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## AC Motors

Square Frame and Round Frame  
Three-Phase AC Induction Motors



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## Square Frame Three-Phase Induction Motors - MS Series Motor 0.75 kW - 524 kW

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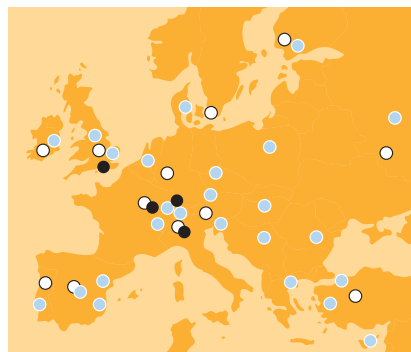
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# Square Frame Three-Phase Induction Motors - MS Series Motor 0.75 kW - 524 kW

## Overview

### Description

The MS series family of motors has been specially engineered to be suitable for high dynamic performance when used with a flux vector type controller - AC890 and AC690+. They permit operation in constant power at maximum speed up to 8000 min<sup>-1</sup>

- **Compact square frame format**
- **Same frame dimensions as DC motors of similar power rating**
- **IP23 or IP54 protection**
- **Auxiliary cooling fan allows low-speed, high-torque operation**
- **High overload capability**
- **Higher operating speeds**
- **360 V (Contact your local sales office for details)**
- **PTC thermister (option)**
- **IP55 protection (option)**
- **Insulated bearings (option)**
- **Encoder or resolver feedback (option)**



### Technical Characteristics - Overview

|                     |                                          |
|---------------------|------------------------------------------|
| Motor type          | Square Frame Three-Phase Induction Motor |
| Power range         | 0.75 kW ... 524 kW                       |
| Speed range         | 0 ... 8000 min <sup>-1</sup>             |
| Protection level    | IP23 or IP54                             |
| Feedback            | Encoder or resolver (optional)           |
| Suitable for drives | AC30V, AC690+, AC890, AC890PX-M          |



# Technical Features

## MS133 Series: 13 kW - 60 kW, 3 x 400 VAC (IP23)

| Order Code    | Motor | Code | Nominal speed nn [min <sup>-1</sup> ] | Nominal power Pn [KW] | Nominal torque Tn [Nm] | Inertia J [kgcm <sup>2</sup> ] | Nominal voltage Vn [VRMS] | Nominal current In [ARMS] | Magnetising current Iμ [ARMS] | Nominal frequency Fn [Hz] | Max. speed at Pn Nmax1 [min <sup>-1</sup> ] | Max. speed Nmax2 [min <sup>-1</sup> ] | Weight W [kg] |
|---------------|-------|------|---------------------------------------|-----------------------|------------------------|--------------------------------|---------------------------|---------------------------|-------------------------------|---------------------------|---------------------------------------------|---------------------------------------|---------------|
| MS24133KEC... | MS133 | K EC | 800                                   | 13                    | 155                    | 670                            | 395                       | 28                        | 9                             | 28.9                      | 1000                                        | 7 000                                 | 132           |
| MS24133KEB... |       | K EB | 1000                                  | 16                    | 153                    | 670                            | 395                       | 33                        | 10                            | 35.7                      | 1200                                        | 7 000                                 | 132           |
| MS24133KE3... |       | K E3 | 1350                                  | 21                    | 149                    | 670                            | 400                       | 42                        | 14                            | 47.2                      | 1500                                        | 7 000                                 | 132           |
| MS24133KFA... |       | K FA | 1500                                  | 23                    | 146                    | 670                            | 395                       | 45                        | 14                            | 52.2                      | 1900                                        | 7 000                                 | 132           |
| MS24133KF2... |       | K F2 | 1800                                  | 27                    | 143                    | 670                            | 400                       | 52                        | 17                            | 62.1                      | 2100                                        | 7 000                                 | 132           |
| MS24133KF3... |       | K F3 | 2000                                  | 30                    | 142                    | 670                            | 400                       | 57                        | 19                            | 68.7                      | 2300                                        | 7 000                                 | 132           |
| MS24133KG1... |       | K G1 | 2500                                  | 36                    | 138                    | 670                            | 395                       | 70                        | 26                            | 85.3                      | 3700                                        | 7 000                                 | 132           |
| MS24133KGB... |       | K GB | 3000                                  | 42                    | 134                    | 670                            | 400                       | 79                        | 28                            | 101.9                     | 3600                                        | 7 000                                 | 132           |
| MS24133SE2... |       | S E2 | 850                                   | 19                    | 213                    | 860                            | 385                       | 40                        | 13                            | 30.3                      | 1400                                        | 7 000                                 | 157           |
| MS24133SEC... |       | S EC | 1000                                  | 22                    | 210                    | 860                            | 385                       | 45                        | 15                            | 35.3                      | 1700                                        | 7 000                                 | 157           |
| MS24133SE3... |       | S E3 | 1250                                  | 27                    | 206                    | 860                            | 400                       | 52                        | 18                            | 43.5                      | 1500                                        | 7 000                                 | 157           |
| MS24133SFB... |       | S FB | 1500                                  | 31                    | 197                    | 860                            | 400                       | 59                        | 20                            | 51.9                      | 1700                                        | 7 000                                 | 157           |
| MS24133SF2... |       | S F2 | 1800                                  | 35                    | 186                    | 860                            | 400                       | 67                        | 24                            | 61.8                      | 2200                                        | 7 000                                 | 157           |
| MS24133SF4... |       | S F4 | 2050                                  | 39                    | 182                    | 860                            | 400                       | 75                        | 28                            | 70.0                      | 2600                                        | 7 000                                 | 157           |
| MS24133SG1... |       | S G1 | 2450                                  | 43                    | 168                    | 860                            | 400                       | 83                        | 31                            | 83.3                      | 3100                                        | 7 000                                 | 157           |
| MS24133SGB... |       | S GB | 3000                                  | 49                    | 156                    |                                | 400                       | 93                        | 37                            | 101.5                     | 3900                                        | 7 000                                 | 157           |
| MS24133ME4... |       | M E4 | 850                                   | 21                    | 236                    | 980                            | 395                       | 43                        | 14                            | 30.3                      | 1100                                        | 7 000                                 | 175           |
| MS24133ME3... |       | M E3 | 1000                                  | 24                    | 229                    | 980                            | 390                       | 49                        | 17                            | 35.2                      | 1600                                        | 7 000                                 | 175           |
| MS24133MEB... |       | M EB | 1250                                  | 29                    | 222                    | 980                            | 395                       | 58                        | 20                            | 43.5                      | 1800                                        | 7 000                                 | 175           |
| MS24133MFB... |       | M FB | 1500                                  | 34                    | 216                    | 980                            | 395                       | 67                        | 24                            | 51.8                      | 2200                                        | 7 000                                 | 175           |
| MS24133MF2... |       | M F2 | 1800                                  | 39                    | 207                    | 980                            | 400                       | 74                        | 26                            | 61.8                      | 2100                                        | 7 000                                 | 175           |
| MS24133MF3... |       | M F3 | 2100                                  | 42                    | 191                    | 980                            | 400                       | 81                        | 32                            | 71.6                      | 2700                                        | 7 000                                 | 175           |
| MS24133MG1... |       | M G1 | 2500                                  | 47                    | 180                    | 980                            | 395                       | 92                        | 39                            | 84.8                      | 4100                                        | 7 000                                 | 175           |
| MS24133MG2... |       | M G2 | 2850                                  | 50                    | 168                    | 980                            | 400                       | 97                        | 42                            | 96.4                      | 4000                                        | 7 000                                 | 175           |
| MS24133PE7... |       | P E7 | 800                                   | 23                    | 275                    | 1200                           | 385                       | 48                        | 16                            | 28.4                      | 1400                                        | 7000                                  | 200           |
| MS24133PED... |       | P ED | 1000                                  | 28                    | 267                    | 1200                           | 390                       | 56                        | 20                            | 35.0                      | 1600                                        | 7000                                  | 200           |
| MS24133PFC... |       | P FC | 1350                                  | 36                    | 255                    | 1200                           | 400                       | 69                        | 25                            | 46.6                      | 1600                                        | 7000                                  | 200           |
| MS24133PFB... |       | P FB | 1500                                  | 39                    | 248                    | 1200                           | 390                       | 77                        | 31                            | 51.5                      | 2700                                        | 7000                                  | 200           |
| MS24133PF2... |       | P F2 | 1850                                  | 45                    | 232                    | 1200                           | 400                       | 86                        | 36                            | 63.1                      | 2500                                        | 7000                                  | 200           |
| MS24133PF3... |       | P F3 | 2100                                  | 48                    | 218                    | 1200                           | 400                       | 92                        | 37                            | 71.4                      | 2600                                        | 7000                                  | 200           |
| MS24133PG1... |       | P G1 | 2600                                  | 54                    | 198                    | 1200                           | 395                       | 105                       | 47                            | 87.9                      | 4400                                        | 7000                                  | 200           |
| MS24133PG2... |       | P G2 | 3000                                  | 57                    | 181                    | 1200                           | 400                       | 112                       | 56                            | 101.1                     | 4500                                        | 7000                                  | 200           |
| MS24133XE3... |       | X E3 | 850                                   | 25                    | 281                    | 1260                           | 395                       | 51                        | 19                            | 29.9                      | 1200                                        | 7000                                  | 220           |
| MS24133XEB... |       | X EB | 1000                                  | 29                    | 277                    | 1260                           | 390                       | 59                        | 23                            | 34.8                      | 1700                                        | 7000                                  | 220           |
| MS24133XF3... |       | X F3 | 1250                                  | 36                    | 275                    | 1260                           | 395                       | 71                        | 28                            | 43.2                      | 1900                                        | 7000                                  | 220           |
| MS24133XFA... |       | X FA | 1500                                  | 42                    | 267                    | 1260                           | 400                       | 81                        | 32                            | 51.5                      | 1900                                        | 7000                                  | 220           |
| MS24133XF1... |       | X F1 | 1800                                  | 47                    | 249                    | 1260                           | 395                       | 92                        | 39                            | 61.4                      | 2900                                        | 7000                                  | 220           |
| MS24133XF2... |       | X F2 | 2000                                  | 50                    | 239                    | 1260                           | 390                       | 98                        | 42                            | 68.0                      | 3800                                        | 7000                                  | 220           |
| MS24133XG1... |       | X G1 | 2600                                  | 57                    | 209                    | 1260                           | 390                       | 114                       | 55                            | 87.8                      | 5600                                        | 7000                                  | 220           |
| MS24133XG2... |       | X G2 | 3000                                  | 60                    | 191                    | 1260                           | 380                       | 125                       | 63                            | 101.1                     | 7000                                        | 7000                                  | 220           |

## MS160 Series: 30 kW - 114 kW, 3 x 400 VAC (IP23)

| Order Code    | Motor | Code | Nominal speed<br>nn<br>[min <sup>-1</sup> ] | Nominal power<br>Pn<br>[KW] | Nominal torque<br>Tn<br>[Nm] | Inertia<br>J<br>[kgcm <sup>2</sup> ] | Nominal voltage<br>Vn<br>[VRMS] | Nominal current<br>In<br>[ARMS] | Magnetising current<br>Iμ<br>[ARMS] | Nominal frequency<br>Fn<br>[Hz] | Max. speed at<br>Pn Nmax1<br>[min <sup>-1</sup> ] | Max. speed<br>Nmax2<br>[min <sup>-1</sup> ] | Weight<br>W<br>[kg] |
|---------------|-------|------|---------------------------------------------|-----------------------------|------------------------------|--------------------------------------|---------------------------------|---------------------------------|-------------------------------------|---------------------------------|---------------------------------------------------|---------------------------------------------|---------------------|
| MS24160ME3... | MS160 | M E3 | 650                                         | 30                          | 441                          | 2400                                 | 395                             | 62                              | 17                                  | 23.7                            | 800                                               | 6 000                                       | 270                 |
| MS24160MEA... |       | M EA | 900                                         | 40                          | 424                          | 2400                                 | 400                             | 79                              | 23                                  | 31.9                            | 1000                                              | 6 000                                       | 270                 |
| MS24160ME8... |       | M E8 | 1000                                        | 44                          | 420                          | 2400                                 | 385                             | 89                              | 27                                  | 35.2                            | 1700                                              | 6 000                                       | 270                 |
| MS24160MF4... |       | M F4 | 1300                                        | 56                          | 411                          | 2400                                 | 400                             | 106                             | 33                                  | 45.2                            | 1600                                              | 6 000                                       | 270                 |
| MS24160MFA... |       | M FA | 1500                                        | 63                          | 401                          | 2400                                 | 400                             | 120                             | 39                                  | 51.8                            | 1900                                              | 6 000                                       | 270                 |
| MS24160MFE... |       | M FE | 1800                                        | 73                          | 387                          | 2400                                 | 400                             | 138                             | 45                                  | 61.8                            | 2300                                              | 6 000                                       | 270                 |
| MS24160MF5... |       | M F5 | 2000                                        | 80                          | 382                          | 2400                                 | 390                             | 153                             | 51                                  | 68.4                            | 3300                                              | 6 000                                       | 270                 |
| MS24160MG2... |       | M G2 | 2600                                        | 96                          | 353                          | 2400                                 | 400                             | 180                             | 64                                  | 88.3                            | 3600                                              | 6 000                                       | 270                 |
| MS24160LED... |       | L ED | 650                                         | 34                          | 500                          | 3020                                 | 400                             | 68                              | 22                                  | 23.3                            | 800                                               | 6 000                                       | 325                 |
| MS24160LEA... |       | L EA | 850                                         | 44                          | 494                          | 3020                                 | 390                             | 87                              | 29                                  | 29.9                            | 1400                                              | 6 000                                       | 325                 |
| MS24160LE5... |       | L E5 | 1000                                        | 51                          | 487                          | 3020                                 | 400                             | 98                              | 33                                  | 34.9                            | 1300                                              | 6 000                                       | 325                 |
| MS24160LFB... |       | L FB | 1300                                        | 64                          | 470                          | 3020                                 | 400                             | 121                             | 43                                  | 44.8                            | 1800                                              | 6 000                                       | 325                 |
| MS24160LF4... |       | L F4 | 1500                                        | 71                          | 452                          | 3020                                 | 400                             | 132                             | 47                                  | 51.4                            | 2000                                              | 6 000                                       | 325                 |
| MS24160LF3... |       | L F3 | 1850                                        | 84                          | 434                          | 3020                                 | 400                             | 156                             | 59                                  | 63.0                            | 2700                                              | 6 000                                       | 325                 |
| MS24160LFA... |       | L FA | 2000                                        | 88                          | 420                          | 3020                                 | 400                             | 165                             | 65                                  | 68.0                            | 3000                                              | 6 000                                       | 325                 |
| MS24160LG1... |       | L G1 | 2450                                        | 99                          | 386                          | 3020                                 | 400                             | 186                             | 77                                  | 82.9                            | 3800                                              | 6 000                                       | 325                 |
| MS24160PEC... |       | P EC | 700                                         | 42                          | 573                          | 3600                                 | 390                             | 85                              | 29                                  | 24.8                            | 1300                                              | 5 000                                       | 365                 |
| MS24160PEB... |       | P EB | 850                                         | 50                          | 562                          | 3600                                 | 395                             | 99                              | 35                                  | 29.7                            | 1400                                              | 5 000                                       | 365                 |
| MS24160PE4... |       | P E4 | 1000                                        | 58                          | 554                          | 3600                                 | 395                             | 111                             | 41                                  | 34.7                            | 1700                                              | 5 000                                       | 365                 |
| MS24160PFA... |       | P FA | 1300                                        | 73                          | 536                          | 3600                                 | 395                             | 138                             | 51                                  | 44.6                            | 2200                                              | 5 000                                       | 365                 |
| MS24160PF1... |       | P F1 | 1500                                        | 82                          | 522                          | 3600                                 | 395                             | 156                             | 60                                  | 51.3                            | 2700                                              | 5 000                                       | 365                 |
| MS24160PFB... |       | P FB | 1800                                        | 94                          | 499                          | 3600                                 | 395                             | 177                             | 70                                  | 61.2                            | 3300                                              | 5 000                                       | 365                 |
| MS24160PFC... |       | P FC | 2000                                        | 100                         | 477                          | 3600                                 | 395                             | 189                             | 76                                  | 67.8                            | 3800                                              | 5 000                                       | 365                 |
| MS24160PG2... |       | P G2 | 2500                                        | 110                         | 420                          | 3600                                 | 395                             | 213                             | 97                                  | 84.4                            | 5000                                              | 5 000                                       | 365                 |
| MS24160XE3... | MS160 | X E3 | 650                                         | 44                          | 639                          | 3900                                 | 385                             | 90                              | 30                                  | 23.1                            | 1200                                              | 4500                                        | 395                 |
| MS24160XEB... |       | X EB | 850                                         | 56                          | 629                          | 3900                                 | 390                             | 110                             | 28                                  | 29.7                            | 1400                                              | 4500                                        | 395                 |
| MS24160XE1... |       | X E1 | 1000                                        | 65                          | 621                          | 3900                                 | 385                             | 128                             | 45                                  | 34.7                            | 1900                                              | 4500                                        | 395                 |
| MS24160XF5... |       | X F5 | 1300                                        | 81                          | 595                          | 3900                                 | 400                             | 151                             | 53                                  | 44.7                            | 1500                                              | 4500                                        | 395                 |
| MS24160XF3... |       | X F3 | 1500                                        | 91                          | 579                          | 3900                                 | 395                             | 171                             | 63                                  | 51.3                            | 2300                                              | 4500                                        | 395                 |
| MS24160XF2... |       | X F2 | 1800                                        | 102                         | 541                          | 3900                                 | 390                             | 193                             | 75                                  | 61.2                            | 3300                                              | 4500                                        | 395                 |
| MS24160XFC... |       | X FC | 2000                                        | 108                         | 516                          | 3900                                 | 390                             | 206                             | 85                                  | 67.8                            | 3900                                              | 4500                                        | 395                 |
| MS24160XG1... |       | X G1 | 2500                                        | 114                         | 435                          | 3900                                 | 400                             | 208                             | 82                                  | 84.4                            | 3000                                              | 4500                                        | 395                 |

