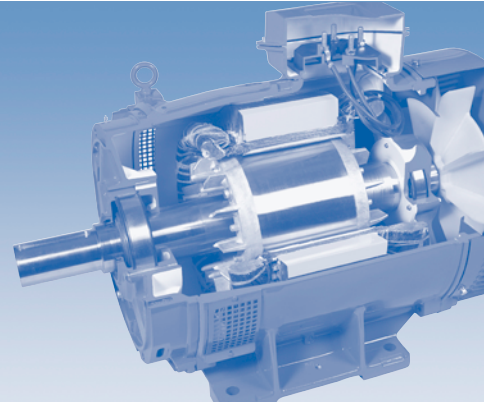


Drip proof motors IP23



Frame sizes CF180M - K-CF315M

BROOK
CROMPTON

Drip proof cast iron motors IP23

Introduction

The drip proof range has been designed to optimise the customer benefits of a high power to weight ratio. Wherever possible the technology developed for the 'W' TEFV range has been incorporated.

The drip proof range is an ideal option where weight, size or cost per kW output are important. Typical applications are compressors, fire pumps and marine duties, etc.

Drip proof motors are suitable for relatively clean environments, and locations where a degree of protection is already afforded to the motor, eg pump houses.

All motors are IP23 enclosure as standard. This means that motors are protected against the harmful ingress of solid and foreign objects, and against the harmful ingress of water (spray) falling at 60° to the vertical shaft mounting.

Electrical information

The K-CF range is designed for either spot voltage 400 V class B rise or 380-415 V class

F rise operation.

The speed torque curve is designed to provide 70% locked rotor torque in star.

Service factors of 1.1 to 1.15 are available.

Trickle impregnation ensures a very rigid winding, suitable for arduous starting conditions.

Mechanical information

The drip proof range utilises cast iron integral foot frames, endshields and terminal boxes. The fan cover is steel.

All rotors are die cast and reduced balanced. Where dual lifting points are fitted, it allows a horizontal lift.

The IP55 terminal box is mounted on top as standard but can be manufactured as right or left hand side position if specified at the time of order.

Features
IP23 enclosure
Top mounted terminal box (225-315 frames) (RHS and LHS options are available)
Compressor speed torque curve
Class F insulation
400 V ± 5%, class B temperature rise
380-415 V, class F rise
IP55 terminal box
4 x 90° cable entry
Undrilled gland plate
R grade balance
Flange adaptor rings (225-315 frames)
Dual lifting points (225-315 frames)
Ball/ball C3 bearings
Medium series drive end bearing
Esso Unirex N3 grease
Through greasing with relief at drive end
Through greasing at non-drive end



Frame size K-CF250M

Performance data

3000 min⁻¹ (2 pole)

