marathon™ Motors

Type - KF
FLAME-PROOF MOTOR
FRAME 80 TO 355
Ex d

A Regal Brand

REGAL

www.regalbeloit.com

TYPE-KF FLAME-PROOF MOTOR

Standards

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

i) Enclosure	–	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 one 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.

Zones

Hazardous areas have been classified into three zones as follows :

Zone 0 in which on 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 bond. The classification of these temperature classes is detailed in Table 1.

Table 1

Temperature Class

Temperature Class	MaximumSurface 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 post 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 – Coal 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 ±10% voltage variation and ±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 outpur reduced to	95%	90%	85%	
Altitude	1500m	2000m	2500m	3000m
Rated outpur reduced to	95%	91%	87%	79%

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

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 service 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 frame size KF80 – KF100L 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 concentricity 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 subtantially knurled 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 (C3) ball and roller bearings are used in general. The bearings are lubricated with premium grade lithium base (Shell Gadues 3) 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 eleminate 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 sizes KF80-KF100L is

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

Frame Size	Pole	Bearing	
		D.E.	N.D.E.
KF 80	2-8P	6204 ZZ C3	6204 ZZ C3
KF 90L	2-8P	6205 ZZ C3	6205 ZZ C3
KF 100L	2-8P	6206 ZZ C3	6206 ZZ C3
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

provided with a single entry terminal box. Terminal box location for KF80 is Top. For KF90L to KF355L, 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 KF80 – 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 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.

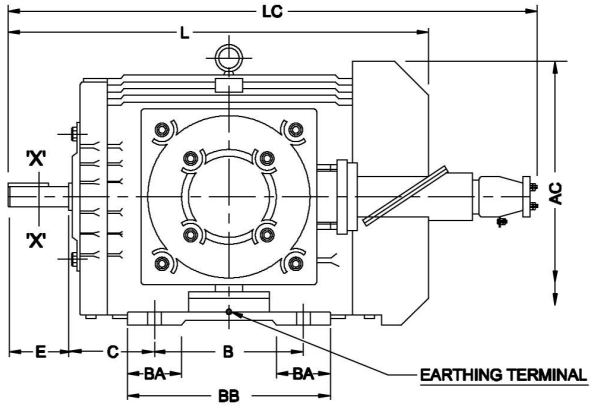
For highly corrosive atmosphere special winding treatment is provided against specific order.

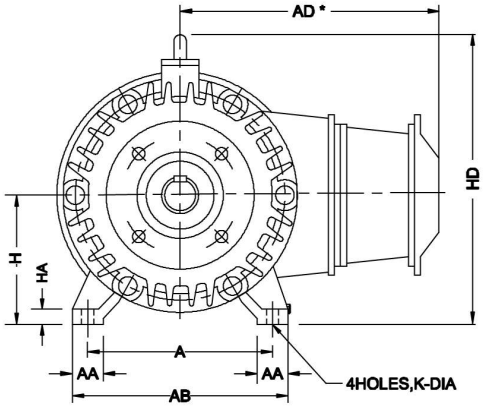
To ensure good corrosion resistance under such environment motors may be provided with chlorinated rubber based paint or epoxy based paint on request.

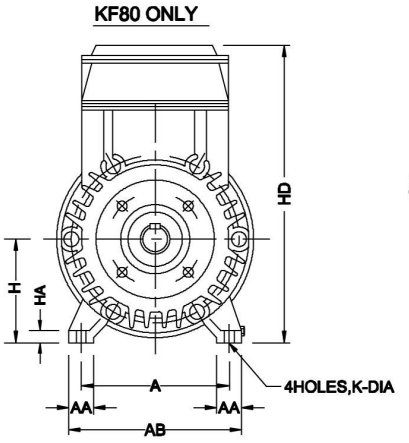
Gas Group	Area	Statutory Authority
I	Underground Coal Mines	Directorate General of Mines Safety (DGMS), Dhanbad, Jharkhand.
IIA & IIB	Oil Mines	Directorate General of Mines Safety (DGMS), Dhanbad, Jharkhand.
IIA	Petro-Chemical Industries/ Refineries	Chief Controller of Explosives (CCE), Dept. of Explosives,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

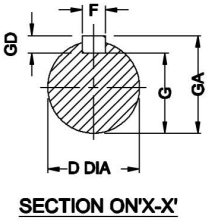
Note : All flameproof motors are covered by BIS licence.

