Fenner

J.K. Fenner (India) Limited

FW Series
Worm Geared Motor

CONTENTS

1. SUMMARIZE

1.1 Products Features :

FW Series main design features are as follows;

- High durability - The Gear Box body made of high quality aluminum alloy, non-rusting.
- Superior efficiency & Low noise, because of precise machining.
- Worm shaft made of case hardened steel for high strength & efficiency, ground machining for excellent finishing.
- Flexible mounting, wide variety of mounting options.
- High reduction ratio.
- Efficient radiator.
- Elegant appearance.
- Lubricated for life and maintenance free operation.

1.2 Main materials

1. Housing: die-cast aluminum alloy (frame size: 30 to 90); cast iron (frame size: 110 to 150).

2. Worm Shaft: 20Cr, carbonize & quencher heat treatment make the hardness of gear's surface upto 56-62 HRC.

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, powder coated in silvery white.

Cast iron housing:
First paint with red antirust paint, then painted with silvery white paint.

2. PRODUCT STRUCTURE PICTURE

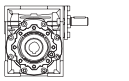
FW

HL-FW

FW / FW

3. MODEL DESIGNATION

WORM GEAR BOX DESIGNATION (FW)

FW	63	U	50	F90	B5	B3	Options
Gear box type (Worm)	Gear box Frame 30 (or) 40 (or) 50 (or) 63 (or) 75 (or) 90 (or) 110 (or) 130 (or) 150	U-Universal Mounting (Foot) (or) UFA (or) UFB (or) UFD } Flange Mounting	i-Ratio 7.5 (or) 10 (or) 15 (or) 20 (or) 25 (or) 30 (or) 40 (or) 50 (or) 60 (or) 80 (or) 100	Gear box Input Frame Size F 63 (or) F 71 (or) F 80 (or) F 90 (or) F 100 (or) F 112 (or) F 132 (or) F 160 (or) ISS (Input Solid Shaft)  	Motor Mounting B5-FW 30 to FW 150 (or) B14-FW 30 to FW 110 (or) NA 	Gear box Mounting Position B3 (or) B6 (or) B7 (or) B8 (or) V5 (or) V6	**SSOS** (Single Solid Output Shaft); **DOS** (Double Output Shaft); **NDES** (Non Driven End Side Shaft); **TRA** (Torque Arm); **C** (Output Side Cover)

HELI - WORM GEAR BOX DESIGNATION (HL-FW)

HL-FW	63	U	300	F71	B5	B3	Options
Gear box Type (Heli-Worm)	Gear box Frame	U-Universal Mounting (Foot) (or) UFA (or) UFB (or) UFD } Flange Mounting	i-Ratio	Gear box Input Frame Size F 63 (or) F 71 (or) F 80 (or) F 90	Motor Mounting Only B5	Gear box Mounting Position B3 (or) B6 (or) B7 (or) B8 (or) V5 (or) V6	**SSOS** (Single Solid Output Shaft); **DOS** (Double Output Shaft); **NDES** (Non Driven End Side Shaft); **TRA** (Torque Arm); **C** (Output Side Cover)

Double (Combination) Worm Gear Box Designation (FW / FW)

FW / FW	30/50	U	200	F90	B5	AS2	Options
Gear box type (Double Worm)	Gear box Frame	U-Universal Mounting (Foot) (or) UFA (or) UFB (or) UFD } Flange Mounting	i-Ratio 150 (or) 200 (or) 250 (or) 300 (or) 400 (or) 500 (or) 600 (or) 750 (or) 900 (or) 1200 (or) 1500 (or) 1800 (or) 2400 (or) 3000 4000 (or) 5000	Gear box Input Frame Size F 63 (or) F 71 (or) F 80 (or) F 90 (or) ISS (Input Solid Shaft)	Motor Mounting B5-FW 30 to FW 150 (or) B14-FW 30 to FW 110 (or) NA	Gear box Mounting Position AS1 (or) AS2 (or) VS1 (or) VS2 (or) PS1 (or) PS2 (or) BS1 (or) BS2	**SSOS** (Single Solid Output Shaft); (or) **DOS** (Double Output Shaft); **NDES** (Non Driven End Side Shaft); (or) **TRA** (Torque Arm); (or) **C** (Output Side Cover)

4. RELEVANT PARAMETER

4.1 PowerP

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

$$P_{1n} = P_1 * f_s \text{ [kW]}$$

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 FW / ISS gearbox rating charts and represents the **kW** that can be safely transmitted to the gear box, based on input speed n_1 and service factor $f_s = 1$.

Values of η_d are calculated for gear boxes 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, 1400 r/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

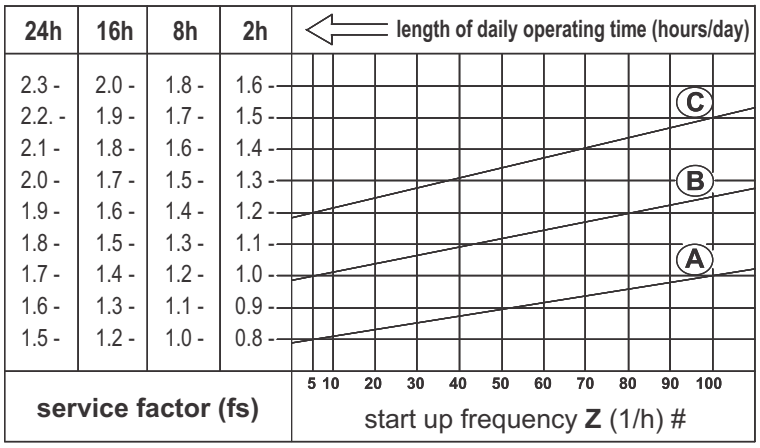
$$M_2 = \frac{9550 * P_1 * \eta}{n_2} \text{ [Nm]}$$

$$M_{2n} = M_2 \times f_s \text{ [Nm]}$$

P_2 Output power
M_2 Output torque
M_{2n} Rated output torque
P_1 Input power
η Transmission efficiency
f_s Service factor

4.5 Service factor

The effect of the driven machine on the gear unit is taken into account to a sufficient level of accuracy using the service factor . 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 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 breaking procedures as well as change overs from low to high speed.

4.5.1 Load classifications

Type of load:

Ⓐ Uniform, permitted mass acceleration factor $f_a = 0.25$

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

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

4.5.2 Mass acceleration factor

The mass acceleration factor is calculated as follows:

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

f_a Mass acceleration factor

Jc All external mass moments of interia [kgm^2]

Jm Mass moment of inertia on the motor end [kgm^2]

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

Service factor fs should be adjusted as followings:

1. Ambient temperature is 30 ~ 40^{0}C: fs x (1.1 ~ 1.2)
2. Ambient temperature is 40 ~ 40^{0}C: fs x (1.3 ~ 1.4)
3. Ambient temperature is 50 ~ 60^{0}C: fs x (1.5 ~ 1.6)
4. Ambient temperature is > 60^{0}C, please call our Technical Service.

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

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 factor **fz** :

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 :

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

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

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

$$F \times L = \frac{F_{r2} * a}{(b+x)} \text{ [N]}$$

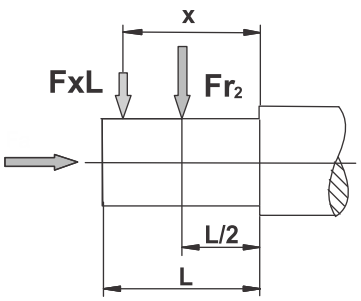
F_{r2} Permitted overhung load (x = L/2) for foot-mounted gear units according to the selection tables in [N]

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

x Distance from the shaft shoulder to the force application point in (mm)

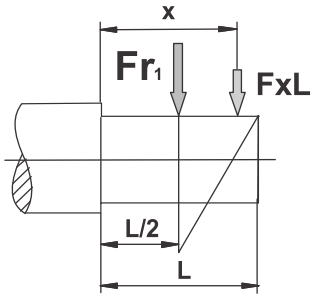
The value of **a, b,** F_{r2} are given in the following tables :

Output shafts radial loads



FW	30	40	050	063	075	090	110	130	150
a	65	84	101	120	131	162	176	188	215
b	50	64	76	95	101	122	136	148	174
F_{r2} max	1830	3490	4840	6270	7380	8180	12000	13500	18000

Input shafts radial loads



FW / ISS	030	040	050	063	075	090	110	130	150
a	86	106	129	159	192	227	266	314	350
b	76	94.5	114	139	167	202	236	274	310
F_{r1} max	210	350	490	700	980	1270	1700	2100	2800

4.7 Symbols and Units of Measure

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	Fr_2 [N]	fs			

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

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

M_{2n} Rated output torque **[r/min];**

i Gear unit ratio;

Fr_2 Output Shaft radial load

fs Service factor;

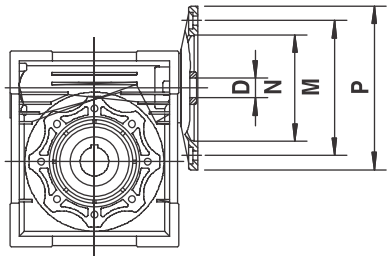
Gear unit type ;

Motor type ;

Page Number - Dimension Details

5. RELEVANT DATA

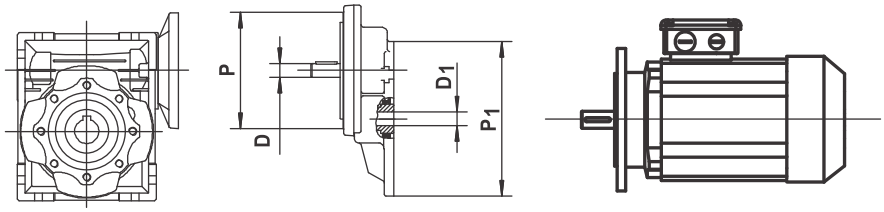
5.1 Ratio and IEC motor adapters



	IEC motor adapters				D Input Hollow Shaft Dia										
	IEC	P	M	N	i Transmission ratio										
					7.5	10	15	20	25	30	40	50	60	80	100
FW30	63B5	140	115	95	11	11	11	11	11	11	11	11	11		
	63B14	90	75	60											
FW40	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											
FW50	63B5	140	115	95								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											
FW63	71B5	160	130	110							14	14	14	14	14
	71B14	105	85	70											
	80B5	200	165	130	19	19	19	19	19	19	19	19	19	19	
	80B14	120	100	80											
	90B5	200	165	130	24	24	24	24	24	24	24				
	90B14	140	115	95											
FW75	71B5	160	130	110								14	14	14	14
	80B5	200	165	130				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											
	100 / 112B5	250	215	180	28	28	28								
	100 / 112B14	160	130	110											
FW90	80B5	200	165	130							19	19	19	19	19
	80B14	120	100	80											
	90B5	200	165	130	24	24	24	24	24	24	24	24	24		
	90B14	140	115	95											
	100 / 112B5	250	215	180	28	28	28	28	28	28					
	100 / 112B14	160	130	110											
FW110	80B5	200	165	130										19	19
	90B5	200	165	130					24	24	24	24	24	24	24
	100 / 112B5	250	215	180	28	28	28	28	28	28	28	28	28		
	100 / 112B14	160	130	110											
	132B5	300	265	230	38	38	38	38							
FW130	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				
FW150	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						

5.2 HL - FW Combinations

	i	HL 063 105 / 11 i = 3	HL 071 120 / 14 i = 3	HL 080 160 / 19 i = 3	HL 090 160 / 24 i = 2.42
FW40	25				
	30				
	40				
	50				
	60				
	80				
	100				
FW50	25				
	30				
	40				
	50				
	60				
	80				
	100				
FW63	25				
	30				
	40				
	50				
	60				
	80				
	100				
FW75	25				
	30				
	40				
	50				
	60				
	80				
	100				
FW90	25				
	30				
	40				
	50				
	60				
	80				
	100				
FW110	25				
	30				
	40				
	50				
	60				
	80				
	100				
FW130	25				
	30				
	40				
	50				
	60				
	80				
	100				



	P	D	P1	D1
HL 063	105	11	140 (63B5)	11
HL 071	120	14	160 (71B5)	14
HL 080	160	19	200 (80B5)	19
HL 090	160	24	200 (90B5)	24

5.3 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 shows dynamic efficiency (η_1-1400) and static efficiency values. Remember that these value are only achieved after the unit has been run in. Torque values M_{n2} indicated in the catalogue are calculated by considering the steady-state performance of the gearboxes. The actual values mentioned above may be have deflection.

5.3.1 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 **ηd < 0.4**

5.3.2 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 **ηs < 0.5**

η d	**> 0.6**	**0.~ 0.6**	**0.4 ~ 0.5**	**< 0.4**
DYNAMIC IRREVERSIBILITY	dynamic reversibility	low dynamic reversibility	good dynamic irreversibility	dynamic irreversibility

η_s	**> 0.55**	**0.5 ~ 0.55**	**< 0.5**
STATIC IRREVERSIBILITY	Static irreversibility	low static irreversibility	Static irreversibility

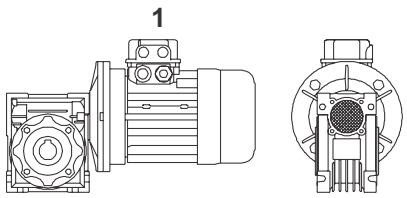
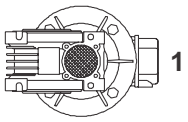
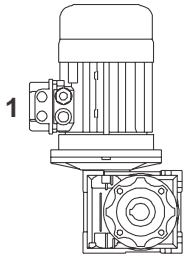
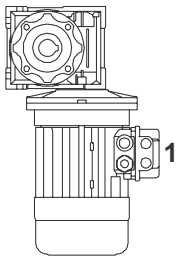
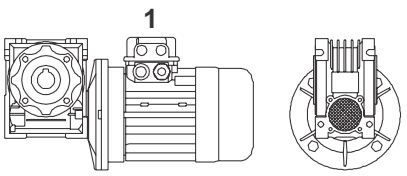
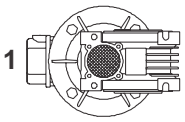
The table shows approximate irreversibility classes. Vibrations and shocks can affect a gear reducer's irreversibility. As it is virtually impossible to provide and guarantee total non reversing, we recommend the use of an external brake with sufficient capability to prevent vibrations in duced starting, 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.: $\eta_{tot} = \eta_1 \times \eta_2$

5.3.3 Mesh Data

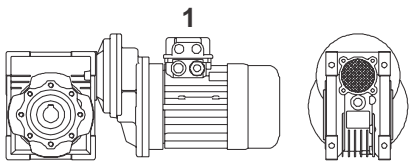
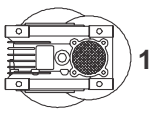
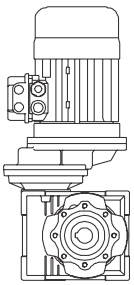
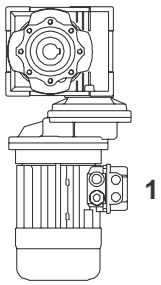
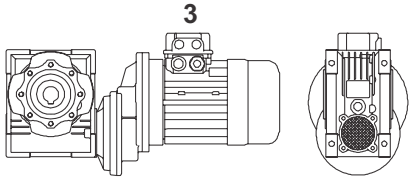
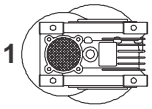
	i	7.5	10	15	20	25	30	40	50	60	80	100
FW30	z_1	4	3	2	2	1	1	1	1	1		
	m_n	1.36	1.39	1.42	1.09	1.69	1.43	1.10	0.89	0.74		
	Y	18°55'	14°25'	9°44'	7°50'	5°33'	4°54'	3°56'	3°17'	2°43'		
	η_d	0.84	0.81	0.76	0.72	0.66	0.64	0.59	0.54	0.50		
	η_s	0.66	0.62	0.54	0.49	0.41	0.38	0.33	0.29	0.26		
FW40	z_1	4	3	2	2	2	1	1	1	1	1	1
	m_n	1.87	1.95	2.00	1.54	1.26	2.04	1.55	1.27	1.06	0.80	0.65
	Y	23°54'	18°23'	12°30'	10°3'	8°45'	6°19'	5°4'	4°24'	3°42'	2°52'	2°29'
	η_d	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
FW50	z_1	4	3	2	2	2	1	1	1	1	1	1
	m_n	2.34	2.43	2.50	1.92	1.56	2.54	1.94	1.58	1.32	1.00	0.80
	Y	23°49'	18°19'	12°27'	10°3'	8°33'	6°18'	5°4'	4°18'	3°38'	2°52'	2°17'
	η_d	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	0.33	0.27	0.24
FW63	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
	Y	24°31'	18°53'	12°51'	10°29'	8°45'	6°30'	5°17'	4°24'	3°49'	2°59'	2°26'
	η_d	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
FW75	z_1	4	3	2	2	2	1	1	1	1	1	1
	m_n	3.53	3.70	3.83	2.94	2.39	3.92	2.99	2.41	2.02	1.54	1.24
	Y	26°38'	20°37'	14°5'	11°19'	9°29'	7°9'	5°43'	4°46'	4°1'	3°17'	2°44'
	η_d	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
FW90	z_1	4	3	2	2	2	1	1	1	1	1	1
	m_n	4.23	4.47	4.66	3.60	2.93	4.79	3.67	2.97	2.49	1.89	1.52
	Y	29°5'	22°39'	15°33'	12°50'	10°53'	7°55'	6°30'	5°29'	4°46'	3°45'	3°6'
	η_d	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
FW110	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
	Y	28°15'	21°57'	15°2'	14°42'	12°33'	7°39'	7°29'	6°21'	5°33'	4°27'	3°46'
	η_d	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
FW130	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	2.33
	Y	28°43'	22°20'	15°19'	13°47'	11°54'	7°48'	6°60'	6°1'	5°16'	4°8'	3°27'
	η_d	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
FW150	z_1	6	4	2	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
	Y	32°09'	24°35'	17°27'	12°53'	11°19'	9°50'	6°32'	5°43'	4°57'	3°55'	3°14'
	η_d	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. MOUNTING POSITIONS

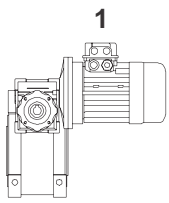
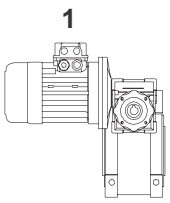
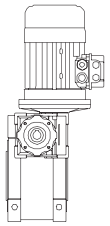
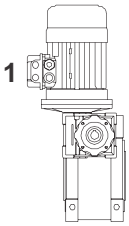
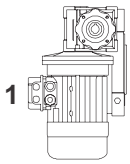
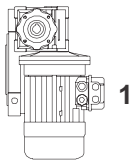
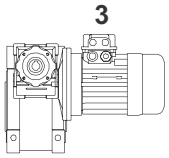
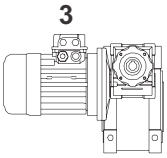
6.1 FW & FW.. ISS Mounting Positions

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

6.2 HL - FW .. Mounting Positions

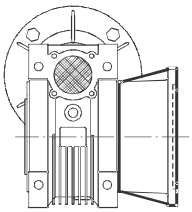
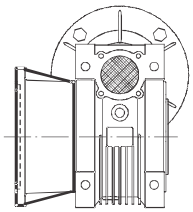
HL - FW.... U - B3	B6	V5	V6
			
B8	**B7**		
			

6.3 FW / FW & FW / FW.. ISS Mounting Positions

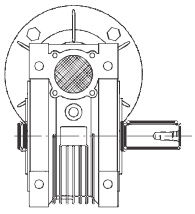
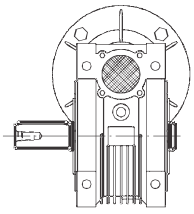
AS1	AS2	VS1	VS2
			
PS1	**PS2**	**BS1**	**BS2**
			

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.

