

A close-up photograph of a dark grey industrial motor. The motor has a prominent cooling fan on the front and a terminal box on top. The background is blurred, showing some orange and yellow light trails. A semi-transparent white box is overlaid on the center of the image, containing the company logo and name.

**F**indynamica  
drive and control products

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## 01. GENERAL FEATURES

### High efficiency motors

These motors are designed with the new european standard for high efficiency.

MS line, is designing and manufacturing in according to the parameters of the new european classification standard for high efficiency IE1 ,IE2.

TA and TC lines, are designed and manufactured in accordance with the parameters of the new european classification standard for high efficiency IE 1 ,IE2,IE3

The motors are totally enclosed, fan cooled, with squirrel cage rotor.

MS and TA lines, from frame 56 to frame 200, are provided with aluminium frame.

TC line, from frame 132 to frame 560, is provided with cast iron frame.

IEC 60034-30 standard defines three IE (International Efficiency) efficiency classes of single speed three-phase cage induction motors; 50Hz and 60Hz; 2,4,6 pole; rated voltage up to 1000V;duty type S1 or S3 with a rated cyclic duration factor of 80% or higher operating direct on line.

- IE1 standard efficiency
- IE2 high efficiency from 0,75 to 375 Kw, obligatory in Europe from 16.07.2012
- IE3 premium efficiency form 7,5 to 375 Kw ,obligatory in Europe from 01.01.2015 and from 0,75 to 375 Kw obligatory in Europe from 01.01.2017

RATED POWER Kw	STANDARD EFFICIENCY (IE1) STANDARD POLI-POLES			STANDARD EFFICIENCY (IE2) HIGH POLI-POLES			STANDARD EFFICIENCY (IE3) PREMIUM POLI-POLES			STANDARD EFFICIENCY (IE4) SUPER PREMIUM POLI-POLES		
	2	4	6	2	4	6	2	4	6	2	4	6
0,75	72,1	72,1	70,0	77,4	79,6	75,9	80,7	82,5	78,9	Under consideration, it is expected that new technologies allow cage- induction motors to reach IE4 standrads level.		
1,1	75,0	75,0	72,9	79,6	81,4	78,1	82,7	84,1	81,0			
1,5	77,2	77,2	75,2	81,3	82,8	79,8	84,2	85,3	82,5			
2,2	79,7	79,7	77,7	83,2	84,3	81,8	85,9	86,7	84,3			
3	81,5	81,5	79,7	84,6	85,5	83,3	87,1	87,7	85,6			
4	83,1	83,1	81,4	85,8	86,6	84,6	88,1	88,6	86,8			
5,5	84,7	84,7	83,1	87,0	87,7	86,0	89,2	89,6	88,0			
7,5	86,0	86,0	84,7	88,1	88,7	87,2	90,1	90,4	89,1			
11	87,6	87,6	86,4	89,4	89,8	88,7	91,2	91,4	90,3			
15	88,7	88,7	87,7	90,3	90,6	89,7	91,9	92,1	91,2			
18,5	89,3	89,3	88,6	90,9	91,2	90,4	92,4	92,6	91,7			
22	89,9	89,9	89,2	91,3	91,6	90,9	92,7	93,0	92,2			
30	90,7	90,7	90,2	92,0	92,3	91,7	93,3	93,6	92,9			
37	91,2	91,2	90,8	92,5	92,7	92,2	93,7	93,9	93,3			
45	91,7	91,7	91,4	92,9	93,1	92,7	94,0	94,2	93,7			
55	92,1	92,1	91,9	93,2	93,5	93,1	94,3	94,6	94,1			
75	92,7	92,7	92,6	93,8	94,0	93,7	94,7	95,0	94,6			
90	93,0	93,0	92,9	94,1	94,2	94,0	95,0	95,2	94,9			
110	93,3	93,3	93,3	94,3	94,5	94,3	95,2	95,4	95,1			
132	93,5	93,5	93,5	94,6	94,7	94,6	95,4	95,6	95,4			
160	93,8	93,8	93,8	94,8	94,9	94,8	95,6	95,8	95,6			
200-375	94,0	94,0	94,0	95,0	95,1	95,0	95,8	96,0	95,8			

## 02. STANDARDS

### **Motors MS,TA,TC series are comply with the following Standards:**

RATINGS AND PERFORMANCES  
IEC 60034-1 CEI EN 60034- 1

METHODS FOR DETERMINING LOSSES AND EFFICIENCY IEC 60034-2 CEI EN 60034-2

ROTATING ELECTRICAL MACHINES, PART 30, EFFICIENCY CLASSES OF SINGLE SPEED, THREE-PHASE INDUCTION MOTORS (IE CODE)  
IEC 60034-30 edition 1

CLASSIFICATION OF DEGREES OF PROTECTION (IP CODE) IEC 60034-5 CEI EN 60034-5

METHODS OF COOLING (IC CODE)  
IEC 60034 - 6 CEI EN 60034-6

CLASSIFICATION OF TYPE OF CONSTRUCTION MOUNTING ARRANGEMENTS (IM CODE)  
IEC 60034-7 CEI EN 60034-7

TERMINAL MARKINGS AND DIRECTION OF ROTATION  
IEC 60034-8 CEI 2-8

NOISE LIMITS  
IEC 60034-9 CEI EN 60034- 9

BUILT-IN THERMAL PROTECTIONS  
IEC 60034-11

STARTING PERFORMANCE OF ROTATING ELECTRICAL MACHINES  
IEC 60034- 12 CEI EN 60034 - 12

MECHANICAL VIBRATIONS  
IEC 60034-14 CEI EN 60034-14

DIMENSIONS AND OUTPUTS FOR ELECTRICAL MACHINES  
CEI EN50347 IEC 60072-1 IEC 60072-2

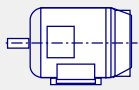
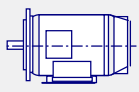
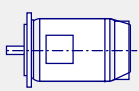
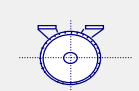
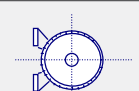
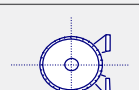
The coupling dimensions are in compliance with the following standards:  
UNEL 13113-71 for the B3 mounting and for other frame shapes  
UNEL 13117-71 for the B5 mounting and for other frame shapes

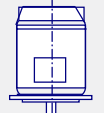
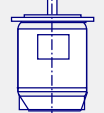
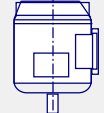
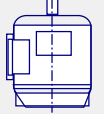
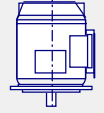
The UNEL standards are in accordance with the IEC international standards publication 72 and relative Amendment Nr. 1.

## 03. MOUNTING AND POSITIONS

Frame according to IEC 60034-7, are defined in the following table:

FIGURE	STANDARDS			FRAME SIZES		
	CEI 2-14	IEC 60034-7		56-160	180-280	315-355
		Code I	Code II			

	B 3	IM B 3	IM 1001	standard		
	B 3/B 5	IM B 35	IM 2001	standard		
	B 5	IM B 5	IM 3001	standard	standard	A richiesta
	B 8	IM B 8	IM 1071	standard	upon request	upon request
	B 6	IM B 6	IM 1051	standard	upon request	upon request
	B 7	IM B 7	IM 1061	standard	upon request	upon request

	V 1	IM V 1	IM 3011	standard		
	V 3	IM V 3	IM 3031	standard	standard	upon request
	V 5	IM V 5	IM 1011	upon request	upon request	upon request
	V 6	IM V 6	IM 1031	upon request	upon request	upon request
	V 1 / V 5	IM V 15	IIM 2011	standard	standard	upon request

## 04. INGRESS PROTECTION

The motors protection degrees according to IEC 60034-5 standards, are:

**IP 55 (standard)** totally enclosed motors, fan cooled, protected against penetration of dust and water splashes coming from any direction

**IP 56 (upon request)** totally enclosed motors, protected against dust penetration and against sea waves, for use on deck.

Normally IP56 motors are supplied with external fan (IC 411 - IC 416 or IC 418).  
Upon request they can be supplied without fan . (IC410). In this case the features, outputs and technical data will be supplied upon request.

The external fan is covered by a fan cover with IP 20 protection degree, in line with safety standards.  
Motors for vertical mounting V 1, V5, V1N 5, are supplied with rain cowl.  
The terminal box, in aluminium or cast iron, has IP 55 or IP56 protection degree.

## 05. GENERAL COSTRUCTION FEATURES

The motors have been designed and manufactured in compliance with international standards.

TA and MS series are available from frame size 56 to frame size 200.  
Frame and terminal box are in aluminum, cover fan cover is in sheet steel, flanges and shields are in aluminum.

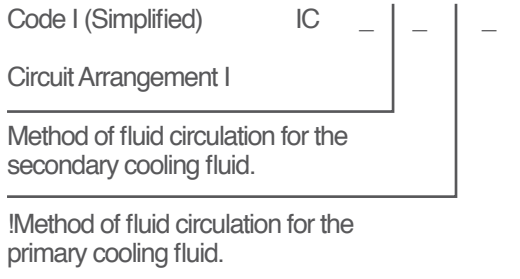
TC serie is available from frame size 132 to frame size 355.  
Frame and terminal box are in cast iron, cover fan cover is in sheet steel, flanges and shields are in cast iron.

The terminal box, standard is on the top of the motor, can be rotated in step of 90° , can transform motors with terminal box on left or on right from frame size 56 to frame size 280.

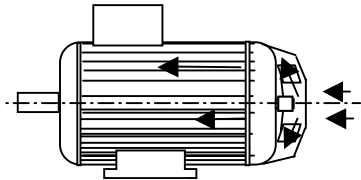
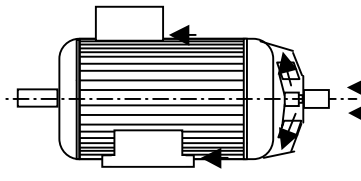
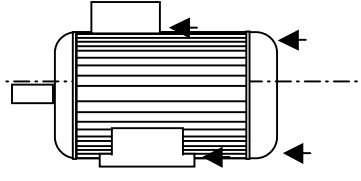
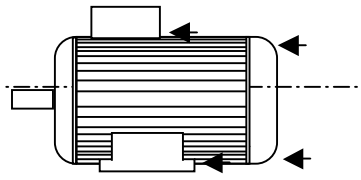
Fans are in nylon, upon request can be supplied with fans in aluminium or steel sheet.  
Feet are removable , on all series, from frame size 56 to frame size 280.

## 06. COOLING

The designation of cooling method is given by the IC (International Cooling) code, according to IEC 60034-6



Motors in standard execution of frame sizes from 56 to 355 are supplied with IC 411 cooling systems, incorporating a bidirectional fan. All frame sizes can be supplied with cooling system IC 416 on request. In this case a proper fan is fitted inside the fan cover, suitably reinforced, in order to make the ventilation independent of the rotation speed.

IC CODE	FIGURE	DESCRIPTION	NOTE
IC 411		Self ventilating motor. Enclosed machine. Externally finned. External shaft-mounted fan.	Standard
IC 416		Motor with assisted ventilation. Enclosed machine. Externally finned. Independent external fan mounted inside the fan cover.	Upon request
IC 418		Motor with external ventilation. Enclosed machine. Externally finned ventilation provided by air flowing from the driven system.	Upon request
IC 410		Motor with natural ventilation. Enclosed machine.	Upon request



## 07. BEARINGS

Motors TA and MS series from frame size 56 to frame size 200 have sealed pre-lubricated ball bearings, DE and NDE side, C3  
 Motors TC series frame size 132 have sealed pre-lubricated ball bearings, DE and NDE side, C3.

Motors TC series from frame size 160 to frame size 280 (including 315 2 pole) have ball bearings, DE and NDE, C3.

Motors TC series from frame size 315 (4,6,8 pole) to frame size 355, have roller bearings DE side and ball bearings NDE side.

All non pre-lubricated bearings need to periodically re-lubricated according to the data give in the motors maintenance manuals  
 Motor with bearing axial constrains have an arrangement with a spring in order to absorb vibrations.

The lifetime of bearings (in accordance with supplier data) is in excess of 40.000 hours, for motors with direct coupling.

In table are mentioned all specifications concerning bearings installed on motors frame size 56-355

MOTOR TYPE	POLES	MOUNTING B3		FORMA COSTRUTTIVA B5/B14	
		Bearing coupling side DE	Bearing opposite coupling side NDE	Bearing coupling side DE	Bearing opposite coupling side NDE
TA/MS 56	2-4-6-8	6201-2RS-C3	6201-2RS-C3	6201-2RS-C3	6201-2RS-C3
TA/MS 63	2-4-6-8	6201-2RS-C3	6201-2RS-C3	6201-2RS-C3	6201-2RS-C3
TA/MS 71	2-4-6-8	6202-2RS-C3	6202-2RS-C3	6202-2RS-C3	6202-2RS-C3
TA/MS 80	2-4-6-8	6204-2RS-C3	6204-2RS-C3	6204-2RS-C3	6204-2RS-C3
TA/MS 90	2-4-6-8	6205-2RS-C3	6205-2RS-C3	6205-2RS-C3	6205-2RS-C3
TA/MS 100	2-4-6-8	6206-2RS-C3	6206-2RS-C3	6206-2RS-C3	6206-2RS-C3
TA/MS 112	2-4-6-8	6306-2RS-C3	6206-2RS-C3	6306-2RS-C3	6206-2RS-C3
TA/MS 132	2-4-6-8	6308-2RS-C3	6208-2RS-C3	6308-2RS-C3	6208-2RS-C3
TA/MS 160	2-4-6-8	6309-2RS-C3	6209-2RS-C3	6309-2RS-C3	6209-2RS-C3
TA/MS 180	2-4-6-8	6311-2RS-C3	6211-2RS-C3	6311-2RS-C3	6211-2RS-C3
TA/MS 200	2-4-6-8	6312-2RS-C3	6212-2RS-C3	6312-2RS-C3	6212-2RS-C3
TC 132	2-4-6-8	6308ZZ-C3	6308ZZ-C3	6308ZZ-C3	6308ZZ-C3
TC 160	2-4-6-8	6309-C3	6309-C3	6309-C3	6309-C3
TC 180	2-4-6-8	6311-C3	6311-C3	6311-C3	6311-C3
TC 200	2-4-6-8	6312-C3	6312-C3	6312-C3	6312-C3
TC 225	2-4-6-8	6313-C3	6313-C3	6313-C3	6313-C3
TC 250	2-4-6-8	6314-C3	6314-C3	6314-C3	6314-C3
TC 280	2-4-6-8	6316-C3	6316-C3	6316-C3	6316-C3
TC 315	2	6317-C3	6317-C3	6317-C3	6317-C3
TC 315	4-6-8	NU319	6319-C3	NU319	6319-C3
TC 355	2	6319-C3	6319-C3	6319-C3	6319-C3
TC 355	4-6-8	NU322	6322-C3	NU322	6322-C3

Upon request can be mounted, roller bearings at DE side, where non-standard, insulated bearings at NDE side , and reinforced bearings at NDE side.



## 08. TERMINAL BOX

The terminal board is normally equipped with 6 terminal and is made with non hygroscopic and mildew resistance material.

Terminal box for TA and MS series is made in aluminum, in cast iron for TC series.

Terminal box has IP 55 standard protection degree or IP56.

In the series TA and MS from size 56 to size 90 are mounted a cable-holder and a plug, from size 100 to size 200 are mounted two cable-holder, from size 160 up is mounted a cable-holder M16x1,5 for PTC connection.

In the TC series are mounted two cable-holders. from size 160 up is mounted a cable-holder M 16x 1,5 for PTC connection.

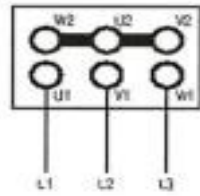
Generally. a cable-holder with the following dimensions is provided for:

FRAME	CABLE-HOLDER
TA/MS 56	1-M16x1,5
TA/MS 63	1-M16x1,5
TA/MS 71	1-M20x1,5
TA/MS 80	1-M20x1,5
TA/MS 90	1-M20x1,5
TA/MS 100	2-M20x1,5
TA/MS 112	2-M25x1,5
TA/MS 132	2-M25x1,5
TA/MS 160	2-M32x1,5+1-M16x1,5
TA/MS 180	2-M40x1,5+1M16x1,5
TA/MS 200	2-M40x1,5+1M16x1,5
TC 132	2-M25x1,5
TC 160	2-M32x1,5+1M16x1,5
TC 180	2-M32x1,5+1M16x1,5
TC 200	2-M40x1,5+1M16x1,5
TC 225	2-M50x1,5+1M16x1,5
TC 250	2-M50x1,5+1M16x1,5
TC 280	2-M50x1,5+1M16x1,5
TC 315	2-M63x1,5+1M16x1,5
TC 355	2-M63x1,5+1M16x1,5

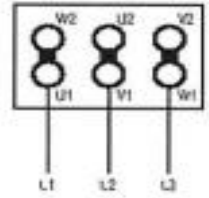
## 09. CONNECTION

### Single speed motors

connection star Y  
highest voltage on plate



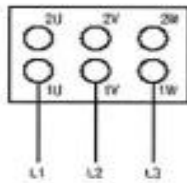
connection delta  $\Delta$   
lower voltage on plate



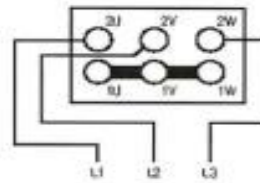
### Double speed motors

Dahlander  
single winding  
6 terminals

lower speed

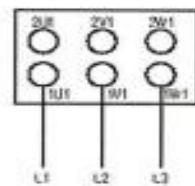


higher speed

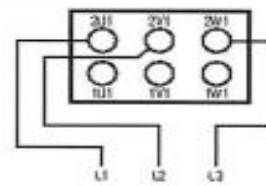


Two separate windings  
6 terminals

lower speed



higher speed



## 10. PLATE

### Motor plate

MOTOR						CE
TYPE:			(H)	IEC60034	Kg	
SN No.		ThCl.		IMB		
V	Hz	min <sup>-1</sup>	kW	A	cosφ	(100%)
Δ						(75%)
Y						(50%)
Δ						
Y						

Motors with Standard efficiency IE1 is given on the plate efficiency at 100% load

Motors subject to the efficiency classification level IE2 and IE3 in accordance to IEC 60034-30 and the commission regulation (EC) No. 640/2009 on plate there are the correspondent efficiency level and the nominal efficiency at full, 3/4 and 2/4 rated load.

### Servo-ventilation plate

MOTOR		CE
Type G	<input type="text"/>	No <input type="text"/>
Power	<input type="text"/> W	Electric current <input type="text"/> A
Rotating speed <input type="text"/> r/min		
Frequency	<input type="text"/> Hz	Voltage <input type="text"/>
Capacity	<input type="text"/> m <sup>3</sup> /h	Pressure <input type="text"/> Pa
Noise	<input type="text"/> dB(A)	Diameter <input type="text"/> mm
Insulation Class	<input type="text"/>	Protection Class <input type="text"/> IP

## 11. INSULATION, WINDING

The motors of the series MS,TA,TC are made in F insulation class.

The soft copper electrolytic wire is insulated by using a special enamel (double enamel). Such enamel is classified as H insulation class. All insulating materials used to produce motors are in F or H insulation class.

The winding undergoes a treatment as follows: it is impregnated by soaking it in oven-curing F class resins, it is tropicalized following a process including a spraying of anti-salty enamel and, finally, it is coated using a spray with heatproof, humidity-proof, chemical agent and sea-ambient corrosive action resistant characteristics.

The impregnation cycle is carried out under vacuum.

## 12. RATINGS AND TECHNICAL DATA

Power and data reported in the Technical Data Tables are for continuous duty (S 1) at an ambient temperature of 40 C, max. altitude 1000 a.s.l., with supply at 400 V - 50Hz.

In such conditions, the temperature rise reached by the motors is lower than the one provided for by the F insulation class.

The operating characteristics are guaranteed with the tolerances defined by the CEI EN 60034-1 Standards and the IEC 60034-1 Recommendations, reported in the table:

CHARACTERISTICS	TOLERANCES
<b>Efficiency</b>	Motor power < 50 kW -15% di (1 - $\eta$ ) Motor power > 50 kW -10% di (1 - $\eta$ )
<b>Power factor</b>	+1/6 (1 - $\cos\phi$ ) Min 0.02 Max 0.07
<b>Locked rotor current</b>	+20% of guaranteed value
<b>Locked rotor torque</b>	-15% + 25% of guaranteed value
<b>Pull out torque</b>	-10% of guaranteed value
<b>Slip</b>	$\pm$ 20% of guaranteed value

## 13. SUPPLY VOLTAGE

The motors, series MS,TA,TC from frame size 56 to frame size 250 are designed to be used for supply at rated voltages from 220V to 690V at 50Hz and at 60Hz, motors from frame size 280 to frame size 355 are designed to be used for supply at rated voltages from 400V to 690V at 50Hz and at 60 Hz.

Standard rated voltages of the motors usually in stock are:

from frame size 56 to frame size 100, 230/400V 50Hz  
from frame size 112 to frame size 355, 400/690V 50Hz

Lower voltage is made with delta connection while the higher voltage is made with star connection.

In these supply conditions efficiencies are in compliance with the IEC 60034-30.

## 14. VOLTAGE AND FREQUENCY VARIATIONS

Motors can work without failures if the supply voltage variations are limited as stated in the Classification Society Standards. In particular, motors can run with voltage variations of 10% and frequency variations of 5% with a maximum combined variation of 10% with temperature rise in compliance with the provisions of the Classification Society Standards.

## 15. OPERATION AT 60HZ FREQUENCY

The motors can run with a frequency of 60 Hz with differences in performances and electrical sizes applying the multiplicative coefficients as described in the table. For motors made at 50Hz and supply at 60Hz, efficiency class of the motor at 50Hz is no longer valid.

PLATE VOLTAGE	PLATE VOLTAGE	NOMINAL POWER	NOMINAL CURRENT	NOMINAL TORQUE	RPM	STARTING CURRENT	STARTING TORQUE	MAX TORQUE
50 HZ	60 HZ							
230 +/- 10%	220 +/- 5%	1	1	0.83	1.2	0.83	0.83	0.83
230 +/- 10%	230 +/- 10%	1	0.95	0.83	1.2	0.83	0.83	0.83
230 +/- 10%	254 +/- 5%	1.15	1.02	0.96	1.2	0.93	0.93	0.93
230 +/- 10%	277 +/- 5%	1.2	1	1	1.2	1	1	1
400 +/- 10%	380 +/- 5%	1	1	0.83	1.2	0.83	0.83	0.83
400 +/- 10%	400 +/- 10%	1	0.95	0.83	1.2	0.83	0.83	0.83
400 +/- 10%	440 +/- 5%	1.15	1.02	0.96	1.2	0.93	0.93	0.93
400 +/- 10%	460 +/- 10%	1.15	1	0.96	1.2	0.96	0.96	0.96
400 +/- 10%	480 +/- 5%	1.2	1	1	1.2	1	1	1

## 16. DERATINGS

The tables of technical data are referred to an ambient temperature of 40 °C and an altitude up to 1000 a.s.l. In different environmental conditions output ratings vary, and are obtainable by applying the factors as mentioned in the following table, maintaining the temperature rise provided for by the B insulation class.

ALTITUDE M A.S.L	AMBIENT TEMPERATURE (°C)					
	30	30-40	45	50	55	60

≤ 1000	1.06	1	0.97	0.94	0.90	0.87
1500	1.04	0.97	0.94	0.91	0.87	0.84
2000	1	0.95	0.92	0.88	0.84	0.81
3000	0.96	0.89	0.86	0.82	0.78	0.74
4000	0.91	0.84	0.80	0.76	0.72	0.67

In case the temperature rise permitted for the F insulation class is used, the corrective factors are the same mentioned in the following table:

ALTITUDE M A.S.L	AMBIENT TEMPERATURE (°C)					
	30	30-40	45	50	55	60

≤ 1000	1.17	1.12	1.09	1.06	1.03	1
1500	1.15	1.10	1.07	1.04	1.01	0.97
2000	1.13	1.07	1.04	1.01	0.98	0.95
3000	1.08	1.02	0.99	0.96	0.93	0.89
4000	1.04	0.97	0.94	0.91	0.87	0.84

## 17. DUTIES

All technical data reported in the tables are referred to continuous duty (S1). Upon request, motors for limited Duty S2 (30 or 60 minutes) can be supplied.

