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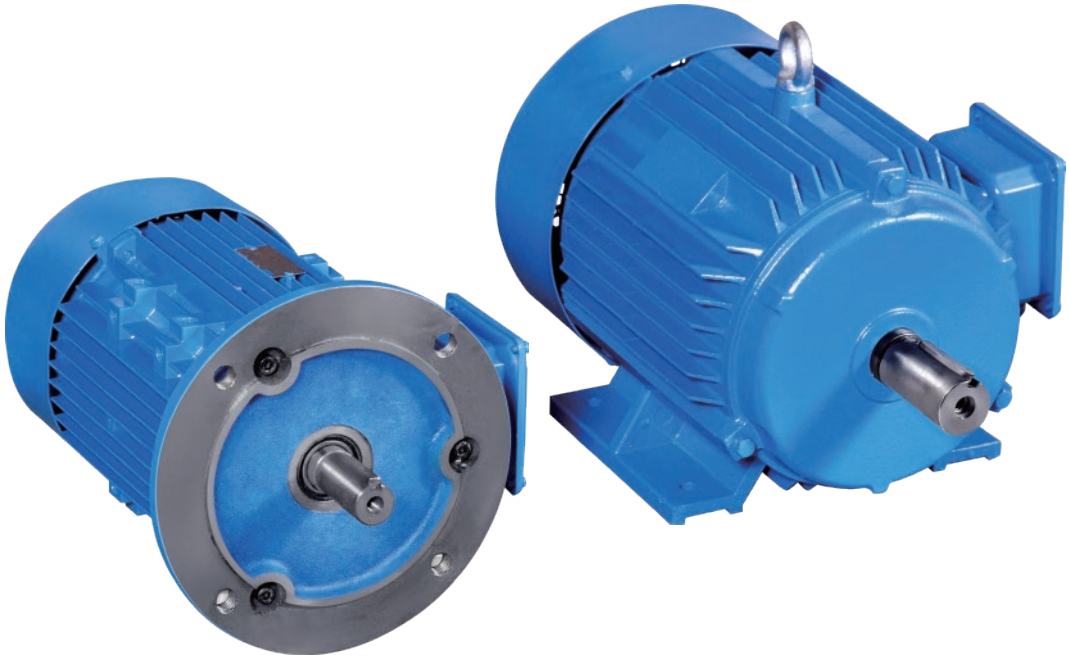

YZ Crane And Metallurgical Applications Three-Phase Asynchronous Motor

Power: 0.37kW~90kW; Frame Size: 80~280

Modified date 03/2021
Selection Sample C05.0031-EN

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Notes:

- The structure scheme,appearance diagram and other attached diagrams in sample are examples,there is no strict proportion requirement.(The unmarked dimension units are mm).
- The marked weight is average value, it has no constraint force.

⚠The following items must be strictly observed:

- To prevent accidents,all the rotation parts are added with protective covers by the purchaser according to the safety regulations of the nation and region.
- The instruction book must be read carefully before the test run.

Contents

1 Overview

BONENG three–phase asynchronous motor for crane and metallurgical applications is a universal closed–fan cooling or forced–cooled three–phase asynchronous motor,the standard protection class IP55,the design and production in line with IEC,GB and other related standards .Apply to intermittent work system ,constant speed or speed within a certain range of frequency control applications.

1.1 Technical Design

- Frame material：H80–100：Die–casting aluminum；
  H112–280：grey cast iron；
- Rated power：0.37 kW–90 kW。
- Number of motor poles：4,6
- Standard mounting structure（Compliance with standards IEC 60034–7）：IMB3,IMB5,IMB14B,IM B35,IMB34B,etc.
- Motor Degree of Protection：Protection class IP55 (IEC 60034–5).
- Motor Insulation class：Insulation system designed according to the temperature level of 155 ℃ (F),by 130 (B) temperature level assessment, H–class insulation (optional)；The temperature rise limits according to IEC 60034–1 are as follows (resistance method).

Insulation class	Temperature rise level (K)		
	Thermometer method	Resistance method	Embedded thermometer method
B	70	80	85
F	85	100	100
H	105	125	130

- Motor thermal protection：Optional PTC thermistor, thermal switch or PT100 temperature sensor for winding protection.
- Motor terminal box：From the motor tail,the standard position of the terminal box is on the left side of the frame,with the cable entry facing down. Terminal box location and cable entry can be selected according to the customer requirements.
- Motor terminal box cable entry：Motor cable entry H80 for one, H90–280 for two.
- Motor cooling method :Motor cooling is radial–flow fans cooled (IC 411 as specified in IEC 60034–6) and provide the motor that independently drives fan for forced cooling and natural cooling.

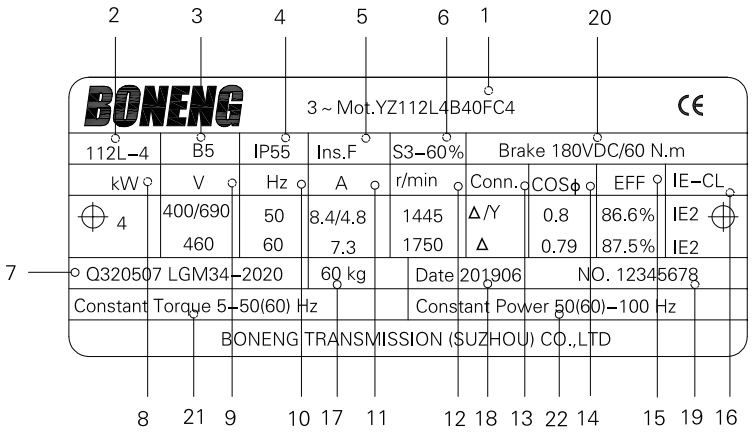
1.2 Operating environment

- Motor standard operating environment
  - Operating altitude does not 1000m above sea level（IEC 60034–1）；
  - Allowable working environment temperature –20℃–40℃（IEC 60034–1）；
  - Permitted relative humidity:
    –20℃≤T≤20℃：100%
    20℃＜T≤30℃：95%
    30℃＜T≤40℃：55%
- For higher ambient temperatures and / or locations 1000 m above sea level, the specified motor output must be reduced by using the factor kHT. P_N’ ： P_N’ = $P_N \cdot K_{HT}$

  Factor K_{HT} for different side altitudes and / or ambient temperature

Ambient temperature / Altitude above sea level	＜30℃	30～40℃	45℃	50℃	55℃	60℃
1000 m	1.07	1	0.96	0.92	0.87	0.82
1500 m	1.04	0.97	0.93	0.89	0.84	0.79
2000 m	1	0.94	0.9	0.86	0.82	0.77
2500 m	0.96	0.9	0.86	0.83	0.78	0.74
3000 m	0.92	0.86	0.82	0.79	0.75	0.7
3500 m	0.88	0.82	0.79	0.75	0.71	0.67
4000 m	0.82	0.77	0.74	0.71	0.67	0.63

1.3 Nameplate information



1. Motor type
2.Frame size
3. Type of construction
4. Degree of protection
5. Insulation Class
6. Duty
7. Enterprise standard
8. Rated power
9. Rated voltage
10. Rated frequency
11. Rated current
12. Rated speed
13. Winding connections
14. Power factor
15. Efficiency
16. Energy efficiency class
17. Weight
18. Date of manufacture
19. Number of manufacture
20. Braking voltage / torque
21. Constant torque Range
22. Constant power Range

1.4 Motor Energy Efficiency

IEC60034-30-1 Energy Efficiency

Power (kW)	IE1-50Hz		IE2-50Hz		IE3-50Hz		IE4-50Hz	
	4P	6P	4P	6P	4P	6P	4P	6P
0.12	50	38.3	59.1	50.6	64.8	57.7	69.8	64.9
0.18	57	45.5	64.7	56.6	69.9	63.9	74.7	70.1
0.2	58.5	47.6	65.9	58.2	71.1	65.4	75.8	71.4
0.25	61.5	52.1	68.5	61.6	73.5	68.8	77.9	74.1
0.37	66	59.7	72.7	67.6	77.3	73.5	81.1	78
0.4	66.8	61.1	73.5	68.8	78	74.4	81.7	78.7
0.55	70	65.8	77.1	73.1	80.8	77.2	83.9	80.9
0.75	72.1	70	79.6	75.9	82.5	78.9	85.7	82.7
1.1	75	72.9	81.4	78.1	84.1	81	87.2	84.5
1.5	77.2	75.2	82.8	79.8	85.3	82.5	88.2	85.9
2.2	79.7	77.7	84.3	81.8	86.7	84.3	89.5	87.4
3	81.5	79.7	85.5	83.3	87.7	85.6	90.4	88.6
4	83.1	81.4	86.6	84.6	88.6	86.8	91.1	89.5
5.5	84.7	83.1	87.7	86	89.6	88	91.9	90.5
7.5	86	84.7	88.7	87.2	90.4	89.1	92.6	91.3
11	87.6	86.4	89.8	88.7	91.4	90.3	93.3	92.3
15	88.7	87.7	90.6	89.7	92.1	91.2	93.9	92.9
18.5	89.3	88.6	91.2	90.4	92.6	91.7	94.2	93.4
22	89.9	89.2	91.6	90.9	93	92.2	94.5	93.7
30	90.7	90.2	92.3	91.7	93.6	92.9	94.9	94.2
37	91.2	90.8	92.7	92.2	93.9	93.3	95.2	94.5
45	91.7	91.4	93.1	92.7	94.2	93.7	95.4	94.8
55	92.1	91.9	93.5	93.1	94.6	94.1	95.7	95.1
75	92.7	92.6	94	93.7	95	94.6	96	95.4
90	93	92.9	94.2	94	95.2	94.9	96.1	95.6
110	93.3	93.3	94.5	94.3	95.4	95.1	96.3	95.8
132	93.5	93.5	94.7	94.6	95.6	95.4	96.4	96
160	93.8	93.8	94.9	94.8	95.8	95.6	96.6	96.2
200	94	94	95.1	95	96	95.8	96.7	96.3
250	94	94	95.1	95	96	95.8	96.7	96.5
315-1000	94	94	95.1	95	96	95.8	96.7	96.6
Power (kW)	IE1-60Hz		IE2-60Hz		IE3-60Hz		IE4-60Hz	
	4P	6P	4P	6P	4P	6P	4P	6P
0.12	62	48	64	50.5	66	64	70	68
0.18	66	52.5	68	55	69.5	67.5	74	72
0.25	68	57.5	70	59.5	73.4	71.4	77	75.5
0.37	70	62	72	64	78.2	75.3	81.5	78.5
0.55	74	66	75.5	68	81.1	81.7	84	82.5
0.75	77	72	82.5	80	85.5	82.5	85.5	84
1.1	79	75	84	85.5	86.5	87.5	87.5	88.5
1.5	81.5	77	84	86.5	86.5	88.5	88.5	89.5
2.2	83	78.5	87.5	87.5	89.5	89.5	91	90.2
3.7	85	83.5	87.5	87.5	89.5	89.5	91	90.2
5.5	87	85	89.5	89.5	91.7	91	92.4	91.7
7.5	87.5	86	89.5	89.5	91.7	91	92.4	92.4
11	88.5	89	91	90.2	92.4	91.7	93.6	93
15	89.5	89.5	91	90.2	93	91.7	94.1	93
18.5	90.5	90.2	92.4	91.7	93.6	93	94.5	94.1
22	91	91	92.4	91.7	93.6	93	94.5	94.1
30	91.7	91.7	93	93	94.1	94.1	95	95
37	92.4	91.7	93	93	94.5	94.1	95.4	95
45	93	91.7	93.6	93.6	95	94.5	95.4	95.4
55	93	92.1	94.1	93.6	95.4	94.5	95.8	95.4
75	93.2	93	94.5	94.1	95.4	95	96.2	95.8
90	93.2	93	94.5	94.1	95.4	95	96.2	95.8
110	93.5	94.1	95	95	95.8	95.8	96.2	96.2
150	94.5	94.1	95	95	96.2	95.8	96.5	96.2
185	94.5	94.1	95	95	96.2	95.8	96.5	96.2
220	94.5	94.1	95.4	95	96.2	95.8	96.8	96.5
250-335	94.5	94.1	95.4	95	96.2	95.8	96.8	96.5
375-1000	94.5	94.1	95.8	95	96.2	95.8	96.8	96.5