## MS180 Series: 47 kW - 162 kW, 3 x 400 VAC (IP23)

| Order Code    | Motor | Code | Nominal speed<br>nn<br>[min <sup>-1</sup> ] | Nominal power<br>Pn<br>[KW] | Nominal torque<br>Tn<br>[Nm] | Inertia<br>J<br>[kgcm <sup>2</sup> ] | Nominal voltage<br>Vn<br>[VRMS] | Nominal current<br>In<br>[ARMS] | Magnetising current<br>Iμ<br>[ARMS] | Nominal frequency<br>Fn<br>[Hz] | Max. speed at<br>Pn Nmax1<br>[min <sup>-1</sup> ] | Max. speed<br>Nmax2<br>[min <sup>-1</sup> ] | Weight<br>W<br>[kg] |
|---------------|-------|------|---------------------------------------------|-----------------------------|------------------------------|--------------------------------------|---------------------------------|---------------------------------|-------------------------------------|---------------------------------|---------------------------------------------------|---------------------------------------------|---------------------|
| MS24180ME5... | MS180 | M E5 | 650                                         | 47                          | 690                          | 5050                                 | 390                             | 92                              | 26                                  | 22.8                            | 900                                               | 4 500                                       | 480                 |
| MS24180MEC... |       | M EC | 850                                         | 61                          | 685                          | 5050                                 | 395                             | 115                             | 34                                  | 29.5                            | 1100                                              | 4 500                                       | 480                 |
| MS24180MED... |       | M ED | 1000                                        | 71                          | 678                          | 5050                                 | 395                             | 129                             | 39                                  | 34.4                            | 1300                                              | 4 500                                       | 480                 |
| MS24180MEB... |       | M EB | 1300                                        | 89                          | 654                          | 5050                                 | 395                             | 158                             | 49                                  | 44.4                            | 1800                                              | 4 500                                       | 480                 |
| MS24180MFB... |       | M FB | 1500                                        | 100                         | 637                          | 5050                                 | 395                             | 178                             | 58                                  | 51.0                            | 2100                                              | 4 500                                       | 480                 |
| MS24180MF1... |       | M F1 | 1800                                        | 112                         | 594                          | 5050                                 | 400                             | 198                             | 69                                  | 60.9                            | 2100                                              | 4 500                                       | 480                 |
| MS24180MF2... |       | M F2 | 2050                                        | 118                         | 550                          | 5050                                 | 385                             | 215                             | 67                                  | 69.3                            | 3700                                              | 4 500                                       | 480                 |
| MS24180MG1... |       | M G1 | 2500                                        | 122                         | 466                          | 5050                                 | 380                             | 225                             | 63                                  | 84.4                            | 4500                                              | 4 500                                       | 480                 |
| MS24180PED... |       | P ED | 650                                         | 60                          | 881                          | 6300                                 | 395                             | 117                             | 35                                  | 23.0                            | 800                                               | 4 500                                       | 550                 |
| MS24180PE7... |       | P E7 | 850                                         | 78                          | 876                          | 6300                                 | 390                             | 147                             | 46                                  | 29.7                            | 1300                                              | 4 500                                       | 550                 |
| MS24180PE4... |       | P E4 | 1000                                        | 90                          | 859                          | 6300                                 | 390                             | 164                             | 49                                  | 34.7                            | 1500                                              | 4 500                                       | 550                 |
| MS24180PE6... |       | P E6 | 1250                                        | 109                         | 833                          | 6300                                 | 390                             | 200                             | 64                                  | 42.9                            | 2000                                              | 4 500                                       | 550                 |
| MS24180PFB... |       | P FB | 1500                                        | 124                         | 789                          | 6300                                 | 385                             | 232                             | 77                                  | 51.2                            | 2800                                              | 4 500                                       | 550                 |
| MS24180PFA... |       | P FA | 1750                                        | 135                         | 737                          | 6300                                 | 395                             | 242                             | 83                                  | 59.5                            | 2600                                              | 4 500                                       | 550                 |
| MS24180PF1... |       | P F1 | 2050                                        | 146                         | 680                          | 6300                                 | 390                             | 262                             | 85                                  | 69.5                            | 3400                                              | 4 500                                       | 550                 |
| MS24180PG1... |       | P G1 | 2500                                        | 155                         | 592                          | 6300                                 | 385                             | 285                             | 86                                  | 84.6                            | 4500                                              | 4 500                                       | 550                 |
| MS24180XE5... |       | X E5 | 650                                         | 65                          | 955                          | 7300                                 | 390                             | 125                             | 38                                  | 23.1                            | 1000                                              | 4000                                        | 590                 |
| MS24180XE6... |       | X E6 | 850                                         | 84                          | 94                           | 7300                                 | 395                             | 156                             | 46                                  | 29.8                            | 1100                                              | 4000                                        | 590                 |
| MS24180XE3... |       | X E3 | 1000                                        | 97                          | 926                          | 7300                                 | 395                             | 178                             | 51                                  | 34.8                            | 1300                                              | 4000                                        | 590                 |
| MS24180XEA... |       | X EA | 1300                                        | 119                         | 874                          | 7300                                 | 395                             | 216                             | 65                                  | 44.7                            | 1700                                              | 4000                                        | 590                 |
| MS24180XF2... |       | X F2 | 1600                                        | 138                         | 824                          | 7300                                 | 395                             | 248                             | 81                                  | 54.6                            | 2200                                              | 4000                                        | 590                 |
| MS24180XF1... |       | X F1 | 1800                                        | 148                         | 785                          | 7300                                 | 395                             | 265                             | 93                                  | 61.2                            | 2700                                              | 4000                                        | 590                 |
| MS24180XG1... |       | X G1 | 2300                                        | 162                         | 673                          | 7300                                 | 395                             | 285                             | 88                                  | 78.0                            | 3100                                              | 4000                                        | 590                 |

## MS225 - MS280 Series: 71 kW - 524 kW, 3 x 400 VAC (IP23)

| Order Code    | Motor | Code | Nominal speed<br>n <sub>n</sub><br>[min <sup>-1</sup> ] | Nominal power<br>P <sub>n</sub><br>[KW] | Nominal torque<br>T <sub>n</sub><br>[Nm] | Inertia<br>J<br>[kgcm <sup>2</sup> ] | Nominal voltage<br>V <sub>n</sub><br>[VRMS] | Nominal current<br>I <sub>n</sub><br>[ARMS] | Magnetising current<br>I <sub>μ</sub><br>[ARMS] | Nominal frequency<br>F <sub>n</sub><br>[Hz] | Max. speed at<br>P <sub>n</sub> Nmax1<br>[min <sup>-1</sup> ] | Max. speed<br>Nmax2<br>[min <sup>-1</sup> ] | Weight<br>W<br>[kg] |
|---------------|-------|------|---------------------------------------------------------|-----------------------------------------|------------------------------------------|--------------------------------------|---------------------------------------------|---------------------------------------------|-------------------------------------------------|---------------------------------------------|---------------------------------------------------------------|---------------------------------------------|---------------------|
| MS24255SE4... | MS225 | S E4 | 650                                                     | 71                                      | 1043                                     | 10500                                | 395                                         | 135                                         | 34                                              | 22.7                                        | 800                                                           | 3 500                                       | 640                 |
| MS24255SEC... |       | S EC | 800                                                     | 86                                      | 1027                                     | 10500                                | 395                                         | 161                                         | 42                                              | 27.6                                        | 1000                                                          | 3 500                                       | 640                 |
| MS24255SE5... |       | S E5 | 1000                                                    | 104                                     | 993                                      | 10500                                | 385                                         | 200                                         | 58                                              | 34.3                                        | 1600                                                          | 3 500                                       | 640                 |
| MS24255SFB... |       | S FB | 1250                                                    | 124                                     | 947                                      | 10500                                | 390                                         | 233                                         | 65                                              | 42.6                                        | 1800                                                          | 3 500                                       | 640                 |
| MS24255SFA... |       | S FA | 1500                                                    | 144                                     | 917                                      | 10500                                | 400                                         | 260                                         | 74                                              | 50.9                                        | 1700                                                          | 3 500                                       | 640                 |
| MS24255SF1... |       | S F1 | 1800                                                    | 161                                     | 854                                      | 10500                                | 390                                         | 295                                         | 80                                              | 60.9                                        | 2700                                                          | 3 500                                       | 640                 |
| MS24255SF2... |       | S F2 | 2000                                                    | 176                                     | 840                                      | 10500                                | 390                                         | 320                                         | 86                                              | 67.5                                        | 2900                                                          | 3 500                                       | 640                 |
| MS24255LE3... |       | L E3 | 650                                                     | 95                                      | 1396                                     | 15000                                | 395                                         | 178                                         | 46                                              | 22.7                                        | 800                                                           | 3 500                                       | 860                 |
| MS24255LEA... |       | L EA | 850                                                     | 122                                     | 1370                                     | 15000                                | 390                                         | 230                                         | 62                                              | 29.3                                        | 1300                                                          | 3 500                                       | 860                 |
| MS24255LEC... |       | L EC | 1000                                                    | 141                                     | 1346                                     | 15000                                | 395                                         | 255                                         | 70                                              | 34.3                                        | 1300                                                          | 3 500                                       | 860                 |
| MS24255LE2... |       | L E2 | 1300                                                    | 174                                     | 1278                                     | 15000                                | 400                                         | 310                                         | 91                                              | 44.2                                        | 1500                                                          | 3 500                                       | 860                 |
| MS24255LFA... |       | L FA | 1450                                                    | 190                                     | 1251                                     | 15000                                | 400                                         | 336                                         | 98                                              | 49.2                                        | 1700                                                          | 3 500                                       | 860                 |
| MS24255LF1... |       | L F1 | 1800                                                    | 216                                     | 1146                                     | 15000                                | 390                                         | 391                                         | 115                                             | 60.8                                        | 2800                                                          | 3 500                                       | 860                 |
| MS24255XE3... |       | X E3 | 650                                                     | 139                                     | 2042                                     | 21300                                | 395                                         | 254                                         | 65                                              | 22.7                                        | 800                                                           | 3500                                        | 1080                |
| MS24255XE4... |       | X E4 | 800                                                     | 169                                     | 2017                                     | 21300                                | 385                                         | 313                                         | 82                                              | 27.7                                        | 1400                                                          | 3500                                        | 1080                |
| MS24255XEB... |       | X EB | 1000                                                    | 208                                     | 1986                                     | 21300                                | 395                                         | 370                                         | 98                                              | 34.4                                        | 1300                                                          | 3500                                        | 1080                |
| MS24255XE1... |       | X E1 | 1250                                                    | 250                                     | 1910                                     | 21300                                | 390                                         | 447                                         | 123                                             | 42.7                                        | 2000                                                          | 3500                                        | 1080                |
| MS24255XFA... |       | X FA | 1450                                                    | 280                                     | 1844                                     | 21300                                | 395                                         | 493                                         | 143                                             | 49.3                                        | 2100                                                          | 3500                                        | 1080                |
| MS24255XF1... |       | X F1 | 1700                                                    | 305                                     | 1713                                     | 21300                                | 390                                         | 540                                         | 163                                             | 57.6                                        | 3000                                                          | 3500                                        | 1080                |
| MS24280MEA... | MS280 | M EA | 690                                                     | 210                                     | 2906                                     | 39330                                | 395                                         | 370                                         | 78                                              | 23.7                                        | 900                                                           | 3000                                        | 1290                |
| MS24280ME1... |       | M E1 | 840                                                     | 252                                     | 2865                                     | 39330                                | 395                                         | 439                                         | 93                                              | 28.7                                        | 1100                                                          | 3000                                        | 1290                |
| MS24280ME2... |       | M E2 | 1060                                                    | 311                                     | 2802                                     | 39330                                | 395                                         | 536                                         | 117                                             | 36.0                                        | 1400                                                          | 3000                                        | 1290                |
| MS24280MF1... |       | M F1 | 1450                                                    | 407                                     | 2680                                     | 39330                                | 400                                         | 686                                         | 155                                             | 49.0                                        | 1500                                                          | 3000                                        | 1290                |
| MS24280LEA... |       | L EA | 560                                                     | 206                                     | 3512                                     | 47250                                | 395                                         | 366                                         | 79                                              | 19.4                                        | 700                                                           | 3000                                        | 1520                |
| MS24280LE1... |       | L E1 | 680                                                     | 247                                     | 3468                                     | 47250                                | 395                                         | 434                                         | 95                                              | 23.3                                        | 900                                                           | 3000                                        | 1520                |
| MS24280LE2... |       | L E2 | 870                                                     | 309                                     | 3391                                     | 47250                                | 395                                         | 535                                         | 115                                             | 29.7                                        | 1100                                                          | 3000                                        | 1520                |
| MS24280LF1... |       | L F1 | 1170                                                    | 401                                     | 3273                                     | 47250                                | 395                                         | 688                                         | 156                                             | 39.7                                        | 1600                                                          | 3000                                        | 1520                |
| MS24280XEA... |       | X EA | 470                                                     | 189                                     | 3840                                     | 56820                                | 395                                         | 347                                         | 86                                              | 16.4                                        | 600                                                           | 2800                                        | 1890                |
| MS24280XE1... |       | X E1 | 520                                                     | 226                                     | 3786                                     | 56820                                | 395                                         | 410                                         | 105                                             | 19.7                                        | 700                                                           | 2800                                        | 1890                |
| MS24280XE2... |       | X E2 | 720                                                     | 281                                     | 3727                                     | 56820                                | 395                                         | 503                                         | 132                                             | 24.7                                        | 900                                                           | 2800                                        | 1890                |
| MS24280XF1... |       | X F1 | 980                                                     | 371                                     | 3615                                     | 56820                                | 395                                         | 656                                         | 173                                             | 33.3                                        | 1300                                                          | 2800                                        | 1890                |
| MS24280XF2... |       | X F2 | 1510                                                    | 524                                     | 3314                                     | 56820                                | 400                                         | 907                                         | 262                                             | 50.9                                        | 1600                                                          | 2800                                        | 1890                |

## MS100 Series: 2.5 kW - 17 kW, 3 x 400 VAC (IP54)

| Order Code    | Motor | Code | Nominal speed<br>n <sub>n</sub><br>[min <sup>-1</sup> ] | Nominal power<br>P <sub>n</sub><br>[KW] | Nominal torque<br>T <sub>n</sub><br>[Nm] | Inertia<br>J<br>[kgcm <sup>2</sup> ] | Nominal voltage<br>V <sub>n</sub><br>[VRMS] | Nominal current<br>I <sub>n</sub><br>[ARMS] | Magnetising current<br>I <sub>μ</sub><br>[ARMS] | Nominal frequency<br>F <sub>n</sub><br>[Hz] | Max. speed at<br>P <sub>n</sub> Nmax1<br>[min <sup>-1</sup> ] | Max. speed<br>Nmax2<br>[min <sup>-1</sup> ] | Weight<br>W<br>[kg] |
|---------------|-------|------|---------------------------------------------------------|-----------------------------------------|------------------------------------------|--------------------------------------|---------------------------------------------|---------------------------------------------|-------------------------------------------------|---------------------------------------------|---------------------------------------------------------------|---------------------------------------------|---------------------|
| MS54100SE2... | MS100 | S E2 | 1000                                                    | 2.5                                     | 23.9                                     | 190                                  | 395                                         | 5.9                                         | 2.5                                             | 35.8                                        | 1200                                                          | 8000                                        | 50                  |
| MS54100SE1... |       | S E1 | 1200                                                    | 3.0                                     | 23.8                                     | 190                                  | 395                                         | 6.9                                         | 3.1                                             | 42.4                                        | 1500                                                          | 8000                                        | 50                  |
| MS54100SFA... |       | S FA | 1500                                                    | 3.7                                     | 23.6                                     | 190                                  | 380                                         | 9.0                                         | 4.2                                             | 52.3                                        | 2600                                                          | 8000                                        | 50                  |
| MS54100SF1... |       | S F1 | 1750                                                    | 4.3                                     | 23.5                                     | 190                                  | 395                                         | 10.0                                        | 4.7                                             | 60.7                                        | 2400                                                          | 8000                                        | 50                  |
| MS54100SF2... |       | S F2 | 2000                                                    | 4.9                                     | 23.4                                     | 190                                  | 380                                         | 11.8                                        | 5.5                                             | 69.0                                        | 3400                                                          | 8000                                        | 50                  |
| MS54100SF3... |       | S F3 | 2400                                                    | 5.7                                     | 22.7                                     | 190                                  | 395                                         | 13.3                                        | 6.5                                             | 82.2                                        | 3400                                                          | 8000                                        | 50                  |
| MS54100SG2... |       | S G2 | 3000                                                    | 6.8                                     | 21.6                                     | 190                                  | 390                                         | 16.3                                        | 8.3                                             | 102.2                                       | 4700                                                          | 8000                                        | 50                  |
| MS54100MEA... |       | M EA | 1000                                                    | 4.1                                     | 39.2                                     | 250                                  | 395                                         | 9.4                                         | 3.9                                             | 35.6                                        | 1200                                                          | 8000                                        | 65                  |
| MS54100ME2... |       | M E2 | 1200                                                    | 4.9                                     | 38.8                                     | 250                                  | 400                                         | 11.0                                        | 5.1                                             | 42.1                                        | 1300                                                          | 8000                                        | 65                  |
| MS54100MFB... |       | M FB | 1500                                                    | 6.0                                     | 38.2                                     | 250                                  | 385                                         | 13.7                                        | 6.1                                             | 52.1                                        | 2400                                                          | 8000                                        | 65                  |
| MS54100MF1... |       | M F1 | 1750                                                    | 6.9                                     | 37.7                                     | 250                                  | 400                                         | 15.2                                        | 6.8                                             | 60.5                                        | 1900                                                          | 8000                                        | 65                  |
| MS54100MF3... |       | M F3 | 2100                                                    | 8.1                                     | 36.8                                     | 250                                  | 400                                         | 17.8                                        | 8.4                                             | 72.0                                        | 2500                                                          | 8000                                        | 65                  |
| MS54100MG1... |       | M G1 | 2700                                                    | 10.0                                    | 35.4                                     | 250                                  | 400                                         | 21.9                                        | 10.6                                            | 92.0                                        | 3400                                                          | 8000                                        | 65                  |
| MS54100MG2... |       | M G2 | 3000                                                    | 11.0                                    | 35.0                                     | 250                                  | 400                                         | 24.2                                        | 11.2                                            | 102.1                                       | 3600                                                          | 8000                                        | 65                  |
| MS54100LE2... |       | L E2 | 1000                                                    | 5.7                                     | 54.4                                     | 310                                  | 400                                         | 13.0                                        | 5.8                                             | 35.4                                        | 1200                                                          | 8000                                        | 80                  |
| MS54100LE1... |       | L E1 | 1250                                                    | 7.0                                     | 53.5                                     | 310                                  | 400                                         | 15.7                                        | 7.1                                             | 43.7                                        | 1500                                                          | 8000                                        | 80                  |
| MS54100LFC... |       | L FC | 1500                                                    | 8.2                                     | 52.2                                     | 310                                  | 390                                         | 18.4                                        | 8.3                                             | 52.0                                        | 2300                                                          | 8000                                        | 80                  |
| MS54100LF1... |       | L F1 | 1800                                                    | 9.6                                     | 50.9                                     | 310                                  | 400                                         | 21.0                                        | 9.6                                             | 62.0                                        | 2200                                                          | 8000                                        | 80                  |
| MS54100LF2... |       | L F2 | 1900                                                    | 10.0                                    | 50.3                                     | 310                                  | 395                                         | 23.5                                        | 10.8                                            | 65.4                                        | 2700                                                          | 8000                                        | 80                  |
| MS54100LGA... |       | L GA | 2400                                                    | 12.2                                    | 48.5                                     | 310                                  | 400                                         | 27.0                                        | 12.8                                            | 82.0                                        | 2900                                                          | 8000                                        | 80                  |
| MS54100LG1... |       | L G1 | 2700                                                    | 13.3                                    | 47.0                                     | 310                                  | 395                                         | 28.8                                        | 13.8                                            | 91.9                                        | 3900                                                          | 8000                                        | 80                  |
| MS54100LG2... |       | L G2 | 3000                                                    | 14.5                                    | 46.2                                     | 310                                  | 390                                         | 32.0                                        | 15.6                                            | 101.9                                       | 5000                                                          | 8000                                        | 80                  |
| MS54100PEB... | MS100 | P EB | 1000                                                    | 6.9                                     | 66.2                                     | 370                                  | 395                                         | 15.1                                        | 6.6                                             | 35.3                                        | 1300                                                          | 8000                                        | 90                  |
| MS54100PE2... |       | P E2 | 1300                                                    | 8.8                                     | 64.8                                     | 370                                  | 400                                         | 19.3                                        | 9.1                                             | 45.2                                        | 1500                                                          | 8000                                        | 90                  |
| MS54100PFB... |       | P FB | 1500                                                    | 10.0                                    | 63.7                                     | 370                                  | 380                                         | 23.0                                        | 11.5                                            | 51.8                                        | 3100                                                          | 8000                                        | 90                  |
| MS54100PF1... |       | P F1 | 1750                                                    | 11.4                                    | 62.2                                     | 370                                  | 395                                         | 25.0                                        | 12.2                                            | 60.1                                        | 2600                                                          | 8000                                        | 90                  |
| MS54100PF2... |       | P F2 | 2000                                                    | 12.8                                    | 61.0                                     | 370                                  | 400                                         | 28.3                                        | 13.0                                            | 68.6                                        | 2200                                                          | 8000                                        | 90                  |
| MS54100PGA... |       | P GA | 2500                                                    | 15.1                                    | 57.8                                     | 370                                  | 390                                         | 33.0                                        | 16.8                                            | 85.0                                        | 4400                                                          | 8000                                        | 90                  |
| MS54100PG2... |       | P G2 | 3000                                                    | 17.0                                    | 54.1                                     | 370                                  | 400                                         | 36.8                                        | 19.1                                            | 101.6                                       | 3900                                                          | 8000                                        | 90                  |

