



ESCS - ESI SERIES CATALOGUE



ENERTECH

ADVANTAGE & INTRODUCTION

NEMA and IEC Stainless Steel motors are designed and manufactured to operate in extreme conditions with high ambient temperatures, high humidity, water, steam, etc. These motors are IP67 as standard and can operate under water! The motors have a specially designed construction which avoids the use of through bolts or end shield bolts. The outer surfaces of the motors are completely smooth to make it easier to clean and wash away any dirt, food scraps or debris that might collect on them.

The motors can be manufactured in 302, 304, or 316 Grades of Stainless Steel. Standard motors are produced in SS304 Food Grade - for a long service life with no corrosion. The shafts are made from SS420 as standard.

Commonly Electric Motors (Normally Cast Iron or Aluminium Frame) are usually painted and it is not uncommon for flakes of paint to break free, when the motor starts to corrode, and contaminate food being processed. This is another advantage of stainless steel motors - The Stainless Steel Construction requires no surface treatments and introduces no possible contaminants to the process.

The standard motors are fitted with SKF or equivalent bearings, which are suitable for a very wide range of temperatures with very low friction losses. The drive end is sealed with 2 oil seals and the shaft is induction hardened to ensure a long

service life. Special bearings can also be fitted as per customer requirement.

All motors are supplied with 1 metre of Cable and are tested under water as part of the standard routine testing of these motors.

Stainless Steel motors have a higher Capital Cost than commonly used Cast Iron or Aluminium framed motors, but using a Stainless Steel Electric Motor instead of a standard motor can result in significant savings over the life of the motor. Commonly used Cast Iron or Aluminium framed motors do not last very long when subjected to Steam, Hot Water or Chemical Cleaning every day. When the motors fail, the cost of the downtime and the loss of production can often be much more than the extra cost of purchasing a Stainless Steel motor. Stainless Steel Electric Motors have a long service life provided they operate under normal conditions and are subject to a suitable maintenance regime and are expected to operate reliably for many years, while a Commonly used Cast Iron or Aluminium framed motor might only last 6 months in a similar application.



GENERAL SPECIFICATION

Stainless Steel motors are required by the following industries

- > Food Processing and Production
- > Marine
- > Beverage
- > Pharmaceutical
- > And anywhere that requires a very clean sanitised environment. These motors are designed to work in applications where the motors are Steam or Chemically Cleaned at regular intervals.

Type

The motors can be supplied in TENV (Totally Enclosed Non Ventilated) Construction with no Fan or Fan Cowl - or - TEFC (Totally Enclosed Fan Cooled) Construction with a Fan and Stainless Steel Fan Cowl. The TENV motors are generally more popular as they are easier to clean. (It is not easy to completely clean motors with a Fan and Fan Cowl, if the Fan Cowl is not removed).

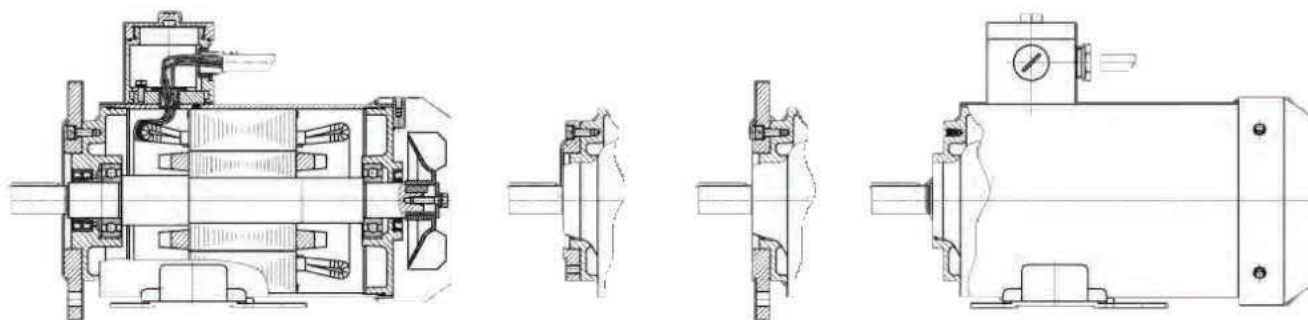
Efficiency

These motors can be supplied at IE1, IE2, IE3 and Premium Efficiency levels (CSA Approval C*-PUS) and have been tested according to the requirements of IEC60034.2.1:2007 Method A. All the motors are suitable for operation with Inverters or Reduced Voltage Starting and can be manufactured with special Inverter duty wire - if requested. All motors are supplied with 150 Deg.C. Thermistors in the windings.

Mounting

The motors are available in standard IEC frames from 63 to 160 in B3, B5, B35, and B14 configurations. All Motors 132 Frame and below have a modular construction and are able to be easily modified to suit different Mounting requirements. The standard Foot mount B3 motor can be easily modified to B3/B5 or B3/B14 by installing a separate flange disk. In the same way, a B5 motor can be quickly and easily modified to be B14.

The motors can also be supplied with non-standard mounting configurations and can be fitted to special OEM gearboxes like SEW and Flender Products.





GENERAL SPECIFICATION

Motor wound for 50Hz at rated voltage	Connected to	Data in percentage of values at 50Hz and rated voltage							
		Output	r/min	I_L/I_N	I_L	T_N	T_L/T_N	T_B/T_N	
380V	400V 50Hz	100	100	95	110	100	110	110	
	380V 60Hz	100	120	98	83	83	70	85	
	400V 60Hz	105	120	98	90	87	80	90	
	415V 60Hz	110	120	98	95	91	85	93	
	440V 60Hz	115	120	100	100	96	95	98	
	460V 60Hz	120	120	100	105	100	100	103	
400V	380V 50Hz	100	100	105	91	100	90	90	
	415V 50Hz	100	100	96	108	100	108	108	
	400V 60Hz	100	120	98	83	83	70	85	
	415V 60Hz	104	120	98	89	86	75	88	
	440V 60Hz	110	120	98	95	91	85	93	
	460V 60Hz	115	120	100	100	96	93	98	
415V	480V 60Hz	120	120	100	105	100	100	103	
	380V 50Hz*	100	100	109	84	100	84	84	
	400V 50Hz	100	100	104	93	100	93	93	
	440V 50Hz	100	100	94	112	100	112	112	
	415V 60Hz	100	120	98	83	83	70	85	
	440V 60Hz	105	120	98	90	87	80	90	
525V	460V 60Hz	110	120	98	95	91	85	94	
	480V 60Hz	115	120	100	100	96	95	98	
	550V 50Hz	100	100	95	110	100	110	110	
	525V 60Hz	100	120	98	83	83	70	85	
	550V 60Hz	105	120	98	90	87	80	90	
	575V 60Hz	110	120	98	95	91	85	94	
	600V 60Hz	115	120	100	100	96	95	98	

*Not applicable for motors with F class temperature rise.

*Note: This table is not applicable for hazardous area motors.

1) I_N = Full load current T_N = Full load torque motors

I_L/I_N = Locked rotor current/full load current

T_L/T_N = Locked rotor torque/full load torque

T_B/T_N = Breakdown torque/full load torque

Standard torque values for alternative supplies are obtainable only with special windings. For these purpose-built motors the performance data is the same as for 380V motors except for the currents which are calculated with the accompanying formula:

Where:

$$I_x = \frac{380 \times I_N}{U_x}$$

I_x = Current

I_N = Full load current at 380 volt

U_x = Design voltage

Temperature and altitude

Standard torque values for alternative supplies are obtainable only with special windings. For these purpose-built motors the performance data is the same as for 380V motors except for the currents which are calculated with the accompanying formula:

Ambient temperature	Temperature factor	Altitude above sea level	Altitude factor
30°C	1.06	1000m	1.00
35°C	1.03	1500m	0.98
40°C	1.00	2000m	0.94
45°C	0.97	2500m	0.91
50°C	0.93	3000m	0.87
55°C	0.88	3500m	0.82
60°C	0.82	4000m	0.77

$$\text{Effective Power} = \frac{\text{Rated Power}}{\text{Temperature Factor} \times \text{Altitude Factor}}$$

Example 1

Effective Power required = 2.2 kW

Air temperature = 50°C (factor 0.93)

Altitude = 2500 metres (factor 0.91)

$$\text{Rated power required} = \frac{2.2}{0.93 \times 0.91} = 2.6 \text{ kW}$$

The appropriate motor is one with a rated power above the required, being 3 kW.

Example 2

Rated power = 7.5 kW

Air temperature = 50°C (factor 0.93)

Altitude = 1500 metres (factor 0.98)

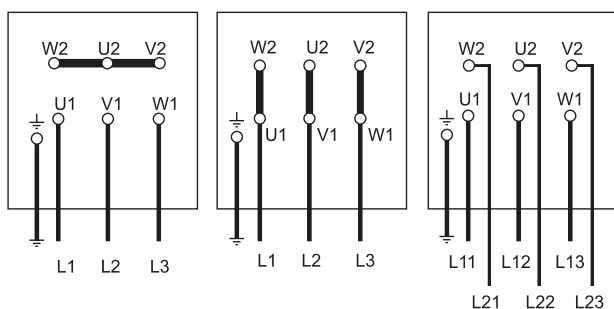
$$\text{Effective Power} = 7.5 \times 0.93 \times 0.98 = 6.84 \text{ kW}$$

Rotation

For clockwise rotation, viewed from drive end, standard three phase ESCS and ESI motor terminal markings coincide with the sequence of the phase line conductors.

