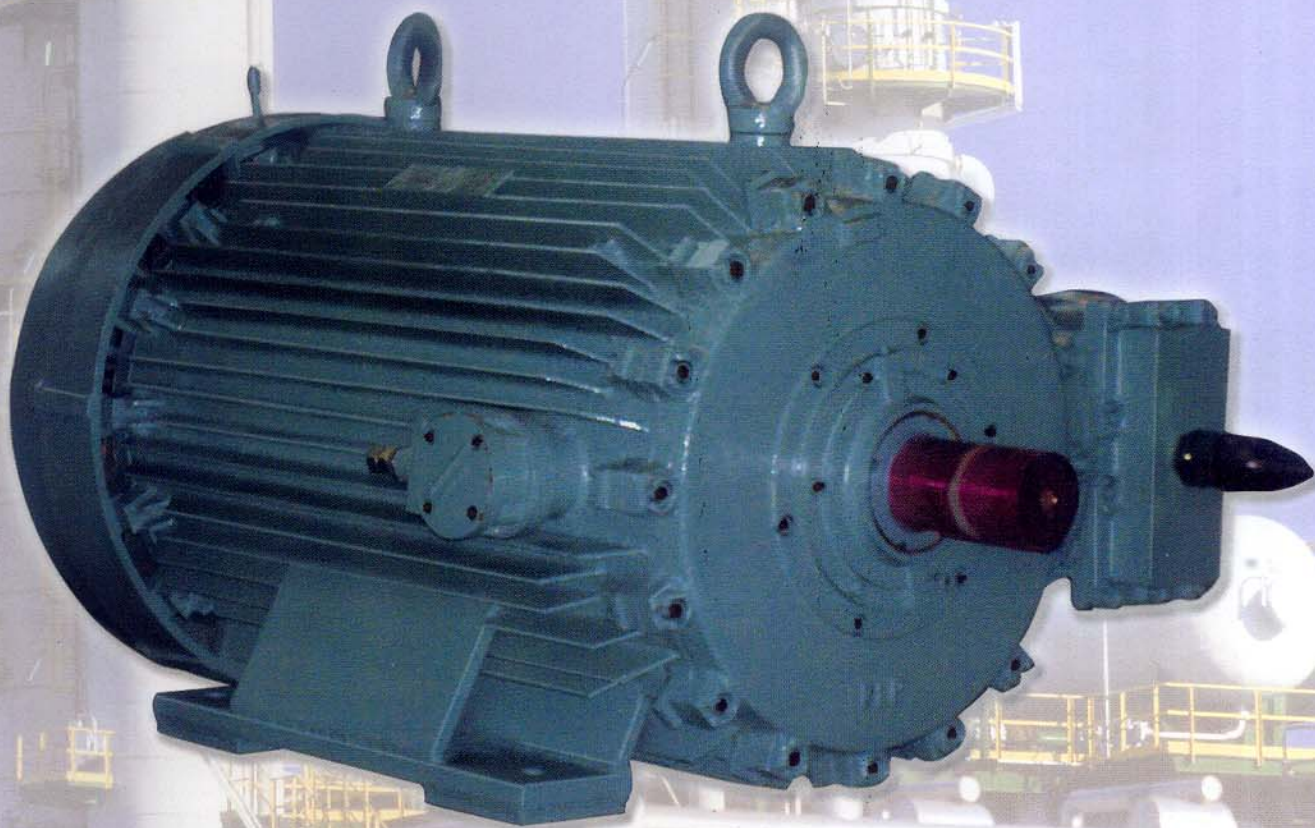
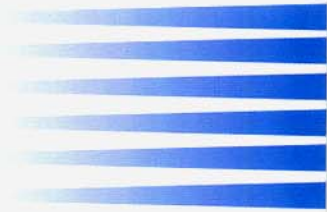


Type - KF
FLAME-FROOF MOTOR
FRAME 90 TO 355
Ex d



Motors for the Long Run!



TYPE-KF FLAME-FROOF MOTOR



Zones

Hazardous areas have been classified into three zones as follows :

Zone 0 in which an explosive gas-air mixture is continuously present or present for long periods.

N.B. No motors may be used in Zone 0.

Zone 1 in which an explosive gas-air mixture is likely to occur in normal operation.

Zone 2 in which an explosive gas-air mixture is not likely to occur in normal operation and if it occurs it will exist only for a short time. By implication an area other than zone 0, 1 or 2 is deemed to be a non-hazardous or safe area.

Temperature Considerations

Ignition Temperature

The minimum temperature at which a gas, vapour or mist ignites spontaneously at atmospheric pressure is known as the Ignition Temperature. As the gases and vapours encountered in industry have a wide spread of Ignition Temperatures, it has been agreed internationally to group together those which lie within certain temperature bands. The classification of these temperature classes is detailed in Table 1.

Standards

Flameproof Motors (type Ex d) conform to the following standards.

i) Enclosure	-	IS 2148 / IS/IEC 60079-1
ii) Performance	-	IS 325 IS 8789 / IS 12615
iii) Dimension	-	IS 1231 IS 2223
iv) Protection	-	IS 4691
v) Mounting	-	IS 2253
vi) Performance for mines	-	IS 3682

Flameproof Environment

An explosive atmosphere is one where mixture with air under atmospheric conditions of flammable substances in the form of gas, vapour or mist, exists in such proportion that may explode due to excessive temperature, arcs or sparks.