2 Reference standards

Name	IEC standard	Chinese national standard
Rotating electrical machines-Rating and performance	IEC 60034-1	GB 755
Test procedures for three-phase induction motors	IEC 60034-2	GB/T 1032
Classification of degrees of protection provided by enclosures of rotating electrical machines (IP code)	IEC 60034-5	GB/T 4942.1
Cooling methods of rotating electrical machines	IEC 60034-6	GB/T 1993
Classification of types of construction and mounting arrangements for rotating electrical machines (IM code)	IEC 60034-7	GB/T 997
Rotating electrical machines —Terminal marking sand direction of rotation	IEC 60034-8	GB/T 1971
Measurement of airborne noise emitted by rotating electrical machines and the noise limits - Part 3:Noise limits	IEC 60034-9	GB/T 10069.3
Mechanical vibration of certain machines with shaft heights 56 mm and higher-measurement ,evaluation and limits of vibration severity	IEC 60034-14	GB/T 10068
Dimensions and output series for rotating electrical machines—Part 1:Frame numbers 56 to 400 and flange numbers 55 to 1080	IEC 60072-1	GB/T 4772.1
General requirements for safety of small and medium size rotating electrical machines	/	GB/T 14711
Electrical insulation—Thermal evaluation and designation	IEC 60085	GB/T 11021
Environmental conditions appearing in nature of electric and electronic products Temperature and humidity	IEC 60721-2-1	GB/T 4797.1
Standard Voltages	IEC 60038	GB/T 156

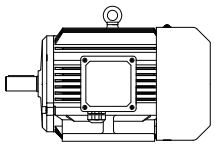
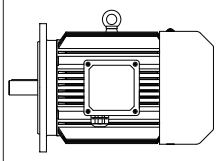
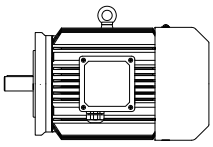
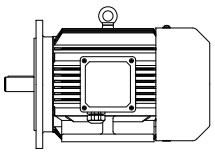
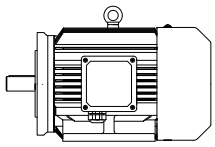
3 Mechanical design

3.1 Terminal box

- The terminal box is self-rotating by 4x90 ° , allowing cables to enter in all directions. 80 motor terminal box has one cable entry using gland seal, 90-280 motor terminal box has two cable entries, one of the cable entry with gland seal, the other cable entry using plug seal.
- Motor terminal box technical parameters see the table below:

Terminal box	Numbers of main terminals	Contact screw thread	Outer cable diameter (mm)	Cable entry size (gland +screwed plug)
80	6	M4	14~20	M25X1.5
90		M4	14~20	M25X1.5+M25X1.5
100		M4	14~20	M25X1.5+M25X1.5
112		M5	18~24	M30X2+M30X2
132				
160		M6	22~28	M36X2+M36X2
180				
200		M8	30~36	M48X2+M48X2

3.2 Type of construction

Basic construction	Frame with feet	Cover with flange	Cover with small flange	Cover with flange , Frame with feet	Cover with small flange , Frame with feet
Frame size	80-280	80-280	80-132	80-280	80-132
Mounting type	IMB3	IMB5	IMB14B	IMB35	IMB34B
Diagram					

3.3 Motor shaft end thread

Frame size	Drive end	Non-drive end
80	CM6L12/10.5	CM8L12/13.2
90	CM8L12/13.2	
100	CM10L15/16.3	
112		
132	CM12L20/19.8	CM10L15/16.3
160	CM16L25/25.3	CM16L25/25.3
180		
200-280	CM20L30/31.3	CM20L30/31.3

3.4 Bearing

BONENG motor for crane and metallurgical applications is using deep groove ball bearings for the standard configuration, these bearings are sealed.Bearing specifications are as follows:

Frame size	Standard motor bearing specifications	
	Drive end	Non-drive end
80	6204-2Z/C3	6204-2Z/C3
90	6205-2Z/C3	6304-2Z/C3
100	6206-2Z/C3	6206-2Z/C3
112	6306-2Z/C3	6206-2Z/C3
132	6308-2Z/C3	6208-2Z/C3
160	6309-2Z/C3	6209-2Z/C3
180	6311-2Z/C3	6211-2Z/C3
200	6312-2Z/C3	6212-2Z/C3
225	6313-2Z/C3	6312-2Z/C3
250	6314-2Z/C3	6314-2Z/C3
280	6317-2Z/C3	6316-2Z/C3

Bearing life

The nominal bearing life can be calculated according to the standard calculation procedures specified in ISO 281. If the motor is operated under the conditions specified in this catalog, 90% or more of the bearings will reach the nominal life. Generally, the service life of a bearing depends on the bearing specification, bearing loaded, operating conditions, rotational speed, and grease life. When the motor is installed horizontally and without axial force, the bearing life of the motor can reach at least 40,000 hours. In the case of maximum allowable load, the life of the motor is at least 20,000 hours. The bearing life here refers to the normal operation of the motor at 50/60Hz.

When the motor is operating under abnormal conditions, the bearing life will be shortened. Such as the following situations:

- When the motor speed is higher than the rated speed, due to increased vibration of the motor, making the bearing subjected to additional radial and axial forces, resulting in reduced life expectancy;
- When the environment or equipment and other factors lead to increased vibration of the motor, the bearing will therefore be subjected to additional radial and axial forces, resulting in reduced life expectancy;
- When the ambient temperature increases 10 ℃,grease life and relubrication time will be cut in half.

3.5 Noise

Motor noise is divided into N level (general level), R level (first level), S level (excellent level) and E level (low noise level) four levels . R is lower than the level N level 5dB, S level is lower than the level N 10dB, E level lower than the level N 15dB. BONENG general series of motor noise values are lower than the N–class noise level.

◆ The noise value of A weighted sound power level measured when the motor is not loaded:

Motor Power (KW)	Synchronous speed (r/min)	
	1500/1800	1000/1200
	Sound power level dB (A)	
0.37		54
0.55	58	54
0.75	58	57
1.1	61	57
1.5	61	61
2.2	64	65
3	64	69
4	65	69
5.5	71	69
7.5	71	73
11	75	73
15	75	73
18.5	76	76
22	76	76
30	79	76
37	81	78
45	81	80
55	83	80
75	86	
90	86	

◆ A weighted sound power level noise increase measured at motor load:

Motor Power (KW)	Synchronous speed (r/min)	
	1500/1800	1000/1200
	Sound power level dB(A)	
≤11	5	7
>11～37	4	6
>37～90	3	5

3.6 Vibration

Motor vibration levels are divided into N level (conventional level), R level (lower level) and S level (special level). BONENG motor rotors are half–key balancing, in line with N class IEC60034–14 vibration level. For applications requiring lower vibrations, we can offer motors with lower R or S vibration requirements.

Vibration level	Speed (r/min)	Frame size		
		80–132	160–225	250–280
N	600–3600	1.8mm/s	2.8 mm/s	3.5 mm/s
R	600–1800	0.71 mm/s	1.12 mm/s	1.8 mm/s
	＞1800–3600	1.12 mm/s	1.8 mm/s	2.8 mm/s
S	600–1800	0.45 mm/s	0.71 mm/s	1.12 mm/s
	＞1800–3600	0.71 mm/s	1.12 mm/s	1.8 mm/s

4 Electrical design

4.1 Voltage/Frequency

IEC 60034–1 classifies voltage and frequency variations into class A (±5% voltage deviation, ±2% frequency deviation) and class B (± 10% voltage deviation, ±3%/–5% frequency deviation). Motors are rated for class A and class B torque. In class A, the temperature is about 10 K higher than during normal operation.

