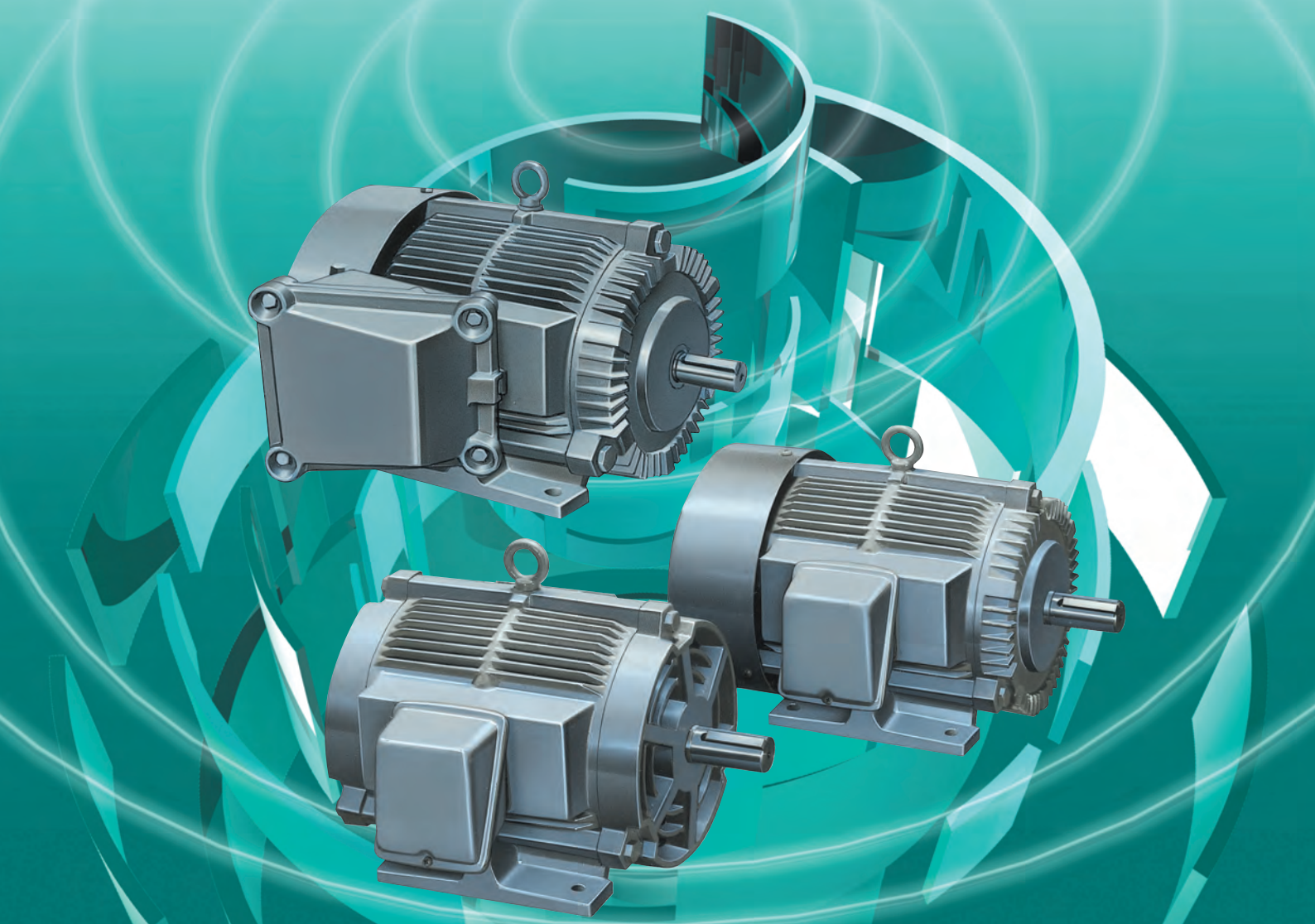
LITTLE KING 85 Series

MEIDEN

# Low-Voltage 3-Phase Induction Motor

Squirrel Cage-Rotor Type

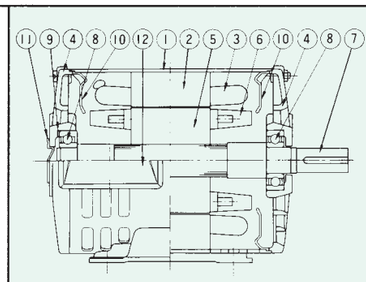
## Our abundant experience and solid technical expertise maximize the performance of industrial machines



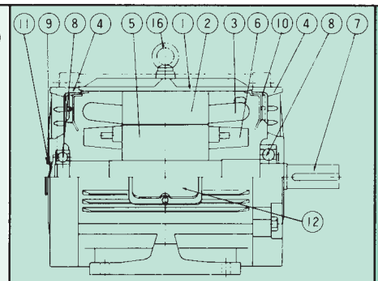
*Empower for new days*

# Motor Construction

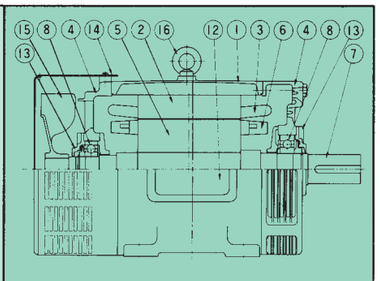
**Protected drip-proof type**



Frame Nos 80L ~ 112M

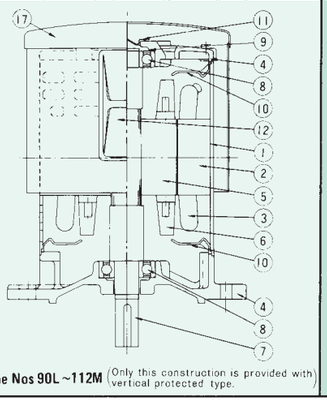


Frame Nos 132S ~ 180M (The Frame 180M is provided with ventilation holes in its frame.)

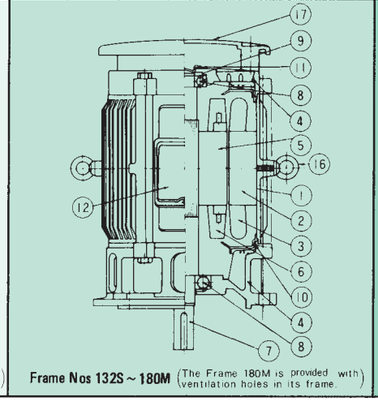


Frame Nos 180L ~ 280M

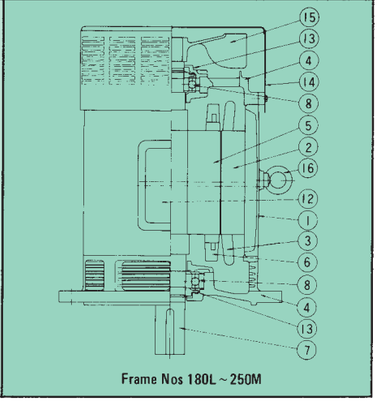
**Vertical protected drip-proof type**



Frame Nos 90L ~ 112M (Only this construction is provided with vertical protected type.)



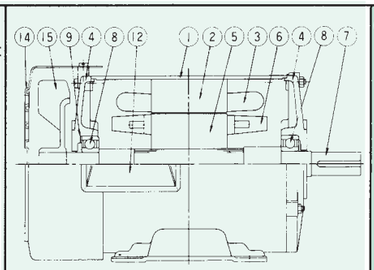
Frame Nos 132S ~ 180M (The Frame 180M is provided with ventilation holes in its frame.)



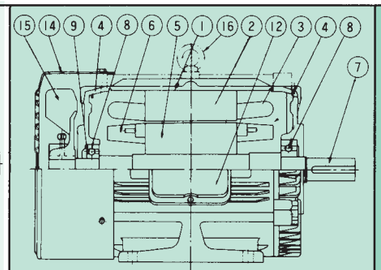
Frame Nos 180L ~ 250M

| No. | Name | No. | Name | No. | Name | No. | Name |
|---|---|---|---|---|---|---|---|
| ① | Frame | ⑥ | Rotor fan | ⑪ | End lid | ⑯ | Eye bolt |
| ② | Stator core | ⑦ | Shaft | ⑫ | Terminal box | ⑰ | Drip-proof cover |
| ③ | Stator winding | ⑧ | Bearing | ⑬ | Bearing box | ⑱ | Inner cover |
| ④ | Bracket | ⑨ | Corrugate spring | ⑭ | Outer cover | | |
| ⑤ | Rotor core | ⑩ | Fan guide | ⑮ | Fan | | |

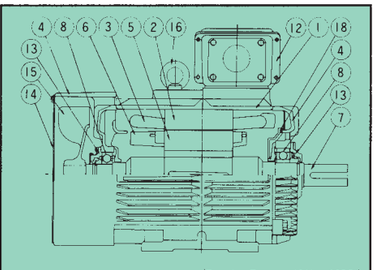
**Totally-enclosed, frame surface cooled type**



Frame Nos 63 ~ 80

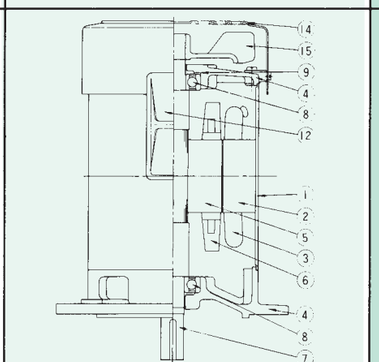


Frame Nos 90L ~ 180M

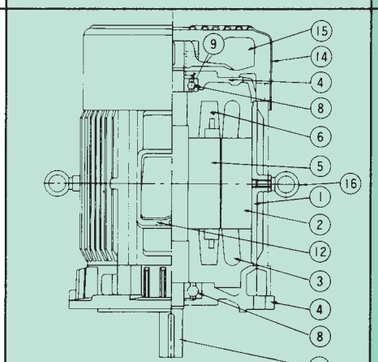


Frame Nos 180L ~ 315M (For the Frames 180L ~ 225S, terminal boxes are of side mounting type.)

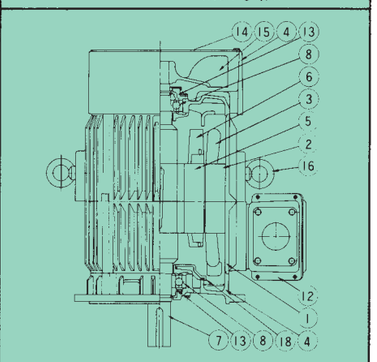
**Vertical totally-enclosed, frame surface cooled type**



Frame Nos 63 ~ 80



Frame Nos 90L ~ 180M



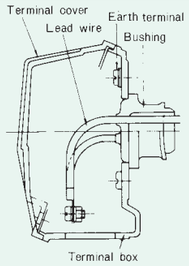
Frame Nos 180L ~ 280M (For the Frames 180L ~ 225S, terminal boxes are mounted in different positions.)



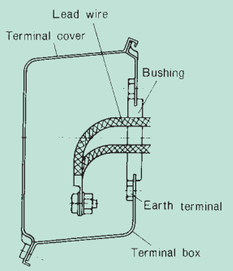
<Note> The above construction varies with Frame No.

# Terminal Construction

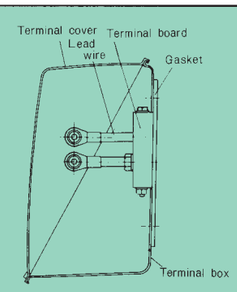
**Indoor type**



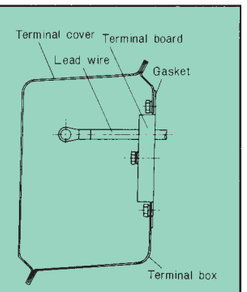

Frame Nos of Protected type 80 ~ 112
Frame Nos Totally-enclosed type 80
(Bushing type)




Frame Nos of Protected type 132 ~ 160
Frame Nos Totally-enclosed type 90 ~ 160
(Bushing type)

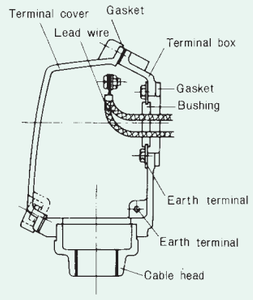



Frame Nos. 180 ~ 225
(Clamp type)

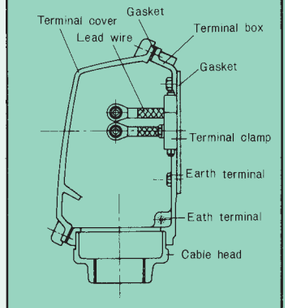



Frame Nos.250 ~ 315
(Clamp type)

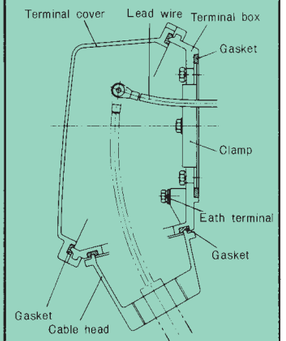
**Outdoor type**




Frame No.160 and below (Bushing type)



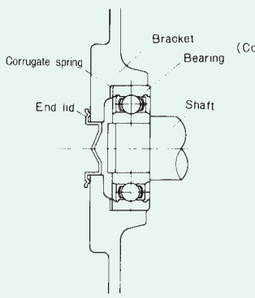

Frame Nos. 180 ~ 225
(Clamp type)



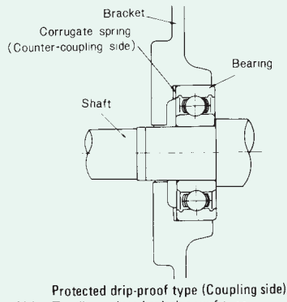

Frame Nos. 250 ~ 315
(Clamp type)

# Bearing Construction

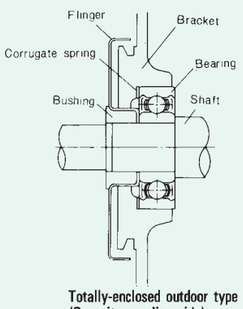
**Shielded bearing type**



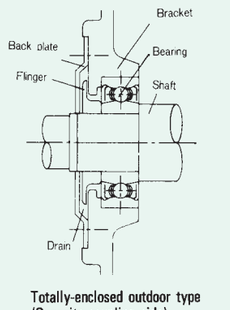

Protected drip-proof type (Opposite-coupling side)




Protected drip-proof type (Coupling side)
Totally-enclosed splash-proof type

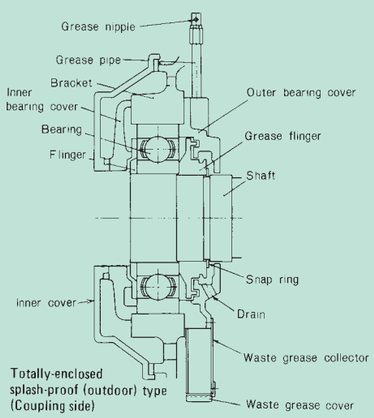



Totally-enclosed outdoor type
(Opposite-coupling side)

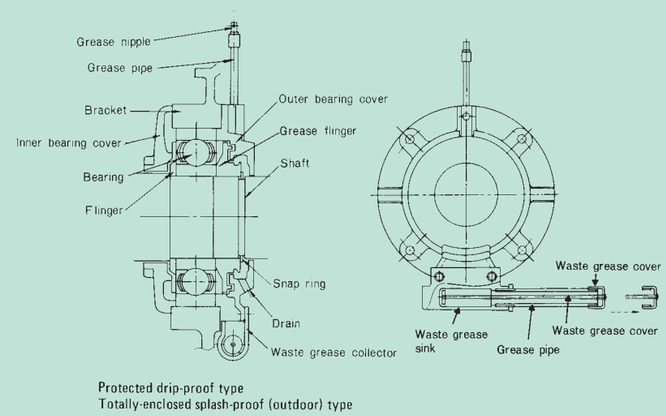



Totally-enclosed outdoor type
(Opposite-coupling side)

**Grease supplement type**



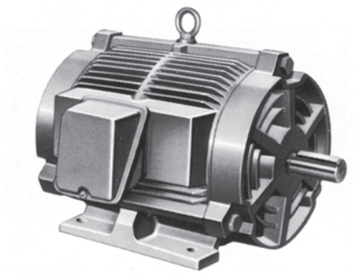

Totally-enclosed
splash-proof (outdoor) type
(Coupling side)




Protected drip-proof type
Totally-enclosed splash-proof (outdoor) type

# Protected Drip-Proof Type (TypeED85)

| | |
|---|---|
| Protection type | IP22 |
| Cooling type | IC01 |



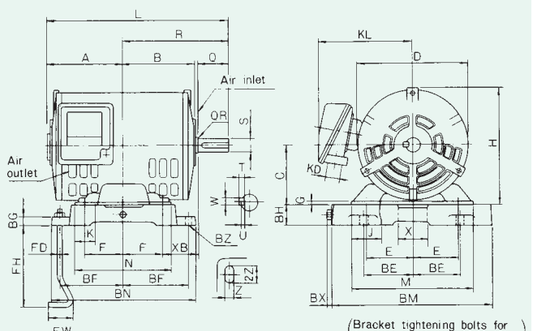
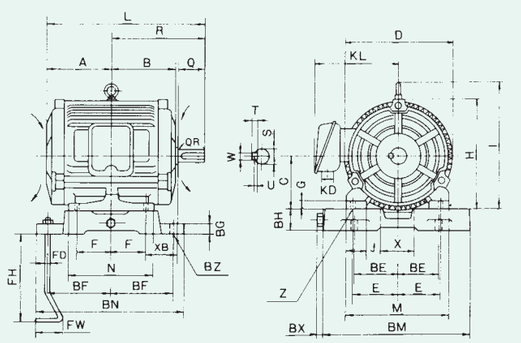



Fig. 1 Frame Nos 80 ~ 100L
Frame No. 112M

(Bracket tightening bolts for 6-pole and 8-pole machines are located outside the frame.)
(Only 2-pole and 4-pole machines are attached hunging bolt.)




