

YB2EJ Series

3 Phase **IEC 'Ex d'**

Induction Brake Motor

Installation & Maintenance
Manual

YB2EJ 132-160

ROTOTECH

ROTOTECH Pty. Ltd.

1. Outlines

1.1 The manual applies to YB2EJ series 3-phase explosion-proof induction motor and derived products, frame size 80-160.

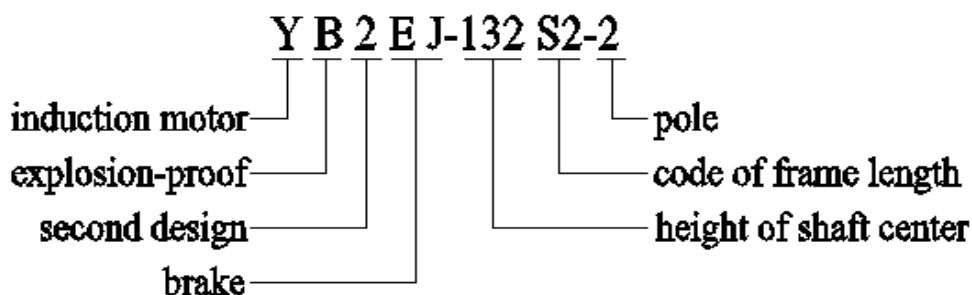
1.2 Standards to comply with :

IEC 60079-0: 2004 Electrical apparatus for explosive gas atmospheres-Part 0: General requirements Edition: 4.0

IEC 60079-1: 2007-04 Electrical apparatus for explosive gas atmospheres-Part 1: Equipment protection by flameproof enclosures “d” Edition: 6

The explosion-proof motor mark is: Ex d IIBT4 S2 25min/T5 S2 18min. Motors can be used in group II, temperature class is T1-T5.

2. Meanings of the motor type



3. Applicable scope and conditions

3.1 Applicable for gas type and temperature class, see table 1

Table 1

GROUP	TEMPERATURE CLASS			
	T1	T2	T3	T4
IIA	CH ₄ , C ₂ H ₆ , C ₃ H ₈ , C ₆ H ₅ CH=CH ₂ , C ₆ H ₅ CH ₃ , C ₆ H ₄ (CH ₃), CO, CH ₃ COOH	C ₄ H ₁₀ , C ₃ H ₈ , C ₆ H ₅ C ₂ H ₅ , CH ₃ CH, C ₂ H ₅ OH, C ₃ H ₇ OH, C ₄ H ₉ OH	C ₅ H ₁₂ , C ₆ H ₁₄ , C ₇ H ₁₆ , C ₈ H ₁₈ , C ₁₀ H ₂₂ , CH ₂ (CH ₂) ₄ CH ₂ , Petroleum, Diesel oil, Gasoline	
IIB	C ₃ H ₄ , C ₃ H ₆ , Coke gas	C ₂ H ₄ , CH ₂ =CH-CH=CH ₂ , CH ₂ CH ₂ O, 1.2-CH ₃ CHCH ₂ O	(CH ₃) ₂ O, CH ₂ =CHCHO, CH ₂ (CH ₂) ₂ CH ₂ O, H ₂ S	CH ₃ OC ₂ H ₅ (C ₂ H ₅) ₂ O, C ₂ F ₄

3.2 Use conditions

3.2.1 Ambient temperature changes with climatic season, but does not surpass 40°C. Minimum temperature is -20°C

3.2.2 Maximum altitude 1000m.

3.2.3 The maximum relative air humidity is not higher than 90% when the temperature is not over 25°C.

3.2.4 Rated voltage: 200-460V.

3.2.5 Rated frequency: 50Hz/60Hz.

3.2.6 The electric motor is rated S2 duty and started with rated voltage. The explosion proof marking: Exd IIBT4, S2 25min /T5, S2 18min.