## MS133 Series: 9.5 kW - 47 kW, 3 x 400 VAC (IP54)

| Order Code    | Motor | Code | Nominal speed<br>nn<br>[min <sup>-1</sup> ] | Nominal power<br>Pn<br>[KW] | Nominal torque<br>Tn<br>[Nm] | Inertia<br>J<br>[kgcm <sup>2</sup> ] | Nominal voltage<br>Vn<br>[VRMS] | Nominal current<br>In<br>[ARMS] | Magnetising<br>current<br>Ip<br>[ARMS] | Nominal frequency<br>Fn<br>[Hz] | Max. speed at<br>Pn Nmax1<br>[min <sup>-1</sup> ] | Max. speed<br>Nmax2<br>[min <sup>-1</sup> ] | Weight<br>W<br>[kg] |
|---------------|-------|------|---------------------------------------------|-----------------------------|------------------------------|--------------------------------------|---------------------------------|---------------------------------|----------------------------------------|---------------------------------|---------------------------------------------------|---------------------------------------------|---------------------|
| MS54133KEC... | MS133 | K EC | 850                                         | 9.5                         | 107                          | 670                                  | 395                             | 21                              | 9                                      | 29.9                            | 1400                                              | 7 000                                       | 132                 |
| MS54133KEB... |       | K EB | 1000                                        | 11                          | 105                          | 670                                  | 385                             | 24                              | 11                                     | 34.9                            | 2200                                              | 7 000                                       | 132                 |
| MS54133KE5... |       | K E5 | 1200                                        | 13                          | 103                          | 670                                  | 400                             | 29                              | 14                                     | 41.5                            | 1900                                              | 7 000                                       | 132                 |
| MS54133KFA... |       | K FA | 1500                                        | 16                          | 102                          | 670                                  | 390                             | 34                              | 15                                     | 51.6                            | 2800                                              | 7 000                                       | 132                 |
| MS54133KF2... |       | K F2 | 1800                                        | 19                          | 101                          | 670                                  | 395                             | 40                              | 18                                     | 61.5                            | 3100                                              | 7 000                                       | 132                 |
| MS54133KF3... |       | K F3 | 2000                                        | 21                          | 100                          | 670                                  | 395                             | 43                              | 20                                     | 68.1                            | 3600                                              | 7 000                                       | 132                 |
| MS54133KGA... |       | K GA | 2500                                        | 25                          | 95                           | 670                                  | 400                             | 51                              | 22                                     | 84.8                            | 3400                                              | 7 000                                       | 132                 |
| MS54133KGB... |       | K GB | 3000                                        | 29                          | 92                           | 670                                  | 395                             | 60                              | 29                                     | 101.4                           | 5500                                              | 7 000                                       | 132                 |
| MS54133SE4... |       | S E4 | 850                                         | 13                          | 146                          | 860                                  | 390                             | 28                              | 12                                     | 29.8                            | 1600                                              | 7 000                                       | 157                 |
| MS54133SEB... |       | S EB | 1000                                        | 15                          | 143                          | 860                                  | 395                             | 31                              | 14                                     | 34.7                            | 1700                                              | 7 000                                       | 157                 |
| MS54133SED... |       | S ED | 1250                                        | 18                          | 138                          | 860                                  | 400                             | 37                              | 17                                     | 43.0                            | 1700                                              | 7 000                                       | 157                 |
| MS54133SFA... |       | S FA | 1500                                        | 21                          | 134                          | 860                                  | 400                             | 42                              | 18                                     | 51.4                            | 1900                                              | 7 000                                       | 157                 |
| MS54133SF2... |       | S F2 | 1800                                        | 24                          | 127                          | 860                                  | 395                             | 50                              | 25                                     | 61.2                            | 3400                                              | 7 000                                       | 157                 |
| MS54133SF4... |       | S F4 | 2100                                        | 27                          | 123                          | 860                                  | 390                             | 55                              | 26                                     | 71.2                            | 4500                                              | 7 000                                       | 157                 |
| MS54133SG1... |       | S G1 | 2600                                        | 31                          | 114                          | 860                                  | 400                             | 62                              | 29                                     | 87.9                            | 3700                                              | 7 000                                       | 157                 |
| MS54133SGB... |       | S GB | 3000                                        | 34                          | 108                          | 860                                  | 395                             | 71                              | 37                                     | 101.0                           | 6100                                              | 7 000                                       | 157                 |
| MS54133ME4... |       | M E4 | 850                                         | 15                          | 169                          | 980                                  | 385                             | 33                              | 14                                     | 29.8                            | 1800                                              | 7 000                                       | 175                 |
| MS54133ME2... |       | M E2 | 1000                                        | 17                          | 162                          | 980                                  | 400                             | 35                              | 14                                     | 34.8                            | 1200                                              | 7 000                                       | 175                 |
| MS54133MEB... |       | M EB | 1300                                        | 21                          | 156                          | 980                                  | 400                             | 44                              | 21                                     | 44.6                            | 1900                                              | 7 000                                       | 175                 |
| MS54133MFA... |       | M FA | 1500                                        | 24                          | 153                          | 980                                  | 395                             | 48                              | 21                                     | 51.3                            | 2500                                              | 7 000                                       | 175                 |
| MS54133MF2... |       | M F2 | 1800                                        | 27                          | 143                          | 980                                  | 395                             | 56                              | 27                                     | 61.2                            | 3400                                              | 7 000                                       | 175                 |
| MS54133MF3... |       | M F3 | 2100                                        | 30                          | 136                          | 980                                  | 390                             | 63                              | 31                                     | 71.2                            | 4600                                              | 7 000                                       | 175                 |
| MS54133MG1... |       | M G1 | 2600                                        | 34                          | 125                          | 980                                  | 395                             | 71                              | 37                                     | 87.8                            | 5200                                              | 7 000                                       | 175                 |
| MS54133MG2... |       | M G2 | 3000                                        | 37                          | 118                          | 980                                  | 400                             | 75                              | 39                                     | 101.0                           | 4700                                              | 7 000                                       | 175                 |
| MS54133PE7... |       | P E7 | 850                                         | 18                          | 202                          | 1200                                 | 395                             | 39                              | 16                                     | 29.7                            | 1300                                              | 7 000                                       | 200                 |
| MS54133PE3... |       | P E3 | 1000                                        | 21                          | 201                          | 1200                                 | 400                             | 44                              | 19                                     | 34.7                            | 1300                                              | 7 000                                       | 200                 |
| MS54133PF4... |       | P F4 | 1300                                        | 27                          | 198                          | 1200                                 | 400                             | 52                              | 23                                     | 44.6                            | 1700                                              | 7 000                                       | 200                 |
| MS54133PFA... |       | P FA | 1500                                        | 30                          | 191                          | 1200                                 | 400                             | 58                              | 26                                     | 51.2                            | 2000                                              | 7 000                                       | 200                 |
| MS54133PF1... |       | P F1 | 1800                                        | 33                          | 175                          | 1200                                 | 400                             | 65                              | 29                                     | 61.2                            | 2400                                              | 7 000                                       | 200                 |
| MS54133PF3... |       | P F3 | 2100                                        | 36                          | 164                          | 1200                                 | 390                             | 73                              | 36                                     | 71.1                            | 4600                                              | 7 000                                       | 200                 |
| MS54133PG1... |       | P G1 | 2600                                        | 40                          | 147                          | 1200                                 | 385                             | 85                              | 46                                     | 87.6                            | 7000                                              | 7 000                                       | 200                 |
| MS54133PG2... |       | P G2 | 3000                                        | 43                          | 137                          | 1200                                 | 390                             | 93                              | 53                                     | 100.9                           | 7000                                              | 7 000                                       | 200                 |
| MS54133XE3... |       | X E3 | 850                                         | 20                          | 225                          | 1260                                 | 385                             | 42                              | 19                                     | 29.6                            | 1900                                              | 7000                                        | 220                 |
| MS54133XE2... |       | X E2 | 1000                                        | 23                          | 220                          | 1260                                 | 400                             | 46                              | 21                                     | 34.5                            | 1300                                              | 7000                                        | 220                 |
| MS54133XF3... |       | X F3 | 1300                                        | 29                          | 213                          | 1260                                 | 400                             | 58                              | 27                                     | 44.5                            | 1800                                              | 7000                                        | 220                 |
| MS54133XFA... |       | X FA | 1500                                        | 33                          | 210                          | 1260                                 | 390                             | 67                              | 31                                     | 51.2                            | 3100                                              | 7000                                        | 220                 |
| MS54133XF1... |       | X F1 | 1800                                        | 37                          | 196                          | 1260                                 | 390                             | 76                              | 39                                     | 61.1                            | 4100                                              | 7000                                        | 220                 |
| MS54133XF2... |       | X F2 | 2100                                        | 40                          | 182                          | 1260                                 | 400                             | 80                              | 41                                     | 71.0                            | 3200                                              | 7000                                        | 220                 |
| MS54133XG1... |       | X G1 | 2600                                        | 45                          | 165                          | 1260                                 | 385                             | 96                              | 54                                     | 87.6                            | 7000                                              | 7000                                        | 220                 |
| MS54133XG2... |       | X G2 | 3000                                        | 47                          | 150                          | 1260                                 | 380                             | 106                             | 64                                     | 100.8                           | 7000                                              | 7000                                        | 220                 |

## MS160 Series: 19 kW - 67 kW, 3 x 400 VAC (IP54)

| Order Code    | Motor | Code | Nominal speed<br>nn<br>[min <sup>-1</sup> ] | Nominal power<br>Pn<br>[KW] | Nominal torque<br>Tn<br>[Nm] | Inertia<br>J<br>[kgcm <sup>2</sup> ] | Nominal voltage<br>Vn<br>[Vrms] | Nominal current<br>In<br>[Arms] | Magnetising current<br>Iμ<br>[Arms] | Nominal frequency<br>Fn<br>[Hz] | Max. speed at<br>Pn Nmax1<br>[min <sup>-1</sup> ] | Max. speed<br>Nmax2<br>[min <sup>-1</sup> ] | Weight<br>W<br>[kg] |
|---------------|-------|------|---------------------------------------------|-----------------------------|------------------------------|--------------------------------------|---------------------------------|---------------------------------|-------------------------------------|---------------------------------|---------------------------------------------------|---------------------------------------------|---------------------|
| MS54160MEB... | MS160 | M EB | 650                                         | 19                          | 279                          | 2400                                 | 395                             | 35                              | 13                                  | 23.0                            | 1000                                              | 6 000                                       | 255                 |
| MS54160MEC... |       | M EC | 850                                         | 24                          | 270                          | 2400                                 | 400                             | 43                              | 17                                  | 29.6                            | 1100                                              | 6 000                                       | 255                 |
| MS54160MEA... |       | M EA | 1000                                        | 28                          | 267                          | 2400                                 | 390                             | 51                              | 20                                  | 34.6                            | 1900                                              | 6 000                                       | 255                 |
| MS54160ME1... |       | M E1 | 1300                                        | 35                          | 257                          | 2400                                 | 400                             | 61                              | 24                                  | 44.6                            | 1700                                              | 6 000                                       | 255                 |
| MS54160MFC... |       | M FC | 1500                                        | 40                          | 255                          | 2400                                 | 390                             | 72                              | 28                                  | 51.2                            | 2900                                              | 6 000                                       | 255                 |
| MS54160MF1... |       | M F1 | 1800                                        | 45                          | 239                          | 2400                                 | 400                             | 79                              | 33                                  | 61.2                            | 2600                                              | 6 000                                       | 255                 |
| MS54160MFE... |       | M FE | 2000                                        | 48                          | 229                          | 2400                                 | 395                             | 86                              | 37                                  | 67.8                            | 3600                                              | 6 000                                       | 255                 |
| MS54160MF5... |       | M F5 | 2250                                        | 51                          | 216                          | 2400                                 | 390                             | 93                              | 42                                  | 76.1                            | 5000                                              | 6 000                                       | 255                 |
| MS54160MGB... |       | M GB | 2500                                        | 53                          | 202                          | 2400                                 | 400                             | 93                              | 44                                  | 84.3                            | 4100                                              | 6 000                                       | 255                 |
| MS54160LE6... |       | L E6 | 650                                         | 22                          | 323                          | 3020                                 | 395                             | 43                              | 16                                  | 22.9                            | 1000                                              | 6000                                        | 310                 |
| MS54160LE4... |       | L E4 | 850                                         | 28                          | 315                          | 3020                                 | 390                             | 56                              | 22                                  | 29.5                            | 1700                                              | 6000                                        | 310                 |
| MS54160LEA... |       | L EA | 1000                                        | 33                          | 315                          | 3020                                 | 400                             | 62                              | 23                                  | 34.5                            | 1200                                              | 6000                                        | 310                 |
| MS54160LE3... |       | L E3 | 1300                                        | 40                          | 294                          | 3020                                 | 395                             | 77                              | 31                                  | 44.4                            | 2300                                              | 6000                                        | 310                 |
| MS54160LFB... |       | L FB | 1500                                        | 45                          | 287                          | 3020                                 | 400                             | 84                              | 33                                  | 51.1                            | 2000                                              | 6000                                        | 310                 |
| MS54160LF1... |       | L F1 | 1750                                        | 50                          | 273                          | 3020                                 | 395                             | 96                              | 42                                  | 59.3                            | 3300                                              | 6000                                        | 310                 |
| MS54160LF2... |       | L F2 | 1950                                        | 53                          | 260                          | 3020                                 | 400                             | 100                             | 42                                  | 66.0                            | 2800                                              | 6000                                        | 310                 |
| MS54160LFA... |       | L FA | 2250                                        | 57                          | 242                          | 3020                                 | 400                             | 110                             | 52                                  | 75.9                            | 3700                                              | 6000                                        | 310                 |
| MS54160LG2... |       | L G2 | 2500                                        | 59                          | 225                          | 3020                                 | 400                             | 114                             | 55                                  | 84.2                            | 4100                                              | 6000                                        | 310                 |
| MS54160PE5... |       | P E5 | 650                                         | 23                          | 338                          | 3600                                 | 395                             | 47                              | 19                                  | 22.7                            | 1200                                              | 5 000                                       | 350                 |
| MS54160PEC... |       | P EC | 850                                         | 30                          | 337                          | 3600                                 | 400                             | 58                              | 22                                  | 29.4                            | 1100                                              | 5 000                                       | 350                 |
| MS54160PEA... |       | P EA | 1000                                        | 35                          | 334                          | 3600                                 | 390                             | 69                              | 30                                  | 34.3                            | 2300                                              | 5 000                                       | 350                 |
| MS54160PE2... |       | P E2 | 1300                                        | 44                          | 323                          | 3600                                 | 400                             | 83                              | 36                                  | 44.3                            | 2100                                              | 5 000                                       | 350                 |
| MS54160PFA... |       | P FA | 1500                                        | 49                          | 312                          | 3600                                 | 400                             | 93                              | 40                                  | 50.9                            | 2400                                              | 5 000                                       | 350                 |
| MS54160PF1... |       | P F1 | 1750                                        | 55                          | 300                          | 3600                                 | 400                             | 104                             | 46                                  | 59.2                            | 2800                                              | 5 000                                       | 350                 |
| MS54160PFB... |       | P FB | 2000                                        | 60                          | 286                          | 3600                                 | 390                             | 119                             | 56                                  | 67.5                            | 5000                                              | 5 000                                       | 350                 |
| MS54160PG1... |       | P G1 | 2400                                        | 64                          | 255                          | 3600                                 | 385                             | 133                             | 70                                  | 80.7                            | 5000                                              | 5 000                                       | 350                 |
| MS54160XE4..  |       | X E4 | 650                                         | 28                          | 411                          | 3900                                 | 395                             | 56                              | 22                                  | 22.8                            | 1000                                              | 4500                                        | 395                 |
| MS54160XEC..  |       | X EC | 850                                         | 36                          | 404                          | 3900                                 | 395                             | 69                              | 27                                  | 29.4                            | 1300                                              | 4500                                        | 395                 |
| MS54160XEA..  |       | X EA | 1000                                        | 41                          | 392                          | 3900                                 | 395                             | 81                              | 33                                  | 34.4                            | 2300                                              | 4500                                        | 395                 |
| MS54160XED..  |       | X ED | 1250                                        | 49                          | 374                          | 3900                                 | 395                             | 94                              | 39                                  | 42.7                            | 2000                                              | 4500                                        | 395                 |
| MS54160XFA..  |       | X FA | 1500                                        | 56                          | 357                          | 3900                                 | 385                             | 110                             | 49                                  | 50.9                            | 3700                                              | 4500                                        | 395                 |
| MS54160XF3..  |       | X F3 | 1700                                        | 60                          | 337                          | 3900                                 | 400                             | 114                             | 53                                  | 57.5                            | 2100                                              | 4500                                        | 395                 |
| MS54160XF1..  |       | X F1 | 1900                                        | 64                          | 322                          | 3900                                 | 400                             | 121                             | 56                                  | 64.2                            | 2200                                              | 4500                                        | 395                 |
| MS54160XFC..  |       | X FC | 2300                                        | 67                          | 278                          | 3900                                 | 395                             | 133                             | 69                                  | 77.4                            | 4500                                              | 4500                                        | 395                 |