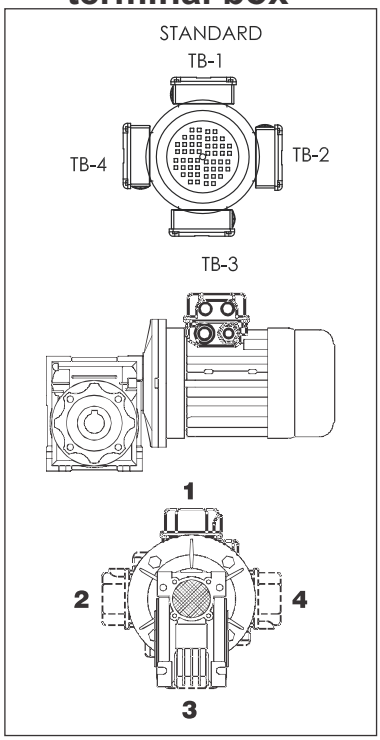
6.4 Position diagram for output flange

FA1, FB1, FD1	FA2, FB2, FD2
	

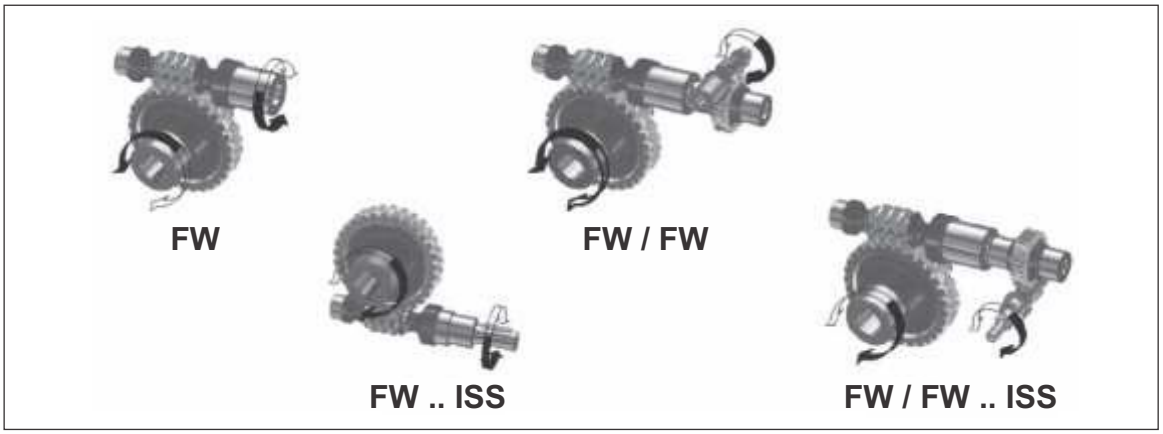
6.5 Position diagram for single output shaft

SSOS1	SSOS2
	

6.6 Position of terminal box



6.7 Direction of rotation



7. LUBRICATION

7.1 Lubricants detail

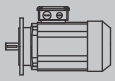
	°C -50 0 +50 +100	ISO	SHELL	AGIP	ESSO	MOBIL	CASTROL	BP	广研	
FW30~90 HL63~90	-25 +50	VG320	Tivela Oil S320	Telium VSF320	S220	Glygoyle 30	Alphasyn PG320	Energol SG-XP320		Synthetic Oil
FW110~150	-5 +40	VG460	Omala OIL460	Blasia 460	Spartan EP460	Mobilgear 634	Alpha MAX 460	Energol GR-XP460	CKE460	Mineral Oil
	-15 +25	VG220	Omala OIL220	Blasia 220	Spartan EP220	Mobilgear 630	Alpha MAX 220	Energol GR-XP220		

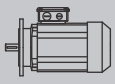
7.2 Quantity of Lubricant

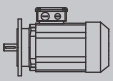
	B3	B6	B7	B8	V5	V6
FW30	0.05					
FW40	0.1					
FW50	0.15					
FW63	0.3					
FW75	0.5					
FW90	1					
FW110	3	2.5	2.5	2.2	3	2.2
FW130	4.5	3.5	3.5	3.3	4.5	3.3
FW150	7	5.4	5.4	5.1	7	5.1
HL 63	0.05					
HL 71	0.07					
HL 80	0.15					
HL 90	0.16					

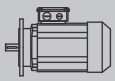
8. GEAR UNIT SELECTION TABLES

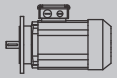
8.1 FW..(IEC).. Performance Parameter

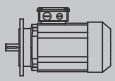
P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	Fr_2 [N]	fs			
0.12	186.7	5.2	7.5	683	3.5	**FW30 63B5 / B14**	**FM 63 A4**	**46**
	140	6.6	10	752	2.7			
	93.3	9.3	15	861	1.9			
	70	12	20	948	1.5			
	56	14	25	1021	1.6			
	46.7	16	30	1085	1.3			
	35	19	40	1194	0.9			
	28	22	50	1286	0.8			
	46.7	17	30	2087	2.7	**FW40 63B5 / B14**	**FM 63 A4**	**47**
	35	21	40	2298	1.9			
	28	25	50	2475	1.6			
	23.3	28	60	2630	1.3			
	17.5	33	80	2895	1.0			
	14	38	100	3118	0.8			
	23.3	29	60	3610	2.3	**FW50 63B5 / B14**	**FM 63 A4**	**48**
	17.5	35	80	3973	1.9			
	14	39	100	4280	1.4			
0.18	373.3	4.0	7.5	542	3.2	**FW30 63B5 / B14**	**FM 63 A2**	**46**
	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	**FW30 63B5 / B14**	**FM 63 B4**	**46**
	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			
	93.3	14	30	1657	2.5	**FW40 63B5 / B14**	**FM 63 A2**	**47**
	70	17	40	1824	1.8			
	56	21	50	1964	1.4			
	70	19	20	1824	2.1	**FW40 63B5 / B14**	**FM 63 B4**	**47**
	56	23	25	1964	1.7			
	46.7	25	30	2087	1.8			
	35	32	40	2298	1.3			
	28	37	50	2475	1.0			
	23.3	42	60	2630	0.9			
	45	28	20	2113	1.6	**FW40 71B5 / B14**	**FM 71 A6**	**47**
	36	34	25	2276	1.3			
	30	38	30	2419	1.3			
	22.5	47	40	2662	1.0			
	46.7	24	60	2865	2.1	**FW50 63B5 / B14**	**FM 63 A2**	**48**
	35	30	80	3153	1.5			
	28	34	100	3397	1.2			

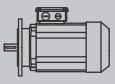
P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	Fr_2 [N]	fs			
0.18	35	33	40	3153	2.3	**FW50 63B5 / B14**	**FM 63 B4**	**48**
	28	39	50	3397	1.9			
	23.3	43	60	3610	1.6			
	17.5	52	80	3973	1.2			
	14	59	100	4280	0.9			
	18	56	50	3936	1.4			
	15	63	60	4183	1.1	**FW50 71B5 / B14**	**FM 71 A6**	**48**
	11.3	75	80	4604	0.9			
	15	66	60	5467	2.1			
	11.3	79	80	6018	1.6	**FW63 71B5 / B14**	**FM 71 A6**	**49**
	9	90	100	6270	1.4			
0.25	373.3	5.6	7.5	542	2.3	**FW30 63B5 / B14**	**FM 63 B2**	**46**
	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	7.5	1315	3.6	**FW40 71B5 / B14**	**FM 71 A4**	**47**
	140	14	10	1447	3.0			
	93.3	21	15	1657	2.0			
	70	27	20	1824	1.5			
	56	32	25	1964	1.2			
	46.7	36	30	2087	1.3			
	35	45	40	2298	0.9			
	120	17	7.5	1524	2.6	**FW40 71B5 / B14**	**FM 71 B6**	**47**
	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			
	35	42	80	3153	1.1	**FW50 63B5 / B14**	**FM 63 B2**	**48**
	28	48	100	3397	0.8			
	70	27	20	2503	2.7	**FW50 71B5 / B14**	**FM 71 A4**	**48**
	56	32	25	2696	2.2			
	46.7	36	30	2865	2.3			
	35	46	40	3153	1.7			
	28	54	50	3397	1.4			
	23.3	60	60	3610	1.1			
	17.5	72	80	3973	0.9			
	45	40	20	2900	1.9	**FW50 71B5 / B14**	**FM 71 B6**	**48**
	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			

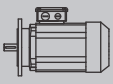
P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	Fr_2 [N]	fs			
0.25	28	55	50	4440	2.4	**FW63 71B5 / B14**	**FM 71 A4**	**49**
	23.3	63	60	4719	2.0			
	17.5	76	80	5193	1.6			
	14	87	100	5595	1.4			
	18	81	50	5145	1.8	**FW63 71B5 / B14**	**FM 71 B6**	**49**
	15	92	60	5467	1.5			
	11.3	110	80	6018	1.2			
	9	125	100	6270	1.0			
	17.5	80	80	6130	2.4	**FW75 71B5 / B14**	**FM 71 A4**	**50**
	14	94	100	6603	1.9			
	11.3	117	80	7103	1.7	**FW75 71B5 / B14**	**FM 71 B6**	**50**
	9	133	100	7380	1.4			
0.37	373.3	8.3	7.5	1044	3.4	**FW40 71B5 / B14**	**FM 71 A2**	**47**
	280	11	10	1149	2.6			
	186.7	16	15	1315	1.9			
	140	20	20	1447	1.4			
	112	25	25	1559	1.1			
	186.7	16	7.5	1315	2.5	**FW40 71B5 / B14**	**FM 71 B4**	**47**
	140	21	10	1447	2.1			
	93.3	31	15	1657	1.4			
	70	40	20	1824	1.1			
	56	48	25	1964	0.8			
	46.7	54	30	2087	0.9			
	112	25	25	2140	2.0	**FW50 71B5 / B14**	**FM 71 A2**	**48**
	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	**FW50 71B5 / B14**	**FM 71 B4**	**48**
	93.3	31	15	2274	2.4			
	70	39	20	2503	1.9			
	56	47	25	2696	1.5			
	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	**FW50 80B5 / B14**	**FM 80 A6**	**48**
	90	33	10	2302	2.6			
	60	47	15	2635	1.8			
	45	59	20	2900	1.3			
	36	72	25	3124	1.0			
	30	80	30	3320	1.1			
	35	70	40	4122	2.1	**FW63 71B5 / B14**	**FM 71 B4**	**49**
	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			

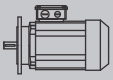
P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	Fr_2 [N]	fs			
0.37	45	60	20	3791	2.4	**FW63 80B5 / B14**	**FM 80 A6**	**49**
	36	73	25	4084	1.9			
	30	82	30	4339	2.1			
	22.5	102	40	4776	1.6			
	18	120	50	5145	1.2			
	15	137	60	5467	1.0			
	23.3	97	60	5569	2.1	**FW75 71B5 / B14**	**FM 71 B4**	**50**
	17.5	119	80	6130	1.6			
	14	139	100	6603	1.3			
	18	124	50	6073	1.8	**FW75 80B5 / B14**	**FM 80 A6**	**50**
	15	141	60	6453	1.5			
	11.3	173	80	7103	1.2			
	9	196	100	7380	1.0			
	11.3	185	80	7859	1.7	**FW90 80B5 / B14**	**FM 80 A6**	**51**
	9	212	100	8180	1.3			
0.55	373.3	12	7.5	1044	2.3	**FW40 71B5 / B14**	**FM 71 B2**	**47**
	280	16	10	1149	1.8			
	186.7	24	15	1315	1.3			
	140	30	20	1447	1.0			
	112	37	25	1559	0.8			
	140	31	20	1987	1.7	**FW50 71B5 / B14**	**FM 71 B2**	**48**
	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	**FW50 80B5 / B14**	**FM 80 A4**	**48**
	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	**FW50 80B5 / B14**	**FM 80 B6**	**48**
	90	48	10	2302	1.7			
	60	69	15	2635	1.2			
	45	88	20	2900	0.9			
	70	56	40	3272	1.9	**FW63 71B5 / B14**	**FM 71 B2**	**49**
	56	68	50	3524	1.5			
	46.7	78	60	3745	1.2			
	35	96	80	4122	0.9			
	28	111	100	4440	0.7			
	70	60	20	3272	2.2	**FW63 80B5 / B14**	**FM 80 A4**	**49**
	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			

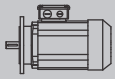
P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	Fr_2 [N]	fs			
0.55	60	70	15	3444	2.2	**FW63 80B5 / B14**	**FM 80 B6**	**49**
	45	90	20	3791	1.6			
	36	108	25	4084	1.3			
	30	123	30	4339	1.4			
	22.5	152	40	4776	1.1			
	35	99	80	4865	1.3	**FW75 71B5 / B14**	**FM 71 B2**	**50**
	28	116	100	5241	1.0			
	35	108	40	4865	2.0			
	28	128	50	5241	1.6	**FW75 80B5 / B14**	**FM 80 A4**	**50**
	23.3	144	60	5569	1.4			
	17.5	177	80	6130	1.1			
	14	206	100	6603	0.9			
	30	124	30	5122	2.1	**FW75 80B5 / B14**	**FM 80 B6**	**50**
	22.5	156	40	5637	1.5			
	18	184	50	6073	1.2			
	15	210	60	6453	1.0			
	17.5	189	80	6783	1.5	**FW90 80B5 / B14**	**FM 80 A4**	**51**
	14	221	100	7306	1.2			
	18	196	50	6719	2.0	**FW90 80B5 / B14**	**FM 80 B6**	**51**
	15	224	60	7140	1.6			
	11.3	275	80	7859	1.1			
	9	315	100	8180	0 9			
	17.5	201	80	8571	2.6	**FW110 80B5 / B14**	**FM 80 A4**	**52**
	14	236	100	9232	2.0			
	11.3	294	80	9931	1.9	**FW110 80B5 / B14**	**FM 80 B6**	**52**
	9	344	100	10320	1.5			
0.75	373.3	17	7.5	1433	3.0	**FW50 80B5 / B14**	**FM 80 A2**	**48**
	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	**FW50 80B5 / B14**	**FM 80 B4**	**48**
	140	43	10	1987	1.7			
	93.3	62	15	2274	1.2			
	70	80	20	2503	0.9			
	140	43	20	2597	2.3	**FW63 80B5 / B14**	**FM 80 A2**	**49**
	112	52	25	2797	1.8			
	93.3	60	30	2973	2.0			
	70	77	40	3272	1.4			
	56	92	50	3524	1.1			
	46.7	106	60	3745	0.9			
	93.3	63	15	2973	2.2	**FW63 80B5 / B14**	**FM 80 B4**	**49**
	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			

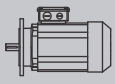
P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	Fr_2 [N]	fs			
0.75	120	51	7.5	2734	2.9	**FW63 90B5 / B14**	**FM 90 S6**	**49**
	90	67	10	3009	2.3			
	60	96	15	3444	1.6			
	45	123	20	3791	1.2			
	36	147	25	4084	0.9			
	30	167	30	4339	1.0			
	46.7	107	60	4421	1.3	**FW75 80B5 / B14**	**FM 80 A2**	**50**
	35	135	80	4865	1.0			
	28	159	100	5241	0.8			
	56	101	25	4160	2.0	**FW75 80B5 / B14**	**FM 80 B4**	**50**
	46.7	117	30	4421	2.0			
	35	147	40	4865	1.5			
	28	174	50	5241	1.2			
	23.3	196	60	5569	1.0			
	60	97	15	4065	2.4	**FW75 90B5 / B14**	**FM 90 S6**	**50**
	45	124	20	4474	1.9			
	36	149	25	4820	1.4			
	30	170	30	5122	1.5			
	22.5	213	40	5637	1.1			
	35	143	80	5383	1.6	**FW90 80B5 / B14**	**FM 80 A2**	**51**
	28	169	100	5799	1.2			
	28	182	50	5799	1.9	**FW90 80B5 / B14**	**FM 80 B4**	**51**
	23.3	209	60	6163	1.5			
	17.5	258	80	6783	1.1			
	14	302	100	7306	0.9			
	30	179	30	5667	2.6	**FW90 90B5 / B14**	**FM 90 S6**	**51**
	22.5	226	40	6238	1.8			
	18	267	50	6719	1.5			
	15	306	60	7140	1.1			
	17.5	274	80	8571	1.9	**FW110 80B5 / B14**	**FM 80 B4**	**52**
	14	322	100	9232	1.5			
	15	325	60	9023	2.1	**FW110 90B5 / B14**	**FM 90 S6**	**52**
	11.3	401	80	9931	1.4			
	9	470	100	10320	1.1			
	11.3	401	80	12989	2.1	**FW130 90B5 / B14**	**FM 90 S6**	**53**
	9	470	100	13500	1.7			
1.1	373.3	25	7.5	1433	2.1	**FW50 80B5 / B14**	**FM 80 B2**	**48**
	280	33	10	1577	1.7			
	186.7	48	15	1805	1.2			
	140	62	20	1987	0.9			
	186.7	46	15	2359	2.1	**FW63 80B5 / B14**	**FM 80 B2**	**49**
	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			

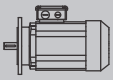
P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	Fr_2 [N]	fs			
1.1	120	75	7.5	2734	2.0	**FW63 90B5 / B14**	**FM 90 L6**	**49**
	90	98	10	3009	1.6			
	60	140	15	3444	1.1			
	45	180	20	3791	0.8			
	186.7	50	7.5	2359	2.6	**FW63 90B5 / B14**	**FM 90 B2**	**49**
	140	65	10	2597	2.0			
	93.3	92	15	2973	1.5			
	70	120	20	3272	1.1			
	56	144	25	3524	0.9			
	46.7	164	30	3745	1.0			
	112	77	25	3302	2.0	**FW75 80B5 / B14**	**FM 80 B2**	**50**
	93.3	89	30	3509	1.9			
	70	114	40	3862	1.4			
	56	137	50	4160	1.1			
	46.7	158	60	4421	0.9			
	90	98	10	3551	2.3	**FW75 90B5 / B14**	**FM 90 L6**	**50**
	60	142	15	4065	1.7			
	45	182	20	4474	1.3			
	36	219	25	4820	1.0			
	30	249	30	5122	1.0			
	93.3	95	15	3509	2.1	**FW75 90B5 / B14**	**FM 90 S4**	**50**
	70	122	20	3862	1.7			
	56	148	25	4160	1.3			
	46.7	171	30	4421	1.3			
	35	216	40	4865	1.0			
	35	210	80	5383	1.1	**FW90 80B5 / B14**	**FM 80 B2**	**51**
	28	248	100	5799	0.8			
	36	228	25	5333	1.6	**FW90 90B5 / B14**	**FM 90 L6**	**51**
	30	263	30	5667	1.8			
	22.5	331	40	6238	1.2			
	18	391	50	6719	1.0			
	15	448	60	7140	0.8			
	35	222	40	5383	1.6	**FW90 90B5 / B14**	**FM 90 S4**	**51**
	28	266	50	5799	1.3			
	23.3	306	60	6163	1.0			
	22.5	345	40	7882	2.3	**FW110 90B5 / B14**	**FM 90 L6**	**52**
	18	414	50	8491	1.8			
	15	476	60	9023	1.4			
	11.3	588	80	9931	1.0			
	28	278	50	7328	2.4	**FW110 90B5 / B14**	**FM 90 S4**	**52**
	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	**FW130 90B5**	**FM 90 L6**	**53**
	9	689	100	13500	1.1			
	17.5	408	80	11210	2.1	**FW130 90B5**	**FM 90 S4**	**53**
	14	480	100	12076	1.5			

