

# Flame Proof Motors For Hazardous Environment

## JHX



**ABB**

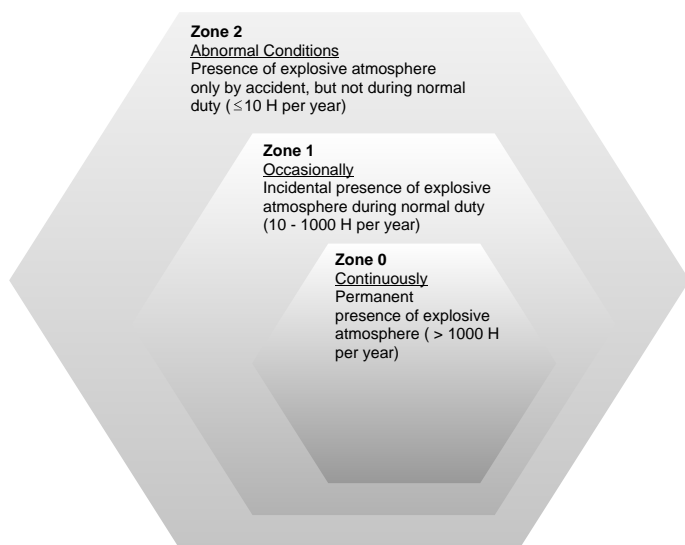
## Introduction

The use of electrical motors in potentially explosive atmospheres is quite frequent these days. These motors have to be constructed in such a way that there is no risk of an explosion. An Explosion occurs when the following situations occur:

- presence of potentially explosive atmosphere
- existence of a source of ignition
- possibility of transmission of the explosion

## Classification of Hazardous Environment:

According to IS: 5572, Hazardous areas are classified in the following ways depending on the degree of probability of the presence of hazardous atmosphere.



| Zone   | Criteria presence of gas                        |
|--------|---|
| Zone 0 | Continuously of very long period                |
| Zone 1 | Present in normal operations                    |
| Zone 2 | Unlikely, but if present, only for a short time |

In Zone 0, no electrical motors can be installed. Most common motor for Zone 1 is the flameproof design, but it can also be used in Zone 2.

## Application Groups:

Depending on the intended use, explosion-proof electrical operating equipment is divided into two major groups:

|          |   |
|----------|---|
| Group I  | Equipment for coal mines (only specially designed motors for mines can be used) |
| Group II | Electrical equipment for use other than mines (surface industry)                |
| Group II | motors with flameproof enclosures are still further divided into gas groups:    |
| II A     | Propane   |
| II B     | Ethylene  |
| II C     | Hydrogen  |

## Temperature Classes:

Combustible gas or vapour and explosion-protected electrical equipment are divided into temperature of the gas or to T6 with regard to the ignition temperature of the gas or vapour and the maximum surface temperature of the component.

| Temperature class | Ignition temperature for the gas / vapour °C | Maximum permitted temperature of electrical equipment °C |
|-------------------|--|--|
| T1                | >450   | 450  |
| T2                | >300 <450                                    | 300  |
| T3                | >200 <300                                    | 200  |
| T4                | >135 <200                                    | 135  |
| T5                | >100 <135                                    | 100  |
| T6                | >85 <100                                     | 15   |

## Flame proof motors, type "d"

ABB motors of flame proof design (type JHX) are TEFC, 3 phase squirrel cage induction motor (as per IS:2148 - 2004) for operation in hazardous location classified as Zone 1 and Zone 2 areas as per IS:5572

**Note:** Other frame sizes are available on request.

The motor enclosure has been designed in such a way that no internal explosion can be transmitted to the explosive atmosphere surrounding the machine. The enclosure must withstand, without damage, any pressure levels caused by an internal explosion, the shape, length and gap of part assembly joints at shaft opening, cable entries, etc., shall be designed to allow for throttling and cooling of hot gases escaping outside. The standard emphasise the impact of an explosive atmosphere (for instance, explosion pressure) over constructional requirements of such apparatus.

