

ECHTOP[®] MOTOR

SHANGHAI TOP MOTOR CO.,LTD.



COMPANY BRIEF INTRODUCTION

Shanghai Top Motor Co., Ltd., one of leading motor manufacturers in China with a famous brand, TECHTOP, specializes in production and sale of electrical products, which are electric motors conformed to IEC, NEMA, GOST standard, permanent magnet motor, water pumps, generators, generating sets and the likes. The company has obtained ISO9001 Certificate and its products have Certificates of CSA, UL, CE, CCC etc..

Composing a group, there are Shanghai Himak Motor Co., Ltd., Fujian Ningde Top Motor Co., Ltd., Shanghai The-one Co., Ltd., The production capacity is 3,000,000 units with a volume of USD200,000,000 TECHTOP warmly welcomes cooperation with the customers all over the world and provides the best-quality products and most sincere service to the friends.



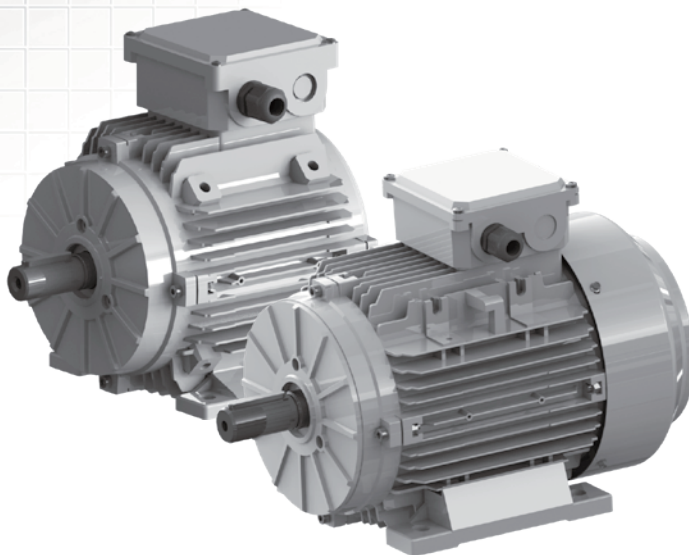
NATURE OF MECHANICAL



Electronically Commutated Motors

As a professional electric motors manufacturer who cares about environment and energy saving, one of our most important goals is to help our partners to reduce total life operation costs, increase profitability and make production more environmentally friendly.

TECHTOP EC (Electronically Commutated) motors is the special designed PMS (permanent magnet synchronous) motors which constructed on the base of the IEC norm, it is now available in four frame sizes: IEC-71#, IEC-90#, IEC-100#, IEC-132#, the maximum output is 22kW and the maximum torque is 70Nm.



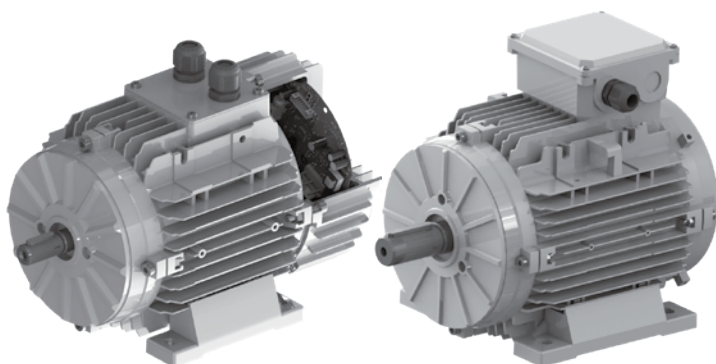
To be qualified for the next generation which requires for higher energy saving products, TECHTOP EC motors has the following advantages:

- Extremely high efficiency, average value is over IE4 norms.
- Very high efficiency in wide speed up to 3600rpm and power range.
- Compact and light design with high uniformity in appearance design with other TECHTOP products.
- Mounting dimensions according to the IEC norm, easy to replace from standard AC motors to TECHTOP EC motors.
- Various and flexible mounting types suitable for different applications.

E-Max motors is the first generation of TECHTOP EC motors which has led to develop the next generation of technology in motor efficiency and performance.

E-Max motors contains two series:

- **ECI**
IEC frame size 71# to 132# permanent magnet synchronous motors with integrated drive.
- **EC**
IEC frame size 71# to 132# permanent magnet synchronous motors



ECI motor

EC motor

Product Brief

E-MAX motor is the special designed permanent magnet synchronous motor based on the IEC norm. E-MAX PMSM will be used for next generation which need more energy saving product. Exceed IE4 variable speed AC motor (IEC60034-30-2-2016).

E-MAX motor is the first generation of TechTop EC motor. E-MAX has led to develop the next generation of technology in motor efficiency and performance.