X:Sliding distance

Fig. 2 Frame No. 112M (6-pole and 8-pole)

## External Dimension

| Frame No. | Output (kW) 2-pole | 4-pole | 6-pole | 8-pole | Class of Insulation | Fig. No. | Motor A | B | C | D | E | F | G | H | I | J | K | L | M | N | Z | XB | KD | KL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 80 | 0.75 | 0.75 | 0.4 | 0.2 | E | 1 | 97.5 | 96 | 80 | (155) 146 | 62.5 | 50 | 3 | (165) 155 | – | 34 | 28 | 237.5 | 160 | 128 | 10X20 | 50 | 22 | 139 |
| 90L | 1.5 2.2 | 1.5 | 0.75 | 0.4 | E | 1 | 115.5 | 114 | 90 | (170) 161 | 70 | 62.5 | 4 | (183) 172.5 | – | 36 | 30 | 284 | 175 | 155 | 10X20 | 56 | 22 | 146 |
| 100L | – | 2.2 | 1.5 | 0.75 | E | 1 | 130 | 128.5 | 100 | (190) 182 | 80 | 70 | 4 | (204) 193 | – | 42 | 34 | 323 | 200 | 175 | 12X24 | 63 | 22 | 156 |
| 112M | 3.7 | 3.7 | – | – | E | 1 | 137.5 | 135.5 | 112 | 202 | 95 | 70 | 4 | 229 | 262 | 42 | 34 | 337.5 | 230 | 175 | 12X24 | 70 | 22 | 167 |
| 112M | – | – | 2.2 | 1.5 | E | 2 | 135.5 | 135.5 | 112 | 225 | 95 | 70 | 14 | 233 | 266.5 | 45 | – | 335.5 | 226 | 176 | 12 | 70 | 22 | 170 |
| 132S | 5.5 7.5 | 5.5 | 3.7 | *2.2 | B | 3 | 151.5 | 153 | 132 | 253.5 | 108 | 70 | 16 | 270 | 311.5 | 50 | – | 390.5 | 252 | 176 | 12 | 89 | 34 | 213 |
| 132M | – | 7.5 | 5.5 | 3.7 | B | 3 | 170.5 | 172 | 132 | 253.5 | 108 | 89 | 16 | 270 | 311.5 | 50 | – | 428.5 | 252 | 214 | 12 | 89 | 34 | 213 |
| 160M | 11 15 | 11 | 7.5 | 5.5 | B | 3 | 207 | 207 | 160 | 298.5 | 127 | 105 | 20 | 318 | 369 | 60 | 61 | 530 | 315 | 262 | 15 | 108 | 34 | 238 |
| 160L | 18.5 | 15 | 11 | 7.5 | B | 3 | 229 | 229 | 160 | 298.5 | 127 | 127 | 20 | 318 | 369 | 60 | 63 | 574 | 315 | 306 | 15 | 108 | 34 | 238 |
| 160L | 22 | 18.5 | – | – | B | 3 | 229 | 229 | 160 | 298.5 | 127 | 127 | 20 | 318 | 369 | 60 | 63 | 574 | 315 | 306 | 15 | 108 | 34 | 238 |
| 180M | 30 | 22 30 | 15 18.5 | 11 15 | B | 4 | 236 | (237.5) 236 | 180 | 341 | 139.5 | 120.5 | 22 | 367 | 427 | 70 | 65 | 587.5 | 350 | 294 | 15 | 121 | 49 | 320 |
| 180LH | 37 45 | – | – | – | F | 5 | 330 | 256 | 180 | 378 | 139.5 | 139.5 | 22 | 365 | 425 | 70 | 68 | 700.5 | 350 | 332 | 15 | 121 | 62 | 320 |
| 180L | – | 37 45 | 22 30 | 15 18.5 | | | | 255 | | | | | | | | | | 730.5 | | | | | | |
| 200MH | 55 | – | – | – | F | 5 | 342 | 262 | 200 | 418 | 159 | 133.5 | 25 | 405 | 465 | 80 | 80 | 718.5 | 395 | 334 | 19 | 133 | 62 | 344 |
| 200M*B | – | 55 | 37 45 | 30 | | | | 262.5 | | | | | | | | | | 748.5 | | | | | | |
| 225SH | 75 | – | – | – | F | 5 | 393 | 286 | 225 | 473 | 178 | 143 | 28 | 457 | 528 | 85 | 85 | 795 | 445 | 353 | 19 | 149 | 62 | 374 |
| 225S*B | – | 75 | 55 | 37 | | | | 286.5 | | | | | | | | | | 825 | | | | | | |
| 225MH | 90 | – | – | – | F | 5 | 405.5 | 298.5 | 225 | 473 | 178 | 155.5 | 28 | 457 | 528 | 85 | 85 | 820 | 445 | 378 | 19 | 149 | 62 | 374 |
| 225M*B | – | 90 | 75 | 45 | | | 405.5 | 299 | | | | | | | | | | 850 | | | | | | |
| 250SH | 110 | – | – | – | F | 6 | 475 | 316 | 250 | 525 | 203 | 155.5 | 36 | – | 605 | 90 | 100 | 908.5 | 500 | 380 | 24 | 168 | 120X160 | 463 |
| 250S*B | – | 110 | 90 | 55 | | | | 319 | | | | | | | | | | 968.5 | | | | | | |
| 250MH | 132 | – | – | – | F | 6 | 496 | 335 | 250 | 525 | 203 | 174.5 | 36 | – | 605 | 90 | 100 | 948.5 | 500 | 420 | 24 | 168 | 120X160 | 463 |
| 250M*B | – | 132 | 110 | 75 | | | | 338 | | | | | | | | | | 1008.5 | | | | | | |
| 280SH | 160 | – | – | – | F | 6 | 515 | 366 | 280 | 585 | 228.5 | 184 | 36 | – | 685 | 100 | 110 | 999 | 560 | 440 | 24 | 190 | 120X160 | 493 |
| 280S*B | – | 160 | 132 | 90 | | | | 368 | | | | | | | | | | 1059 | | | | | | |
| 280MH | 200 | – | – | – | F | 6 | 569.5 | 391 | 280 | 585 | 228.5 | 209.5 | 36 | – | 685 | 100 | 110 | 1079 | 560 | 490 | 24 | 190 | 120X160 | 493 |
| 280M*B | – | 200 | 160 | 110 | | | | 393 | | | | | | | | | | 1139 | | | | | | |

<Notes>
1. Tolerance for size S is j6 for $\phi$28 or less, k6 for $\phi$38 to $\phi$48 and m6 for $\phi$55 or over, according to JIS B 0401 (Limits and fits for engineering).
2. Tolerance for size C is 0 to –0.5 for 250 or less and 0 to –1.0 in case of exceeding 250.
3. Frame No. C/B show direct coupling (C) and belt driving (B) and the two types have different kinds of bearings at coupling sides.



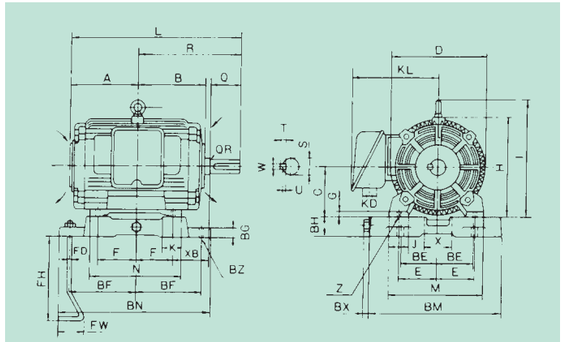



Fig. 3 Frame Nos 132S ~ 160L (For the Frame 132, three bracket mounting bolts are used.)

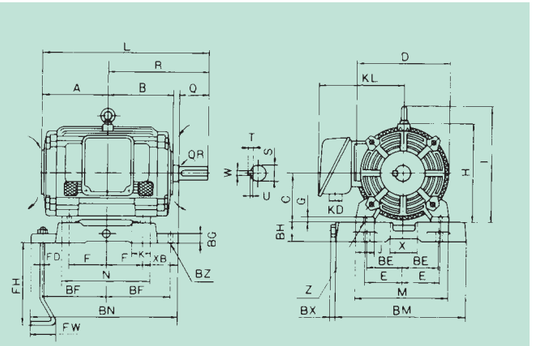



Fig. 4 Frame No. 180M

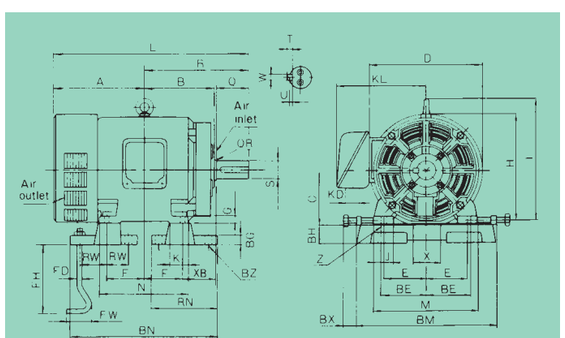



Fig. 5 Frame Nos 180L ~ 225M (The Frames 180L~200L are provided with slide bases.)

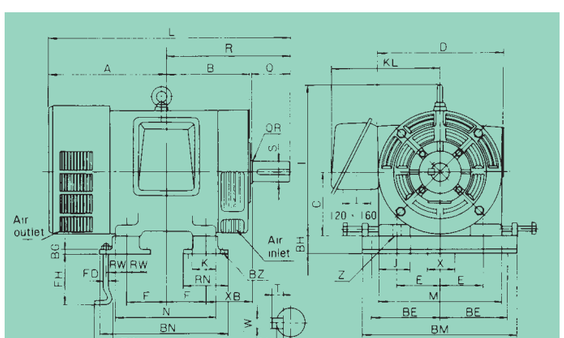



Fig. 6 Frame Nos 250M ~ 280M

| Shaft R | S | Q | T | U | W | QR | Slide base (Rail) BE | BF | BG | BH | BM | BN | BZ | BX | RW | RN | X | Foundation bolt FD | FH | FW | Bearing No. Coupling side | Opposite coupling side | Approx. mass (kg) Motor | Base | Frame No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 140 | 19 | 40 | 6 | 3.5 | 6 | 0.3 | 65 | 90 | 15 | 30 | 214 | 210 | 13 | 9 | – | – | 40 | 10 | 95 | 40 | 6204ZZ | 6204ZZ | 11.5 | 2.0 | 80 |
| 168.5 | 24 | 50 | 7 | 4 | 8 | 0.3 | 70 | 105 | 15 | 30 | 230 | 240 | 13 | 9 | – | – | 40 | 10 | 95 | 40 | 6205ZZ | 6205ZZ | 17 | 2.2 | 90L |
| 193 | 28 | 60 | 7 | 4 | 8 | 0.5 | 80 | 115 | 20 | 40 | 270 | 260 | 13 | 9 | – | – | 50 | 10 | 90 | 40 | 6206ZZ | 6205ZZ | 24 | 3.0 | 100L |
| 200 | 28 | 60 | 7 | 4 | 8 | 0.5 | 95 | 115 | 20 | 40 | 290 | 260 | 13 | 9 | – | – | 50 | 10 | 90 | 40 | 6306ZZ | 6206ZZ | 35 | 3.5 | 112M |
| 200 | 28 | 60 | 7 | 4 | 8 | 0.5 | 95 | 115 | 20 | 40 | 290 | 260 | 13 | 9 | – | – | 50 | 10 | 90 | 40 | 6306ZZ | 6206ZZ | 40 | 3.5 | 112M |
| 239 | 38 | 80 | 8 | 5 | 10 | 0.5 | 110 | 120 | 25 | 45 | 355 | 280 | 13 | 10.5 | – | – | 60 | 10 | 85 | 40 | 6308ZZ | 6207ZZ | 55 | 5.0 | 132S |
| 258 | 38 | 80 | 8 | 5 | 10 | 0.5 | 110 | 140 | 25 | 45 | 360 | 318 | 13 | 10.5 | – | – | 60 | 10 | 85 | 40 | 6308ZZ | 6207ZZ | 69 | 6.0 | 132M |
| 323 | 42 | 110 | 8 | 5 | 12 | 0.5 | 125 | 165 | 30 | 50 | 406 | 380 | 16 | 10.5 | – | – | 70 | 12 | 115 | 50 | 6309ZZ | 6308ZZ | 100 | 8.5 | 160M |
| 345 | 42 | 110 | 8 | 5 | 12 | 0.5 | 125 | 185 | 30 | 50 | 406 | 420 | 16 | 10.5 | – | – | 70 | 12 | 115 | 50 | 6309ZZ | 6308ZZ | 110 | 10.0 | 160L |
| 345 | 48 | 110 | 9 | 5.5 | 14 | 0.5 | 125 | 185 | 30 | 50 | 406 | 420 | 16 | 10.5 | – | – | 70 | 12 | 115 | 50 | 6310ZZ | 6308ZZ | 130 | 10.0 | 160L |
| 351.5 | 55 | 110 | 10 | 6 | 16 | 1 | 140 | 185 | 35 | 55 | 456 | 420 | 16 | 11.5 | – | – | 80 | 12 | 115 | 50 | (6312) 6312ZZ | (6308ZZ) 6310ZZ | 190 | 13.0 | 180M |
| 370.5 | 55 | 110 | 10 | 6 | 16 | 1 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | 6312 | 6308ZZ | 210 | – | 180LH |
| 400.5 | 60 | 140 | 11 | 7 | 18 | 0.5 | 140 | 205 | 35 | 55 | 456 | 460 | 16 | 11.5 | – | – | 80 | 12 | 115 | 50 | 6313ZZ | 6311ZZ | 215 | 14 | 180L |
| 376.5 | 55 | 110 | 10 | 6 | 16 | 1 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | 6312 | 6308ZZ | 250 | – | 200MH |
| 406.5 | 65 | 140 | 11 | 7 | 18 | 1 | 160 | 210 | 35 | 60 | 535 | 470 | 18 | 13 | – | – | 100 | 16 | 150 | 63 | 6314C3/NU314 | 6312ZZ | 260 | 17.5 | 200M*B |
| 402 | 55 | 110 | 10 | 6 | 16 | 1 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | 6312 | 6308ZZ | 315 | – | 225SH |
| 432 | 75 | 140 | 12 | 7.5 | 20 | 1 | 200 | – | 35 | 71 | 770 | 476 | 20 | 225 | 71 | 190 | 180 | 16 | 265 | 63 | 6316C3/NU316 | 6313ZZ | 325 | 38 | 225S*B |
| 414.5 | 55 | 110 | 10 | 6 | 16 | 1 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | 6312 | 6308ZZ | 350 | – | 225MH |
| 444.5 | 75 | 140 | 12 | 7.5 | 20 | 1 | 200 | – | 35 | 71 | 770 | 501 | 20 | 225 | 71 | 190 | 180 | 16 | 265 | 63 | 6316C3/NU316 | 6313ZZ | 360 | 38 | 225M*B |
| 433.5 | 55 | 110 | 10 | 6 | 16 | 1 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | 6312 | 6312 | 470 | – | 250SH |
| 493.5 | 85 | 170 | 14 | 9 | 22 | 1 | 315 | – | 30 | 85 | 900 | 521 | 19 | 250 | 80 | 210 | 180 | 16 | 265 | 63 | 6318C3/NU318 | 6315ZZ | 485 | 65 | 250S*B |
| 452.5 | 55 | 110 | 10 | 6 | 16 | 1 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | 6312 | 6312 | 515 | – | 250MH |
| 512.5 | 85 | 170 | 14 | 9 | 22 | 1 | 315 | – | 30 | 85 | 900 | 559 | 19 | 250 | 80 | 210 | 180 | 16 | 265 | 63 | 6318C3/NU318 | 6315ZZ | 530 | 65 | 250M*B |
| 484 | 55 | 110 | 10 | 6 | 16 | 1 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | 6312 | 6312 | 620 | – | 280SH |
| 544 | 95 | 170 | 14 | 9 | 25 | 1 | 315 | – | 30 | 85 | 900 | 578 | 19 | 250 | 80 | 210 | 200 | 16 | 265 | 63 | 6320C3/NU320 | 6317 | 640 | 65 | 280S*B |
| 509.5 | 55 | 110 | 10 | 6 | 16 | 1 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | 6312 | 6312 | 710 | – | 280MH |
| 569.5 | 95 | 170 | 14 | 9 | 25 | 1 | 315 | – | 30 | 85 | 900 | 629 | 19 | 250 | 80 | 210 | 200 | 16 | 265 | 63 | 6320C3/NU320 | 6317 | 730 | 65 | 280M*B |

4. In case of V-belts, after reference the table of "Application of V-Belts and V-Pully" (P16), please be careful with selection and installation.
5. Bearing Nos. in the parenthesis show the one for 2-pole motors.
6. In frame Nos. 80 to 100L, sizes D and H in brackets are those of 6 and 8-pole motors.
7. Size may be changed. Please inquire sizes, when used for design.
8. In frame No. 180M, size B in bracket is 2-pole motor.
9. 2.2kW-8-pole in marked symbol* is class E insulation.

# Vertical Protected Type (Type VE90)

# Vertical Protected Drip-Proof Type (Type VED85)

# Protected Drip-Proof Flange-Mounted Type (Type HED85)

| | | |
|---|---|---|
| Protection type | 90L~100L, 112M (2,4-pole) | IP20 |
| | 112M (6,8-pole), 132S~250M | IP22 |
| Cooling type | | IC01 |

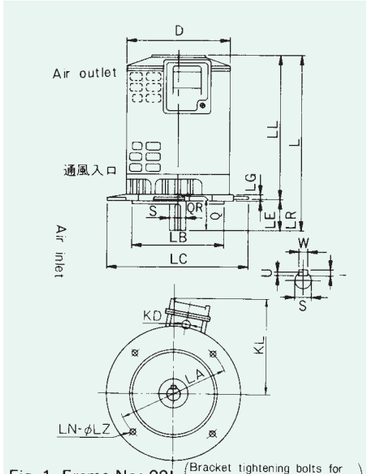



Fig. 1 Frame Nos 90L ~ 100L / Frame No.112M (Bracket tightening bolts for 6-pole and 8-pole machines are located outside the frame. Only 2-pole and 4-pole machines are attached hunging bolt.)