For counter clockwise rotation, viewed from drive end, two of the line conductors have to be reversed. This is made clear in the table of connection diagrams three phase motors with cage rotor (page 8).

Connection Diagrams

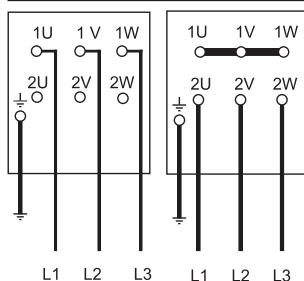


Star connection

Delta connection

Connection to
Star-delta starter

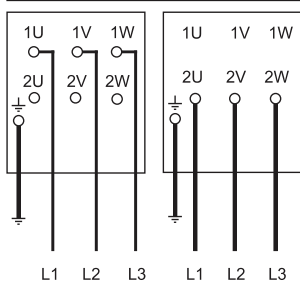
Multi-speed motors in dahlander
connection (tapped winding).



Low speed

High speed

Multi-speed motors with 2
separate windings.






Low speed

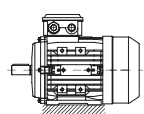
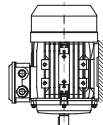
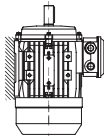
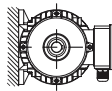
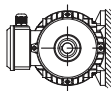
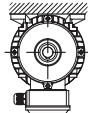
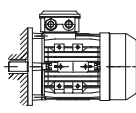
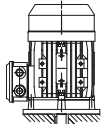
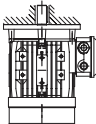
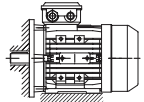
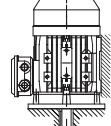
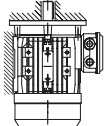
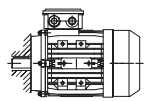
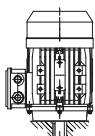
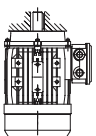
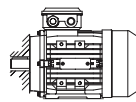
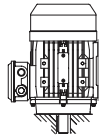
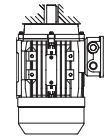
High speed

Rating Plate

Frame size from 56 to 160

 ENERTECH ELECTRIC MOTORS(AUSTRALIA) 3 PHASE ASYNCHRONOUS MOTOR								 	
TYPE				SERIAL NUMBER					
VOLTSC	ONN.	Hz	kW	RPM	AMP	CosØ	EFF.%		
BEARINGD		E		NDE		DUTY			
AMB.TEMP		IP		INS.CL.		WEIGHT			
PRODUCT CODE:				STAINLESS STEEL					

Mounting

Foot mount		
		
B3 (IM1001)*	V5 (IM1011)	V6 (IM1031)
		
B6 (IM1051)	B7 (IM1061)	B8 (IM1071)
Large flange mount		
		
B5 (IM3001)*	V1 (IM3011)*	V3 (IM3031)
Large flange and feet		
		
B3/B5 (IM2001)*	V1/V5 (IM2011)	V3/V6 (IM2031)
Small flange mount		
		
B14 (IM3601)	V18 (IM3611)	V19 (IM3631)
Small flange and feet		
		
B3/B14 (IM2101)	V5/V18 (IM2111)	V6/V19 (IM2131)



GENERAL SPECIFICATION

Against solar radiation

High solar radiation will result in undue temperature rise. In these circumstances motors should be screened from solar radiation by placement of adequate sun-shades which do not inhibit air flow.

Degree of protection

Standard levels of enclosure protection for all ESC frame sizes for both motor and terminal box is IP55, with IP56, IP65 and IP66 available on request. Enclosure designations comply with IEC or AS60529. The enclosure protection required will depend upon the environmental and operational conditions within which the motor is to operate.

IP standard explanation

IP	5	5
	1	2

International protection rating prefix (IEC 60034 - 5)

First Numeral

First characteristic numeral

Degree of protection of persons against approach to live parts or contact with live or moving parts (other than smooth rotating shafts and the like) inside the enclosure, and degree of protection of equipment within the enclosure against the ingress of solid foreign bodies.

- 4. Protected against solid object greater than 1.0 mm: Wires or strips of thickness greater than 1.0 mm, solid objects exceeding 1.0 mm.
- 5. Dust protected: Ingress of dust is not totally prevented but it does not enter in sufficient quantity to interfere with satisfactory operation of the equipment.
- 6. Dust tight: No ingress of dust.

Second Numeral

Second characteristic numeral

- 4. Protected against splashing water: Water splashed against the enclosure from any direction shall have no harmful effect.
- 5. Protected against water jets: Water projected by a nozzle against the enclosure from any direction shall have no harmful effect.
- 6. Protected against heavy seas: Water from heavy seas or water projected in powerful jets (larger nozzle and higher pressure than second numeral 5) shall not enter the enclosure in harmful quantities.

Shaft

ESCS - ESI motors have standard shaft extension lengths which provided with standard key, drilled and tapped hole. Non standard shaft extensions are available upon special order, with shaft design outlined on a detailed drawing. Shaft extension run out, concentricity and perpendicularity to face of standard flange mount motors, comply with normal grade tolerance as specified in IEC 60072-1 and AS1359. Precision grade tolerance is available upon special order.

Electrical design

As standard, ESCS and ESI motors have the following design and operating parameters. Performance data is based on this standard. Any deviation should be examined and performance values altered in accordance with the information provided in this section.

Three phase, 380V, 50Hz

Ambient cooling air temperature, 40°C

Altitude - 1000m Duty cycle 51 (continuous)

Rotatio - Clockwise viewed from drive end

Connection - 220 volt Delta/380 volt Star (3kW and below)
- 380 volt Delta/660 volt Star (4kW and above)

Voltage and frequency

Standard ESCS and ESI motors are designed for a power supply of three phase 380V, 50Hz. Motors can be manufactured for any supply between 100V and 600 V and frequencies other than 50Hz.

Standard ESCS and ESI motors wound for a certain voltage at 50Hz can also operate at other voltages at 50Hz and 60Hz without modification, subject to the changes in their data .

Duty

Enertech motors are suitable for S1 operation (continuous operation under rated load). When the motor is operated under any other type of duty the following information should be supplied to determine the correct motorsize:

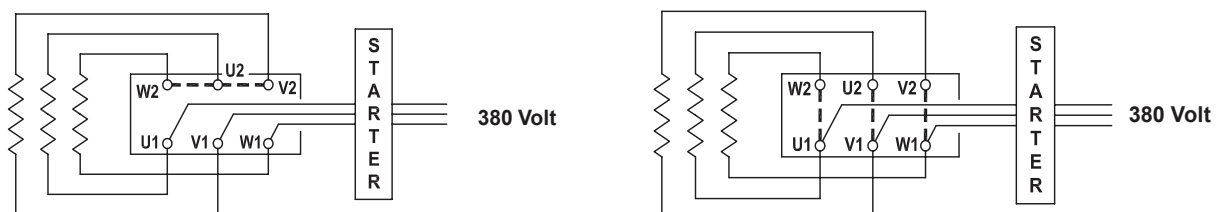
- 1. Continuous duty S1:** The motor works at a constant load for enough time to reach temperature equilibrium.
- 2. Short time duty S2:** The motor works at a constant load, but not long enough to reach temperature equilibrium, and the rest periods are long enough for the motor to reach ambient temperature.
- 3. Intermittent periodic duty S3:** Sequential, identical run and rest cycles with constant load. Temperature equilibrium is never reached. Starting current has little effect on temperature rise.
- 4. Intermittent periodic duty with starting S4:** Sequential identical start, run and rest cycles with constant load. Temperature equilibrium is not reached, but starting current affects temperature rise.
- 5. Intermittent periodic duty with electric braking S5:** Sequential, identical cycles of starting, running at constant load, electric braking and rest. Temperature equilibrium is not reached.
- 6. Continuous operation with intermittent load S6:** Sequential, identical cycles of running with constant load and running with no load. No rest periods.
- 7. Continuous operation with electric braking S7:** Sequential, identical cycles of starting, running at constant load and electric braking. No rest periods.
- 8. Continuous operation with periodic changes in load and speed S8:** Sequential, identical, duty cycles of start, running at constant load and given speed, then run at other constant loads and speeds. No rest periods.

Connection

A motor's rated voltage must agree with the power supply line-to-line voltage. It is careful to ensure the correct connection to the motor terminals.

Internal connections, voltages and VF drive selection

Standard terminal connections for motors 3kW and below is 220V delta / 380V star. These motors are designed for 380V Direct On Line (D.O.L.) starting, when connected in the star configuration. They are also suitable for operation with 220V three phase variable frequency drives when connected in the delta configuration. Standard terminal connection for motors 4kW and above is 380V delta / 660V star. These motors are designed for 380V Direct On Line (D.O.L.) starting, when connected in the delta configuration. They are also suitable for operation with 380V three phase variable frequency drives. Alternatively they can be operated D.O.L. in the star configuration from a 660V supply or with a 660V variable frequency drive. In this case the drive must be supplied with an output reactor to protect the winding insulation. These size motors are also suitable for 380V star-delta starting as described below. Motor connected for D.O.L. starting with bridges in place for delta connection (3kW and below).



