

TW SERIES

1. SUMMARIZE

1.1 Products Features:

TW 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 up to 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.

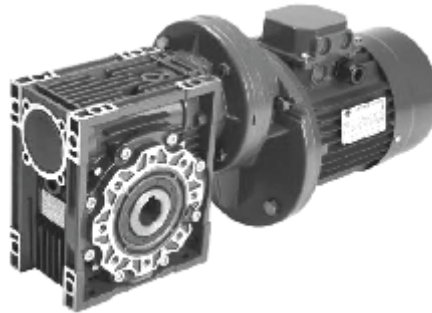
Cast iron housing:

First paint with red antirust paint, then painted with silvery white paint.

2. PRODUCT STRUCTURE PICTURE



TW



HL-TW



TW / TW

3. MODEL DESIGNATION

WORM GEAR BOX DESIGNATION (TW)

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

HELI - WORM GEAR BOX DESIGNATION (HL-TW)

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

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

TW / TW	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 (or) 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-TW 30 to TW 150 (or) B14-TW 30 to TW 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); (or) NDES (Non Driven End Side Shaft); (or) TRA (Torque Arm); (or) C (Output Side Cover)

4. RELEVANT PARAMETER

4.1 Power P

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

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

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

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

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

4.2 Rotation speed n

- n_1 Gear units input speed
- n_2 Gear units output speed

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

4.3 Transmission ratio i

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

4.4 Torque M

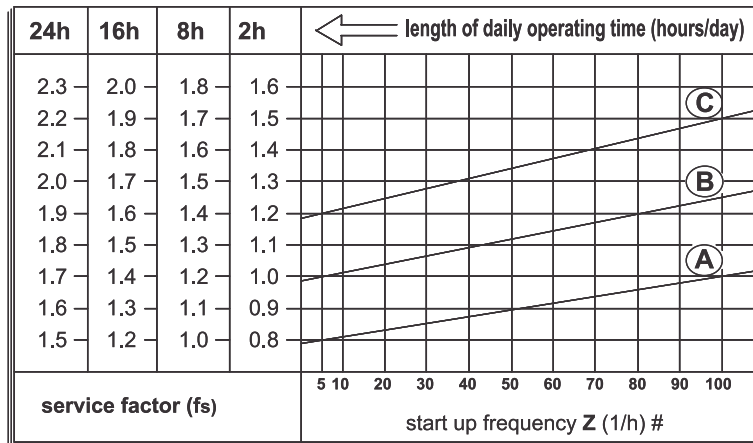
$$M_2 = \frac{9550 \cdot P_1 \cdot \eta}{n_2} \text{ [Nm]}$$

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

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

4.5 Service factor fs

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



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

4.5.1 Load classifications

Type of load:

- (A) Uniform, permitted mass acceleration factor $f_a \leq 0.25$
- (B) Moderate shock load, permitted mass acceleration factor $f_a \leq 3$
- (C) Heavy shock load, permitted mass acceleration factor $f_a \leq 10$

NOTE : For detailed load classification refer page no : 6

4.5.2 Mass acceleration factor

The mass acceleration factor is calculated as follows:

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

fa Mass acceleration factor

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

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

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

Service factor f_s should be adjusted as followings:

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

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

4.A Radial loads F_r

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

Transmission element	Transmission element factor f_z	Comments
Gears	1.00	≥ 17 / teeth
	1.15	< 17 / teeth
Chain sprockets	1.00	≥ 20 / teeth
	1.25	< 20 / teeth
	1.40	< 13 / teeth
Narrow V-belt pulleys	1.75	Influence of the tensile force
Flat belt pulleys	2.50	Influence of the tensile force
Toothed belt pulleys	2.50	Influence of the tensile force

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

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

F_r 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:

$$F_{xL} \leq \frac{F_{r2} \cdot a}{(b+x)} \text{ [N]}$$

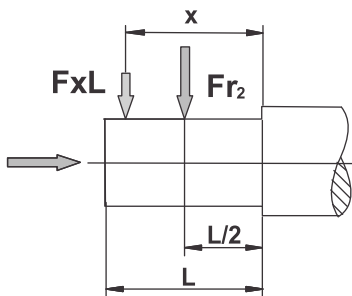
F_{r2} Permitted overhung load ($x = L/2$) for foot-mounted gear units according to the selection tables in [N]

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

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

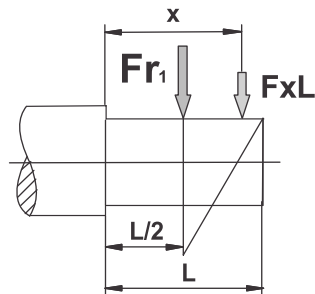
The values of a , b , F_{r2} are given in the following tables:

Output shafts radial loads






TW	030	040	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
Fr₂ max	1830	3490	4840	6270	7380	8180	12000	13500	18000

Input shafts radial loads



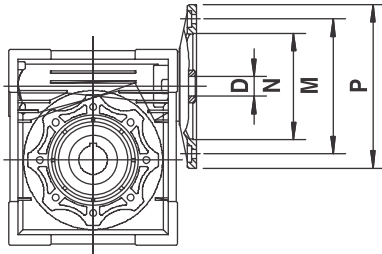
TW/ISS	030	040	050	063	075	090	110	130	150
a	86	106	129	159	192	227	266	314	350
b	76	94.5	114	139	167	202	236	274	310
Fr₁ max	210	350	490	700	980	1270	1700	2100	2800

4.7 SYMBOLS AND UNITS OF MEASURE

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r_2} [N]	f_s			
Rated power driving motor	Output speed	Rated output torque	Gear unit ratio	Output Shaft radial load	Service factor	Gear unit Size	Motor Size	Page number - Dimension details

5. RELEVANT DATA

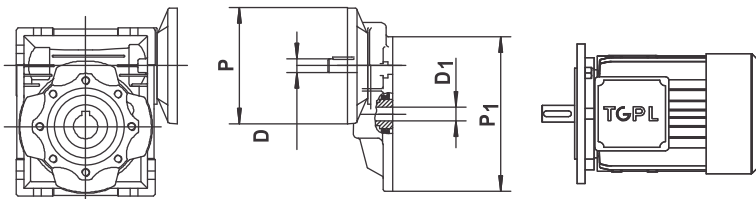
5.1 Ratio and IEC motor adapters



	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		
TW30	63B5	140	115	95													
	63B14	90	75	60	11	11	11	11	11	11	11	11	11				
TW40	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							
TW50	71B14	105	85	70													
	63B5	140	115	95									11	11	11	11	
	71B5	160	130	110	14	14	14	14	14	14	14	14	14				
	71B14	105	85	70													
	80B5	200	165	130	19	19	19										
TW63	80B14	120	100	80													
	71B5	160	130	110								14	14	14	14	14	
	71B14	105	85	70													
	80B5	200	165	130	19	19	19	19	19	19	19	19	19	19	19		
	80B14	120	100	80													
	90B5	200	165	130	24	24	24	24	24	24							
TW75	90B14	140	115	95													
	71B5	160	130	110									14	14	14	14	
	80B5	200	165	130				19	19	19	19	19	19	19	19	19	
	80B14	120	100	80													
	90B5	200	165	130	24	24	24	24	24	24	24						
	90B14	140	115	95													
	100 / 112B5	250	215	180	28	28	28										
TW90	100 / 112B14	160	130	110													
	80B5	200	165	130								19	19	19	19	19	
	80B14	120	100	80													
	90B5	200	165	130	24	24	24	24	24	24	24	24	24	24			
	90B14	140	115	95													
TW110	100 / 112B5	250	215	180	28	28	28	28	28	28							
	100 / 112B14	160	130	110													
	80B5	200	165	130											19	19	
	90B5	200	165	130					24	24	24	24	24	24	24	24	24
TW130	100 / 112B5	250	215	180	28	28	28	28	28	28	28	28	28	28	28	28	28
	90B5	200	165	130												24	24
	100 / 112B14	160	130	110													
TW150	100 / 112B5	250	215	180									28	28	28	28	
	132B5	300	265	230				38	38	38	38	38	38	38			

5.2. HL - TW Combinations

	i	HL 063	HL 071	HL 080	HL 090
		105 / 11 i = 3	120 / 14 i = 3	160 / 19 i = 3	160 / 24 i = 2.42
TW40	25				
	30				
	40				
	50				
	60				
	80				
	100				
TW50	25				
	30				
	40				
	50				
	60				
	80				
	100				
TW63	25				
	30				
	40				
	50				
	60				
	80				
	100				
TW75	25				
	30				
	40				
	50				
	60				
	80				
	100				
TW90	25				
	30				
	40				
	50				
	60				
	80				
	100				
TW110	25				
	30				
	40				
	50				
	60				
	80				
	100				
TW130	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 ($n_1=1400$) and static efficiency values. Remember that these values are only achieved after the unit has been run in. Torque values Mn_2 indicated in the catalogue are calculated by considering the steady-state performance of the gearboxes. The actual values mentioned above may be have deflection.

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 $\eta_d < 0.4$

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 $\eta_s < 0.5$

η_d	>0.6	0.5 ~ 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 reversibility	low static reversibility	static irreversibility

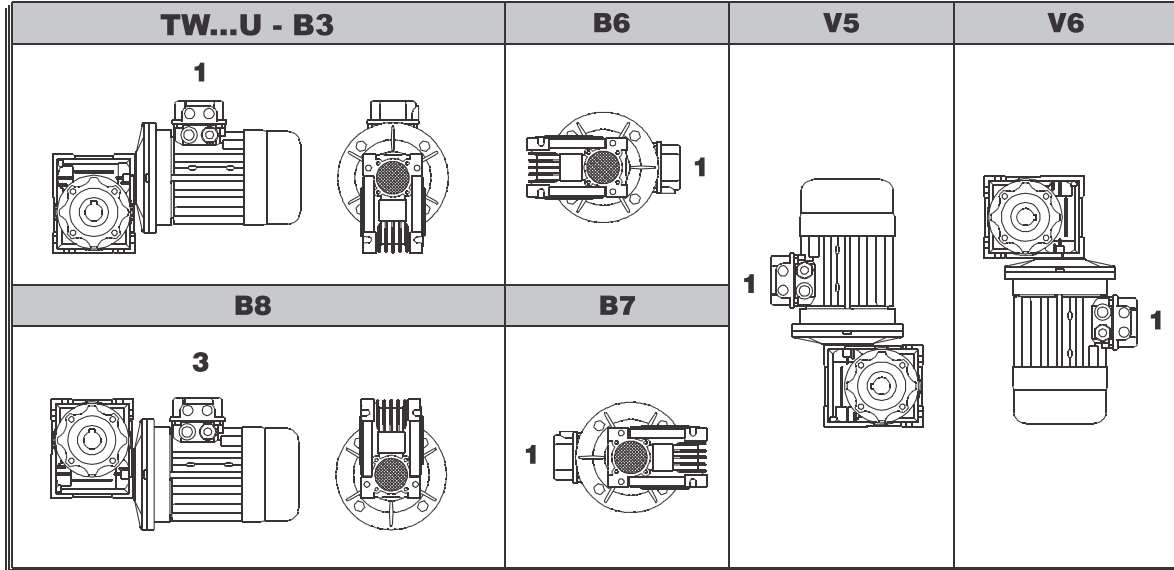
The table shows approximate irreversibility classes. Vibrations and shocks can affect a gear reducer's irreversibility. As it is virtually impossible to provide and guarantee total non reversing, we recommend the use of an external brake with sufficient capability to prevent vibrations in duced starting,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

5.3.3 Mesh Data

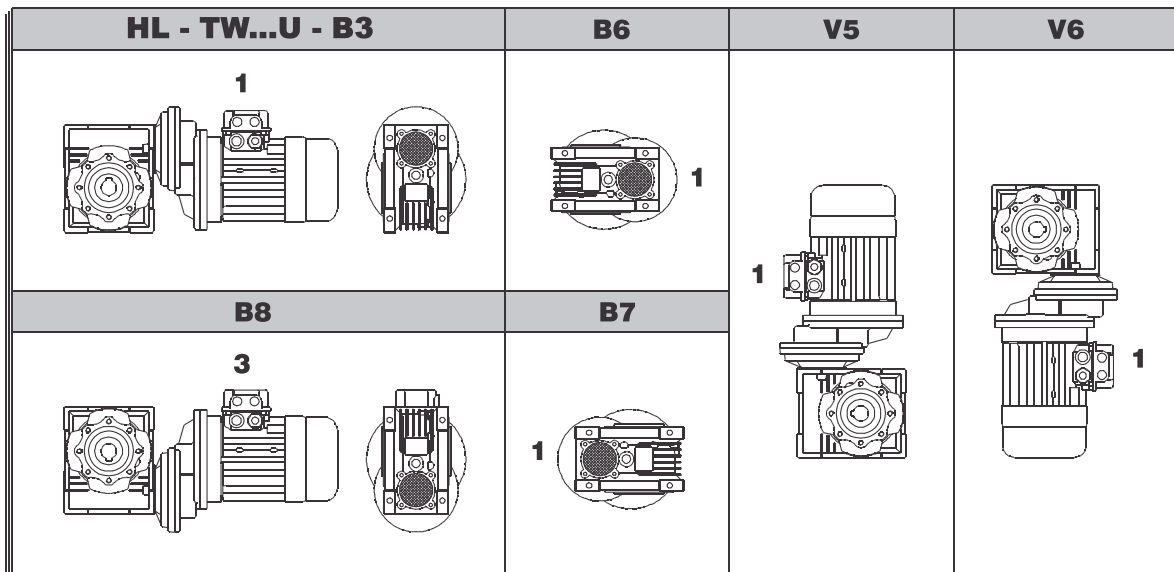
	<i>i</i>	7.5	10	15	20	25	30	40	50	60	80	100
TW30	<i>z</i> ₁	4	3	2	2	1	1	1	1	1		
	<i>m</i> _n	1.36	1.39	1.42	1.09	1.69	1.43	1.10	0.89	0.74		
	<i>γ</i>	18°55'	14°25'	9°44'	7°50'	5°33'	4°54'	3°56'	3°17'	2°43'		
	<i>η</i> _d	0.84	0.81	0.76	0.72	0.66	0.64	0.59	0.54	0.50		
	<i>η</i> _s	0.66	0.62	0.54	0.49	0.41	0.38	0.33	0.29	0.26		
TW40	<i>z</i> ₁	4	3	2	2	2	1	1	1	1	1	1
	<i>m</i> _n	1.87	1.95	2.00	1.54	1.26	2.04	1.55	1.27	1.06	0.80	0.65
	<i>γ</i>	23°54'	18°23'	12°30'	10°3'	8°45'	6°19'	5°4'	4°24'	3°42'	2°52'	2°29'
	<i>η</i> _d	0.86	0.84	0.80	0.77	0.74	0.69	0.65	0.61	0.57	0.51	0.47
	<i>η</i> _s	0.70	0.66	0.59	0.54	0.51	0.44	0.39	0.36	0.32	0.27	0.24
TW50	<i>z</i> ₁	4	3	2	2	2	1	1	1	1	1	1
	<i>m</i> _n	2.34	2.43	2.50	1.92	1.56	2.54	1.94	1.58	1.32	1.00	0.80
	<i>γ</i>	23°49'	18°19'	12°27'	10°3'	8°33'	6°18'	5°4'	4°18'	3°38'	2°52'	2°17'
	<i>η</i> _d	0.87	0.85	0.81	0.78	0.75	0.71	0.67	0.63	0.59	0.53	0.48
	<i>η</i> _s	0.70	0.66	0.59	0.54	0.51	0.44	0.39	0.36	0.32	0.27	0.24
TW63	<i>z</i> ₁	4	3	2	2	2	1	1	1	1	1	1
	<i>m</i> _n	2.96	3.08	3.17	2.44	1.98	3.23	2.47	1.99	1.68	1.27	1.02
	<i>γ</i>	24°31'	18°53'	12°51'	10°29'	8°45'	6°30'	5°17'	4°24'	3°49'	2°59'	2°26'
	<i>η</i> _d	0.88	0.86	0.82	0.80	0.77	0.73	0.69	0.65	0.62	0.56	0.51
	<i>η</i> _s	0.70	0.66	0.59	0.55	0.51	0.44	0.40	0.36	0.33	0.28	0.24
TW75	<i>z</i> ₁	4	3	2	2	2	1	1	1	1	1	1
	<i>m</i> _n	3.53	3.70	3.83	2.94	2.39	3.92	2.99	2.41	2.02	1.54	1.24
	<i>γ</i>	26°38'	20°37'	14°5'	11°19'	9°29'	7°9'	5°43'	4°46'	4°1'	3°17'	2°44'
	<i>η</i> _d	0.88	0.87	0.84	0.81	0.79	0.76	0.72	0.68	0.64	0.59	0.55
	<i>η</i> _s	0.71	0.68	0.61	0.57	0.53	0.47	0.41	0.37	0.34	0.29	0.26
TW90	<i>z</i> ₁	4	3	2	2	2	1	1	1	1	1	1
	<i>m</i> _n	4.23	4.47	4.66	3.60	2.93	4.79	3.67	2.97	2.49	1.89	1.52
	<i>γ</i>	29°5'	22°39'	15°33'	12°50'	10°53'	7°55'	6°30'	5°29'	4°46'	3°45'	3°6'
	<i>η</i> _d	0.89	0.88	0.85	0.83	0.81	0.78	0.74	0.71	0.68	0.63	0.59
	<i>η</i> _s	0.72	0.69	0.63	0.59	0.56	0.49	0.44	0.41	0.37	0.32	0.28
TW110	<i>z</i> ₁	4	3	2	2	2	1	1	1	1	1	1
	<i>m</i> _n	5.18	5.45	5.67	4.47	3.64	5.82	4.58	3.71	3.12	2.36	1.91
	<i>γ</i>	28°15'	21°57'	15°2'	14°42'	12°33'	7°39'	7°29'	6°21'	5°33'	4°27'	3°46'
	<i>η</i> _d	0.89	0.88	0.86	0.85	0.83	0.79	0.77	0.74	0.72	0.67	0.63
	<i>η</i> _s	0.72	0.69	0.62	0.62	0.59	0.48	0.48	0.44	0.41	0.36	0.32
TW130	<i>z</i> ₁	4	3	2	2	2	1	1	1	1	1	1
	<i>m</i> _n	6.11	6.45	6.72	5.24	4.28	6.91	5.36	4.35	3.65	2.76	2.23
	<i>γ</i>	28°43'	22°20'	15°19'	13°47'	11°54'	7°48'	6°60'	6°1'	5°16'	4°8'	3°27'
	<i>η</i> _d	0.90	0.89	0.87	0.85	0.84	0.80	0.78	0.75	0.73	0.68	0.64
	<i>η</i> _s	0.72	0.69	0.63	0.61	0.58	0.49	0.46	0.43	0.40	0.34	0.30
TW150	<i>z</i> ₁	6	4	3	2	2	2	1	1	1	1	1
	<i>m</i> _n	5.5	6.155	5.5	6.155	5	4.193	6.155	5	4.193	3.17	2.55
	<i>γ</i>	32°09'	24°35'	17°27'	12°53'	11°19'	9°50'	6°32'	5°43'	4°57'	3°55'	3°14'
	<i>η</i> _d	0.91	0.90	0.88	0.86	0.84	0.83	0.78	0.76	0.73	0.68	0.64
	<i>η</i> _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