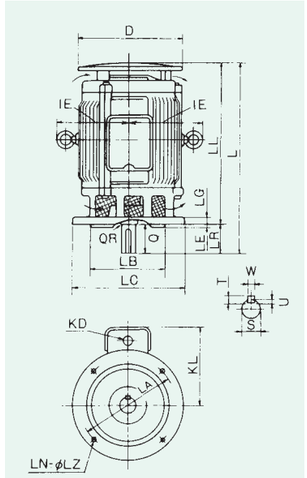



Fig. 2 Frame No. 112M (6-pole and 8-pole)

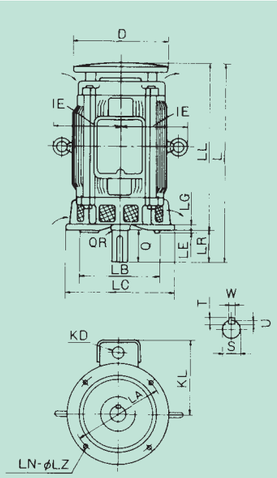


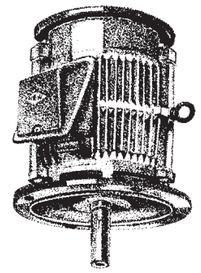

Fig. 3 Frame Nos 132S ~ 160L

## External Dimension

| Flange No. | Frame No. | Output (kW) 2-pole | 4-pole | 6-pole | 8-pole | Class of Insulation | Fig. No. | Motor D | LL | L | IE | LA | LB | LC | LE | LG | LZ | LN | LR | KD | KL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FF165 | 90L | 1.5 / 2.2 | 1.5 | 0.75 | 0.4 | E | 1 | 161 | 305.5 | 255.5 | — | 165 | 130 | 200 | 3.5 | 12 | 12 | 4 | 50 | 22 | 149 |
| FF215 | 100L | — | 2.2 | 1.5 | 0.75 | E | 1 | 182 | 341 | 281 | — | 215 | 180 | 250 | 4 | 16 | 15 | 4 | 60 | 22 | 158 |
| | 112M | 3.7 | 3.7 | — | — | E | 1 | 202 | 363.5 | 303.5 | 150 | 215 | 180 | 250 | 4 | 16 | 15 | 4 | 60 | 22 | 169 |
| | 112M | — | — | 2.2 | 1.5 | E | 2 | 240 | 421 | 361 | 155 | 215 | 180 | 250 | 4 | 16 | 15 | 4 | 60 | 22 | 170 |
| FF265 | 132S | 5.5 / 7.5 | 5.5 | 3.7 | *2.2 | B | 3 | 270 | 485 | 405 | 180 | 265 | 230 | 300 | 4 | 20 | 15 | 4 | 80 | 34 | 213 |
| | 132M | — | 7.5 | 5.5 | 3.7 | B | 3 | 270 | 523 | 443 | 180 | 265 | 230 | 300 | 4 | 20 | 15 | 4 | 80 | 34 | 213 |
| FF300 | 160M | 11 / 15 | 11 | 7.5 | 5.5 | B | 3 | 310 | 613 | 503 | 209 | 300 | 250 | 350 | 5 | 20 | 19 | 4 | 110 | 34 | 238 |
| | 160L | — | 15 | 11 | 7.5 | B | 3 | 310 | 657 | 547 | 209 | 300 | 250 | 350 | 5 | 20 | 19 | 4 | 110 | 34 | 238 |
| FF350 | 160L | 18.5 | — | — | — | B | 3 | 310 | 657 | 547 | 209 | 350 | 300 | 400 | 5 | 20 | 19 | 4 | 110 | 34 | 238 |
| | 160L | 22 | 18.5 | — | — | B | 3 | 310 | 657 | 547 | 209 | 350 | 300 | 400 | 5 | 20 | 19 | 4 | 110 | 34 | 238 |
| | 180M | 30 | 22 / 30 | 15 / 18.5 | 11 / 15 | B | 4 | 362 | 671 | 561 | 247 | 350 | 300 | 400 | 5 | 20 | 19 | 4 | 110 | 49 | 320 |
| FF400 | 180LH | 37 / 45 | — | — | — | F | 5 | 378 | 700.5 | 590.5 | 247 | 400 | 350 | 450 | 5 | 22 | 19 | 8 | 110 | 62 | 320 |
| | 180L | — | 37 / 45 | 22 / 30 | 18.5 / 22 | | | | 730.5 | | | | | | | | | | 140 | | |
| FF500 | 200MH | 55 | — | — | — | F | 5 | 418 | 718.5 | 608.5 | 265 | 500 | 450 | 550 | 5 | 22 | 19 | 8 | 110 | 62 | 344 |
| | 200M※ | — | 55 | 37 / 45 | 30 | | | | 748.5 | | | | | | | | | | 140 | | |
| | 225SH | 75 | — | — | — | F | 5 | 473 | 795 | 685 | 303 | 500 | 450 | 550 | 5 | 22 | 19 | 8 | 110 | 62 | 374 |
| | 225S※ | — | 75 | 55 | 37 | | | | 825 | | | | | | | | | | 140 | | |
| | 225MH | 90 | — | — | — | F | 5 | 473 | 820 | 693.5 | 303 | 500 | 450 | 550 | 5 | 22 | 19 | 8 | 110 | 62 | 374 |
| | 225M※ | — | 90 | 75 | 45 | | | | 850 | | | | | | | | | | 140 | | |
| FF600 | 250SH | 110 | — | — | — | F | 6 | 525 | 908.5 | 798.5 | 315 | 600 | 550 | 660 | 6 | 25 | 24 | 8 | 110 | 120×160 | 463 |
| | 250S※ | — | 110 | 90 | 55 | | | | 968.5 | | | | | | | | | | 170 | | |
| | 250MH | 132 | — | — | — | F | 6 | 525 | 948.5 | 838.5 | 315 | 600 | 550 | 660 | 6 | 25 | 24 | 8 | 110 | 120×160 | 463 |
| | 250M※ | — | 132 | 110 | 75 | | | | 1008.5 | | | | | | | | | | 170 | | |

<Notes>
1. Tolerance for size S is j6 for φ28 or less, k6 for φ38 to φ48 and m6 for φ55 or over, according to JIS B 0401 (Limits and fits for engineering).
2. Tolerance for size LB is j6 for φ450 or less and js6 for φ550 or over, according to JIS B 0401.
3. Frame No. C/B show direct coupling (C) and belt driving (B) and the two types have different kinds of bearings at coupling sides.





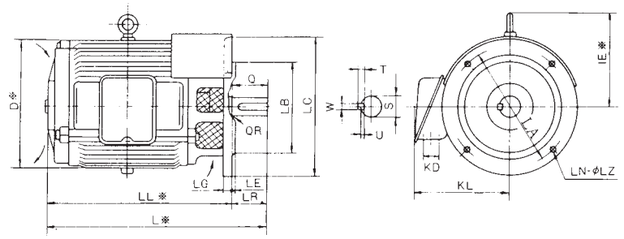



Fig. 7 Frame Nos. 90L~132M (Typical Drawing for Flange Type)

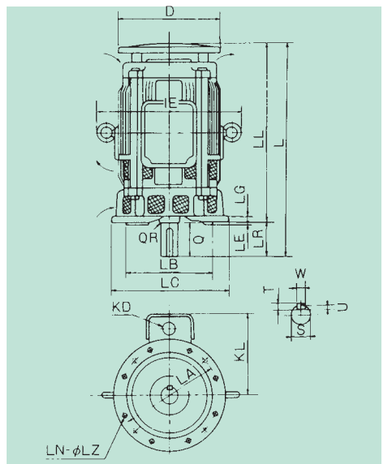



Fig. 4 Frame No. 180M

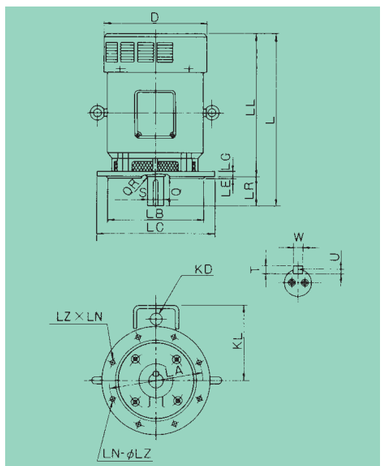



Fig. 5 Frame Nos 180L ~ 225M

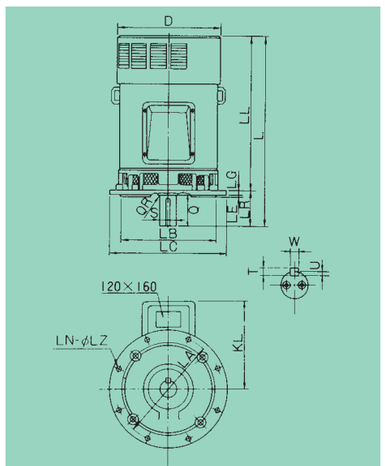


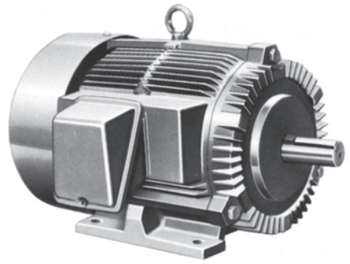

Fig. 6 Frame Nos 250S ~ 250M

| Shaft S | Q | T | U | W | QR | Bearing No. Coupling side | Opposite coupling side | Approx. mass (kg) | Flange type D※ | L※ | LL※ | IE※ | Frame No. | Flange No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 24 | 50 | 7 | 4 | 8 | 0.3 | 6205ZZ | 6205ZZ | 19.5 | 161 | 305.5 | 255.5 | — | 90L | FF165 |
| 28 | 60 | 7 | 4 | 8 | 0.3 | 6206ZZ | 6205ZZ | 27 | 182 | 341 | 281 | — | 100L | FF215 |
| 28 | 60 | 7 | 4 | 8 | 0.5 | 6306ZZ | 6206ZZ | 40 | 202 | 363.5 | 303.5 | 150 | 112M | |
| 28 | 60 | 7 | 4 | 8 | 0.5 | 6306ZZ | 6206ZZ | 45 | 225 | 381 | 321 | 155 | 112M | |
| 38 | 80 | 8 | 5 | 10 | 0.5 | 6308ZZ | 6207ZZ | 62 | 253.5 | 441 | 361 | 180 | 132S | FF265 |
| 38 | 80 | 8 | 5 | 10 | 0.5 | 6308ZZ | 6207ZZ | 76 | 253.5 | 479 | 399 | 180 | 132M | |
| 42 | 110 | 8 | 5 | 12 | 0.5 | 6309ZZ | 6308ZZ | 106 | 298.5 | 570 | 460 | 209 | 160M | FF300 |
| 42 | 110 | 8 | 5 | 12 | 0.5 | 6309ZZ | 6308ZZ | 127 | 298.5 | 614 | 504 | 209 | 160ML | |
| 42 | 110 | 8 | 5 | 12 | 0.5 | 6309ZZ | 6308ZZ | 135 | 298.5 | 614 | 504 | 209 | 160ML | FF350 |
| 48 | 110 | 9 | 5.5 | 14 | 0.5 | 6310ZZ | 6308ZZ | 137 | 298.5 | 614 | 504 | 209 | 160ML | |
| 55 | 110 | 10 | 6 | 16 | 1 | (6312) 6312ZZ | (6308ZZ) 6310ZZ | 200 | 341 | 628 | 518 | 247 | 180M | |
| 55 | 110 | 10 | 6 | 16 | 1 | 6312 | 6308ZZ | 200 | 378 | 700.5 | 590.5 | 247 | 180LH | FF400 |
| 60 | 140 | 11 | 7 | 18 | 0.5 | 6313ZZ | 6311ZZ | 205 | | 730.5 | | | 180L | |
| 55 | 110 | 10 | 6 | 16 | 1 | 6312 | 6308ZZ | 240 | 418 | 718.5 | 608.5 | 265 | 200MH | FF500 |
| 65 | 140 | 11 | 7 | 18 | 1 | 6314C3/NU314 | 6312ZZ | 250 | | 748.5 | | | 200M※ | |
| 55 | 110 | 10 | 6 | 16 | 1 | 6312 | 6308ZZ | 305 | 473 | 778.5 | 668.5 | 303 | 225SH | |
| 75 | 140 | 12 | 7.5 | 20 | 1 | 6316C3/NU316 | 6313ZZ | 315 | | 808.5 | | | 225S※ | |
| 55 | 110 | 10 | 6 | 16 | 1 | 6312 | 6308ZZ | 340 | 473 | 803.5 | 693.5 | 303 | 225MH | |
| 75 | 140 | 12 | 7.5 | 20 | 1 | 6316C3/NU316 | 6313ZZ | 350 | | 833.5 | | | 225M※ | |
| 55 | 110 | 10 | 6 | 16 | 1 | 6312 | 6312 | 460 | 525 | 908.5 | 798.5 | 315 | 250SH | FF600 |
| 85 | 170 | 14 | 9 | 22 | 1 | 6318C3/NU318 | 6315ZZ | 475 | | 968.5 | | | 250S※ | |
| 55 | 110 | 10 | 6 | 16 | 1 | 6312 | 6312 | 505 | 525 | 948.5 | 838.5 | 315 | 250MH | |
| 85 | 170 | 14 | 9 | 22 | 1 | 6318C3/NU318 | 6315ZZ | 520 | | 1008.5 | | | 250M※ | |

4. In case of V-belts, after reference the table of "Application of V-Belts and V-Pully" (P16), please be careful with selection and installation.
5. Bearing Nos. in the parenthesis show the one for 2-pole motors.
6. Sizes of flange-mounted type are the same as those values of vertical type shown in the above table other than those marked symbol*.
7. In frame Nos. 80 to 100L, sizes D and H in brackets are those of 6 and 8-pole motors.
8. Size may be changed. Please inquire sizes, when used for design.

# Totally-Enclosed Frame Surface Cooled Type (Type TIS85)

| | | |
|---|---|---|
| Protection type | 63 ~ 71 | Body IP44 |
| | 80 ~ 315M | IP44 |
| Cooling type | | IC0141 |



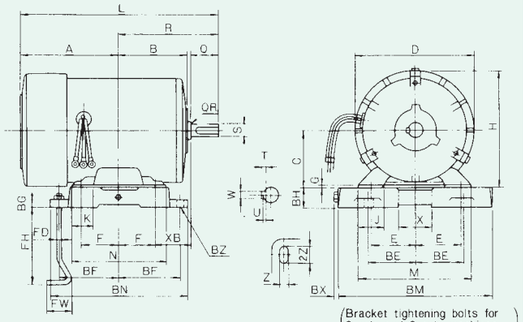



Fig. 1 Frame Nos 63 ~ 71 (Bracket tightening bolts for 6-pole and 8-pole machines are located outside the frame)

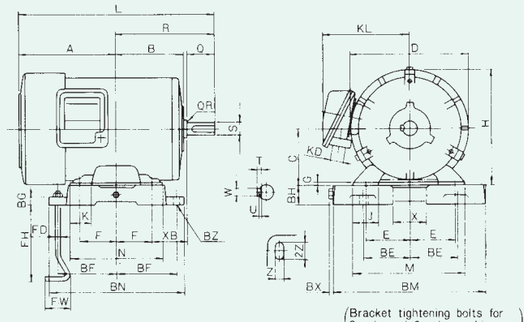



Fig. 2 Frame No. 80 (Bracket tightening bolts for 6-pole and 8-pole machines are located outside the frame)

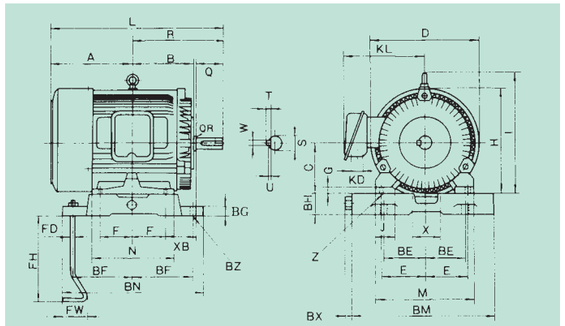



Fig. 3 Frame Nos 90L ~ 112M

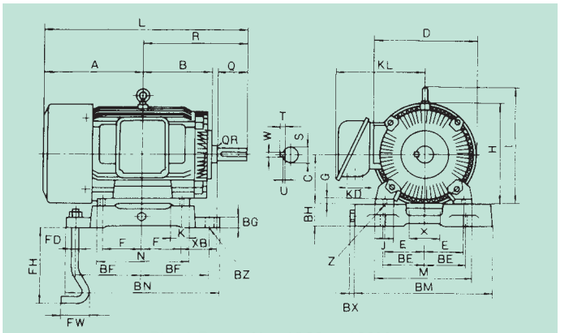



Fig. 4 Frame Nos 132S ~ 180M

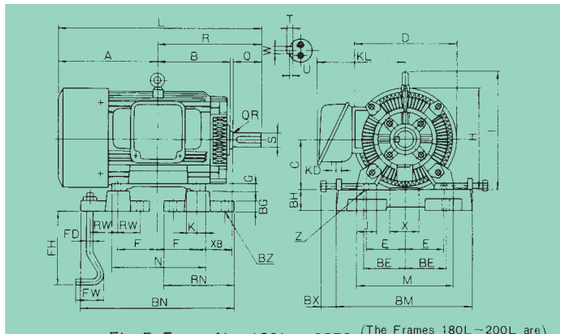



Fig. 5 Frame Nos 180L ~ 225S (The Frames 180L~200L are provided with slide bases.)

