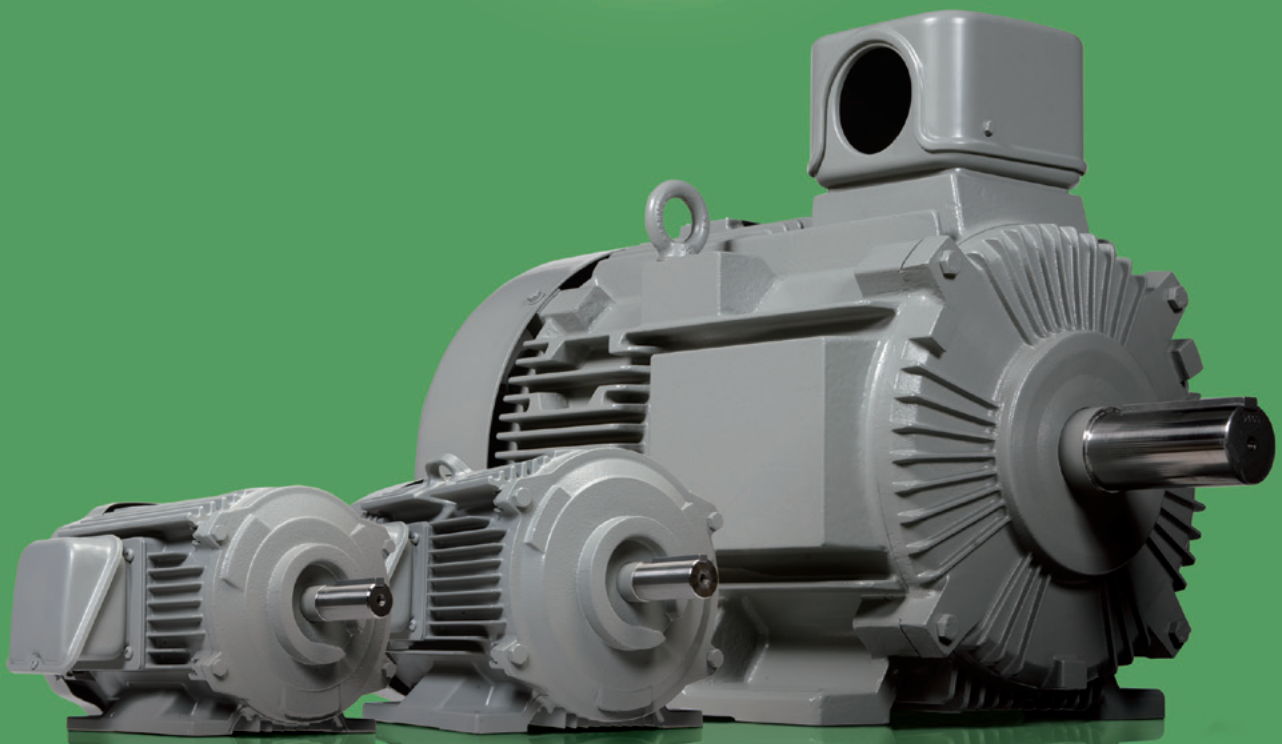


HITACHI MOTOR

**HITACHI**  
Inspire the Next

# Hitachi High-Efficiency Motors



# With a century of motor development experience, Hitachi provides a new generational motor.

## Main Features :

### 1. Global standard

- Conformity to JIS C 4213(Japan) [Efficiency class: IEC60034-30 Premium efficiency class (IE3)]

### 2. High-efficiency

- Compare to the standard motors, iron core shape is improved and material quality is raised
- Motor loss is reduced 30~40%
- This improvement realizes higher efficiency when compared with the standard motors

### 3. Long motor life

- The temperature of stator coil has been decreased at 10~20°C under a rationalization design and a high cooling effect for an electric part
- The coil insulation is achieved two times longer on operation life compared with the standard motor
- The bearings are also 2.5 times longer on operation life
- The operation life changes depending on operation conditions

### 4. Inverter operation is also available (1:10 or 1:20 constant torque)

- 0.4~1.5kW 4P is available to operate with 1:10(6~60Hz) speed under 100% constant torque operation using the inverters (In case the sensorless vector inverters are used) 1:20(3~60Hz) is also available with special design motors. These motors are adopted durable insulation system with advanced technology.

### 5. Furthermore benefit

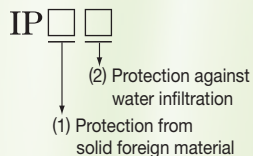
- Low noise and vibration can be realized with advanced technologies

## Strengthened compatibility with the global standard

### Standard-compatible with protective structure IP 55 and heat-resistant class F

#### Protective structure IP 55

The conventional “the motor” series employed “IP 44” even for outdoor types. However, “The motor Neo100” outdoor series employs “IP55” based on the global standard.



#### Heat-resistant class F

“The motor Neo100” employs heat-resistant class F (the increase in motor temperature is within the range of heat-resistant classes E and B); the reliability of which has been improved.

#### Description of the protective structure (conforming to JIS C 4034-5)

Model	(1) Degree of protection from solid foreign material	(2) Degree of housing structure protection against water infiltration
Neo100 (IP55)	5 Rotating machine protected against dust	5 Rotating machine protected against fountain flow
Conventional (IP44)	4 Rotating machine protected against solid foreign material in excess of 1 mm	4 Rotating machine protected against splashes

Heat-resistant class	A	E	B	F	H
Limit of temperature rise*	60°C	75°C	80°C	105°C	125°C

\* : A temperature which rises by 40°C or more is prescribed when the ambient temperature is supposed to be 40°C.

## Circumferences of the spray test (Degree of housing structure protection against water infiltration)



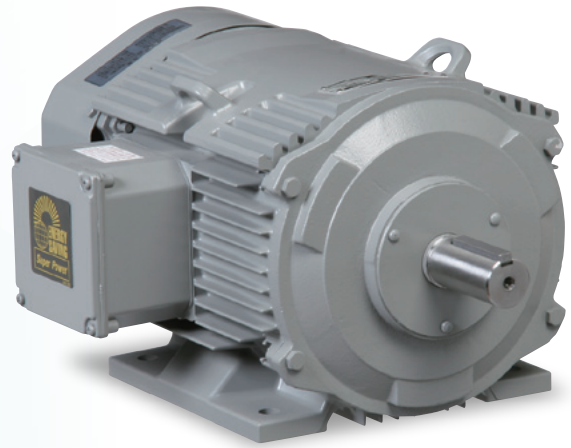
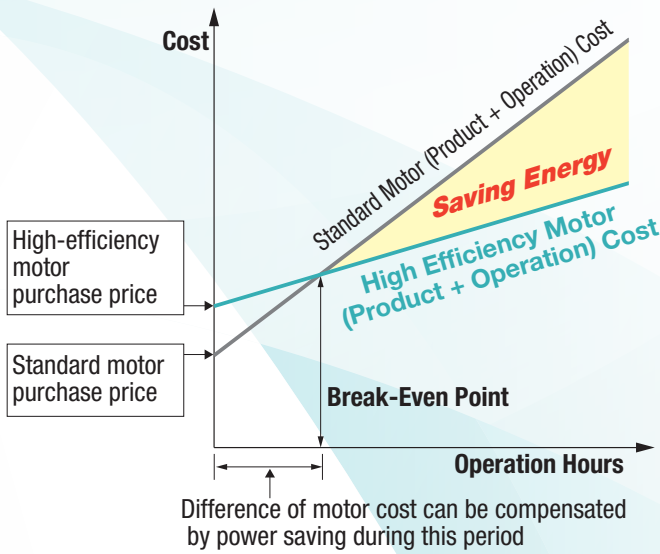
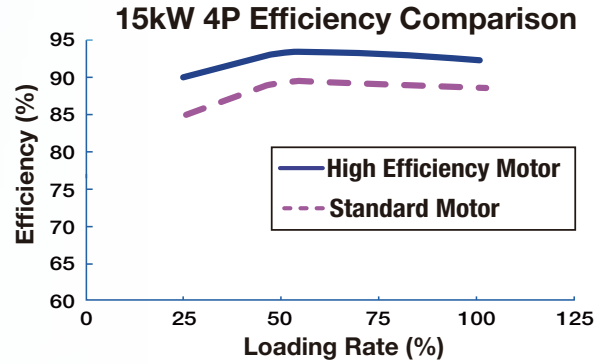
**(Reference) IP44 spray test**  
Rotating machine protected against splashes



**IP55 spray test**  
Rotating machine protected against fountain flow

## 6. Operational cost saving

- Considering the operational cost under long term period, the best idea is to adopt the high efficiency motors
- The point is just not to consider the initial cost of motor but overall cost including long term operation



- The annual energy savings with high efficiency motor can be estimated by following formula

$$\text{The annual saving fee} = \text{Output (kW)} \times \text{Operation hour (Hour/year)} \times \text{Power charge cost (Cost/kWh)} \times \left( \frac{100}{\text{Standard Motor efficiency (\%)}} - \frac{100}{\text{High efficiency motor efficiency (\%)}} \right)$$

High efficiency motor saves energy consumption in proportion to operating hour.