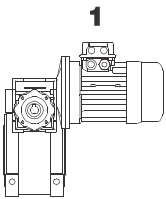
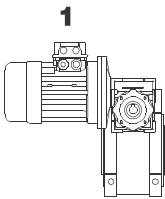
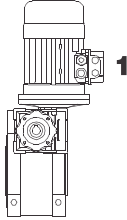
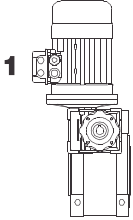
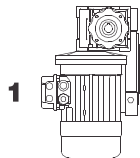
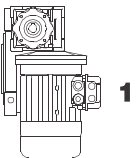
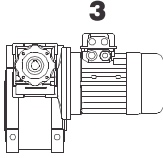
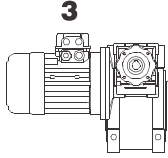
6.1 TW & TW.. ISS Mounting Positions



6.2 HL - TW.. Mounting Positions

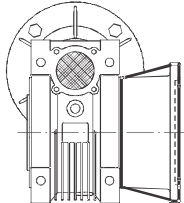
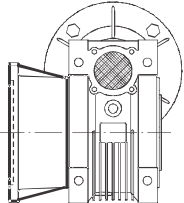


6.3 TW / TW & TW / TW.. ISS Mounting Positions

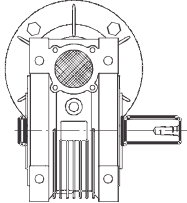
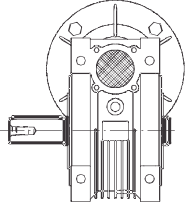
AS1	AS2	VS1	VS2
			
PS1	PS2	BS1	BS2
			

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 PS1. The specified mounting position refers to the 1st gear reducer.

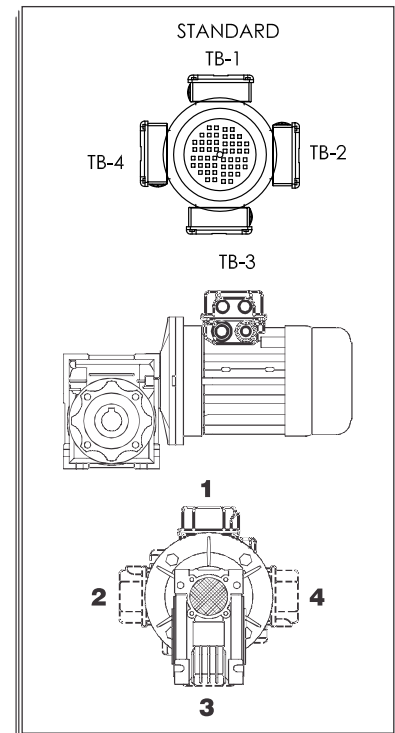
6.4 Position diagram for output flange

FA1, FB1, FD1	FA2, FB2, FD2
	

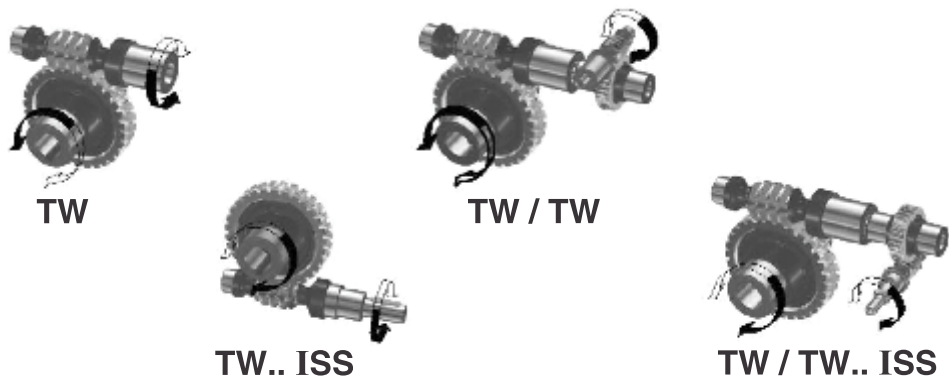
6.5 Position diagram for single output shaft

SSOS1	SSOS2
	

6.6 Position of terminal box



6.7 Direction of rotation



7. LUBRICATION

7.1 Lubricants detail


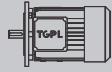

MODEL	GRADE			OIL TYPE	AMBIENT TEMPERATURE	
	LIGHT DUTY	NORMAL DUTY	Heavy DUTY			
TW30 TO TW90	150	220	320	SYNTHETIC OIL	-15°	+50°
HL63 TO HL90	150	220	320			
TW110 TO TW150	220	220	320	MINERAL OIL		


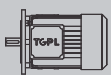

7.2 Quantity of Lubricant (Ltrs)


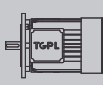

	B3	B6	B7	B8	V5	V6
TW 30				0.05		
TW 40				0.1		
TW 50				0.15		
TW 63				0.3		
TW 75				0.5		
TW 90				1		
TW 110	3	2.5	2.5	2.2	3	2.2
TW 130	4.5	3.5	3.5	3.3	4.5	3.3
TW 150	7	5.4	5.4	5.1	7	5.1
HL 63				0.05		
HL 71				0.07		
HL 80				0.15		
HL 90				0.16		


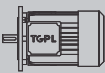

8. GEAR UNIT SELECTION TABLES


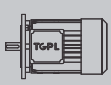

8.1 TW..(IEC).. Performance Parameter


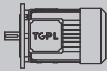

P _{1n} [kW]	n ₂ [r/min]	M _{2n} [Nm]	i	Fr ₂ [N]	f _s			
0.12	186.7	5.2	7.5	683	3.5	TW30 63B5/B14	TM 63 A4	119
	140	6.6	10	752	2.7			
	93.3	9.3	15	861	1.9			
	70	12	20	948	1.5			
	56	14	25	1021	1.6			
	46.7	16	30	1085	1.3			
	35	19	40	1194	0.9			
	28	22	50	1286	0.8			
	46.7	17	30	2087	2.7	TW40 63B5/B14	TM 63 A4	120
	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	TW50 63B5/B14	TM 63 A4	121
17.5	35	80	3973	1.9				
14	39	100	4280	1.4				
0.18	373.3	4.0	7.5	542	3.2	TW30 63B5/B14	TM 63 A2	119
	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	TW30 63B5/B14	TM 63 B4	119
	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	TW40 63B5/B14	TM 63 A2	120
	70	17	40	1824	1.8			
	56	21	50	1964	1.4			
	70	19	20	1824	2.1	TW40 63B5/B14	TM 63 B4	120
	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			
	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	TW50 63B5/B14	TM 63 A2	121	
35	30	80	3153	1.5				
28	34	100	3397	1.2				


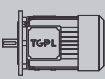

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	f_s			
0.18	35	33	40	3153	2.3	TW50 63B5/B14	TM 63 B4	121
	28	39	50	3397	1.9			
	23.3	43	60	3610	1.6			
	17.5	52	80	3973	1.2			
	14	59	100	4280	0.9			
	18	56	50	3936	1.4	TW50 71B5/B14	TM 71 A6	121
	15	63	60	4183	1.1			
	11.3	75	80	4604	0.9			
	15	66	60	5467	2.1	TW63 71B5/B14	TM 71 A6	122
	11.3	79	80	6018	1.6			
	9	90	100	6270	1.4			
	0.25	373.3	5.6	7.5	542	2.3	TW30 63B5/B14	TM 63 B2
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	TW40 71B5/B14	TM 71 A4	120
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			
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	TW50 63B5/B14	TM 63 B2	121
28		48	100	3397	0.8			
70		27	20	2503	2.7	TW50 71B5/B14	TM 71 A4	121
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			
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			


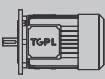

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	Fr_2 [N]	f_s						
0.25	28	55	50	4440	2.4	TW63 71B5/B14	TM 71 A4	122			
	23.3	63	60	4719	2.0						
	17.5	76	80	5193	1.6						
	14	87	100	5595	1.4						
	18	81	50	5145	1.8	TW63 71B5/B14	TM 71 B6	122			
	15	92	60	5467	1.5						
	11.3	110	80	6018	1.2						
	9	125	100	6270	1.0						
	17.5	80	80	6130	2.4	TW75 71B5/B14	TM 71 A4	123			
	14	94	100	6603	1.9						
	11.3	117	80	7103	1.7	TW75 71B5/B14	TM 71 B6	123			
	9	133	100	7380	1.4						
	0.37	373.3	8.3	7.5	1044	3.4	TW40 71B5/B14	TM 71 A2	120		
		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	TW40 71B5/B14	TM 71 B4	120			
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	TW50 71B5/B14	TM 71 A2	121			
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				TW50 71B5/B14	TM 71 B4	121
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	TW50 80B5/B14	TM 80 A6	121			
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	TW63 71B5/B14	TM 71 B4	122			
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						


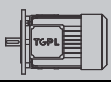

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	Fr_2 [N]	f_s			
0.37	45	60	20	3791	2.4	TW63 80B5/B14	TM 80 A6	122
	36	73	25	4084	1.9			
	30	82	30	4339	2.1			
	22.5	102	40	4776	1.6			
	18	120	50	5145	1.2			
	15	137	60	5467	1.0			
	23.3	97	60	5569	2.1	TW75 71B5/B14	TM 71 B4	123
	17.5	119	80	6130	1.6			
	14	139	100	6603	1.3			
	18	124	50	6073	1.8	TW75 80B5/B14	TM 80 A6	123
	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	TW90 80B5/B14	TM 80 A6	124
	9	212	100	8180	1.3			
	0.55	373.3	12	7.5	1044	2.3	TW40 71B5/B14	TM 71 B2
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	TW50 71B5/B14	TM 71 B2	121
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	TW50 80B5/B14	TM 80 A4	121
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	TW50 80B5/B14	TM 80 B6	121
90		48	10	2302	1.7			
60		69	15	2635	1.2			
45		88	20	2900	0.9			
70		56	40	3272	1.9	TW63 71B5/B14	TM 71 B2	122
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	TW63 80B5/B14	TM 80 A4	122
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			


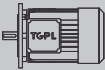

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	Fr_2 [N]	f_s			
0.55	60	70	15	3444	2.2	TW63 80B5/B14	TM 80 B6	122
	45	90	20	3791	1.6			
	36	108	25	4084	1.3			
	30	123	30	4339	1.4			
	22.5	152	40	4776	1.1			
	35	99	80	4865	1.3	TW75 71B5/B14	TM 71 B2	123
	28	116	100	5241	1.0			
	35	108	40	4865	2.0	TW75 80B5/B14	TM 80 A4	123
	28	128	50	5241	1.6			
	23.3	144	60	5569	1.4			
	17.5	177	80	6130	1.1			
	14	206	100	6603	0.9			
	30	124	30	5122	2.1	TW75 80B5/B14	TM 80 B6	123
	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	TW90 80B5/B14	TM 80 A4	124
	14	221	100	7306	1.2			
18	196	50	6719	2.0	TW90 80B5/B14	TM 80 B6	124	
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	TW110 80B5/B14	TM 80 A4	125	
14	236	100	9232	2.0				
11.3	294	80	9931	1.9	TW110 80B5/B14	TM 80 B6	125	
9	344	100	10320	1.5				
0.75	373.3	17	7.5	1433	3.0	TW50 80B5/B14	TM 80 A2	121
	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	TW50 80B5/B14	TM 80 B4	121
	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	TW63 80B5/B14	TM 80 A2	122
	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	TW63 80B5/B14	TM 80 B4	122
	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				


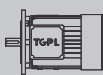

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	Fr_2 [N]	f_s			
0.75	120	51	7.5	2734	2.9	TW63 90B5/B14	TM 90 S6	122
	90	67	10	3009	2.3			
	60	96	15	3444	1.6			
	45	123	20	3791	1.2			
	36	147	25	4084	0.9			
	30	167	30	4339	1.0			
	46.7	107	60	4421	1.3	TW75 80B5/B14	TM 80 A2	123
	35	135	80	4865	1.0			
	28	159	100	5241	0.8			
	56	101	25	4160	2.0	TW75 80B5/B14	TM 80 B4	123
	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	TW75 90B5/B14	TM 90 S6	123
	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	TW90 80B5/B14	TM 80 A2	124
28	169	100	5799	1.2				
28	182	50	5799	1.9	TW90 80B5/B14	TM 80 B4	124	
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	TW90 90B5/B14	TM 90 S6	124	
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	TW110 80B5/B14	TM 80 B4	125	
14	322	100	9232	1.5				
15	325	60	9023	2.1	TW110 90B5/B14	TM 90 S6	125	
11.3	401	80	9931	1.4				
9	470	100	10320	1.1				
11.3	401	80	12989	2.1	TW130 90B5/B14	TM 90 S6	126	
9	470	100	13500	1.7				
1.1	373.3	25	7.5	1433	2.1	TW50 80B5/B14	TM 80 B2	121
	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	TW63 80B5/B14	TM 80 B2	122
	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]	f_s			
1.1	120	75	7.5	2734	2.0	TW63 90B5/B14	TM 90 L6	122
	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	TW63 90B5/B14	TM 90 S4	122
	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	TW75 80B5/B14	TM 80 B2	123
	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	TW75 90B5/B14	TM 90 L6	123
	60	142	15	4065	1.7			
	45	182	20	4474	1.3			
	36	219	25	4820	1.0			
	93.3	95	15	3509	2.1	TW75 90B5/B14	TM 90 S4	123
	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	TW90 80B5/B14	TM 80 B2	124
	28	248	100	5799	0.8			
	36	228	25	5333	1.6	TW90 90B5/B14	TM 90 L6	124
	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				
28	266	50	5799	1.3	TW90 90B5/B14	TM 90 S4	124	
23.3	306	60	6163	1.0				
22.5	345	40	7882	2.3				
18	414	50	8491	1.8	TW110 90B5/B14	TM 90 L6	125	
15	476	60	9023	1.4				
11.3	588	80	9931	1.0				
28	278	50	7328	2.4				
23.3	324	60	7787	1.9	TW110 90B5/B14	TM 90 S4	125	
17.5	402	80	8571	1.3				
14	473	100	9232	1.0				
11.3	588	80	12989	1.5				
9	689	100	13500	1.1	TW130 90B5	TM 90 L6	126	
17.5	408	80	11210	2.1				
14	480	100	12076	1.5	TW130 90B5	TM 90 S4	126	
14	480	100	12076	1.5				