## 18. OVERLOADS

Continuous duty motors can withstand the following overloads

OVERLOAD %	DURATION MINUTES	TIME INTERVAL MINUTES
10	10	15
20	6	15
30	4	15
40	3	15
50	2	15

In these operating overloads conditions, over temperature are than the limits of the insulation class F.

## 19. STARTING

Motors are suitable for the following types of starting:

- Direct
- Star - delta
- By autotransformer
- Soft-start (\*)
- by inverter (\*\*)

(\*)when the starting is finished soft-start should be by-passed, or precaution must be used the same when the motor powered with inverter

(\*\*) see as recommended in the paragraph n.23 "Inverter Supply"

## 20. VIBRATIONS

Motors are dynamically balanced with a half key applied to the shaft extension in accordance with standard IEC 60034-14 to vibration severity grade normal (N) in standard execution.

The following table indicates the maximum vibration grades with respect to the different shaft heights.

VIBRATION DEGREE	RATED SPEED	FRAME SIZE 56-355 Vmm/sec
N (normal)	600-1800	1.8
R (reduced)	600-1800	0.71
	1800-3600	1.12
S (special)	600-1800	0.45
	1800-3600	0.71



## 21. NOISE

The technical features table contains the values of A-sound pressure level (LpA) and A sound power level (LwA), measured at a one meter distance.

Sound levels are measured in no-load conditions and have tolerances of 3 dB(A).

FRAME SIZE	A-sound pressure level (LpA) · A-sound power level (LwA) dB(A)							
	2POLES		4POLES		6POLES		8POLES	
	LpA	LwA	LpA	LwA	LpA	LwA	LpA	LwA

56	69	78	63	72	58	67	54	63
63	75	84	67	76	61	70	58	67
71	75	84	67	76	61	70	58	67
80	75	84	70	79	63	72	61	70
90	75	85	70	80	66	76	66	76
100	77	87	70	80	66	76	66	76
112	78	88	73	83	66	76	66	76
132	69	78	63	72	58	67	54	63
160	75	84	67	76	61	70	58	67
180	75	84	67	76	61	70	58	67
200	75	84	70	79	63	72	61	70
225	75	85	70	80	66	76	66	76
250	77	87	70	80	66	76	66	76
280	78	88	73	83	66	76	66	76
315	80	90	77	87	73	83	69	79
355	86	97	84	96	82	94	79	91

The values of the noise (LpA) and of the sound power (LwA) in the table are related to the operation at 50Hz, when the frequency changes these values change how indicated in the following table:

SUPPLY FREQUENCY HZ	% VALUE OF THE NOISE LEVEL COMPARED TO THE 50HZ VALUE
------------------------	---

10	60%
20	60%
30	70%
40	100%
50	100%
60	100%
80	120%

## 22. THERMAL PROTECTIONS

All the motors from frame size 160 to frame size 355 have installed the positive temperature coefficient thermistors PTC, these protections at the active temperature this device quickly changes its standard resistance value, these protection, upon request, will be installed from frame size 56 to frame size 132.

Resistance of PTC, for nominal operating temperature (TK), will be satisfy the following value:

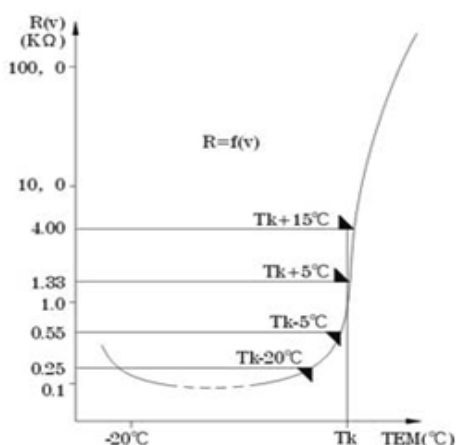
- < 250 Ohm from temperature from  $-20^{\circ}\text{C}$  to  $\text{TK}-20^{\circ}\text{C}$
- < 550 Ohm at a temperature of  $\text{TK}-5^{\circ}\text{C}$
- > 1330 Ohm at a temperature of  $\text{TK}+5^{\circ}\text{C}$
- > 4000 Ohm at a temperature of  $\text{TK}+15^{\circ}\text{C}$

In line with the standards, PTC installed disengaged for resistance value from 1650 Ohm to 4000 Ohm, in our case, installed n. 3 PTC in series, disengaged takes in the temperature range from  $\text{TK}-5^{\circ}\text{C}$  to  $\text{TK}+5^{\circ}\text{C}$ . Values of TK related with the class of insulation are the following:

CLASS OF INSULATION	OPERATING TEMPERATURE LIMIT OF THE INSULATION $^{\circ}\text{C}$	TK $^{\circ}\text{C}$
A	105	95-100
E	120	110-115
B	130	120-125
F	155	145-150
H	180	170-175

The nominal operating temperature of the thermistors PTC, mounted on the motors is  $150^{\circ}\text{C}$ , maximum supply voltage of the PTC theristors is 2,5V.

Below the characteristic resistance/ temperature of the PTC thermistors:



Upon request, the following thermal protections can be installed on the motors:

### Bimetallic devices

Motor protectors with contact normally closed. The contact opens when the winding temperature reaches limits dangerous to the insulation system of the motor.

### Platinum resistance thermometers PT100

Variable linear resistance with the winding temperature. Device particularly suitable for a continuous winding temperature monitoring.

The protection is normally made by 3 sensitive elements, one for every phase, series connected and with two terminals in a specially provided terminal board located in the main terminal box or in a specially provided auxiliary terminal box.

## 23. ANTICONDENSATION HEATERS

Motors subject to atmospheric condensation, either through standing idle in damp environments or because of wide ambient temperature variations, may be fitted with anticondensation heaters.

They are of tape form and are normally mounted on the stator winding head.

Anticondensation heaters are normally switched on automatically when the supply to the motor is interrupted, heating the motor to avoid water condensation.

Normal supply voltage is 115 V or 220/240V.

Anticondensation heater terminals are led to a specially provided terminal board located in the main terminal box. Upon request they can be led to a terminal board located in an auxiliary terminal box.

The power values normally used are shown in the table :

FRAME SIZE	POWER (W)
132-160	26
180-200	26
225-250	50
280-315	100
355	200

### Drainage hole

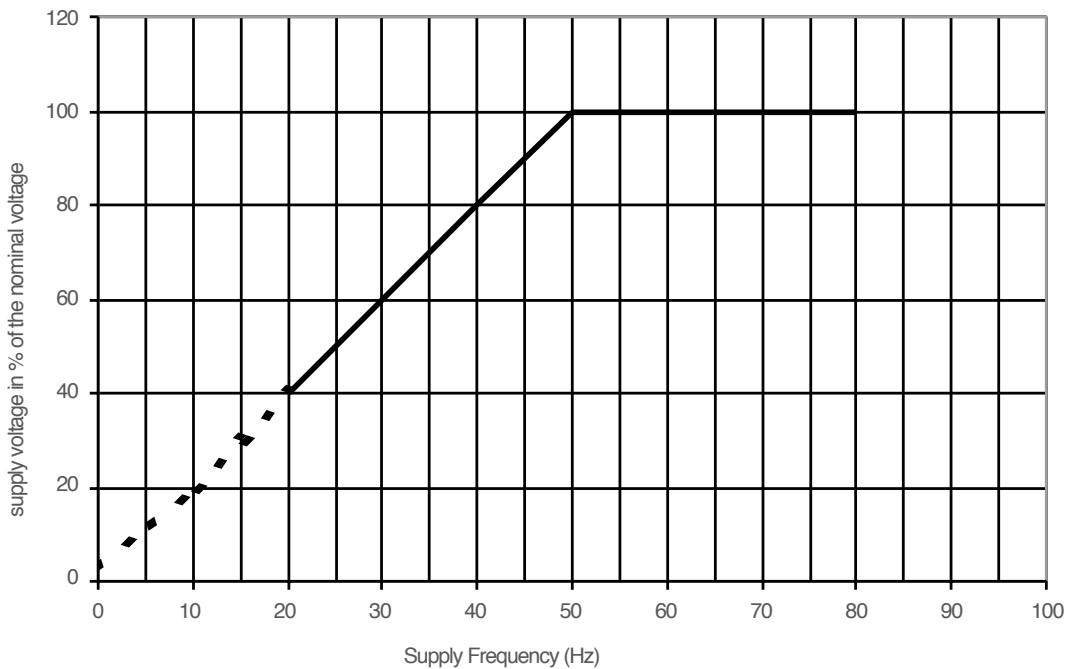
Motors of series MS, TA, TC are provided with holes for the discharge of condensate closed with a plug to guarantee the degree of protection IP reported on plate.

As a function of the operating conditions such plugs can be removed to allow the discharge of condensate that may form inside the motor.

## 24. INVERTER SUPPLY

Motors series MS,TA,TC are designed to be supplied by inverter.

These motors can be driven up to the rated frequency (50Hz) with supply voltage proportional to the frequency. (See diagr. 1), at higher frequencies they can be supplied at constant voltage up to the achievement of 80Hz



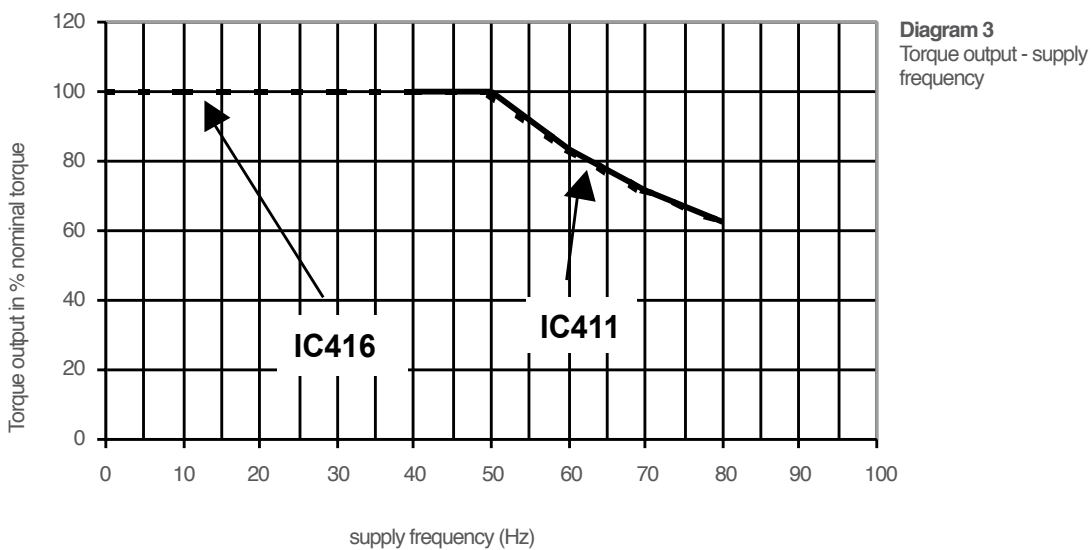
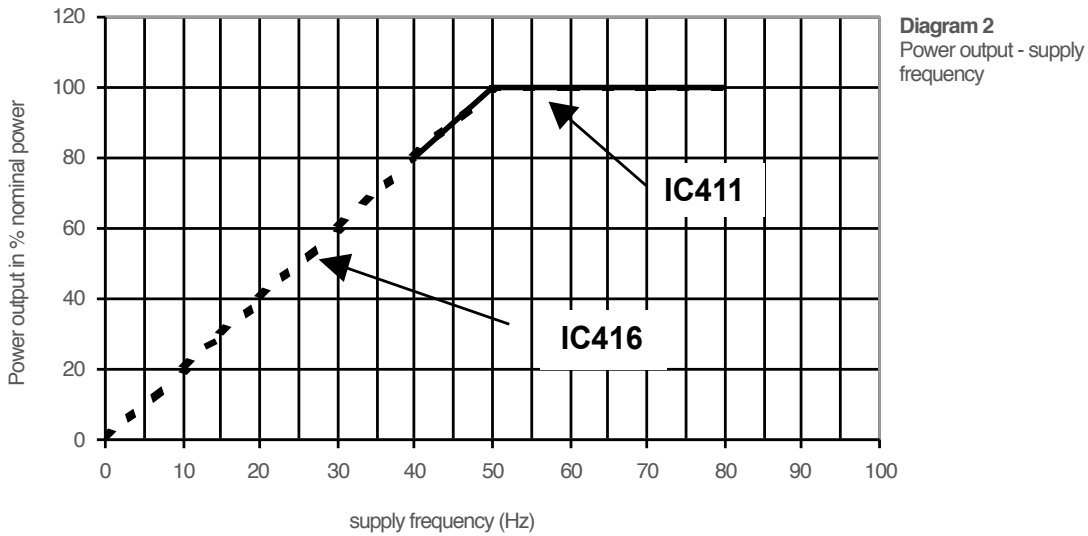
**Diagram 1**  
Supply voltage - Supply frequency

By the type of supply shown in diagr. 1, the flux created by the stator windings will be constant from 0 frequency to 50 Hz frequency, at frequencies higher than 50 Hz, the flux will be lower than the maximum value.

Note: At low frequencies ( 0 ~ 10Hz. ) due to the voltage drops, in order to keep the flux constant, the supply voltage should be slightly increased. This voltage increase depends both on the motor type and on the inverter type.

Consequently the motors in standard execution (self ventilating code IC411) are able to run at constant torque between 40 and 50 Hz and at constant power in the section included between 50 and 80 Hz (see diagram 2 and 3).

Upon request, the MS,TA,TC series motors can be equipped with an auxiliary fan (code IC 416), in this case they can supply a constant torque between 0 and 50 Hz and a constant power in the section included between 50 and 80 Hz.



The asynchronous three-phase motors to be used for inverter supply are designed and manufactured based on design and manufacturing choices that allow an optimum and reliable operation.

It has to be considered that generally the inverter supplies the asynchronous motor with a non sinusoidal current having a certain harmonic contents. This is due in particular: to the type of inverter, to the value of the switch frequency, to the length of the supply cables. Moreover steep voltage fronts to the motor terminals ( $dv/dt$ ) originated by the short commutation times of the IGBT, generate considerable stresses on the insulating materials.

Consequently the motor insulation must be carried out with the utmost care because it has to be able to withstand such higher stresses.

## 25. MAXIMUM SPEED

Motors supplied by inverter can run at a frequency higher than the rated one supplying the rated power up to the maximum frequency mentioned in table.

In these conditions the motor maximum torque remains 1.6 times higher than the rated torque.

FRAME SIZE	MAX SUPPLY FREQUENCY			
	2 POLES	4 POLES	6 POLES	8 POLES

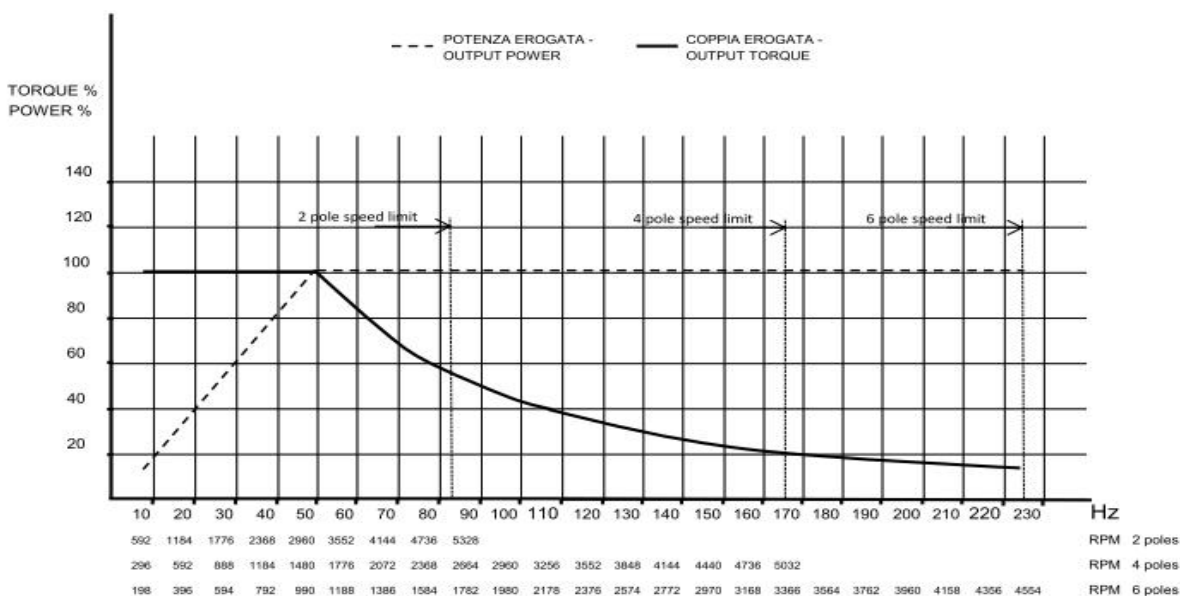
56 - 90	75	75	60	60
100 - 112	70	70	60	60
132 - 160	65	65	60	60

It is also possible to supply motors at an higher frequency, in this case the deliverable motor powers will be progressively reduced. In any case the motor maximum speeds, also at no load operation or dragged by the machine, must never exceed the limit mentioned in the following table:

FRAME SIZE	MAX PERMISSIBLE SPEED			
	2 POLES	4 POLES	6 POLES	8 POLES

132	5000	5000	4500	4500
160	5000	5000	4500	4500
180	5000	5000	4500	4500
200	5000	5000	4500	4500
225	4500	4500	4000	4000
250	4000	4000	3800	3800
280	4000	3000	3000	3000
315	3600	2600	2600	2600
355	3600	2600	2600	2600

Maximum allowable curves, continuous duty S1, 2,4,6 poles motor with forced ventilation (IC416)



## 26. AUXILIARY FANS

All frame sizes can be supplied with cooling system IC 416 (forced ventilation) on request. In this case a proper fan is fitted inside the fan cover, suitably reinforced.

Consequently the ventilation is independent of the rotation speed of the motor itself.

This solution is particularly suitable for inverter supplied motors.

### Auxiliary fans three phase

TYPE	SPEED r/min	MAXIMUM AIR FLOW m <sup>3</sup> /h	MAXIMUM PRESSURE pa	NOISE dB (A)
------	----------------	--	---------------------------	-----------------

63	2800	45	40	62
71	2800	52	50	62
80	2800	58	60	62
90	2800	91	80	65
100	2750	142	80	67
112	2600	229	80	67
132	1400	337	35	69
160	1390	609	40	72
180	1330	686	55	72
200	1230	1679	65	72
225	1430	1786	70	74
250	1420	1813	80	75
280	1360	2415	85	78
315	1320	2820	110	81
355	900	3500	800	85

3PHASE V	INPUT CURRENT A	Hz	INPUT POWER w
-------------	-----------------------	----	---------------------

230	0,124	50	20
230	0,132	50	25
230	0,132	50	29
230	0,142	50	32
230	0,291	50	58
230	0,297	50	69
230	0,330	50	52
230	0,430	50	70
230	0,430	50	85
230	0,446	50	105
230	0,611	50	75
230	0,661	50	115
230	0,925	50	180
230	1,289	50	480
230	1,652	50	400

3PHASE V	INPUT CURRENT A	Hz	INPUT POWER w
-------------	-----------------------	----	---------------------

400	0,071	50	20
400	0,076	50	25
400	0,076	50	29
400	0,082	50	32
400	0,167	50	58
400	0,171	50	69
400	0,190	50	52
400	0,247	50	70
400	0,247	50	85
400	0,257	50	105
400	0,352	50	75
400	0,380	50	115
400	0,532	50	180
400	0,741	50	480
400	0,950	50	400

3PHASE V	INPUT CURRENT A	Hz	INPUT POWER w
-------------	-----------------------	----	---------------------

690	0,041	50	20
690	0,044	50	25
690	0,044	50	29
690	0,047	50	32
690	0,097	50	58
690	0,099	50	69
690	0,110	50	52
690	0,143	50	70
690	0,143	50	85
690	0,149	50	105
690	0,204	50	75
690	0,220	50	115
690	0,308	50	180
690	0,430	50	480
690	0,551	50	400



## 26. AUXILIARY FANS

### Auxiliary fans single phase

TYPE	SPEED r/min	MAXIMUM AIR FLOW m <sup>3</sup> /h	MAXIMUM PRESSURE pa	NOISE dB (A)
------	----------------	--	---------------------------	-----------------

63	2800	45	40	62
71	2800	52	50	62
80	2700	58	60	62
90	2300	91	80	65
100	2700	142	80	67
112	2400	229	80	67
132	1400	337	35	69
160	1400	609	40	72
180	1200	686	55	72
200	1200	1679	65	72
225	1400	1786	70	74
250	1400	1813	80	75
280	1400	2415	85	78

1PHASE		INPUT POWER	INPUT CURRENT	
V	Hz	w	A	μF

230	50	17	0,12	1
230	50	33	0,17	2
230	50	35	0,18	2
230	50	45	0,2	3
230	50	55	0,3	2
230	50	65	0,37	2
230	50	55	0,35	3
230	50	55	0,28	4
230	50	80	0,4	4
230	50	85	0,4	4
230	50	85	0,5	6
230	50	120	0,9	6
230	50	170	0,95	10

## 26. AUXILIARY FANS

Montando la servo ventilazione la quota L del motore di serie autoventilato aumenta, per le diverse grandezze, di quanto indicato nella tabella seguente, se si monta l'encoder la servo ventilazione è necessaria, in questo caso la quota L non varia, rimane quella del motore servo ventilato.

TIPO	SERIE MS mm	SERIE TA mm	SERIE TC mm
63	92	92	–
71	92	105	–
80	98	110	–
90	97	110	–
100	103	120	–
112	93	125	–
132	109	120	120
160	–	145	130
180	–	–	130
200	–	–	140
225	–	–	160
250	–	–	167
280	–	–	175
315	–	–	205
355	–	–	205

## 27. PERMISSIBLE LOAD ON THE BEARINGS

The theoretical basic fatigue life for bearings is calculated according to the provisions of the ISO R 281-1 Standard.

Life is calculated assuming that motors are running under normal ambient conditions, without abnormal vibrations, without axial or radial loads beyond the ones mentioned in the following tables and with operating temperatures of the bearings ranging between - 30 and +85 C°.

Life calculated this way is called basic life ( $L_{10h}$ ) expressed in hours of operation.

50% of bearings reaches a life equal to five times the basic life resulting from the calculation.

In table 13 are mentioned the maximum permitted axial and radial loads for a basic life ( $L_{10h}$ ), calculated according to the provisions of the ISO Standards, equal to 20000 and 40000 hours of operation.

Values of the radial loads are given both for loads applied to the shaft extension ( $X_{max}$ ) and in correspondence of the face on the shaft hub ( $X_0$ ).