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	Fr_2 [N]	fs			
1.5	186.7	68	7.5	2359	1.9	**FW63 90B5 / B14**	**FM 90 L4**	**49**
	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	**FW63 90B5 / B14**	**FM 90 S2**	**49**
	280	45	10	2061	2.2			
	186.7	66	15	2359	1.6			
	140	86	20	2597	1.2			
	112	105	25	2797	0.9			
	93.3	120	30	2973	1.0			
	120	103	7.5	3227	2.1	**FW75 100B5 / B14**	**FM 100 L6**	**50**
	90	134	10	3551	1.7			
	60	193	15	4065	1.2			
	56	187	50	4160	1.3	**FW75 90B5 / B14**	**FM 90 S2**	**50**
	46.7	215	60	4421	1.1			
	140	89	10	3065	2.2	**FW75 90B5 / B14**	**FM 90 L4**	**50**
	93.3	129	15	3509	1.6			
	70	166	20	3862	1.3			
	56	202	25	4160	1.0			
	46.7	233	30	4421	1.0			
	280	45	10	2433	3.2	**FW75 90B5 / B14**	**FM 90 S2**	**50**
	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			
	90	137	10	3929	2.7	**FW90 100B5 / B14**	**FM 100 L6**	**51**
	60	198	15	4498	2.1			
	45	258	20	4951	1.5			
	36	310	25	5333	1.2			
	30	358	30	5667	1.3			
	70	170	20	4273	2.1	**FW90 90B5 / B14**	**FM 90 L4**	**51**
	56	207	25	4603	1.6			
	46.7	239	30	4891	1.7			
	35	303	40	5383	1.2			
	28	363	50	5799	0.9			
	23.3	417	60	6163	0.8			
	56	197	50	4603	1.3	**FW90 90B5 / B14**	**FM 90 S2**	**51**
	46.7	227	60	4891	1.1			
	45	264	20	6256	2.7	**FW110 100B5 / B14**	**FM 100 L6**	**52**
	36	322	25	6739	2.4			
	30	363	30	7161	2.3			
	22.5	471	40	7882	1.7			
	18	565	50	8491	1.3			
	15	649	60	9023	1.1			
	35	315	40	6803	2.2	**FW110 90B5 / B14**	**FM 90 L4**	**51**
	28	379	50	7328	1.7			
	23.3	442	60	7787	1.4			
	17.5	548	80	8571	0.9			

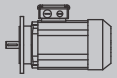
P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	Fr_2 [N]	fs			
1.5	46.7	236	60	6181	2.0	**FW110 90B5 / B14**	**FM 90 S2**	**52**
	35	299	80	6803	1.3			
	28	358	100	7328	1.0			
	22.5	471	40	10309	2.3	**FW130 100B5 / B14**	**FM 100 L6**	**53**
	18	565	50	11105	1.9			
	15	659	60	11801	1.4			
	11.3	802	80	12989	1.1			
	17.5	557	80	11210	1.5	**FW130 90B5 / B14**	**FM 90 L4**	**53**
	14	655	100	12076	1.1			
	18	589	50	15182	2.7	**FW150 100 / 112 B5**	**FM 100 L6**	**54**
	15	678	60	16133	2.1			
	11.3	841	80	17757	1.5			
	9	971	100	18000	1.2			
2.2	373.3	51	7.5	1873	1.8	**FW63 90B5 / B14**	**FM 90 L2**	**49**
	280	66	10	2061	1.5			
	186.7	97	15	2359	1.1			
	186.7	99	7.5	2785	1.9	**FW75 100B5 / B14**	**FM 100 LA4**	**50**
	140	131	10	3065	1.5			
	93.3	189	15	3509	1.1			
	373.3	50	7.5	2210	2.6	**FW75 90B5 / B14**	**FM 90 L2**	**50**
	280	66	10	2433	2.2			
	186.7	97	15	2785	1.5			
	140	126	20	3065	1.3			
	112	154	25	3302	1.0			
	93.3	178	30	3509	1.0			
	186.7	100	7.5	3081	2.9	**FW90 100B5 / B14**	**FM 100 LA4**	**51**
	140	132	10	3391	2.3			
	93.3	191	15	3882	1.9			
	70	249	20	4273	1.4			
	56	304	25	4603	1.1			
	46.7	351	30	4891	1.2			
	120	154	7.5	3570	2.2	**FW90 112B5 / B14**	**FM 112 M6**	**51**
	90	201	10	3929	1.8			
	60	291	15	4498	1.4			
	45	378	20	4951	1.0			
	140	129	20	3391	2.0	**FW90 90B5 / B14**	**FM 90 L2**	**51**
	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			
	70	255	20	5399	2.5	**FW110 100B5 / B14**	**FM 100 LA4**	**52**
	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			

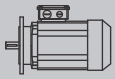
P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	Fr_2 [N]	fs			
2.2	90	203	10	4965	3.5	**FW110 112B5 / B14**	**FM 112 M6**	**52**
	60	294	15	5684	2.6			
	45	388	20	6256	1.9			
	36	473	25	6739	1.6			
	30	532	30	7161	1.6			
	112	161	25	4616	3.1	**FW110 90B5 / B14**	**FM 90 L2**	**52**
	93.3	187	30	4905	3.0			
	70	243	40	5399	2.2			
	56	296	50	5816	1.7			
	46.7	347	60	6181	1.4			
	35	468	40	8897	2.2	**FW130 100B5**	**FM 100 LA4**	
	28	563	50	9584	1.7			
	23.3	657	60	10185	1.4			
	17.5	816	80	11210	1.0			
	36	473	25	8814	2.2	**FW130 112B5**	**FM 112 M6**	**52**
	30	539	30	9366	2.2			
	22.5	691	40	10309	1.6			
	18	829	50	11105	1.3			
	15	966	60	11801	1.0			
	35	444	80	8897	1.3	**FW130 90B5 / B14**	**FM 90 L2**	**53**
	28	525	100	9584	1.0			
	28	578	50	13103	2.4	**FW150 100B5**	**FM 100 LA4**	**54**
	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	**FW150 112B5**	**FM 112 M6**	**54**
	15	995	60	16133	1.4			
	11.3	1233	80	17757	1.1			
	9	1425	100	18000	0.8			
4.0	373.3	91	7.5	2210	1.4	**FW75 112B5 / B14**	**FM 112 M2**	**50**
	280	120	10	2433	1.2			
	186.7	180	7.5	2785	1.0	**FW75 112B5 / B14**	**FM 112 M4**	**50**
	140	237	10	3065	0.8			
	373.3	93	7.5	2446	2.3	**FW90 112B5 / B14**	**FM 112 M2**	**51**
	280	123	10	2692	1.9			
	186.7	182	7.5	3081	1.6	**FW90 112B5 / B14**	**FM 112 M4**	**51**
	140	240	10	3391	1.3			
	93.3	348	15	3882	1.0			
	70	453	20	4273	0 8			
	140	240	10	4285	2.5	**FW110 112B5 / B14**	**FM 112 M4**	**52**
	93.3	352	15	4905	1.9			
	70	464	20	5399	1.4			
	56	566	25	5816	1.2			
	46.7	647	30	6181	1.1			

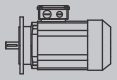
P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	Fr_2 [N]	fs			
4.0	120	280	7.5	4511	2.3	**FW110 132B5**	**FM 132 MA6**	**52**
	90	369	10	4965	1.9			
	60	535	15	5684	1.4			
	56	573	25	7607	1.6	**FW130 112B5**	**FM 112 M4**	**53**
	46.7	655	30	8084	1.6			
	35	851	40	8897	1.2			
	28	1023	50	9584	1.0			
	23.3	1195	60	10185	0.8			
	120	283	7.5	5901	3.1	**FW130 132B5**	**FM 132 MA6**	**53**
	90	369	10	6494	2.6			
	60	541	15	7434	2.0			
	45	705	20	8182	1.5			
	36	860	25	8814	1.2			
	28	1051	50	13103	1.3	**FW150 112B5**	**FM 112 M4**	**54**
	23.3	1212	60	13924	1.0			
	17.5	1507	80	15325	0.8			
	45	722	20	11186	2.1	**FW150 132B5**	**FM 132 MA6**	**54**
	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	2.2	**FW110 132B5**	**FM 132 S4**	**52**
	140	330	10	4285	1.8			
	93.3	484	15	4905	1.4			
	70	638	20	5399	1.0			
	140	334	10	5605	2.5	**FW130 132B5**	**FM 132 S4**	**53**
	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	**FW150 132B5**	**FM 132 S4**	**54**
	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	1.6	**FW110 132B5**	**FM 132 M4**	**52**
	140	450	10	4285	1.3			
	93.3	660	15	4905	1.0			
	186.7	345	7.5	5092	2.2	**FW130 132B5**	**FM 132 M4**	**53**
	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			

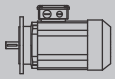
P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	Fr_2 [N]	fs			
7.5	70	891	20	9654	1.5	**FW150 132B5**	**FM 132 M4**	**54**
	56	1088	25	10400	1.1			
	46.7	1290	30	11051	0.9			
	35	1617	40	12163	1.0			
	28	1971	50	13103	0.7			
11	186.7	512	7.5	6962	2.3	**FW150 160B5**	**FM 160 M4**	**54**
	140	676	10	7663	1.8			
	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	**FW150 160B5**	**FM 160 M4**	**54**
	140	921	10	7663	1.3			
	93.3	1351	15	8771	0.9			
	70	1781	20	9654	0.7			

8.2 HL-FW.. (IEC).. Performance Parameter

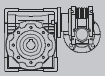
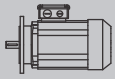
P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	fs			
0.12	18.7	42	75	2833	1.2	**HL63 - FW40 63B5**	**FM 63 A4**	**56**
	15.6	46	90	3011	1.2			
	11.7	57	120	3314	0.9			
	9.3	66	150	3490	0.7			
	7.8	74	180	3490	0.6			
	9.3	68	150	4840	1.3	**HL63 - FW50 63B5**	**FM 63 A4**	**56**
	7.8	75	180	4840	1.1			
	5.8	88	240	4840	0.8			
	4.7	98	300	4840	0.7			
	5.8	92	240	6270	1.5	**HL63 - FW63 63B5**	**FM 63 A4**	**56**
	4.7	103	300	6270	1.2			
0.18	18.7	64	75	2833	0.8	**HL63 - FW40 63B5**	**FM 63 B4**	**56**
	15.6	70	90	3011	0.8			
	11.7	85	120	3314	0.6			
	18.7	64	75	3889	1.4	**HL63 - FW50 63B5**	**FM 63 B4**	**56**
	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	**HL63 - FW63 63B5**	**FM 63 B4**	**56**
	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	**HL71 - FW50 71B5**	**FM 71 A6**	**57**
	10.0	105	90	4788	1.4			
	7.5	126	120	4840	1.0			
	12.0	97	75	5889	2.2	**HL71 - FW63 71B5**	**FM 71 A6**	**57**
	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	**HL71 - FW75 71B5**	**FM 71 A6**	**57**
	3.8	211	240	7380	1.2			
	3.0	235	300	7380	1.0			
0.25	18.7	88	75	3889	1.0	**HL71 - FW50 71B5**	**FM 71 A4**	**57**
	15.6	98	90	4132	1.1			
	11.7	121	120	4548	0.8			
	18.7	91	75	5083	1.8	**HL71 - FW63 71B5**	**FM 71 A4**	**57**
	15.6	100	90	5401	2.0			
	11.7	125	120	5945	1.5			
	9.3	143	150	6270	1.2			

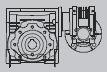
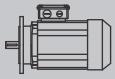
P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	Fr_2 [N]	fs			
0.25	7.8	163	180	6270	1.0	**HL71 - FW63 71B5**	**FM 71 A4**	**57**
	5.8	192	240	6270	0.7			
	4.7	215	300	6270	0.6			
	12.0	135	75	5889	1.6	**HL71 - FW63 71B5**	**FM 71 B6**	**57**
	10.0	148	90	6259	1.8			
	7.5	181	120	6270	1.3			
	6.0	211	150	6270	1.0			
	9.3	151	150	7380	1.7	**HL71 - FW75 71B5**	**FM 71 A4**	**57**
	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	**HL71 - FW75 71B5**	**FM 71 B6**	**57**
	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	**HL71 - FW90 71B5**	**FM 71 B6**	**58**
	3.8	318	240	8180	1.4			
	3.0	358	300	8180	1.1			
0.37	18.7	134	75	5083	1.2	**HL71 - FW63 71B5**	**FM 71 B4**	**57**
	15.6	148	90	5401	1.4			
	11.7	185	120	5945	1.0			
	9.3	212	150	6270	0.8			
	18.7	138	75	6000	1.8	**HL71 - FW75 71B5**	**FM 71 B4**	**57**
	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	**HL80 - FW75 80B5**	**FM 80 A6**	**58**
	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	**HL71 - FW90 71B5**	**FM 71 B4**	**58**
	5.8	321	240	8180	1.1			
	4.7	371	300	8180	0.9			
	6.0	347	150	8180	1.6	**HL80 - FW90 80B5**	**FM 80 A6**	**58**
	5.0	389	180	8180	1.3			
	3.8	471	240	8180	1.0			
	3.8	509	240	10320	1.6	**HL80 - FW110 80B5**	**FM 80 A6**	**59**
	3.0	577	300	10320	1.3			
0.55	18.7	205	75	6000	1.2	**HL80 - FW75 80B5**	**FM 80 A4**	**58**
	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	**HL80 - FW75 80B5**	**FM 80 B6**	**58**
	10.0	341	90	7380	1.1			

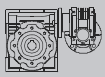
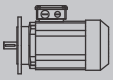
P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	Fr_2 [N]	fs			
0.55	15.6	240	90	7054	2.3	**HL80 - FW90 80B5**	**FM 80 A4**	**58**
	11.7	297	120	7764	1.6			
	9.3	355	150	8180	1.3			
	7.8	398	180	8180	1.0			
	10.0	357	90	8174	2.0	**HL80 - FW90 80B5**	**FM 80 B6**	**58**
	7.5	441	120	8180	1.4			
	6.0	516	150	8180	1.1			
	5.0	578	180	8180	0.9			
	7.8	425	180	10320	1.8	**HL80 - FW110 80B5**	**FM 80 A4**	**59**
	5.8	513	240	10320	1.3			
	4.7	597	300	10320	1.0			
	7.5	462	120	10320	2.6	**HL80 - FW110 80B5**	**FM 80 B6**	**59**
	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	**HL80 - FW130 80B5**	**FM 80 B6**	**59**
	3.0	858	300	13500	1.3			
0.75	18.7	280	75	6000	0.9	**HL80 - FW75 80B5**	**FM 80 B4**	**58**
	15.6	313	90	6375	1.0			
	15.6	327	90	7054	1.7	**HL80 - FW90 80B5**	**FM 80 B4**	**58**
	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	2.2	**HL80 - FW110 80B5**	**FM 80 B4**	**59**
	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	**HL90 - FW110 90B5**	**FM 90 S6**	**59**
	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	**HL80 - FW130 80B5**	**FM 80 B4**	**59**
	4.7	813	300	13500	1.1			
	12.4	399	73	12575	4.4	**HL90 - FW130 90B5**	**FM 90 S6**	**59**
	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	2.2	**HL90 - FW110 90B5**	**FM 90 L6**	**59**
	9.3	746	96.8	10320	1.6			
	7.4	890	121	10320	1.2			
	6.2	1000	145.2	10320	1.0			

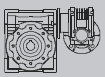
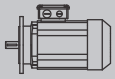
P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	fs			
1.1	19.3 14 5	392 508	73 96 8	8298 9133	2.5 1 8	**HL90 - FW110 90B5**	**FM 90 S4**	**59**
	11.6 9.6 7.2	599 686 828	121 145.2 193.6	9838 10320 10320	1.5 1.1 0.8	**HL90 - FW110 90B5**	**FM 90 S4**	**59**
	12.4 9.3 7.4 6.2 4.6	585 746 890 1000 1220	73 96.8 121 145.2 193.6	12575 13500 13500 13500 13500	3.0 2.2 1.7 1.4 1.0	**HL90 - FW130 90B5**	**FM 90 L6**	**59**
	19.3 14.5 11.6 9.6 7.2 5.8	398 508 608 686 843 962	73 96.8 121 145.2 193.6 242	10853 11945 12868 13500 13500 13500	3.5 2.6 2.0 1.6 1.2 0.9	**HL90 - FW130 90B5**	**FM 90 S4**	**59**
1.5	19.3 14.5 11.6 9.6	535 693 817 936	73 96.8 121 145.2	8298 9133 9838 10320	1.9 1.3 1.1 0.8	**HL90 - FW110 90B5**	**FM 90 L4**	**59**
	19.3 14.5 11.6 9.6 7.2	542 693 830 936 1149	73 96.8 121 145.2 194	10853 11945 12868 13500 13500	2.6 1.9 1.5 1.1 0.8	**HL90 - FW130 90B5**	**FM 90 L4**	**59**
2.2	38.6 28.9 23.1	398 516 617	73 96.8 121	6586 7249 7809	2.1 1.5 1.2	**HL90 - FW110 90B5**	**FM 90 L2**	**59**
	38.6 28.9 23.1 19.3	409 545 654 752	73 96.8 121 145.2	8614 9481 10213 10853	2.9 2.0 1.6 1.3	**HL90 - FW130 90B5**	**FM 90 L2**	**59**

8.3 FW / FW.. (IEC).. Performance Parameter

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	fs			
0.12	9.3	74	150	4350	1.8	**FW/FW30/50 63B5/B14**	**FM 63 A4**	**60**
	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			
	9.3	75	150	5686	2.8	**FW/FW30/63 63B5/B14**	**FM 63 A4**	**60**
	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	335	900	7380	1.2	**FW/FW40/75 63B5/B14**	**FM 63 A4**	**61**
	1.2	411	1200	7380	0.9			
	0.8	470	1800	8180	0.9	**FW/FW40/90 63B5/B14**	**FM 63 A4**	**61**
	0.6	593	2400	8180	0.9			
	0.5	731	3000	10320	1.2	**FW/FW50/110 63B5/B14**	**FM 63 A4**	**62**
	0.4	884	4000	10320	1.0			
	0.3	1023	5000	10320	0.8			
0.18	9.3	112	150	4350	1.2	**FW/FW30/50 63B5/B14**	**FM 63 A4**	**60**
	7.0	141	200	4788	0.9			
	4.7	183	300	4840	0.8			
	9.3	113	150	5686	1.9	**FW/FW30/63 63B5/B14**	**FM 63 A4**	**60**
	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	336	600	7380	1.1	**FW/FW40/75 63B5/B14**	**FM 63 B4**	**61**
	1.9	371	750	7380	0.9			
	1.6	419	900	7380	0.8			
	1.2	544	1200	8180	1.0	**FW/FW40/90 63B5/B14**	**FM 63 B4**	**61**
	0.9	647	1500	8180	0.8			
	0.8	727	1800	10320	1.5	**FW/FW50/110 63B5/B14**	**FM 63 B4**	**62**
	0.6	948	2400	10320	1.1			
0.25	7.0	150	400	6270	1.4	**FW/FW30/63 63B5/B14**	**FM 63 B2**	**60**
	5.6	175	500	6270	1.2			