Motor connected for D.O.L. starting with bridges in place for delta connection (4kW and above).

Starting

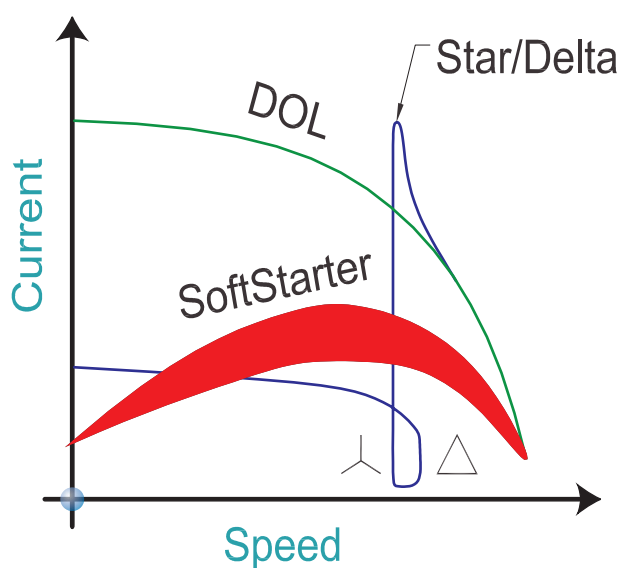
All of the following starter options are available and are the best supplied together with the motor.

D.O.L Starter

When an electric motor is started by direct connection to the power supply (D.O.L.), it draws a high current, called the 'starting current', which is approximately equal in magnitude to the locked rotor current I_L . As listed in the performance data, locked rotor current can be up to 8 times the rated current I_N of the motor. In circumstances where the motor starts under no load or where high starting torque is not required, it is preferable to reduce the starting current by one of the following means.

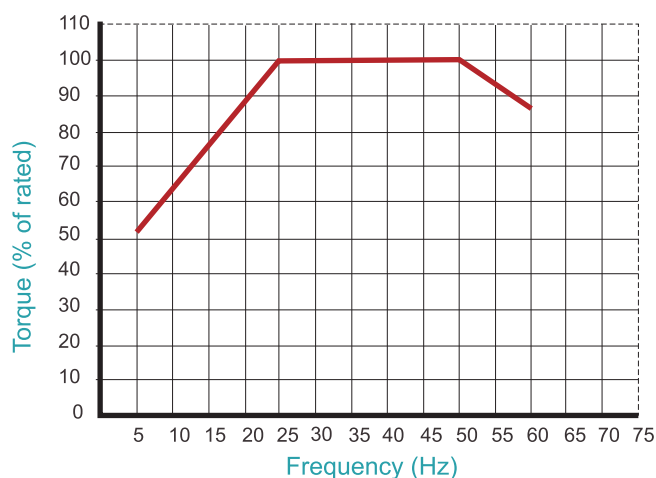
Star - Delta starting

The ESCS and ESI motors 4kW and above are suitable for the star-delta starting method. Through the use of a star-delta starter, the motor terminals are connected in the star configuration during starting, and reconnected to the delta configuration when running. The benefits of this starting method are a significantly lower starting current, to a value about 1/3 of the D.O.L. starting current, and a corresponding starting torque also reduced to about 1/3 of its D.O.L. value. It should be noted that a second current surge occurs on change-over to the delta connection. The level of this surge will depend on the speed the motor has reached at the moment of change over.



VVVF

Variable Voltage Variable Frequency drives are primarily recognized for their ability to manipulate power from a constant 3 phase 50/60Hz supply converting it to variable voltage and variable frequency power. This enables the speed of the motor to be matched to its load in a flexible and energy efficient manner. The only way of producing starting torque equal to full load torque with full load current is by using VVVF drives. The functionally flexible VVVF drive is also commonly used to reduce energy consumption on fans, pumps and compressors and offers a simple and repeatable method of changing speeds or flow rates.



EDM Concerns

Capacitive voltages in the rotor can be generated due to an effect caused by harmonics in the waveform causing voltage discharge to earth through the bearings. This discharge results in etching of the bearing running surfaces. This effect is known as Electrical Discharge Machining (EDM). It can be controlled with the fitment of appropriate filters to the drive. To further reduce the effect of EDM, an insulated non drive bearing can be used.

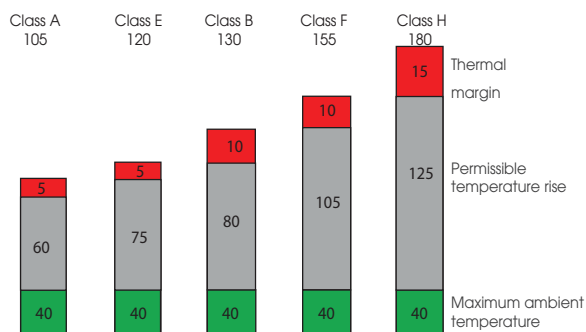


GENERAL SPECIFICATION

Insulation

The insulation system is Class F (155°C) and the motors are designed to operate with Class B (80°C).

This ensures long life and reliability with the ability to withstand ambient temperatures as high as 54°C or up to 10% overload in adverse electrical supply situations.



Temperature Limits According to IEC 85

Speed at partial loads

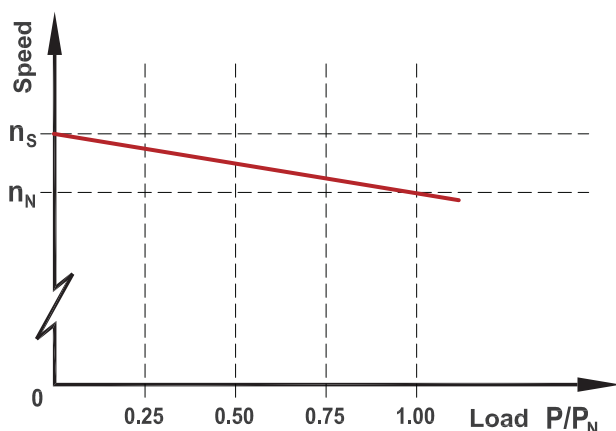
The relationship between the motor speed and the degree of loading on an ESCS motor is approximately linear up to the rated load. This is expressed graphically in the accompanying drawing.

Where:

n_N = full load speed

n_s = asynchronous speed

P/P_N = partial load factor



Current at partial loads

Current at partial loads can be calculated using the following formula.

$$\text{Where: } I_x = \frac{P_{out_x}}{\sqrt{3} \times U_{NX} \times \cos\phi_x \times \eta} \times 10^5$$

I_x = partial load current (amps)

P_{out_x} = partial load (kW)

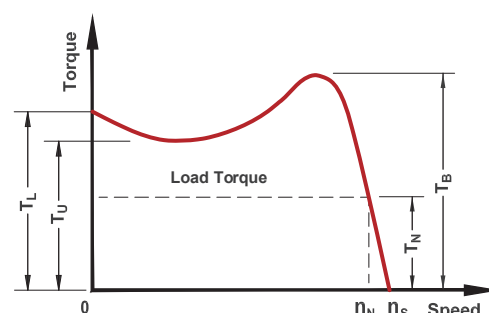
U_N = rated voltage

$\cos\phi_x$ = partial load power factor

η_x = partial load efficiency (%)

Torque characteristics

Typical characteristics of torque behaviour relative to speed are shown in the torque speed curve example below.



Where:

T_N = full load torque

T_L = locked rotor torque

T_U = pull-up torque

T_B = break down torque

n_N = full load speed

n_s = asynchronous speed

ESCS - ESI motors all exceed the minimum starting torque requirements for Design N (Normal torque) as specified in IEC60034-12, and in most cases meet the requirements of Design H (High torque). Rated torque can be calculated with the following formula:

$$\text{Where: } T_N = \frac{9950 \times P_N}{n_N}$$

T_N = full load torque (Nm)

P_N = full load output power (kW)

n_N = full load speed (r/min)



PERFORMANCE DATA

ESCS SERIES

2 poles 50Hz Stainless Steel Frames IE2

Frame size	Output (kW)	Full load speed (RPM)	Current			Efficiency at 100% full load	Power factor cos φ at 100% full load	Locked rotor I _L /I _N	Torque			Noise level at 1m dB (A)	Net weight (kg)
			full load I _N 50 Hz						Full load torque T _N (Nm)	Locked rotor torque T _L /T _N	Break down torque T _B /T _N		
			380V (A)	400V (A)	415V (A)								
631-2	0.18	2815	0.44	0.42	0.4	76.6	0.8	5.2	0.59	2.7	3.2	60	10.5
632-2	0.25	2795	0.62	0.59	0.57	75.3	0.81	4.8	0.88	2.5	2.8	61	11.5
711-2	0.37	2875	0.84	0.8	0.77	79.3	0.84	5.9	1.27	2.2	3	55	14
712-2	0.55	2865	1.3	1.2	1.2	79.1	0.84	5.8	1.86	2.3	2.9	56	14.5
801-2	0.75	2885	1.6	1.5	1.4	85	0.84	6.6	2.45	2.5	3.2	61	21
802-2	1.1	2885	2.3	2.2	2.1	84	0.85	5.9	3.36	2.3	2.7	61	23.5
90S-2	1.5	2890	2.9	2.8	2.7	85.5	0.9	6.6	5	2.3	3.1	65	29
90L-2	2.2	2890	4.4	4.2	4	85.5	0.88	6.6	7.3	2.9	3.3	65	29
100L-2	3	2895	5.8	5.5	5.3	86.1	0.91	6.6	9.9	2.9	3.3	70	30
112M1-2	4	2925	7.6	7.2	6.9	89.7	0.89	6.6	13	2.2	3.5	74	30
112M2-2	5.5	2920	10.5	10	9.6	89.3	0.89	6.5	18	2.3	3.3	78	32
132S1-2	5.5	2930	10.1	9.6	9.3	88.8	0.93	6.5	18	2.2	2.8	80	42
132S2-2	7.5	2920	13.7	13	12.5	89.5	0.93	6.5	24.6	2.1	2.7	81	44
132M-2	11	2915	19.7	18.7	18	90.2	0.94	6.4	35.9	2	2.8	82	48
160M1-2	11	2935	19.4	18.4	17.7	90.6	0.95	6.5	35.8	2.4	2.8	80	110
160M2-2	15	2935	26.2	24.9	24	91.4	0.95	6.2	48.8	2.4	2.8	81	110
160L-2	18.5	2925	32.3	30.7	29.6	91.5	0.95	6.6	60.4	2.1	2.7	81	130