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





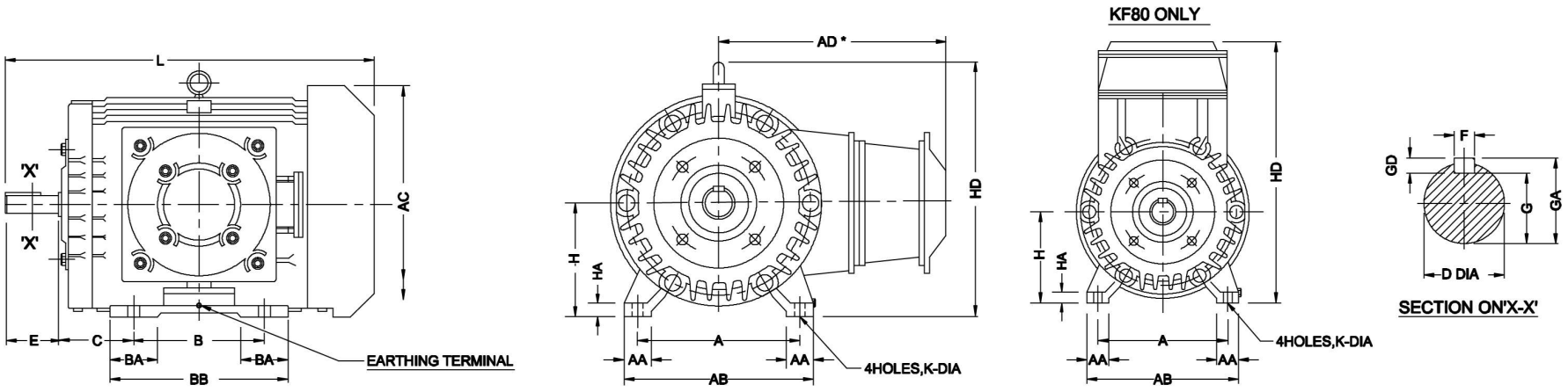




Foot Mounted

PART NO	FRAME SIZE	NO. OF POLES	H(CEN HEIGHT) NOM	H(CEN HEIGHT) TOL	D-DIA NOM	D-DIA TOL	E SHAFT EXTN	GA	F NOM	F TOL	GD NOM	GD TOL	G NOM	G TOL	FIXING DIMENSIONS A	B	C	K	AB	AA	BB	BA	HA	HD	AC	AD	L	LC
1	KF80	2-8	80	+0 −0.5	19	+0.009 −0.004	40	21.5	6	+0 −0.030	6	+0 −0.090	15.5	+0 −0.2	125	100	50	10	156	32	125	32	12	290	182	210	350	395
2	KF90L	2-8	90	+0 −0.5	24	+0.009 −0.004	50	27	8	+0 −0.036	7	+0 −0.090	20	+0 −0.2	140	125	56	10	170	40	155	45	15	317	200	227	360	415
3	KF100L	2-8	100	+0 −0.5	28	+0.009 −0.004	60	31	8	+0 −0.036	7	+0 −0.090	24	+0 −0.2	160	140	63	12	200	38	170	45	14	280	240	265	465	455
4	KF112M	2-8	112	+0 −0.5	28	+0.009 −0.004	60	31	8	+0 −0.036	7	+0 −0.090	24	+0 −0.2	190	140	70	12	230	40	180	50	15	315	255	330	476	592
5	KF132M	2-8	132	+0 −0.5	38	+0.018 +0.002	80	41	10	+0 −0.036	8	+0 −0.090	33	+0 −0.2	216	178	89	12	280	58	218	50	20	350	294	350	500	650
6	KF160L	2-8	160	+0 −0.5	42	+0.018 +0.002	110	45	12	+0 −0.043	8	+0 −0.090	37	+0 −0.2	254	254	108	15	355	80	305	82	30	406	342	400	656	736
7	KF180L	2-8	180	+0 −0.5	48	+0.018 +0.002	110	51.5	14	+0 −0.043	9	+0 −0.090	42.5	+0 −0.2	279	279	121	15	370	80	327	82	30	450	395	425	706	762
8	KF200L	2-8	200	+0 −0.5	55	+0.030 +0.011	110	59	16	+0 −0.043	10	+0 −0.090	49	+0 −0.2	318	305	133	19	390	90	356	88	25	505	450	450	774	788
9	KF225M	2	225	+0 −0.5	55	+0.030 +0.011	110	59	16	+0 −0.043	10	+0 −0.090	49	+0 −0.2	356	311	149	19	448	95	368	95	30	548	515	480	860	806