Range:0.25 ..... 15kW, 0.33 .....20hp

Frame:JHX71 .....JHX160

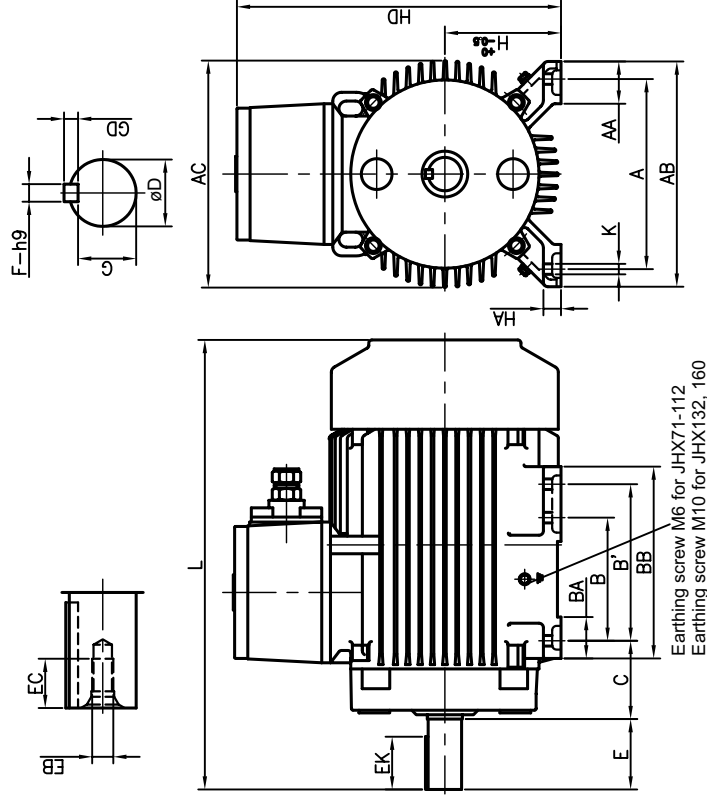
Pole:2 .....8

## Features:

1. Motors suitable for high ambient temperature 50°C.
2. Keeps an explosion which takes place inside the enclosure from propagating through gaps to the ambient.
3. Withstands the explosion pressure created inside the enclosures.
4. Benefits when dealing with special operating modes such as heavy stars and special applications.
5. All surface temperatures are selected to comply with the temperature class.
6. Suitability for use in temperature classes T1 toT4.
7. Can be used both in Zone 1 and Zone 2.