Radial loads that can be applied linearly, change with the change of the application point, therefore for loads placed at a distance  $X$  from the shaft face ( $X_0$ ), the maximum load that can be applied is given by the following expression:

$$Fra_X = \frac{C_{x_0} - C_{x_{max}}}{X_{max}} \times X + C_{x_{max}}$$

Where:

$Fra$  = permitted radial load at point  $X$

$C_{x_0}$  = permitted radial load at point  $X_0$

$C_{x_{max}}$  = permitted radial load at point  $X_{max}$

$X_{max}$  = shaft extension

$X$  = distance from the application point of the radial load to the shaft face

To verify that the belt pull does not exceed the maximum value allowed the following formula can be used:

$$F = \frac{19100 \times P \times K}{n \times D}$$

$F$  = radial force in Nm

$P$  = power transmitted in KW

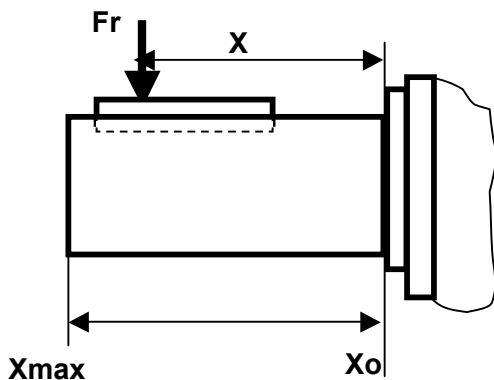
$n$  = numbers of revs. per minute

$D$  = pulley diameter in meters

$K$  = constant

Constant values  $K$ :

2	for flat pulley with tension roller
2,25	for sheaves with V belt
2,5-3	for flat belts without tension roller, or for heavy duty with any type of pulley



## 28. MAXIMUM RADIAL AND AXIAL LOADS PERMISSIBLE

### MS, TA series mounting IM 83 (50Hz)

Poles	Frame size	Radial load (Nm)				Shaft length mm	Axial load (Nm) on side DE	
		(L10h) = 20000 hours		(L10h) = 40000 hours			(L10h) = 20000 ore	(L10h) = 40000 ore
		$X_0$	Xmax	X=0	Xmax			
2	63	450	390	350	300	23	380	290
	71	530	450	420	350	30	460	340
	80	720	590	560	460	40	620	470
	90	800	640	610	500	50	660	490
	100	1100	900	870	700	60	930	690
	112	1100	870	840	680	60	900	670
	132	1800	1400	1400	1100	80	1450	1080
	160	3000	2350	2300	1800	110	2430	1800
	180	3500	2800	2700	2220	110	2800	2070
	200	4600	3840	3600	2900	110	3700	2700
4	63	570	490	450	390	23	510	385
	71	690	580	540	460	30	620	470
	80	920	750	720	580	40	850	635
	90	1000	810	770	630	50	890	659
	100	1350	1080	1050	830	60	1200	880
	112	1300	1050	1000	800	60	1170	850
	132	2100	1690	1600	1300	80	1850	1340
	160	3700	2800	2850	2200	110	3150	2330
	180	4300	3400	3350	2700	110	3700	2700
	200	6400	5100	4400	3600	110	4100	2850
6	63	630	540	500	430	23	600	440
	71	750	630	590	490	30	720	530
	80	1080	880	840	690	40	1030	760
	90	1130	920	870	700	50	1040	770
	100	1570	1260	1220	1000	60	1430	1050
	112	1500	1200	1150	930	60	1400	1020
	132	2300	1900	1800	1430	80	2150	1570
	160	4200	3300	3200	2500	110	3700	2730
	180	4800	3800	3600	2900	110	3400	2470
	200	6600	5500	5100	4200	110	5700	4200
8	63	770	660	600	520	23	700	530
	71	900	770	720	610	30	840	630
	80	1300	1040	1000	820	40	1200	900
	90	1300	1050	1020	830	50	1220	910
	100	1900	1550	1500	1200	60	1950	1460
	112	1900	1550	1500	1200	60	1920	1440
	132	2800	2250	2150	1700	80	2540	1870
	160	4800	3700	3700	2900	110	4400	3300
	180	5500	4400	4300	3400	110	4000	2930
	200	7300	6000	5600	4600	110	5200	3850

## 28. MAXIMUM RADIAL AND AXIAL LOADS PERMISSIBLE

### MS, TA series mounting IM V1 (50Hz)

Poles	Frame size	Load downwards axial load (Nm)		Load upwards axial load (Nm)	
		(L10h) = 20000 hours	(L10h) = 40000 hours	(L10h) = 20000 hours	(L10h) = 40000 hours

2	63	225	125	400	300
	71	300	180	480	360
	80	450	290	670	510
	90	500	320	720	550
	100	650	380	1000	760
	112	620	380	1000	770
	132	980	600	1600	1250
	160	2000	1400	2750	2100
	180	2300	1600	2700	2100
	200	3200	2250	3850	2900
4	63	390	250	540	405
	71	400	230	650	490
	80	690	460	900	680
	90	730	490	970	730
	100	900	590	1300	1000
	112	860	540	1300	1000
	132	1320	800	2100	1600
	160	2650	1850	3600	2800
	180	2300	2050	3700	2750
	200	4300	3000	4800	3700
6	63	460	300	610	460
	71	470	290	750	570
	80	860	590	1060	810
	90	870	590	1150	860
	100	1100	740	1550	1200
	112	1050	700	1550	1200
	132	1700	1000	2500	1900
	160	3200	2200	4300	3300
	180	3600	2500	4250	3150
	200	5100	3450	6700	5200
8	63	550	370	610	460
	71	560	360	750	570
	80	1050	740	1060	810
	90	1060	740	1150	850
	100	1400	900	1600	1200
	112	1500	1100	1600	1200
	132	2000	1350	2600	1750
	160	4000	2900	4400	3400
	180	4400	3100	4600	3500
	200	5800	4650	6300	5000

### TC series mounting IM 83 (50Hz)

Poles	Frame size	Radial load (Nm)				Shaft length mm	Axial load (Nm) on side DE	
		(L10h) = 20000 hours		(L10h) = 40000 hours			(L10h) = 20000 hours	(L10h) = 20000 hours
		X0	Xmax	X0	Xmax			
2	132S1-2	2300	1800	1800	1400	80	1900	1400
	132S2-2	2300	1800	1800	1400	80	1900	1400
	160M1-2	3000	2400	2400	1800	110	2400	1800
	160M2-2	3000	2300	2300	1800	110	2400	1800
	160L-2	3000	2400	2300	1800	110	2400	1800
	180M-2	4000	3200	3100	2500	110	3200	2400
	200L1-2	4700	3800	3600	3000	110	3700	2700
	200L2-2	4600	3800	3600	2900	110	3600	2700
	225M-2	5200	4300	4000	3400	110	4100	3100
	250M-2	5800	4400	4400	3400	140	4700	3400
	280S-2	5800	4700	4400	3600	140	4600	3400
	280M-2	5800	4800	4400	3700	140	4600	3300
	315S-2	7200	6100	5400	4600	140	5600	4100
	315M-2	7000	6000	5300	4500	140	5500	4000
	315L1-2	7000	6000	5200	4500	140	5400	3900
	315L2-2	6900	6000	5200	4500	140	5400	3900
4	132S-4	2900	2300	2200	1800	80	2500	1900
	132M-4	2800	2300	2200	1800	80	2500	1800
	160M-4	3700	2900	2900	2200	110	3200	2300
	160L-4	3700	2900	2800	2200	110	3100	2300
	180M-4	4900	4000	3800	3000	110	4200	3100
	180L-4	4800	3700	3700	2900	110	4200	3100
	200L-4	5600	4700	4300	3600	110	4800	3500
	225S-4	6400	5000	4900	3800	140	5400	4000
	225M-4	6300	5000	4800	3800	140	5400	3900
	250M-4	7200	5800	5400	4400	140	6100	4400
	280S-4	24000	19800	18800	15500	140	7500	5500
	280M-4	23900	19900	18600	15500	140	7300	5300
	315S-4	27800	22800	21600	17800	170	8200	6000
	315M-4	27600	23200	21400	18000	170	8000	5800
	315L1-4	27300	23000	21200	17800	170	7900	5700
	315L2-4	27800	24400	21500	18900	170	7800	5600

## 28. MAXIMUM RADIAL AND AXIAL LOAD PERMISSIBLE

### TC series mounting IM 83 (50Hz)

Poles	Frame size	Radial load (Nm)				Shaft length mm	Axial load (Nm) on side DE	
		(L10h) = 20000 hours		(L10h) = 40000 hours			(L10h) = 20000 hours	(L10h) = 20000 hours
		X0	Xmax	X0	Xmax			

6	132M2-6	3200	2600	2500	2000	80	2900	2100
	160M-6	3200	2500	2400	1900	110	2800	2100
	160L-6	4200	3300	3200	2500	110	3700	2700
	180L-6	5600	4500	4200	3500	110	4900	3600
	200L1-6	5600	4600	4200	3500	110	4900	3600
	200L2-6	6400	5300	4900	4000	110	5600	4100
	225M-6	7500	6000	5800	4600	140	6500	4800
	250M-6	8400	6800	6400	5200	140	7300	5400
	280S-6	27800	22900	21800	17900	140	9000	6600
	280M-6	27800	23200	21700	18100	140	8900	6500
	315S-6	31900	26200	24900	20500	170	9900	7200
	315M-6	31800	26800	24800	20900	170	9700	7000
	315L1-6	31600	26600	24500	20700	170	9500	6900
315L2-6	31100	26200	24100	20300	170	9300	6700	
8	160M2-8	4800	3700	3700	2900	110	4300	3200
	160L-8	4700	3700	3600	2900	110	4200	3100
	180L-8	6300	5100	4900	4000	110	5600	4100
	200L-8	7200	6000	5500	4600	110	6400	4700
	225S-8	8200	6500	6300	5000	140	7300	5400
	225M-8	8100	6400	6200	4900	140	7200	5300
	250M-8	9300	7600	7100	5800	140	8300	6100
	280S-8	30600	25200	23900	19700	140	10100	7500
	280M-8	30600	25500	23900	19900	140	10000	7300
	315S-8	34900	28700	27200	22400	170	11000	8000
	315M-8	34600	29200	26900	22600	170	10700	7700
	315L1-8	34300	28900	26600	22400	170	10500	7600
	315L2-8	33800	28500	26100	22000	170	10200	7300



### TC series mounting IM V1 (50Hz)

Poles	Frame size	Load downwards axial load (Nm)		Load upwards axial load (Nm)	
		(L10h) = 20000 hours	(L10h) = 40000 hours	(L10h) = 20000 hours	(L10h) = 40000 hours
2	132S1-2	2600	2300	2200	1800
	132S2-2	2600	2300	2300	1800
	160M1-2	3300	3000	2900	2300
	160M2-2	3200	2900	3000	2300
	160L-2	3200	2900	3000	2300
	180M-2	4400	4000	4000	3100
	200L1-2	5000	4500	4600	3500
	200L2-2	5000	4500	4600	3500
	225M-2	5600	5000	5300	3900
	250M-2	6200	5600	6000	4300
	280S-2	6700	5400	6200	4100
	280M-2	6800	5400	6200	4100
	315S-2	8800	6800	8000	5200
	315M-2	9000	6700	8200	5000
	315L1-2	9100	7500	8300	5000
	315L2-2	9100	7500	8300	5000
4	132S-4	3200	3000	2800	2300
	132M-4	3200	2900	2900	2300
	160M-4	4100	3700	3700	2900
	160L-4	4200	3600	3800	2800
	180M-4	5700	5000	5100	2900
	180L-4	5800	5000	5100	3800
	200L-4	6600	5600	5900	4300
	225S-4	7500	6200	6700	4900
	225M-4	7600	6200	6800	4800
	250M-4	8600	6900	7700	5300
	280S-4	10900	8800	9800	6800
	280M-4	11200	8600	10100	6600
	315S-4	12800	9900	11600	7600
	315M-4	13100	9500	12000	7200
	315L1-4	13300	9400	12200	7000
	315L2-4	13300	9400	12200	7000

## 28. MAXIMUM RADIAL AND AXIAL LOAD PERMISSIBLE

### TC series mounting IM V1 (50Hz)

Poles	Frame size	Load downwards axial load (Nm)		Load upwards axial load (Nm)	
		(L10h) = 20000 hours	(L10h) = 40000 hours	(L10h) = 20000 hours	(L10h) = 40000 hours

6	132M2-6	3700	3200	3300	2500
	160M-6	3800	3200	3400	2500
	160L-6	4900	4100	4400	3200
	180L-6	6600	5600	5900	4300
	200L1-6	7500	6500	6700	5000
	200L2-6	7600	6400	6800	5000
	225M-6	8500	7200	7600	5600
	250M-6	9700	8000	8700	6200
	280S-6	12300	10300	11100	7900
	280M-6	12600	10100	11400	7700
	315S-6	14500	11500	13100	8800
	315M-6	14800	11300	13400	8600
	315L1-6	14900	11100	13600	8400
	315L2-6	15300	10700	14100	8000
8	160M2-8	5200	4100	4700	4700
	160L-8	5100	4000	4800	4800
	180L-8	7000	5400	6400	6400
	200L-8	7900	6200	7400	7400
	225S-8	8900	7000	8400	8400
	225M-8	8800	6800	8500	8500
	250M-8	9900	7700	9600	9600
	280S-8	12600	9800	12200	12200
	280M-8	12400	9600	12400	12400
	315S-8	14000	10700	14600	14600
	315M-8	13500	10200	15100	15100
	315L1-8	13300	10000	15300	15300
	315L2-8	12900	9600	15700	15700

### TC series mounting IM 83 (50Hz)

Poles	Frame size	Radial load (Nm)				Shaft length mm	Axial load (Nm) on side DE	
		(L10h) = 20000 hours		(L10h) = 40000 hours			(L10h) = 20000 hours	(L10h) = 40000 hours
		X0	Xmax	X0	Xmax			

<b>2</b>	355	6400	5700	4800	4100	140	5000	3500
<b>4</b>	355	13000	11000	9900	8300	210	5100	2000
<b>6</b>	355	15200	13000	11200	9500	210	4300	2000
<b>8</b>	355	14000	12000	10000	8500	210	9200	6500

### TC series mounting IM V1 (50Hz)

Poles	Frame size	Load downwards axial load (Nm)		Load upwards axial load (Nm)	
		(L10h) = 20000 hours	(L10h) = 40000 hours	(L10h) = 20000 hours	(L10h) = 40000 hours

<b>2</b>	355	12200	8800	-	-
<b>4</b>	355	6200	3500	11800	9700
<b>6</b>	355	6500	3300	13500	11000
<b>8</b>	355	9000	5300	13600	11000



electrical and mechanical data

# MS SERIES



aluminum casing

## 29. MS SERIES - Three-Phase Asynchronous single speed motors

### Electrical data (50Hz) Efficiency IE1- 2 poles

Frame size	Power (KW)	Current (A)			Current (A)			Current (A)			rpm. (r/min)	Eff. (%)	Power factor (Cosφ)	Cs/ Cn	Cmax/ Cn	Cn (Nm)	Is/In	dB(A)	Weight (Kg)
		220V	380V	660V	230V	400V	690V	240V	415V	720V									
MS 561-2	0.09	0.66	0.38	0.22	0.62	0.36	0.21	0.60	0.35	0.20	2710	53	0.72	2.2	2.3	0,502	4	58	2.60
MS 562-2	0.12	0.73	0.42	0.24	0.69	0.40	0.23	0.67	0.39	0.22	2700	61	0.72	2.2	2.3	0,534	4	58	3.00
MS 563-2	0.18	1.00	0.58	0.33	0.95	0.55	0.32	0.92	0.53	0.31	2710	63	0.75	2.2	2.4	0,642	6	61	4.00
MS 631-2	0.18	1.00	0.58	0.33	0.95	0.55	0.32	0.92	0.53	0.31	2710	63	0.75	2.2	2.4	0,641	6	61	4.00
MS 632-2	0.25	1.29	0.75	0.43	1.23	0.71	0.41	1.19	0.69	0.40	2710	65	0.78	2.2	2.4	0,884	6	61	4.20
MS 633-2	0.37	1.92	1.11	0.64	1.82	1.05	0.61	1.76	1.02	0.59	2710	65	0.78	2.2	2.4	1,261	6	62	4.70
MS 711-2	0.37	1.76	1.02	0.59	1.67	0.97	0.56	1.61	0.93	0.54	2730	70	0.79	2.2	2.4	1,262	6	64	5.20
MS 712-2	0.55	2.57	1.49	0.86	2.45	1.42	0.82	2.36	1.36	0.79	2760	71	0.79	2.2	2.4	1,869	6	64	6.00
MS 713-2	0.75	3.33	1.93	1.11	3.18	1.83	1.06	3.06	1.77	1.02	2730	72	0.82	2.2	2.4	2,54	6	65	7.00
MS 801-2	0.75	3.21	1.86	1.07	3.06	1.77	1.02	2.94	1.70	0.98	2770	73	0.84	2.2	2.4	2,54	6	67	8.70
MS 802-2	1.1	4.56	2.64	1.52	4.35	2.51	1.45	4.18	2.42	1.39	2770	76.2	0.83	2.2	2.4	3,72	6	67	10.00
MS 803-2	1.5	6.04	3.50	2.01	5.87	3.32	1.92	5.54	3.20	1.85	2800	78.5	0.83	2.2	2.4	5,04	6	70	11.20
MS 90S-2	1.5	5.97	3.46	1.99	5.76	3.28	1.90	5.47	3.16	1.82	2840	78.5	0.84	2.2	2.4	5,04	6	72	12.00
MS 90L1-2	2.2	8.39	4.85	2.80	8.0	4.61	2.66	7.69	4.45	2.56	2840	81	0.85	2.2	2.4	7,4	6	72	14.50
MS 90L2-2	3	11.1	6.42	3.69	10.6	6.10	3.52	10.2	5.88	3.39	2840	82.6	0.86	2.2	2.4	10,1	6	74	15.00
MS 100L1-2	3	11.0	6.34	3.65	10.4	6.03	3.48	10.0	5.81	3.35	2840	82.6	0.87	2.2	2.3	10,1	7	76	20.00
MS 100L2-2	4	14.3	8.30	4.78	13.7	7.88	4.55	13.1	7.60	4.38	2850	84.2	0.87	2.2	2.3	13,4	7.5	77	24.00
MS 112M-2	4	14.3	8.30	4.78	13.7	7.88	4.55	13.1	7.60	4.38	2880	84.2	0.87	2.2	2.3	13,4	7.5	77	26.00
MS 112L-2	5.5	19.1	11.1	6.38	18.2	10.5	6.08	17.5	10.1	5.85	2880	85.7	0.88	2.2	2.3	18,2	7.5	78	29.30
MS 132S1-2	5.5	19.1	11.1	6.38	18.2	10.5	6.08	17.5	10.1	5.85	2900	85.7	0.88	2	2.2	18,1	7.5	80	38.40
MS 132S2-2	7.5	25.7	14.9	8.57	24.5	14.1	8.16	23.6	13.6	7.86	2920	87	0.88	2	2.2	24,7	7.5	80	41.30
MS 132M1-2	9.2	30.8	17.8	10.3	29.9	17.3	9.96	28.3	16.3	9.42	2930	88	0.89	2	2.2	29,5	7.5	81	48.20
MS 132M2-2	11	36.3	21.0	12.1	34.6	20.0	11.5	33.3	19.2	11.1	2930	88.4	0.9	2	2.2	36,0	7.5	83	52.50
MS 160M1-2	11	36.3	21.0	12.1	34.6	20.0	11.5	33.3	19.2	11.1	2940	88.4	0.9	2	2.2	36,1	7.5	86	76.00
MS 160M2-2	15	48.4	28.0	16.1	46.1	26.6	15.4	44.4	25.7	14.8	2940	89.4	0.91	2	2.2	48,9	7.5	86	77.50
MS 160L-2	18.5	59.3	34.3	19.8	56.5	32.6	18.8	54.3	31.4	18.1	2940	90	0.91	2	2.2	60,1	7.5	86	92.00
MS 180M-2	22	71.3	41.3	23.8	68.2	39.2	22.6	65.3	37.8	21.8	2950	90	0.9	2	2.2	71,2	7.5	91	121.0
MS 200L1-2	30	96.0	55.6	32.1	91.8	52.8	30.5	88.0	50.9	29.4	2950	91.2	0.9	2	2.2	97,0	7.5	94	144.0
MS 200L2-2	37	117	67.9	39.2	112	64.5	37.2	108	62.2	35.9	2940	92	0.9	2	2.2	119	7.5	94	151.0

### Electrical data (50Hz) Efficiency IE1 - 4 poles

Frame size	Power (KW)	Current (A)			Current (A)			Current (A)			rpm. (r/min)	Eff. (%)	Power factor (Cosφ)	Cs/ Cn	Cmax/ Cn	Cn (Nm)	Is/In	dB(A)	Weight (Kg)
		220V	380V	660V	230V	400V	690V	240V	415V	720V									
MS 561-4	0.06	0.64	0.37	0.21	0.61	0.35	0.20	0.58	0.34	0.19	1360	50	0.56	2.3	2.4	0,478	4	50	2.90
MS 562-4	0.09	0.82	0.47	0.27	0.78	0.45	0.26	0.75	0.43	0.25	1360	52	0.59	2.3	2.4		4	50	3.20
MS 631-4	0.12	1.00	0.58	0.33	0.95	0.55	0.32	0.92	0.53	0.31	1360	52	0.64	2.2	2.4	0,93	4	52	3.70
MS 632-4	0.18	1.28	0.74	0.43	1.21	0.70	0.40	1.17	0.67	0.39	1310	57	0.65	2.2	2.4	1,28	4	52	4.20
MS 633-4	0.25	1.66	0.96	0.55	1.58	0.91	0.53	1.52	0.88	0.51	1340	60	0.66	2.2	2.2	1,77	4	54	5.00
MS 711-4	0.25	1.52	0.88	0.51	1.45	0.84	0.48	1.39	0.81	0.46	1350	60	0.72	2.2	2.4	1,78	6	55	5.00
MS 712-4	0.37	2.02	1.17	0.67	1.92	1.11	0.64	1.85	1.07	0.62	1370	65	0.74	2.2	2.4	2,62	6	55	5.80
MS 713-4	0.55	2.92	1.69	0.97	2.78	1.60	0.93	2.67	1.55	0.89	1380	66	0.75	2.2	2.4	3,86	6	57	6.50
MS 801-4	0.55	2.87	1.66	0.96	2.74	1.58	0.91	2.63	1.52	0.88	1370	67	0.75	2.2	2.4	3,87	6	58	8.10
MS 802-4	0.75	3.50	2.03	1.17	3.34	02.33.00	1.11	3.21	1.86	1.07	1380	72	0.78	2.2	2.4	5,27	6	58	9.10
MS 803-4	1.1	4.86	2.81	1.62	4.63	2.67	1.54	4.45	2.57	1.48	1390	76.2	0.78	2.2	2.4	7,61	6	60	11.00
MS 90S-4	1.1	4.80	2.78	1.60	4.57	2.64	1.52	4.40	2.54	1.47	1400	76.2	0.79	2.2	2.4	7,60	6	61	11.70
MS 90L1-4	1.5	6.27	3.63	2.09	5.97	3.45	1.99	5.75	3.32	1.92	1400	78.5	0.8	2.2	2.4	10,38	6	61	14.40
MS 90L2-4	2.2	8.91	5.16	2.97	8.45	4.90	2.83	8.17	4.72	2.72	1400	81	0.8	2.2	2.4	14,90	7	63	17.60
MS 100L1-4	2.2	8.80	5.09	2.93	8.38	4.84	2.79	8.07	4.66	2.69	1420	81	0.81	2.2	2.3	14,90	7	64	19.20
MS 100L2-4	3	11.8	6.81	3.92	11.2	6.47	3.74	10.8	6.24	3.60	1420	82.6	0.81	2.2	2.3	20,32	7	64	22.50
MS 100L3-4	4	15.2	8.80	5.07	14.2	8.36	4.83	13.9	8.06	4.65	1430	84.2	0.82	2.2	2.3	26,93	7	65	27.30
MS 112M-4	4	15.0	8.70	5.01	14.3	8.26	4.77	13.8	7.96	4.59	1430	84.2	0.83	2.2	2.2	26,90	7	65	29.00
MS 112L-4	5.5	20.3	11.7	6.76	19.3	11.2	6.44	18.6	10.8	6.20	1440	85.7	0.83	2.2	2.2	36,74	7	68	35.70
MS 132S-4	5.5	20.1	11.6	6.68	19.1	11.0	6.37	18.4	10.6	6.13	1450	85.7	0.84	2.2	2.2	36,72	7	71	39.00
MS 132M-4	7.5	26.6	15.4	8.87	25.4	14.6	8.45	24.4	14.1	8.13	1450	87	0.85	2.2	2.2	50,12	7	71	48.60
MS 132L1-4	9.2	32.5	18.8	10.8	30.9	17.9	10.3	29.8	17.2	9.9	1460	87.5	0.85	2.2	2.2	60,13	7.5	74	56.50
MS 132L2-4	11	38.0	22.0	12.7	36.2	20.9	12.1	34.8	20.1	11.6	1460	88.4	0.86	2.2	2.2	71,74	7.5	74	64.00
MS 160M-4	11	37.5	21.7	12.5	35.8	20.6	11.9	34.4	19.9	11.5	1460	88.4	0.87	2.2	2.2	71,78	7	75	73.00
MS 160L1-4	15	51.2	29.6	17.1	48.8	28.2	16.3	46.9	27.1	15.6	1460	88.4	0.87	2.2	2.2	97,83	7.5	75	88.50
MS 160L2-4	18.5	63.1	36.5	21.0	60.1	34.7	20.0	57.9	33.5	19.3	1460	90.5	0.85	2.2	2.2	120	7.5	78	97.50
MS 180M-4	18.5	62.4	36.1	20.8	59.7	34.3	19.8	57.2	33.1	19.1	1460	90.5	0.86	2.2	2.2	143	7.5	80	118.0
MS 180L-4	22	73.8	42.7	24.7	70.6	40.6	23.4	67.7	39.1	22.6	1460	91	0.86	2.2	2.2	143	7.5	80	128.0
MS 200L-4	30	99.5	57.6	33.2	95.1	54.7	31.6	91.2	52.7	30.4	1470	92	0.86	2.2	2.2	195	7.5	83	158.0



