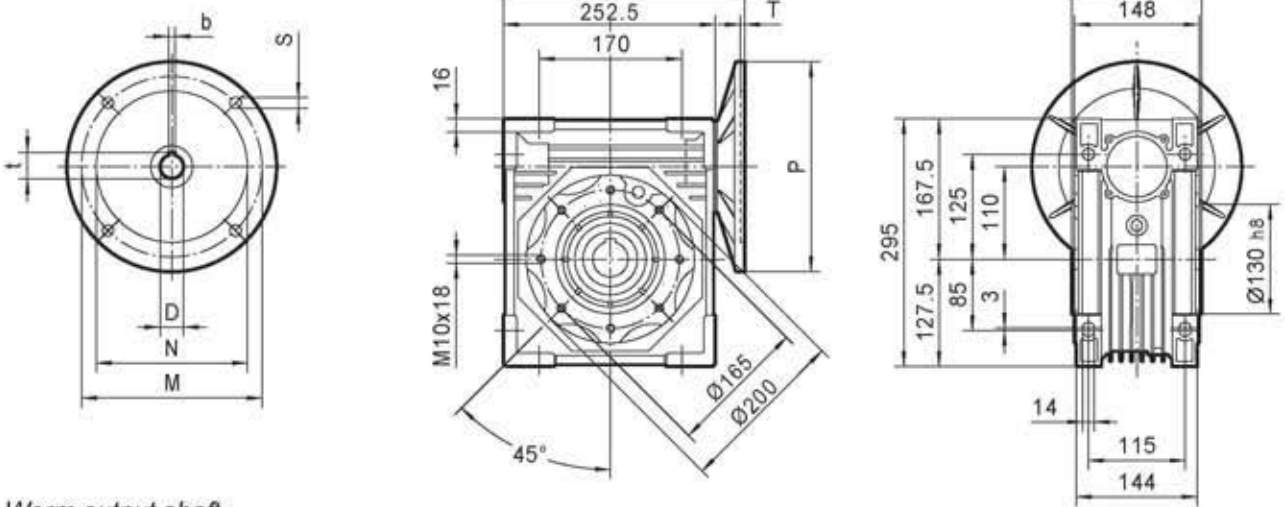


IEC	D_{E8}	b	t	P	M	N	S	T	$D_{1\ H8}$	b_1	t_1
80B5	19	6	21.8	200	165	130	11	4	35	10	38.3
80B14	19	6	21.8	120	100	80	7	4	38*	10*	41.3*
90B5	24	8	27.3	200	165	130	11	4	* Only on request		
90B14	24	8	27.3	140	115	95	9	4			
100/112B5	28	8	31.3	250	215	180	13.5	4.5			
100/112B14	28	8	31.3	160	130	110	9	4.5			

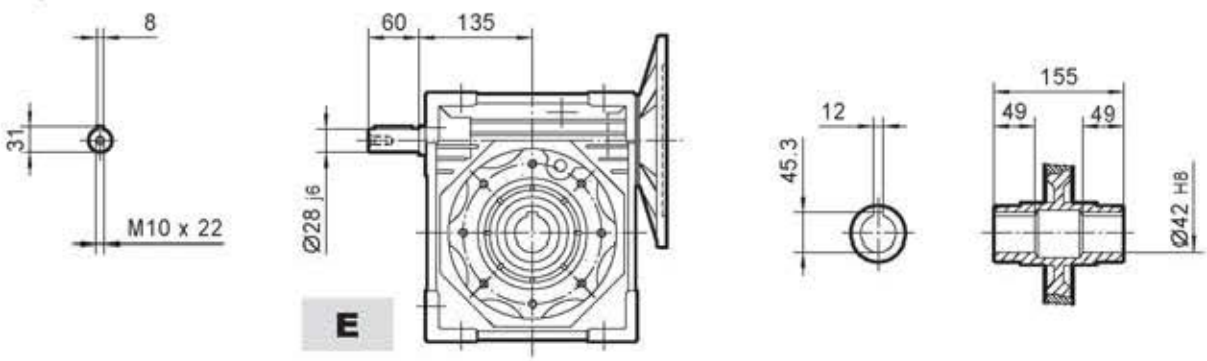
Weight without motor ≈ 13 kg

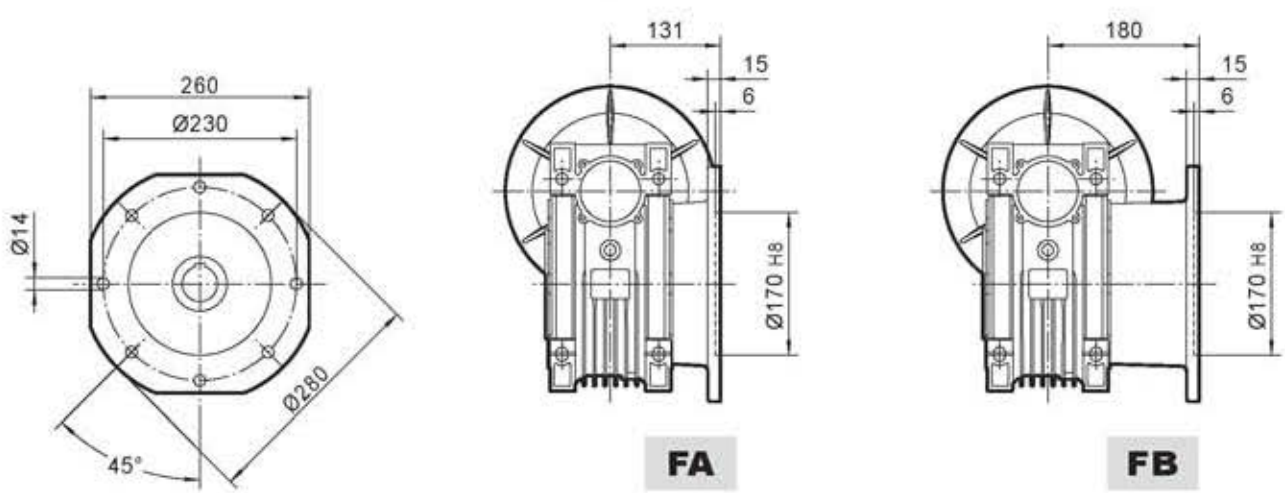
MHR105..(IEC)

Input adapters



Worm output shaft



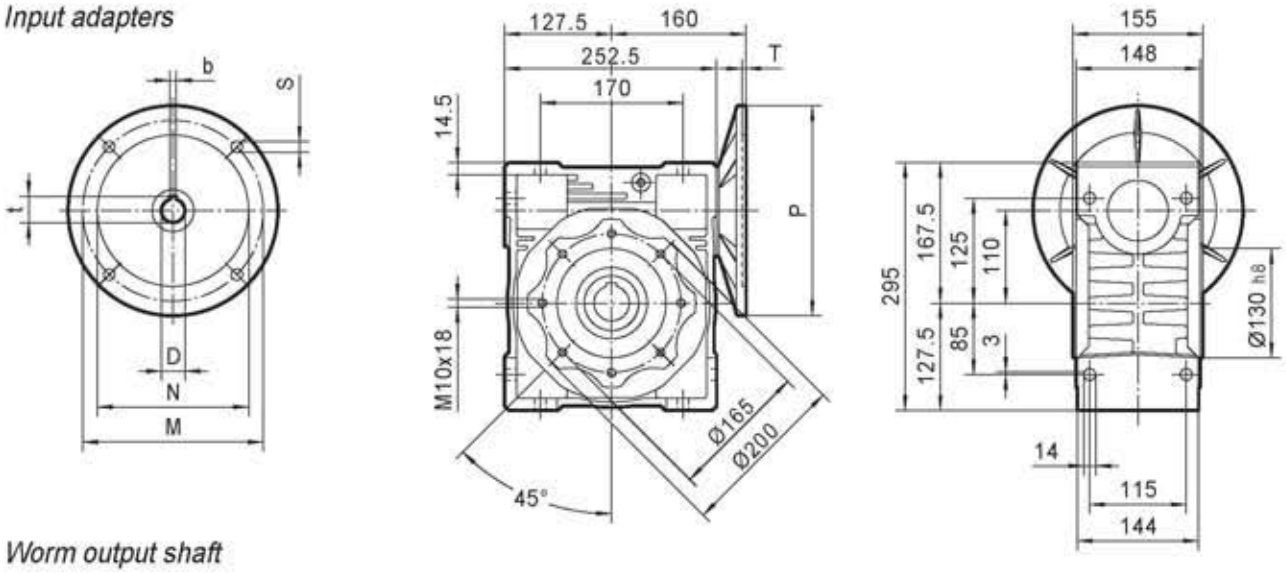


IEC	D_{E8}	b	t	P	M	N	S	T
80B5	19	6	21.8	200	165	130	11	4
90B5	24	8	27.3	200	165	130	11	4
100B5	28	8	31.3	250	215	180	14	4.5
112B5	28	8	31.3	250	215	180	14	4.5
132B5	38	10	41.3	300	265	230	14	4.5

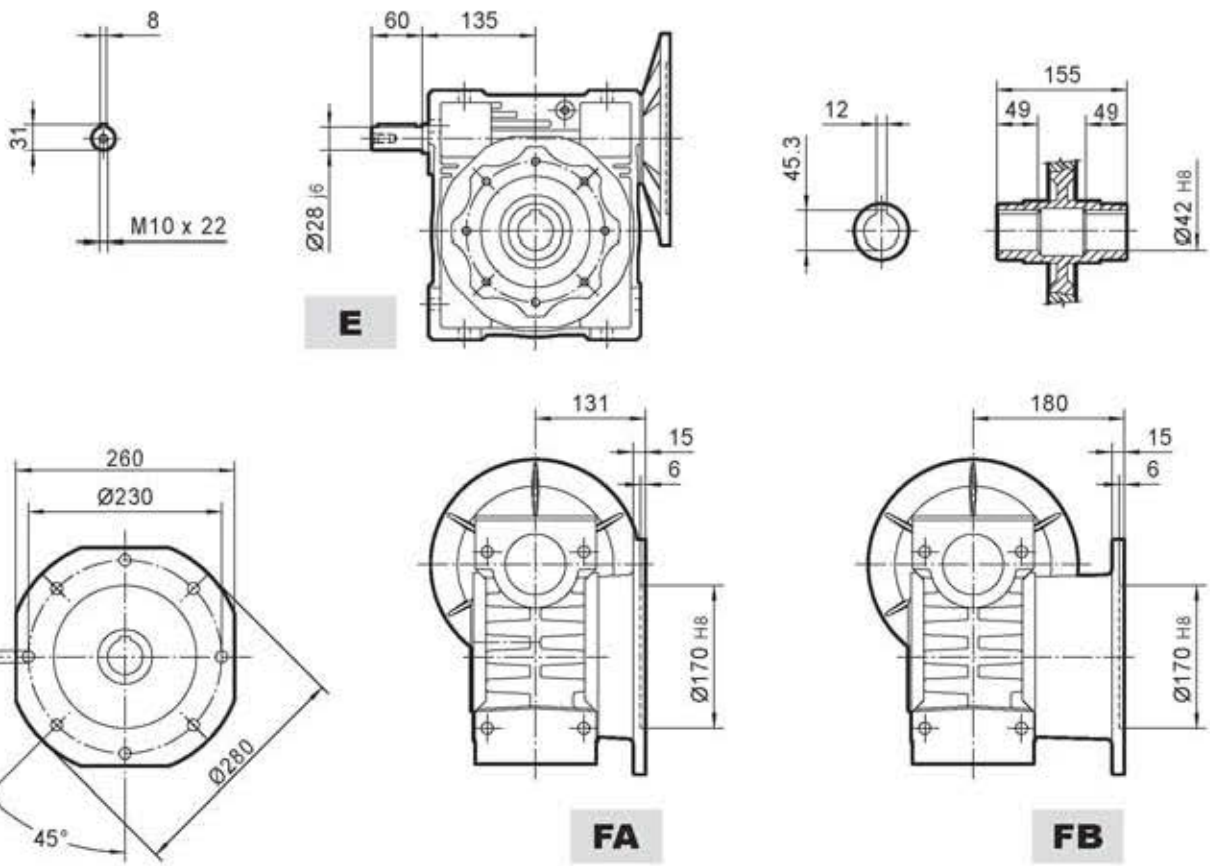
Weight without motor ≈ 21 kg

MHR110..(IEC)

Input adapters



Worm output shaft

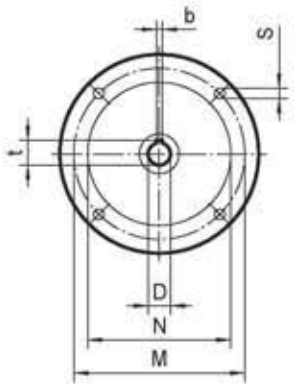


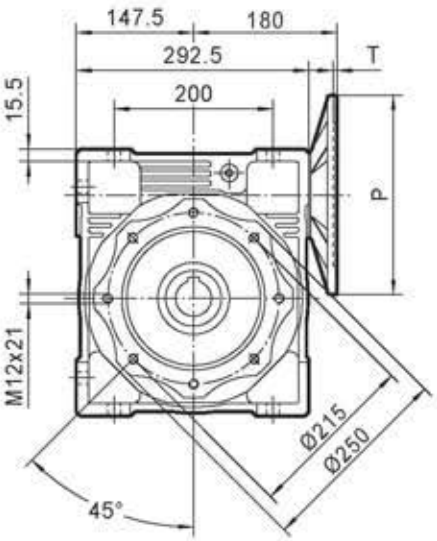
IEC	D_{E8}	b	t	P	M	N	S	T
80B5	19	6	21.8	200	165	130	11	4
90B5	24	8	27.3	200	165	130	11	4
100B5	28	8	31.3	250	215	180	14	4.5
112B5	28	8	31.3	250	215	180	14	4.5
132B5	38	10	41.3	300	265	230	14	4.5

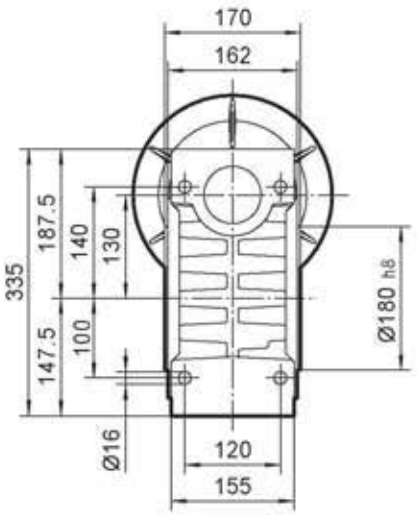
Weight without motor ≈ 35 kg

MHR130..(IEC)

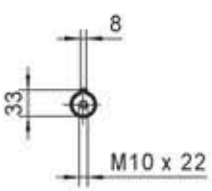
Input adapters

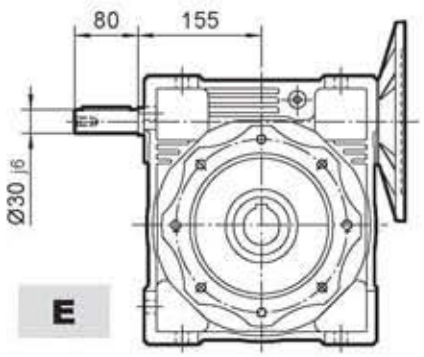


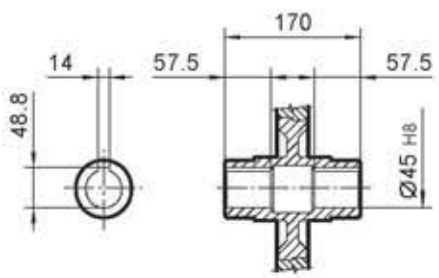


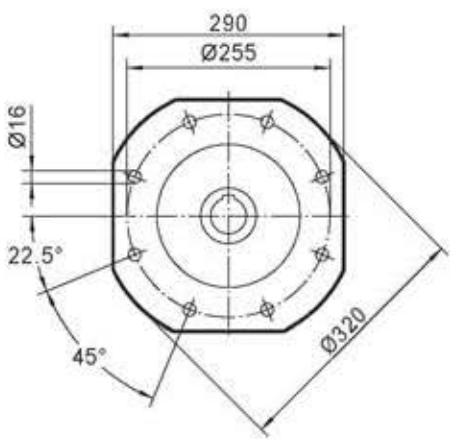


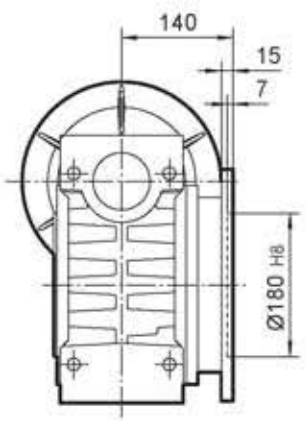
Worm output shaft









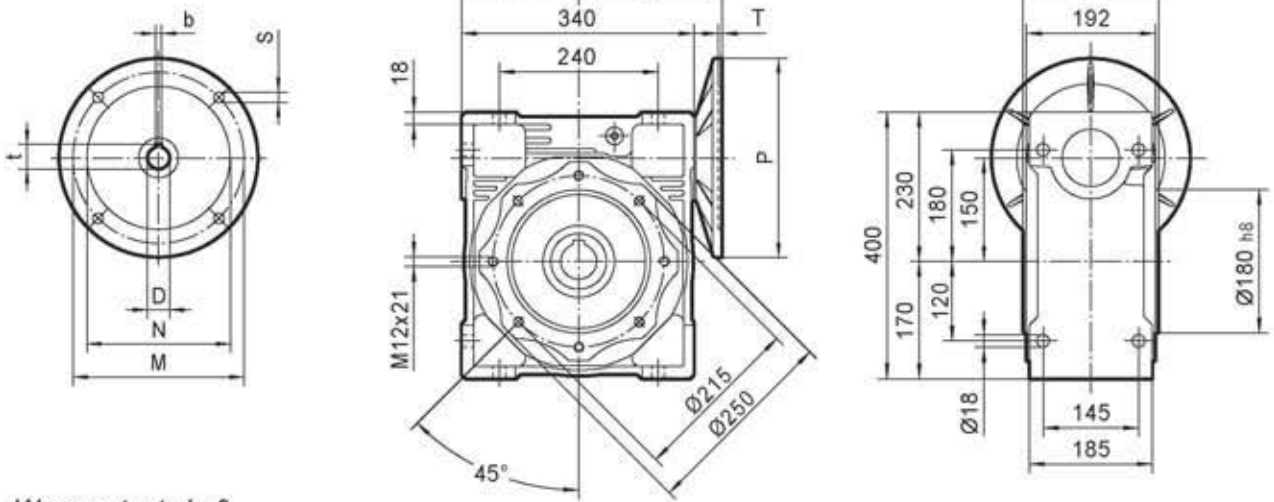


IEC	D_{E8}	b	t	P	M	N	S	T
90B5	24	8	27.3	200	165	130	11	4
100B5	28	8	31.3	250	215	180	14	4.5
112B5	28	8	31.3	250	215	180	14	4.5
132B5	38	10	41.3	300	265	230	14	4.5

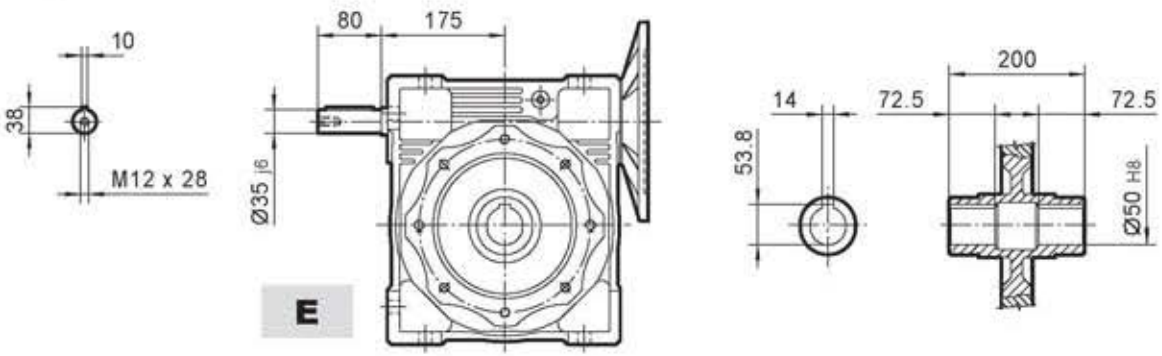
Weight without motor ≈ 48 kg

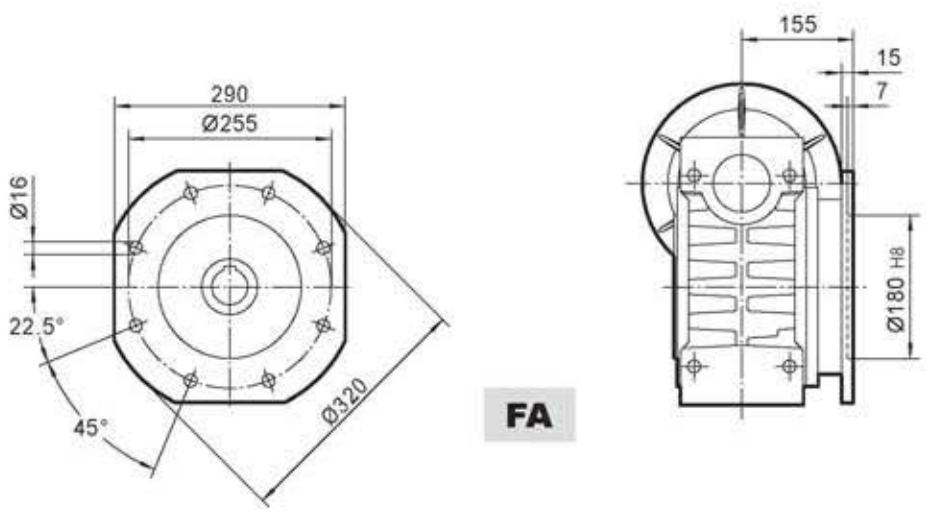
MHR150..(IEC)

Input adapters



Worm output shaft



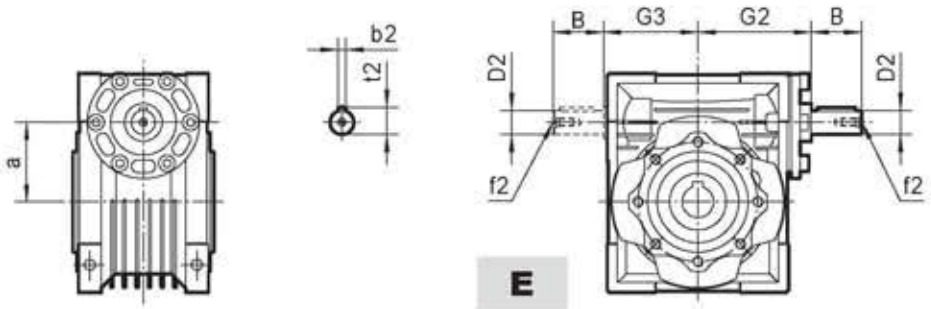


IEC	D_{E8}	b	t	P	M	N	S	T
160B5	42	12	45.3	350	300	250	19	6
132B5	38	10	41.3	300	265	230	14	4.5
100/ 112B5	28	8	31.3	250	215	180	14	4.5

Weight without motor ≈ 84 kg

8.2 HSR.. Outline dimension

HSR *WORM GEAR UNITS*



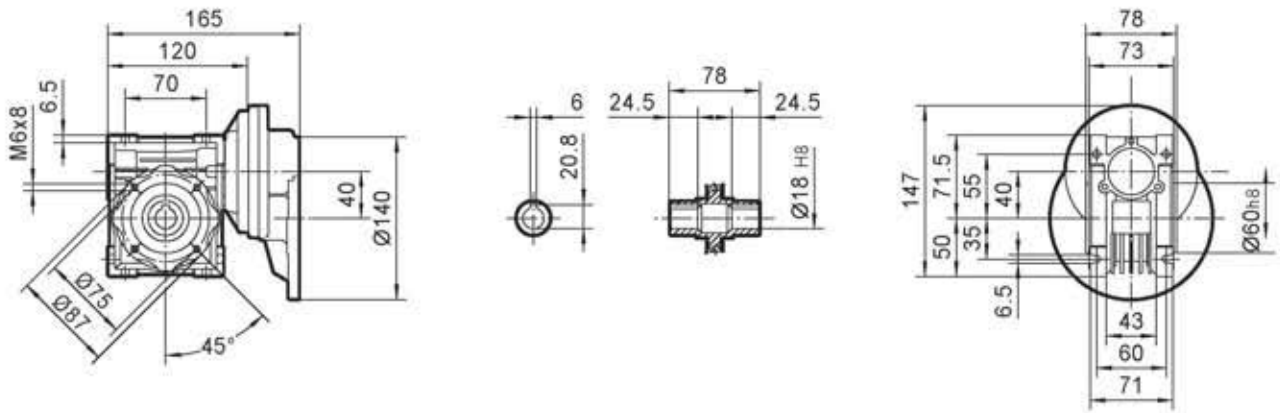
HSR	030	040	050	063	075	090	105	110	130	150
B	20	23	30	40	50	50	60	60	80	80
D2 j6	9	11	14	19	24	24	28	28	30	35
G2	51	60	74	90	105	125	142	142	162	195
G3	45	53	64	75	90	108	135	135	155	175
a	30	40	50	63	75	90	110	110	130	150
b2	3	4	5	6	8	8	8	8	8	10
f2	-	-	M6	M6	M8	M8	M10	M10	M10	M12
t2	10. 2	12. 5	16	21. 5	27	27	31	31	33	38

For the missing dimensions, please refer to page 78-88.

