

TMEiC
We drive industry

**Cast Iron Frame Construction
Low and Medium Voltage Motors**

21-FII Series



Meets World Wide 21-FII Series



Technical Features / Benefits:

- High performance reduces cost of ownership
- Compact size reduces cost of installation
- New casting construction provides low noise and lower vibration
- High quality insulation system provides mechanical rigidity and electrical reliability

1 Highly-Reliable Aluminum Die Cast Rotor

Expanded range of applications for an aluminum die cast rotor. This rotor construction has resulted in greater capacity, high reliability, high frequent starting duty and lower rotor inertia.



2 Expansion of cast iron fin frame

Improved ventilation flow and higher efficiency result in greater frame size capacity.

3 Improved bearing maintenance

Improved bearing housing construction and a longer bearing re-greasing interval lengthened to twice that of our other series motors result in less maintenance and improved performance.

Motors with ball or roller bearings are equipped with grease supply nipple discharge devices for easy grease exchange.

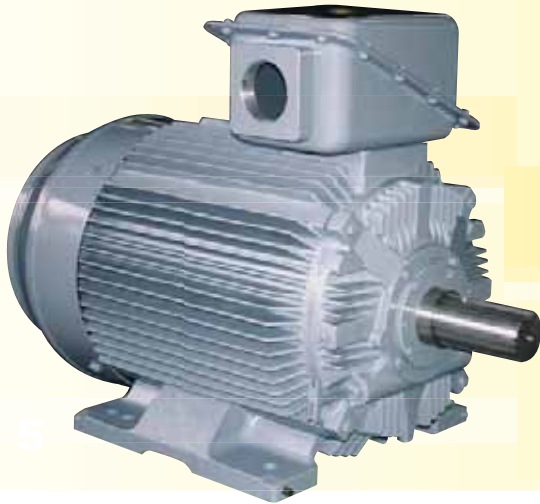
Re-greasing can be done easily and safely while the motor is operating; grease inlet nipples are located on the side of the bearing housing of the frame; grease is discharged into the cassette. The pull-out direction of the grease discharging device (cassette) can be changed if necessary.



4 Main terminal box

The main terminal box is located on top of the motor frame; cables can be connected at every 90° or 180° angle. Sufficient space for easy incoming cable connection is provided. The terminal box can be mounted on a slant (left and right) when required for side mount cable entry.

Market Needs

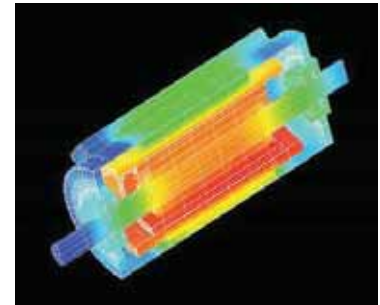


Output	37kW(50HP)~1400kW(1850HP)
Poles	2P*~10P
Voltage	up to 6600V
Enclosure	TEFC
Frame size	250~500(IEC basis)
Thermal class	F

* 2 pole motor is not applied to more than 400 frame size.

5 Highly efficient ventilation and cooling construction

Using three-dimensional thermal conduction analysis tools, efficiency and ratings have been optimized for each frame size. This analysis enables us to provide a compact size motor with higher efficiency.



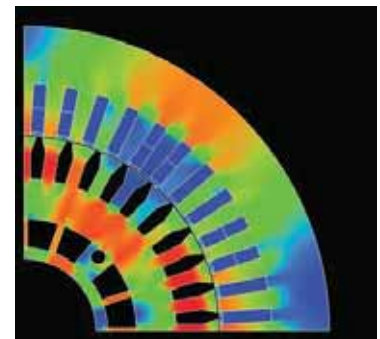
Three dimensional thermal conduction analysis

6 Compact size

Improved cooling reduces the machine size. 21-FII series motors are easy to install and transport, with a small footprint.

7 Quiet operation

Quiet operation is achieved through improved cooling and magnetic field analysis. We provide low noise and low-vibration machines.



Magnetic field analysis

8 Quality-certified by third parties

The 21-FII series motors are manufactured to meet ISO9001 and ISO14001, and have been certified by third parties such as LLOYD's, Baseefa, CSA, etc.

9 Meets international standards

Meets international standards such as IEC, NEMA, BS, AS, etc. Degree of protection is available for IP44 to IP55.