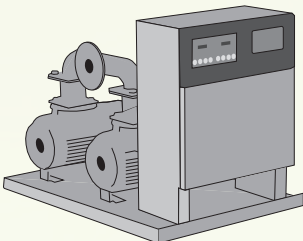
### Sample calculation

Motor output : 15kW  
 High-efficiency motor efficiency : 93.0%  
 Standard motor efficiency : 88.5%  
 Annual operation hours : 4,800hours (16h/day)  
 Electric power rate : US\$0.15/kWh

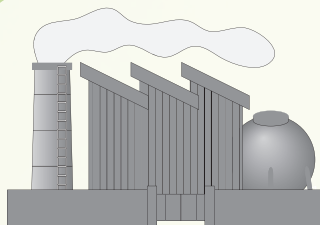
Annual energy saving  
 Approx. US\$590.49

## Application examples

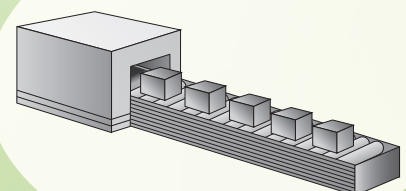
For fans, pumps and compressors.



Factories under long time operation



For process machines for non stop operation



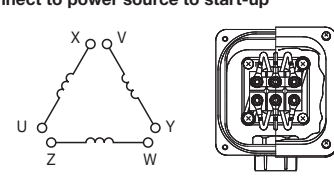
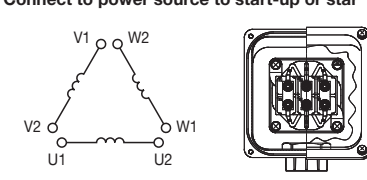
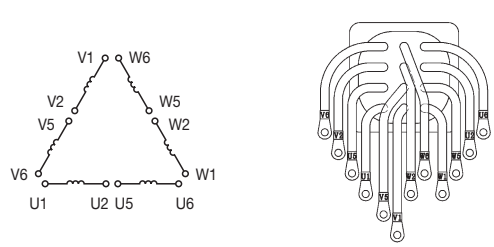
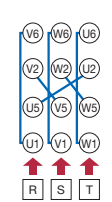
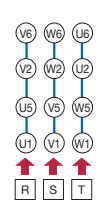
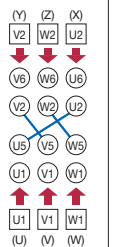
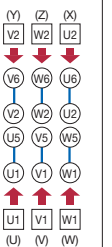
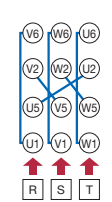
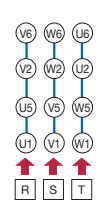
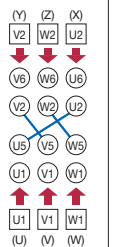
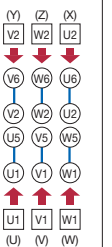
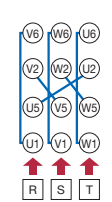
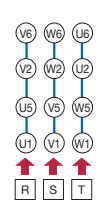
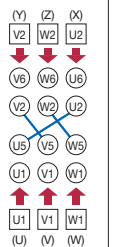
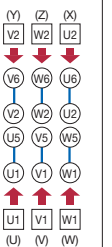
# Product specifications

Item		Specifications	
Standard		JIS C 4213 (Efficiency classes: JIS C 4034-30:2011 Premium efficiency class (IE3))	
Construction		Totally enclosed fan-cooled types (Indoor and outdoor types)	
Model	Foot mount	Indoor type	TFO-LK (0.75~3.7kW), TFO-LKK (5.5kW~)
		Outdoor type	TFOA-LK (0.75~3.7kW), TFOA-LKK (5.5kW~)
	Flange mount	Indoor type	VTFO-LK (0.75~3.7kW), VTFO-LKK (5.5kW~)
		Outdoor type	VTFOA-LK (0.75~3.7kW), VTFOA-LKK (5.5kW~)
Output	2 Poles	0.75~132kW	
	4 Poles	0.75~132kW	
	6 Poles	0.75~110kW	
Heat-resistant class		155 (F) *1	
Rating		S1 (Continuous)	
Protection		Indoor types: IP44 Outdoor types: IP55	
Voltage / Frequency		220/380V or 380/415V 50Hz 2Poles 22kW~, 4Poles 18.5kW~, 6Poles 15kW~ 200V 50/60Hz, 220/230V 60Hz 400V 50/60Hz, 440/460V 60Hz	
Lead wire construction		Lug connection: 2 Poles 22kW~, 4 Poles 18.5kW~, 6 Poles 15kW~ ※5.5kW~ Available Y-△ starting	
Number of lead wires		6: (5.5kW~) 12: 2 Poles 22kW~, 4 Poles 18.5kW~, 6 Poles 15kW~	
Painting color		Rigail gray (munsell 8.9Y 5.1/0.3)	
Transmission system		2Poles 11kW~: Direct coupling only 2Poles ~7.5kW and all of 4 Poles~: Direct or belt coupling	
Rotation		Clockwise when viewed from the anti-load side	
Environment	Temperature	-30~40°C	
	Humidity	95%RH or less	
	Altitude	1,000m or less	
Atmosphere		No corrosive gas, no explosive gas, no steam, no dew condensation, and little dust	

Note : Request a dimensional drawing to us for design use because the specifications may be subject to change.  
 ※1 Temperature rise : Frame size 112M or less class E, Frame size 132S~180M class B

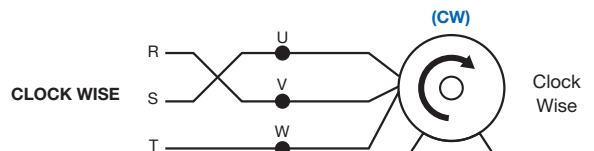
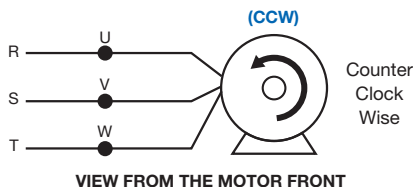
## The Wiring Connection and Driving Direction

### Circuit Diagram for the use of motor wiring connection

<b>0.4-3.7kW/6-wire 220/380V</b> Connect to power source to start-up 	<b>5.5-30kW/6-wire 380/415V</b> Connect to power source to start-up or star 												
<b>37-55kW/12-wire 200/380/400V</b> Connect to power source to start-up or star 	<table border="1"> <tr> <th colspan="2">Direct on Line Start</th> <th colspan="2">Star-Delta Start</th> </tr> <tr> <th>400V Class</th> <th>200V Class</th> <th>400V Class</th> <th>200V Class</th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </table>	Direct on Line Start		Star-Delta Start		400V Class	200V Class	400V Class	200V Class				
Direct on Line Start		Star-Delta Start											
400V Class	200V Class	400V Class	200V Class										
													

