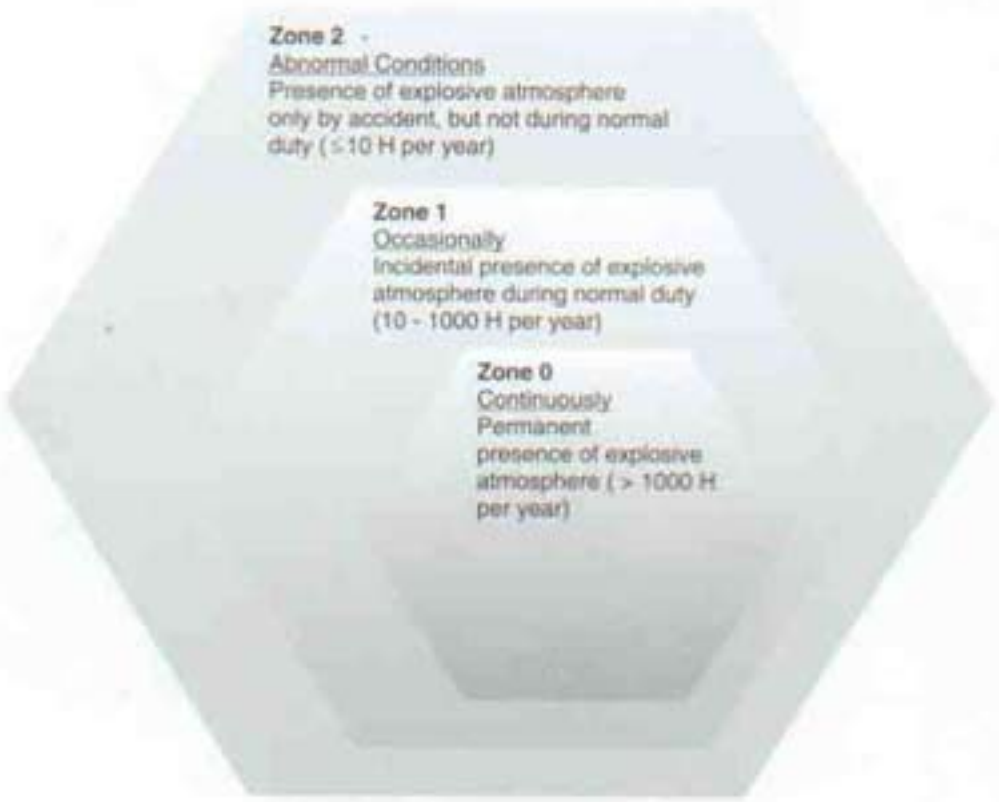
Introduction

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) 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:1.1 ..... 15kW, 1.5 .....20hp
Frame:JHX100 .....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.

TEFC, S1 Duty
415 ± 10% V, 50 ± 5%Hz.
Combined Variation of ±10%

Insulation Class F, Ambient Temp. = 50° C
Temperature rise class B (70° C)
Gas Group IIA & IIB