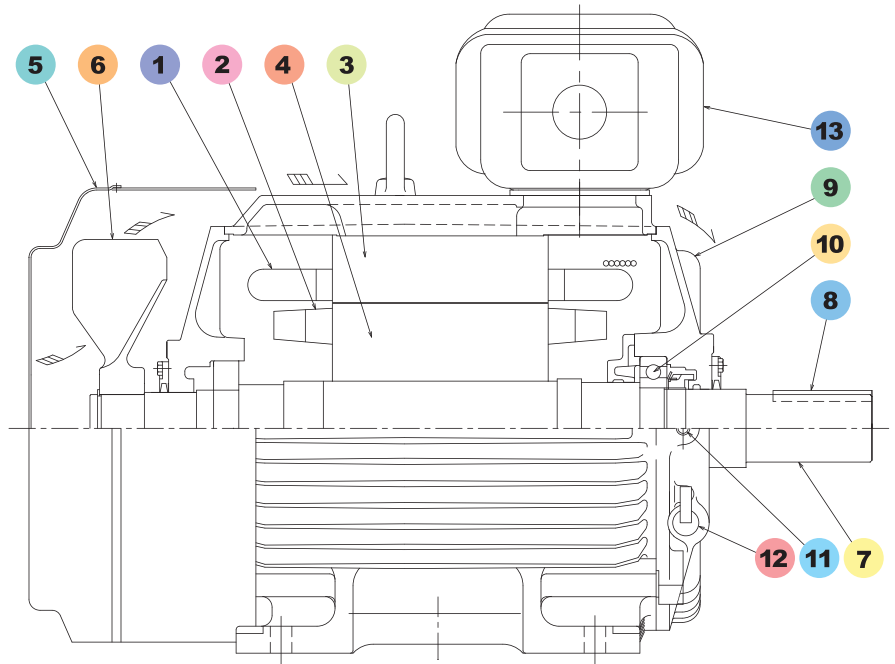


GENERAL CONSTRUCTION

Frame size 250SA~280MD

Part No. Part Name

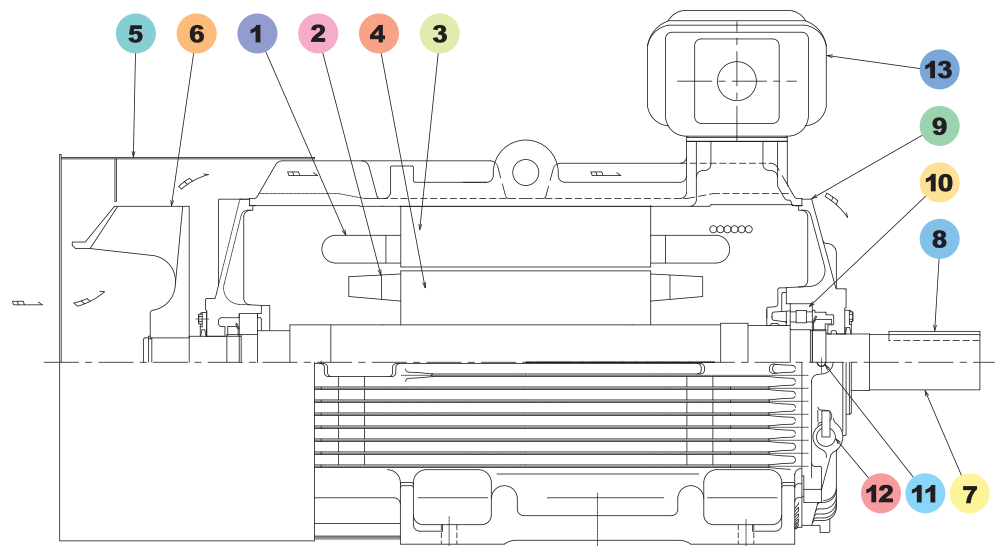
- 1 — Stator coil
- 2 — End ring
- 3 — Stator core
- 4 — Rotor core
- 5 — Fan cover
- 6 — External fan
- 7 — Shaft
- 8 — Shaft end key
- 9 — Bearing bracket
- 10 — Bearing
- 11 — Grease inlet
- 12 — Grease outlet
- 13 — Terminal box



Frame size 280L

Part No. Part Name

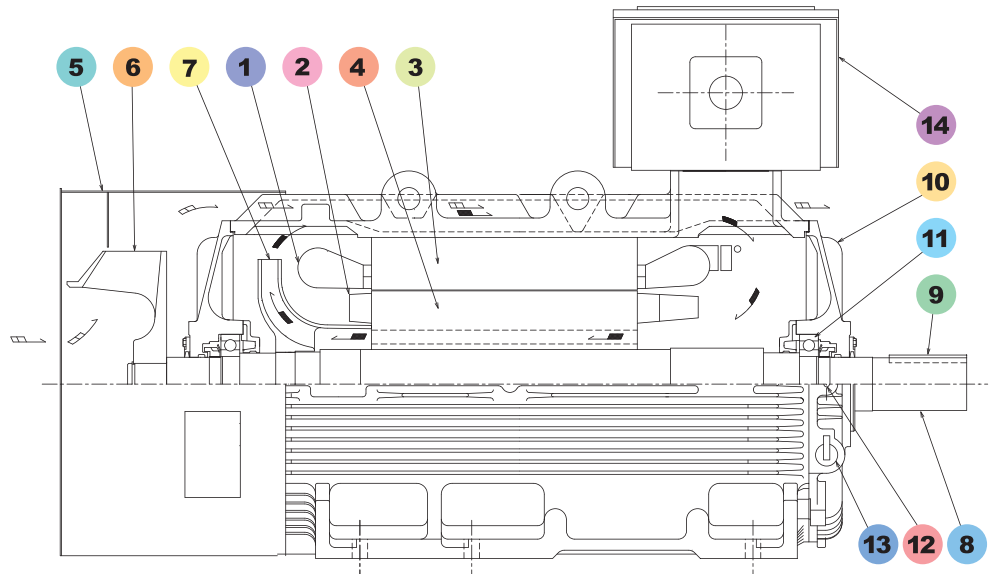
- 1 — Stator coil
- 2 — End ring
- 3 — Stator core
- 4 — Rotor core
- 5 — Fan cover
- 6 — External fan
- 7 — Shaft
- 8 — Shaft end key
- 9 — Bearing bracket
- 10 — Bearing
- 11 — Grease inlet
- 12 — Grease outlet
- 13 — Terminal box