### Driving Direction

**COUNTER CLOCK WISE**  
(Hitachi Standard)

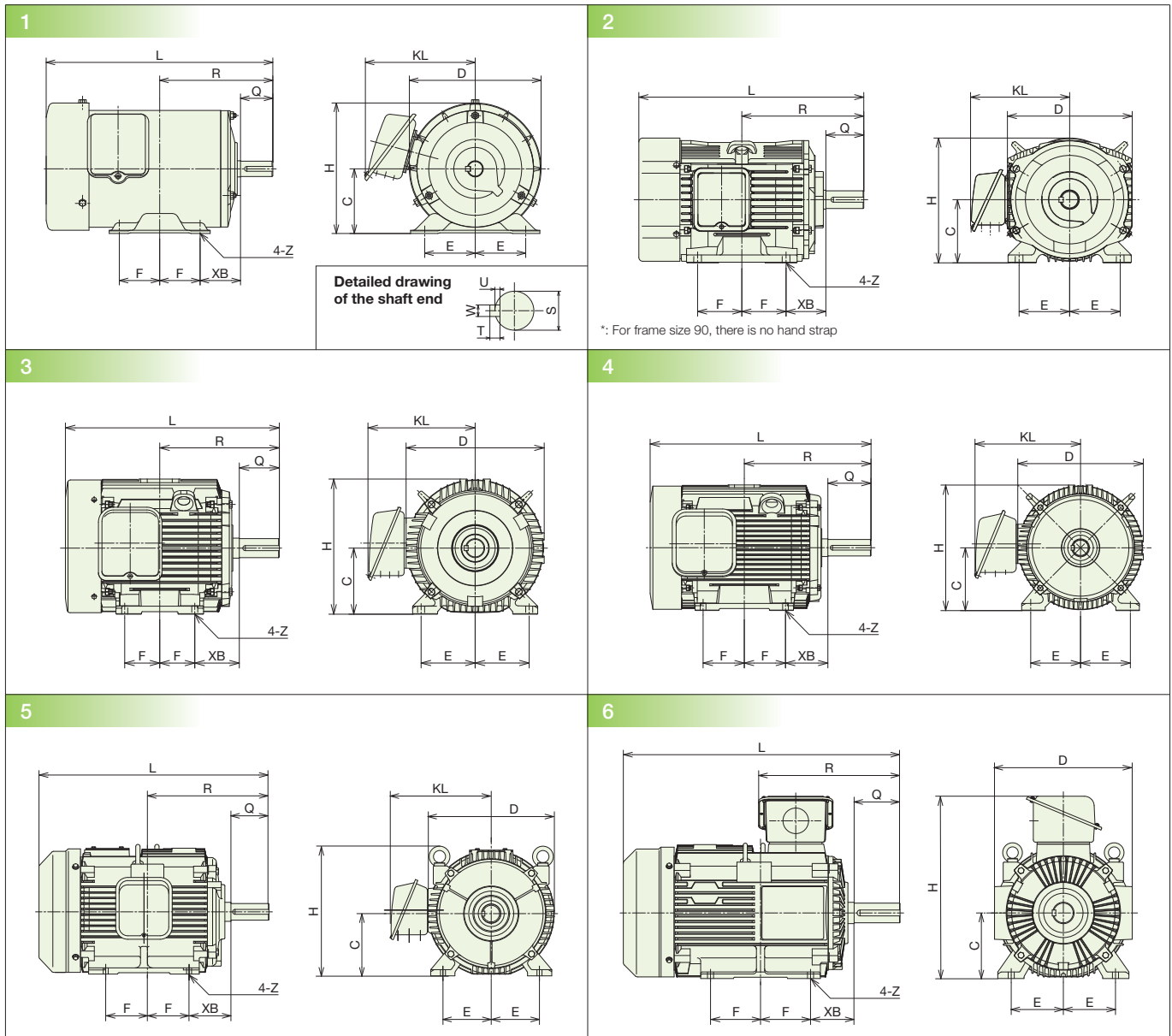






# Dimensions

## Indoor types (IP44) / Foot mount

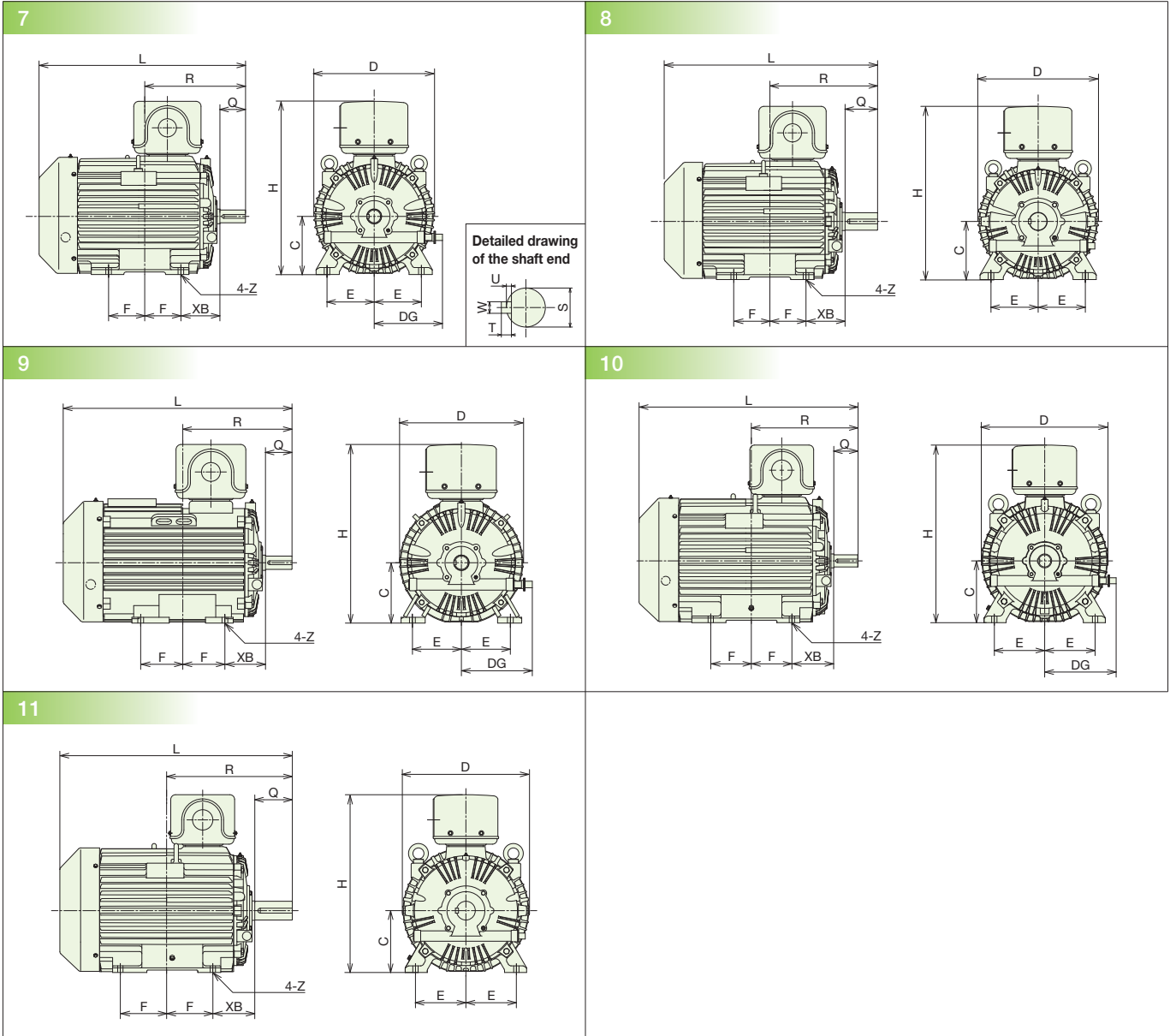


- Mounting dimensions are compatible with IE1 class standard models.
- Request an official dimensional drawing to sales office for your design purpose because the dimensions might be subject to change without any notice.

Frame size	Output (kW)			Fig. No.	Dimensions (mm)														Approx. weight (kg)			
	2 Poles	4 Poles	6 Poles		L	R	D	KL	H	C	F	E	Z	XB	S	W	U	T	Q	2 Poles	4 Poles	6 Poles
80M	0.75	—	—	1	268.5	140	163	135	161.5	80 <sup>0</sup> <sub>-0.5</sub>	50	62.5	10×25	50	19j6	6	3.5	6	40	12	—	—
	—	0.75	—		280.5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	14	—
90L	1.5	—	—	2	315	168.5	182	149	178	90 <sup>0</sup> <sub>-0.5</sub>	62.5	70	10	56	24j6	8	4	7	50	17	19	20.5
	2.2	1.5	0.75		20.5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
100L	—	2.2	1.5	3	356	193	198	156	197.5	100 <sup>0</sup> <sub>-0.5</sub>	70	80	12	63	28j6	8	4	7	60	—	28.5	31
112M	3.7	3.7	2.2		372	200	225	169	219.5	112 <sup>0</sup> <sub>-0.5</sub>	70	95	12	70	28j6	8	4	7	60	34	37	40
132S	5.5	—	—	4	427.5	239	276	212	270	132 <sup>0</sup> <sub>-0.5</sub>	70	108	12×14	89	38k6	10	5	8	80	45	56	50
	7.5	5.5	3.7		50	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
132M	—	7.5	5.5	5	465.5	258	276	212	270	132 <sup>0</sup> <sub>-0.5</sub>	89	108	12×14	89	38k6	10	5	8	80	—	63	62
160M	11	11	7.5		563	323	320	269	320	160 <sup>0</sup> <sub>-0.5</sub>	105	127	14.5×16.5	108	42k6	12	5	8	110	82	91	83
160L	15	—	—	6	595	345	320	269	320	160 <sup>0</sup> <sub>-0.5</sub>	127	127	14.5×16.5	108	42k6	12	5	8	110	91	—	—
	18.5	15	11		102	108	103	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
180M	22	—	—	7	665	351.5	365	290	375	180 <sup>0</sup> <sub>-0.5</sub>	120.5	139.5	14.5	121	48k6	14	5.5	9	110	180	190	180
	—	18.5	22		200	200	220	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
180L	30	30	18.5	8	738	370.5	365	—	505	180 <sup>0</sup> <sub>-0.5</sub>	139.5	139.5	14.5	121	55m6	16	6	10	110	200	230	200
	—	—	22		220	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
200LB	37	—	—	9	814	395.5	—	—	—	—	—	—	—	—	55m6	16	6	10	110	290	—	—
	45	—	—		315	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
200L	—	37	30	10	844	425.5	420	—	556	200 <sup>0</sup> <sub>-0.5</sub>	152.5	159	18.5	133	60m6	18	7	11	140	—	320	310
	—	45	37		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
225SB	55	—	—	11	821	402	—	—	606	225 <sup>0</sup> <sub>-0.5</sub>	143	178	18.5	149	55m6	16	6	10	110	365	—	—
225S	—	55	45		851	432	470	—	—	—	—	—	—	—	65m6	18	7	11	140	—	400	410

Note : Mounting dimensions are the conventional products and compatibility.  
 Note : Request a dimensional drawing to us for design use because the dimensions may be subject to change.