Rated power		Full load speed in revolutions per minute		Frame reference and size	Full load current at rated voltage			Efficiency	Power factor	Full load torque	Direct on line starting torque ratio	Direct on line starting current ratio	Direct on line pull out torque ratio	Star delta starting torque ratio	Star delta starting current ratio	Direct on line pull up torque	Star delta pull up torque	Rotor inertia Wk^2
P_N		n			I_N													
kW	hp	min^{-1}	Type		380 V A	400 V A	415 V A	$\frac{1.0 P_N}{0.75 P_N}$ $\frac{1.0 P_N}{0.75 P_N}$ $\frac{0.5 P_N}{0.5 P_N}$	$\cos \phi$ $\frac{1.0 P_N}{0.75 P_N}$ $\frac{1.0 P_N}{0.75 P_N}$ $\frac{0.5 P_N}{0.5 P_N}$	M_N Nm	$\frac{M_A}{M_N}$	$\frac{I_A}{I_N}$	$\frac{M_K}{M_N}$	$\frac{M_A}{M_N}$ Y	$\frac{I_A}{I_N}$ Y	$\frac{M_S}{M_N}$	$\frac{M_S}{M_N}$ Y	J kgm ²
30	40	2935	CF180MN		62	59	57	$\left\{ \begin{matrix} 87.0 & 0.84 \\ 86.0 & 0.78 \\ 83.0 & 0.67 \end{matrix} \right\}$		97.6	2.25	7.00	2.80	0.70	2.20	1.55	0.50	0.131
37	50	2930	CF180LN		74	71	68	$\left\{ \begin{matrix} 88.0 & 0.86 \\ 88.0 & 0.82 \\ 86.0 & 0.73 \end{matrix} \right\}$		121	2.1	6.70	2.60	0.65	2.10	1.40	0.45	0.151
45	60	2936	CF200MN		89	85	82	$\left\{ \begin{matrix} 89.0 & 0.86 \\ 89.0 & 0.81 \\ 87.0 & 0.70 \end{matrix} \right\}$		146	2.5	7.50	3.10	0.78	2.30	1.70	0.55	0.182
55	75	2935	CF200LN		106	100	97	$\left\{ \begin{matrix} 90.0 & 0.88 \\ 90.0 & 0.84 \\ 88.0 & 0.76 \end{matrix} \right\}$		179	2.25	7.60	2.80	0.70	2.40	1.50	0.50	0.222
75	100	2935	K-CF225MN		142	135	130	$\left\{ \begin{matrix} 91.0 & 0.88 \\ 91.0 & 0.84 \\ 89.5 & 0.76 \end{matrix} \right\}$		244	2.40	7.30	2.90	0.75	2.30	2.15	0.65	0.38
90	125	2935	K-CF250SN		170	162	156	$\left\{ \begin{matrix} 91.3 & 0.88 \\ 91.3 & 0.84 \\ 90.0 & 0.78 \end{matrix} \right\}$		293	2.20	6.60	2.60	0.65	2.00	2.00	0.60	0.47
110	150	2940	K-CF250MN		206	196	188	$\left\{ \begin{matrix} 92.0 & 0.88 \\ 92.0 & 0.84 \\ 90.5 & 0.78 \end{matrix} \right\}$		357	2.50	7.30	3.00	0.75	2.20	2.30	0.70	0.57
132	175	2960	K-CF280SN		253	240	231	$\left\{ \begin{matrix} 92.5 & 0.86 \\ 92.0 & 0.82 \\ 90.0 & 0.73 \end{matrix} \right\}$		426	2.20	6.60	2.70	0.70	2.00	2.00	0.65	0.93
150	200	2950	K-CF280SN		284	270	260	$\left\{ \begin{matrix} 93.3 & 0.86 \\ 93.0 & 0.81 \\ 91.0 & 0.71 \end{matrix} \right\}$		486	1.90	6.00	2.40	0.65	1.90	1.80	0.55	0.93
185	250	2960	K-CF280MN		342	325	313	$\left\{ \begin{matrix} 93.3 & 0.88 \\ 93.3 & 0.85 \\ 92.0 & 0.77 \end{matrix} \right\}$		597	2.30	6.80	2.80	0.70	2.10	2.10	0.60	1.20
220	295	2965	K-CF315SN		406	386	372	$\left\{ \begin{matrix} 93.5 & 0.88 \\ 93.3 & 0.85 \\ 91.3 & 0.77 \end{matrix} \right\}$		709	2.10	6.50	2.80	0.65	2.00	1.90	0.60	1.80
265	355	2965	K-CF315MN		487	463	446	$\left\{ \begin{matrix} 93.8 & 0.88 \\ 93.5 & 0.85 \\ 91.5 & 0.77 \end{matrix} \right\}$		853	2.20	6.50	3.00	0.70	2.00	1.90	0.60	2.10

Performance data

1500 min⁻¹ (4 pole)