Flameproof motors are manufactured with an enclosure constructed in such a manner that any explosion inside is not capable of igniting an explosive atmosphere outside the enclosure and the surface temperature is safe enough not to ignite the outside explosive atmosphere.

Table 1
Temperature Class

Temperature Class	Maximum Surface Temperature (°C)
T1	450
T2	300
T3	200
T4	135
T5	100
T6	85

Standard motors are suitable for T3 temperature class.

Flash Point

Ignition by flames or sparks is concerned with another physical characteristics of a gas mixture. This is a temperature known as Flash Point

This Flash Point of a compound is the minimum temperature of which it gives up sufficient vapour to form a flammable mixture near the surface of the compound or within the enclosure used for Flash Point determination.

Motor selection must therefore ensure that maximum surface temperature class must not exceed the Ignition Temperature of the explosive mixture.

Flame Propagation

A further property of an explosive mixture is the ability to spread or propagate a flame, once ignited, around, through or past obstacles placed in its path. Based on the tests conducted at various international laboratories Maximum Experimental Sale Gap (MESG) for different gas/air mixtures have been obtained and the guidelines indicating gaps permitted for joints and seals for flameproof enclosure are set.

According to the international norms electrical apparatus for hazardous atmosphere is divided into following groups :

Group 1 – Cool Mines

Group II – All Hazardous Atmospheres other than Coal Mines.

Supply Voltage and Frequency

Motors can be wound for any voltage from 200V to 690V and for either 50 Hz or 60 Hz frequency with preferred voltage of 380V, 415V, 440V, 525V or 550V with 50 Hz frequency.

Motors are suitable for operation $\pm 10\%$ voltage variation and $\pm 5\%$ frequency variation with permissible combined variation of 10%.

Motors may also be manufactured for higher voltage/frequency variation on request.

Site Conditions

Standard motors are suitable for operation of rated output with on ambient temperature upto 45°C and altitude not exceeding 1000 meters. For higher ambient temperature and altitude following correction factors should be applied.

Ambient Temp.	50°C	55°C	60°C	
Rated output reduced to	95%	90%	85%	
Altitude	1500m	2000m	2500m	3000m
Rated output reduced to	95%	91%	87%	79%

Ratings and Performance

Motors are designed for continuous running duty type S1.

Motors to suit other duty conditions e.g. S2 and S6 may be offered on request.

Performance data of motors also conform to IS 8789/IS 12615.

Electrical Design

The electromagnetic design of KF series of flameproof motors are based on the use of well proven series of wound stator and cast aluminium rotors.

'Class 'F' insulation system are used as standard with total temperature limited to 120°C (R). Class 'H'

insulation system may be offered on request.

Windings

The integral system of wire insulation, slot and phase insulation and the overall varnish impregnation withstands high moisture, injurious deposits and chemical contamination. The impregnation provides tracking protection together with a winding rigidity which is capable of withstanding the vibration limits imposed by industrial drives.

Mounting

Standard motors are provided with horizontal foot mounted construction (IMB3) with single cylindrical shaft extension at driven-end side. Other mounting options as per IS 2253 are available.

Degree of Protection

Standard motors are provided with IP55 degree of protection. Higher degree of protection e.g. IP56 may be provided on request.

Cooling Forms

The standard cooling arrangement is IC411 in accordance with IS6362. However, alternative cooling forms e.g. air stream cooling (IC418) and totally enclosed surface cooling (IC410) are also available.

Air stream cooling arrangement is popularly used for Mine Ventilation Fan application.

Vibration Limits

All rotors are dynamically balanced with half key to ensure normal class of vibration level as per IS12075. Motors with reduced vibration level can be supplied on request.

Overspeed

All standard motors will withstand continuously a mechanical over speed of 120% rated speed.

Momentary Over Load

Standard motors will withstand momentary over load of 1.6 times normal full load torque for a time not exceeding 15 seconds, provided the supply is maintained at the rated values.

Noise Level

Noise level for KF series flameproof motors conform to the requirement of IS12065.

Reduced noise levels may be offered on specific enquiry.

Construction

Frame

KF series flame proof motors have specifically been designed keeping in view the underground. Mine servgice requirements.

The motors have rugged and robust construction using FG220 grade of grey iron castings. For foot mounted construction integrally cast foot of sufficient thickness one provided. The rugged and robust construction have been designed to withstand rough handling of motors specially in underground mines in arduous site conditions complicated by lack of space, light, cleanliness retaining the flameproofness of the enclosures. The recess for endbracket location are accurately turned with reference to stator bore, thus ensuring concentricity.

Endshields/Bearing Housing

Robust grey iron castings using FG220 or superior grade of castings are used. For KF90L bearings are directly mounted in endshield bore. For KF 112M and above bearings are located in cartridge type housing

located on endshields.

The accurately machined location spigots and bearing housing ensure accurate alignment and connectricity of rotor assembly.

Lamination

High grade low loss electrical grade steel lamination are used.

Shaft and Rotor

Standard shafts are machined from C45 grade of carbon steel and are machined to fine limits. Standard motors have a single cylindrical shaft extension with keyway. Standard KF series flameproof motor offer aluminium die cast rotor for entire range.