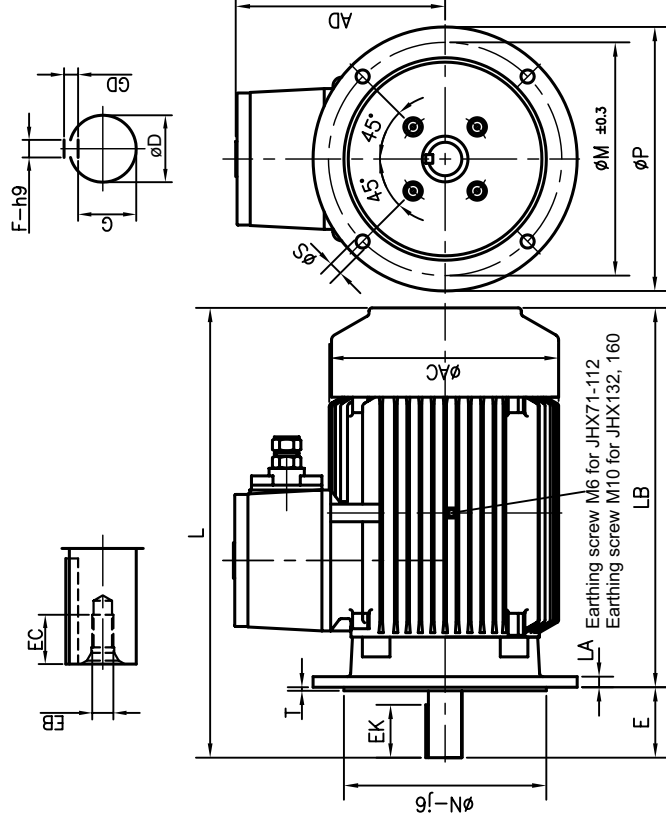


**Dimension Drawing Foot Mounted Flame Proof Motors 71....160  
Mounting Designation B3, B6, B7, B8, V5, V6**



Earthing screw M6 for JHX71-112  
Earthing screw M10 for JHX132, 160

**Dimension Drawing Flange Mounted Flame Proof Motors 71....160  
Mounting Designation B5, V1, V3**



Earthing screw M6 for JHX71-112  
Earthing screw M10 for JHX132, 160

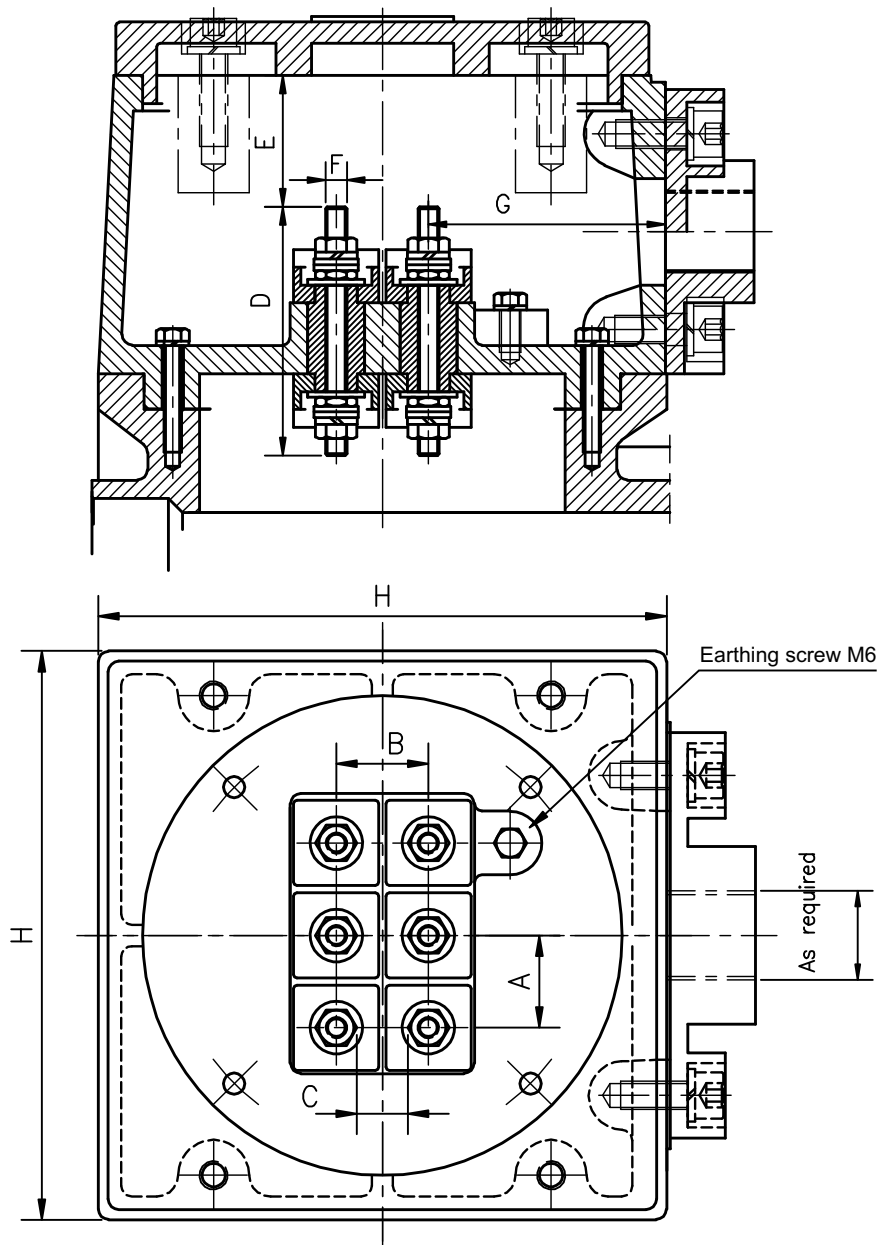
| Type      | A      | AA  | AB  | AC  | B     | B'  | BA | BB  | C   | D  | Tol. | E   | EB  | EC | EK |
|-----------|--------|-----|-----|-----|-------|-----|----|-----|-----|----|------|-----|-----|----|----|
|           | JHX 71 | 112 | 25  | 130 | 140.5 | 90  | -  | 26  | 110 | 45 | 14   | j6  | 30  | M5 | 12 |
| JHX 80    | 125    | 25  | 147 | 158 | 100   | -   | 30 | 126 | 50  | 19 | j6   | 40  | M6  | 17 | 24 |
| JHX 90SL  | 140    | 27  | 162 | 174 | 100   | 125 | 40 | 158 | 56  | 24 | j6   | 50  | M8  | 19 | 32 |
| JHX 100L  | 160    | 42  | 200 | 203 | 140   | -   | 47 | 180 | 63  | 28 | j6   | 60  | M10 | 22 | 42 |
| JHX 112M  | 190    | 48  | 230 | 225 | 140   | -   | 47 | 180 | 70  | 28 | j6   | 60  | M10 | 22 | 42 |
| JHX 132SM | 216    | 48  | 256 | 258 | 140   | 178 | 47 | 218 | 89  | 38 | k6   | 80  | M12 | 28 | 60 |
| JHX 160ML | 254    | 60  | 310 | 305 | 210   | 254 | 65 | 310 | 108 | 42 | k6   | 110 | M16 | 36 | 90 |