Frame size 315H~450

Part No. Part Name

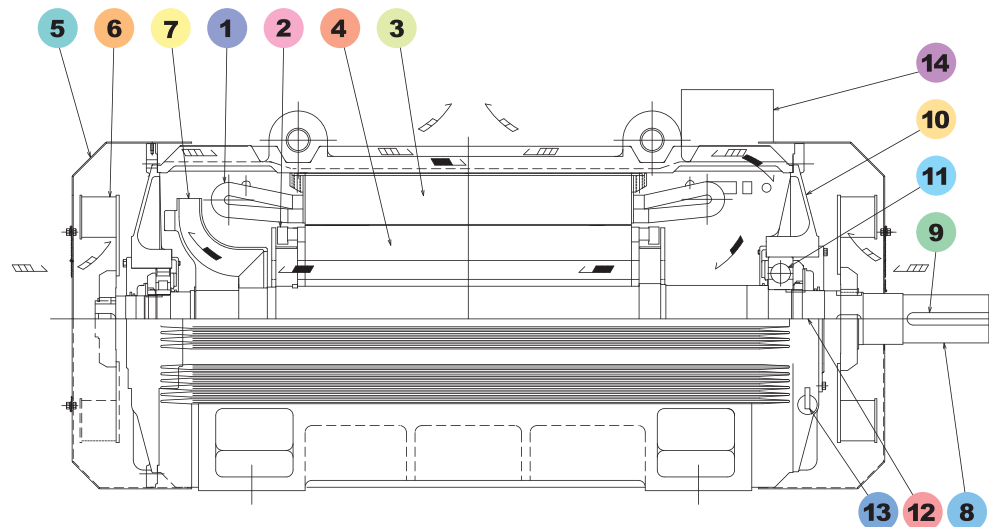
- 1 — Stator coil
- 2 — End ring
- 3 — Stator core
- 4 — Rotor core
- 5 — Fan cover
- 6 — External fan
- 7 — Internal fan
- 8 — Shaft
- 9 — Shaft end key
- 10 — Bearing bracket
- 11 — Bearing
- 12 — Grease inlet
- 13 — Grease outlet
- 14 — Terminal box



Frame size 500

Part No. Part Name

- 1 — Stator coil
- 2 — Short-circuit ring / End ring
- 3 — Stator core
- 4 — Rotor core
- 5 — Fan cover
- 6 — External fan
- 7 — Internal fan
- 8 — Shaft
- 9 — Shaft end key
- 10 — Bearing bracket
- 11 — Bearing
- 12 — Grease inlet
- 13 — Grease outlet
- 14 — Terminal box

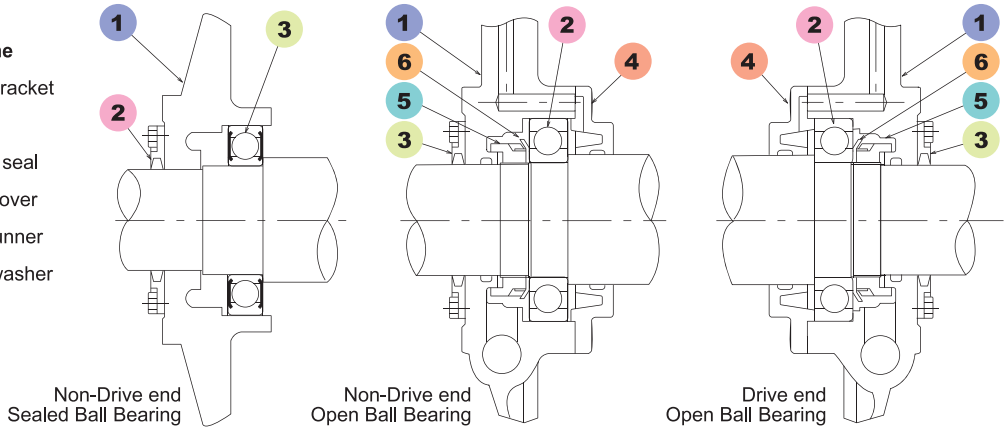


BEARING ARRANGEMENTS

Bearing Construction of Grease Lubricating Type Anti-friction Bearings (for Direct Coupled)

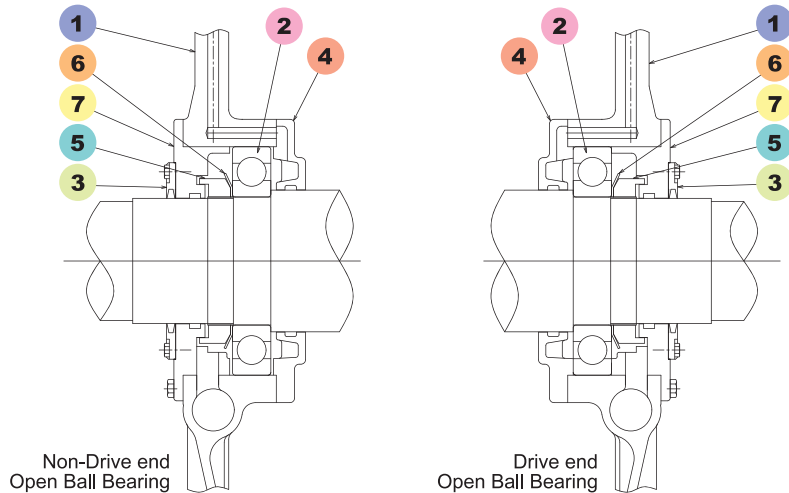
Frame size 250SA~315H

- | Part No. | Part Name |
|----------|-----------------|
| 1 | Bearing bracket |
| 2 | Bearing |
| 3 | Labyrinth seal |
| 4 | Bearing cover |
| 5 | Grease runner |
| 6 | Bearing washer |