For standard motors upto frame size 225M aluminium die cast rotor core assembly is cold pressed onto a substantially knurleid shaft. For frame sizes 250M and upwards rotors are keyed with shaft.

Alternate arrangement of shaft extension including double cylindrical, single taper, non-standard extension details may be offered on request.

Cooling Fan

Cast iron cooling fan is used for

entire range of motors excepting 2-Pole motors in sizes 200L and upwards where fabricated MS construction fan is used. All cooling fans are bi-directional.

Bearings

Metric size medium series (O3) ball and roller bearings are used. The bearings are lubricated with premium grade lithium base MP3 grease containing oxidation and corrosion inhibitors. Regreasing facility is provided as standard for motors with open type of bearing. The non-driven end bearing is normally located to eliminate axial movement of rotor sub-assembly. In vertical mounted motors (VI construction) the rotor weight is supported by top bearings either deep groove ball or duplex type depending on degree of axial loading to be accommodated.

Standard bearing sizes for horizontal foot mounted motors are indicated in Table below.

Termination Arrangement

Standard foot mounted motor in frame size KF90L is provided with a single entry terminal box located at Top. For KF112M to KF355L,

Bearing Details Horizontal Mounting Brand-Flame Froof (Single Cylindrical)

Frame Size	Pole	Bearing	
		D.E.	N.D.E.
KF 90L	2-8P	6205 ZZ C3	6205 ZZC3
KF 112M	2-8P	6306 ZZ C3	6305 ZZ C3
KF 132M	2-8P	6308 ZZ C3	6306 ZZ C3
KF 160L	2-8P	6309 ZZ C3	6309 ZZ C3
KF 180L	2-8P	6310 ZZ C3	6310 ZZ C3
KF 200L	2P	6312 C3	6312 C3
KF 200L	4-8P	N312 C3	6312 C3
KF 225M	2P	6313 C3	6311 ZZ C3
KF 225M	4-8P	N313 C3	6311 ZZ C3
KF 250M	2P	6315 C3	6313 C3
KF 250M	4-8P	N315 C3	6313 C3
KF 280M	2P	6317 C3	6317 C3
KF 280M	4-8P	N317	6317 C3
KF 315	2P	N217 C3	6316 C3
KF 315	4-8P	N319	6316 C3
KF 355	4-8P	N321	6321 C3

terminal box is located at RHS looking from driven end side for standard foot mounted motors. Terminal box can be located at LHS looking from driven end side by reversing the stator assembly.

Terminal box is made of amply dimensioned grey iron casting using FG220 or superior grade casting and conform its own flame proof enclosure capable of containing the internal explosion without transmitting the flame to the surrounding atmosphere or to the motor main enclosure.

Terminal box can be rotated in steps of 90° so that cable can be terminated from any of the four directions. Unless otherwise specified standard motors are provided with a single entry terminal box suitable for DOL starting. For KF90L – KF132M three terminals are provided in terminal box as standard. For KF160 – KF225M three terminals are provided with single entry terminal box for DOL starting and six terminals with double entry terminal box are provided as optional arrangement. For KF250M – KF355L six terminals are always terminated in terminal box suitable for star/delta starting.

For gas group 1 i.e. for underground Mining applications cable entry arrangement with sealing box to suit PILCDWA cables is provided as standard. For gas group 1 optional plug socket entry may be provided to suit trailing type cables when specified.

For gas group IIA and IIB terminal box is provided with gland plate suitable for customers' specified cable size.

For air stream motors popularly known as mine ventilation fan motors

special termination arrangement using flying leads and conduit pipe with terminal box assembly located outside the fan casing are provided. Special termination arrangement mentioned as above are approved by ERTL/CIMFR and DGMS.

Over sized terminal box assembly to suit derated aluminium cables as required for Petro-Chemical Industries are also available on request.

Earthing Terminals

All motors are provided with one internal earthing terminal in terminal box assembly with two external earthing terminals on frame housing.

Certification

Entire range of KF series flame proof motors have been tested and certified by either Electronic Regional Test Laboratory (ERTL), Kolkata or Central Institute of Mining and Fuel Research

(CIMFR), Dhanbad for gas group I, IIA and IIB in accordance with IS2148 / IS/IEC 60079-1. Separate approvals are also available from respective statutory authorities for operation in respective gas groups for areas under their jurisdiction as per table below.

Paint System

Standard motors are provided with synthetic enamel finish paint. All cast iron/steel components are shot blasted and fettled prior to application of red oxide primer before application of final paint.