## 29. MS SERIES - Three-Phase Asynchronous single speed motors

### Electrical data (50Hz) Efficiency IE1 - 6 poles

Frame size	Power (KW)	Current (A)			Current (A)			Current (A)			rpm. (r/min)	Eff. (%)	Power factor (Cosφ)	Cs/ Cn	Cmax/ Cn	Cn (Nm)	Is/In	dB(A)	Weight (Kg)
		220V	380V	660V	230V	400V	690V	240V	415V	720V									
MS 631-6	0.09	0.92	0.53	0.31	0.88	0.51	0.29	0.85	0.49	0.28	840	42	0.61	2	2	0.98	3.5	50	4.20
MS 632-6	0.12	1.13	0.65	0.38	1.08	0.62	0.36	1.03	0.60	0.34	850	45	0.62	2	2	1,18	3.5	50	4.50
MS 711-6	0.18	1.28	0.74	0.43	1.22	0.70	0.41	1.17	0.68	0.39	880	56	0.66	1.6	1.7	1,93	4	52	5.60
MS 712-6	0.25	1.59	0.92	0.53	1.51	0.87	0.50	1.46	0.84	0.49	900	59	0.7	2.1	2.2	2,36	4	52	6.00
MS 713-6	0.37	2.31	1.34	0.77	2.2	1.27	0.73	2.11	1.22	0.70	890	61	0.69	2	2.1	3,93	4	54	6.80
MS 801-6	0.37	2.24	1.30	0.75	2.13	1.23	0.71	2.05	1.19	0.68	900	62	0.7	1.9	1.9	3,90	4	56	8.10
MS 802-6	0.55	2.99	1.73	1.00	2.85	1.65	0.95	2.74	1.59	0.91	900	67	0.72	2	2.3	5,84	4	56	9.60
MS 803-6	0.75	4.02	2.33	1.34	3.83	2.21	1.28	3.69	2.13	1.23	900	68	0.72	2	2.3	7,88	4	58	10.00
MS 90S-6	0.75	3.96	2.29	1.32	3.77	2.18	1.26	3.63	2.10	1.21	920	69	0.72	2.2	2.2	7,83	5.5	59	11.30
MS 90L1-6	1.1	5.49	3.18	1.83	5.23	3.02	1.74	5.03	2.91	1.68	925	72	0.73	2.2	2.2	11,54	5.5	59	14.40
MS 90L2-6	1.5	7.09	4.11	2.36	6.76	3.90	2.25	6.50	3.76	2.17	925	74	0.75	2.2	2.2	15,64	5.5	60	15.50
MS 100L1-6	1.5	7.00	4.05	2.33	6.67	3.85	2.22	6.42	3.71	2.14	945	74	0.76	2.2	2.2	15,62	6	61	18.80
MS 100L2-6	2.2	9.87	5.71	3.29	9.40	5.43	3.13	9.04	5.23	3.01	950	77	0.76	2.2	2.2	22,31	6	63	19.80
MS 112M-6	2.2	9.7	5.64	3.25	9.28	5.36	3.09	8.93	5.16	2.98	955	78	0.76	2.2	2.2	22,34	6	64	25.00
MS 112L-6	3	12.9	7.49	4.31	12.3	7.12	4.11	11.9	6.86	3.95	950	79	0.77	2.2	2.2	30,21	6	64	30.00
MS 132S-6	3	13.1	7.59	4.37	12.5	7.21	4.16	12.0	6.95	4.01	960	79	0.76	2	2	30,18	6.5	64	35.00
MS 132M1-6	4	17.2	9.93	5.72	16.4	9.44	5.45	15.7	9.10	5.24	960	80.5	0.76	2	2	40,21	6.5	68	47.60
MS 132M2-6	5.5	22.6	13.1	7.53	21.5	12.4	7.17	20.7	12.0	6.9	960	83	0.77	2	2	55,32	6.5	68	50.70
MS 132L-6	7.5	30.1	17.4	10.0	28.7	16.5	9.55	27.6	15.9	9.2	960	85	0.77	2	2	74,60	6.5	68	47.60
MS 160M-6	7.5	28.6	16.6	9.5	27.3	15.7	9.08	26.2	15.2	8.7	960	86	0.8	2	2.2	74,58	6.5	68	70.0
MS 160L-6	11	41.8	24.2	13.9	39.8	23.0	13.3	38.3	22.1	12.8	960	87.5	0.79	2	2.2	109,43	6.5	73	87.0
MS 180L-6	15	54.6	31.6	18.2	52.2	30.0	17.3	50.1	28.9	16.7	970	89	0.81	2	2.2	147,73	6.5	79	122.0
MS 200L1-6	18.5	66.6	38.6	22.2	63.7	36.6	21.1	61.0	35.3	20.3	975	90	0.81	2	2.2	181,23	6.5	82	136.0
MS 200L2-6	22	77.3	44.7	25.8	73.9	42.5	24.5	70.8	41.0	23.6	975	90	0.83	2	2.2	215,21	6.5	82	152.0

**Electrical data (50Hz) - 8 poles**

Frame size	Power (KW)	Current (A)			Current (A)			Current (A)			rpm. (r/min)	Eff. (%)	Power factor (Cosφ)	Cs/ Cn	Cmax/ Cn	Cn (Nm)	Is/In	dB(A)	Weight (Kg)
		220V	380V	660V	230V	400V	690V	240V	415V	720V									

<b>MS 711-8</b>	0.09	0.88	0.51	0.29	0.84	0.48	0.28	0.81	0.47	0.27	680	48	0.56	1.5	1.7	1,05	3	50	5.60
<b>MS 712-8</b>	0.12	1.05	0.61	0.35	1.00	0.58	0.33	0.96	0.55	0.32	690	51	0.59	1.6	1.7	1,63	2.7	50	6.00
<b>MS 801-8</b>	0.18	1.52	0.88	0.51	1.45	0.84	0.48	1.39	0.80	0.46	680	51	0.61	1.5	1.7	2,60	2.8	52	9.40
<b>MS 802-8</b>	0.25	1.92	1.11	0.64	1.83	1.06	0.61	1.76	1.02	0.59	680	56	0.61	1.6	2	3,60	2.7	52	10.10
<b>MS 90S-8</b>	0.37	2.45	1.42	0.82	2.33	1.35	0.78	2.24	1.30	0.75	680	63	0.63	1.6	1.8	5,22	2.8	56	12.50
<b>MS 90L-8</b>	0.55	3.36	1.95	1.12	3.21	1.85	1.07	3.08	1.78	1.03	680	66	0.65	1.6	1.8	7,63	3	56	15.30
<b>MS 100L1-8</b>	0.75	4.45	2.58	1.48	4.24	2.45	1.41	4.08	2.36	1.36	710	66	0.67	1.7	2.1	10,42	3.5	59	17.20
<b>MS 100L2-8</b>	1.1	5.81	3.36	1.94	5.54	3.20	1.85	5.33	3.08	1.78	710	72	0.69	1.7	2.1	15,18	3.5	59	19.50
<b>MS 112M-8</b>	1.5	7.82	4.53	2.61	7.45	4.30	2.48	7.17	4.15	2.39	710	74	0.68	1.8	2.1	20,63	4.2	61	25.50
<b>MS 132S-8</b>	2.2	10.8	6.28	3.61	10.3	5.96	3.44	9.94	5.75	3.31	720	75	0.71	2	2	29,82	5.5	64	34.20
<b>MS 132M-8</b>	3	14.0	8.11	4.67	13.3	7.70	4.45	12.8	7.43	4.28	720	77	0.73	2	2	42,35	5.5	64	40.00
<b>MS 160M1-8</b>	4	18.0	10.4	5.99	17.1	9.89	5.71	16.5	9.53	5.49	730	80	0.73	1.9	2.1	53,81	6	68	59.00
<b>MS 160M2-8</b>	5.5	23.4	13.5	7.79	22.3	12.9	7.42	21.4	12.4	7.14	720	83.5	0.74	2	2.2	73,27	6	68	69.00
<b>MS 160L-8</b>	7.5	30.9	17.9	10.3	29.4	17.0	9.8	28.3	16.4	9.43	720	85	0.75	1.9	2.2	100,65	6	68	87.00
<b>MS 180L-8</b>	11	45.2	26.2	15.1	43.6	25.1	14.5	41.5	24.0	13.8	715	87.4	0.73	1.9	2.2	144,2	6	78	125.0
<b>MS 200L-8</b>	15	58.9	34.1	19.6	56.3	32.4	18.7	54.0	31.2	18.0	725	88.0	0.76	1.9	2.2	194,65	6	80	151.0

## 29. MS SERIES - Three-Phase Asynchronous single speed motors

### Electrical data (50Hz) Efficiency IE2 - 2poles

Frame size	Power (KW)	Eff. (%)	Current In(A) 400V	Power factor (Cosφ)	rpm (rpm/min)	Cn (Nm)	Cs/Cn	Is/In
MS2 801-2	0,75	77,4	1,75	0,80	2840	2,49	2,9	5,8
MS2 802-2	1,1	80	2,42	0,82	2850	3,53	3,5	6,8
MS2 90S-2	1,5	81,4	3,20	0,83	2850	5,09	3,5	6,9
MS2 90L-2	2,2	83,2	4,54	0,84	2860	7,32	4,1	7,9
MS2 100L-2	3	84,6	5,88	0,87	2880	9,96	3,4	7,8
MS2 112M-2	4	86	7,54	0,89	2890	13,16	2,7	7,5
MS2 132S1-2	5,5	87,2	10,2	0,89	2900	18,25	2,4	7,7
MS2 132S2-2	7,5	88,1	13,8	0,89	2910	24,47	2,6	8,4
MS2 160M1-2	11	89,4	19,9	0,89	2930	20,23	2,4	7,6
MS2 160M2-2	15	90,3	26,9	0,89	2930	27,68	2,6	8
MS2 160L-2	18,5	90,9	32,6	0,90	2940	33,42	3	9
MS2 180M-2	22	91,3	38,6	0,90	2950	39,11	2,6	8,5
MS2 200L1-2	30	92	52,3	0,90	2950	51,93	2,4	8
MS2 200L2-2	37	92,5	64,1	0,90	2950	63,48	2,5	8,5

### Electrical data (50Hz) efficiency IE2 - 4 poles

Frame size	Power (KW)	Eff. (%)	Current In(A) 400V	Power factor (Cosφ)	rpm (rpm/min)	Cn (Nm)	Cs/Cn	Is/In
MS2 802-4	0,75	79,6	1,79	0,76	1410	5,27	2,8	5,3
MS2 90S-4	1,1	81,4	2,50	0,78	1420	7,61	3,8	6,7
MS2 90L-4	1,5	82,8	3,31	0,79	1420	10,39	4	7,2
MS2 100L1-4	2,2	84,3	4,83	0,78	1440	14,76	3,6	7,4
MS2 100L2-4	3	85,5	6,33	0,80	1440	20,13	3,8	7,8
MS2 112M-4	4	86,6	8,23	0,81	1440	26,89	3,1	7,1
MS2 132S-4	5,5	87,9	10,9	0,83	1450	36,25	2,6	7,4
MS2 132M-4	7,5	88,7	14,5	0,84	1450	49,21	2,8	7,7
MS2 160M-4	11	89,8	21,6	0,82	1450	71,86	2,7	7,7
MS2 160L-4	15	90,6	28,4	0,84	1450	97,90	2,4	7,3
MS2 180M-4	18,5	91,4	34,4	0,85	1460	121,32	2,2	7,4
MS2 180L-4	22	91,7	40,3	0,86	1460	143,26	2,3	7,5
MS2 200L-4	30	92,3	55,2	0,86	1470	195,54	2,8	7,6

**Electrical data (50Hz) Efficiency IE2 - 6 poles**

Frame size	Power (KW)	Eff. (%)	Current In(A) 400V	Power factor (Cosφ)	rpm (rpm/min)	Cn (Nm)	Cs/Cn	Is/In
<b>MS2 90S-6</b>	0.75	76.0	2.01	0.71	925	7,75	3.1	4.7
<b>MS2 90L-6</b>	1.1	78.1	2.82	0.72	930	11,43	3.2	5
<b>MS2 100L-6</b>	1.5	80.0	3.71	0.73	940	15,09	3.1	5.9
<b>MS2 112M-6</b>	2.2	81.8	5.17	0.75	945	22,13	2.6	5.5
<b>MS2 132S-6</b>	3	83.3	6.84	0.76	960	30,32	2.2	5.7
<b>MS2 132M1-6</b>	4	84.6	8.86	0.77	960	41,25	2.4	6.2
<b>MS2 132M2-6</b>	5.5	86	12.0	0.77	960	54,86	2.6	6.7
<b>MS2 160M-6</b>	7.5	87.5	16.1	0.77	970	74,69	2	5.6
<b>MS2 160L-6</b>	11	89.0	22.9	0.78	970	108,92	2	5.8
<b>MS2 180L-6</b>	15	90.1	28.9	0.83	975	147,77	1.9	7.5
<b>MS2 200L1-6</b>	18.5	90.4	35.6	0.83	975	180,32	2.2	6.3
<b>MS2 200L2-6</b>	22	90.9	41.6	0.84	975	214,53	2.3	06.02

## 30. MS SERIES - Three-Phase Asynchronous double speed motors

### Electrical data (50Hz) single winding - 2/4 poles

Frame size	Power (KW)		rpm (rpm/min)		Eff. (%)		Power factor (Cosφ)		Current In(A) 400V		Cn (Nm)		Cs/Cn		Is/In		Cmax/Cn	
	2P	4P	2P	4P	2P	4P	2P	4P	2P	4P	2P	4P	2P	4P	2P	4P	2P	4P
MSD 711-2/4	0.3	0.22	2750	1350	60	55	0.8	0.73	0.90	0.79	1.04	1.56	1.7	1.7	3.5	3.5	1.9	1.9
MSD 712-2/4	0.45	0.3	2790	1380	63	58	0.8	0.73	1.29	1.02	1.54	2.08	2	2	4	4	2	2
MSD 801-2/4	0.55	0.45	2800	1380	65	64	0.84	0.75	1.45	1.35	1.88	3.11	2	2	4.5	4.5	2.1	2.1
MSD 802-2/4	0.75	0.6	2800	1400	67	68	0.86	0.77	1.88	1.65	2.56	4.09	1.8	1.8	4.5	4.5	2	2
MSD 90S-2/4	1.25	0.95	2820	1400	72	68	0.86	0.82	2.91	2.46	4.23	6.48	2	2	5	5	2	2
MSD 90L-2/4	1.7	1.32	2830	1400	73	70	0.86	0.83	3.91	3.28	5.74	9.00	2	2	5	5	2	2
MSD 100L1-2/4	2.4	1.84	2830	1410	73	76	0.86	0.83	5.52	4.21	8.10	12.46	2	2	5.5	5	2	2
MSD 100L2-2/4	3.3	2.6	2840	1420	74	78	0.86	0.85	7.48	5.66	11.10	17.19	2	1.9	5.5	5	2	1.9
MSD 112M-2/4	4.5	4	2860	1430	77	79	0.85	0.86	9.92	8.50	15.03	26.71	2	1.8	5.5	5	2.2	2
MSD 132S-2/4	6	5	2860	1440	79	82	0.84	0.86	13.05	10.23	20.03	33.16	2	1.5	5.5	5.5	2.2	1.9
MSD 132M-2/4	8	6.6	2870	1440	82	84	0.84	0.86	16.76	13.09	26.62	43.77	2	2	6	6	2.2	2.2
MSD 160M-2/4	11	9	2920	1450	84	84	0.85	0.82	22.23	18.86	35.98	59.28	1.8	1.8	7	6	2	2
MSD 160L-2/4	15	12	2920	1450	86	84	0.87	0.83	28.94	24.84	49.06	79.03	2	2	7	7	2.2	2.2

### Electrical data (50Hz) single winding - 4/8 poles

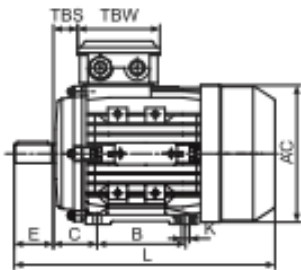
Frame size	Power (KW)		rpm (rpm/min)		Eff. (%)		Power factor (Cosφ)		Current In(A) 400V		Cn (Nm)		Cs/Cn		Is/In		Cmax/Cn	
	4P	8P	4P	8P	4P	8P	4P	8P	4P	8P	4P	8P	4P	8P	4P	8P	4P	8P
MSD 801-4/8	0.25	0.15	1380	680	58	40	0.77	0.60	0.81	0.90	1.73	2.11	2	2	4.5	3	2	2
MSD 802-4/8	0.45	0.25	1390	685	68	48	0.80	0.60	1.19	1.25	3.09	3.49	1.8	2	4.5	3	2	2
MSD 90S-4/8	0.55	0.3	1400	690	68	50	0.83	0.61	1.41	1.42	3.75	4.15	1.8	2	4.5	3.5	2	2
MSD 90L-4/8	0.8	0.45	1400	690	68	53	0.83	0.63	2.05	1.95	5.46	6.23	1.8	1.6	4	3	1.9	1.8
MSD 100L1-4/8	1.25	0.6	1400	700	69	54	0.82	0.56	3.19	2.86	8.53	8.16	1.8	2	5	3.5	2	2
MSD 100L2-4/8	1.76	0.88	1400	700	71	58	0.84	0.56	4.26	3.91	12.00	12.00	1.8	2	5.5	4	2	2
MSD 112M-4/8	2.2	1.5	1420	700	75	64	0.82	0.61	5.16	5.54	14.80	20.46	2	2	6	4	2	2
MSD 132S-4/8	3.3	2.2	1430	705	78	70	0.84	0.64	7.27	7.09	22.04	29.8	2	2	6	5	2	2
MSD 132M-4/8	4.5	3	1430	705	82	77	0.85	0.65	9.32	8.65	30.05	40.64	2	2	6	5	2	2
MSD 160M1-4/8	5.5	4	1440	710	82	77	0.81	0.69	11.95	10.87	36.48	53.80	2.1	1.7	7.6	4.6	2.3	2.2
MSD 160M2-4/8	7.5	5	1440	710	82	79	0.89	0.78	14.83	11.71	49.74	67.25	1.7	1.6	6.6	4.5	2.3	2.1
MSD 160L-4/8	10	7	1450	715	84	82	0.90	0.78	19.09	15.80	65.86	93.50	1.8	1.9	5.5	5	2.3	2.1

**Electrical data (50Hz) double winding - 4/6 poles**

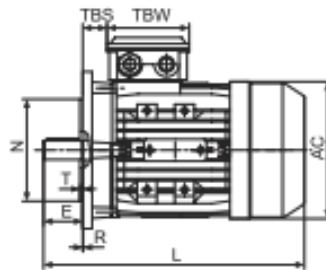
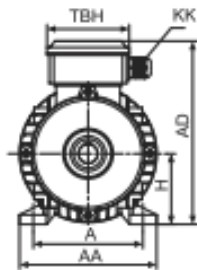
Frame size	Power (KW)		rpm (rpm/min)		Eff. (%)		Power factor (Cosφ)		Current In(A) 400V		Cn (Nm)		Cs/Cn		Is/In		Cmax/Cn	
	4P	6P	4P	6P	4P	6P	4P	6P	4P	6P	4P	6P	4P	6P	4P	6P	4P	6P
<b>MSD 801-4/6</b>	0.3	0.22	1400	910	60	55	0.74	0.69	0.98	0.84	2.05	2.31	2	1.8	4.5	4	2	2
<b>MSD 802-4/6</b>	0.45	0.3	1410	920	63	58	0.75	0.7	1.37	1.07	3.05	3.11	2	1.8	4.5	4	2	2
<b>MSD 90S-4/6</b>	0.66	0.45	1410	920	66	61	0.76	0.65	1.9	1.64	4.47	4.67	1.7	1.7	5	4.5	2	2
<b>MSD 90L-4/6</b>	0.88	0.6	1420	930	70	64	0.77	0.67	2.36	2.02	5.92	6.16	1.7	1.7	5	4.5	2	2
<b>MSD 100L1-4/6</b>	1.32	0.88	1420	940	72	67	0.85	0.75	3.11	2.3	8.88	8.94	1.8	1.8	6	5	2	2
<b>MSD 100L2-4/6</b>	1.76	1.2	1430	950	74	70	0.85	0.75	4.04	3.3	11.75	12.06	1.8	1.8	6	5	2	2
<b>MSD 112M-4/6</b>	2.2	1.5	1430	950	76	70	0.8	0.70	5.22	4.42	14.69	15	2	1.8	6	5	2.2	2.2
<b>MSD 132S-4/6</b>	3.3	2.2	1440	960	82	78	0.81	0.72	7.17	5.65	21.9	21.9	2	2	7	6	2.2	2.2
<b>MSD 132M-4/6</b>	4.5	3	1450	970	83	80	0.82	0.74	9.54	7.31	29.6	29.5	2	2	7	6	2.3	2.3
<b>MSD 160M-4/6</b>	6.6	4.5	1460	970	84	81	0.84	0.78	13.5	10.3	43.2	44.3	1.8	1.8	7	6	2.3	2.3
<b>MSD 160L-4/6</b>	8.8	6	1460	970	84	81	0.85	0.79	17.8	13.5	57.6	59.1	1.8	1.8	7	6	2.3	2.3

## 31. MS SERIES - Overall & Installation dimension

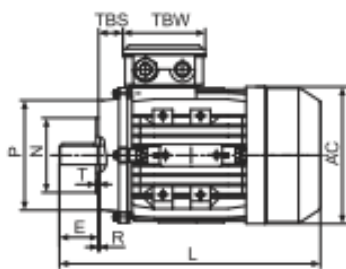
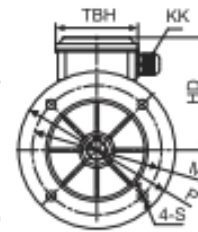
Measures in mm



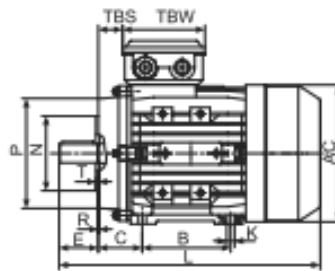
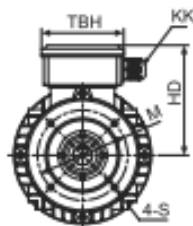
IM B3