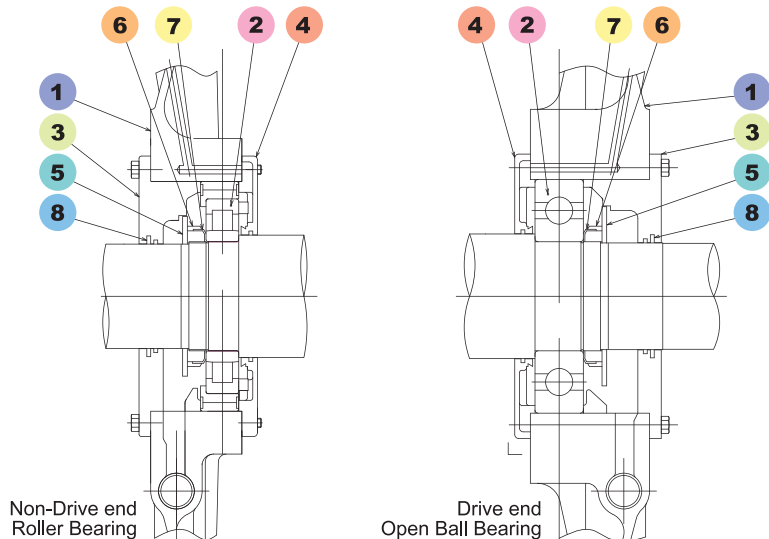
Frame size 355H~450

- | Part No. | Part Name |
|----------|---------------------|
| 1 | Bearing bracket |
| 2 | Bearing |
| 3 | Labyrinth seal |
| 4 | Inner bearing cover |
| 5 | Grease runner |
| 6 | Bearing washer |
| 7 | Outer bearing cover |



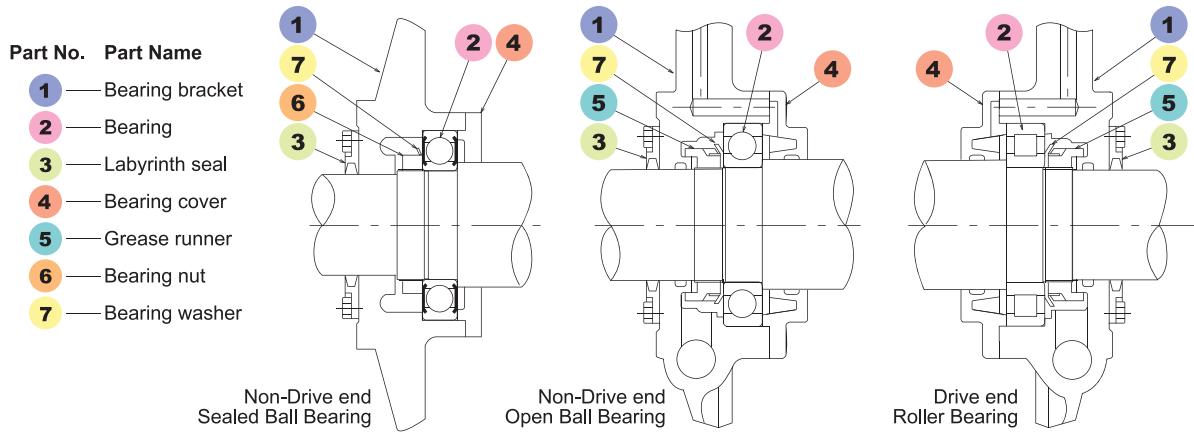
Frame size 500

- | Part No. | Part Name |
|----------|------------------|
| 1 | Bearing bracket |
| 2 | Bearing |
| 3 | Outside oil seal |
| 4 | Inside oil seal |
| 5 | Grease valve |
| 6 | Bearing nut |
| 7 | Bearing washer |
| 8 | Packing |

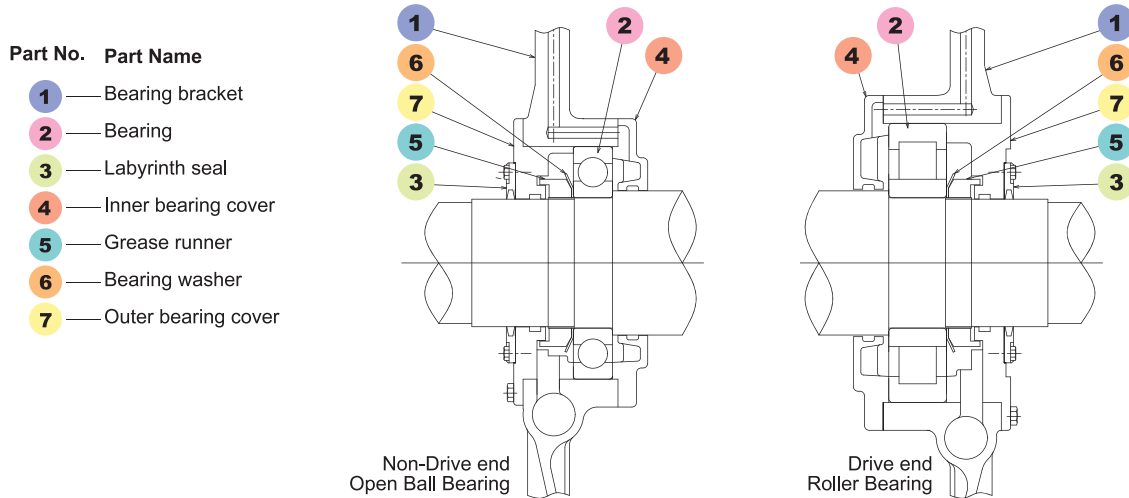


Bearing Construction of Grease Lubricating Type Anti-friction Bearings (for Belt Drive)