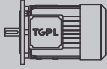

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	f_s			
1.5	186.7	68	7.5	2359	1.9	TW63 90B5/B14	TM 90 L4	122
	140	88	10	2597	1.5			
	93.3	126	15	2973	1.1			
	70	164	20	3272	0.8			
	373.3	35	7.5	1873	2.7	TW63 90B5/B14	TM 90 S2	122
	280	45	10	2061	2.2			
	186.7	66	15	2359	1.6			
	140	86	20	2597	1.2			
	112	105	25	2797	0.9			
	93.3	120	30	2973	1.0			
	120	103	7.5	3227	2.1	TW75 100B5/B14	TM 100 L6	123
	90	134	10	3551	1.7			
	60	193	15	4065	1.2			
	56	187	50	4160	1.3	TW75 90B5/B14	TM 90 S2	123
	46.7	215	60	4421	1.1			
	140	89	10	3065	2.2	TW75 90B5/B14	TM 90 L4	123
	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	TW75 90B5/B14	TM 90 S2	123
	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	TW90 100B5/B14	TM 100 L6	124
	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	TW90 90B5/B14	TM 90 L4	124
	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	TW90 90B5/B14	TM 90 S2	124
	46.7	227	60	4891	1.1			
	45	264	20	6256	2.7	TW110 100B5/B14	TM 100 L6	125
	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	TW110 90B5/B14	TM 90 L4	125
	28	379	50	7328	1.7			
	23.3	442	60	7787	1.4			
	17.5	548	80	8571	0.9			


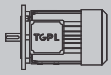

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	f_s			
1.5	46.7	236	60	6181	2.0	TW110 90B5/B14	TM 90 S2	125
	35	299	80	6803	1.3			
	28	358	100	7328	1.0			
	22.5	471	40	10309	2.3	TW130 100B5/B14	TM 100 L6	126
	18	565	50	11105	1.9			
	15	659	60	11801	1.4			
	11.3	802	80	12989	1.1			
	17.5	557	80	11210	1.5	TW130 90B5/B14	TM 90 L4	126
	14	655	100	12076	1.1			
	18	589	50	15182	2.7	TW150 100/112B5	TM 100 L6	127
	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	TW63 90B5/B14	TM 90 L2	122
	280	66	10	2061	1.5			
	186.7	97	15	2359	1.1			
	186.7	99	7.5	2785	1.9	TW75 100B5/B14	TM 100 LA4	123
	140	131	10	3065	1.5			
	93.3	189	15	3509	1.1			
	373.3	50	7.5	2210	2.6	TW75 90B5/B14	TM 90 L2	123
	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	TW90 100B5/B14	TM 100 LA4	124
	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	TW90 112B5/B14	TM 112 M6	124
	90	201	10	3929	1.8			
	60	291	15	4498	1.4			
	45	378	20	4951	1.0			
	140	129	20	3391	2.0	TW90 90B5/B14	TM 90 L2	124
	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	TW110 100B5/B14	TM 100 LA4	125	
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				


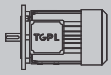

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	Fr_2 [N]	f_s			
2.2	90	203	10	4965	3.5	TW110 112B5/B14	TM 112 M6	125
	60	294	15	5684	2.6			
	45	388	20	6256	1.9			
	36	473	25	6739	1.6			
	30	532	30	7161	1.6			
	112	161	25	4616	3.1	TW110 90B5/B14	TM 90 L2	125
	93.3	187	30	4905	3.0			
	70	243	40	5399	2.2			
	56	296	50	5816	1.7			
	46.7	347	60	6181	1.4			
	35	468	40	8897	2.2	TW130 100B5	TM 100 LA4	126
	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	TW130 112B5	TM 112 M6	126
	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	TW130 90B5/B14	TM 90 L2	126
28	525	100	9584	1.0				
28	578	50	13103	2.4	TW150 100B5	TM 100 LA4	127	
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	TW150 112B5	TM 112 M6	127	
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	TW75 112B5/B14	TM 112 M2	123
	280	120	10	2433	1.2			
	186.7	180	7.5	2785	1.0	TW75 112B5/B14	TM 112 M4	123
	140	237	10	3065	0.8			
	373.3	93	7.5	2446	2.3	TW90 112B5/B14	TM 112 M2	124
	280	123	10	2692	1.9			
	186.7	182	7.5	3081	1.6	TW90 112B5/B14	TM 112 M4	124
	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	TW110 112B5/B14	TM112M4	125
	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]	f_s			
4.0	56	573	25	7607	1.6	TW130 112B5	TM 112 M4	126
	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			
	28	1051	50	13103	1.3	TW150 112B5	TM 112 M4	127
	23.3	1212	60	13924	1.0			
	17.5	1507	80	15325	0.8			
	45	722	20	11186	2.1	TW150 132B5	TM 132 MA6	127
	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	70	653	20	9654	2.0	TW150 132B5	TM 132 S4
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	70	891	20	9654	1.5	TW150 132B5	TM 132 M4	127
	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			

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




P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	f_s			
0.12	18.7	42	75	2833	1.2	HL63 - TW40 63B5	TM 63 A4	129
	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 - TW5063B5	TM 63 A4	129
	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 - TW6363B5	TM 63 A4	129
	4.7	103	300	6270	1.2			
	0.18	18.7	64	75	2833	0.8	HL63 - TW4063B5	TM 63 B4
15.6		70	90	3011	0.8			
11.7		85	120	3314	0.6			
18.7		64	75	3889	1.4	HL63 - TW5063B5	TM 63 B4	129
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 - TW6363B5	TM 63 B4	129
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 - TW5071B5	TM 71 A6	130
10.0		105	90	4788	1.4			
7.5		126	120	4840	1.0			
12.0		97	75	5889	2.2	HL71 - TW63 71B5	TM 71 A6	130
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 - TW7571B5	TM 71 A6	130
3.8	211	240	7380	1.2				
3.0	235	300	7380	1.0				
0.25	18.7	88	75	3889	1.0	HL71 - TW5071B5	TM 71 A4	130
	15.6	98	90	4132	1.1			
	11.7	121	120	4548	0.8			
	18.7	91	75	5083	1.8	HL71 - TW63 71B5	TM 71 A4	130
	15.6	100	90	5401	2.0			
	11.7	125	120	5945	1.5			
	9.3	143	150	6270	1.2			

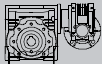


P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	f_s			
0.25	7.8	163	180	6270	1.0	HL71 - TW63 71B5	TM 71 A4	130
	5.8	192	240	6270	0.7			
	4.7	215	300	6270	0.6			
	12.0	135	75	5889	1.6	HL71 - TW63 71B5	TM 71 B6	130
	10.0	148	90	6259	1.8			
	7.5	181	120	6270	1.3			
	6.0	211	150	6270	1.0			
	9.3	151	150	7380	1.7			
	7.8	172	180	7380	1.4	HL71 - TW75 71B5	TM 71 A4	130
	5.8	201	240	7380	1.1			
	4.7	230	300	7380	0.9			
	12.0	139	75	6952	2.4			
	10.0	155	90	7380	2.5	HL71 - TW75 71B5	TM 71 B6	130
	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				
3.8	318	240	8180	1.4	HL71 - TW90 71B5	TM 71 B6	131	
3.0	358	300	8180	1.1				
0.37	18.7	134	75	5083	1.2	HL71 - TW63 71B5	TM 71 B4	130
	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 - TW75 71B5	TM 71 B4	130
	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 - TW75 80B5	TM 80 A6	131
	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 - TW90 71B5	TM 71 B4	131
	5.8	321	240	8180	1.1			
	4.7	371	300	8180	0.9			
	6.0	347	150	8180	1.6	HL80 - TW90 80B5	TM 80 A6	131
5.0	389	180	8180	1.3				
3.8	471	240	8180	1.0				
3.8	509	240	10320	1.6	HL80 - TW110 80B5	TM 80 A6	132	
3.0	577	300	10320	1.3				
0.55	18.7	205	75	6000	1.2	HL80 - TW75 80B5	TM 80 A4	131
	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 - TW75 80B5	TM 80 B6	131
	10.0	341	90	7380	1.1			


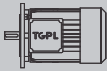

P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	f_s			
0.55	15.6	240	90	7054	2.3	HL80 - TW90 80B5	TM 80 A4	131
	11.7	297	120	7764	1.6			
	9.3	355	150	8180	1.3			
	7.8	398	180	8180	1.0			
	10.0	357	90	8174	2.0	HL80 - TW90 80B5	TM 80 B6	131
	7.5	441	120	8180	1.4			
	6.0	516	150	8180	1.1			
	5.0	578	180	8180	0.9			
	7.8	425	180	10320	1.8	HL80 - TW110 80B5	TM 80 A4	132
	5.8	513	240	10320	1.3			
	4.7	597	300	10320	1.0			
	7.5	462	120	10320	2.6	HL80 - TW110 80B5	TM 80 B6	132
	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 - TW130 80B5	TM 80 B6	132
	3.0	858	300	13500	1.3			
	0.75	18.7	280	75	6000	0.9	HL80 - TW75 80B5	TM 80 B4
15.6		313	90	6375	1.0			
15.6		327	90	7054	1.7	HL80 - TW90 80B5	TM 80 B4	131
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 - TW110 80B5	TM 80 B4	132
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			
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 - TW130 80B5	TM 80 B4	132
4.7		813	300	13500	1.1			
12.4		399	73	12575	4.4	HL90 - TW130 90B5	TM 90 S6	132
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				
12.4	576	73	9614	2.2	HL90 - TW110 90B5			
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]	f_s			
1.1	19.3	392	73	8298	2.5	HL90 - TW110 90B5	TM 90 S4	132
	14.5	508	96.8	9133	1.8			
	11.6	599	121	9838	1.5	HL90 - TW110 90B5	TM 90 S4	132
	9.6	686	145.2	10320	1.1			
	7.2	828	193.6	10320	0.8			
	12.4	585	73	12575	3.0	HL90 - TW130 90B5	TM 90 L6	132
	9.3	746	96.8	13500	2.2			
	7.4	890	121	13500	1.7			
	6.2	1000	145.2	13500	1.4			
	4.6	1220	193.6	13500	1.0			
	19.3	398	73	10853	3.5	HL90 - TW130 90B5	TM 90 S4	132
	14.5	508	96.8	11945	2.6			
	11.6	608	121	12868	2.0			
9.6	686	145.2	13500	1.6				
7.2	843	193.6	13500	1.2				
5.8	962	242	13500	0.9				
1.5	19.3	535	73	8298	1.9	HL90 - TW110 90B5	TM 90 L4	132
	14.5	693	96.8	9133	1.3			
	11.6	817	121	9838	1.1			
	9.6	936	145.2	10320	0.8			
	19.3	542	73	10853	2.6	HL90 - TW130 90B5	TM 90 L4	132
	14.5	693	96.8	11945	1.9			
	11.6	830	121	12868	1.5			
	9.6	936	145.2	13500	1.1			
	7.2	1149	194	13500	0.8			

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



P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	f_s					
0.12	9.3	74	150	4350	1.8	TW/TW30/50	63B5/B14	TM 63 A4	133	
	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	TW/TW30/63	63B5/B14	TM 63 A4	133	
	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	TW/TW40/75	63B5/B14	TM 63 A4	134	
	1.2	411	1200	7380	0.9					
	0.8	470	1800	8180	0.9	TW/TW40/90	63B5/B14	TM 63 A4	134	
	0.6	593	2400	8180	0.9					
0.5	731	3000	10320	1.2	TW/TW50/110	63B5/B14	TM 63 A4	135		
0.4	884	4000	10320	1.0						
0.3	1023	5000	10320	0.8						
0.18	9.3	112	150	4350	1.2	TW/TW30/50	63B5/B14	TM 63 B4	133	
	7.0	141	200	4788	0.9					
	4.7	183	300	4840	0.8					
	9.3	113	150	5686	1.9	TW/TW30/63	63B5/B14	TM 63 B4	133	
	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	TW/TW40/75	63B5/B14	TM 63 B4	134	
	1.9	371	750	7380	0.9					
	1.6	419	900	7380	0.8					
	1.2	544	1200	8180	1.0	TW/TW40/90	63B5/B14	TM 63 B4	134	
	0.9	647	1500	8180	0.8					
	0.8	727	1800	10320	1.5	TW/TW50/110	63B5/B14	TM 63 B4	135	
	0.6	948	2400	10320	1.1					
	0.25	7.0	150	400	6270	1.4	TW/TW30/63	63B5/B14	TM 63 B2	133
		5.6	175	500	6270	1.2				



P_{1n} [kW]	n_2 [r/min]	M_{2n} [Nm]	i	F_{r2} [N]	f_s					
0.25	9.3	165	150	6712	2.6	TW/TW40/75	71B5/B14	TM 71 A4	134	
	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	TW/TW40/90	71B5/B14	TM 71 A4	134	
	1.9	553	750	8180	0.9					
	1.6	612	900	8180	0.8					
	1.2	776	1200	10320	1.3	TW/TW50/110	71B5/B14	TM 71 A4	135	
	0.9	924	1500	10320	1.2					
	0.8	1010	1800	10320	1.1					
	0.6	1358	2400	13500	1.0	TW/TW63/130	71B5/B14	TM 71 A4	135	
	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	TW/TW63/150	71B5/B14	TM 71 A4	136	
	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	245	150	6712	1.7	TW/TW40/75	71B5/B14	TM 71 B4	134	
	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	TW/TW40/90	71B5/B14	TM 71 B4	134	
	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	TW/TW50/110	71B5/B14	TM 71 B4	135	
	1.6	928	900	10320	1.1					
	1.2	1148	1200	10320	0.8					
	0.9	1699	1500	13500	1.0	TW/TW63/130	71B5/B14	TM 71 B4	135	
	0.8	1918	1 00	13500	0.9					
	0.6	2519	2400	18000	1.1	TW/TW63/150	71B5/B14	TM 71 B4	136	
	0.5	2958	3000	18000	0.8					
	0.55	9.3	305	300	8180	2.0	TW/TW40/90	71B5/B14	TM71B2	134
		7.0	375	400	8180	1.5				
5.6		441	500	8180	1.2					
9.3		382	150	7426	1.7	TW/TW50/90	80B5/B14	TM 80 A4	134	
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]	f_s					
0.55	4.7	615	300	10320	1.9	TW/TW50/110	80B5/B14	TM 80 A4	135	
	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	TW/TW63/130	80B5/B14	TM 80 A4	135	
	1.9	1382	750	13500	1.2					
	1.2	2057	1200	13500	0.8					
	2.3	1248	600	18000	2.1	TW/TW63/150	80B5/B14	TM 80 A4	136	
	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	TW/TW50/90	80B5/B14	TM 80 B4	134
		7.0	668	200	8174	0.9				
5.6		801	250	8180	0.7					
9.3		424	300	10320	2.8	TW/TW50/110	80B5/B14	TM 80 A2	135	
7.0		553	400	10320	2.1					
5.6		640	500	10320	1.6					
9.3		527	150	9384	1.8	TW/TW50/110	80B5/B14	TM 80 B4	135	
7.0		685	200	10320	1.7					
5.6		835	250	10320	1.4					
4.7		838	300	10320	1.3					
3.5		1105	400	1032	0.9					
9.3		527	150	9384	2.3	TW/TW63/110	80B5/B14	TM 80 B4	135	
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	TW/TW63/130	80B5/B14	TM 80 B4	135	
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	TW/TW63/150	80B5/B14	TM 80 B4	136	
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	TW/TW50/110	80B5/B14	TM 80 B2	135	
	7.0	810	400	10320	1.4					
	5.6	938	500	10320	1.1					
	9.3	774	150	9384	1.5	TW/TW63/110	90B5/B14	TM 90 S4	135	
	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]	f_s							
1.1	4.7	1274	300	13500	1.3	TW/TW63/130 90B5/B14	TM 90 S4	135				
	3.5	1621	400	13500	1.0							
	2.8	1913	500	13500	0.8							
	1.5	9.3	771	150	18000	2.6	TW/TW63/150 90B5/B14	TM 90 S4	136			
		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				TW/TW50/110 90B5/B14	TM 90 S2	135
		7.0	1105	400	10320	1.0						
	5.6	1279	500	10320	0.8							
	1.5	9.3	1055	150	9384	1.1	TW/TW63/110 90B5/B14	TM 90 L4	135			
		7.0	1371	200	10320	0.8						
		5.6	1669	250	10320	0.7						
		4.7	1789	300	10320	0.7						
	1.5	9.3	878	300	13500	1.9	TW/TW63/130 90B5/B14	TM 90 S2	135			
		7.0	1105	400	13500	1.4						
		5.6	1305	500	13500	1.1						
	1.5	9.3	1042	150	12274	1.5	TW/TW63/130 90B5/B14	TM 90 L4	135			
		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						
	1.5	9.3	1052	150	18000	1.9	TW/TW63/150 90B5/B14	TM 90 L4	136			
		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 TW.. ISS.. Performance Parameter