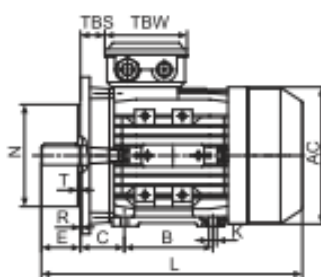
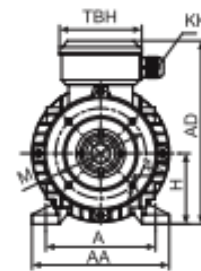
IM B5



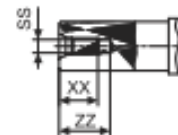
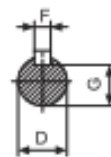
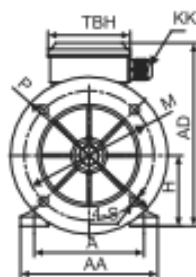
IM B14



IM B34



IM B35



Frame size	B3					Shaft							General								
	H	A	B	C	K	D	E	F	G	SS	XX	ZZ	AA	AD	HD	AC	L	KK	TBS	TBW	TBH

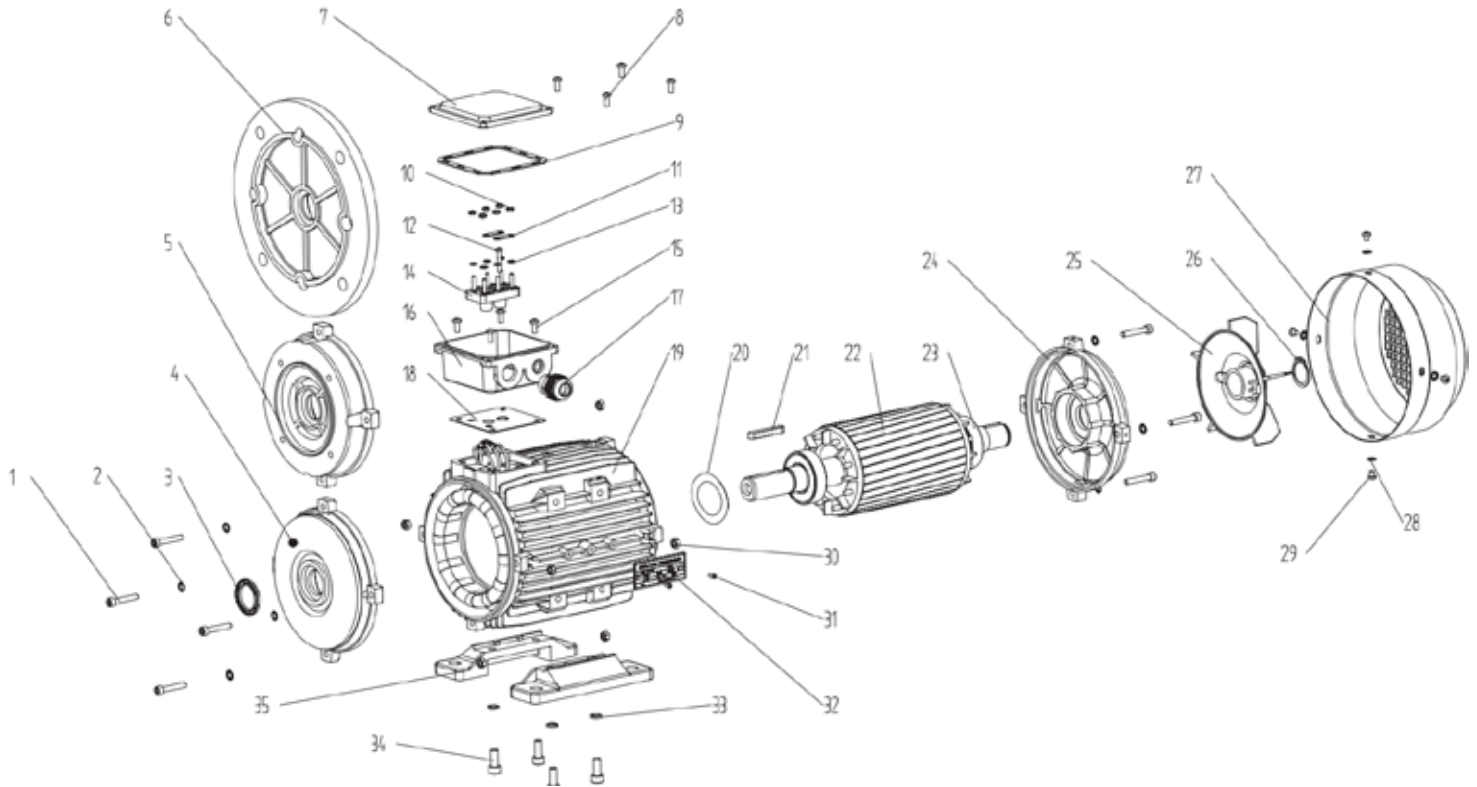
<b>56</b>	56	90	71	36	5.8X8.8	Ø9	20	3	7.2	M3	9	12	110	156	100	Ø117	196	1-M16X1.5	14	88	88
<b>63</b>	63	100	80	40	7X10	Ø11	23	4	8.5	M4	10	14	120	171	108	Ø130	220	1-M16X1.5	14	94	94
<b>71</b>	71	112	90	45	7X10	Ø14	30	5	11	M5	12	17	132	186	115	Ø147	241	1-M20X1.5	20	94	94
<b>80</b>	80	125	100	50	10X13	Ø19	40	6	15.5	M6	16	21	160	213	133	Ø163	290	1-M20X1.5	27	105	105
<b>90S</b>	90	140	100	56	10X13	Ø24	50	8	20	M8	19	25	175	229	139	Ø183	312	1-M20X1.5	30	105	105
<b>90L1/L2</b>	90	140	125	56	10X13	Ø24	50	8	20	M8	19	25	175	229	139	Ø183	337/367	1-M20X1.5	30	105	105
<b>100</b>	100	160	140	63	12X15	Ø28	60	8	24	M10	22	30	198	252	152	Ø205	369	2-M20X1.5	26	105	105
<b>112</b>	112	190	140	70	12X15	Ø28	60	8	24	M10	22	30	220	279	167	Ø229	395	2-M25X1.5	32	112	112
<b>132S</b>	132	216	140	89	12X15	Ø38	80	10	33	M12	28	37	252	318	186	Ø265	437	2-M25X1.5	38	112	112
<b>132ML</b>	132	216	178	89	12X15	Ø38	80	10	33	M12	28	37	252	318	186	Ø265	475/501	2-M25X1.5	38	112	112
<b>160ML</b>	160	254	210/254	108	15X19	Ø42	110	12	37	M16	36	45	290	384	224	Ø325	640	2-M32X1.5	64	143	143
<b>180ML</b>	180	279	241/279	121	15X25	Ø48	110	14	42.5	M16	36	45	340	440	260	Ø368	730	2-M32X1.5	73	190	190
<b>200L</b>	200	318	305	133	19X29	Ø55	110	16	49	M20	42	53	390	460	260	Ø368	745	2-M40X1.5	85	190	190

Frame size	B5						B5R						B14						B14R					
	M	N	P	T	S	R	M	N	P	T	S	R	N	M	P	T	S	R	N	M	P	T	S	R

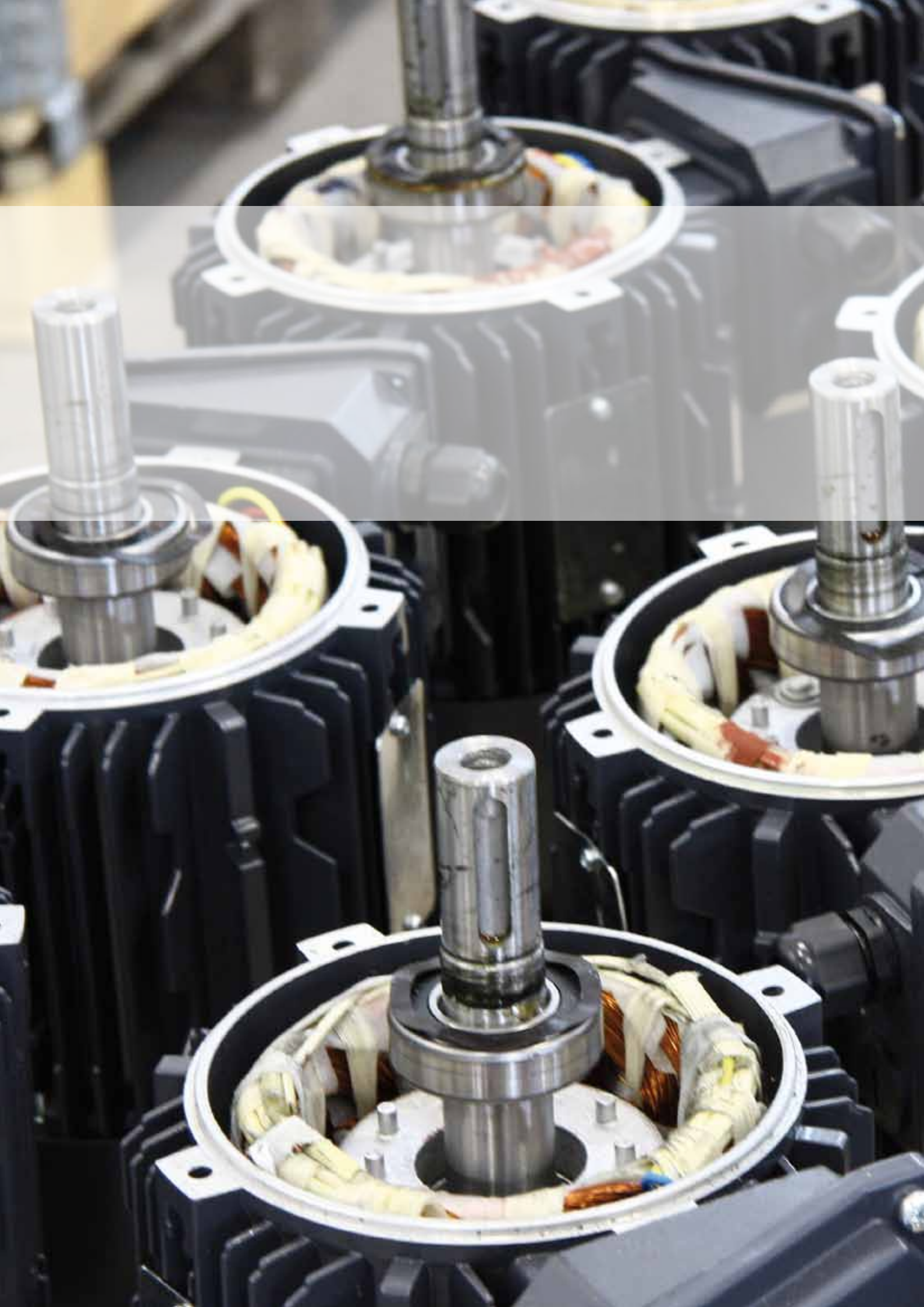
<b>56</b>	Ø100	Ø80	Ø120	3.0	Ø7	0								Ø50	Ø65	Ø80	2.5	M5	0						
<b>63</b>	Ø115	Ø95	Ø140	3.0	Ø10	0								Ø60	Ø75	Ø90	2.5	M5	0	Ø80	Ø100	Ø120	3.0	M6	0
<b>71</b>	Ø130	Ø110	Ø160	3.5	Ø10	0	Ø115	Ø95	Ø140	3.5	Ø10	0	Ø70	Ø85	Ø105	2.5	M6	0	Ø95	Ø115	Ø140	3.0	M8	0	
<b>80</b>	Ø165	Ø130	Ø200	3.5	Ø12	0	Ø130	Ø110	Ø160	3.5	Ø10	0	Ø80	Ø100	Ø120	3.0	M6	0	Ø110	Ø130	Ø160	3.5	M8	0	
<b>90S</b>	Ø165	Ø130	Ø200	3.5	Ø12	0	Ø130	Ø110	Ø160	3.5	Ø10	0	Ø95	Ø115	Ø140	3.0	M8	0	Ø110	Ø130	Ø160	3.5	M8	0	
<b>90L1/L2</b>	Ø165	Ø130	Ø200	3.5	Ø12	0	Ø130	Ø110	Ø160	3.5	Ø10	0	Ø95	Ø115	Ø140	3.0	M8	0	Ø110	Ø130	Ø160	3.5	M8	0	
<b>100</b>	Ø215	Ø180	Ø250	4.0	Ø15	0	Ø165	Ø130	Ø200	4.0	Ø12	0	Ø110	Ø130	Ø160	3.5	M8	0	Ø130	Ø165	Ø200	3.5	M10	0	
<b>112</b>	Ø215	Ø180	Ø250	4.0	Ø15	0	Ø165	Ø130	Ø200	4.0	Ø12	0	Ø110	Ø130	Ø160	3.5	M8	0	Ø130	Ø165	Ø200	3.5	M10	0	
<b>132S</b>	Ø265	Ø230	Ø300	4.0	Ø15	0	Ø215	Ø180	Ø250	4.0	Ø15	0	Ø130	Ø165	Ø200	4.0	M10	0	Ø180	Ø215	Ø250	4.0	M12	0	
<b>132M/L</b>	Ø265	Ø230	Ø300	4.0	Ø15	0	Ø215	Ø180	Ø250	4.0	Ø15	0	Ø130	Ø165	Ø200	4.0	M10	0	Ø180	Ø215	Ø250	4.0	M12	0	
<b>160M/L</b>	Ø300	Ø250	Ø350	5.0	Ø19	0							Ø180	Ø215	Ø250	4.0	M12	0							
<b>180M/L</b>	Ø300	Ø250	Ø350	5.0	Ø19	0																			
<b>200L</b>	Ø350	Ø300	Ø400	5.0	Ø19	0																			



## 32. MS SERIES - Exploded drawing spare part list



- |                               |                                |                             |
|-------------------------------|--------------------------------|-----------------------------|
| 1. Screw                      | 13. Terminal shim              | 25. Cooling fan             |
| 2. Gasket                     | 14. Terminal board             | 26. Fan circlip             |
| 3. Oil seal                   | 15. Terminal box fixing screws | 27. Fan cover               |
| 4. DE endshleld               | 16. Terminal box Dase          | 28. Fan cover fixing shim   |
| 5. B14 nang                   | 17. Cable gland                | 29. Fan cover fixing screws |
| 6. B5 nange                   | 18. Terminal box bottomgaskel  | 30. Endshield fixing nul    |
| 7. Terminal box cover         | 19. Frame                      | 31. Rivet                   |
| 8. Terminal box fixing screws | 20. Preload washer             | 32. Nameplate               |
| 9. Terminal box upper gasket  | 21. Key                        | 33. Foot fixing nut         |
| 10. Terminal box fixing nut   | 22. Rotor                      | 34. Foot fixing screws      |
| 11. Terminal bridge           | 23. Bearing                    | 35. Foot                    |
| 12. Terminal pin              | 24. NDE endshield              |                             |



electrical and mechanical data

# TA SERIES

*“ECOL”*



Alluminum casing

## 33. TA SERIES - Three-Phase Asynchronous single speed motors

### Electrical data (50Hz) Efficiency IE1 - 2 poles

Frame size	Power(Kw)	rpm (rpm/min)	Current In(A) 400V	Eff. (%)	Power factor (cosφ)	Torque Cn (Nm)	Is/In	Cs/Cn	Cmin./Cn	Cmax/Cn
T1A 801-2	0.75	2838	2.06	72.1	0.73	2.52	5	2.2	1.9	2.6
T1A 802-2	1.1	2836	2.90	75	0.73	3.70	5	2.2	1.8	2.6
T1A 90S-2	1.5	2842	3.79	77.2	0.74	5.04	5	2.2	1.8	2.5
T1A 90L-2	2.2	2835	5.04	79.7	0.79	7.41	5.5	2.2	1.8	2.5
T1A 100L-2	3	2841	6.56	81.5	0.81	10.08	5.5	2.3	1.9	2.6
T1A 112M-2	4	2900	8.58	83.1	0.81	13.17	6	2.4	1.9	2.6
T1A 132S1-2	5.5	2895	11.16	84.7	0.84	18.14	6	2.3	2	2.6
T1A 132S2-2	7.5	2900	14.81	86	0.85	24.70	6.4	2.3	2	2.7
T1A 160M1-2	11	2910	20.83	87.6	0.87	36.10	6.3	2.3	2	2.7
T1A 160M2-2	15	2908	28.06	88.7	0.87	49.26	6.8	2.3	2	2.7
T1A 160L-2	18.5	2912	33.60	89.3	0.89	60.67	7	2.3	2	2.7
T1A 180M-2	22	2920	39.69	89.9	0.89	71.95	7.2	2.3	2	2.6
T1A 200L1-2	30	2915	53.64	90.7	0.89	98.28	7	2.3	2	2.6
T1A 200L2-2	37	2920	65.80	91.2	0.89	121.00	7.2	2.3	2	2.7

### Electrical data (50Hz) Efficiency IE1 - 4 poles

Frame size	Power(Kw)	rpm (rpm/min)	Current In(A) 400V	Eff. (%)	Power factor (cosφ)	Torque Cn (Nm)	Is/In	Cs/Cn	Cmin./Cn	Cmax/Cn
T1A 801-4	0.55	1410	1.6	72.0	0,71	3.86	4.3	2.3	1.9	2.3
T1A 802-4	0.75	1410	2.00	72.1	0.75	5.08	5.4	2.2	1.9	2.6
T1A 90S-4	1.1	1415	2.71	75	0.78	7.42	5.3	2.2	1.8	2.6
T1A 90L-4	1.5	1410	3.60	77.2	0.78	10.16	5.5	2.2	1.8	2.5
T1A 100L1-4	2.2	1420	4.98	79.7	0.80	14.79	6	2.2	1.8	2.5
T1A 100L2-4	3	1420	6.64	81.5	0.80	20.17	6	2.3	1.9	2.6
T1A 112M-4	4	1425	8.47	83.1	0.82	26.81	6.3	2.4	1.9	2.6
T1A 132S-4	5.5	1420	11.29	84.7	0.83	36.99	6.5	2.3	2	2.6
T1A 132M-4	7.5	1420	14.81	86	0.85	50.44	6.4	2.3	2	2.7
T1A 160M-4	11	1430	21.32	87.6	0.85	73.46	6.8	2.3	2	2.7
T1A 160L-4	15	1435	27.74	88.7	0.88	99.82	6.7	2.3	2	2.7
T1A 180M-4	18.5	1435	33.98	89.3	0.88	123.11	7.2	2.3	2	2.7
T1A 180L-4	22	1450	40.60	89.9	0.87	144.89	7.3	2.3	2	2.6
T1A 200L-4	30	1450	53.64	90.7	0.89	197.57	7.6	2.3	2	2.6



### Electrical data (50Hz) Efficiency IE1- 6 poles

Frame size	Power(Kw)	rpm (rpm/min)	Current In(A) 400V	Eff. (%)	Power factor (cosφ)	Torque Cn (Nm)	Is/In	Cs/Cn	Cmin./Cn	Cmax/Cn
T1A 801-6	0.37	900	1.1	66	0.71	3.93	3	1.9	1.6	2
T1A 802-6	0.55	900	1.6	67	0.71	5.84	3.5	2.1	1.8	2.2
T1A 90S-6	0.75	930	2.15	70	0.72	7.70	5.3	2.2	1.9	2.6
T1A 90L-6	1.1	930	3.02	72.9	0.72	11.29	5	2.2	1.8	2.6
T1A 100L-6	1.5	935	3.94	75.2	0.73	15.32	4.9	2.2	1.8	2.5
T1A 112M-6	2.2	935	5.60	77.7	0.73	22.47	5.7	2.2	1.8	2.5
T1A 132S-6	3	935	7.44	79.7	0.73	30.64	6.3	2.3	1.9	2.6
T1A 132M1-6	4	940	9.59	81.4	0.74	40.64	6.2	2.4	1.9	2.6
T1A 132M2-6	5.5	940	12.57	83.1	0.76	55.87	6.8	2.3	2	2.6
T1A 160M-6	7.5	950	16.82	84.7	0.76	75.39	7	2.3	2	2.7
T1A 160L-6	11	955	23.56	86.4	0.78	109.99	7.3	2.3	2	2.7
T1A 180L-6	15	955	31.25	87.7	0.79	149.99	7.2	2.3	2	2.7
T1A 200L1-6	18.5	960	36.31	88.6	0.83	184.02	6.9	2.3	2	2.7
T1A 200L2-6	22	960	42.89	89.2	0.83	218.84	7.3	2.3	2	2.6

### Electrical data (50Hz) - 8 poles

Frame size	Power(Kw)	rpm (rpm/min)	Current In(A) 400V	Eff. (%)	Power factor (cosφ)	Torque Cn (Nm)	Is/In	Cs/Cn	Cmin./Cn	Cmax/Cn
T1A 801-8	0,18	670	0.83	52	0.62	2.6	3	1.6	1.1	2
T1A 802-8	0,25	670	1	61	0.62	3.6	3	1.8	1.3	2
T1A 90S-8	0.37	680	1.3	64	0.63	5.2	3.2	1.8	1.3	2
T1A 90L-8	0.55	690	1.9	67	0.63	7.6	3.4	1.8	1.3	2
T1A 100L-8	0.75	690	2.5	68	0.64	10.4	3.4	2	1.7	2.1
T1A 100L-8	1.1	690	3.5	70	0.64	15.2	3.4	2	1.7	2.1
T1A 112M-8	1.5	700	4.6	73	0.65	20.5	3.5	1.9	1.6	2.1
T1A 132S-8	2.2	705	5.7	78	0.71	29.8	4.6	1.9	1.6	2.1
T1A 132M1-8	3	710	7.6	79	0.72	40.4	5	1.9	1.6	2.2
T1A 160M1-8	4	710	9.9	80	0.73	53.8	5	2	1.7	2.3
T1A 160M2-8	5.5	715	13	82	0.73	73	5.2	2	1.7	2.1
T1A 160L-8	7.5	720	17	84	0.74	100	5.4	2.1	1.8	2.2
T1A 180L-8	11	730	24	86	0.76	144	5.1	2.1	1.8	2.2
T1A 200L-8	15	730	33	87	0.76	196	5.3	2.1	1.8	2.2

## 33. TA SERIES - Three-Phase Asynchronous single speed motors

### Electrical data (50Hz) Efficiency IE2 - 2 poles

Frame size	Power(Kw)	rpm (rpm/min)	Current In(A) 400V	Eff. (%)	Power factor (cosφ)	Torque Cn (Nm)	Is/In	Cs/Cn	Cmin./Cn	Cmax/Cn
T2A 801-2	0.75	2848	1.86	77.4	0.75	2.51	6	2.7	2.1	2.8
T2A 802-2	1.1	2846	2.52	79.6	0.79	3.69	6.7	2.7	2.1	2.9
T2A 90S-2	1.5	2852	3.17	81.3	0.84	5.02	6.1	2.3	2	2.7
T2A 90L-2	2.2	2845	4.54	83.2	0.84	7.38	7	2.6	2.1	2.7
T2A 100L-2	3	2851	5.75	84.6	0.89	10.05	7.6	2.5	2	2.8
T2A 112M-2	4	2910	7.56	85.8	0.89	13.13	7.8	2.5	2	2.7
T2A 132S1-2	5.5	2905	10.25	87	0.89	18.08	7.8	2.4	2	2.9
T2A 132S2-2	7.5	2910	13.96	88.1	0.88	24.61	7.9	2.7	2	2.8
T2A 160M1-2	11	2920	19.73	89.4	0.90	35.97	7.9	2.2	2.1	3
T2A 160M2-2	15	2918	26.35	90.3	0.91	49.09	7.9	2.3	2.1	3
T2A 160L-2	18.5	2922	31.93	90.9	0.92	60.46	8	2.4	2.1	2.9
T2A 180M-2	22	2930	39.08	91.3	0.89	71.70	7.5	2.3	2	2.8
T2A 200L1-2	30	2925	53.49	92	0.88	97.94	6.7	2.4	2	2.7
T2A 200L2-2	37	2930	64.15	92.5	0.90	120.59	6.3	2.3	2	2.7