10	KF225M	4-8	225	+0 −0.5	60	+0.030 +0.011	140	64	18	+0 −0.043	11	+0 −0.110	53	+0 −0.2	356	311	149	19	448	95	368	95	30	548	515	480	890	836
11	KF250M	2	250	+0 −0.5	60	+0.030 −0.011	140	64	18	+0 −0.043	11	+0 −0.110	53	+0 −0.2	406	349	168	24	484	121	420	115	30	590	515	470	966	1012
12	KF250M	4-8	250	+0 −0.5	65	+0.030 +0.011	140	69	18	+0 −0.043	11	+0 −0.110	58	+0 −0.2	406	349	168	24	484	121	420	115	30	590	515	470	966	1012
13	KF280M	2	280	+0 −1	65	+0.030 +0.011	140	69	18	+0 −0.043	11	+0 −0.110	58	+0 −0.2	457	419	190	24	540	142	500	120	32	660	600	625	1078	1070
14	KF280M	4-8	280	+0 −1	75	+0.030 +0.011	140	79.5	20	+0 −0.052	12	+0 −0.110	67.5	+0 −0.2	457	419	190	24	540	142	500	120	32	660	600	625	1078	1070
15	KF315M	2	315	+0 −1	65	+0.030 +0.011	140	69	18	+0 −0.043	11	+0 −0.110	58	+0 −0.2	508	457	216	28	600	170	540	135	36	722	612	645	1173	1120
16	KF315M	4-8	315	+0 −1	80	+0.030 +0.011	170	85	22	+0 −0.052	14	+0 −0.110	71	+0 −0.2	508	457	216	28	600	170	540	135	36	722	612	645	1203	1150
17	KF315L	2	315	+0 −1	65	+0.030 +0.011	140	69	18	+0 −0.043	11	+0 −0.110	58	+0 −0.2	508	508	216	28	600	170	591	135	36	722	612	645	1273	1120
18	KF315L	4-8	315	+0 −1	80	+0.030 +0.011	170	85	22	+0 −0.052	14	+0 −0.110	71	+0 −0.2	508	508	216	28	600	170	591	135	36	722	612	645	1303	1150
19	KF355M	4-8	355	+0 −1	95	+0.035 +0.013	170	100	25	+0 −0.052	14	+0 −0.110	86	+0 −0.2	610	560	254	28	720	140	650	160	45	820	740	635	1440	
20	KF355L	4-8	355	+0 −1	95	+0.035 +0.013	170	100	25	+0 −0.052	14	+0 −0.110	86	+0 −0.2	610	630	254	28	720	140	720	160	45	820	740	635	1570	