M_{2n} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]	F_{r2} [N]	F_{r1} [N]		
13	2800	7.5	0.58	373.3	542	125	TW 30 ISS	128
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	TW 40 ISS	128
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	TW 50 ISS	128
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	TW 63 ISS	128
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	TW 75 ISS	128
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]	n₁ [r/min]	i	P_{1n} [kW]	n₂ [r/min]	F_{r2} [N]	F_{r1} [N]				
170	2800	30	2.1	93.3	3509	980	TW 75 ISS	128		
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	TW 90 ISS	128		
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			TW 110 ISS	128
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	TW 130 ISS	128		
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	TW 150 ISS	128		
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	TW 30 ISS	128
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	TW 40 ISS	128
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	TW 50 ISS	128
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	TW 63 ISS	128
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	TW 75 ISS	128
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]	n₁ [r/min]	i	P_{1n} [kW]	n₂ [r/min]	F_{r2} [N]	F_{r1} [N]		
220	1400	40	1.1	35	4865	980	TW 75 ISS	128
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	TW 90 ISS	128
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		
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	TW 130 ISS	128
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		
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	TW 30 ISS	128
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	TW 40 ISS	128
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	TW 50 ISS	128
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	TW 63 ISS	128
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	TW 75 ISS	128
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		

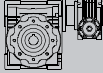

M_{2n} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]	F_{r2} [N]	F_{r1} [N]				
240	900	40	0.84	22.5	5637	980	TW 75 ISS	128		
220	900	50	0.66	18	6073	980				
210	900	60	0.55	15	6453	980				
200	900	80	0.43	11.3	7103	980				
190	900	100	0.36	9	7380	980				
340	900	7.5	4.9	120	3570	1040	TW 90 ISS	128		
370	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			TW 110 ISS	128
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	TW 130 ISS	128		
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			TW 150 ISS	128
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				

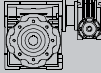

M_{2n} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]	F_{r2} [N]	F_{r1} [N]		
24	500	7.5	0.21	66.7	963	210	TW 30 ISS	128
24	500	10	0.16	50	1060	210		
24	500	15	0.12	33.3	1213	210		
23	500	20	0.09	25	1336	210		
29	500	25	0.10	20	1439	210		
26	500	30	0.08	16.7	1529	210		
23	500	40	0.06	12.5	1683	210		
21	500	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	TW 40 ISS	128
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	TW 50 ISS	128
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	TW 63 ISS	128
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		
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]	n₁ [r/min]	i	P_{1n} [kW]	n₂ [r/min]	F_{r2} [N]	F_{r1} [N]		
280	500	40	0.58	12.5	6858	980	TW 75 ISS	128
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	TW 90 ISS	128
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		
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	TW 130 ISS	128
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		
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 TW / TW.. ISS Performance Parameter

M_{2n} [Nm]	n₁ [r/min]	i	P_{1n} [kW]	n₂ [r/min]	F_{r2} [N]	F_{r1} [N]	
73	1400	300	0.07	4.7	3490	210	TW/TW 30/40 ISS
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	TW/TW 30/50 ISS
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	TW/TW 30/63 ISS
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	TW/TW 40/75 ISS
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	

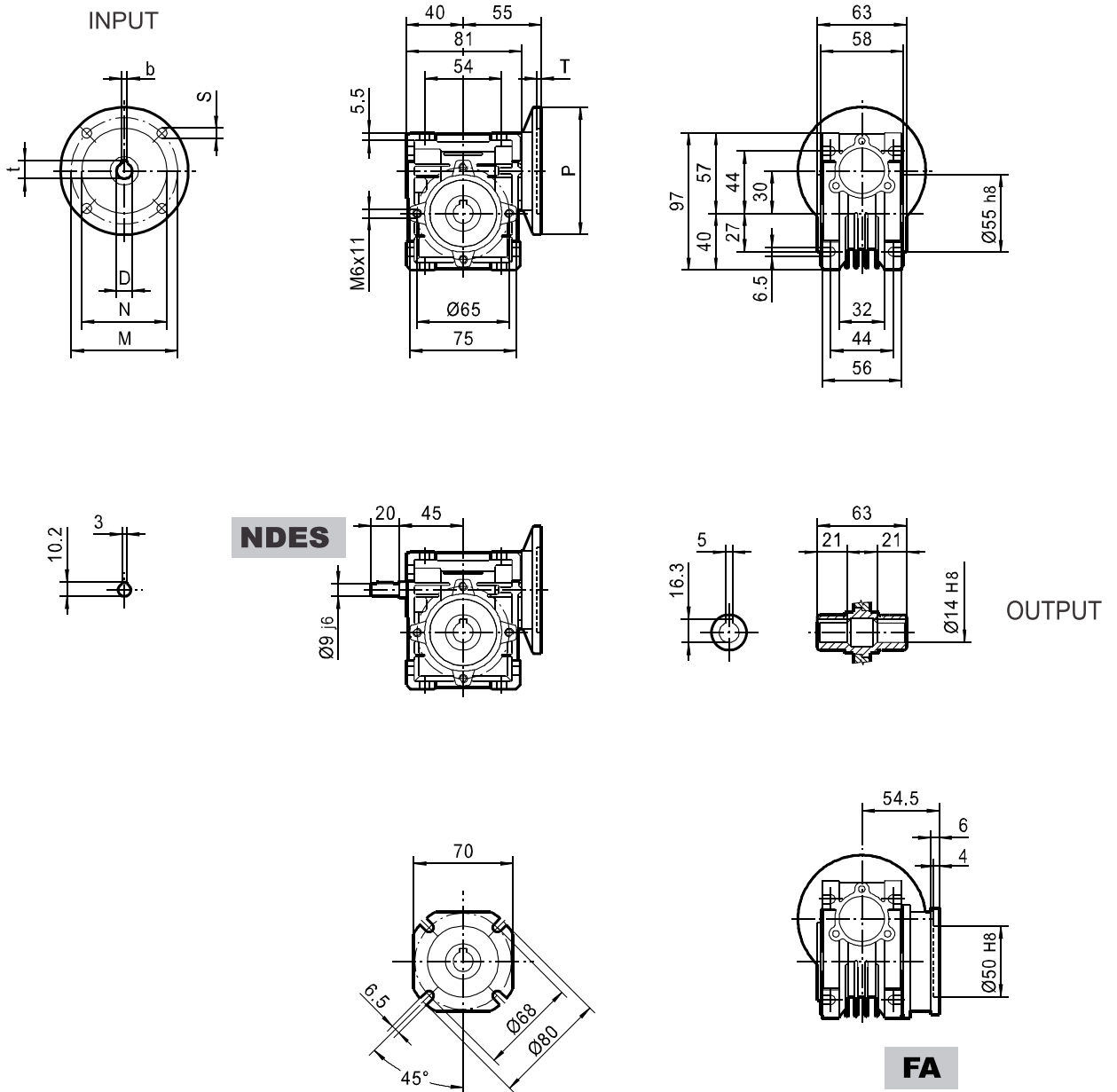
M_{2n} [Nm]	n_1 [r/min]	i	P_{1n} [kW]	n_2 [r/min]	F_{r2} [N]	F_{r1} [N]		
610	1400	300	0.56	4.7	8180	350	TW/TW 40/90 ISS	136
610	1400	400	0.45	3.5	8180	350		
560	1400	500	0.35	2.8	8180	350		
610	1400	600	0.31	2.3	8180	350		
560	1400	750	0.25	1.9	8180	350		
505	1400	900	0.21	1.6	8180	350		
610	1400	1200	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	TW/TW 50/90 ISS	136
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	TW/TW 50/110 ISS	136
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	TW/TW 63/110 ISS	136
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	TW/TW 63/130 ISS	136
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		
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 TW.. Outline dimension

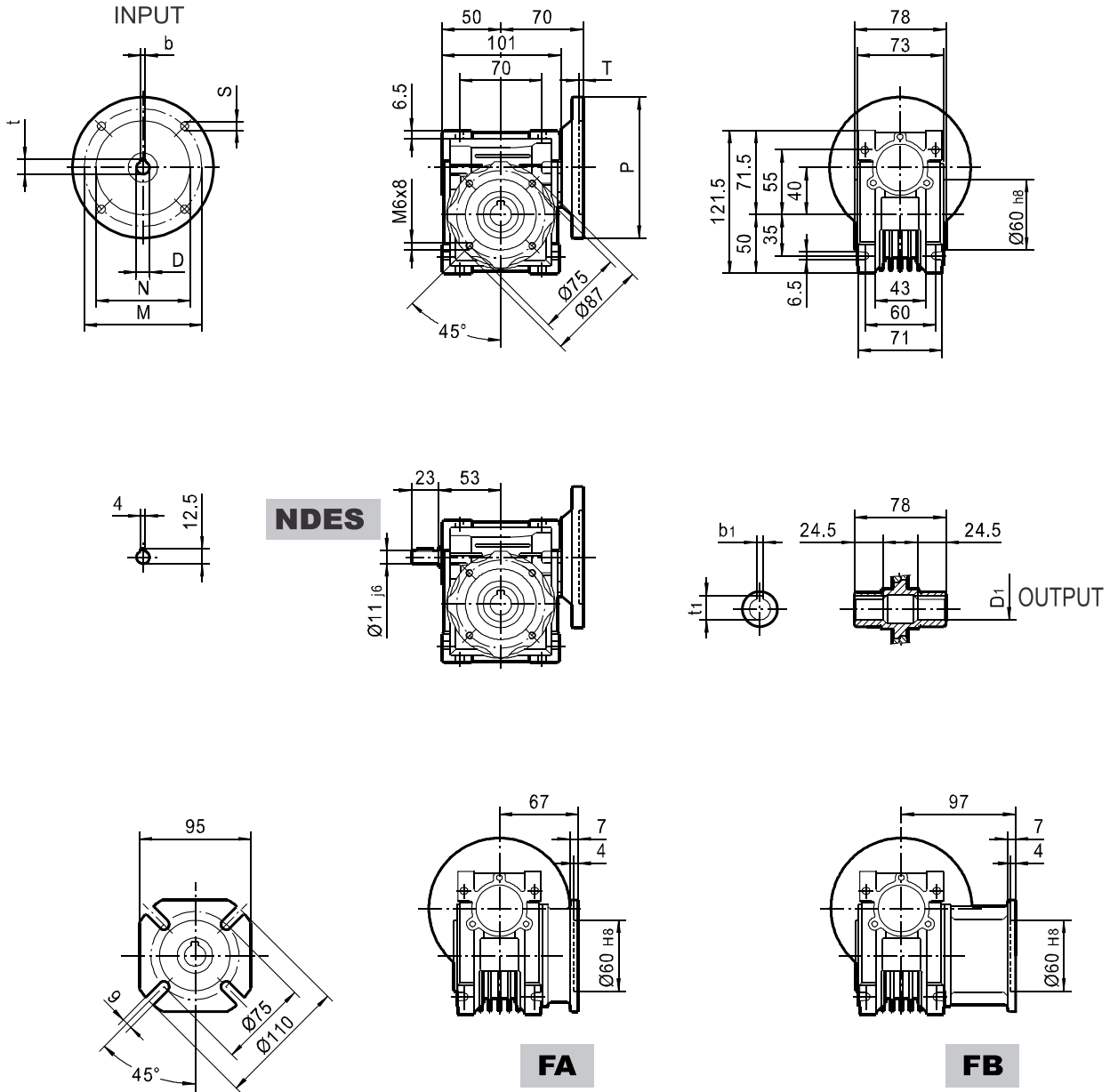
TW30..(IEC)



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

TW 30 Gear Box Weight \approx 1.3 kg
(Without Flange)

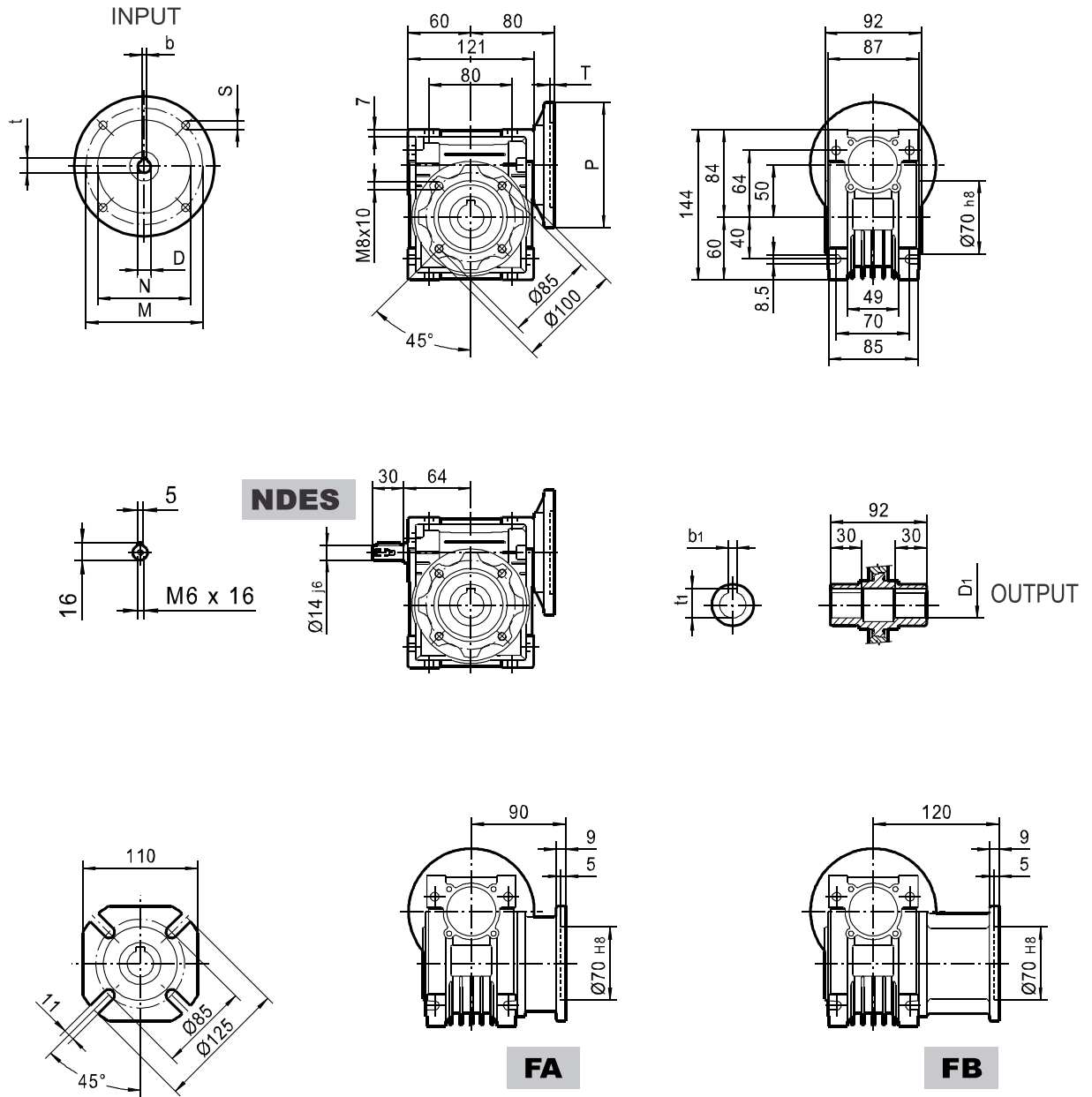
TW40..(IEC)