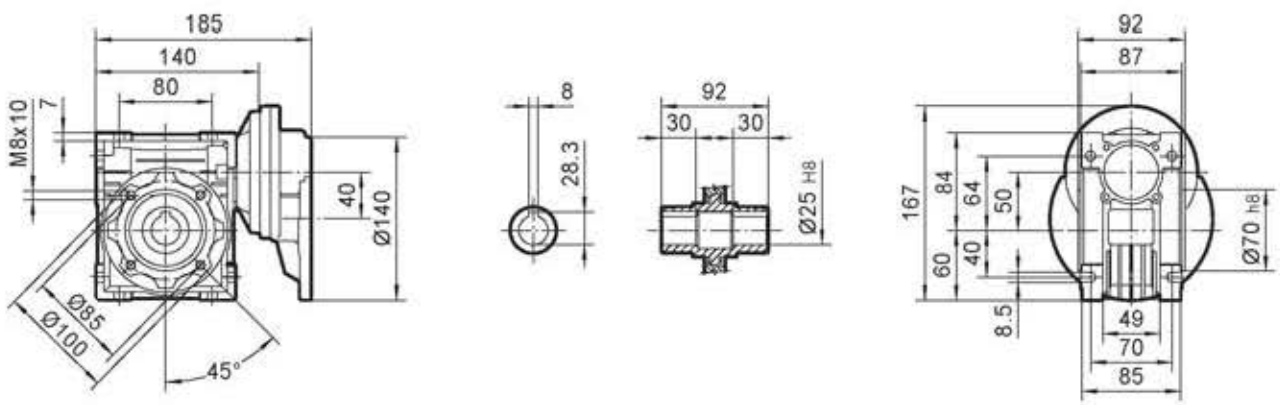
8.3 PC - MHR.. Outline dimension

- For the dimensions of the output flanges, please refer to pages 78-88.
- For the dimensions of the hollow shafts , please refer to pages 78-88.
- For the dimensions of the double extention warm shafts, please refer to page 101.