Standard 60034-1	Class A	Class B
Voltage deviation	±5%	±10%
Frequency deviation	±2%	+3%/–5%

4.2 Electrical parameter tolerances

- Efficiency η
  - $P_N \leqslant 150$ kW: $-0.15(1-\eta)$
  - $P_N > 150$ kW: $-0.10(1-\eta)$
  - Efficiency η is a value less than one
- Power factor: $(1-\cos\phi)/6$
  - Minimum absolute value:0.02
  - maximum absolute value:0.07
- Slip rate: ± 20 % (When motor power < 1 kW ± 30 % is allowed)
- Locked–rotor motor current: +20 %
- Locked–rotor torque: –15 % – +25 %
- Maximum torque: –10 %
- Rotational inertia: ± 10 %

4.3 Overload

According to standard IEC60034,BONENG motors can withstand 1.5 times the rated current at rated voltage and frequency for 2 minutes without damage.

4.4 Insulation system

BONENG motors insulation system with reliability, durability and long life, impact resistance and strong features. BONENG motors standard design temperature is class F (155 ℃), optional temperature class H (180 ℃).

4.5 Duty

The duty is a description of some of the column load conditions that the motor is subjected to, including starting, Electric brake, no-load, downtime ， power-off, duration and sequencing. Work system is divided into 10 categories, see the table below:

Duty	Meaning
S1	Continuous duty: Constant load operation, the motor reaches the state of thermal stability.
S2	Short-time duty: constant load for a predetermined limited time, and then stop the motor until it returns to ambient temperature.
S3	Intermittent periodic duty :start-up process has no effect on temperature rise. Run in the same series of work cycles.
S4-S10	Intermittent duty: Start-up process has an impact on temperature rise, operation consists of a series of the same cycle, each cycle includes the dead load section and no-load and energy-cut section. It can use load continuation cdf and start and stop every hour to describe.

4.6 Load factor

Load Continuity is the ratio of load duration to duty cycle duration. The duty cycle time is the sum of the running time plus the break time. Cdf= sum of one cycle run time / work cycle time * 100%. Our general series of motor work system are S1, if S1 working system motor use at S2 or S3 working system, allowing the output power should be the product of the rated power and power growth factor K. The growth factors are as follow:

Duty			Power growth factor K
S2	operation hours	60 mim	1.1
		30 min	1.2
		10 min	1.4
S3	load factor (cdf)	60%	1.1
		40%	1.15
		25%	1.3
		15%	1.4
S4-S10	In order to determine the rated power and working system, it is necessary to give start and stop numbers per hour, start and stop mode, load time, brake type, braking time and no-load power-off time.		Please consult separately

4.7 Degree of protection

BONENG motor protection strict implementation of IEC60034–5 related standards, our production of the motor protection is IP55 as a standard configuration, according to customer needs we can also provide a higher degree of protection of the motor.

IP	First characteristic numeral	Second characteristic numeral
	Protection against solid objects	Protection against liquid
0	No special protection	No special protection
1	Protected against solid objects greater than 50 mm	Protected against dripping water
2	Protected against solid objects greater than 12 mm	Protected against dripping water when tilted up to 15°
3	Protected against solid objects greater than 2.5 mm	Protected against spraying water
4	Protected against solid objects greater than 1 mm	Protected against splashing water
5	Dust-protected	Protected against water jets
6	Dust-tight	Protected against heavy seas
7	/	Protected against the effects of immersion
8	/	Protected against the effects of continuous submersion

5 Options

5.1 Cooling and ventilation

BONENG motors are equipped with a radial cooling fan as standard and their cooling performance is independent of the direction of rotation of the motor (The cooling method is IC411,meets the IEC60034–6 standard). For some applications, you can consider use separate drive fans such as:

- Motor is running at low speed, separately driven fan is recommended, so that the motor can be used efficiently.
- When the motor is operated at a speed obviously higher than the rated synchronous speed, it is also recommended to
- use a separate drive fan, which helps to reduce the motor noise.

Cooling method:
IC410 motor surface self–cooling
IC411 motor surface self–fan cooling
IC416 motor surface independent fan forced cooling

- With independent drive fan, you must select the appropriate fan parameter configuration according to needs.

Independent fan technical data

Frame size	Type	Voltage (V)	Frequency (Hz)	Power (W)	Current (A)	Speed (r/min)
080	G80	400 / 460	50 / 60	37 / 38	0.1 / 0.08	2700 / 3400
090	G90	400 / 460	50 / 60	45 / 40	0.1 / 0.08	2500 / 3200
100	G100	400 / 460	50 / 60	45 / 70	0.1 / 0.13	2750 / 3250
112	G112	400 / 460	50 / 60	50 / 80	0.1 / 0.13	2750 / 3200
132	G132	400 / 460	50 / 60	40 / 50	0.13 / 0.15	1450 / 1700
160	G160	400 / 460	50 / 60	70 / 100	0.13 / 0.15	1350 / 1550
180	G180	400 / 460	50 / 60	70 / 100	0.13 / 0.15	1350 / 1550
200	G200	400 / 460	50 / 60	180 / 270	0.36 / 0.45	1250 / 1350
225	G225	400 / 460	50 / 60	200 / 280	0.36 / 0.45	1200 / 1300
250	G250	400 / 460	50 / 60	400 / 600	0.9 / 1.0	1300 / 1400
280	G280	400 / 460	50 / 60	450 / 600	0.9 / 1.0	1250 / 1400

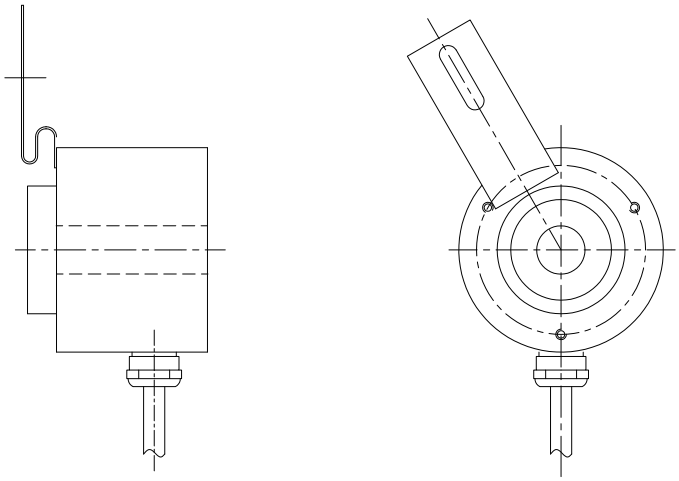
5.2 Encoder

BONENG motor for crane and metallurgical applications can be connected with the encoder to achieve speed closed–loop control, the encoder has the characteristics of high resolution ,high control accuracy and reliable operation.

◆ Encoder electrical parameters

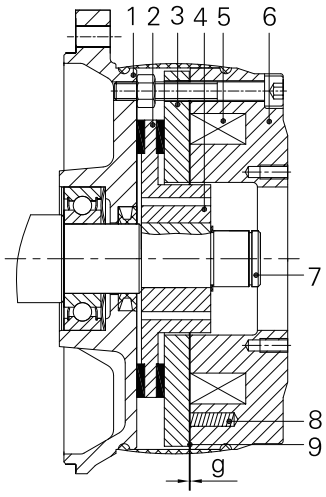
Encoder type	E25A	E25B	E25C
Voltage	10-30V	10-30V	5-30V
Signal output form	push-pull	push-pull	RS422
Resolution	1024	1024	1024
Maximum output frequency	300KHz	100KHz	300KHz
Working temperature	-20℃～70℃	-10℃～70℃	-20℃～70℃
Degree of Protection	IP65	IP55	IP65
Output signal	A; A-; B; B-; O; O-; 0V; +V; GND	A; A-; B; B-; Z; Z-; 0V; +V; GND	A; A-; B; B-; O; O-; 0V; +V; GND

◆ Encoder machine dimension



5.3 Brake

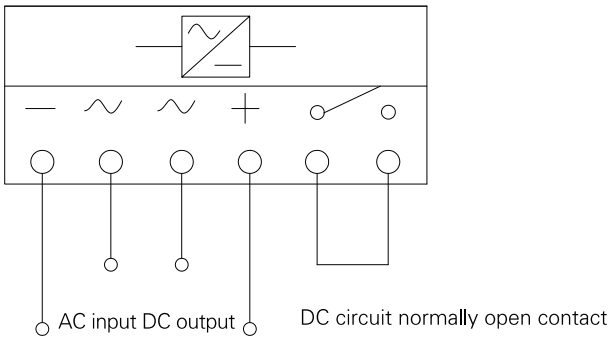
According to user requirements, BONENG motors for crane and metallurgical applications can installed an external brake device on the motor back end cover, the brake device is a DC coil excitation disc brake, electromagnetic force generated when the DC coil is energized acts on the spring to release the brake. Brakes are designed for loss of power and meet basic safety requirements. Brake can select mounted manual release handle or release screw to achieve mechanical release. Each brake is equipped with a rectifying device because the brake coil works with direct current. The device is used to change the power frequency current(single phase or two phase)provided by the outside through a simple bridge rectifier structure to the direct current to meet the working needs of brake coil, and supply it to the brake coil. Brakes are controlled by a control system that can be installed in the motor terminal box or in a power distribution cabinet.Brake structure principle is as follows:



1、Motor back end cover
2、Brake friction disk
3、Brake armature disks
4、Brake splined hub
5、Brake DC excitation coil
6、Brake stator
7、Motor shaft
8、Brake thrust spring
9、Brake air gap

- Braking fast brake（Preset normally open connacts）

  Using BONENG universal brake motors for applications such as hoisting gear or other applications that require brakes to minimize brake delay after motor has been powered down for immediate braking, BONENG motor to the brake configuration of the rectifier to provide users with a pair of rectifier DC circuit normally open contact, through the normally open contact of the control, you can easily and quickly achieve the rapid braking you want.Rapid brake wiring diagram sees in chapter 12 "Electrical connection schematics".Rectifier schematic diagram is as follows:



- Brake micro switch

  Brake micro switch provides a group of normally open and a group of normally closed switch signal used to detect the working status of the brake, the micro switch can feed back a switch quantity signal by detecting the working state of the brake , By processing the feedback switch signal, the brake can be effectively prevented from starting without releasing the motor, In this way, the brake working state monitoring and more effective protection of the motor.
- When the motor is selected for brakes, the corresponding accessory code must be selected according to the requirement; Brakes can provide different voltage configurations to meet user needs.
- Brake parameters