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	fs			
0.25	9.3	165	150	6712	2.6	**FW/FW40/75 71B5/B14**	**FM 71 A4**	**61**
	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	488	600	8180	1.2	**FW/FW40/90 71B5/B14**	**FM 71 A4**	**61**
	1.9	553	750	8180	0.9			
	1.6	612	900	8180	0.8			
	1.2	776	1200	10320	1.3	**FW/FW50/110 71B5/B14**	**FM 71 A4**	**62**
	0.9	924	1500	10320	1.2			
	0.8	1010	1800	10320	1.1			
	0.6	1358	2400	13500	1.0	**FW/FW63/130 71B5/B14**	**FM 71 A4**	**62**
	0.5	1626	3000	13500	0.8			
	0.4	1910	4000	13500	0.6			
	0 3	2132	5000	13500	0.5			
	0.6	1702	2400	18000	1.6	**FW/FW63/150 71B5/B14**	**FM 71 A4**	**63**
	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	**FW/FW30/63 71B5/B14**	**FM 71 A2**	**60**
	7.0	222	400	6270	1.0			
	9.3	245	150	6712	1.7	**FW/FW40/75 71B5/B14**	**FM 71 B4**	**61**
	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			
	4.7	406	300	8180	1.5	**FW/FW40/90 71B5/B14**	**FM 71 B4**	**61**
	3.5	505	400	8180	1.2			
	2.8	593	500	8180	0.9			
	2.3	722	600	8180	0.8			
	1.9	837	750	10320	1.3	**FW/FW50/110 71B5/B14**	**FM 71 B4**	**62**
	1.6	928	900	10320	1.1			
	1.2	1148	1200	10320	0·8			
	0.9	1699	1500	13500	1.0	**FW/FW63/130 71B5/B14**	**FM 71 B4**	**62**
	0·8	1918	1800	13500	0·9			
	0.6	2519	2400	18000	1.1	**FW/FW63/150 71B5/B14**	**FM 71 B4**	**63**
	0.5	2958	3000	18000	0.8			
0.55	9.3	305	300	8180	2.0	**FW/FW40/90 71B5/B14**	**FM 71 B2**	**61**
	7.0	375	400	8180	1.5			
	5.6	441	500	8180	1.2			
	9.3	382	150	7426	1.7	**FW/FW50/90 80B5/B14**	**FM 80 A4**	**61**
	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			

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	fs			
0.55	4.7	615	300	10320	1.9	**FW/FW50/110 80B5/B14**	**FM 80 A4**	**62**
	3.5	810	400	10320	1.4			
	2.8	938	500	10320	1.1			
	2.3	1096	600	10320	1.0			
	1.9	1244	750	10320	0.9			
	2.8	957	500	13500	1.6	**FW/FW63/130 80B5/B14**	**FM 80 A4**	**62**
	1.9	1382	750	13500	1.2			
	1.2	2057	1200	13500	0.8			
	2.3	1248	600	18000	2.1	**FW/FW63/150 80B5/B14**	**FM 80 A4**	**63**
	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	9.3	521	150	7426	1.3	**FW/FW50/90 80B5/B14**	**FM 80 B4**	**61**
	7.0	668	200	8174	0.9			
	5.6	801	250	8180	0.7			
	9.3	424	300	10320	2.8	**FW/FW50/110 80B5/B14**	**FM 80 A2**	**62**
	7.0	553	400	10320	2.1			
	5.6	640	500	10320	1.6			
	9.3	527	150	9384	1.8			
	7.0	685	200	10320	1.7	**FW/FW50/110 80B5/B14**	**FM 80 B4**	**62**
	5.6	835	250	10320	1.4			
	4.7	838	300	10320	1.3			
	3.5	1105	400	1032	0.9			
	9.3	527	150	9384	2.3	**FW/FW63/110 80B5/B14**	**FM 80 B4**	**62**
	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			
	2.8	1305	500	13500	1.1	**FW/FW63/130 80B5/B14**	**FM 80 B4**	**62**
	2.3	1557	600	13500	1.0			
	1.9	1772	750	13500	0.9			
	1 6	2014	900	13500	0.8			
	2.3	1702	600	18000	1.6	**FW/FW63/150 80B5/B14**	**FM 80 B4**	**63**
	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	1.9	**FW/FW50/110 80B5/B14**	**FM 80 B2**	**62**
	7.0	810	400	10320	1.4			
	5.6	938	500	10320	1.1			
	9.3	774	150	9384	1.5	**FW/FW63/110 90B5/B14**	**FM 90 S4**	**62**
	7.0	1005	200	10320	1.1			
	5.6	1224	250	10320	1.0			
	4.7	1312	300	10320	1.0			

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	fs			
1.1	4.7	1274	300	13500	1.3	**FW/FW63/130 90B5/B14**	**FM 90 S4**	**62**
	3.5	1621	400	13500	1.0			
	2.8	1913	500	13500	0.8			
	9.3	771	150	18000	2.6	**FW/FW63/150 90B5/B14**	**FM 90 S4**	**63**
	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	1.4	**FW/FW50/110 90B5/B14**	**FM 90 S2**	**62**
	7.0	1105	400	10320	1.0			
	5.6	1279	500	10320	0.8			
	9.3	1055	150	9384	1.1	**FW/FW63/110 90B5/B14**	**FM 90 L4**	**62**
	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	**FW/FW63/130 90B5/B14**	**FM 90 S2**	**62**
	7.0	1105	400	13500	1.4			
	5.6	1305	500	13500	1.1			
	9.3	1042	150	12274	1.5	**FW/FW63/130 90B5/B14**	**FM 90 L4**	**62**
	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	**FW/FW63/150 90B5/B14**	**FM 90 L4**	**63**
	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			

8.4 FW.. ISS Performance Parameter

M_{2n} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]	Fr_2 [N]	Fr_1 [N]		
13	2800	7.5	0.58	373.3	542	125	**FW 30 ISS**	**55**
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	**FW 40 ISS**	**55**
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	**FW 50 ISS**	**55**
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	**FW 63 ISS**	**55**
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	**FW 75 ISS**	**55**
145	2800	10	4.8	280	2433	703		
150	2800	15	3.4	186.7	2785	727		
160	2800	20	2.8	140	3065	872		
150	2800	25	2.1	112	3302	980		

M_{2n} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]	Fr_2 [N]	Fr_1 [N]		
170	2800	30	2.1	93.3	3509	980	**FW 75 ISS**	**55**
165	2800	40	1.6	70	3862	980		
150	2800	50	1.2	56	4160	980		
145	2800	60	1.0	46.7	4421	980		
130	2800	80	0.72	35	4865	980		
120	2800	100	0.57	28	5241	980		
210	2800	7.5	9.0	373.3	2446	715	**FW 90 ISS**	**55**
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		
391	2800	7.5	16.8	373.3	3090	950	**FW 110 ISS**	**55**
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	**FW 130 ISS**	**55**
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	**FW 150 ISS**	**55**
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]		
18	1400	7.5	0.4	186.7	683	150	**FW 30 ISS**	**55**
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	**FW 40 ISS**	**55**
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	**FW 50 ISS**	**55**
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	**FW 63 ISS**	**55**
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	**FW 75 ISS**	**55**
195	1400	10	3.3	140	3065	830		
200	1400	15	2.3	93.3	3509	851		
210	1400	20	1.9	70	3862	980		
200	1400	25	1.5	56	4160	980		
230	1400	30	1.5	46.7	4421	980		

M_{2n} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]	F_{r2} [N]	F_{r1} [N]		
220	1400	40	1.1	35	4865	980	**FW 75 ISS**	**55**
210	1400	50	0.9	28	5241	980		
200	1400	60	0.8	23.3	5569	980		
190	1400	80	0.6	17.5	6130	980		
180	1400	100	0.5	14	6603	980		
290	1400	7.5	6.4	186.7	3081	900	**FW 90 ISS**	**55**
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		
552	1400	7.5	12.1	186.7	3893	1200	**FW 110 ISS**	**55**
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	**FW 130 ISS**	**55**
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	**FW 150 ISS**	**55**
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		

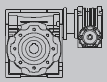
M_{2n} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]	F_{r2} [N]	F_{r1} [N]		
20	900	7.5	0.30	120	792	175	**FW 30 ISS**	**55**
20	900	10	0.24	90	871	197		
20	900	15	0.17	60	997	197		
20	900	20	0.13	45	1098	210		
23	900	25	0.14	36	1183	210		
21	900	30	0.11	30	1257	210		
20	900	40	0.09	22.5	1383	210		
18	900	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	**FW 40 ISS**	**55**
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	**FW 50 ISS**	**55**
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	**FW 63 ISS**	**55**
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	**FW 75 ISS**	**55**
230	900	10	2.6	90	3551	975		
235	900	15	1.8	60	4065	980		
235	900	20	1.4	45	4474	980		
215	900	25	1.1	36	4820	980		
260	900	30	1.2	30	5122	980		

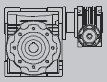
M_{2n} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]	F_{r2} [N]	F_{r1} [N]		
240	900	40	0.84	22.5	5637	980	**FW 75 ISS**	**55**
220	900	50	0.66	18	6073	980		
210	900	60	0.55	15	6453	980		
200	900	80	0.43	11.3	7103	980		
190	900	100	0.36	9	7380	980		
340	900	7.5	4.9	120	3570	1040	**FW 90 ISS**	**55**
370	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		
650	900	7.5	9.3	120	4511	1390	**FW 110 ISS**	**55**
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	**FW 130 ISS**	**55**
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	**FW 150 ISS**	**55**
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		

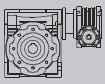
M_{2n} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]	F_{r2} [N]	F_{r1} [N]		
24	500	7.5	0.21	66.7	963	210	**FW 30 ISS**	**55**
24	500	10	0.16	50	1060	210		
24	500	15	0.12	33.3	1213	210		
23	500	20	0.09	25	1336	210		
29	500	25	0.10	20	1439	210		
26	500	30	0.08	16.7	1529	210		
23	500	40	0.06	12.5	1683	210		
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	**FW 40 ISS**	**55**
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	**FW 50 ISS**	**55**
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	**FW 63 ISS**	**55**
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	**FW 75 ISS**	**55**
270	500	10	1.7	50	4320	980		
280	500	15	1.3	33.3	4945	980		
285	500	20	0.99	25	5443	980		
255	500	25	0.74	20	5863	980		
300	500	30	0.77	16.7	6231	980		

M_{2n} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]	F_{r2} [N]	F_{r1} [N]		
280	500	40	0.58	12.5	6858	980	**FW 75 ISS**	**55**
250	500	50	0.44	10	7380	980		
240	500	60	0.38	8.3	7380	980		
215	500	80	0.28	6.3	7380	980		
210	500	100	0.24	5	7380	980		
410	500	7.5	3.3	66.7	4343	1270	**FW 90 ISS**	**55**
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		
794	500	7.5	6.4	66.7	5488	1700	**FW 110 ISS**	**55**
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	**FW 130 ISS**	**55**
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	**FW 150 ISS**	**55**
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		

8.5 FW / FW.. ISS Performance Parameter

M_{2n} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]	F_{r2} [N]	F_{r1} [N]		
73	1400	300	0.07	4.7	3490	210	**FW/FW 30/40 ISS**	**63**
65	1400	400	0.06	3.5	3490	210		
61	1400	500	0.04	2.8	3490	210		
73	1400	600	0.05	2.3	3490	210		
73	1400	750	0.04	1.9	3490	210		
73	1400	900	0.04	1.6	3490	210		
65	1400	1200	0.03	1.2	3490	210		
73	1400	1500	0.03	0.9	3490	210		
73	1400	1800	0.02	0.8	3490	210		
65	1400	2400	0.02	0.58	3490	210		
60	1400	3200	0.01	0.43	3490	210		
48	1400	4000	0.01	0.35	3490	210		
43	1400	5000	0.01	0.28	3490	210		
145	1400	300	0.16	4.7	4840	210	**FW/FW 30/50 ISS**	**63**
124	1400	400	0.11	3.5	4840	210		
120	1400	500	0.09	2.8	4840	210		
145	1400	600	0.09	2.3	4840	210		
145	1400	750	0.08	1.9	4840	210		
145	1400	900	0.07	1.6	4840	210		
145	1400	1200	0.05	1.2	4840	210		
145	1400	1500	0.05	0.93	4840	210		
145	1400	1800	0.05	0.78	4840	210		
124	1400	2400	0.03	0.6	4840	210		
120	1400	3000	0.03	0.5	4840	210		
82	1400	4000	0.02	0.35	4840	210		
79	1400	5000	0.02	0.29	4840	210		
255	1400	300	0.24	4.7	6270	210	**FW/FW 30/63 ISS**	**63**
230	1400	400	0.19	3.5	6270	210		
216	1400	500	0.15	2.8	6270	210		
230	1400	600	0.14	2.3	6270	210		
216	1400	750	0.12	1.9	6270	210		
198	1400	900	0.09	1.6	6270	210		
230	1400	1200	0.09	1.2	6270	210		
216	1400	1500	0.08	0.93	6270	210		
198	1400	1800	0.06	0.78	6270	210		
230	1400	2400	0.06	0.58	6270	210		
216	1400	3000	0.05	0.47	6270	210		
172	1400	4000	0.04	0.35	6270	210		
150	1400	5000	0.03	0.28	6270	210		
390	1400	300	0.38	4.7	7380	350	**FW/FW 40/75 ISS**	**63**
360	1400	400	0.28	3.5	7380	350		
320	1400	500	0.21	2.8	7380	350		
390	1400	600	0.21	2.3	7380	350		
390	1400	750	0.19	1.9	7380	350		
390	1400	900	0.17	1.6	7380	350		
360	1400	1200	0.13	1.2	7380	350		
390	1400	1500	0.12	0.93	7380	350		
390	1400	1800	0.11	0.78	7380	350		
360	1400	2400	0.08	0.58	7380	350		
320	1400	3000	0.06	0.47	7380	350		
250	1400	4000	0.04	0.35	7380	350		
230	1400	5000	0.03	0.28	7380	350		

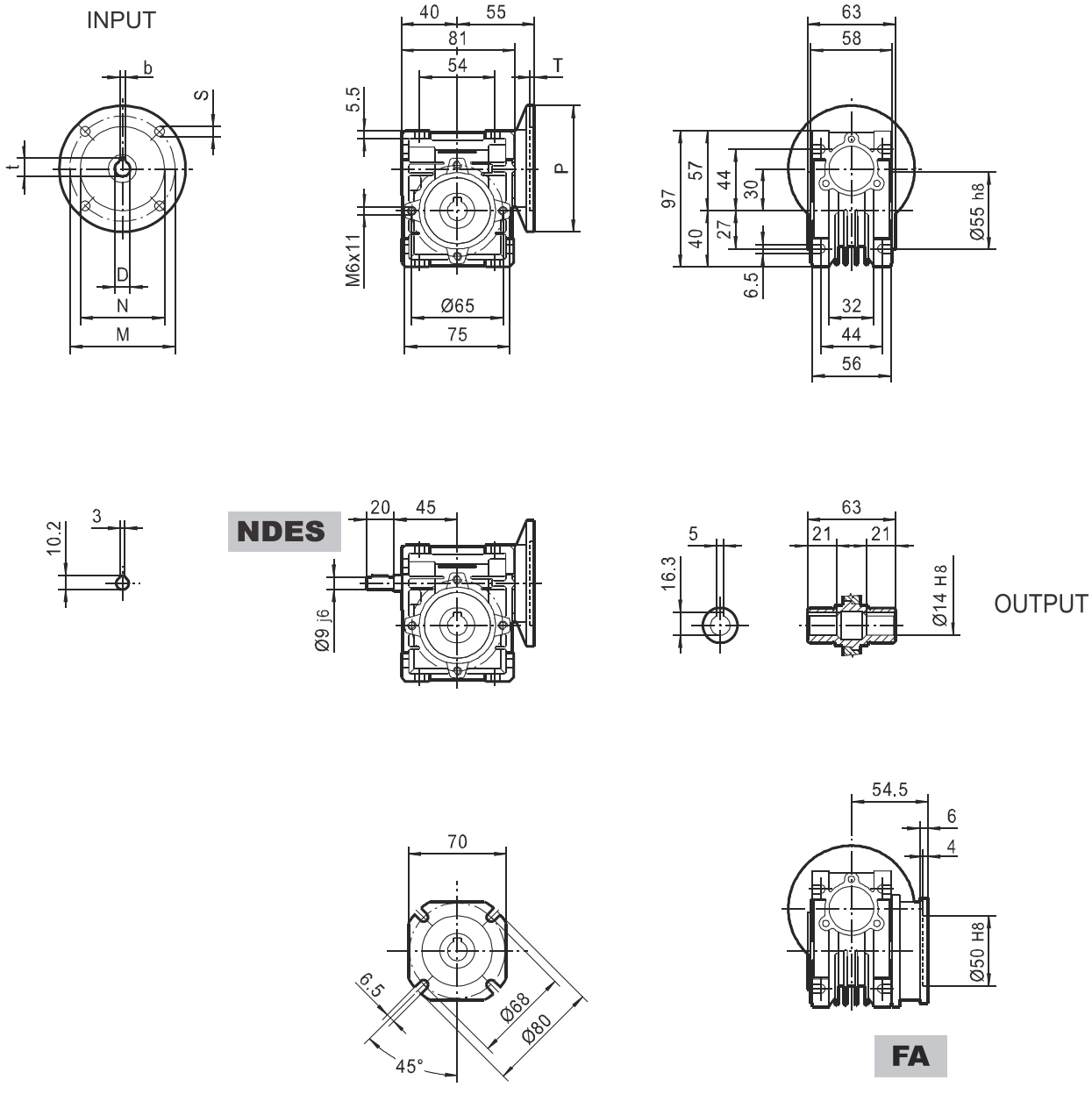
M_{2n} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]	F_{r2} [N]	F_{r1} [N]		
610	1400	300	0.56	4.7	8180	350	**FW/FW 40/90 ISS**	**63**
610	1400	400	0.45	3.5	8180	350		
560	1400	500	0.35	2.8	8180	350		
610	1400	600	0.31	2.3	8180	350		
560	1400	750	0.25	1.9	8180	350		
505	1400	900	0.21	1.6	8180	350		
610	1400	1200	0.20	1.2	8180	350		
560	1400	1500	0.16	0.93	8180	350		
505	1400	1800	0.13	0.78	8180	350		
610	1400	2400	0.12	0.58	8180	350		
560	1400	3000	0.10	0.47	8180	350		
460	1400	4000	0.07	0.35	8180	350		
410	1400	5000	0.05	0.28	8180	350		
700	1400	300	0.59	4.7	8180	490	**FW/FW 50/90 ISS**	**63**
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		
1265	1400	300	1.06	4.7	10320	490	**FW/FW 50/110 ISS**	**63**
1185	1400	400	0.77	3.5	10320	490		
1173	1400	500	0.60	2.8	10320	490		
1265	1400	600	0.54	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	0.31	1.2	10320	490		
1265	1400	1500	0.29	0.93	10320	490		
1265	1400	1800	0.26	0.78	10320	490		
1185	1400	2400	0.19	0.58	10320	490		
1100	1400	3000	0.14	0.47	10320	490		
1100	1400	4000	0.12	0.35	10320	490		
1100	1400	5000	0.10	0.28	10320	490		
1196	1400	150	1.70	9.3	9384	595	**FW/FW 63/110 ISS**	**63**
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		