3.2.7 The insulation of the electric motor is class F (class H as an option), the temperature rise can not surpass 80K.

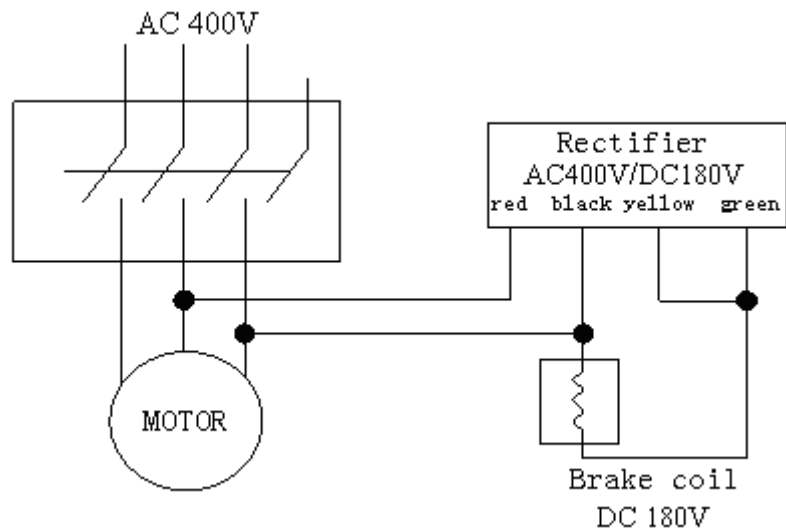
4. Motor & Brake specification

4.1 This series electric motor technical parameter, please see Table 2

Table 2

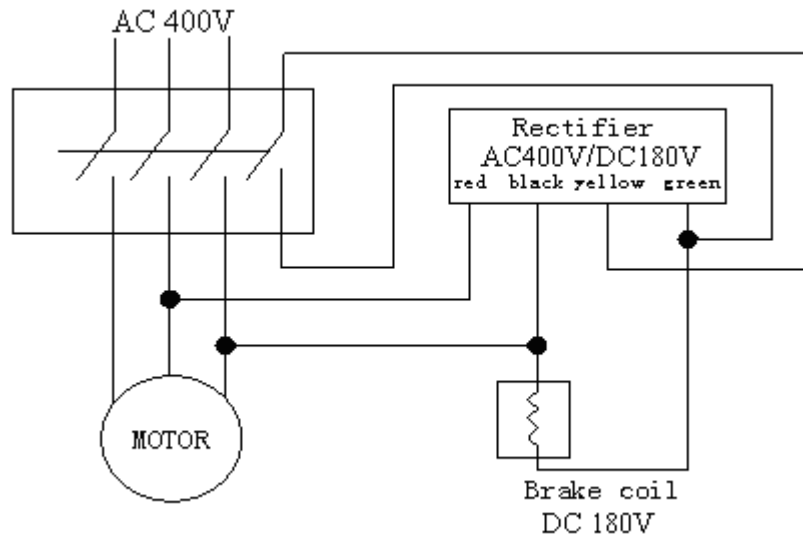
Frame no.	Rated output(KW)	Brake Torque (N.M)	Excitation voltage(V)	Air gap working
80	0.55-1.1	7.5	180	0.3
90	1.1-2.2	15	180	0.4
100	1.5-3	30	180	0.4
112	2.2-4	40	180	0.5
132	2.2-7.5	75	180	0.5
160	4-18.5	150	170	0.6

The brake connection diagrams:



Slow braking





Quick braking

4.2 Construction and mounting arrangement please look at Table 3

Table 3

Frame No.	Structure and installation code number (IM)
80 ~ 112	B3、 B5、 B6、 B7、 B8、 B35、 V1、 V3
132 ~ 160	B3、 B5、 B6、 B7、 B8、 B35、 V1、 V3

5. Main structure summary.

5.1 The terminal box is top mounted. Cable entries can be in four directions. It is suitable steel pipe wiring. There are 3 or 6 terminals and one earth terminal in terminal box. There are two terminal entries on terminal box.