### Electrical data (50Hz) Efficiency IE2 - 4 poles

Frame size	Power(Kw)	rpm (rpm/min)	Current In(A) 400V	Eff. (%)	Power factor (cosφ)	Torque Cn (Nm)	Is/In	Cs/Cn	Cmin./Cn	Cmax/Cn
T2A 802-4	0.75	1420	1.79	79.6	0.76	5.04	5.4	2.3	2.1	2.9
T2A 90S-4	1.1	1425	2.50	81.4	0.78	7.37	5.9	2.3	2.1	2.7
T2A 90L-4	1.5	1420	3.31	82.8	0.79	10.09	6.4	2.4	2	2.7
T2A 100L1-4	2.2	1430	4.59	84.3	0.82	14.69	6.6	2.4	2.1	2.9
T2A 100L2-4	3	1430	6.33	85.5	0.80	20.03	6.9	2.4	2	2.8
T2A 112M-4	4	1435	8.44	86.6	0.79	26.62	7.9	2.5	2	3
T2A132S-4	5.5	1430	11.04	87.7	0.82	36.73	7.1	2.3	2	2.8
T2A 132M-4	7.5	1430	14.70	88.7	0.83	50.08	7.8	2.3	2	2.7
T2A160M-4	11	1440	19.43	89.8	0.91	72.95	7.9	2.5	2.1	2.8
T2A 160L-4	15	1445	25.92	90.8	0.92	99.13	7.8	2.4	2.1	2.9
T2A 180M-4	18.5	1445	33.66	91.2	0.87	122.26	7.8	2.4	2.1	3
T2A 180L-4	22	1460	38.95	91.6	0.89	143.89	7.5	2.3	2	3
T2A 200L-4	30	1460	53.31	92.3	0.88	196.22	7.9	2.4	2	2.7

**Electrical data (50Hz) Efficiency IE2 - 6 poles**

Frame size	Power(Kw)	rpm (rpm/min)	Current In(A) 400V	Eff. (%)	Power factor (cosφ)	Torque Cn (Nm)	Is/In	Cs/Cn	Cmin./Cn	Cmax/Cn
T2A 90S-6	0.75	935	1.88	75.9	0.76	7.66	6.2	2.2	2	2.7
T2A 90L-6	1.1	935	2.54	78.1	0.80	11.23	6	2.3	2.1	2.6
T2A 100L-6	1.5	940	3.31	79.8	0.82	15.24	5.8	2.3	2.1	2.7
T2A 112M-6	2.2	940	4.85	81.8	0.80	22.35	6.4	2.3	2.1	2.9
T2A 132S-6	3	940	6.26	83.3	0.83	30.48	6.3	2.4	2.2	2.8
T2A 132M1-6	4	945	8.12	84.6	0.84	40.42	6.2	2.5	2	2.8
T2A 132M2-6	5.5	945	11.26	86	0.82	55.58	6.8	2.3	1.9	2.8
T2A 160M-6	7.5	955	14.78	87.2	0.84	74.99	7	2.4	1.9	2.7
T2A 160L-6	11	960	21.06	88.7	0.85	109.42	7.3	2.5	2	2.8
T2A 180L-6	15	960	29.08	89.7	0.83	149.21	7.8	2.3	2.1	2.9
T2A 200L1-6	18.5	965	34.75	90.4	0.85	183.07	7.8	2.4	2.1	3.2
T2A 200L2-6	22	965	40.62	90.9	0.86	217.70	7.9	2.3	1.9	3.1

## 33. TA SERIES - Three-Phase Asynchronous single speed motors

### Electrical data (50Hz) Efficiency IE3 - 2 poles

Frame size	Power(Kw)	rpm (rpm/min)	Current In(A) 400V	Eff. (%)	Power factor (cosφ)	Torque Cn (Nm)	Is/In	Cs/Cn	Cmin./Cn	Cmax/Cn
T3A 801-2	0.75	2848	1.79	80.7	0.75	2.51	6	2.7	2.1	2.8
T3A 802-2	1.1	2846	2.43	82.7	0.79	3.69	6.7	2.7	2.1	2.9
T3A 90S-2	1.5	2852	3.06	84.2	0.84	5.02	6.1	2.3	2	2.7
T3A 90L-2	2.2	2845	4.40	85.9	0.84	7.38	7	2.6	2.1	2.7
T3A 100L-2	3	2851	5.59	87.1	0.89	10.05	7.6	2.5	2	2.8
T3A 112M-2	4	2910	7.36	88.1	0.89	13.13	7.8	2.5	2	2.7
T3A 132S1-2	5.5	2905	10.00	89.2	0.89	18.08	7.8	2.4	2	2.9
T3A 132S2-2	7.5	2910	13.65	90.1	0.88	24.61	7.9	2.7	2	2.8
T3A 160M1-2	11	2920	19.34	91.2	0.90	35.97	7.9	2.2	2.1	3
T3A 160M2-2	15	2918	25.89	91.9	0.91	49.09	7.9	2.3	2.1	3
T3A 160L-2	18.5	2922	31.41	92.4	0.92	60.46	8	2.4	2.1	2.9
T3A 180M-2	22	2930	38.49	92.7	0.89	71.70	7.5	2.3	2	2.8
T3A 200L1-2	30	2925	52.74	93.3	0.88	97.94	6.7	2.4	2	2.7
T3A 200L2-2	37	2930	63.33	93.7	0.90	120.59	6,3	2.3	2	2.7

### Electrical data (50Hz) Efficiency IE3 - 4 poles

Frame size	Power(Kw)	rpm (rpm/min)	Current In(A) 400V	Eff. (%)	Power factor (cosφ)	Torque Cn (Nm)	Is/In	Cs/Cn	Cmin./Cn	Cmax/Cn
T3A 802-4	0.75	1420	1.73	82.5	0.76	5.04	5.4	2.3	2.1	2.9
T3A 90S-4	1.1	1425	2.42	84.1	0.78	7.37	5.9	2.3	2.1	2.7
T3A 90L-4	1.5	1420	3.21	85.3	0.79	10.09	6.4	2.4	2	2.7
T3A 100L1-4	2.2	1430	4.47	86.7	0.82	14.69	6.6	2.4	2.1	2.9
T3A 100L2-4	3	1430	6.17	87.7	0.80	20.03	6.9	2.4	2	2.8
T3A 112M-4	4	1435	8.25	88.6	0.79	26.62	7.9	2.5	2	3
T3A 132S-4	5.5	1430	10.81	89.6	0.82	36.73	7.1	2.3	2	2.8
T3A 132M-4	7.5	1430	14.43	90.4	0.83	50.08	7.8	2.3	2	2.7
T3A 160M-4	11	1440	19.09	91.4	0.91	72.95	7.9	2.5	2.1	2.8
T3A 160L-4	15	1445	25.55	92.1	0.92	99.13	7.8	2.4	2.1	2.9
T3A 180M-4	18.5	1445	33.15	92.6	0.87	122.26	7.8	2.4	2.1	3
T3A 180L-4	22	1460	38.37	93	0.89	143.89	7.5	2.3	2	3
T3A 200L-4	30	1460	52.57	93.6	0.88	196.22	7.9	2.4	2	2.7



### Electrical data (50Hz) Efficiency IE3 - 6 poles

Frame size	Power(Kw)	rpm (rpm/min)	Current In(A) 400V	Eff. (%)	Power factor (cosφ)	Torque Cn (Nm)	Is/In	Cs/Cn	Cmin./Cn	Cmax/Cn
T3A 90S-6	0.75	935	1.81	78.9	0.76	7.66	6.2	2.2	2	2
T3A 90L-6	1.1	935	2.45	81	0.80	11.23	6	2.3	2.1	2.1
T3A 100L-6	1.5	940	3.20	82.5	0.82	15.24	5.8	2.3	2.1	2.1
T3A 112M-6	2.2	940	4.71	84.3	0.80	22.35	6.4	2.3	2.1	2.1
T3A 132S-6	3	940	6.09	85.6	0.83	30.48	6.3	2.4	2.2	2.2
T3A 132M1-6	4	945	7.92	86.8	0.84	40.42	6.2	2.5	2	2
T3A 132M2-6	5.5	945	11.00	88	0.82	55.58	6.8	2.3	1.9	1.9
T3A 160M-6	7.5	955	14.46	89.1	0.84	74.99	7	2.4	1.9	1.9
T3A 160L-6	11	960	20.69	90.3	0.85	109.42	7.3	2.5	2	2
T3A 180L-6	15	960	28.60	91.2	0.83	149.21	7.8	2.3	2.1	2.1
T3A 200L1-6	18.5	965	34.26	91.7	0.85	183.07	7.8	2.4	2.1	2.1
T3A 200L2-6	22	965	40.05	92.2	0.86	217.70	7.9	2.3	1.9	1.9

## 34. TA SERIES - Weight TA IE1

Frame size	Kw	Weight kg				
		B3	B14	B5	B34	B35
801-2	0,75	8,90	8,90	9,00	9,50	9,50
802-2	1,10	10,10	10,10	10,20	10,50	10,50
90S-2	1,50	12,30	12,30	12,36	12,80	12,80
90L1-2	2,20	15,50	15,50	15,80	16,00	16,00
100L1-2	3,00	22,40	22,40	22,50	22,80	22,80
112M-2	4,00	26,40	26,40	26,50	26,80	26,80
132S1-2	5,50	41,30	41,30	44,00	44,50	44,50
132S2-2	7,50	43,00	43,00	43,20	43,60	43,60
160M1-2	11,00	81,00	81,00	82,30	82,70	82,70
160M2-2	15,00	83,00	83,00	84,10	84,60	84,60
160L-2	18,50	97,30	97,30	97,90	98,40	98,40
180M-2	22,00	128,00		129,80		130,00
200L1-2	30,00	147,50		150,00		151,00
200L2-2	37,00	169,00		170,00		171,50

Frame size	Kw	Weight kg				
		B3	B14	B5	B34	B35
801-4	0,55	8,20	8,20	8,25	8,75	8,75
802-4	0,75	9,80	9,80	10,10	10,40	10,40
90S-4	1,10	12,30	12,30	12,50	13,10	13,10
90L1-4	1,50	15,10	15,10	15,20	15,50	15,50
100L1-4	2,20	24,10	24,10	24,10	26,50	26,50
100L2-4	3,00	24,50	24,50	25,10	26,90	26,90
112M-4	4,00	29,50	29,50	31,50	32,20	32,20
132S-4	5,50	43,60	43,60	44,00	45,20	45,20
132M-4	7,50	54,50	54,50	55,00	56,50	56,50
160M-4	11,00	78,50	78,50	79,80	80,20	80,20
160L1-4	15,00	93,60	93,60	95,30	96,40	96,40
180M-4	18,5	118,65		130,00		131,00
180L-4	22	127,50		129,80		132,00
200L-4	30	153,00		155,00		156,70

Frame size	Kw	Weight kg				
		B3	B14	B5	B34	B35
801-6	0,37	8,25	8,25	8,30	8,80	8,80
802-6	0,55	9,75	9,75	10,50	8,80	8,80
90S-6	0,75	12,50	12,50	12,80	13,30	13,30
90L-6	1,10	14,50	14,50	15,30	15,90	15,90
100L-6	1,50	19,90	19,90	20,00	21,30	21,30
112M-6	2,20	32,50	32,50	33,70	34,10	34,10
132S-6	3,00	37,00	37,00	38,20	39,40	39,40
132M1-6	4,00	42,00	42,00	43,10	43,90	43,90
132M2-6	5,50	56,90	56,90	57,80	58,60	58,60
160M-6	7,50	78,00	78,00	79,10	80,20	80,20
160L-6	11,00	98,00	98,00	99,85	101,30	101,30
180L-6	15	124,00		125,20		126,40
200L1-6	18,5	141,00		143,00		144,00
200L2-6	22	157,80		159,00		160,20

Frame size	Kw	Weight kg				
		B3	B14	B5	B34	B35
801-8	0,18	8,30	8,30	8,20	8,45	8,45
802-8	0,25	9,30	9,30	9,20	9,60	9,60
803-8	0,37	10,50	10,50	11,00	11,60	11,60
90S-8	0,37	11,40	11,40	12,00	12,50	12,50
90L-8	0,55	14,00	14,00	14,50	14,90	14,90
100L1-8	0,75	17,60	17,60	18,03	18,90	18,90
100L2-8	1,10	20,00	20,00	21,00	22,10	22,10
112M-8	1,50	25,30	25,30	25,80	26,90	26,90
132S-8	2,20	39,60	39,60	40,20	41,25	41,25
132M-8	3,00	47,40	47,40	48,45	50,00	50,00
160M1-8	4,00	59,00	59,00	59,00	60,00	60,00
160M2-8	5,50	69,00	69,00	69,00	71,00	71,00
160L-8	7,5	87,00	87,00	87,90	88,60	88,60
180L-8	11	128,00		129,00		132,00
200L-8	15	157,00		158,60		160,30

## 35. TA SERIES - Weight TA IE2

Frame size	Kw	Weight kg				
		B3	B14	B5	B34	B35
801-2	0,75	9,50	9,50	9,60	10,00	10,00
802-2	1,10	10,40	10,40	10,60	11,00	11,00
90S-2	1,50	13,50	13,50	14,00	15,00	15,00
90L-2	2,20	16,20	16,20	17,50	17,00	17,00
100L-2	3,00	22,30	22,30	25,00	25,50	25,50
112M-2	4,00	28,70	28,70	31,00	30,00	30,00
132S1-2	5,50	45,40	45,40	46,50	47,00	47,00
132S2-2	7,50	50,00	50,00	51,50	52,00	52,00
160M1-2	11,00	79,00	79,00	82,30	83,50	83,50
160M2-2	15,00	91,00	91,00	91,80	93,10	93,10
160L-2	18,50	101,00	101,00	102,00	102,90	102,90
180M-2	22,00	138,00		142,30		146,70
200L1-2	30,00	158,00		153,70		154,00
200L2-2	37,00	181,30		182,00		183,70

Frame size	Kw	Weight kg				
		B3	B14	B5	B34	B35
802-4	0,75	10,50	10,50	11,00	11,50	11,50
90S-4	1,10	14,30	14,30	14,50	14,60	14,60
90L-4	1,50	18,00	18,00	18,00	18,50	18,50
100L1-4	2,20	23,40	23,40	24,00	25,00	25,00
100L2-4	3,00	26,30	26,30	28,00	28,50	28,50
112M-4	4,00	35,20	35,20	37,00	36,00	36,00
132S-4	5,50	49,40	49,40	50,00	51,50	51,50
132M-4	7,50	62,30	62,30	62,00	63,00	63,00
160M-4	11,00	83,00	83,00	84,00	84,90	84,90
160L-4	15,00	102,00	102,00	102,60	104,10	104,10
180M-4	18,5	119,00		119,60		121,20
180L-4	22	139,00		139,50		140,40
200L-4	30	169,20		169,80		171,30

Frame size	Kw	Weight kg				
		B3	B14	B5	B34	B35
90S-6	0,75	13,00	13,00	13,20	13,90	13,90
90L-6	1,10	16,00	16,00	16,60	17,40	17,40
100L-6	1,50	20,00	20,00	21,50	22,30	22,30
112M-6	2,20	31,00	31,00	32,00	32,70	32,70
132S-6	3,00	43,00	43,00	44,00	44,90	44,90
132M1-6	4,00	52,00	52,00	53,00	54,20	54,20
132M2-6	5,50	58,50	58,50	59,70	61,30	61,30
160M-6	7,50	78,50	78,50	79,40	80,30	80,30
160L-6	11,00	98,40	98,40	99,50	101,00	101,00
180L-6	15	143,20		144,30		145,50
200L1-6	18,5	158,70		159,80		160,80
200L2-6	22	166,80		167,50		169,10

## 36. TA SERIES - Weight TA IE3

Frame size	Kw	Weight kg				
		B3	B14	B5	B34	B35
801-2	0,75	11,40	11,40	11,52	12,00	12,00
802-2	1,1	12,48	12,48	12,72	13,20	13,20
90S-2	1,5	16,20	16,20	16,80	18,00	18,00
90L-2	2,2	19,44	19,44	21,00	20,40	20,40
100L-2	3	26,76	26,76	30,00	30,60	30,60
112M-2	4	34,44	34,44	37,20	36,00	36,00
132S1-2	5,5	54,48	54,48	55,80	56,40	56,40
132S2-2	7,5	60,00	60,00	61,80	62,40	62,40
160M1-2	11	94,80	94,80	98,76	100,20	100,20
160M2-2	15	109,20	109,20	110,16	111,72	111,72
160L-2	18,5	121,20	121,20	122,40	123,48	123,48
180M-2	22	153,60		154,56		156,00
200L1-2	30	189,60		184,44		184,80
200L2-2	37	217,56		218,40		220,44

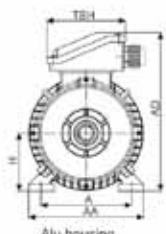
Frame size	Kw	Weight kg				
		B3	B14	B5	B34	B35
802-4	0,75	12,60	12,60	13,20	13,80	13,80
90S-4	1,1	17,16	17,16	17,40	17,52	17,52
90L-4	1,5	21,60	21,60	21,60	22,20	22,20
100L1-4	2,2	28,08	28,08	28,80	30,00	30,00
100L2-4	3	31,56	31,56	33,60	34,20	34,20
112M-4	4	42,24	42,24	44,40	43,20	43,20
132S-4	5,5	59,28	59,28	60,00	61,80	61,80
132M-4	7,5	74,76	74,76	74,40	75,60	75,60
160M-4	11	99,60	99,60	100,80	101,88	101,88
160L-4	15	122,40	122,40	123,12	124,92	124,92
180M-4	18,5	142,80		143,52		145,44
180L-4	22	166,80		167,40		168,48
200L-4	30	203,04		203,76		205,56

Frame size	Kw	Weight kg				
		B3	B14	B5	B34	B35

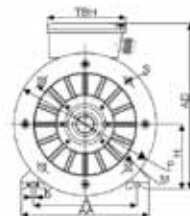
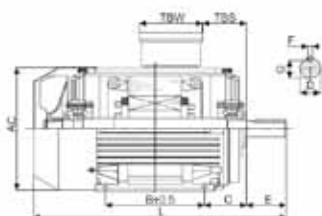
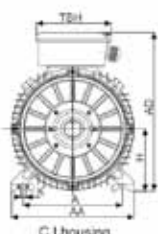
90S-6	0,75	15,60	15,60	15,84	16,68	16,68
90L-6	1,1	19,20	19,20	19,92	20,88	20,88
100L-6	1,5	24,00	24,00	25,80	26,76	26,76
112M-6	2,2	37,20	37,20	38,40	39,24	39,24
132S-6	3	51,60	51,60	52,80	53,88	53,88
132M1-6	4	62,40	62,40	63,60	65,04	65,04
132M2-6	5,5	70,20	70,20	71,64	73,56	73,56
160M-6	7,5	94,20	94,20	95,28	96,36	96,36
160L-6	11	118,08	118,08	119,40	121,20	121,20
180L-6	15	171,84		173,16		174,60
200L1-6	18,5	190,44		191,76		192,96
200L2-6	22	200,16		201,00		202,92

## 37. TA SERIES - Overall and installation dimensions

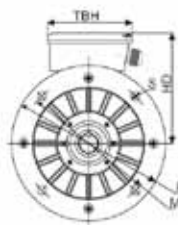
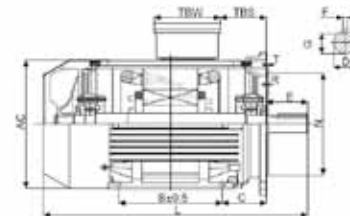
Measures in mm



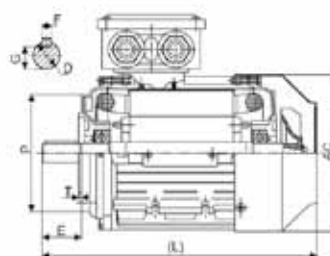
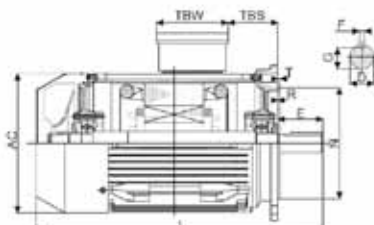
IM B3



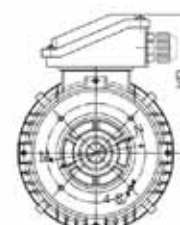
IM B3/B5



IM B5



IM B14

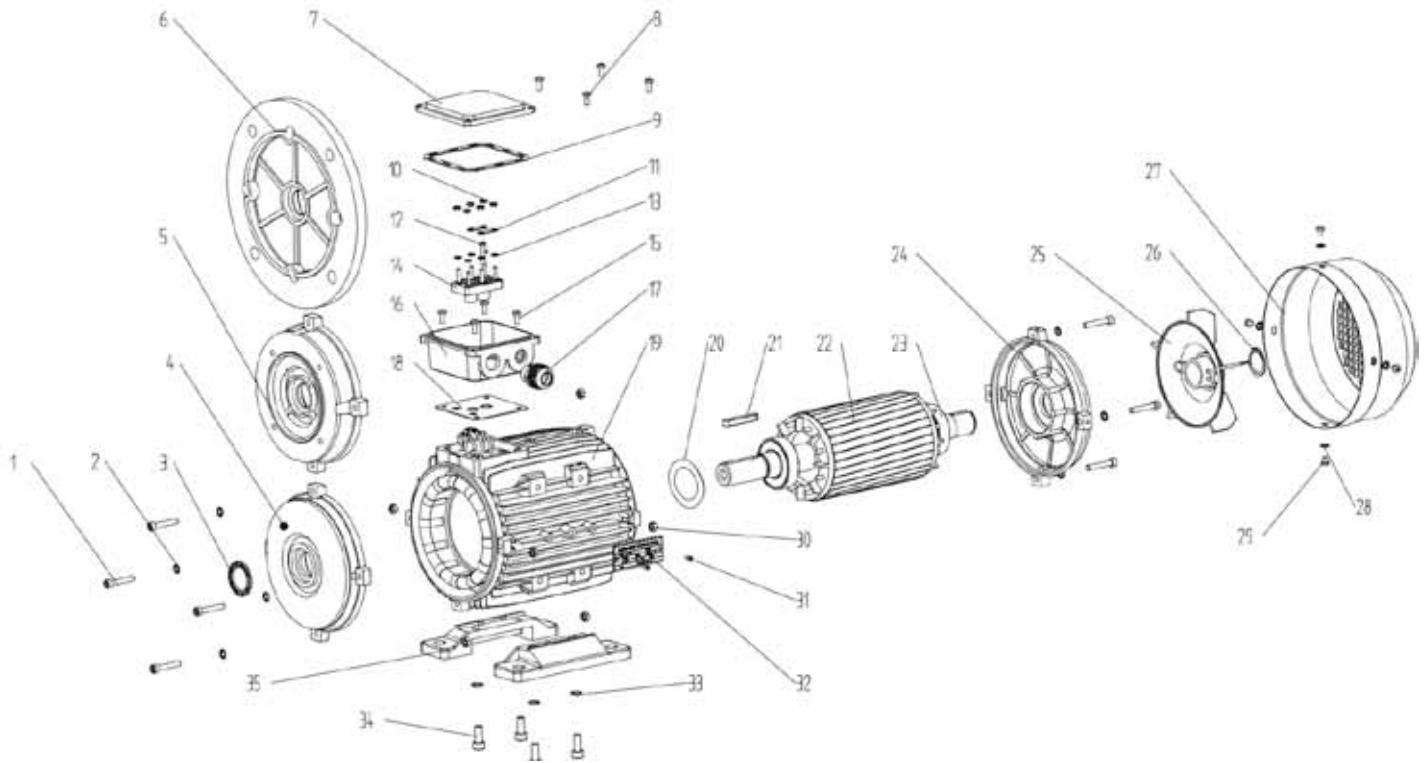


Frame size	B3				Shaft					General							
	H	A	B	C	D	E	F	G	K	AA	AD	HD	AC	L	TBS	TBW	TBH
80	80	125	100	50	Ø19	40	6	15.5	Ø9	160	220	140	158	280	16	97	97
90S/L	90	140	100/125	56	Ø24	50	8	20	Ø10	175	240	150	176	325/350	16	97	97
100	100	160	140	63	Ø28	60	8	24	Ø12	200	265	165	199	388	20	118	118
112	112	190	140	70	Ø28	60	8	24	Ø12	230	291	179	220	405	29	118	118
132S/M	132	216	140/178	89	Ø38	80	10	33	Ø12	255	332	200	259	467/505	29	118	118
160ML	160	254	210/254	108	Ø42	110	12	37	Ø15	314	402	242	313	605/650	91	162	187
180ML	180	279	241/279	121	Ø48	110	14	42.5	Ø15	348	439	259	360	687/725	160/180	162	187
200L	200	318	305	133	Ø55	110	16	49	Ø19	388	497	297	399	768	192	186	233