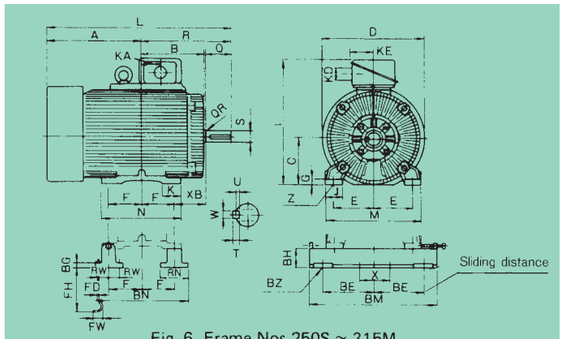



Fig. 6 Frame Nos 250S ~ 315M

## External Dimension

| Frame No. | Output (kW) 2-pole | 4-pole | 6-pole | 8-pole | Class of Insulation | Fig No. | Motor A | B | C | D | E | F | G | H | I | J | K | L | M | N | Z | XB | KD | KL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63 | 0.2 | 0.2 | — | — | E | 1 | 108 | 76 | 63 | 129 | 50 | 40 | 2.5 | 128 | — | 25 | 20 | 211 | 125 | 100 | 7×14 | 40 | — | — |
| 71 | 0.4 | 0.4 | 0.2 | — | E | 1 | 120 | 86 | 71 | 145 | 56 | 45 | 3 | 144 | — | 27 | 22 | 240 | 140 | 112 | 7×14 | 45 | — | — |
| 80 | 0.75 | 0.75 | 0.4 | 0.2 | E | 2 | 140 | 96 | 80 | 167 | 62.5 | 50 | 3 | 163.5 | — | 34 | 28 | 280 | 160 | 128 | 10×20 | 50 | 22 | 139 |
| 90L | 1.5 2.2 | 1.5 | 0.75 | 0.4 | E | 3 | 160.5 | 114 | 90 | 194 | 70 | 62.5 | 10 | 187 | — | 35 | — | 329 | 170 | 155 | 10 | 56 | 22 | 152 |
| 100L | — | 2.2 | 1.5 | 0.75 | E | 3 | 180 | 128.5 | 100 | 220 | 80 | 70 | 12 | 210 | 243.5 | 40 | — | 373 | 196 | 176 | 12 | 63 | 22 | 160 |
| 112M | 3.7 | 3.7 | 2.2 | 1.5 | E | 3 | 189 | 135.5 | 112 | 240 | 95 | 70 | 14 | 233 | 266.5 | 45 | — | 389 | 226 | 176 | 12 | 70 | 22 | 172 |
| 132S | 5.5 7.5 | 5.5 | 3.7 | *2.2 | B | 4 | 217 | 153 | 132 | 276 | 108 | 70 | 16 | 270 | 311.5 | 50 | — | 456 | 252 | 176 | 12 | 89 | 34 | 215 |
| 132M | — | 7.5 | 5.5 | 3.7 | B | 4 | 236 | 172 | 132 | 276 | 108 | 89 | 16 | 270 | 311.5 | 50 | — | 494 | 252 | 214 | 12 | 89 | 34 | 215 |
| 160M | 11 15 | 11 | 7.5 | 5.5 | B | 4 | 270 | 207 | 160 | 320 | 127 | 105 | 20 | 318 | 369 | 60 | 61 | 593 | 315 | 262 | 15 | 108 | 34 | 240 |
| 160L | 18.5 | 15 | 11 | 7.5 | B | 4 | 292 | 229 | 160 | 320 | 127 | 127 | 20 | 318 | 369 | 60 | 63 | 637 | 315 | 306 | 15 | 108 | 34 | 240 |
| 180M | 22 | 18.5 22 | 15 | 11 | B | 4 | 311 | [237.5] 236 | 180 | 366 | 139.5 | 120.5 | 22 | 367 | 427 | 70 | 64.5 | 662.5 | 350 | 294 | 15 | 121 | 49 | 320 |
| 180L | 30 | 30 | 18.5 22 | 15 | F | 5 | 330 | [257.5] 255 | 180 | 366 | 139.5 | 139.5 | 22 | 367 | 427 | 70 | 68.5 | 700.5 | 350 | 332 | 15 | 121 | 49 | 320 |
| 200LH | 37 45 | — | — | — | F | 5 | 361 | 281 | 200 | 409 | 159 | 152.5 | 25 | 405 | 465 | 80 | 81 | 756.5 | 400 | 372 | 19 | 133 | 62 | 344 |
| 200L | — | 37 45 | 30 37 | 18.5 22 | | | | 280 | | | | | | | | | | 786.5 | | | | | | |
| 225SH | 55 | — | — | — | F | 5 | 376.5 | 286 | 225 | 462 | 178 | 143 | 28 | 457 | 528 | 80 | 85 | 778.5 | 440 | 355 | 19 | 149 | 62 | 374 |
| 225S$_B$ | — | 55 | 45 | 30 | | | | 286.5 | | | | | | | | | | 808.5 | | | | | | |
| 250SH | 75 | — | — | — | F | 6 | 481 | 317 | 250 | 530 | 203 | 155.5 | 32 | 740 | — | 90 | 100 | 914.5 | 500 | 385 | 24 | 168 | 62 | — |
| 250S$_B$ | — | 75 | 55 | 37 | | | | 317.5 | | | | | | | | | | 944.5 | | | | | | |
| 250MH | 90 | — | — | — | F | 6 | 500 | 336 | 250 | 530 | 203 | 174.5 | 32 | 740 | — | 90 | 100 | 952.5 | 500 | 425 | 24 | 168 | 62 | — |
| 250M$_B$ | — | 90 | 75 | 45 | | | | 336.5 | | | | | | | | | | 982.5 | | | | | | |
| 280SH | 110 | — | — | — | F | 6 | 510 | 363 | 280 | 590 | 228.5 | 184 | 32 | 805 | — | 100 | 110 | 994 | 560 | 450 | 24 | 190 | 77 | — |
| 280S$_B$ | — | 110 | 90 | 55 | | | | 366 | | | | | | | | | | 1054 | | | | | | |
| 280MH | 132 | — | — | — | F | 6 | 534.5 | 388.5 | 280 | 590 | 228.5 | 209.5 | 32 | 805 | — | 100 | 110 | 1044 | 560 | 500 | 24 | 190 | 77 | — |
| 280M$_B$ | — | 132 | 110 | 75 | | | | 391.5 | | | | | | | | | | 1104 | | | | | | |
| 315SH | 160 | — | — | — | F | 6 | 590 | 408 | 315 | 635 | 254 | 203 | 36 | 880 | — | 110 | 125 | 1119 | 630 | 500 | 28 | 216 | 77 | — |
| 315S$_B$ | — | 160 | 132 | 90 | | | | 410 | | | | | | | | | | 1179 | | | | | | |
| 315MH | 200 | — | — | — | F | 6 | 614.5 | 436.5 | 315 | 635 | 254 | 228.5 | 36 | 880 | — | 110 | 125 | 1169 | 630 | 550 | 28 | 216 | 77 | — |
| 315M$_B$ | — | 200 | 160 | 110 | | | | 435.5 | | | | | | | | | | 1229 | | | | | | |

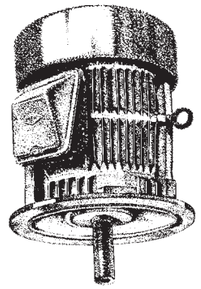
| Frame No. | Shaft R | S | Q | T | U | W | QR | Slide base (rail) BE | BF | BG | BH | BM | BN | BZ | BX | RW | RN | X | Foundation bolt FD | FH | FW | Bearing No. Coupling side | Opposite coupling side | Approx mass (kg) Motor | Base |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63 | 103 | 11 | 23 | — | 1 | — | 0.3 | 50 | 80 | 17 | 30 | 188 | 185 | 13 | 9 | — | — | 40 | 10 | 95 | 40 | 6201ZZ | 6201ZZ | 7.0 | 1.5 |
| 71 | 120 | 14 | 30 | 5 | 3 | 5 | 0.3 | 55 | 85 | 15 | 30 | 194 | 200 | 13 | 9 | — | — | 40 | 10 | 95 | 40 | 6202ZZ | 6202ZZ | 9.0 | 1.8 |
| 80 | 140 | 19 | 40 | 5 | 3.5 | 6 | 0.3 | 65 | 90 | 15 | 30 | 214 | 210 | 13 | 9 | — | — | 40 | 10 | 95 | 40 | 6204ZZ | 6204ZZ | 12.0 | 2.0 |
| 90L | 168.5 | 24 | 50 | 7 | 4 | 8 | 0.3 | 70 | 105 | 15 | 30 | 230 | 240 | 13 | 9 | — | — | 40 | 10 | 95 | 40 | 6205ZZ | 6205ZZ | 23.5 | 2.2 |
| 100L | 193 | 28 | 60 | 7 | 4 | 8 | 0.5 | 80 | 115 | 20 | 40 | 270 | 260 | 13 | 9 | — | — | 50 | 10 | 90 | 40 | 6206ZZ | 6205ZZ | 32 | 3.0 |
| 112M | 200 | 28 | 60 | 7 | 4 | 8 | 0.5 | 95 | 115 | 20 | 40 | 290 | 260 | 13 | 9 | — | — | 50 | 10 | 90 | 40 | 6206ZZ | 6206ZZ | 45 | 3.5 |
| 132S | 239 | 38 | 80 | 8 | 5 | 10 | 0.5 | 110 | 120 | 25 | 45 | 355 | 280 | 13 | 10.5 | — | — | 60 | 10 | 85 | 40 | 6308ZZ | 6207ZZ | 62 | 5.0 |
| 132M | 258 | 38 | 80 | 8 | 5 | 10 | 0.5 | 110 | 140 | 25 | 45 | 360 | 318 | 13 | 10.5 | — | — | 60 | 10 | 85 | 40 | 6308ZZ | 6207ZZ | 72 | 6.0 |
| 160M | 323 | 42 | 110 | 8 | 5 | 12 | 0.5 | 125 | 165 | 30 | 50 | 406 | 380 | 16 | 10.5 | — | — | 70 | 12 | 115 | 50 | 6309ZZ | 6308ZZ | 100 | 8.5 |
| 160L | 345 | 42 | 110 | 8 | 5 | 12 | 0.5 | 125 | 185 | 30 | 50 | 406 | 420 | 16 | 10.5 | — | — | 70 | 12 | 115 | 50 | 6309ZZ | 6308ZZ | 115 | 10.0 |
| 180M | 351.5 | 48 | 110 | 9 | 5.5 | 14 | 1 | 140 | 185 | 35 | 55 | 456 | 420 | 16 | 11.5 | — | — | 80 | 12 | 115 | 50 | (6311) 6311ZZ | (6308ZZ) 6310ZZ | 165 | 12.0 |
| 180L | 370.5 | 55 | 110 | 10 | 6 | 16 | (1) 0.5 | 140 | 205 | 35 | 55 | 456 | 460 | 16 | 11.5 | — | — | 80 | 12 | 115 | 50 | (6312C3) 6312ZZC3 | (6308ZZ) 6310ZZ | 190 | 14 |
| 200LH | 395.5 | 55 | 110 | 10 | 6 | 16 | 1 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 6312C3 | 6308ZZ | 265 | — |
| 200L | 425.5 | 60 | 140 | 11 | 7 | 18 | 0.5 | 160 | 230 | 35 | 60 | 535 | 520 | 18 | 13 | — | — | 100 | 16 | 150 | 63 | 6313ZZC3 | 6311ZZ | 275 | 18 |
| 225SH | 402 | 55 | 110 | 10 | 6 | 16 | 1 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 6312C3 | 6308ZZ | 315 | — |
| 225S$_B$ | 432 | 65 | 140 | 11 | 7 | 18 | 1 | 200 | — | 35 | 71 | 770 | 476 | 20 | 225 | 71 | 190 | 180 | 16 | 265 | 63 | 6314C3/NU314 | 6312ZZ | 325 | 38 |
| 250SH | 433.5 | 55 | 110 | 10 | 6 | 16 | 1 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 6312C3 | 6312C3 | 470 | — |
| 250S$_B$ | 463.5 | 75 | 140 | 12 | 7.5 | 20 | 1 | 315 | — | 30 | 85 | 900 | 521 | 19 | 250 | 80 | 210 | 180 | 16 | 265 | 63 | 6316C3/NU316 | 6313ZZ | 490 | 65 |
| 250MH | 452.5 | 55 | 110 | 10 | 6 | 16 | 1 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 6312C3 | 6312C3 | 520 | — |
| 250M$_B$ | 482.5 | 75 | 140 | 12 | 7.5 | 20 | 1 | 315 | — | 30 | 85 | 900 | 559 | 19 | 250 | 80 | 210 | 180 | 16 | 265 | 63 | 6316C3/NU316 | 6313ZZ | 540 | 65 |
| 280SH | 484 | 55 | 110 | 10 | 6 | 16 | 1 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 6312C3 | 6312C3 | 650 | — |
| 280S$_B$ | 544 | 85 | 170 | 14 | 9 | 22 | 1 | 315 | — | 30 | 85 | 900 | 578 | 19 | 250 | 80 | 210 | 200 | 16 | 265 | 63 | 6318C3/NU318 | 6315ZZ | 670 | 65 |
| 280MH | 509.5 | 55 | 110 | 10 | 6 | 16 | 1 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 6312C3 | 6312C3 | 750 | — |
| 280M$_B$ | 569.5 | 85 | 170 | 14 | 9 | 22 | 1 | 315 | — | 30 | 85 | 900 | 629 | 19 | 250 | 80 | 210 | 200 | 16 | 265 | 63 | 6318C3/NU318 | 6315ZZ | 770 | 65 |
| 315SH | 529 | 55 | 110 | 10 | 6 | 16 | 1 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 6312C3 | 6312C3 | 880 | — |
| 315S$_B$ | 589 | 95 | 170 | 14 | 9 | 25 | 1 | 375 | — | 35 | 100 | 1120 | 656 | 24 | 280 | 95 | 250 | 200 | 20 | 445 | 88 | 6320C3/NU320 | 6317 | 900 | 105 |
| 315MH | 554.5 | 55 | 110 | 10 | 6 | 16 | 1 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 6312C3 | 6312C3 | 950 | — |
| 315M$_B$ | 614.5 | 95 | 170 | 14 | 9 | 25 | 1 | 375 | — | 35 | 100 | 1120 | 707 | 24 | 280 | 95 | 250 | 200 | 20 | 445 | 88 | 6320C3/NU320 | 6317 | 975 | 105 |

<Notes>
1. Tolerance for size S is h6 for $\phi$11, j6 for $\phi$14 to $\phi$28, k6 for $\phi$38 to $\phi$48 and m6 for $\phi$55 or over, according to JIS B 0401 (Limits and fits for engineering).
2. Tolerance for size C is 0 to −0.5 for 250 or less and 0 to −1.0 in case of exceeding 250.
3. Frame No. C/B show direct coupling (C) and belt driving (B) and the two types have different kinds of bearings at coupling sides.
4. In case of V-belts, after reference table of "Application of V-Belts and V-Pully" (P16), please be careful with selection and installation.
5. Bearing Nos. in the parenthesis show the one for 2-pole motors.
6. Size may be changed. Please inquire sizes, when used for design.
7. In frame Nos. 180M and 180L, size B in bracket is 2-pole motor.
8. 2.2kW-8-pole in marked symbol* is class E insulation.

# Vertical Totally-Enclosed Frame Surface Cooled Type (Type VTIS85)

# Totally-Enclosed Frame Surface Cooled Flange-Mounted Type (Type HTIS85)

| | | |
|---|---|---|
| Protection type | 63 ~ 71 | Body IP44 |
| | 80 ~ 315M | IP44 |
| Cooling type | | IC0141 |



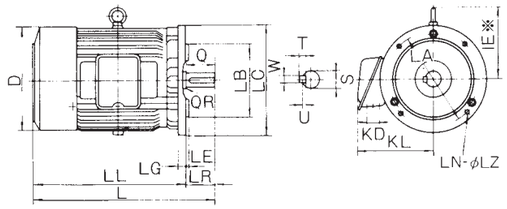



Fig. 7 Frame Nos 90L ~ 132M (Typical Drawing for Flange Type)

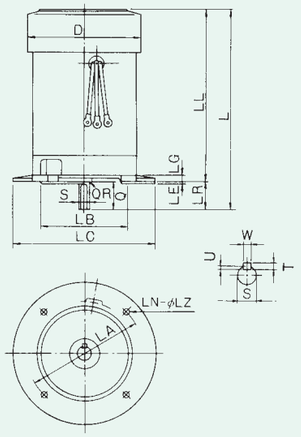



Fig. 1
Frame Nos 63 ~ 71

(Bracket tightening bolts for 6-pole and 8-pole machines are located outside the frame

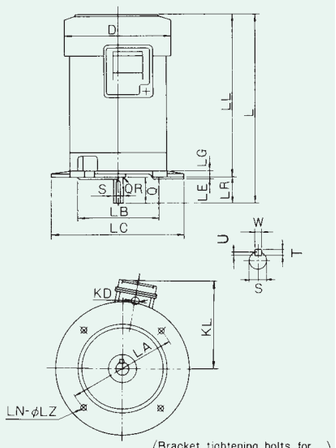



Fig. 2 Frame No. 80

(Bracket tightening bolts for 6-pole and 8-pole machines are located outside the frame