M_{2n} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]	F_{r2} [N]	F_{r1} [N]		
1584	1400	150	2.28	9.3	12274	700	**FW/FW 63/130 ISS**	**63**
1600	1400	200	1.75	7.0	13500	700		
1530	1400	250	1.37	5.6	13500	700		
1760	1400	300	1.5	4.7	13500	700		
1650	1400	400	1.1	3.5	13500	700		
1550	1400	500	0.89	2.8	13500	700		
1650	1400	600	0.79	2.3	13500	700		
1760	1400	750	0.75	1.9	13500	700		
1760	1400	900	0.66	1.6	13500	700		
1650	1400	1200	0.51	1.2	13500	700		
1760	1400	1500	0.45	0.93	13500	700		
1760	1400	1800	0.41	0.78	13500	700		
1650	1400	2400	0.30	0.58	13500	700		
1550	1400	3000	0.24	0.47	13500	700		
1550	1400	4000	0.16	0.35	13500	700		
1550	1400	5000	0.13	0.28	13500	700		
1971	1400	150	2.81	9.3	18000	500	**FW/FW 63/150 ISS**	**63**
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		

9. OUTLINE DIMENSION

9.1 FW.. Outline dimension

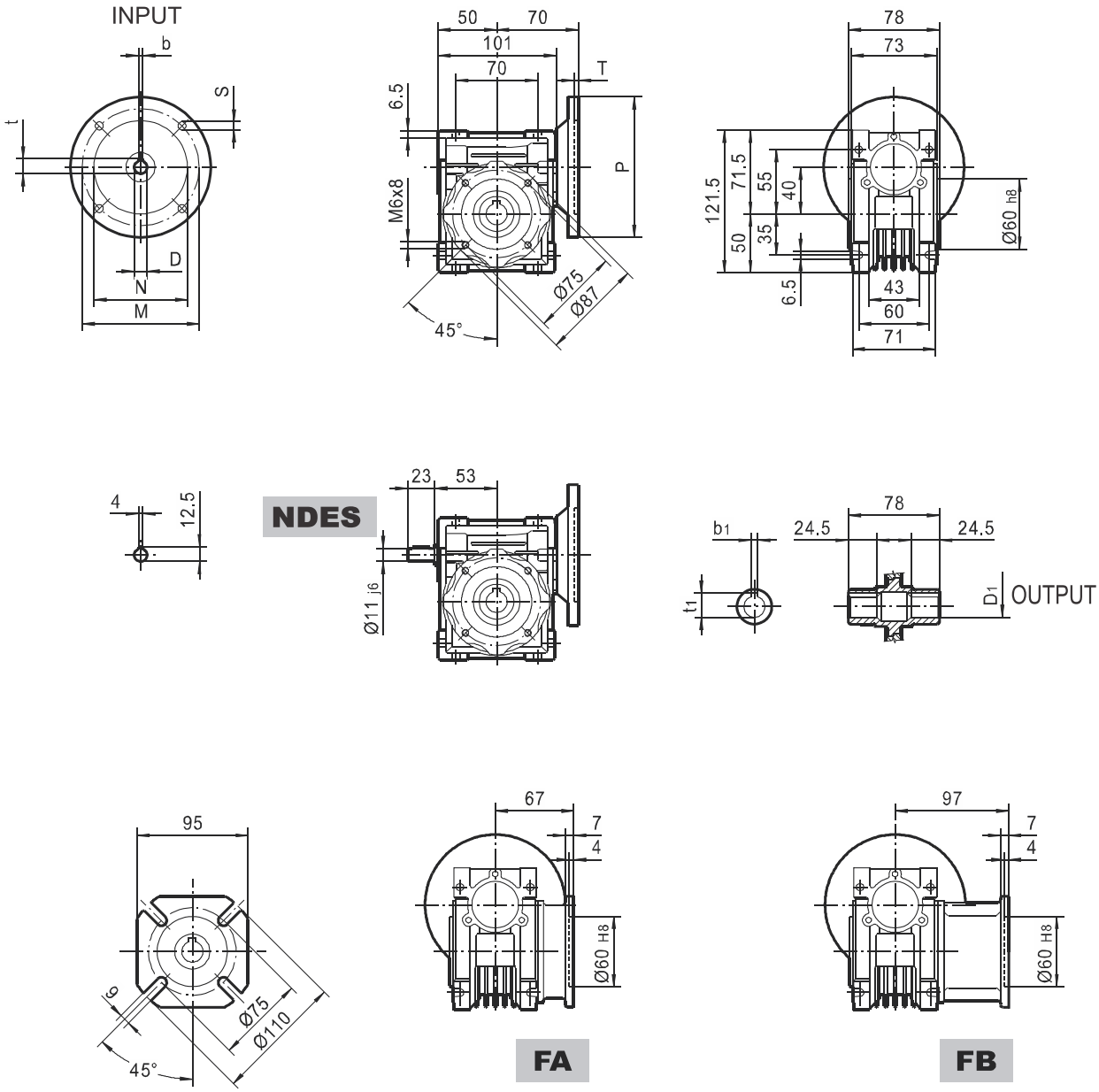
FW30..(IEC)



IEC	D_{E8}	t	b	P	M	N	S	T
63B5	11	12.8	4	140	115	95	9	5
63B14	11	12.8	4	90	75	60	5.5	4

FW30 Gear Box Weight ≈ 1.3 kg
(Without Flange)

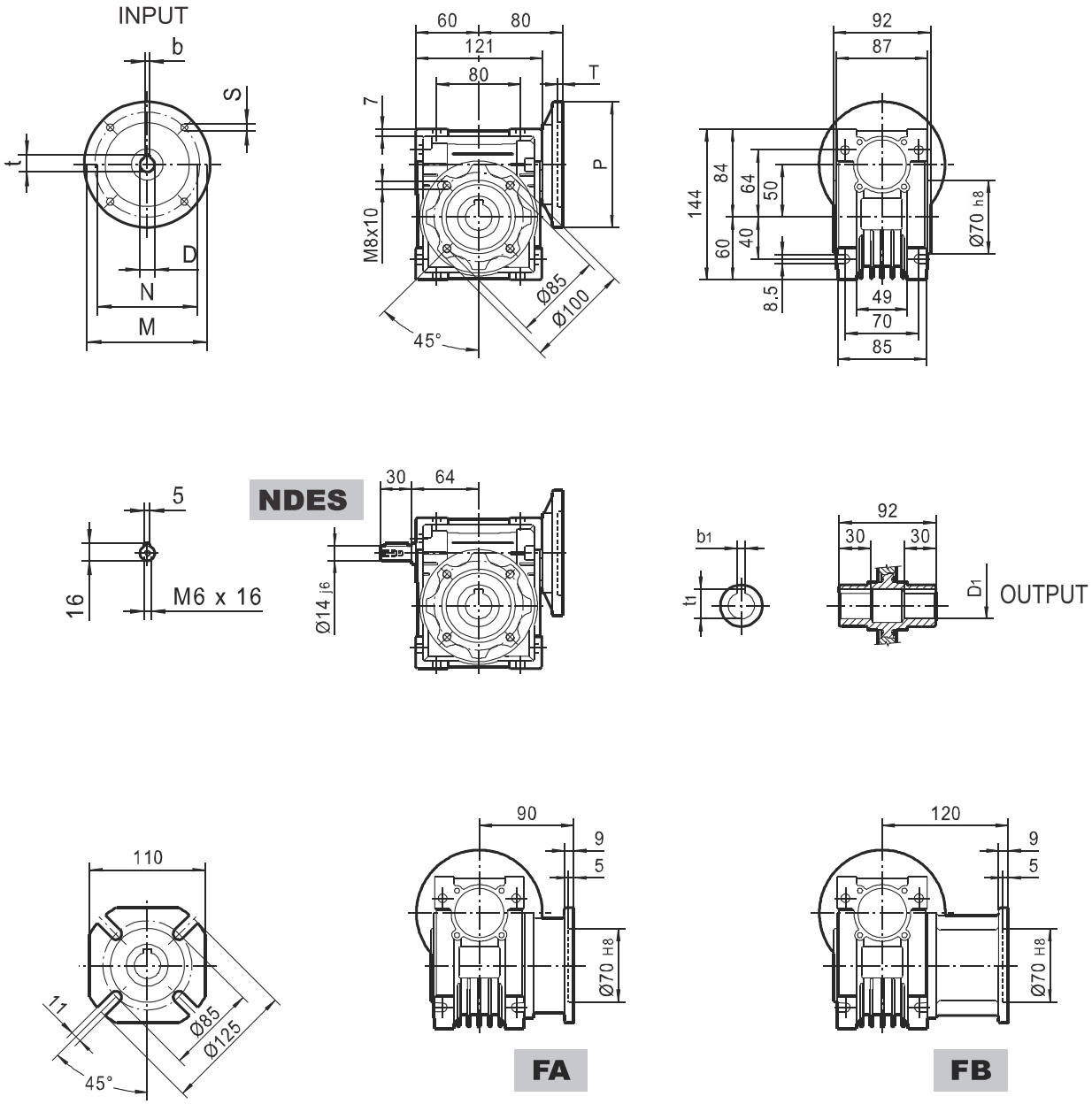
FW40..(IEC)



IEC	D_{E8}	t	b	P	M	N	S	T	$D_{1\ H8}$	b_1	t_1
63B5	11	12.8	4	140	115	95	9	5	18	6	20.8
63B14	11	12.8	4	90	75	60	5.5	4			
71B5	14	16.3	5	160	130	110	9	5			
71B14	14	16.3	5	105	85	70	7	5			

FW 40 Gear Box Weight ≈ 2.4 kg
(Without Flange)

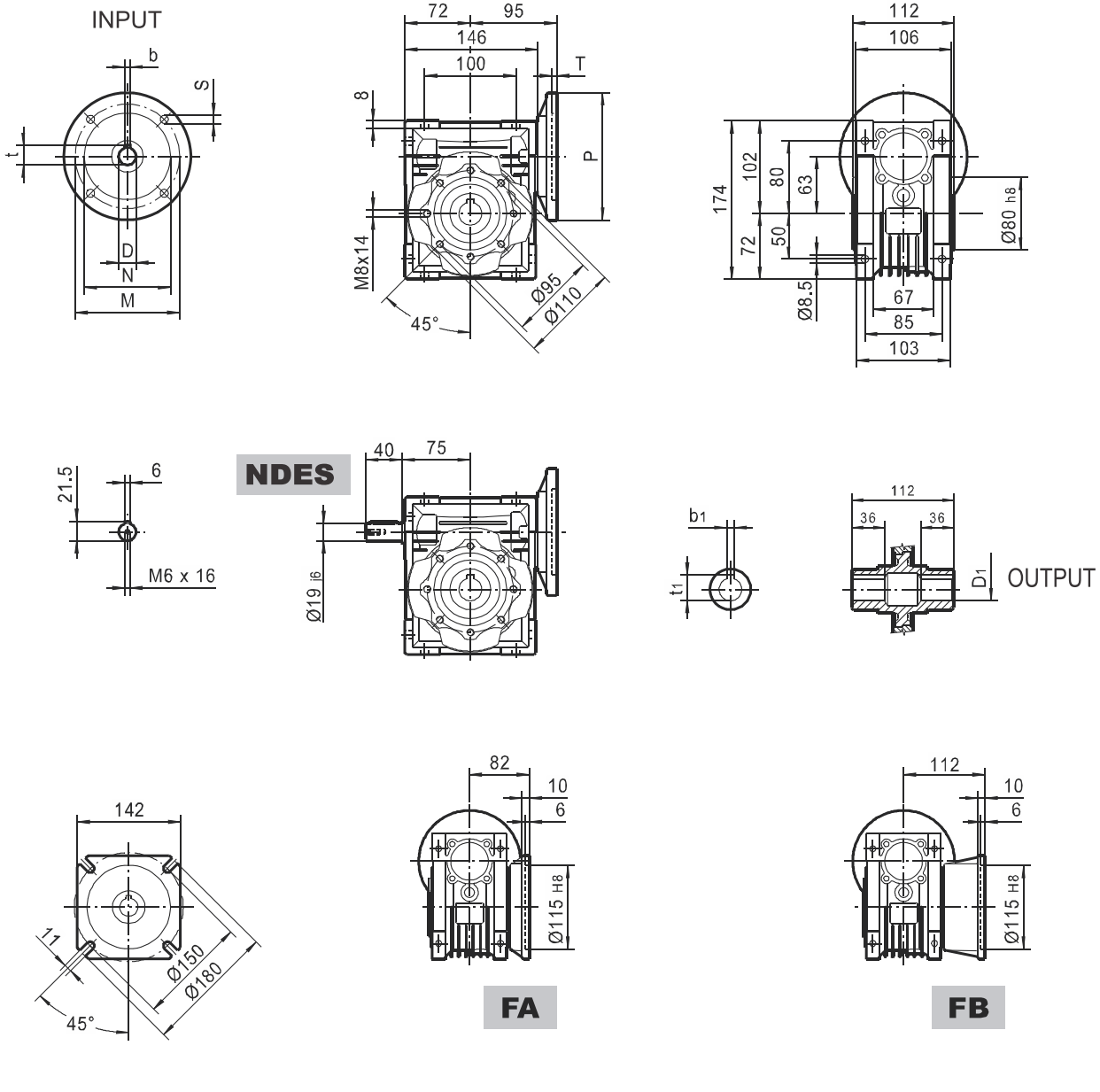
FW50..(IEC)



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

FW 50 Gear Box Weight ≈ 3.75 kg
(Without Flange)

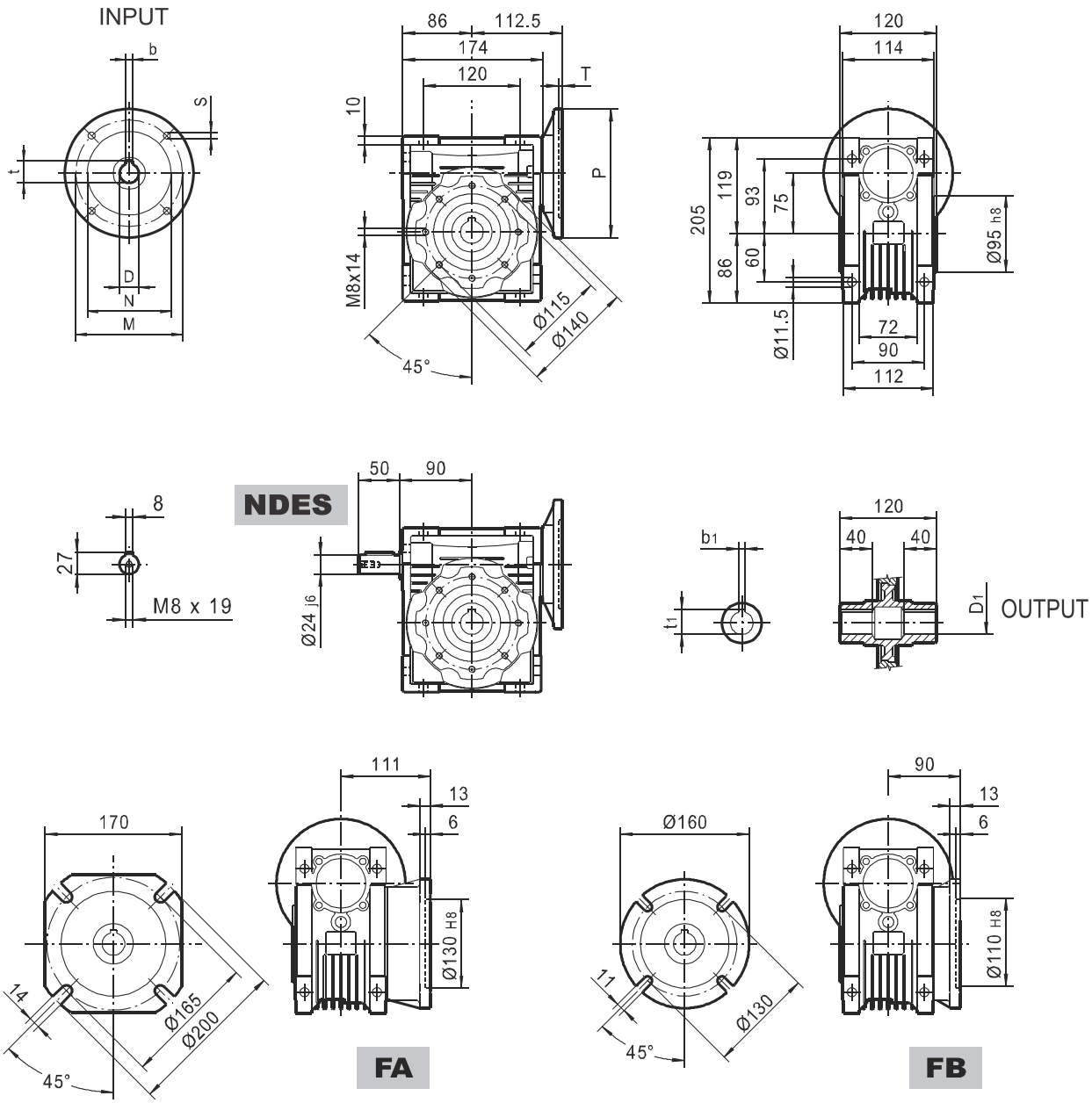
FW63..(IEC)



IEC	D_{E8}	t	b	P	M	N	S	T	$D_{1\ H8}$	b_1	t_1
71B5	14	16.3	5	160	130	110	9	5	25	8	28.3
71B14	14	16.3	5	105	85	70	7	5			
80B5	19	21.8	6	200	165	130	11	5			
80B14	19	21.8	6	120	100	80	7	5			
90B5	24	27.3	8	200	165	130	11	5			
90B14	24	27.3	8	140	115	95	9	5			

FW 63 Gear Box Weight ≈ 6.2 kg
(Without Flange)