## MS180 - MS225 Series: 31 kW - 202 kW, 3 x 400 VAC (IP54)

| Order Code     | Motor | Code | Nominal speed<br>nn<br>[min <sup>-1</sup> ] | Nominal power<br>Pn<br>[KW] | Nominal torque<br>Tn<br>[Nm] | Inertia<br>J<br>[kgcm <sup>2</sup> ] | Nominal voltage<br>Vn<br>[VRMS] | Nominal current<br>In<br>[ARMS] | Magnetising current<br>Iμ<br>[ARMS] | Nominal frequency<br>Fn<br>[Hz] | Max. speed at<br>Pn Nmax1<br>[min <sup>-1</sup> ] | Max. speed<br>Nmax2<br>[min <sup>-1</sup> ] | Weight<br>W<br>[kg] |
|----------------|-------|------|---------------------------------------------|-----------------------------|------------------------------|--------------------------------------|---------------------------------|---------------------------------|-------------------------------------|---------------------------------|---------------------------------------------------|---------------------------------------------|---------------------|
| MS54180ME3...  | MS180 | M E3 | 650                                         | 31                          | 455                          | 5050                                 | 395                             | 58                              | 24                                  | 22.4                            | 1000                                              | 4 500                                       | 480                 |
| MS54180MEC...  |       | M EC | 900                                         | 42                          | 446                          | 5050                                 | 400                             | 78                              | 34                                  | 30.7                            | 1200                                              | 4 500                                       | 480                 |
| MS54180MEA...  |       | M EA | 1000                                        | 46                          | 439                          | 5050                                 | 395                             | 85                              | 36                                  | 34.1                            | 1700                                              | 4 500                                       | 480                 |
| MS54180MEB...  |       | M EB | 1350                                        | 59                          | 417                          | 5050                                 | 395                             | 108                             | 48                                  | 45.7                            | 2400                                              | 4 500                                       | 480                 |
| MS54180MFB...  |       | M FB | 1500                                        | 64                          | 407                          | 5050                                 | 385                             | 123                             | 58                                  | 50.7                            | 3900                                              | 4 500                                       | 480                 |
| MS54180MFA...  |       | M FA | 1800                                        | 73                          | 387                          | 5050                                 | 400                             | 129                             | 56                                  | 60.7                            | 2300                                              | 4 500                                       | 480                 |
| MS54180MF2...  |       | M F2 | 2300                                        | 83                          | 345                          | 5050                                 | 395                             | 149                             | 60                                  | 77.4                            | 3600                                              | 4 500                                       | 480                 |
| MS54180MG1...  |       | M G1 | 2600                                        | 86                          | 316                          | 5050                                 | 395                             | 157                             | 65                                  | 87.4                            | 4200                                              | 4 500                                       | 480                 |
| MS54180PEB...  |       | P EB | 650                                         | 38                          | 558                          | 6300                                 | 395                             | 73                              | 30                                  | 22.6                            | 1000                                              | 4 500                                       | 550                 |
| MS54180PE5...  |       | P E5 | 850                                         | 49                          | 550                          | 6300                                 | 400                             | 91                              | 37                                  | 29.3                            | 1000                                              | 4 500                                       | 550                 |
| MS54180PE1...  |       | P E1 | 1000                                        | 57                          | 544                          | 6300                                 | 400                             | 107                             | 46                                  | 34.2                            | 1300                                              | 4 500                                       | 550                 |
| MS54180PE2...  |       | P E2 | 1250                                        | 69                          | 527                          | 6300                                 | 400                             | 128                             | 56                                  | 42.5                            | 1600                                              | 4 500                                       | 550                 |
| MS54180PEA...  |       | P EA | 1500                                        | 80                          | 509                          | 6300                                 | 400                             | 149                             | 65                                  | 50.9                            | 2000                                              | 4 500                                       | 550                 |
| MS54180PFA...  |       | P FA | 1800                                        | 91                          | 483                          | 6300                                 | 395                             | 174                             | 82                                  | 60.8                            | 3400                                              | 4 500                                       | 550                 |
| MS54180PF1...  |       | P F1 | 2250                                        | 100                         | 424                          | 6300                                 | 395                             | 183                             | 77                                  | 75.8                            | 3700                                              | 4 500                                       | 550                 |
| MS54180PG1...  |       | P G1 | 2600                                        | 105                         | 386                          | 6300                                 | 390                             | 195                             | 86                                  | 87.5                            | 4500                                              | 4 500                                       | 550                 |
| MS54180XEC...  |       | X EC | 650                                         | 42                          | 617                          | 7300                                 | 390                             | 82                              | 36                                  | 22.6                            | 1300                                              | 4000                                        | 600                 |
| MS54180XE4...  |       | X E4 | 850                                         | 54                          | 607                          | 7300                                 | 400                             | 100                             | 43                                  | 29.3                            | 1100                                              | 4000                                        | 600                 |
| MS54180XE3...  |       | X E3 | 1000                                        | 63                          | 602                          | 7300                                 | 390                             | 121                             | 54                                  | 34.2                            | 2100                                              | 4000                                        | 600                 |
| MS54180XEA...  |       | X EA | 1300                                        | 78                          | 573                          | 7300                                 | 390                             | 149                             | 67                                  | 44.2                            | 2800                                              | 4000                                        | 600                 |
| MS54180XFB...  |       | X FB | 1500                                        | 88                          | 560                          | 7300                                 | 400                             | 162                             | 72                                  | 50.9                            | 2000                                              | 4000                                        | 600                 |
| MS54180XF1...  |       | X F1 | 1800                                        | 99                          | 525                          | 7300                                 | 390                             | 192                             | 94                                  | 60.8                            | 4000                                              | 4000                                        | 600                 |
| MS54180XG1...  |       | X G1 | 2500                                        | 110                         | 420                          | 7300                                 | 400                             | 196                             | 82                                  | 84.2                            | 2800                                              | 4000                                        | 600                 |
| MS54225SSE7... | MS225 | S E7 | 650                                         | 46                          | 676                          | 10500                                | 395                             | 87                              | 30                                  | 22.4                            | 900                                               | 3 500                                       | 640                 |
| MS54225SEC...  |       | S EC | 850                                         | 58                          | 652                          | 10500                                | 400                             | 109                             | 42                                  | 29.0                            | 1100                                              | 3 500                                       | 640                 |
| MS54225SEA...  |       | S EA | 1000                                        | 67                          | 640                          | 10500                                | 400                             | 125                             | 46                                  | 34.0                            | 1300                                              | 3 500                                       | 640                 |
| MS54225SFB...  |       | S FB | 1300                                        | 82                          | 602                          | 10500                                | 395                             | 157                             | 68                                  | 43.9                            | 2400                                              | 3 500                                       | 640                 |
| MS54225SFA...  |       | S FA | 1500                                        | 93                          | 592                          | 10500                                | 390                             | 178                             | 75                                  | 50.6                            | 3100                                              | 3 500                                       | 640                 |
| MS54225SF1...  |       | S F1 | 1800                                        | 105                         | 557                          | 10500                                | 395                             | 200                             | 90                                  | 60.5                            | 3500                                              | 3 500                                       | 640                 |
| MS54225SF2...  |       | S F2 | 2100                                        | 116                         | 527                          | 10500                                | 400                             | 213                             | 87                                  | 70.5                            | 2900                                              | 3 500                                       | 640                 |
| MS54225LE3...  |       | L E3 | 650                                         | 64                          | 940                          | 15000                                | 385                             | 125                             | 48                                  | 22.3                            | 1400                                              | 3 500                                       | 860                 |
| MS54225LE6...  |       | L E6 | 850                                         | 81                          | 910                          | 15000                                | 400                             | 150                             | 58                                  | 29.0                            | 1100                                              | 3 500                                       | 860                 |
| MS54225LEC...  |       | L EC | 1000                                        | 94                          | 898                          | 15000                                | 385                             | 178                             | 71                                  | 33.9                            | 2400                                              | 3 500                                       | 860                 |
| MS54225LE2...  |       | L E2 | 1300                                        | 116                         | 852                          | 15000                                | 390                             | 219                             | 91                                  | 43.9                            | 2800                                              | 3 500                                       | 860                 |
| MS54225LFA...  |       | L FA | 1500                                        | 130                         | 828                          | 15000                                | 400                             | 235                             | 95                                  | 50.6                            | 2100                                              | 3 500                                       | 860                 |
| MS54225LF1...  |       | L F1 | 1800                                        | 142                         | 753                          | 15000                                | 390                             | 273                             | 124                                 | 60.5                            | 3500                                              | 3 500                                       | 860                 |
| MS54225XE3...  |       | X E3 | 650                                         | 92                          | 1352                         | 21300                                | 385                             | 175                             | 67                                  | 22.4                            | 1600                                              | 3 500                                       | 1080                |
| MS54225XE4...  |       | X E4 | 850                                         | 117                         | 1314                         | 21300                                | 395                             | 214                             | 82                                  | 29.0                            | 1500                                              | 3 500                                       | 1080                |
| MS54225XEB...  |       | X EB | 1000                                        | 135                         | 1289                         | 21300                                | 385                             | 252                             | 99                                  | 34.0                            | 2500                                              | 3 500                                       | 1080                |
| MS54225XE1...  |       | X E1 | 1300                                        | 166                         | 1220                         | 21300                                | 400                             | 300                             | 126                                 | 44.0                            | 1800                                              | 3 500                                       | 1080                |
| MS54225XFA...  |       | X FA | 1500                                        | 184                         | 1172                         | 21300                                | 400                             | 333                             | 143                                 | 50.6                            | 2100                                              | 3 500                                       | 1080                |
| MS54225XF1...  |       | X F1 | 1750                                        | 202                         | 1102                         | 21300                                | 395                             | 371                             | 164                                 | 58.9                            | 3500                                              | 3 500                                       | 1080                |

## MS280 Series: 143 kW - 342 kW, 3 x 400 VAC (IP54)

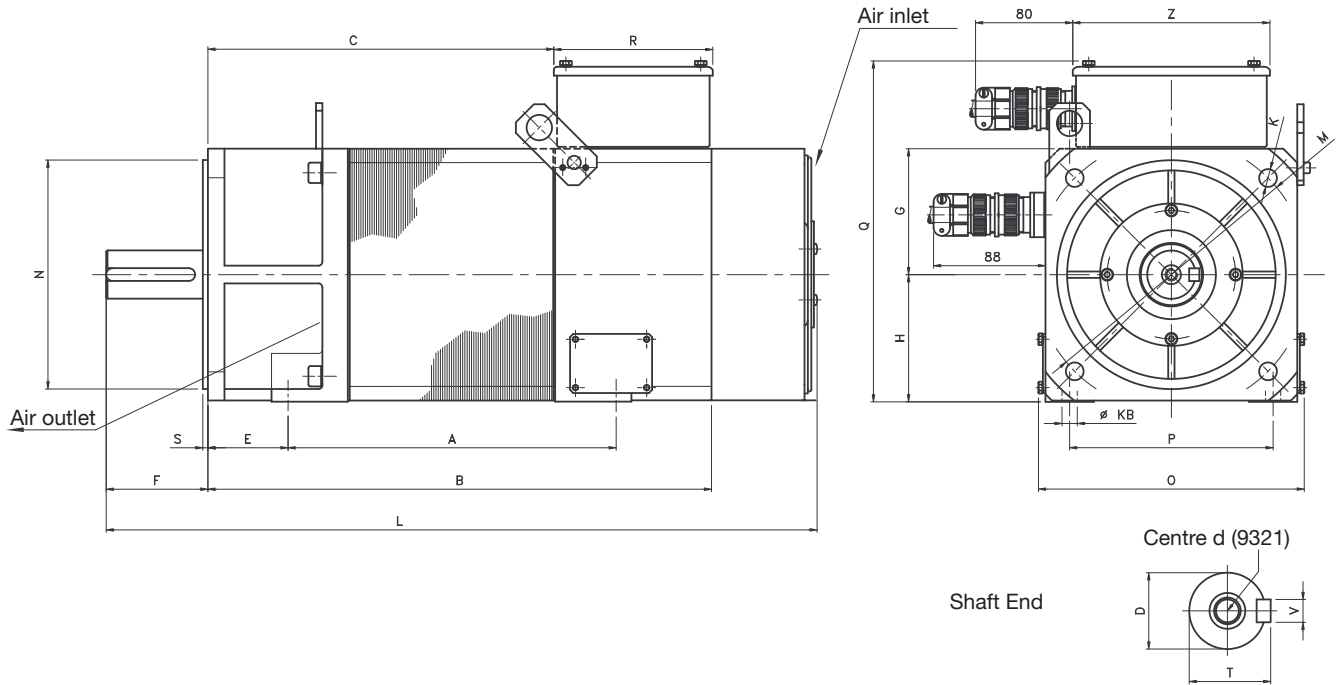
| Order Code    | Motor | Code | Nominal speed<br>nn<br>[min <sup>-1</sup> ] | Nominal power<br>Pn<br>[KW] | Nominal torque<br>Tn<br>[Nm] | Inertia<br>J<br>[kgcm <sup>2</sup> ] | Nominal voltage<br>Vn<br>[Vrms] | Nominal current<br>In<br>[ARMS] | Magnetising current<br>Iμ<br>[ARMS] | Nominal frequency<br>Fn<br>[Hz] | Max. speed at<br>Pn Nmax1<br>[min <sup>-1</sup> ] | Max. speed<br>Nmax2<br>[min <sup>-1</sup> ] | Weight<br>W<br>[kg] |
|---------------|-------|------|---------------------------------------------|-----------------------------|------------------------------|--------------------------------------|---------------------------------|---------------------------------|-------------------------------------|---------------------------------|---------------------------------------------------|---------------------------------------------|---------------------|
| MS54280MEA... | MS280 | M EA | 730                                         | 143                         | 1870                         | 39330                                | 400                             | 247                             | 77                                  | 24.8                            | 900                                               | 3 000                                       | 1290                |
| MS54280ME1... |       | M E1 | 880                                         | 169                         | 1834                         | 39330                                | 400                             | 291                             | 93                                  | 29.8                            | 1100                                              | 3 000                                       | 1290                |
| MS54280ME2... |       | M E2 | 1100                                        | 207                         | 1797                         | 39330                                | 400                             | 356                             | 117                                 | 37.1                            | 1400                                              | 3 000                                       | 1290                |
| MS54280MF1... |       | M F1 | 1500                                        | 270                         | 1719                         | 39330                                | 400                             | 461                             | 151                                 | 50.4                            | 1900                                              | 3 000                                       | 1290                |
| MS54280LEA... |       | L EA | 590                                         | 140                         | 2266                         | 47250                                | 400                             | 244                             | 79                                  | 20.1                            | 700                                               | 3000                                        | 1520                |
| MS54280LE1... |       | L E1 | 720                                         | 168                         | 2228                         | 47250                                | 400                             | 291                             | 92                                  | 24.4                            | 900                                               | 3000                                        | 1520                |
| MS54280LE2... |       | L E2 | 900                                         | 206                         | 2186                         | 47250                                | 400                             | 356                             | 118                                 | 30.4                            | 1200                                              | 3000                                        | 1520                |
| MS54280LF1... |       | L F1 | 1200                                        | 264                         | 2101                         | 47250                                | 395                             | 460                             | 155                                 | 40.4                            | 2100                                              | 3000                                        | 1520                |
| MS54280XEA... |       | X EA | 490                                         | 127                         | 2475                         | 56820                                | 400                             | 232                             | 89                                  | 16.8                            | 650                                               | 2800                                        | 1890                |
| MS54280XE1... |       | X E1 | 600                                         | 153                         | 2435                         | 56820                                | 400                             | 277                             | 104                                 | 20.4                            | 750                                               | 2800                                        | 1890                |
| MS54280XE2... |       | X E2 | 760                                         | 191                         | 2400                         | 56820                                | 400                             | 342                             | 129                                 | 25.8                            | 1000                                              | 2800                                        | 1890                |
| MS54280XF1... |       | X F1 | 1020                                        | 248                         | 2322                         | 56820                                | 400                             | 444                             | 173                                 | 34.4                            | 1400                                              | 2800                                        | 1890                |
| MS54280XF2... |       | X F2 | 1540                                        | 342                         | 2121                         | 56820                                | 400                             | 617                             | 262                                 | 51.7                            | 2200                                              | 2800                                        | 1890                |