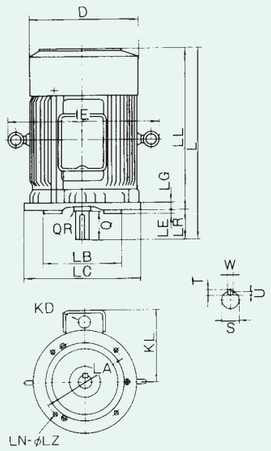



Fig. 3 Frame Nos 90L ~ 112M

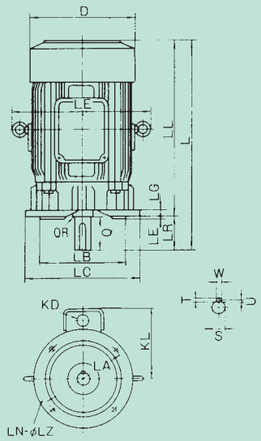



Fig. 4 Frame Nos 132S ~ 180M

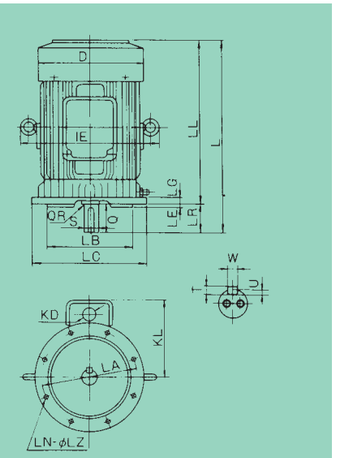



Fig. 5 Frame Nos. 180L~225S

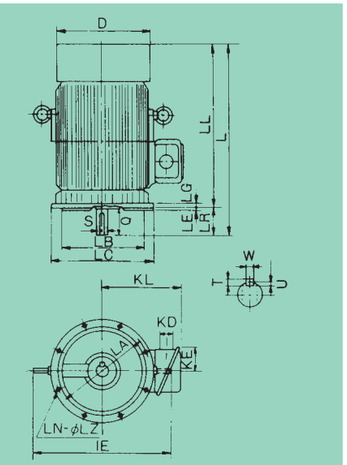



Fig. 6 Frame Nos 250S ~ 280M

## External Dimension

| Flange No. | Frame No. | Output (kW) 2-pole | 4-pole | 6-pole | 8-pole | Class on insulation | Fig-No. | Motor D | L | LL | IE | LA | LB | LC | LE | LG | LZ | LN | LR | KD | KL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FF130 | 63 | 0.2 | 0.2 | — | — | E | 1 | 129 | 229 | 206 | — | 130 | 110 | 160 | 3.5 | 10 | 10 | 4 | 23 | — | — |
| | 71 | 0.4 | 0.4 | 0.2 | — | E | 1 | 145 | 260.5 | 230.5 | — | 130 | 110 | 160 | 3.5 | 10 | 10 | 4 | 30 | — | — |
| FF165 | 80 | 0.75 | 0.75 | 0.4 | 0.2 | E | 2 | 167 | 298 | 258 | — | 165 | 130 | 200 | 3.5 | 12 | 12 | 4 | 40 | 22 | 142 |
| | 90L | 1.5 2.2 | 1.5 | 0.75 | 0.4 | E | 3 | 194 | 342 | 292 | — | 165 | 130 | 200 | 3.5 | 12 | 12 | 4 | 50 | 22 | 152 |
| FF215 | 100L | — | 2.2 | 1.5 | 0.75 | E | 3 | 220 | 373 | 313 | 144 | 215 | 180 | 250 | 4 | 16 | 15 | 4 | 60 | 22 | 160 |
| | 112M | 3.7 | 3.7 | 2.2 | 1.5 | E | 3 | 240 | 402 | 342 | 155 | 215 | 180 | 250 | 4 | 16 | 15 | 4 | 60 | 22 | 172 |
| FF265 | 132S | 5.5 7.5 | 5.5 | 3.7 | *2.2 | B | 4 | 276 | 456 | 376 | 180 | 265 | 230 | 300 | 4 | 20 | 15 | 4 | 80 | 34 | 215 |
| | 132M | — | 7.5 | 5.5 | 3.7 | B | 4 | 276 | 494 | 414 | 180 | 265 | 230 | 300 | 4 | 20 | 15 | 4 | 80 | 34 | 215 |
| FF300 | 160M | 11 15 | 11 | 7.5 | 5.5 | B | 4 | 320 | 633 | 523 | 209 | 300 | 250 | 350 | 5 | 20 | 19 | 4 | 110 | 34 | 240 |
| | 160L | 18.5 | 15 | 11 | 7.5 | B | 4 | 320 | 677 | 567 | 209 | 300 | 250 | 350 | 5 | 20 | 19 | 4 | 110 | 34 | 240 |
| FF350 | 180M | 22 | 18.5 22 | 15 | 11 | B | 4 | 366 | 702.5 | 592.5 | 247 | 350 | 300 | 400 | 5 | 20 | 19 | 4 | 110 | 49 | 320 |
| FF350 | 180L | 30 | 30 | 18.5 22 | 15 | F | 5 | 366 | 740.5 | 630.5 | 247 | 350 | 300 | 400 | 5 | 20 | 19 | 4 | 110 | 49 | 320 |
| FF400 | 200LH | 37 45 | — | — | — | F | 5 | 409 | 756.5 | 646.5 | 265 | 400 | 350 | 450 | 5 | 22 | 19 | 8 | 110 | 62 | 344 |
| | 200L | — | 37 45 | 30 37 | 18.5 22 | | | | 786.5 | | | | | | | | | | 140 | | |
| FF500 | 225SH | 55 | — | — | — | F | 5 | 462 | 778.5 | 668.5 | 303 | 500 | 450 | 550 | 5 | 22 | 19 | 8 | 110 | 62 | 374 |
| | 225S$_B$ | — | 55 | 45 | 30 | | | | 808.5 | | | | | | | | | | 140 | | |
| | 250SH | 75 | — | — | — | F | 6 | 530 | 914.5 | 804.5 | 365 | 500 | 450 | 550 | 5 | 22 | 19 | 8 | 110 | 62 | 490 |
| | 250S$_B$ | — | 75 | 55 | 37 | | | | 944.5 | | | | | | | | | | 140 | | |
| | 250MH | 90 | — | — | — | F | 6 | 530 | 952.5 | 842.5 | 365 | 500 | 450 | 550 | 5 | 22 | 19 | 8 | 110 | 62 | 490 |
| | 250M$_B$ | — | 90 | 75 | 45 | | | | 982.5 | | | | | | | | | | 140 | | |
| FF600 | 280SH | 110 | — | — | — | F | 6 | 590 | 994 | 884 | 420 | 600 | 550 | 660 | 6 | 25 | 24 | 8 | 110 | 77 | 525 |
| | 280S$_B$ | — | 110 | 90 | 55 | | | | 1054 | | | | | | | | | | 170 | | |
| | 280MH | 132 | — | — | — | F | 6 | 590 | 1044 | 934 | 420 | 600 | 550 | 660 | 6 | 25 | 24 | 8 | 110 | 77 | 525 |
| | 280M$_B$ | — | 132 | 110 | 75 | | | | 1104 | | | | | | | | | | 170 | | |

<Notes>
1. Tolerance for size S is h6 for $\phi$11, j6 for $\phi$14 to $\phi$28, k6 for $\phi$38 to $\phi$48 and m6 for $\phi$55 or over, according to JIS B 0401 (Limits and fits for engineering).
2. Tolerance for size LB is j6 for $\phi$450 or less and js6 for $\phi$550 or over, according to JIS B 0401.
3. Frame No. C/B show direct coupling (C) and belt driving (B) and the two types have different kinds of bearings at coupling sides.

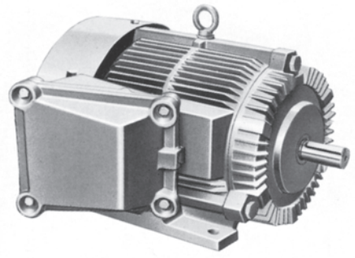


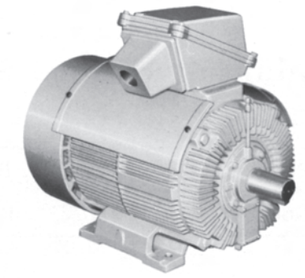
| Shaft S | Q | T | U | W | QR | Bearing No. Coupling side | Opposite coupling side | Approx mass (kg) | Flange type I E※ | Frame No. | Flange No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 | 23 | — | 1 | — | 0.3 | 6201ZZ | 6201ZZ | 14 | — | 63 | FF130 |
| 14 | 30 | 5 | 3 | 5 | 0.3 | 6202ZZ | 6202ZZ | 17 | — | 71 | |
| 19 | 40 | 6 | 3.5 | 6 | 0.3 | 6204ZZ | 6204ZZ | 22 | — | 80 | FF165 |
| 24 | 50 | 7 | 4 | 8 | 0.3 | 6205ZZ | 6205ZZ | 30 | — | 90L | |
| 28 | 60 | 7 | 4 | 8 | 0.5 | 6206ZZ | 6205ZZ | 40 | 144 | 100L | FF215 |
| 28 | 60 | 7 | 4 | 8 | 0.5 | 6306ZZ | 6206ZZ | 50 | 155 | 112M | |
| 38 | 80 | 8 | 5 | 10 | 0.5 | 6308ZZ | 6207ZZ | 76 | 180 | 132S | FF265 |
| 38 | 80 | 8 | 5 | 10 | 0.5 | 6308ZZ | 6207ZZ | 87 | 180 | 132M | |
| 42 | 110 | 8 | 5 | 12 | 0.5 | 6309ZZ | 6308ZZ | 125 | 209 | 160M | FF300 |
| 42 | 110 | 8 | 5 | 12 | 0.5 | 6309ZZ | 6308ZZ | 140 | 209 | 160L | |
| 48 | 110 | 9 | 5.5 | 14 | 1 | (6311) 6311ZZ | (6308ZZ) 6310ZZ | 205 | 247 | 180M | FF350 |
| 55 | 110 | 10 | 6 | 16 | (1) 0.5 | (6312C3) 6312ZZC3 | (6308ZZ) 6310ZZ | 230 | 247 | 180L | FF350 |
| 55 | 110 | 10 | 6 | 16 | 1 | 6312C3 | 6308ZZ | 290 | 265 | 200LH | FF400 |
| 60 | 140 | 11 | 7 | 18 | 0.5 | 6313ZZC3 | 6311ZZ | 300 | 265 | 200L | |
| 55 | 110 | 10 | 6 | 16 | 1 | 6312C3 | 6308ZZ | 380 | 303 | 225SH | FF500 |
| 65 | 140 | 11 | 7 | 18 | 1 | 6314C3/NU314 | 6312ZZ | 390 | 303 | 225S$_B$ | |
| 55 | 110 | 10 | 6 | 16 | 1 | 6312C3 | 6312C3 | 520 | — | 250SH | |
| 75 | 140 | 12 | 7.5 | 20 | 1 | 6316C3/NU316 | 6313ZZ | 550 | — | 250S$_B$ | |
| 55 | 110 | 10 | 6 | 16 | 1 | 6312C3 | 6312C3 | 590 | — | 250MH | |
| 75 | 140 | 12 | 7.5 | 20 | 1 | 6316C3/NU316 | 6313ZZ | 610 | — | 250M$_B$ | |
| 55 | 110 | 10 | 6 | 16 | 1 | 6312C3 | 6312C3 | 720 | — | 280SH | FF600 |
| 85 | 170 | 14 | 9 | 22 | 1 | 6318C3/NU318 | 6315ZZ | 740 | — | 280S$_B$ | |
| 55 | 110 | 10 | 6 | 16 | 1 | 6312C3 | 6312C3 | 810 | — | 280MH | |
| 85 | 170 | 14 | 9 | 22 | 1 | 6318C3/NU318 | 6315ZZ | 830 | — | 280M$_B$ | |

4. In case of V-belts, after reference table of "Application of V-Belts and V-Pully" (P16), please be careful with selection and installation.
5. Bearing Nos. in the parenthesis show the one for 2-pole motors.
6. Size may be changed. Please inquire sizes, when used for design.
7. In frame Nos. 180M and 180L, size B in bracket is 2-pole motor.
8. 2.2kW-8-pole in marked symbol* is class E insulation.

# Totally-Enclosed Frame Surface Cooled Outdoor Type (Type TISP85)

| | |
|---|---|
| Protection type | IPW44 |
| Cooling type | IC0141 |





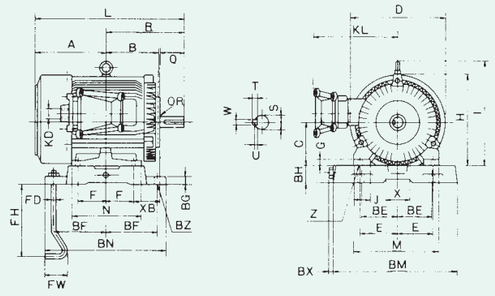



Fig. 1 Frame Nos 63 ~ 112M

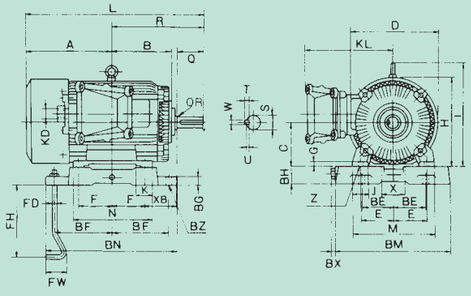



Fig. 2 Frame Nos 132S ~ 180M

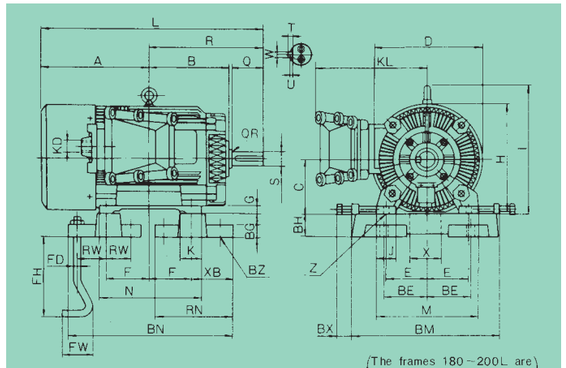



Fig. 3 Frame Nos 180L~225S (The frames 180~200L are provided with side bases)

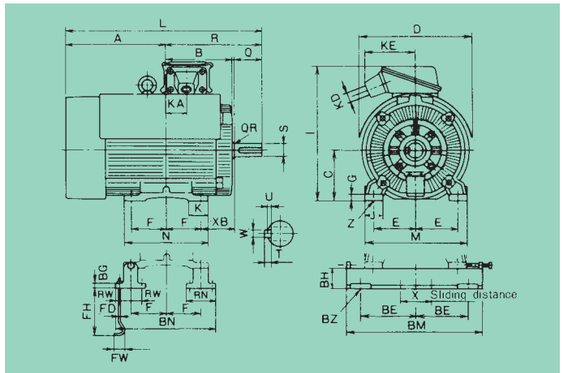



Fig. 4 Frame Nos 250S ~ 315M

## External Dimension

| Frame No. | Output (kW) 2-pole | 4-pole | 6-pole | 8-pole | Class of insulation | Fig No. | Motor A | B | C | D | E | F | G | H | I | J | K | L | M | N | Z | XB | KD | KL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63 | 0.2 | 0.2 | — | — | E | 1 | 107 | 78.5 | 63 | 141 | 50 | 40 | 7 | 133.5 | — | 26 | — | 210 | 124 | 101 | 7 | 40 | PF¾ | 178 |
| 71 | 0.4 | 0.4 | 0.2 | — | E | 1 | 121 | 88.5 | 71 | 157 | 56 | 45 | 8 | 149.5 | — | 28 | — | 241 | 136 | 111 | 7 | 45 | PF¾ | 185 |
| 80 | 0.75 | 0.75 | 0.4 | 0.2 | E | 1 | 136 | 98.5 | 80 | 178 | 62.5 | 50 | 9 | 169 | — | 33 | — | 276 | 155 | 130 | 10 | 50 | PF¾ | 192 |
| 90L | 1.5 2.2 | 1.5 | 0.75 | 0.4 | E | 1 | 160.5 | 117 | 90 | 194 | 70 | 62.5 | 10 | 187 | — | 35 | — | 329 | 170 | 155 | 10 | 56 | PF¾ | 202 |
| 100L | — | 2.2 | 1.5 | 0.75 | E | 1 | 180 | 131.5 | 100 | 220 | 80 | 70 | 12 | 210 | 243.5 | 40 | — | 373 | 196 | 176 | 12 | 63 | PF¾ | 218 |
| 112M | 3.7 | 3.7 | 2.2 | 1.5 | E | 1 | 189 | 138.5 | 112 | 240 | 95 | 70 | 14 | 233 | 266.5 | 45 | — | 389 | 226 | 176 | 12 | 70 | PF¾ | 230 |
| 132S | 5.5 7.5 | 5.5 | 3.7 | *2.2 | B | 2 | 217 | 157 | 132 | 276 | 108 | 70 | 16 | 270 | 311.5 | 50 | — | 456 | 252 | 176 | 12 | 89 | PF1¼ | 274 |
| 132M | — | 7.5 | 5.5 | 3.7 | B | 2 | 236 | 176 | 132 | 276 | 108 | 89 | 16 | 270 | 311.5 | 50 | — | 494 | 252 | 214 | 12 | 89 | PF1¼ | 274 |
| 160M | 11 15 | 11 | 7.5 | 5.5 | B | 2 | 270 | 211 | 160 | 320 | 127 | 105 | 20 | 318 | 369 | 60 | 61 | 593 | 315 | 262 | 15 | 108 | PF1¼ | 300 |
| 160L | 18.5 | 15 | 11 | 7.5 | B | 2 | 292 | 233 | 160 | 320 | 127 | 127 | 20 | 318 | 369 | 60 | 63 | 637 | 315 | 306 | 15 | 108 | PF1¼ | 300 |
| 180M | 22 | 18.5 22 | 15 | 11 | B | 2 | 311 | (237.5) 236 | 180 | 366 | 139.5 | 120.5 | 22 | 367 | 427 | 70 | 64.5 | 662.5 | 350 | 294 | 15 | 121 | PF2 | 375 |
| 180L | 30 | 30 | 18.5 22 | 15 | F | 3 | 330 | 255 (257.5) | 180 | 366 | 139.5 | 139.5 | 22 | 367 | 427 | 70 | 68.5 | 700.5 | 350 | 332 | 15 | 121 | PF2 | 375 |
| 200LH | 37 45 | — | — | — | F | 3 | 361 | 281 | 200 | 409 | 159 | 152.5 | 25 | 405 | 465 | 80 | 81 | 756.5 | 400 | 372 | 19 | 133 | PF2 | 400 |
| 200L | — | 37 45 | 37 37 | 18.5 22 | | | | 280 | | | | | | | | | | 786.5 | | | | | | |
| 225SH | 55 | — | — | — | F | 3 | 376.5 | 286 | 225 | 462 | 178 | 143 | 28 | 457 | 528 | 80 | 85 | 778.5 | 440 | 355 | 19 | 149 | PF2 | 430 |
| 225S*6 | — | 55 | 45 | 30 | | | | 286.5 | | | | | | | | | | 808.5 | | | | | | |
| 250SH | 75 | — | — | — | F | 4 | 481 | 317 | 250 | 530 | 203 | 155.5 | 32 | 755 | — | 90 | 100 | 914.5 | 500 | 385 | 24 | 168 | PF2½ | — |
| 250S*6 | — | 75 | 55 | 37 | | | | 317.5 | | | | | | | | | | 944.5 | | | | | | |
| 250MH | 90 | — | — | — | F | 4 | 500 | 336 | 250 | 530 | 203 | 174.5 | 32 | 755 | — | 90 | 100 | 952.5 | 500 | 425 | 24 | 168 | PF2½ | — |
| 250M*6 | — | 90 | 75 | 45 | | | | 336.5 | | | | | | | | | | 982.5 | | | | | | |
| 280SH | 110 | — | — | — | F | 4 | 510 | 363 | 280 | 590 | 228.5 | 184 | 32 | 820 | — | 100 | 110 | 994 | 560 | 450 | 24 | 190 | PF2½ | — |
| 280S*6 | — | 110 | 90 | 55 | | | | 366 | | | | | | | | | | 1054 | | | | | | |
| 280MH | 132 | — | — | — | F | 4 | 534.5 | 388.5 | 280 | 590 | 228.5 | 209.5 | 32 | 820 | — | 100 | 110 | 1044 | 560 | 500 | 24 | 190 | PF2½ | — |
| 280M*6 | — | 132 | 110 | 75 | | | | 391.5 | | | | | | | | | | 1104 | | | | | | |
| 315SH | 160 | — | — | — | F | 4 | 590 | 408 | 315 | 670 | 254 | 203 | 36 | 895 | — | 110 | 125 | 1119 | 630 | 500 | 28 | 216 | PF2½ | — |
| 315S*6 | — | 160 | 132 | 90 | | | | 410 | | | | | | | | | | 1179 | | | | | | |
| 315MH | 200 | — | — | — | F | 4 | 614.5 | 436.5 | 315 | 670 | 254 | 228.5 | 36 | 895 | — | 110 | 125 | 1169 | 630 | 550 | 28 | 216 | PF2½ | — |
| 315M*6 | — | 200 | 160 | 110 | | | | 435.5 | | | | | | | | | | 1229 | | | | | | |