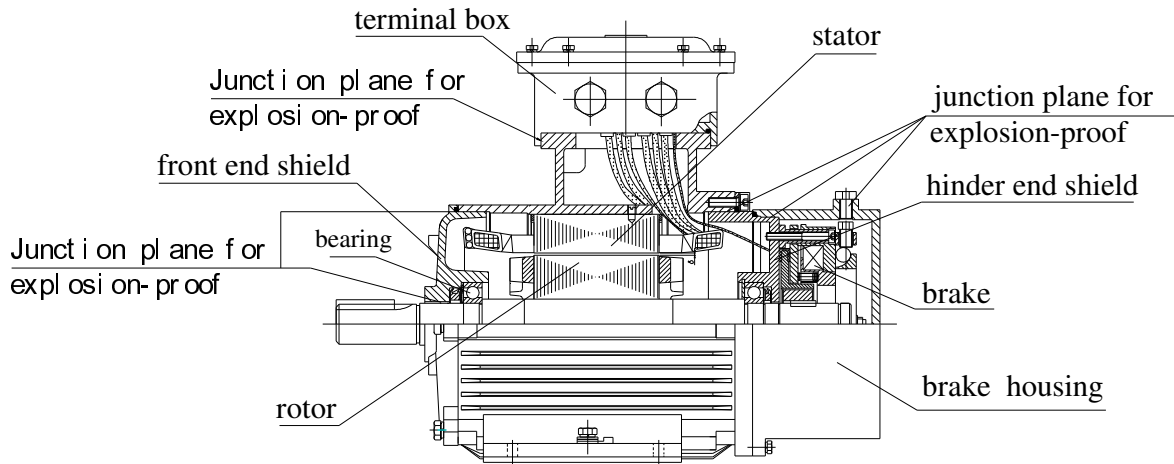
5.2 Structure of this series electric motor, please see drawing No.1.

The terminal box structure, please look at drawing No.2.



Drawing No. 1

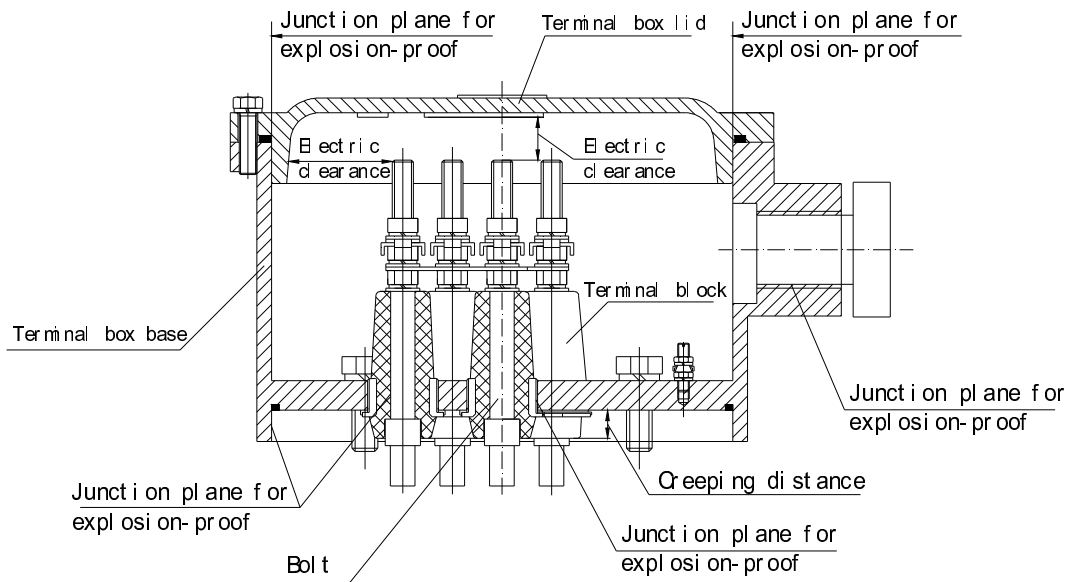
General Assemble



H80~160

Drawing No. 2

Structure of terminal box



5.3 The motors up to 3 kW are star (Y) connection to rated voltage 400V. above 3 kW are delta(Δ) connection.

6. Explosion-proof motor description.

6.1 This series electric motor is explosion-proof. The explosion proof enclosure should not be damaged or distorted to cause any failure. An internal gas explosion should not cause an external gas explosion when the mixture passes through the explosion-proof joints.