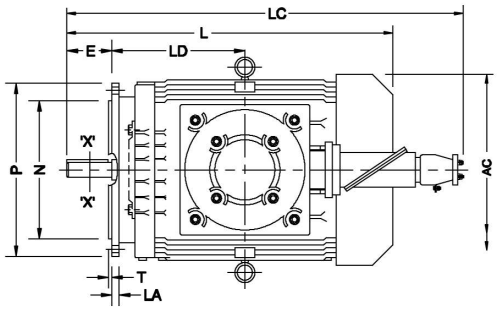
TERMINATION AS PER GAS GR.-I



Foot Mounted

PART NO	FRAME SIZE	NO. OF POLES	H(CEN HEIGHT) NOM	H(CEN HEIGHT) TOL	D-DIA NOM	D-DIA TOL	E SHAFT EXTN	GA	F NOM	F TOL	GD NOM	GD TOL	G NOM	G TOL	FIXING DIMENSIONS A	B	C	K	AB	AA	BB	BA	HA	HD	AC	AD	L
1	KF80	2-8	80	$^{+0}_{-0.5}$	19	$^{+0.009}_{-0.004}$	40	21.5	6	$^{+0}_{-0.030}$	6	$^{+0}_{-0.090}$	15.5	$^{+0}_{-0.2}$	125	100	50	10	156	32	125	32	12	290	182	210	350
2	KF90L	2-8	90	$^{+0}_{-0.5}$	24	$^{+0.009}_{-0.004}$	50	27	8	$^{+0}_{-0.036}$	7	$^{+0}_{-0.090}$	20	$^{+0}_{-0.2}$	140	125	56	10	170	40	155	45	15	317	200	227	360
3	KF100L	2-8	100	$^{+0}_{-0.5}$	28	$^{+0.009}_{-0.004}$	60	31	8	$^{+0}_{-0.036}$	7	$^{+0}_{-0.090}$	24	$^{+0}_{-0.2}$	160	140	63	12	200	38	170	45	14	280	240	265	465
4	KF112M	2-8	112	$^{+0}_{-0.5}$	28	$^{+0.009}_{-0.004}$	60	31	8	$^{+0}_{-0.036}$	7	$^{+0}_{-0.090}$	24	$^{+0}_{-0.2}$	190	140	70	12	230	40	180	50	15	315	255	330	476
5	KF132M	2-8	132	$^{+0}_{-0.5}$	38	$^{+0.018}_{+0.002}$	80	41	10	$^{+0}_{-0.036}$	8	$^{+0}_{-0.090}$	33	$^{+0}_{-0.2}$	216	178	89	12	280	58	218	50	20	350	294	350	500
6	KF160L	2-8	160	$^{+0}_{-0.5}$	42	$^{+0.018}_{+0.002}$	110	45	12	$^{+0}_{-0.043}$	8	$^{+0}_{-0.090}$	37	$^{+0}_{-0.2}$	254	254	108	15	355	80	305	82	30	406	342	400	656
7	KF180L	2-8	180	$^{+0}_{-0.5}$	48	$^{+0.018}_{+0.002}$	110	51.5	14	$^{+0}_{-0.043}$	9	$^{+0}_{-0.090}$	42.5	$^{+0}_{-0.2}$	279	279	121	15	370	80	327	82	30	450	395	425	706
8	KF200L	2-8	200	$^{+0}_{-0.5}$	55	$^{+0.030}_{+0.011}$	110	59	16	$^{+0}_{-0.043}$	10	$^{+0}_{-0.090}$	49	$^{+0}_{-0.2}$	318	305	133	19	390	90	356	88	25	505	450	450	774
9	KF225M	2	225	$^{+0}_{-0.5}$	55	$^{+0.030}_{+0.011}$	110	59	16	$^{+0}_{-0.043}$	10	$^{+0}_{-0.090}$	49	$^{+0}_{-0.2}$	356	311	149	19	448	95	368	95	30	548	515	480	860