IEC	D_{E8}	t	b	P	M	N	S	T	$D1 H8$	$b1$	$t1$
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			

TW 40 Gear Box Weight \approx 2.4 kg
(Without Flange)

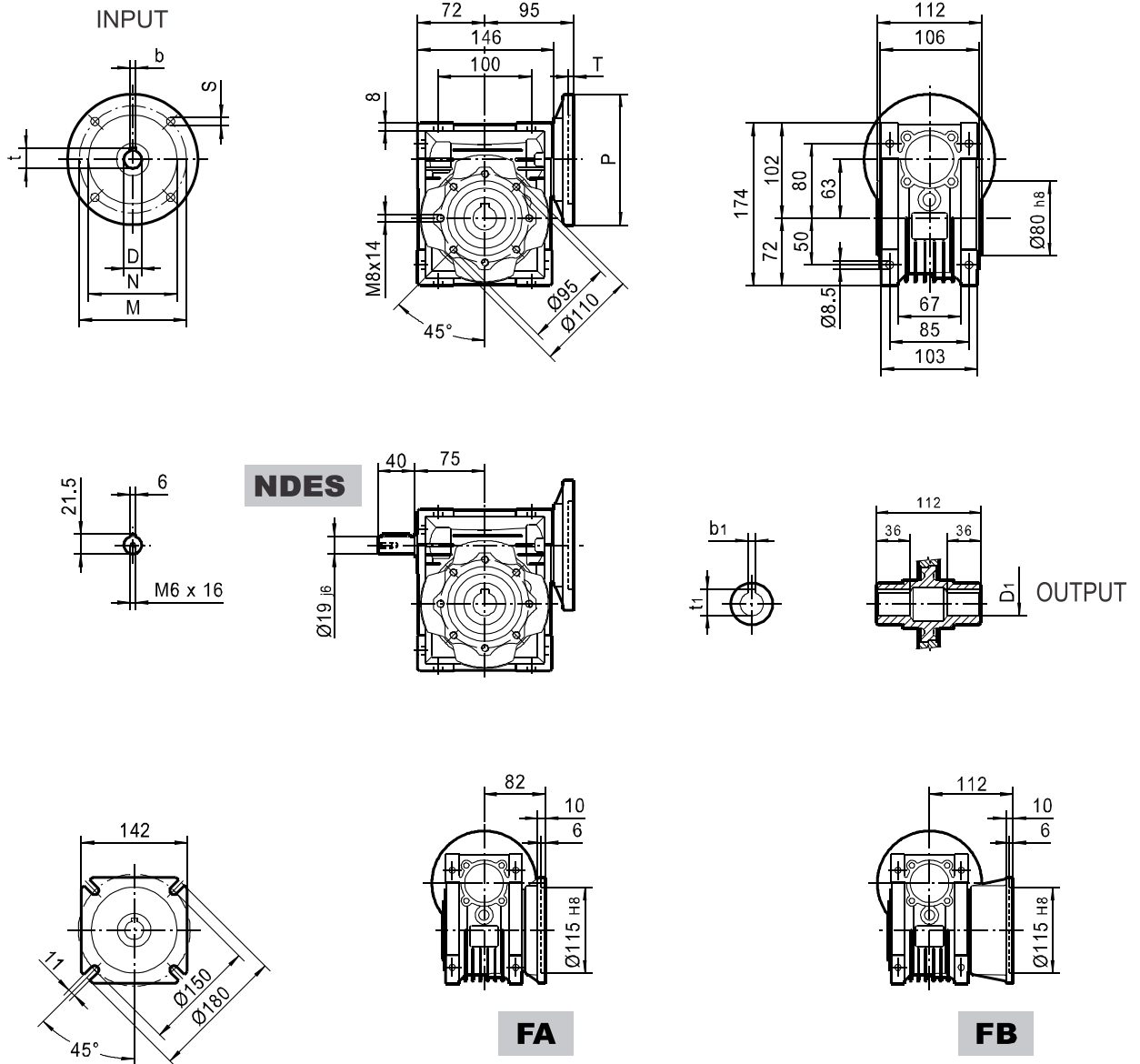
TW50..(IEC)



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			

TW 50 Gear Box Weight \approx 3.75 kg
(Without Flange)

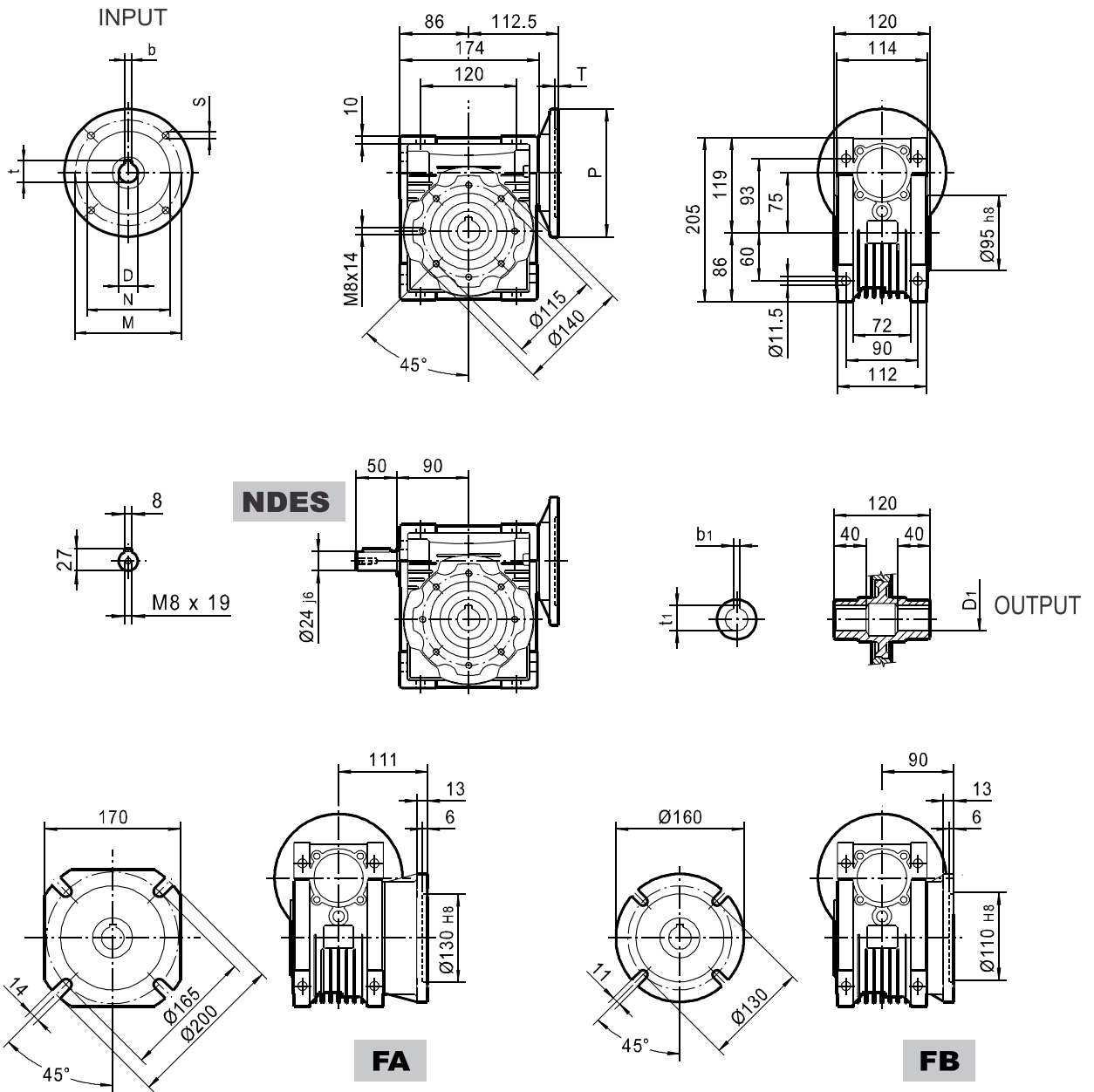
TW63..(IEC)



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			

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

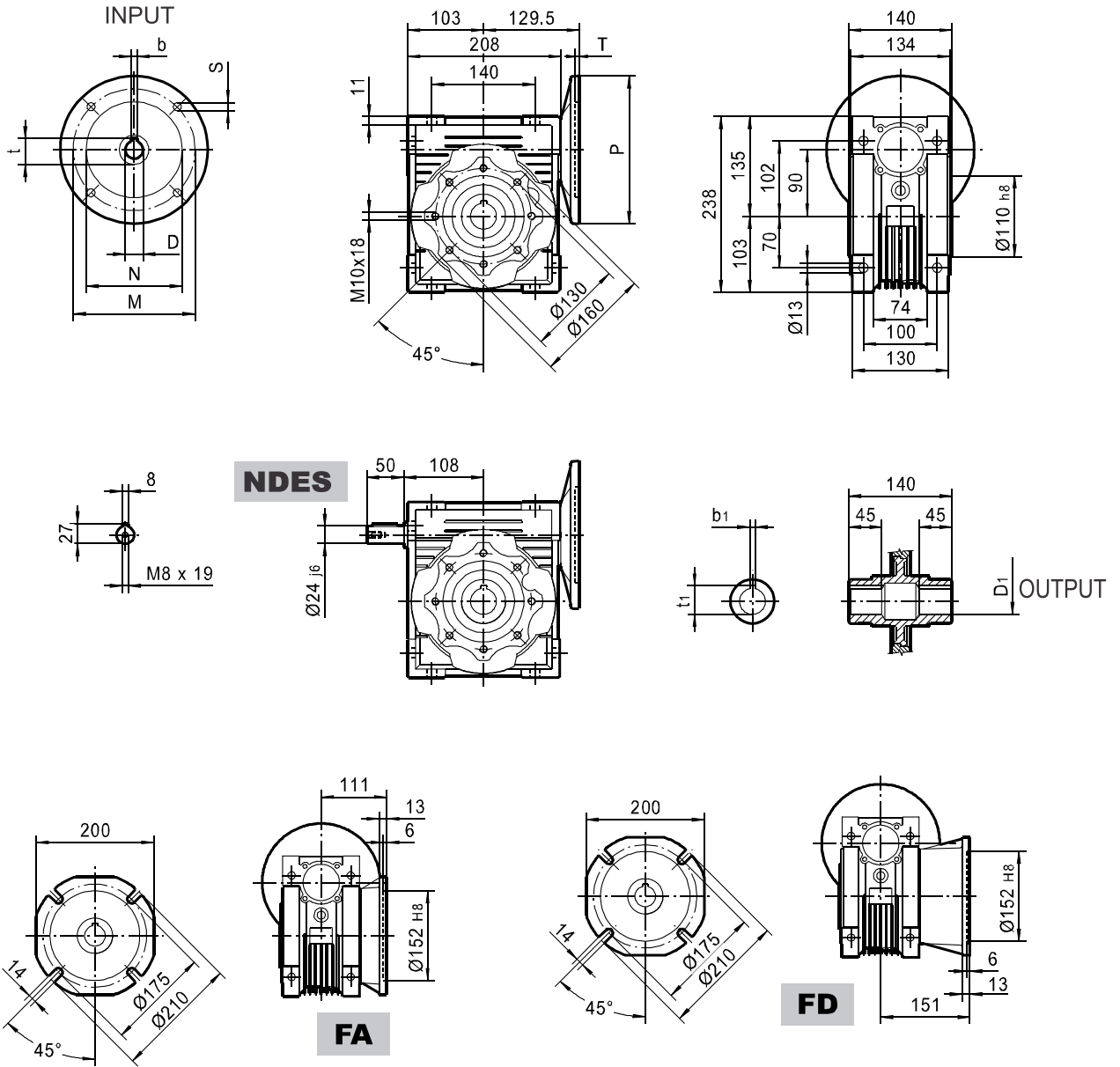
TW75..(IEC)



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			

TW 75 Gear Box Weight \approx 9 kg
(Without Flange)

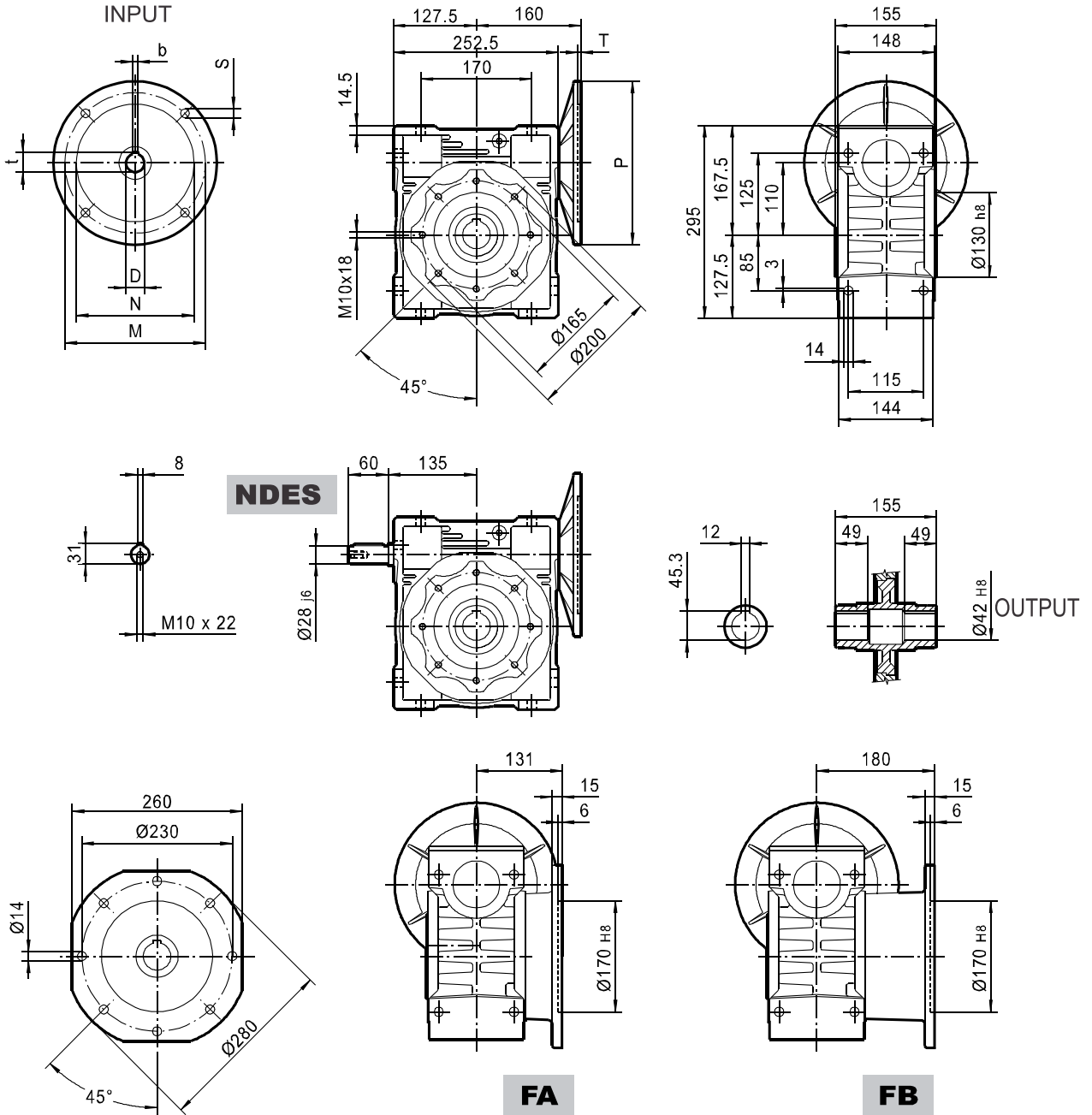
TW90..(IEC)



IEC	D _{E8}	t	b	P	M	N	S	T	D ₁ H ₈	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			