| Type      | F  | G    | GD | H   | HA | HD  | K  | L   | Bearings |          |
|-----------|----|------|----|-----|----|-----|----|-----|----------|----------|
|           |    |      |    |     |    |     |    |     | D        | N        |
| JHX 71    | 5  | 11   | 5  | 71  | 9  | 218 | 7  | 268 | 6203ZZC3 | 6202ZZC3 |
| JHX 80    | 6  | 15.5 | 6  | 80  | 10 | 234 | 10 | 314 | 6204ZZC3 | 6203ZZC3 |
| JHX 90SL  | 8  | 20   | 7  | 90  | 13 | 252 | 10 | 363 | 6205ZZC3 | 6205ZZC3 |
| JHX 100L  | 8  | 24   | 7  | 100 | 15 | 317 | 12 | 400 | 6306ZZC3 | 6206ZZC3 |
| JHX 112M  | 8  | 24   | 7  | 112 | 18 | 337 | 12 | 420 | 6307ZZC3 | 6206ZZC3 |
| JHX 132SM | 10 | 33   | 8  | 132 | 20 | 374 | 12 | 511 | 6308ZZC3 | 6307ZZC3 |
| JHX 160ML | 12 | 37   | 8  | 160 | 22 | 457 | 15 | 702 | 6309ZZC3 | 6308ZZC3 |

| Type      | AC     | AD    | E   | EB  | EC | EK | F  | G    | GD |
|-----------|--------|-------|-----|-----|----|----|----|------|----|
|           | JHX 71 | 140.5 | 147 | 30  | M5 | 12 | 16 | 5    | 11 |
| JHX 80    | 158    | 154   | 40  | M6  | 17 | 24 | 6  | 15.5 | 6  |
| JHX 90SL  | 174    | 162   | 50  | M8  | 19 | 32 | 8  | 20   | 7  |
| JHX 100L  | 203    | 217   | 60  | M10 | 22 | 42 | 8  | 24   | 7  |
| JHX 112M  | 225    | 225   | 60  | M10 | 22 | 42 | 8  | 24   | 7  |
| JHX 132SM | 258    | 242   | 80  | M12 | 28 | 60 | 10 | 33   | 8  |
| JHX 160ML | 305    | 297   | 110 | M16 | 36 | 90 | 12 | 37   | 8  |