Frame size	B5						B14					
	N	M	P	S	T	R	N	M	P	S	T	R
80	130	165	200	4-Ø12	3.5	0	80	100	118	M6	3	0
90S/L	130	165	200	4-Ø12	3.5	0	95	115	138	M8	3	0
100	180	215	250	4-Ø15	4	0	110	130	158	M8	3.5	0
112	180	215	250	4-Ø15	4	0	110	130	158	M8	3.5	0
132S/M	230	265	300	4-Ø15	4	0	130	165	198	M10	3.5	0
160ML	250	300	350	4-Ø19	5	0						0
180ML	250	300	350	4-Ø19	5	0						0
200L	300	350	400	4-Ø19	5	0						0



## 38. TA SERIES - Exploded drawing spare part list



- |                               |                                |                             |
|-------------------------------|--------------------------------|-----------------------------|
| 1. Screw                      | 13. Terminal shim              | 25. Cooling fan             |
| 2. Gasket                     | 14. Terminal board             | 26. Fan circlip             |
| 3. Oil seal                   | 15. Terminal box fixing screws | 27. Fan cover               |
| 4. DE endshield               | 16. Terminal box Dase          | 28. Fan cover fixing shim   |
| 5. B14 nang                   | 17. Cable gland                | 29. Fan cover fixing screws |
| 6. B5 nange                   | 18. Terminal box bottomgaskel  | 30. Endshield fixing nul    |
| 7. Terminal box cover         | 19. Frame                      | 31. Rivet                   |
| 8. Terminal box fixing screws | 20. Preload washer             | 32. Nameplate               |
| 9. Terminal box upper gasket  | 21. Key                        | 33. Foot fixing nut         |
| 10. Terminal box fixing nut   | 22. Rotor                      | 34. Foot fixing screws      |
| 11. Terminal bridge           | 23. Bearing                    | 35. Foot                    |
| 12. Terminal pin              | 24. NDE endshield              |                             |



electrical and mechanical data

# TC SERIES

*“ECOL”*



cast iron casing

## 39. TC SERIES - Three-Phase Asynchronous single speed motors

### Electrical data (50Hz) Efficiency IE1 - 2 poles

Frame size	Power(Kw)	rpm (rpm/min)	Current In(A) 400V	Eff. (%)	Power factor (cosφ)	Torque Cn (Nm)	Is/In	Cs/Cn	Cmin./Cn	Cmax/Cn
T1C 132S1-2	5.5	2895	11.16	84.7	0.84	18.14	6	2.3	2	2.6
T1C 132S2-2	7.5	2900	14.81	86	0.85	24.70	6.4	2.3	2	2.7
T1C 160M1-2	11	2910	20.83	87.6	0.87	36.10	6.3	2.3	2	2.7
T1C 160M2-2	15	2908	28.06	88.7	0.87	49.26	6.8	2.3	2	2.7
T1C 160L-2	18.5	2912	33.60	89.3	0.89	60.67	7	2.3	2	2.7
T1C 180M-2	22	2920	39.69	89.9	0.89	71.95	7.2	2.3	2	2.6
T1C 200L1-2	30	2915	53.64	90.7	0.89	98.28	7	2.3	2	2.6
T1C 200L2-2	37	2920	65.80	91.2	0.89	121.00	7.2	2.3	2	2.7
T1C 225M-2	45	2920	78.70	91.7	0.90	147.16	7	2.3	2	2.7
T1C 250M-2	55	2930	97.85	92.2	0.88	179.25	7.8	2.2	1.9	2.5
T1C 280S-2	75	2930	131.22	92.7	0.89	244.44	7.8	2.1	1.9	2.5
T1C 280M-2	90	2930	155.21	93	0.90	293.32	7.7	2.1	1.9	2.5
T1C 315S-2	110	2940	189.09	93.3	0.90	357.29	7.7	2	1.8	2.3
T1C 315M-2	132	2940	223.93	93.5	0.91	428.74	7.6	2	1.8	2.3
T1C 315L1-2	160	2945	273.57	93.8	0.90	518.81	7.8	2	1.8	2.3
T1C 315L2-2	200	2945	345.07	94	0.89	648.51	7.9	2	1.8	2.3
T1C 355M-2	250	2945	426.54	94	0.90	810.64	7.8	2	1.8	2.3
T1C 355L-2	315	2945	543.48	94	0.89	1021.40	7.8	2	1.8	2.3

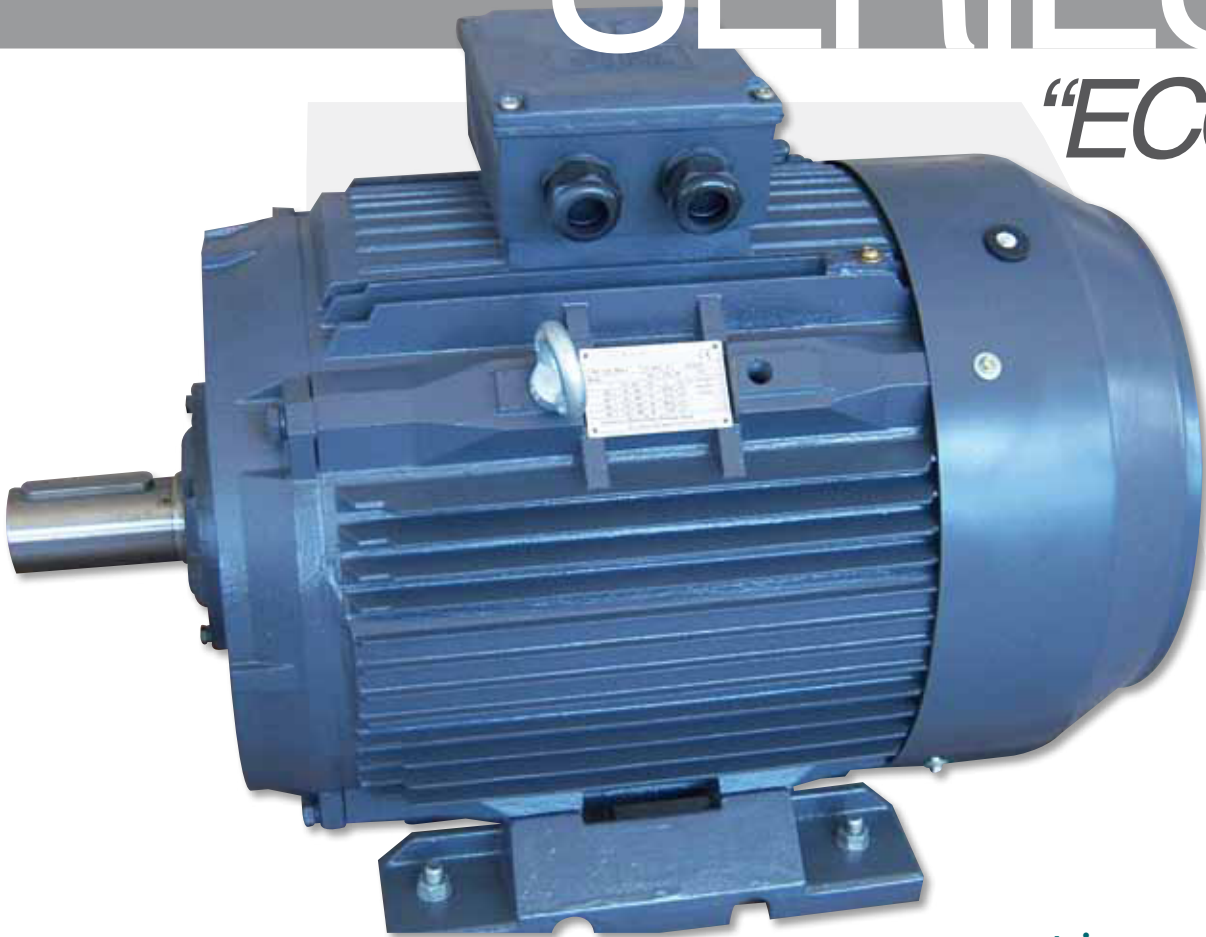
### Electrical data (50Hz) Efficiency IE1 - 4 poles

Frame size	Power(Kw)	rpm (rpm/min)	Current In(A) 400V	Eff. (%)	Power factor (cosφ)	Torque Cn (Nm)	Is/In	Cs/Cn	Cmin./Cn	Cmax/Cn
T1C 132S-4	5.5	1420	11.29	84.7	0.83	36.99	6.5	2.3	2	2.6
T1C 132M-4	7.5	1420	14.81	86	0.85	50.44	6.4	2.3	2	2.7
T1C 160M-4	11	1430	21.32	87.6	0.85	73.46	6.8	2.3	2	2.7
T1C 160L-4	15	1435	27.74	88.7	0.88	99.82	6.7	2.3	2	2.7
T1C 180M-4	18.5	1435	33.98	89.3	0.88	123.11	7.2	2.3	2	2.7
T1C 180L-4	22	1450	40.60	89.9	0.87	144.89	7.3	2.3	2	2.6
T1C 200L-4	30	1450	53.64	90.7	0.89	197.57	7.6	2.3	2	2.6
T1C 225S-4	37	1460	65.80	91.2	0.89	242.00	7.5	2.3	2	2.7
T1C 225M-4	45	1470	80.49	91.7	0.88	292.33	7.3	2.3	2	2.7
T1C 250M-4	55	1470	96.85	92.1	0.89	357.29	7.4	2.2	1.9	2.5
T1C 280S-4	75	1470	132.71	92.7	0.88	487.21	7.5	2.1	1.9	2.5
T1C 280M-4	90	1470	155.21	93	0.90	584.65	7.7	2.1	1.9	2.5
T1C 315S-4	110	1475	189.09	93.3	0.90	712.15	7.8	2	1.8	2.3
T1C 315M-4	132	1475	223.93	93.5	0.91	854.58	7.8	2	1.8	2.3
T1C 315L1-4	160	1475	270.56	93.8	0.91	1035.86	7.9	2	1.8	2.3
T1C 315L2-4	200	1475	341.23	94	0.90	1294.82	7.7	2	1.8	2.3
T1C 355M-4	250	1475	431.33	94	0.89	1618.52	7.9	2	1.8	2.3
T1C 355L-4	315	1475	537.44	94	0.90	2039.34	7.8	2	1.8	2.3

electrical and mechanical data

# TC SERIES

*“ECOL”*



cast iron casing



## 39. TC SERIES - Three-Phase Asynchronous single speed motors

### Electrical data (50Hz) Efficiency IE2 - 2 poles

Frame size	Power(Kw)	rpm (rpm/min)	Current In(A) 400V	Eff. (%)	Power factor (cosφ)	Torque Cn (Nm)	Is/In	Cs/Cn	Cmin./Cn	Cmax/Cn
T2C132S1-2	5.5	2905	10.25	87	0.89	18.08	7.8	2.4	2	2.9
T2C 132S2-2	7.5	2910	13.96	88.1	0.88	24.61	7.9	2.7	2	2.8
T2C 160M1-2	11	2920	19.73	89.4	0.90	35.97	7.9	2.2	2.1	3
T2C 160M2-2	15	2918	26.35	90.3	0.91	49.09	7.9	2.3	2.1	3
T2C 160L-2	18.5	2922	31.93	90.9	0.92	60.46	8	2.4	2.1	2.9
T2C 180M-2	22	2930	39.08	91.3	0.89	71.70	7.5	2.3	2	2.8
T2C 200L1-2	30	2925	53.49	92	0.88	97.94	6.7	2.4	2	2.7
T2C 200L2-2	37	2930	64.15	92.5	0.90	120.59	6.3	2.3	2	2.7
T2C 225M-2	45	2930	79.45	92.9	0.88	146.66	6.9	2.3	2	2.8
T2C 250 M-2	55	2940	96.80	93.2	0.88	178.64	8	2.3	1.9	2.7
T2C 280S-2	75	2940	125.45	93.8	0.92	243.60	8	2.2	1.9	2.7
T2C 280M-2	90	2940	150.06	94.1	0.92	292.33	7.7	2.2	1.9	2.6
T2C 315S-2	110	2940	187.08	94.3	0.90	357.29	7.7	2	1.8	2.3
T2C 315M-2	132	2940	221.33	94.6	0.91	428.74	7.6	2	1.8	2.3
T2C 315L1-2	160	2945	270.68	94.8	0.90	518.81	7.8	2	1.8	2.3
T2C 315L2-2	200	2945	341.44	95	0.89	648.51	7.9	2	1.8	2.3
T2C 355M-2	250	2945	422.05	95	0.90	810.64	7.8	2	1.8	2.3
T2C 355L-2	315	2945	537.76	95	0.89	1021.40	7.8	2	1.8	2.3

### Electrical data (50Hz) Efficiency IE2 - 4 poles

Frame size	Power(Kw)	rpm (rpm/min)	Current In(A) 400V	Eff. (%)	Power factor (cosφ)	Torque Cn (Nm)	Is/In	Cs/Cn	Cmin./Cn	Cmax/Cn
T2C 132S-4	5.5	1430	11.04	87.7	0.82	36.73	7.1	2.3	2	2.8
T2C 132M-4	7.5	1430	14.70	88.7	0.83	50.08	7.8	2.3	2	2.7
T2C 160M-4	11	1440	19.43	89.8	0.91	72.95	7.9	2.5	2.1	2.8
T2C 160L-4	15	1445	25.92	90.8	0.92	99.13	7.8	2.4	2.1	2.9
T2C 180M-4	18.5	1445	33.66	91.2	0.87	122.26	7.8	2.4	2.1	3
T2C 180L-4	22	1460	38.95	91.6	0.89	143.89	7.5	2.3	2	3
T2C 200L-4	30	1460	53.31	92.3	0.88	196.22	7.9	2.4	2	2.7
T2C 225S-4	37	1470	72.02	92.7	0.80	240.36	6.7	2.4	2	2.7
T2C 225M-4	45	1480	87.21	93.1	0.80	290.35	7	2.3	2	2.8
T2C 250M-4	55	1480	96.49	93.5	0.88	354.87	7.4	2.4	1.9	2.7
T2C 280S-4	75	1480	126.56	94	0.91	483.92	7.5	2.2	1.9	2.6
T2C 280M-4	90	1480	149.90	94.2	0.92	580.70	7.7	2.2	1.9	2.6
T2C 315S-4	110	1480	186.69	94.5	0.90	709.75	7.8	2	1.8	2.3
T2C 315M-4	132	1480	221.09	94.7	0.91	851.69	7.8	2	1.8	2.3
T2C 315L1-4	160	1480	267.43	94.9	0.91	1032.36	7.9	2	1.8	2.3
T2C 315L2-4	200	1480	337.29	95.1	0.90	1290.45	7.7	2	1.8	2.3
T2C 355M-4	250	1480	426.35	95.1	0.89	1613.06	7.9	2	1.8	2.3
T2C 355L-4	315	1480	531.23	95.1	0.90	2032.45	7.8	2	1.8	2.3

**Electrical data (50Hz) Efficiency IE2 - 6 poles**

Frame size	Power(Kw)	rpm (rpm/min)	Current In(A) 400V	Eff. (%)	Power factor (cosφ)	Torque Cn (Nm)	Is/In	Cs/Cn	Cmin./Cn	Cmax/Cn
T2C 132S-6	3	940	6.26	83.3	0.83	30.48	6.4	2.4	2.2	2.8
T2C 132M1-6	4	945	8.12	84.6	0.84	40.42	6.2	2.5	2	2.8
T2C 132M2-6	5.5	945	11.26	86	0.82	55.58	6.7	2.3	1.9	2.8
T2C 160M-6	7.5	955	14.78	87.2	0.84	74.99	7	2.4	1.9	2.7
T2C 160L-6	11	960	21.06	88.7	0.85	109.42	7.3	2.5	2	2.8
T2C 180L-6	15	960	29.08	89.7	0.83	149.21	7.8	2.3	2.1	2.9
T2C200L1-6	18.5	965	34.75	90.4	0.85	183.07	7.8	2.4	2.1	3.2
T2C 200L2-6	22	965	40.62	90.9	0.86	217.70	7.9	2.3	1.9	3.1
T2C 225M-6	30	975	55.56	91.7	0.85	293.82	7.9	2.2	1.9	2.7
T2C 250M-6	37	975	69.79	92.2	0.83	362.38	7.5	2.3	2.1	2.7
T2C 280S-6	45	980	81.48	92.7	0.86	438.49	7.2	2.3	2	2.8
T2C280M1-6	55	980	99.15	93.1	0.86	535.93	7.7	2.2	1.9	2.7
T2C315S-6	75	980	129.81	93.7	0.89	730.81	7.9	2.1	1.9	2.5
T2C315M-6	90	980	153.56	94	0.90	876.98	7,9	2	1.8	2.3
T2C315L1-6	110	980	187.08	94.3	0.90	1071.86	7.7	2	1.8	2.3
T2C315L2-6	132	980	226.30	94.6	0.89	1286.23	7.8	2	1.8	2.3
T2C355M1-6	160	980	267.71	94.8	0.91	1559.07	7.8	2	1.8	2.3
T2C 355M2-6	200	980	337.64	95	0.90	1948.84	7.8	2	1.8	2.3
T2C 355L-6	250	980	426.79	95	0.89	2436.05	7.8	2	1.8	2.3

## 39. TC SERIES - Three-Phase Asynchronous single speed motors

### Electric data (50Hz) Efficiency IE3 - 2 poles

Frame size	Power(Kw)	rpm (rpm/min)	Current In(A) 400V	Eff. (%)	Power factor (cosφ)	Torque Cn (Nm)	Is/In	Cs/Cn	Cmin./Cn	Cmax/Cn
T3C 132S1-2	5.5	2905	10.00	89.2	0.89	18.08	7.8	2.4	2	2.9
T3C 132S2-2	7.5	2910	13.65	90.1	0.88	24.61	7.9	2.7	2	2.8
T3C 160M1-2	11	2920	19.34	91.2	0.90	35.97	7.9	2.2	2.1	3
T3C160M2-2	15	2918	25.89	91.9	0.91	49.09	7.9	2.3	2.1	3
T3C 160L-2	18.5	2922	31.41	92.4	0.92	60.46	8	2.4	2.1	2.9
T3C 180M-2	22	2930	38.49	92.7	0.89	71.70	7.5	2.3	2	2.8
T3C 200L1-2	30	2925	52.74	93.3	0.88	97.94	6.7	2.4	2	2.7
T3C 200L2-2	37	2930	63.33	93.7	0.90	120.59	6.3	2.3	2	2.7
T3C 225M-2	45	2930	78.52	94	0.88	146.66	6.9	2.3	2	2.8
T3C 250M-2	55	2940	95.67	94.3	0.88	178.64	8	2.3	1.9	2.7
T3C 280S-2	75	2940	124.26	94.7	0.92	243.60	8	2.2	1.9	2.7
T3C 280M-2	90	2940	148.64	95	0.92	292.33	7.7	2.2	1.9	2.6
T3C 315S-2	110	2940	185.31	95.2	0.90	357.29	7.7	2	1.8	2.3
T3C 315M-2	132	2940	219.47	95.4	0.91	428.74	7.6	2	1.8	2.3
T3C 315L1-2	160	2945	267.86	95.8	0.90	518.81	7.8	2	1.8	2.3
T3C 315L2-2	200	2945	338.58	95.8	0.89	648.51	7.9	2	1.8	2.3
T3C 355M-2	250	2945	418.53	95.8	0.90	810.64	7.8	2	1.8	2.3
T3C 355L-2	315	2945	533.27	95.8	0.89	1021.40	7.8	2	1.8	2.3

### Electric data (50Hz) Efficiency IE3 - 4 poles

Frame size	Power(Kw)	rpm (rpm/min)	Current In(A) 400V	Eff. (%)	Power factor (cosφ)	Torque Cn (Nm)	Is/In	Cs/Cn	Cmin./Cn	Cmax/Cn
T3C 132S-4	5.5	1430	10.81	89.6	0.82	36.73	7.1	2.3	2	2.8
T3C 132M-4	7.5	1430	14.43	90.4	0.83	50.08	7.8	2.3	2	2.7
T3C160M-4	11	1440	19.09	91.4	0.91	72.95	7.9	2.5	2.1	2.8
T3C 160L-4	15	1445	25.55	92.1	0.92	99.13	7.8	2.4	2.1	2.9
T3C 180M-4	18.5	1445	33.15	92.6	0.87	122.26	7.8	2.4	2.1	3
T3C 180L-4	22	1460	38.37	93	0.89	143.89	7.5	2.3	2	3
T3C 200L-4	30	1460	52.57	93.6	0.88	196.22	7.9	2.4	2	2.7
T3C 225S-4	37	1470	71.09	93.9	0.80	240.36	6.7	2.4	2	2.7
T3C 225M-4	45	1480	86.19	94.2	0.80	290.35	7	2.3	2	2.8
T3C 250M-4	55	1480	95.36	94.6	0.88	354.87	7.4	2.4	1.9	2.7
T3C 280S-4	75	1480	125.22	95	0.91	483.92	7.5	2.2	1.9	2.6
T3C 280M-4	90	1480	148.32	95.2	0.92	580.70	7.7	2.2	1.9	2.6
T3C 315S-4	110	1480	184.92	95.4	0.90	709.75	7.8	2	1.8	2.3
T3C 315M-4	132	1480	219.01	95.6	0.91	851.69	7.8	2	1.8	2.3
T3C 315L1-4	160	1480	264.91	95.8	0.91	1032.36	7.9	2	1.8	2.3
T3C 315L2-4	200	1480	334.12	96	0.90	1290.45	7.7	2	1.8	2.3
T3C 355M-4	250	1480	422.35	96	0.89	1613.06	7.9	2	1.8	2.3
T3C 355L-4	315	1480	526.25	96	0.90	2032.45	7.8	2	1.8	2.3