4 poles 50Hz Stainless Steel Frames IE2

Frame size	Output (kW)	Full load speed (RPM)	Current			Efficiency at 100% full load	Power factor cos φ at 100% full load	Locked rotor I _L / I _N	Torque			Noise level at 1m dB (A)	Net weight (kg)
			full load I _N 50 Hz						Full load torque T _N (Nm)	Locked rotor torque T _L / T _N	Break down torque T _B / T _N		
			380V (A)	400V (A)	415V (A)								
631-4	0.12	1440	0.34	0.32	0.31	69.3	0.78	3.2	0.88	1.9	2.2	47	10.5
632-4	0.18	1370	0.54	0.51	0.49	72.1	0.71	3.8	1.27	2.5	2.8	48	11.5
711-4	0.25	1420	0.67	0.64	0.62	76.3	0.74	4.5	1.67	2.2	2.9	60	111
712-4	0.37	1415	1	0.95	0.92	76	0.74	4.6	2.55	2.4	2.8	61	11.5
801-4	0.55	1420	1.4	1.3	1.3	79.7	0.76	5.1	3.7	2.6	2.8	61	20.5
802-4	0.75	1425	1.9	1.8	1.7	81.5	0.75	5.9	5	3.3	2.8	62	22.5
90S-4	1.1	1445	2.5	2.4	2.3	83.7	0.8	6	7.35	2.5	3.1	60	29
90L-4	1.5	1440	3.2	3	2.9	84.2	0.85	5.6	10	2.3	2.7	62	29
100L1-4	2.2	1445	4.7	4.5	4.3	86.6	0.81	6.3	14.5	2.4	3.1	61	30
100L2-4	3	1440	6.4	6.1	5.9	86.5	0.83	5.8	19.9	2.3	2.7	62	30
112M-4	4	1455	8.4	8	7.7	88.3	0.82	6.5	26.3	2.4	3	63	31
132S-4	5.5	1455	10.6	10.1	9.7	90.1	0.87	6.5	36.1	2.3	2.8	68	45
132M1-4	7.5	1455	14.1	13.4	12.9	90.5	0.89	6.6	49.3	2.2	2.9	69	53
132M2-4	11	1460	20.5	19.5	18.8	91.5	0.89	6.5	71.8	2.5	3.3	71	62
160M-4	11	1470	20.6	19.6	18.9	91.8	0.88	6.5	71.3	1.9	2.8	72	115
160L-4	15	1470	27.7	26.3	25.3	92.4	0.89	6.5	97.8	1.8	2.8	74	132

6 poles 50Hz Stainless Steel Frames IE2

Frame size	Output (kW)	Full load speed (RPM)	Current			Efficiency at 100% full load	Power factor cos φ at 100% full load	Locked rotor I _L /I _N	Torque			Noise level at 1m dB (A)	Net weight (kg)
			full load I _N 50 Hz						Full load torque T _N (Nm)	Locked rotor torque T _L /T _N	Break down torque T _B /T _N		
			380V (A)	400V (A)	415V (A)								
711-6	0.18	925	0.59	0.56	0.54	71.3	0.65	3.6	1.86	2.1	3	50	14
712-6	0.25	915	0.81	0.77	0.74	69.9	0.67	3.4	2.65	2.4	2.8	51	16
801-6	0.37	935	1.01	0.96	0.93	77.1	0.72	3.9	3.8	2.1	2.7	53	22
802-6	0.55	935	1.47	1.4	1.35	11.9	0.72	4.1	5.6	2.2	2.7	54	26
90S-6	0.75	930	1.8	1.7	1.6	78.9	0.79	4	7.7	1.9	2.1	56	32
90L-6	1.1	935	2.6	2.5	2.4	78.5	0.78	4.8	11.3	2.3	2.4	57	38
100-L6	1.5	950	3.6	3.4	3.3	80.6	0.76	5	15.1	2.2	2.4	60	24
112M-6	2.2	970	4.9	4.7	4.5	83.5	0.78	6.4	21.7	1.7	3.1	63	33
132S-6	3	950	6.7	6.4	6.2	87.1	0.77	2.7	30.2	1.9	2.4	66	41
132M1-6	4	940	9.1	8.6	8.3	87.3	0.77	4.7	40.6	2	2.5	67	41
132M2-6	5.5	950	12.3	11.7	11.3	87	0.76	5.1	55.3	1.47	2.7	69	59
160M-6	7.5	975	14.6	13.9	13.4	88	0.86	5.7	73.3	1.5	2.6	71	119
160L-6	11	980	21.6	20.5	19.8	89	0.85	6.5	107	2.1	2.9	73	119

2 poles 50Hz Stainless Steel Frames IE3

Frame size	Output (kW)	Full load speed (RPM)	Current			Efficiency at 100% full load	Power factor cos ϕ at 100% full load	Locked rotor I_L / I_N	Torque			Noise level at 1m dB (A)	Net weight (kg)
			full load I_N 50 Hz						Full load torque T_N (Nm)	Locked rotor torque T_L / T_N	Break down torque T_B / T_N		
			380V (A)	400V (A)	415V (A)								
631-2	0.18	2830	0.43	0.41	0.4	80.6	0.83	6.2	0.6	2.3	2.7	70	10.5
632-2	0.25	2820	0.51	0.48	0.46	82.3	0.86	6.3	0.84	2.3	2.8	61	11.5
711-2	0.37	2850	0.86	0.82	0.79	83.4	0.87	6.3	1.23	2.4	2.7	60	14
712-2	0.55	2830	1.26	1.2	1.16	84.4	0.88	6.5	1.82	2.3	2.7	56	14.5
801-2	0.75	2850	1.66	1.58	1.52	86	0.88	6.3	2.48	2.4	2.8	61	21
802-2	1.1	2870	2.4	2.28	2.2	87.7	0.88	6.4	3.36	2.3	2.8	61	23.5
90S-2	1.5	2855	2.8	2.7	2.6	85.7	0.92	6.6	5	2.4	2.8	65	16
90L-2	2.2	2855	4.2	4	3.9	86.6	0.91	6.5	7.4	2.4	2.8	65	16
100L-2	3	2870	5.6	5.3	5.1	87.9	0.93	6.5	10	2.4	2.8	70	21
112M1-2	4	2840	7.4	7	6.7	88.9	0.93	6.4	13.4	2.4	2.8	74	32
112M2-2	5.5	2845	10.2	9.7	9.3	89.5	0.91	6.6	18.4	2.54	2.9	78	32
132S1-2	5.5	2935	9.9	9.4	9.1	90.3	0.94	6.5	17.9	2.1	2.7	80	42
132S2-2	7.5	2930	13.4	12.7	12.2	90.9	0.694	6.6	24.2	2.3	2.7	81	44
132M-2	11	2925	19.5	18.5	17.8	91.5	0.94	6.6	35.9	2.2	2.8	82	48
160M1-2	11	2940	19.9	18.9	18.2	91.5	0.92	6.5	35.7	2.4	2.8	80	110
160M2-2	15	2935	26.9	25.6	24.7	91.8	0.92	6.5	48.8	2.4	2.8	81	110
160L-2	18.5	2935	33.4	31.7	30.6	92.7	0.91	6.6	60.2	2.4	2.8	81	130