## Motor cooling fans

| Motor  | Cooling method | Voltage<br>[V rms] | Current<br>[Arms] | Noise<br>[dB] | Voltage<br>[Vrms] | Current<br>[Arms] | Noise<br>[dB] | Air flow<br>[m³/h] | Pressure<br>[mmH₂O] |
|--------|----------------|--------------------|-------------------|---------------|-------------------|-------------------|---------------|--------------------|---------------------|
|        |                | Frequency 50 Hz    |                   |               | Frequency 60 Hz   |                   |               |                    |                     |
| MS 100 | IP54-PVAP      | 345-440            | 0.19              | 66            | 345-460           | 0.12              | 70            | 220                | 12                  |
| MS 133 | IP54-PVAP      | 345-480            | 0.34              | 74            | 345-480           | 0.31              | 78            | 720                | 17                  |
| MS 133 | IP23-PVA       | 315-500            | 1.1               | 75            | 380-600           | 1.1               | 79            | 930                | 93                  |
| MS 160 | IP54-PVAP      | 380-400            | 0.44              | 78            | 380-440           | 0.5               | 80            | 1100               | 21                  |
| MS 160 | IP23-PVA       | 300-460            | 2.6               | 78            | 360-510           | 2.38              | 82            | 1300               | 125                 |
| MS 180 | IP54/IP23-PVA  | 315-400            | 4.8               | 80            | 380-480           | 4.51              | 84            | 2200               | 120                 |
| MS 225 | IP54/IP23-PVA  | 380-400            | 6.3               | 86            | 460-480           | 6.0               | 86            | 3300               | 315                 |
| MS 280 | IP54/IP23-PVA  | 380-400            | 6.5               | 86            | 460-480           | 6.5               | 86            | 3900               | 285                 |

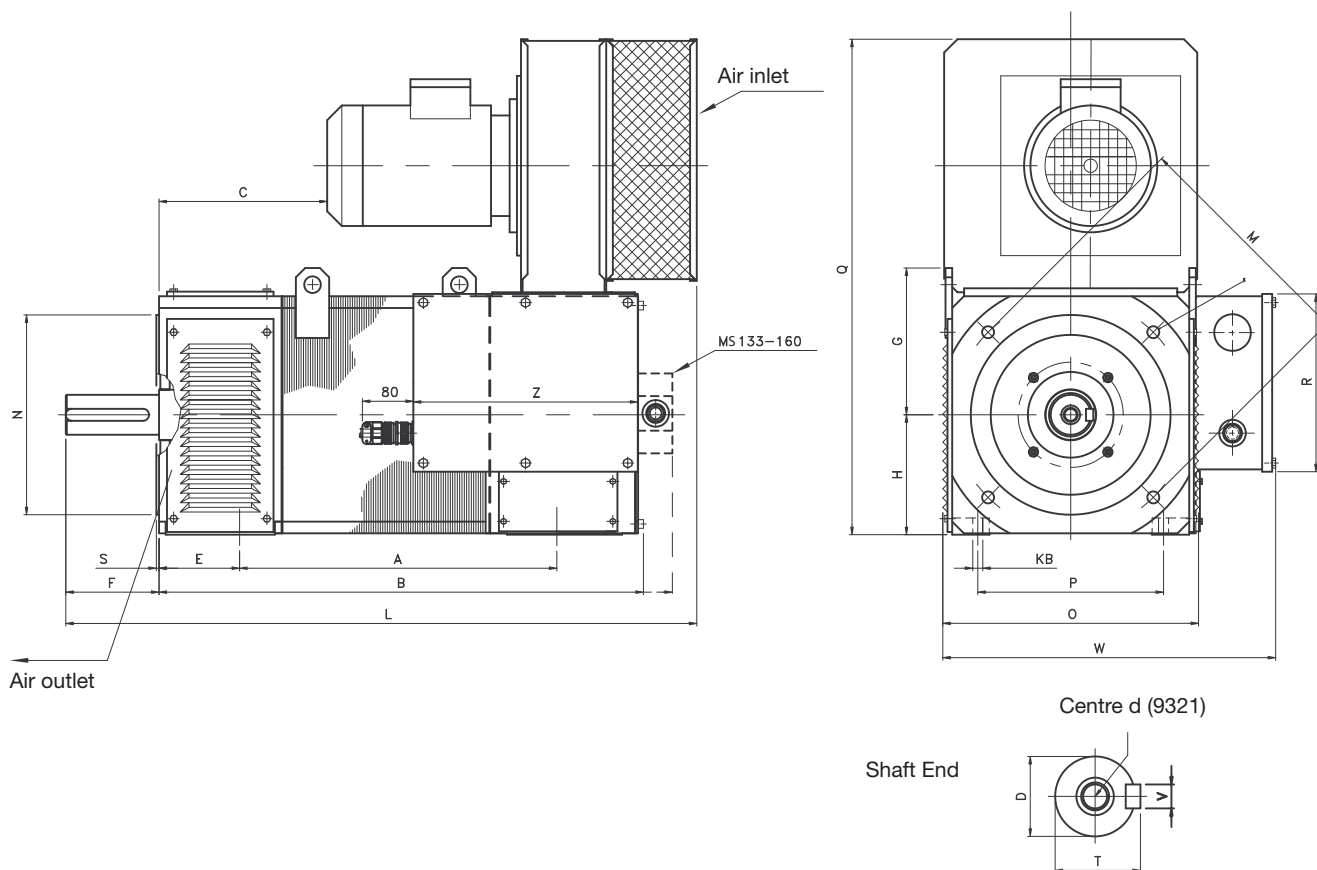
## Dimensions

### MS100 - MS133 - MS160 - IP54 PVAP Cooling Configuration



| Motor |   | A   | E   | S | F   | B   | L    | KB | P   | O   | M   | K  | H   | G   | Q   | N   | C   | R   | Z   | D  | T    | V  | d   |
|-------|---|-----|-----|---|-----|-----|------|----|-----|-----|-----|----|-----|-----|-----|-----|-----|-----|-----|----|------|----|-----|
| MS100 | S | 198 | 63  | 4 | 80  | 336 | 500  | 12 | 160 | 209 | 215 | 14 | 100 | 99  | 268 | 180 | 212 | 125 | 155 | 38 | 41   | 10 | M12 |
|       | M | 258 | 63  | 4 | 80  | 396 | 560  | 12 | 160 | 209 | 215 | 14 | 100 | 99  | 268 | 180 | 272 | 125 | 155 | 38 | 41   | 10 | M12 |
|       | L | 318 | 63  | 4 | 80  | 456 | 620  | 12 | 160 | 209 | 215 | 14 | 100 | 99  | 268 | 180 | 332 | 125 | 155 | 38 | 41   | 10 | M12 |
|       | P | 378 | 63  | 4 | 80  | 516 | 680  | 12 | 160 | 209 | 215 | 14 | 100 | 99  | 268 | 180 | 392 | 125 | 155 | 38 | 41   | 10 | M12 |
| MS133 | K | 308 | 66  | 5 | 110 | 478 | 690  | 13 | 216 | 271 | 300 | 18 | 132 | 130 | 345 | 250 | 310 | 170 | 245 | 48 | 51.5 | 14 | M16 |
|       | S | 368 | 66  | 5 | 110 | 538 | 750  | 13 | 216 | 271 | 300 | 18 | 132 | 130 | 345 | 250 | 370 | 170 | 245 | 48 | 51.5 | 14 | M16 |
|       | M | 408 | 66  | 5 | 110 | 578 | 790  | 13 | 216 | 271 | 300 | 18 | 132 | 130 | 345 | 250 | 410 | 170 | 245 | 48 | 51.5 | 14 | M16 |
|       | P | 473 | 66  | 5 | 110 | 643 | 855  | 13 | 216 | 271 | 300 | 18 | 132 | 130 | 345 | 250 | 475 | 170 | 245 | 48 | 51.5 | 14 | M16 |
| MS160 | M | 402 | 108 | 5 | 110 | 642 | 872  | 14 | 254 | 327 | 350 | 18 | 160 | 158 | 400 | 300 | 473 | 170 | 245 | 55 | 59   | 16 | M20 |
|       | L | 482 | 108 | 5 | 110 | 722 | 952  | 14 | 254 | 327 | 350 | 18 | 160 | 158 | 400 | 300 | 553 | 170 | 245 | 55 | 59   | 16 | M20 |
|       | P | 552 | 108 | 5 | 110 | 792 | 1022 | 14 | 254 | 327 | 350 | 18 | 160 | 158 | 400 | 300 | 623 | 170 | 245 | 55 | 59   | 16 | M20 |

## MS133 - MS160 - MS180 PVA Cooling Configuration



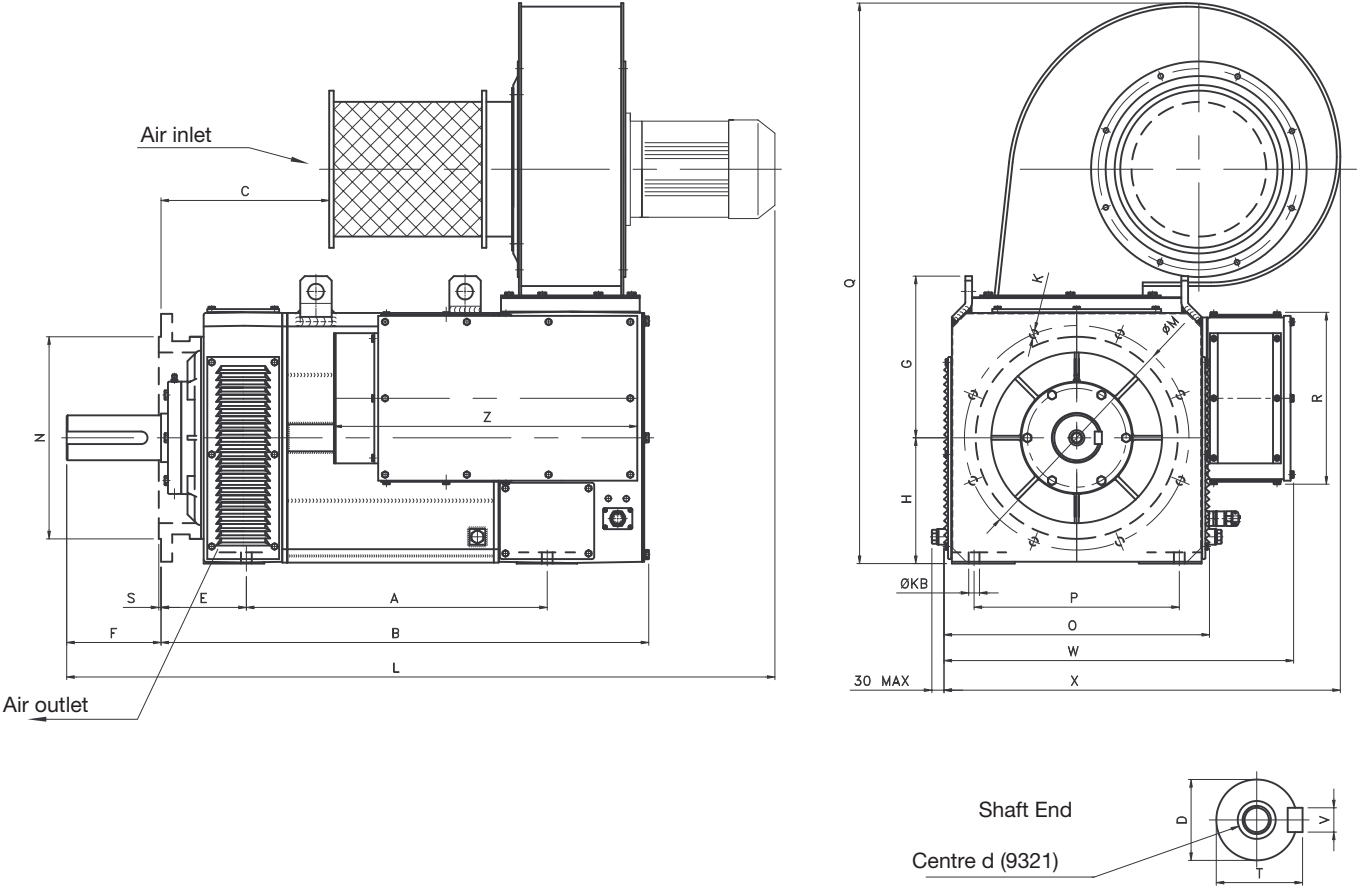
## MS133 - MS160 - IP23 PVA Cooling Configuration

| Motor |   | A   | E   | S | F   | B   | L   | KB | P   | O   | M   | K  | H   | G   | Q   | N   | C   | W   | R   | Z   | D  | T    | V  | d   |
|-------|---|-----|-----|---|-----|-----|-----|----|-----|-----|-----|----|-----|-----|-----|-----|-----|-----|-----|-----|----|------|----|-----|
| MS133 | K | 308 | 66  | 5 | 110 | 508 | 646 | 13 | 216 | 294 | 300 | 18 | 132 | 182 | 523 | 250 | 101 | 367 | 170 | 245 | 48 | 51.5 | 14 | M16 |
|       | S | 368 | 66  | 5 | 110 | 568 | 706 | 13 | 216 | 294 | 300 | 18 | 132 | 182 | 523 | 250 | 161 | 367 | 170 | 245 | 48 | 51.5 | 14 | M16 |
|       | M | 408 | 66  | 5 | 110 | 608 | 746 | 13 | 216 | 294 | 300 | 18 | 132 | 182 | 523 | 250 | 201 | 367 | 170 | 245 | 48 | 51.5 | 14 | M16 |
|       | P | 473 | 66  | 5 | 110 | 673 | 811 | 13 | 216 | 294 | 300 | 18 | 132 | 182 | 523 | 250 | 266 | 367 | 170 | 245 | 48 | 51.5 | 14 | M16 |
| MS160 | M | 402 | 108 | 5 | 110 | 675 | 835 | 14 | 254 | 350 | 350 | 18 | 160 | 206 | 637 | 300 | 228 | 423 | 170 | 245 | 55 | 59   | 16 | M20 |
|       | L | 482 | 108 | 5 | 110 | 755 | 915 | 14 | 254 | 350 | 350 | 18 | 160 | 206 | 637 | 300 | 308 | 423 | 170 | 245 | 55 | 59   | 16 | M20 |
|       | P | 552 | 108 | 5 | 110 | 825 | 985 | 14 | 254 | 350 | 350 | 18 | 160 | 206 | 637 | 300 | 378 | 423 | 170 | 245 | 55 | 59   | 16 | M20 |

## MS180 IP23 & IP54 PVA Cooling Configuration

| Motor |   | A   | E   | S | F   | B   | L    | KB | P   | O   | M   | K  | H   | G   | Q   | N   | C   | W   | R   | Z   | D  | T  | V  | d   |
|-------|---|-----|-----|---|-----|-----|------|----|-----|-----|-----|----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|-----|
| MS180 | M | 567 | 121 | 5 | 140 | 816 | 1039 | 15 | 279 | 394 | 350 | 18 | 180 | 215 | 740 | 300 | 344 | 505 | 267 | 337 | 60 | 64 | 18 | M20 |
|       | P | 667 | 121 | 5 | 140 | 916 | 1139 | 15 | 279 | 394 | 350 | 18 | 180 | 215 | 740 | 300 | 444 | 505 | 267 | 337 | 60 | 64 | 18 | M20 |

MS225 - MS280 - IP23 / IP54 PVA Cooling Configuration



| Motor |   | A   | E   | S | F   | B    | L    | KB | P   | O   | M   | K  | H   | G   | Q    | N   | C   | W   | X   | R   | Z   | D   | T    | V  | d   |
|-------|---|-----|-----|---|-----|------|------|----|-----|-----|-----|----|-----|-----|------|-----|-----|-----|-----|-----|-----|-----|------|----|-----|
| MS225 | S | 475 | 149 | 5 | 140 | 791  | 1203 | 19 | 356 | 482 | 400 | 18 | 225 | 272 | 1061 | 350 | 255 | 602 | 697 | 267 | 337 | 75  | 79.5 | 20 | M20 |
|       | L | 615 | 149 | 5 | 140 | 931  | 1343 | 19 | 356 | 482 | 400 | 18 | 225 | 272 | 1061 | 350 | 395 | 602 | 697 | 267 | 337 | 75  | 79.5 | 20 | M20 |
|       | X | 805 | 149 | 5 | 140 | 1121 | 1533 | 19 | 356 | 482 | 400 | 18 | 225 | 272 | 1061 | 350 | 585 | 602 | 697 | 267 | 337 | 75  | 79.5 | 20 | M20 |
| MS280 | M | 670 | 190 | 5 | 210 | 1086 | 1577 | 24 | 457 | 592 | 500 | 18 | 280 | 360 | 1248 | 450 | 375 | 780 | 882 | 383 | 676 | 100 | 106  | 28 | M24 |
|       | L | 770 | 190 | 5 | 210 | 1186 | 1677 | 24 | 457 | 592 | 500 | 18 | 280 | 360 | 1248 | 450 | 475 | 780 | 882 | 383 | 676 | 100 | 106  | 28 | M24 |
|       | X | 930 | 190 | 5 | 210 | 1346 | 1837 | 24 | 457 | 592 | 500 | 18 | 280 | 360 | 1248 | 450 | 635 | 780 | 882 | 383 | 676 | 100 | 106  | 28 | M24 |