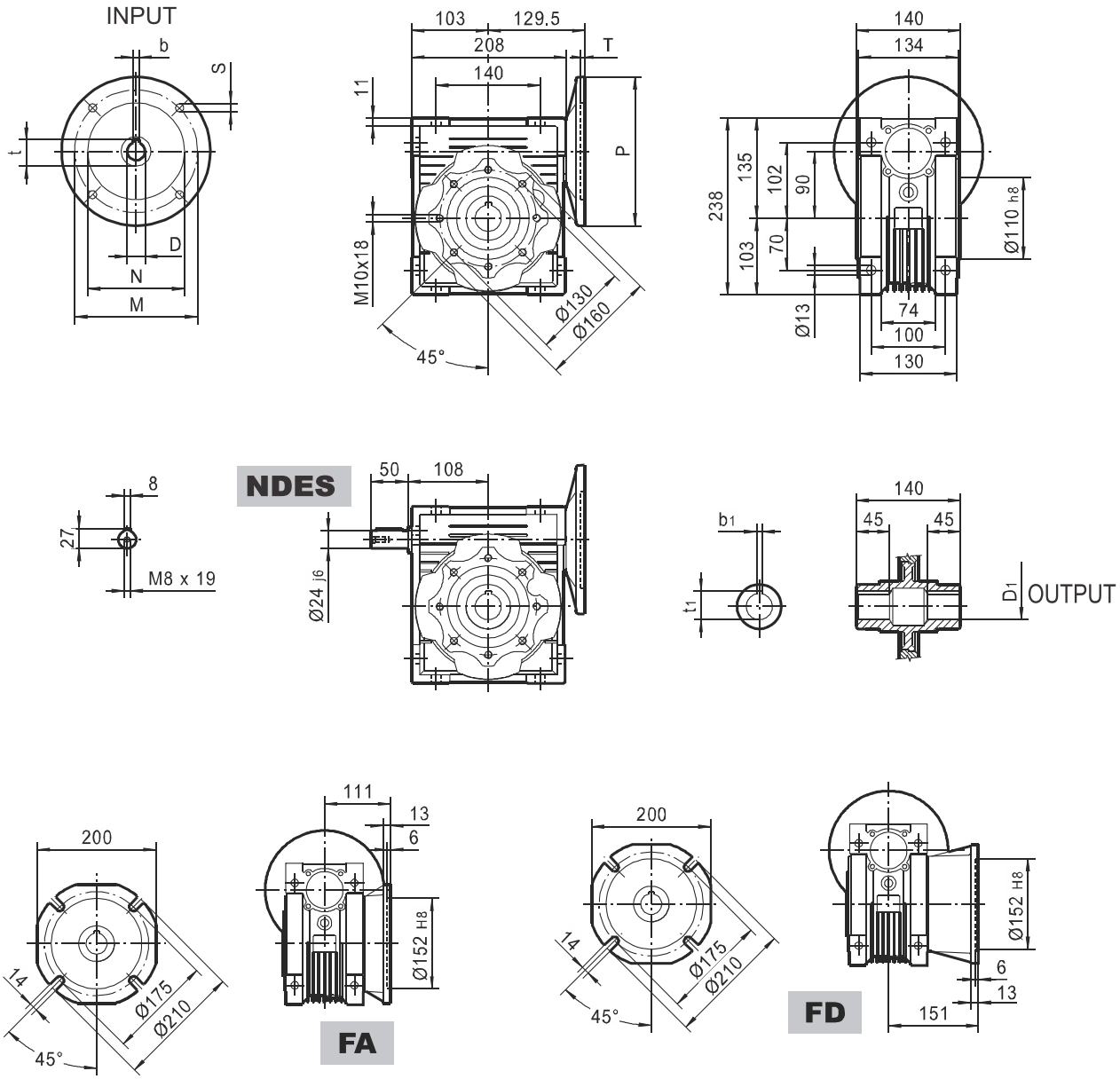
FW75..(IEC)



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

FW 75 Gear Box Weight ≈ 9 kg
(Without Flange)

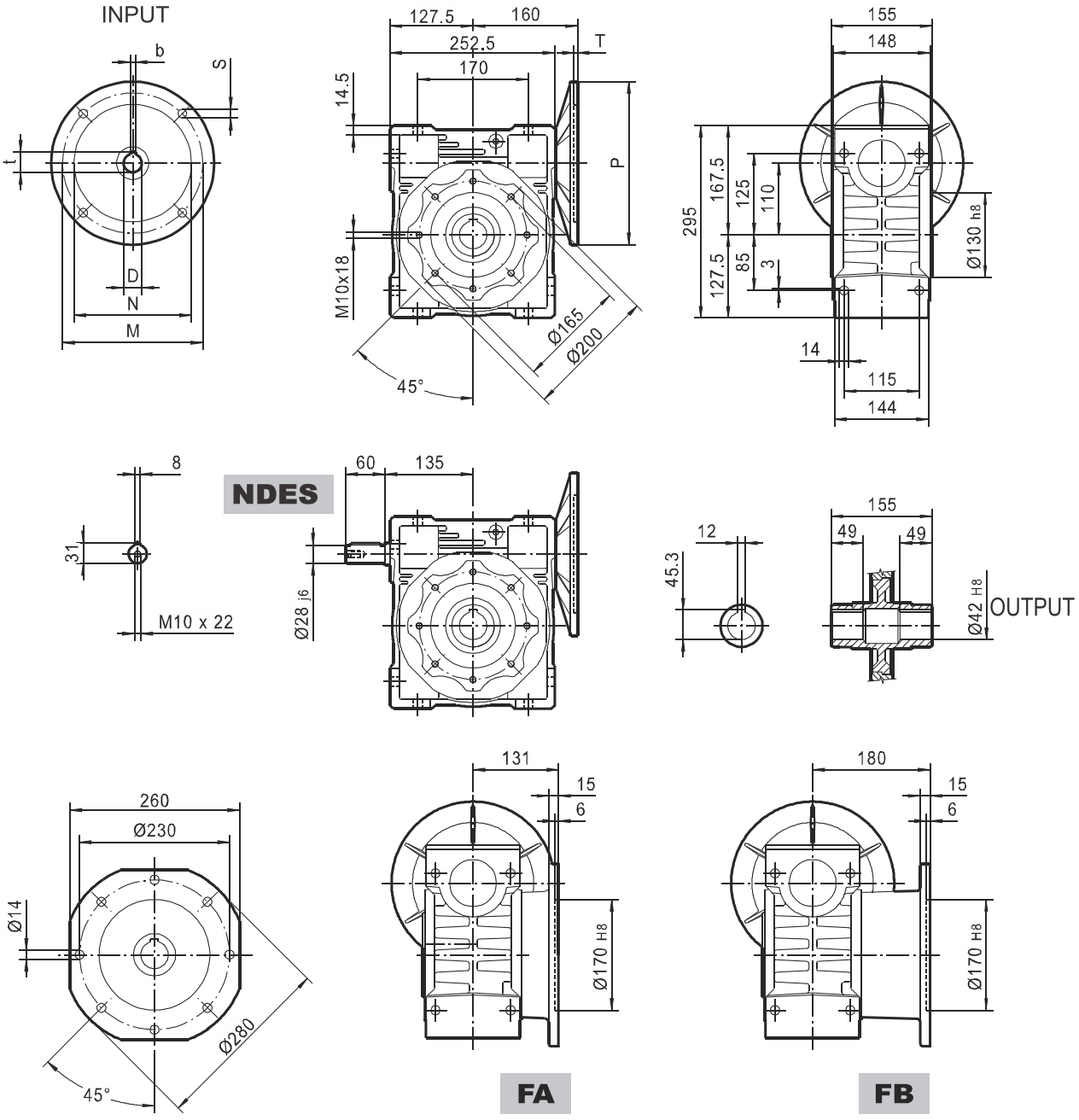
FW90..(IEC)



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

FW 90 Gear Box Weight ≈ 13.25 kg
(Without Flange)

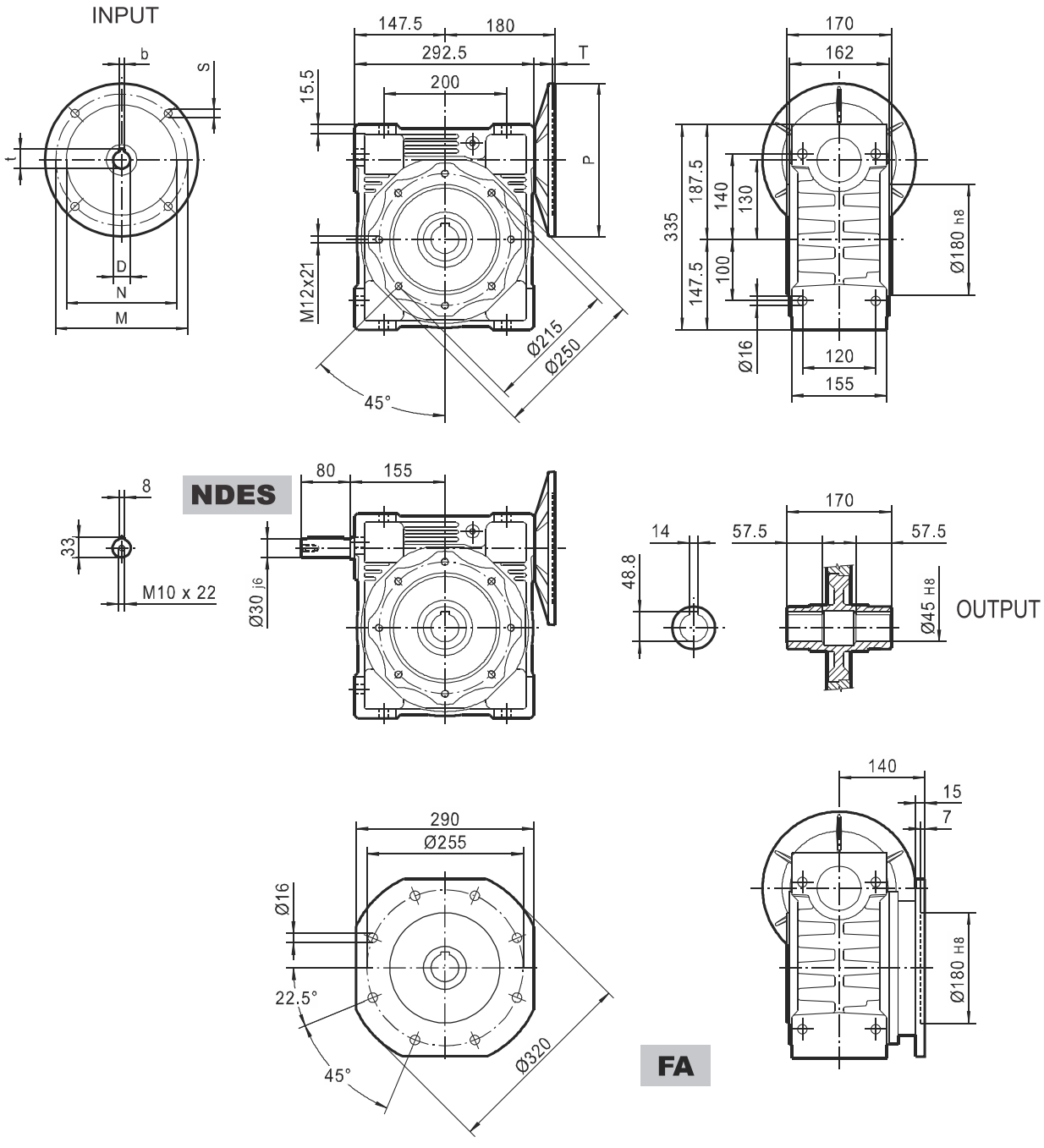
FW110..(IEC)



IEC	D_{E8}	t	b	P	M	N	S	T
80B5	19	21.8	6	200	165	130	11	5
80B14	19	21.8	6	120	100	80	7	5
90B5	24	27.3	8	200	165	130	11	5
90B14	24	27.3	8	140	115	95	9	5
100/112B5	28	31.3	8	250	215	180	13.5	7
100/112B14	28	31.3	8	160	130	110	9	7
132B5	38	41.3	10	300	265	230	14	7

FW 110 Gear Box Weight ≈ 35 kg
(Without Flange)

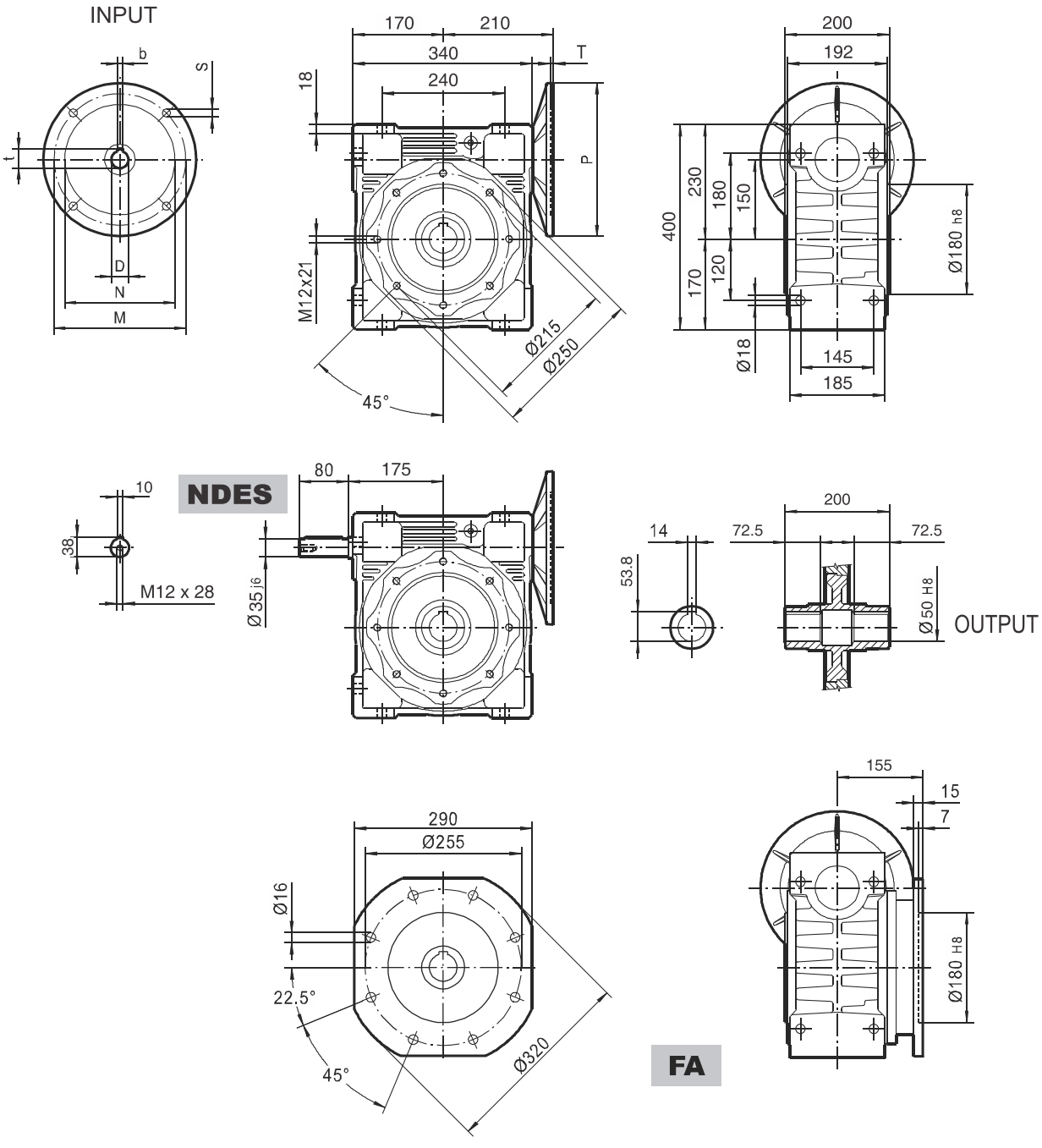
FW130..(IEC)



IEC	D_{E8}	t	b	P	M	N	S	T
90B5	24	27.3	8	200	165	130	11	5
100B5	28	31.3	8	250	215	180	14	7
112B5	28	31.3	8	250	215	180	14	7
132B5	38	41.3	10	300	265	230	14	7

FW 130 Gear Box Weight ≈ 48 kg
(Without Flange)

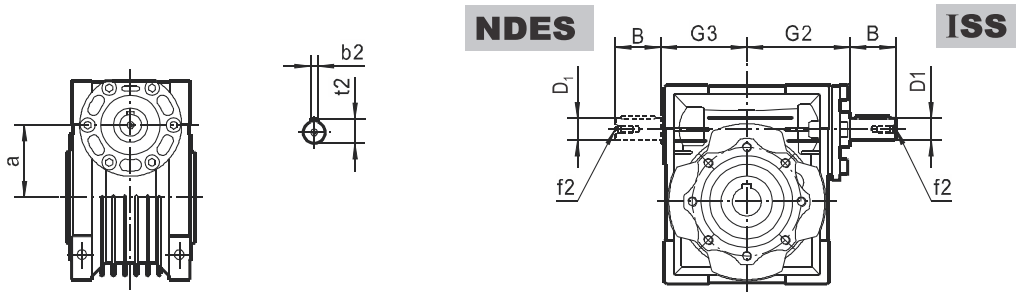
FW150..(IEC)



IEC	D_{E8}	t	b	P	M	N	S	T
100/112B5	28	31.3	8	250	215	180	14	7
132B5	38	41.3	10	300	265	230	14	7
160B5	42	45.3	12	350	300	250	19	7

FW 150 Gear Box Weight ≈ 84 kg
(Without Flange)

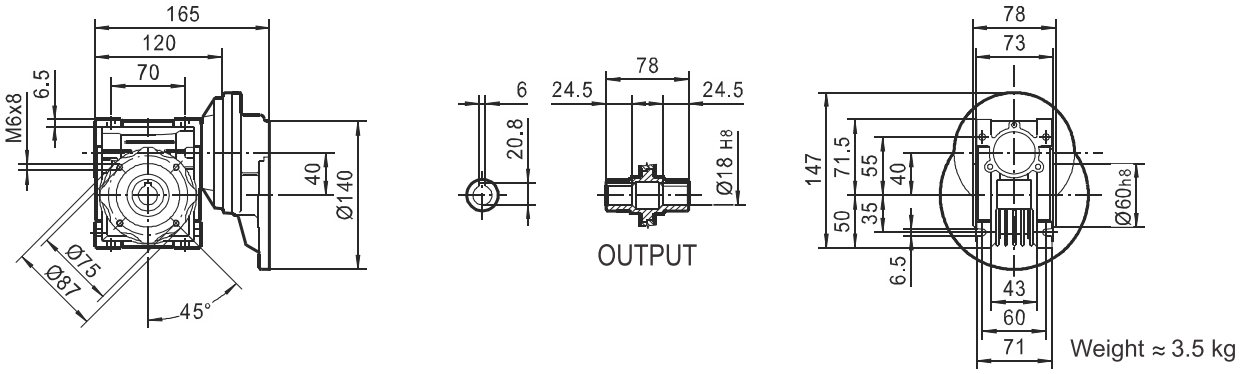
9.2 FW..ISS and NDES Outline Dimension



FW..ISS & NDES	030	040	050	063	075	090	110	130	150
B	20	23	30	40	50	50	60	80	80
$D_{1\ j6}$	9	11	14	19	24	24	28	30	35
G_2	51	60	74	90	105	125	142	162	195
G_3	45	53	64	75	90	108	135	155	175
a	30	40	50	63	75	90	110	130	150
b_2	3	4	5	6	8	8	8	8	10
f_2	-	-	M6	M6	M8	M8	M10	M10	M12
t_2	10.2	12.5	16	21.5	27	27	31	33	38