2 Pole

Output kW	Output HP	Frame Size	Rated Speed (rpm)	Current In(A)	Current I_s/I_n(A)	Efficiency % FL	Efficiency % 3/4FL	Efficiency % 1/2FL	Power Factor FL	Power Factor 3/4FL	Power Factor 1/2FL	Torque T_s/T_n	Torque T_{max}/T_n	Torque T_n(Nm)	T_{hot} (Sec)	T_{cold} (Sec)	Gd2 Kgm2	Weight Kg
1.5	2	JHX90SLC2	2865	2.9	6.0	81.0	81.0	77.0	0.90	0.84	0.74	2.2	3.0	5.0	5	10	0.008	33
2.2	3	JHX90SLD2	2865	4.2	6.0	81.5	81.5	77.5	0.90	0.84	0.74	2.1	3.0	7.3	6	12	0.009	35
3.7	5	JHX100LB2	2830	7.2	6.0	80.0	79.5	77.5	0.87	0.84	0.74	2.2	2.7	12.5	5	10	0.026	55
5.5	7.5	JHX132SMA2	2875	10.5	6.0	84.2	83.5	81.0	0.85	0.81	0.72	2.3	3.0	18.3	9	20	0.044	75
7.5	10	JHX132SMC2	2870	13.4	6.4	86.0	86.0	85.0	0.91	0.88	0.80	2.4	3.0	25.0	9	20	0.072	90
9.3	12.5	JHX132SMD2	2870	16	6.0	86.5	86.5	85.5	0.91	0.89	0.86	2.5	3	30.9	9	20	0.092	100
11	15	JHX160MLB2	2900	20.0	6.2	88.5	88.0	87.0	0.86	0.81	0.72	2.2	2.8	36.2	12	28	0.128	120
15	20	JHX160MLD2	2900	26.0	6.4	90.0	90.0	88.0	0.87	0.84	0.76	2.2	3.0	49.4	12	28	0.152	130
18.5	25	JHX160MLE2	2900	32	6.0	91.0	91.0	90.0	0.90	0.87	0.84	2.5	2.9	60.9	12	28	0.182	145

4 Pole

Output kW	Output HP	Frame Size	Rated Speed (rpm)	Current In(A)	Current I_s/I_n(A)	Efficiency % FL	Efficiency % 3/4FL	Efficiency % 1/2FL	Power Factor FL	Power Factor 3/4FL	Power Factor 1/2FL	Torque T_s/T_n	Torque T_{max}/T_n	Torque T_n(Nm)	T_{hot} (Sec)	T_{cold} (Sec)	Gd2 Kgm2	Weight Kg
1.1	1.5	JHX90SLD4	1420	2.5	5.5	76.0	76.0	74.0	0.80	0.71	0.56	2.0	2.7	7.4	5	10	0.015	34
1.5	2	JHX90SLE4	1420	3.4	5.5	77.0	77.0	75.0	0.81	0.73	0.62	2.0	2.7	10.1	5	12	0.017	36
2.2	3	JHX100LA4	1415	4.8	5.0	78.0	77.5	75.0	0.80	0.73	0.60	2.1	2.7	14.9	5	12	0.02	55
3.7	5	JHX112MA4	1425	7.6	6.0	83.0	83.0	82.0	0.80	0.76	0.65	2.2	2.8	24.8	5	12	0.044	60
5.5	7.5	JHX132SMB4	1440	11.2	6.0	84.5	84.5	82.0	0.80	0.71	0.58	2.2	3.0	36.5	7	16	0.06	80
7.5	10	JHX132SMC4	1440	14.8	6.0	86.0	86.0	84.5	0.80	0.74	0.63	2.1	3.0	49.7	7	16	0.088	85
9.3	12.5	JHX160MLA4	1450	19.0	6.0	88.0	88.0	87.0	0.80	0.73	0.6	2.1	2.7	61.3	7	16	0.167	105
11	15	JHX160MLB4	1455	22.0	6.0	89.0	89.0	88.0	0.80	0.74	0.63	2.2	2.8	72.2	8	18	0.208	125
15	20	JHX160MLE4	1450	28.0	6.0	89.0	89.0	87.0	0.82	0.76	0.66	2.1	2.8	98.8	14	30	0.272	155