Rated power Full load speed in revolutions per minute Frame reference and size				Full load current at rated voltage			Efficiency	Power factor	Full load torque	Direct on line starting torque ratio	Direct on line starting current ratio	Direct on line pull out torque ratio	Star delta starting torque ratio	Star delta starting current ratio	Direct on line pull up torque	Star delta pull up torque	Rotor inertia Wk^2
P_N		n	Type	I_N			η $\cos \varnothing$		M_N	$\frac{M_A}{M_N}$	$\frac{I_A}{I_N}$	$\frac{M_K}{M_N}$	$\frac{M_A}{M_N}$ Y	$\frac{I_A}{I_N}$ Y	$\frac{M_S}{M_N}$	$\frac{M_S}{M_N}$ Y	J kgm²
kW	hp			380 V A	400 V A	415 V A	$1.0 P_N$ $0.75 P_N$ $0.5 P_N$	$1.0 P_N$ $0.75 P_N$ $0.5 P_N$									
22	30	1460	CF180MN	46	44	42	88.0 88.0 87.0	0.82 0.77 0.66	144	2.10	5.50	2.25	0.65	1.70	1.7	0.40	0.323
30	40	1460	CF180LN	61	58	56	89.5 89.5 89.0	0.83 0.79 0.69	196	2.20	5.50	2.40	0.70	1.70	1.35	0.50	0.353
37	50	1460	CF200MN	77	73	71	90.0 90.0 89.0	0.81 0.76 0.65	242	2.20	5.60	2.40	0.70	1.75	1.35	0.45	0.434
45	60	1460	CF200LN	91	86	83	90.5 91.0 90.0	0.83 0.80 0.70	294	2.20	5.60	2.40	0.66	1.75	1.35	0.45	0.658
55	75	1465	K-CF225MN	108	102	98	91.5 91.5 90.0	0.85 0.80 0.71	358	2.00	6.00	2.50	0.60	1.90	1.70	0.50	0.51
75	100	1465	K-CF250SN	149	142	137	92.0 92.3 91.5	0.83 0.80 0.71	489	2.40	6.60	2.50	0.70	2.00	2.00	0.60	0.84
90	125	1465	K-CF250MN	178	169	163	92.5 92.7 92.0	0.83 0.80 0.71	587	2.40	6.60	2.50	0.70	2.00	2.00	0.60	1.00
110	150	1475	K-CF280SN	211	201	193	92.7 93.0 92.5	0.85 0.83 0.74	712	2.20	6.60	2.60	0.65	2.00	1.90	0.55	1.50
132	175	1480	K-CF280MN	251	239	230	93.6 93.5 92.7	0.85 0.82 0.73	852	2.30	8.00	3.20	0.80	2.50	2.70	0.68	1.95
150	200	1475	K-CF280MN	283	269	259	93.5 93.7 93.3	0.86 0.84 0.76	971	2.40	7.00	2.80	0.70	2.10	2.00	0.60	1.95
185	250	1475	K-CF315SN	352	334	322	94.0 94.0 93.5	0.85 0.83 0.74	1198	2.20	7.00	2.60	0.65	2.10	1.90	0.55	3.30
220	295	1475	K-CF315MN	413	392	378	94.2 94.2 93.8	0.86 0.84 0.76	1424	2.30	7.00	2.70	0.70	2.10	2.00	0.60	3.90
250	355	1475	K-CF315MP	468	445	429	94.2 94.2 93.8	0.86 0.84 0.76	1618	2.20	7.00	2.60	0.65	2.10	1.90	0.55	4.30

Performance data
1000 min⁻¹ (6 pole)