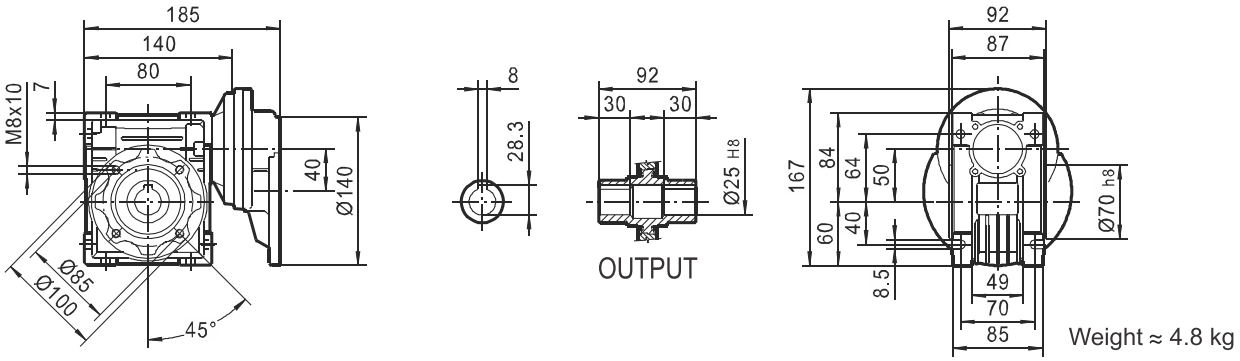
9.3 HL - FW .. Outline dimension

HL63 - FW40



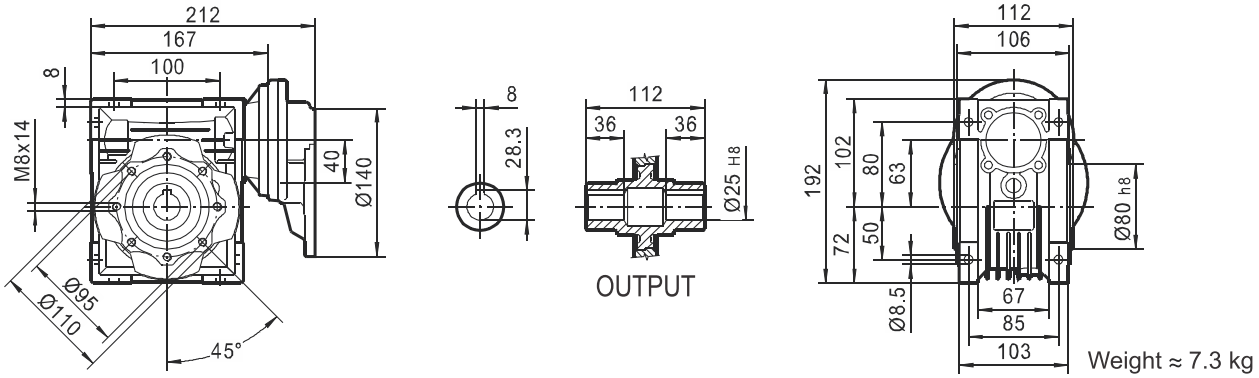
Weight ≈ 3.5 kg

HL63 - FW50



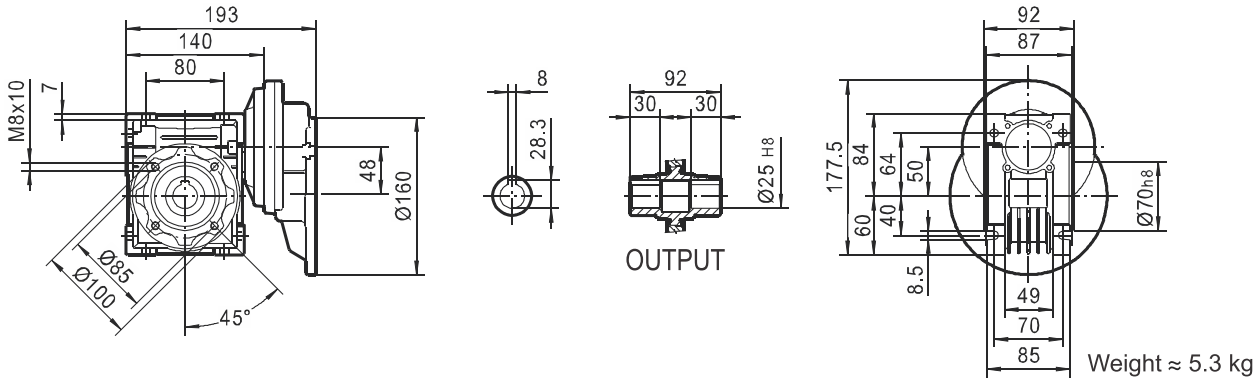
Weight ≈ 4.8 kg

HL63 - FW63



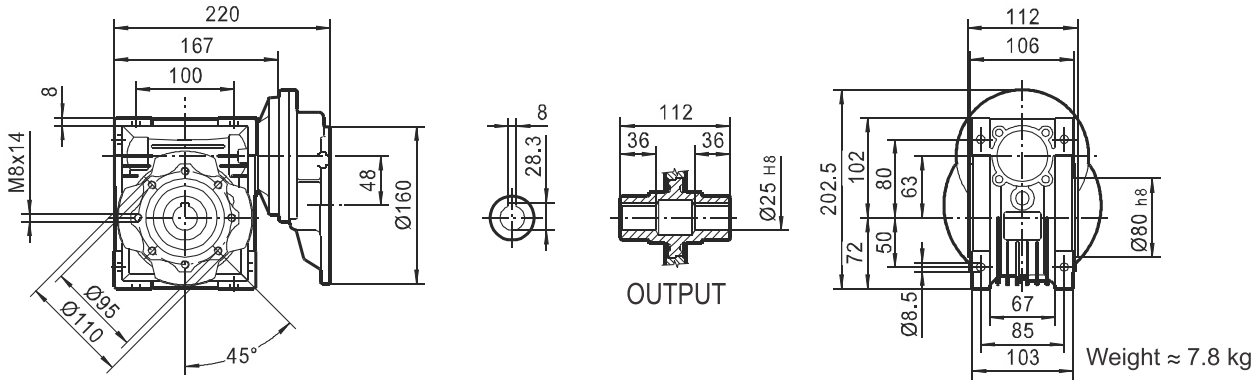
Weight ≈ 7.3 kg

HL71 - FW50



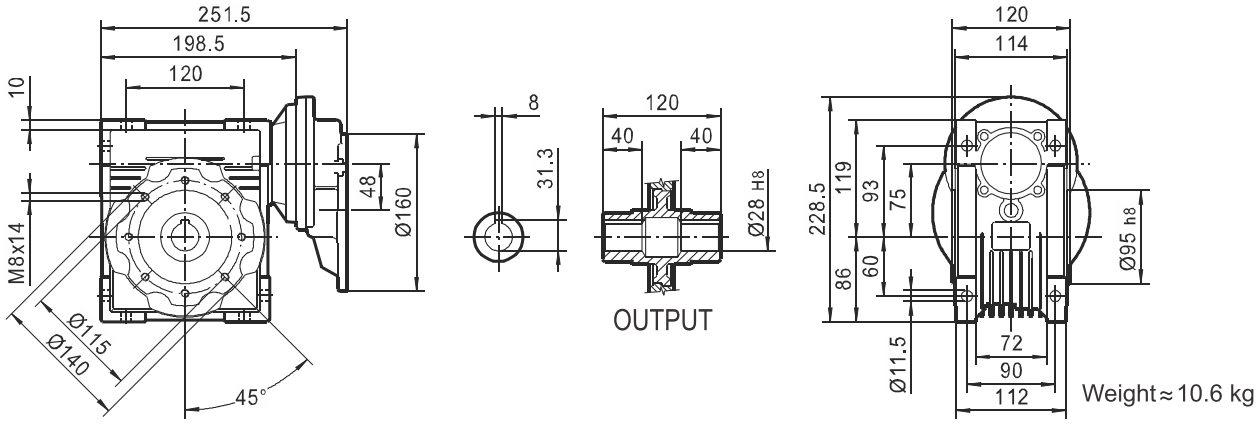
Weight ≈ 5.3 kg

HL71 - FW63



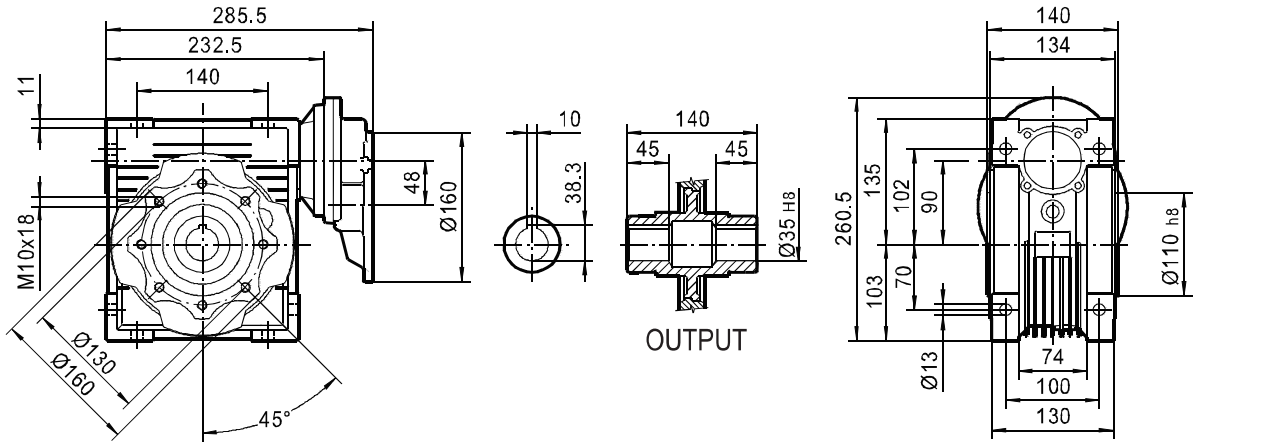
Weight ≈ 7.8 kg

HL71 - FW75



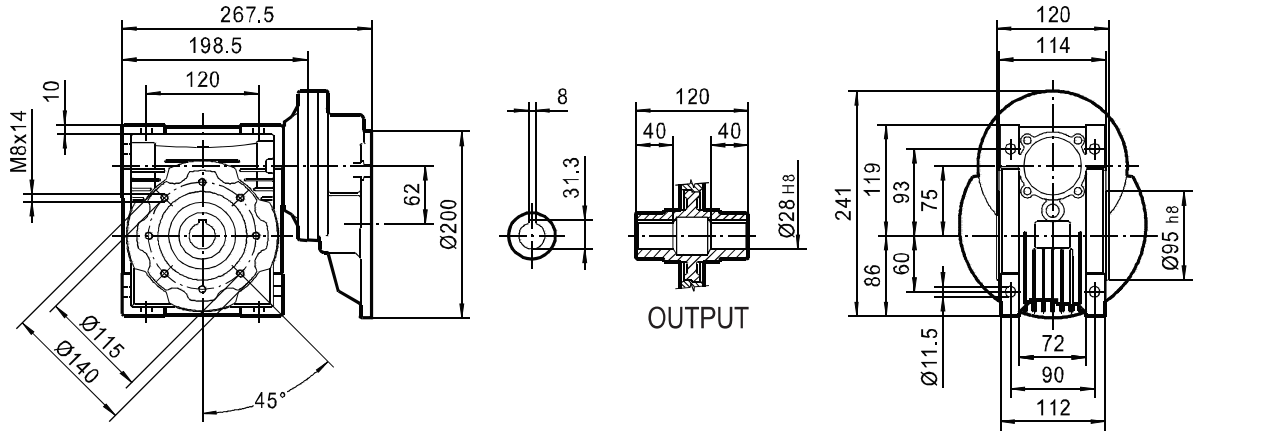
Weight ≈ 10.6 kg

HL71 - FW90



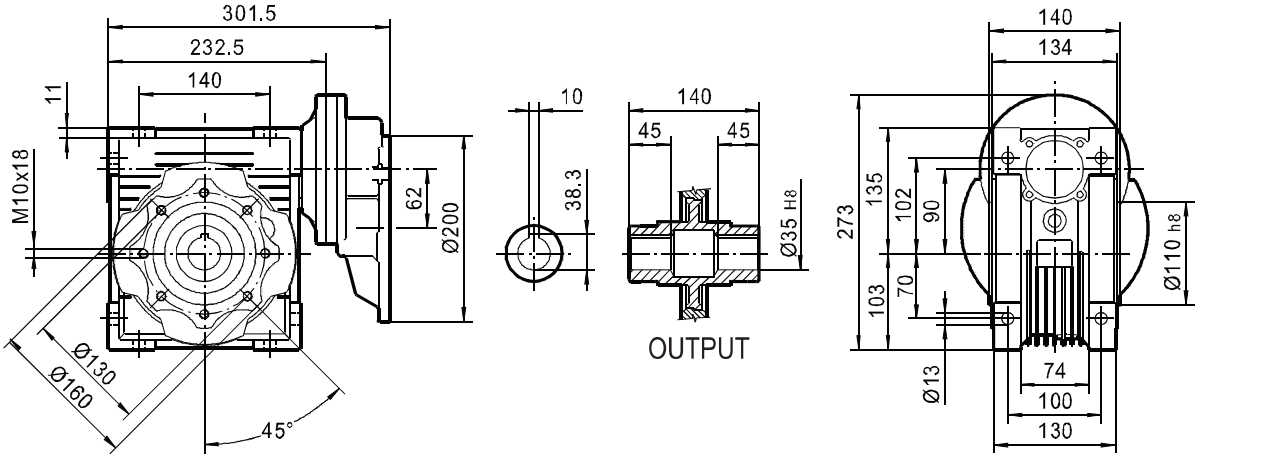
Weight ≈ 14.8 kg

HL80 - FW75



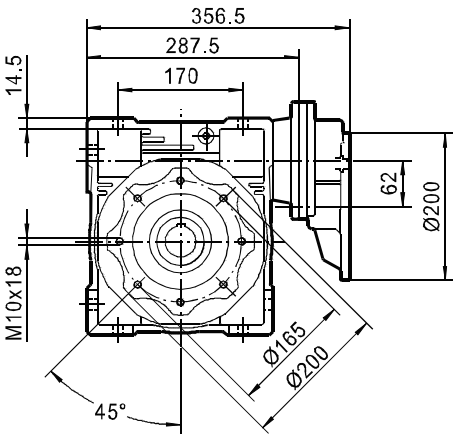
Weight ≈ 12.4 kg

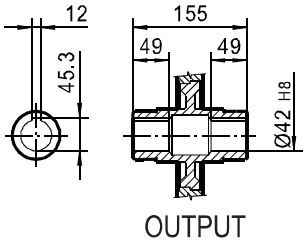
HL80 - FW90



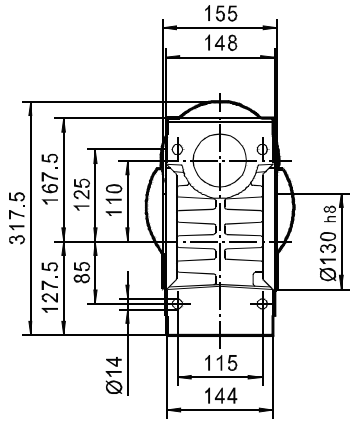
Weight ≈ 16.6 kg

HL80 - FW110



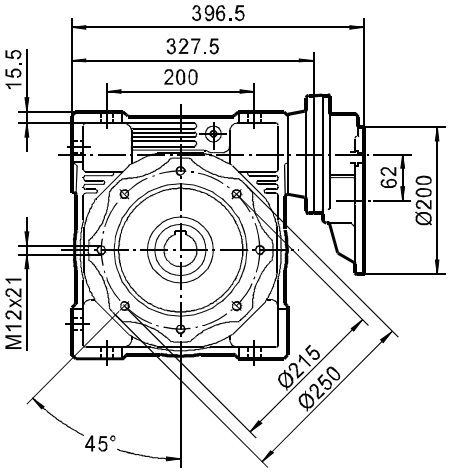


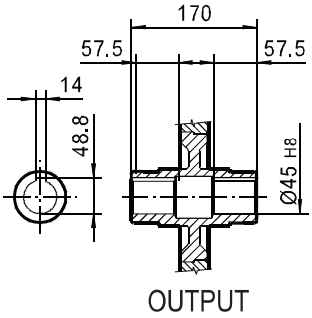
HL90 - FW110



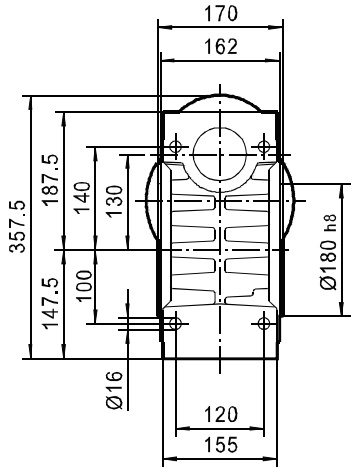
Weight≈41.4 kg

HL80 - FW130





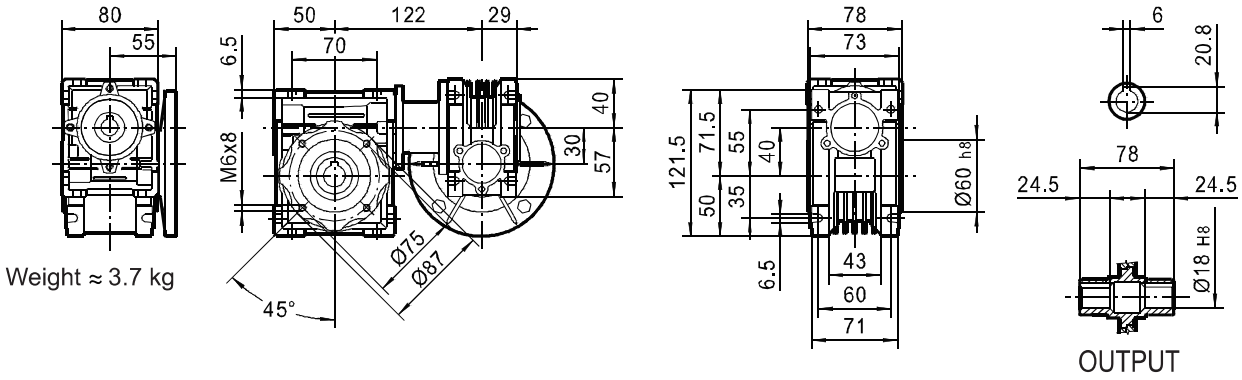
HL90 - FW130



Weight ≈ 55.9kg

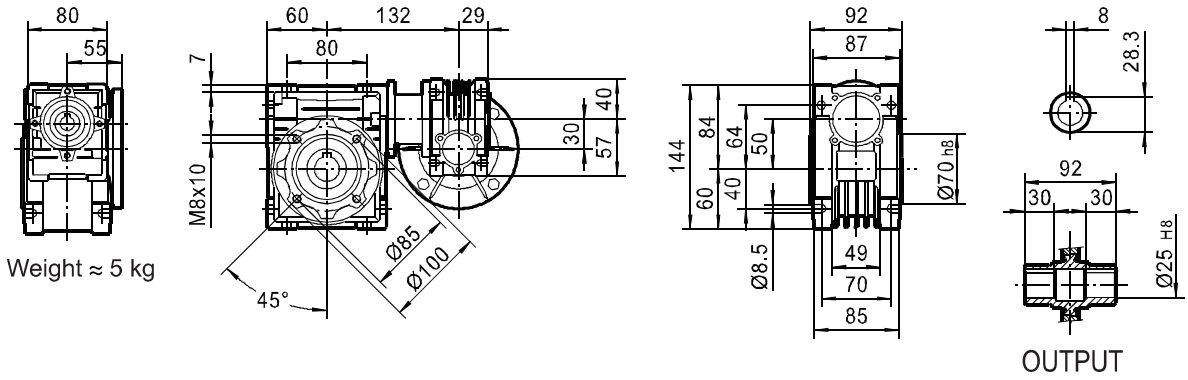
9.4 FW / FW .. Outline dimension

FW30/40



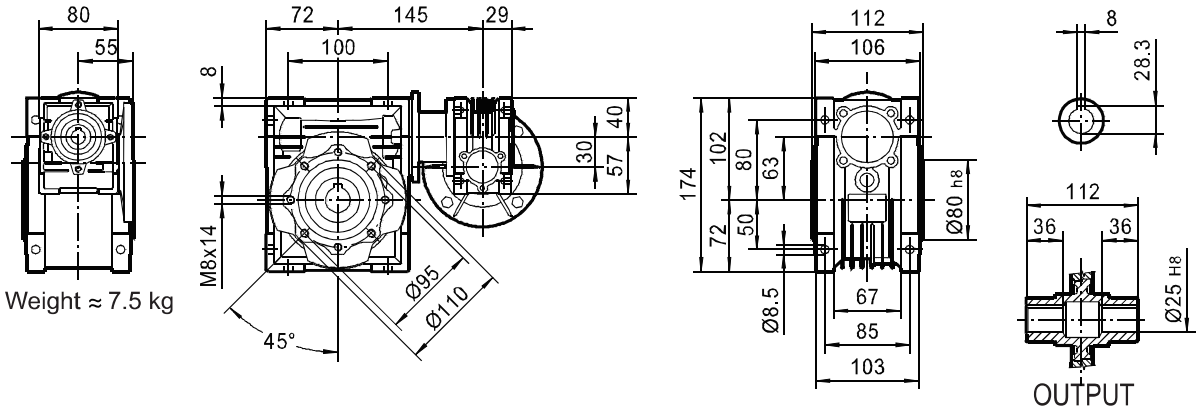
Weight ≈ 3.7 kg

FW30/50



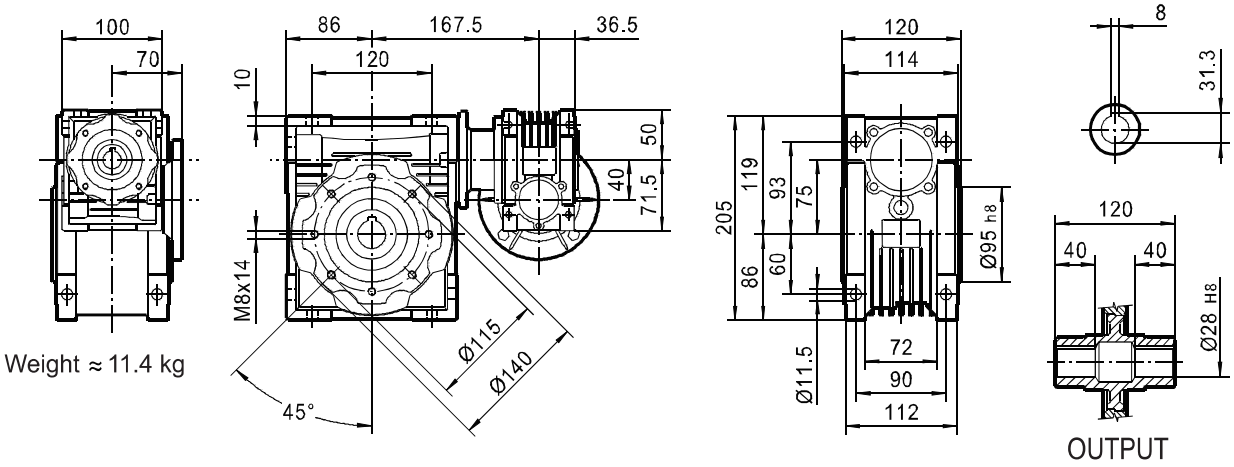
Weight ≈ 5 kg

FW30/63



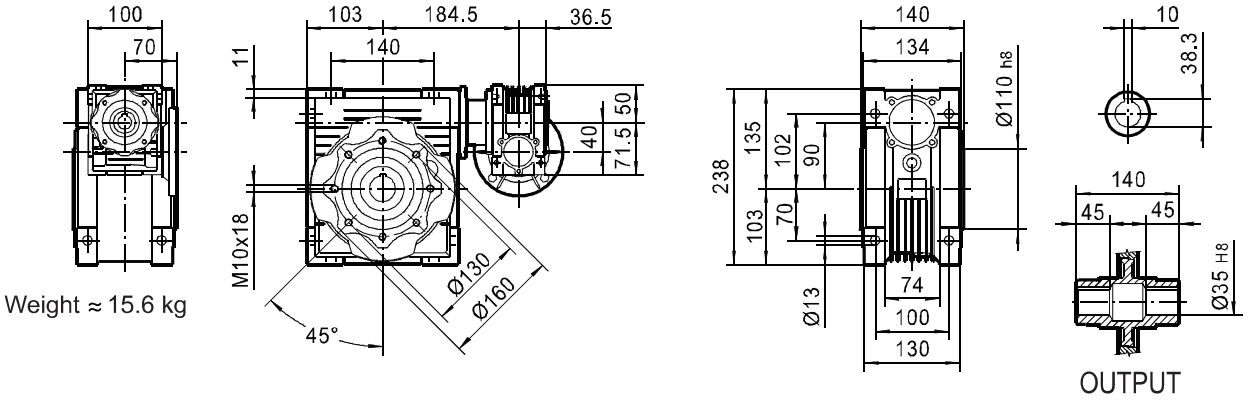
Weight ≈ 7.5 kg

FW40/75



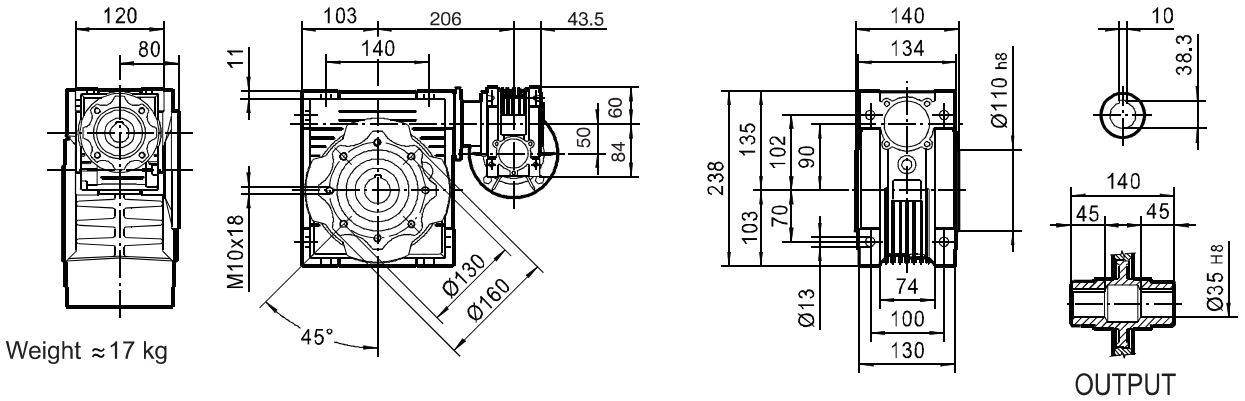
Weight ≈ 11.4 kg

FW40/90



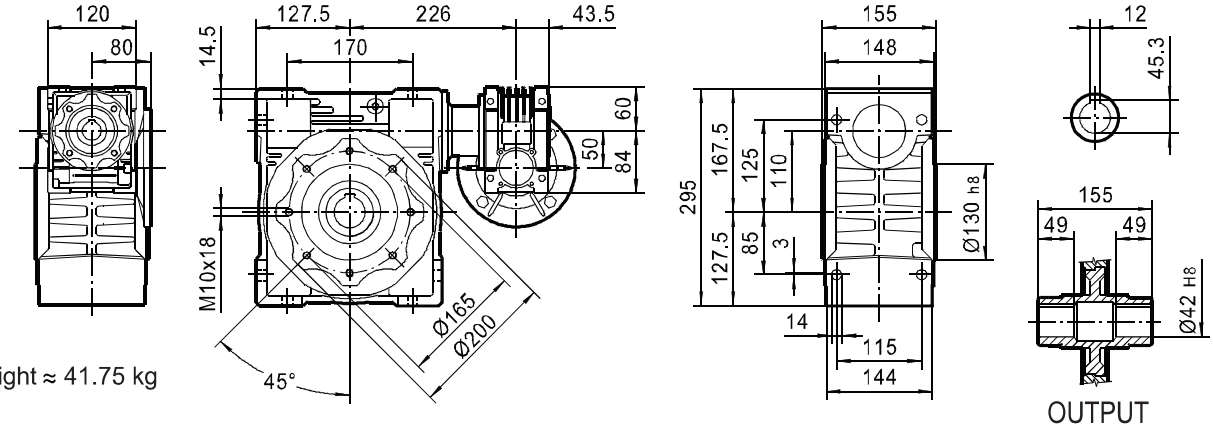
Weight ≈ 15.6 kg

FW50/90



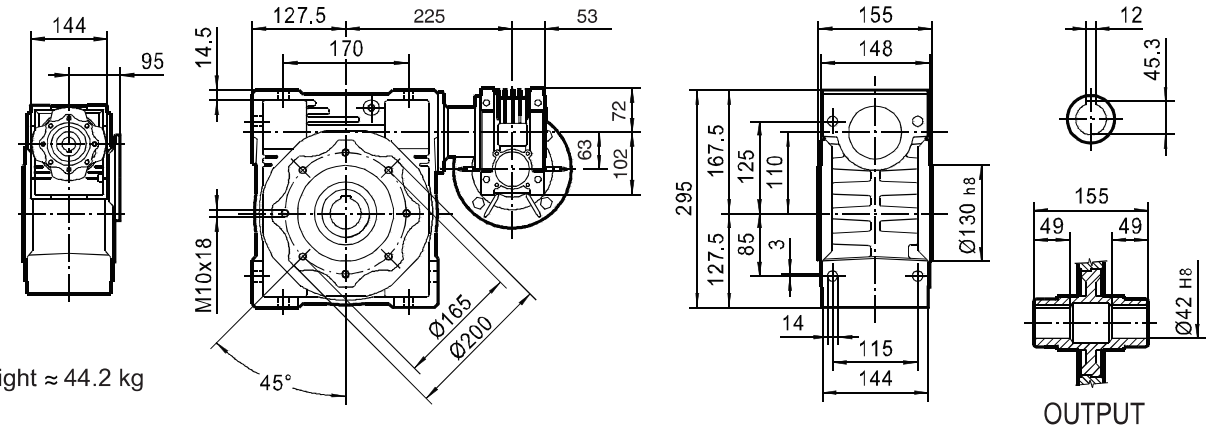
Weight ≈17 kg