<Notes>
1. Tolerance for size S is h6 for $\phi$11, j6 for $\phi$14 to $\phi$28, k6 for $\phi$38 to $\phi$48 and m6 for $\phi$55 or over, according to JIS B 0401 (Limits and fits for engineering).
2. Tolerance for size C is 0 to −0.5 for 250 or less and 0 to −1.0 in case of exceeding 250.
3. Frame No. C/B show direct coupling (C) and belt driving (B) and the two types have different kinds of bearings at coupling side.



| Frame No. | Shaft R | S | Q | T | U | W | QR | Slide base (rail) BE | BF | BG | BH | BM | BN | BZ | BX | RW | RN | X | Foundation bolt FD | FH | FW | Bearing No. Coupling side | Opposite coupling | Approx. mass(kg) Motor | Base | Frame No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63 | 103 | 11 | 23 | — | 1 | — | 0.3 | 50 | 80 | 17 | 30 | 188 | 185 | 13 | 9 | — | — | 40 | 10 | 95 | 40 | 6201ZZ | 6201ZZ | 14 | 1.5 | 63 |
| 71 | 120 | 14 | 30 | 5 | 3 | 5 | 0.3 | 55 | 85 | 15 | 30 | 194 | 200 | 13 | 9 | — | — | 40 | 10 | 95 | 40 | 6202ZZ | 6202ZZ | 17 | 1.8 | 71 |
| 80 | 140 | 19 | 40 | 6 | 3.5 | 6 | 0.3 | 65 | 90 | 15 | 30 | 214 | 210 | 13 | 9 | — | — | 40 | 10 | 95 | 40 | 6204ZZ | 6204ZZ | 21 | 2.0 | 80 |
| 90L | 168.5 | 24 | 50 | 7 | 4 | 8 | 0.3 | 70 | 105 | 15 | 30 | 230 | 240 | 13 | 9 | — | — | 40 | 10 | 95 | 40 | 6205ZZ | 6205ZZ | 29 | 2.2 | 90L |
| 100L | 193 | 28 | 60 | 7 | 4 | 8 | 0.5 | 80 | 115 | 20 | 40 | 270 | 260 | 13 | 9 | — | — | 50 | 10 | 90 | 40 | 6206ZZ | 6205ZZ | 38 | 3.0 | 100L |
| 112M | 200 | 28 | 60 | 7 | 4 | 8 | 0.5 | 95 | 115 | 20 | 40 | 290 | 260 | 13 | 9 | — | — | 50 | 10 | 90 | 40 | 6306ZZ | 6206ZZ | 51 | 3.5 | 112M |
| 132S | 239 | 38 | 80 | 8 | 5 | 10 | 0.5 | 110 | 120 | 25 | 45 | 355 | 280 | 13 | 10.5 | — | — | 60 | 10 | 85 | 40 | 6308ZZ | 6207ZZ | 72 | 5.0 | 132S |
| 132M | 258 | 38 | 80 | 8 | 5 | 10 | 0.5 | 110 | 140 | 25 | 45 | 360 | 318 | 13 | 10.5 | — | — | 60 | 10 | 85 | 40 | 6308ZZ | 6207ZZ | 82 | 6.0 | 132M |
| 160M | 323 | 42 | 110 | 8 | 5 | 12 | 0.5 | 125 | 165 | 30 | 50 | 406 | 380 | 16 | 10.5 | — | — | 70 | 12 | 115 | 50 | 6309ZZ | 6308ZZ | 110 | 8.5 | 160M |
| 160L | 345 | 42 | 110 | 8 | 5 | 12 | 0.5 | 125 | 185 | 30 | 50 | 406 | 420 | 16 | 10.5 | — | — | 70 | 12 | 115 | 50 | 6309ZZ | 6308ZZ | 125 | 10.0 | 160L |
| 180M | 351.5 | 48 | 110 | 9 | 5.5 | 14 | 1 | 140 | 185 | 35 | 55 | 456 | 420 | 16 | 11.5 | — | — | 80 | 12 | 115 | 50 | (6311) 6311ZZ | (6308ZZ) 6310ZZ | 185 | 13.0 | 180M |
| 180L | 370.5 | 55 | 110 | 10 | 6 | 16 | (1) 0.5 | 140 | 205 | 35 | 55 | 456 | 460 | 16 | 11.5 | — | — | 80 | 12 | 115 | 50 | (6312C3) 6312ZZC3 | (6308ZZ) 6310ZZ | 210 | 14 | 180L |
| 200LH | 395.5 | 55 | 110 | 10 | 6 | 16 | 1 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 6312C3 | 6308ZZ | 290 | — | 200LH |
| 200L | 425.5 | 60 | 140 | 11 | 7 | 18 | 0.5 | 160 | 230 | 35 | 60 | 535 | 520 | 18 | 13 | — | — | 100 | 16 | 150 | 63 | 6313ZZC3 | 6311ZZ | 300 | 18 | 200L |
| 225SH | 402 | 55 | 110 | 10 | 6 | 16 | 1 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 6312C3 | 6308ZZ | 350 | — | 225SH |
| 225S*6 | 432 | 65 | 140 | 11 | 7 | 18 | 1 | 200 | — | 35 | 71 | 770 | 476 | 20 | 225 | 71 | 190 | 180 | 16 | 265 | 63 | 6314C3/NU314 | 6312ZZ | 360 | 36 | 225S*6 |
| 250SH | 433.5 | 55 | 110 | 10 | 6 | 16 | 1 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 6312C3 | 6312C3 | 550 | — | 250SH |
| 250S*6 | 463.5 | 75 | 140 | 12 | 7.5 | 20 | 1 | 315 | — | 30 | 85 | 900 | 521 | 19 | 250 | 80 | 210 | 180 | 16 | 265 | 63 | 6316C3/NU316 | 6313ZZ | 570 | 65 | 250S*6 |
| 250MH | 452.5 | 55 | 110 | 10 | 6 | 16 | 1 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 6312C3 | 6312C3 | 610 | — | 250MH |
| 250M*6 | 482.5 | 75 | 140 | 12 | 7.5 | 20 | 1 | 315 | — | 30 | 85 | 900 | 559 | 19 | 250 | 80 | 210 | 180 | 16 | 265 | 63 | 6316C3/NU316 | 6313ZZ | 630 | 65 | 250M*6 |
| 280SH | 484 | 55 | 110 | 10 | 6 | 16 | 1 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 6312C3 | 6312C3 | 740 | — | 280SH |
| 280S*6 | 544 | 85 | 170 | 14 | 9 | 22 | 1 | 315 | — | 30 | 85 | 900 | 578 | 19 | 250 | 80 | 210 | 200 | 16 | 265 | 63 | 6318C3/NU318 | 6315ZZ | 760 | 65 | 280S*6 |
| 280MH | 509.5 | 55 | 110 | 10 | 6 | 16 | 1 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 6312C3 | 6312C3 | 830 | — | 280MH |
| 280M*6 | 569.5 | 85 | 170 | 14 | 9 | 22 | 1 | 315 | — | 30 | 85 | 900 | 629 | 19 | 250 | 80 | 210 | 200 | 16 | 265 | 63 | 6318C3/NU318 | 6315ZZ | 850 | 65 | 280M*6 |
| 315SH | 529 | 55 | 110 | 10 | 6 | 16 | 1 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 6312C3 | 6312C3 | 960 | — | 315SH |
| 315S*6 | 589 | 95 | 170 | 14 | 9 | 25 | 1 | 375 | — | 35 | 100 | 1120 | 656 | 24 | 280 | 95 | 250 | 200 | 20 | 445 | 88 | 6320C3/NU320 | 6317 | 980 | 105 | 315S*6 |
| 315MH | 554.5 | 55 | 110 | 10 | 6 | 16 | 1 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 6312C3 | 6312C3 | 1030 | — | 315MH |
| 315M*6 | 614.5 | 95 | 170 | 14 | 9 | 25 | 1 | 375 | — | 35 | 100 | 1120 | 707 | 24 | 280 | 95 | 250 | 200 | 20 | 445 | 88 | 6320C3/NU320 | 6317 | 1060 | 105 | 315M*6 |

4. In case of V-belts, after reference table of "Application of V-Belts and V-Pully" (P16), please be careful with selection and installation.
5. Bearing Nos. in the parenthesis show the one for 2-pole motors.
6. Size may be changed. Please inquire sizes, when used for design.
7. In frame Nos. 180M and 180L, size B in bracket is 2-pole motor.
8. 2.2kW-8-pole in marked symbol* is class E insulation.

# Vertical Totally-Enclosed Frame Surface Cooled Outdoor Type (Type VTISP85)

# Totally-Enclosed Frame Surface Cooled Flange-Mounted Outdoor Type (Type HTISP85)

| | |
|---|---|
| Protection type | IP W44 |
| Cooling type | IC0141 |

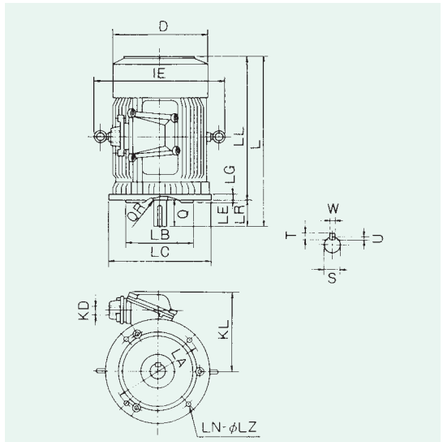



Fig. 1 Frame Nos 63 ~ 112M

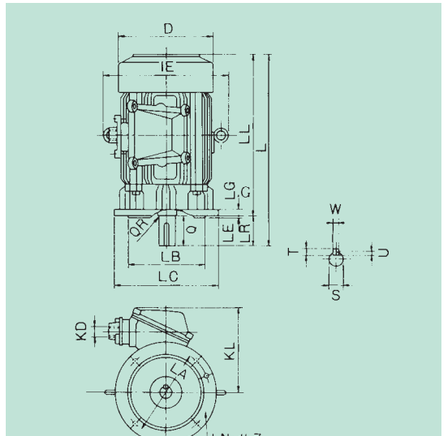


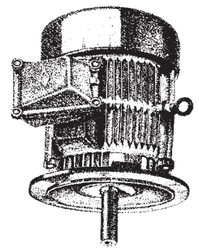

Fig. 2 Frame Nos 132S ~ 180M

## External Dimension

| Flange No. | Frame No. | Output (kW) 2-pole | 4-pole | 6-pole | 8-pole | Class of insulation | Fig. No. | Motor D | L | LL | IE | LA | LB | LC | LE | LG | LZ | LN | LR | KD | KL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FF130 | 63 | 0.2 | 0.2 | — | — | E | 1 | 141 | 221 | 198 | — | 130 | 110 | 160 | 3.5 | 10 | 10 | 4 | 23 | PF¾ | 178 |
| | 71 | 0.4 | 0.4 | 0.2 | — | E | 1 | 157 | 251 | 221 | — | 130 | 110 | 160 | 3.5 | 10 | 10 | 4 | 30 | PF¾ | 185 |
| FF165 | 80 | 0.75 | 0.75 | 0.4 | 0.2 | E | 1 | 178 | 285 | 245 | — | 165 | 130 | 200 | 3.5 | 12 | 12 | 4 | 40 | PF¾ | 192 |
| | 90L | 1.5 2.2 | 1.5 | 0.75 | 0.4 | E | 1 | 194 | 342 | 292 | — | 165 | 130 | 200 | 3.5 | 12 | 12 | 4 | 50 | PF¾ | 202 |
| FF215 | 100L | — | 2.2 | 1.5 | 0.75 | E | 1 | 220 | 373 | 313 | 144 | 215 | 180 | 250 | 4 | 16 | 15 | 4 | 60 | PF¾ | 218 |
| | 112M | 3.7 | 3.7 | 2.2 | 1.5 | E | 1 | 240 | 402 | 342 | 310 | 215 | 180 | 250 | 4 | 16 | 15 | 4 | 60 | PF¾ | 230 |
| FF265 | 132S | 5.5 7.5 | 5.5 | 3.7 | *2.2 | B | 2 | 276 | 456 | 376 | 180 | 265 | 230 | 300 | 4 | 20 | 15 | 4 | 80 | PF1¼ | 274 |
| | 132M | — | 7.5 | 5.5 | 3.7 | B | 2 | 276 | 494 | 414 | 180 | 265 | 230 | 300 | 4 | 20 | 15 | 4 | 80 | PF1¼ | 274 |
| FF300 | 160M | 11 15 | 11 | 7.5 | 5.5 | B | 2 | 320 | 633 | 523 | 209 | 300 | 250 | 350 | 5 | 20 | 19 | 4 | 110 | PF1¼ | 300 |
| | 160L | 18.5 | 15 | 11 | 7.5 | B | 2 | 320 | 677 | 567 | 209 | 300 | 250 | 350 | 5 | 20 | 19 | 4 | 110 | PF1¼ | 300 |
| FF350 | 180M | 22 | 18.5 22 | 15 | 11 | B | 2 | 366 | 702.5 | 592.5 | 247 | 350 | 300 | 400 | 5 | 20 | 19 | 4 | 110 | PH2 | 375 |
| FF350 | 180L | 30 | 30 | 18.5 22 | 15 | F | 3 | 366 | 740.5 | 630.5 | 247 | 350 | 300 | 400 | 5 | 20 | 19 | 4 | 110 | PF2 | 375 |
| FF400 | 200LH | 37 45 | — | — | — | F | 3 | 409 | 756.5 | 646.5 | 265 | 400 | 350 | 450 | 5 | 22 | 19 | 8 | 110 | PF2 | 400 |
| | 200L | — | 37 45 | 30 37 | 18.5 32 | | | | 786.5 | | | | | | | | | | 140 | | |
| FF500 | 225SH | 55 | — | — | — | F | 3 | 462 | 778.5 | 668.5 | 303 | 500 | 450 | 550 | 5 | 22 | 19 | 8 | 110 | PF2 | 430 |
| | 225S$_B$ | — | 55 | 45 | 30 | | | | 808.5 | | | | | | | | | | 140 | | |
| | 250SH | 75 | — | — | — | F | 4 | 530 | 914.5 | 804.5 | 365 | 500 | 450 | 550 | 5 | 22 | 19 | 8 | 110 | PF2½ | 505 |
| | 250S$_B$ | — | 75 | 55 | 37 | | | | 944.5 | | | | | | | | | | 140 | | |
| | 250MH | 90 | — | — | — | F | 4 | 530 | 952.5 | 842.5 | 365 | 500 | 450 | 550 | 5 | 22 | 19 | 8 | 110 | PF2½ | 505 |
| | 250M$_B$ | — | 90 | 75 | 45 | | | | 982.5 | | | | | | | | | | 140 | | |
| FF600 | 280SH | 110 | — | — | — | F | 4 | 590 | 994 | 884 | 420 | 600 | 550 | 660 | 6 | 25 | 24 | 8 | 110 | PF2½ | 540 |
| | 280S$_B$ | — | 110 | 90 | 55 | | | | 1054 | | | | | | | | | | 170 | | |
| | 280MH | 132 | — | — | — | F | 4 | 590 | 1044 | 934 | 420 | 600 | 550 | 660 | 6 | 25 | 24 | 8 | 110 | PF2½ | 540 |
| | 280M$_B$ | — | 132 | 110 | 75 | | | | 1104 | | | | | | | | | | 170 | | |

<Notes>
1. Tolerance for size S is h6 for $\phi$11, j6 for $\phi$14 to $\phi$28, k6 for $\phi$38 to $\phi$48 and m6 for $\phi$55 or over, according to JIS B 0401 (Limits and fits for engineering).
2. Tolerance for size LB is j6 for $\phi$450 or less and js6 for $\phi$550 or over, according to JIS B 0401.
3. Frame No. C/B show direct coupling (C) and belt driving (B) and the two types have different kinds of bearings at coupling sides.