Rated power		Full load speed in revolutions per minute	Frame reference and size	Full load current at rated voltage			Efficiency	Power factor	Full load torque	Direct on line starting torque ratio	Direct on line starting current ratio	Direct on line pull out torque ratio	Star delta starting torque ratio	Star delta starting current ratio	Direct on line pull up torque	Star delta pull up torque	Rotor inertia Wk^2
P_N				I_N													
kW	hp	n min^{-1}	Type	380 V A	400 V A	415 V A	$1.0 P_N$ $0.75 P_N$ $0.5 P_N$	$1.0 P_N$ $0.75 P_N$ $0.5 P_N$	Nm								
15	20	963	CF180MN	33	31	29.8	$\left\{ \begin{matrix} 86.5 & 0.81 \\ 87.0 & 0.75 \\ 86.0 & 0.65 \end{matrix} \right\}$		149	1.75	5.20	2.20	0.55	1.60	1.20	0.40	0.304
18.5	25	965	CF108LN	39	37	36	$\left\{ \begin{matrix} 88.0 & 0.81 \\ 88.5 & 0.76 \\ 87.0 & 0.65 \end{matrix} \right\}$		183	1.85	5.60	2.40	0.58	1.75	1.30	0.40	0.380
22	30	965	CF200MN	46	44	42	$\left\{ \begin{matrix} 88.5 & 0.82 \\ 89.0 & 0.77 \\ 88.0 & 0.65 \end{matrix} \right\}$		218	1.90	5.70	2.40	0.60	1.80	1.30	0.40	0.455
30	40	964	CF200LN	62	59	47	$\left\{ \begin{matrix} 89.0 & 0.82 \\ 89.5 & 0.78 \\ 89.0 & 0.67 \end{matrix} \right\}$		297	1.75	5.60	2.30	0.55	1.75	1.20	0.40	0.544
37	50	975	K-CF225MN	77	73	71	$\left\{ \begin{matrix} 90.0 & 0.81 \\ 90.0 & 0.76 \\ 89.0 & 0.66 \end{matrix} \right\}$		362	2.30	7.00	2.60	0.65	2.20	2.10	0.60	0.93
45	60	980	K-CF250SN	94	89	85	$\left\{ \begin{matrix} 90.5 & 0.81 \\ 91.0 & 0.76 \\ 90.0 & 0.66 \end{matrix} \right\}$		438	2.30	6.50	2.50	0.65	2.00	2.10	0.60	1.36
55	75	980	K-CF250MN	110	105	101	$\left\{ \begin{matrix} 91.0 & 0.83 \\ 91.0 & 0.79 \\ 90.0 & 0.70 \end{matrix} \right\}$		536	2.30	6.50	2.50	0.65	2.00	2.10	0.60	1.63
75	100	985	K-CF280SN	147	140	135	$\left\{ \begin{matrix} 92.0 & 0.84 \\ 92.0 & 0.80 \\ 91.0 & 0.72 \end{matrix} \right\}$		727	2.30	6.50	2.60	0.65	2.10	2.10	0.60	3.00
90	125	985	K-CF280MN	176	167	161	$\left\{ \begin{matrix} 92.5 & 0.84 \\ 92.5 & 0.80 \\ 91.5 & 0.72 \end{matrix} \right\}$		872	2.30	6.50	2.60	0.65	2.10	2.10	0.60	3.85
110	150	985	K-CF315SN	212	201	194	$\left\{ \begin{matrix} 93.0 & 0.85 \\ 93.0 & 0.81 \\ 92.0 & 0.73 \end{matrix} \right\}$		1066	2.10	6.50	2.70	0.60	2.10	2.00	0.55	3.95
132	175	985	K-CF315MJ	253	240	231	$\left\{ \begin{matrix} 93.5 & 0.85 \\ 93.5 & 0.81 \\ 92.5 & 0.73 \end{matrix} \right\}$		1280	2.10	6.50	2.70	0.60	2.10	2.00	0.55	4.50
150	200	985	K-CF315MN	285	271	261	$\left\{ \begin{matrix} 94.0 & 0.85 \\ 94.0 & 0.81 \\ 93.0 & 0.73 \end{matrix} \right\}$		1454	2.10	6.50	2.70	0.60	2.10	2.00	0.55	4.90

Performance data
750 min⁻¹ (8 pole)