**Indoor types (IP44) / Foot mount**



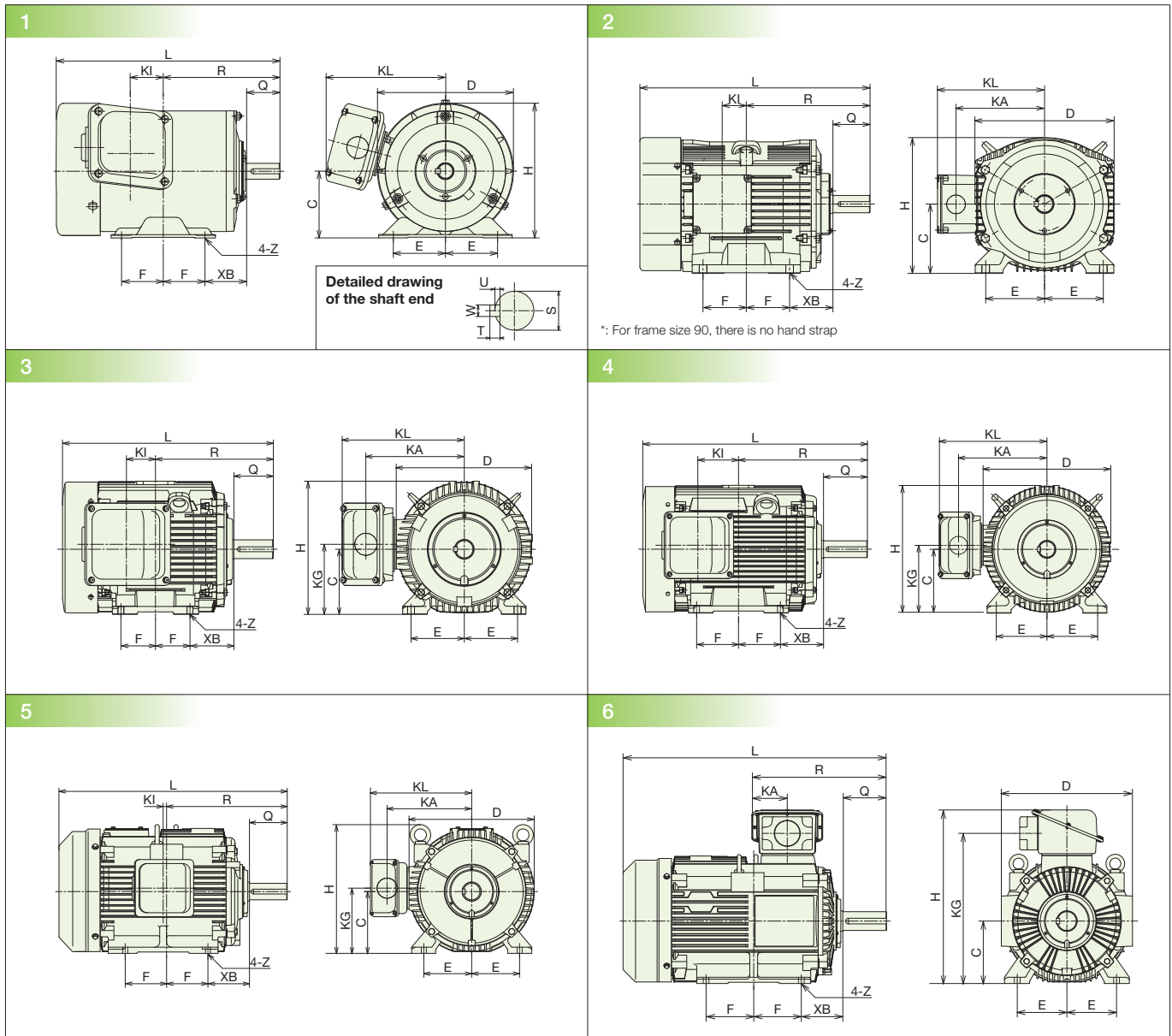
Frame size	Output (kW)			Fig. No.	Dimensions (mm)															Approx. weight (kg)		
	2 Poles	4 Poles	6 Poles		L	R	D	DG	H	C	F	E	Z	XB	S	W	U	T	Q	2 Poles	4 Poles	6 Poles
250SB	75	—	—	7	888	433.5	520	294	745	250 <sup>0</sup> <sub>-0.5</sub>	155.5	203	24	168	55m6	16	6	10	110	545	—	—
250S	—	75	55	8	918	463.5	520	—	745	250 <sup>0</sup> <sub>-0.5</sub>	155.5	203	24	168	75m6	20	7.5	12	140	—	535	525
250MB1	90	—	—	9	948	452.5	513	294	740	250 <sup>0</sup> <sub>-0.5</sub>	174.5	203	24	168	55m6	16	6	10	110	550	—	—
250M	—	90	75	8	918	482.5	520	—	745	250 <sup>0</sup> <sub>-0.5</sub>	174.5	203	24	168	75m6	20	7.5	12	140	—	560	585
280SB	110	—	—	10	993	484	575	324	805	280 <sup>0</sup> <sub>-1.0</sub>	184	228.5	24	190	55m6	16	6	10	110	720	—	—
280S	—	110	90	8	1053	544	575	—	805	280 <sup>0</sup> <sub>-1.0</sub>	184	228.5	24	190	85m6	22	9	14	170	—	775	790
280MB1	132	—	—	10	1031	509.5	575	324	805	280 <sup>0</sup> <sub>-1.0</sub>	209.5	228.5	24	190	55m6	16	6	10	110	815	—	—
280M	—	132	—	11	1053	569.5	575	—	805	280 <sup>0</sup> <sub>-1.0</sub>	209.5	228.5	24	190	85m6	22	9	14	170	—	825	—
280M1	—	—	110		1091	569.5	575	—	805	280 <sup>0</sup> <sub>-1.0</sub>	209.5	228.5	24	190	85m6	22	9	14	170	—	—	880

Note : Mounting dimensions are the conventional products and compatibility.

Note : Request a dimensional drawing to us for design use because the dimensions may be subject to change.