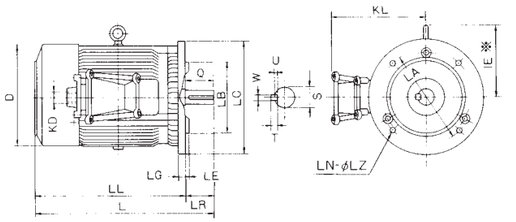



Fig. 5 Frame Nos. 90L~132M (Typical Drawing for Flange Type)

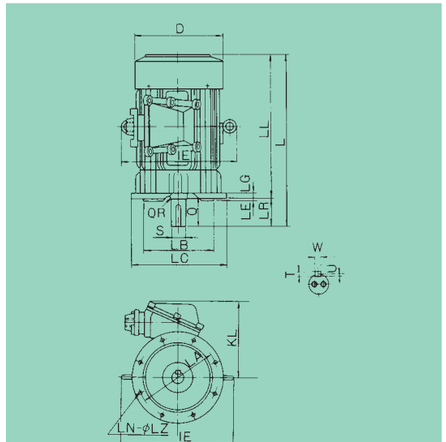



Fig. 3 Frame Nos 180L ~ 225S

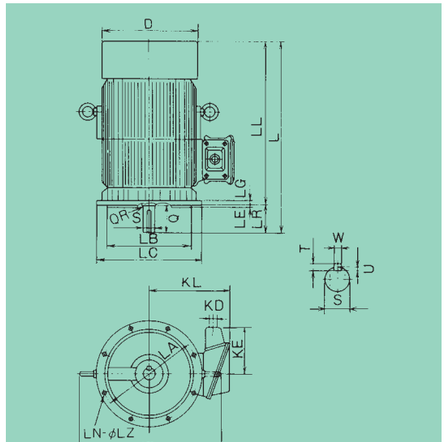



Fig. 4 Frame Nos 250S ~ 315M

| Shaft S | Q | T | U | W | QR | Bearing No. Coupling side | Opposite coupling side | Approx. mass (kg) | Flange type IE※ | Frame No. | Flange No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 | 23 | — | 1 | — | 0.3 | 6201ZZ | 6201ZZ | 8.0 | — | 63 | FF130 |
| 14 | 30 | 5 | 3 | 5 | 0.3 | 6202ZZ | 6202ZZ | 10.5 | — | 71 | |
| 19 | 40 | 6 | 3.5 | 6 | 0.3 | 6204ZZ | 6204ZZ | 14.0 | — | 80 | FF165 |
| 24 | 50 | 7 | 4 | 8 | 0.3 | 6205ZZ | 6205ZZ | 26 | — | 90L | |
| 28 | 60 | 7 | 4 | 8 | 0.5 | 6206ZZ | 6205ZZ | 35 | 144 | 100L | FF215 |
| 28 | 60 | 7 | 4 | 8 | 0.5 | 6306ZZ | 6206ZZ | 50 | 155 | 112M | |
| 38 | 80 | 8 | 5 | 10 | 0.5 | 6308ZZ | 6207ZZ | 68 | 180 | 132S | FF265 |
| 38 | 80 | 8 | 5 | 10 | 0.5 | 6308ZZ | 6207ZZ | 79 | 180 | 132M | |
| 42 | 110 | 8 | 5 | 12 | 0.5 | 6309ZZ | 6308ZZ | 115 | 209 | 160M | FF300 |
| 42 | 110 | 8 | 5 | 12 | 0.5 | 6309ZZ | 6308ZZ | 130 | 209 | 160L | |
| 48 | 110 | 9 | 5.5 | 14 | 1 | (6311) 6311ZZ | (6308ZZ) 6310ZZ | 185 | 247 | 180M | FF350 |
| 55 | 110 | 10 | 6 | 16 | (1) 0.5 | (6312C3) 6312ZZC3 | (6308ZZ) 6310ZZ | 210 | 247 | 180L | FF350 |
| 55 | 110 | 10 | 6 | 16 | 1 | 6312C3 | 6308ZZ | 270 | 265 | 200LH | FF400 |
| 60 | 140 | 11 | 7 | 18 | 0.5 | 6313ZZC3 | 6311ZZ | 280 | 265 | 200L | |
| 55 | 110 | 10 | 6 | 16 | 1 | 6312C3 | 6308ZZ | 310 | 303 | 225SH | FF500 |
| 65 | 140 | 11 | 7 | 18 | 1 | 6314C3/NU314 | 6312ZZ | 320 | 303 | 225S$_B$ | |
| 55 | 110 | 10 | 6 | 16 | 1 | 6312C3 | 6312C3 | 460 | — | 250SH | |
| 75 | 140 | 12 | 7.5 | 20 | 1 | 6316C3/NU316 | 6313ZZ | 480 | — | 250S$_B$ | |
| 55 | 110 | 10 | 6 | 16 | 1 | 6312C3 | 6312C3 | 510 | — | 250MH | |
| 75 | 140 | 12 | 7.5 | 20 | 1 | 6316C3/NU316 | 6313ZZ | 530 | — | 250M$_B$ | |
| 55 | 110 | 10 | 6 | 16 | 1 | 6312C3 | 6312C3 | 640 | — | 280SH | FF600 |
| 85 | 170 | 14 | 9 | 22 | 1 | 6318C3/NU318 | 6315ZZ | 660 | — | 280S$_B$ | |
| 55 | 110 | 10 | 6 | 16 | 1 | 6312C3 | 6312C3 | 740 | — | 280MH | |
| 85 | 170 | 14 | 9 | 22 | 1 | 6318C3/NU318 | 6315ZZ | 760 | — | 280M$_B$ | |

4. In case of V-belts, after reference table of "Application of V-Belts and V-Pully" (P16), please be careful with selection and installation.
5. Bearing Nos. in the parenthesis show the one for 2-pole motors.
6. Sizes of flange-mounted type are the same as those values of vertical type shown in the above table other than those marked symbol*.
7. Size may be changed. Please inquire sizes, when used for design.
8. 2.2kW-8-pole in marked symbol* is class E insulation.

## Rated Current and Rated Speed (reference values)

| Output (kW) | Voltage Frequency (V-Hz) | Protected drip-proof type | | | | | | | | Totally-enclosed frame surface cooled type | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2-pole | | 4-pole | | 6-pole | | 8-pole | | 2-pole | | 4-pole | | 6-pole | | 8-pole | |
| | | AMP | $min^{-1}$ | AMP | $min^{-1}$ | AMP | $min^{-1}$ | AMP | $min^{-1}$ | AMP | $min^{-1}$ | AMP | $min^{-1}$ | AMP | $min^{-1}$ | AMP | $min^{-1}$ |
| 0.2 | 200-50 | | | | | | | 1.8 | 670 | 1.0 | 2840 | 1.4 | 1390 | 1.4 | 920 | 1.8 | 670 |
| | 200-60 | | | | | | | 1.6 | 800 | 0.9 | 3400 | 1.2 | 1670 | 1.2 | 1100 | 1.6 | 800 |
| | 220-60 | | | | | | | 1.6 | 810 | 0.9 | 3440 | 1.2 | 1680 | 1.2 | 1120 | 1.6 | 810 |
| 0.4 | 200-50 | | | | | 2.6 | 920 | 3.0 | 695 | 1.8 | 2880 | 2.2 | 1410 | 2.6 | 920 | 3.0 | 695 |
| | 200-60 | | | | | 2.2 | 1100 | 2.6 | 835 | 1.7 | 3460 | 1.9 | 1690 | 2.2 | 1100 | 2.6 | 835 |
| | 220-60 | | | | | 2.3 | 1120 | 2.6 | 845 | 1.6 | 3480 | 1.9 | 1700 | 2.3 | 1120 | 2.6 | 845 |
| 0.75 | 200-50 | 3.4 | 2900 | 3.6 | 1420 | 4.1 | 930 | 4.8 | 700 | 3.4 | 2900 | 3.7 | 1420 | 4.1 | 930 | 4.8 | 700 |
| | 200-60 | 3.0 | 3470 | 3.4 | 1700 | 3.6 | 1120 | 4.2 | 840 | 3.0 | 3470 | 3.3 | 1700 | 3.6 | 1120 | 4.2 | 840 |
| | 220-60 | 3.0 | 3490 | 3.2 | 1710 | 3.6 | 1130 | 4.2 | 850 | 3.0 | 3490 | 3.2 | 1710 | 3.6 | 1130 | 4.2 | 850 |
| 1.5 | 200-50 | 6.0 | 2900 | 6.4 | 1420 | 7.2 | 930 | 8.0 | 705 | 6.0 | 2900 | 6.6 | 1420 | 7.2 | 930 | 8.0 | 705 |
| | 200-60 | 5.8 | 3470 | 6.0 | 1700 | 6.5 | 1120 | 7.2 | 845 | 5.8 | 3470 | 6.0 | 1700 | 6.5 | 1120 | 7.2 | 845 |
| | 220-60 | 5.4 | 3490 | 5.6 | 1710 | 6.2 | 1130 | 7.0 | 855 | 5.4 | 3490 | 5.8 | 1710 | 6.2 | 1130 | 7.0 | 855 |
| 2.2 | 200-50 | 8.4 | 2900 | 9.0 | 1420 | 10 | 930 | 11 | 705 | 8.4 | 2900 | 8.9 | 1420 | 10 | 930 | 11 | 705 |
| | 200-60 | 8.2 | 3470 | 8.4 | 1710 | 9.2 | 1120 | 9.8 | 845 | 8.2 | 3470 | 8.5 | 1710 | 9.2 | 1120 | 9.8 | 845 |
| | 220-60 | 7.6 | 3490 | 8.0 | 1720 | 8.8 | 1130 | 9.4 | 855 | 7.6 | 3490 | 7.9 | 1720 | 8.8 | 1130 | 9.4 | 855 |
| 3.7 | 200-50 | 13 | 2900 | 15 | 1420 | 16 | 950 | 18 | 710 | 13 | 2900 | 15 | 1420 | 16 | 950 | 18 | 710 |
| | 200-60 | 13 | 3470 | 14.2 | 1710 | 15 | 1130 | 16 | 850 | 13 | 3470 | 14 | 1710 | 15 | 1130 | 16 | 850 |
| | 220-60 | 12 | 3490 | 13.2 | 1720 | 14 | 1140 | 16 | 860 | 12 | 3490 | 13 | 1720 | 14 | 1140 | 16 | 860 |
| 5.5 | 200-50 | 20 | 2900 | 22 | 1450 | 24 | 950 | 26 | 720 | 20 | 2900 | 22 | 1450 | 24 | 950 | 26 | 720 |
| | 200-60 | 20 | 3470 | 20 | 1730 | 22 | 1130 | 23 | 860 | 20 | 3470 | 21 | 1730 | 22 | 1130 | 23 | 860 |
| | 220-60 | 18 | 3490 | 19 | 1740 | 22 | 1140 | 23 | 870 | 18 | 3490 | 20 | 1740 | 22 | 1140 | 24 | 870 |
| 7.5 | 200-50 | 28 | 2900 | 29 | 1450 | 32 | 960 | 34 | 720 | 28 | 2900 | 30 | 1450 | 32 | 960 | 36 | 720 |
| | 200-60 | 26 | 3470 | 27 | 1730 | 30 | 1150 | 30 | 860 | 26 | 3470 | 28 | 1730 | 30 | 1150 | 32 | 860 |
| | 220-60 | 24 | 3490 | 25 | 1740 | 28 | 1160 | 30 | 870 | 24 | 3490 | 26 | 1740 | 28 | 1160 | 31 | 870 |
| 11 | 200-50 | 40 | 2900 | 44 | 1450 | 44 | 960 | 51 | 725 | 40 | 2900 | 42 | 1450 | 46 | 960 | 48 | 725 |
| | 200-60 | 38 | 3470 | 40 | 1730 | 42 | 1150 | 46 | 870 | 40 | 3470 | 40 | 1730 | 42 | 1150 | 46 | 870 |
| | 220-60 | 36 | 3500 | 38 | 1750 | 40 | 1160 | 44 | 875 | 36 | 3500 | 38 | 1750 | 40 | 1160 | 42 | 875 |
| 15 | 200-50 | 54 | 2900 | 56 | 1450 | 62 | 970 | 71 | 725 | 52 | 2900 | 56 | 1450 | 62 | 970 | 64 | 720 |
| | 200-60 | 52 | 3470 | 53 | 1730 | 58 | 1160 | 63 | 870 | 52 | 3470 | 54 | 1730 | 58 | 1160 | 60 | 865 |
| | 220-60 | 48 | 3500 | 50 | 1750 | 54 | 1170 | 62 | 875 | 48 | 3500 | 50 | 1750 | 54 | 1170 | 58 | 870 |
| 18.5 | 200-50 | 68 | 2920 | 68 | 1450 | 75 | 970 | 83 | 720 | 64 | 2920 | 70 | 1450 | 76 | 960 | 80 | 720 |
| | 200-60 | 64 | 3500 | 66 | 1740 | 70 | 1160 | 75 | 865 | 64 | 3500 | 68 | 1740 | 72 | 1150 | 76 | 865 |
| | 220-60 | 59 | 3520 | 60 | 1750 | 66 | 1170 | 72 | 870 | 58 | 3520 | 62 | 1750 | 66 | 1160 | 70 | 870 |
| 22 | 200-50 | 77 | 2920 | 80 | 1460 | 88 | 960 | 96 | 720 | 76 | 2920 | 82 | 1450 | 90 | 960 | 96 | 720 |
| | 200-60 | 75 | 3500 | 78 | 1750 | 84 | 1150 | 87 | 865 | 76 | 3500 | 80 | 1740 | 84 | 150 | 88 | 865 |
| | 220-60 | 69 | 3520 | 72 | 1760 | 78 | 1160 | 82 | 870 | 70 | 3520 | 74 | 1750 | 80 | 1160 | 84 | 870 |
| 30 | 200-50 | 108 | 2940 | 110 | 1460 | 120 | 960 | 130 | 720 | 104 | 2920 | 110 | 1450 | 120 | 960 | 136 | 725 |
| | 200-60 | 106 | 3520 | 106 | 1750 | 114 | 1150 | 120 | 865 | 102 | 3500 | 108 | 1740 | 112 | 1150 | 124 | 870 |
| | 220-60 | 96 | 3540 | 98 | 1760 | 104 | 1160 | 112 | 870 | 94 | 3520 | 98 | 1750 | 106 | 1160 | 120 | 875 |
| 37 | 200-50 | 130 | 2940 | 134 | 1460 | 146 | 960 | 150 | 720 | 126 | 2920 | 134 | 1460 | 146 | 960 | 158 | 725 |
| | 200-60 | 130 | 3520 | 132 | 1750 | 140 | 1150 | 144 | 865 | 126 | 3500 | 132 | 1750 | 138 | 1150 | — | — |
| | 220-60 | 118 | 3540 | 120 | 1760 | 130 | 1160 | 132 | 870 | 114 | 3520 | 120 | 1760 | 128 | 1160 | 138 | 875 |
| 45 | 400-50 | 80 | 2940 | 85 | 1460 | 90 | 970 | 95 | 720 | 76 | 2920 | 79 | 1460 | 87 | 970 | 101 | 725 |
| | 440-60 | 72 | 3540 | 74 | 1760 | 78 | 1170 | 85 | 870 | 69 | 3520 | 71 | 1760 | 77 | 1170 | 87 | 875 |
| 55 | 400-50 | 95 | 2940 | 98 | 1460 | 108 | 970 | 114 | 720 | 93 | 2940 | 97 | 1460 | 116 | 970 | 117 | 730 |
| | 440-60 | 85 | 3540 | 87 | 1760 | 95 | 1170 | 99 | 870 | 85 | 3530 | 87 | 1760 | 99 | 1170 | 102 | 880 |
| 75 | 400-50 | 133 | 2940 | 133 | 1460 | 148 | 970 | 144 | 720 | 129 | 2940 | 135 | 1470 | 153 | 970 | 164 | 730 |
| | 440-60 | 118 | 3540 | 118 | 1760 | 129 | 1170 | 126 | 870 | 116 | 3530 | 119 | 1770 | 132 | 1170 | 142 | 880 |
| 90 | 400-50 | 150 | 2940 | 158 | 1460 | 167 | 970 | 171 | 720 | 150 | 2940 | 164 | 1470 | 178 | 970 | 187 | 730 |
| | 440-60 | 139 | 3540 | 140 | 1760 | 148 | 1170 | 151 | 870 | 136 | 3530 | 144 | 1770 | 157 | 1170 | 165 | 880 |
| 110 | 400-50 | 192 | 2940 | 201 | 1470 | 216 | 970 | 214 | 720 | 181 | 2940 | 195 | 1470 | 212 | 970 | 211 | 730 |
| | 440-60 | 170 | 3540 | 177 | 1765 | 189 | 1170 | 191 | 870 | 164 | 3540 | 172 | 1770 | 185 | 1170 | 188 | 880 |
| 132 | 400-50 | 225 | 2940 | 238 | 1470 | 252 | 970 | | | 222 | 2940 | 236 | 1470 | 250 | 970 | | |
| | 440-60 | 198 | 3540 | 210 | 1765 | 222 | 1170 | | | 198 | 3540 | 207 | 1770 | 220 | 1170 | | |
| 160 | 400-50 | 269 | 2940 | 281 | 1470 | 285 | 970 | | | 264 | 2950 | 278 | 1470 | 308 | 970 | | |
| | 440-60 | 240 | 3540 | 252 | 1765 | 255 | 1170 | | | 239 | 3540 | 247 | 1770 | 268 | 1170 | | |
| 200 | 400-50 | 339 | 2950 | 347 | 1470 | | | | | 335 | 2950 | 348 | 1470 | | | | |
| | 440-60 | 300 | 3540 | 313 | 1765 | | | | | 299 | 3540 | 308 | 1770 | | | | |



## Application of V-Belts and V-Pulley and Mounting of V-Pulleys

- The standard V-belts conform to JISK6323 (V Belts for Power Transmission), while narrow V-belts conform to JISK6368 (Narrow V-Belts for Power Transmission).
- Outputs of motors suitable for V-belt driving are as specified in Table 1, applicable according to the type of V-belt.
- Application of V-belts and V-pulleys for the respective motor outputs is as specified in Table 2.
- If the diameter of a V-pulley is smaller than the value specified in the Table or if the number of belts becomes unusually large, then the shaft may be broken due to excessive shaft loading or bearings may be damaged. If such usage is intended, please make inquiries to us.