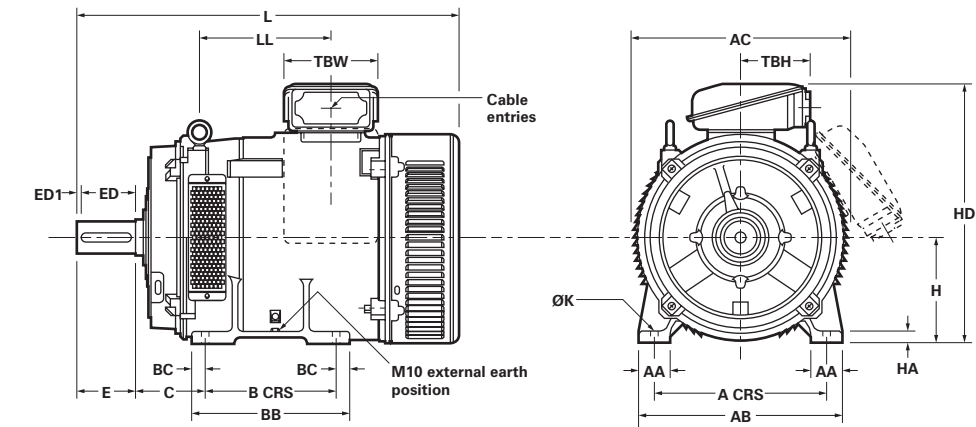
Rated power		Full load speed in revolutions per minute	Frame reference and size	Full load current at rated voltage			Efficiency	Power factor	Full load torque	Direct on line starting torque ratio	Direct on line starting current ratio	Direct on line pull out torque ratio	Star delta starting torque ratio	Star delta starting current ratio	Direct on line pull up torque	Star delta pull up torque	Rotor inertia
P_N				I_N	η	$\cos \varnothing$											
kW	hp	n min^{-1}	Type	380 V A	400 V A	415 V A	$1.0 P_N$ $0.75 P_N$ $0.5 P_N$	$1.0 P_N$ $0.75 P_N$ $0.5 P_N$	Nm	$\bar{M}_N$	$\bar{I}_N$	$\bar{M}_N$	$\bar{M}_N$ Y	$\bar{I}_N$ Y	$\bar{M}_N$	$\bar{M}_N$ Y	kgm^2
11	15	717	CF180MN	27.3	25.9	25	$\left\{ \begin{matrix} 84.0 \\ 85.0 \\ 84.0 \end{matrix} \right\}$	$\left\{ \begin{matrix} 0.73 \\ 0.66 \\ 0.54 \end{matrix} \right\}$	146	1.50	4.20	2.25	0.47	1.30	0.90	0.30	0.303
15	20	720	CF180LN	37	35	34	$\left\{ \begin{matrix} 87.0 \\ 87.0 \\ 86.0 \end{matrix} \right\}$	$\left\{ \begin{matrix} 0.71 \\ 0.65 \\ 0.52 \end{matrix} \right\}$	199	1.80	4.80	2.80	0.55	1.50	1.10	0.35	0.380
18.5	25	718	CF200MN	44	41	40	$\left\{ \begin{matrix} 87.0 \\ 88.0 \\ 87.5 \end{matrix} \right\}$	$\left\{ \begin{matrix} 0.74 \\ 0.68 \\ 0.56 \end{matrix} \right\}$	246	1.50	4.50	2.25	0.45	1.40	0.90	0.30	0.455
22	30	717	CF200LN	51	48	46	$\left\{ \begin{matrix} 87.0 \\ 88.5 \\ 88.0 \end{matrix} \right\}$	$\left\{ \begin{matrix} 0.76 \\ 0.71 \\ 0.60 \end{matrix} \right\}$	293	1.50	4.20	2.25	0.45	1.30	0.90	0.30	0.544
30	40	725	K-CF225MN	70	67	64	$\left\{ \begin{matrix} 90.0 \\ 90.0 \\ 87.0 \end{matrix} \right\}$	$\left\{ \begin{matrix} 0.72 \\ 0.66 \\ 0.55 \end{matrix} \right\}$	395	2.00	5.50	2.20	0.60	1.60	1.80	0.55	0.93
37	50	730	K-CF250SN	86	82	79	$\left\{ \begin{matrix} 90.0 \\ 90.0 \\ 88.0 \end{matrix} \right\}$	$\left\{ \begin{matrix} 0.72 \\ 0.66 \\ 0.55 \end{matrix} \right\}$	484	2.00	5.50	2.00	0.60	1.60	1.80	0.55	1.36
45	60	730	K-CF250MN	103	98	94	$\left\{ \begin{matrix} 90.5 \\ 90.5 \\ 89.0 \end{matrix} \right\}$	$\left\{ \begin{matrix} 0.73 \\ 0.68 \\ 0.57 \end{matrix} \right\}$	589	2.00	5.50	2.00	0.60	1.60	1.80	0.55	1.63
55	75	735	K-CF280SN	126	120	116	$\left\{ \begin{matrix} 91.0 \\ 91.0 \\ 90.0 \end{matrix} \right\}$	$\left\{ \begin{matrix} 0.73 \\ 0.68 \\ 0.57 \end{matrix} \right\}$	715	2.30	5.80	2.30	0.65	1.80	2.00	0.55	2.80
75	100	735	K-CF280MN	171	162	156	$\left\{ \begin{matrix} 91.5 \\ 91.5 \\ 90.5 \end{matrix} \right\}$	$\left\{ \begin{matrix} 0.73 \\ 0.68 \\ 0.57 \end{matrix} \right\}$	974	2.30	5.80	2.30	0.65	1.80	2.00	0.55	3.85
90	125	740	K-CF315SN	202	191	185	$\left\{ \begin{matrix} 92.0 \\ 92.0 \\ 91.0 \end{matrix} \right\}$	$\left\{ \begin{matrix} 0.74 \\ 0.68 \\ 0.57 \end{matrix} \right\}$	1161	2.30	5.80	2.30	0.65	1.80	2.00	0.55	4.00
110	150	740	K-CF315MN	244	232	224	$\left\{ \begin{matrix} 92.5 \\ 92.5 \\ 91.5 \end{matrix} \right\}$	$\left\{ \begin{matrix} 0.74 \\ 0.68 \\ 0.57 \end{matrix} \right\}$	1419	2.30	5.80	2.30	0.65	1.80	2.00	0.55	4.80