FW50/110



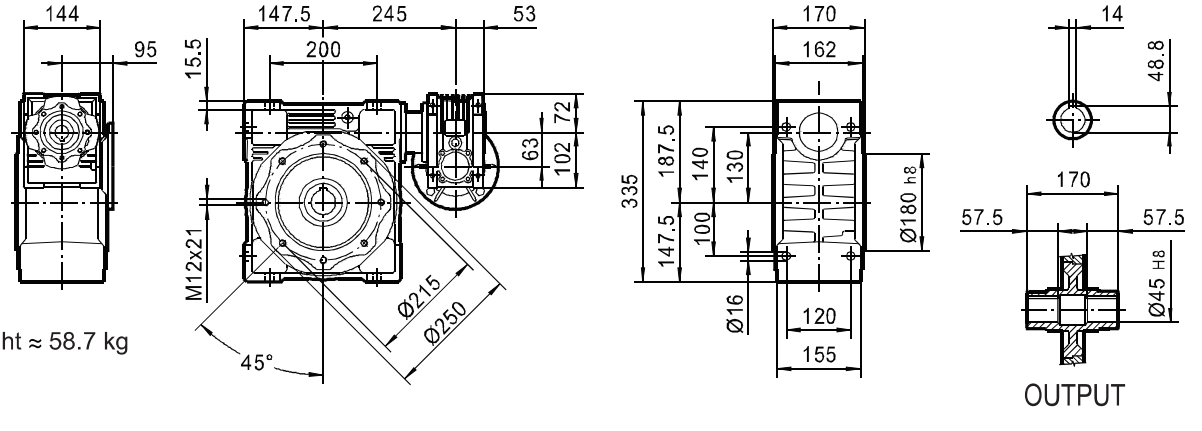
Weight ≈ 41.75 kg

FW63/110



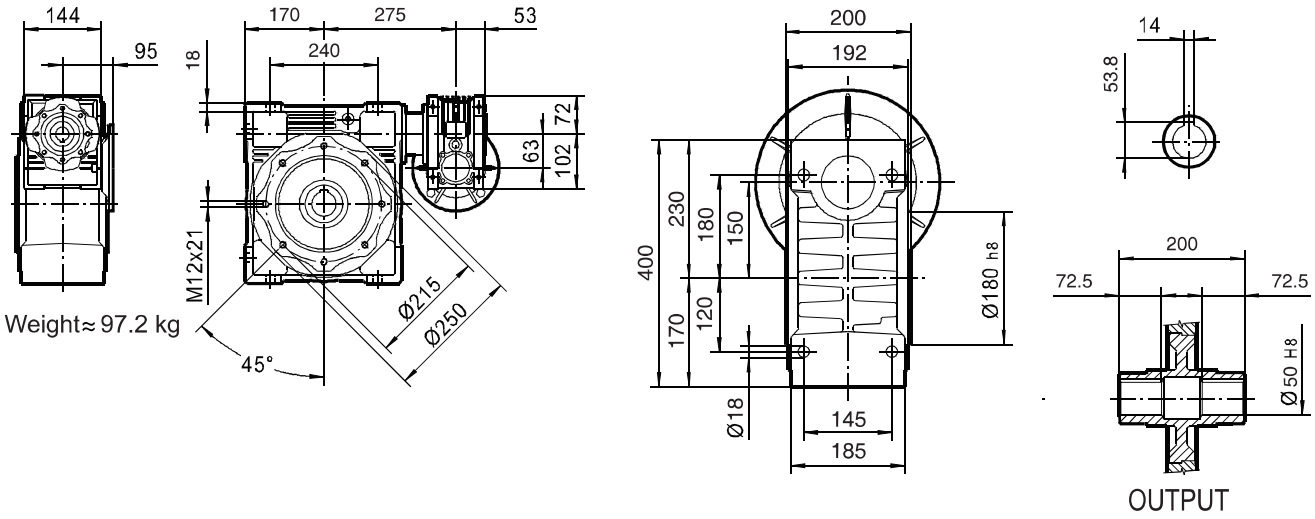
Weight ≈ 44.2 kg

FW63/130

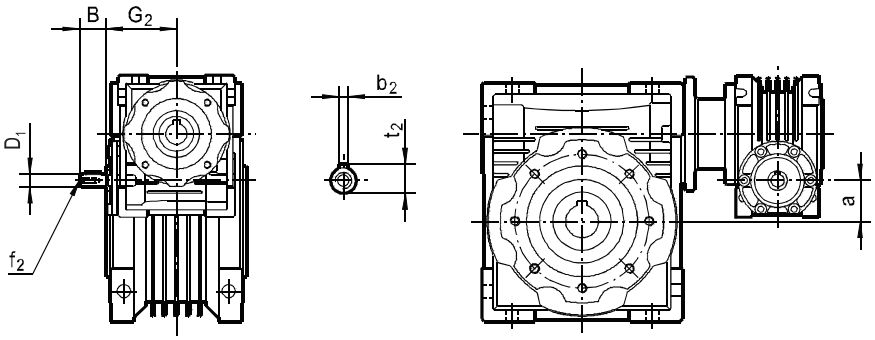


Weight ≈ 58.7 kg

FW63/150



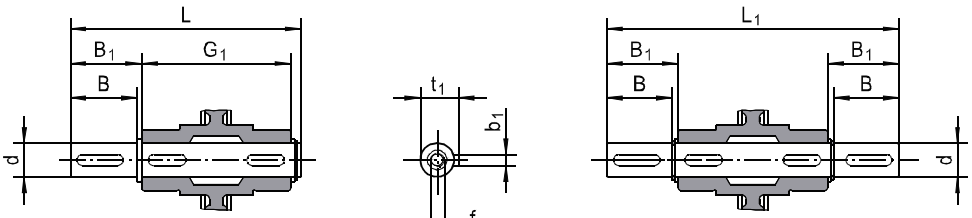
9.5 FW / FW .. ISS Outline Dimension



FW/FW..ISS	30 / 40	30 / 50	30 / 63	40 / 75	40 / 90	50 / 90	50 / 110	63 / 110	63 / 130	63/150
B	20	20	20	23	23	30	30	40	40	40
$D_{1\ j6}$	9	9	9	11	11	14	14	19	19	19
G_2	51	51	51	60	60	74	74	90	90	90
a	10	20	33	35	50	40	60	47	67	87
b_2	3	3	3	4	4	5	5	6	6	6
f_2	-	-	-	-	-	M6	M6	M6	M6	M6
t_2	10.2	10.2	10.2	12.5	12.5	16	16	21.5	21.5	21.5

10. ACCESSORIES OUTLINE DIMENSION

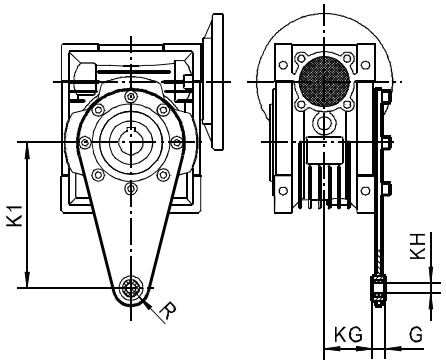
10.1 Output Shafts



SSOS **DOS**

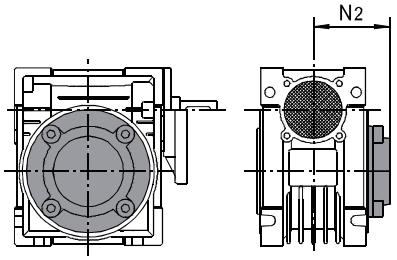
	d h6	B	B1	G1	L	L1	f	b1	t1
FW30	14	30	32.5	63	102	128	M6	5	16
FW40	18	40	43	78	128	164	M6	6	20.5
FW50	25	50	53.5	92	153	199	M10	8	28
FW63	25	50	53.5	112	173	219	M10	8	28
FW75	28	60	63.5	120	192	247	M10	8	31
FW90	35	80	84.5	140	234	309	M12	10	38
FW110	42	80	84.5	155	249	324	M16	12	45
FW130	45	80	85	170	265	340	M16	14	48.5
FW150	50	82	87	200	297	374	M16	14	53.5

10.2 Torque Arm (TRA)



	K1	G	KG	KH	R
FW30	85	14	24	8	15
FW40	100	14	31.5	10	18
FW50	100	14	38.5	10	18
FW63	150	14	49	10	18
FW75	200	25	47.5	20	30
FW90	200	25	57.5	20	30
FW110	250	30	62	25	35
FW130	250	30	69	25	35
FW150	250	30	84	25	35

10.3 Output side Cover (C)



	N2		N2
FW30	47	**FW90**	94
FW40	55	**FW110**	102
FW50	63	**FW130**	117
FW63	73	**FW150**	132
FW75	79		