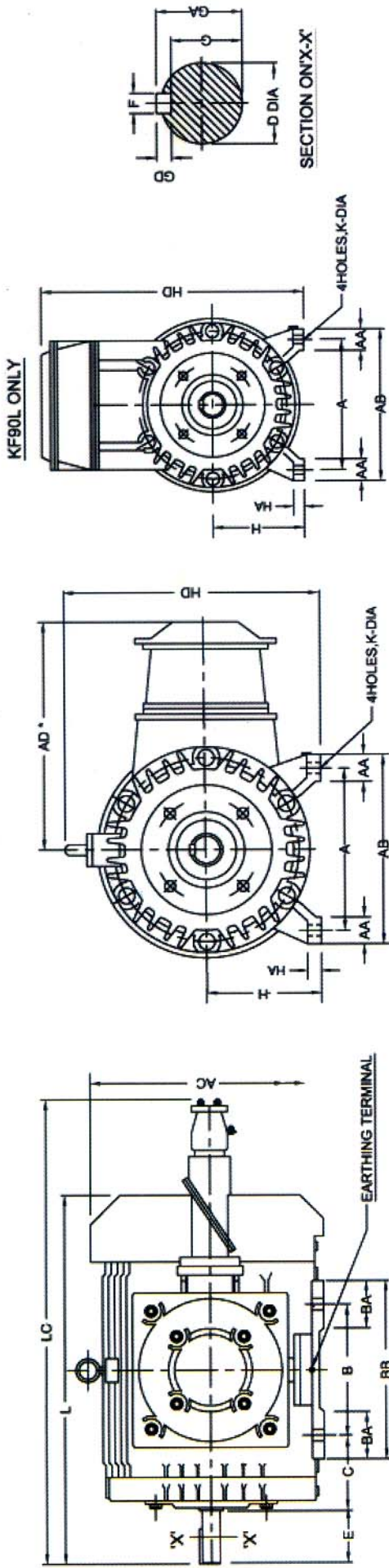
For highly corrosive atmosphere special winding treatment is provided against specific order.

To ensure good corrosion resistance under such environment motors may be provided with chlorinated rubber based paint or epoxy based paint on request.

Gas Group	Area	Statutory Authority
I	Underground Coal Mines	Directorate General of Mines Safety (DGMS), Dhanbad, Jharkhand.
IIA & IIB	Oil Mines	Directorate General of Mines Safety (DGMS), Dhanbad, Jharkhand.
IIA	Petro-Chemical Industries/ Refineries	Chief Controller of Explosives (CCE), Dept. of Explosives, Nagpur, Maharashtra
IIB	Factories	Directorate General of Factory Advise Services & Labour Institute, Mumbai, Maharashtra.

Note : All flameproof motors are covered by BIS licence.

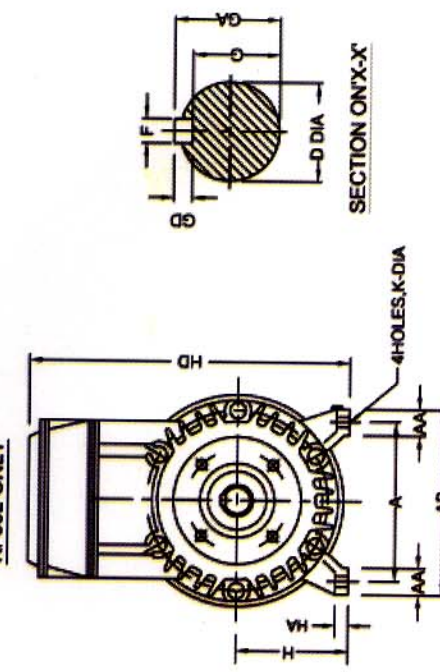
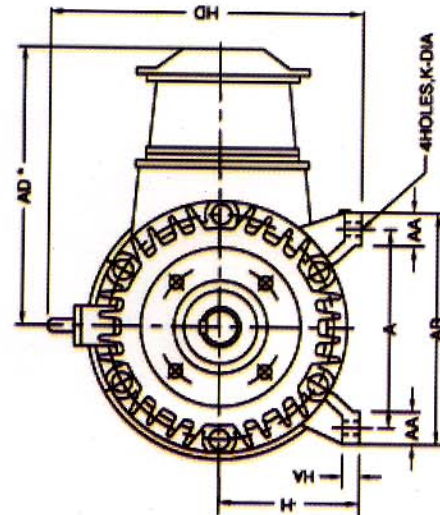
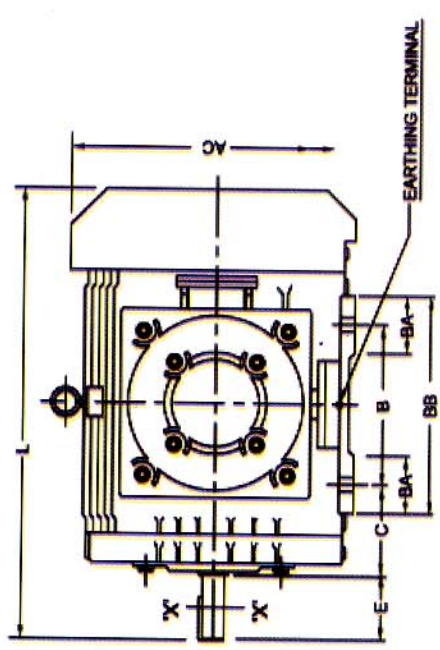
Note : For Medium Voltage (upto 11KV) Flame-Proof Motors please refer to works.