## Order Code

### MS Series Motors

|               | 1  | 2  | 3    | 4  | 5 | 6 | 7  | 8 | 9 | 10 | 11   |
|---------------|----|----|------|----|---|---|----|---|---|----|------|
| Order example | MS | 23 | 100S | E1 | 1 | B | R0 | 0 | K | 1  | 0000 |

|                                     |             |                                                                                                                         |
|-------------------------------------|-------------|-------------------------------------------------------------------------------------------------------------------------|
| <b>1 Type of Motor</b>              | <b>MS</b>   | Square Frame Motor                                                                                                      |
| <b>2 IP Rating / Voltage</b>        | <b>23</b>   | IP23 / 360V                                                                                                             |
|                                     | <b>24</b>   | IP23 / 460V                                                                                                             |
|                                     | <b>53</b>   | IP54 / 360V                                                                                                             |
|                                     | <b>54</b>   | IP54 / 460V                                                                                                             |
| <b>3 Motor Frame Size</b>           | <b>100S</b> | Frame 100S                                                                                                              |
|                                     | <b>100M</b> | Frame 100M                                                                                                              |
|                                     | <b>100L</b> | Frame 100L                                                                                                              |
|                                     | <b>100P</b> | Frame 100P                                                                                                              |
|                                     | <b>133S</b> | Frame 133S                                                                                                              |
|                                     | <b>133M</b> | Frame 133M                                                                                                              |
|                                     | <b>133P</b> | Frame 133P                                                                                                              |
|                                     | <b>133K</b> | Frame 133K                                                                                                              |
|                                     | <b>133X</b> | Frame 133X                                                                                                              |
|                                     | <b>160M</b> | Frame 160M                                                                                                              |
|                                     | <b>160L</b> | Frame 160L                                                                                                              |
|                                     | <b>160P</b> | Frame 160P                                                                                                              |
|                                     | <b>160X</b> | Frame 160X                                                                                                              |
|                                     | <b>180M</b> | Frame 180M                                                                                                              |
|                                     | <b>180P</b> | Frame 180P                                                                                                              |
|                                     | <b>180X</b> | Frame 180X                                                                                                              |
|                                     | <b>225S</b> | Frame 225S                                                                                                              |
|                                     | <b>225L</b> | Frame 225L                                                                                                              |
|                                     | <b>225X</b> | Frame 225X                                                                                                              |
|                                     | <b>280M</b> | Frame 280M                                                                                                              |
|                                     | <b>280L</b> | Frame 280L                                                                                                              |
|                                     | <b>280X</b> | Frame 280X                                                                                                              |
| <b>4 Windings/Speed</b>             | <b>E1</b>   |                                                                                                                         |
|                                     | <b>E2</b>   |                                                                                                                         |
|                                     | <b>E3</b>   |                                                                                                                         |
|                                     | <b>E4</b>   |                                                                                                                         |
|                                     | <b>E5</b>   | Refer to motor technical features to identify the required frame size and winding combination to suit your requirements |
|                                     | <b>E6</b>   |                                                                                                                         |
|                                     | <b>E7</b>   |                                                                                                                         |
|                                     | <b>E8</b>   |                                                                                                                         |
|                                     | <b>EA</b>   |                                                                                                                         |
|                                     | <b>EB</b>   |                                                                                                                         |
|                                     | <b>EC</b>   |                                                                                                                         |
|                                     | <b>ED</b>   |                                                                                                                         |
| <b>4 Windings/Speed (continued)</b> | <b>F1</b>   |                                                                                                                         |
|                                     | <b>F2</b>   |                                                                                                                         |
|                                     | <b>F3</b>   |                                                                                                                         |
|                                     | <b>F5</b>   |                                                                                                                         |
|                                     | <b>FA</b>   | Refer to motor technical features to identify the required frame size and winding combination to suit your requirements |
|                                     | <b>FB</b>   |                                                                                                                         |
|                                     | <b>FC</b>   |                                                                                                                         |
|                                     | <b>FE</b>   |                                                                                                                         |
|                                     | <b>G1</b>   |                                                                                                                         |
|                                     | <b>G2</b>   |                                                                                                                         |
|                                     | <b>GA</b>   |                                                                                                                         |
|                                     | <b>GB</b>   |                                                                                                                         |
| <b>5 Mounting</b>                   | <b>1</b>    | Foot Mounting (B3)                                                                                                      |
|                                     | <b>2</b>    | Flange Mounting (B5)                                                                                                    |
|                                     | <b>3</b>    | Foot & Flange Mounting (B35)                                                                                            |
| <b>6 Brake</b>                      | <b>0</b>    | Not Fitted                                                                                                              |
|                                     | <b>B</b>    | Brake Fitted                                                                                                            |
| <b>7 Bearings/Rollers</b>           | <b>R0</b>   | Standard Roller Bearings                                                                                                |
|                                     | <b>RI</b>   | Insulated Roller Bearings                                                                                               |
|                                     | <b>BI</b>   | Insulated Ball Bearings                                                                                                 |
| <b>8 Motor Shaft</b>                | <b>0</b>    | Straight Shaft without Keyway                                                                                           |
|                                     | <b>1</b>    | Straight Shaft with Keyway                                                                                              |
| <b>9 Thermal Protection</b>         | <b>K</b>    | Klixon Protection                                                                                                       |
|                                     | <b>T</b>    | Thermistor Protection                                                                                                   |
|                                     | <b>P</b>    | PT100                                                                                                                   |
| <b>10 Feedback Device</b>           | <b>0</b>    | None                                                                                                                    |
|                                     | <b>1</b>    | 1024 PPR Encoder                                                                                                        |
|                                     | <b>2</b>    | 2048 PPR Encoder                                                                                                        |
|                                     | <b>3</b>    | Resolver (45 kHz)                                                                                                       |
| <b>11 Special Options</b>           | <b>0000</b> | None                                                                                                                    |

# Round Frame Three-Phase Induction Motors - MR Series Motor 0.09 kW - 315 kW

## Overview

### Description

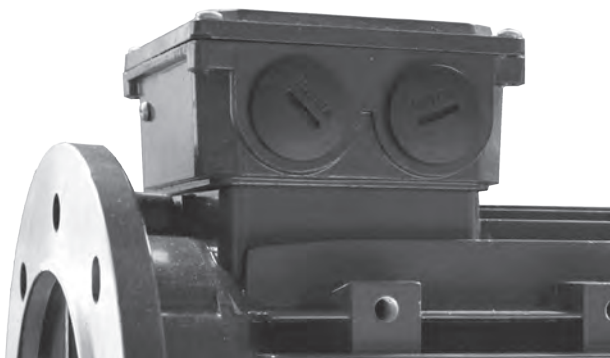
These IE2 efficiency round frame three-phase induction motors are suitable for use with the entire range of Parker variable speed AC drives. Featuring a durable rigid construction, these motors are specially engineered for use in heavy industrial applications. Featuring axial, In-Line force ventilation fan and optional 2048 ppr encoder, the round frame MR Series motor is suitable for general purpose open or closed-loop control applications. For higher dynamic performance, such as that required in printing or test rig applications, the MS series square frame vector motor should be considered.

- **Light aluminium body up to and including 160 frame size. Cast iron construction over 160 frame**
- **IP55 Protection as minimum**
- **Foot, flange, or foot and flange mounting options**
- **Insulation Class F (IEC - EN60034 -1)**
- **Auxiliary cooling fan allowing low-speed operation**
- **3x PTC thermistors embedded in motor stator as standard**
- **Holding brake or brake with hand release (Option)**
- **2048 ppr encoder (Option)**
- **2,4, or 6 poles (Option)**

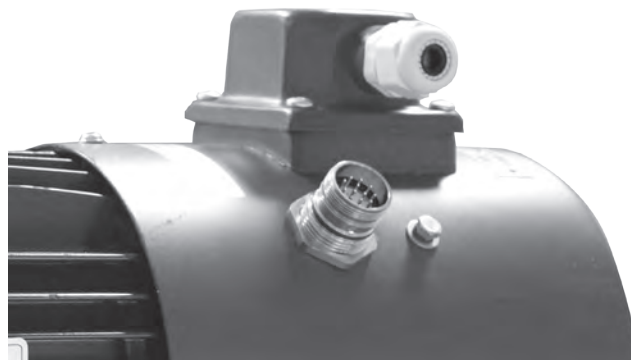


### Technical Characteristics - Overview

|                     |                                         |
|---------------------|-----------------------------------------|
| Motor type          | Round Frame Three-Phase Induction Motor |
| Power range         | 0.09 kW ... 315 kW                      |
| Speed range         | 0 – 3000 min <sup>-1</sup>              |
| Protection level    | IP55                                    |
| Insulation Class    | F (IEC – EN600034 -1)                   |
| Feedback            | Encoder (optional)                      |
| Suitable for drives | AC30V, AC690+, AC890, AC890PX-M         |



Generous motor terminal box for easy access



Simplified connection with a pre-wired encoder plug

## Technical Features

### MR Series: 2 Pole - 0.75 kW - 315 kW, 3 x 400 VAC

| Order Code   | Nominal Power P <sub>n</sub> [kW] | Frame Size  | Nominal speed n <sub>n</sub> [min <sup>-1</sup> ] | Full-load current at 400 V [A <sub>rms</sub> ] | Efficiency [%] | Power factor [cosφ] | Torque C <sub>n</sub> [Nm] | I <sub>s</sub> /I <sub>n</sub> | C <sub>s</sub> /C <sub>n</sub> |
|--------------|-----------------------------------|-------------|---------------------------------------------------|------------------------------------------------|----------------|---------------------|----------------------------|--------------------------------|--------------------------------|
| MR2P00018... | 0.18                              | TECA 563-2  | 2710                                              | 0.55                                           | 63             | 0.75                | -                          | 6                              | -                              |
| MR2P00025... | 0.25                              | TECA 632-2  | 2710                                              | 0.71                                           | 65             | 0.78                | -                          | 6                              | -                              |
| MR2P00037... | 0.37                              | TECA 633-2  | 2710                                              | 1.05                                           | 65             | 0.78                | -                          | 6                              | -                              |
| MR2P00055... | 0.55                              | TECA 712-2  | 2760                                              | 1.42                                           | 71             | 0.79                | -                          | 6                              | -                              |
| MR2P00075... | 0.75                              | MS2 801-2   | 2840                                              | 1.75                                           | 77.4           | 0.80                | 2.49                       | 5.8                            | 2.9                            |
| MR2P00110... | 1.1                               | MS2 802-2   | 2850                                              | 2.42                                           | 80             | 0.82                | 3.53                       | 6.8                            | 3.5                            |
| MR2P00150... | 1.5                               | MS2 90S-2   | 2850                                              | 3.20                                           | 81.4           | 0.83                | 5.09                       | 6.9                            | 3.5                            |
| MR2P00220... | 2.2                               | MS290L-2    | 2860                                              | 4.54                                           | 83.2           | 0.84                | 7.32                       | 7.9                            | 4.1                            |
| MR2P00300... | 3                                 | MS2 100L-2  | 2880                                              | 5.88                                           | 84.6           | 0.87                | 9.96                       | 7.8                            | 3.4                            |
| MR2P00400... | 4                                 | MS2 112M-2  | 2890                                              | 7.54                                           | 86             | 0.89                | 13.16                      | 7.5                            | 2.7                            |
| MR2P00550... | 5.5                               | MS2 132S1-2 | 2900                                              | 10.2                                           | 87.2           | 0.89                | 18.25                      | 7.7                            | 2.4                            |
| MR2P00750... | 7.5                               | MS2 132S2-2 | 2910                                              | 13.8                                           | 88.1           | 0.89                | 24.47                      | 8.4                            | 2.6                            |
| MR2P01100... | 11                                | MS2 160M1-2 | 2930                                              | 19.9                                           | 89.4           | 0.89                | 20.23                      | 7.6                            | 2.4                            |
| MR2P01500... | 15                                | MS2 160M2-2 | 2930                                              | 26.9                                           | 90.3           | 0.89                | 27.68                      | 8                              | 2.6                            |
| MR2P01850... | 18.5                              | MS2 160L-2  | 2940                                              | 32.6                                           | 90.9           | 0.90                | 33.42                      | 9                              | 3                              |
| MR2P02200... | 22                                | T2C 180M-2  | 2930                                              | 39.08                                          | 91.3           | 0.89                | 71.70                      | 7.5                            | 2.3                            |
| MR2P03000... | 30                                | T2C 200L1-2 | 2925                                              | 53.49                                          | 92             | 0.88                | 97.94                      | 6.7                            | 2.4                            |
| MR2P03700... | 37                                | T2C 200L2-2 | 2930                                              | 64.15                                          | 92.5           | 0.90                | 120.59                     | 6.3                            | 2.3                            |
| MR2P04500... | 45                                | T2C 225M-2  | 2930                                              | 79.45                                          | 92.9           | 0.88                | 146.66                     | 6.9                            | 2.3                            |
| MR2P05500... | 55                                | T2C 250M-2  | 2940                                              | 96.80                                          | 93.2           | 0.88                | 178.64                     | 8                              | 2.3                            |
| MR2P07500... | 75                                | T2C 280S-2  | 2940                                              | 125.45                                         | 93.8           | 0.92                | 243.60                     | 8                              | 2.2                            |
| MR2P09000... | 90                                | T2C 280M-2  | 2940                                              | 150.06                                         | 94.1           | 0.92                | 292.33                     | 7.7                            | 2.2                            |
| MR2P11000... | 110                               | T2C 315S-2  | 2940                                              | 187.08                                         | 94.3           | 0.90                | 357.29                     | 7.7                            | 2                              |
| MR2P13200... | 132                               | T2C 315M-2  | 2940                                              | 221.33                                         | 94.6           | 0.91                | 428.74                     | 7.6                            | 2                              |
| MR2P16000... | 160                               | T2C 315L1-2 | 2945                                              | 270.68                                         | 94.8           | 0.90                | 518.81                     | 7.8                            | 2                              |
| MR2P20000... | 200                               | T2C 315L2-2 | 2945                                              | 341.44                                         | 95             | 0.89                | 648.51                     | 7.9                            | 2                              |
| MR2P25000... | 250                               | T2C 355M-2  | 2945                                              | 422.05                                         | 95             | 0.90                | 810.64                     | 7.8                            | 2                              |
| MR2P31500... | 315                               | T2C355L-2   | 2945                                              | 537.76                                         | 95             | 0.89                | 1021.40                    | 7.8                            | 2                              |

Motors below 0.75 kW are not IE rated. For dimensions please contact your local sales office.

## MR Series: 4 Pole - 0.75 kW - 315 kW, 3 x 400 VAC

| Order Code   | Nominal Power P <sub>n</sub> [kW] | Frame Size  | Nominal speed n <sub>n</sub> [min <sup>-1</sup> ] | Full-load current at 400 V [A <sub>rms</sub> ] | Efficiency [%] | Power factor [cosφ] | Torque C <sub>n</sub> [Nm] | Is/In | Cs/Cn |
|--------------|-----------------------------------|-------------|---------------------------------------------------|------------------------------------------------|----------------|---------------------|----------------------------|-------|-------|
| MR4P00012... | 0.12                              | TECA 631-4  | 1360                                              | 0.55                                           | 52             | 0.64                | -                          | 4     | -     |
| MR4P00018... | 0.18                              | TECA 632-4  | 1310                                              | 0.7                                            | 57             | 0.65                | -                          | 4     | -     |
| MR4P00025... | 0.25                              | TECA 633-4  | 1340                                              | 0.91                                           | 60             | 0.66                | -                          | 4     | -     |
| MR4P00037... | 0.37                              | TECA 712-4  | 1370                                              | 1.11                                           | 65             | 0.74                | -                          | 6     | -     |
| MR4P00055... | 0.55                              | TECA 713-4  | 1380                                              | 1.6                                            | 66             | 0.75                | -                          | 6     | -     |
| MR4P00075... | 0.75                              | MS2 802-4   | 1410                                              | 1.79                                           | 79.6           | 0.76                | 5.27                       | 5.3   | 2.8   |
| MR4P00110... | 1.1                               | MS2 90S-4   | 1420                                              | 2.50                                           | 81.4           | 0.78                | 7.61                       | 6.7   | 3.8   |
| MR4P00150... | 1.5                               | MS2 90L-4   | 1420                                              | 3.31                                           | 82.8           | 0.79                | 10.39                      | 7.2   | 4     |
| MR4P00220... | 2.2                               | MS2 100L1-4 | 1440                                              | 4.83                                           | 84.3           | 0.78                | 14.76                      | 7.4   | 3.6   |
| MR4P00300... | 3                                 | MS2 100L2-4 | 1440                                              | 6.33                                           | 85.5           | 0.80                | 20.13                      | 7.8   | 3.8   |
| MR4P00400... | 4                                 | MS2 112M-4  | 1440                                              | 8.23                                           | 86.6           | 0.81                | 26.89                      | 7.1   | 3.1   |
| MR4P00550... | 5.5                               | MS2 132S-4  | 1450                                              | 10.9                                           | 87.9           | 0.83                | 36.25                      | 7.4   | 2.6   |
| MR4P00750... | 7.5                               | MS2 132M-4  | 1450                                              | 14.5                                           | 88.7           | 0.84                | 49.21                      | 7.7   | 2.8   |
| MR4P01100... | 11                                | MS2 160M-4  | 1450                                              | 21.6                                           | 89.8           | 0.82                | 71.86                      | 7.7   | 2.7   |
| MR4P01500... | 15                                | MS2 160L-4  | 1450                                              | 28.4                                           | 90.6           | 0.84                | 97.90                      | 7.3   | 2.4   |
| MR4P01850... | 18.5                              | MS2 180M-4  | 1460                                              | 34.4                                           | 91.4           | 0.85                | 121.32                     | 7.4   | 2.2   |
| MR4P02200... | 22                                | T2C 180L-4  | 1460                                              | 38.95                                          | 91.6           | 0.89                | 143.89                     | 7.5   | 2.3   |
| MR4P03000... | 30                                | T2C 200L-4  | 1460                                              | 53.31                                          | 92.3           | 0.88                | 196.22                     | 7.9   | 2.4   |
| MR4P03700... | 37                                | T2C 225S-4  | 1470                                              | 72.02                                          | 92.7           | 0.80                | 240.36                     | 6.7   | 2.4   |
| MR4P04500... | 45                                | T2C 225M-4  | 1480                                              | 87.21                                          | 93.1           | 0.80                | 290.35                     | 7     | 2.3   |
| MR4P05500... | 55                                | T2C 250M-4  | 1480                                              | 96.49                                          | 93.5           | 0.88                | 354.87                     | 7.4   | 2.4   |
| MR4P07500... | 75                                | T2C 280S-4  | 1480                                              | 126.56                                         | 94.0           | 0.91                | 483.92                     | 7.5   | 2.2   |
| MR4P09000... | 90                                | T2C 280M-4  | 1480                                              | 149.90                                         | 94.2           | 0.92                | 580.70                     | 7.7   | 2.25  |
| MR4P11000... | 110                               | T2C 315S-4  | 1480                                              | 186.69                                         | 94.5           | 0.90                | 709.75                     | 7.8   | 2     |
| MR4P13200... | 132                               | T2C 315M-4  | 1480                                              | 221.09                                         | 94.7           | 0.91                | 851.69                     | 7.8   | 2     |
| MR4P16000... | 160                               | T2C 315L1-4 | 1480                                              | 267.43                                         | 94.9           | 0.91                | 1032.36                    | 7.9   | 2     |
| MR4P20000... | 200                               | T2C 315L2-4 | 1480                                              | 337.29                                         | 95.1           | 0.90                | 1290.45                    | 7.7   | 2     |
| MR4P25000... | 250                               | T2C 355M-4  | 1480                                              | 426.35                                         | 95.1           | 0.89                | 1613.06                    | 7.9   | 2     |
| MR4P31500... | 315                               | T2C355L-4   | 1480                                              | 531.23                                         | 95.1           | 0.90                | 2032.45                    | 7.8   | 2     |

Motors below 0.75 kW are not IE rated. For dimensions please contact your local sales office.