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

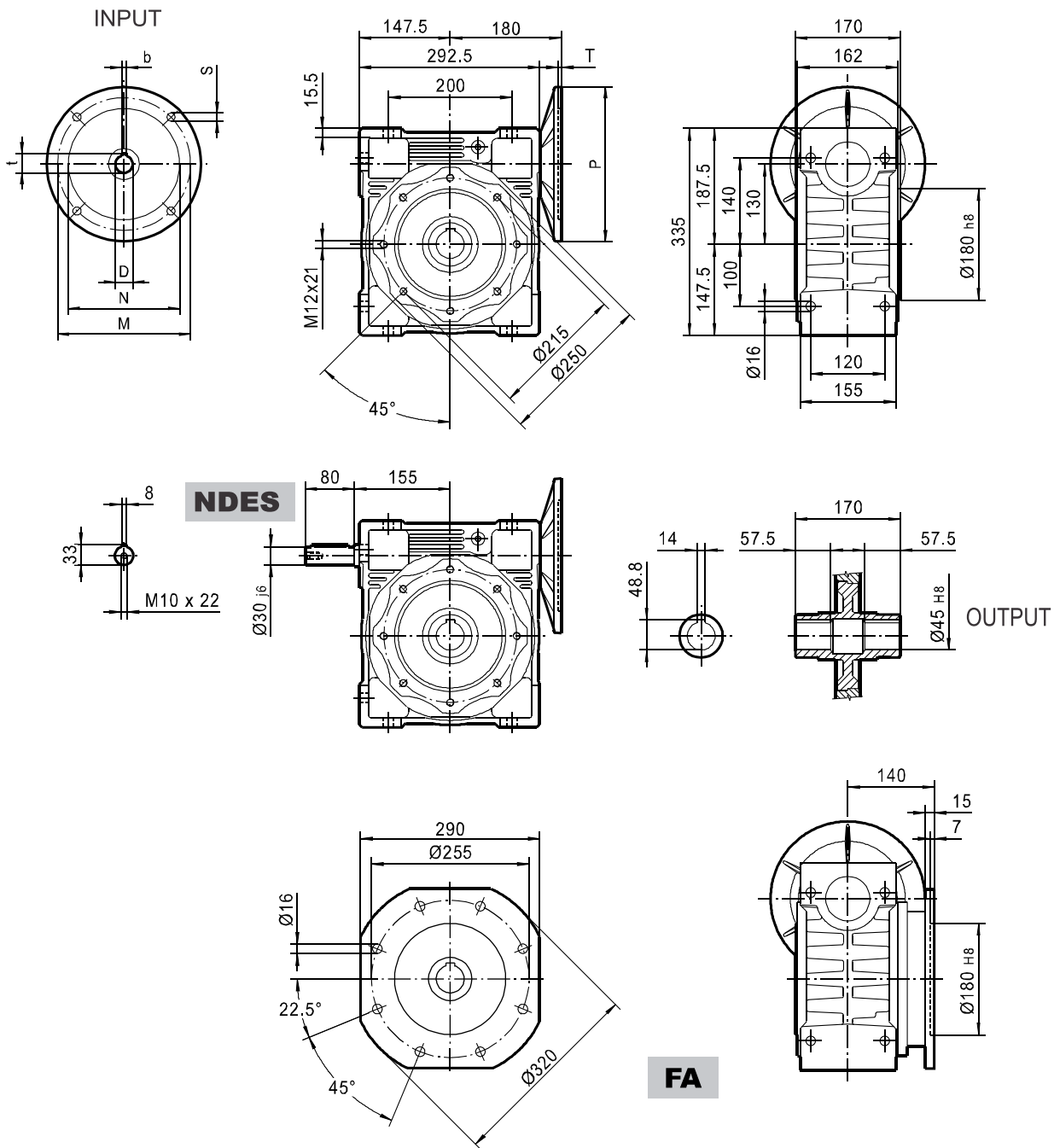
TW110..(IEC)



IEC	DE8	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

TW 110 Gear Box Weight \approx 35 kg
(Without Flange)

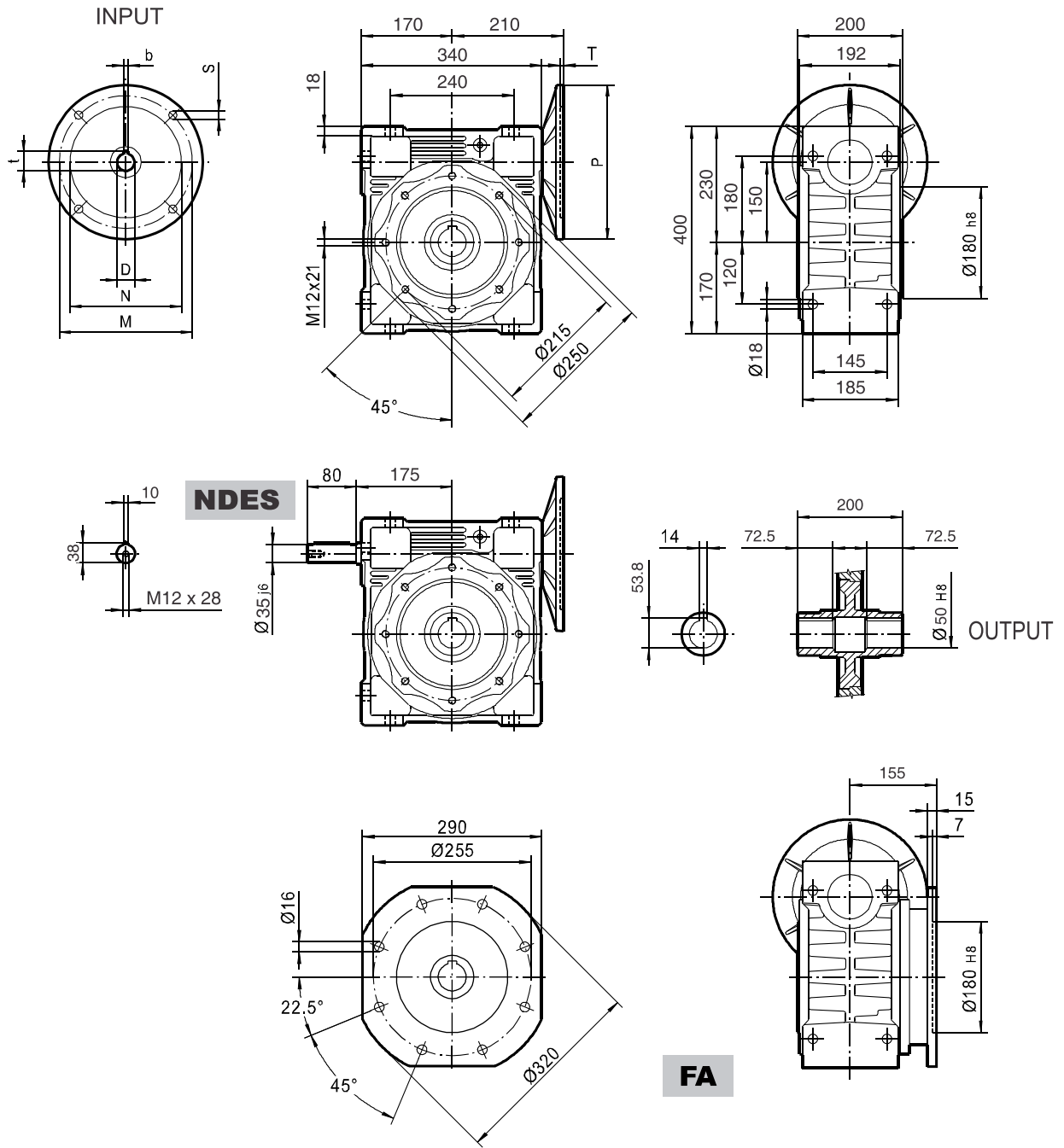
TW130..(IEC)



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

TW 130 Gear Box Weight \approx 48 kg
(Without Flange)

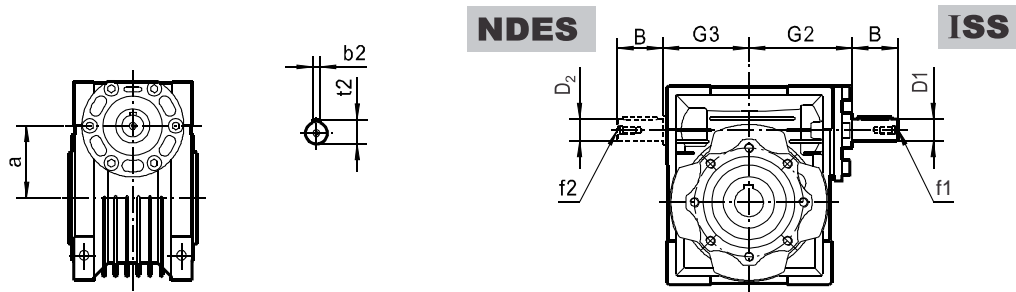
TW150..(IEC)



IEC	DE8	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

TW 150 Gear Box Weight \approx 84 kg
(Without Flange)

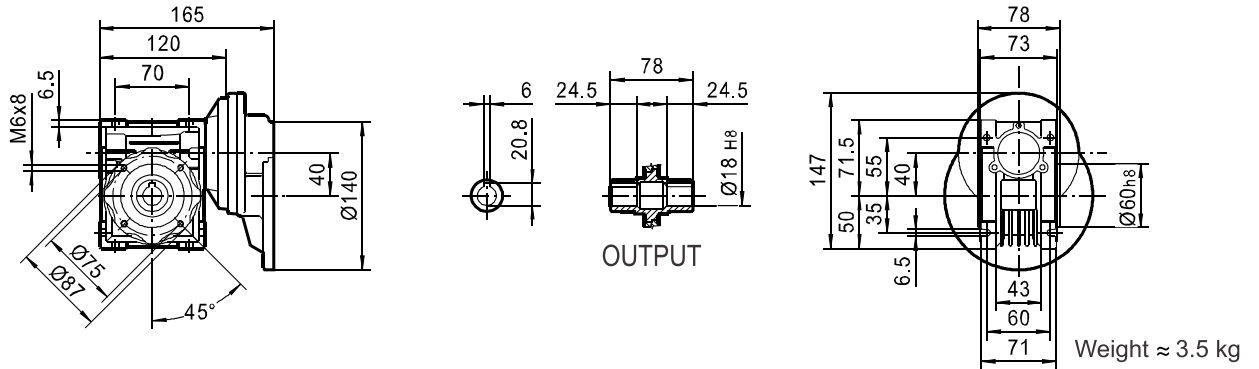
9.2 TW..ISS and NDES Outline Dimension



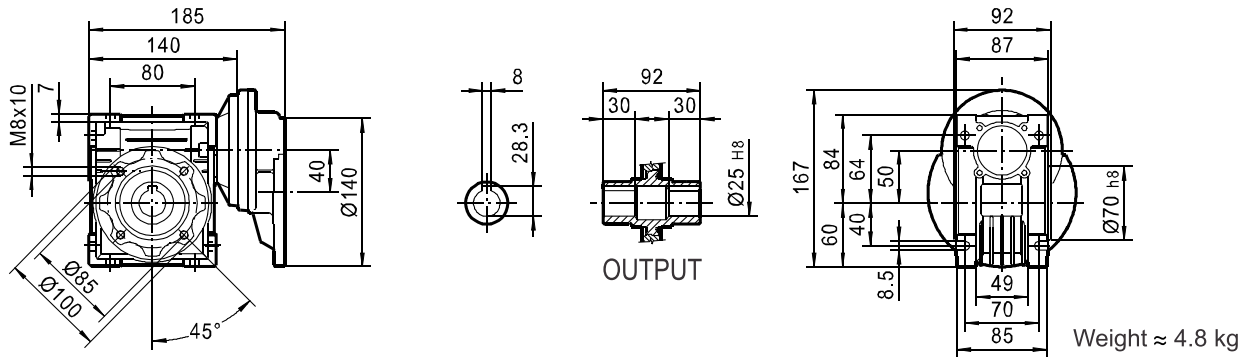
TW..ISS & NDES	030	040	050	063	075	090	110	130	150
B	23mm for 11mm dia 30mm for 14mm dia	23mm for 11mm dia 30mm for 14mm dia	30	40	50	50	60	60 (80)	60 (80)
D1 j6	11	11	14	19	24	24	28	28-(30 on request)	28-(35 on request)
D2 j6	14	14	14	19	24	24	28	28-(30 on request)	28-(35 on request)
G2	51	60	74	90	105	125	142	162	195
G3	45	53	64	75	90	108	135	155	175
a	30	40	50	63	75	90	110	130	150
b2	4mm for 11mm dia 5mm for 14mm dia	4mm for 11mm dia 5mm for 14mm dia	5	6	8	8	8	8	8 (10)
f1	M4	M4	M6	M6	M8	M8	M10	M10	M10 (M12)
f2	M5	M5	M6	M6	M8	M8	M10	M10	M10 (M12)
t2	10.2	12.5	16	21.5	27	27	31	31(33)	31(38)