Foot Mounted

PART NO	FRAME	NO. OF POLES	HIGEN HEIGHT		D-DIA	E	SHAFT	FIXING DIMENSIONS																				
			NOM	TOL				F	GD	G	NOM	TOL	A	B	C	K	AB	AA	BB	BA	HA	HD	AC	AD	L	LC		
1	KF90L	2-8	90	-0.5	24	+0.009	50	27	8	+0.036	7	+0.090	20	-0.2	140	125	56	10	170	40	155	45	15	317	190	227	360	415
2	KF112M	2-8	112	-0.5	28	+0.009	60	31	8	+0.036	7	+0.090	24	-0.2	190	140	70	12	230	40	180	50	15	315	255	330	440	592
3	KF132M	2-8	132	-0.5	38	+0.018	80	41	10	+0.036	8	+0.090	33	-0.2	216	178	89	12	280	58	218	50	20	350	294	350	500	650
4	KF160L	2-8	160	-0.5	42	+0.018	110	45	12	+0.036	8	+0.090	37	-0.2	254	254	108	15	355	80	305	82	30	406	342	400	656	736
5	KF180L	2-8	180	-0.5	48	+0.018	110	51.5	14	+0.036	9	+0.090	42.5	-0.2	279	279	121	15	370	80	327	82	30	450	395	425	706	762
6	KF200L	2-8	200	-0.5	55	+0.030	110	59	16	+0.043	10	+0.090	49	-0.2	318	305	133	19	390	90	356	88	25	505	450	450	774	788
7	KF225M	2	225	-0.5	55	+0.030	110	59	16	+0.043	10	+0.090	49	-0.2	356	311	149	19	448	95	368	95	30	548	515	480	860	806
8	KF225M	4-8	225	-0.5	60	+0.030	140	64	18	+0.043	11	+0.110	53	-0.2	356	311	149	19	448	95	368	95	30	548	515	480	890	836
9	KF250M	2	250	-0.5	60	+0.030	140	64	18	+0.043	11	+0.110	53	-0.2	406	349	168	24	484	121	420	115	30	590	515	470	966	1012
10	KF250M	4-8	250	-0.5	65	+0.030	140	69	18	+0.043	11	+0.110	58	-0.2	406	349	168	24	484	121	420	115	30	590	515	470	966	1012
11	KF280M	2	280	-0.5	65	+0.030	140	69	18	+0.043	11	+0.110	58	-0.2	457	419	190	24	540	142	500	120	32	660	555	625	1060	1070
12	KF280M	4-8	280	-0.5	75	+0.030	140	79.5	20	+0.052	12	+0.110	67.5	-0.2	457	419	190	24	540	142	500	120	32	660	555	625	1060	1070
13	KF315M	2	315	-0.5	65	+0.030	140	69	18	+0.043	11	+0.110	58	-0.2	508	457	216	28	600	170	540	135	36	722	612	645	1173	1120
14	KF315M	4-8	315	-0.5	80	+0.030	170	85	22	+0.052	14	+0.110	71	-0.2	508	457	216	28	600	170	540	135	36	722	612	645	1203	1150
15	KF315L	2	315	-0.5	65	+0.030	140	69	18	+0.043	11	+0.110	58	-0.2	508	508	216	28	600	170	591	135	36	722	612	645	1273	1120
16	KF315L	4-8	315	-0.5	80	+0.030	170	85	22	+0.052	14	+0.110	71	-0.2	508	508	216	28	600	170	591	135	36	722	612	645	1303	1150
17	KF355M	4-8	355	-0.5	95	+0.035	170	100	25	+0.052	14	+0.110	84	-0.2	610	560	254	28	720	140	650	160	45	820	740	635	1440	
18	KF355L	4-8	355	-0.5	95	+0.035	170	100	25	+0.052	14	+0.110	84	-0.2	610	630	254	28	720	140	720	160	45	820	740	635	1570	
	FRAME	NO. OF POLES	HIGEN HEIGHT	D-DIA	E	SHAFT	FIXING DIMENSIONS																					
	SIZE	POLES	NOM	TOL	NOM	TOL	F	GD	G	NOM	TOL	A	B	C	K	AB	AA	BB	BA	HA	HD	AC	AD	L	LC			

TERMINATION AS PER GAS GR.-I

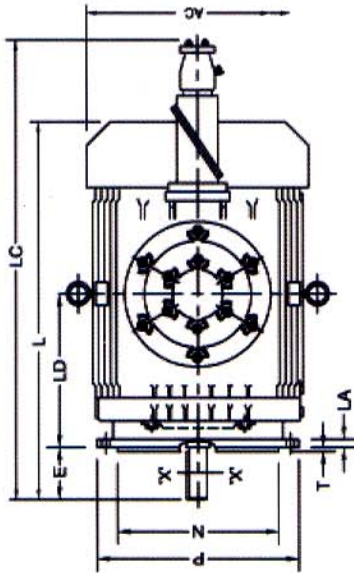
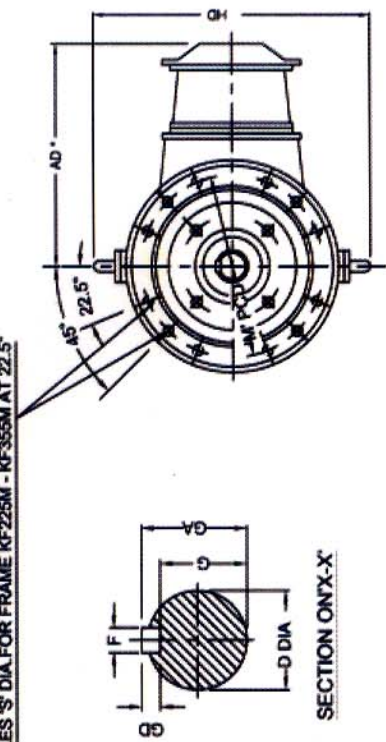