Brake type	BN10	BN14	BN16	BN18	BN20	BN25	BN30
Brake torque(N.m)	16	60	80	150	260	600	1000
Brake power (W)	30	50	55	85	100	110	200
Rated gap (mm)	0.2	0.3	0.3	0.4	0.4	0.5	0.6
Maximum gap (mm)	0.5	0.75	0.75	1	1	1.25	1.5
AC brake voltage(AC-V)	230or400	230or400	400	400	400	400	400
DC brake voltage(DC-V)	103or180	103or180	180	180	180	180	180
Fit motor frame size	80-90	100-112	132	160	180	200-225	250-280
Brake actuation time (ms)	70	190	200	260	340	390	420
Slow brake releasing time (ms)	450	570	600	780	1650	2000	3000
Rapid brake releasing time (ms)	45	57	60	78	165	230	380

5.4 Motor thermal protection

Motor thermal protection refers to the temperature protection sensor or temperature detection sensor embedded in the motor stator windings or other appropriate place, so that motor will not be damaged due to overheating. Temperature sensor options are as follows:

- PTC thermistor temperature protection

  Three PTC thermistors are connected in series with each resistor buried in the motor three–phase winding end and leads from the terminal box, the user can according to the actual situation connected them to the frequency converter terminal drive or the thermorelay thermal relay to achieve the motor winding overheating protection. At present, the most commonly used motor winding overheating protection is the use of PTC thermistors installed in the motor windings for protection. The winding temperature can be accurately monitored due to the lower thermal capacity of the thermistor and its excellent thermal conductivity around the foot. When the limit temperature is reached (nominal trip temperature), there is a step change in the PTC thermistor resistance. After this change is captured by the trip device, the auxiliary circuit can be disconnected. PTC thermistor itself can't tolerate high current and high voltage, otherwise it will lead to damage to the semiconductor device. PTC thermistor and trip device switching hysteresis effect is small, so you can achieve rapid restart. For heavy load start, high start frequency, large load changes, high ambient temperature or power fluctuations and other applications, we recommended that the motor use this type of protection.

- Thermal switch temperature protection

  3 bimetal switches in series way to each switch are buried in the motor end of the three–phase winding and leads from the terminal box, bimetal switches provide the switch signal, the user can achieve the motor winding overheating protection based on the actual situation in the detection circuit.

- PT100 Thermistor Sensor Temperature Protection

  PT100 thermistor is a high preciseness, high sensitivity sensor with better linear temperature resistance than other resistive sensors with stable performance and high reliability.

- Moisture–proof heating protection

  When the motor is in a harsh environment, such as large humidity or relatively large temperature difference between day and night, the motor winding is likely to condensation phenomenon, which will bring the risk of motor burned. In this case, we advisable to configure the motor windings with moisture–proof heating belt. The motor must be in not working state when the Moisture–proof heating belt is in the working process; when the motor is down, moisture–proof heating belt must be started for the winding heating. Electrical parameters of moisture–proof heating belt are shown in the following table.

Electrical parameters of moisture–proof heating belt

Frame size	Power(w)	Voltage(v)
80～90	20	220
100～112	30	220
132～160	40	220
180～200	50	220
225～280	60	220

6 Frequency conversion applications

The three-phase asynchronous motor of Boneng Metallurgy and Lifting can realize the application of variable speed and constant speed under the forced cooling of axial fan and the specified operating conditions, and can realize constant torque or constant power output within the specified operating frequency range.

When the running speed of the motor exceeds the rated speed, the noise and vibration will increase and the life of the bearing will be shortened.

The maximum safe speed allowed by the motor is as follows:

Frame size	4-pole		6-pole	
	Maximum speed (r/min)	Maximum frequency (Hz)	Maximum speed (r/min)	Maximum frequency (Hz)
80	3600	120	2400	120
90	3600	120	2400	120
100	3600	120	2400	120
112	3600	120	2400	120
132	2700	90	2400	120
160	2700	90	2400	120
180	2700	90	2400	120
200	2250	75	1800	90
225	2250	75	1800	90
250	2250	75	1800	90
280	2250	75	1800	90

7 YZ motor type Designation

YZ 132S 4 B55 H C 3 – A 0 N 0 0 – 1 1 1

Motor type[1)]

YZ=Three–phase asynchronous motor for crane and metallurgical applications

Frame size[1)]

Motor poles[1)]

4=4–pole； 6=6–pole

Power code[1)]

Types of construction

H=B3 foot–mounted
F=B5 flange–mounted
S=B14B flange–mounted
B=B35 foot and flange–mounted

Frame material

L=Die–casting aluminum frame(Standard configuration of H00 and below)
C=Grey cast iron frame(Standard configuration of H112 and above)

Frequency/Voltage code

1=50Hz 220V△/380VY	5=60Hz 440V△	E=60Hz 220V△/380VY
2=50Hz 230V△/400VY	6=60Hz 460V△	F=60Hz 380V△
3=50Hz 380V△/660VY	7=60Hz 440VY	
4=50Hz 400V△/690VY	8=60Hz 460VY	
A=50Hz 240V△/415VY	C=60Hz 480VY	
B=50Hz 415V△	D=60Hz 480V△	

Cooling method

F=forced–fan cooling

Encoder

0=no encoder	2=with standard encoder eccessories	4=with encoder E25C
1=with encoder E25A	3=with encoder E25B	

Brake

N=no brake

A=brake 220–240VAC	G=self–locking brake 220–240VAC	P=double brake 220–240VAC
B=brake 380–415VAC	H=self–locking brake 380–415VAC	Q=double brake 380–415VAC
C=brake 440–480VAC	J=self–locking brake 440–480VAC	X=double brake 440–480VAC
D=brake with handle 220–240VAC	K=brake with micro switch 220–240VAC	R=double brake with handle 220–240VAC
E=brake with handle 380–415VAC	L=brake with micro switch 380–415VAC	S=double brake with handle 380–415VAC
F=brake with handle 440–480VAC	M=brake with micro switch 440–480VAC	T=double brake with handle 440–480VAC

Thermal protection and heating protection

0=no winding protection	3=PT100 temperature Sensor	6=thermoswith and heating belt
1=thermistors	4=heating belt	7=PT100 temperature Sensorand heating belt
2=thermoswith	5=thermistors and heating belt	

Degree of protection

0=IP55/F	B=IP55/H with rain cover	L=IP55/H/Metal waterproof joint
1=IP55/F with rain cover	J=IP55/F/Metal waterproof joint	M=IP55/H/Metal waterproof joint with rain cover
A=IP55/H	K=IP55/F/Metal waterproof joint with rain cover	

Mounting position[2)]

1/2/3/4/5/6

Terminal box location[3)]

1/2/3/4

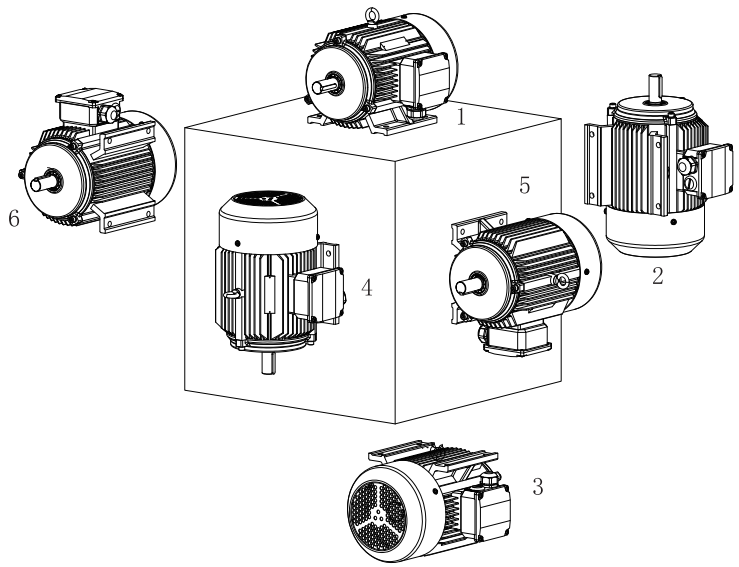
Cable entry location[3)]

1/2/3/4

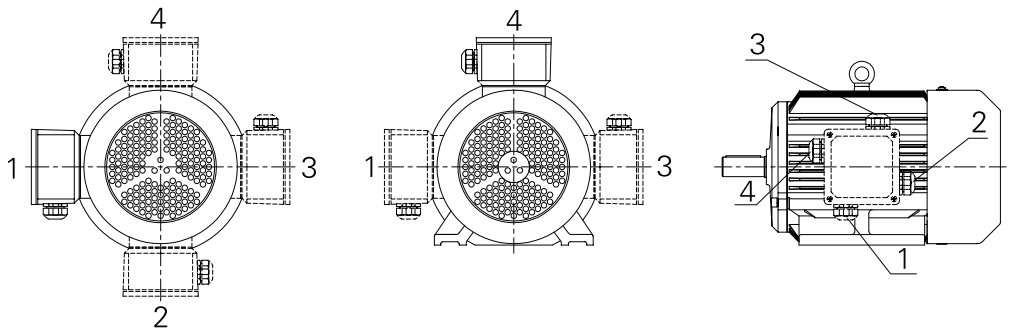
Note[1)]: Motor type/Frame size/Motor poles/Power code

Power (kW)	4-pole specification	6-pole specification	Power (kW)	4-pole specification	6-pole specification	Power (kW)	4-pole specification	6-pole specification
0.37		YZ080M6A37	1.1	YZ090S4B11	YZ090S6B11	11	YZ160M4C11	YZ160M6C11
0.55	YZ080M4A55	YZ080M6A55	1.5	YZ090S4B15	YZ100M6B15	15	YZ160M4C15	YZ180M6C15
0.75	YZ080M4A75	YZ090S6A75	2.2	YZ100M4B22	YZ112M6B22	18.5	YZ180M4C18	YZ200M6C18
			3	YZ100M4B30	YZ132S6B30	22	YZ180L4C22	YZ200M6C22
			4	YZ112L4B40	YZ132M6B40	30	YZ200M4C30	YZ225M6C30
			5.5	YZ132S4B55	YZ132M6B55	37	YZ225M4C37	YZ250M4C37
			7.5	YZ132M4B75	YZ160S6B75	45	YZ225M4C45	YZ280S6C45
						55	YZ250M4C55	YZ280M6C55
						75	YZ280S4C75	
						90	YZ280M4C90	