# Dimensions

## Outdoor types (IP55) / Foot mount



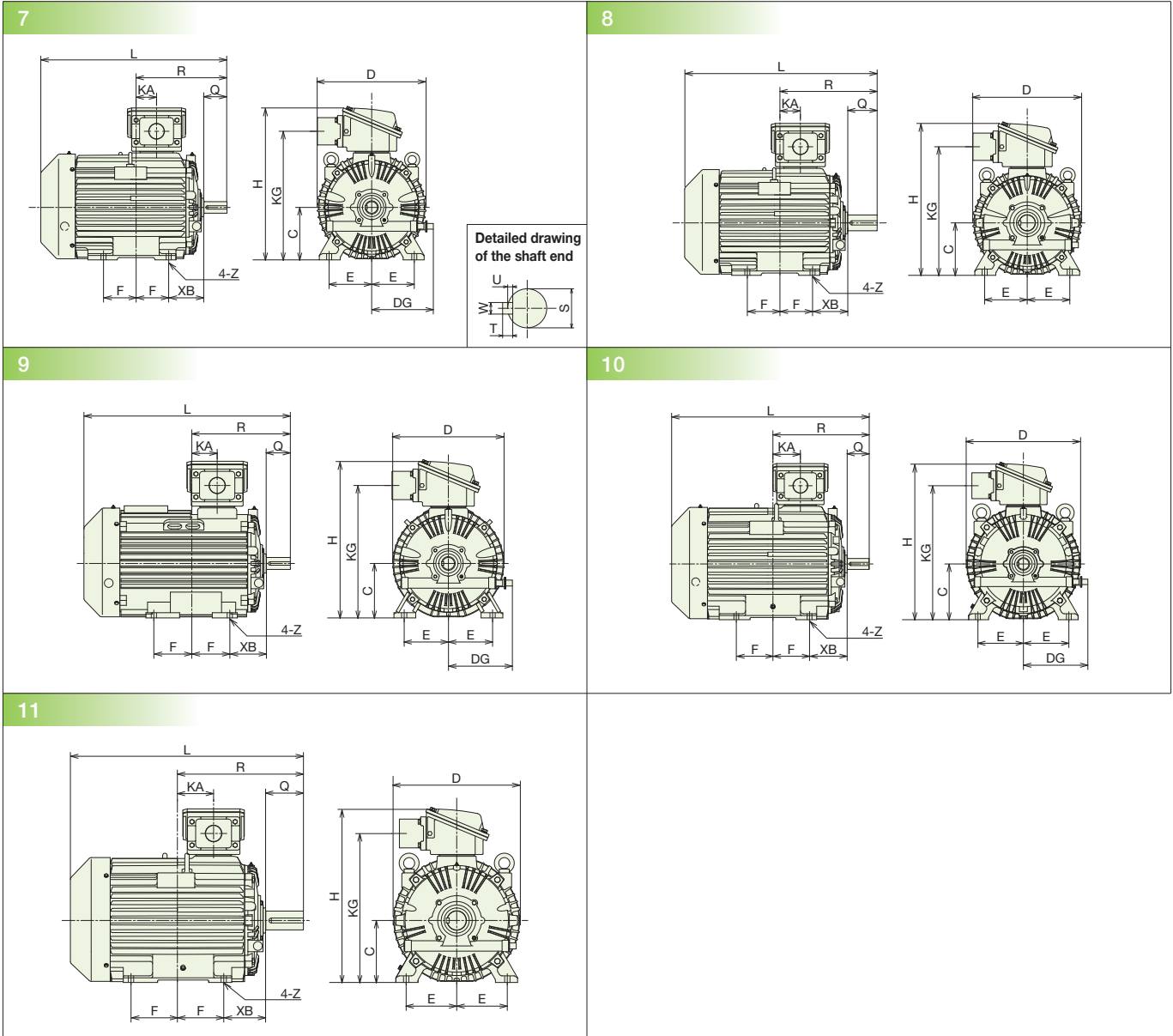
Frame size	Output (kW)			Fig. No.	Dimensions (mm)																Approx. weight (kg)				
	2 Poles	4 Poles	6 Poles		L	R	D	KL	KA	KG	KI	H	C	F	E	Z	XB	S	W	U	T	Q	2 Poles	4 Poles	6 Poles
80M	0.75	—	—	1	268.5	140	163	144	—	—	39.5	161.5	80	50	62.5	10×25	50	19j6	6	3.5	6	40	12.5	—	—
	—	0.75	—		280.5	—	—	51.5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	14.5	—
90L	1.5	1.5	0.75	2	315	168.5	182	153	123	—	20	178	90	62.5	70	10	56	24j6	8	4	7	50	17.5	19.5	21
	2.2	—	—		356	193	198	160	130	—	32	197.5	100	70	80	12	63	28j6	8	4	7	60	—	29	31.5
100L	—	2.2	1.5	3	372	200	225	173	143	—	39	219.5	112	70	95	12	70	28j6	8	4	7	60	34.5	37.5	40.5
112M	3.7	3.7	2.2		427.5	239	276	248	199.5	142	59	270	132	70	108	12×14	89	38k6	10	5	8	80	46	57	51
132S	5.5	5.5	3.7	4	465.5	258	276	248	199.5	142	78	270	132	89	108	12×14	89	38k6	10	5	8	80	—	64	63
132M	—	7.5	5.5		563	323	320	270	221.5	170	102	320	160	105	127	14.5×16.5	108	42k6	12	5	8	110	83	92	84
160M	11	11	7.5	5	595	345	320	270	221.5	170	112	320	160	127	127	14.5×16.5	108	42k6	12	5	8	110	103	109	104
160L	18.5	15	11		665	351.5	365	295	246.5	190	10	375	180	120.5	139.5	14.5	121	48k6	14	5.5	9	110	185	195	185
180M	22	18.5	15	6	738	370.5	365	—	102.5	430	—	505	180	139.5	139.5	14.5	121	55m6	16	6	10	110	205	235	205
180L	30	30	18.5		814	395.5	—	—	107.5	481	—	—	200	152.5	159	18.5	133	55m6	16	6	10	110	295	—	—
200LB	37	—	—	6	844	425.5	420	—	107.5	481	—	556	200	152.5	159	18.5	133	60m6	18	7	11	140	—	325	315
200L	—	37	30		821	402	470	—	108	531	—	606	225	143	178	18.5	149	55m6	16	6	10	110	330	—	—
225SB	55	—	—	6	851	432	—	—	108	531	—	606	225	143	178	18.5	149	65m6	18	7	11	140	—	405	415
225S	—	55	45		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Note : Mounting dimensions are the conventional products and compatibility.

Note : Request a dimensional drawing to us for design use because the dimensions may be subject to change.



## Outdoor types (IP55) / Foot mount



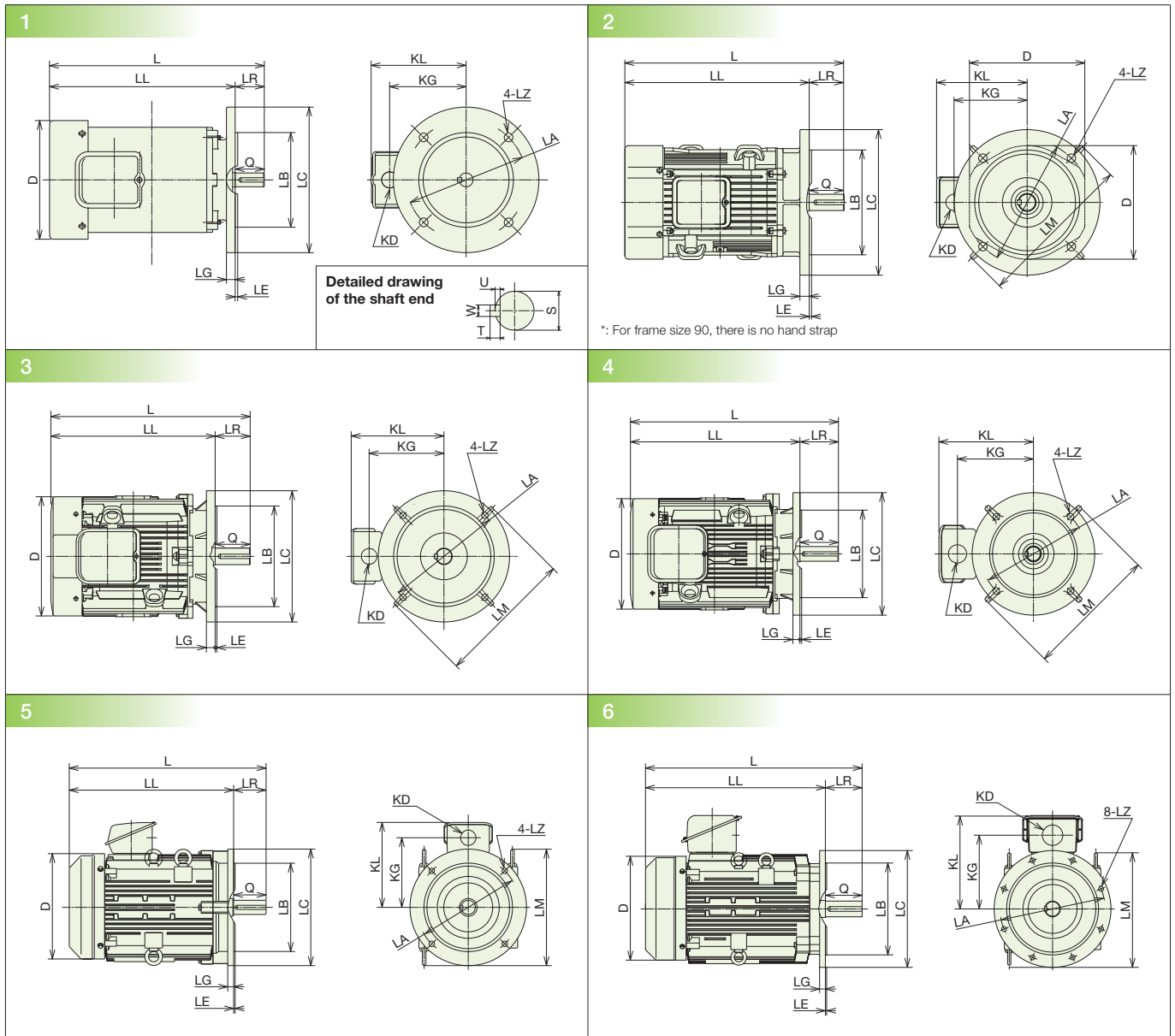
Frame size	Output (kW)			Fig. No.	Dimensions (mm)																	Approx. weight (kg)		
	2 Poles	4 Poles	6 Poles		L	R	D	DG	KA	KG	H	C	F	E	Z	XB	S	W	U	T	Q	2 Poles	4 Poles	6 Poles
250SB	75	—	—	7	888	433.5	520	294	97.5	613	723	250 <sup>0</sup> <sub>-0.5</sub>	155.5	203	24	168	55m6	16	6	10	110	570	—	—
250S	—	75	55	8	918	463.5	520	—	97.5	613	723	250 <sup>0</sup> <sub>-0.5</sub>	155.5	203	24	168	75m6	20	7.5	12	140	—	560	550
250MB1	90	—	—	9	948	452.5	513	294	116.5	608	718	250 <sup>0</sup> <sub>-0.5</sub>	174.5	203	24	168	55m6	16	6	10	110	575	—	—
250M	—	90	75	8	918	482.5	520	—	116.5	613	723	250 <sup>0</sup> <sub>-0.5</sub>	174.5	203	24	168	75m6	20	7.5	12	140	—	585	610
280SB	110	—	—	10	993	484	575	324	138	673	783	280 <sup>0</sup> <sub>-1.0</sub>	184	228.5	24	190	55m6	16	6	10	110	745	—	—
280S	—	110	90	8	1053	544	575	—	138	673	783	280 <sup>0</sup> <sub>-1.0</sub>	184	228.5	24	190	85m6	22	9	14	170	—	800	815
280MB1	132	—	—	10	1031	509.5	575	324	163.5	673	783	280 <sup>0</sup> <sub>-1.0</sub>	209.5	228.5	24	190	55m6	16	6	10	110	840	—	—
280M	—	132	—	11	1053	569.5	575	—	163.5	673	783	280 <sup>0</sup> <sub>-1.0</sub>	209.5	228.5	24	190	85m6	22	9	14	170	—	850	—
280M1	—	—	110		1091	569.5	575	—	163.5	673	783	280 <sup>0</sup> <sub>-1.0</sub>	209.5	228.5	24	190	85m6	22	9	14	170	—	—	905

Note : Mounting dimensions are the conventional products and compatibility.