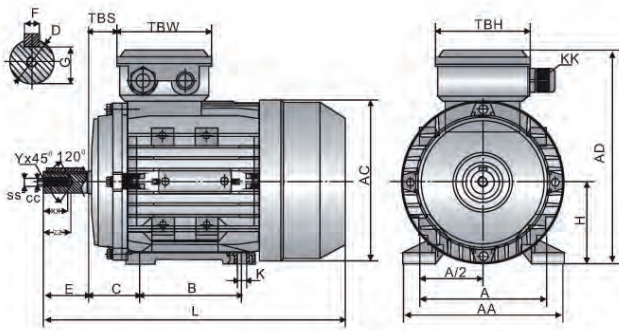
## MR Series: 6 Pole - 0.75 kW - 250 kW, 3 x 400 VAC

| Order Code   | Nominal Power P <sub>n</sub> [kW] | Frame Size  | Nominal speed n <sub>n</sub> [min <sup>-1</sup> ] | Full-load current at 400 V [A <sub>rms</sub> ] | Efficiency [%] | Power factor [cosφ] | Torque C <sub>n</sub> [Nm] | I <sub>s</sub> /I <sub>n</sub> | C <sub>s</sub> /C <sub>n</sub> |
|--------------|-----------------------------------|-------------|---------------------------------------------------|------------------------------------------------|----------------|---------------------|----------------------------|--------------------------------|--------------------------------|
| MR6P00009... | 0.09                              | TECA 631-6  | 840                                               | 0.51                                           | 42             | 0.61                | -                          | 3.5                            |                                |
| MR4P00012... | 0.12                              | TECA 632-6  | 850                                               | 0.62                                           | 45             | 0.62                | -                          | 3.5                            | -                              |
| MR4P00018... | 0.18                              | TECA 711-6  | 880                                               | 0.70                                           | 56             | 0.66                | -                          | 4                              | -                              |
| MR4P00025... | 0.25                              | TECA 712-6  | 900                                               | 0.87                                           | 59             | 0.7                 | -                          | 4                              | -                              |
| MR4P00037... | 0.37                              | TECA 713-6  | 890                                               | 1.27                                           | 61             | 0.69                | -                          | 6                              | -                              |
| MR4P00055... | 0.55                              | TECA 802-6  | 900                                               | 1.65                                           | 67             | 0.72                | -                          | 6                              | -                              |
| MR6P00075... | 0.75                              | MS2 90S-6   | 925                                               | 2.01                                           | 76.0           | 0.71                | 7.75                       | 4.7                            | 3.1                            |
| MR6P00110... | 1.1                               | MS2 90L-6   | 930                                               | 2.82                                           | 78.1           | 0.72                | 11.43                      | 5                              | 3.2                            |
| MR6P00150... | 1.5                               | MS2 100L-6  | 940                                               | 3.71                                           | 80.0           | 0.73                | 15.09                      | 5.9                            | 3.1                            |
| MR6P00220... | 2.2                               | MS2 112M-6  | 945                                               | 5.17                                           | 81.8           | 0.75                | 22.13                      | 5.5                            | 2.6                            |
| MR6P00300... | 3                                 | MS2 132S-6  | 960                                               | 6.84                                           | 83.3           | 0.76                | 30.32                      | 5.7                            | 2.2                            |
| MR6P00400... | 4                                 | MS2 132M1-6 | 960                                               | 8.86                                           | 84.6           | 0.77                | 41.25                      | 6.2                            | 2.4                            |
| MR6P00550... | 5.5                               | MS2 132M2-6 | 960                                               | 12.0                                           | 86             | 0.77                | 54.86                      | 6.7                            | 2.6                            |
| MR6P00750... | 7.5                               | MS2 160M-6  | 970                                               | 16.1                                           | 87.5           | 0.77                | 74.69                      | 5.6                            | 2                              |
| MR6P01100... | 11                                | MS2 160L-6  | 970                                               | 22.9                                           | 89.0           | 0.78                | 108.92                     | 5.8                            | 2                              |
| MR6P01500... | 15                                | MS2 180L-6  | 975                                               | 28.9                                           | 90.1           | 0.83                | 147.77                     | 7.5                            | 1.9                            |
| MR6P01850... | 18.5                              | MS2 200L1-6 | 975                                               | 35.6                                           | 90.4           | 0.83                | 180.32                     | 6.3                            | 2.2                            |
| MR6P02200... | 22                                | T2C 200L2-6 | 965                                               | 40.62                                          | 90.9           | 0.86                | 217.70                     | 7.9                            | 2.3                            |
| MR6P03000... | 30                                | T2C 225M-6  | 975                                               | 55.56                                          | 91.7           | 0.85                | 293.82                     | 7.9                            | 2.2                            |
| MR6P03700... | 37                                | T2C 250M-6  | 975                                               | 69.79                                          | 92.2           | 0.83                | 362.38                     | 7.5                            | 2.3                            |
| MR6P04500... | 45                                | T2C 280S-6  | 980                                               | 81.48                                          | 92.7           | 0.86                | 438.49                     | 7.2                            | 2.3                            |
| MR6P05500... | 55                                | T2C280M1-6  | 980                                               | 99.15                                          | 93.1           | 0.86                | 535.93                     | 7.7                            | 2.2                            |
| MR6P07500... | 75                                | T2C 315S-6  | 980                                               | 129.81                                         | 93.7           | 0.89                | 730.81                     | 7.9                            | 2.1                            |
| MR6P09000... | 90                                | T2C 315M-6  | 980                                               | 153.56                                         | 94             | 0.90                | 876.98                     | 7.9                            | 2                              |
| MR6P11000... | 110                               | T2C 315L1-6 | 980                                               | 187.08                                         | 94.3           | 0.90                | 1071.86                    | 7.7                            | 2                              |
| MR6P13200... | 132                               | T2C 315L2-6 | 980                                               | 226.30                                         | 94.6           | 0.89                | 1286.23                    | 7.8                            | 2                              |
| MR6P16000... | 160                               | T2C 355M1-6 | 980                                               | 267.71                                         | 94.8           | 0.91                | 1559.07                    | 7.8                            | 2                              |
| MR6P20000... | 200                               | T2C 355M2-6 | 980                                               | 337.64                                         | 95             | 0.90                | 1948.84                    | 7.8                            | 2                              |
| MR6P25000... | 250                               | T2C 355L-6  | 980                                               | 426.79                                         | 95             | 0.89                | 2436.06                    | 7.8                            | 2                              |

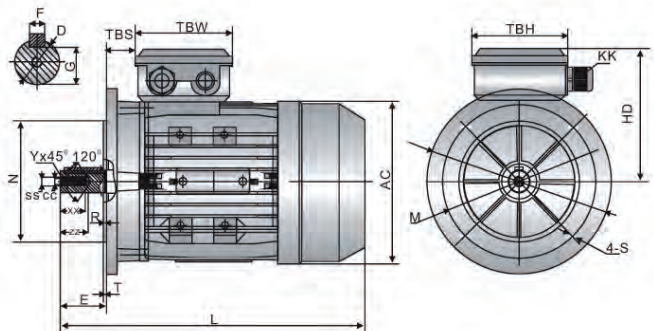
Motors below 0.75 kW are not IE rated. For dimensions please contact your local sales office.

# Dimensions

## MR Series Frames MS2



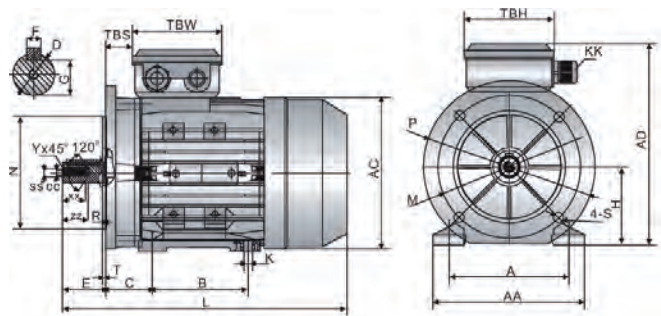
B3 Mounting



B5 Mounting

| Frame<br>MS2 | B3 Foot Mounting |     |         |     |         | Shaft |     |    |      |     |    |    | General |     |     |      |         |           |     |     |     |  |
|--------------|------------------|-----|---------|-----|---------|-------|-----|----|------|-----|----|----|---------|-----|-----|------|---------|-----------|-----|-----|-----|--|
|              | H                | A   | B       | C   | K       | D     | E   | F  | G    | SS  | XX | ZZ | AA      | AD  | HD  | AC   | L       | KK        | TBS | TBW | TBH |  |
| 56           | 56               | 90  | 71      | 36  | 5.8x8.8 | ø9    | 20  | 3  | 7.2  | M3  | 9  | 12 | 110     | 156 | 100 | ø117 | 196     | 1-M16x1.5 | 14  | 88  | 88  |  |
| 63           | 63               | 100 | 80      | 40  | 7x10    | ø11   | 23  | 4  | 8.5  | M4  | 10 | 14 | 120     | 171 | 108 | ø130 | 220     | 1-M16x1.5 | 14  | 94  | 94  |  |
| 71           | 71               | 112 | 90      | 45  | 7x10    | ø14   | 30  | 5  | 11   | M5  | 12 | 17 | 132     | 186 | 115 | ø147 | 241     | 1-M20x1.5 | 20  | 94  | 94  |  |
| 80           | 80               | 125 | 100     | 50  | 10x13   | ø19   | 40  | 6  | 15.5 | M6  | 16 | 21 | 160     | 213 | 133 | ø163 | 290     | 1-M20x1.5 | 27  | 105 | 105 |  |
| 90S          | 90               | 140 | 100     | 56  | 10x13   | ø24   | 50  | 8  | 20   | M8  | 19 | 25 | 175     | 229 | 139 | ø183 | 312     | 1-M20x1.5 | 30  | 105 | 105 |  |
| 90L1/L2      | 90               | 140 | 125     | 56  | 10x13   | ø24   | 50  | 8  | 20   | M8  | 19 | 25 | 175     | 229 | 139 | ø183 | 337/367 | 1-M20x1.5 | 30  | 105 | 105 |  |
| 100          | 100              | 160 | 140     | 63  | 12x15   | ø28   | 60  | 8  | 24   | M10 | 22 | 30 | 198     | 252 | 152 | ø205 | 369     | 2-M20x1.5 | 26  | 105 | 105 |  |
| 112          | 112              | 190 | 140     | 70  | 12x15   | ø28   | 60  | 8  | 24   | M10 | 22 | 30 | 220     | 279 | 167 | ø229 | 395     | 2-M25x1.5 | 32  | 112 | 112 |  |
| 132S         | 132              | 216 | 140     | 89  | 12x15   | ø38   | 80  | 10 | 33   | M12 | 28 | 37 | 252     | 318 | 186 | ø265 | 437     | 2-M25x1.5 | 38  | 112 | 112 |  |
| 132M/L       | 132              | 216 | 178     | 89  | 12x15   | ø38   | 80  | 10 | 33   | M12 | 28 | 37 | 252     | 318 | 186 | ø265 | 475/501 | 2-M25x1.5 | 38  | 112 | 112 |  |
| 160M/L       | 160              | 254 | 210/254 | 108 | 15x19   | ø42   | 110 | 12 | 37   | M16 | 36 | 45 | 290     | 384 | 224 | ø325 | 640     | 2-M32x1.5 | 64  | 143 | 143 |  |
| 180M/L       | 180              | 279 | 241/279 | 121 | 15x25   | ø48   | 110 | 14 | 42.5 | M18 | 36 | 45 | 340     | 440 | 260 | ø368 | 730     | 2-M32x1.5 | 73  | 190 | 190 |  |
| 200L         | 200              | 318 | 305     | 133 | 19x29   | ø55   | 110 | 16 | 49   | M20 | 42 | 53 | 390     | 460 | 260 | ø368 | 745     | 2-M32x1.5 | 85  | 190 | 190 |  |

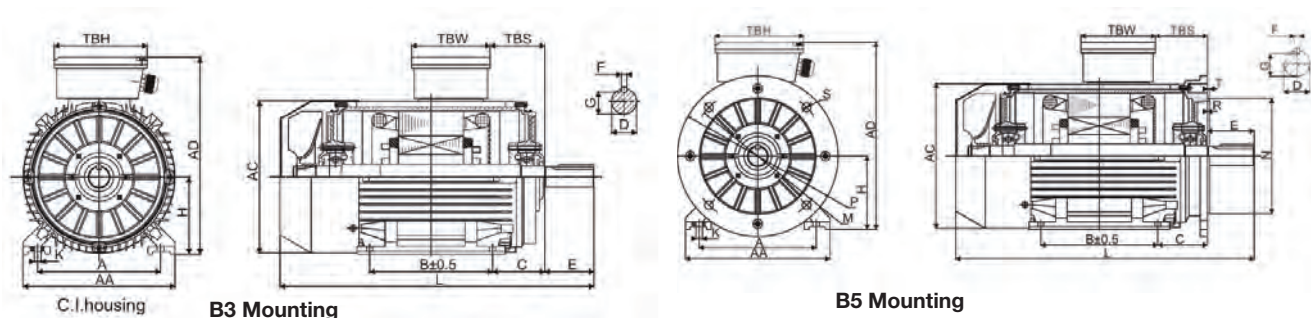
| Frame<br>MS2 | B5 Flange Mounting |      |      |     |     |   |
|--------------|--------------------|------|------|-----|-----|---|
|              | M                  | N    | P    | T   | S   | R |
| 56           | ø100               | ø80  | ø120 | 3.0 | ø7  | 0 |
| 63           | ø115               | ø95  | ø140 | 3.0 | ø10 | 0 |
| 71           | ø130               | ø110 | ø160 | 3.5 | ø10 | 0 |
| 80           | ø165               | ø130 | ø200 | 3.5 | ø12 | 0 |
| 90S          | ø165               | ø130 | ø200 | 3.5 | ø12 | 0 |
| 90L1/L2      | ø165               | ø130 | ø200 | 3.5 | ø12 | 0 |
| 100          | ø215               | ø180 | ø250 | 4.0 | ø15 | 0 |
| 112          | ø215               | ø180 | ø250 | 4.0 | ø15 | 0 |
| 132S         | ø265               | ø230 | ø300 | 4.0 | ø15 | 0 |
| 132M/L       | ø265               | ø230 | ø300 | 4.0 | ø15 | 0 |
| 160M/L       | ø300               | ø250 | ø350 | 5.0 | ø19 | 0 |
| 180M/L       | ø300               | ø250 | ø350 | 5.0 | ø19 | 0 |
| 200L         | ø350               | ø300 | ø400 | 5.0 | ø19 | 0 |



B35 Mounting

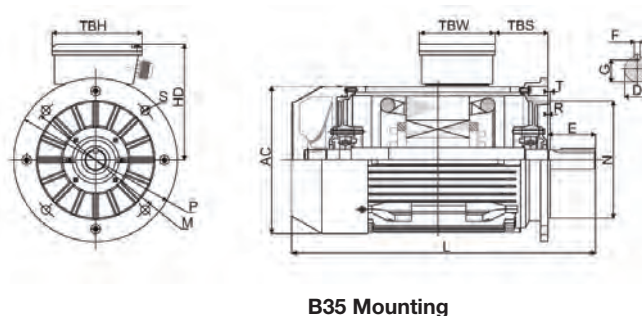
For Dimensions of Motors below 0.75 kW please contact your local sales office.

## MR Series Frames T2C



| Frame<br>T2C |          | B3 Foot Mounting |     |         |     | Shaft |     |    |      |     | General |      |     |     |          |         |     |     |
|--------------|----------|------------------|-----|---------|-----|-------|-----|----|------|-----|---------|------|-----|-----|----------|---------|-----|-----|
|              |          | H                | A   | B       | C   | D     | E   | F  | G    | K   | AA      | AD   | HD  | AC  | L        | TBS     | TBW | TBH |
| 180M/L       |          | 180              | 279 | 241/279 | 121 | ø48   | 110 | 14 | 42.5 | ø15 | 348     | 439  | 259 | 360 | 687/725  | 160/180 | 162 | 187 |
| 200L         |          | 200              | 318 | 305     | 133 | ø55   | 110 | 16 | 49   | ø19 | 388     | 497  | 297 | 399 | 768      | 192     | 186 | 233 |
| 225S         |          | 225              | 356 | 286     | 149 | ø60   | 140 | 18 | 53   | ø19 | 436     | 553  | 328 | 465 | 814      | 190     | 186 | 233 |
| 225M         | 2 Pole   | 225              | 356 | 311     | 149 | ø55   | 110 | 16 | 49   | ø19 | 436     | 553  | 328 | 456 | 809      | 202     | 186 | 233 |
|              | 4,6 Pole | 225              | 356 | 311     | 149 | ø60   | 140 | 18 | 53   | ø19 | 436     | 553  | 328 | 465 | 839      | 202     | 186 | 233 |
| 250M         | 2 Pole   | 250              | 406 | 349     | 168 | ø60   | 140 | 18 | 53   | ø24 | 484     | 616  | 366 | 506 | 918      | 233     | 218 | 260 |
|              | 4,6 Pole | 250              | 406 | 349     | 168 | ø65   | 140 | 18 | 58   | ø24 | 484     | 616  | 366 | 506 | 918      | 233     | 218 | 260 |
| 280S/M       | 2 Pole   | 280              | 457 | 368/419 | 190 | ø65   | 140 | 18 | 58   | ø24 | 557     | 668  | 388 | 559 | 984/1035 | 265     | 218 | 260 |
|              | 4,6 Pole | 280              | 457 | 368/419 | 190 | ø75   | 140 | 20 | 67.5 | ø24 | 557     | 668  | 388 | 559 | 984/1035 | 265     | 218 | 260 |
| 315S         | 2 Pole   | 315              | 457 | 406     | 216 | ø65   | 140 | 18 | 58   | ø28 | 630     | 845  | 530 | 680 | 1205     | 130     | 280 | 320 |
|              | 4,6 Pole | 315              | 508 | 406     | 216 | ø80   | 170 | 22 | 71   | ø28 | 630     | 845  | 530 | 680 | 1235     | 130     | 280 | 320 |
| 315M/L       | 2 Pole   | 315              | 508 | 457/508 | 216 | ø65   | 140 | 18 | 58   | ø28 | 630     | 845  | 530 | 680 | 1355     | 130     | 280 | 320 |
|              | 4,6 Pole | 315              | 508 | 457/508 | 216 | ø80   | 170 | 22 | 71   | ø28 | 630     | 845  | 530 | 680 | 1385     | 130     | 280 | 320 |
| 355M/L       | 2 Pole   | 355              | 610 | 560/630 | 254 | ø75   | 140 | 20 | 67.5 | ø28 | 740     | 1010 | 655 | 820 | 1500     | HO      | 330 | 380 |
|              | 4,6 Pole | 355              | 610 | 560/630 | 254 | ø100  | 210 | 28 | 90   | ø28 | 740     | 1010 | 655 | 820 | 1570     | 140     | 330 | 380 |

| Frame<br>T2C |          | B5 Flange Mounting |     |     |       |   |   |
|--------------|----------|--------------------|-----|-----|-------|---|---|
|              |          | N                  | M   | P   | S     | T | R |
| 180M/L       |          | 250                | 300 | 350 | 4-ø19 | 5 | 0 |
| 200L         |          | 300                | 350 | 400 | 4-ø19 | 5 | 0 |
| 225S         |          | 350                | 400 | 450 | 8-ø19 | 5 | 0 |
| 225M         | 2 Pole   | 350                | 400 | 450 | 8-ø19 | 5 | 0 |
|              | 4,6 Pole | 350                | 400 | 450 | 8-ø19 | 5 | 0 |
| 250M         | 2 Pole   | 450                | 500 | 550 | 8-ø19 | 5 | 0 |
|              | 4,6 Pole | 450                | 500 | 550 | 8-ø19 | 5 | 0 |
| 280S/M       | 2 Pole   | 450                | 500 | 550 | 8-ø19 | 5 | 0 |
|              | 4,6 Pole | 450                | 500 | 550 | 8-ø19 | 5 | 0 |
| 355M/L       | 2 Pole   | 550                | 600 | 660 | 8-ø24 | 6 | 0 |



For Dimensions of Motors below 0.75 kW please contact your local sales office.