Note[2)]: Motor mounting position:



Note[3)]: Motor terminal box and cable entry location(View Angle:motor tail):



Standard color of motor (RAL5015)

8 YZ motor with forced-air cooling selection technical data

50Hz 380V 4P-1500r/min S3-60%

Frame size	PN (kW)	UN (V)	FN (Hz)	Conn.	nN (r/min)	TN (N.m)	IE-CL	η(%)	COSΦ	IN(A)	Tst/TN	Tmax/TN	LWdB (A)	J (kg.m^2)
080M	0.55	220/380	50	△/Y	1405	3.7	IE2	77.1	0.77	2.5/1.4	>2.2	2.4	56.0	0.0017
080M	0.75	220/380	50	△/Y	1410	5.1	IE2	79.6	0.78	3.2/1.9	>2.2	2.4	56	0.00206
090S	1.1	220/380	50	△/Y	1415	7.4	IE2	81.4	0.78	4.6/2.7	>2.2	2.4	59	0.00318
090S	1.5	220/380	50	△/Y	1415	10.1	IE2	82.8	0.79	6/3.5	>2.2	2.4	59	0.00395
100M	2.2	220/380	50	△/Y	1440	14.6	IE2	84.3	0.82	8.4/4.9	>2.2	2.7	64	0.00846
100M	3	220/380	50	△/Y	1440	19.9	IE2	85.5	0.83	11.2/6.5	>2.2	2.7	64	0.0102
112L	4	380/660	50	△/Y	1440	26.5	IE2	86.6	0.83	8.5/4.9	>2.2	2.7	65	0.014
132S	5.5	380/660	50	△/Y	1450	36.2	IE2	87.7	0.83	11.5/6.7	>2.2	2.7	71	0.029
132M	7.5	380/660	50	△/Y	1450	49.4	IE2	88.7	0.83	15.5/8.9	>2.2	2.6	71	0.0374
160S	11	380/660	50	△/Y	1460	72.0	IE2	89.8	0.84	22.2/12.8	>2.2	2.6	73	0.0878
160M	15	380/660	50	△/Y	1455	98.5	IE2	90.6	0.84	30/17.3	>2.2	2.4	73	0.115
180M	18.5	380/660	50	△/Y	1465	120.6	IE2	91.2	0.85	36.3/21	>2.2	2.9	76	0.164
180L	22	380/660	50	△/Y	1465	143.4	IE2	91.6	0.85	43/24.8	>2.2	2.9	76	0.192
200M	30	380/660	50	△/Y	1470	194.9	IE2	92.3	0.86	57.5/33.5	>2.2	2.8	76	0.303
225M	37	380/660	50	△/Y	1480	238.8	IE2	92.7	0.87	70/40.5	>2.2	2.7	78	0.517
225M	45	380/660	50	△/Y	1480	290.4	IE2	93.1	0.87	84.5/49	>2.2	2.6	78	0.609
250M	55	380/660	50	△/Y	1480	354.9	IE2	93.5	0.87	103/59.5	>2.2	2.7	79	0.758
280S	75	380/660	50	△/Y	1485	482.3	IE2	94.0	0.88	138/80	>2.2	2.7	80	1.397
280M	90	380/660	50	△/Y	1485	578.8	IE2	94.2	0.88	165/95.5	>2.2	2.7	80	1.658

50Hz 400 V 4P-1500r/min S3-60%

Frame size	PN (kW)	UN (V)	FN (Hz)	Conn.	nN (r/min)	TN (N.m)	IE-CL	η(%)	COSΦ	IN(A)	Tst/TN	Tmax/TN	LWdB (A)	J (kg.m^2)
080M	0.55	230/400	50	△/Y	1415	3.7	IE2	77.1	0.75	2.5/1.4	>2.6	2.7	56	0.0017
080M	0.75	230/400	50	△/Y	1420	5.0	IE2	79.6	0.76	3.2/1.9	>2.6	2.7	56	0.00206
090S	1.1	230/400	50	△/Y	1425	7.4	IE2	81.4	0.76	4.5/2.6	>2.6	2.8	59	0.00318
090S	1.5	230/400	50	△/Y	1425	10.1	IE2	82.8	0.77	5.9/3.4	>2.6	2.7	59	0.00395
100M	2.2	230/400	50	△/Y	1445	14.5	IE2	84.3	0.79	8.3/4.8	>2.6	3.1	64	0.00846
100M	3	230/400	50	△/Y	1445	19.8	IE2	85.5	0.80	11/6.4	>2.6	3.1	64	0.0102
112L	4	400/690	50	△/Y	1445	26.4	IE2	86.6	0.80	8.4/4.8	>2.6	3.0	65	0.014
132S	5.5	400/690	50	△/Y	1455	36.1	IE2	87.7	0.81	11.2/6.5	>2.6	3.0	71	0.029
132M	7.5	400/690	50	△/Y	1455	49.2	IE2	88.7	0.82	14.9/8.6	>2.6	3.0	71	0.0374
160S	11	400/690	50	△/Y	1460	72.0	IE2	89.8	0.82	21.6/12.5	>2.6	2.9	73	0.0878
160M	15	400/690	50	△/Y	1460	98.1	IE2	90.6	0.83	29/17	>2.6	2.7	73	0.115
180M	18.5	400/690	50	△/Y	1470	120.2	IE2	91.2	0.84	35/20.5	>2.6	3.3	76	0.164
180L	22	400/690	50	△/Y	1470	142.9	IE2	91.6	0.84	41.5/24	>2.6	3.3	76	0.192
200M	30	400/690	50	△/Y	1470	194.9	IE2	92.3	0.85	55.5/32	>2.6	3.2	76	0.303
225M	37	400/690	50	△/Y	1480	238.8	IE2	92.7	0.85	68/39.5	>2.6	3.1	78	0.517
225M	45	400/690	50	△/Y	1480	290.4	IE2	93.1	0.86	81.5/47	>2.6	3.0	78	0.609
250M	55	400/690	50	△/Y	1480	354.9	IE2	93.5	0.85	100/58	>2.6	3.1	79	0.758
280S	75	400/690	50	△/Y	1485	482.3	IE2	94.0	0.86	134/77.5	>2.6	3.0	80	1.397
280M	90	400/690	50	△/Y	1485	578.8	IE2	94.2	0.87	159/92	>2.6	3.0	80	1.658

50Hz 380V 6P–1000r/min S3–60%

Frame size	P_N (kW)	U_N (V)	F_N (Hz)	Conn.	n_N (r/min)	T_N (N.m)	IE-CL	η(%)	COSΦ	I_N(A)	Tst/TN	Tmax/TN	LwdB (A)	J (kg.m^2)
80M	0.37	220/380	50	△/Y	930	3.8	IE2	67.6	0.73	2.1/1.2	>2.0	2.3	54	0.00212
80M	0.55	220/380	50	△/Y	925	5.7	IE2	73.1	0.75	2.8/1.6	>2.0	2.2	54	0.00258
90S	0.75	220/380	50	△/Y	935	7.7	IE2	75.9	0.74	3.6/2.1	>2.0	2.2	57	0.00358
90S	1.1	220/380	50	△/Y	935	11.2	IE2	78.1	0.75	5.0/2.9	>2.0	2.2	57	0.00478
100M	1.5	220/380	50	△/Y	940	15.2	IE2	79.8	0.75	6.6/3.8	>2.0	2.3	61	0.0097
112M	2.2	220/380	50	△/Y	940	22.4	IE2	81.8	0.75	9.5/5.5	>2.0	2.3	65	0.0158
132S	3	220/380	50	△/Y	965	29.7	IE2	83.3	0.76	12.5/7.3	>2.0	2.7	69	0.0299
132M	4	380/660	50	△/Y	965	39.6	IE2	84.6	0.77	9.4/5.4	>2.0	2.8	69	0.0389
132M	5.5	380/660	50	△/Y	965	54.4	IE2	86.0	0.79	12.4/7.2	>2.0	2.7	69	0.0522
160S	7.5	380/660	50	△/Y	960	74.6	IE2	87.2	0.79	16.6/9.6	>2.0	2.3	73	0.094
160M	11	380/660	50	△/Y	960	109.4	IE2	88.7	0.80	23.6/13.7	>2.0	2.3	73	0.135
180M	15	380/660	50	△/Y	975	146.9	IE2	89.7	0.82	31/18	>2.0	2.7	73	0.238
200M	18.5	380/660	50	△/Y	975	181.2	IE2	90.4	0.82	38/22	>2.0	2.8	73	0.375
200M	22	380/660	50	△/Y	975	215.5	IE2	90.9	0.82	45/26	>2.0	2.7	73	0.421
225M	30	380/660	50	△/Y	980	292.3	IE2	91.7	0.83	60/35	>2.0	2.2	74	0.595
250M	37	380/660	50	△/Y	980	360.6	IE2	92.2	0.84	73/42	>2.0	3.2	76	1.01
280S	45	380/660	50	△/Y	985	436.3	IE2	92.7	0.85	87/50.5	>2.0	2.9	78	1.678
280M	55	380/660	50	△/Y	985	533.2	IE2	93.1	0.86	105/60.5	>2.0	2.9	78	2.012