Frame size 250SA~315H



Frame size 355H~400H



OUTLINE DRAWINGS

Fig.1

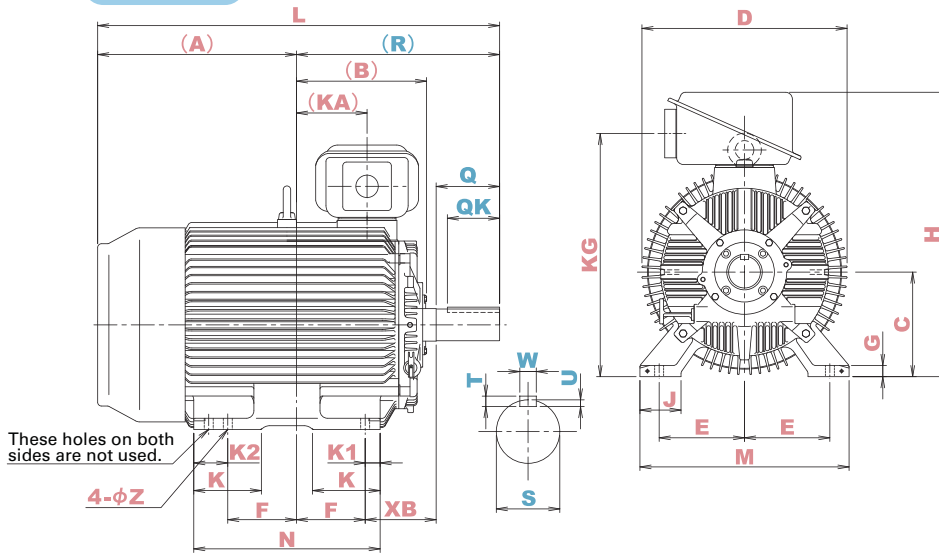
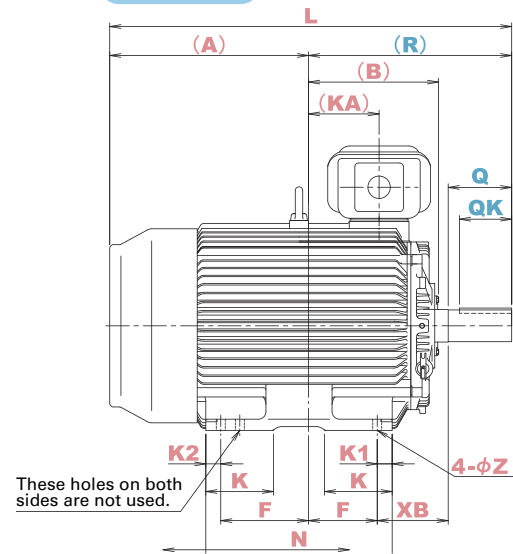


Fig.2



Dimensions for Totally Enclosed Fan Cooled Type (TEFC)

Frame size	Poles	Voltage	Fig.No.	Dimensions												
				A	B	C*1	D	E	F	G	H	KA	KG	J	K	K1
250SA	2P	Low & High	Fig.1	486.5	298	250	490	203	155.5	30	692	138.5	583	100	168	50
	468.5															
250MA	2P	Low & High	Fig.2	467.5	317	250	490	203	174.5	30	692	157.5	583	100	168	50
	449.5															
250MD	2P	Low & High	Fig.3	545.5	317	250	535	203	174.5	30	712	157.5	603	100	130	168
	4P~	Low High(3kV)														
280SA	2P	Low & High	Fig.1	550	348.5	280	550	228.5	184	30	762	189	653	110	181	40
	532															
280MA	2P	Low & High	Fig.2	524.5	374	280	550	228.5	209.5	30	762	214.5	653	110	181	40
	506.5															
280MD	2P	Low & 3kV	Fig.3	596.5	374	280	587	228.5	209.5	30	782 ^{*9}	210.5	673 ^{*9}	110	130	181
	4P~															
280L*5	2P	Low & 3kV	Fig.4	886.5	393	280	640	228.5	228.5	30	822 ^{*10}	214.5	713 ^{*10}	110	160	160
	828.5															
315H*6	2P	Low & High	Fig.5	939	541.5	315	707	254	355	35	996	306	840	130	175	428
	881															
355H*7	2P	3kV~	Fig.5	976	669	355	764	305	450	40	1076	434	920	160	190	460
	4P~															
400H*8	4P~	3kV~	Fig.5	1060	745	400	900	343	500	40	1166	510	1010	165	230	420
450	4P~	3kV~	Fig.5	1174	801	450	950	375	500	40	1270	566	1114	200	280	280
500	4P~	3kV~	Fig.6	1175	1195	500	1030	475	625	40	1220	760	620	220	310	310

Note : *1 The tolerance of shaft center-height (C) are 0~-0.5mm for 250 frame, 0~-1.0mm for 280~450 frame and -0.2~-0.8mm for 500 frame.

*2 Shaft key and key way are in accordance with JIS B1301(1976) and B0903(1977).