- a. All components of the enclosure, such as frame, end cover, inner bearing caps, terminal box lid, terminal box base, should pass the hydraulic pressure test, with the pressure of 1.0 MP for a period of 1 minute.
- b. The length, gap and surface roughness of explosion proof joints. Please see Drawing No. 1. The clearance between conductors and creepage distance please see Drawing No. 2.
- c. Spring washers are fitted to the connections of enclosure components to prevent loosening.
- d. The stator housing, end covers, inner bearing caps, terminal box, terminal block, shaft and oil seals comply to explosion-proof specification..

6.2 The maximum motor surface temperature according to table 4. The temperature outside cable entries should not be higher than the temperature limit that the cable allowed.



Table 4

Temperature Class	T1	T2	T3	T4	T5
Maximum surface temperature °C	450	300	200	135	100

7 . Installation and operation

7.1 Preparation before installation

7.1.1 Visual check the packaging & motor for damage.

7.1.2 Remove dust and anticorrosive oil.

7.1.3 Check following items before installation of the motor:

- a. Explosion-proof mark and Ex. Certificate No. must comply with the requirements.
- b. Connections between explosion-proof enclosures are correct, firm and reliable.
- c. All explosion-proof components are free from cracks, damage and disfigurements (excluding the brand new motors).
- d. Bearings run freely (when brake is no applied).
- e. The insulation resistance should not be lower than $0.38M\Omega$ when the rated voltage is 380V, and should not be lower than $0.66M\Omega$ when the rated voltage is 660V.

7.2 When coupling used, ensure correct alignment of the motor shaft and the driven machine to prevent bearing & shaft damage.

7.3 The brake is fitted with hand release device & can be released by turning the screw clockwise. Turn anti-clockwise to activate brake. Ensure brake cover plug

is fitted prior to powering motor.

7.4 Connection between the motor and power:

7.4.1 The outer diameter of the cable must match the cable entries(2-M20x1.5).

Plug, cable entries that are not in use. (EXd certified components must be used)

7.4.2 The sequence of the 3 phase power should be same as the motor terminals.

The rotation is clockwise see from the drive end. Please see Table 5.

Table 5

Phase sequence	A	B	C
start	U1	V1	W1
end	U2	V2	W2

7.4.3 Outer earth bolt should be connected firmly.

7.4.4 Confirm the connection is correct, then run the motor with no load, double check the running condition is good, then run the motor with load.

8. Maintenance

8.1 The motor should be checked and cleaned periodically. Surface of the motor should be debris & dust free.

8.2 The temperature of the bearing should not surpass +95°C when motor is running. The bearing should be checked every 2500 running hours.

Bearing used please see table 6



Table 6

Frame No.	Pole	Driving end	Non-driving end
80	2-8P	6204	6204
90	2-8P	6205	6205
100	2-8P	6206	6206
112	2-8P	6206	6206
132	2-8P	6208	6208
160	2P	6209	6209
	4 ~ 8P	6309	6309

8.3 Attention should be paid to protect the explosion-proof joints when disassembling and reassembling the motor. There are no bearing caps in the motors frame size from 80 to 160. Bore circlips are fixed to prevent axial floating. The steps to disassemble motors are: remove V-ring and endshield on drive end, remove the fan cowl, undo the bolts of endshield on non-drive end, pull out the rotor together with endshield of non-drive end. Now, take apart the endshield, circlip, and bearing as well. When reassemble, use the reverse sequence.

8.4 When the motor is damp internally, it must be dried. Two ways to dry the motor: oven drying or short circuit current. The winding temperature should rise but not surpassed 150°C during drying. When use short circuit current method, short circuit the motor, the current should be 0.6~0.8 p.u. of the rated current. It is not recommended to use short circuit current method when motor is extremely damp.

8.5 When rewinding motor, should use the original data, any improperly change will cause the motor function failure.