10	KF225M	4-8	225	$^{+0}_{-0.5}$	60	$^{+0.030}_{+0.011}$	140	64	18	$^{+0}_{-0.043}$	11	$^{+0}_{-0.110}$	53	$^{+0}_{-0.2}$	356	311	149	19	448	95	368	95	30	548	515	480	890
11	KF250M	2	250	$^{+0}_{-0.5}$	60	$^{+0.030}_{-0.011}$	140	64	18	$^{+0}_{-0.043}$	11	$^{+0}_{-0.110}$	53	$^{+0}_{-0.2}$	406	349	168	24	484	121	420	115	30	590	515	470	966
12	KF250M	4-8	250	$^{+0}_{-0.5}$	65	$^{+0.030}_{+0.011}$	140	69	18	$^{+0}_{-0.043}$	11	$^{+0}_{-0.110}$	58	$^{+0}_{-0.2}$	406	349	168	24	484	121	420	115	30	590	515	470	966
13	KF280M	2	280	$^{+0}_{-1}$	65	$^{+0.030}_{+0.011}$	140	69	18	$^{+0}_{-0.043}$	11	$^{+0}_{-0.110}$	58	$^{+0}_{-0.2}$	457	419	190	24	540	142	500	120	32	660	600	625	1078
14	KF280M	4-8	280	$^{+0}_{-1}$	75	$^{+0.030}_{+0.011}$	140	79.5	20	$^{+0}_{-0.052}$	12	$^{+0}_{-0.110}$	67.5	$^{+0}_{-0.2}$	457	419	190	24	540	142	500	120	32	660	600	625	1078
15	KF315M	2	315	$^{+0}_{-1}$	65	$^{+0.030}_{+0.011}$	140	69	18	$^{+0}_{-0.043}$	11	$^{+0}_{-0.110}$	58	$^{+0}_{-0.2}$	508	457	216	28	600	170	540	135	36	722	612	645	1173
16	KF315M	4-8	315	$^{+0}_{-1}$	80	$^{+0.030}_{+0.011}$	170	85	22	$^{+0}_{-0.052}$	14	$^{+0}_{-0.110}$	71	$^{+0}_{-0.2}$	508	457	216	28	600	170	540	135	36	722	612	645	1203
17	KF315L	2	315	$^{+0}_{-1}$	65	$^{+0.030}_{+0.011}$	140	69	18	$^{+0}_{-0.043}$	11	$^{+0}_{-0.110}$	58	$^{+0}_{-0.2}$	508	508	216	28	600	170	591	135	36	722	612	645	1273
18	KF315L	4-8	315	$^{+0}_{-1}$	80	$^{+0.030}_{+0.011}$	170	85	22	$^{+0}_{-0.052}$	14	$^{+0}_{-0.110}$	71	$^{+0}_{-0.2}$	508	508	216	28	600	170	591	135	36	722	612	645	1303
19	KF355M	4-8	355	$^{+0}_{-1}$	95	$^{+0.035}_{+0.013}$	170	100	25	$^{+0}_{-0.052}$	14	$^{+0}_{-0.110}$	86	$^{+0}_{-0.2}$	610	560	254	28	720	140	650	160	45	820	740	635	1440
20	KF355L	4-8	355	$^{+0}_{-1}$	95	$^{+0.035}_{+0.013}$	170	100	25	$^{+0}_{-0.052}$	14	$^{+0}_{-0.110}$	86	$^{+0}_{-0.2}$	610	630	254	28	720	140	720	160	45	820	740	635	1570