4 poles 50Hz Stainless Steel Frames IE3

Frame size	Output (kW)	Full load speed (RPM)	Current			Efficiency at 100% full load	Power factor cos φ at 100% full load	Locked rotor I _L /I _N	Torque			Noise level at 1m dB (A)	Net weight (kg)
			full load I _N 50 Hz						Full load torque T _N (Nm)	Locked rotor torque T _L /T _N	Break down torque T _B /T _N		
			380v (A)	400v (A)	415v (A)								
632-2	0.18	1400	0.57	0.54	0.52	76.5	0.69	3.4	1.27	2.1	2.3	48	11.5
711-2	0.25	1440	0.69	0.66	0.64	81.4	0.74	5.9	1.65	2.4	2.8	60	14
712-2	0.37	1440	0.99	0.94	0.91	81.9	0.74	6	2.46	2.4	2.7	61	15
801-2	0.55	1410	1.49	1.42	1.37	82.9	0.73	4.6	3.73	2.2	2.7	61	20.5
802-2	0.75	1420	1.94	1.84	1.77	84.5	0.76	5.7	5.05	2.4	2.8	61	22.5
90S-2	1.1	1450	2.3	2.2	2.1	87	0.83	6.5	7.3	2.4	2.8	60	29
90L-2	1.5	1445	3.2	3	2.9	87.2	0.84	6.5	9.9	2.4	2.8	62	29
100L1	2.2	1445	4.5	4.3	4.1	88.5	0.84	6.7	14.5	2.4	2.58	61	30
100L2	3	1445	6	5.7	5.5	89.1	0.86	6.3	19.8	2.4	2.8	62	30
112M	4	1445	7.4	7	6.7	89.8	0.92	6.6	26.4	2.4	2.7	63	31
132S	5.5	1455	11	10.5	10.1	90.4	0.84	6.5	36.1	2.1	2.8	68	45
132M1	7.5	1455	14.7	14	13.5	91.2	0.85	6.5	49.1	2	2.8	69	53
132M2	11	1460	20.6	19.6	18.9	92.2	0.88	6.5	71.9	1.8	2.8	71	62
160M	11	1475	20.9	19.9	19.2	93	0.86	6.4	71.3	1.6	2.8	71	115



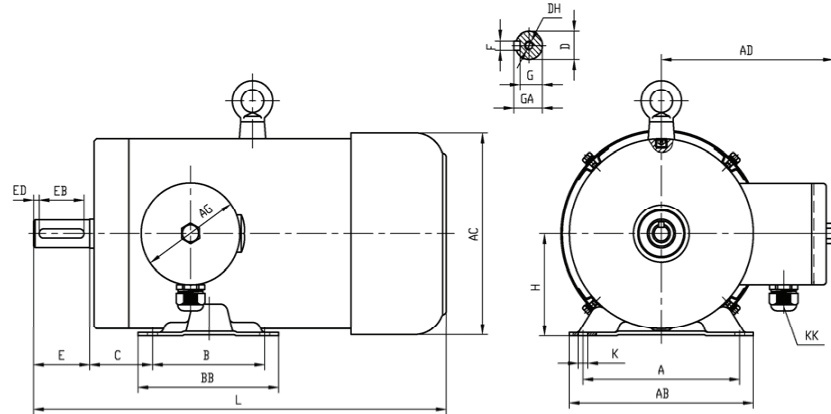


DIMENSIONS



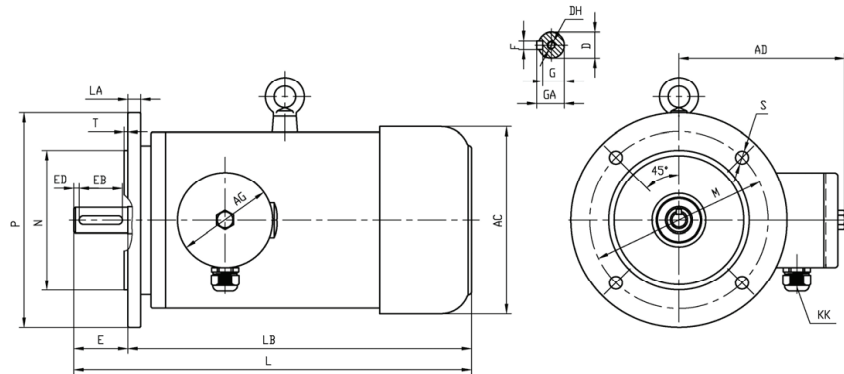
MOTORS CAN BE ORDERED WITH SIDE MOUNTED TERMINAL BOX-BUT THIS IS NON STANDARD

Dimension foot mount B3 ESCS frame size 63 to 160



Frame size	A	AB	AC	AD	AG	B	BB	C	D	DH	E	EB	ED	F	G	GA	H	K	KK	L
63	100	125	124	110	60	80	95	40	11	M4X12	23	16	3.5	4	8.5	12.5	63	7	2-M20X1.5	255
71	112	140	144	124	71	90	118	45	14	M5X12	30	25	2.5	5	11	16	71	7	2-M20X1.5	280
80	125	150	150	140	88	100	125	50	19	M6X16	40	30	5	6	15.5	21.5	80	10	2-M20X1.5	360
90S	140	165	180	155	88	100	150	56	24	M8X19	50	40	5	8	20	27	90	10	2-M20X1.5	370
90L	140	165	180	155	88	125	150	56	24	M8X19	50	40	5	8	20	27	90	10	2-M20X1.5	415
100L	160	190	202	170	88	140	170	63	28	M10X22	60	50	5	8	24	31	100	12	2-M25X1.5	455
112M	190	225	227	180	98	140	165	70	28	M10X22	60	50	5	8	24	31	112	12	2-M25X1.5	455
132S	216	246	267	210	98	140	206	89	38	M12X28	80	65	7.5	10	33	41	132	12	2-M25X1.5	530
132M	216	246	267	210	98	178	206	89	38	M12X28	80	65	7.5	10	33	41	132	12	2-M25X1.5	550
160M	254	285	326	230	136	210	240	108	42	M16X36	110	90	10	12	37	45	160	14.5	2-M32X1.5	620
160L	254	285	326	230	136	254	284	108	42	M16X36	110	90	10	12	37	45	160	14.5	2-M32X1.5	660

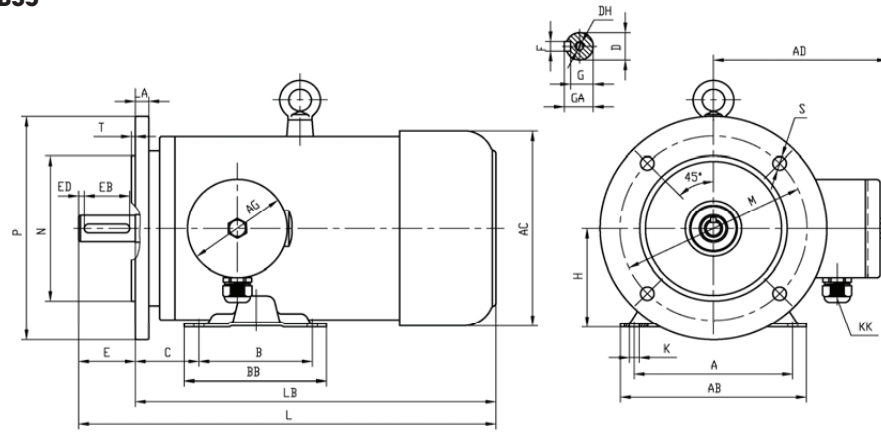
Dimension flange mount B5 ESCS frame size 63 to 160



Frame size	AC	AD	AG	D	DH	E	EB	ED	F	G	GA	KK	L	LA	LB	M	N	P	S	T
63	124	110	60	11	M4X12	23	16	3.5	4	8.5	12.5	2-M20X1.5	255	8	232	115	95	140	10	3
71	144	124	71	14	M5X12	30	25	2.5	5	11	16	2-M20X1.5	280	8	250	130	110	160	10	3.5
80	150	140	88	19	M6X16	40	30	5	6	15.5	21.5	2-M20X1.5	360	10	320	165	130	200	12	3.5
90S	180	155	88	24	M8X19	50	40	5	8	20	27	2-M20X1.5	370	10	320	165	130	200	12	3.5
90L	180	155	88	24	M8X19	50	40	5	8	20	27	2-M20X1.5	415	10	365	165	130	200	12	3.5
100L	202	170	88	28	M10X22	60	50	5	8	24	31	2-M25X1.5	455	12	395	215	180	250	14.5	4
112M	227	180	98	28	M10X22	60	50	5	8	24	31	2-M25X1.5	455	12	395	215	180	250	14.5	4
132S	267	210	98	38	M12X28	80	65	7.5	10	33	41	2-M25X1.5	530	13	450	265	230	300	14.5	4
132M	267	210	98	38	M12X28	80	65	7.5	10	33	41	2-M25X1.5	550	13	470	265	230	300	14.5	4
160M	326	230	136	42	M16X36	110	90	10	12	37	45	2-M32X1.5	620	15	510	300	250	350	18.5	5
160L	326	230	136	42	M16X36	110	90	10	12	37	45	2-M32X1.5	660	15	550	300	250	350	18.5	5