Foot Mounted

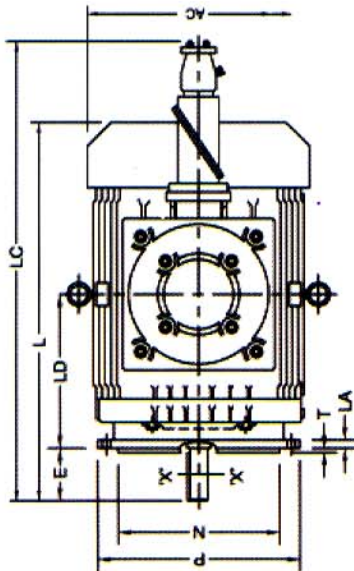
PART NO	FRAME	SIZE	NO. OF POLES	D-DIA			SHAFT EXTN			FIXING DIMENSIONS																		
				NOM	TOL	EXTN	NOM	TOL	EXTN	F	GD	G	A	B	C	K	AB	AA	BB	BA	HA	HD	AC	AD	L			
1	KF90L	2-8	90	+0.5	-0.009	24	+0.009	50	27	8	+0.036	7	+0.090	20	+0.2	140	125	56	10	170	40	155	45	15	317	190	227	360
2	KF112M	2-8	112	-0.5	+0.009	28	+0.009	60	31	8	+0.036	7	+0.090	24	+0.2	190	140	70	12	230	40	180	50	15	315	255	330	440
3	KF132M	2-8	132	+0.5	+0.018	38	+0.018	80	41	10	+0.036	8	+0.090	33	+0.2	216	178	89	12	280	58	218	50	20	350	294	350	500
4	KF160L	2-8	160	-0.5	+0.018	42	+0.018	110	45	12	+0.036	8	+0.090	37	+0.2	254	254	108	15	355	80	305	82	30	406	342	400	656
5	KF180L	2-8	180	-0.5	+0.018	48	+0.018	110	51.5	14	+0.036	9	+0.090	42.5	+0.2	279	279	121	15	370	80	327	82	30	450	395	425	706
6	KF200L	2-8	200	+0.5	+0.030	55	+0.030	110	59	16	+0.043	10	+0.090	49	+0.2	318	305	133	19	390	90	356	88	25	505	450	450	774
7	KF225M	2	225	-0.5	+0.030	55	+0.030	110	59	16	+0.043	10	+0.090	49	+0.2	356	311	149	19	448	95	368	95	30	548	515	480	860
8	KF225M	4-8	225	-0.5	+0.030	60	+0.030	140	64	18	+0.043	11	+0.110	53	+0.2	356	311	149	19	448	95	368	95	30	548	515	480	890
9	KF250M	2	250	+0.5	+0.030	60	+0.030	140	64	18	+0.043	11	+0.110	53	+0.2	406	349	168	24	484	121	420	115	30	590	515	470	966
10	KF250M	4-8	250	-0.5	+0.030	65	+0.030	140	69	18	+0.043	11	+0.110	58	+0.2	406	349	168	24	484	121	420	115	30	590	515	470	966
11	KF280M	2	280	+0.5	+0.030	65	+0.030	140	69	18	+0.043	11	+0.110	58	+0.2	457	419	190	24	540	142	500	120	32	660	555	625	1060
12	KF280M	4-8	280	-0.5	+0.030	75	+0.030	140	79.5	20	+0.052	12	+0.110	67.5	+0.2	457	419	190	24	540	142	500	120	32	660	555	625	1060
13	KF315M	2	315	+0.5	+0.030	65	+0.030	140	69	18	+0.043	11	+0.110	58	+0.2	508	457	216	28	600	170	540	135	36	722	612	645	1173
14	KF315M	4-8	315	-0.5	+0.030	80	+0.030	170	85	22	+0.052	14	+0.110	71	+0.2	508	457	216	28	600	170	540	135	36	722	612	645	1203
15	KF315L	2	315	+0.5	+0.030	65	+0.030	140	69	18	+0.043	11	+0.110	58	+0.2	508	457	216	28	600	170	540	135	36	722	612	645	1203
16	KF315L	4-8	315	-0.5	+0.030	80	+0.030	170	85	22	+0.052	14	+0.110	71	+0.2	508	457	216	28	600	170	540	135	36	722	612	645	1273
17	KF355M	4-8	355	+0.5	+0.035	95	+0.035	170	100	25	+0.052	14	+0.110	84	+0.2	610	560	254	28	720	140	650	160	45	820	740	635	1440
18	KF355L	4-8	355	-0.5	+0.035	95	+0.035	170	100	25	+0.052	14	+0.110	84	+0.2	610	560	254	28	720	140	650	160	45	820	740	635	1570
	FRAME	NO. OF POLES	SIZE	NO. OF HOLES	TOL	NOM	TOL	EXTN	GA	NOM	TOL	NOM	TOL	NOM	TOL	A	B	C	K	AB	AA	BB	BA	HA	HD	AC	AD	L