E-MAX motor contain two series:

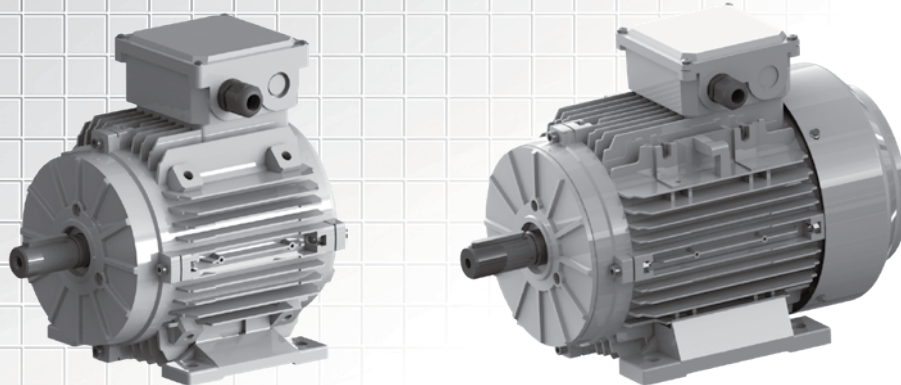
- EC series – Permanent magnet synchronous motor
- ECI series – permanent magnet synchronous motor integrated drive

Model number nomenclature

I **90** **EC** **03** **V** **36** **C2** **B14** **T1** **W**
 1 2 3 4 5 6 7 8 9 10

Position	Character	Description
1	"T"	Product platform
2	"90"	Frame size: IEC 71, 80, 90, 100, 112, 132
3	"EC"	EC: permanent magnet motor ECI: permanent magnet motor with integrated drive
4	"03"	Rated torque: 3.2 N.m = 03
5	"V"	Cooling method:
		G = General purposes, with fan and fan hood. IC411
		V = Ventilation applications, without fan and fan hood IC410 D = Double shaft structure
6	"36"	Maximum speed: 3600 rpm
7	C2	Power line connection method: T1 = Terminal box on top T2 = Terminal box on NDE C1 = No terminal box, power line from housing C2 = No terminal box, power line from NDE C3 = No terminal box, Power line with special connector
8	B14	Mounting method: B3, B14, B5, B34, B35
9	T1	Voltage code: T1 = 3PH, 360–460 V, T2 = 3PH, 200–240V T3 = 3PH, 400/230V, S1 = 1PH, 200–277V, S2 = 1PH, 115V S3 = 1PH, 220/115V dual voltage D1 = DC, 24V, D2 = DC, 48V, D3 = DC, 60V
10	W	Special requirement: F = Internal protector W = Wireless control

EC series



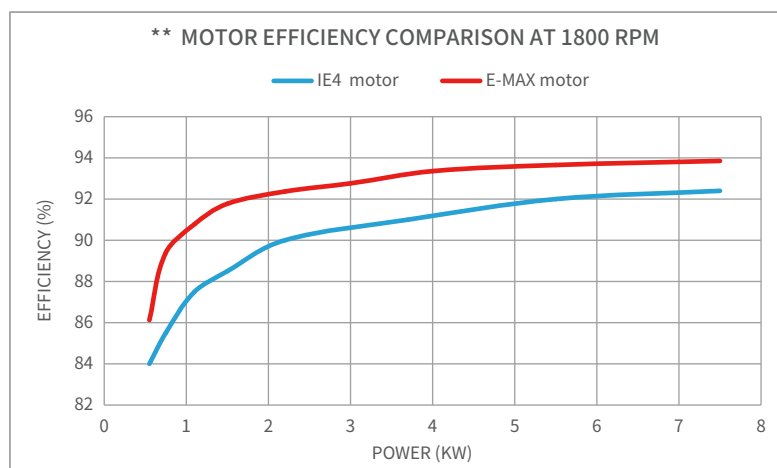
Model list

Frame size	Model	Rated torque (N.m)	Maximum speed (r/min)	Power (kW)
90	T90EC03X06	3.2	600	0.20
90	T90EC05X06	4.8	600	0.30
90	T90EC07X06	7.0	600	0.44
100	T100EC10X06	10.0	600	0.63
100	T100EC14X06	14.0	600	0.88
100	T100EC19X06	19.0	600	1.19
132	T132EC26X06	25.5	600	1.60
132	T132EC35X06	35.0	600	2.20
132	T132EC48X06	48.0	600	3.01
132	T132EC59X06	59.0	600	3.71
132	T132EC70X06	70.0	600	4.40
90	T90EC03X09	3.2	900	0.30
90	T90EC05X09	4.8	900	0.45
90	T90EC07X09	7.0	900	0.66
100	T100EC10X09	10.0	900	0.94
100	T100EC14X09	14.0	900	1.32
100	T100EC19X09	19.0	900	1.79
132	T132EC26X09	25.5	900	2.40
132	T132EC35X09	35.0	900	3.30
132	T132EC48X09	48.0	900	4.52
132	T132EC59X09	59.0	900	5.56
132	T132EC70X09	70.0	900	6.59
71	T71EC01X15	1.2	1500	0.19
71	T71EC02X15	2.4	1500	0.38
71	T71EC03X15	3.2	1500	0.50
90	T90EC03X15	3.2	1500	0.50
90	T90EC05X15	4.8	1500	0.75
90	T90EC07X15	7.0	1500	1.10
100	T100ECX15	10.0	1500	1.57
100	T100ECX15	14.0	1500	2.20
100	T100ECX15	19.0	1500	2.98
132	T132ECX15	25.5	1500	4.00
132	T132ECX15	35.0	1500	5.50
132	T132ECX15	48.0	1500	7.54
132	T132ECX15	59.0	1500	9.26
132	T132ECX15	70.0	1500	10.99