Dimension foot - flange mount B35

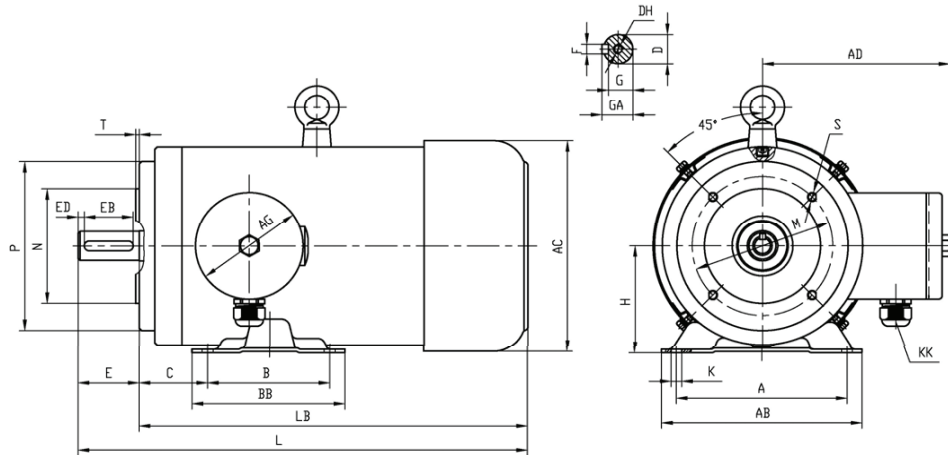
ESCS frame size 63 to 160



Frame size	A	AB	AC	AD	AG	B	BB	C	D	DH	E	EB	ED	F	G	GA	H	K	KK	L	LA	LB	M	N	P	S	T
63	100	125	124	110	60	80	95	40	11	M4X12	23	16	3.5	4	8.5	13	63	7	2-M20X1.5	255	8	232	115	95	140	10	3
71	112	140	144	124	71	90	118	45	14	M5X12	30	25	2.5	5	11	16	71	7	2-M20X1.5	280	8	250	130	110	160	10	4
80	125	150	150	140	88	100	125	50	19	M6X16	40	30	5	6	16	22	80	10	2-M20X1.5	360	10	320	165	130	200	12	4
90S	140	165	180	155	88	100	150	56	24	M8X19	50	40	5	8	20	27	90	10	2-M20X1.5	370	10	320	165	130	200	12	4
90L	140	165	180	155	88	125	150	56	24	M8X19	50	40	5	8	20	27	90	10	2-M20X1.5	415	10	365	165	130	200	12	4
100L	160	190	202	170	88	140	170	63	28	M10X22	60	50	5	8	24	31	100	12	2-M25X1.5	455	12	395	215	180	250	15	4
112M	190	225	227	180	98	140	165	70	28	M10X22	60	50	5	8	24	31	112	12	2-M25X1.5	455	12	395	215	180	250	15	4
132S	216	246	267	210	98	140	206	89	38	M12X28	80	65	7.5	10	33	41	132	12	2-M25X1.5	530	13	450	265	230	300	15	4
132M	216	246	267	210	98	178	206	89	38	M12X28	80	65	7.5	10	33	41	132	12	2-M25X1.5	550	13	470	265	230	300	15	4
160M	254	285	326	230	136	210	240	108	42	M16X36	110	90	10	12	37	45	160	14.5	2-M32X1.5	620	15	510	300	250	350	19	5
160L	254	285	326	230	136	254	284	108	42	M16X36	110	90	10	12	37	45	160	14.5	2-M32X1.5	660	15	550	300	250	350	19	5

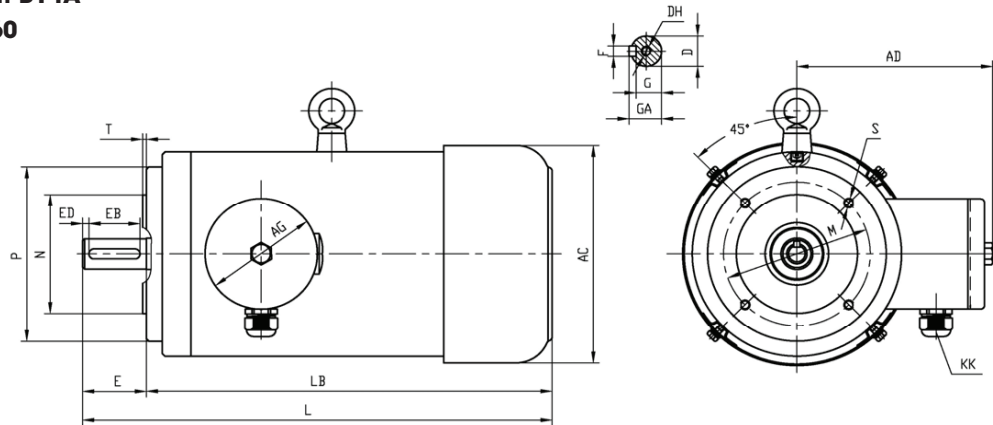
Dimension foot - flange mount B34

ESCS frame size 63 to 160



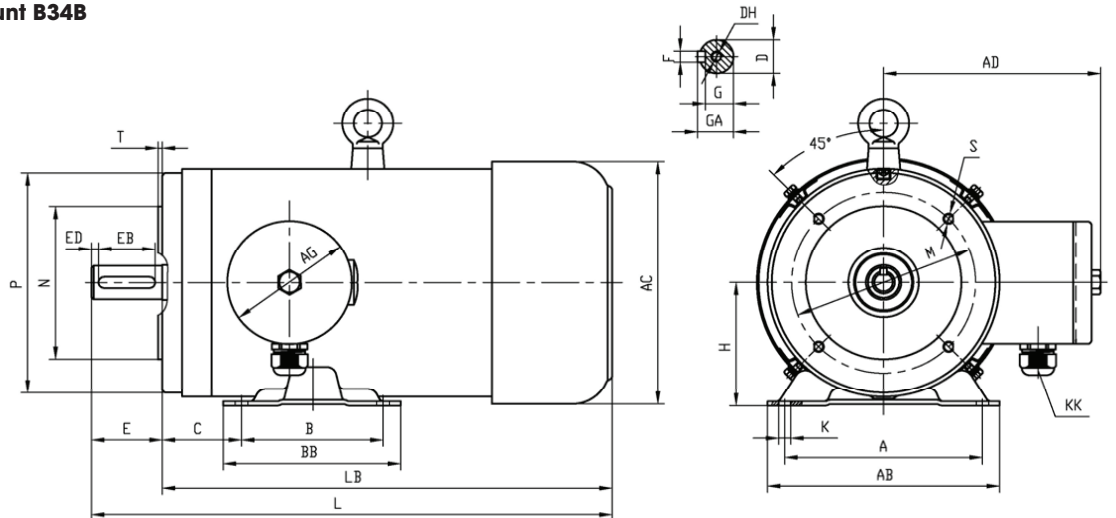
Frame size	A	AB	AC	AD	AG	B	BB	C	D	DH	E	EB	ED	F	G	GA	H	K	KK	L	LB	M	N	P	S	T
63	100	125	124	110	60	80	95	40	11	M4X12	23	16	3.5	4	8.5	12.5	63	7	2-M20X1.5	255	232	75	60	90	M5	2.5
71	112	140	144	124	71	90	118	45	14	M5X12	30	25	2.5	5	11	16	71	7	2-M20X1.5	280	250	85	70	105	M6	2.5
80	125	150	150	140	88	100	125	50	19	M6X16	40	30	5	6	15.5	21.5	80	10	2-M20X1.5	360	320	100	80	120	M6	3
90S	140	165	180	155	88	100	150	56	24	M8X19	50	40	5	8	20	27	90	10	2-M20X1.5	370	320	115	95	140	M8	3
90L	140	165	180	155	88	125	150	56	24	M8X19	50	40	5	8	20	27	90	10	2-M20X1.5	415	365	115	95	140	M8	3
100L	160	190	202	170	88	140	170	63	28	M10X22	60	50	5	8	24	31	100	12	2-M25X1.5	455	395	130	110	160	M8	3.5
112M	190	225	227	180	98	140	165	70	28	M10X22	60	50	5	8	24	31	112	12	2-M25X1.5	455	395	130	110	160	M8	3.5
132S	216	246	267	210	98	140	206	89	38	M12X28	80	65	7.5	10	33	41	132	12	2-M25X1.5	530	450	165	130	200	M10	3.5
132M	216	246	267	210	98	178	206	89	38	M12X28	80	65	7.5	10	33	41	132	12	2-M25X1.5	550	470	165	130	200	M10	3.5
160M	254	285	326	230	136	210	240	108	42	M16X36	110	90	10	12	37	45	160	14.5	2-M32X1.5	620	510	215	180	250	M12	4
160L	254	285	326	230	136	254	284	108	42	M16X36	110	90	10	12	37	45	160	14.5	2-M32X1.5	660	550	215	180	250	M12	4

Dimension flange mount B14A
ESCS frame size 63 to 160



Frame size	AC	AD	AG	D	DH	E	EB	ED	F	G	GA	KK	L	LB	M	N	P	S	T
63	124	110	60	11	M4X12	23	16	3.5	4	8.5	12.5	2-M20X1.5	255	232	75	60	90	M5	2.5
71	144	124	71	14	M5X12	30	25	2.5	5	11	16	2-M20X1.5	280	250	85	70	105	M6	2.5
80	150	140	88	19	M6X16	40	30	5	6	15.5	21.5	2-M20X1.5	360	320	100	80	120	M6	3
90S	180	155	88	24	M8X19	50	40	5	8	20	27	2-M20X1.5	370	320	115	95	140	M8	3
90L	180	155	88	24	M8X19	50	40	5	8	20	27	2-M20X1.5	415	365	115	95	140	M8	3
100L	202	170	88	28	M10X22	60	50	5	8	24	31	2-M25X1.5	455	395	130	110	160	M8	3.5
112M	227	180	98	28	M10X22	60	50	5	8	24	31	2-M25X1.5	455	395	130	110	160	M8	3.5
132S	267	210	98	38	M12X28	80	65	7.5	10	33	41	2-M25X1.5	530	450	165	130	200	M10	3.5
132M	267	210	98	38	M12X28	80	65	7.5	10	33	41	2-M25X1.5	550	470	165	130	200	M10	3.5
160M	326	230	136	42	M16X36	110	90	10	12	37	45	2-M32X1.5	620	510	215	180	250	M12	4
160L	326	230	136	42	M16X36	110	90	10	12	37	45	2-M32X1.5	660	550	215	180	250	M12	4