50Hz 400 V 6P–1000r/min S3–60%

Frame size	P_N (kW)	U_N (V)	F_N (Hz)	Conn.	n_N (r/min)	T_N (N.m)	IE-CL	η(%)	COSΦ	I_N(A)	Tst/TN	Tmax/TN	LwdB (A)	J (kg.m^2)
80M	0.37	230/400	50	△/Y	935	3.8	IE2	67.6	0.69	2.1/1.2	>2.4	2.6	54	0.00212
80M	0.55	230/400	50	△/Y	935	5.6	IE2	73.1	0.71	2.8/1.6	>2.4	2.1	54	0.00258
90S	0.75	230/400	50	△/Y	940	7.6	IE2	75.9	0.70	3.6/2.1	>2.4	2.5	57	0.00358
90S	1.1	230/400	50	△/Y	940	11.2	IE2	78.1	0.70	5.1/2.9	>2.4	2.6	57	0.00478
100M	1.5	230/400	50	△/Y	945	15.2	IE2	79.8	0.72	6.5/3.8	>2.4	2.6	61	0.0097
112M	2.2	230/400	50	△/Y	945	22.2	IE2	81.8	0.72	9.4/5.4	>2.4	2.6	65	0.0158
132S	3	230/400	50	△/Y	965	29.7	IE2	83.3	0.73	12.5/7.2	>2.4	3.1	69	0.0299
132M	4	400/690	50	△/Y	965	39.6	IE2	84.6	0.73	9.4/5.5	>2.4	3.2	69	0.0389
132M	5.5	400/690	50	△/Y	965	54.4	IE2	86.0	0.75	12.5/7.5	>2.4	3.1	69	0.0522
160S	7.5	400/690	50	△/Y	965	74.2	IE2	87.2	0.77	16.2/9.4	>2.4	2.7	73	0.094
160M	11	400/690	50	△/Y	965	108.9	IE2	88.7	0.78	23/13.5	>2.4	2.6	73	0.135
180M	15	400/690	50	△/Y	975	146.9	IE2	89.7	0.79	31/18	>2.4	3.1	73	0.238
200M	18.5	400/690	50	△/Y	980	180.3	IE2	90.4	0.79	37.5/22	>2.4	3.1	73	0.375
200M	22	400/690	50	△/Y	980	214.4	IE2	90.9	0.80	44/25.5	>2.4	3.1	73	0.421
225M	30	400/690	50	△/Y	985	290.9	IE2	91.7	0.81	58.5/34	>2.4	2.6	74	0.595
250M	37	400/690	50	△/Y	985	358.7	IE2	92.2	0.82	71/41	>2.4	3.6	76	1.01
280S	45	400/690	50	△/Y	985	436.3	IE2	92.7	0.83	84.5/49	>2.4	3.3	78	1.678
280M	55	400/690	50	△/Y	985	533.2	IE2	93.1	0.84	105/59	>2.4	3.2	78	2.012

60Hz 440V 4P 1800r/min S3–60%

Frame size	PN (kW)	UN (V)	FN (Hz)	Conn.	nN (r/min)	TN (N.m)	IE-CL	η(%)	COSΦ	IN(A)	Tst/TN	Tmax/TN	LwdB (A)	J (kg.m^2)
080M	0.55	440	60	Y	1725	3.0	IE2	80.0	0.74	1.3	>2.6	2.9	56	0.0017
080M	0.75	440	60	Y	1725	4.2	IE2	82.5	0.75	1.6	>2.6	2.9	56	0.00206
090S	1.1	440	60	Y	1730	6.1	IE2	84.0	0.76	2.3	>2.6	2.9	59	0.00318
090S	1.5	440	60	Y	1730	8.3	IE2	84.0	0.77	3.1	>2.6	2.8	59	0.00395
100M	2.2	440	60	Y	1750	12.0	IE2	87.5	0.80	4.2	>2.6	3.2	64	0.00846
100M	3	440	60	Y	1750	16.4	IE2	87.5	0.81	5.6	>2.6	3.2	64	0.0102
112L	4	440	60	△	1745	21.9	IE2	87.5	0.81	7.4	>2.6	3.1	65	0.014
132S	5.5	440	60	△	1755	29.9	IE2	89.5	0.82	9.9	>2.6	3.1	71	0.029
132M	7.5	440	60	△	1760	40.7	IE2	89.5	0.82	13.3	>2.6	3.1	71	0.0374
160S	11	440	60	△	1765	59.5	IE2	91.0	0.82	19.4	>2.6	2.9	73	0.0878
160M	15	440	60	△	1760	81.4	IE2	91.0	0.83	26.1	>2.6	2.7	73	0.115
180M	18.5	440	60	△	1770	99.8	IE2	92.4	0.85	31.0	>2.6	3.3	76	0.164
180L	22	440	60	△	1770	118.7	IE2	92.4	0.85	37.0	>2.6	3.3	76	0.192
200M	30	440	60	△	1775	161.4	IE2	93.0	0.86	49.5	>2.6	3.2	76	0.303
225M	37	440	60	△	1780	198.5	IE2	93.0	0.86	61.0	>2.6	3.1	78	0.517
225M	45	440	60	△	1780	241.4	IE2	93.6	0.87	73.0	>2.6	3.0	78	0.609
250M	55	440	60	△	1780	295.1	IE2	94.1	0.86	89.5	>2.6	3.1	79	0.758
280S	75	440	60	△	1785	401.3	IE2	94.5	0.87	120.0	>2.6	3.0	80	1.397
280M	90	440	60	△	1785	481.5	IE2	94.5	0.88	143.0	>2.6	3.0	80	1.658

60HZ 460V 4P–1800r/min S3–60%

Frame size	PN (kW)	UN (V)	FN (Hz)	Conn.	nN (r/min)	TN (N.m)	IE-CL	η(%)	COSΦ	IN(A)	Tst/TN	Tmax/TN	LwdB (A)	J (kg.m^2)
080M	0.55	460	60	Y	1730	3.0	IE2	80.0	0.71	1.3	>3.0	3.2	56	0.0017
080M	0.75	460	60	Y	1730	4.1	IE2	82.5	0.72	1.6	>3.0	3.2	56	0.00206
090S	1.1	460	60	Y	1735	6.1	IE2	84.0	0.73	2.3	>3.0	3.2	59	0.00318
090S	1.5	460	60	Y	1735	8.3	IE2	84.0	0.74	3.1	>3.0	3.1	59	0.00395
100M	2.2	460	60	Y	1755	12.0	IE2	87.5	0.77	4.1	>3.0	3.6	64	0.00846
100M	3	460	60	Y	1755	16.3	IE2	87.5	0.78	5.6	>3.0	3.6	64	0.0102
112L	4	460	60	△	1750	21.8	IE2	87.5	0.79	7.3	>3.0	3.5	65	0.014
132S	5.5	460	60	△	1760	29.8	IE2	89.5	0.80	9.7	>3.0	3.4	71	0.029
132M	7.5	460	60	△	1760	40.7	IE2	89.5	0.81	13.0	>3.0	3.4	71	0.0374
160S	11	460	60	△	1765	59.5	IE2	91.0	0.81	18.8	>3.0	3.3	73	0.0878
160M	15	460	60	△	1765	81.2	IE2	91.0	0.82	25.5	>3.0	3.0	73	0.115
180M	18.5	460	60	△	1775	99.5	IE2	92.4	0.82	31.0	>3.0	3.7	76	0.164
180L	22	460	60	△	1775	118.4	IE2	92.4	0.82	37.0	>3.0	3.7	76	0.192
200M	30	460	60	△	1775	161.4	IE2	93.0	0.84	48.5	>3.0	3.6	76	0.303
225M	37	460	60	△	1780	198.5	IE2	93.0	0.85	59.0	>3.0	3.4	78	0.517
225M	45	460	60	△	1780	241.4	IE2	93.6	0.85	71.0	>3.0	3.2	78	0.609
250M	55	460	60	△	1785	294.3	IE2	94.1	0.85	86.5	>3.0	3.4	79	0.758
280S	75	460	60	△	1785	401.3	IE2	94.5	0.86	116.0	>3.0	3.3	80	1.397
280M	90	460	60	△	1785	481.5	IE2	94.5	0.87	138.0	>3.0	3.3	80	1.658

60Hz 440V 6P 1200r/min S3–60%

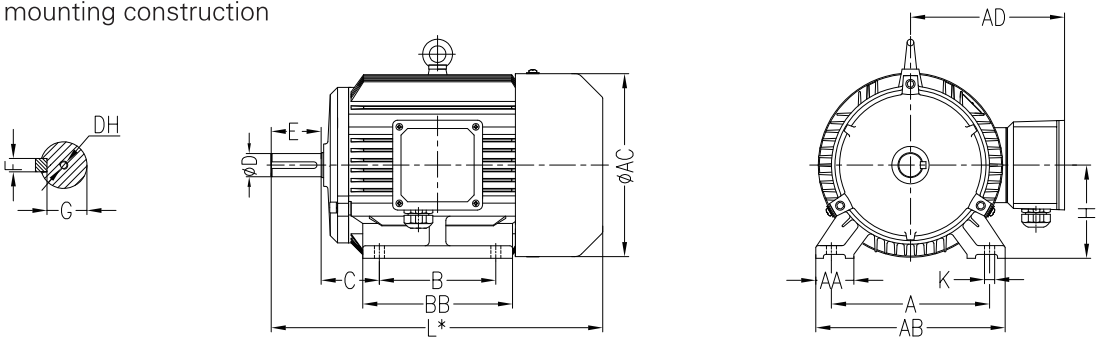
Frame size	P_N (kW)	U_N (V)	F_N (Hz)	Conn.	n_N (r/min)	T_N (N.m)	IE-CL	η(%)	COSΦ	I_N(A)	Tst/TN	Tmax/TN	LWdB (A)	J (kg.m^2)
80M	0.37	440	60	Y	1145	3.1	IE2	64.0	0.68	1.1	>2.3	2.9	54	0.00212
80M	0.55	440	60	Y	1140	4.6	IE2	68.0	0.71	1.5	>2.3	2.7	54	0.00258
90S	0.75	440	60	Y	1145	6.3	IE2	80.0	0.70	1.8	>2.3	2.7	57	0.00358
90S	1.1	440	60	Y	1145	9.2	IE1	82.0	0.71	2.6	>2.3	2.7	57	0.00478
100M	1.5	440	60	Y	1150	12.5	IE1	82.5	0.72	3.4	>2.3	2.7	61	0.0097
112M	2.2	440	60	Y	1150	18.3	IE1	84.5	0.72	4.8	>2.3	2.7	65	0.0158
132S	3	440	60	Y	1170	24.5	IE1	86.0	0.73	6.3	>2.3	3.3	69	0.0299
132M	4	440	60	△	1170	32.6	IE2	87.5	0.74	8.2	>2.3	3.3	69	0.0389
132M	5.5	440	60	△	1170	44.9	IE2	89.5	0.75	10.9	>2.3	3.2	69	0.0522
160S	7.5	440	60	△	1165	61.5	IE2	89.5	0.78	14.2	>2.3	2.7	73	0.094
160M	11	440	60	△	1165	90.2	IE2	90.2	0.79	20.3	>2.3	2.6	73	0.135
180M	15	440	60	△	1180	121.4	IE2	90.2	0.80	27.5	>2.3	3.1	73	0.238
200M	18.5	440	60	△	1180	149.7	IE2	91.7	0.80	33.5	>2.3	3.2	73	0.375
200M	22	440	60	△	1180	178.1	IE2	91.7	0.80	39.5	>2.3	3.1	73	0.421
225M	30	440	60	△	1185	241.8	IE2	93.0	0.82	52.0	>2.3	2.5	74	0.595
250M	37	440	60	△	1185	298.2	IE2	93.0	0.82	64.0	>2.3	3.6	76	1.01
280S	45	440	60	△	1185	362.7	IE2	93.6	0.83	76.5	>2.3	3.3	78	1.678
280M	55	440	60	△	1185	443.2	IE2	93.6	0.84	92.0	>2.3	3.3	78	2.012