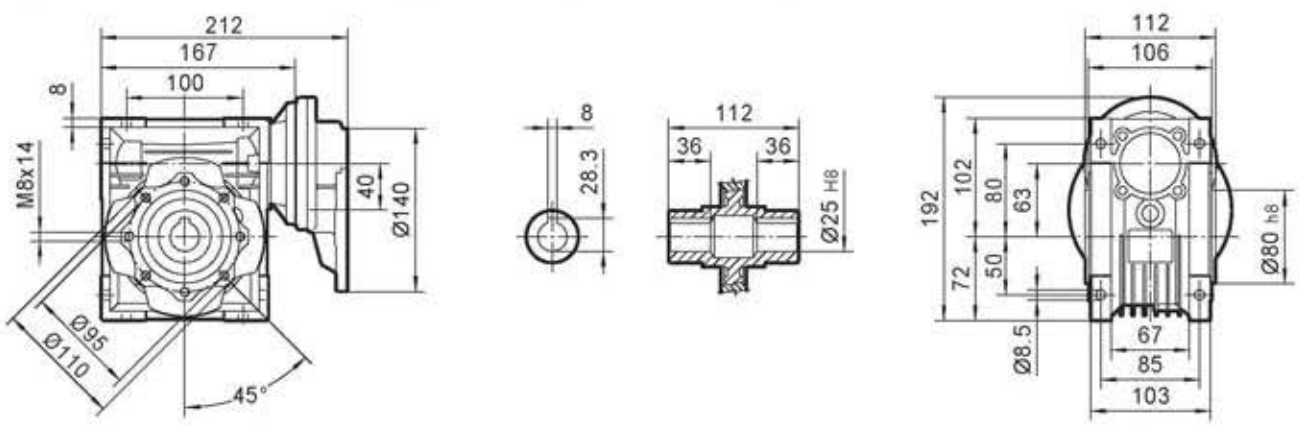
PC063 - MHR040



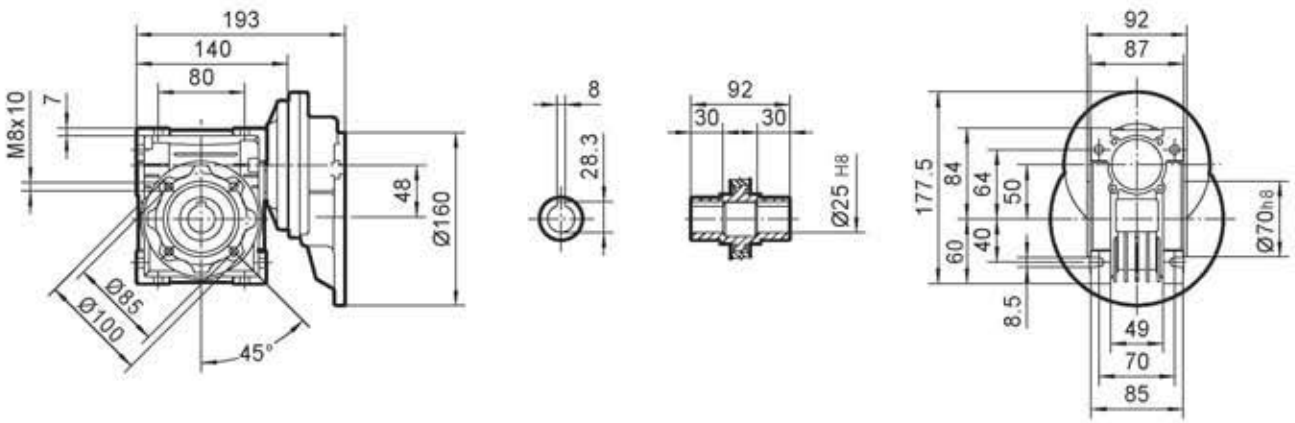
PC063 - MHR050



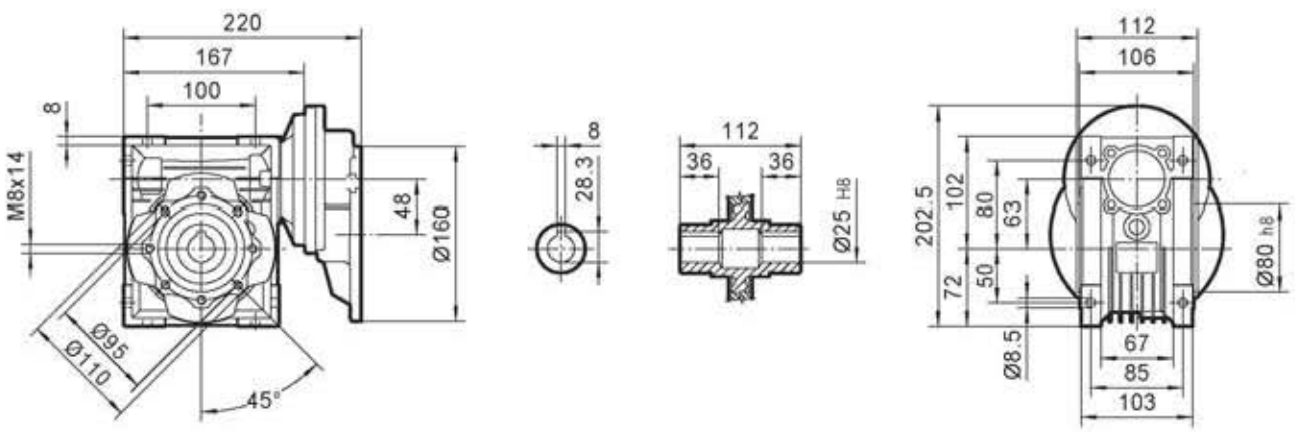
PC063 - MHR063



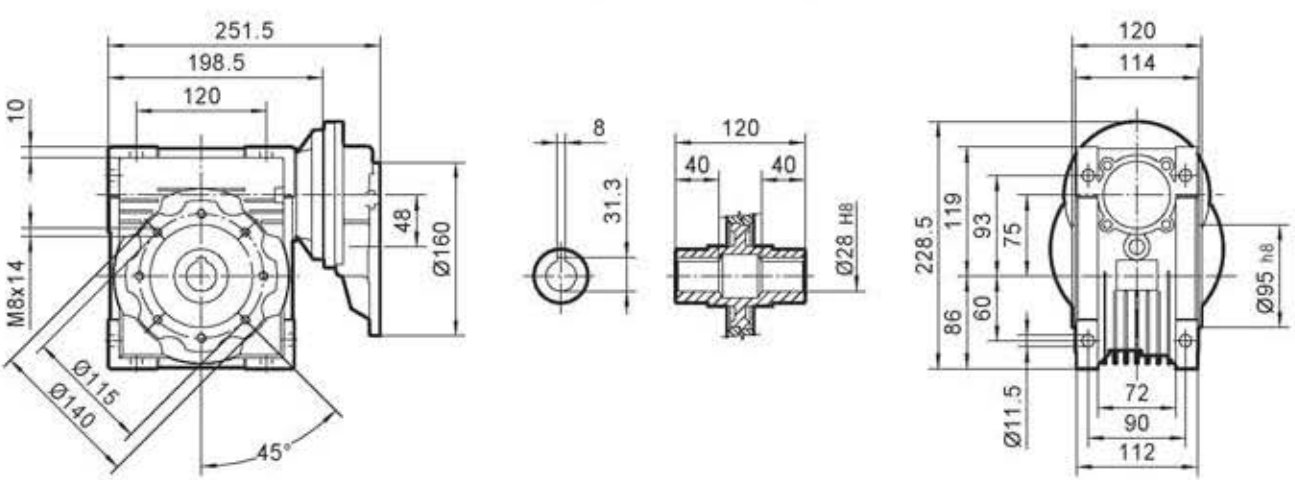
PC071 - MHR050



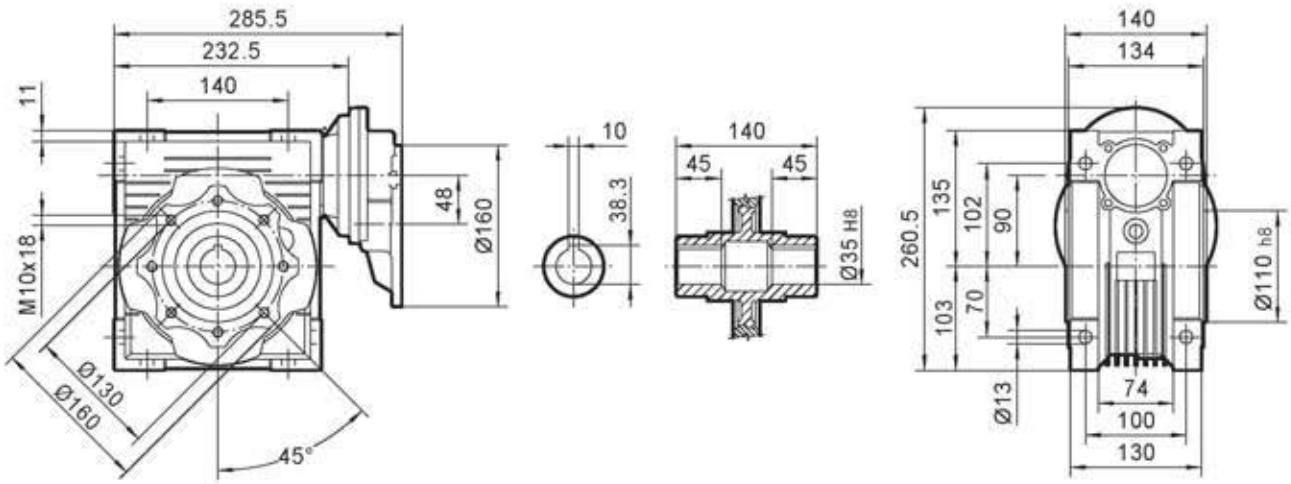
PC071 - MHR063



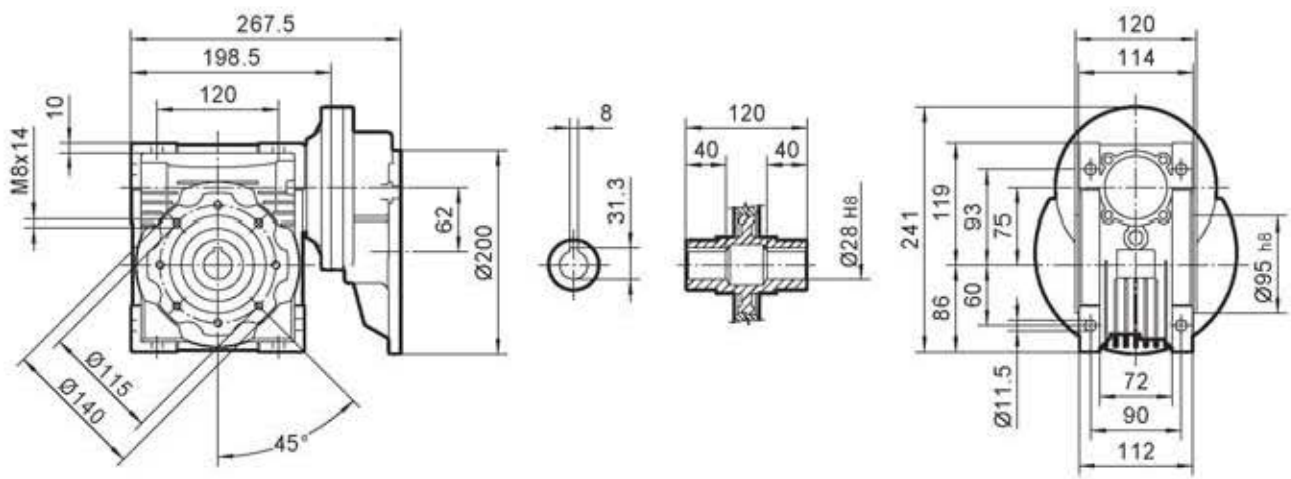
PC071 - MHR075



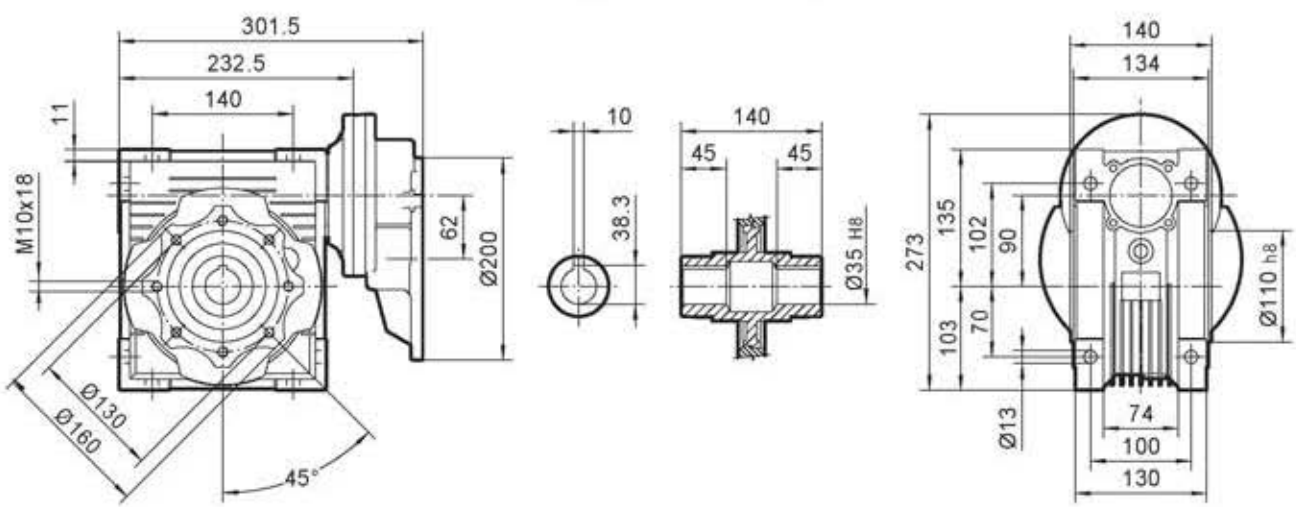
PC071 - MHR090



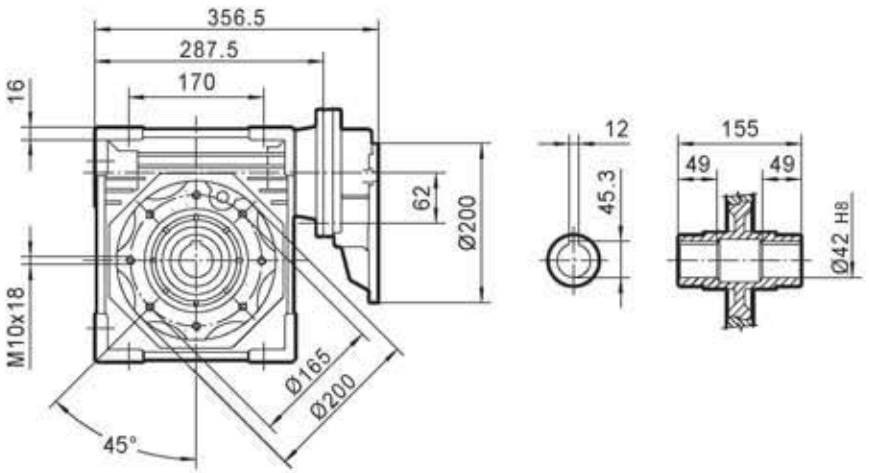
PC080 - MHR075



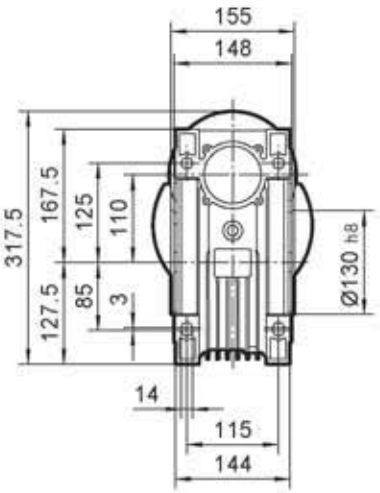
PC080 - MHR090



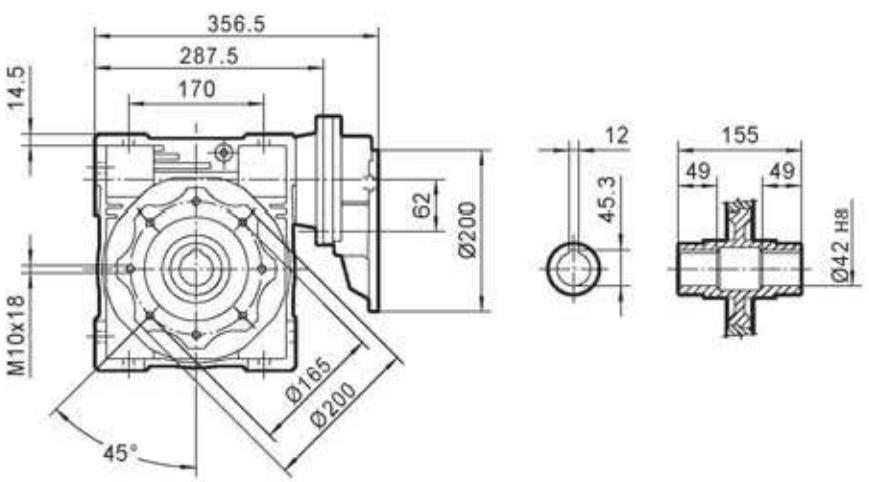
PC080 - MHR105



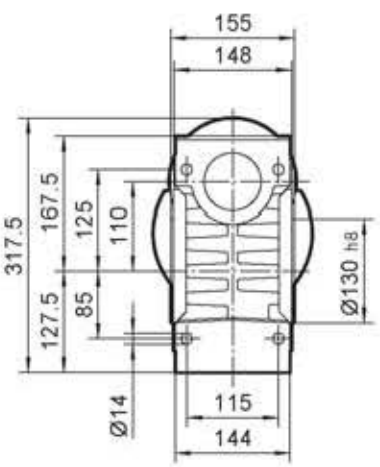
PC090 - MHR105



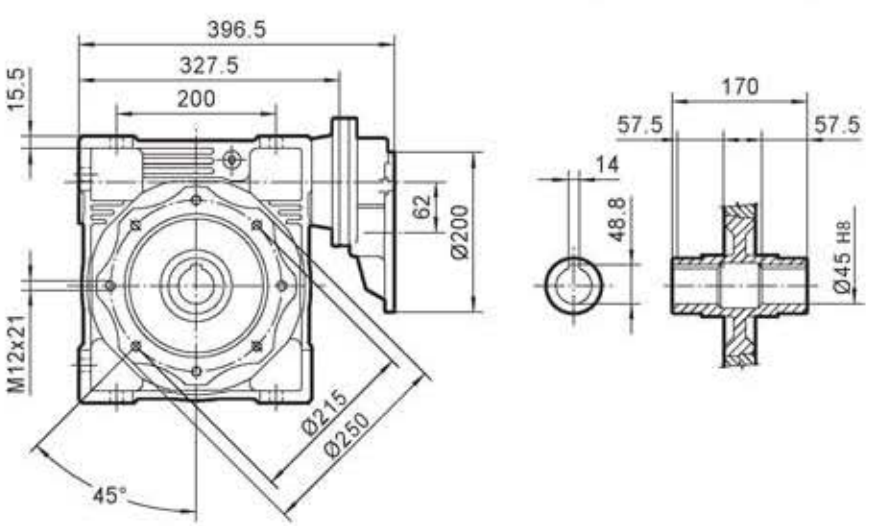
PC080 - MHR110



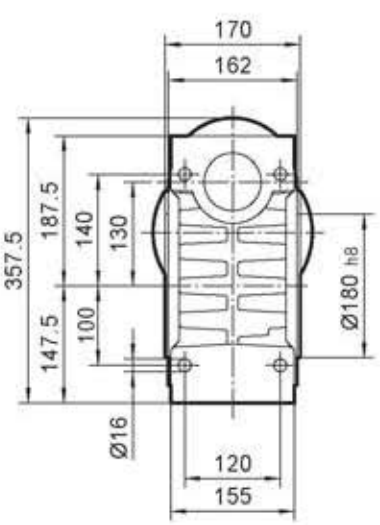
PC090 - MHR110



PC080 - MHR130



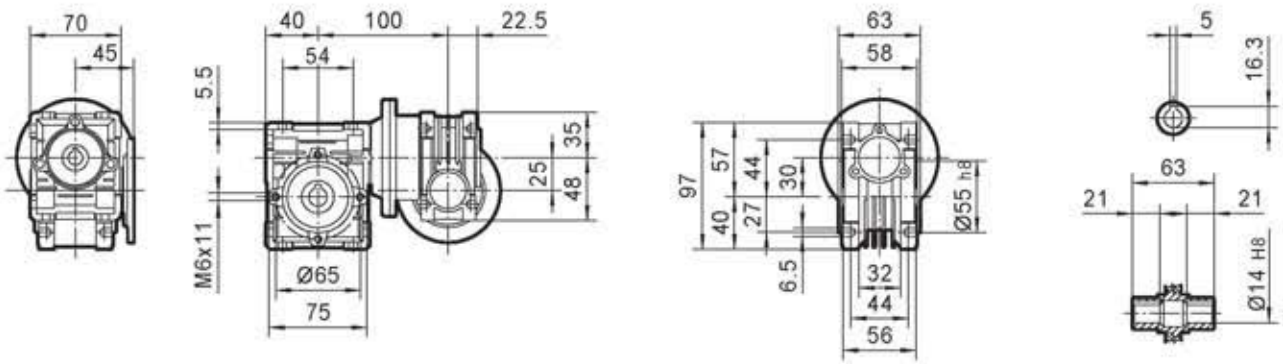
PC090 - MHR130



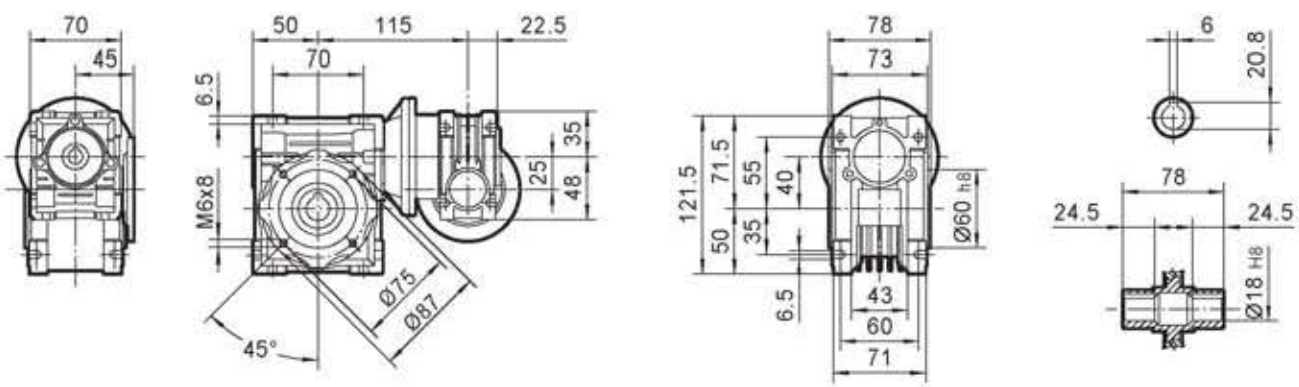
8.4 MHR.. / MHR.. 组合外形尺寸 / Outline dimension

- For the dimensions of the output flanges, please refer to pages 78-88.
- For the dimensions of the hollow shafts , please refer to pages 78-88.
- For the dimensions of the double extention warm shafts, please refer to page 101.