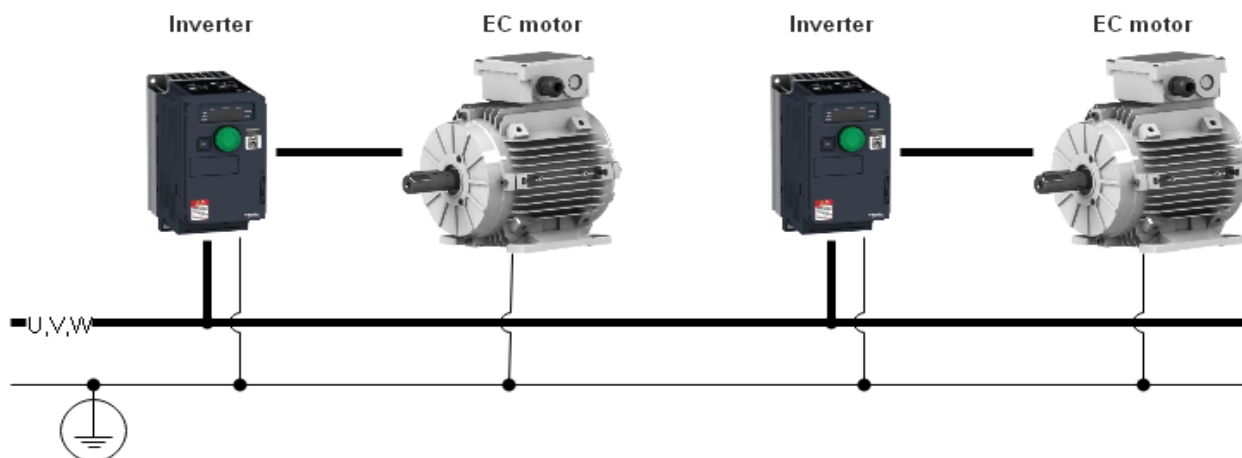
Model list

Frame size	Model	Rated torque (N.m)	Maximum speed (r/min)	Power (kW)
71	T71EC01X18	1.2	1800	0.23
71	T71EC02X18	2.4	1800	0.45
71	T71EC03X18	3.2	1800	0.60
90	T90EC03X18	3.2	1800	0.60
90	T90EC05X18	4.8	1800	0.90
90	T90EC07X18	7.0	1800	1.32
100	T100EC10X18	10.0	1800	1.88
100	T100EC14X18	14.0	1800	2.64
100	T100EC19X18	19.0	1800	3.58
132	T132EC26X18	25.5	1800	4.80
132	T132EC35X18	35.0	1800	6.59
132	T132EC48X18	48.0	1800	9.04
132	T132EC59X18	59.0	1800	11.12
132	T132EC70X18	70.0	1800	13.19
71	T71EC01X30	1.2	3000	0.38
71	T71EC02X30	2.4	3000	0.75
71	T71EC03X30	3.2	3000	1.00
90	T90EC03X30	3.2	3000	1.00
90	T90EC05X30	4.8	3000	1.51
90	T90EC07X30	7.0	3000	2.20
100	T100EC10X30	10.0	3000	3.14
100	T100EC14X30	14.0	3000	4.40
100	T100EC19X30	19.0	3000	5.97
132	T132EC26X30	25.5	3000	8.01
132	T132EC35X30	35.0	3000	10.99
132	T132EC48X30	48.0	3000	15.07
132	T132EC59X30	59.0	3000	18.53
132	T132EC70X30	70.0	3000	21.98
71	T71EC01X36	1.2	3600	0.45
71	T71EC02X36	2.4	3600	0.90
71	T71EC03X36	3.2	3600	1.21
90	T90EC03X36	3.2	3600	1.21
90	T90EC05X36	4.8	3600	1.81
90	T90EC07X36	7.0	3600	2.64
100	T100EC10X36	10.0	3600	3.77
100	T100EC14X36	14.0	3600	5.28
100	T100EC19X36	19.0	3600	7.16