Note : Request a dimensional drawing to us for design use because the dimensions may be subject to change.

# Dimensions

## Indoor types (IP44) / Flange mount

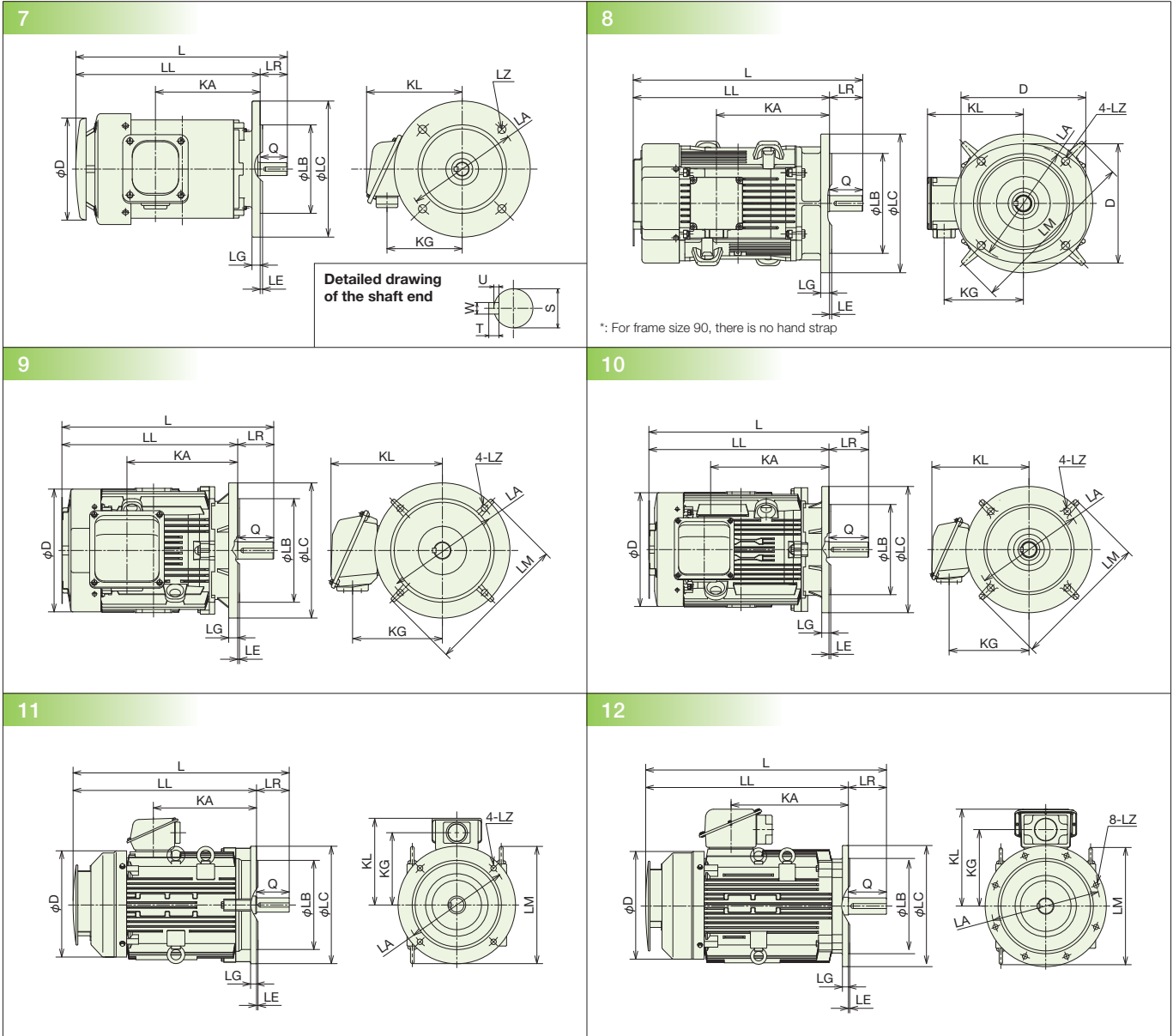


Frame size	Output (kW)			Fig. No.	Dimensions (mm)																Approx. weight (kg)					
	2 Poles	4 Poles	6 Poles		LA	LB	LC	LE	LG	LZ	D	L	LL	KL	KG	LM	LR	S	W	U	T	Q	2 Poles	4 Poles	6 Poles	
80M	0.75	—	—	1	165	130	200	3.5	12	12	163	283	243	131	105	—	40	19	6	3.5	6	40	14.5	—	—	
	—	0.75	—									295	255										—	—	—	—
90L	1.5	1.5	0.75	2	165	130	200	3.5	12	12	182/176	336	286	148.5	118.5	213	50	24	6	8	4	7	50	20	22	23.5
	2.2	—	—									—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
100L	—	2.2	1.5	2	215	180	250	4	16	14.5	198/195	376.5	316.5	155.5	125.5	270	60	28	8	4	7	60	—	33.5	36	
112M	3.7	3.7	2.2		215	180	250	4	16	14.5	225/215	397.5	337.5	168.5	138.5	308	60	28	8	4	7	60	39	42	45	
132S	5.5	5.5	3.7	3	265	230	300	4	20	14.5	273	455.5	375.5	212	171	315	80	38	10	5	8	80	53	64	58	
132M	—	7.5	5.5		265	230	300	4	20	14.5	273	493.5	413.5	212	171	315	80	38	10	5	8	80	—	71	70	
160M	11	11	7.5	4	300	250	350	5	20	18.5	316	594	484	269	217	380	110	42	12	5	8	110	93	102	94	
160L	15	15	11		300	250	350	5	20	18.5	316	614	504	269	217	380	110	42	12	5	8	110	102	102	94	
180M	22	18.5	15	5	350	300	395	5	20	18.5	364.5	667	557	288	236	394	110	48	14	5.5	9	110	190	200	190	
180L	30	30	18.5		350	300	395	5	20	18.5	364.5	740	630	325	250	394	110	55	16	6	10	110	210	240	210	
200LB	37	—	—	6	400	350	445	5	22	18.5	401.5	795	685	356	281	428	110	55	16	6	10	110	295	—	—	
	45	—	—																				320	—	—	
200L	—	37	30	6	400	350	445	5	22	18.5	401.5	825	685	356	281	428	140	60	18	7	11	140	—	325	310	
	—	45	37																				—	330	335	
225SB	55	—	—	6	500	450	545	5	22	18.5	456	816	706	381	306	486	110	55	16	6	10	110	375	—	—	
225S	—	55	45		500	450	545	5	22	18.5	456	846	706	381	306	486	140	65	18	7	11	140	—	410	420	

Note : Mounting dimensions are the conventional products and compatibility.

Note : Request a dimensional drawing to us for design use because the dimensions may be subject to change.