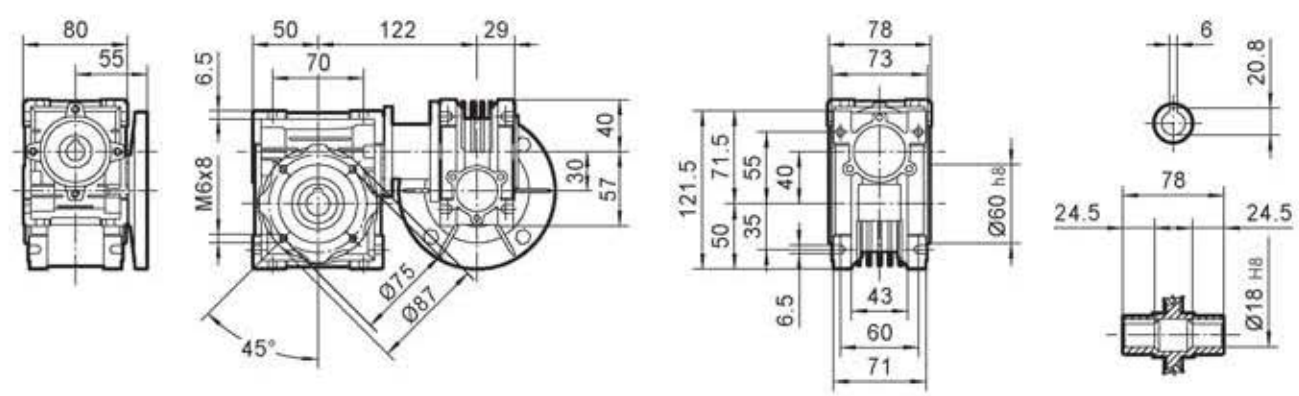
MHR025 / 030



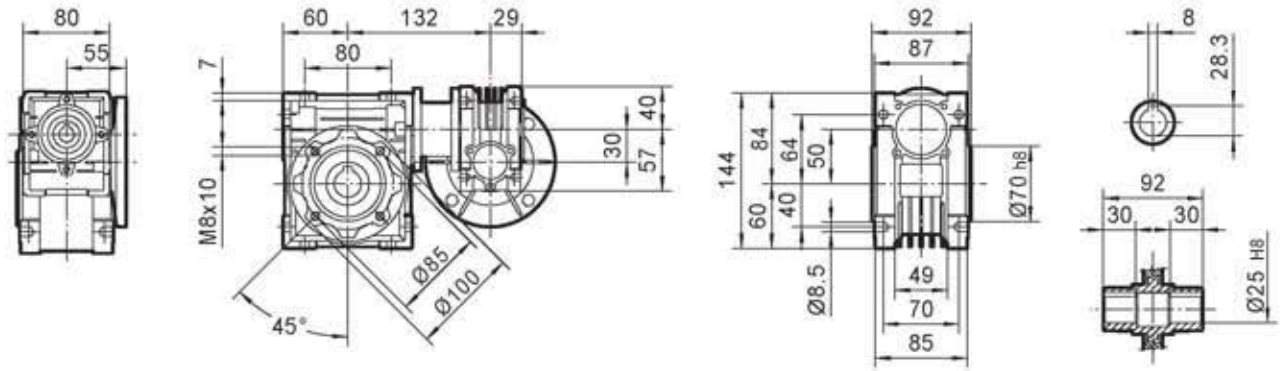
MHR025 / 040



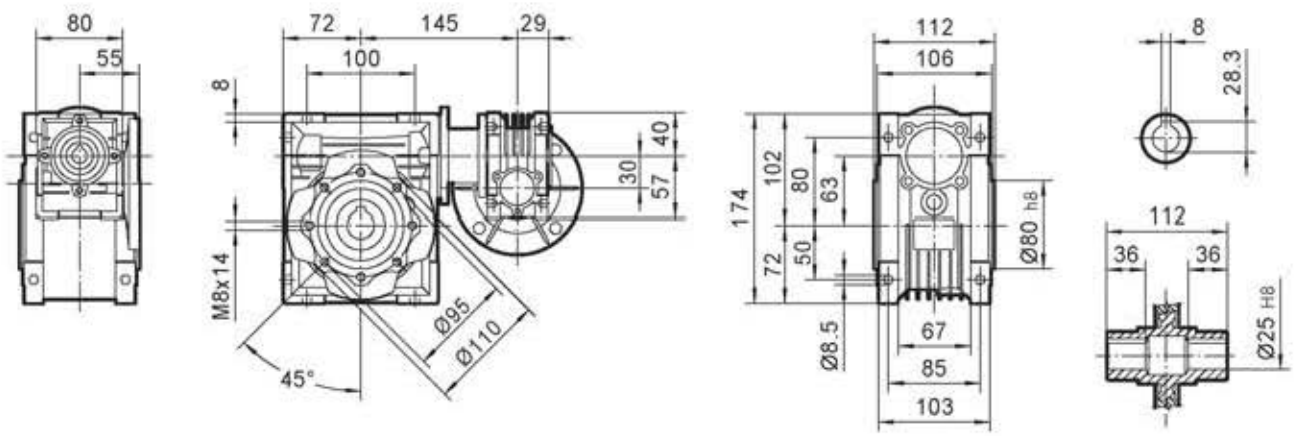
MHR030 / 040



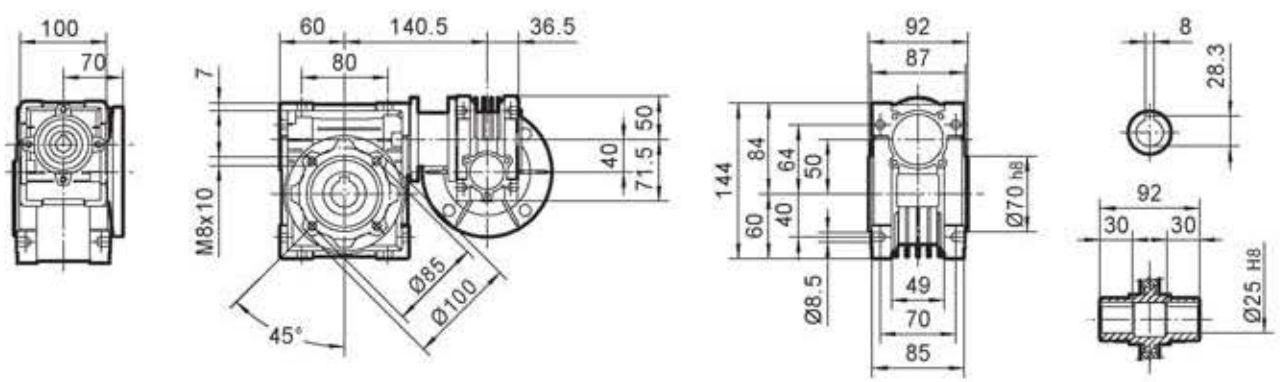
MHR030 / 050



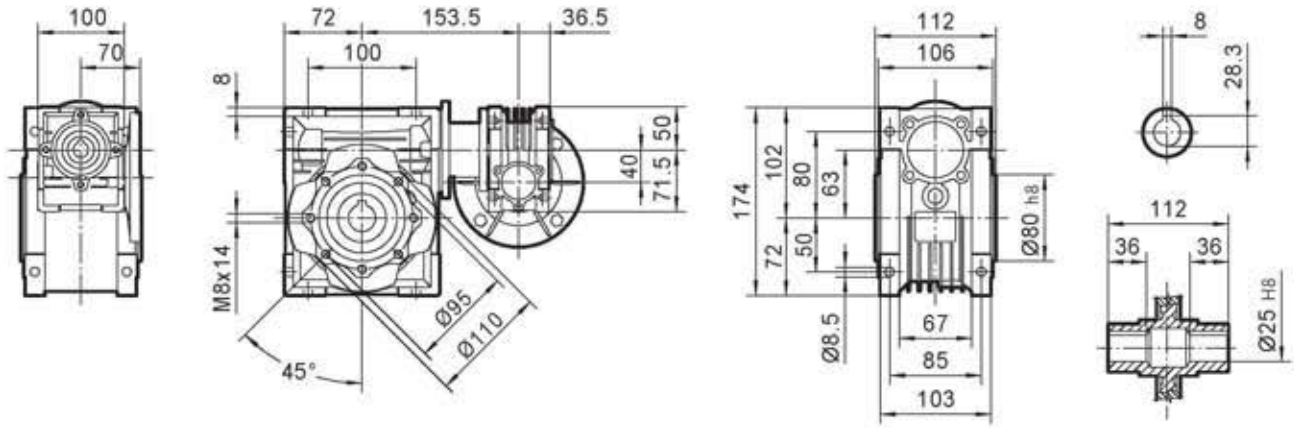
MHR030 / 063



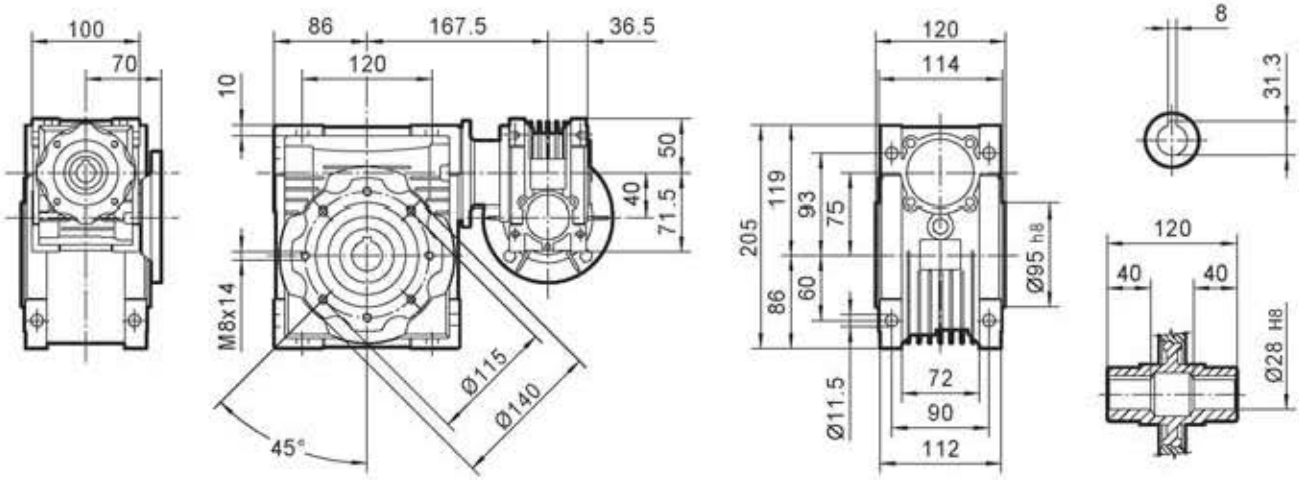
MHR040 / 050



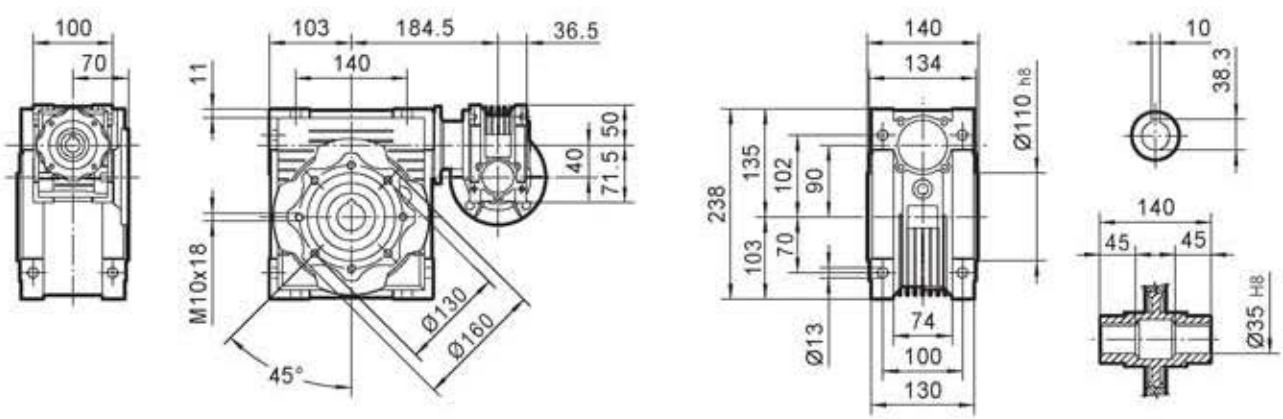
MHR040 / 063



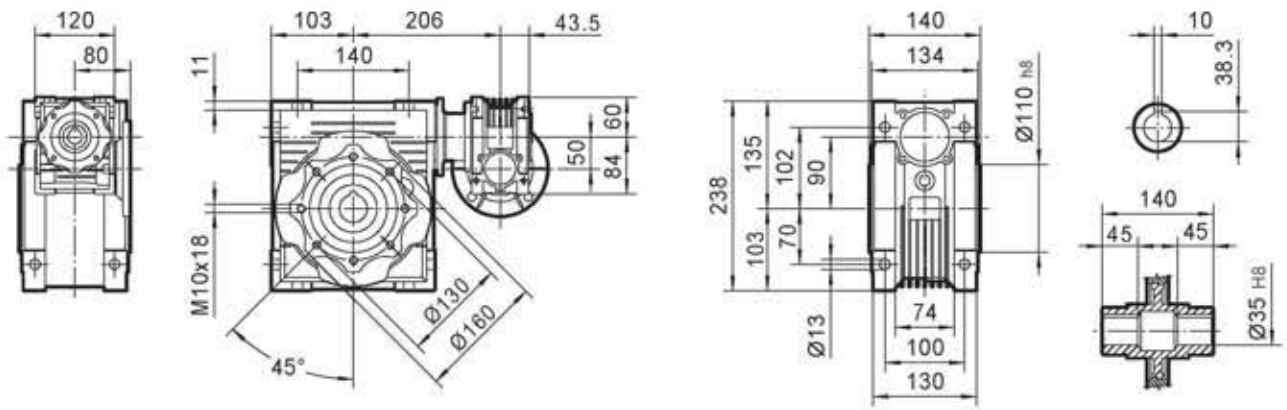
MHR040 / 075



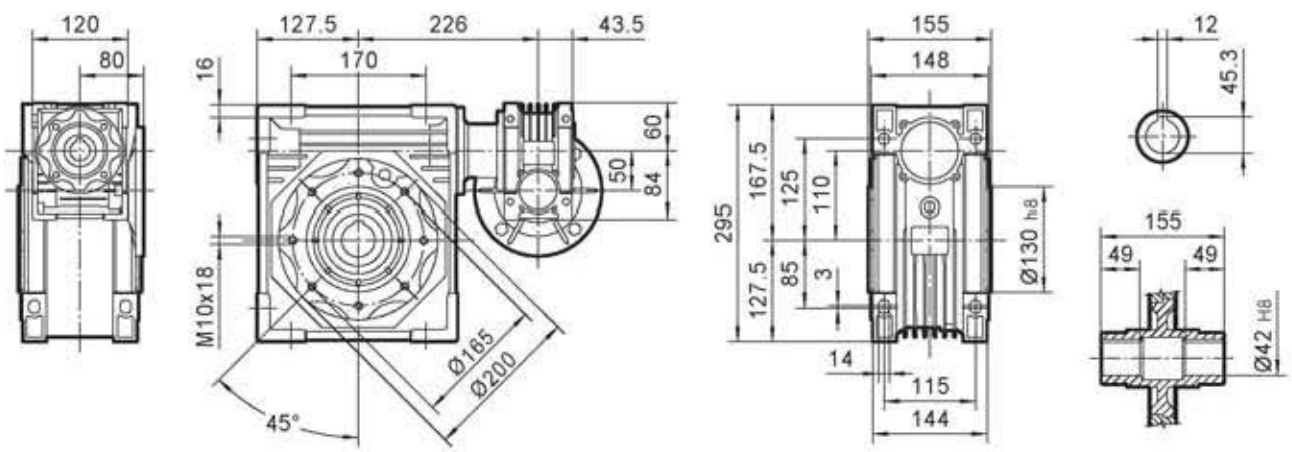
MHR040 / 090



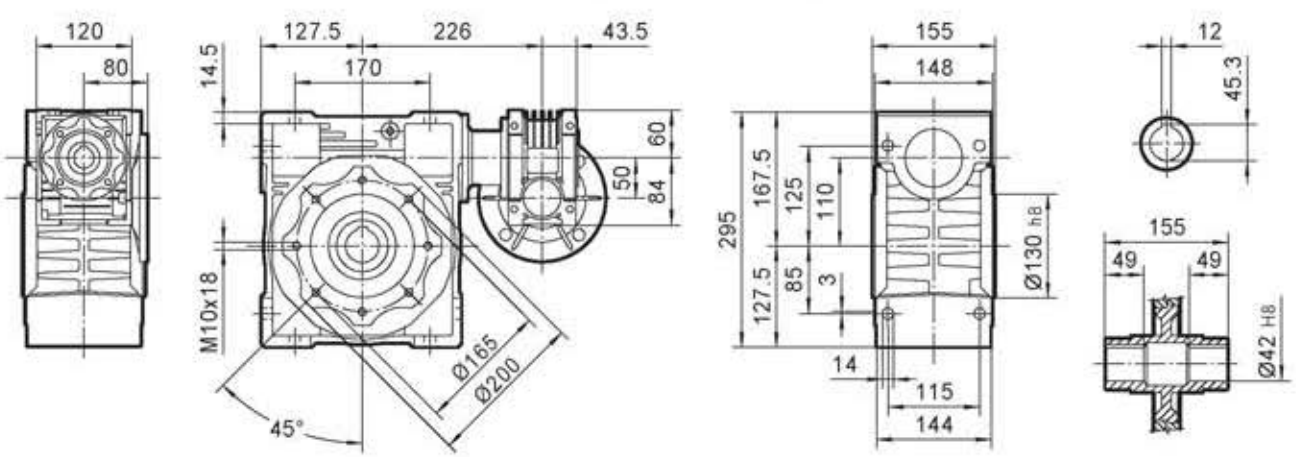
MHR050 / 090



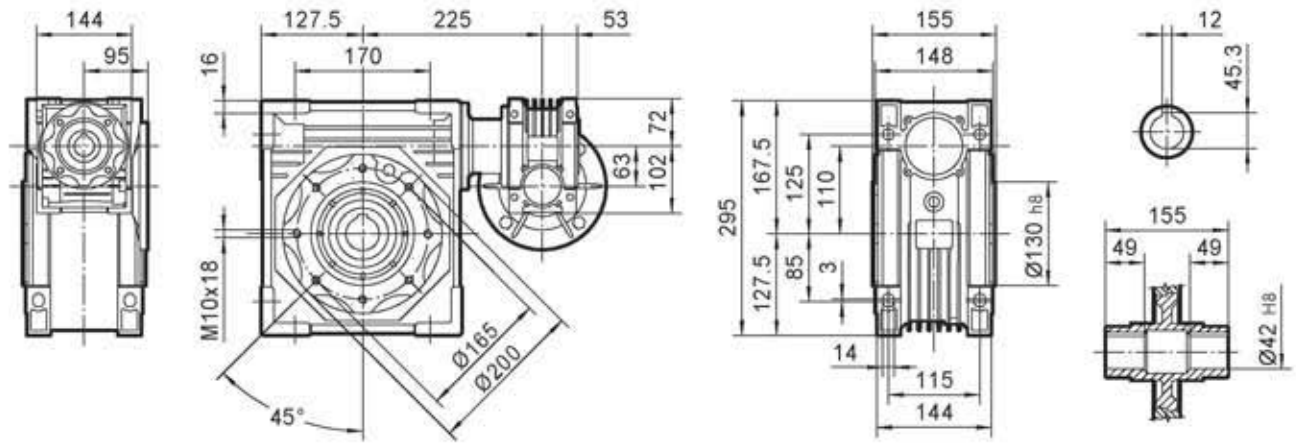
MHR050 / 105



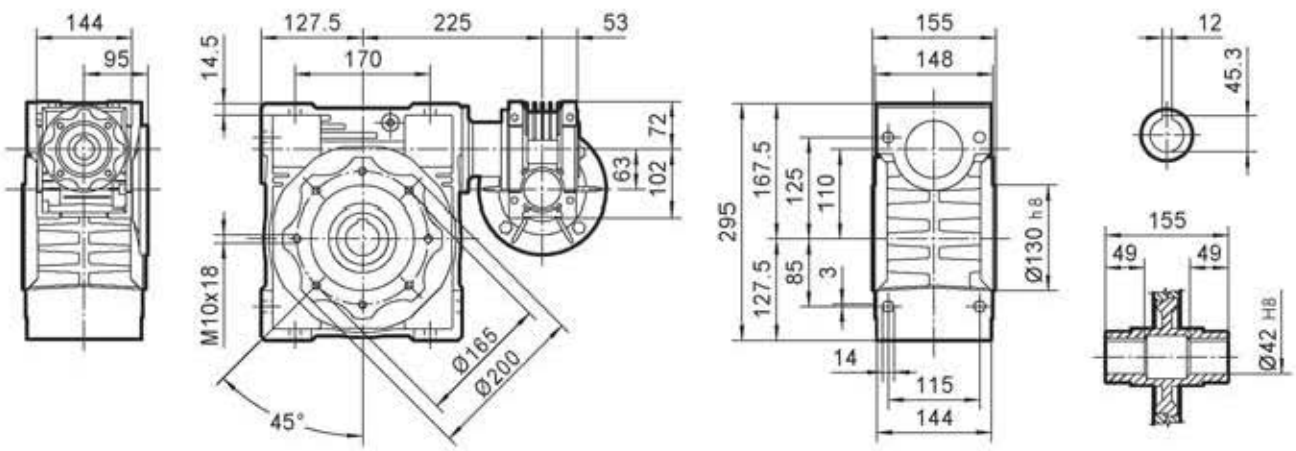
MHR050 / 110



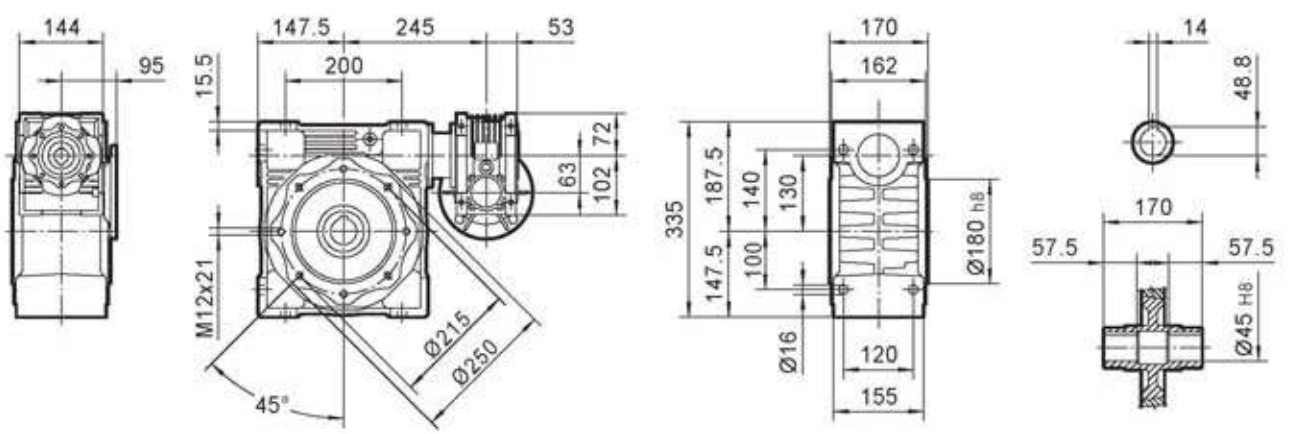
MHR063 / 105



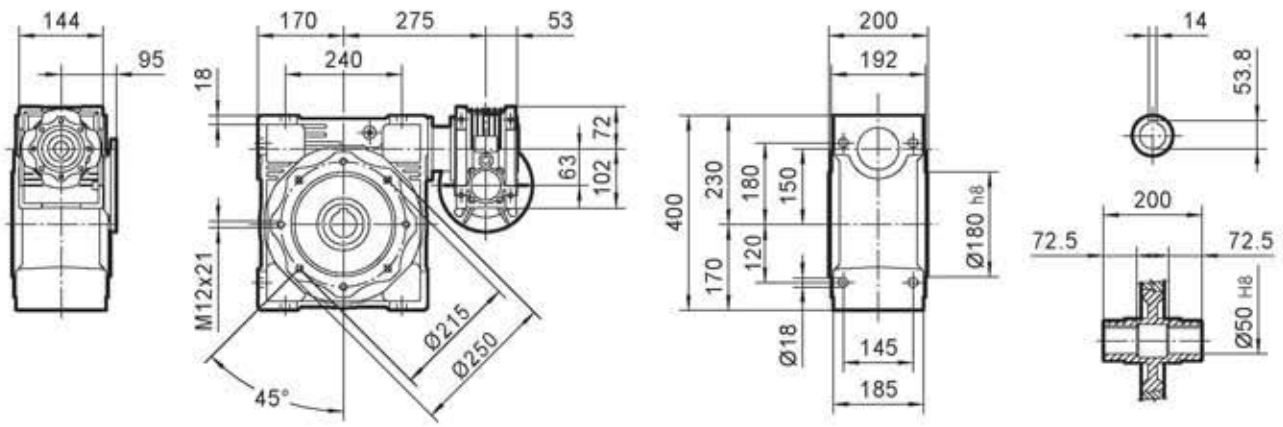
MHR063 / 110



MHR063 / 130

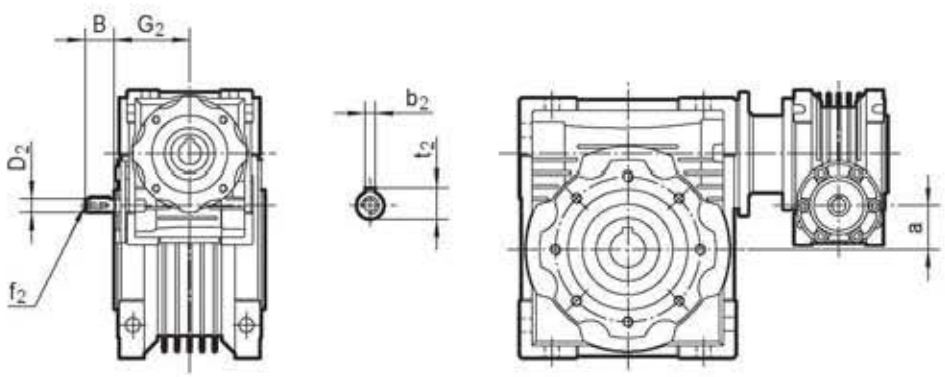


MHR063 / 150



8.5 HSR / MHR.. Outline dimension

HSR / MHR COMBINATION WORM GEAR UNITS

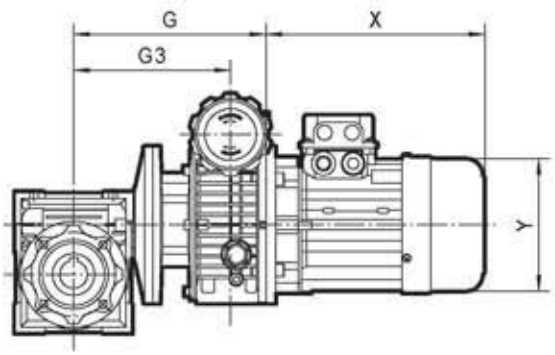


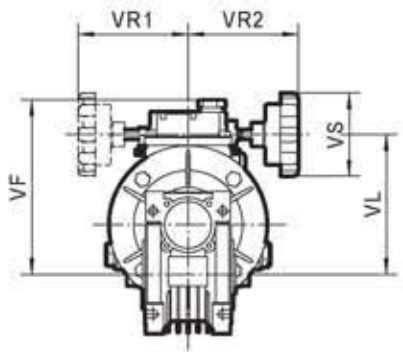
HSR-MHR..	B	$D_{2\ j6}$	G_2	a	b_2	f_2	t_2
030 / 040	20	9	51	10	3	-	10.2
030 / 050	20	9	51	20	3	-	10.2
030 / 063	20	9	51	33	3	-	10.2
040 / 050	23	11	60	10	4	-	12.5
040 / 063	23	11	60	23	4	-	12.5
040 / 075	23	11	60	35	4	-	12.5
040 / 090	23	11	60	50	4	-	12.5
050 / 090	30	14	74	40	5	M6	16
050 / 105	30	14	74	60	5	M6	16
050 / 110	30	14	74	60	5	M6	16
063 / 105	40	19	90	47	6	M6	21.5
063 / 110	40	19	90	47	6	M6	21.5
063 / 130	40	19	90	67	6	M6	21.5
063 / 150	40	19	90	87	6	M6	21.5

For the missing dimensions, please refer to page 78-88.

8.6 VSA-MHR.. Outline dimension

VSA - MHR COMBINATION OF SPEED VARIATOR AND WORM GEAR UNITS



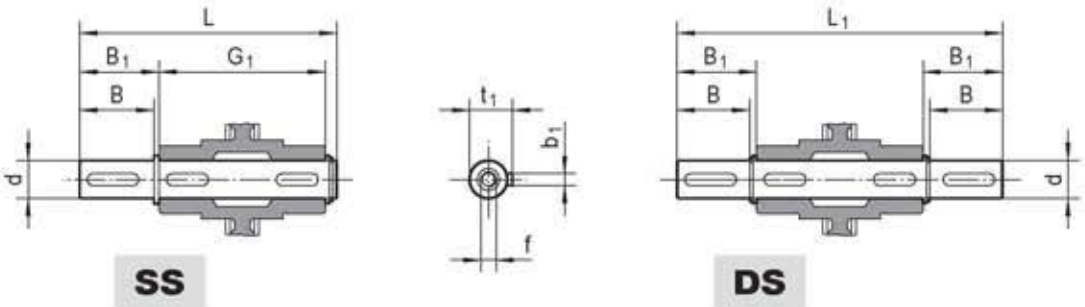


model	G	G3	VF	VL	VS	VR	VR1	base No. 4P n1=1400r/min	X	Y
VSA002-MHR040	183	135	151	118	85	110	110	63	200	120
VSA002-MHR050	193	145	161	128	85	110	110			
VSA005-MHR050	190	154	173	140	85	110	110	71	227	141
VSA005-MHR063	205	169	186	153	85	110	110			
VSA010-MHR063	234	181	203	170	110	120	120	80	268	160
VSA010-MHR063	234	181	203	170	110	120	120			
VSA005-MHR075	223	187	198	165	85	110	110	71	227	141
VSA010-MHR075	252	198	215	182	110	120	120	80	268	160
VSA010-MHR075	252	198	215	182	110	120	120			
VSF020-MHR075	259.5	207.5	199	177	110	150	-	90S	265	195
VSF020-MHR075	300.5	227.5	219	197	110	150	-	90L	290	195
VSA010-MHR090	269	215	230	197	110	120	120	80	268	160
VSA010-MHR090	269	215	230	197	110	120	120			
VSF020-MHR090	276.5	224.5	214	192	110	150	-	90S	265	195
VSF020-MHR090	317.5	244.5	234	212	110	150	-	90L	290	195
VSA020-MHR105	307	255	234	212	110	120	-	90S	265	195
VSA020-MHR105	348	275	254	232	110	150	-	90L	290	195
VSA030-MHR105	368	291	298	260	110	160	-	100L	320	215
VSA030-MHR105	368	291	298	260	110	160	-			
VSA050-MHR105	368	291	298	260	110	160	-	112M	340	240
VSA020-MHR110	307	255	234	212	110	120	-	90S	265	195
VSA020-MHR110	348	275	254	232	110	150	-	90L	290	195
VSA030-MHR110	368	291	298	260	110	160	-	100L	320	215
VSA030-MHR110	368	291	298	260	110	160	-			
VSA050-MHR110	368	291	298	260	110	160	-	112M	340	240
VSA020-MHR130	368	295	274	252	110	150	-	90L	290	195
VSA030-MHR130	388	311	318	280	110	160	-	100L	320	215
VSA030-MHR130	388	311	318	280	110	160	-			
VSA050-MHR130	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

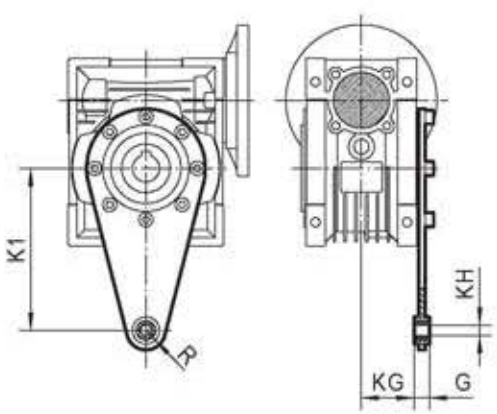


SS **DS**

	d h6	B	B1	G1	L	L1	f	b1	t1
MHR025	11 g6	23	25.5	50	81	101	—	4	12.5
	9 *	25 *	30 *	50	85.5 *	101	—	3 *	10.2 *
MHR030	14	30	32.5	63	102	128	M6	5	16
MHR040	18	40	43	78	128	164	M6	6	20.5
MHR050	25	50	53.5	92	153	199	M10	8	28
MHR063	25	50	53.5	112	173	219	M10	8	28
MHR075	28	60	63.5	120	192	247	M10	8	31
MHR090	35	80	84.5	140	234	309	M12	10	38
MHR105	42	80	84.5	155	249	324	M16	12	45
MHR110	42	80	84.5	155	249	324	M16	12	45
MHR130	45	80	85	170	265	340	M16	14	48.5
MHR150	50	82	87	200	297	374	M16	14	53.5

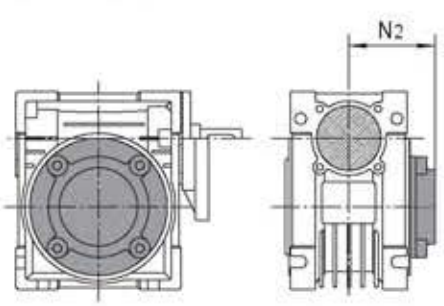
* Only on request

9.2 Torque Arm



	K1	G	KG	KH	R
MHR025	70	14	17.5	8	15
MHR030	85	14	24	8	15
MHR040	100	14	31.5	10	18
MHR050	100	14	38.5	10	18
MHR063	150	14	49	10	18
MHR075	200	25	47.5	20	30
MHR090	200	25	57.5	20	30
MHR105	250	30	62	25	35
MHR110	250	30	62	25	35
MHR130	250	30	69	25	35
MHR150	250	30	84	25	35

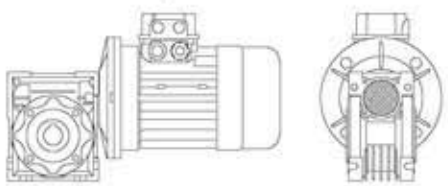
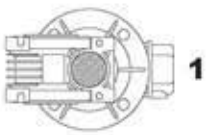
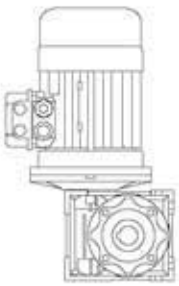
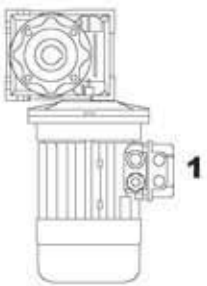
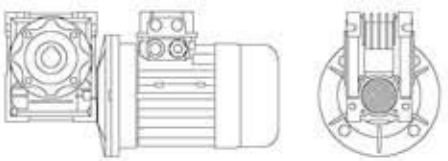
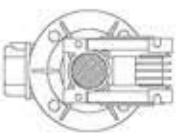
9.3 Cover



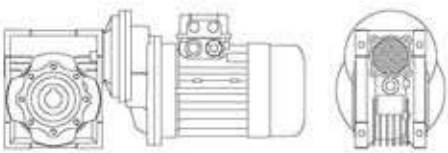
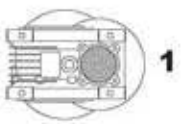
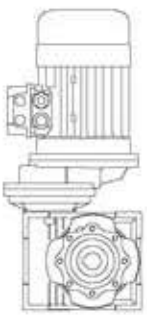
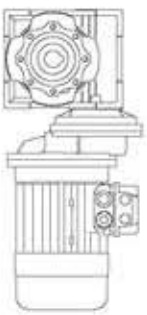
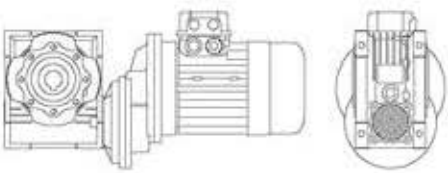
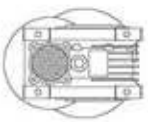
	N2		N2
MHR030	47	TNRV090	94
MHR040	55	TNRV105	102
MHR050	63	TNRV110	102
MHR063	73	TNRV130	117
MHR075	79	TNRV150	113

10. INSTALLATION POSITIONS DIAGRAM

10.1 MHR.. OR HSR.. Mounting Positions

MHR...U - B3	B6	V5	V6
1 	 1	 1	 1
B8	**B7**		
3 	 1		

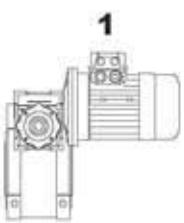
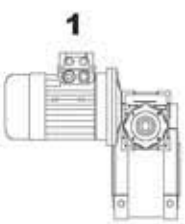
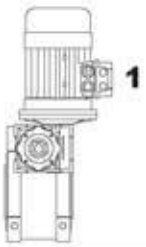
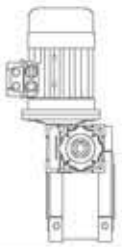
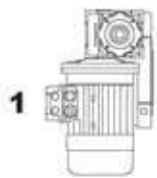
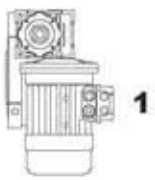
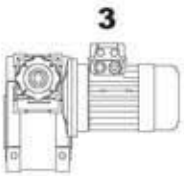
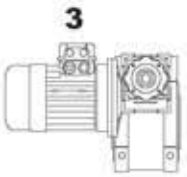
10.2 PC.. - MHR.. Mounting Positions

PC.. - MHR...U - B3	B6	V5	V6
1 	 1	 1	 1
B8	**B7**		
3 	 1		

"**U**" version is related to sizes from **MHR025-075** and **HSR030-063** For these sizes it is not necessary to specify mounting position.

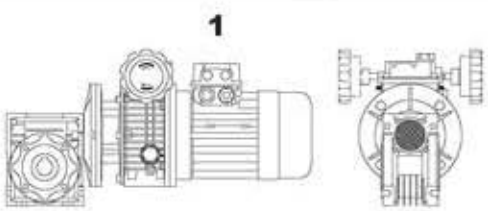
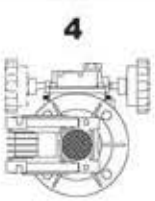
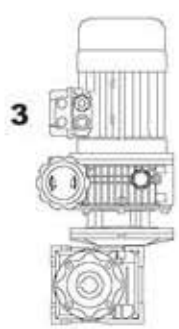
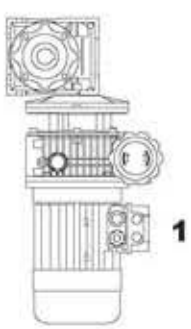
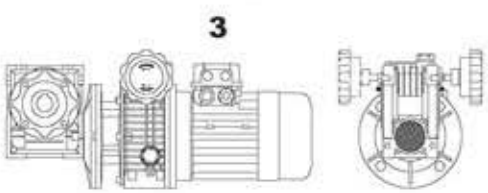
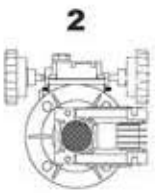
- For vertical positions, please refer to the table on page 106.
- Unless specified otherwise, the standard positions are **B3**.
- For positions not envisaged, it is necessary to call our Technical Service.

10.3 MHR.. - MHR.. / HSR.. - MHR.. *Mounting Positions*

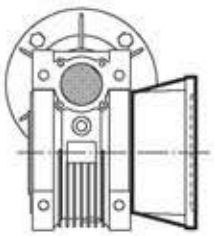
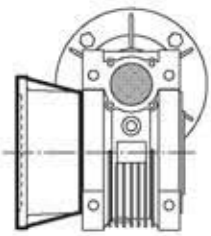
AS1	AS2	VS1	VS2
			
PS1	**PS2**	**BS1**	**BS2**
			

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 1nd gear reducer, see page 76 for the possible mounting positions.