TERMINATION AS PER GAS GR.-IIA & IIB

4-HOLES 'S' DIA FOR FRAME KF90L - KF200L AT 45°
 8-HOLES 'S' DIA FOR FRAME KF225M - KF355M AT 22.5°



FRAME SIZE KF200 & ABOVE

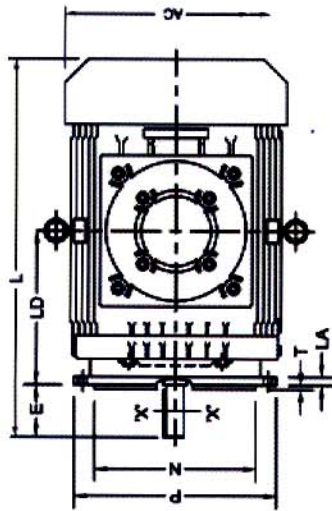


FRAME SIZE KF90 TO KF180

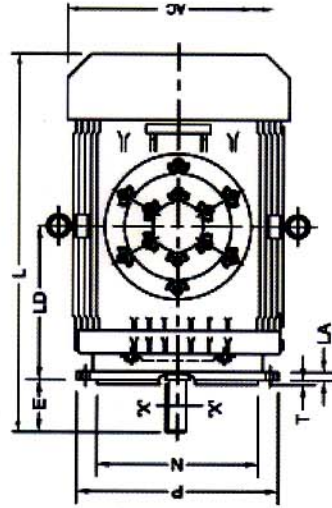
Flange Mounted

PART NO	FRAME NO. OF POLES	SIZE	D-DIA NOM	D-DIA TOL	E SHAFT EXTN	GA	NOM	TOL	F	NOM	TOL	GD	NOM	TOL	G	AC	AD	L	LA	LC	LD	M	NOM	TOL	P	B	T	HD
1	KF90L	2-8	24	+0.009	-0.004	50	27	8	+0.036	7	+0.090	20	+0.2	190	227	385	10	442	147	165	130	+0.014	200	12	3.5	304		
2	KF112M	2-8	28	+0.009	-0.004	60	31	8	+0.036	7	+0.090	24	+0.2	255	330	495	11	648	196	215	180	+0.014	250	15	4	396		
3	KF132M	2-8	38	+0.018	-0.002	80	41	10	+0.036	8	+0.090	33	+0.2	294	350	525	12	675	203	265	230	+0.016	300	15	4	428		
4	KF160L	2-8	42	+0.018	-0.002	110	45	12	+0.036	8	+0.090	37	+0.2	342	400	692	13	772	271	300	250	+0.016	350	19	5	472		
5	KF180L	2-8	48	+0.018	-0.002	110	51.5	14	+0.036	9	+0.090	42.5	+0.2	395	425	736	13	792	290	300	250	+0.016	350	19	5	518		
6	KF200L	2-8	55	+0.030	-0.011	110	59	16	+0.043	10	+0.090	49	+0.2	450	450	847	15	880	329	350	300	+0.018	400	19	5	604		
7	KF225M	2	55	+0.030	-0.011	110	59	16	+0.043	10	+0.090	49	+0.2	515	480	925	16	870	368	400	350	+0.018	450	19	5	638		
8	KF225M	4-8	60	+0.030	-0.011	140	64	18	+0.043	11	+0.110	53	+0.2	515	480	955	16	900	369	400	350	+0.018	450	19	5	638		
9	KF250M	2	60	+0.030	-0.011	140	64	18	+0.043	11	+0.110	53	+0.2	515	470	1036	18	1062	412	500	450	+0.020	550	19	5	704		
10	KF250M	4-8	65	+0.030	-0.011	140	69	18	+0.043	11	+0.110	58	+0.2	515	470	1036	18	1062	412	500	450	+0.020	550	19	5	704		
11	KF280M	2	65	+0.030	-0.011	140	69	18	+0.043	11	+0.110	58	+0.2	555	625	1120	18	1130	441	500	450	+0.020	550	19	5	752		
12	KF280M	4-8	75	+0.030	-0.011	140	79.5	20	+0.052	12	+0.110	67.5	+0.2	555	625	1120	18	1130	441	500	450	+0.020	550	19	5	752		
13	KF315M	2	65	+0.030	-0.011	140	69	18	+0.043	11	+0.110	58	+0.2	612	645	1224	22	1171	495	600	550	+0.022	660	24	6	806		
14	KF315M	4-8	80	+0.030	-0.011	170	85	22	+0.052	14	+0.110	71	+0.2	612	645	1254	22	1201	495	600	550	+0.022	660	24	6	806		
15	KF315L	2	65	+0.030	-0.011	140	69	18	+0.043	11	+0.110	58	+0.2	612	645	1325	22	1171	495	600	550	+0.022	660	24	6	806		
16	KF315L	4-8	80	+0.030	-0.011	170	85	22	+0.052	14	+0.110	71	+0.2	612	645	1355	22	1201	495	600	550	+0.022	660	24	6	806		
17	KF355M	4-8	95	+0.035	-0.013	170	100	25	+0.052	14	+0.110	84	+0.2	740	635	1453	25	568	740	680	680	+0.025	800	24	6	1260		
18	KF355L	4-8	95	+0.035	-0.013	170	100	25	+0.052	14	+0.110	84	+0.2	740	635	1583	25	568	740	680	680	+0.025	800	24	6	1260		
	FRAME	NO. OF POLES	D-DIA NOM	D-DIA TOL	E SHAFT EXTN	GA	NOM	TOL	F	NOM	TOL	GD	NOM	TOL	G	AC	AD	L	LA	LC	LD	M	NOM	TOL	P	B	T	HD