E C motor efficiency comparison with IE4



EC motor application - Inverter and motor connection



EC motor parameters for inverter

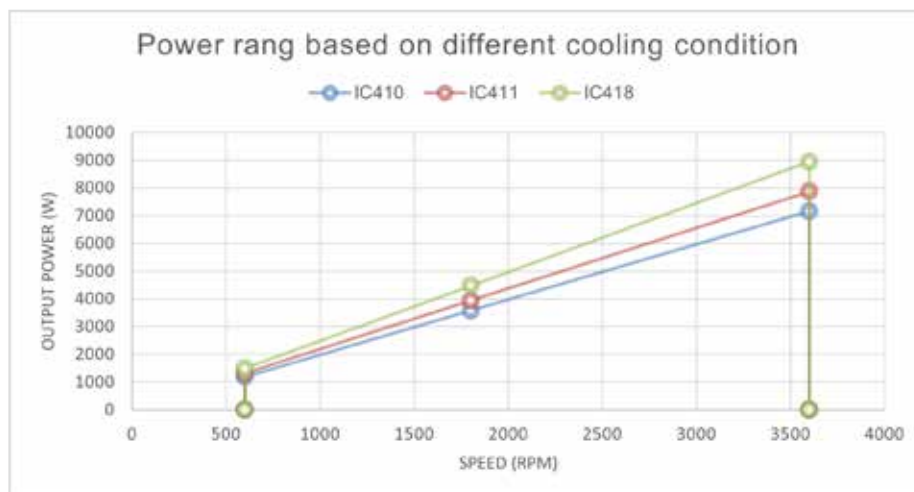
PMSM must drive by the VSD. The motor cannot connect to the normal AC power directly. The VSD can be the commercial drive with vector control or PM motor control mode. VSD need to be set up the correct motor parameter (see below table). The detail parameters can be find in the model data sheet. (T100EC19X36 model such as a sample)

Items	Y	Δ	Unit	Note
Inverter input voltage:	360-460	360-460	V	
Pole numbers:	6	6		
Max speed:	1800	3600 rpm	rpm	
Max frequency:	90	180	Hz	
VSD output voltage:	360	360	V	Minimum
Max current:	8.75	15.5	A	
Max output power:	4500	9000	w	
Resistance:	0.67	0.22	Ohm	Phase
Ld:	11.60	3.87	mH	Phase
Lq:	24.00	8.00	mH	Phase
Back EMF value:	111	65	L-N Vrms per 1000 rpm	

*The detail model parameters please check Data sheet for each model.

EC motor running power range

Different cooling condition the motor power range will be different
(T100EC19X36 model such as a sample)



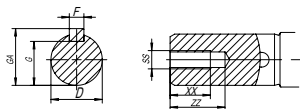
* The better cooling can make motor to run higher power range. IEC411 should be 1.1 times, IEC418 can be 1.25 times than IEC410.

* S2 or other duty cycle can reach higher power based on the duty cycle value.

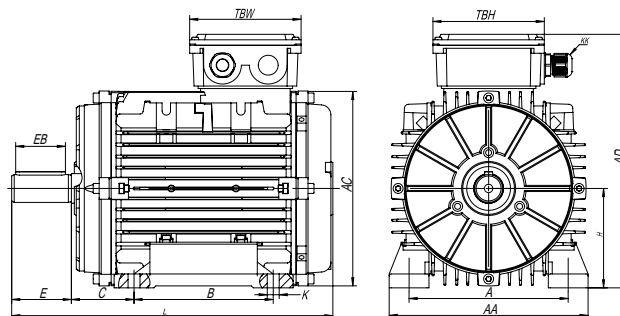
EC motor name plate reference

				
Serial n° :		*****		
Model or type :		T100EC14G36T1B5T1		
Rate torque :		14N.m		
Inverter voltage :		340-460V@50/60Hz		
Duty cycle :	S1	IP :		55
Insulation class :	F	Temp. Ambient :		-25-40°C
Connection	Frequency	Speed	Rated current	Max.output
Y	90Hz	1800rpm	5.3A	2.6kW
Δ	180Hz	3600rpm	9.5A	5.2kW