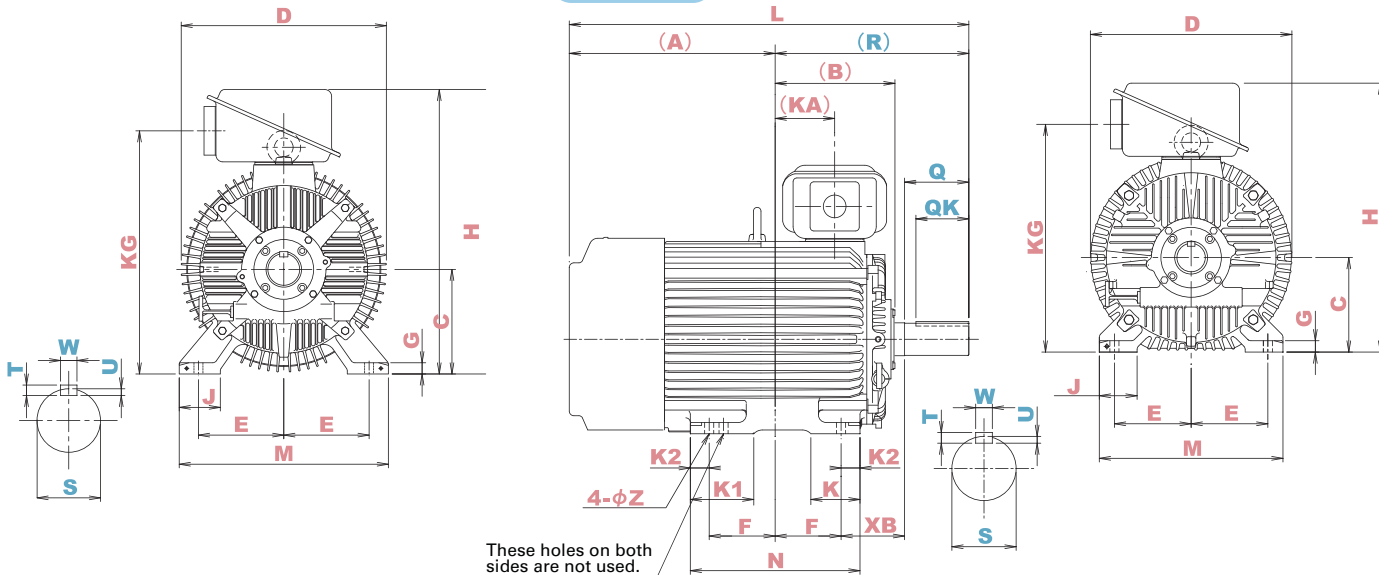
Regarding about 355 and 400 frames, the shaft size and bearing size may change as per the belt specification.

*3 No radial clearance symbol bearing shall be CM type.

*4 Bearing size indicated ZZ means used sealed type bearing.

*5 When specified 315S or 315M frame, it is available.

Fig.3



K2	L	M	N	XB	Z	Shaft end dimensions ^{*2}						Bearing sizes ^{*3}		
						Q	QK	R	S	T	U	W	Load side	Opp.Load side ^{*4}
88	920	486	449	168	24	110	90	433.5	55m6	10	6	16	6312C3	6312C3
	932					140	110	463.5	75m6	12	7.5	20	D.C.:6218 B.D.:NU218	6216ZZ
50	920	486	449	168	24	110	90	452.5	55m6	10	6	16	6312C3	6312C3
	932					140	110	482.5	75m6	12	7.5	20	D.C.:6218 B.D.:NU218	6216ZZ
50	998	486	449	168	24	110	90	452.5	55m6	10	6	16	6312C3	6312C3
	1028					140	110	482.5	75m6	12	7.5	20	D.C.:6218 B.D.:NU218	6217ZZ
	1058					170	140	512.5	85m6	14	9	22	6312C3	6312C3
91	1034	560	499	190	24	110	90	484	55m6	10	6	16	6312C3	6312C3
	1076					170	140	544	85m6	14	9	22	D.C.:6220 B.D.:NU220	6216ZZ
40	1034	560	499	190	24	110	90	509.5	55m6	10	6	16	6312C3	6312C3
	1076					170	140	569.5	85m6	14	9	22	D.C.:6220 B.D.:NU220	6216ZZ
40	1106	560	499	190	24	110	90	509.5	55m6	10	6	16	6312C3	6312C3
	1166					170	140	569.5	85m6	14	9	22	D.C.:6220 B.D.:NU220	6217ZZ
75	1415	560	607	190	24	110	90	528.5	55m6	10	6	16	6312C3	6312C3
	1417					170	140	588.5	85m6	14	9	22	D.C.:6220	6217ZZ
	1457					210	170	628.5	110m6	16	10	28	B.D.:NU324	6220
80	1650	636	870	216	28	140	110	711	65m6	11	7	18	6214C3	6214C3
	1622					170	140	741	95m6	14	9	25	D.C.:6220	6220
	1662					210	170	781	125m6	18	11	32	B.D.:NU326	6216C3
80	1820	710	1060	254	28	140	110	844	75m6	12	7.5	20	6216C3	6216C3
	1890					210	160	914	110m6	16	10	28	D.C.:6224C3 B.D.:NU328	6224C3
	1930					250	200	954	130m6	18	11	32	D.C.:6228C3 B.D.:NU328	6228C3
110	2050	800	1220	280	35	210	160	990	120m6	18	11	32	D.C.:6228C3	6228C3
	2090					250	200	1030	130m6	18	11	32	D.C.:6228C3	6228C3
140	2259	950	1280	335	42	250	200	1085	130m6	18	11	32	D.C.:6228C3	6228C3
180	2720	1120	1610	670	48	250	224	1545	130m6	18	11	32	D.C.:6328C3	NU228

Note : *6 When specified 315L(2F=508) frame, it is available.
 *7 When specified 355L(2F=630) or 355J(2F=800) frame, it is available.
 *8 When specified 400K(2F=800) frame, it is available.
 *9 When supply voltage is 6kV class, then dimensions H and KG becomes H=877mm and KG=721mm.
 *10 When supply voltage is 6kV class, then dimensions H and KG becomes H=917mm and KG=761mm.
 D.C. means Direct Coupled, B.D. means Belted Drive.
 These data given in this table are subject to change without notice.