## Outdoor types (IP55) / Flange mount



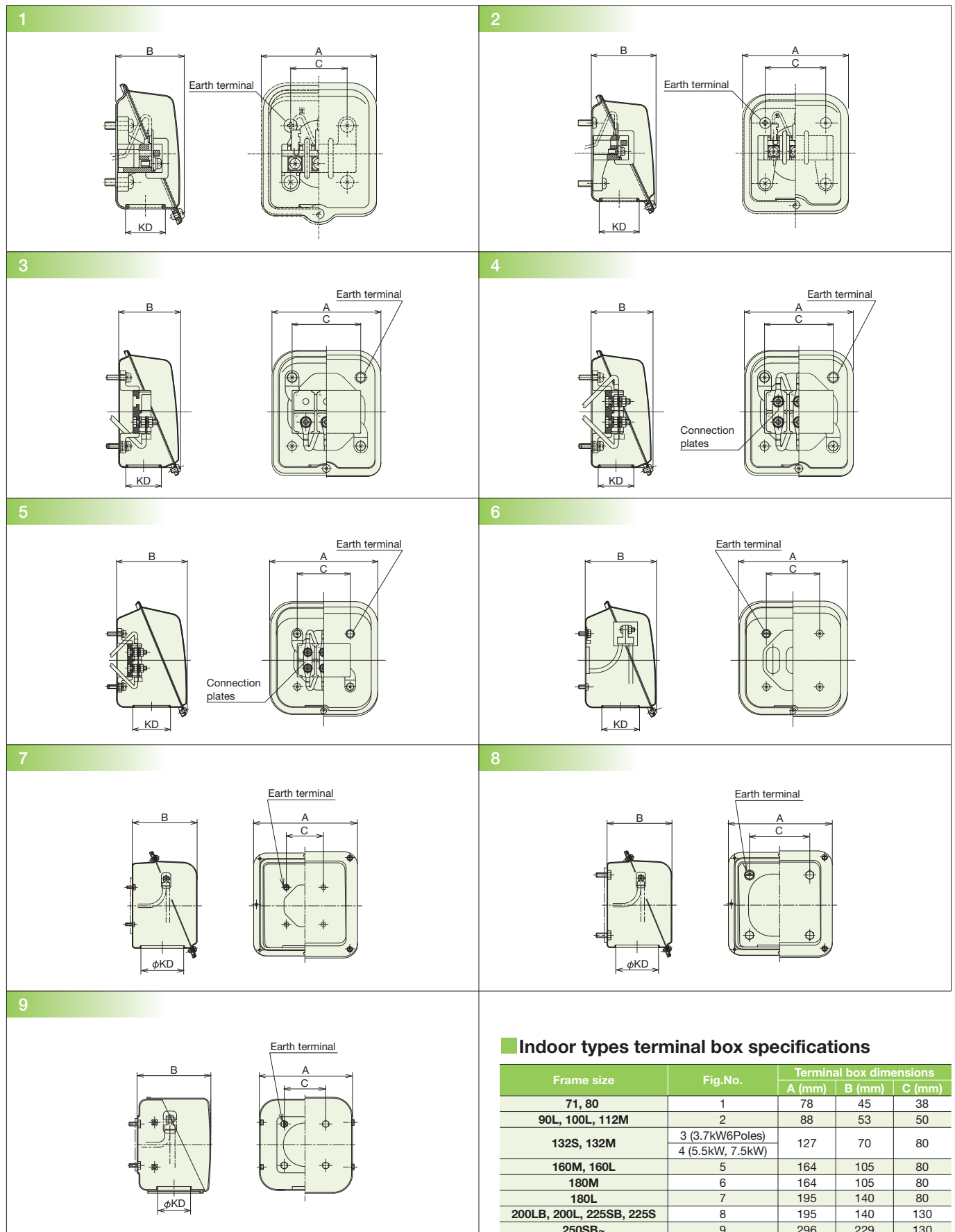
Frame size	Output (kW)			Fig. No.	Dimensions (mm)																	Approx. weight (kg)				
	2 Poles	4 Poles	6 Poles		LA	LB	LC	LE	LG	LZ	D	L	LL	KL	KA	KG	LM	LR	S	W	U	T	Q	2 Poles	4 Poles	6 Poles
80M	0.75	—	—	1	165	130j6	200	3.5	12	12	163	311	271	141	154	111	—	40	19j6	6	3.5	6	40	15.5	—	—
	—	0.75	—									323	283		166									17.5		
90L	1.5	1.5	0.75	2	165	130j6	200	3.5	12	12	182/176	352	302	153	158.5	123	213	50	24j6	8	4	7	50	21	23	24.5
	2.2											24.5														
100L	—	2.2	1.5	3	215	180j6	250	4	16	14.5	198/195	392.5	332.5	160	185	130	270	60	28j6	8	4	7	60	—	34.5	37
112M	3.7	3.7	2.2		215	180j6	250	4	16	14.5	225/215	414.5	354.5	173	204	143	308	60	28j6	8	4	7	60	40	43	46
132S	5.5	5.5	3.7	3	265	230j6	300	4	20	14.5	273	470.5	390.5	248	246	199.5	315	80	38k6	10	5	8	80	55	66	60
	7.5																		60							
132M	—	7.5	5.5	4	265	230j6	300	4	20	14.5	273	508.5	428.5	248	284	199.5	315	80	38k6	10	5	8	80	—	73	72
160M	11	11	7.5																300					250j6		
160L	15	15	11	5	300	250j6	350	5	20	18.5	316	630	520	270	366	221.5	380	110	42k6	12	5	8	110	116	122	117
180M	18.5	18.5	11																350					300j6	395	5
180L	30	30	18.5	5	350	300j6	395	5	20	18.5	364.5	790	680	325	412	250	394	110	55m6	16	6	10	110	215	245	215
	22																		22					215	235	
200LB	37	—	—	6	400	350j6	445	5	22	18.5	401.5	855	745	356	431	281	428	110	55m6	16	6	10	110	300	—	—
	45																		325							
200L	—	37	30	6	400	350j6	445	5	22	18.5	401.5	885	745	356	431	281	428	140	60m6	18	7	11	140	—	330	315
	—	45	37																—					335	340	
225SB	55	—	—	6	500	450j6	545	5	22	18.5	456	886	776	381	439	306	486	110	55m6	16	6	10	110	380	—	—
225S	—	55	45		500	450j6	545	5	22	18.5	456	916	776	381	439	306	486	140	65m6	18	7	11	140	—	415	425

Note : Mounting dimensions are the conventional products and compatibility.

Note : Request a dimensional drawing to us for design use because the dimensions may be subject to change.

# Terminal box dimensions

## Indoor types terminal box (IP44)

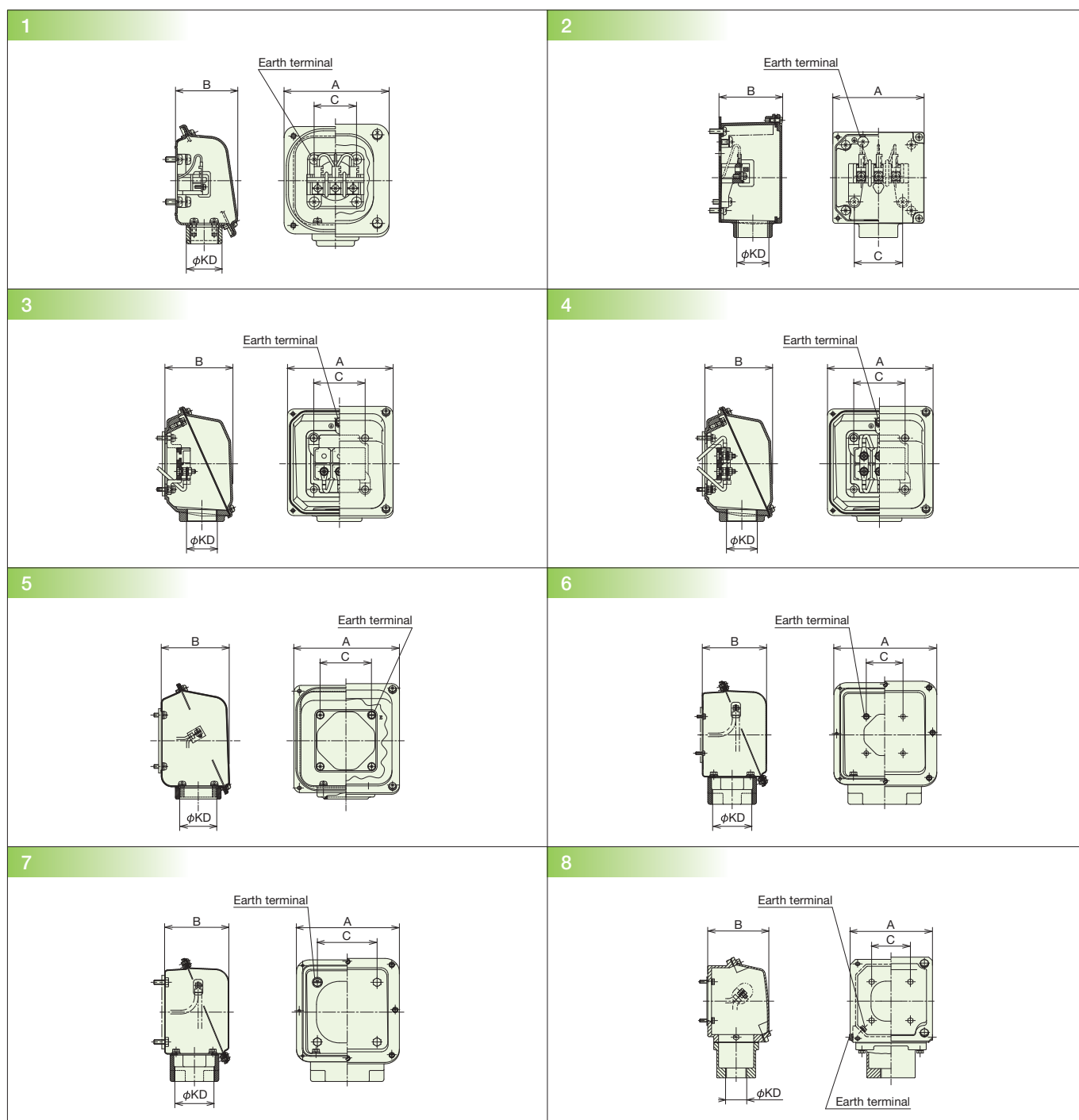


Note : Knock diameter (KD) - See page 13

### Indoor types terminal box specifications

Frame size	Fig.No.	Terminal box dimensions		
		A (mm)	B (mm)	C (mm)
71, 80	1	78	45	38
90L, 100L, 112M	2	88	53	50
132S, 132M	3 (3.7kW/6Poles)	127	70	80
	4 (5.5kW, 7.5kW)			
160M, 160L	5	164	105	80
180M	6	164	105	80
180L	7	195	140	80
200LB, 200L, 225SB, 225S	8	195	140	130
250SB~	9	296	229	130