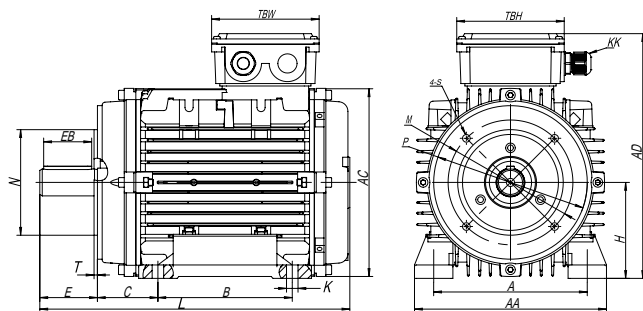
E C motor machinal dimension



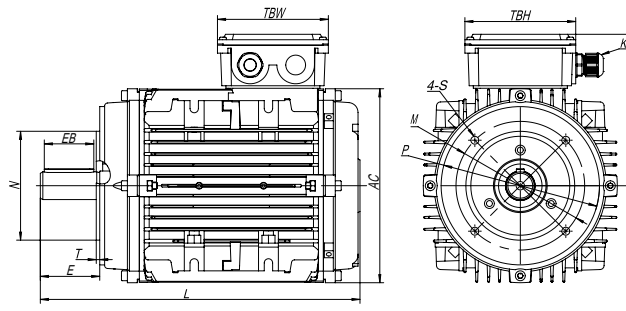
Shaft size



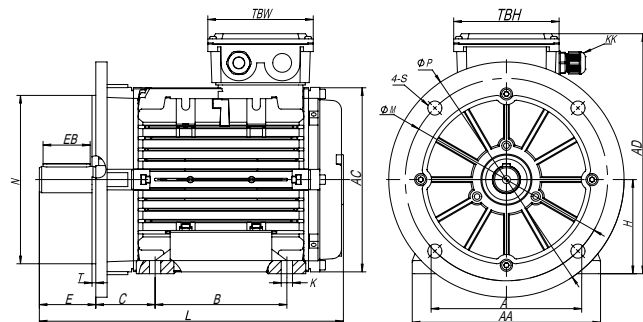
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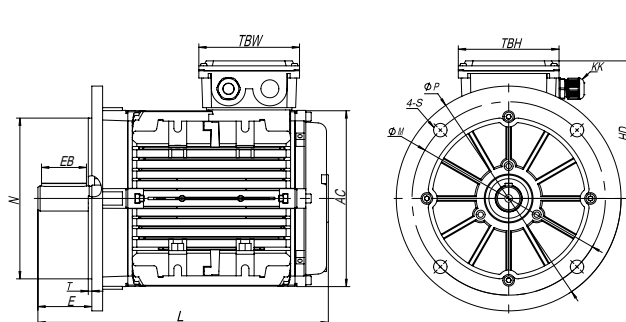
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B14



B35



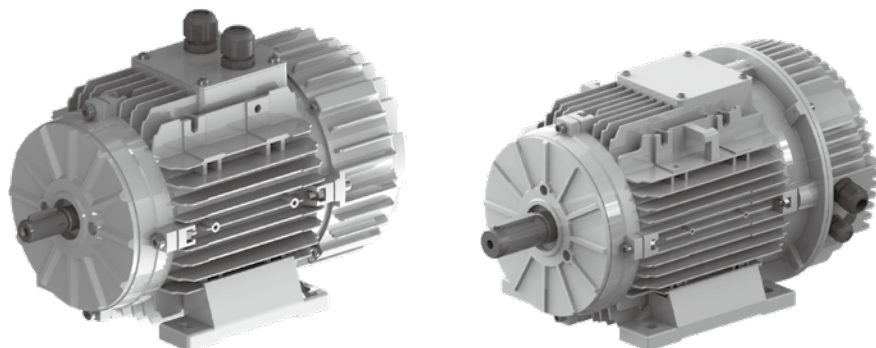
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Frame	Foot Mounting				Shaft								
	H	A	B	C	D	E	F	G	K	SS	EB	XX	ZZ
71	71	112	90	45	Φ 14	30	5	11	7 × 10	M5	22	12	17
90	90	140	100	56	Φ 24	50	8	20	10 × 15	M8	40	19	25
100	100	160	140	63	Φ 28	60	8	24	12 × 16	M10	50	22	30
132	132	216	140	89	Φ 38	80	10	33	12 × 16	M12	70	28	37

Frame	General								TBW	TBH
	AA	AD	HD	AC		L				
				IC410	IC411	IC410	IC411			
71	140	189	118	Φ 136	Φ 138	208	245	94	94	
90	176	235	145	Φ 175	Φ 177	244	315	105	105	
100	200	255	155	Φ 197	Φ 199	323	376	112	112	
132	260	318	186	Φ 259	Φ 261	395	460	112	112	

Frame	KK	B5					B14					B5R					B14B				
		N	M	P	S	T	N	M	P	S	T	N	M	P	S	T	N	M	P	S	T
71	1-M20 × 1.5	Φ 110	Φ 130	Φ 160	Φ 10	3.5	Φ 70	Φ 85	Φ 105	M6	2.5	Φ 95	Φ 115	Φ 140	Φ 10	3	Φ 95	Φ 115	Φ 140	M8	3
90	1-M20 × 1.5	Φ 130	Φ 165	Φ 200	Φ 12	3.5	Φ 95	Φ 115	Φ 140	M8	3	Φ 110	Φ 130	Φ 160	Φ 10	3.5	Φ 110	Φ 130	Φ 160	M8	3.5
100	1-M20 × 1.5	Φ 180	Φ 215	Φ 250	Φ 15	4	Φ 110	Φ 130	Φ 160	M8	3.5	Φ 130	Φ 165	Φ 200	Φ 12	3.5	Φ 130	Φ 165	Φ 200	M10	3.5
132	1-M25 × 1.5	Φ 230	Φ 265	Φ 300	Φ 15	4	Φ 130	Φ 165	Φ 200	M10	3.5	Φ 180	Φ 215	Φ 250	Φ 15	4	Φ 180	Φ 215	Φ 250	M12	4