9.3 HL - TW.. Outline dimension

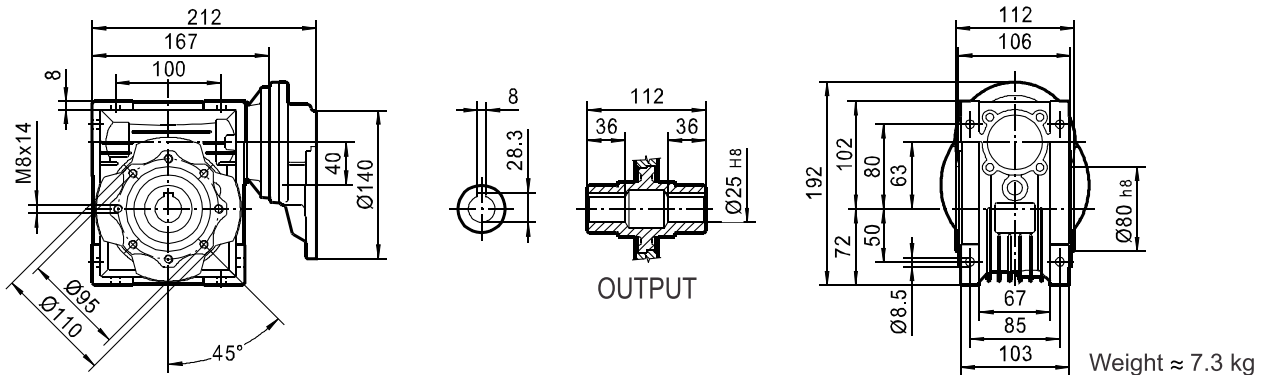
HL63 - TW40



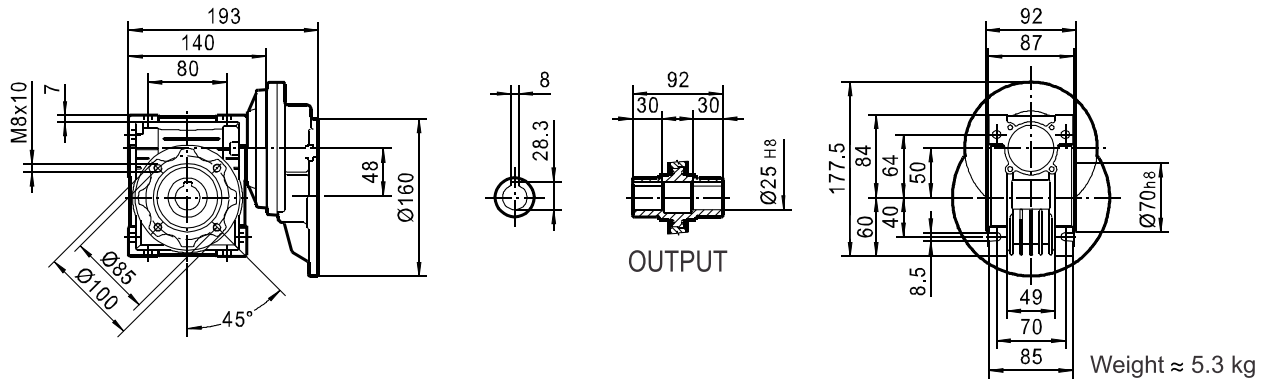
HL63 - TW50



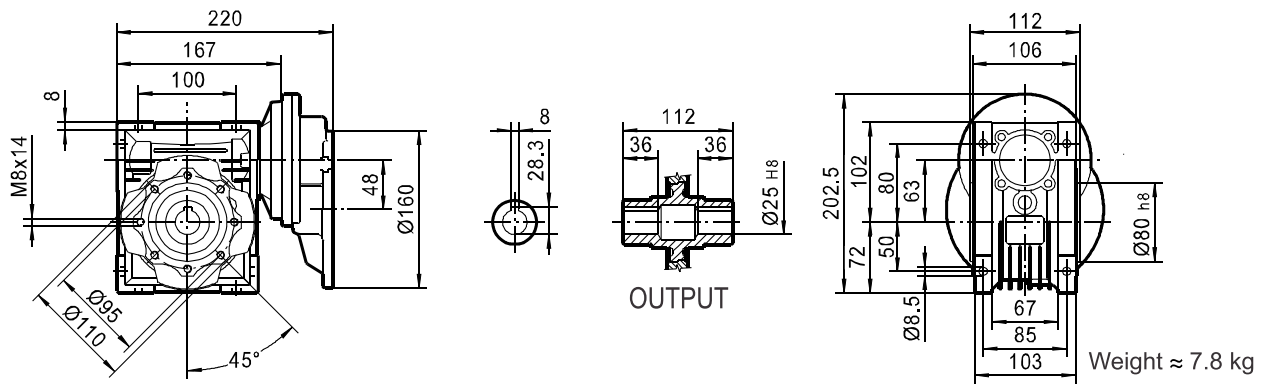
HL63 - TW63



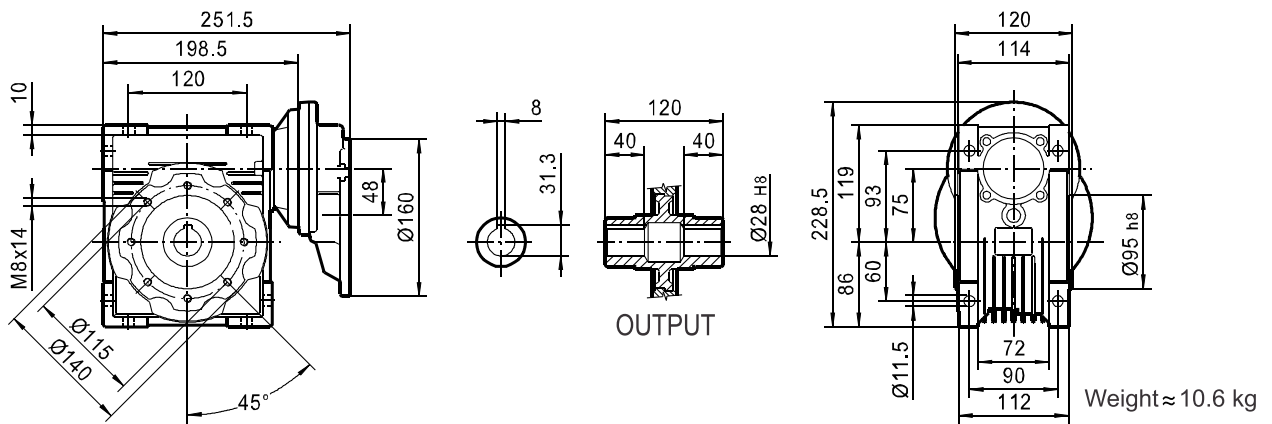
HL71 - TW50



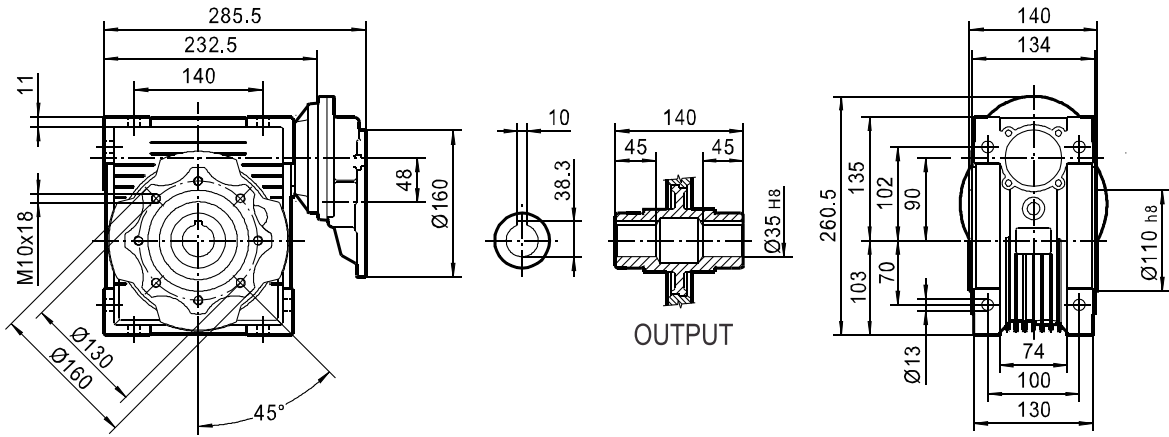
HL71 - TW63



HL71 - TW75

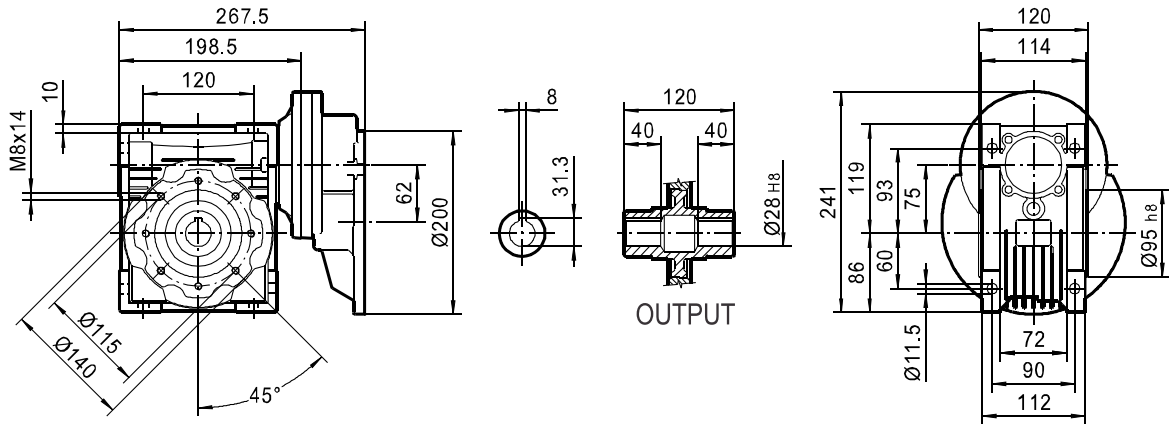


HL71 - TW90



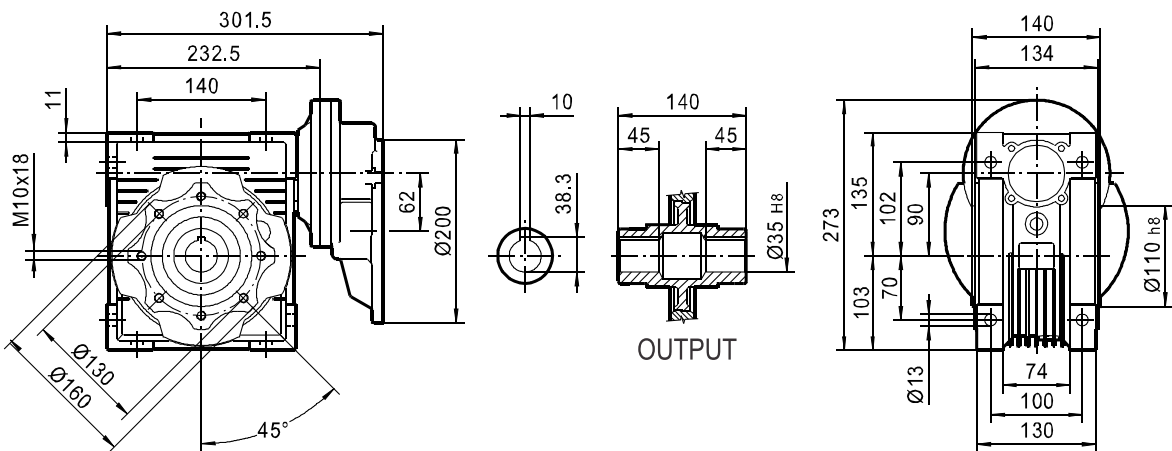
Weight \approx 14.8 kg

HL80 - TW75



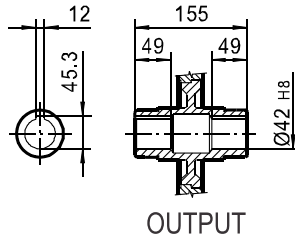
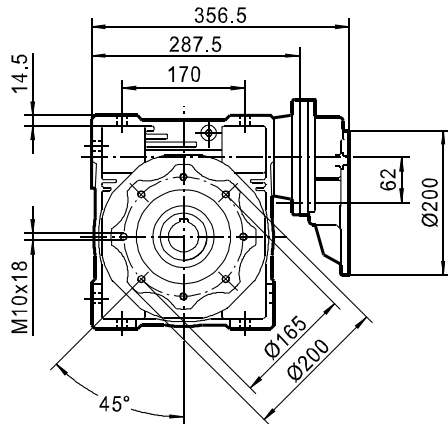
Weight \approx 12.4 kg

HL80 - TW90



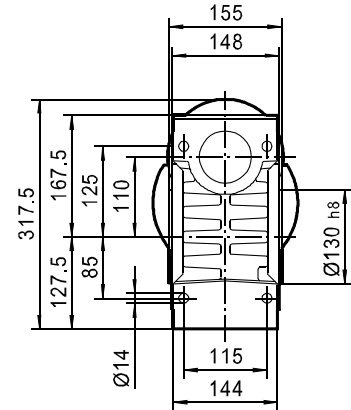
Weight \approx 16.6 kg

HL80- TW110



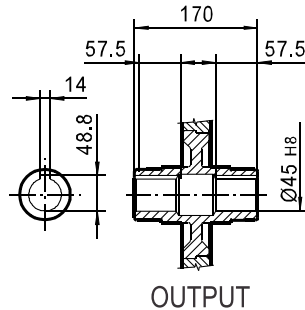
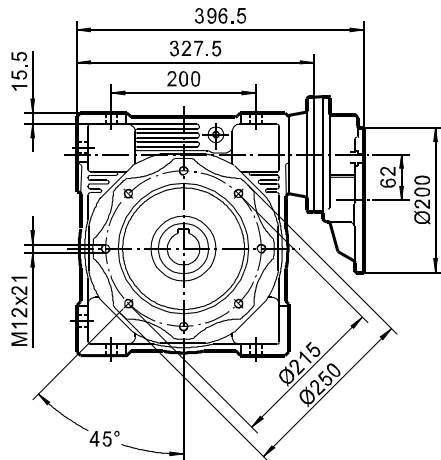
OUTPUT