TERMINATION AS PER GAS GR.-IIA & IIB



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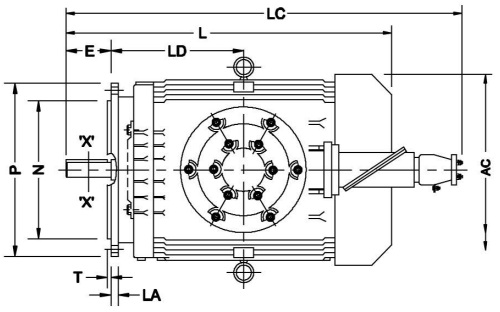
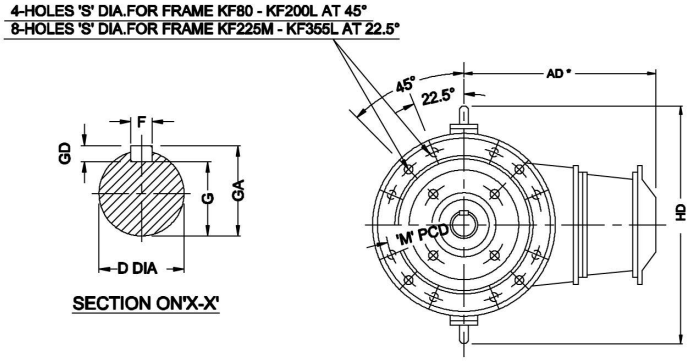