ECI series



Model list

Frame size	Model	Rated torque (N.m)	Maximum speed (r/min)	Power (kW)
90	T90ECI03	3.2	600	0.20
90	T90ECI05	4.8	600	0.30
90	T90ECI07	7.0	600	0.44
100	T100ECI10	10.0	600	0.63
100	T100ECI14	14.0	600	0.88
100	T100ECI19	19.0	600	1.19
132	T132ECI26	26.0	600	1.63
132	T132ECI35	35.0	600	2.20
132	T132ECI48	48.0	600	3.01
90	T90ECI03	3.2	900	0.30
90	T90ECI05	4.8	900	0.45
90	T90ECI07	7.0	900	0.66
100	T100ECI10	10.0	900	0.94
100	T100ECI14	14.0	900	1.32
100	T100ECI19	19.0	900	1.79
132	T132ECI26	26.0	900	2.45
132	T132ECI35	35.0	900	3.30
71	T71ECI01	1.2	1500	0.19
71	T71ECI02	2.4	1500	0.38
71	T71ECI03	3.2	1500	0.50
90	T90ECI03	3.2	1500	0.50
90	T90ECI05	4.8	1500	0.75
90	T90ECI07	7.0	1500	1.10
100	T100ECI10	10.0	1500	1.57
100	T100ECI14	14.0	1500	2.20
100	T100ECI19	19.0	1500	2.98
132	T132ECI26	26.0	1500	4.08
71	T71ECI01	1.2	1800	0.23
71	T71ECI02	2.4	1800	0.45
71	T71ECI03	3.2	1800	0.60
90	T90ECI03	3.2	1800	0.60
90	T90ECI05	4.8	1800	0.90
90	T90ECI07	7.0	1800	1.32
100	T100ECI10	10.0	1800	1.88
100	T100ECI14	14.0	1800	2.64
100	T100ECI19	19.0	1800	3.58
71	T71ECI01	1.2	3600	0.45
71	T71ECI02	2.4	3000	0.75
71	T71ECI03	3.2	3000	1.00
90	T90ECI03	3.2	3000	1.00
90	T90ECI05	4.8	3000	1.51
90	T90ECI07	7.0	3000	2.20
100	T100ECI10	10.0	3000	3.14

** The rated torque is based on the motor cooling method. The detail torque please see data sheet.

** 71 frame and 90 frame ECI motor are supplied by 1 phase power with 200–277V, 100 frame and 132 frame ECI motor are supplied by 3 phase power with 360–460V.

** IC418: Motor must be run at forced air cooling condition

ECI motor structure reference

ECI motor drive function

- CW/CCW choose
- Start-stop terminal
- 0-10VDC speed control
- RS485 Modbus
- Speed feedback



Single phase nameplate and connection

			
Serial n° :		*****	
Model or type :		T90ECI05V30C1B3S1	
Voltage/frequency/phase :		200-277V,50/60Hz,1ph	
Rate torque and speed :		4.8N.m,500-1800rpm	
Nominal power and current :		0.9kW,9.5A	
Efficiency:		η85%	
S1	IP55	F/B Class	-25 - 40°C
Power terminal and cable		Control terminal and cable	
Line: Brown		Speed output: White	
Neutral: Blue		On/Off: Red	
PE: Yellow/Green		12VDC output: Yellow	
ON/OFF Control: Red+Yellow		0-10VDC input: Blue	
CW/CCW Control: Yellow+Brown		Common: Black	
		Modbus: A-Green,B-Grey	

Control cable connection

Item	Fuction	Wire color	Note
1	Speed output	White	3 puls per rev
2	Start/Stop	Red	Start: Red+Yellow
3	DC 12V output	Yellow	
4	DC 0-10V input	Blue	Speed control
5	COM	Black	
6	CW/CCW	Brown	CW: Brown, CCW:Brown+Yellow
7	RS485 B	Gray	
8	RS485 A	Green	

Power cable connection

Item	Fuction	Wire color
9	L	Brown
10	N	Blue
11	PE	Yellow/Green

Three phase nameplate and connection

 	
Serial n° :	*****
Model or type :	T100EC119V06C2B3T1
Voltage/frequency/phase :	360-460V, 50/60Hz, 3ph
Rate torque and speed :	19N.m, 600rpm
Nominal power and current :	1.2kW, 2.1A
Efficiency :	η83.5%
S1	IP55
F/B Class	-25 - 40°C
Power terminal and cable T1: Brown T2: Blue T3: Black PE: Yellow/Green ON/OFF Control: Red+Yellow CW/CCW Control: Yellow+Brown	Control terminal and cable Speed output: White On/Off: Red 12VDC output: Yellow 0-10VDC input: Blue Common: Black Modbus: A-Green, B-Grey

• Control cable connection

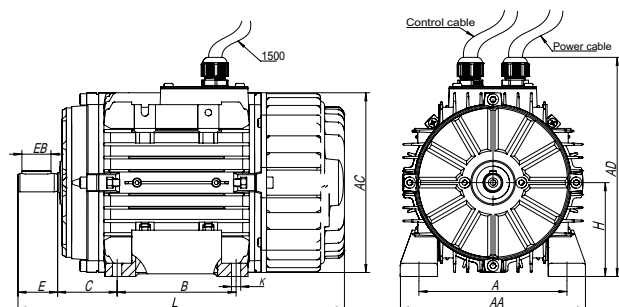
Item	Fuction	Wire color	Note
1	Speed output	White	3 puls per rev
2	Start/Stop	Red	Start: Red+Yellow
3	DC 12V output	Yellow	
4	DC 0-10V input	Blue	Speed control
5	COM	Black	
6	CW/CCW	Brown	CW: Brown, CCW: Brown+Yellow
7	RS485 B	Gray	
8	RS485 A	Green	