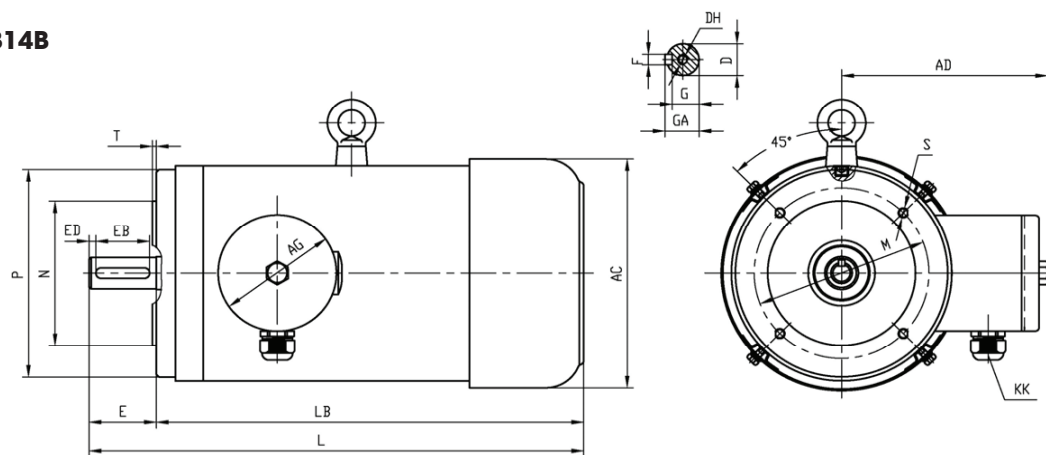
Dimension foot-flange mount B34B
ESCS frame size 63 to 160



Frame size	A	AB	AC	AD	AG	B	BB	C	D	DH	E	EB	ED	F	G	GA	H	K	KK	L	LB	M	N	P	S	T
63	100	125	124	110	60	80	95	40	11	M4X12	23	16	3.5	4	8.5	12.5	63	7	2-M20X1.5	255	232	100	80	120	M6	3
71	112	140	144	124	71	90	118	45	14	M5X12	30	25	2.5	5	11	16	71	7	2-M20X1.5	280	250	115	95	140	M8	3
80	125	150	150	140	88	100	125	50	19	M6X16	40	30	5	6	15.5	21.5	80	10	2-M20X1.5	360	320	130	110	160	M8	3.5
90S	140	165	180	155	88	100	150	56	24	M8X19	50	40	5	8	20	27	90	10	2-M20X1.5	370	320	130	110	160	M8	3.5
90L	140	165	180	155	88	125	150	56	24	M8X19	50	40	5	8	20	27	90	10	2-M20X1.5	415	365	130	110	160	M8	3.5
100L	160	190	202	170	88	140	170	63	28	M10X22	60	50	5	8	24	31	100	12	2-M25X1.5	455	395	165	130	200	M10	3.5
112M	190	225	227	180	98	140	165	70	28	M10X22	60	50	5	8	24	31	112	12	2-M25X1.5	455	395	165	130	200	M10	3.5
132S	216	246	267	210	98	140	206	89	38	M12X28	80	65	7.5	10	33	41	132	12	2-M25X1.5	530	450	215	180	250	M12	4
132M	216	246	267	210	98	178	206	89	38	M12X28	80	65	7.5	10	33	41	132	12	2-M25X1.5	550	470	215	180	250	M12	4
160M	254	285	326	230	136	210	240	108	42	M16X36	110	90	10	12	37	45	160	14.5	2-M32X1.5	620	510	265	230	300	M12	4
160L	254	285	326	230	136	254	284	108	42	M16X36	110	90	10	12	37	45	160	14.5	2-M32X1.5	660	550	265	230	300	M12	4

Dimension flange mount B14B

ESCS frame size 63 to 160



Frame size	AC	AD	AG	D	DH	E	EB	ED	F	G	GA	KK	L	LB	M	N	P	S	T
63	124	110	60	11	M4X12	23	16	3.5	4	8.5	12.5	1-M20X1.5	255	232	100	80	120	M6	3
71	144	124	71	14	M5X12	30	25	2.5	5	11	16	1-M20X1.5	280	250	115	95	140	M8	3
80	150	140	88	19	M6X16	40	30	5	6	15.5	21.5	1-M25X1.5	360	320	130	110	160	M8	3.5
90S	180	155	88	24	M8X19	50	40	5	8	20	27	1-M25X1.5	370	320	130	110	160	M8	3.5
90L	180	155	88	24	M8X19	50	40	5	8	20	27	1-M25X1.5	415	365	130	110	160	M8	3.5
100L	202	170	88	28	M10X22	60	50	5	8	24	31	1-M32X1.5	455	395	165	130	200	M10	3.5
112M	227	180	98	28	M10X22	60	50	5	8	24	31	2-M32X1.5	455	395	165	130	200	M10	3.5
132S	267	210	98	38	M12X28	80	65	7.5	10	33	41	2-M32X1.5	530	450	215	180	250	M12	4
132M	267	210	98	38	M12X28	80	65	7.5	10	33	41	2-M32X1.5	550	470	215	180	250	M12	4
160M	326	230	136	42	M16X36	110	90	10	12	37	45	2-M40X1.5	620	510	265	230	300	M12	4
160L	326	230	136	42	M16X36	110	90	10	12	37	45	2-M40X1.5	660	550	265	230	300	M12	4



MOTOR MODIFICATION OPTION

The ESCS series can be modified to incorporate one or more of the Kiln timber following options, please contact your nearest. Please contact to EnerTech Electric motor (Australia) branch for more details.

- Anti-condensation heater terminated in the main terminal box.
- Stainless steel shafts.
- Alternative shaft diameters and/or shaft length.
- Double shaft extensions.
- Alternative conduit entry dimensions.
- Alternative bearing arrangements (ball, roller, angular contact or four point contact types).
- Low noise fan and cowl in steel or cowl only in stainless steel.
- Rain canopy for vertical mount (V1) in steel or stainless steel.
- Class H winding insulation for 180°C working environment.
- PTC and condensate heater (optional).
- Grease nipple both DE and NDE bearing for frame size 100L, 112M and 132) if required.
- Especial design for IQF tunner freezer condition.
- Working temperature -49°C max.
- IPSS with Anti-condensation heater terminated in main terminal box.
- IP 66 (optional).
- Air Blast Freezer

STAINLESS STEEL CASTING FOR FREEZER AIR COOLER

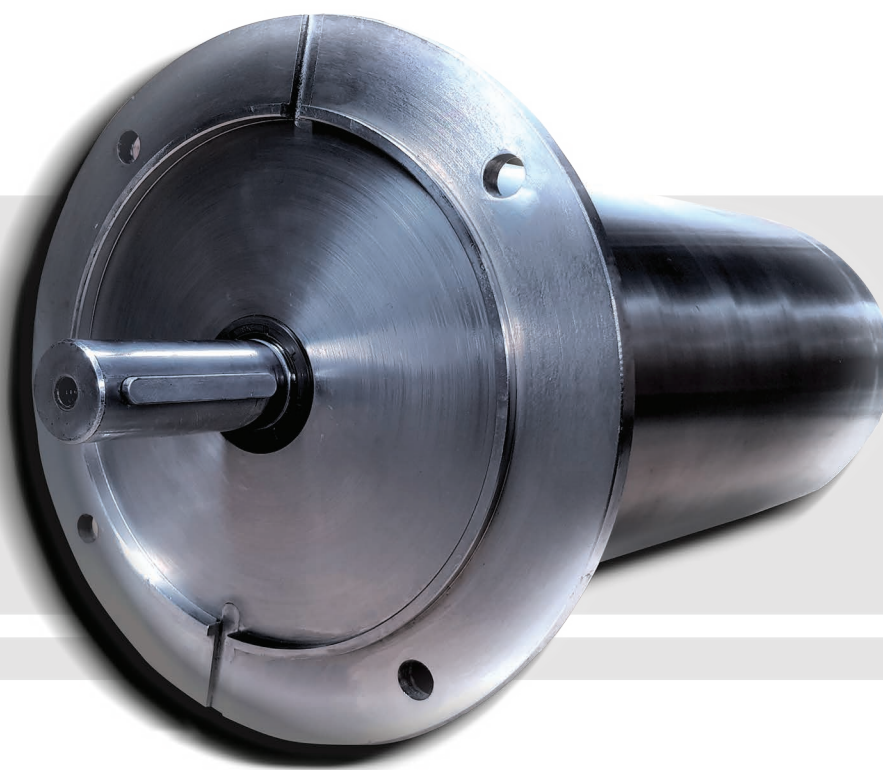




DIRECTIVE AND REFERENCE STANDARD

Electric motors are in compliance with the following Directives and specific Standards

2006/95/CE EC	Low Voltage Directive
2011/65/EC EC	RoHS Directive regarding the Restriction of Hazardous Substances in electrical and electronic equipments
2009/125/CE EC	ErP Directive regarding the ecodesign requirements for Energy related Products
640/2009/CE EC	Regulation regarding the ecodesign requirements for electric motors
IEC 60034-1:2011	Rating and Performance
IEC 60034-5:2001	Degrees of Protection
IEC 60034-6:1993	Methods of cooling
IEC 60034-7:1993	Types of construction, mounting arrangements
IEC 60034-8:2008	Terminal marking and direction of rotation
IEC 60034-9:2006	Noise limits
IEC 60034-12:2003	Starting performances
IEC 60034-14:2004	Mechanical vibrations
IEC 60038:2011	European standard voltage
IEC 60072-1:1991	Output dimensions and tolerances
IEC 60034-30:2011	Efficiency classes
IEC 60034-2-1:2011	Efficiency measurement methods



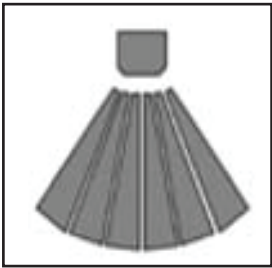


GENERAL TECHNICAL DATA

TESTS EXECUTED

Corrosion, dipping tests have been executed, using the most common cleansing and sanitizing agents on the industrial cleaning market. A particular attention has been paid to the food industry, being the most rigorous application sector requiring frequent rinsing cycles.