6 Pole

Output kW	Output HP	Frame Size	Rated Speed (rpm)	Current In(A)	Current I_s/I_n(A)	Efficiency % FL	Efficiency % 3/4FL	Efficiency % 1/2FL	Power Factor FL	Power Factor 3/4FL	Power Factor 1/2FL	Torque T_s/T_n	Torque T_{max}/T_n	Torque T_n(Nm)	T_{hot} (Sec)	T_{cold} (Sec)	Gd2 Kgm2	Weight Kg
0.75	1	JHX90SLD6	915	2	3.5	73.0	73.0	70.0	0.70	0.6	0.52	1.8	2.1	7.8	10	24	0.015	34
1.1	1.5	JHX90SLE6	915	2.9	3.5	74.0	74.0	71.0	0.70	0.6	0.52	1.8	2.1	11.2	12	25	0.017	36
1.5	2	JHX100LB6	935	4	4.5	75.5	74.0	71.0	0.70	0.61	0.48	2.2	2.5	15.3	9	20	0.026	55
2.2	3	JHX112MA6	940	5.7	5.0	78.5	78.0	75.0	0.70	0.56	0.47	2.0	2.5	22.4	8	19	0.044	60
3.7	5	JHX132SMC6	960	8.3	5.5	83.0	83.0	81.0	0.70	0.66	0.53	2.2	2.6	36.8	8	19	0.088	70
5.5	7.5	JHX132SMD6	955	12.2	5.5	83.5	83.0	80.0	0.70	0.65	0.52	2.3	2.8	55.0	7	16	0.108	75
7.5	10	JHX160MLB6	965	15.5	5.5	87.5	87.5	86.5	0.80	0.71	0.58	2.1	2.4	74.2	9	20	0.288	125
9.3	12.5	JHX160MLC6	960	19.4	5.5	86.5	85.5	83.5	0.80	0.71	0.58	2.0	2.4	92.5	8	18	0.326	145
11	15	JHX160MLD6	960	23	5.5	88.0	87.0	86.0	0.80	0.72	0.59	2.0	2.4	109	9	20	0.372	155

8 Pole

Output kW	Output HP	Frame Size	Rated Speed (rpm)	Current In(A)	Current I_s/I_n(A)	Efficiency % FL	Efficiency % 3/4FL	Efficiency % 1/2FL	Power Factor FL	Power Factor 3/4FL	Power Factor 1/2FL	Torque T_s/T_n	Torque T_{max}/T_n	Torque T_n(Nm)	T_{hot} (Sec)	T_{cold} (Sec)	Gd2 Kgm2	Weight Kg
0.37	0.50	JHX90SLA8	680	1.4	2.8	58.0	55.0	48.0	0.65	0.55	0.40	1.6	1.9	5.20	10	24	0.012	30
0.55	0.75	JHX90SLD8	680	1.9	3.2	63.0	60.0	54.0	0.63	0.55	0.40	1.8	2.1	7.70	10	24	0.015	34
0.75	1	JHX100LA8	695	3.1	3.0	63.0	62.0	57.0	0.56	0.50	0.37	1.8	2.1	10.3	10	24	0.02	50
1.1	1.5	JHX100LB8	695	3.9	3.0	62.5	62.0	57.0	0.59	0.51	0.38	1.8	2.3	15.1	10	24	0.026	55
1.5	2	JHX112MA8	700	4.8	3.5	69.0	67.0	62.0	0.69	0.51	0.41	1.8	2.3	20.5	9	20	0.044	60
2.2	3	JHX132SMD8	710	6.3	4.1	77.0	75.0	72.0	0.65	0.55	0.42	1.9	2.4	29.6	8	19	0.06	75
3.7	5	JHX160MLA8	715	8.4	5.1	82.0	81.0	77.0	0.77	0.69	0.55	1.8	2.5	49.4	8	19	0.24	110
5.5	7.5	JHX160MLB8	715	12	5.1	84.0	83.0	80.0	0.79	0.72	0.59	1.8	2.5	73.5	9	20	0.288	125
7.5	10	JHX160MLD8	715	16	5.1	85.0	84.0	82.0	0.79	0.72	0.59	1.8	2.5	100	13	29	0.372	140

I_n = Nominal or rated current
T_n = Nominal or rated torque in Nm
T_{max} = Maximum torque
T_{cold} = Cold withstand time
I_s = Starting current
T_s = Starting torque
T_{hot} = Hot withstand time

Note : 1. All performance figures are subject to IS tolerances.
2. Max. load GD^2 has been calculated assuming load torque is proportional to square of speed.

Note : Owing to continuous upgradation of our design, performance parameters and dimensions are subject to change without prior notice.