Dimensions

Foot and flange mounting

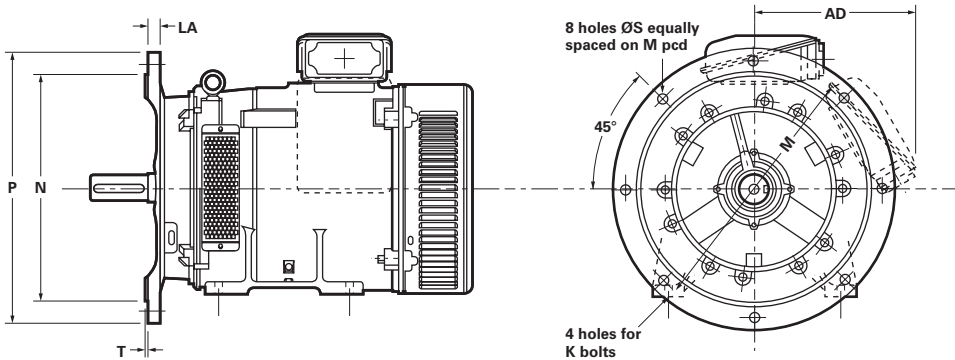
IM B3
IM 1001

Mounting options



IM B5/IM B35
IM 3001/IM 2001

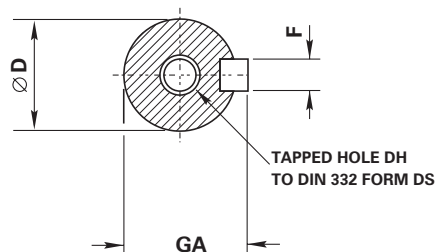
Mounting options



IM B3, IM B5, IM B53																		
Type	* 2 pole motors only	General																
		A	B	C	H	AB	BB	K	L	AA	AC	AD	BC	HA	HD	LL	TBH	TBW
180M		279	241	121	180	356	299	M15	645	75	422	305	29	15	434	29	80	175
180L		279	279	121	180	356	337	M15	683	75	422	305	29	15	434	29	80	175
200M		318	267	133	200	380	317	M19	715	75	440	320	25	22	475	28	80	175
200L		318	305	133	200	380	355	M19	750	75	440	320	25	22	475	28	80	175
225S		356	286	149	225	425	375	M16	900	70	454	344	32	25	570	333	161	220
225M		356	311	149	225	425	375	M16	900	70	454	344	32	25	570	333	161	220
250S		406	311	168	250	480	372	M20	915	75	511	395	30	28	620	294	161	220
250M	*	406	349	168	250	480	410	M20	955	75	511	395	30	28	620	334	161	220
												500			700		255.5	295
280S	*	457	368	190	280	540	439	M20	1015	85	568	510	36	35	745	323	255.5	295
									985									
280M	*	457	419	190	280	540	490	M20	1075	85	568	510	36	35	745	383	255.5	295
									1045									
315S	*	508	406	216	315	595	486	M24	1140	95	634	590	40	38	850	403	327	332
									1110									
315M	*	508	457	216	315	595	537	M24	1180	95	634	590	40	38	850	443	327	332
									1150									