**Electric data (50Hz) Efficiency IE3 - 6 poles**

Frame size	Power(Kw)	rpm (rpm/min)	Current In(A) 400V	Eff. (%)	Power factor (cosφ)	Torque Cn (Nm)	Is/In	Cs/Cn	Cmin./Cn	Cmax/Cn
T3C 132S-6	3	940	6.09	85.6	0.83	30.48	6.3	2.4	2.2	2.8
T3C 132M1-6	4	945	7.92	86.8	0.84	40.42	6.2	2.5	2	2.8
T3C 132M2-6	5.5	945	11.00	88	0.82	55.58	6.8	2.3	1.9	2.8
T3C 160M-6	7.5	955	14.46	89.1	0.84	74.99	7	2.4	1.9	2.7
T3C 160L-6	11	960	20.69	90.3	0.85	109.42	7.3	2.5	2	2.8
T3C 180L-6	15	960	28.60	91.2	0.83	149.21	7.8	2.3	2.1	2.9
T3C 200L1-6	18.5	965	34.26	91.7	0.85	183.07	7.8	2.4	2.1	3.2
T3C 200L2-6	22	965	40.05	92.2	0.86	217.70	7.9	2.3	1.9	3.1
T3C 225M-6	30	975	54.84	92.9	0.85	293.82	7.9	2.2	1.9	2.7
T3C 250M-6	37	975	68.97	93.3	0.83	362.38	7.5	2.3	2.1	2.7
T3C 280S-6	45	980	80.61	93.7	0.86	438.49	7.2	2.3	2	2.8
T3C 280M1-6	55	980	98.10	94.1	0.86	535.93	7.7	2.2	1.9	2.7
T3C 315S-6	75	980	128.58	94.6	0.89	730.81	7.9	2.1	1.9	2.5
T3C 315M-6	90	980	152.10	94.9	0.90	876.98	8	2	1.8	2.3
T3C 315L1-6	110	980	185.51	95.1	0.90	1071.86	7.7	2	1.8	2.3
T3C 315L2-6	132	980	224.40	95.4	0.89	1286.23	.8	2	1.8	2.3
T3C 355M1-6	160	980	265.47	95.6	0.91	1559.07	7.6	2	1.8	2.3
T3C 355M2-6	200	980	334.82	95.8	0.90	1948.84	7.8	2	1.8	2.3
T3C 355L-6	250	980	423.23	95.8	0.89	2436.05	7.8	2	1.8	2.3

## 40. TC SERIES - Weight TC IE1

Frame size	Kw	Weight kg			
		B3	B14	B5	B35

132S1-2	5,5	57,20	61,30	62,00	63,20
132S2-2	7,5	62,00	66,10	67,20	68,00
160M1-2	11	111,00	112,40	114,80	115,30
160M2-2	15	118,30	119,70	121,10	122,60
160L-2	18,5	134,80	136,20	137,50	139,10
180M-2	22	152,80		168,70	172,40
200L1-2	30	218,10		239,80	247,60
200L2-2	37	230,00		247,50	259,50
225M1-2	45	303,00		321,90	329,60
250M1-2	55	391,20		410,76	425,00
280S-2	75	530,00		549,20	560,00
280M-2	90	572,00		579,50	589,00
315S-2	110	1030,00		1042,00	1054,00
315M-2	132	1264,80		1283,00	1293,00
315L1-2	160	1416,20		1431,00	1451,00
315L2-2	200	1432,00		1447,00	1467,00
355M2-2	250	1570,00		1578,00	1603,00
355L2-2	315	1760,00		1767,00	1792,00

Frame size	Kw	Weight kg			
		B3	B14	B5	B35

132S-4	5,5	60,00	64,10	65,20	66,00
132M-4	7,5	73,60	77,70	78,40	79,50
160M-4	11	114,60	116,00	117,10	118,90
160L-4	15	130,70	137,00	140,80	145,00
180M-4	18,5	149,50		161,10	169,10
180L-4	22	165,10		176,70	184,70
200L-4	30	216,50		238,00	246,00
225S-4	37	293,00		310,60	319,60
225M1-4	45	335,00		345,80	354,80
250M1-4	55	397,00		407,80	416,80
280S-4	75	540,00		549,80	560,00
280M-4	90	620,00		629,80	640,00
315S-4	110	1108,00		1120,00	1140,00
315M-4	132	1360,00		1364,00	1384,00
315L1-4	160	1450,00		1465,00	1485,00
315L2-4	200	1480,00		1495,00	1515,00
355M2-4	250	1600,00		1607,00	1632,00
355L2-4	315	1840,00		1847,00	1872,00

Frame size	Kw	Weight kg			
		B3	B14	B5	B35

132S-6	3	49,60	53,70	54,40	55,60
132M1-6	4	59,40	63,50	64,10	65,30
132M2-6	5,5	65,00	69,10	69,70	70,90
160M-6	7,5	105,00	106,40	108,10	109,30
160L-6	11	122,40	128,80	129,10	130,00
180L-6	15	161,50		175,10	181,10
200L1-6	18,5	208,30		231,80	237,80
200L2-6	22	218,20		241,70	247,70
225M-6	30	289,00		310,00	316,00
250M-6	37	380,00		391,80	399,80
280S-6	45	489,50		494,00	502,00
280M-6	55	620,00		635,00	643,00
315S-6	75	824,00		827,00	847,00
315M-6	90	960,00		967,00	987,00
315L1-6	110	1100,00		1114,00	1134,00
315L2-6	132	1175,00		1192,00	1212,00
355M1-6	160	1520,00		1527,00	1552,00
355M2-6	200	1580,00		1587,00	1612,00
355L2-6	250	1640,00		1647,00	1672,00

Frame size	Kw	Weight kg			
		B3	B14	B5	B35

132S-8	2,2	59,00	63,00	65,00	66,00
132M-8	3	70,00	75,00	76,00	77,00
160M1-8	4	77,00	82,00	83,00	84,00
160M2-8	5,5	124,00	126,00	127,50	129,00
160L-8	7,5	144,00	152,00	153,00	153,00
180L-8	11	191,00		208,00	214,00
200L-8	15	246,00		275,00	281,00
225S-8	18,5	257,00		286,00	292,00
225M-8	22	341,00		367,00	373,00
250M-8	30	448,00		464,00	472,00
280S-8	37	578,00		584,00	592,00
280M-8	45	732,00		751,00	759,00
315S-8	55	972,00		979,00	999,00
315M-8	75	1133,00		1145,00	1165,00
315L1-8	90	1298,00		1318,00	1338,00
315L2-8	110	1387,00		1410,00	1430,00
355M1-8	132	1794,00		1806,00	1831,00
355M2-8	160	1864,00		1877,00	1902,00
355L2-8	200	1935,00		1948,00	1973,00

## 41. TC SERIES - Weight TC IE2

Frame size	Kw	Weight kg			
		B3	B14	B5	B35

132S1-2	5,5	64,00	64,70	66,40	67,40
132S2-2	7,5	70,00	70,70	72,40	73,40
160M1-2	11	116,00	120,00	123,00	124,00
160M2-2	15	139,00	142,00	146,00	147,00
160L-2	18,5	152,00	154,00	159,00	160,00
180M-2	22	177,00		182,00	186,00
200L1-2	30	233,00		246,00	250,00
200L2-2	37	246,00		252,00	256,00
225M-2	45	322,00		330,00	334,00
250M-2	55	420,00		436,00	442,00
280S-2	75	655,00		669,00	675,00
280M-2	90	572,00		645,00	651,00
315S-2	110	920,00		940,00	950,00
315M-2	132	1020,00		1040,00	1050,00
315L1-2	160	1060,00		1080,00	1090,00
315L2-2	200	1130,00		1150,00	1160,00
355M2-2	250	1630,00		1648,00	1663,00
355L2-2	315	1760,00		1779,00	1794,00

Frame size	Kw	Weight kg			
		B3	B14	B5	B35

132S-4	5,5	66,00	66,70	67,90	69,40
132M-4	7,5	81,00	81,70	82,90	84,40
160M-4	11	137,00	140,00	143,50	145,00
160L-4	15	136,00	144,00	148,50	150,00
180M-4	18,5	158,00		166,50	168,00
180L-4	22	183,00		188,50	190,00
200L-4	30	242,00		252,00	256,00
225S-4	37	307,00		316,00	320,00
225M-4	45	352,00		367,00	371,00
250M-4	55	428,00		446,00	450,00
280S-4	75	600,00		614,00	620,00
280M-4	90	646,00		664,00	670,00
315S-4	110	940,00		960,00	970,00
315M-4	132	1060,00		1080,00	1090,00
315L1-4	160	1040,00		1160,00	1170,00
315L2-4	200	1220,00		1240,00	1250,00
355M2-4	250	1643,00		1665,00	1680,00
355L-4	315	1895,00		1911,00	1926,00

Frame size	Kw	Weight kg			
		B3	B14	B5	B35

132S-6	3	56,54	61,22	62,38	63,38
132M1-6	4	67,72	72,39	73,44	74,44
132M2-6	5,5	74,10	78,77	79,83	80,83
160M-6	7,5	121,00	124,00	127,50	129,00
160L-6	11	139,00	142,00	145,50	147,00
180L-6	15	187,00		194,80	196,30
200L1-6	18,5	237,46		267,09	271,09
200L2-6	22	248,75		278,38	282,38
225M-6	30	335,00		343,00	347,00
250M-6	37	433,20		451,77	455,77
280S-6	45	514,00		528,30	534,30
280M-6	55	706,80		727,02	733,02
315S-6	75	939,36		955,58	965,58
315M-6	90	960,00		980,00	990,00
315L1-6	110	1000,00		1020,00	1030,00
315L2-6	132	1080,00		1100,00	1110,00
355M1-6	160	1732,80		1754,28	1769,28
355M3-6	200	1801,20		1822,68	1837,68
355L2-6	250	1869,60		1891,08	1906,08

## 42. SERIE TC - Weight TC IE3

Frame size	Kw	Weight kg			
		B3	B14	B5	B35

132S1-2	5,5	71,68	72,46	74,37	75,49
132S2-2	7,5	78,40	79,18	81,09	82,21
160M1-2	11	129,92	134,40	137,76	138,88
160M2-2	15	155,68	159,04	163,52	164,64
160L-2	18,5	170,24	172,48	178,08	179,20
180M-2	22	198,24		203,84	208,32
200L1-2	30	260,96		275,52	280,00
200L2-2	37	275,52		282,24	286,72
225M-2	45	360,64		369,60	374,08
250M-2	55	470,40		488,32	495,04
280S-2	75	733,60		749,28	756,00
280M-2	90	640,64		722,40	729,12
315S-2	110	1030,40		1052,80	1064,00
315M-2	132	1142,40		1164,80	1176,00
315L1-2	160	1187,20		1209,60	1220,80
315L2-2	200	1265,60		1288,00	1299,20
355M2-2	250	1825,60		1845,76	1862,56
355L2-2	315	1971,20		1992,48	2009,28

Frame size	Kw	Weight kg			
		B3	B14	B5	B35

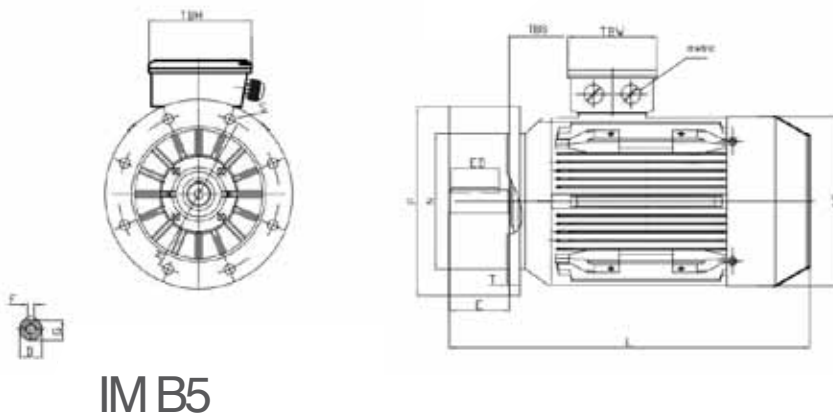
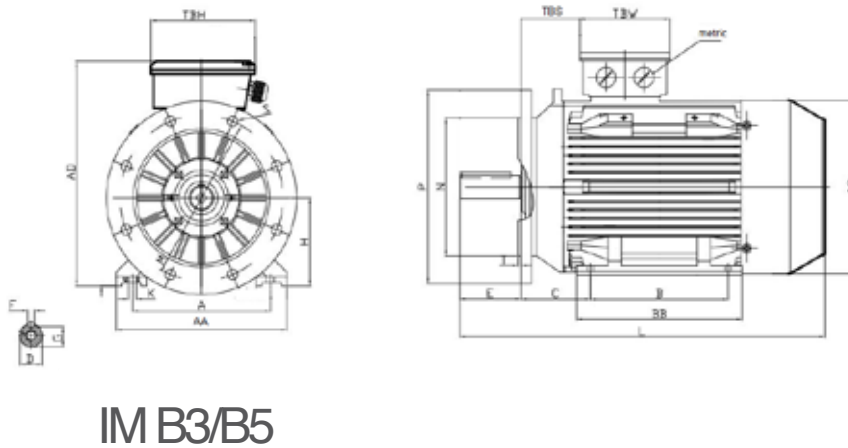
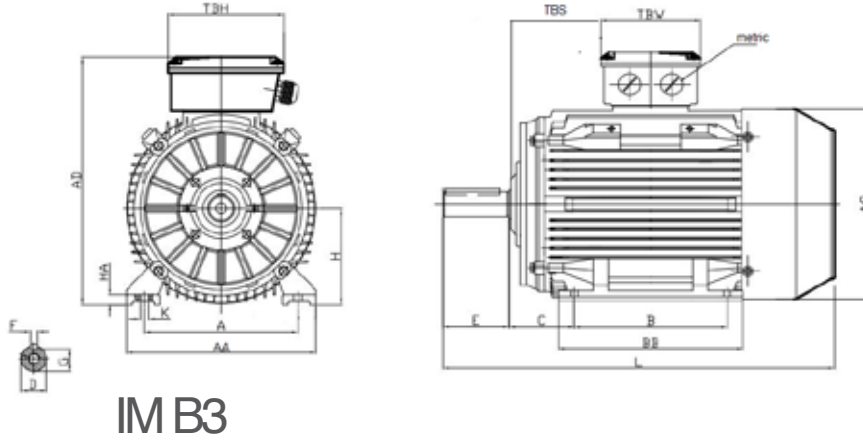
132S-4	5,5	73,92	74,70	76,05	77,73
132M-4	7,5	90,72	91,50	92,85	94,53
160M-4	11	153,44	156,80	160,72	162,40
160L-4	15	152,32	161,28	166,32	168,00
180M-4	18,5	176,96		186,48	188,16
180L-4	22	204,96		211,12	212,80
200L-4	30	271,04		282,24	286,72
225S-4	37	343,84		353,92	358,40
225M-4	45	394,24		411,04	415,52
250M-4	55	479,36		499,52	504,00
280S-4	75	672,00		687,68	694,40
280M-4	90	723,52		743,68	750,40
315S-4	110	1052,80		1075,20	1086,40
315M-4	132	1187,20		1209,60	1220,80
315L1-4	160	1164,80		1299,20	1310,40
315L2-4	200	1366,40		1388,80	1400,00
355M2-4	250	1840,16		1864,80	1881,60
355L-4	315	2122,40		2140,32	2157,12

Frame size	Kw	Weight kg			
		B3	B14	B5	B35

132S-6	3	63,33	68,56	69,87	70,99
132M1-6	4	75,84	81,08	82,26	83,38
132M2-6	5,5	82,99	88,23	89,41	90,53
160M-6	7,5	135,52	138,88	142,80	144,48
160L-6	11	155,68	159,04	162,96	164,64
180L-6	15	209,44		218,18	219,86
200L1-6	18,5	265,96		299,14	303,62
200L2-6	22	278,60		311,78	316,26
225M-6	30	375,20		384,16	388,64
250M-6	37	485,18		505,98	510,46
280S-6	45	575,68		591,70	598,42
280M-6	55	791,62		814,26	820,98
315S-6	75	1052,08		1070,25	1081,45
315M-6	90	1075,20		1097,60	1108,80
315L1-6	110	1120,00		1142,40	1153,60
315L2-6	132	1209,60		1232,00	1243,20
355M1-6	160	1940,74		1964,79	1981,59
355M3-6	200	2017,34		2041,40	2058,20
355L2-6	250	2093,95		2118,01	2134,81

## 43. TC SERIES - Overall & Installation dimension

Measures in mm





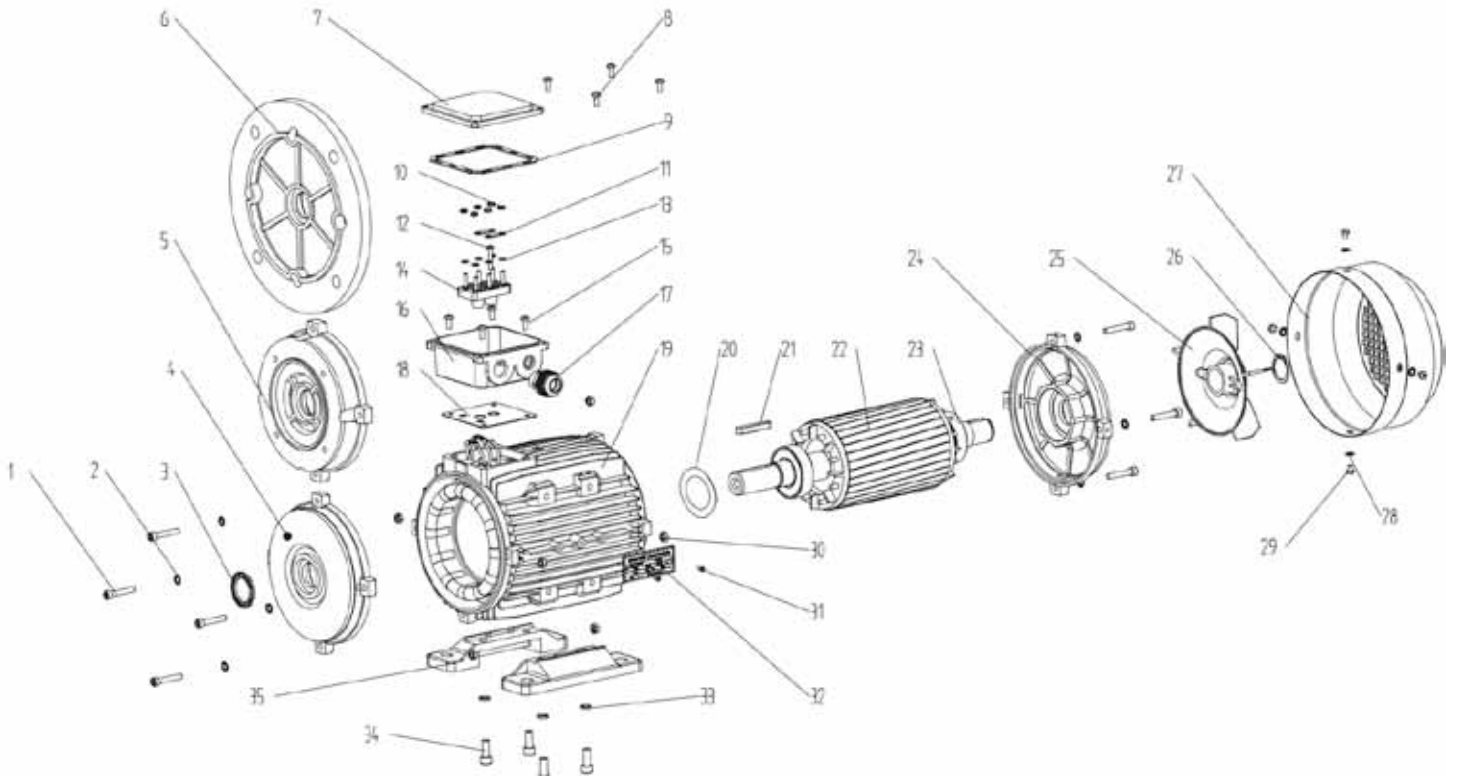
Frame size	B3				Sharf					General							
	H	A	B	C	D	E	F	G	K	AA	AD	HD	AC	L	TBS	TBW	TBH

<b>132S/M</b>		132	216	140/178	89	Ø38	80	10	33	Ø12	255	332	200	259	467/505	29	118	118
<b>160ML</b>		160	254	210/254	108	Ø42	110	12	37	Ø15	314	402	242	313	605/650	91	162	187
<b>180ML</b>		180	279	241/279	121	Ø48	110	14	42.5	Ø15	348	439	259	360	687/725	160/180	162	187
<b>200L</b>		200	318	305	133	Ø55	110	16	49	Ø19	388	497	297	399	768	192	186	233
<b>225S</b>	4,8	225	356	286	149	Ø60	140	18	53	Ø19	436	553	328	465	814	190	186	233
<b>225M</b>	2	225	356	311	149	Ø55	110	16	49	Ø19	436	553	328	465	809	202	186	233
	4,6,8	225	356	311	149	Ø60	140	18	53	Ø19	436	553	328	465	839	202	186	233
<b>250M</b>	2	250	406	349	168	Ø60	140	18	53	Ø24	484	616	366	506	918	233	218	260
	4,6,8	250	406	349	168	Ø65	140	18	58	Ø24	484	616	366	506	918	233	218	260
<b>280S/M</b>	2	280	457	368/419	190	Ø65	140	18	58	Ø24	557	668	388	559	984/1035	265	218	260
	4,6,8	280	457	368/419	190	Ø75	140	20	67.5	Ø24	557	668	388	559	984/1035	265	218	260
<b>315S</b>	2	315	508	406	216	Ø65	140	18	58	Ø28	630	845	530	680	1205	130	280	320
	4,6,8	315	508	406	216	Ø80	170	22	71	Ø28	630	845	530	680	1235	130	280	320
<b>315M/L</b>	2	315	508	457/508	216	Ø65	140	18	58	Ø28	630	845	530	680	1355	130	280	320
	4,6,8	315	508	457/508	216	Ø80	170	22	71	Ø28	630	845	530	680	1385	130	280	320
<b>355M/L</b>	2	355	610	560/630	254	Ø75	140	20	67.5	Ø28	740	1010	655	820	1500	HO	330	380
	4,6,8	355	610	560/630	254	Ø100	210	28	90	Ø28	740	1010	655	820	1570	140	330	380

Frame size	B5						B14					
	N	M	P	S	T	R	N	M	P	S	T	R

<b>132S/M</b>		230	265	300	4-Ø15	4	0	130	165	198	M10	3.5	0
<b>160ML</b>		250	300	350	4-Ø19	5	0						
<b>180ML</b>		250	300	350	4-Ø19	5	0						
<b>200L</b>		300	350	400	4-Ø19	5	0						
<b>225S</b>	4,8	350	400	450	8-Ø19	5	0						
<b>225M</b>	2	350	400	450	8-Ø19	5	0						
	4,6,8	350	400	450	8-Ø19	5	0						
<b>250M</b>	2	400	500	550	8-Ø19	5	0						
	4,6,8	400	500	550	8-Ø19	5	0						
<b>280S/M</b>	2	400	500	550	8-Ø19	5	0						
	4,6,8	400	500	550	8-Ø19	5	0						
<b>315S/M/L</b>	2	550	600	660	4-Ø24	6	0						
	4,6,8	550	600	660	4-Ø24	6	0						
<b>355M/L</b>	2	680	740	800	4-Ø24	6	0						
	4,6,8	680	740	800	4-Ø24	6	0						

## 44. TC SERIES - Exploded drawing spare part list



- |                               |                                |                             |
|-------------------------------|--------------------------------|-----------------------------|
| 1. Screw                      | 13. Terminal shim              | 25. Cooling fan             |
| 2. Gasket                     | 14. Terminal board             | 26. Fan circlip             |
| 3. Oil seal                   | 15. Terminal box fixing screws | 27. Fan cover               |
| 4. DE endshleld               | 16. Terminal box Dase          | 28. Fan cover fixing shim   |
| 5. B14 nang                   | 17. Cable gland                | 29. Fan cover fixing screws |
| 6. B5 nange                   | 18. Terminal box bottomgaskel  | 30. Endshield fixing nul    |
| 7. Terminal box cover         | 19. Frame                      | 31. Rivet                   |
| 8. Terminal box fixing screws | 20. Preload washer             | 32. Nameplate               |
| 9. Terminal box upper gasket  | 21. Key                        | 33. Foot fixing nut         |
| 10. Terminal box fixing nut   | 22. Rotor                      | 34. Foot fixing screws      |
| 11. Terminal bridge           | 23. Bearing                    | 35. Foot                    |
| 12. Terminal pin              | 24. NDE endshield              |                             |