## Auxiliary Fans

All frame sizes can be supplied with cooling system IC416 (forced ventilation). In this case a suitable fan is fitted inside the fan cover and suitably reinforced. We always recommend forced ventilation on motors used below 25 Hz or above 75 Hz. Consequently the ventilation is independant of the rotation speed of the motor itself.

| Frame Size | Three Phase Supply Voltage [VAC] | Supply Frequency [Hz] | Input Power [W] | Single Phase Supply Voltage [VAC] | Supply Frequency [Hz] | Input Power [W] | Overall length L (increasing) [mm] |
|------------|----------------------------------|-----------------------|-----------------|-----------------------------------|-----------------------|-----------------|------------------------------------|
| 63         | 230/400                          | 50                    | 20              | 230                               | 50                    | 17              | 92                                 |
| 71         | 230/400                          | 50                    | 25              | 230                               | 50                    | 33              | 92                                 |
| 80         | 230/400                          | 50                    | 29              | 230                               | 50                    | 35              | 98                                 |
| 90         | 230/400                          | 50                    | 32              | 230                               | 50                    | 45              | 97                                 |
| 100        | 230/400                          | 50                    | 58              | 230                               | 50                    | 30              | 103                                |
| 112        | 230/400                          | 50                    | 69              | 230                               | 50                    | 35              | 93                                 |
| 132        | 230/400                          | 50                    | 52              | 230                               | 50                    | 32              | 109                                |
| 160        | 230/400                          | 50                    | 70              | 230                               | 50                    | 50              | 145                                |
| 180        | 230/400                          | 50                    | 85              | 230                               | 50                    | 47              | 130                                |
| 200        | 230/400                          | 50                    | 105             | 230                               | 50                    | 49              | 140                                |
| 225        | 230/400                          | 50                    | 105             | 230                               | 50                    | 70              | 160                                |
| 250        | 230/400                          | 50                    | 115             | 230                               | 50                    | 126             | 167                                |
| 280        | 230/400                          | 50                    | 180             | 230                               | 50                    | 149             | 175                                |
| 315        | 230/400                          | 50                    | 480             | 230                               | 50                    | -               | 205                                |
| 355        | 230/400                          | 50                    | 400             | 230                               | 50                    | -               | 205                                |

When an encoder is mounted with the ventilation option, dimension L does not change and remains the same as the motor with independant ventilation.

## Order Code

### MR Series Motors

|               | 1         | 2         | 3            | 4        | 5        | 6        | 7        | 8        | 9        | 10       | 11          |
|---------------|-----------|-----------|--------------|----------|----------|----------|----------|----------|----------|----------|-------------|
| Order example | <b>MR</b> | <b>2P</b> | <b>00018</b> | <b>1</b> | <b>B</b> | <b>R</b> | <b>1</b> | <b>T</b> | <b>1</b> | <b>1</b> | <b>0000</b> |

|              |                                        |
|--------------|----------------------------------------|
| <b>1</b>     | <b>Type Of Motor (mandatory field)</b> |
| <b>MR</b>    | Round Frame Motor                      |
| <b>2</b>     | <b>Motor Type</b>                      |
| <b>2P</b>    | 2 Pole                                 |
| <b>4P</b>    | 4 Pole                                 |
| <b>6P</b>    | 6 Pole                                 |
| <b>3</b>     | <b>Motor Rating</b>                    |
| <b>00009</b> | 0.09 kW (6 Pole only)                  |
| <b>00012</b> | 0.12 kW (not available as 2 Pole)      |
| <b>00018</b> | 0.18 kW                                |
| <b>00025</b> | 0.25 kW                                |
| <b>00037</b> | 0.37 kW                                |
| <b>00055</b> | 0.55 kW                                |
| <b>00075</b> | 0.75 kW                                |
| <b>00110</b> | 1.1 kW                                 |
| <b>00150</b> | 1.5 kW                                 |
| <b>00220</b> | 2.2 kW                                 |
| <b>00300</b> | 3 kW                                   |
| <b>00400</b> | 4 kW                                   |
| <b>00550</b> | 5.5 kW                                 |
| <b>00750</b> | 7.5 kW                                 |
| <b>01100</b> | 11 kW                                  |
| <b>01500</b> | 15 kW                                  |
| <b>01850</b> | 18.5 kW                                |
| <b>02200</b> | 22 kW                                  |
| <b>03000</b> | 30 kW                                  |
| <b>03700</b> | 37 kW                                  |
| <b>04500</b> | 45 kW                                  |
| <b>05500</b> | 55 kW                                  |
| <b>07500</b> | 75 kW                                  |
| <b>09000</b> | 90 kW                                  |
| <b>11000</b> | 110 kW                                 |
| <b>13200</b> | 132 kW                                 |
| <b>16000</b> | 160 kW                                 |
| <b>20000</b> | 200 kW                                 |
| <b>22000</b> | 220 kW                                 |
| <b>25000</b> | 250 kW                                 |
| <b>28000</b> | 280 kW (not available as 6 Pole)       |
| <b>31500</b> | 315 kW (not available as 6 Pole)       |

|             |                                     |
|-------------|-------------------------------------|
| <b>4</b>    | <b>Mounting</b>                     |
| <b>1</b>    | Foot Mounting (B3)                  |
| <b>2</b>    | Flange Mounting (B5)                |
| <b>3</b>    | Foot & Flange Mounting (B35)        |
| <b>5</b>    | <b>Brake</b>                        |
| <b>0</b>    | Not Fitted                          |
| <b>B</b>    | Brake Fitted                        |
| <b>H</b>    | Hand Brake Fitted                   |
| <b>6</b>    | <b>Bearings/Rollers</b>             |
| <b>B</b>    | Bearings                            |
| <b>R</b>    | Rollers                             |
| <b>7</b>    | <b>Force Ventilation Fan</b>        |
| <b>0</b>    | None                                |
| <b>1</b>    | Single Phase                        |
| <b>2</b>    | Three Phase                         |
| <b>8</b>    | <b>Protection (mandatory field)</b> |
| <b>T</b>    | Thermistors                         |
| <b>9</b>    | <b>Feedback Device</b>              |
| <b>0</b>    | None                                |
| <b>1</b>    | 2048 ppr Encoder                    |
| <b>10</b>   | <b>IP Rating (mandatory field)</b>  |
| <b>1</b>    | IP55                                |
| <b>11</b>   | <b>Special Options</b>              |
| <b>0000</b> | None                                |



# Parker's Motion & Control Technologies

At Parker, we're guided by a relentless drive to help our customers become more productive and achieve higher levels of profitability by engineering the best systems for their requirements. It means looking at customer applications from many angles to find new ways to create value. Whatever the motion and control technology need, Parker has the experience, breadth of product and global reach to consistently deliver. No company knows more about motion and control technology than Parker. For further info call 00800 27 27 5374



## Aerospace

### Key Markets

Aftermarket services  
Commercial transports  
Engines  
General & business aviation  
Helicopters  
Launch vehicles  
Military aircraft  
Missiles  
Power generation  
Regional transports  
Unmanned aerial vehicles

### Key Products

Control systems & actuation products  
Engine systems & components  
Fluid conveyance systems & components  
Fluid metering, delivery & atomization devices  
Fuel systems & components  
Fuel tank inerting systems  
Hydraulic systems & components  
Thermal management  
Wheels & brakes



## Climate Control

### Key Markets

Agriculture  
Air conditioning  
Construction Machinery  
Food & beverage  
Industrial machinery  
Life sciences  
Oil & gas  
Precision cooling  
Process  
Refrigeration  
Transportation

### Key Products

Accumulators  
Advanced actuators  
CO<sub>2</sub> controls  
Electronic controllers  
Filter driers  
Hand shut-off valves  
Heat exchangers  
Hose & fittings  
Pressure regulating valves  
Refrigerant distributors  
Safety relief valves  
Smart pumps  
Solenoid valves  
Thermostatic expansion valves



## Electromechanical

### Key Markets

Aerospace  
Factory automation  
Life science & medical  
Machine tools  
Packaging machinery  
Paper machinery  
Plastics machinery & converting  
Primary metals  
Semiconductor & electronics  
Textile  
Wire & cable

### Key Products

AC/DC drives & systems  
Electric actuators, gantry robots & slides  
Electrohydraulic actuation systems  
Electromechanical actuation systems  
Human machine interface  
Linear motors  
Stepper motors, servo motors, drives & controls  
Structural extrusions



## Filtration

### Key Markets

Aerospace  
Food & beverage  
Industrial plant & equipment  
Life sciences  
Marine  
Mobile equipment  
Oil & gas  
Power generation & renewable energy  
Process  
Transportation  
Water Purification

### Key Products

Analytical gas generators  
Compressed air filters & dryers  
Engine air, coolant, fuel & oil filtration systems  
Fluid condition monitoring systems  
Hydraulic & lubrication filters  
Hydrogen, nitrogen & zero air generators  
Instrumentation filters  
Membrane & fiber filters  
Microfiltration  
Sterile air filtration  
Water desalination & purification filters & systems



## Fluid & Gas Handling

### Key Markets

Aerial lift  
Agriculture  
Bulk chemical handling  
Construction machinery  
Food & beverage  
Fuel & gas delivery  
Industrial machinery  
Life sciences  
Marine  
Mining  
Mobile  
Oil & gas  
Renewable energy  
Transportation

### Key Products

Check valves  
Connectors for low pressure fluid conveyance  
Deep sea umbilicals  
Diagnostic equipment  
Hose couplings  
Industrial hose  
Mooring systems & power cables  
PTFE hose & tubing  
Quick couplings  
Rubber & thermoplastic hose  
Tube fittings & adapters  
Tubing & plastic fittings



## Hydraulics

### Key Markets

Aerial lift  
Agriculture  
Alternative energy  
Construction machinery  
Forestry  
Industrial machinery  
Machine tools  
Marine  
Material handling  
Mining  
Oil & gas  
Power generation  
Refuse vehicles  
Renewable energy  
Truck hydraulics  
Turf equipment

### Key Products

Accumulators  
Cartridge valves  
Electrohydraulic actuators  
Human machine interfaces  
Hybrid drives  
Hydraulic cylinders  
Hydraulic motors & pumps  
Hydraulic systems  
Hydraulic valves & controls  
Hydrostatic steering  
Integrated hydraulic circuits  
Power take-offs  
Power units  
Rotary actuators  
Sensors



## Pneumatics

### Key Markets

Aerospace  
Conveyor & material handling  
Factory automation  
Life science & medical  
Machine tools  
Packaging machinery  
Transportation & automotive

### Key Products

Air preparation  
Brass fittings & valves  
Manifolds  
Pneumatic accessories  
Pneumatic actuators & grippers  
Pneumatic valves & controls  
Quick disconnects  
Rotary actuators  
Rubber & thermoplastic hose & couplings  
Structural extrusions  
Thermoplastic tubing & fittings  
Vacuum generators, cups & sensors



## Process Control

### Key Markets

Alternative fuels  
Biopharmaceuticals  
Chemical & refining  
Food & beverage  
Marine & shipbuilding  
Medical & dental  
Microelectronics  
Nuclear Power  
Offshore oil exploration  
Oil & gas  
Pharmaceuticals  
Power generation  
Pulp & paper  
Steel  
Water/wastewater

### Key Products

Analytical Instruments  
Analytical sample conditioning products & systems  
Chemical injection fittings & valves  
Fluoropolymer chemical delivery fittings, valves & pumps  
High purity gas delivery fittings, valves, regulators & digital flow controllers  
Industrial mass flow meters/controllers  
Permanent no-weld tube fittings  
Precision industrial regulators & flow controllers  
Process control double block & bleeds  
Process control fittings, valves, regulators & manifold valves



## Sealing & Shielding

### Key Markets

Aerospace  
Chemical processing  
Consumer  
Fluid power  
General Industrial  
Information technology  
Life sciences  
Microelectronics  
Military  
Oil & gas  
Power generation  
Renewable energy  
Telecommunications  
Transportation

### Key Products

Dynamic seals  
Elastomeric o-rings  
Electro-medical instrument design & assembly  
EMI shielding  
Extruded & precision-cut, fabricated elastomeric seals  
High temperature metal seals  
Homogeneous & inserted elastomeric shapes  
Medical device fabrication & assembly  
Metal & plastic retained composite seals  
Shielded optical windows  
Silicone tubing & extrusions  
Thermal management  
Vibration dampening

# Parker Worldwide

## Europe, Middle East, Africa

**AE – United Arab Emirates, Dubai**  
Tel: +971 4 8127100  
parker.me@parker.com

**AT – Austria, Wiener Neustadt**  
Tel: +43 (0)2622 23501-0  
parker.austria@parker.com

**AT – Eastern Europe, Wiener Neustadt**  
Tel: +43 (0)2622 23501 900  
parker.easteurope@parker.com

**AZ – Azerbaijan, Baku**  
Tel: +994 50 2233 458  
parker.azerbaijan@parker.com

**BE/LU – Belgium, Nivelles**  
Tel: +32 (0)67 280 900  
parker.belgium@parker.com

**BG – Bulgaria, Sofia**  
Tel: +359 2 980 1344  
parker.bulgaria@parker.com

**BY – Belarus, Minsk**  
Tel: +375 17 209 9399  
parker.belarus@parker.com

**CH – Switzerland, Etoy**  
Tel: +41 (0)21 821 87 00  
parker.switzerland@parker.com

**CZ – Czech Republic, Klecany**  
Tel: +420 284 083 111  
parker.czechrepublic@parker.com

**DE – Germany, Kaarst**  
Tel: +49 (0)2131 4016 0  
parker.germany@parker.com

**DK – Denmark, Ballerup**  
Tel: +45 43 56 04 00  
parker.denmark@parker.com

**ES – Spain, Madrid**  
Tel: +34 902 330 001  
parker.spain@parker.com

**FI – Finland, Vantaa**  
Tel: +358 (0)20 753 2500  
parker.finland@parker.com

**FR – France, Contamine s/Arve**  
Tel: +33 (0)4 50 25 80 25  
parker.france@parker.com

**GR – Greece, Athens**  
Tel: +30 210 933 6450  
parker.greece@parker.com

**HU – Hungary, Budaörs**  
Tel: +36 23 885 470  
parker.hungary@parker.com

**IE – Ireland, Dublin**  
Tel: +353 (0)1 466 6370  
parker.ireland@parker.com

**IT – Italy, Corsico (MI)**  
Tel: +39 02 45 19 21  
parker.italy@parker.com

**KZ – Kazakhstan, Almaty**  
Tel: +7 7273 561 000  
parker.easteurope@parker.com

**NL – The Netherlands, Oldenzaal**  
Tel: +31 (0)541 585 000  
parker.nl@parker.com

**NO – Norway, Asker**  
Tel: +47 66 75 34 00  
parker.norway@parker.com

**PL – Poland, Warsaw**  
Tel: +48 (0)22 573 24 00  
parker.poland@parker.com

**PT – Portugal, Leca da Palmeira**  
Tel: +351 22 999 7360  
parker.portugal@parker.com

**RO – Romania, Bucharest**  
Tel: +40 21 252 1382  
parker.romania@parker.com

**RU – Russia, Moscow**  
Tel: +7 495 645-2156  
parker.russia@parker.com

**SE – Sweden, Spånga**  
Tel: +46 (0)8 59 79 50 00  
parker.sweden@parker.com

**SK – Slovakia, Banská Bystrica**  
Tel: +421 484 162 252  
parker.slovakia@parker.com

**SL – Slovenia, Novo Mesto**  
Tel: +386 7 337 6650  
parker.slovenia@parker.com

**TR – Turkey, Istanbul**  
Tel: +90 216 4997081  
parker.turkey@parker.com

**UA – Ukraine, Kiev**  
Tel: +380 44 494 2731  
parker.ukraine@parker.com

**UK – United Kingdom, Warwick**  
Tel: +44 (0)1926 317 878  
parker.uk@parker.com

**ZA – South Africa, Kempton Park**  
Tel: +27 (0)11 961 0700  
parker.southafrica@parker.com

## North America

**CA – Canada, Milton, Ontario**  
Tel: +1 905 693 3000

**US – USA, Cleveland**  
Tel: +1 216 896 3000

## Asia Pacific

**AU – Australia, Castle Hill**  
Tel: +61 (0)2-9634 7777

**CN – China, Shanghai**  
Tel: +86 21 2899 5000

**HK – Hong Kong**  
Tel: +852 2428 8008

**IN – India, Mumbai**  
Tel: +91 22 6513 7081-85

**JP – Japan, Tokyo**  
Tel: +81 (0)3 6408 3901

**KR – South Korea, Seoul**  
Tel: +82 2 559 0400

**MY – Malaysia, Shah Alam**  
Tel: +60 3 7849 0800

**NZ – New Zealand, Mt Wellington**  
Tel: +64 9 574 1744

**SG – Singapore**  
Tel: +65 6887 6300

**TH – Thailand, Bangkok**  
Tel: +662 186 7000-99

**TW – Taiwan, Taipei**  
Tel: +886 2 2298 8987

## South America

**AR – Argentina, Buenos Aires**  
Tel: +54 3327 44 4129

**BR – Brazil, Sao Jose dos Campos**  
Tel: +55 800 727 5374

**CL – Chile, Santiago**  
Tel: +56 2 623 1216

**MX – Mexico, Toluca**  
Tel: +52 72 2275 4200

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### EMEA Product Information Centre

**Free phone: 00 800 27 27 5374**

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### US Product Information Centre

**Toll-free number: 1-800-27 27 537**

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