IM B3, IM B5/IM B35								
Type	* 2 pole motors only	Shaft D	E	F	G	ED	ED1	DH
180M		55	110	16	48.8	80	-	M20 x 42
180L		55	110	16	48.8	80	-	M20 x 42
200M		60	140	18	53	110	-	M20 x 42
200L		60	140	18	53	110	-	M20 x 42
225S	*	65	140	18	58	100	5	M20 x 42
		60	140	18	53	100	5	M20 x 42
225M	*	65	140	18	58	100	5	M20 x 42
		60	140	18	53	100	5	M20 x 42
250S	*	75	140	20	67.5	125	5	M20 x 42
		65	140	18	58	125	5	M20 x 42
250M	*	75	140	20	67.5	125	5	M20 x 42
		65	140	18	58	125	5	M20 x 42
280S	*	85	170	22	76	160	5	M20 x 42
		65	140	18	58	125	5	M20 x 42
280M	*	85	170	22	76	160	5	M20 x 42
		65	140	18	58	125	5	M20 x 42
315S	*	90	170	25	81	160	5	M24 x 50
		70	140	20	62.5	125	5	M20 x 42
315M	*	90	170	25	81	160	5	M24 x 50
		70	140	20	62.5	125	5	M20 x 42

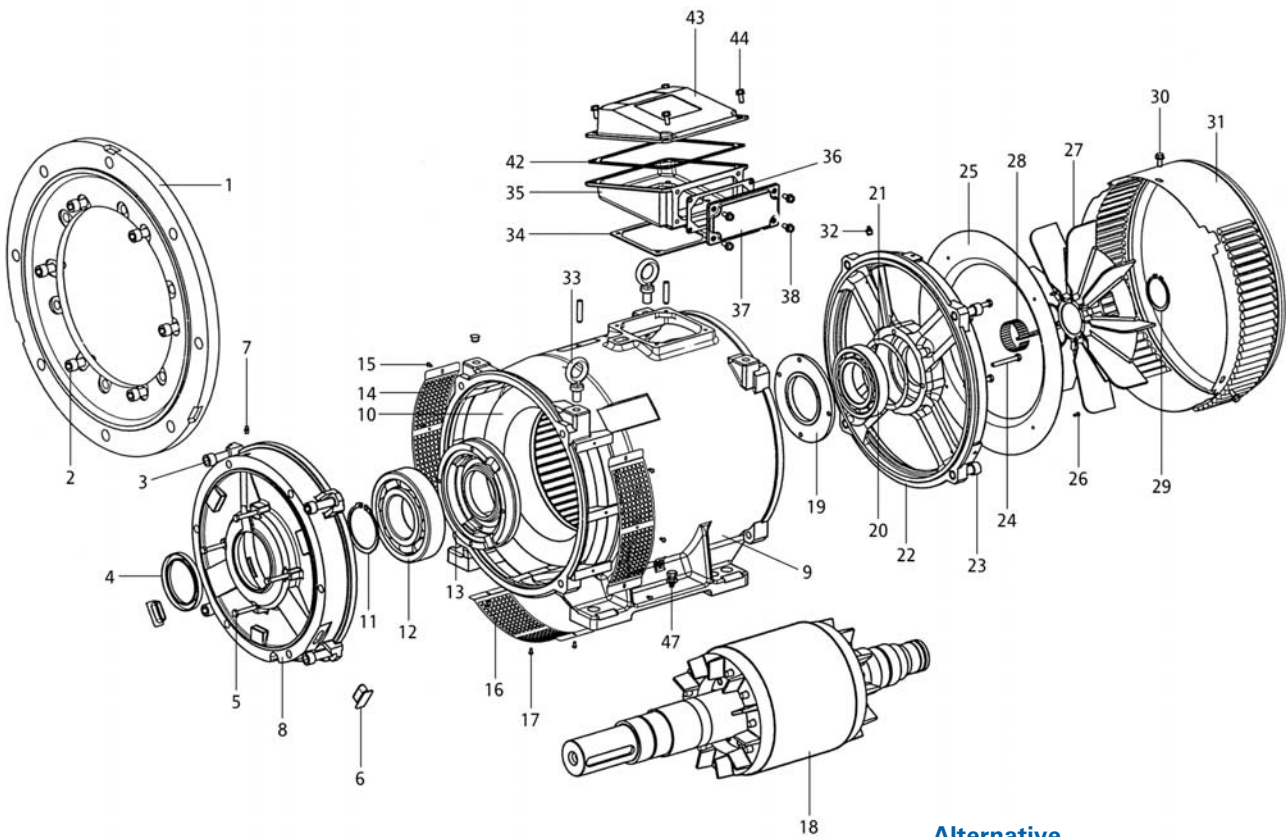
Shaft	
Diameter	Limits
55 to 75	+0.030
	+0.011
85 to 90	+0.035
	+0.013