FRAME SIZE KF200 & ABOVE

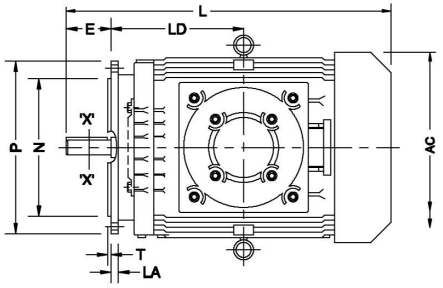


SECTION ON'X-X'

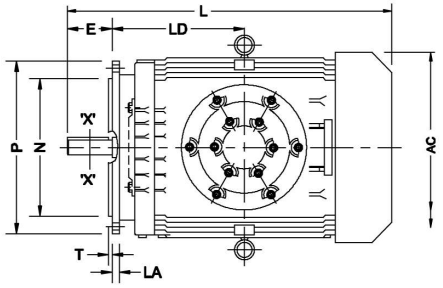
Flange Mounted

PART NO	FRAME SIZE	NO. OF POLES	D-DIA NOM	D-DIA TOL	E SHAFT EXTN	GA	F NOM	F TOL	GD NOM	GD TOL	G NOM	G TOL	AC	AD	L	LA	LC	LD	M	N NOM	N TOL	P	B	T	HD
1	KF80	2-8	19	+0.009 −0.004	40	21.5	6	+0 −0.030	6	+0 −0.090	15.5	+0 −0.2	182	210	385	10	430	152	165	130	+0.014 −0.011	200	12	3.5	
2	KF90L	2-8	24	+0.009 −0.004	50	27	8	+0 −0.036	7	+0 −0.090	20	+0 −0.2	200	227	385	10	442	147	165	130	+0.014 −0.011	200	12	3.5	304
3	KF100L	2-8	28	+0.009 −0.004	60	31	8	+0 −0.036	7	+0 −0.090	24	+0 −0.2	240	265	505	11	495	181	215	180	+0.014 −0.011	250	15	4	360
4	KF112M	2-8	28	+0.009 −0.004	60	31	8	+0 −0.036	7	+0 −0.090	24	+0 −0.2	255	330	495	11	648	196	215	180	+0.014 −0.011	250	15	4	396
5	KF132M	2-8	38	+0.018 +0.002	80	41	10	+0 −0.036	8	+0 −0.090	33	+0 −0.2	294	350	525	12	675	203	265	230	+0.016 −0.013	300	15	4	428
6	KF160L	2-8	42	+0.018 +0.002	110	45	12	+0 −0.043	8	+0 −0.090	37	+0 −0.2	342	400	692	13	772	271	300	250	+0.016 −0.013	350	19	5	472
7	KF180L	2-8	48	+0.018 +0.002	110	51.5	14	+0 −0.043	9	+0 −0.090	42.5	+0 −0.2	395	425	736	13	792	290	300	250	+0.016 −0.013	350	19	5	518
8	KF200L	2-8	55	+0.030 +0.011	110	59	16	+0 −0.043	10	+0 −0.090	49	+0 −0.2	450	450	847	15	880	329	350	300	+0.018 −0.018	400	19	5	604
9	KF225M	2	55	+0.030 +0.011	110	59	16	+0 −0.043	10	+0 −0.090	49	+0 −0.2	515	480	925	16	870	368	400	350	+0.018 −0.018	450	19	5	638
10	KF225M	4-8	60	+0.030 +0.011	140	64	18	+0 −0.043	11	+0 −0.110	53	+0 −0.2	515	480	955	16	900	369	400	350	+0.018 −0.018	450	19	5	638
11	KF250M	2	60	+0.030 −0.011	140	64	18	+0 −0.043	11	+0 −0.110	53	+0 −0.2	515	470	1036	18	1062	412	500	450	+0.020 −0.020	550	19	5	704
12	KF250M	4-8	65	+0.030 +0.011	140	69	18	+0 −0.043	11	+0 −0.110	58	+0 −0.2	515	470	1036	18	1062	412	500	450	+0.020 −0.020	550	19	5	704
13	KF280M	2	65	+0.030 +0.011	140	69	18	+0 −0.043	11	+0 −0.110	58	+0 −0.2	600	625	1120	18	1130	441	500	450	+0.020 −0.020	550	19	5	752
14	KF280M	4-8	75	+0.030 +0.011	140	79.5	20	+0 −0.052	12	+0 −0.110	67.5	+0 −0.2	600	625	1120	18	1130	441	500	450	+0.020 −0.020	550	19	5	752
15	KF315M	2	65	+0.030 +0.011	140	69	18	+0 −0.043	11	+0 −0.110	58	+0 −0.2	612	645	1224	22	1171	495	600	550	+0.022 −0.022	660	24	6	806
16	KF315M	4-8	80	+0.030 +0.011	170	85	22	+0 −0.052	14	+0 −0.110	71	+0 −0.2	612	645	1254	22	1201	495	600	550	+0.022 −0.022	660	24	6	806
17	KF315L	2	65	+0.030 +0.011	140	69	18	+0 −0.043	11	+0 −0.110	58	+0 −0.2	612	645	1325	22	1171	495	600	550	+0.022 −0.022	660	24	6	806
18	KF315L	4-8	80	+0.030 +0.011	170	85	22	+0 −0.052	14	+0 −0.110	71	+0 −0.2	612	645	1355	22	1201	495	600	550	+0.022 −0.022	660	24	6	806
19	KF355M	4-8	95	+0.035 +0.013	170	100	25	+0 −0.052	14	+0 −0.110	84	+0 −0.2	740	635	1453	25		568	740	680	+0.025 −0.025	800	24	6	1260
20	KF355L	4-8	95	+0.035 +0.013	170	100	25	+0 −0.052	14	+0 −0.110	84	+0 −0.2	740	635	1583	25		568	740	680	+0.025 −0.025	800	24	6	1260