OUTLINE DRAWINGS

Fig.4

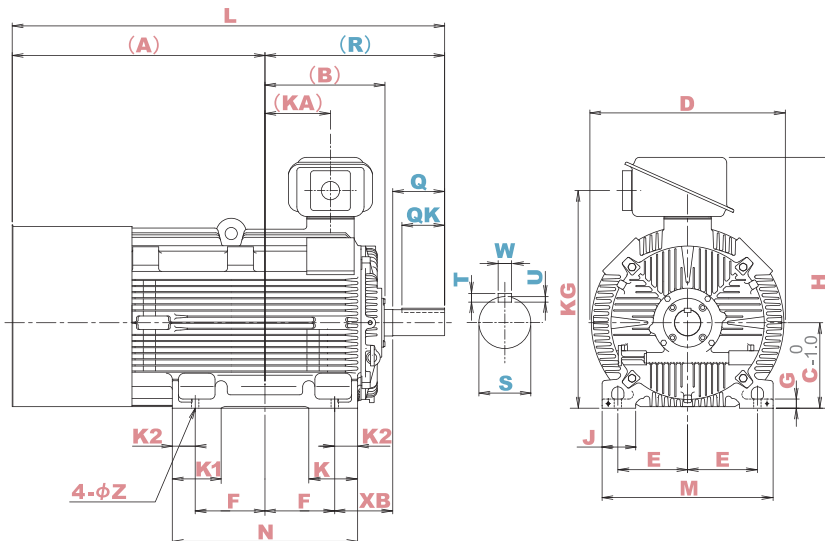
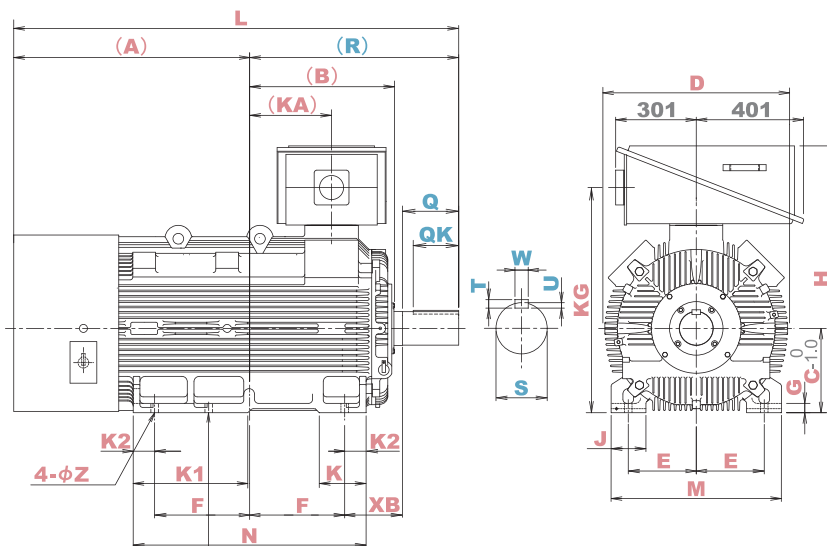
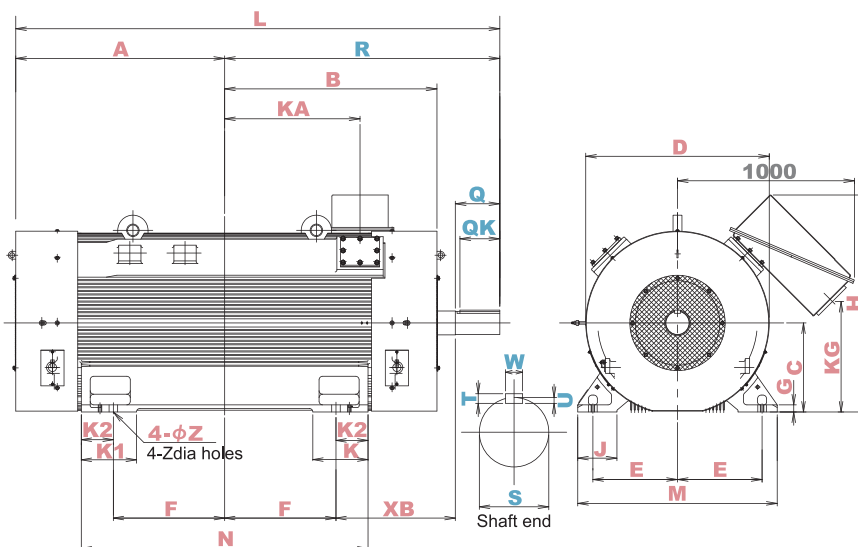


Fig 5

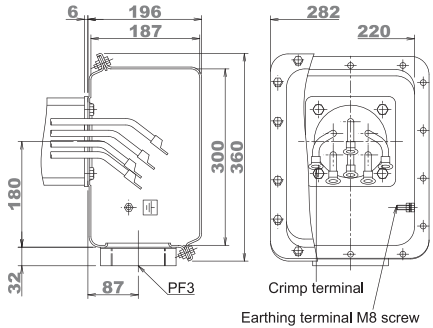


This and opposite side holes are not used.