TERMINATION AS PER GAS GR.-I

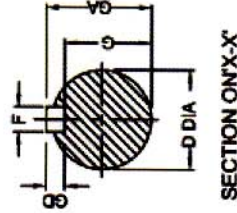
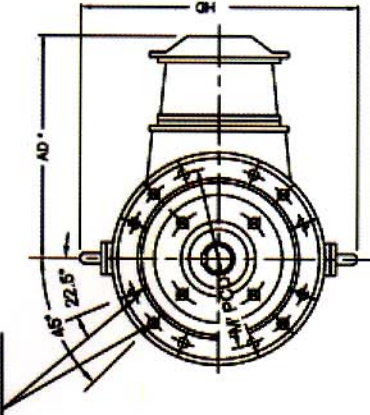


FRAME SIZE KF90 TO KF180



FRAME SIZE KF200 & ABOVE

4-HOLES 'S' DIA. FOR FRAME KF90L - KF200L AT 45°
8-HOLES 'S' DIA. FOR FRAME KF225M - KF355M AT 22.5°



SECTION ON'X-X'

Flange Mounted

PART NO	FRAME NO. OF POLES	D-DIA	SHAFT		F	G		AC	AD	L	LA	LD	M	N		P	B	T	HD								
			NOM	TOL		NOM	TOL							NOM	TOL												
1	KF90L	2-8	24	+0.002	50	27	8	+0.036	7	-0.090	20	-0.2	190	227	385	10	147	165	130	+0.014	200	12	3.5	304			
2	KF112M	2-8	28	+0.002	60	31	8	+0.036	7	-0.090	24	-0.2	255	330	495	11	196	215	180	+0.014	250	15	4	396			
3	KF132M	2-8	38	+0.018	80	41	10	+0.036	8	-0.090	33	-0.2	294	350	525	12	203	265	230	+0.016	300	15	4	428			
4	KF160L	2-8	42	+0.018	110	45	12	+0.036	8	-0.090	37	-0.2	342	400	692	13	271	300	250	+0.016	350	19	5	472			
5	KF180L	2-8	48	+0.018	110	51.5	14	-0.036	9	-0.090	42.5	-0.2	395	425	736	13	290	300	250	+0.016	350	19	5	518			
6	KF200L	2-8	55	+0.030	110	59	16	-0.043	10	-0.090	49	-0.2	450	450	847	15	329	350	300	+0.018	400	19	5	604			
7	KF225M	2	55	+0.030	110	59	16	+0.043	10	-0.090	49	-0.2	515	480	925	16	368	400	350	+0.018	450	19	5	638			
8	KF225M	4-8	60	+0.030	140	64	18	-0.043	11	-0.110	53	-0.2	515	480	955	16	369	400	350	+0.018	450	19	5	638			
9	KF250M	2	60	+0.030	140	64	18	-0.043	11	-0.110	53	-0.2	515	470	1036	18	412	500	450	+0.020	550	19	5	704			
10	KF250M	4-8	65	+0.030	140	69	18	-0.043	11	-0.110	58	-0.2	515	470	1036	18	412	500	450	+0.020	550	19	5	704			
11	KF280M	2	65	+0.030	140	69	18	-0.043	11	-0.110	58	-0.2	555	625	1120	18	441	500	450	+0.020	550	19	5	752			
12	KF280M	4-8	75	+0.030	140	79.5	20	-0.052	12	-0.110	67.5	-0.2	555	625	1120	18	441	500	450	+0.020	550	19	5	752			
13	KF315M	2	65	+0.030	140	69	18	-0.043	11	-0.110	58	-0.2	612	645	1224	22	495	600	550	+0.022	660	24	6	806			
14	KF315M	4-8	80	+0.030	170	85	22	-0.052	14	-0.110	71	-0.2	612	645	1254	22	495	600	550	+0.022	660	24	6	806			
15	KF315L	2	65	+0.030	140	69	18	-0.043	11	-0.110	58	-0.2	612	645	1325	22	495	600	550	+0.022	660	24	6	806			
16	KF315L	4-8	80	+0.030	170	85	22	-0.052	14	-0.110	71	-0.2	612	645	1355	22	495	600	550	+0.022	660	24	6	806			
17	KF355M	4-8	95	+0.035	170	100	25	-0.052	14	-0.110	84	-0.2	740	635	1453	25	568	740	680	+0.025	800	24	6	1260			
18	KF355L	4-8	95	+0.035	170	100	25	-0.052	14	-0.110	84	-0.2	740	635	1583	25	568	740	680	+0.025	800	24	6	1260			
	FRAME	NO. OF POLES	D-DIA	NOM	TOL	GA	NOM	TOL	F	NOM	TOL	GD	NOM	TOL	G	AC	AD	L	LA	LD	M	NOM	TOL	P	B	T	HD

TERMINATION AS PER GAS GR.-IIA & IIB

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