## Outdoor types terminal box (IP55)



Note : Knock diameter (KD) - See page 13

## Indoor types terminal box specifications

Frame size	Fig.No.	Terminal box dimensions		
		A (mm)	B (mm)	C (mm)
71, 80	1	96	56	38
90L, 100L, 112M	2	94.5	63	50
132S, 132M	3 (3.7kW6Poles)	167.4	105.5	80
160M, 160L				
180M	5	166.6	106.5	80
180L	6	227	140	80
200LB, 200L, 225SB, 225S	7	227	140	130
250SB~	8	278	205	130



# Terminal box dimensions

## Knock diameter (KD) dimensions of the terminal box

Output (kW)	KD (mm)					
	Indoor types (IP44)			Outdoor types (IP55)		
	2 Poles	4 Poles	6 Poles	2 Poles	4 Poles	6 Poles
0.4	22	22	22	PF3/4	PF3/4	PF3/4
0.75	22	22	28	PF3/4	PF3/4	PF3/4
1.5	28	28	28	PF3/4	PF3/4	PF1
2.2	28	28	28	PF1	PF1	PF1
3.7	28	28	36	PF1	PF1	PF1-1/4
5.5	36	36	36	PF1-1/4	PF1-1/4	PF1-1/4
7.5	36	36	52	PF1-1/4	PF1-1/4	PF1-1/2
11	52	52	52	PF1-1/2	PF1-1/2	PF1-1/2
15	52	52	52	PF1-1/2	PF1-1/2	PF1-1/2
18.5	65	65	65	PF2	PF2	PF2
22	65	65	65	PF2	PF2	PF2
30	78	78	78	PF2	PF2	PF2
37	78	78	78	PF2-1/2	PF2-1/2	PF2-1/2
45	78	78	78	PF2-1/2	PF2-1/2	PF2-1/2
55	92	92	92	PF3	PF3	PF3
75	78	78	78	PF2-1/2	PF2-1/2	PF2-1/2
90	78	78	78	PF2-1/2	PF2-1/2	PF2-1/2
110	92	92	92	PF3	PF3	PF3
132	92	92	92	PF3	PF3	PF3

## Motor wiring connection

Voltage	Number of lead wires	Starting method	Connection method											
Single voltage	3	Direct on line												
	6 <sup>*1</sup>	Direct on line Y-Δ start	<table border="1"> <thead> <tr> <th>CONNECTION</th> <th>Y-Δ START</th> <th colspan="2">CHANGE OVER OF STARTER TERMINAL</th> </tr> <tr> <th>DIRECT ON LINE</th> <th>STARTER</th> <th>Y START</th> <th>Δ RAN</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	CONNECTION	Y-Δ START	CHANGE OVER OF STARTER TERMINAL		DIRECT ON LINE	STARTER	Y START	Δ RAN			
CONNECTION	Y-Δ START	CHANGE OVER OF STARTER TERMINAL												
DIRECT ON LINE	STARTER	Y START	Δ RAN											
Double voltage (ex. 220/380V)	6	Direct on line	<p><b>High voltage (Y)</b></p> <p><b>Low voltage (Δ)</b></p>											

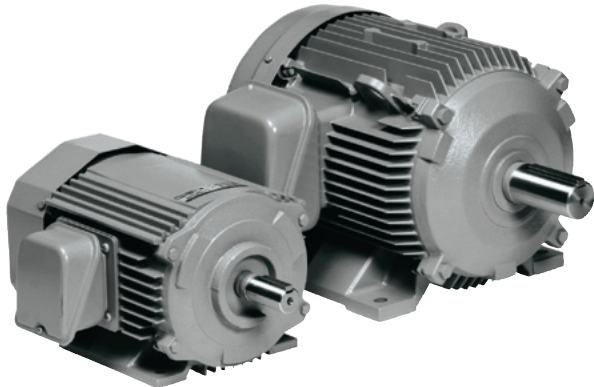
Voltage	Number of lead wires	Starting method	Connection method																
Double voltage (ex. 200/400V 220/440V)	9	Direct on line	<p><b>400V class (M)</b></p> <p><b>200V class (2Y)</b></p>																
			<p><b>400V class (Δ)</b></p> <p><b>200V class (2Δ)</b></p>																
Double voltage (ex. 200/400V 220/440V)	12	Direct on line Y-Δ start	<table border="1"> <thead> <tr> <th colspan="2">CONNECTION</th> <th colspan="2">Y START</th> </tr> <tr> <th colspan="2">DIRECT ON LINE</th> <th colspan="2">CONNECTIONS BETWEEN MOTOR AND STARTER</th> </tr> <tr> <th>400V CLASS</th> <th>200V CLASS</th> <th>400V CLASS</th> <th>200V CLASS</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table> <p><b>INNER CONNECTIONS</b></p>	CONNECTION		Y START		DIRECT ON LINE		CONNECTIONS BETWEEN MOTOR AND STARTER		400V CLASS	200V CLASS	400V CLASS	200V CLASS				
CONNECTION		Y START																	
DIRECT ON LINE		CONNECTIONS BETWEEN MOTOR AND STARTER																	
400V CLASS	200V CLASS	400V CLASS	200V CLASS																

\*1: Please remove connection plates at starting method of Y-Δ

# Other Line-up

## Premium High-Efficiency Motors

Equivalent to IE3 class



## High-Efficiency Motors

Equivalent to IE2 class



## Brake Motors

On Brake & Off Brake model  
Brake model : HBA, FA, NA  
Output : 0.2 ~ 30kW (in case 4 pole)



## Gear Motors

GA/GH-series (For General load)  
Output : 0.2 ~ 11kW 1/5 ~ 1/100



## High-Pressure Blowers

Vortex Blower  
E-series (Large air flow type)  
G-series (High-pressure type)  
DN-series (General type)



## Water Pumps

JD Type : Circulation Pumps  
JL Type : In-line Pumps  
Output : 0.25kW ~ 11kW



# Technical Managements

## Special Instruction

### [ Inspect the machine before use ]

Please inspect the following area before turning on the switch ;

- Inspect if the following area are in ground wiring and insulation wiring,
- Inspect preventive apparatus and control circuit if they are working properly.
- Is the value of insulation resistance less than  $1M\Omega$  or not.
- Inspect if machine installation (direct belt) is correctly done.

### [ Precaution during use ]

- Should be careful in loading capacity and frequency in turning on the machine. Machine should not be on for a long period of time.
- If the motor rotates in a wrong direction, in case of three-phase motor, swap the two wires. In case of single-phase motor, re-wiring following the connection circuit.
- Voltage Amp should be within a correct limitation.
  - Is voltage amp correct as indicated in the instruction manual ?
  - Is there any balance in voltage amp for three-phase line ?
  - Is the electrical distributed power higher than the indicated limitation? It should be adjusted to an appropriate loading capacity.
  - Inspect to make sure there is no vibration sound and abnormal heating.

## Outdoor Installation

- Use a motor that has a totally enclosed with cooling fan and can be placed outside a building. The motor can be installed outside because it can prevent any water droplets in between core structures. The terminal box should have water protection and seal that can prevent water coming into lead wire connection. Insulated wires can tolerate humidity and seal that can prevent water seeping into lead wire connection.
- You can connect wires in steel tubed connection on the side (For wire connection of motor outside the building, you should follow the instructional pictures in preventing rain from iron pipe seeping into the terminal box).
- General type of totally enclosed motor with cooling fan is IP44 class. If installing in high dust area, you can use IP54 class. In case having water injection into a machine, you can use IP55 class.

## Maintenance

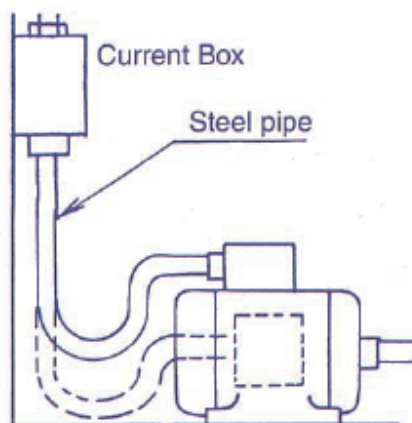
### [ Daily basis ]

- Surrounding environment :  
Inspect the temperature around the entire machine, humidity, dust, gas and ventilation system.
- Working essentials :  
Inspect the electric distribution (loading capacity), frequency and voltage amp.
- Loading condition and machine connection :  
Inspect the tension of connecting belt.
- Condition around machine connection area :  
Vibration and sound for making sure if it's working properly.

### [ Periodic basis ]

- Should be inspected  
Bearings, insulating stator (no less than  $1M\Omega$ , looseness of any bolt and nut, colors, etc. Including inspection of motor condition if it's working correctly at least once a year.

### Installation Example



**Hitachi Asia, Ltd.**

**Hitachi Industrial Technology (Thailand), Ltd.**