| Type      | L   | LA | LB  | M   | N   | P   | S  | T   | Bearings |          |
|-----------|-----|----|-----|-----|-----|-----|----|-----|----------|----------|
|           |     |    |     |     |     |     |    |     | D        | N        |
| JHX 71    | 268 | 9  | 238 | 130 | 110 | 160 | 10 | 3.5 | 6203ZZC3 | 6202ZZC3 |
| JHX 80    | 314 | 10 | 274 | 165 | 130 | 200 | 12 | 3.5 | 6204ZZC3 | 6203ZZC3 |
| JHX 90SL  | 363 | 10 | 313 | 165 | 130 | 200 | 12 | 3.5 | 6205ZZC3 | 6205ZZC3 |
| JHX 100L  | 400 | 11 | 340 | 215 | 180 | 250 | 15 | 4   | 6306ZZC3 | 6206ZZC3 |
| JHX 112M  | 420 | 11 | 360 | 215 | 180 | 250 | 15 | 4   | 6307ZZC3 | 6206ZZC3 |
| JHX 132SM | 511 | 12 | 431 | 265 | 230 | 300 | 15 | 4   | 6308ZZC3 | 6307ZZC3 |
| JHX 160ML | 702 | 16 | 592 | 300 | 250 | 350 | 19 | 5   | 6309ZZC3 | 6308ZZC3 |

## Terminal Box



| Type        | A  | B  | C    | D  | E  | F  | G    | H   |
|-------------|----|----|------|----|----|----|------|-----|
| JHX 71 - 90 | 20 | 20 | 10.5 | 50 | 27 | M5 | 42   | 115 |
| JHX 100-132 | 26 | 26 | 13.5 | 75 | 32 | M6 | 66.5 | 160 |
| JHX 160     | 32 | 32 | 12   | 95 | 39 | M8 | 94   | 210 |

\* For JHX160, conduit entry is double

## Certifications and Approvals for ABB Make Flame - Proof Motors

| CMRI/ERTL Certificate No.                     | CCE Certificate No.                              | DGFASLI Certificate No.             | BIS Certificate No. | Frame  |
|---|--|-------------------------------------|---------------------|--------|
| CIMFR/TC/P/113<br>Dt. 12.05.2009              | A/P/HQ/MH/104/1889 (P234925/1)<br>Dt. 27.07.2009 | 66/7/2009 - Tech<br>Dt. 02.07.2009  | CML 1327946         | JHX71  |
| CIMFR/TC/P/60<br>Dt. 05.05.2009               | A/P/HQ/MH/104/1856 (P233102/1)<br>Dt. 15.06.2009 | 66/7/2009 - Tech<br>Dt. 02.07.2009  | CML 1327946         | JHX80  |
| CMRI/TC/P/H409<br>Dt. 28.08.2006              | A/P/HQ/MH/104/1270 (P187868)<br>Dt. 23.11.2006   | 66/07/2006 - Tech<br>Dt. 15.11.2006 | CML 1327946         | JHX90  |
| CIMFR/TC/SR/H969<br>Dt. 19.02.2008            | A/P/HQ/MH/104/1564 (P214909)<br>Dt. 04.07.2008   | 66/05/2005 - Tech<br>Dt. 14.08.2008 | CML 1327946         | JHX100 |
| ERTL(E)/TES/A356/0076/03-08<br>Dt. 02/04/2008 | A/P/HQ/MH/104/1545 (P213402/1)<br>Dt. 30.05.2008 | 66/05/2008 - Tech<br>Dt. 09.06.2009 | CML 9342275         | JHX112 |
| ERTL(E)/TES/A356/0077/03-08<br>Dt. 02/04/2008 | A/P/HQ/MH/104/1545 (P213402/2)<br>Dt. 30.05.2008 | 66/05/2008 - Tech<br>Dt. 09.06.2009 | CML 9342275         | JHX132 |
| ERTL(E)/TES/A356/0075/03-08<br>Dt. 02/04/2008 | A/P/HQ/MH/104/1545 (P213402/3)<br>Dt. 30.05.2008 | 66/05/2008 - Tech<br>Dt. 09.06.2009 | CML 9342275         | JHX160 |



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