HL90- TW110



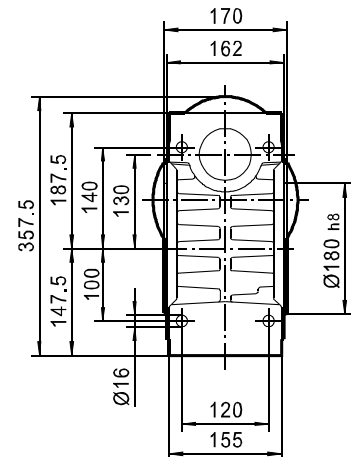
Weight ≈ 41.4 kg

HL80- TW130



OUTPUT

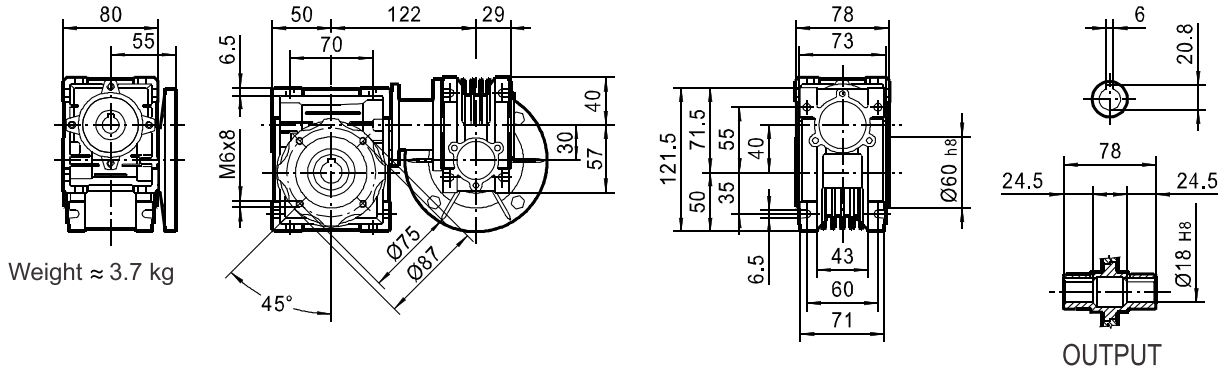
HL90- TW130



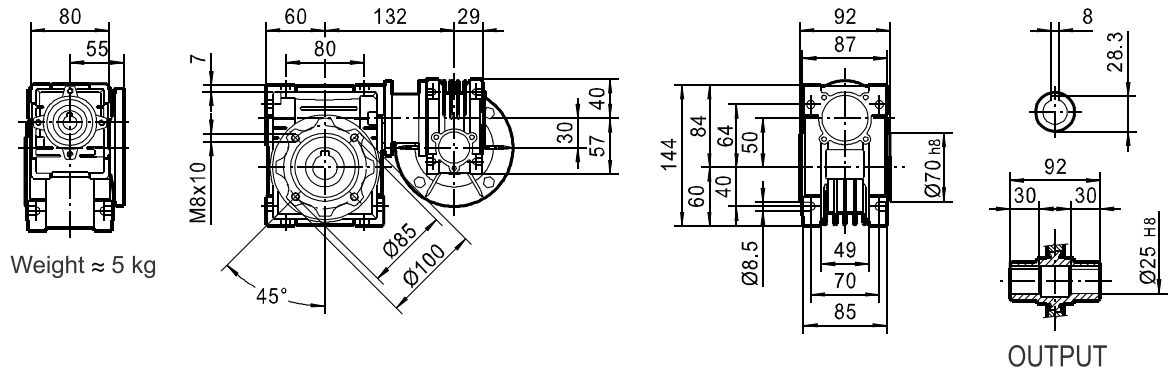
Weight ≈ 55.9kg

9.4 TW / TW.. Outline dimension

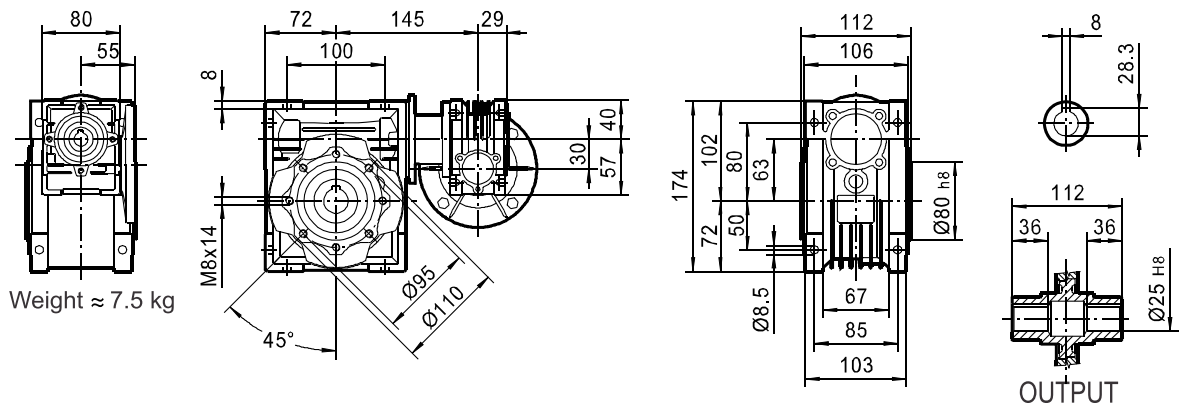
TW30/40



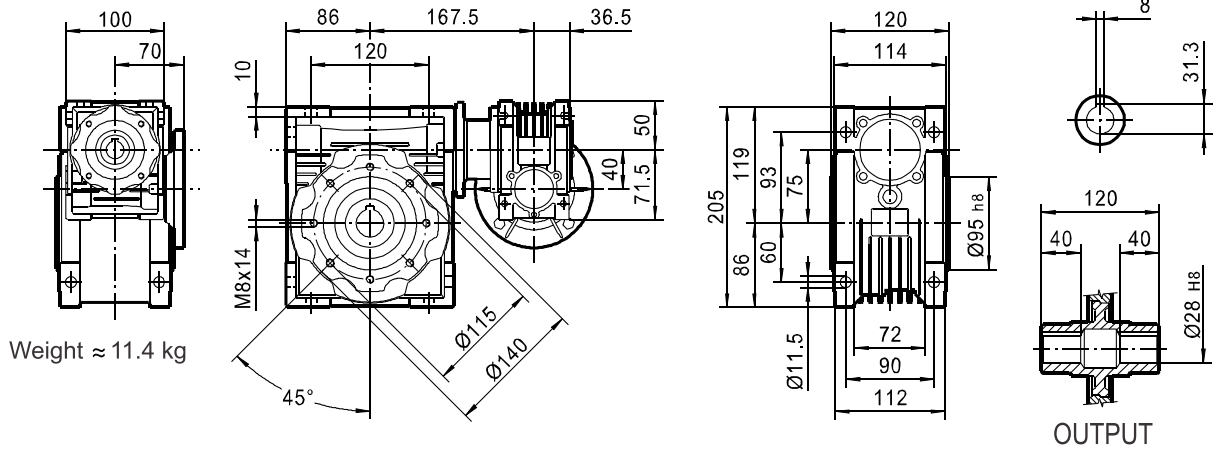
TW30/50



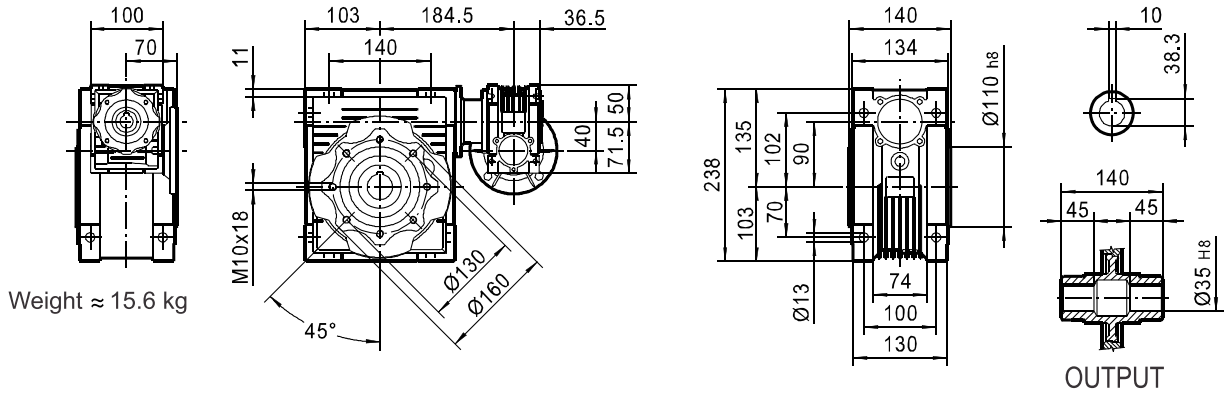
TW30/63



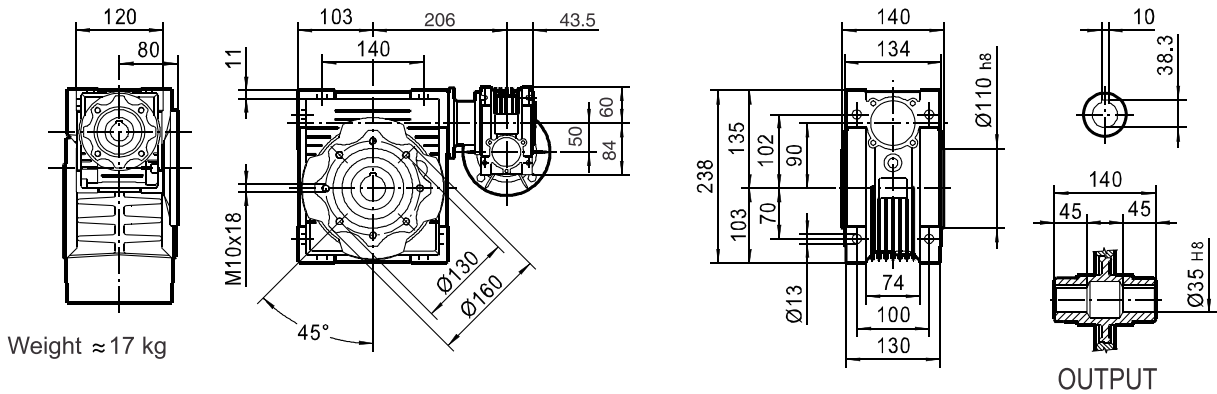
TW40/75



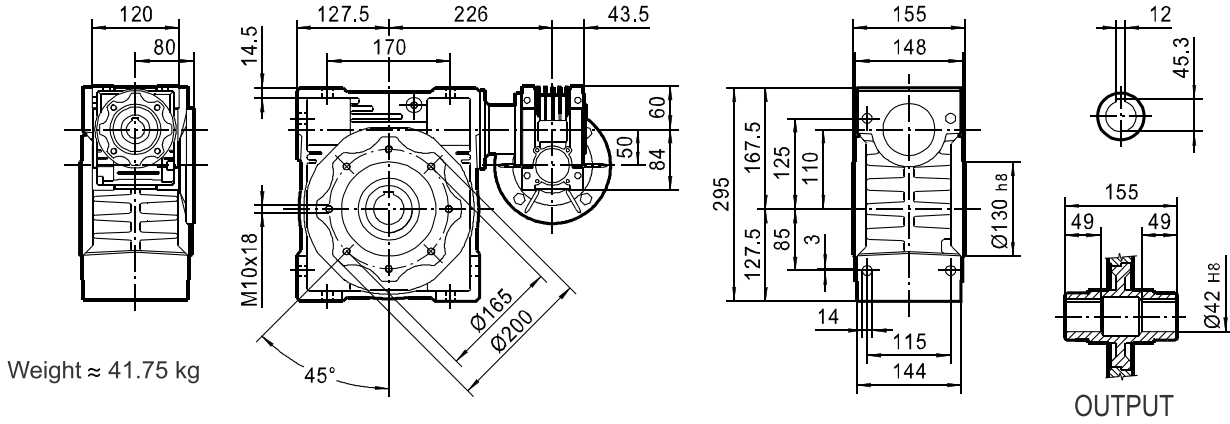
TW40/90



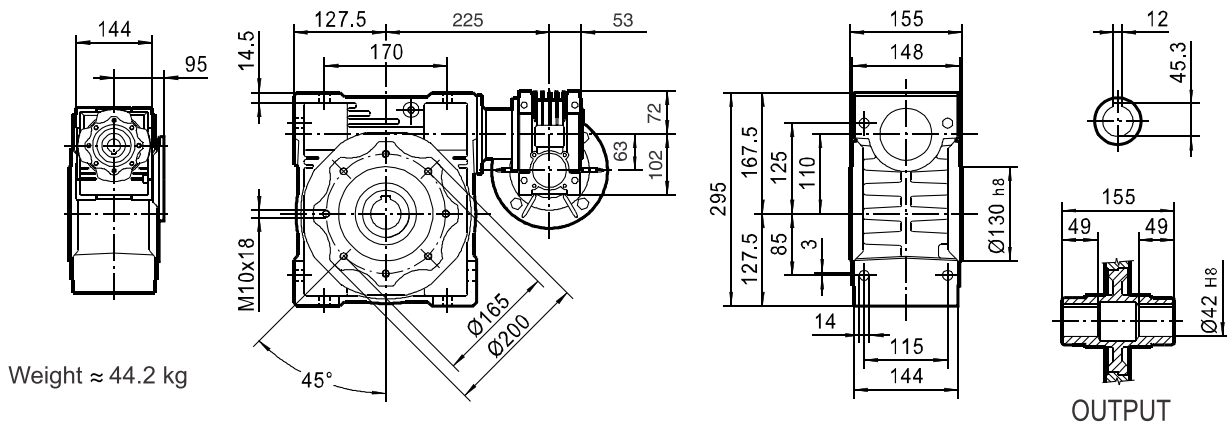
TW50/90



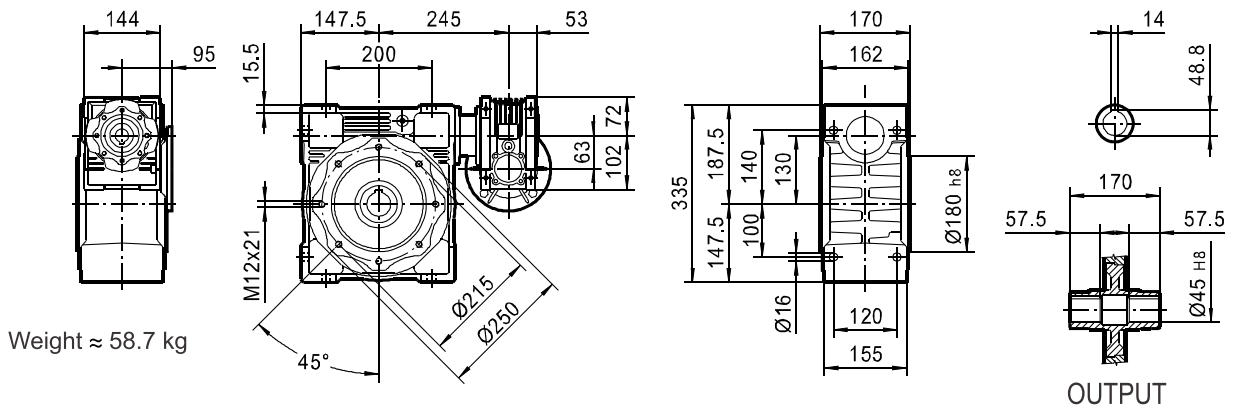
TW50/110



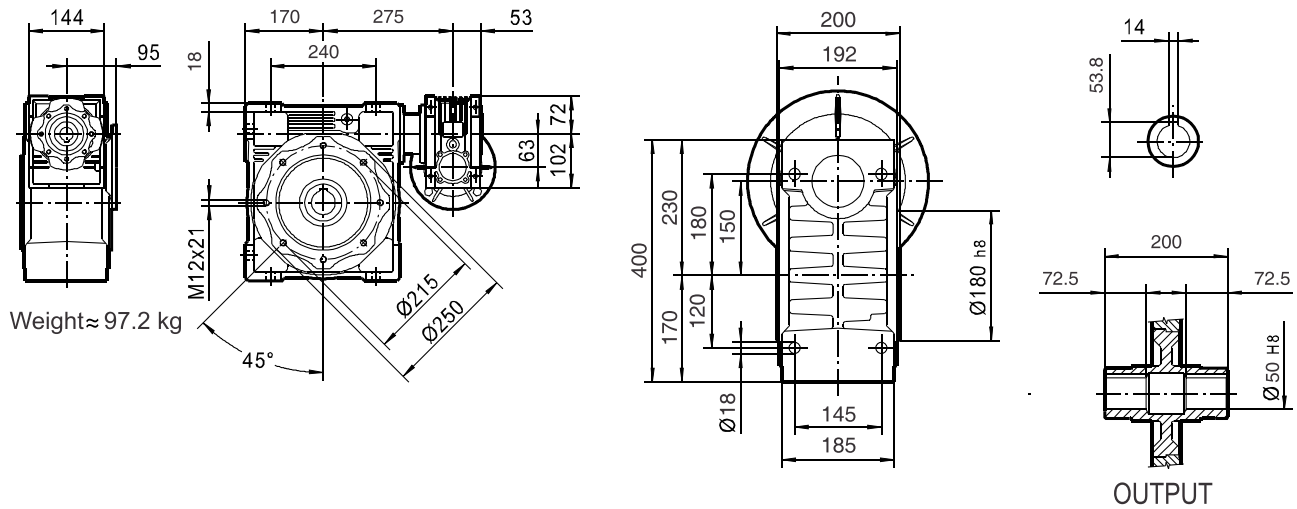
TW63/110



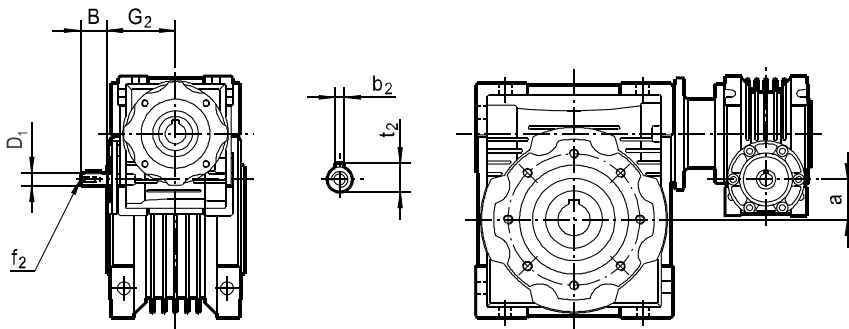
TW63/130



TW63/150



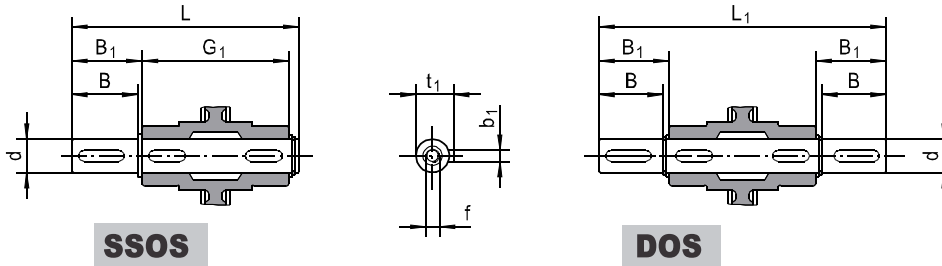
9.5 TW / TW..ISS Outline Dimension



TW/TW..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
D1 j6	9	9	9	11	11	14	14	19	19	19
G2	51	51	51	60	60	74	74	90	90	90
a	10	20	33	35	50	40	60	47	67	87
b2	3	3	3	4	4	5	5	6	6	6
f2	-	-	-	-	-	M6	M6	M6	M6	M6
t2	10.2	10.2	10.2	12.5	12.5	16	16	21.5	21.5	21.5

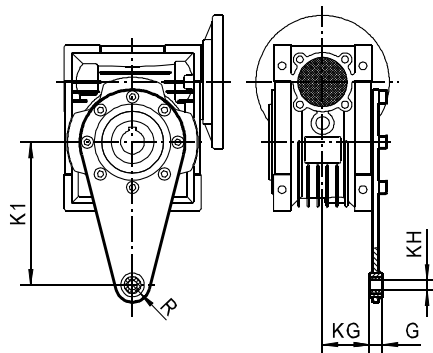
10. ACCESSORIES OUTLINE DIMENSION

10.1 Output Shafts



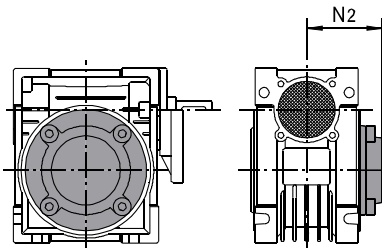
	d_{h6}	B	B₁	G₁	L	L₁	f	b₁	t₁
TW30	14	30	32.5	63	102	128	M6	5	16
TW40	18	40	43	78	128	164	M6	6	20.5
TW50	25	50	53.5	92	153	199	M10	8	28
TW63	25	50	53.5	112	173	219	M10	8	28
TW75	28	60	63.5	120	192	247	M10	8	31
TW90	35	80	84.5	140	234	309	M12	10	38
TW110	42	80	84.5	155	249	324	M16	12	45
TW130	45	80	85	170	265	340	M16	14	48.5
TW150	50	82	87	200	297	374	M16	14	53.5

10.2 Torque Arm (TRA)



	K₁	G	KG	KH	R
TW30	85	14	24	8	15
TW40	100	14	31.5	10	18
TW50	100	14	38.5	10	18
TW63	150	14	49	10	18
TW75	200	25	47.5	20	30
TW90	200	25	57.5	20	30
TW110	250	30	62	25	35
TW130	250	30	69	25	35
TW150	250	30	84	25	35

10.3 Output side Cover (C)



	N₂		N₂
TW30	47	TW90	94
TW40	55	TW110	102
TW50	63	TW130	117
TW63	73	TW150	132
TW75	79		