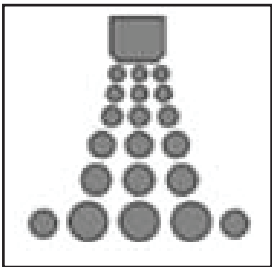
Example of cleansing schedule



Rinsing with cold water from -40 - 50 °C

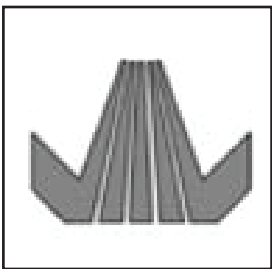
Rinsing with low pressure from top to bottom in the direction of the drains.

Cleaning of the drains.



Foaming from bottom to top / alkaline: P3-topax 19 2÷5% daily / acid: P3-topax 56 2% on demand / temperature: cold up to -40°C

Contact time: 15 minutes recommended



Washdown with high pressure water 40 - 50°C

Spray disinfection P3-topax 91 1÷2%, 20÷30minutes

APPLICATION FILEDS

Industrial sectors:

- Air Blast Freezer
- Poultry, meat
- Seafood
- Dairy Processing
- Bakery
- Bottling / Beverage
- Pharmaceutical Industry / Cosmetics
- Chemical manufacture
- Tobacco

ESI series for IQF Spiral Freezer & Cooler



- Δ/Y 230/400V-50Hz
- I.C.I.F – IP68 - IC410
- Duty S1
- Stainless steel AISI 304 or AISI 316L construction
- Efficiency IE2 or IE3 (IEC60034-30, IEC60034-2-1 $P_n \geq 0,75kW$)

Performance Data

4 Pole - 1500 rpm asynchronous speed 50Hz

Output (Kw)	Frame Size	Full lock speed (rpm)	Current			Locked rotor I_L/I_N	Efficiency %			power factor, $\cos \phi$ at 100 % full load	Torque			Moment of inertia $J=1/4 GD^2$ (kgxm ²)	Net weight (kg)
			Full load I _N 50Hz				at % full load				Full load T_N (Nm)	Locked rotor T_L/T_N	Break down T_B/T_N		
			380V	400V	415V		100	75	50						
			(A)	(A)	(A)										

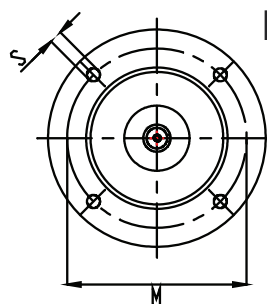
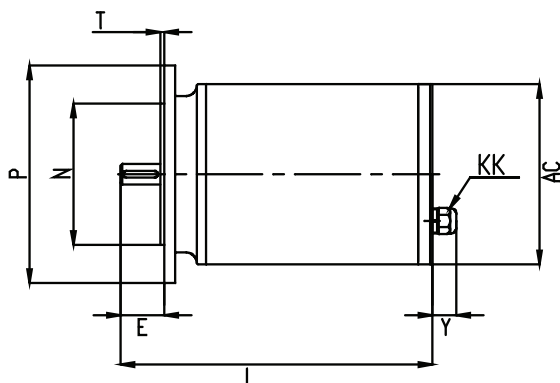
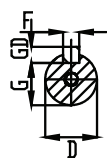
1500r/min = 4 poles

0.12	63A	1430	0.44	0.42	0.4	3.5	75	---	---	0.57	0.8	4.5	0.4	0.0011	10
0.18	63B	1430	0.59	0.56	0.54	3.5	75	---	---	0.62	1.2	4.5	0.54	0.0015	12
0.25	71A	1430	0.74	0.7	0.67	4	80	77	77	0.64	1.7	5	0.67	0.0018	13
0.37	71B	1435	1.16	1.1	1.06	4	80	79	79	0.64	2.5	5	1.06	0.0023	16
0.55	80A	1440	1.47	1.4	1.34	4.5	80	81	81	0.7	3.6	5.4	1.34	0.0041	22
0.75	80B	1440	2.1	2	1.92	6.5	90	80.9	78	0.7	5	5.6	2.6	0.0053	25
1.1	90A	1450	2.94	2.8	2.69	6.6	90	81.8	81	0.7	7.2	6	2.5	0.0075	32
1.5	90B	1450	3.78	3.6	3.46	6.9	95	83.7	83	0.71	9.9	6	2.7	0.0100	40
4	112M	1450	8.5	8.1	7.8	7.7	86.6	86	84	0.82	26.5	2.3	2.7	0.009	46
5.5	132S	1450	11.4	10.8	10.4	7.5	88.1	87.1	86	0.83	36.5	2.2	2.4	0.0223	47
7.5	132M	1455	15.4	14.6	14.1	7.4	88.1	87.1	86	0.84	49.6	2.3	2.5	0.0308	61.5
9.2	132L1	1455	18.5	17.5	16.9	7.5	89.8	88.8	87.5	0.85	61.4	2.2	2.6	0.0410	67
11	132L2	1455	22.2	21.1	20.4	7.5	89.8	88.8	87.5	0.84	72.0	2.2	2.6	0.0780	67
11	160M	1465	22.2	21	20.3	7.5	89.8	88.8	87.5	0.84	72.0	2.2	2.6	0.0780	115
15	160L	1465	29.6	28.1	27.1	7.5	90.6	90.1	87.9	0.85	98.1	2.2	2.4	0.0952	132

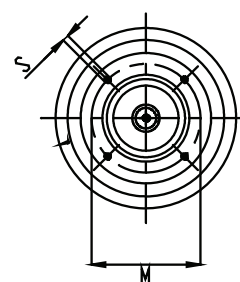
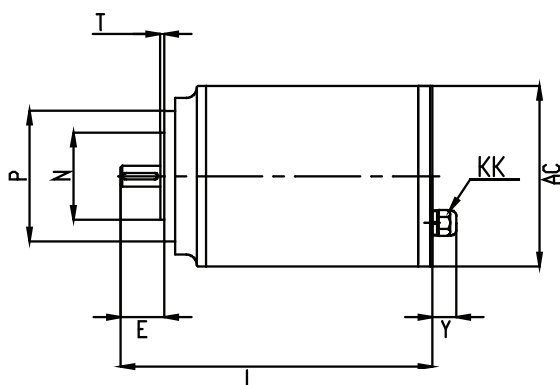


TECHNICAL DATA - DIMENSIONS

Stainless Steel casting for Freezer Air Coolers



IM B5



IM B14

Size	Bearings		Cable Glands		IMB5						IMB14					
	DE	NDE	KK	M	N	P	R	n x S	T	M	N	P	R	n x S	T	
63	6202 2RZ	6202 2RZ	M16X1.5	115	95 j6	140	≤0	4x10	3	75	60 j6	90	≤0	4xM5	2,5	
71	6202 2RZ	6202 2RZ	M20X1.5	130	110 j6	160	≤0	4x10	3,5	85	70 j6	105	≤0	4xM6	2,5	
80	6205 2RZ	6203 2RZ	M20X1.5	165	130 j6	200	≤0	4x12	3,5	100	80 j6	120	≤0	4xM6	3	
90S/L	6205 2RZ	6203 2RZ	M25X1.5	165	130 j6	200	≤0	4x12	3,5	115	95 j6	140	≤0	4xM8	3	
112	6308 2RS C3	6308 2RS C3	M25X1.5	215	180	250	≤0	4x14.5	4				-----			
132	6308 2RS C3	6308 2RS C3	M25X1.5	265	230	300	≤0	4x14.5	4				-----			
160	6309 2RS C3	6309 2RS C3	M40X1.5	300	250	350	≤0	4x18.5	5				-----			



TECHNICAL DATA - DIMENSIONS

Size	Shaft					General		
	D	E	F	G	GD	AC	Y	L
63A	11@M4	23	4	8,5	4	131	22	228
63B								243
71A	14@M5	30	5	11	5	131	25	265
71B								285
80A	19@M6	40	6	15,5	6	166	25	268
80B								288
90S	24@M8	50	8	20	7	166	30	333
90L								373
112	28@M10	60	8	24	7	218	15	437
132S	38@M12	80	10	33	8	218	15	457
132M								495
160	42@M16	110	12	37	8	282	-----	610





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