10.4 VSA.. - MHR.. *Mounting Positions*

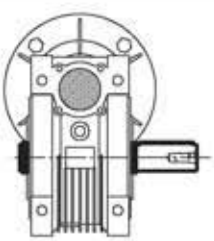
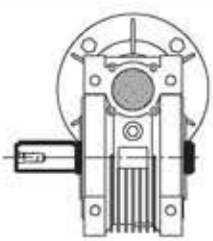
MHR...U - B3	B6	V5	V6
			
B8	**B7**		
			

10.5 Position diagram for output flange

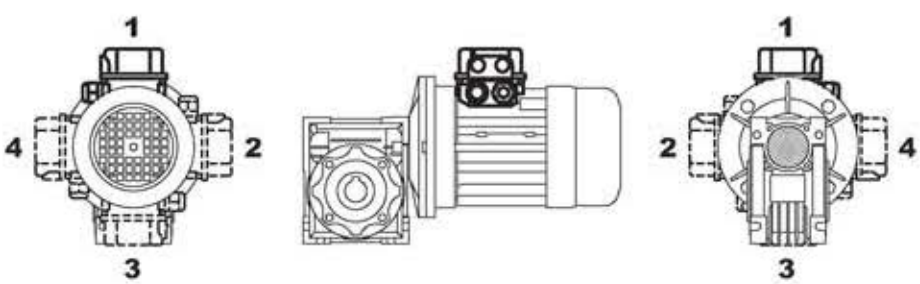
FA1,FB1,FC1,FD1,FE1	FA2,FB2,FC2,FD2,FE2
	

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

SS1	SS2
	

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.

10.8 Direction of rotation

MHR

MHR - MHR

HSR

HSR - MHR

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 directiy and the wsight 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°C or > +40°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° under -5°C or over 40°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 (fs =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.

MHR	025	030	040	050	063	075	090	105	110	130	150
V5: 1500 < n_1 < 3000	—	—	—	—	—	B	B	B	B	B	B
n_1 > 3000	B	B	B	B	B	A	A	A	A	A	A
V6	B	B	B	B	B	B	B	B	B	B	B

A Application not recommended

B Check the application and/or call our technical service

12.1 WORM GEARBOX PRODUCT PICTURE

VF..A..

VF..A..E..

VF..N..

VF..V..

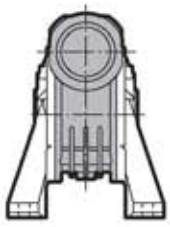
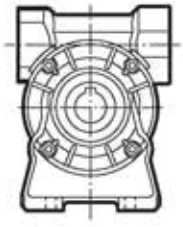
VF..F(FA)..

VF..P..

VF..HS..

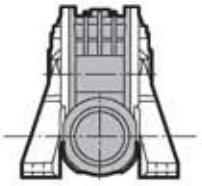
VF..P..E..HS..

12.1.2 Model illuminate

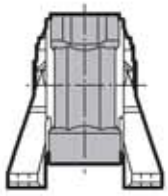
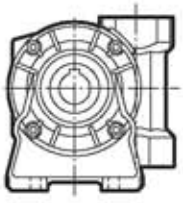
VF..A..

Foot mounted,overdriven



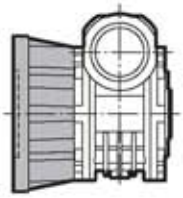
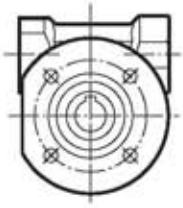

VF..N..

Foot mounted,underdriven.

VF..V..

Foot mounted,wormshaft vertical

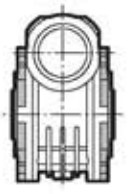
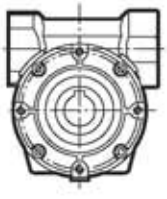



VF..F..

Standard output flange

VF..FA..

Extended output flange

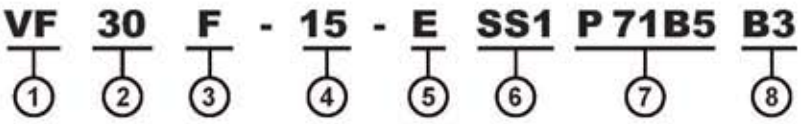



VF..P..

Side cover for shaft mounting

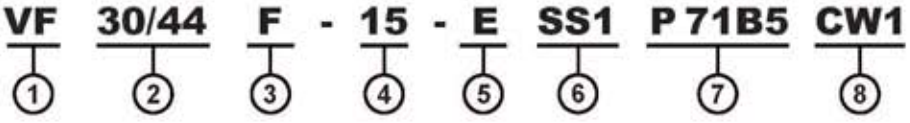
12.2 MODEL ILLUMINATE

12.2.1 VF Worm gear units model illuminate



No	Comments
1	Code of worm gear units
2	Central distance of worm gear units (spec)
3	Central distance of worm gear units (spec) **1). A**: Foot mounted overdriven **2). N:**Foot mounted underdriven **3). V:**Foot mounted wormshaft vertical **4). F(1/2)**: Standard output flange **5). FA(1/2)**：Extended output flange **6). P**: Side cover for shaft mounting
4	Speed ratio of reducer (i = 7; 10; 14; 80; 100)
5	**1).** No mark means single extension worm shaft **2). E:** Double extension worm shaft
6	**1).** No mark means hole output **2). SS(1/2):** Single output shaft and position **3). DS:** Double output shaft
7	**1). IEC** Output flange **2). HS:** Shaft input
8	Installation position code

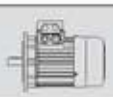
12.2.2 VF/VF Combination worm gear units model illuminate

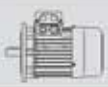


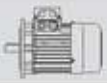
No	Comments
1	Code of worm gear units
2	Central distance of worm gear units (spec)
3	Central distance of worm gear units (spec) **1). A**: Foot mounted overdriven **2). F(1/2)**: Standard output flange **3). FA(1/2)**：Extended output flange **4). P**: Side cover for shaft mounting
4	Speed ratio of reducer (i = 240; 245; 315 .....)
5	**1).** No mark means single extension worm shaft **2). E:** Double extension worm shaft
6	**1).** No mark means hole output **2). SS(1/2):** Single output shaft and position **3). DS:** Double output shaft
7	**1). IEC** Output flange **2). HS:** Shaft input
8	Installation position code

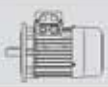
12.3 GEAR UNIT SELECTION TABLES

12.3.1 VF..P(IEC).. Performance parameter

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	f_s				Page
0.06	19.3	14	70	1600	1.1	**VF30**	**56B5/B14**	**5614**	119
	22.5	13	60	1600	1.5				
	34	10	40	1650	1.9				
	45	8	30	1340	2.5				
	68	6	20	1180	2.9				
	90	5	15	1080	3.7				
	135	3	10	950	4.7				
	193	2	7	840	6.4				
	2.4	74	560	2500	0.8	**VF30/44**	**56B5/B14**	**5614**	126
	3.2	62	420	2500	1.0				
	3.9	53	350	2500	1.1				
	5.5	42	245	2500	1.4				
	2	116	720	3450	0.8	**VF30/49**	**56B5/B14**	**5614**	126
	2.5	85	540	3450	1.1				
	3.2	73	420	3450	1.3				
	4.3	53	315	3450	1.8				
	5.6	45	240	3450	2.1				
0.09	22.5	19	60	1600	1.0	**VF30**	**56B5/B14**	**5624**	119
	34	15	40	1410	1.3				
	45	12	30	1290	1.6				
	68	9	20	1140	2.0				
	90	7	15	1050	2.5				
	135	5	10	920	3.1				
	193	4	7	820	4.3				
	22	22	40	1560	0.9	**VF30**	**63B5/B14**	**6316**	119
	29.3	18	30	1440	1.2				
	44	14	20	1230	1.5				
	59	11	15	1170	1.9				
	88	8	10	1050	2.3				
	126	6	7	920	3.2				
	3.9	80	350	2500	0.7	**VF30/44**	**56B5/B14**	**5624**	125
	5.5	62	245	2500	1.0				
	12.6	38	70	2300	0.8	**VF44**	**63B5/B14**	**6316**	121
	14.7	33	60	2300	1.2				
	19.1	28	46	2300	1.4				
	25.1	23	35	2300	1.7				
	31	19	28	2300	2.0				
	44	15	20	2300	2.6				
	3.2	110	420	3450	0.9	**VF30/49**	**56B5/B14**	**5624**	126
	4.3	80	315	3450	1.2				
	5.6	69	240	3450	1.4				
	8.8	41	100	3300	1.3	**VF49**	**63B5/B14**	**6316**	123
	11.0	37	80	3300	1.6				
	12.6	34	70	3300	1.8				
	14.7	31	60	3300	2.1				
	19.6	26	45	3300	2.7				
	24.4	22	36	3300	3.4				
0.12	138	7	20	840	2.1	**VF30**	**56B5/B14**	**5622**	119
	275	4	10	740	3.4				
	393	3	7	660	4.7				
	33	21	40	1360	0.9	**VF30**	**63B5/B14**	**6314**	119
	44	17	30	1250	1.2				
	66	13	20	1110	1.4				

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	f_s				Page
0.12	87	10	15	1020	1.8	VF30	63B5/B14	6314	119
	131	7	10	900	2.3				
	187	5	7	810	3.1				
	29	24	30	1360	0.9	VF30	63B5/B14	6326	119
	44	18	20	1250	1.1				
	58	15	15	1130	1.4				
	87	10	10	1020	1.7				
	124	8	7	900	2.4				
	18.7	34	70	3300	0.9	VF44	63B5/B14	6314	121
	21.8	30	60	2300	1.3				
	28.5	25	46	2300	1.6				
	37	21	35	2300	1.9				
	47	17	28	2300	2.2				
	66	13	20	2100	2.9				
	94	10	14	1870	2.9				
	14.5	42	60	2300	1.1	VF44	63B5/B14	6326	121
	19	36	46	2300	1.4				
	25	30	35	2300	1.7				
	31	25	28	2300	2.0				
	44	19	20	2300	2.3				
	62	14	14	2150	2.7				
	4.2	110	315	3450	0.9	VF30/49	63B5/B14	6314	126
	5.5	94	240	3450	1.0				
	13.1	42	100	3150	1.2	VF49	63B5/B14	6314	123
	16.4	36	80	3150	1.5				
	18.7	34	70	3150	1.6				
	21.8	30	60	3150	1.9				
	29.1	25	45	3040	2.6				
	36	21	36	2830	3.3				
	8.7	55	100	3300	0.9	VF49	63B5/B14	6326	123
	10.9	50	80	3300	1.2				
0.18	90	13	30	1020	1.1	VF30	63B5/B14	6312	119
	135	10	20	900	1.4				
	180	8	15	800	1.8				
	270	5	10	710	2.2				
	386	4	7	640	3.1				
	66	19	20	1040	1.0	VF30	63B5/B14	6324	119
	88	15	15	960	1.2				
	132	11	10	860	1.5				
	189	8	7	770	2.1				
	45	24	60	2300	1.2	VF44	63B5/B14	6312	121
	59	20	46	2190	1.4				
	77	16	35	1970	1.8				
	96	14	28	1770	2.1				
	135	10	20	1590	2.8				
	193	7	14	1470	2.9				
	22	45	60	2300	0.9	VF44	63B5/B14	6324	121
	29	37	46	2500	1.1				
	38	31	35	2430	1.3				
	47	26	28	2270	1.5				
	66	20	20	2040	1.9				
	94	15	14	1830	2.0				
	132	11	10	1640	2.7				
	26	43	35	2340	1.1	VF44	71B5/B14	7116	121
	32	36	28	2290	1.4				
	45	28	20	2050	1.6				
	64	21	14	1830	1.9				
	90	16	10	1650	2.5				

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	f_s				Page
0.18	16.5	54	80	3150	1.0	**VF49**	**63B5/B14**	**6324**	123
	18.9	50	70	3150	1.1				
	22	45	60	3150	1.3				
	29.3	37	45	2300	1.8				
	37	31	36	2760	2.2				
	47	26	28	2560	2.9				
	55	23	24	2430	2.7				
	73	19	18	2230	3.2				
	15	61	60	3000	1.1	**VF49**	**71B5/B14**	**7116**	123
	20	52	45	2790	1.4				
	25	43	36	2650	1.7				
	32	36	28	2450	2.3				
0.25	135	14	20	840		**VF30**	**63B5/B14**	**6322**	119
	180	11	15	780					
	270	7	10	690					
	77	23	35	1930	1.3	**VF44**	**63B5/B14**	**6322**	121
	96	19	28	1730	1.5				
	135	14	20	1550	2.0				
	193	10	14	1400	2.1				
	270	8	10	1300	2.9				
	38	43	35	2300	0.9	**VF44**	**71B5/B14**	**7114**	121
	47	36	28	2190	1.1				
	66	28	20	1970	1.4				
	94	21	14	1770	1.4				
	132	15	10	1590	1.9				
	189	11	7	1420	2.7				
	32	50	28	2300	1.0	**VF44**	**71B5/B14**	**7126**	121
	45	39	20	2190	1.1				
	64	29	14	1980	1.3				
	90	22	10	1780	1.8				
	129	16	7	1590	2.5				
	39	38	70	2650	1.1	**VF49**	**63B5/B14**	**6322**	123
	45	34	60	2500	1.3				
	60	28	45	2350	1.8				
	75	23	36	2230	2.2				
	96	19	28	2070	2.9				
	113	17	24	1930	2.8				
	22	63	60	3100	0.9	**VF49**	**71B5/B14**	**7114**	123
	29	51	45	2810	1.3				
	37	44	36	2670	1.6				
	47	36	28	2480	2.1				
	55	33	24	2360	1.9				
	73	26	18	2170	2.3				
	94	21	14	2010	3.2				
	20	72	45	3150	1.0	**VF49**	**71B5/B14**	**7126**	123
	25	60	36	3150	1.2				
	32	51	28	3150	1.6				
	38	46	24	2600	1.5				
	50	36	18	2460	1.9				
	64	29	14	2260	2.4				
	90	22	10	2040	2.9				
0.37	79	33	35	1860	0.9	**VF44**	**71B5/B14**	**7112**	121
	98	27	28	1720	1.1				
	138	21	20	1570	1.4				
	196	15	14	1400	1.5				
	275	11	10	1260	2.0				
	393	8	7	1120	2.7				

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	f_s				Page
0.37	69	40	20	1870	1.0	**VF44**	**71B5/B14**	**7124**	121
	98	29	14	1690	1.0				
	137	22	10	1520	1.3				
	196	16	7	1360	1.9				
	61	40	45	2270	1.2	**VF49**	**71B5/B14**	**7112**	123
	76	34	36	2180	1.5				
	98	28	28	2020	2.0				
	115	25	24	1880	1.9				
	153	19	18	1720	2.3				
	30	73	45	2680	0.9	**VF49**	**71B5/B14**	**7124**	123
	38	62	36	2530	1.1				
	49	51	28	2360	1.4				
	57	46	24	2250	1.4				
	76	37	18	2080	1.6				
	98	29	14	1940	2.2				
	137	22	10	1750	2.7				
	196	16	7	1570	3.4				
	38	67	24	2350	1.0	**VF49**	**80B5/B14**	**8016**	123
	51	53	18	2240	1.3				
	65	43	14	2070	1.7				
	91	32	10	1930	2.0				
	130	23	7	1740	2.6				
0.55	141	30	20	1490	1.0	**VF44**	**71B5/B14**	**7122**	121
	201	22	14	1350	1.0				
	281	16	10	1210	1.4				
	401	12	7	1080	1.9				
	78	49	36	2090	1.1	**VF49**	**71B5/B14**	**7122**	123
	100	40	28	1960	1.4				
	117	36	24	1800	1.3				
	156	28	18	1650	1.6				
	201	22	14	1420	2.2				
	281	16	10	1390	2.7				
	401	12	7	1250	3.5				
	49	76	28	2170	1.0	**VF49**	**80B5/B14**	**8014**	123
	58	69	24	2080	0.9				
	77	54	18	1930	1.1				
	99	43	14	1810	1.5				
	138	32	10	1650	1.8				
	197	23	7	1480	2.3				
	66	63	14	1960	1.1	**VF49**	**80B5/B14**	**8026**	123
	92	47	10	1800	1.4				
	131	34	7	1660	1.8				
0.75	117	49	24	1710	1.0	**VF49**	**80B5/B14**	**8012**	123
	156	38	18	1580	1.2				
	200	30	14	1480	1.6				
	280	22	10	1340	2.0				
	400	16	7	1200	2.6				
	100	58	14	1690	1.1	**VF49**	**80B5/B14**	**8024**	123
	140	43	10	1540	1.4				
	200	31	7	1400	1.7				
1.1	200	45	14	1370	1.1	**VF49**	**80B5/B14**	**8022**	123
	280	33	10	1250	1.3				
	400	23	7	1130	1.8				

12.3.2 VF..HS.. Performance parameter

M_{2n} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]	F_{r2} [N]	F_{r1} [N]		Page
12	2800	7	0.58	400	510	120	**VF30**	127
12	2800	10	0.41	280	620	70		
14	2800	15	0.34	187	720	—		
14	2800	20	0.26	140	820	—		
15	2800	30	0.21	93	960	—		
14	2800	40	0.16	70	1090	—		
14	2800	60	0.12	47	1270	—		
11	2800	70	0.08	40	1380	—		
16	1400	7	0.41	200	630	140	**VF30**	127
16	1400	10	0.30	140	770	80		
18	1400	15	0.24	93	910	—		
18	1400	20	0.19	70	1030	—		
20	1400	30	0.15	47	1200	—		
19	1400	40	0.12	35	1360	—		
19	1400	60	0.09	23.3	1590	—		
15	1400	70	0.07	20	1600	—		
18	900	7	0.30	129	730	150	**VF30**	127
18	900	10	0.22	90	900	150		
20	900	15	0.17	60	1060	—		
20	900	20	0.14	45	1200	—		
22	900	30	0.12	30	1400	—		
20	900	40	0.09	23	1590	—		
20	900	60	0.07	15	1650	—		
17	900	70	0.05	13	1700	—		
20	500	7	0.19	71	920	150	**VF30**	127
20	500	10	0.14	50	1120	150		
22	500	15	0.11	33	1320	150		
22	500	20	0.09	25	1490	150		
24	500	30	0.07	16.7	1700	—		
22	500	40	0.06	12.5	1700	—		
22	500	60	0.05	8.3	1700	—		
19	500	70	0.04	7	1700	—		

M_{2n} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]	F_{r2} [N]	F_{r1} [N]		Page
22	2800	7	1.1	400	950	220	VF44	127
22	2800	10	0.74	280	1150	220		
22	2800	14	0.55	200	1340	220		
29	2800	20	0.52	140	1490	220		
29	2800	28	0.40	100	1710	220		
29	2800	35	0.33	80	1870	220		
29	2800	46	0.27	61	2080	220		
29	2800	60	0.22	47	2290	220		
22	2800	70	0.15	40	2300	220		
21	2800	100	0.11	28	2300	220		
29	1400	7	0.71	200	1180	220	VF44	127
29	1400	10	0.51	140	1430	220		
29	1400	14	0.37	100	1680	220		
39	1400	20	0.37	70	1860	220		
39	1400	28	0.29	50	2140	220		
39	1400	35	0.25	40	2300	220		
39	1400	46	0.19	30	2300	220		
39	1400	60	0.16	23.3	2300	220		
29	1400	70	0.11	20	2300	220		
28	1400	100	0.09	14	2300	220		
39	900	7	0.63	129	1300	220	VF44	127
39	900	10	0.45	90	1610	220		
39	900	14	0.34	64	1890	220		
45	900	20	0.29	45	2160	220		
49	900	28	0.24	32	2300	220		
49	900	35	0.20	25.7	2300	220		
49	900	46	0.17	19.6	2300	220		
45	900	60	0.13	15	2300	200		
39	900	70	0.10	12.9	2300	220		
30	900	100	0.06	9	2300	220		
45	500	7	0.41	71	1610	220	VF44	127
45	500	10	0.29	50	1980	220		
50	500	14	0.25	36	2280	220		
50	500	20	0.18	25	2500	220		
55	500	28	0.16	17.9	2500	220		
55	500	35	0.14	14.3	2500	220		
50	500	46	0.10	10.9	2500	220		
50	500	60	0.09	8.3	2500	220		
45	500	70	0.07	7.1	2500	220		
32	500	100	0.04	5	2500	220		

M_{2n} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]	F_{r2} [N]	F_{r1} [N]		Page
41	2800	7	2	400	950	400	**VF49**	127
44	2800	10	1.5	280	1140	400		
49	2800	14	1.2	200	1310	400		
44	2800	18	0.87	156	1520	400		
47	2800	24	0.73	117	1670	400		
56	2800	28	0.78	100	1740	400		
52	2800	36	0.59	78	1970	400		
49	2800	45	0.46	62	2180	400		
44	2800	60	0.34	47	2480	400		
41	2800	70	0.28	40	2650	400		
41	2800	80	0.25	35	2780	400		
37	2800	100	0.20	28	3050	400		
54	1400	7	1.3	200	1170	400	**VF49**	127
59	1400	10	1.0	140	1410	400		
65	1400	14	0.90	100	1630	400		
59	1400	18	0.60	78	1890	400		
63	1400	24	0.50	58	2110	400		
74	1400	28	0.55	50	2170	400	**VF49**	127
69	1400	36	0.42	39	2460	400		
65	1400	45	0.33	31	2725	400		
59	1400	60	0.25	23.3	3100	400		
55	1400	70	0.21	20	3150	400		
54	1400	80	0.19	17.5	3150	400		
49	1400	100	0.13	14	3150	400		
61	900	7	0.97	129	1370	400	**VF49**	127
64	900	10	0.75	90	1670	400		
71	900	14	0.61	64	1920	400		
68	900	18	0.47	50	2190	400		
68	900	24	0.36	38	2480	400		
82	900	28	0.41	32	2540	400		
75	900	36	0.31	25	2880	400		
71	900	45	0.25	20	3190	400		
64	900	60	0.19	15	3300	400		
60	900	70	0.16	12.9	3300	400		
58	900	80	0.14	11.3	3300	400		
52	900	100	0.11	9	3300	400		
74	500	7	0.67	71	1670	400	**VF49**	127
74	500	10	0.49	50	2060	400		
78	500	14	0.39	36	2400	400		
74	500	18	0.30	27.8	2730	400		
74	500	24	0.24	20.8	3090	400		
88	500	28	0.26	17.9	3180	400		
80	500	36	0.20	13.9	3450	400		
78	500	45	0.17	11.1	3450	400		
69	500	60	0.12	8.3	3450	400		
69	500	70	0.11	7.1	3450	400		
59	500	80	0.09	6.3	3450	400		
59	500	100	0.08	5	3450	400		