IM B5, IM B35 mounting						
Type	M	N	P	S	T	LA
180M	350	300	400	19	5	19
180L	350	300	400	19	5	19
200M	400	350	450	19	5	20
200L	400	350	450	19	5	20
225S	500	450	550	19	5	25
225M	500	450	550	19	5	25
250S	600	550	660	24	6	29
250M	600	550	660	24	6	29
280S	600	550	660	24	6	29
280M	600	550	660	24	6	29
315S	740	680	800	24	6	29
315M	740	680	800	24	6	29

IM B5, IM B35 N spigot	
Diameter	Limits
350	+0.018
	-0.018
450	+0.000
	-0.097
550	+0.000
	-0.110
680	+0.000
	-0.125

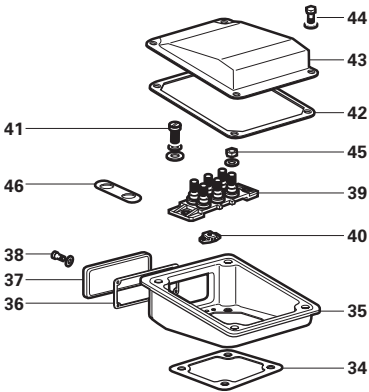
Typical construction



Alternative
terminal box
arrangement:
Frame sizes
K-CF280M to
K-CF315M

Ref	Part description
1	Flange adapter (optional)
2	Fixing bolts (optional)
3	Endshield fixing bolt
4	Drive end oil seal
5	Drive end bearing cap fixing bolt
6	Grease exit plug
7	Grease nipple
8	Drive end endshield
9	Stator frame
10	Stator core pack
11	Drive end bearing circlip
12	Drive end bearing
13	Drive end inner bearing cap
14	Drive end side vent grid
15	Vent grid fixing rivets
16	Drive end bottom vent grid
17	Vent grid fixing rivets
18	Rotor assembly
19	Non-drive end inner bearing cap
20	Non-drive end bearing
21	Non-drive end preload washer
22	Non-drive end endshield
23	Endshield fixing bolts
24	Inner bearing cap fixing screws

Ref	Part description
25	Fan baffle
26	Fan baffle fixing rivets
27	Fan
28	Tolerance ring
29	Fan circlip
30	Fan cover fixing screws and washers
31	Fan cover
32	Grease nipple
33	Eyebolt
34	Terminal box to frame gasket
35	Terminal box
36	Gland plate gasket
37	Gland plate
38	Gland plate fixing bolt
39	Main terminal block
40	Auxiliary terminal block
41	Block fixing bolt and washer
42	Terminal box lid gasket
43	Terminal box lid
44	Terminal box lid fixing bolts
45	Terminal lock nuts
46	Terminal link
47	External earth bolt and washers



Notes

[illegible]

Rotating Electrical Machines

Every care has been taken to ensure the accuracy of the information contained in this publication, but, due to a policy of continuous development and improvement the right is reserved to supply products which may differ slightly from those illustrated and described in this publication

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BROOK CROMPTON

Brook Crompton
St Thomas' Road Huddersfield
West Yorkshire HD1 3LJ UK
Tel: +44 (0) 1484 557200
Fax: +44 (0) 1484 557201
E-mail: csc@brookcrompton.com
Internet: www.brookcrompton.com

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