### Application of V-Belts and V-pulleys for Various Motor Outputs

| Reted motor output (kW) | | | | Standard V-belt | | | | Narrow V-belt | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2-pole | 4-pole | 6-pole | 8-pole | Type of V-belt | No. of V-belts | Nominal V-pulley diameter dp (mm) | V-pulley rim width PW (mm) | Type of V-belt | No. of V-belts | Nominal V-pulley diameter de (mm) | V-pulley rim width PW (mm) |
| 0.2 | 0.2 | — | — | A | 1 | 75 | 20 | 3V | 1 | 71 | 17.4 |
| 0.4 | 0.4 | — | — | A | 1 | 75 | 20 | 3V | 1 | 71 | 17.4 |
| 0.75 | 0.75 | 0.4 | — | A | 1 | 80 | 20 | 3V | 1 | 71 | 17.4 |
| 1.5 | — | 0.75 | — | A | 2 | 80 | 35 | 3V | 1 | 75 | 17.4 |
| 2.2 | — | — | — | A | 2 | 90 | 35 | 3V | 1 | 75 | 17.4 |
| — | 1.5 | — | — | A | 2 | 90 | 35 | 3V | 2 | 75 | 27.7 |
| — | 2.2 | 1.5 | — | A | 2 | 100 | 35 | 3V | 2 | 75 | 27.7 |
| 3.7 | — | — | — | A | 3 | 90 | 50 | 3V | 2 | 75 | 27.7 |
| — | — | 2.2 | — | A | 3 | 100 | 50 | 3V | 2 | 90 | 27.7 |
| — | 3.7 | — | — | A | 3 | 112 | 50 | 3V | 2 | 100 | 27.7 |
| 5.5 | — | — | — | A | 3 | 112 | 50 | 3V | 3 | 75 | 38.0 |
| 7.5 | — | — | — | A | 3 | 132 | 50 | 3V | 4 | 80 | 48.3 |
| — | 5.5 | 3.7 | — | B | 3 | 125 | 63 | 3V | 3 | 100 | 38.0 |
| — | 7.5 | — | — | B | 3 | 150 | 63 | 3V | 3 | 125 | 38.0 |
| — | — | 5.5 | — | B | 3 | 150 | 63 | 3V | 3 | 140 | 38.0 |
| — | — | 7.5 | — | B | 4 | 150 | 82 | 3V | 4 | 140 | 48.3 |
| — | 11 | — | — | B | 4 | 160 | 82 | 3V | 4 | 125 | 48.3 |
| — | — | 11 | — | B | 5 | 170 | 101 | 3V | 5 | 140 | 58.6 |
| — | 15 | — | — | B | 5 | 170 | 101 | 3V | 6 | 125 | 68.9 |
| — | 18.5 | — | — | B | 5 | 200 | 101 | 3V | 6 | 140 | 68.9 |
| — | 22 | 15 | — | B | 5 | 224 | 101 | 3V | 6 | 160 | 68.9 |
| — | — | 18.5 | — | C | 4 | 224 | 110.5 | 5V | 3 | 180 | 60.4 |
| — | 30 | 22 | — | C | 5 | 224 | 136 | 5V | 4 | 180 | 77.5 |
| — | — | 30 | — | C | 5 | 265 | 136 | 5V | 4 | 224 | 77.9 |
| — | 37 | — | — | C | 6 | 224 | 161.5 | 5V | 4 | 200 | 77.9 |
| — | 45 | 37 | — | C | 6 | 265 | 161.5 | 5V | 4 | 224 | 77.9 |
| — | — | — | 30 | C | 6 | 265 | 161.5 | 5V | 5 | 224 | 95.4 |
| — | 55 | — | — | C | 7 | 265 | 187 | 5V | 5 | 224 | 95.4 |
| — | — | 45 | — | C | 7 | 280 | 187 | 5V | 5 | 224 | 95.4 |
| — | — | — | 37 | C | 7 | 280 | 187 | 5V | 5 | 250 | 95.4 |
| — | — | — | 45 | C | 7 | 315 | 187 | 5V | 6 | 250 | 112.9 |
| — | — | 55 | — | C | 8 | 300 | 212.5 | 5V | 6 | 250 | 112.9 |
| — | 75 | — | — | C | 8 | 315 | 212.5 | 5V | 6 | 250 | 112.9 |
| — | — | — | 55 | D | 5 | 355 | 196 | 5V | 6 | 280 | 112.9 |
| — | 90 | — | — | — | — | — | — | 5V | 6 | 280 | 112.9 |
| — | — | 75 | — | D | 6 | 355 | 233 | 5V | 6 | 315 | 112.9 |
| — | — | 90 | 75 | D | 6 | 400 | 233 | 5V | 6 | 355 | 112.9 |
| — | — | 110 | — | D | 7 | 400 | 270 | 8V | 4 | 355 | 123.8 |
| — | — | — | 90 | — | — | — | — | 8V | 4 | 355 | 123.8 |
| — | — | 132 | 110 | — | — | — | — | 8V | 4 | 400 | 123.8 |
| — | — | 160 | 132 | — | — | — | — | 8V | 4 | 450 | 123.8 |

### How to Stretch V-Belt:

If the tension of V-belt is too much, its life may be shortened due to fatigue or the belt will give rise to overheating in bearings, breakage in the shaft, etc.
If the tension of V-belt is insufficient the belt may increase vibration and slippage and the life of V-belt will be shortened extremely. These cautions should be borne in mind when arranging the V-belt.

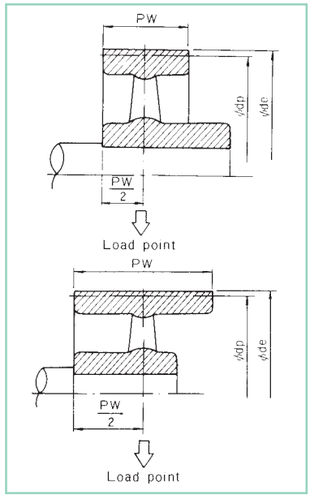
### Type of V-Belt and Applicable Max. Output (Table 1)

| | Standard V-belt | Narrow V-belt |
|---|---|---|
| 2P | 7.5 | 7.5 |
| 4P | 75 | 90 |
| 6P | 110 | 160 |
| 8P | 75 | 132 |

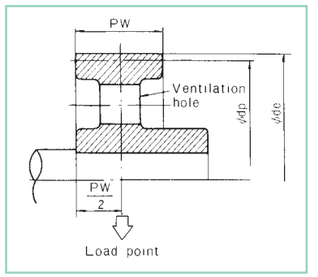
Unit: kW

### How to Mount V-Pulley

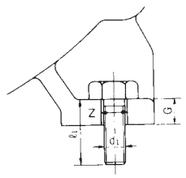
In order to minimize the load to be applied to the bearings and the stepped part of motor shaft, it is necessary to move the shaft's load (caused by V-belt tension) as nearer as possible to the motor side. Therefore the V-pulley should be mounted as illustrated below so that its rim end surface can be contained in the same plane for the stepped part of shaft.



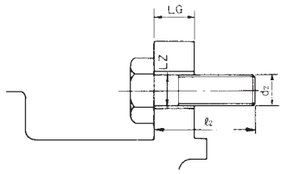

In order not to block ventilation cooling for the motor, the standard V-pulley is arranged into an arm shape as illustrated above. If the pulley is flat plate type as shown below, it should be provided with a big ventilation hole (the bigger the better).



## Installation of Motor




Frame

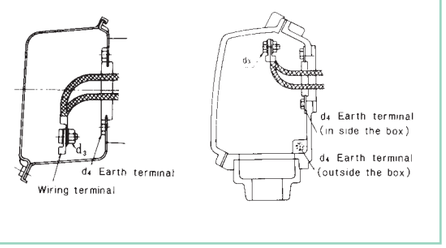



Flange

| Frame No. | | 63 | 71 | 80 | 90 | 100 | 112 | 132 | 160 | 180 | 200 | 225 | 250 | 280 | 315 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Z mounting hole | | 7 | 7 | 10 | 10 | 12 | 12 | 12 | 15 | 15 | 19 | 19 | 24 | 24 | 28 |
| d1 mounting bolt | | M6 | M6 | M8 | M8 | M10 | M10 | M10 | M12 | M12 | M16 | M16 | M20 | M20 | M20 |
| Protected drip-proof type | G | — | — | 3 | 4 | 4 | 14 | 16 | 20 | 22 | 25 | 28 | 36 | 36 | — |
| | ℓ1 | — | — | 16 | 20 | 25 | 30 | 35 | 40 | 40 | 50 | 50 | 75 | 75 | — |
| | ℓ1 Max. | — | — | 25 | 30 | 35 | 35 | 45 | 60 | 60 | 70 | 70 | 85 | 85 | — |
| Totally-enclosed frame surface cooled type | G | 2.5 | 3 | 3 | 10 | 12 | 14 | 16 | 20 | 22 | 25 | 28 | 32 | 32 | 36 |
| | ℓ1 | 12 | 12 | 16 | 25 | 30 | 30 | 35 | 40 | 40 | 50 | 50 | 70 | 70 | 85 |
| | ℓ1 Max. | 20 | 20 | 25 | 30 | 35 | 35 | 45 | 60 | 60 | 70 | 70 | 80 | 80 | 85 |

| Frame No. | | 63 | 71 | 80 | 90 | 100 | 112 | 132 | 160 | 180 | 200 | 225 | 250 | 280 | 315 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected drip-proof type | LZ | -- | — | — | 12 | 15 | 15 | 15 | 19 | 19 | 19 | 19 | 24 | — | — |
| | d2 | — | — | — | M10 | M12 | M12 | M12 | M16 | M16 | M16 | M16 | M20 | — | — |
| | LG | — | — | — | 12 | 16 | 16 | 20 | 20 | 20<br>22 | 22 | 22 | 25 | — | — |
| | ℓ2 | — | — | — | 30 | 35 | 35 | 40 | 45 | 45<br>50 | 50 | 50 | 65 | — | — |
| | ℓ2 Max. | — | — | — | 35 | 45 | 45 | 50 | 50 | 50<br>90 | 90 | 90 | 90 | — | — |
| Totally-enclosed frame sunfoce cooled type | LZ | 10 | 10 | 12 | 12 | 15 | 15 | 15 | 19 | 19 | 19 | 19 | 19 | 24 | — |
| | d2 | M8 | M8 | M10 | M10 | M12 | M12 | M12 | M16 | M16 | M16 | M16 | M16 | M20 | — |
| | LG | 10 | 10 | 12 | 12 | 16 | 16 | 20 | 20 | 20 | 22 | 22 | 22 | 25 | — |
| | ℓ2 | 25 | 25 | 30 | 30 | 35 | 35 | 40 | 45 | 45 | 45 | 50 | 50 | 50 | — |
| | ℓ2 Max. | 25 | 25 | 30 | 30 | 40 | 35 | 45 | 50 | 50 | 50 | 70 | 70 | 70 | — |

## Terminal Connection




| Frame No. | | | 63~112 | 132~160 | 180~225 | | 250~315 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected drip-proof type | Output (kW) | | 3.7 below | 22 below | 37 below | 90 below | 55 | 75 | 90 | 110 | 132 | 160 | 200 | | |
| | d3 | 200V Class | M5 | M6 | M6 | M8 | M12 | M12 | — | — | — | — | — | | |
| | | 400V Class | M5 | M6 | M6 | M8 | M8 | M8 | M10 | M10 | M12 | M12 | M12 | | |
| | d4 | | M6 | M8 | M10 | | M10 | | | | | | | | |
| Totally-enclosed frame surface cooled type | 出力 (kW) | | 3.7 below | 18.5 below | 37 below | 55 below | 37 | 45 | 55 | 75 | 90 | 110 | 132 | 160 | 200 |
| | d3 | 200V Class | M5 | M6 | M6 | M8 | M8 | M10 | M12 | M12 | — | — | — | | |
| | | 400V Class | M5 | M6 | M6 | M8 | M8 | M8 | M8 | M8 | M10 | M10 | M12 | M12 | M12 |
| | d4 | | M6 | M8 | M10 | | M10 | | | | | | | | |

## Relubrication Interval and Amount of Grease

| Bearing No. | | Amount of grease | | Relubrication interval (Unit: $10^2$H) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Ball bearing | | | | | | | | Roller bearing | | | | | | | |
| Ball bearing | Roller bearing | g | CC | 2-pole | | 4-pole | | 6-pole | | 8-pole | | 2-pole | | 4-pole | | 6-pole | | 8-pole | |
| | | | | 50Hz | 60Hz | 50 | 60 | 50 | 60 | 50 | 60 | 50 | 60 | 50 | 60 | 50 | 60 | 50 | 60 |
| 6310 | NU310 | 20 | 22 | 32 | 28 | 50 | 50 | 50 | 50 | 50 | 50 | 27 | 22 | 50 | 44 | 50 | 50 | 50 | 50 |
| 6311 | NU311 | 25 | 28 | 30 | 25 | 50 | 50 | 50 | 50 | 50 | 50 | 24 | 20 | 48 | 40 | 50 | 50 | 50 | 50 |
| 6312 | NU312 | 30 | 33 | 28 | 23 | 50 | 46 | 50 | 50 | 50 | 50 | 22 | 18 | 44 | 36 | 50 | 50 | 50 | 50 |
| 6313 | NU313 | 35 | 39 | 26 | 21 | 50 | 42 | 50 | 50 | 50 | 50 | 20 | 17 | 40 | 34 | 50 | 50 | 50 | 50 |
| 6314 | NU314 | 40 | 45 | 24 | 20 | 48 | 40 | 50 | 50 | 50 | 50 | 19 | 16 | 38 | 32 | 50 | 48 | 50 | 50 |
| 6315 | NU315 | 45 | 50 | — | — | 44 | 36 | 50 | 50 | 50 | 50 | — | — | 36 | 30 | 50 | 45 | 50 | 50 |
| 6316 | NU316 | 50 | 56 | — | — | 42 | 34 | 50 | 50 | 50 | 50 | — | — | 34 | 28 | 50 | 42 | 50 | 50 |
| 6317 | NU317 | 55 | 61 | — | — | 38 | 32 | 50 | 48 | 50 | 50 | — | — | 30 | 26 | 45 | 39 | 50 | 50 |
| 6318 | NU318 | 60 | 67 | — | — | 36 | 30 | 50 | 45 | 50 | 50 | — | — | 30 | 24 | 45 | 36 | 50 | 48 |
| 6319 | NU319 | 65 | 72 | — | — | 34 | 28 | 50 | 42 | 50 | 50 | — | — | 28 | 22 | 42 | 33 | 50 | 44 |
| 6320 | NU320 | 70 | 78 | — | — | 32 | 28 | 48 | 42 | 50 | 50 | — | — | 26 | 22 | 39 | 33 | 50 | 44 |



## Standard Specification

| No. | Item | | Standard specification | | Semi-standard specification |
|---|---|---|---|---|---|
| 1 | Standard | | JIS, JEC, JEM | | IEC, BS |
| 2 | Protection/Cooling type | | Protected type IP20, IC01<br>Protected drip-proof type IP22, IC01 | | IP54, IP55 |
| | | | Totally-enclosed splash-proof frame surface cooled type<br>Indoor type: IP44, IC0141<br>Outdoor type: IPW44, IC0141 | | |
| 3 | Rotor construction | | Squirrel-cage rotor type | | |
| 4 | Rated voltage/frequency | | 37kW and below | 200V-50·60Hz, 220V-60Hz | Other than standard specification |
| | | | 45kW and above | 400V-50Hz, 440V-60Hz | |
| 5 | Type of insulation | | Frame 112M and below | Class E insulation | Other than standard specification |
| | | | Frame 132S~180M | Class B insulation | |
| | | | Frame 180L and above | Class F insulation | |
| 6 | Ambient temperature and altitude | | –20°C~40°C 1000m or below | | Other than standard specification |
| 7 | Environmental conditions | | Relative humidity 90% Max.<br>Sometimes weak acid or alkaline gas may exist. | | |
| 8 | Torque characteristics | Locked-rotor torque | 37kW and below | According to JIS C 4210 | Other than standard specification |
| | | | 45kW and above | 100% | |
| | | Pull-up torque | 37kW and below | According to JIS C 4210 | |
| | | | 45kW and above | 90% | |
| | | Break-down torque | 37kW and below | According to JIS C 4210 | |
| | | | 45kW and above | 200% | |
| 9 | Time rating | | Continuous | | |
| 10 | Revolving direction | | Clockwise as seen from anti-coupling side | | Counter-clockwise |
| 11 | Position of terminal box | Protected drip-proof type | All frames | Right side as seen from opposite coupling side | |
| | | Totally-enclosed splash-proof type | Frame 225 and below | Right side as seen from opposite coupling side | |
| | | | Frame 250 and above | Upper side of the motor | |
| 12 | Terminal arrangement | | Lug type (lead wire system) | | Stud type |
| 13 | Direction of external cable intake | Protected drip-proof type | All frames | Downward | |
| | | Totally-enclosed splash-proof type | Frame 225 and below | Downward (toward opposite coupling side for outdoor type) | |
| | | | Frame 250 and above | Right side as seen from opposite coupling side | |
| 14 | External cable intake method | | Indoor use | Knockout type | Packing type (with threads for conduit pipe) |
| | | | Outdoor use | Threaded joint steel conduit type | |
| 15 | Color of coating | | Munsell 5B5/0.5 (standard color) | | Other than standard color |
| 16 | Accessories | | Shaft end key | | Slide base (Frame 200 and below)<br>Slide rail (Frame 225 and above)<br>Foundation bolts<br>Space heater |

## Please specify the following items when ordering LITTLE KING series motors.

| No. | Specification item | Appointment item | Remarks | No. | Specification item | Appointment item | Remarks |
|---|---|---|---|---|---|---|---|
| 1 | Facility | | | 13 | Starting method | Direct/Star-delta/Reduced voltage | Specify the type of starter, and the tap voltage when reduced voltage starting is required. |
| 2 | Driven equipment | | | | | | |
| 3 | Quantity | | | 14 | Starting frequency | Time/day | When the starting frequency is more than several times per day, please specify the numbeer of times ot starting and its interval time. |
| 4 | Output | kW | | | | | |
| 5 | No. of poles | P | | | | | |
| 6 | Voltage | V | | 15 | Load moment of inertia J (In terms of motor shaft) | $kg \cdot m^2$ | When the $GD^2$ of the load is large, please specify it. ($J=1/4\ GD^2$) |
| 7 | Frequency | 50Hz · 60Hz | | | | | |
| 8 | Location | Indoor<br>Outdoor | | 16 | Performance required | Locked-rotor torque (%), Breakdown torque (%) etc. | When any requirements concerned with performance exist, please specify the value of them. |
| 9 | Type | Protected type<br>Protected drip-proof type<br>Totally-enclosed frame surface cooled type<br>Indoor type<br>Outdoor type | IP20, IC01<br>IP22, IC01<br>IP44, IC0141<br>IPW44, IC0141 | 17 | Noise level limitation | Yes · No | When low noise type is required, please specify the value of noise in dB (A). |
| 10 | Coupling with load | Direct coupling<br>Belt drive | Specify the following items in case of belt drive:<br>Diameter of pulley (P.C.D.),<br>Pulley width (PW),<br>Kind of belt,<br>No. of belt | 18 | Explosion-proof | Yes · No | Specify the kind and class of gas and explosion-proof classification. |
| 11 | Revolving direction | Counter clockwise<br>Clockwise | Viewed from opposite coupling side | 19 | Environmental conditions | Standard,<br>Non-standard | Specify the specific items. (Ambient temperature, humidity, corrosive gas, vibration and description related with the equipment delivered before.) |
| 12 | Terminal | | Terminal leadout: Lug type<br>Stud type:<br>Direct: Right or left side as viewed from opposite coupling side;<br>Diameter of the screw:<br>Kind and size of cable | 20 | Finished color | Yes · No | Munsell 5B5/0.5 (Standerd color) |
| | | | | 21 | Accessories/ spare parts | With, Without | Specify the article and quantity of it. |


MEIDEN

MEIDENSHA CORPORATION

ThinkPark Tower, 2-1-1, Osaki, Shinagawa-ku, Tokyo, 141-6029 Japan

Phone: 81-3-6420-7510 Facsimile: 81-3-5745-3053

**www.meidensha.co.jp**





**CA156-2227Ⓒ** As of Jan.,2009

2009-1ME(4L)0.5L