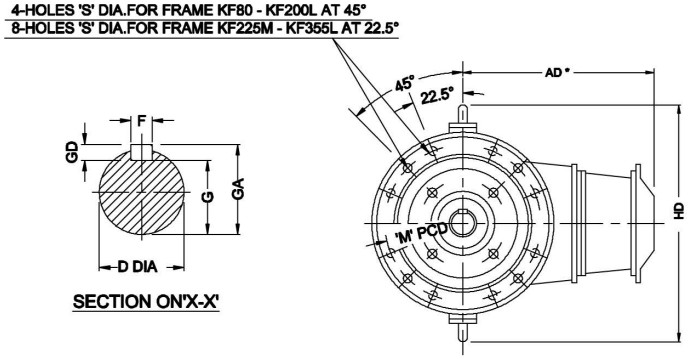
TERMINATION AS PER GAS GR.-I



FRAME SIZE KF80 TO KF180



FRAME SIZE KF200 & ABOVE



SECTION ON'X-X'

Flange Mounted

PART NO	FRAME SIZE	NO. OF POLES	D-DIA NOM	D-DIA TOL	E SHAFT EXTN	GA	F NOM	F TOL	GD NOM	GD TOL	G NOM	G TOL	AC	AD	L	LA	LD	M	N NOM	N TOL	P	S	T	HD
1	KF80	2-8	19	+0.009 −0.004	40	21.5	6	+0 −0.030	6	+0 −0.090	15.5	+0 −0.2	182	210	385	10	152	185	130	+0.014 −0.011	200	12	3.5	
2	KF90L	2-8	24	+0.009 −0.004	50	27	8	+0 −0.036	7	+0 −0.090	20	+0 −0.2	200	227	385	10	147	185	130	+0.014 −0.011	200	12	3.5	304
3	KF100L	2-8	28	+0.009 −0.004	60	31	8	+0 −0.036	7	+0 −0.090	24	+0 −0.2	240	265	505	11	181	215	180	+0.014 −0.011	250	15	4	360
4	KF112M	2-8	28	+0.009 −0.004	60	31	8	+0 −0.036	7	+0 −0.090	24	+0 −0.2	255	330	495	11	196	215	180	+0.014 −0.011	250	15	4	396
5	KF132M	2-8	38	+0.018 +0.002	80	41	10	+0 −0.036	8	+0 −0.090	33	+0 −0.2	294	350	525	12	203	265	230	+0.016 −0.013	300	15	4	428
6	KF160L	2-8	42	+0.018 +0.002	110	45	12	+0 −0.043	8	+0 −0.090	37	+0 −0.2	342	400	692	13	271	300	250	+0.016 −0.013	350	19	5	472
7	KF180L	2-8	48	+0.018 +0.002	110	51.5	14	+0 −0.043	9	+0 −0.090	42.5	+0 −0.2	395	425	736	13	290	300	250	+0.016 −0.013	350	19	5	518
8	KF200L	2-8	55	+0.030 +0.011	110	59	16	+0 −0.043	10	+0 −0.090	49	+0 −0.2	450	450	847	15	329	350	300	+0.016 −0.016	400	19	5	604
9	KF225M	2	55	+0.030 +0.011	110	59	16	+0 −0.043	10	+0 −0.090	49	+0 −0.2	515	480	925	16	368	400	350	+0.018 −0.018	450	19	5	638
10	KF225M	4-8	60	+0.030 +0.011	140	64	18	+0 −0.043	11	+0 −0.110	53	+0 −0.2	515	480	955	16	369	400	350	+0.018 −0.018	450	19	5	638
11	KF250M	2	60	+0.030 −0.011	140	64	18	+0 −0.043	11	+0 −0.110	53	+0 −0.2	515	470	1036	18	412	500	450	+0.020 −0.020	550	19	5	704
12	KF250M	4-8	65	+0.030 +0.011	140	69	18	+0 −0.043	11	+0 −0.110	58	+0 −0.2	515	470	1036	18	412	500	450	+0.020 −0.020	550	19	5	704
13	KF280M	2	65	+0.030 +0.011	140	69	18	+0 −0.043	11	+0 −0.110	58	+0 −0.2	600	625	1120	18	441	500	450	+0.020 −0.020	550	19	5	752
14	KF280M	4-8	75	+0.030 +0.011	140	79.5	20	+0 −0.052	12	+0 −0.110	67.5	+0 −0.2	600	625	1120	18	441	500	450	+0.020 −0.020	550	19	5	752
15	KF315M	2	65	+0.030 +0.011	140	69	18	+0 −0.043	11	+0 −0.110	58	+0 −0.2	612	645	1224	22	495	600	550	+0.022 −0.022	660	24	6	806
16	KF315M	4-8	80	+0.030 +0.011	170	85	22	+0 −0.052	14	+0 −0.110	71	+0 −0.2	612	645	1254	22	495	600	550	+0.022 −0.022	660	24	6	806
17	KF315L	2	65	+0.030 +0.011	140	69	18	+0 −0.043	11	+0 −0.110	58	+0 −0.2	612	645	1325	22	495	600	550	+0.022 −0.022	660	24	6	806
18	KF315L	4-8	80	+0.030 +0.011	170	85	22	+0 −0.052	14	+0 −0.110	71	+0 −0.2	612	645	1355	22	495	600	550	+0.022 −0.022	660	24	6	806
19	KF355M	4-8	95	+0.035 +0.013	170	100	25	+0 −0.052	14	+0 −0.110	84	+0 −0.2	740	635	1453	25	568	740	680	+0.025 −0.025	800	24	6	1260
20	KF355L	4-8	95	+0.035 +0.013	170	100	25	+0 −0.052	14	+0 −0.110	84	+0 −0.2	740	635	1583	25	568	740	680	+0.025 −0.025	800	24	6	1260

TERMINATION AS PER GAS GR.-IIA & IIB

NOTES

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