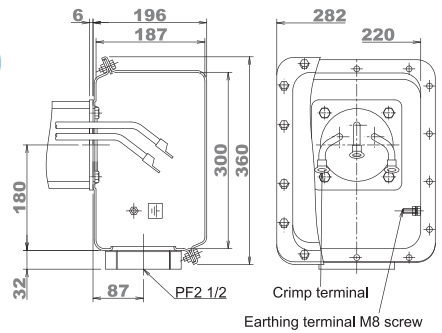
Fig.6



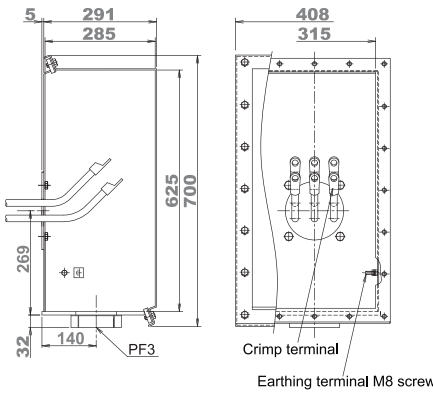
For low voltage and Frame size 280L and smaller



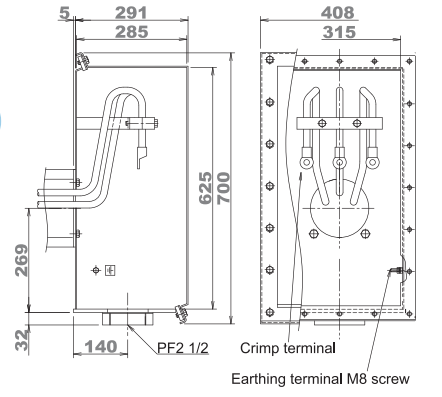
For 3kV class and Frame size 280L and smaller



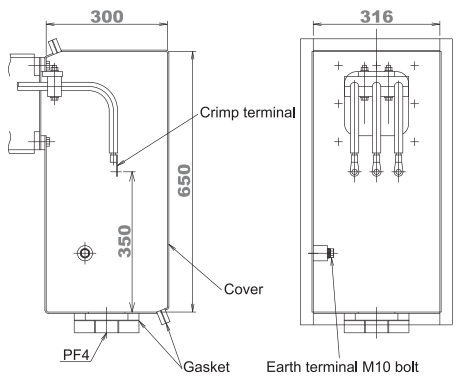
For low voltage and Frame size 315H



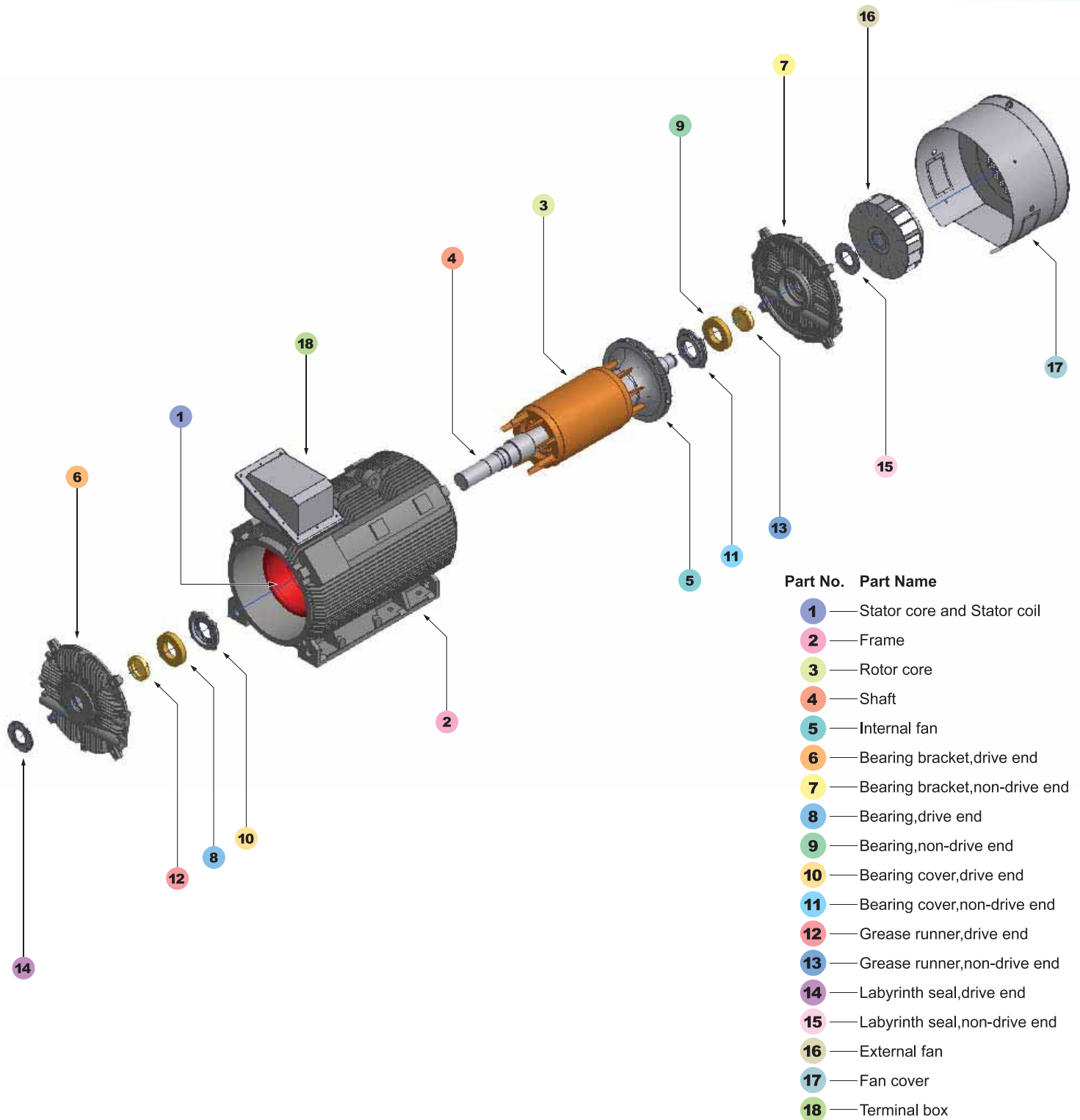
3kV class and Frame size 315H~450, 6kV class and Frame size 280L~450



For Frame size 500



21-F II in detail



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