60Hz 460V 6P 1200r/min S3–60%

Frame size	P_N (kW)	U_N (V)	F_N (Hz)	Conn.	n_N (r/min)	T_N (N.m)	IE-CL	η(%)	COSΦ	I_N(A)	Tst/TN	Tmax/TN	LWdB (A)	J (kg.m^2)
80M	0.37	460	60	Y	1150	3.1	IE2	64.0	0.65	1.1	>2.8	3.2	54	0.00212
80M	0.55	460	60	Y	1145	4.6	IE2	68.0	0.67	1.5	>2.8	3.0	54	0.00258
90S	0.75	460	60	Y	1150	6.2	IE2	80.0	0.67	1.8	>2.8	3.0	57	0.00358
90S	1.1	460	60	Y	1150	9.1	IE1	82.0	0.67	2.6	>2.8	3.1	57	0.00478
100M	1.5	460	60	Y	1155	12.4	IE1	82.5	0.68	3.4	>2.8	3.1	61	0.0097
112M	2.2	460	60	Y	1155	18.2	IE1	84.5	0.69	4.8	>2.8	3.1	65	0.0158
132S	3	460	60	Y	1170	24.5	IE1	86.0	0.70	6.2	>2.8	3.6	69	0.0299
132M	4	460	60	△	1170	32.6	IE2	87.5	0.71	8.1	>2.8	3.7	69	0.0389
132M	5.5	460	60	△	1170	44.9	IE2	89.5	0.73	10.7	>2.8	3.6	69	0.0522
160S	7.5	460	60	△	1170	61.2	IE2	89.5	0.75	14.1	>2.8	3.0	73	0.094
160M	11	460	60	△	1170	89.8	IE2	90.2	0.77	20.0	>2.8	3.0	73	0.135
180M	15	460	60	△	1180	121.4	IE2	90.2	0.78	26.8	>2.8	3.5	73	0.238
200M	18.5	460	60	△	1180	149.7	IE2	91.7	0.78	33.0	>2.8	3.5	73	0.375
200M	22	460	60	△	1180	178.1	IE2	91.7	0.78	39.0	>2.8	3.5	73	0.421
225M	30	460	60	△	1185	241.8	IE2	93.0	0.81	50.0	>2.8	2.8	74	0.595
250M	37	460	60	△	1185	298.2	IE2	93.0	0.81	62.0	>2.8	4.0	76	1.01
280S	45	460	60	△	1190	361.1	IE2	93.6	0.82	74.0	>2.8	3.7	78	1.678
280M	55	460	60	△	1190	441.4	IE2	93.6	0.83	89.0	>2.8	3.6	78	2.012

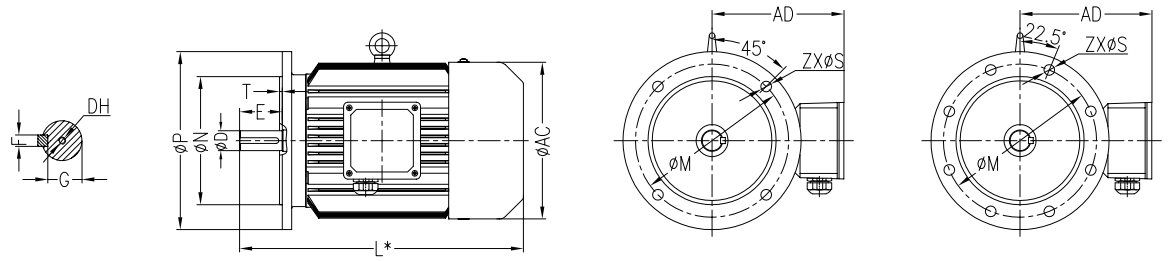
9 YZ motor dimensions

B3 mounting construction



Frame size	No. of poles	Dimension (mm)														
		A	B	C	D	E	F	G	H	K	AA	AB	AC	AD	BB	DH
080M	4、6	125	100	50	19	40	6	15.5	80	10	40	165	159	167	132	CM6L12/10.5
090S	4、6	140	100	56	24	50	8	20	90	10	44	180	176	190	160	CM8L12/13.2
090S	4、6	140	125	56	24	50	8	20	90	10	44	180	176	190	160	CM8L12/13.2
100M	4、6	160	140	63	28	60	8	24	100	12	48	205	199	200	176	CM10L15/16.3
112M	6	190	140	70	28	60	8	24	112	12	45	230	220	220	180	CM10L15/16.3
112L	4	190	140	70	28	60	8	24	112	12	45	230	220	220	248	CM10L15/16.3
132S	4、6	216	140	89	38	80	10	33	132	12	55	270	259	240	186	CM12L20/19.8
132M	4、6	216	178	89	38	80	10	33	132	12	55	270	259	240	224	CM12L20/19.8
160S	4、6	254	210	108	42	110	12	37	160	14.5	65	320	314	285	260	CM16L25/25.3
160M	4、6	254	254	108	42	110	12	37	160	14.5	65	320	314	285	304	CM16L25/25.3
180M	4	279	241	121	48	110	14	42.5	180	14.5	70	355	356	310	349	CM16L25/25.3
180M	6	279	279	121	48	110	14	42.5	180	14.5	70	355	356	310	349	CM16L25/25.3
180L	4	279	279	121	48	110	14	42.5	180	14.5	70	355	356	310	397	CM16L25/25.3
200M	4、6	318	305	133	55	110	16	49	200	18.5	70	395	398	335	369	CM20L30/31.3
225M	4、6	356	286	149	60	140	18	53	225	18.5	75	435	446	370	393	CM20L30/31.3
	4、6	356	311	149	60	140	18	53	225	18.5	75	435	446	370	393	CM20L30/31.3
250M	4、6	406	349	168	65	140	18	58	250	24	80	490	485	380	445	CM20L30/31.3
280S	4、6	457	368	190	75	140	20	67.5	280	24	85	550	547	410	485	CM20L30/31.3
280M	4、6	457	419	190	75	140	20	67.5	280	24	85	550	547	410	536	CM20L30/31.3

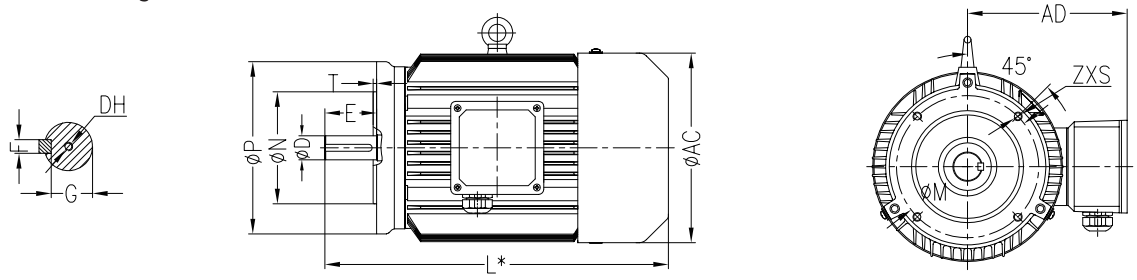
B5 mounting construction



63–200 225–280

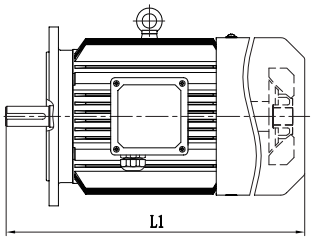
Frame size	No. of poles	Dimension (mm)												
		D	E	F	G	M	N	P	S	T	Z	AC	AD	DH
080M	4、6	19	40	6	15.5	165	130	200	12	3.5	4	159	167	CM6L12/10.5
090S	4、6	24	50	8	20	165	130	200	12	3.5	4	176	190	CM8L12/13.2
100M	4、6	28	60	8	24	215	180	250	14.5	4	4	199	200	CM10L15/16.3
112M	6	28	60	8	24	215	180	250	14.5	4	4	220	220	CM10L15/16.3
112L	4	28	60	8	24	215	180	250	14.5	4	4	220	220	CM10L15/16.3
132S	4、6	38	80	10	33	265	230	300	14.5	4	4	259	240	CM12L20/19.8
132M	4、6	38	80	10	33	265	230	300	14.5	4	4	259	240	CM12L20/19.8
160S	4、6	42	110	12	37	300	250	350	18.5	5	4	314	285	CM16L25/25.3
160M	4、6	42	110	12	37	300	250	350	18.5	5	4	314	285	CM16L25/25.3
180M	4、6	48	110	14	42.5	300	250	350	18.5	5	4	356	310	CM16L25/25.3
180L	4	48	110	14	42.5	300	250	350	18.5	5	4	356	310	CM16L25/25.3
200M	4、6	55	110	16	49	350	300	400	18.5	5	4	398	335	CM20L30/31.3
225M	4、6	60	140	18	53	400	350	450	18.5	5	8	446	370	CM20L30/31.3
250M	4、6	65	140	18	58	500	450	550	18.5	5	8	485	380	CM20L30/31.3
280S	4、6	75	140	20	67.5	500	450	550	18.5	5	8	547	410	CM20L30/31.3
280M	4、6	75	140	20	67.5	500	450	550	18.5	5	8	547	410	CM20L30/31.3