• Power cable connection

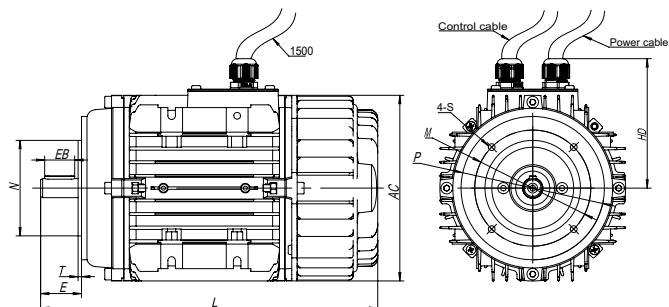
Item	Fuction	Wire color
9	T1	Brown
10	T2	Blue
11	T3	Black
12	Ground	Yellow/Green

E CI motor machinal dimension

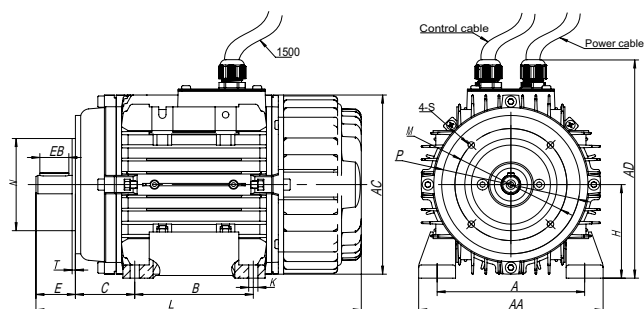
• 71ECI



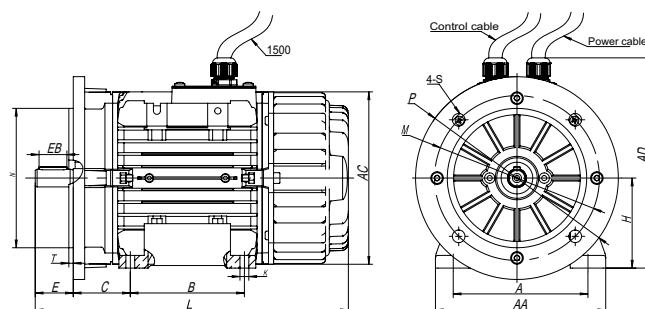
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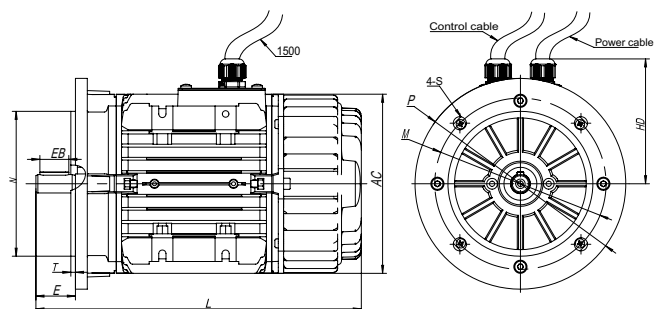
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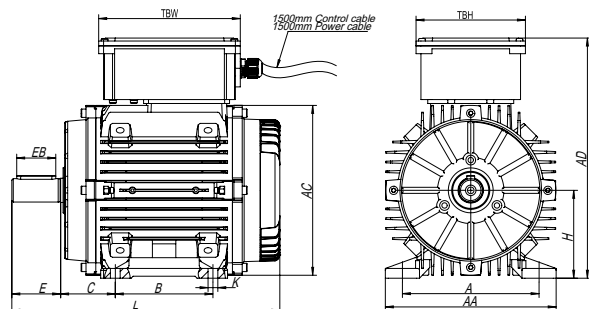


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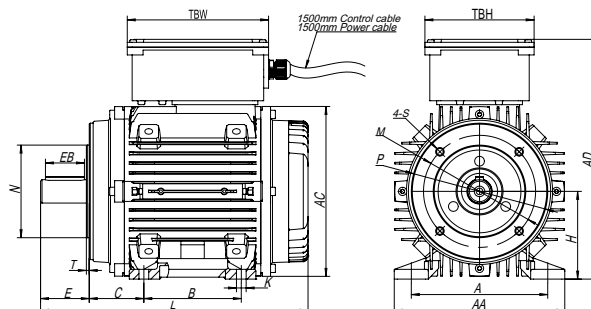


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• 90ECI

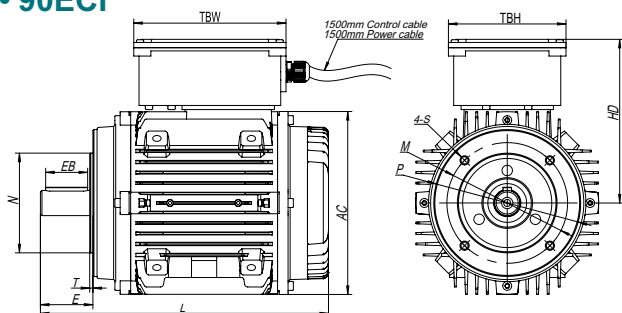


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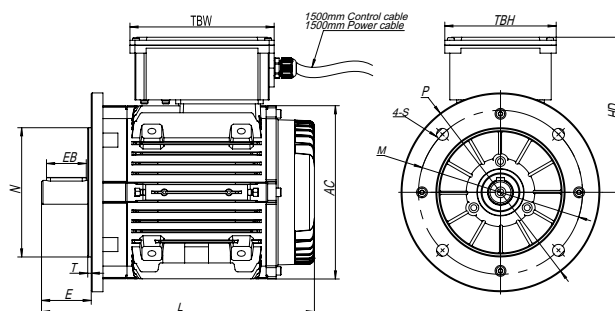