12.3.3 VF/VF..HS.. Performance parameter

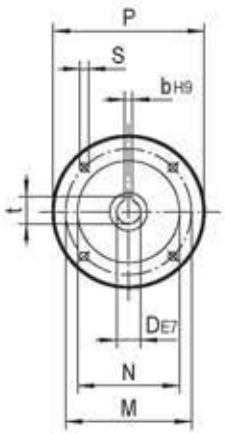
M_{2n} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]	F_{r2} [N]	F_{r1} [N]		Page
60	1400	245	0.09	5.7	2500	140	VF30/44	128
60	1400	350	0.07	4.0	2500	80		
60	1400	420	0.06	3.3	2500	—		
60	1400	560	0.05	2.5	2500	—		
60	1400	700	0.04	2.0	2500	—		
60	1400	840	0.04	1.7	2500	—		
60	1400	1120	0.03	1.3	2500	—		
60	1400	1680	0.02	0.83	2500	—		
60	1400	2100	0.02	0.67	2500	—		
70	900	245	0.07	3.7	2500	150	VF30/44	128
70	900	350	0.05	2.6	2500	150		
70	900	420	0.04	2.1	2500	—		
70	900	560	0.04	1.6	2500	—		
70	900	700	0.03	1.3	2500	—		
70	900	840	0.03	1.1	2500	—		
70	900	1120	0.02	0.8	2500	—		
70	900	1680	0.02	0.54	2500	—		
70	900	2100	0.02	0.43	2500	—		
95	1400	240	0.13	5.8	3450	80	VF30/49	128
95	1400	315	0.11	4.4	3450	140		
95	1400	420	0.08	3.3	3450	—		
95	1400	540	0.07	2.6	3450	—		
95	1400	720	0.05	1.9	3450	—		
95	1400	900	0.05	1.6	3450	—		
95	1400	1120	0.04	1.3	3450	—		
95	1400	1440	0.04	0.97	3450	—		
95	1400	2160	0.03	0.65	3450	—		
95	1400	2700	0.03	0.52	3450	—		
100	900	240	0.09	3.8	3450	150	VF30/49	128
100	900	315	0.07	2.9	3450	150		
100	900	420	0.06	2.1	3450	—		
100	900	540	0.05	1.7	3450	—		
100	900	720	0.04	1.3	3450	—		
100	900	900	0.04	1.0	3450	—		
100	900	1120	0.03	0.80	3450	—		
100	900	1440	0.03	0.63	3450	—		
100	900	2160	0.02	0.42	3450	—		
100	900	2700	0.02	0.33	3450	—		

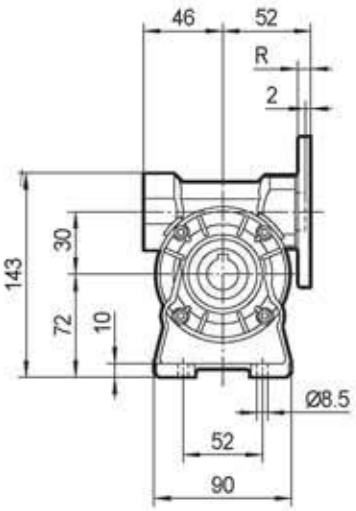
12.4 OUTLINE DIMENSION SHEET

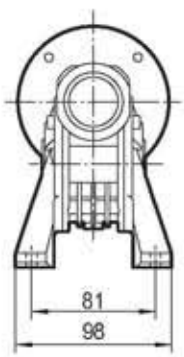
12.4.1 VF.. Outline dimension

VF30A..P(IEC)

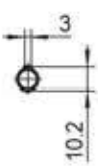
Input adapters

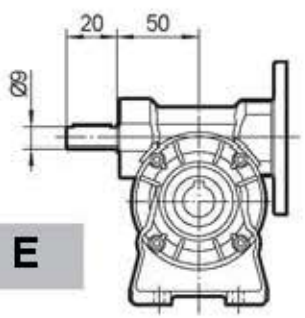




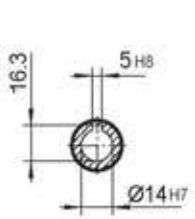


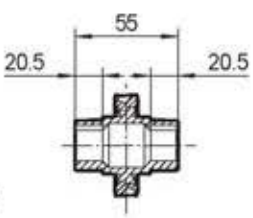
Worm output shaft



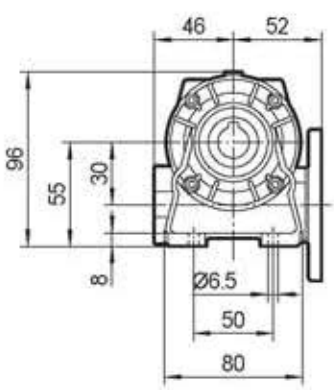


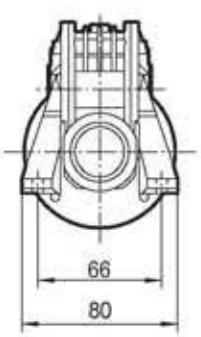
E



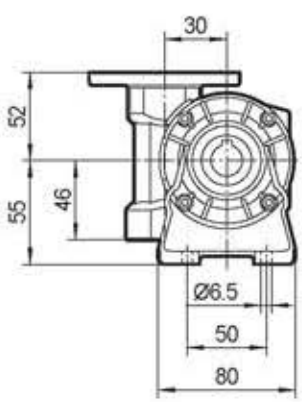


VF30N..





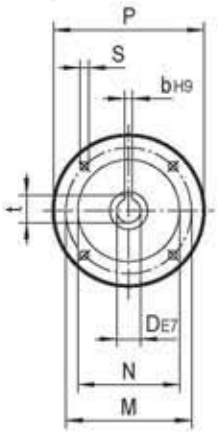
VF30V..

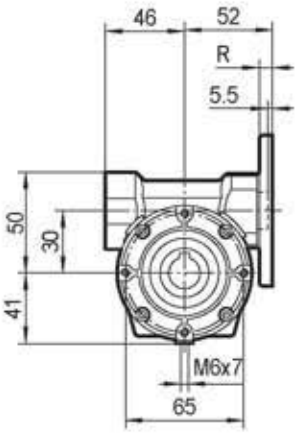


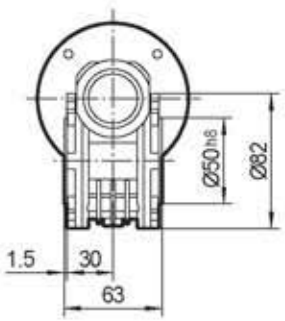
IEC	D_{E7}	b	t	P	M	N	R	S
56B5	9	3	10.4	120	100	80	7	7
56B14	9	3	10.4	80	65	50	7	5.5
63B5	11	4	12.8	140	115	95	8	9.5
63B14	11	4	12.8	90	75	60	7	5.5

VF30A..P(IEC)

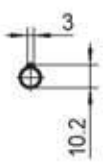
Input adapters

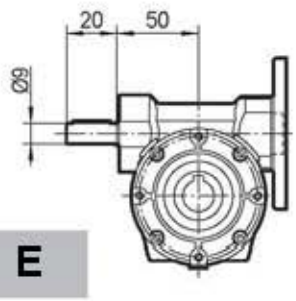




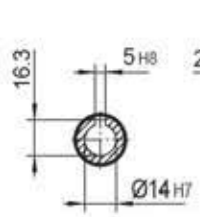


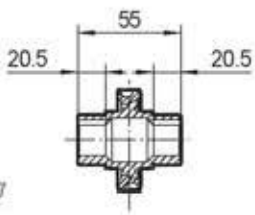
Worm output shaft



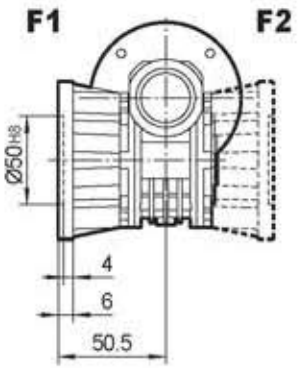


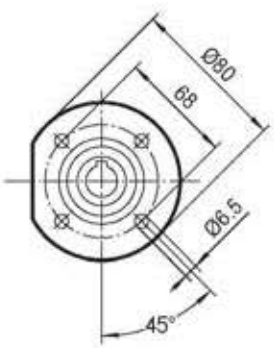
E





VF30N..

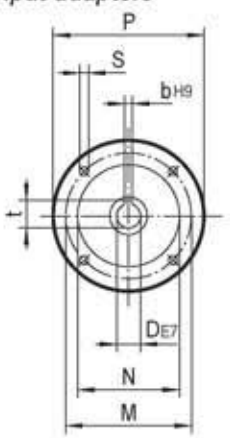


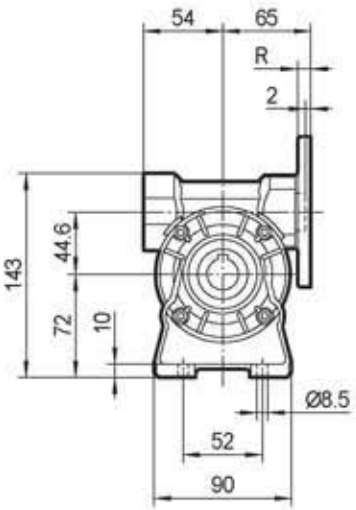


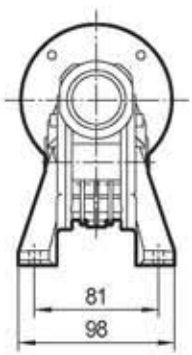
IEC	D_{E7}	b	t	P	M	N	R	S
56B5	9	3	10.4	120	100	80	7	7
56B14	9	3	10.4	80	65	50	7	5.5
63B5	11	4	12.8	140	115	95	8	9.5
63B14	11	4	12.8	90	75	60	7	5.5

VF44A..P(IEC)

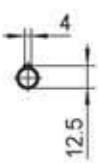
Input adapters

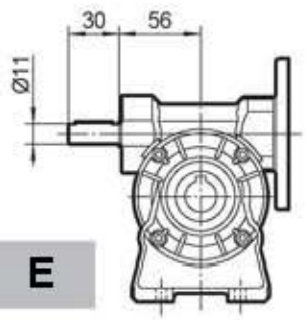


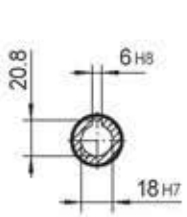


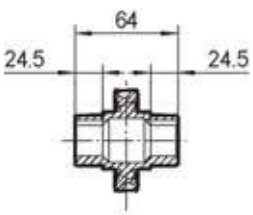


Worm output shaft

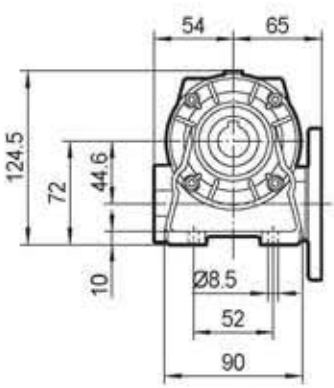


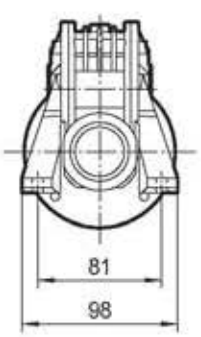




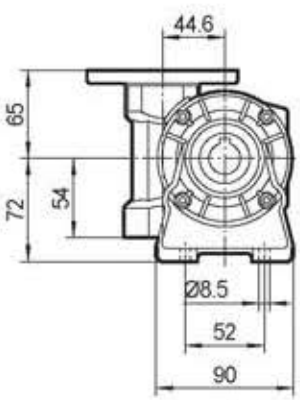


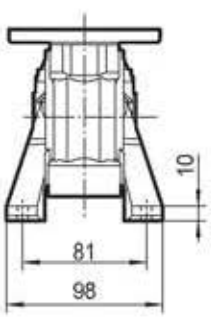
VF44N..





VF44V..

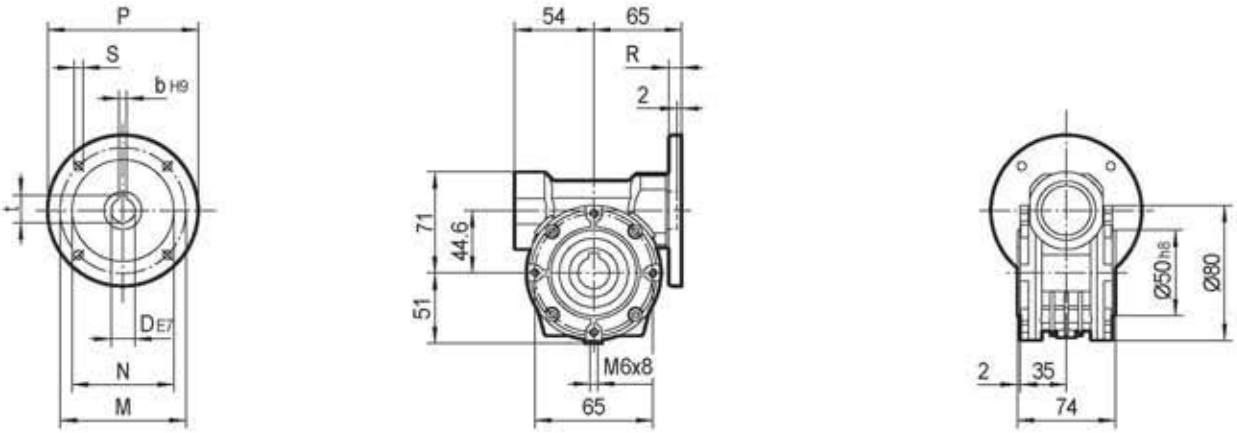




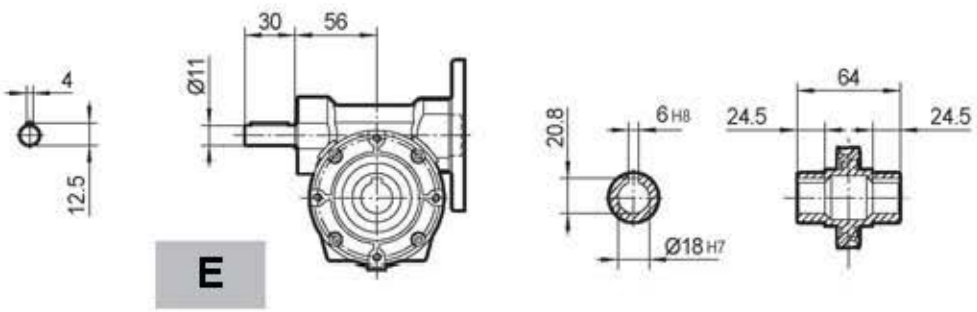
IEC	D_{E7}	b	t	P	M	N	R	S
63B5	11	4	12.8	140	115	95	10	9.5
63B14	11	4	12.8	90	75	60	8	5.5
71B5	14	5	16.3	160	130	110	10	9.5
71B14	14	5	16.3	105	85	70	10	7

VF44P..P(IEC)

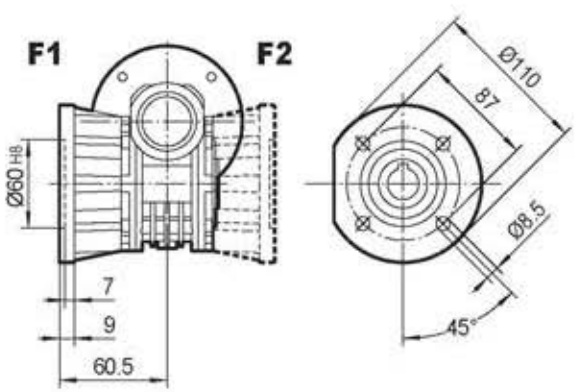
Input adapters



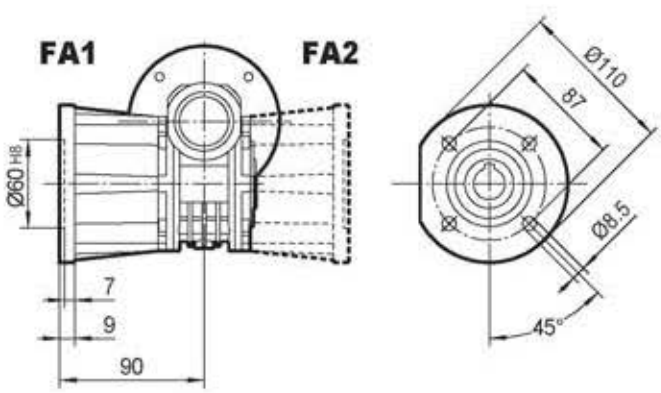
Worm output shaft



VF44F..



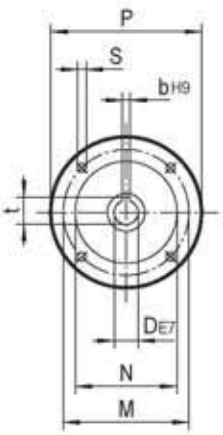
VF44FA..

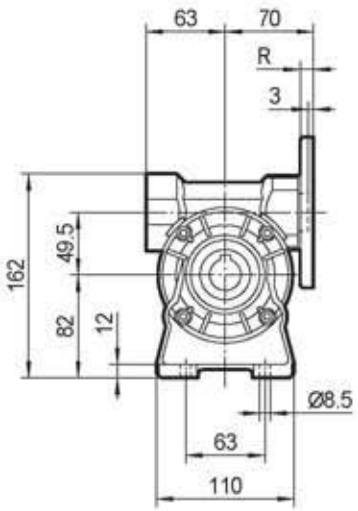


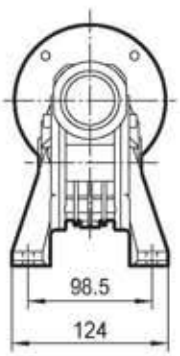
IEC	D_{E7}	b	t	P	M	N	R	S
63B5	11	4	12.8	140	115	95	10	9.5
63B14	11	4	12.8	90	75	60	8	5.5
71B5	14	5	16.3	160	130	110	10	9.5
71B14	14	5	16.3	105	85	70	10	7

VF49A..P(IEC)

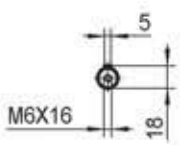
Input adapters

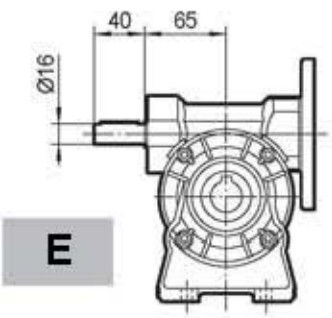


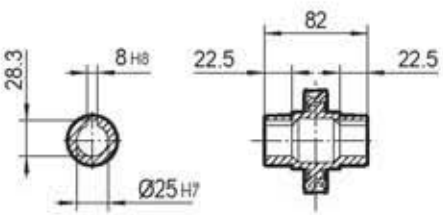




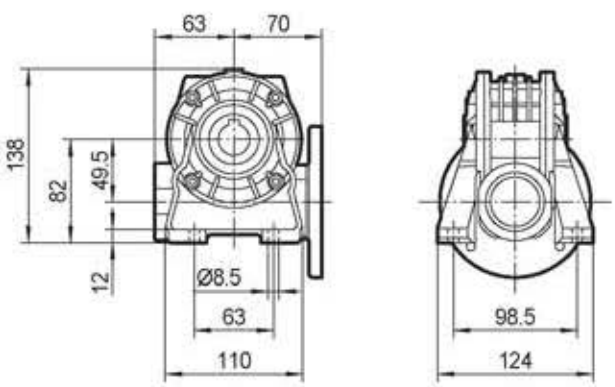
Worm output shaft



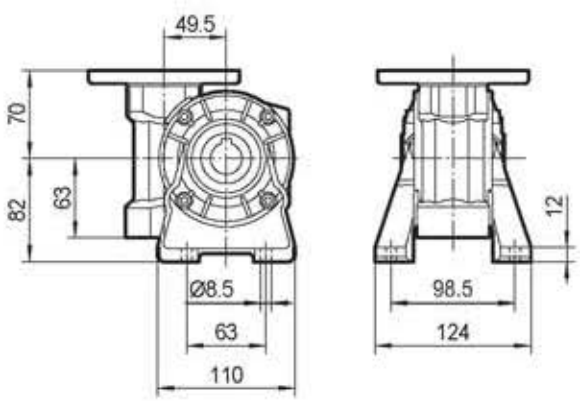




VF49N..



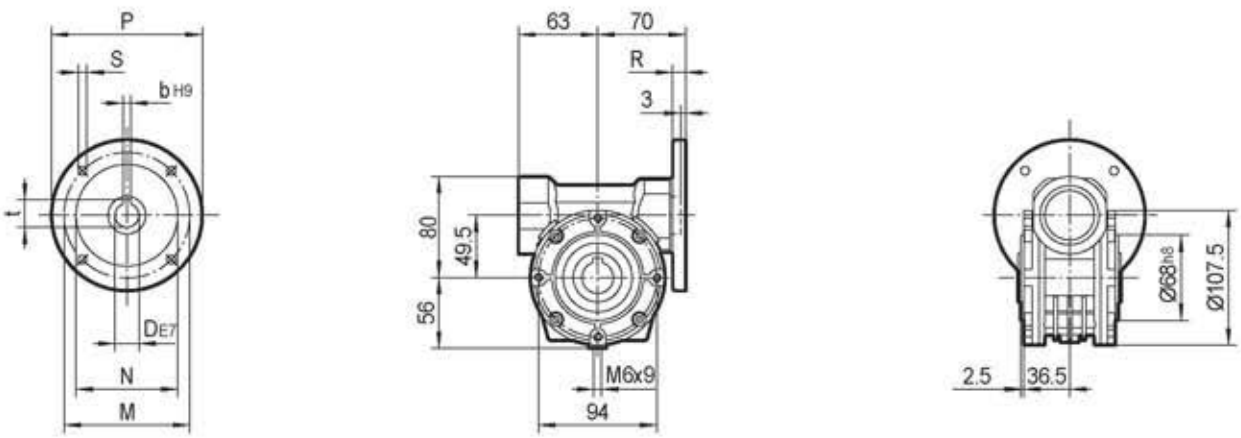
VF49V..