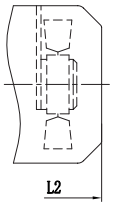
B14B mounting construction



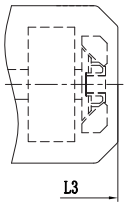
Frame size	No. of poles	Dimension (mm)												
		D	E	F	G	M	N	P	S	T	Z	AC	AD	DH
080M	4、6	19	40	6	15.5	130	110	160	M8	3.5	4	159	167	CM6L12/10.5
090S	4、6	24	50	8	20	130	110	160	M8	3.5	4	176	190	CM8L12/13.2
100M	4、6	28	60	8	24	165	130	200	M10	4	4	199	200	CM10L15/16.3
112M	6	28	60	8	24	165	130	200	M10	4	4	220	220	CM10L15/16.3
112L	4	28	60	8	24	165	130	200	M10	4	4	220	220	CM10L15/16.3
132S	4、6	38	80	10	33	215	180	250	M12	4	4	259	240	CM12L20/19.8
132M	4、6	38	80	10	33	215	180	250	M12	4	4	259	240	CM12L20/19.8

YZ motor length and weight

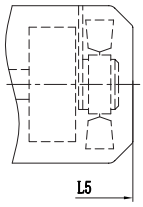




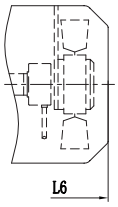
Forced-fan cooling



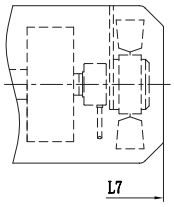
Brake+Self-fan cooling



Brake+Forced-fan cooling



Encoder+Forced-fan cooling

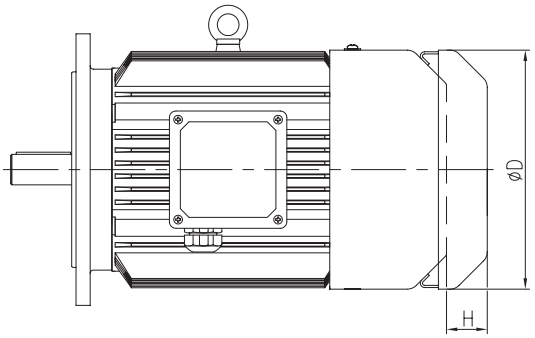


Brake+Encoder +Forced-fan cooling

Frame size	4-pole power (kW)	Motor length L* (mm)						Motor weight(kg)					
		L1	L2	L3	L5	L6	L7	M1	M2	M3	M5	M6	M7
080M	0.55	/	346	/	406	406	451	/	15	/	19	15.5	20
080M	0.75	/	346	/	406	406	451	/	16	/	20	16.5	21
090S	1.1	/	379	/	439	439	484	/	19	/	23	19.5	24
090S	1.5	/	379	/	439	439	484	/	20	/	24	20.5	25
100M	2.2	/	464	/	544	544	589	/	31	/	39	32	40
100M	3	/	464	/	544	544	589	/	34	/	42	35	43
112L	4	/	532	/	612	612	652	/	53	/	61	54	62
132S	5.5	/	530	/	615	615	645	/	69	/	80	70	81
132M	7.5	/	568	/	653	653	683	/	82	/	93	83	94
160S	11	/	651	/	751	751	786	/	123	/	143	124	144
160M	15	/	695	/	795	795	830	/	141	/	161	142	162
180M	18.5	/	751	/	861	861	901	/	184	/	215	185	217
180L	22	/	799	/	909	909	949	/	206	/	237	207	239
200M	30	/	817	/	937	937	987	/	260	/	308	261	310
225M	37	/	904	/	1024	1024	1064	/	332	/	381	334	383
225M	45	/	904	/	1024	1024	1064	/	347	/	396	349	398
250M	55	/	989	/	1144	1144	1174	/	436	/	535	435	537
280S	75	/	1041	/	1191	1191	1231	/	577	/	678	578	680
280M	90	/	1092	/	1242	1242	1282	/	647	/	748	648	750
Frame size	6-pole power (kW)	Motor length L* (mm)						Motor weight(kg)					
		L1	L2	L3	L5	L6	L7	M1	M2	M3	M5	M6	M7
80M	0.37	/	346	/	406	406	451	/	15	/	19	15.5	20
80M	0.55	/	346	/	406	406	451	/	16	/	20	16.5	21
90S	0.75	/	379	/	439	439	484	/	18	/	22	18.5	23
90S	1.1	/	379	/	439	439	484	/	19.5	/	23.5	20	24.5
100M	1.5	/	464	/	544	544	589	/	28	/	36	29	37
112M	2.2	/	464	/	544	544	584	/	44	/	52	45	53
132S	3	/	530	/	615	615	645	/	63	/	74	64	75
132M	4	/	568	/	653	653	683	/	68	/	79	69	80
132M	5.5	/	568	/	653	653	683	/	82	/	93	83	94
160S	7.5	/	651	/	751	751	786	/	117	/	137	118	138
160M	11	/	695	/	795	795	830	/	137	/	157	138	158
180M	15	/	751	/	861	861	901	/	190	/	221	191	223
200M	18.5	/	817	/	937	937	987	/	235	/	283	236	285
200M	22	/	817	/	937	937	987	/	255	/	303	256	305
225M	30	/	904	/	1024	1024	1064	/	322	/	371	324	373
250M	37	/	989	/	1144	1144	1174	/	421	/	520	420	522
280S	45	/	1041	/	1191	1191	1231	/	537	/	638	538	640
280M	55	/	1092	/	1242	1242	1282	/	602	/	703	603	705

10 Dimensions of rainproof cover

◆ Dimensions of rainproof cover

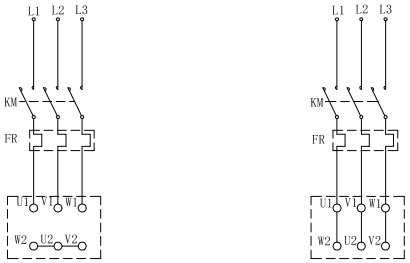


Frame size	H63	H71	H80	H90	H100	H112	H132	H160	H180	H200	H225	H250	H280
D	124	139	159	176	199	220	259	314	356	398	446	485	547
H	25	30	30	35	40	40	40	60	60	70	70	80	80

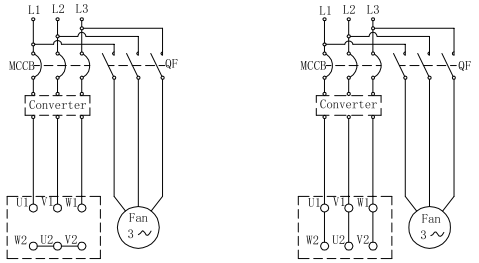
11 Electrical connection schematics

Basic wiring diagram

1) Self-fan cooling motor

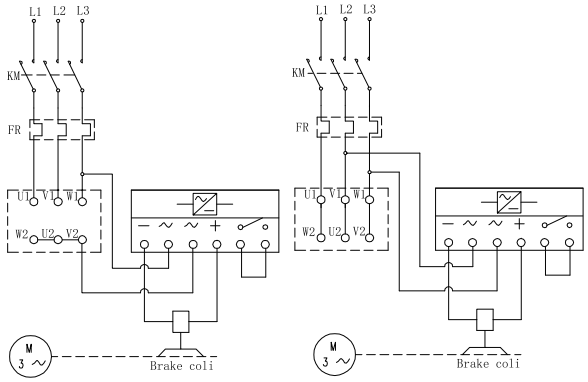


2) Forced-fan cooling motor

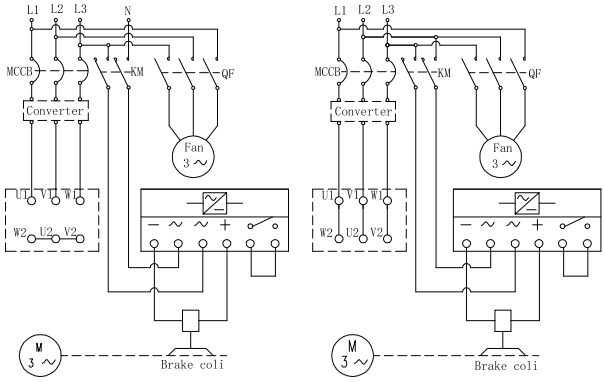


Slow brake wiring diagram(factory standard)

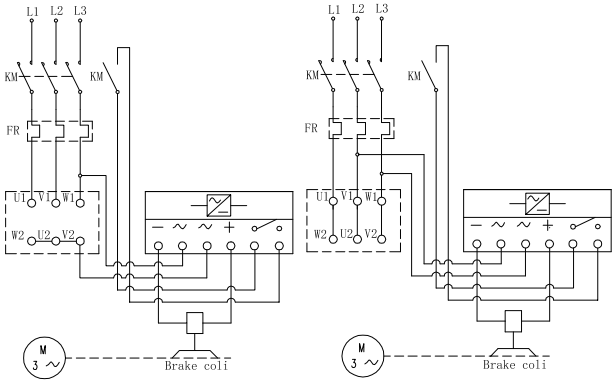
3) Motor with brake

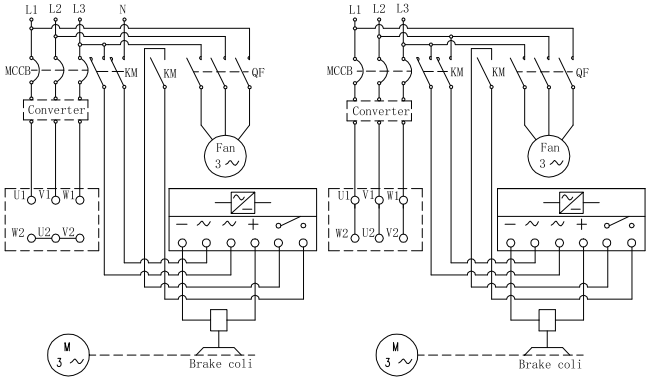


4) Forced-fan cooling motor with brake



Rapid brake wiring diagram(customer connection)





Along with the technology advancedet.,the product of the manual of Boneng will be changed,please forgive.

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