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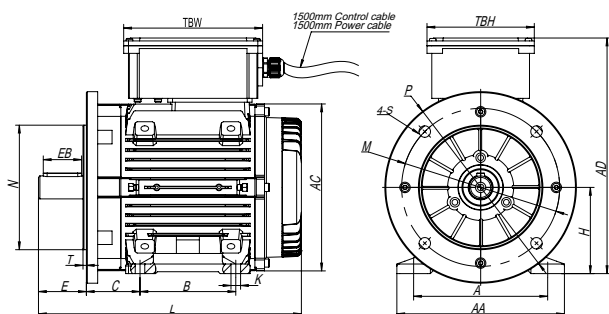
• 90ECI



B14

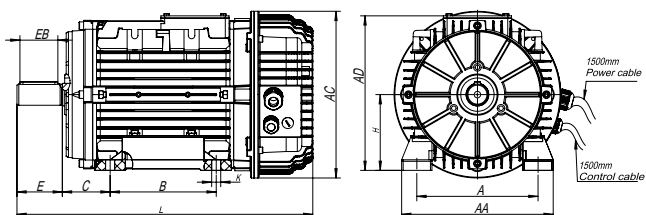


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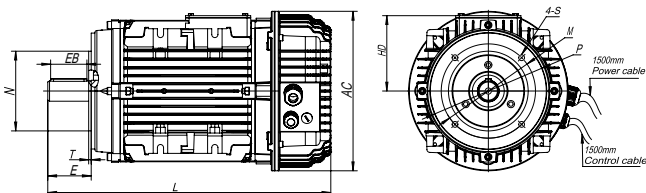


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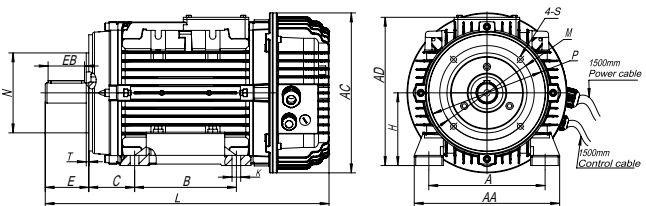
• 100ECI



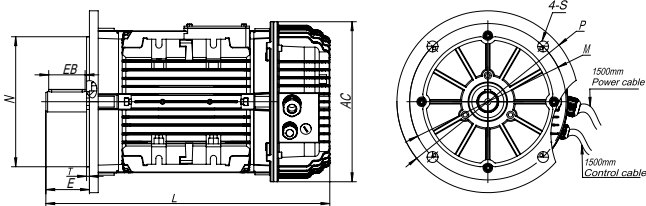
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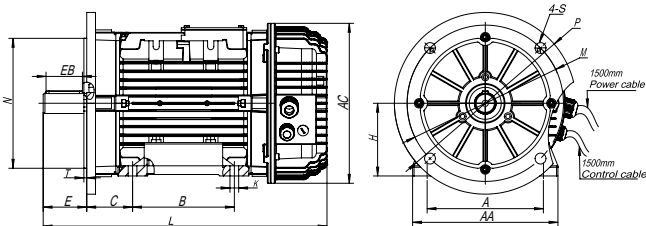
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B34



B5



B35

Frame	Foot Mounting					General				
	H	A	B	C	AA	AD	HD	AC	L	
71	71	112	90	45	140	168	95	Φ 136	247	
90	90	140	100	56	175	248	156	Φ 175	275	
100	100	160	140	63	200	208	108	Φ 220	390.5	

Frame	B5					B14					B5R					B14B				
	N	M	P	S	T	N	M	P	S	T	N	M	P	S	T	N	M	P	S	T
71	Φ 110	Φ 130	Φ 160	Φ 10	3.5	Φ 70	Φ 85	Φ 105	M6	2.5	Φ 95	Φ 115	Φ 140	Φ 10	3	Φ 95	Φ 115	Φ 140	M8	3
90	Φ 130	Φ 165	Φ 200	Φ 12	3.5	Φ 95	Φ 115	Φ 140	M8	3	Φ 110	Φ 130	Φ 160	Φ 10	3.5	Φ 110	Φ 130	Φ 160	M8	3.5
100	Φ 180	Φ 215	Φ 250	Φ 15	4	Φ 110	Φ 130	Φ 160	M8	3.5	Φ 130	Φ 165	Φ 200	Φ 12	3.5	Φ 130	Φ 165	Φ 200	M10	3.5
132	Φ 230	Φ 265	Φ 300	Φ 15	4	Φ 130	Φ 165	Φ 200	M10	3.5	Φ 180	Φ 215	Φ 250	Φ 15	4	Φ 180	Φ 215	Φ 250	M12	4

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