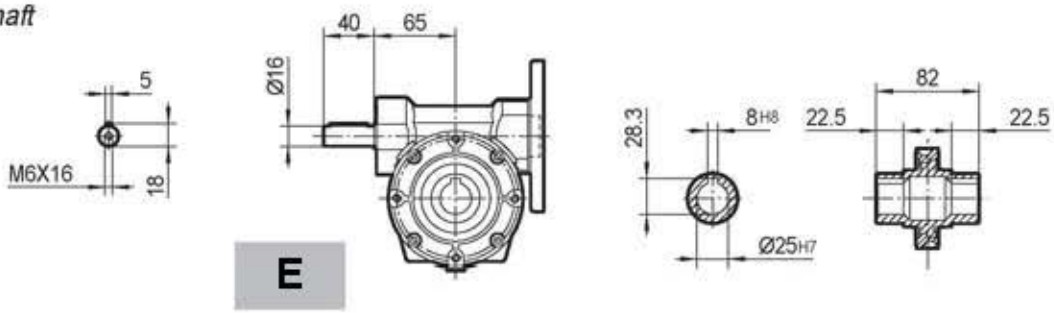
IEC	D_{E7}	b	t	P	M	N	R	S
63B5	11	4	12.8	140	115	95	10.5	9.5
63B14	11	4	12.8	90	75	60	7	6
71B5	14	5	16.3	160	130	110	10.5	9.5
71B14	14	5	16.3	105	85	70	10.5	6.5
80B5	19	6	21.8	200	165	130	10	11.5
80B14	19	6	21.8	120	100	80	10	7

VF49P..P(IEC)

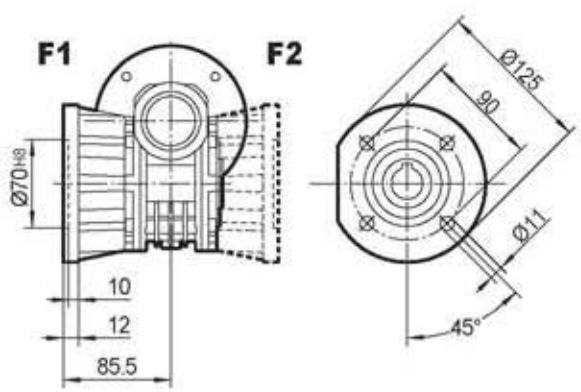
Input adapters



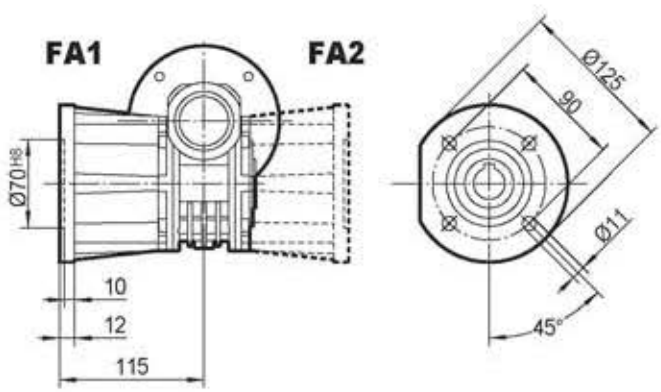
Worm output shaft



VF49F..



VF49FA..



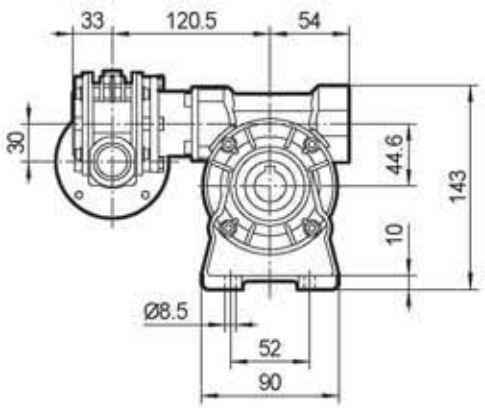
IEC	D_{E7}	b	t	P	M	N	R	S
63B5	11	4	12.8	140	115	95	10.5	9.5
63B14	11	4	12.8	90	75	60	7	6
71B5	14	5	16.3	160	130	110	10.5	9.5
71B14	14	5	16.3	105	85	70	10.5	6.5
80B5	19	6	21.8	200	165	130	10	11.5
80B14	19	6	21.8	120	100	80	10	7

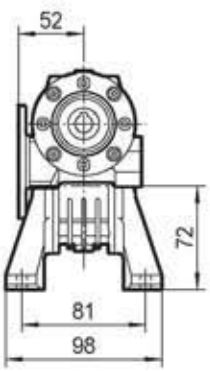
12.4.2 VF / VF.. Outline dimension

- For the dimensions of the tput flanges, please refer to pages 93-98.
- For the dimensions of the hollow shafts , please refer to pages 93-98.
- For the dimensions of the double extention warm shafts, please refer to page 103.

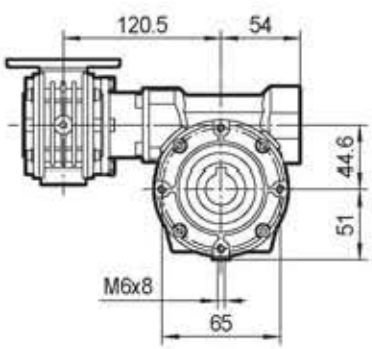
VF30A/44..

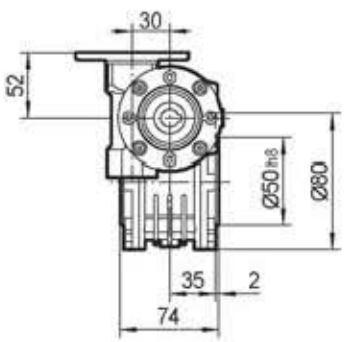
A



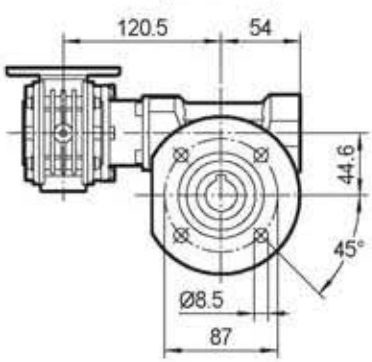


P

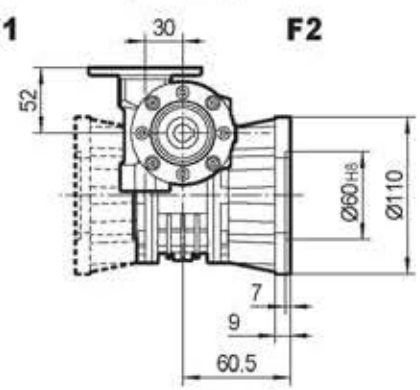




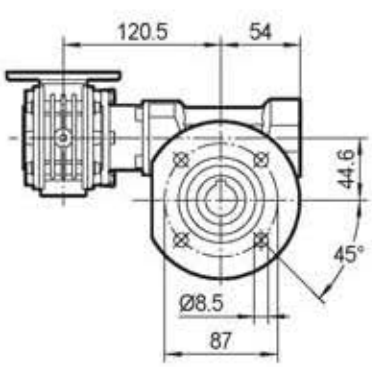
F_



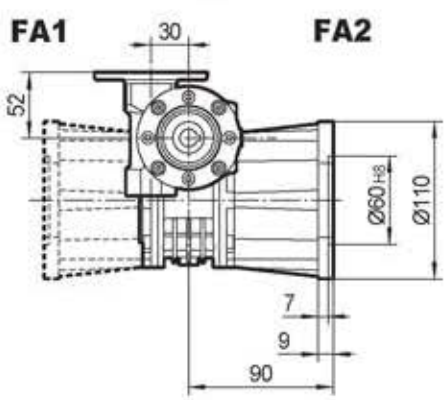
F1 **F2**



FA_

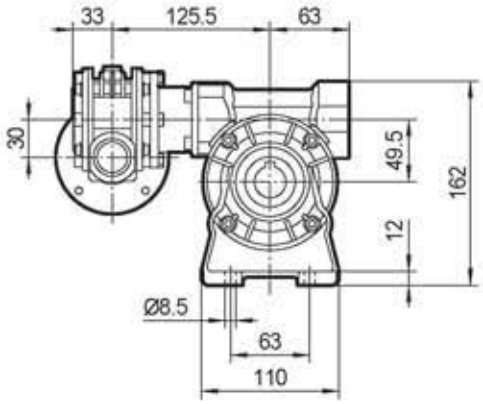


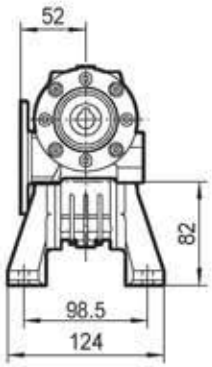
FA1 **FA2**



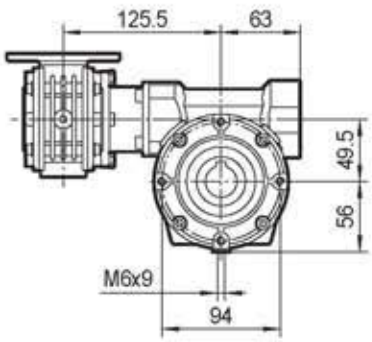
VF30/49..

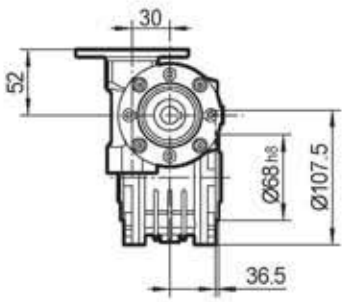
A



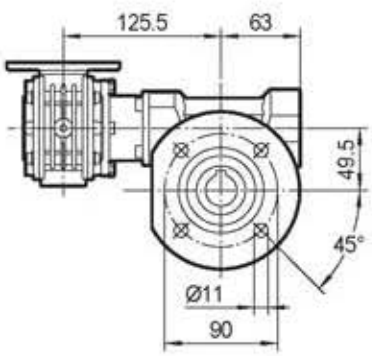


P

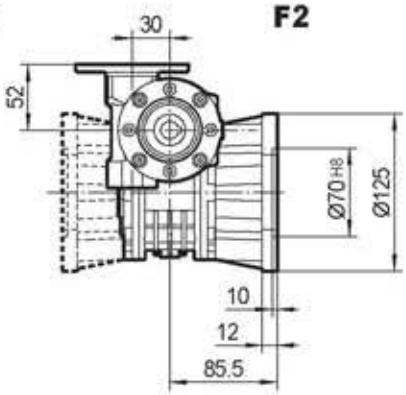




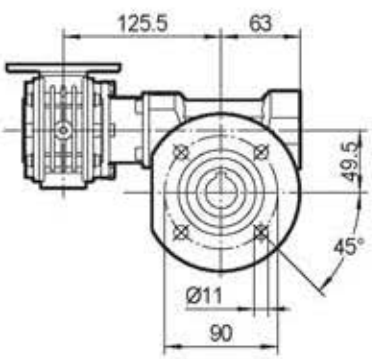
F_



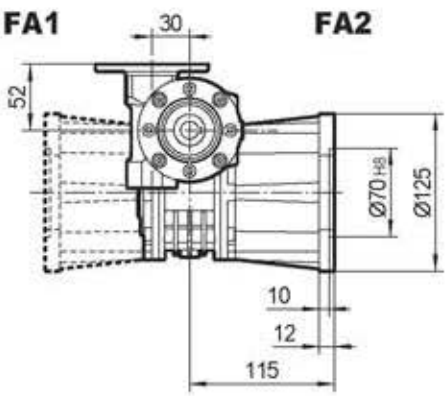
F1 **F2**



FA_



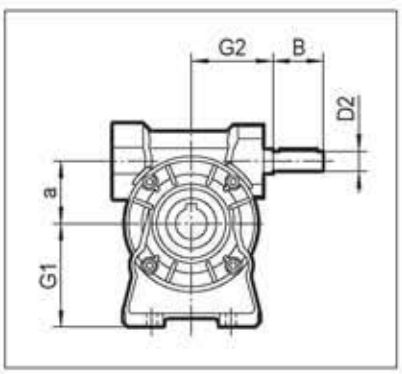
FA1 **FA2**



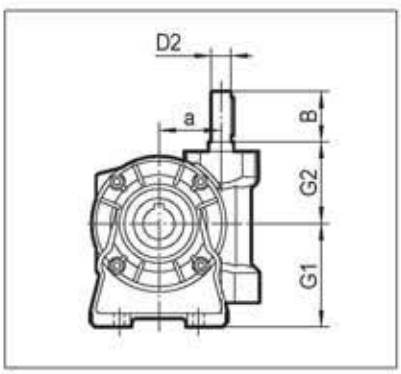
12.4.3 VF.. HS.. Outline dimension

VF..HS..

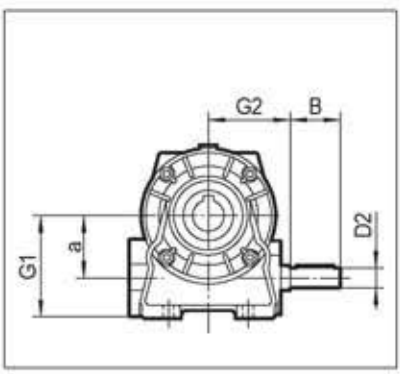
VF_A..HS..



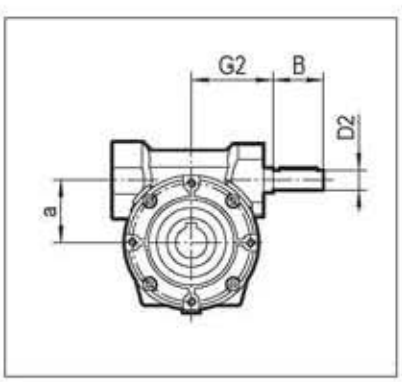
VF_V..HS..



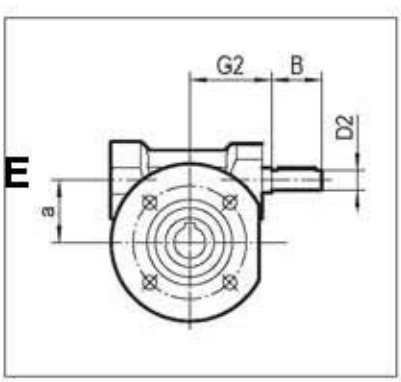
VF_N..HS..

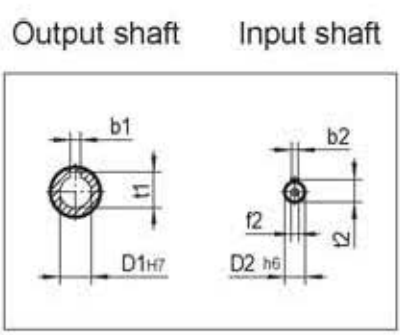


VF_P..HS..



VF_F..HS..
VF_FA..HS..



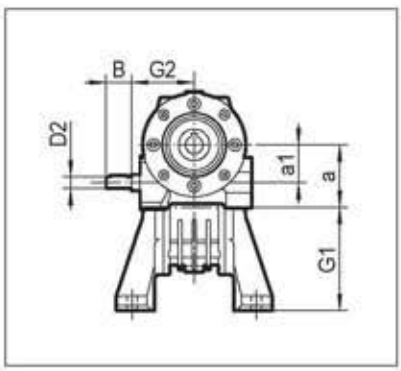


	a	D1 H7	t1	b1	D2 h6	t2	b2	B	G2	G1	f2
VF 30__HS	30	14	16.3	5	9	10.2	3	20	50	47	—
VF 44__HS	44.6	18	20.8	6	11	12.5	4	30	54	55	—
VF 49__HS	49.5	25	28.3	8	16	18	5	40	65	64.5	M6x16

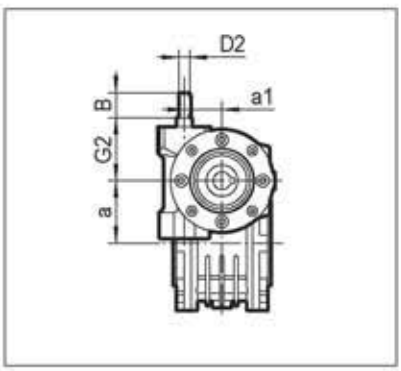
12.4.4 VF/VF.. HS.. Outline dimension

VF/VF..HS..

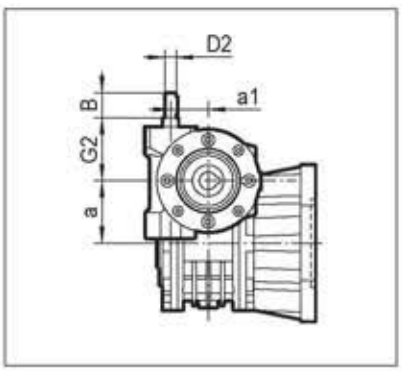
VF/VF_A..HS..



VF/VF_P..HS..

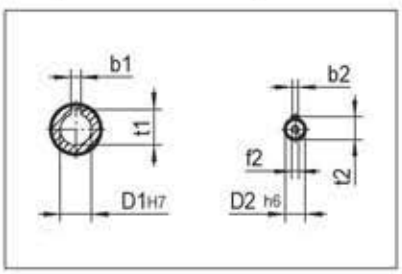


VF/VF_F..HS..



	a	a1	D1 H7	t1	b1	D2 h6
VF/VF 30/44__HS	44.6	30	18	20.8	6	9
VF/VF 30/49__HS	49.5	30	25	28.3	8	9
	t2	b2	B	G2	G1	f2
VF/VF 30/44__HS	10.2	3	20	50	72	—
VF/VF 30/49__HS	10.2	3	20	50	82	—

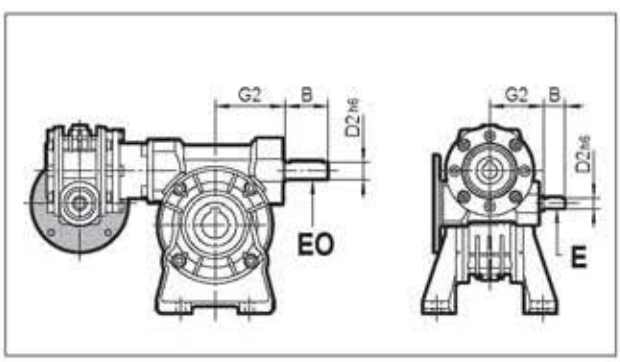
Output shaft Input shaft



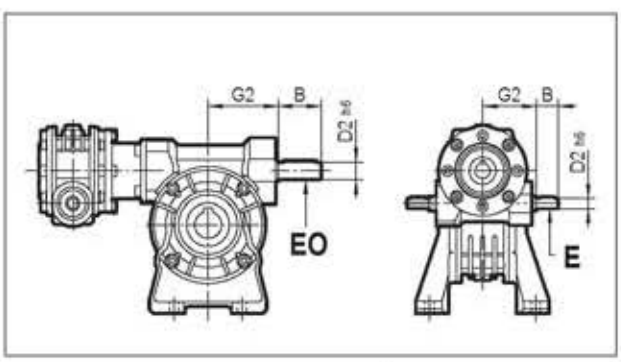
12.4.5 VF/VF.. E(EO)..Outline dimension

Worm gears can be optionally requested with extended wormshaft at NDE by specifying the option E or EO (for double worm combined units) at the time of order.

P(IEC)

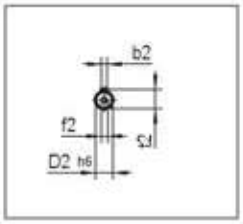


HS



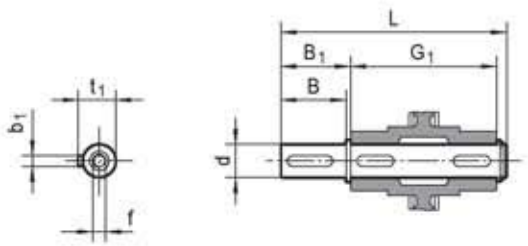
	D2 h6	t2	b2	B	G2	f2
VF 30	9	10.2	3	20	50	-
VF 44	11	12.5	4	30	56	-
VF 49	16	18	5	40	65	M6

Input shaft



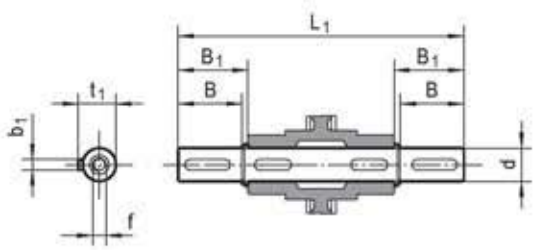
12.5 ACCESSORIES OUTLINE DIMENSION SHEET

12.5.1 Output Shafts



SS

	d_{h6}	B	B1	t1	L	f	G	b1
VF 30	14	30	32.5	16	120	M5x13	55	5
VF 44	18	40	42.7	20.5	149.4	M6x16	64	6
VF 49	25	60	63.2	28	208.4	M8x19	82	8

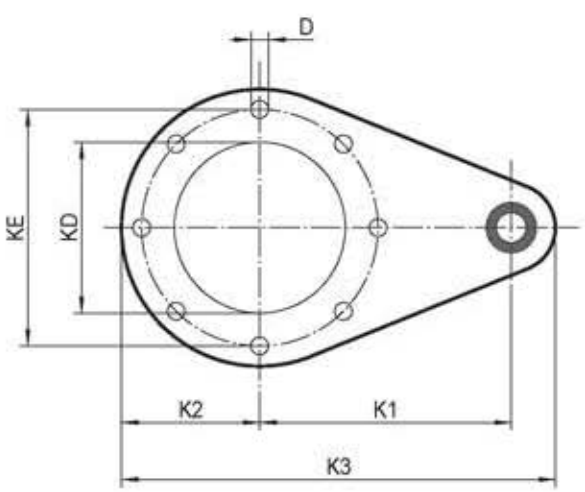


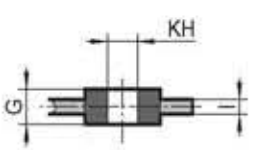
DS

	d_{h6}	B	B1	t1	L	f	G	b1
VF 30	14	30	32.5	16	120	M5x13	55	5
VF 44	18	40	42.7	20.5	149.4	M6x16	64	6
VF 49	25	60	63.2	28	208.4	M8x19	82	8

* Only on request

12.5.2 Torque Arm

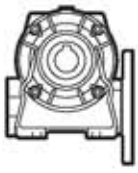
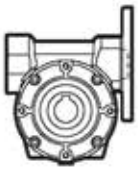
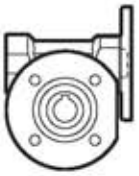
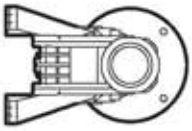
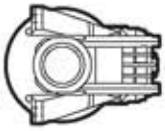
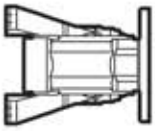
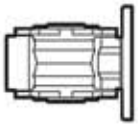
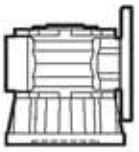
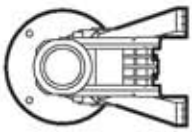
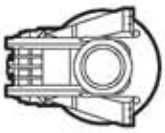
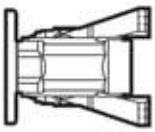
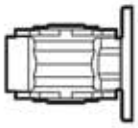
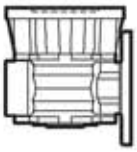
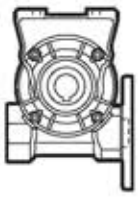
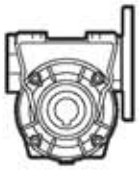
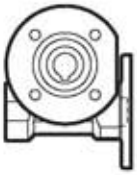
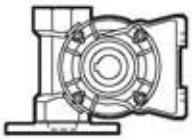
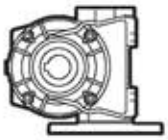
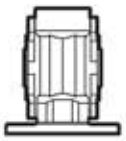
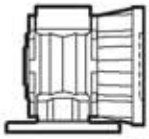
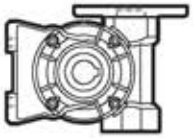
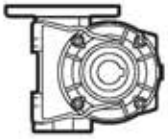
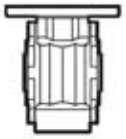
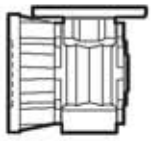




without vibration-dampening bushing

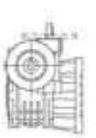
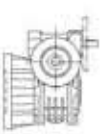
	K1	K2	K3	KD	KE	D	G	KH	I
VF 30	100	40	157.5	50	65	7	14	8	4
VF 44	100	40	157.5	50	65	7	14	8	4
VF 49	100	55	172.5	68	94	7	14	8	4

12.6 VF.. INSTALLATION POSITIONS DIAGRAM

	VF..A	VF..N	VF..V	VF..P	VF..F
B3					
B6					
B7					
B8					
V5					
V6					

12.7 VF/VF.. ARRANGEMENTS

For combined worm gear units, unless otherwise specified at the time of ordering, the arrangements highlighted in grey in the diagrams below will be configured at the factory.

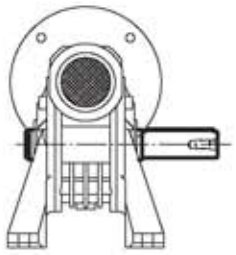
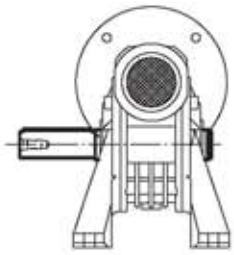
	CW1	CCW1	CW2	CCW2	CW3	CCW3	CW4	CCW4
A								
N								
V								
F1 FA1								
F2 FA2								
P								

For units with the **HS** input (free shaft), all the mounting options shown are available. For units with the **P (IEC)**, certain mounting options can be obtained only by using IEC flanges (**B5** or **B14**) of the same size or smaller than those shown in tables.

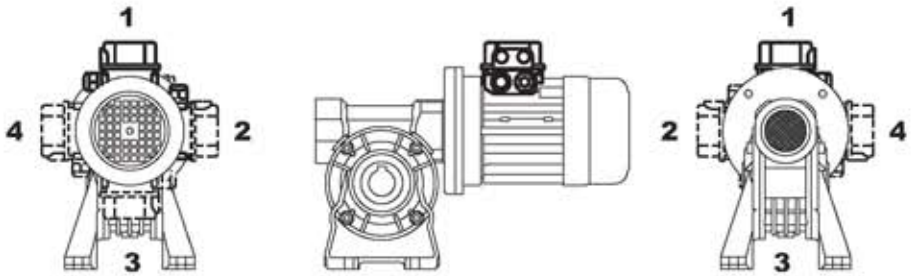
		CW1	CCW1	CW2	CCW2	CW3	CCW3	CW4	CCW4
VF/VF 30/44	N	56B14-63B14	56B14-63B14	56B14-63B14	56B14-63B14	56B14-63B14	56B14-63B14	56B14-63B14	56B14-63B14
	A								
	V								
	P								
VF/VF 30/49	N	56B14-63B14	56B14-63B14	56B14-63B14	56B14-63B14	56B14-63B14	56B14-63B14	56B14-63B14	56B14-63B14
	A								
	V								
	P								

		CW1 (1) CCW1 (2)	CCW1 (1) CW1 (2)	CW2 (1) CCW2 (2)	CCW2 (1) CW2 (2)	CW3 (1) CCW3 (2)	CCW3 (1) CW3 (2)	CW4 (1) CCW4 (2)	CCW4 (1) CW4 (2)
VF/VF 30/44	F-FA	56B14-63B14	56B14-63B14	56B14-63B14	56B14-63B14	56B14-63B14	56B14-63B14	56B14-63B14	56B14-63B14
VF/VF 30/49	F-FA	56B14-63B14	56B14-63B14	56B14-63B14	56B14-63B14	56B14-63B14	56B14-63B14	56B14-63B14	56B14-63B14

12.7.2 Position diagram for single output shaft

SS1	SS2
	

12.7.3 Position of terminal box



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

13. STEPLESS SPEED VARIATOR

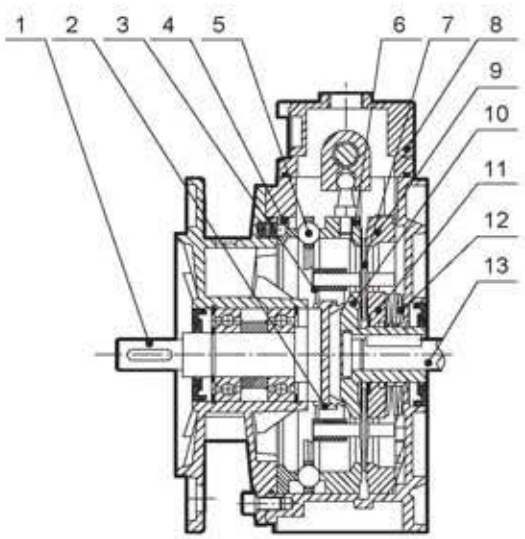
13.1 Brief introduction to stepless speed variator

The design of VSA series stepless speed variator compromises 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: VSA series stepless speed variators can be combined with all kinds of speed reducers, as to achieve low stepless speed-changing.

VSA 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.

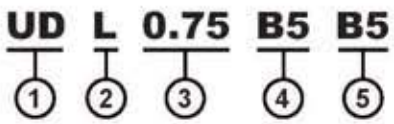
13.2 Structure



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. Adustable sun race
12. Belleville spring
13. Motor shaft

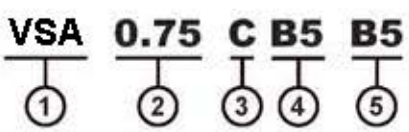
13.3 Model illuminate

13.3.1 stepless speed variator



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

13.3.2 Combination of stepless speed variator and gear speed reducer



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

13.4 Product picture

UDL..B3

UDL..B5

13.5 Performance parameter

13.5.1 VSA Performance table for udl series speed variator

(n_1 =1400 r/min)

	Model	i	n_2 [r/min]	M_2 [Nm]
0.18KW	**VSA002**	1.6 ~ 8.2	880 ~ 170	1.5 ~ 3
0.37KW	**VSA005**	1.4 ~ 7	1000 ~ 200	3 ~ 6
0.55KW	**VSA010**	1.4 ~ 7	1000 ~ 200	4 ~ 8
0.75KW	**VSA010**	1.4 ~ 7	1000 ~ 200	6 ~ 12
1.1KW	**VSF020**	1.4 ~ 7	1000 ~ 200	9 ~ 18
1.5KW	**VSF020**	1.4 ~ 7	1000 ~ 200	12 ~ 24
2.2KW	**VSF030**	1.4 ~ 7	1000 ~ 200	18 ~ 36
3.0KW	**VSF030**	1.4 ~ 7	1000 ~ 200	24 ~ 48
4.0KW	**VSF050**	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

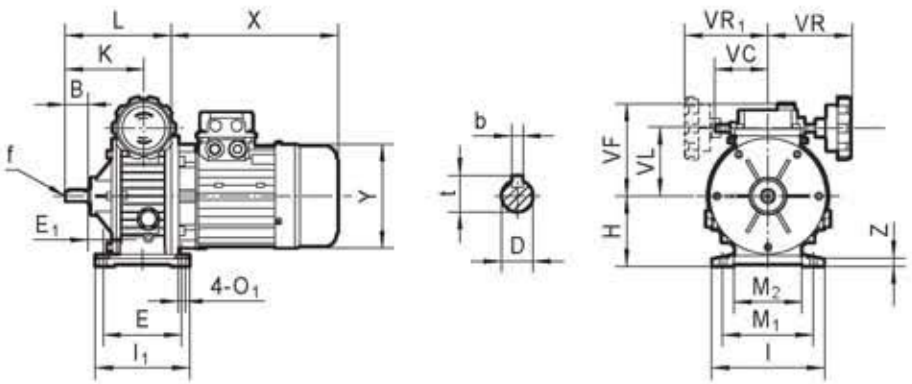
13.5.2 Performance table for stepless speed variator & gear speed reducer

(n_1 =1400 r/min)

Model	i	n_2 [r/min]	M_2 [Nm]
VSA002-CB3	5	176 ~ 34	7 ~ 15
VSA005-CB3	5	200 ~ 40	15 ~ 30
VSA010-CB3	5	200 ~ 40	30 ~ 60

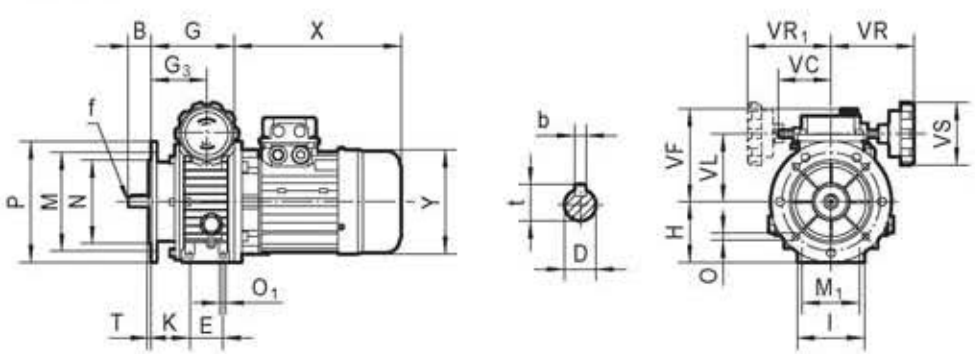
13.6 Outline dimension sheet

13.6.1 B3 Model



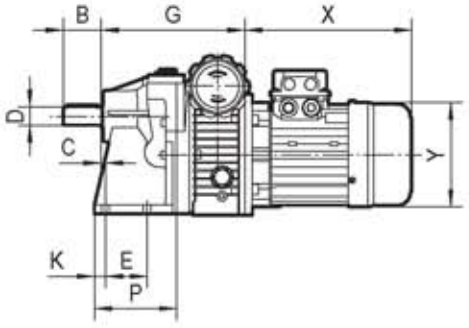
	B	D j6	E	E1	H	l	l1	K	L	M1	M2	O1	VC	VF	VL	VR	VR1	VS	b	f	t	X	Y	Z
VSA002B3	23	11	105	18	80	145	120	88	136	110	71	9	71	111	78	110	110	85	4	-	12.5	200	120	10
VSA005B3	30	14	104	20	93	149	125	104	140	120	96	9	71	123	90	110	110	85	5	M6	16	227	141	10
VSA010B3	40	19	125	26	113	190	150	126	179	160	135	11	79	140	107	120	120	110	6	M6	21.5	268	160	15
VSF020B3	40	24	105	35	100	207	130	136	187	160	115	13	-	124	102	150	-	110	8	M8	27	265	195	15
VSF020B3	50	24	115	54	123	241	150	165	238	190	143	13	-	144	122	150	-	110	8	M8	27	290	195	18
VSF030B3	60	28	230	25	150	300	270	191	268	245	190	14	-	188	150	150	-	110	8	M8	33	320	215	25
VSF030B3	60	28	230	25	150	300	270	191	268	245	190	14	-	188	150	150	-	110	8	M8	33	320	215	25
VSF050B3	60	28	230	25	150	300	270	191	268	245	190	14	-	188	150	150	-	110	8	M8	33	340	240	25
	70	35	250	33	200	365	290	201	319	315	245	18	-	-	192	192	-	110	10	M10	38	395	275	30
	70	35	250	33	200	365	290	201	319	315	245	18	-	-	192	192	-	110	10	M10	38	435	275	30

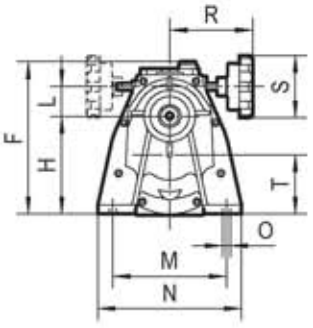
13.6.2 B5 Model



	B	D j6	E	G	G3	H	I	M	M1	N	O	O1	P	T	K	VC	VF	VL	VR	VR1	VS	b	f	t	X	Y
VSA002B5	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
VSA005B5	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
VSA010B5	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
VSF020B5	40	24	-	147	95	98	207	165	-	130	11	-	200	3.5	-	-	124	102	150	-	110	8	M8	27	265	195
VSF020B5	50	24	-	188	115	126	241	165	-	130	11	-	200	3.5	-	-	144	122	150	-	110	8	M8	27	290	195
VSF030B5	60	28	-	208	131	150	270	165	-	230	15	-	250	4	-	-	188	150	160	-	100	8	M8	33	320	215
VSF030B5	60	28	-	208	131	150	270	265	-	230	15	-	250	4	-	-	188	150	160	-	100	8	M8	33	320	215
VSF050B5	60	28	-	208	131	150	270	265	-	230	15	-	250	4	-	-	188	150	160	-	110	8	M8	33	340	240
	70	35	-	244	131	200	-	300	-	250	19	-	350	5	-	-	-	192	194	-	110	10	M10	38	395	275
	70	35	-	244	131	200	-	300	-	250	19	-	350	5	-	-	-	192	194	-	100	10	M10	38	435	275

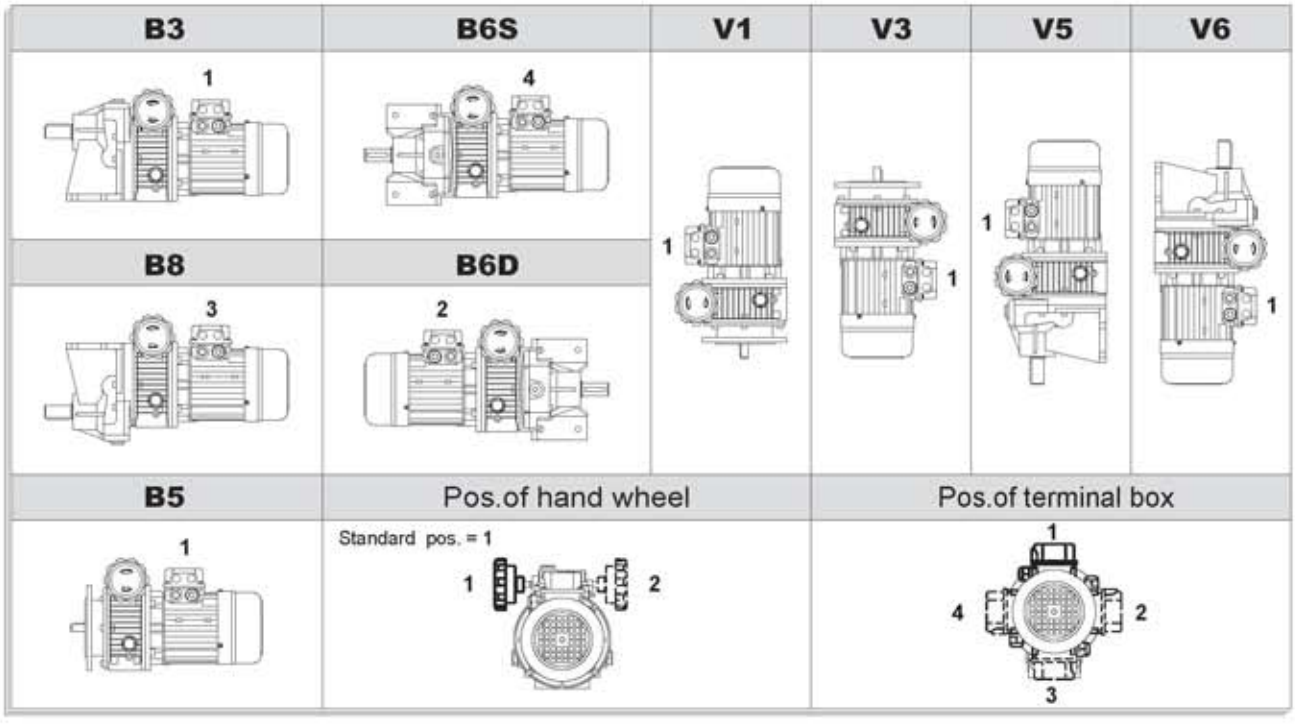
13.6.3 Combined outline & installation sizes for stepless speed variator & gear speed reducer with foot screws





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

13.7 Installation positions diagram



- 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.

13.8 Operation & maintenance

1. 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*.

2. 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.

3. 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!

4. The mechanical stepless speed variator is not used in such an occasion where overload or running-blockage happen to occur.

5. Speed-regulation should be effected in running. Do not turn the hand wheel of speed-regulation when the machine stops!

6. The limit screws of speed-regulation on two ends under the operating box are well adjusted, Please don't touch them!

7. 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.

8. The liquid lubricating oil is used for the speed variator. Its trade mark is Ub-3x. Please check up the oil level before use.

9. 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.

10. 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 loosing!

14. 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 TNRV 025-030-040-050-063-075-090-105，VF30-44-49 are supplied complete with lubricant ,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 ,130 and 150 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 110,130 and 150 it is necessary to specify the position, otherwise the reduction units are supplied with the quantity of oil relating to pos. B3.

○ TNRV series worm gearbox should mount breather plug (optional parts) under special working condition.

○ PC is supplied complete with life-long lubricant, synthetic oil (SHELL TEVELA OIL 320), and can therefore be mounted in all the positions.

14.1 Lubricants oil chosen table

		ISO	SHELL	AGIP	ESSO	MOBIL	CASTROL	BP	GUANGYAN	
MHR025~105 PC063~090 VF30~49	-25 +50	VG320	Tivela OIL S320	Telium VSF320	S220	Glygoyle 30	Alphasyn PG320	Energol SG-XP320		Synthetic oil
MHR110~150	-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		
VSA	-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

14.2 Lubricant fill quantity (L)

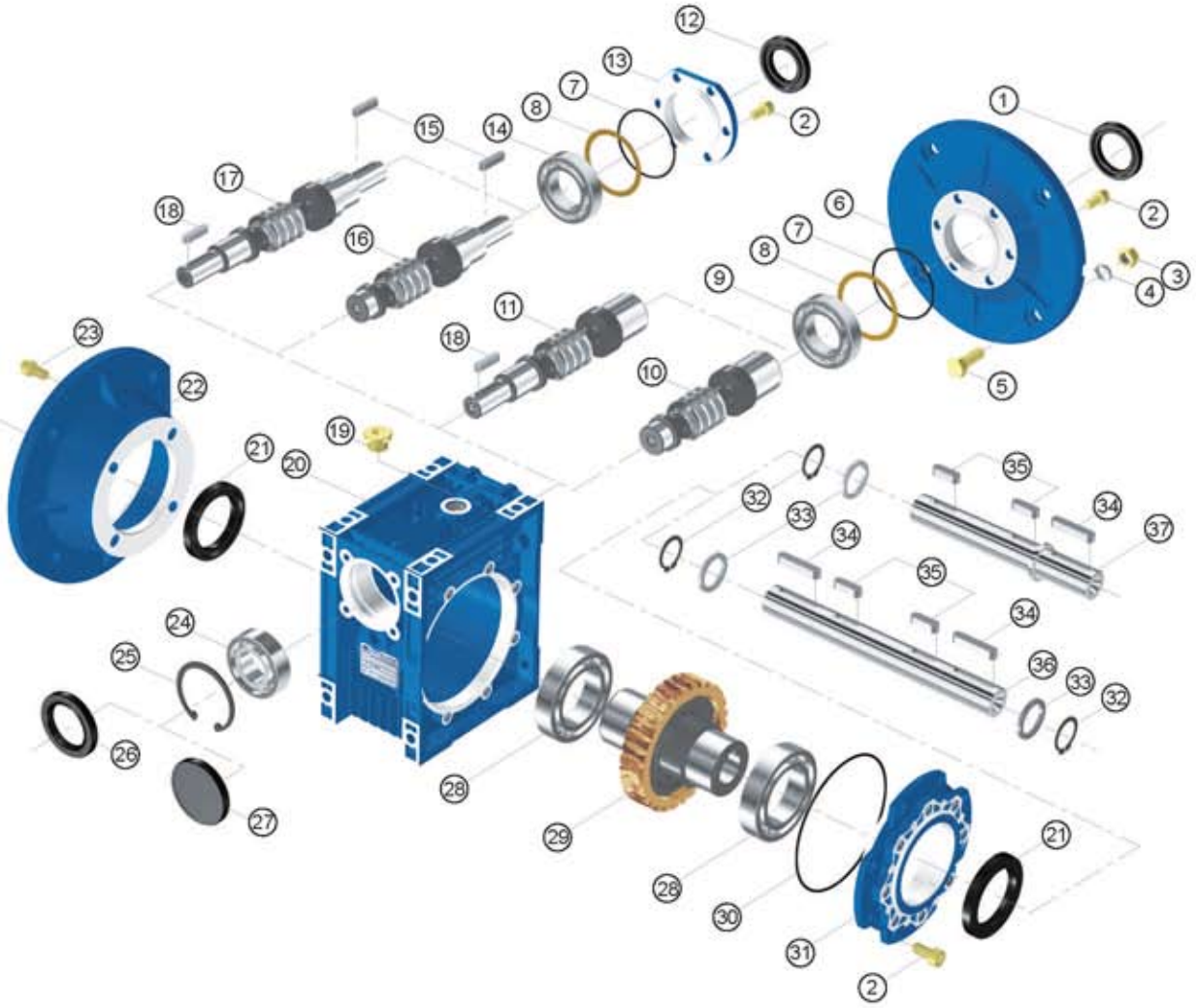
	B3	B6	B7	B8	V1、V5	V3、V6
MHR 025	0.023					
MHR 030	0.05					
MHR 040	0.1					
MHR 050	0.15					
MHR 063	0.3					
MHR 075	0.5					
MHR 090	1					
MHR 105	1.6					
MHR 110	3	2.5	2.5	2.2	3	2.2
MHR 130	4.5	3.5	3.5	3.3	4.5	3.3
MHR 150	7.0	5.4	5.4	5.1	7.0	5.1
PC063	0.05					
PC071	0.07					
PC080	0.15					
PC090	0.16					
VSA002	0.13				0.2	
VSA005	0.15				0.25	
VSA010	0.33				0.45	
VSA010	0.33				0.45	
VSF020	0.8				1	
VSF020	0.8				1	
VSF030	1.2				1.2	
VSF030	1.2				1.2	
VSF050	1.2				1.2	
	B3	B6	B7	B8	V5	V6
VF30	0.045	0.045	0.045	0.045	0.045	0.045
VF44	0.075	0.075	0.075	0.075	0.075	0.075
VF49	0.12	0.12	0.12	0.12	0.12	0.12

The fill quantity in the table is referenced，the exact value velating to the ratio and mounting positions。

15. NOTICE FOR ORDERING

1. Please refer to the sheet of performance parameter、TNRV 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.



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

SHOW THE SERIES PRODUCTS

TR Series helical geared motors

TS Series helical-worm geared motors

TK Series helical-bevel geared motors

TF Series parallel shaft helical geared motors

G3 Series mini helical geared motors

HSR Series mini helical gear units

MHR Series worm gear units

VSA Series stepless speed variator